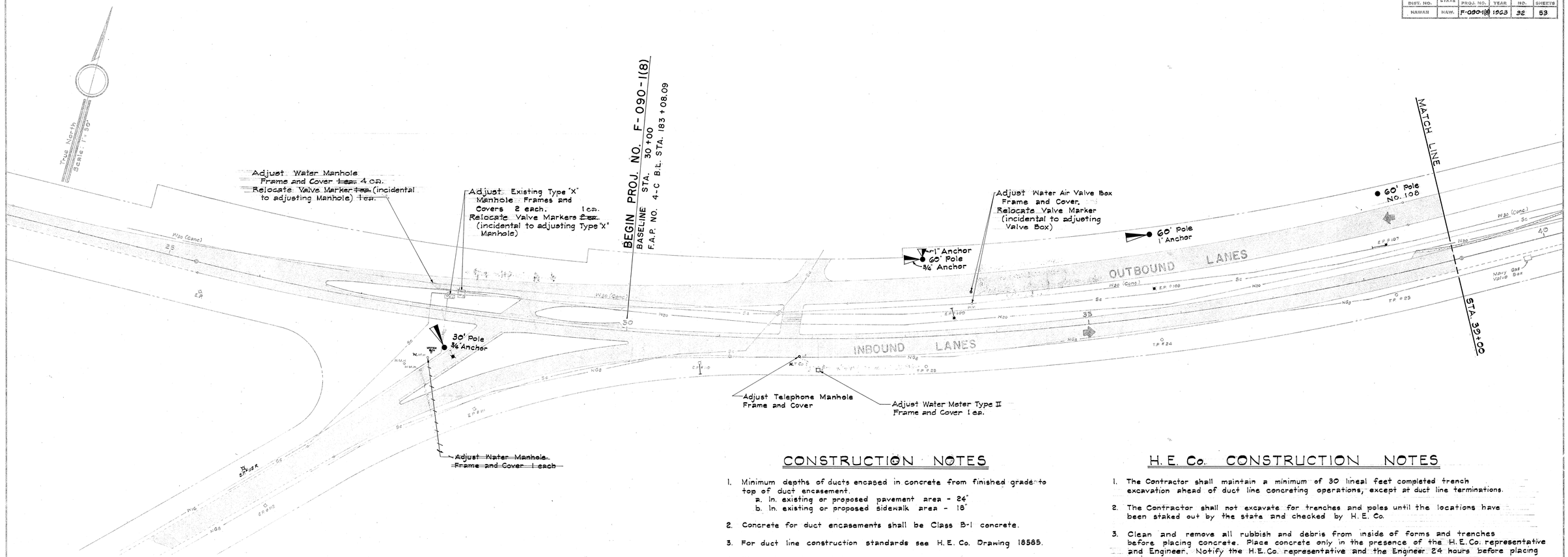
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
NAWAH	HAW.	F-090-1(8)	1963	32	53



CONSTRUCTION NOTES

1. Minimum depths of ducts encased in concrete from finished grade to top of duct encasement.
   a. In existing or proposed pavement area - 24"
   b. In existing or proposed sidewalk area - 18"
2. Concrete for duct encasements shall be Class B-1 concrete.
3. For duct line construction standards see H. E. Co. Drawing 18565.
4. Slope to drain duct lines.
5. Existing Poles to be removed by others.
6. All new poles and anchors belong to H. E. Co. unless otherwise noted in the Plans.

H. E. Co. CONSTRUCTION NOTES

1. The Contractor shall maintain a minimum of 30 lineal feet completed trench excavation ahead of duct line concreting operations, except at duct line terminations.
2. The Contractor shall not excavate for trenches and poles until the locations have been staked out by the state and checked by H. E. Co.
3. Clean and remove all rubbish and debris from inside of forms and trenches before placing concrete. Place concrete only in the presence of the H. E. Co. representative and Engineer. Notify the H. E. Co. representative and the Engineer 24 hours before placing any concrete.
4. Notify H. E. Co. five (5) days in advance of any work required to be done by them.

UTILITY LEGEND

O	Proposed Poles
O E.P.	Existing Electric Poles
O E.P.	Electric Poles to be removed
▷	Proposed Anchors
⊢	Existing Anchors
(S. W.)	Sidewalk Anchor
E	Proposed Electric duct line encased in Concrete.
O T.P.	Existing Telephone Pole
O L.P.	Existing Light Pole
—W8"—	Existing Water Main
—Sc—	Existing Signal Corp Cable
—NG8—	Existing Navy Gas Line
—Sa—	Existing Sewer Line
—G2—	Existing Gas Line

APPROVED:

A.O. Henderson for F.A.K. 10-9-63
DISTR. ENGR., H.E CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

UTILITIES

ELECTRIC-TELEPHONE-WATER-SEWER

FARRINGTON HIGHWAY
PROJECT NO: — F-090-1(8)

Scale: As Shown Date: Aug., 1963

SHEET No. 1 OF 8 SHEETS

32

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

ULTT 3103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(8)	1963	33	53

APPROVED:

A.D. Henderson for FAK 10-9-63
DISTR. ENGR., H.E. CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

UTILITIES

ELECTRIC-TELEPHONE-WATER-SEWER

FARRINGTON HIGHWAY
PROJECT NO: —— F-090-1(8)

Scale: As Shown Date: Aug., 1963

SHEET Nº 2 OF 8 SHEETS

33

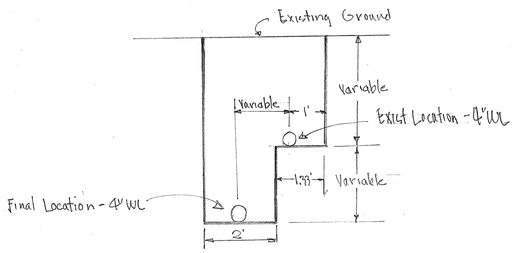
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(8)	1965	33A	55

FARRINGTON HIGHWAY WIDENING

FAP NO F-090-1(8)

