FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5) unit 2	1965	57	276

UTILITIES GENERAL NOTES

ELECTRIC AND TELEPHONE

1. 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.

2. The contractor shall notify each affected property owner 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 the affected party. All trees, shrubbery, fences, lawn, etc. disturbed in the process of performing work on electric and telephone service lines in affected properties shall be restored to original conditions by the contractor. Such restoration work will not be paid for separately but shall be considered as incidental to the various contract items for Electric and Telephone Underground Structures.

3. Where G.I. Conduits, Direct Burial, are to be installed through retaining walls, provide standard weight G.I. pipe sleeves of appropriate size and of length which will extend at least 1'-0" beyond the faces of the retaining walls.

4. Contractor to stake out proposed duct line, pole and anchor locations and H.E. Co. to check locations before Contractor undertakes excavation.

5. Minimum depth of duct lines from finished grade to:
   (a) Top of concrete jacket where ducts are concrete encased = 2'-0" unless otherwise shown.
   (b) Top of ducts not encased in concrete (direct burial) = 1'-6".
   (c) Top of steel conduits (direct burial) = 1'-6"

6. Depth of all pull boxes, service boxes and H.E. Co. Handholes and Manholes to be determined in the field.

7. Depth of poles and anchor holes are taken from finished grade.

8. Installation of, and backfill for poles by H.E.Co. or H.T.Co.

9. Backfill of anchor holes by the Contractor.

10. Poles and anchors for H.E.Co. unless otherwise noted.

11. For Pole Setting Depth Data, see Sheet No. 191

12. Ducts encased in concrete jackets:
   (a) Normal distance from face of conc. jacket to all ducts to be 3" minimum.
   (b) Clear distance of 1½" minimum between ducts of same utility Co.
   (c) Clear distance of 3" minimum between H.E.Co. ducts and H.T.Co. ducts.

13. Adjust existing telephone manholes and manhole frame and covers within proposed roadway to fit New Roadway finished grades.

14. Adjusting of H.E.Co. existing manholes or handholes to be done by H.E.Co.

15. All ducts and conduits called for installation in concrete jacket shall be inspected and approved after laying 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.

16. Maintain a minimum of 30 L.F. completed trench excavation ahead of duct line concreting operations, except at duct line terminations.

17. The Contractor shall be responsible for any damage to existing utilities, whether or not shown on the plans, and shall repair any such damage at his expanse.

18. Existing utility cables which are to remain in place during construction shall be handled by the utility company's men only. The Contractor shall exercise caution to avoid disturbances to the cables or temporary guards erected by the utility company.

WATER

1. The Contractor shall notify the Board of Water Supply in writing one week prior to commencing work on the water system.

2. Existing Water Lines shown on the plans are based on existing records of varying degrees of accuracy and completeness, verified wherever possible by field Surveys. The Contractor shall verify actual location and inverts of existing lines, and shall be required to make adjustment to any new or existing water system wherever directed by the Engineer.

3. The Contractor shall arrange with the Board of Water Supply to cut off existing unused service laterals and remove meter boxes and appurtenances prior to commencing clearing and grading operations.

4. Prior to trench excavation for new or relocated mains, the Contractor shall expose existing water mains where they cross or where connections are to be made to new or relocated mains to verify their locations and depths. Hand excavation shall be utilized wherever excavation around an existing water main is required.

5. The Contractor's attention is directed to the Board of Water Supply's Kaimuki Pumping Station, wells and Transmission mains located in the vicinity of, and within the project area. The Contractor shall minimize the use of explosives near these BWS facilities. Extreme caution should be taken if explosives are used. The Contractor shall be responsible for any damages to the B.W.S. facilities.

6. Existing water mains replaced by new pipes shall be abandoned. Where removal of abandoned pipe is not necessary, open pipe ends shall be plugged with class "B-1" concrete. Costs for removing and disposing, or plugging of existing pipes with concrete shall be considered incidental to the various contract items for the water system.

7. Asterisk (*) incidates work to be performed by the Board of Water Supply. All materials except "reuse" items to be furnished by the Contractor.

8. Items indicated as "reuse" shall be furnished by the Board of Water Supply. "Reuse" materials installed by the Contractor shall be loaded and transported from the BWS Kalihi Store Yard to the job site by the Contractor.

9. "Salvage" items not reused on this project shall be removed, cleaned and returned to the BWS Kalihi Store Yard by the Contractor.

10. Cast iron fittings with lead joints shall be either Class D, AWWA or Class 250, short body for 12"ϕ and smaller pipes and Class D, short body for 16" ϕ to 24" ϕ pipes.

11. Mechanical joint fittings shall be Class 250 for 12"ϕ and smaller pipes. Mechanical joint fittings for pipes 16" ϕ and larger may be either Class 150 or 250, except that only Class 250 mechanical joint fittings shall be used for the 20" ϕ high pressure main.

12. Double hub fittings or service clamps (tapped for the appropriate size corporation stops) shall be used wherever corporation stops larger than allowable taps into new or existing mains.

13. The minimum clearance between fire hydrants and utility poles or light standards shall be 3.0 feet.

14. Water lines and other parallel utility lines shall have a minimum 3.0 feet horizontal clearance. Where water lines and other utility lines cross, there shall be a minimum 6" vertical clearance.

15. Reinforced concrete slabs shall be constructed over shallow water mains as shown on the plans. However, if the 6-inch minimum clearance between the bottom of the slab and top of pipe cannot be maintained, the main shall be lowered instead and the slab eliminated.

SEWER SYSTEM

1. Existing Sewer Lines shown on the plans are based on existing records of varying degrees of accuracy and completeness, verified wherever possible by field Surveys. The Contractor shall verify actual location and inverts of existing lines, and shall be required to make adjustment to any new or existing sewer system wherever directed by the Engineer.

2. Adjust existing sewer manholes and manhole frames and covers within proposed roadway to fit new roadway finished grades.

3. If laterals other than those shown on the plans are exposed during construction, the same shall be cut and plugged, or extended and reconnected as required.

4. All services connected to existing sewer mains which are to be abandoned or removed shall be reconnected to new sewer mains if services are required.

5. Sewer laterals to be extended shall be reconnected as shown on typical house connection detail.

6. Location of laterals and wyes on new sewer lines shall be as designated by the Engineer.

7. All work involved in installation of new sewer mains, connection of existing house sewers to new sewer line, construction of concrete jackets around sewer mains, extension of laterals to new property line, and cutting and plugging of abandoned sewer lines and laterals shall be performed in accordance with the latest City and County Standard Sewer Details and Specifications and under the Supervision of an Inspector or Representative of the Division of Sewers, City and County of Honolulu.

8. Concrete blocks and cradles shall be placed for all sewer mains and laterals.

9. Concrete jackets shall be constructed minimum of one foot beyond the edges of footings, piers, box culverts, etc., or as directed by the Engineer.

10. Salvaged 21 inch diameter manhole frames and covers may be used only for manholes at end of lines and only if the depth of manholes are 5 feet or less. All salvaged 24 inch frames and covers shall be used before 21 inch frames and covers are used.

11. All services shall be maintained at all times during construction. Alterations to service lines shall be done with the least amount of disturbance to the existing services to the various houses.

12. All trees, lawns, shrubbery, fences, etc., disturbed in the process of performing work on sewer service lines, shall be restored by the Contractor to the satisfaction of the Engineer. Such restoration work will not be paid for separately, but shall be considered as incidental to the various contract items for the Sewer System.

GAS

1. The utility lines shown on these plans are located from the best sources available. The Contractor shall check and verify the exact location and depth of same.

2. Cutting, plugging & reconnecting of live gas lines will be done by the Honolulu Gas Co., Ltd.

3. There should be at least 2" clearance, wherever possible, between any gas pipeline or main and any underground structure not used in conjunction with the pipeline or main. When this clearance cannot be attained, the gas pipe shall be protected with Gas Co. approved insulating material.

4. All trees, lawns, shrubbery, fences, etc. disturbed in the process of performing work on gas lines, shall be restored by the Contractor to the satisfaction of the Engineer. Such restoration work will not be paid for separately, but shall be considered as incidental to the various contract items for Gas Co.

LEGEND

ELECTRIC & TELEPHONE UTILITIES

- E.P. — Existing Elec. or Tel. pole
- T.P. — Existing Elec. or Tel. pole to be removed
- E.P. — New Electric or Telephone pole
- Existing pole with existing anchor
- Existing pole with new anchor
- New pole with new anchor
- Existing Pull box or Service box
- New Pull box or Service box
- Existing Manhole or Handhole
- New Manhole or Handhole
- Tr — Tr — Trench only for Direct Burial
- TrC — GIP — Direct Burial; Transite conduit or Galv. Iron Pipe
- TrC — GIP — TrC — Direct Burial; Transite conduit with Galv. Iron Pipe
- Concrete encased duct with Direct Burial Transite
- TrC — GIP — Conduit or Galv. Iron Pipe
- All other concrete encased duct
- N.I.C. — Not in contract

SEWER, WATER & GAS UTILITIES

- S — G — Existing Sewer Line To Remain
- S — G — New Sewer Line
- W — G — Existing Water Line To Remain
- W — G — New Water Line
- G — 2 — Existing Gas Line To Remain
- G — 2 — New Gas Line
- Cut/Plug or Plug Existing Utility Line
- Existing Abandoned Utility Line
- SMH — Existing (Sewer, Water, Gas) Manhole
- SMH — Existing (Sewer, Water, Gas) Manhole to be adjusted
- SMH — New (Sewer, Water, Gas) Manhole
- WM — Existing Water Meter
- WM — New Water Meter
- FH — Existing Fire Hydrant
- FH — New Fire Hydrant
- A.I.P. 2 — Cut and Abandon in Place Existing Utility Line
- Remove — Existing Utility Line to be Removed

STREET ABBREVIATIONS

"WA"	Waialae Avenue
"WL"	Old Waialae Road
"SK"	South King Street
"KB"	Kapiolani Boulevard
"KA"	Kapahulu Avenue
"HA"	Harding Avenue

APPROVED:

PRINCPL. ELECTRICAL ENGR., H.E. Co., Ltd.	5/11/65 DATE
PRINCPL. DISTRIBUTION ENGR., H.E. Co., Ltd.	5/17/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-14-65 DATE
SEWER SYSTEM DIRECTOR DIV. OF SEWERS	M.T. Ino 5-16-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, Ltd.	5/17/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITIES GENERAL NOTES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Date: May, 1964

SHEET No. 1 OF 50 SHEETS

57

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

PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	SHEET NO.
HAWAII	HAW	I-HI-1(5)24 Unit 2	1965	58	276

Sta. 9+00 "WL"
Connect New 8" Sewer To
Exist. S.M.H.
S.M.H. Inv. = 37.95' (Exist.)

Plug 6" Sewer

Sta. 9+00 "WL" to 11+00 "WL"
Install 8" Sewer Line "S-1"
See Profile "S-1"; Sht No. 72
8" V.C. Sewer Pipe = 256 L.F.
8" V.C. Sewer Cradle = 96 L.F.
Plain Conc. Jacket = 160 L.F.
Structure Exc. = 90 C.Y.
(2" Betterment)
Install New 60' Pole
w/1" Anchor, L=15'
Pole Exc. = 7.0 L.F.

Sta. 11+00 "WL"
Connect New 8" Sewer to
Exist. S.M.H.
S.M.H. Inv. = 32.58' (Exist.)

OLD Remove Pole

STRUCTURE NO. 1

RAMP (T-1)

OUTBOUND

RAMP (WL-O)

INBOUND

RAMP (WL-1)

For details of utilities adjustments and relocation in bordered area.
See Sheet No. 59

Sta. 9+13 "WL"
Const. New S.M.H.
Top = 40.0'
Inv. = 36.0'
Struct. Exc. = 8 C.Y.
Brickwall = 3.5 L.F.
Class "B-1" Conc. = 1.0 C.Y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Frame & Cover

Install New 60' Pole on
24" Deadman with two
1¼" Anchors, L=15' & L=20'
Pole Exc. = 7.0 L.F.

L=15'

L=20'

WAIALAE ROAD

Install New 60' Pole
Pole Exc. = 7.5 L.F.

Remove Pole

TRUE NORTH
SCALE: 1" = 50'

Dem. Exist. S.M.H. = 3.0 L.F.
Salvage S.M.H. Frame & Cover

Sta. 37+05, I.B., Left
Install 8" Sewer Line "S-2"
See Profile "S-2"; Sht. No. 72
For Details: See Sht. No. 170
8" V.C. Sewer Pipe = 204 L.F.
8" V.C. Sewer Cradle = 194 L.F.
Reinf. Conc. Jacket = 10 L.F.
Structure Exc. = 64 C.Y.

Plug 8" Sewer

Install 6" V.C. Lat. and Cleanout
Intercept House Service Line
6" V.C. Pipe = 15 L.F. @ 1.00%
6" V.C. Sewer Cradle = 15 L.F.
R/C Jacket = 10 L.F.
Structure Exc. = 4 L.F.

Connect New 8" Sewer to
Exist. S.M.H.
S.M.H. Inv. = 19.34' (Exist.)

Sta. 39+00, O.B., Right
Construct New S.M.H.
Top = 22.60'
Inv. = 18.40' (Exist. 6")
Struct. Exc. = 8 C.Y.
Brickwall = 3.5 L.F.
Class "B-1" Conc. = 1.0 C.Y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Frame & Cover

Cut & Plug 8" Sewer

Dem. 3 Exist. S.M.H. = 15 L.F.
Salvage S.M.H. Frames & Covers = 3 Ea.