SEPTEMBER 22, 1964

LOWING OF EXIST. 4" WATER MAIN FOR WAI-KAI STP

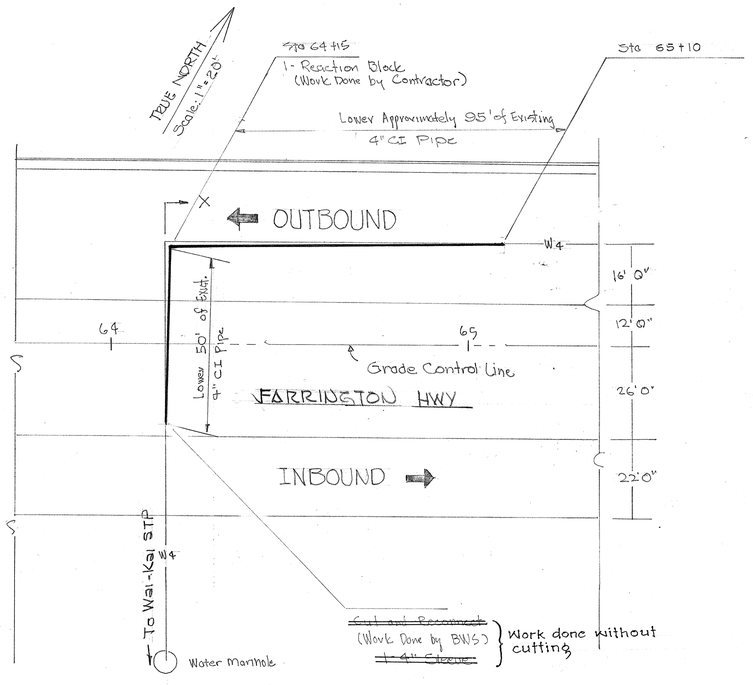


Typical Section

NOTES:

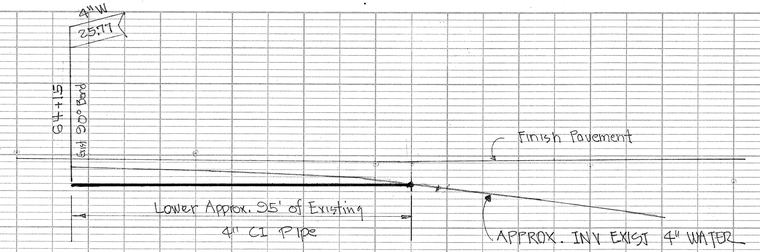
Approximately 145 lin ft. of Existing 4" Cast Iron Pipe to be lowered in the same trench to a depth of 3' cover under the roadway. Work to be done without any new bends (Max defl. - 16.7" for 18' length)

1) Excavation, fine grade and backfill to be done by Contractor
2) Cutting, lowering and reconnecting to be done by the Board of Water Supply.
3) All materials for lowering and reconnection of the 4-inch line will be furnished by the Board of Water Supply

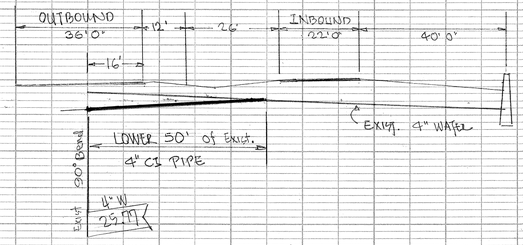


APPROVED:

[signature] 10/5/64



PROFILE - OUTBOUND LANES



STATION 64+15 (Section X-X)

64 65 66

30 20 30 20

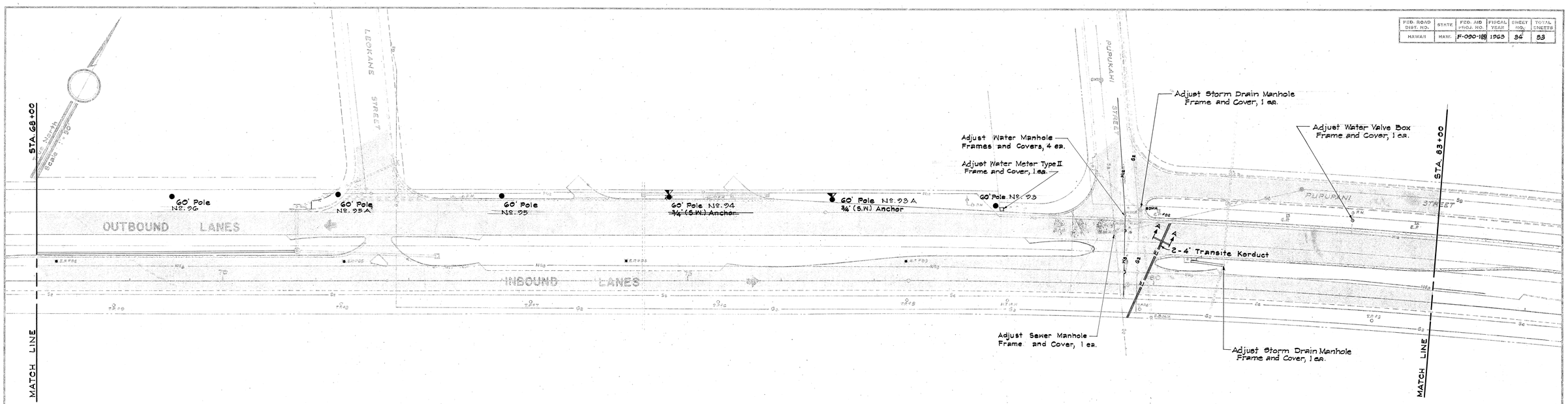
PLATE 1 - PLAN - PROFILE O. P. R. & R. E. STANDARD
KEUFFEL & ESSER CO., NEW YORK.