Sta. 14+75 "WL"
Install 1" Copper Serv.
Lat. & Type "A" Conn.
With Type II Meter Box

Install New 1" Water Service Ext.
1" G.I. Water Pipe = 255 L.F.
Struct. Exc. = 19 C.Y.

APPROVED:

PRINCPL. ELECTRICAL ENG'R., H.E. Co., Inc.	5/10/65 DATE
PRINCPL. DISTRIBUTION ENG'R., H.E. Co., Inc.	5/10/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-17-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-12-65 DATE
SEWER SYSTEM DIRECTOR DIV. OF SEWERS	5-12-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY., Ltd.	5/12/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj No. I-HI-1(5): 24, Unit 2

Scale: 1" = 50'-0" Date: May, 1964

SHEET No. 2 OF 50 SHEETS

58

PLAN: SURVEYED, PLOTTED, CHECKED, NOTE BOOK, NO., FT. OF MAP CHECKED, DATE

PROFILE: SURVEYED, PLOTTED, CHECKED, NOTE BOOK, NO., B. M.'S NOTED, STRUCTURE NOTES, FT. OF MAP CHECKED, DATE

UTILITY MASTER SLD WAIALAE NO. 50 SCALE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	INTER-H-1-1(24)OAHU 24	1966	58	674

Revised: Jan. 10, 1966
Jan. 10, 1967

REVISED Jan. 10, 1966

Sta. 4+27 "WL" to "7+00 "WL"
Install 24" Water Main: See Profile "W-1" Sht. No. 69

24" C.I. Pipe, Class 150 = 304 L.F.
Ramp Conc. Jacket = 250± L.F.
Grouted Rubble Paving = 4.0 cy.
Structure Exc. = 170 cy.

① Sta. 0+00 "W-1"
* 1 - 24" C.I. Sleeve, 15" long
* 1 - 24" C.I. 1/8 Bend
* 8 L.F. 24" C.I. Pipe, Class 150
1 - Conc. Block w/Strut, Strut
Temp. for testing
1 - 24" C.I. Plug
1 - Cleanout

② Sta. 1+37 "W-1"
1 - 24" C.I. 1/8 Bend
1 - Conc. Block

③ Sta. 2+02 "W-1"
1 - 24" C.I. 1/16 Bend (Bott. Vert.)
1 - Conc. Block

④ Sta. 2+47 "W-1"
1 - 24" C.I. 1/16 Bend (Top. Vert.)
1 - Conc. Block

⑤ Sta. 2+54 W-1
1 - 24" C.I. 1/8 Bend
1 - Conc. Block

⑥ Sta. 2+78 "W-1"
1 - 24" S.S.G.V. w/4" By Pass (Reuse ②)
1 - Type "A" Manhole, 5.5' deep
Circul. Exc. = 15 cy.
Class "B" Conc. = 5.5 C.Y.
Reinf. Steel = 330 Lbs.
1 - 30" Std. Cl. Fr. & Cover
2 - 6" C.I. Fr. & Covers

⑦ Sta. 2+98 "W-1"
* 1 - 24" C.I. 1/8 Bend
* 1 - 24" C.I. Sleeve, 15" long
* 8 L.F. 24" C.I. Pipe, Class 150
1 - Conc. Block w/Struct. Strut
Temp. for testing
1 - 24" C.I. Plug
1 - Cleanout

Sta. 3+00 "WL" to 8+80 "WL"
Install H.E. Co. Duct Line
See Profile "E-1" Sht. No. 69
For Details, See Sht. Nos. 150 & 166
Install 6-6" T.H. in P. Conc. Jacket = 232 L.F.
Install 2-5" G.I. Conduits Through Exist. Bridge = 150 L.F.
Install 6-6" Conduits in Rubble Ramp = 144 L.F.
Install 2-5" G.I. Conduit Through Exist. Bridge = 144 L.F.
(Total Betterment)

Sta. 4+27 "WL" to 7+54 "WL"
~~4" C.I. Pipe~~
~~4" C.I. 1/8 Bend~~
~~4" C.I. M.J. Sleeve~~
~~Conc. Block~~
~~No. 150 Lbs~~
Delete: Install 6" Gas Main In Lieu Of
~~4" C.I. Pipe = 85~~
~~4" S.C.H. 80 Steel Pipe thru Structure = 165~~
~~Install 6" Casing with cradle thru Structure = 165 L.F.~~

Remove Pole
Install New 60' Pole w/1" Anchor, L=40'
Pole Exc. = 7.0 L.F.
Remove Pole & Anchor
TRUE NORTH (Scale 1"=200')
Install 3/4" Anchor L=15'
Sta. 5+00 "WL" to 11+00 "WL"
Install 8" Sewer Line "S-1"
See Profile "S-1" Sht. No. 72
For Quantities, See Sht. No. 76 (1" Betterment)
Plug 6" Sewer
Install new 60' Pole w/1" Anchor, L=40'
Pole Exc. = 7.0 L.F.
Remove Pole
Relocate Water Meter (By B.W.S.)
Stub End
Demolish Exist. S.M.H. = 5.0 L.F.
Salvage M.H. Fr. & Cover
Plug Exist. 6" Sewer
Adjust Type "C" MH Frame and Cover to New Grade
4" Insulating Dresser Coupling
Remove Pole
Remove Pole
Remove Pole

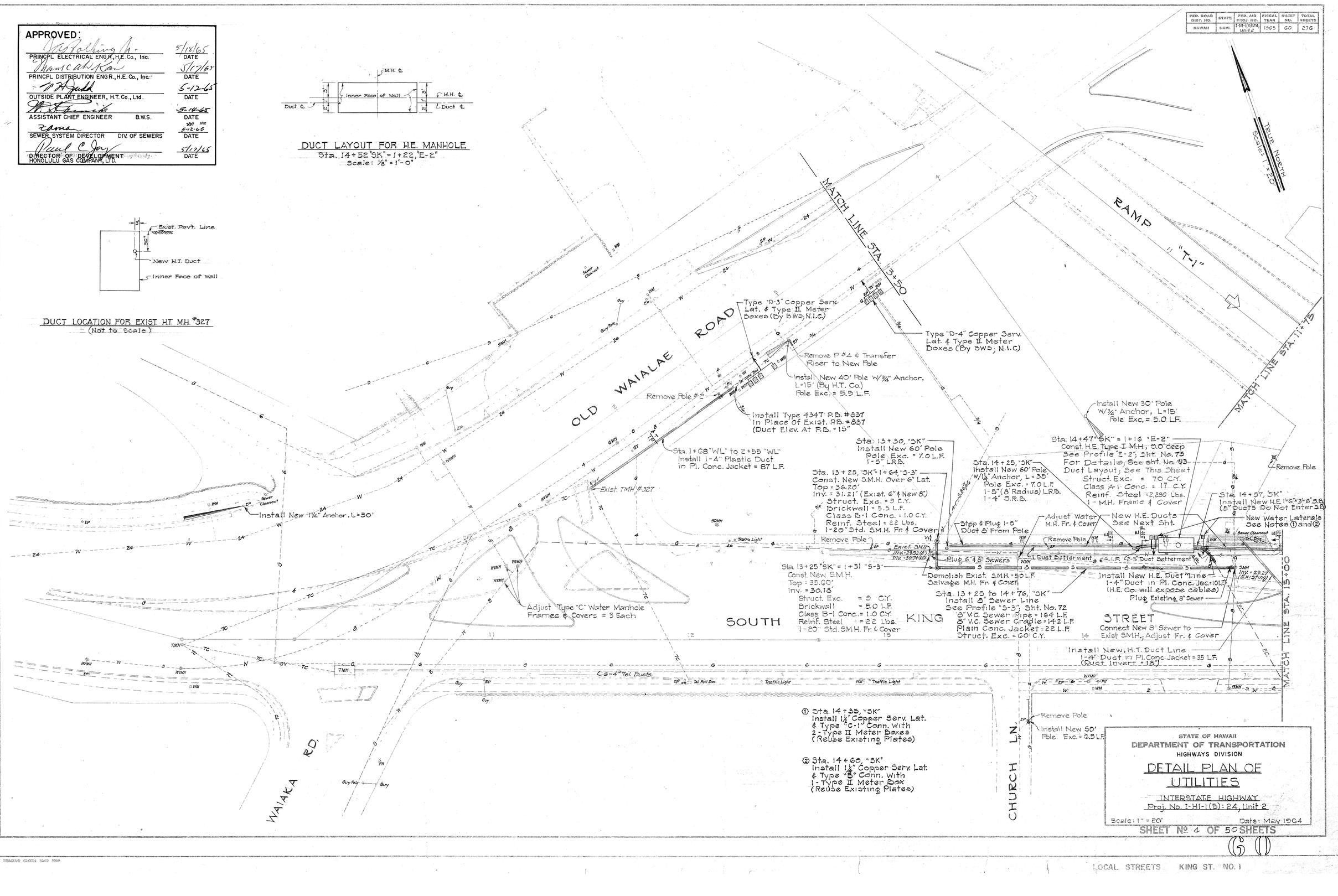
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	60	276

APPROVED:

PRINCPL ELECTRICAL ENGR., H.E. Co., Inc.	DATE 5/18/65
PRINCPL DISTRIBUTION ENGR., H.E. Co., Inc.	DATE 5/17/65
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	DATE 5-12-65
ASSISTANT CHIEF ENGINEER B.W.S.	DATE 5-14-65
SEWER SYSTEM DIRECTOR DIV. OF SEWERS	DATE 5-12-65
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD.	DATE 5-12-65

DUCT LAYOUT FOR H.E. MANHOLE
Sta. 14+52 "3K" = 1+22, "E-2"
Scale: 1/8" = 1'-0"

DUCT LOCATION FOR EXIST. H.T. M.H. #327
(Not to Scale)



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

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Scale: 1" = 20' Date: May 1964

SHEET No. 4 OF 50 SHEETS

60

LOCAL STREETS KING ST. NO. 1

LIETZ 1013 ARROWROOT TRACING CLOTH 1043 10HP

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	61	276

TRUE NORTH
Scale: 1" = 60'

MATCH LINE
See Sheet No. 60

MATCH LINE
See Sheet No. 60

RAMP "T-1"

Concrete Slab Over Existing 8" Water Line

Abandon Exist. TPB

65'x4'x6'

Adjust WVMH Fr. & Cover

Remove Pole

3 Duct Betterment

Drain Intake

Sta. 15+03, "SK"
Install H.T. Type 434T Pull Box #4823 Over Exist. T.C.

Sta. 15+05, "SK"
Install H.E. 1'-6"x3'-6" Service Box Over Existing E.C.

Sta. 16+62, "SK"
Const. H.E. 4'x4' Trans. Pad
For Details, See Sht. No. 96

Trench Only, H.E. Direct Burial

Sta. 16+01, "SK"
Install H.E. 1'-6"x3'-6" Serv. Box

Sta. 15+07 to 17+61, "SK"
Install H.E. Duct Line
1-4" Duct in Pl. Conc. Jacket = 260 L.F.

Install H.T. Duct Line
1-1" G.I. Pipe, Direct Burial = 75 L.F.
1-Type 434T Pull Box #5053
1-1" G.I. Riser, 5' Above Ground

Install H.E. Duct Line
1-3" Duct in Pl. Conc. Jacket = 53 L.F.
1-4" Duct in Pl. Conc. Jacket = 38 L.F.
1-H.E. 1'-6"x3'-6" Service Box

Sta. 16+64 to 17+46, "SK"
Install H.E. Duct Line
3-4" Ducts in Pl. Conc. Jacket = 84 L.F.

Remove Pole

Insulate Tel. Box

Sta. 14+55 to 18+05, "SK"
Install H.E. Duct Line
See Profile "E-2", Sht. No. 75
1-4" Duct in Pl. Conc. Jacket = 4 L.F.
2-5" Ducts in Pl. Conc. Jacket = 94 L.F.
4-5" Ducts in Pl. Conc. Jacket = 354 L.F.
4 Ducts (3-5"(1-4") in Pl. Conc. Jacket = 12 L.F.

Sta. 17+51, "SK"
Const. H.E. 3'x5' Handhole
For Details, See Sht. No. 90
Duct Layout, See This Sht.
Struct. Exc. = 12 C.Y.
Class A-1 Conc. = 2.5 C.Y.
Reinf. Steel = 270 Lbs.
1-Conc. M.H. Fr. & Cover

Sta. 17+56, "SK"
Install H.E. 1'-6"x3'-6" Service Box

Existing Building

New 8" V.C. Sewer Line and SMH
See Sheet No. 170 for Details

Insulate ¾" Gas

Install ¾" Gas Line & Conn. to Existing = 192 L.F.

Future R/W Line

~~Install 17# Type "G" Anode Installation~~

Temporary Pole Anchor Sta. 18+60

Note ①
Install H.E. Duct Line
1-4" Duct in Pl. Conc. Jacket = 25 L.F.
2-4" Ducts in Pl. Conc. Jacket = 39 L.F.
3-4" Ducts in Pl. Conc. Jacket = 14 L.F.

Note ②
Install H.E. & H.T. Duct Line
1-1" G.I. Pipe, Direct Burial (H.T.) = 60 L.F.
1-4" Duct in Pl. Conc. Jacket (H.E.) &
1-1" G.I. Pipe, Direct Burial (H.T.) = 115 L.F.
1-1" G.I. Riser, 5' Above Ground (H.T.)
1-H.E. 1'-6"x3'-6" Service Box
1-H.T. Type 434T Pull Box #5054

Note ②

Contractor shall excavate slot pole hole & H.E.Co. will move existing pole to clear new ductline. Pole Exc. = 14 L.F.

H.E. Box
H.T. Box

Install New H.E. Duct Line For Quantities, See Sht. No. 62

Existing 8-4" Fibre Ducts through Bridge For Special Connection Details At Ends of Bridge. See Sht No. 95

Sta. 18+14, "SK" = 4+87, "E-2"
Const. H.E. Type I Manhole
See Profile "E-2", Sht. No. 73
For Details, See Sht. No. 93
Duct Layout, See This Sht.
Struct. Exc. = 70 C.Y.
Class A-1 Conc. = 17 C.Y.
Reinf. Steel = 2,280 Lbs.
1-M.H. Fr. & Cover

Install 2" Water Line Around H.E. Manhole (By B.W.S.)

Remove Pole

Remove Pole

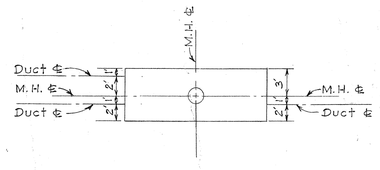
2 Duct Betterment

Install New H.E. Duct Line
Connect to Existing H.E. Ducts in Structure. See Profile "E-3" For Quantities, See Sht. No. 62

SOUTH KING STREET

MATCH LINE
See Sheet No. 62

DUCT LAYOUT FOR H.E. HANDHOLE
Sta. 17+51, "SK"
Scale: ¼" = 1'-0"



DUCT LAYOUT FOR H.E. MANHOLE
Sta. 18+14, "SK" = 4+87, "E-2"
Scale: ⅛" = 1'-0"

APPROVED:

PRINCPL. ELECTRICAL ENG R., H.E. Co., Inc.	5/10/65 DATE
PRINCPL. DISTRIBUTION ENG R., H.E. Co., Inc.	5/17/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-14-65 DATE
SEWER SYSTEM DIRECTOR DIV. OF SEWERS	5-12-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD.	5/17/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2
Scale: 1" = 20' Date: May 1964

SHEET No. 5 OF 50 SHEETS

61

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

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(61)24 Unit 2	1965	62	876

June, 1967
Revised: Aug., 1967

APPROVED:

PRINCPL. ELECTRICAL ENGR., H.E.Co., Inc.	5/18/65 DATE
PRINCPL. DISTRIBUTION ENG R., H.E. Co., Inc.	5/17/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-14-65 DATE
SEWER SYSTEM DIRECTOR DIV. OF SEWERS	5-12-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD.	5/17/65 DATE

TRUE NORTH
Scale: 1" = 20'

Install New 1" G.I. Water Pipe
See Sht. No. 58

Existing S.M.H.
Top = 26.7±
Inv. = 19.79'

10' Wide Sewer Easement

℄ R/W Line

Existing S.M.H.
Top = 26.0
Inv. = 19.23 (Existing 10" V.C.)
Inv. = 19.25 (Existing 8" V.C.)
Inv. = 21.35 (Existing 6" V.C.)

Connect to Existing S.M.H.

Exist'g. S.M.H. Inv. = 18.25

Cut and Plug Exist. 12"

12" VCP
114' S=0.0029

Dem. Exist'g. Sewer M.H. = 6.0 L.F.
Salvage M.H. Frame & Cover
Plug Exist'g. 6", 10" & 12" Sewers

SMH #6
Inv. = 17.92

℄ Ramp H1-1 Station Line

12" VCP
99' S=0.0029

SMH #6
Inv. = 17.43

Note:
℄ Sewer to be 6' away from curb line

12" VCP
71' S=0.0029

See Sheet No. 63 for Detail

Sta. 22+85, "3K" to 23+00, "K8"
Install 4" Gas Main
See Profile G-2; Sht. No.
Install 4" Gas Main = 455 L.F.

Remove Pole

SMH #5R
Inv. = 17.42

Remove Pole

Remove Pole

I.B. Baseline

O.B. Baseline

Sta. 43+81, I.B. Baseline
Install 12" Sewer Line 3-4"
See Profile "3-4", Sht. No. 72
12" V.C. Sewer Pipe = 360 L.F.
12" V.C. Sewer Cradle = 110 L.F.
Pl. Conc. Jacket = 250 L.F.
Structure Exc. = 284 C.Y.

Sta. 22+60, "3K" to 10+15, "H4"
Install 8" Water Main
See Profile "W-3", Sht. No. 70
8" C.I. Pipe = 224 L.F.
Struct. Exc. = 110 C.Y.

Demolish Exist. S.M.H.
Salvage and reuse M.H. Frame and Cover
Top = 26.50
Inv. = 17.73
Struct. Exc. = 15 C.Y.
Brickwall = 9.0 L.F.
Class B-1 Conc. = 1.0 C.Y.
Reinf. Steel = 22 Lbs.
1-20" Std. M.H. Fr. & Cover

Sta. 22+79, "3K"
Dem. Type "C" W.M.H. = 4.5 L.F.
Salvage:
1 - F.H. # 1016
1 - 6" Gate Valve
1 - Type "C" M.H. Fr. & Cover

Remove Pole

Remove TPB
See Sht. No. 64

4" Insulating Dresser Coupling

① Sta. 0+00
*1 - 8" C.I. Sleeve, 15" long
*1 - 8" C.I. 1/8 Bend
1 - Conc. Block
*8 L.F. 8" C.I. Pipe
Temp. for Testing
1 - 8" C.I. Plug
1 - Cleanout

② Sta. 0+28
1 - 8" C.I. 1/8 Bend
1 - Conc. Block

③ Sta. 2+28
*1 - 8" C.I. Sleeve, 15" long
*1 - 8" C.I. 1/32 Bend
*8 L.F. 8" C.I. Pipe
1 - Conc. Block
Temp. for Testing
1 - 8" C.I. Plug
1 - Cleanout

Install H.E. Duct Line
See Profile "E-4", Sht. No. 75
For Quantities, See Sht. No. 63
(1 Duct Betterment)

Install 17# Type "C" Anode Installation

KAPIOLANI BLVD.

Ramp H1-0 Sta. Line

SMH #4R
Inv. = 16.77

12" VCP
201' S=0.0032

Dem. Sewer M.H. = 8.0 L.F.
Salvage M.H. Frame & Cover.
Plug Existing 6" & 8" Sewers
See Note ①

Note ①
Maintain service for the State's field offices. All work shall be performed as directed by the Engineer

Sta. 18+22 to 22+90, "3K"
Install H.E. Duct Line
See Profile "E-3", Sht. No. 75
4-4½" Ducts in Pl. Conc. Jacket = 355 L.F.
(2 Duct Betterment)

MATCH LINE
See Sheet No. 61

SOUTH KING STREET

New 12" Sewer Line
Portion of Line "3-4"

Construct H.E. Type II M.H.
For Details, See Sht. No. 94
Duct Layout, See Sht. No. 64
For Quantities, See Sht. No. 64

Dem. Exist'g. S.M.H. = 9.0 L.F.
Salvage M.H. Fr. & Cover
Plug Exist'g. 10" Sewers

12" VCP
60' S=0.0033

Sta. 5+60
SMH #3R
Inv. = 16.48

S. King St. Sta. 24+55.48
Kapiolani Blvd. Sta. 20+00
Harding Ave. Sta. 10+90

Plug & See Note ①

Cut and Plug

Sta. 22+47 "3K"
Existing SMH
Top = 26.60'
Inv. = 17.00 (Exist'g. 10" V.C.)
Inv. = 17.08 (New 12" V.C.)

See Sht. C.O. 625-2 for Continuation

Install New H.E. Duct Line
See Profile "E-7", Sht. No. 76
For Quantities, See Sht. No. 64
(4 Ducts Betterment)

Sta. 6+65
SMH #2R
Inv. = 16.16

Remove Pole

See Sheet No. ___ for Details

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

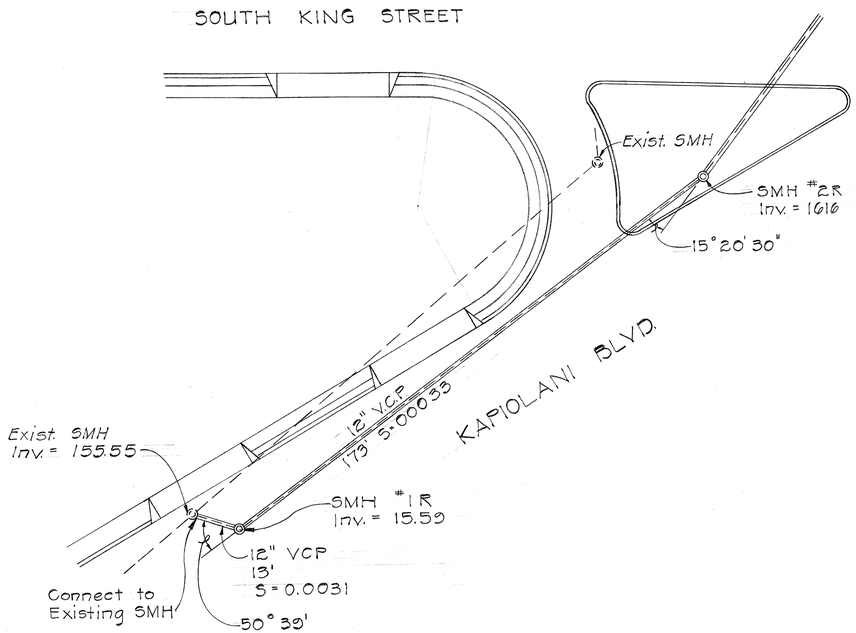
Scale: 1" = 20' Date: May 1967

SHEET No. 6 OF 50 SHEETS

C.O. 625

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5):24 Unit 2	1965	C0625-1	276



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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

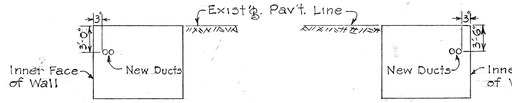
Scale: 1"=20' Date: May 1967

SHEET No. OF SHEETS

C.O. 625-1

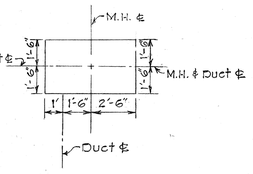
PRINTED ON NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	63	276

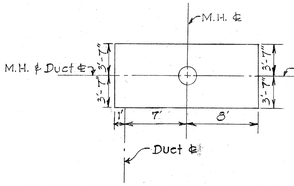


NORTH WALL SOUTH WALL

DUCT LOCATIONS FOR EXIST'G. T.M.H. #1569
(Not to Scale)



DUCT LAYOUT FOR H.E. HANDHOLE
Sta. 13+70,"HA"
Scale: 1/4" = 1'-0"



DUCT LAYOUT FOR H.E. MANHOLE
Sta. 15+30,"HA" = 4+17,"E-9"
Scale: 1/8" = 1'-0"

TRUE NORTH Scale: 1" = 20'

Sta. 23+08,"SK" to 24+20,"KB"
Install H.E. Duct Line
See Profile "E-4", Sht. No. 75
3-5" Ducts in Pl. Conc. Jacket = 554 L.F.
(1 Duct Betterment)

Sta. 21+28,"KB"
Install:
*1-6" Plug w/Hub Clamp
1-Conc. Block
Salvage:
1-F.H. #3410
1-6" G.V.
1-M.H. Frame & Cover
Demolish:
1-Type "C" M.H. = 6.5 L.F.

Remove H.T. Pull Box

Remove H.T. Pull Box

Highway Lighting Panel "A" on abutment wall
Sta. 22+85,"SK" to 23+00,"KB"
Install 4" Gas Main
See Profile G-2, Sht. No. 74
For Quantities, See Sht. No. 62

Remove Pole

Remove TPB

Remove Pole

3" conduit

Install 8" Water Main
For Quantities, See Sht. No. 62

Sta. 24+55.48,"SK"
Sta. 20+00,"KB"
Sta. 10+00,"HA"

Adjust M.H. Fr. & Covers = 4 Ea.

Existing T.M.H. #1569
See Duct Location Details; This Sht.

Control Box

Traffic Signal

1" conduit

Existing H.T. Ducts

Install H.T. Duct Line
2-4" Ducts in Pl. Conc. Jacket = 36 L.F.

Adjust W.M.

Remove Pole

Install H.E. 1'-6" x 3'-6" Service Box

State Hwy Lighting P.B.