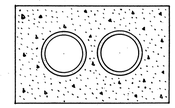
K & E Co. No. 345-1 MADE IN U.S.A. 44918

33 A

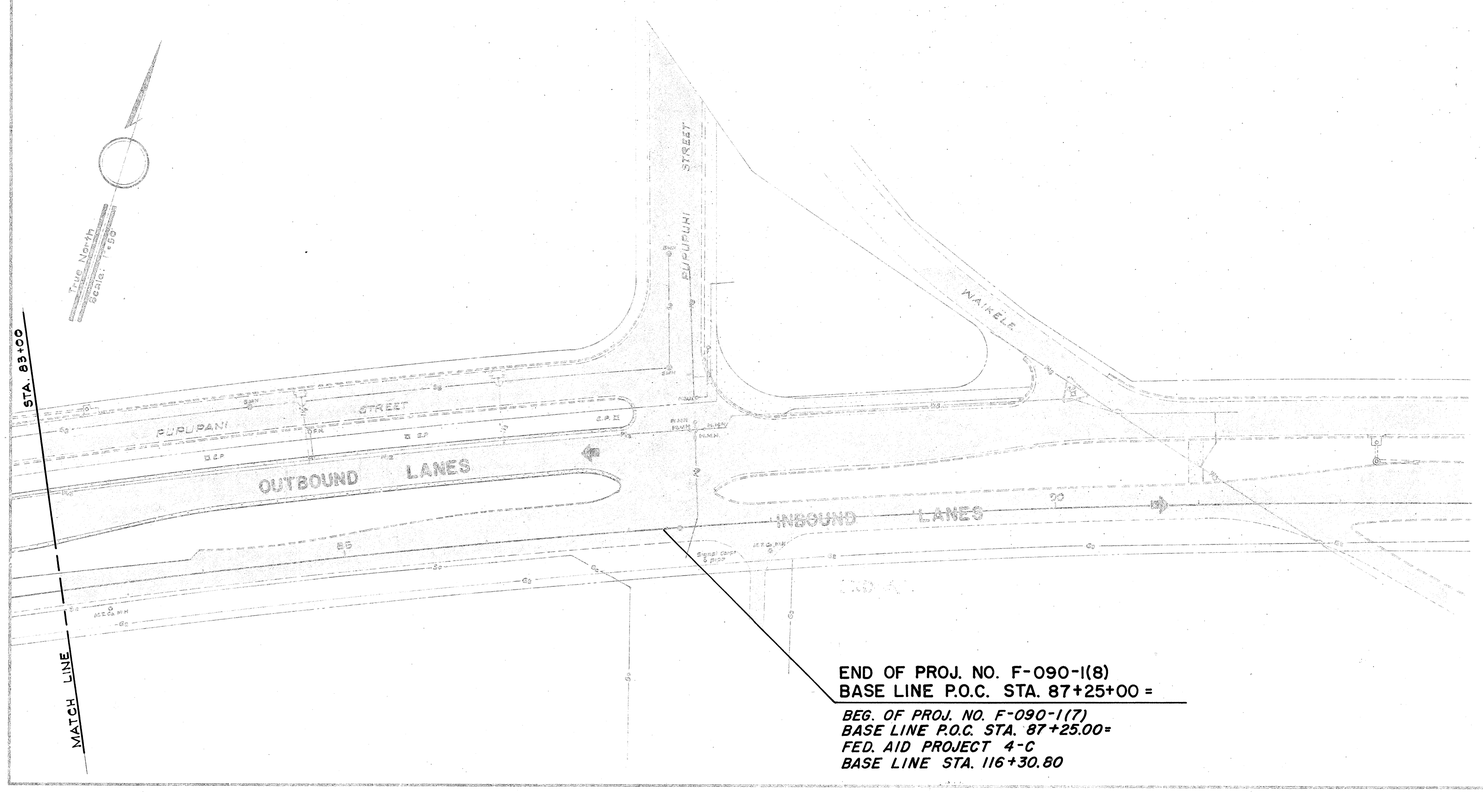
33A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-090-1(8)	1963	34	53





SECTION "AA"
2-4" Transite Korduct
Not to Scale
For Dimensions see sht. 37



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

APPROVED:

R.P. Henderson for E.A.K. 10-9-63
DISTR. ENGR., H.E. CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION

UTILITIES

ELECTRIC-TELEPHONE-WATER-SEWER

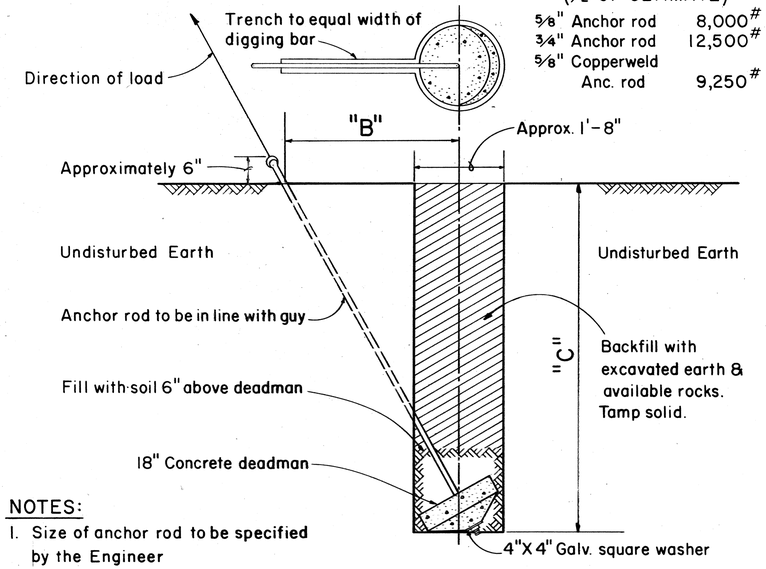
FARRINGTON HIGHWAY
PROJECT NO: —— F-090-1(8)

Scale: As Shown Date: Aug., 1963

SHEET No. 3 OF 8 SHEETS

33 41

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-090-1(8)	1963	35	53



ALLOWABLE LOAD
(½ OF ULTIMATE)