3 Ducts Betterment

Remove Pole

Install H.E. Duct Line
See Profile "E-8", Sht. No. 76
For Quantities, See Sht. No. 64

Sta. 18+94,"KB"
Install Fire Hydrant
Struct. Exc. = 14 C.Y.
*1-12"x6" Tapping Sleeve with 6" Tapping Valve, 150 lbs.
*12 L.F. 6" C.I. Pipe
*1-6" 1/4 Bend
*1-Fire Hydrant (Reuse)
~~1 Type "C" Manhole (5.6')~~
~~Struct. Exc. = 14 C.Y.~~
~~Brickwall = 5.6 L.F.~~
~~Class B-1 Conc. = 0.5 C.Y.~~
~~Reinf. Steel = 24 Lbs.~~
~~1-20" C.I. Fr. & Cover (Reuse)~~
~~3 Conc. Blocks~~

Install Valve Box See Sht. No. 82

Sta. 11+05,"HA" = 4+51,"E-8"
Const. H.E. Type II Manhole
See Profile E-8; Sht. No. 76
For Details, See Sht. No. 94
Duct Layout; See Sht. No. 64
Struct. Exc. = 85 C.Y.
Class A-1 Conc. = 23 C.Y.
Reinf. Steel = 2,970 Lbs.
1-M.H. Fr. & Cover

Sta. 11+16,"HA"
Const. H.E. 7'x7' Trans. Pad
For Details; See Sht. No. 96
(Remove Existing Coconut Tree; Incidental to Pad Mount Construction)

Sta. 20+77 to 24+45 "KB"
Install H.T. Duct Line
See Profile "T-2", Sht. No. 78
For Quantities, See Sht. No. 65

Remove Pole

Remove Pole

Remove Pole

Remove Pole

Remove Pole

Remove Pole

Remove Pole

Remove Pole

4" Insulating Dresser Coupling

MATCH LINE See Sheet No. 65

Remove Pole

Remove Pole

Remove Pole

Remove Pole

Remove Pole

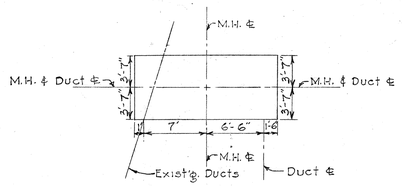
Remove Pole

Remove Pole

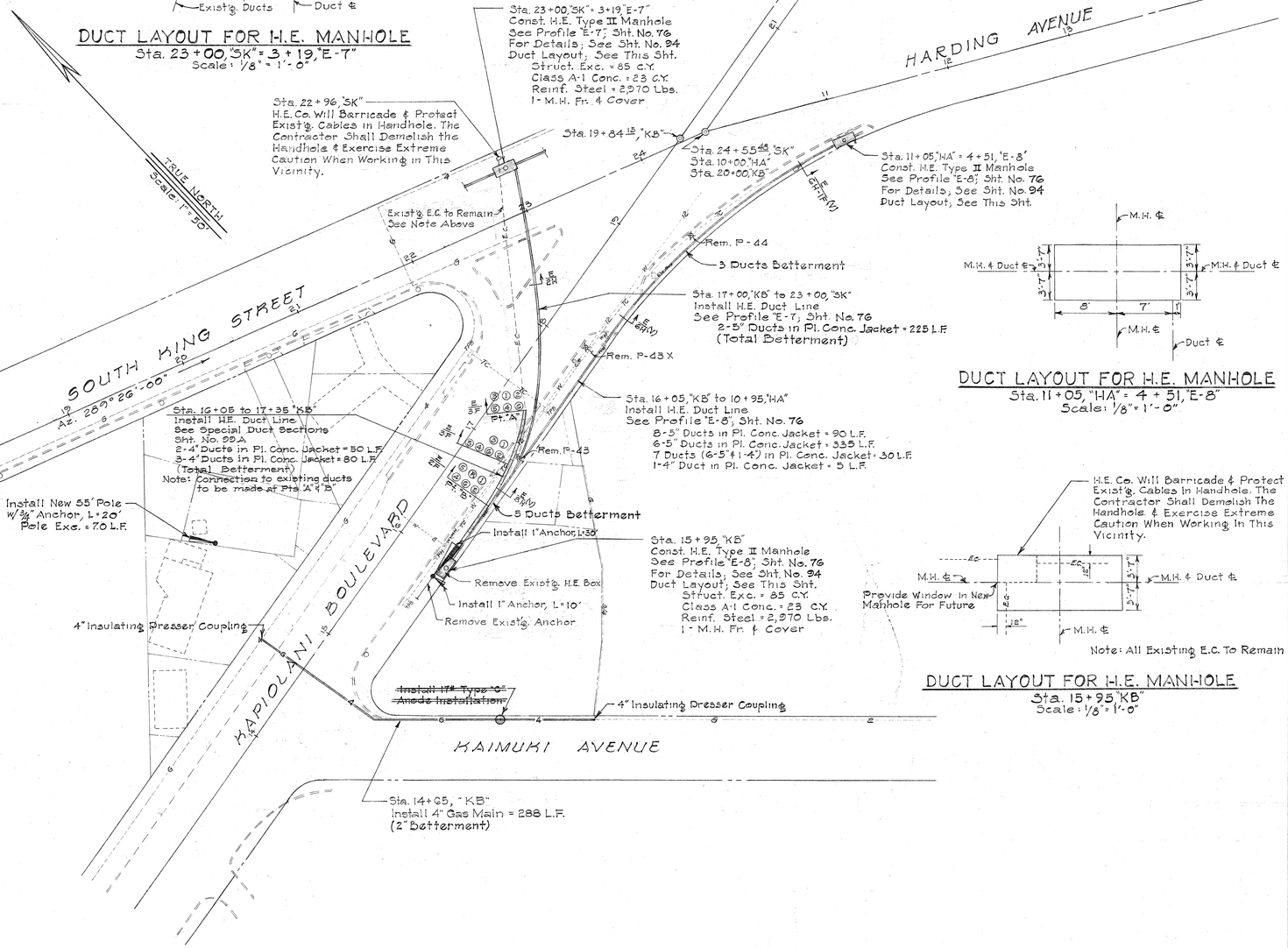
Remove Pole

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6)124 Unit 2	1965	64A	276

Revised: July 16, 1965



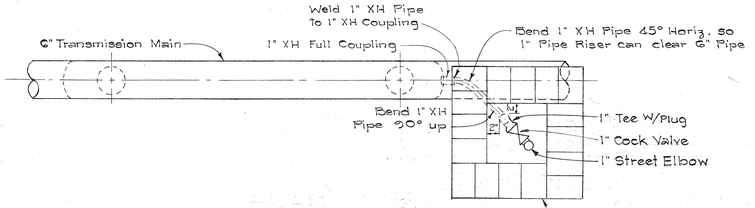
DUCT LAYOUT FOR H.E. MANHOLE
Sta. 23+00,"SK" = 3+19,"E-7"
Scale: 1/8" = 1'-0"



DUCT LAYOUT FOR H.E. MANHOLE
Sta. 11+05, "HA" = 4+51, "E-8"
Scale: 1/8" = 1'-0"

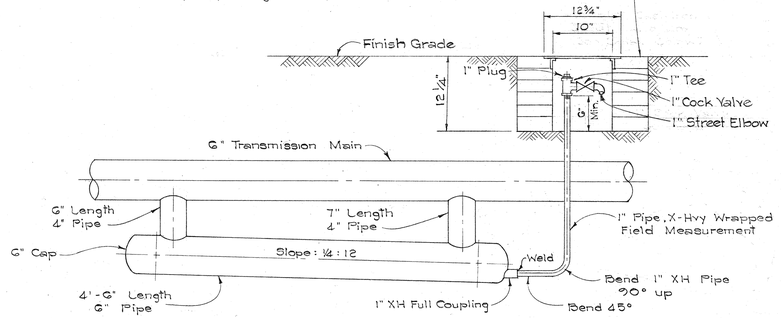
Note: All Existing E.C. To Remain

DUCT LAYOUT FOR H.E. MANHOLE
Sta. 15+95 "KB"
Scale: 1/8" = 1'-0"



PLAN VIEW
Scale: 1" = 1'-0"

NOTE:
Dimensions shown here applicable only if 6" main is horizontal. When 6" main is not horizontal, slope = 1/4" = 12" of water drip trap will govern.



ELEV. VIEW
Scale: 1" = 1'-0"

WATER DRIP ASSEMBLY DETAIL FOR GAS MAIN
Scale: As Shown

APPROVED:

PRINCPL. ELECTRICAL ENGR., H.E.Co., Inc.	5/17/65 DATE
PRINCPL. DISTRIBUTION ENGR., H.E.Co., Inc.	5/17/65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS Co, Ltd.	5/17/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES & WATER DRIP ASSEMBLY DETAIL FOR GAS MAIN

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown Date: May, 1964.

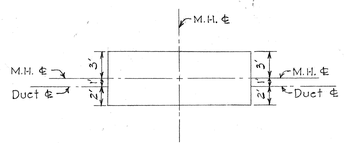
SHEET No. 8 OF 50 SHEETS

64A

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

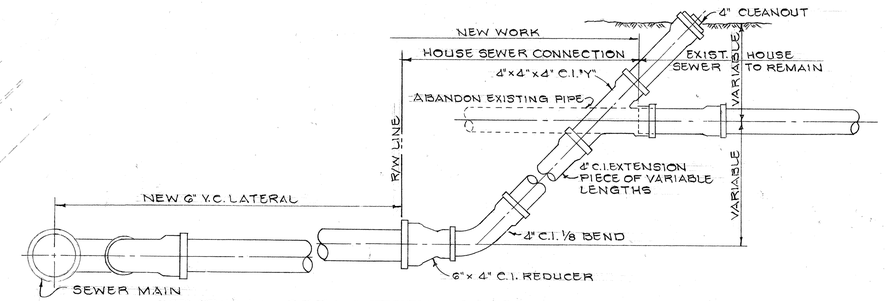
PRINTED ON CLEARPRINT 1000-H

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	65	270



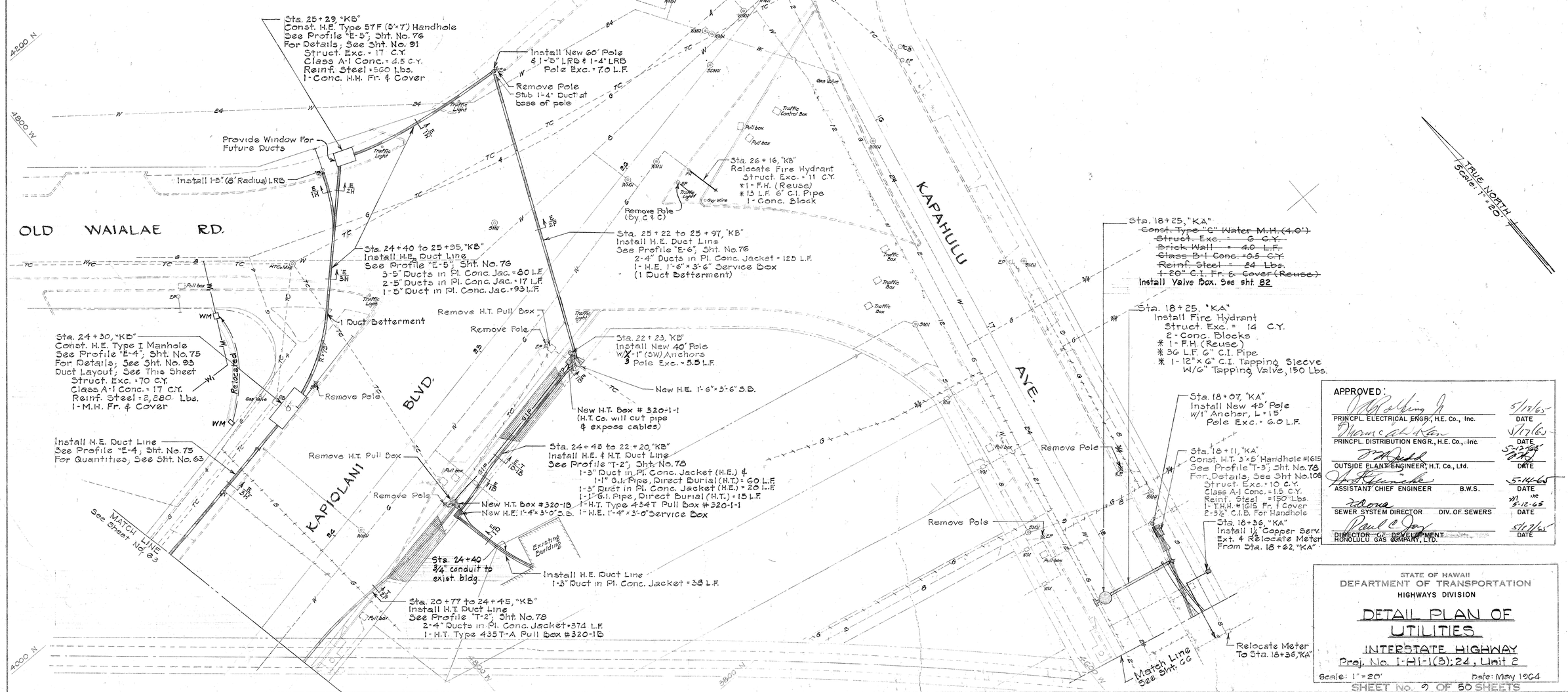
DUCT LAYOUT FOR H.E. MANHOLE

Sta. 24 + 30, "KB" = 5 + 12, "E-4"
Scale: 1/8" = 1'-0"



TYPICAL DETAIL OF HOUSE SEWER CONNECTION

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



APPROVED:		
PRINCPL. ELECTRICAL ENGR., H.E. Co., Inc.		5/18/65 DATE
PRINCPL. DISTRIBUTION ENGR., H.E. Co., Inc.		5/17/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.		5-12-65 DATE
ASSISTANT CHIEF ENGINEER	B.W.S.	5-14-65 DATE
SEWER SYSTEM DIRECTOR	DIV. OF SEWERS	5-12-65 DATE
DIRECTOR OF DEVELOPMENT, HONOLULU GAS COMPANY, LTD.		5/17/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2
Scale: 1" = 20' Date: May 1964
SHEET NO. 9 OF 50 SHEETS

65

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

LOCAL STREETS KAPIOLANI, KAPAHULU, & WAIALAE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(51) 24, Unit 2	1965	66	87G

TRUE NORTH
Scale: 1"=20'

Sta. 16+10, "HA"
Construct New S.M.H.
Top = 32.48'
Inv. = 26.70'
Struct. Exc. = 10 c.y.
Brickwall = 6.0 L.F.
Class B-1 Conc. = 1.0 c.y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Fr. & Cover

Sta. 16+10, "HA" to 18+79, "KA"
Install 8" Sewer Line
See Profile "S-G", Sht. No. 73
8" V.C. Sewer Pipe = 106 L.F.
8" V.C. Sewer Cradle = 101 L.F.
R/C Jacket = 5 L.F.
Struct. Exc. = 50 c.y.