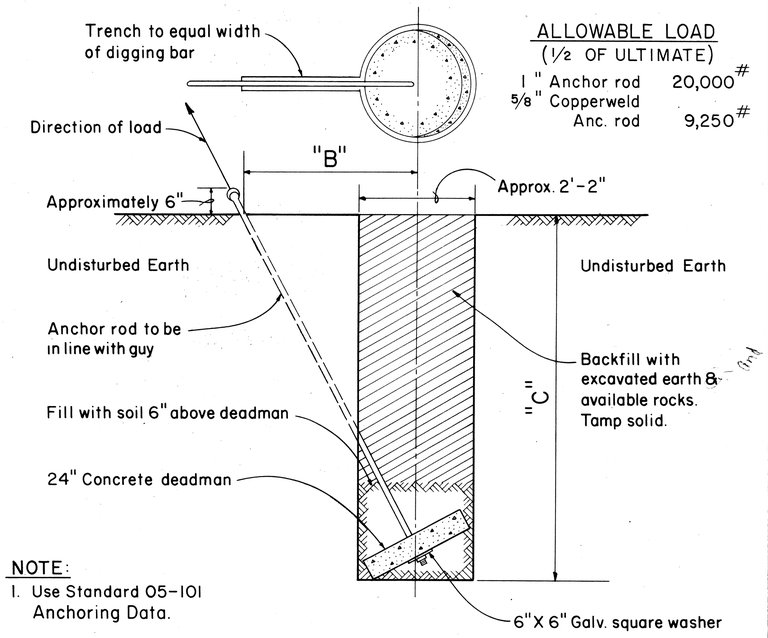
⅝" Anchor rod	8,000#
¾" Anchor rod	12,500#
⅝" Copperweld Anc. rod	9,250#

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

GUY ANCHOR 18" DEADMAN

Scale: ¾" = 1' - 0"

05-102



ALLOWABLE LOAD
(½ OF ULTIMATE)

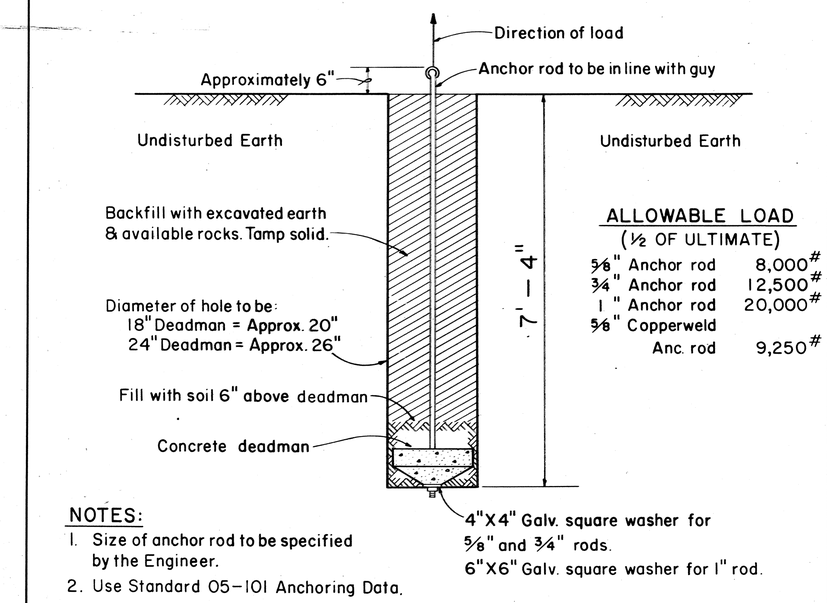
1" Anchor rod	20,000#
⅝" Copperweld Anc. rod	9,250#

NOTE:
1. Use Standard 05-101 Anchoring Data.

GUY ANCHOR 24" DEADMAN

Scale: ¾" = 1' - 0"

05-103



ALLOWABLE LOAD
(½ OF ULTIMATE)

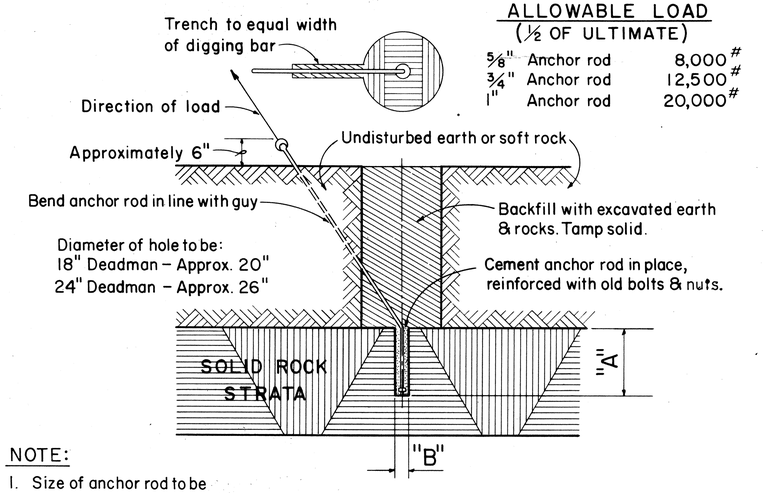
⅝" Anchor rod	8,000#
¾" Anchor rod	12,500#
1" Anchor rod	20,000#
⅝" Copperweld Anc. rod	9,250#

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

SIDE - WALK ANCHOR

Scale: ¾"= 1' - 0"

05-104



ALLOWABLE LOAD
(½ OF ULTIMATE)

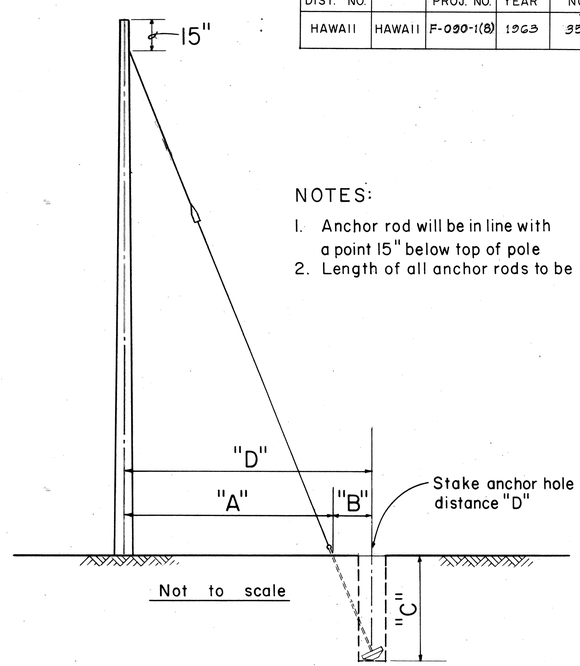
⅝" Anchor rod	8,000#
¾" Anchor rod	12,500#
1" Anchor rod	20,000#

NOTE:
1. Size of anchor rod to be specified by the Engineer.
2. "A" Should not be less than 24". If "A" is less than 24" complete hole & install anchor per O.H. Standard 05-102,103,or104.
3. "B" ⅝" Anchor rod drill 2" hole
   ¾" Anchor rod drill 2" hole
   1" Anchor rod drill 2½" hole
4. Use Standard 05-101 Anchoring Data.

ROCK ANCHOR

Not to Scale

05-105



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

FOR 35', 40', 45', 50', 55', & 60' POLES				
LEAD-ANCHOR ROD TO ℄ OF POLE "A"	ANCHOR ROD TO ℄ OF HOLE "B"	VERTICAL DEPTH 18" D.M. "C"	24" D.M. "C"	TOTAL DISTANCE POLE TO HOLE D = (A + B)
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				
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"

D. M. = Deadman

ANCHORING DATA

05-101

APPROVED:

W. Hendrickson for F.A.K. 10-9-63
PRINCPL. DISTR. ENGR. H.E. CO., LTD. DATE

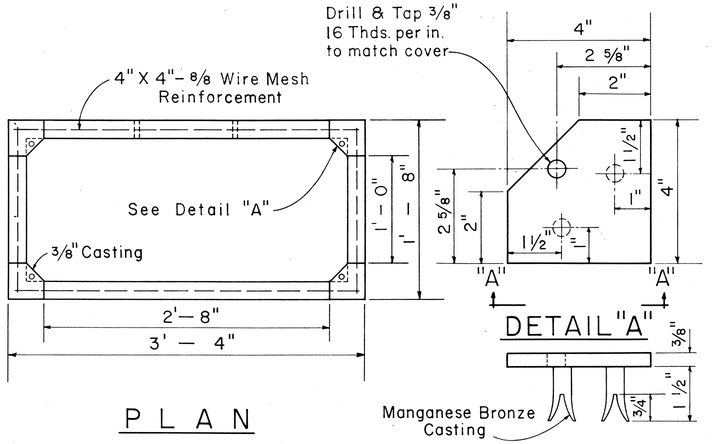
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

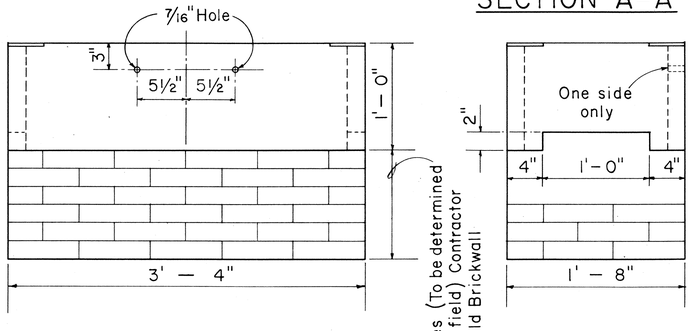
STANDARD DETAILS
H.E.Co. AND H.T.Co.
ANCHOR DETAILS AND ANCHORING DATA

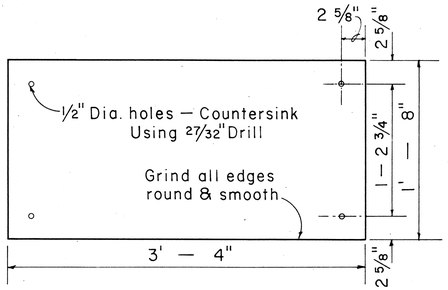
Scales: As Noted Date

SHEET No. 4 OF 8 SHEETS

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-090-1(8)	1963	36	53







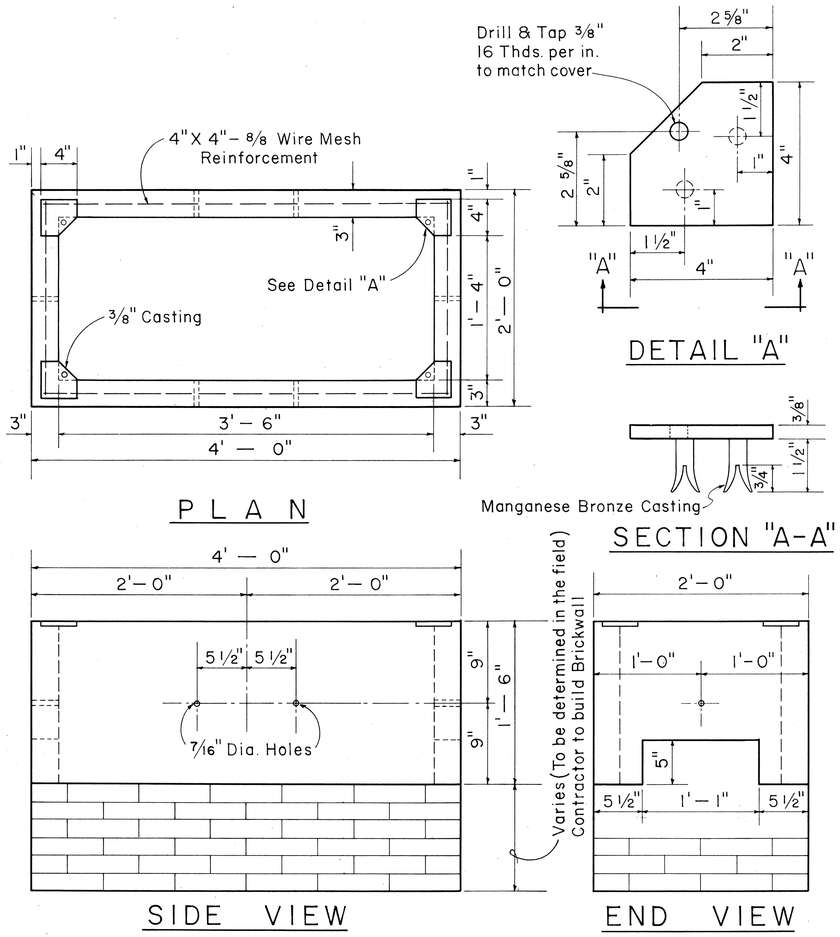
NOTES:
Use 3/8" Plate for driveways.
Concrete Box 225 Lbs.
1/4" Checker Plate 62 Lbs.