Match Line
See Sht. No. G5

Match Line
See Sht. No. G3

Inv.=26.42
0+73
Remove Pole

Inv.=26.38
Remove Pole

0+38

0+00

Sta. 18+79, "KA"
Const. New S.M.H.
Top = 34.46
Inv. = 26.42 (Exist. 8")
Inv. = 26.22 (New 8")
Struct. Exc. = 14 c.y.
Brickwall = 8.0 L.F.
Class B-1 Conc. = 1.0 c.y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Fr. & Cover

Cut & Plug 8" Sewer
Inv.=24.80

4" Insulating Dresser Coupling

Remove Pole

Dem. Exist. S.M.H. = 6.0 L.F.
Salvage S.M.H. Fr. & Cover

Demolish Exist. S.M.H. = 7.0 L.F.
Salvage S.M.H. Fr. & Cover

Sta. 18+79, "KA" to 17+82, "HA"
Install 8" Sewer Line
See Profile "S-G", Sht. No. 73
8" V.C. Sewer Pipe = 111 L.F.
8" V.C. Sewer Cradle = 111 L.F.
Struct. Exc. = 72 c.y.

17+78.60
Sta. 17+82, "HA"
Remove Brick Bottom of Exist'g. Double Drop S.M.H. to Invert Elev. = 25.77'
Top = 36.50'
Inv. = 32.53' (Exist'g. 8", Plug South End)
Inv. = 26.70' (Exist'g 8", To Be Plugged)
Inv. = 25.77' (Exist'g. 8", To Remain)
Inv. = 30.03' (Exist'g. 6" Stub)
Inv. = 25.77' (Exist'g. 8" Stub)
Dist. out from ℄ = 93.85

Duct ℄
Duct & H.H. ℄
3'-0" 2'-1"
3'-0"
Duct & H.H. ℄
Provide Duct Window For Future
H.H. ℄

DUCT LAYOUT FOR H.E. HANDHOLE
Sta. 22+47, "KA"
Scale: 1/8" = 1'-0"

Duct ℄
3" 7'-9" 8'
Duct & M.H. ℄
3'-7"
3'-7"
Duct & M.H. ℄
M.H. ℄

DUCT LAYOUT FOR H.E. MANHOLE
Sta. 19+80, "HA" & 4+41, "E-11"
Scale: 1/8" = 1'-0"

Sta. 18+04 to 22+57, "KA"
Install H.T. Duct Line
See Profile "T-3", Sht. No. 78
6-4" Ducts in Pl. Conc. Jacket = 25 L.F.
2-4" Ducts in Pl. Conc. Jacket = 229 L.F.
2-4" Ducts in R/C Jacket = 104 L.F.
4 Ducts (2-4"&2-5") in Pl. Conc. Jacket, See "E-10"

Sta. 15+38, "HA" to 22+30, "KA"
Install H.E. Duct Line
See Profile "E-10", Sht. No. 77
6-5" Ducts in Pl. Conc. Jacket = 30 L.F.
4 Ducts (2-4"&2-5") in Pl. Conc. Jacket (H.T.&H.E.) = 76 L.F.
2-5" Ducts in Pl. Conc. Jacket = 240 L.F.
(1 Duct Betterment)

Rem. & Exist. S.M.H. = 12.0 L.F.
Salvage S.M.H. Fr. & Cover = 2 Ea.

"HA" Sta. 17+72.48
Dist. out from ℄ 75.95'
Inv. = 25.33'
Top MH = 36.38'

Plug 8" Sewer

17+72.40 17+42.40
Sta. 17+82, "HA" to 17+34, "HA"
Install 8" Sewer Line
See Profile "S-7", Sht. No. 73
8" V.C. Sewer = 148 L.F. 102.60 L.F.
8" V.C. Sewer Cradle = 142 L.F.
Struct. Exc. = 24 c.y.

Sta. 17+82, "HA" to 18+77, "HA"
Install 8" Sewer Line
See Profile "S-8", Sht. No. 73
8" V.C. Sewer Pipe = 99 L.F.
8" V.C. Sewer Cradle = 99 L.F.
Struct. Exc. = 36 c.y.

Sta. 0+66, "1st Ave."
Construct New S.M.H.
Top = 39.00
Inv. = 31.50
Struct. Exc. = 5 c.y.
Brickwall = 7.5 L.F.
Class B-1 Conc. = 1.0 c.y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Fr. & Cover

Sta. 0+66, "1st Ave." to 1+60, "1st Ave."
Install 8" Sewer Line
See Profile "S-9", Sht. No. 73
8" V.C. Sewer Pipe = 102 L.F.
8" V.C. Sewer Cradle = 102 L.F.
Struct. Exc. = 37 c.y.

Sta. 2+20, "1st Ave."
Install New 25' Stub Pole w/3/4" Anchor, L=13'
Pole Exc. = 4.5 L.F.

Sta. 15+38, "HA" to 22+30, "KA"
Install H.E. Duct Line
See Profile "E-10", Sht. No. 77
6-5" Ducts in Pl. Conc. Jacket = 30 L.F.
4 Ducts (2-4"&2-5") in Pl. Conc. Jacket (H.T.&H.E.) = 76 L.F.
2-5" Ducts in Pl. Conc. Jacket = 240 L.F.
(1 Duct Betterment)

Sta. 17+34, "HA"
Construct New S.M.H.
Top = ~~32.58~~
Inv. = ~~25.11~~ (Exist. 8")
Struct. Exc. = 13 c.y.
Brickwall = 7.0 L.F.
Class B-1 Conc. = 1.0 c.y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Fr. & Cover

Remove Pole

Install 17# Type "C" Anode With Test Box

"HA" Sta. 17+42.40
Inv. = 24.80
Top MH. 32.28
Dist. out from ℄ 84.10

Remove Pole

Remove Pole

Remove Pole

Remove Pole

Cut & Plug 8" Sewer

Remove Pole
Cut & Plug Gas

Sta. 21+71, "KA"
Install H.T. Type 435T-A Pull Box #4826 (H.T. Will Cut And Expose Exist. Cable At Approximate Depth = 31")

Sta. 21+71 to 22+48, "KA"
Install H.T. Duct Line
Install 1-1" G.I. Pipe, Direct Burial = 75 L.F.
Struct. Exc. =

Sta. 15+80 to 19+80, "HA"
Install H.E. Duct Line
See Profile "E-11", Sht. No. 77
4-5" Ducts in Pl. Conc. Jacket = 402 L.F.
6-5" Ducts in Pl. Conc. Jacket, See "E-10"
(1 Duct Betterment)

Sta. 0+27 to 0+94, "1st Ave."
Install H.T. Duct Line
See Profile T-4, Sht. No. 78
2-4" Ducts in Pl. Conc. Jacket = 221 L.F.
1-Type 434T Pull Box #5053

Sta. 1+38, "1st Ave."
Extend House Sewer and Connect to New 8" Sewer
6" V.C. Sewer Pipe = 17 L.F.
6" V.C. Sewer Cradle = 17 L.F.
Struct. Exc. = 6 c.y.

Sta. 1+60, 1st Ave.
Const. New Shallow Drop S.M.H.
Top = 41.65
Inv. = 37.70 (Exist. 8")
Inv. = 34.00 (New 8")
Struct. Exc. = 9 c.y.
Brickwall = 4.0 L.F.
Class B-1 Conc. = 3.0 c.y.
Reinf. Steel = 88 Lbs.
Sewer Drop Connection = 3.0 L.F.
1-20" Std. S.M.H. Fr. & Cover

Sta. 22+48, "KA"
Install H.T. Type 434T Pull Box #4825 (Depth of Ducts At Pull Box = 15")

Sta. 22+48 to 22+60, "KA"
Install H.T. Duct Line
1-4" Duct in Pl. Conc. Jacket = 60 L.F.
(Inv. Depth of Duct @ Manhole = 2')

Sta. 22+57, "KA" to 18+82, "HA"
Install H.T. Duct Line
See Profile "T-4", Sht. No. 78
4-4" Ducts in Pl. Conc. Jacket = 270 L.F.

Sta. 22+47, "KA"
Const. H.E. Type 611V (6'x11') Handhole
See Profile "E-10", Sht. No. 77
For Details, See Sht. No. 92
Duct Layout, See This Sht.
Struct. Exc. = 36 c.y.
Class A-1 Conc. = 9 c.y.
Reinf. Steel = 1,780 Lbs.
1-H.H. Fr. & Cover

Sta. 22+48 to 22+60, "KA"
Install H.T. Duct Line
1-4" Duct in Pl. Conc. Jacket = 60 L.F.
(Inv. Depth of Duct @ Manhole = 2')

Sta. 22+60, "KA"
Install New 50' Pole w/1/4 Anchor, L=35'
Pole Exc. = 6.5 L.F.
1-5" LRB

Sta. 22+62 to 22+68, "KA"
Install H.T. Duct Line
2-4" Ducts in Pl. Conc. Jacket = 8 L.F.
2-3 1/2" C.I.D.

Sta. 22+53 to 22+68, "KA"
Install H.E. Duct Line
1-5" Ducts in Pl. Conc. Jacket = 15 L.F.

Sta. 22+60, "KA" = 0+00, "T-3"
Const. H.T. 3'x5' Handhole #1616
See Profile "T-3", Sht. No. 78
For Details, See Sht. No. 106
Struct. Exc. = 10 C.Y.
Class A-1 Conc. = 1.5 C.Y.
Reinf. Steel = 150 Lbs.
1-H.H. #1616 Fr. & Cover

Sta. 22+40, "KA"
Install New 30' Pole w/3/4" Anchor, L=8'
Pole Exc. = 3.0 L.F.

135' (Not to Scale)

Sta. 23+42, "KA"
Install New 30' Pole w/3/4" Anchor, L=8'
Pole Exc. = 3.0 L.F.

Remove Pole

Sta. 24+05, "KA"
Install New 50' Pole
Pole Exc. = 6.5 L.F.

Sta. 1+25, "1st Ave." to 20+15, "HA"
Install 3/4" Gas Service = 167 L.F.

Connect Gas

Sta. 0+94, "1st Ave." to 19+70, "HA"
Install H.E. & H.T. Duct Line
1-3" Duct in Pl. Conc. Jacket & 1-1 1/2" G.I. Pipe, Direct Burial = 55 L.F.
1-H.E. 1'-4"x 3'-0" Service Box

Sta. 0+94, "1st Ave."
Install New 45' Pole w/1/4 Anchor, L=20'
1-5" LRB
Pole Exc. = 6.0 L.F.

Exist. TMH = 1570

Remove Pole

Dem. Exist. S.M.H. = 5.0 L.F.
Salvage S.M.H. Fr. & Cover

Sta. 17+82 to 20+20, "HA"
Install 8" & 6" Sewer Line
See Profile "S-8", Sht. No. 73
8" V.C. Sewer Pipe = 88 L.F.
8" V.C. Sewer Cradle = 58 L.F.
Plain Conc. Jacket (8") = 30 L.F.
6" V.C. Sewer Pipe = 62 L.F.
Plain Conc. Jacket (6") = 62 L.F.
Struct. Exc. = 44 c.y.

Remove Pole
H.T. Box To Remain
New H.E. Box

Install 6" V.C. Lats. w/Plain Conc. Jacket. Reconnect House Sewers and Relocate Cleanouts
6" V.C. Sewer Pipe = 12 L.F.
Plain Conc. Jacket = 12 L.F.
Struct. Exc. = 4 c.y.
House Connection = 3 Ea.

Sta. 19+82, "HA"
Construct New S.M.H.
Top = 48.00
Inv. = 36.75 (New 8")
Inv. = 37.00 (New 6")
Struct. Exc. = 8 c.y.
Brickwall = 6.0 L.F.
Class B-1 Conc. = 1.0 c.y.
Reinf. Steel = 22 Lbs.
1-20" Std. S.M.H. Fr. & Cover

Match Line
See Sht. No. 68

Conn. Gas

Sta. 18+04 to 22+57, "KA"
Install H.T. Duct Line
See Profile "T-3", Sht. No. 78
6-4" Ducts in Pl. Conc. Jacket = 25 L.F.
2-4" Ducts in Pl. Conc. Jacket = 229 L.F.
2-4" Ducts in R/C Jacket = 104 L.F.
4 Ducts (2-4"&2-5") in Pl. Conc. Jacket, See "E-10"

Sta. 10+05 to 21+25, "HA"
Install 8" Gas Main = 644 L.F.
See Profile G-3, Sht. No. 74

Install Gas Drip & Street Valve Box For Details, See Sht. No. 64

Sta. 19+72, "HA" to 0+94, "1st Ave."
Install H.E. Duct Line
See Profile E-12, Sht. No. 77
1-5" Duct in Pl. Conc. Jacket = 90 L.F.
2-Ducts (1-5" & 1-3") in Pl. Conc. Jacket (H.E.)
1-3/4" G.I. Pipe, Direct Burial (H.T.) = 25 L.F.