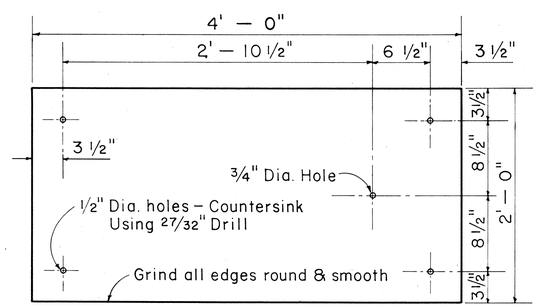
1/4" CHECKER PLATE COVER
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

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

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

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 05.4–1,941, 05.6–1,945
Standard Handbook for Electrical Engineers. Eighth Edition
H. E. Co. Specifications for poles.

WOOD POLE DATA

05-501

APPROVED:

A B Henderson for F A K 10-9-63
PRINCPL. DISTR. ENGR. H.E.CO., LTD. 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

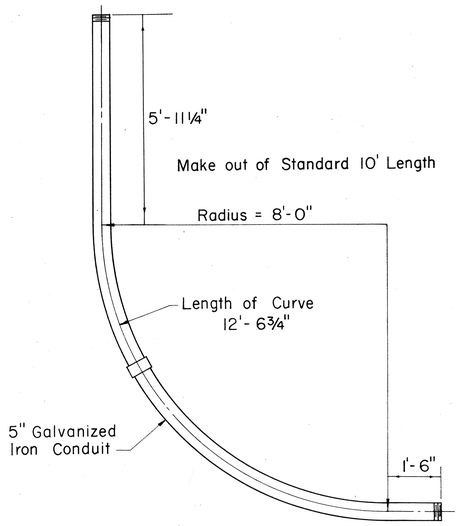
Scales: As Noted Date

SHEET NO. 5 OF 8 SHEETS

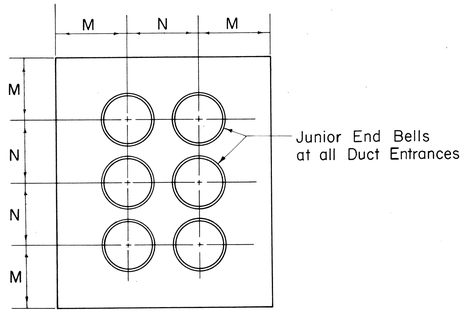
ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

36

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-080-1(8)	1963	37	53

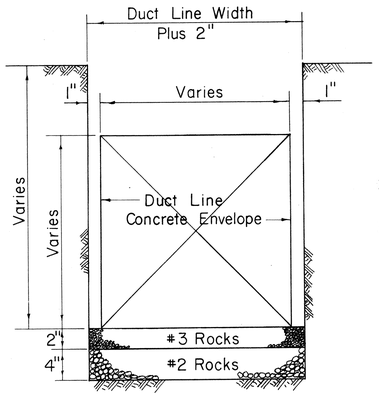


46 KV RISER CONDUIT BEND
(8'-0" RADIUS)
Not to Scale



TYPICAL DUCT DETAIL AT MANHOLE WALL
Not to Scale

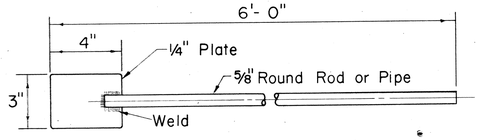
SIZE	M	N
3"	5"	6"
4"	5½"	7"
4½"	5½"	7½"
5"	6"	8"



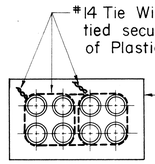
TYPICAL EXCAVATION DETAIL
Not to Scale

NOTES

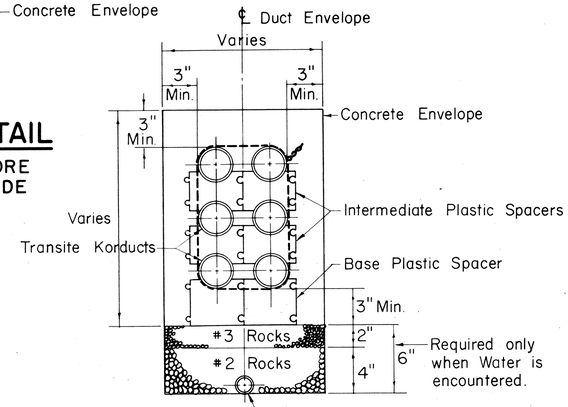
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.



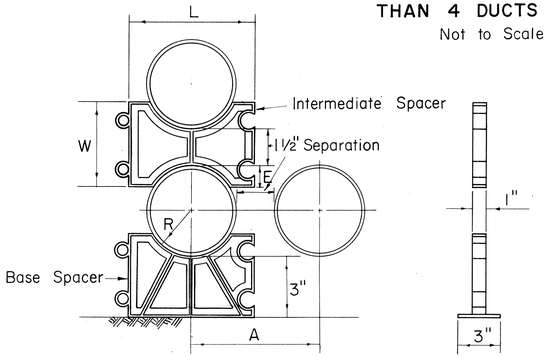
CONCRETE DUCT ENVELOPE TAMPING ROD
Scale: 3" = 1'-0"



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



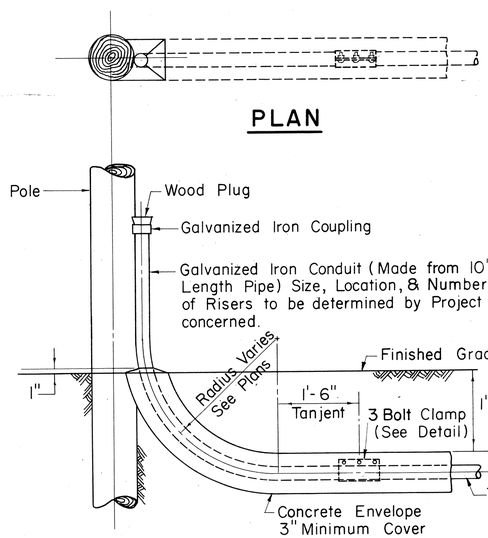
TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION
(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)
Not to Scale