Sta. 19+80, "HA" = 4+41, "E-11"
Construct H.E. Type II Manhole
See Profile "E-11", Sht. No. 77
For Details, See Sht. No. 94
Duct Layout, See This Sht.
Struct. Exc. = 85 c.y.
Class A-1 Conc. = 23 c.y.
Reinf. Steel = 2,970 Lbs.
1-M.H. Fr. & Cover

Sta. 0+94, "1st Ave."
Install New 25' Stub Pole w/3/4" Anchor, L=13'
Pole Exc. = 4.5 L.F.

APPROVED:

PRINCPL. ELECTRICAL ENG R., H.E. Co., Inc. — DATE 5/26/65

PRINCPL. DISTRIBUTION ENG R., H.E. Co., Inc. — DATE 5/27/65

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5/26/65

SEWER SYSTEM DIRECTOR, DIV. OF SEWERS — DATE 5-12-65

DIRECTOR OF DEVELOPMENT, HONOLULU GAS COMPANY, LTD. — DATE 5/21/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Scale: 1" = 20' Date: May, 1964

SHEET No. 10 OF 50 SHEETS

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

66

KEUFFEL & ESSER CO. MADE IN U.S.A.
NO. 340 IMPERIAL TRACING CLOTH

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HH-1(6)24 Unit 2	1965	G7	276

REVISED: June 15, 1966
Aug. 19, 1966

Sta. 15+G5 to 1G+~~79~~82, "H-A"
Install 12" & 18" Water Main
See Profile "W-8", Sht. No. 70
12" C.I. Pipe, Class 200 = G4 L.F.
18" C.I. Pipe, Class 150 = 8G L.F.
Struct. Exc. = 5G c.y.
Sta. 15+58.5
* 1-12" C.I. Sleeve, 14" long, L.J.
* 8-L.F. 12" C.I. Pipe, Class 200
Temp. for Testing
1-12" C.I. Plug
1 - ~~Clean out~~
Sta. 15+~~32~~ 26' ⅝ Left
1-12" C.I. ⅛ Bend (Hor.)
1-Conc. Block
Sta. 1G+14 & 1G+27 19.5 & 24' ⅝ Left
2-12" C.I. ⅛ Bends (Hor)
2-Conc. Blocks
Sta. ~~1G+80~~ 15+91
1-12" Gate Valve, 150 lb. (Reuse)
1-¾" Air Valve (150 psi min. working pressure)
1-Type "B" Manhole (5.0' deep)
Structure Exc. = 5 c.y.
Brickwall = 5.0 L.F.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 27 Lbs.
1-20" C.I. Fr. & Cover (Reuse)
1-R/C Reaction Beam
Struc. Exc. = 1.5 c.y.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 70 Lbs.
Sta. 1G+33
1-18"x12" C.I. Reducer, S.E.B.
Sta. 1G+~~45~~42
1-18" B.G.G.V. w/3" By Pass (Reuse)
1-Type "A" Manhole (5.0' deep)
Struct. Exc. = 12.5 c.y.
Brickwall = 5.0 L.F.
Class B-1 Conc. = 3.0 c.y.
Reinf. Steel = 337 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers
1-R/C Reaction Beam
Struct. Exc. = 3 c.y.
Class B-1 Conc. = 1.5 c.y.
Reinf. Steel = 200 Lbs.
Sta. 1G+~~78~~80
* 1-18" C.I. ⅛ Bend (Hor)
* 1-18" C.I. Sleeve, 15" long, L.J.
* 8-L.F. 18" C.I. Pipe, Class 150
1-Conc. Block w/Struct. Strut
Temp. for Testing
1-18" C.I. Plug
1-Cleanout

Sta. 1G+45
* 1-18" offset 18" Drop B.S. at Reaction Beam

Sta. 1G+05, "HA"
Dem. Type "B" Water M.H. = 5.5 L.F.
Salvage:
1-12" Gate Valve
1-20" C.I. Fr. & Cover

Sta. 1G+10, "HA" to 19+~~25~~28, "KA"
Install New 24" Water Main
See Note ② on This Sheet

Sta. 20+15 to 20+58, "KA"
Install 24" Water Main
See Note ③ on This Sheet

Sta. 1G+50, "HA" to 20+45, "KA"
Dem. Type "A" Water M.H. (2 Ea.) = 19.5 L.F.
Dem. Type "B" Water M.H. (2 Ea.) = 11.5 L.F.
Salvage:
1-24" Gate Valve
1-18" Gate Valve
1-16" Gate Valve
2-12" Gate Valves
2-20" C.I. Fr. & Covers

Sta. 20+85, "KA"
Dem. Type "B" Water M.H. = 17.5 L.F.
Salvage: 1-20" C.I. Fr. & Cover
Const. New Type "A" Manhole
For Details, See Sht. No. 80
Struct. Exc. = 52 c.y.
Class B-1 Conc. = 15 c.y.
Reinf. Steel = 1,200 Lbs.
1-20" C.I. Fr. & Cover (Reuse)
1-16" Special Fr. & Cover

Sta. 20+59 to 21+~~17~~20, "KA"
Install 12" Water Main
See Profile "W-11", Sht. No. 71
12" C.I. Pipe, Class 200 = 48 L.F.
Struct. Exc. = 45 c.y.
Sta. 20+64
1-12" Gate Valve, 150 lb. (Reuse)
1-Type "B" Manhole (6.0' deep)
Struct. Exc. = 8 c.y.
Brickwall = 8 L.F.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 27 Lbs.
1-20" C.I. Fr. & Cover (Reuse)
Sta. 20+68
1-R/C Reaction Beam
Struct. Exc. = 1.5 c.y.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 70 Lbs.
Sta. 20+71 6' ⅝ Right
1-12" C.I. ⅛ Bend (Hor.)
1-Conc. Block
Sta. ~~20+95~~ 21+17
1-12" C.I. Offset, 18" drop, B.B.
1-Conc. Block
Sta. 20+97 32' ⅝ Right
* 1-12" C.I. ⅛ Bend (Hor.)
1-Conc. Block
Sta. 20+97 to 21+17
* 20-L.F. 12" C.I. Pipe, Class 200
Sta. ~~21+17~~ 21+20
* 1-12" C.I. Sleeve, 14" long, L.J.
* 1-¾" Air Valve (150 psi min. working pressure)
1-Type "B" Manhole (6.0' deep)
Struct. Exc. = 5.5 c.y.
Brickwall = 6 L.F.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 27 Lbs.
1-20" C.I. Fr. & Cover (Reuse)
Temp. for Testing
1-12" C.I. Plug
1-Cleanout

Sta. 21+40, "KA"
Install:
* 1-12" C.I. Plug
* 1-12" Hub Clamp w/Strongback
1-Conc. Block
Struct. Exc. = 3.5 c.y.
Demolish:
1-Type "B" W.M.H. = 6.0 L.F.
Salvage:
1-20" C.I. Fr. & Cover
1-12" Gate Valve

Sta. 22+17, "KA"
Install 2½" Copper Serv. Lat. & Type "E-1" Conn. With 2-Type III Meter Boxes

Sta. 1G+96 to 18+62, "HA"
Install 18" Water Main
See Profile "W-12", Sht. No. 71
*18" C.I. Pipe, Class 150 = 1G4 L.F.
Struct. Exc. = 75 C.Y.
* 4-18" ⅛ Bends
* 2-18" Sleeves, 15" Long
4 Conc. Blks.
* Reuse Salvaged 18" C.I. Pipe, 50 L.F.
Sta. ~~17+17~~ 17+22
* 1-18" B.G.G.V., 150 Lbs. (reuse)
1-Type "A" Manhole
Struct. Exc. = 11 C.Y.
Brickwall = 5.0 L.F.
Class B-1 Conc. = 3.0 C.Y.
Reinf. Steel = 332 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers

Sta. 20+00 to 21+50, "KA"
Install 16" & 18" Water Main
See Profile "W-10", Sht. No. 71
18" C.I. Pipe, Class 150 = 5G L.F.
16" C.I. Pipe, Class 150 = 92 L.F.
Struc. Exc. = 112 c.y.

Const. Concrete Slab Over 20" Water Main 20+40 to 21+20 "HA"
Also Over 18" Water Main 18+60 to 18+87
And 21+20 to 21+50

Sta. 20+02
1-18"-18" Offset, Drop B.S.
Sta. 20+00 5' ⅝ Left
~~* 1-18" C.I. ⅛ Bend (Hor.)~~
* 1-18" C.I. Sleeve, 15" long, L.J.
* 8-L.F. C.I. Pipe, Class 150
1-Conc. Block w/Struct. Strut
Temp. for Testing
1-18" C.I. Plug
1-Cleanout
Sta. 20+34 8' ⅝ Left
1-18" C.I. ~~⅛~~ Bend (Hor.)
1-Conc. Block
Sta. 20+40
1-R/C Reaction Beam
Struct. Exc. = 2.5 c.y.
Class B-1 Conc. = 1.5 c.y.
Reinf. Steel = 200 Lbs.
Sta. 20+50
Install 18" Gate Valve & Const. Type "A" Water Manhole (6.0')
1-16" B.G.G.V. w/3" By Pass, 150 Lb. (Reuse)
Struct. Exc. = 14.5 c.y.
Brickwall = G L.F.
Class B-1 Conc. = 3.0 c.y.
Reinf. Steel = 337 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers

Sta. 20+59
1-24"x24" C.I. Tee
1-24"x18" C.I. Reducer, S.E.B.
1-24"x16" C.I. Reducer, S.E.B.
1-Conc. Block
Sta. 20+68
Install 16" Gate Valve & Const. Type "A" Water Manhole (6.0')
1-16" B.G.G.V. w/3" By Pass, 150 Lb. (Reuse)
Struct. Exc. = 14.5 c.y.
Brickwall = G L.F.
Class B-1 Conc. = 3.0 c.y.
Reinf. Steel = 332 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers
Sta. 21+13 8' ⅝ Left
1-16" C.I. ⅛ Bend (Hor.)
1-Conc. Block
Sta. 21+50 77' ⅝ Right
* 1-16" C.I. ⅛ Bend (Hor.)
* 1-16" C.I. Sleeve, 15" long, L.J.
* 8-L.F. 16" C.I. Pipe, Class 150
1-Conc. Block w/Struct. Strut
Temp. for Testing
1-16" C.I. Plug
1-Cleanout

Sta. 19+45 to 21+40, "HA"
Lower 16" Water Main
See Profile "W-12", Sht. No. 71
Struct. Exc. = 280 C.Y.
* 16 L.F. 16" C.I. Pipe, Class 150
* 2-16" ⅛ Bends
* 2-16" Sleeves, 15" Long
* ~~1-16" Offsets, 18" Drop (B.B.)~~
2-Conc. Blks. w/Struct. Strut
1-Conc. Blk.

Sta. 19+~~28~~50 to 19+~~44~~, "KA"
Install 12" Water Main
See Profile "W-7", Sht. No. 70
12" C.I. Pipe, Class 200 = 12 L.F.
Struct. Exc. = 17 c.y.
1-12" C.I. ¼ Bend
1-12" Gate Valve, 150 lb. (Reuse)
1-Type "B" Manhole (4.5' deep)
Struct. Exc. = 2 c.y.
Brickwall = 4.5 L.F.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 27 Lbs.
1-20" C.I. Fr. & Cover (Reuse)
2-Conc. Blocks
* 1-12" C.I. Wye, Type 2
* 1-12" C.I. Sleeve, 14" long, L.J.
* 10-L.F. 12" C.I. Pipe, Class 200
Temp. for Testing
1-12" C.I. Plug
1-Cleanout

Sta. 19+68, "KA"
* 1-12" C.I. Plug
* 1-12" Hub Clamp w/Strong back
1-Conc. Block
Struck Exc. = 3 c.y.

Sta. 1G+~~38~~95 to 1G+~~56~~, "HA"
Install 20" H.P. Water Main
See Note ① on This Sheet

Sta. 19+90, "KA"
Adjust Type "B" M.H. Fr. & Cover

Sta. 17+05, "HA"
Dem. Type "A" Water M.H. = 5.0 L.F.
Dem. Type "C" Water M.H. = 5.0 L.F.
Salvage:
1-Fire Hydrant
1-6" Gate Valve
1-18" Gate Valve
1-20" C.I. Fr. & Cover

Sta. 17+43, "HA"
Adjust Type "A" M.H. Fr. & Cover

Salvage & Reuse 50 L.F. of Existing 18" Pipe

Sta. 16+60 to 18+87, "HA"
Constr. R/C Slab Over 16" Water Main
For Details, See Sht. No. 79
Class B-1 Conc. = 4 C.Y.
Reinf. Steel = 694 Lbs.