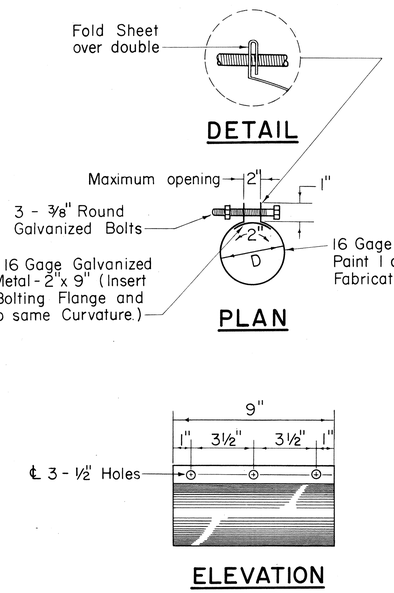
TYPICAL PLASTIC SPACERS
Not to Scale

SIZE	R	E	W	A	L
3"	1 27/32"	⅞"	3 1/4"	5 1/8"	5"
4"	2 13/32"	1 1/8"	3¾"	6 1/4"	6 1/8"
4½"	2 23/32"	1¼"	4"	6⅞"	6¾"
5"	3 1/16"	1 3/8"	4 1/4"	7⅝"	7 1/2"

For 1½" Separation



TYPICAL POLE RISER DETAIL
Scale: ¾" = 1'-0"



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

APPROVED:

A. F. Henderson for JAK 10-9-63
HAWAIIAN ELECTRIC CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

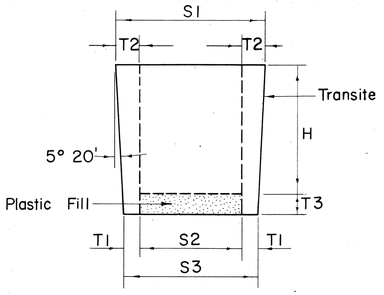
CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

Scales: As Noted Date

SHEET NO. 6 OF 8 SHEETS

37

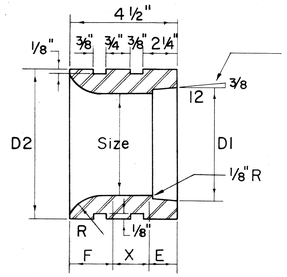
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	F-090-1(8)	1963	38	53



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

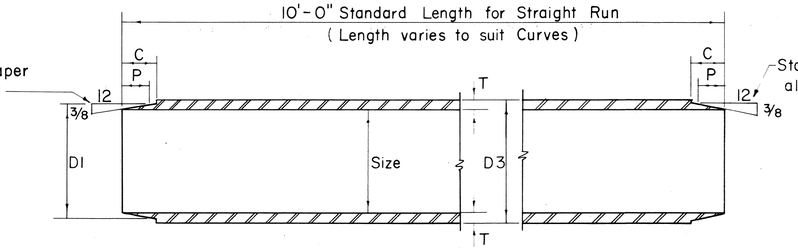
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



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"



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 25/64"	1 1/8"	19/64"

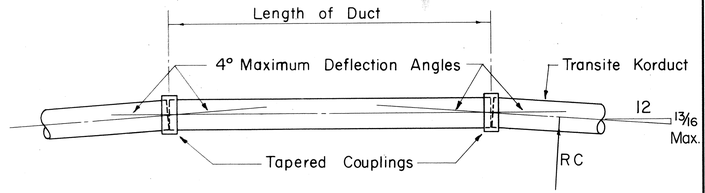
Note "X"

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.

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"

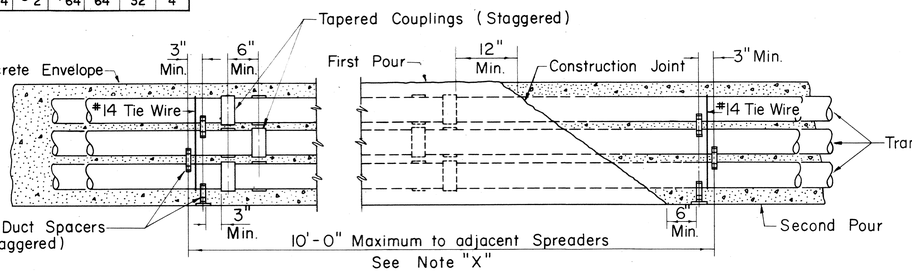
TAPERED COUPLINGS

Not to Scale



METHOD OF FORMING CURVES

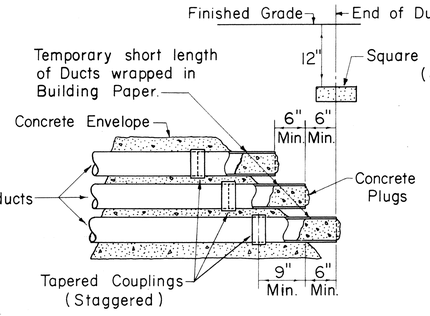
Not to Scale



TYPICAL DUCT ENVELOPE ELEVATION

(6 WAY DUCT LINE SHOWN)

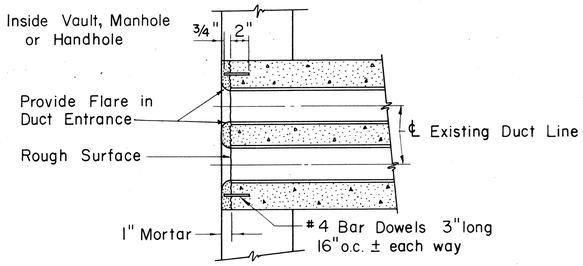
Not to Scale



TYPICAL STUB OUT DETAIL

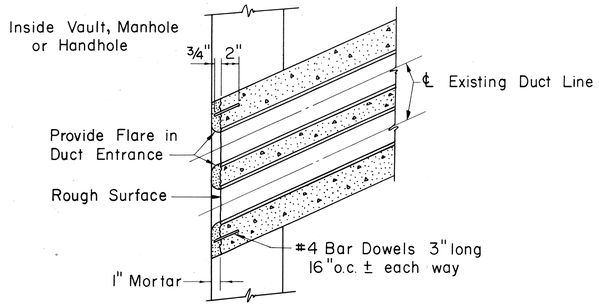
Not to Scale

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"	