Medial Opening Reinforced Conc. Slab Over 18" Main

Sta. 19+85, "HA" to 1+45, "1st Ave."
Install 2" Copper Serv. Lat. & Type "D-2" Conn. w/Approx. 135 L.F. 1½" Copper Serv. Ext. & 3-Type II Meter Boxes

Adjust Type "A" M.H. Top Slabs Including Frames & Covers to New Grade

Note ①~~38~~95
Sta. 1G+~~39~~56 to 1G+~~56~~, "HA"
Install 20" H.P. Water Main
See Profile "W-5", Sht. No. 70
* 20" C.I. Pipe, Class 250 = 100 L.F.
Struct. Exc. = 128 c.y.
Sta. 1G+~~39~~56 to 1G+~~56~~ 51
* ~~2~~ 20" C.I. ⅛ Bend (Hor)
* 1-20"x 20" C.I. Wye, Type 2
* 1-20" C.I. Sleeve, 15" long, L.J.
2-Conc. Blocks (1-w/Struct. Strut)
HA Sta. 1G+~~74~~ 54 17' ⅝ Left
* 1-20" C.I. ⅛ Bend (Hor.)
1-Conc. Block w/Struct. Strut
HA Sta. 1G+~~95~~ 17' ⅝ Left
~~* 1-20" C.I. ⅛ Bend (Bott. Vert.)~~
* 1-20" C.I. Sleeve, 15" long, L.J.
1-Conc. Block

Note ②
Sta. 1G+10, "HA" to 19+~~25~~28, "KA"
Install 24" Water Main
See Profile "W-6", Sht. No. 70
24" C.I. Pipe, Class 150 = 120 L.F.
Struct. Exc. = 142 c.y.
HA Sta. 1G+10
* 1-24" C.I. Sleeve, 15" long, L.J.
* 8-L.F. 24" C.I. Pipe, Class 150
1-24"x24" C.I. Tee
1-24" C.I. ⅛ Bend
2-Conc. Blocks
Temp. for Testing
2-24" C.I. Plugs
1-Cleanout
HA Sta. 1G+14
1-24" B.G.G.V. w/4" By Pass, 150 Lb. (Reuse)
1-Type "A" Manhole (7.0' deep)
Struct. Exc. = 18.5 c.y.
Brickwall = 7 L.F.
Class B-1 Conc. = 3.5 c.y.
Reinf. Steel = 390 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers
1-R/C Reaction Beam
Struct. Exc. = 5 c.y.
Class B-1 Conc. = 3.5 c.y.
Reinf. Steel = 320 Lbs.

Note ③
Sta. 20+~~35~~58, "KA"
Install 24" Water Main
See Profile "W-9", Sht. No. 71
24" C.I. Pipe, Class 150 = G4 L.F.
Struct. Exc. = 95 c.y.
Sta. 20+~~15~~18 80' ⅝ Right
* 1-24" C.I. Sleeve, 15" long, L.J.
* 8-L.F. 24" C.I. Pipe, Class 150
* 1-24" B.G.G.V. w/4" By Pass, 150 Lb. (Reuse)
1-Type "A" Manhole (7.0' deep)
Struct. Exc. = 18.5 c.y.
Brickwall = 7 L.F.
Class B-1 Conc. = 3.5 c.y.
Reinf. Steel = 390 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers
Sta. 20+~~25~~31 45' ⅝ Right
* 1-24" C.I. ⅛ Bend (Hor.)
* 1-24" C.I. Sleeve, 15" long, L.J.
* 8-L.F. 24" C.I. Pipe, Class 150
1-Conc. Block w/Struct. Strut
*1-2" Air Valve (105 psi min. working pressure)
1-Type "B" Manhole (7.0' deep)
Struct. Exc. = 7 c.y.
Brickwall = 7 L.F.
Class B-1 Conc. = 0.5 c.y.
Reinf. Steel = 27 Lbs.
1-20" C.I. Fr. & Cover (Reuse)
Temp. for Testing
1-24" C.I. Plug
1-Cleanout
Sta. 20+58 8' ⅝ Left
1-24" C.I. ⅛ Bend (Hor.)
1-24"x12" C.I. Tee
1-24" C.I. ½ Bend (Bott. Vert.)
3-Conc. Blocks

HA Sta. 1G+~~84~~ 21.5' ⅝ Left
1-24"x 18" C.I. Cross
KA Sta. 19+55
1-24" B.G.G.V. w/4" By Pass, 150 Lb. (Reuse)
1-Type "A" Manhole (6.0' deep)
Struct. Exc. = 12.5 c.y.
Brickwall = 6 L.F.
Class B-1 Conc. = 3.5 c.y.
Reinf. Steel = 390 Lbs.
1-20" C.I. Fr. & Cover
2-G" C.I. Fr. & Covers
KA Sta. 19+~~72~~82 30' ⅝ Right
1-24"x12" C.I. Tee
1-Conc. Block
KA Sta. 19+~~95~~ 20 5' ⅝ Right
* 1-24" C.I. ⅛ Bend
* 1-24" C.I. Sleeve, 15" long, L.J.
* 8-L.F. C.I. Pipe, Class 150
1-Conc. Block w/Struct. Strut
Temp. for Testing
1-24" C.I. Plug
1-Cleanout

Note ④ (Cont.)
~~Sta. 1G+30~~
~~1-24" C.I. ½ Bend (Bott. Vert.)~~
~~1-24" C.I. ½ Bend, 4 W/KA (Top Vert.)~~
~~8-Conc. Blocks~~

Sta. 1+45 to 1+40, "1st Ave."
Begin Lowering 16" Main

TRUE NORTH
SCALE: 1" = 20'

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5-12-65

ASSISTANT CHIEF ENGINEER B.W.S. — DATE 5-14-65

DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD. — DATE 5/17/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: 1" = 20' Date: May, 1964.

SHEET No. 11 OF 50 SHEETS

C 10 65

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	66	276

REVISED : June 15, 1966
Aug. 19, 1966

TRUE NORTH
Scale: 1"=20'

Install New ¾" (3W) Anchor

Remove Pole

Sta. 8+22 "WA"
Install New 65' Pole
w/ 1¼" Anchor, L=30'
& 1-1" (SW) Anchor
Pole Exc. = 7.5 L.F.

WAIALAE AVE.

Remove Pole

Install New 65' Pole
w/1¼" Anchor, L=25'
Pole Exc. = 7.5 L.F.

AVE.

Sta. 21+20 to 21+50, "HA"
Constr. R/C Slab over 18" Water Main
For Details, See Sht. No. 79
Class B-1 Conc. = 5 C.Y.
Reinf. Steel = 503 Lbs.

Sta. 20+40 to 21+20, "HA"
Const. R/C Slab Over 20" H.P. Main
For Details, See Sht. No. 79
Class "B-1" Conc. = 12 C.Y.
Reinf. Steel = 1504 Lbs.

Install 6" Sewer Line
See Profile "S-3", Sht. No. 73
For Quantities, See Sht. No. 66

Sta. 20+40, "HA"
Install 1" Copper Serv. Lat.
& Type "G-1" Conn. With 2-Type
II Meter Boxes (⅝"DWC, ⅓ State)

Stas. 20+72, 21+43 & 21+50, "HA"
Install 1" Copper Serv. Lat.
& Type "B" Conn. With Type II
Meter Box (⅝"DWS, ⅓ State)

4" C.I. Pipe

New 6" V.C. Pipe

Reinforced Conc. Jacket

Adjust Exist'g SMH Fr. & Cover

18" Main to be Lowered

Remove Pole

6" Insulating Dresser Coupling

Sta. 21+50 & Existing 22 Pavement to remain. Resurface with 1½" A.C.

HARDING AVE.

Remove Pole

Sta. 21+85, "HA"
Install New 60' Pole
w/1¼" Anchor, L=40'
Pole Exc. = 7.0 L.F.
1-5" (8' Radius) Bend
1-5" LRB

Sta. 16+09 to 21+95, "HA"
Install 6" Gas Main
See Profile "G-3", Sht. No. 74
For Quantities, See Sht. No. 66

Sta. 21+30
18" Water ⅛ Bend

Sta. 21+40
18" Water ⅛ Bend

Adjust Gas H.H. Fr. & Cover
(Incidental to Roadway Exc.)

Sta. 22+28, "HA"
Install 1" Copper Serv. Lat.
& Type "C-1" Connection With
2-Type II Meter Boxes

Sta. 19+90 to 22+63, "HA"
Install H.E. Duct Line
See Profile "E-13", Sht. No. 77
3-5" Ducts in Pl. Conc. Jacket = 106 L.F.
1-5" Duct in Pl. Conc. Jacket = 160 L.F.

Sta. 22+45, "HA" = 2+57, "E-13"
Const. H.E. Type 57F (5'x7') Handhole
See Profile "E-13", Sht. No. 77
For Details, See Sht. No. 91
Struct. Exc. = 17 c.y.
Class A-1 Conc. = 4.5 c.y.
Reinf. Steel = 560 Lbs.
1-Conc. M.H. Fr. & Cover

Sta. 22+35 "HA"
Install Fire Hydrant "2319
*1-6" C.I. ¼ Bend (Reuse)
*1-6" Gate Valve (Reuse)
*10 L.F. 6" C.I. Pipe
*1-Fire Hydrant (Reuse)
2-Conc. Blocks
Struct. Exc. = 6 C.Y.
Const. Type "C" M.H. (5.0' deep)
Struct. Exc. = 4 C.Y.
Brick Wall = 3.0 L.F.
Class B-1 Conc. = 0.5 C.Y.
Reinf. Steel = 24 Lbs.
1-20" C.I. Fr. & Cover (Reuse)

Sta. 22+60, "HA"
Demolish:
Type "C" Water M.H. = 5.0 L.F.
Salvage:
1-F.H. # 2319
1-6" Gate Valve
1-20" C.I. Fr. & Cover

2ND AVE.

Sta. 10+62 "2nd Ave"
Install New 60' Pole
w/1¼" Anchor, L=30'
& ¾" Anchor, L=15'
Pole Exc. = 7.0 L.F.

2nd Ave. Sta. 10+00
Harding Ave. Sta. 22+31.85

Sta. 24+17 "HA"
Install New 30' Stub
Pole w/ ¾" SW Anchor
Pole Exc. = 5.0 L.F.

Sta. 22+63, "HA"
Install New 60' Pole
w/1" SW Anchor
Pole Exc. = 7.0 L.F.
1-5" (8' Radius) LRB

Sta. 22+60 to 22+77, "HA"
Install H.T. Duct Line
2-4" Ducts in Plain Conc. Jacket = 31 L.F.
1-Type 435T-A Pull Box # 4827
1-3½" C.I.P.

MATCH LINE See Sheet 66

APPROVED:

PRINCPL. ELECTRICAL ENGR., H.E. Co., Inc.	5/17/65 DATE
PRINCPL. DISTRIBUTION ENGR., H.E. Co., Inc.	5/17/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	6-10-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-14-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY LTD.	5/12/65 DATE

3" Exist'g Pavt. Line
3½"
3½"
Inner Face of Wall
New Ducts

DUCT LOCATION FOR EXIST'G. T.M.H. #1588
(Not to Scale)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAIL PLAN OF UTILITIES

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Scale: 1"=20' Date: May 1964

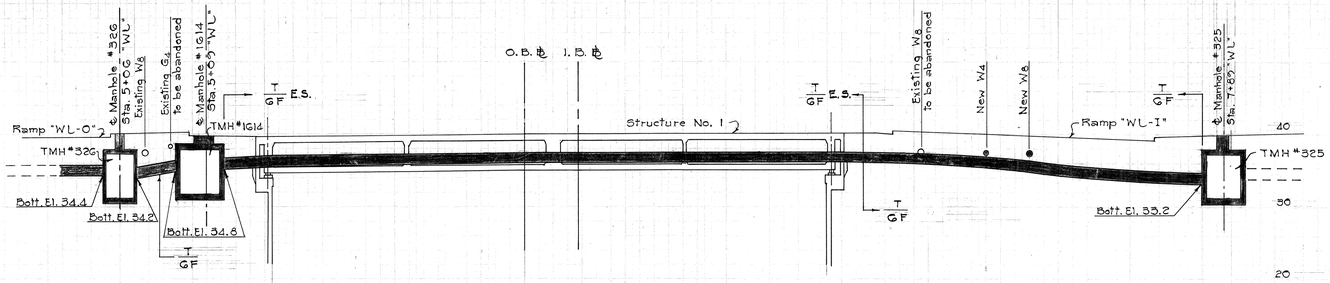
SHEET No. 12 OF 50 SHEETS

C D G S

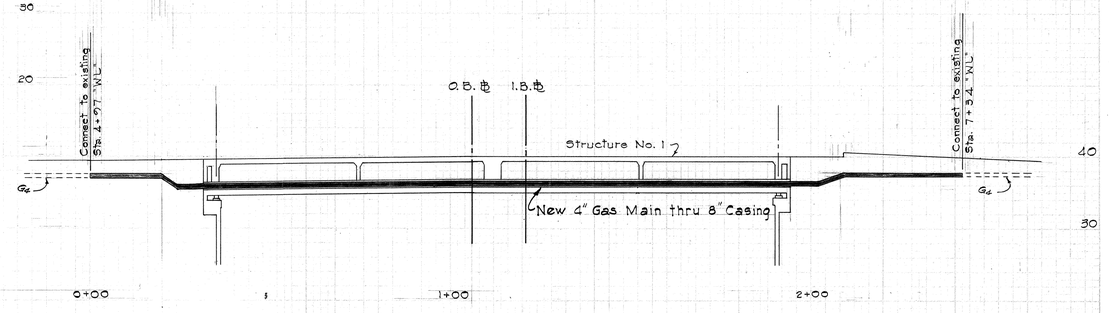
ORIGINAL PLAN — SURVEY PLOTTED BY — DRAWN BY — TRACED BY — DESIGNED BY — NOTE BOOK — QUANTITIES BY — CHECKED BY — DATE