DUCT LINE ENTRANCE AT EXISTING DUCT LINE

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



DUCT LINE DIAGONAL ENTRANCE

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

APPROVED:

AB Henderson for FAK 10-9-63

HAWAIIAN ELECTRIC CO., LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

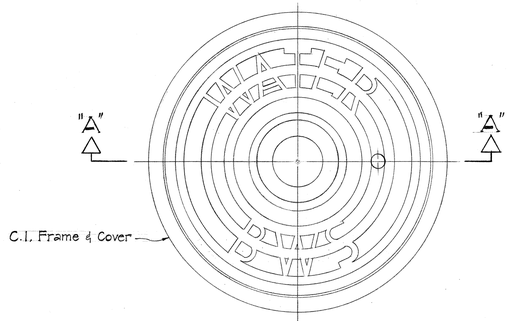
STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

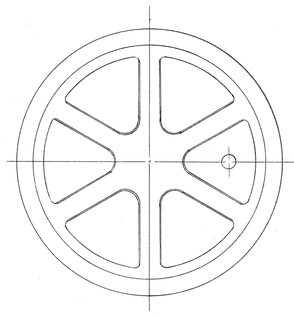
Scales: As Noted Date

SHEET NO. 7 OF 8 SHEETS

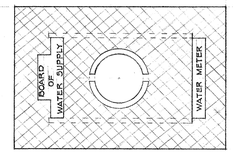
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-030-1(8)	1963	38	53



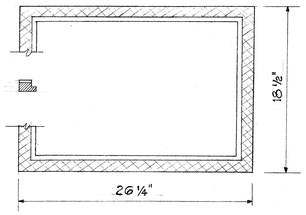
PLAN



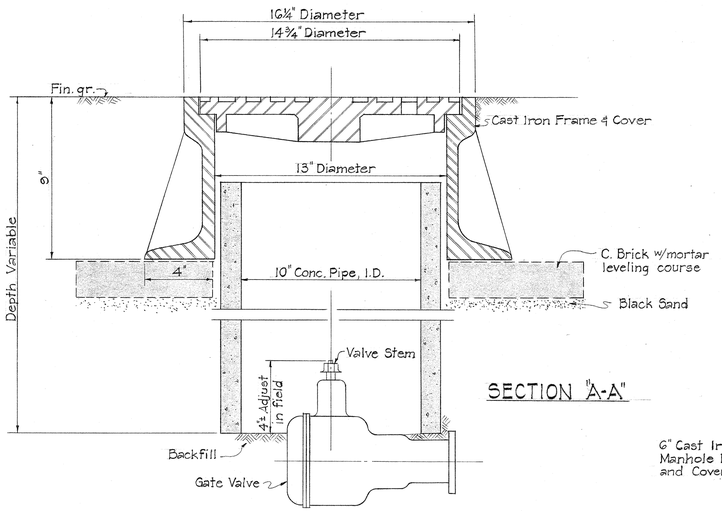
BOTTOM VIEW OF COVER



COVER PLATE

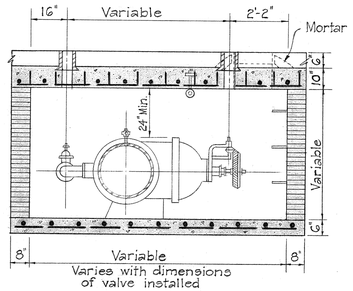


FRAME
CAST IRON FRAME AND PLATE
TYPE II
Scale: 1½"=1'-0"

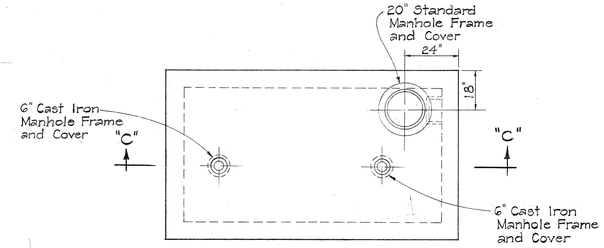


SECTION "A-A"

TYPICAL VALVE BOX DETAIL
Scale: 3"=1'-0"

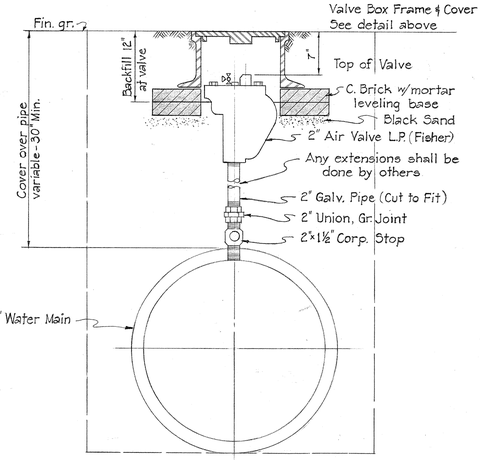


SECTION "C-C"

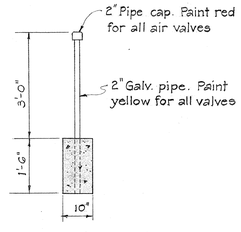


PLAN OF TOP SLAB

EXISTING TYPE "X"
MANHOLE DETAILS
Scale: ⅜"=1'-0"



AIR VALVE DETAIL FOR
30" WATER MAIN
Scale: 1"=1'-0"



DETAIL OF MARKER
Scale: ½"=1'-0"

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WATER VALVE AND
METER BOX DETAILS

FARRINGTON HIGHWAY
PROJECT No. F-030-1(8)

Scale: ½" = 1'-0"

SHEET No. 8 OF 8 SHEETS

PRINTED ON CLEARPRINT 1000-H

33 (2)