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	69	273

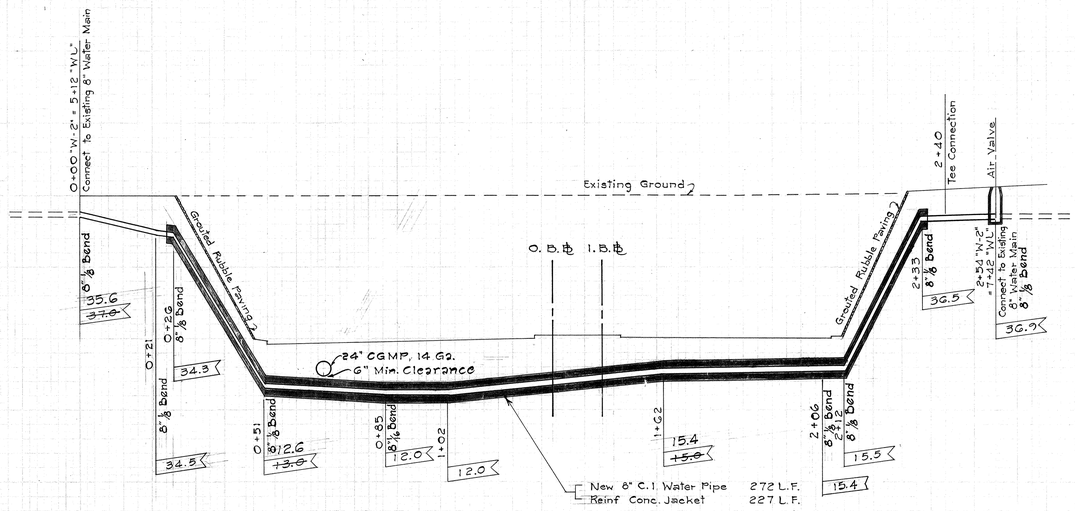
Revised: Jan. 10, 1966
Revised: Jan. 9, 1967
Jan. 10, 1967



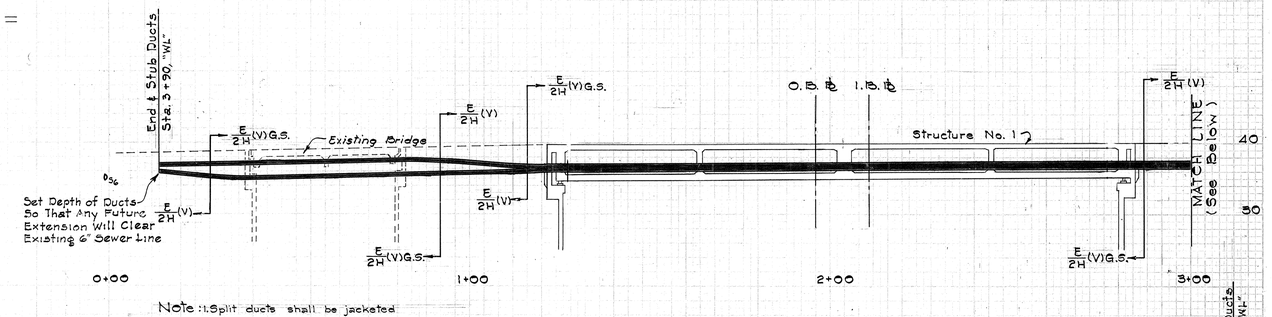
OLD WAIALAE ROAD TELEPHONE PROFILE "T-1"
TMH #326 TO #1614 TO #325



OLD WAIALAE ROAD GAS PROFILE "G-1"

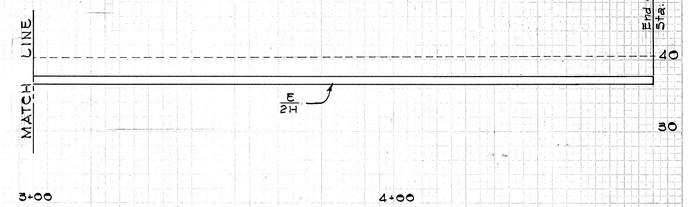


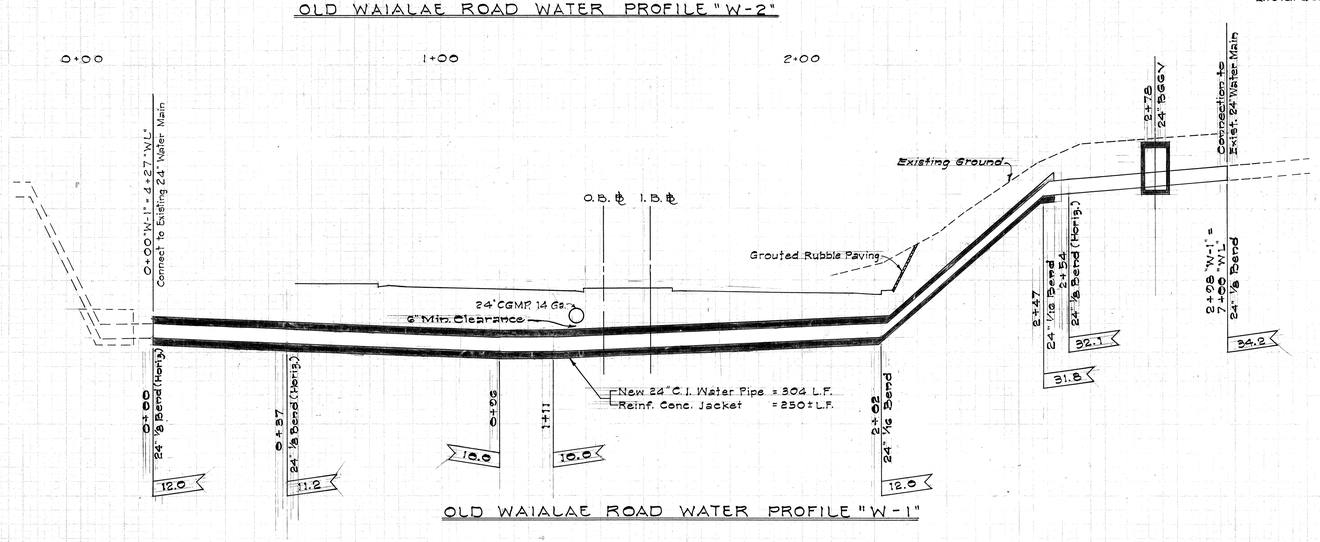
OLD WAIALAE ROAD WATER PROFILE "W-2"



Note: 1. Split ducts shall be jacketed with one encasement. Additional concrete shall be incidental to duct line construction.
2. Total Betterment

ELECTRIC PROFILE "E-1"





OLD WAIALAE ROAD WATER PROFILE "W-1"

APPROVED:

PRINCPL. ELECTRICAL ENG'R., H.E. Co., Inc.	5/10/65 DATE
PRINCPL. DISTRIBUTION ENG'R., H.E. Co., Inc.	5/12/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-14- DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD.	5/11/65 DATE

SCALE: HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
WATER, ELECTRIC, GAS & TELEPHONE

INTERSTATE HIGHWAY
Proj No. I-HI-1(5): 24, Unit 2

Scale: As Shown Date: May 1964

SHEET NO. 13 OF 50 SHEETS

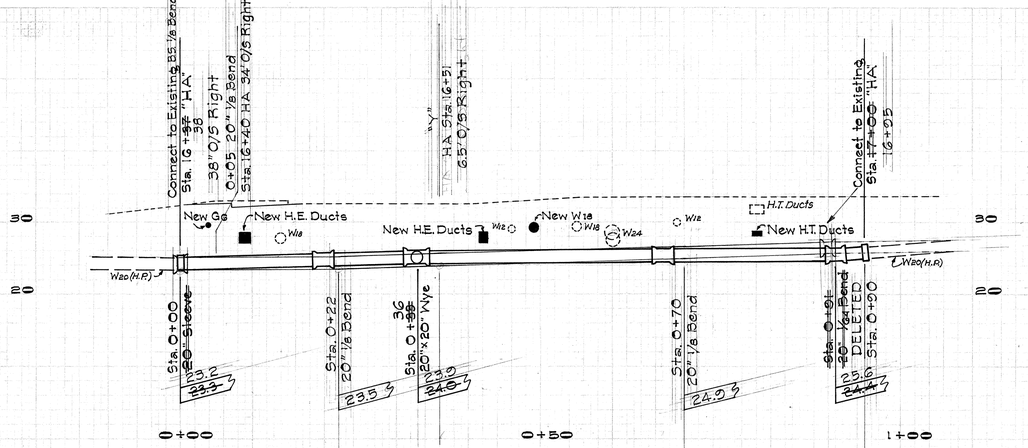
SHEET No. 693 SUPERSEDES SHEET No. 69

T.M.K. 6-9-5

PLATE 3-CROSS SECTION O. P. R & B. E. STANDARD
J. M. PUEL CO. PHILADELPHIA

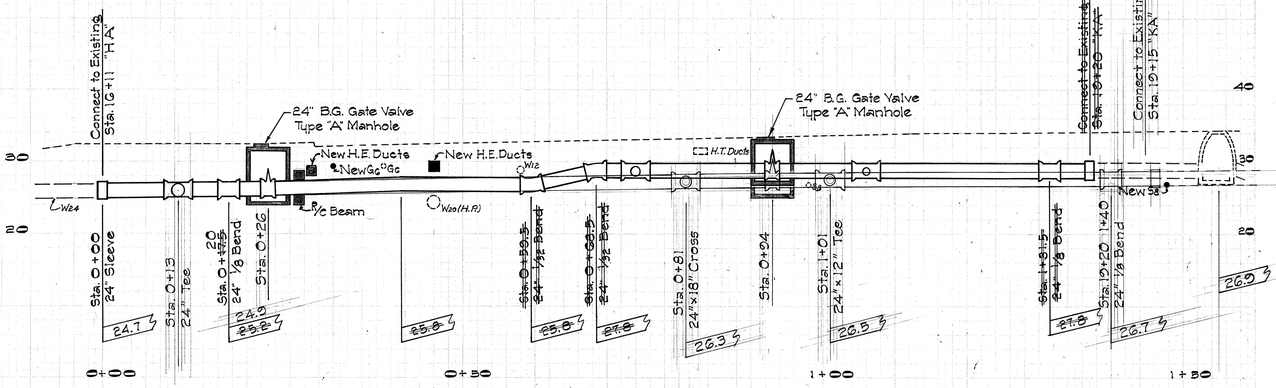
2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	70	270



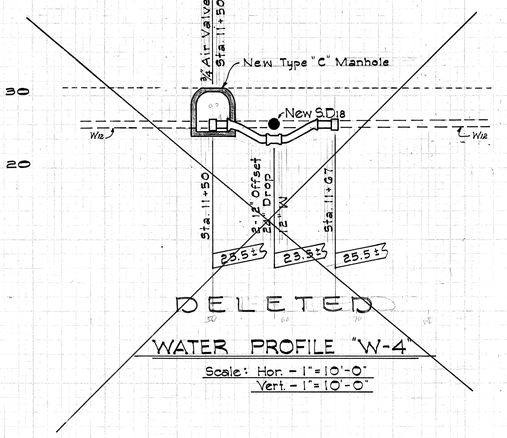
WATER PROFILE "W-5"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



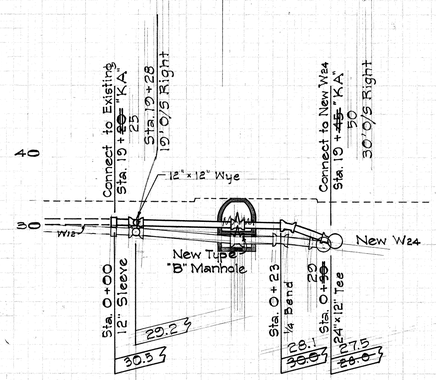
WATER PROFILE "W-6"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



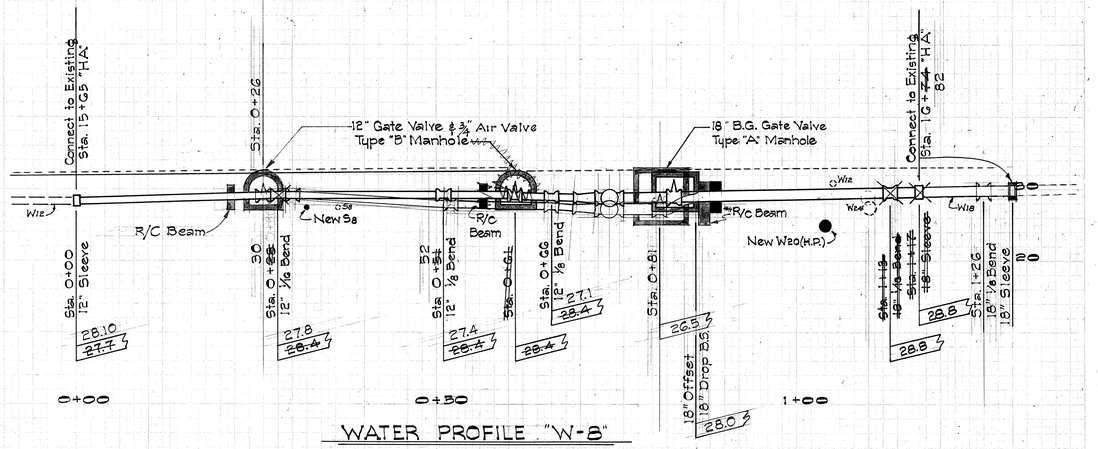
WATER PROFILE "W-4"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



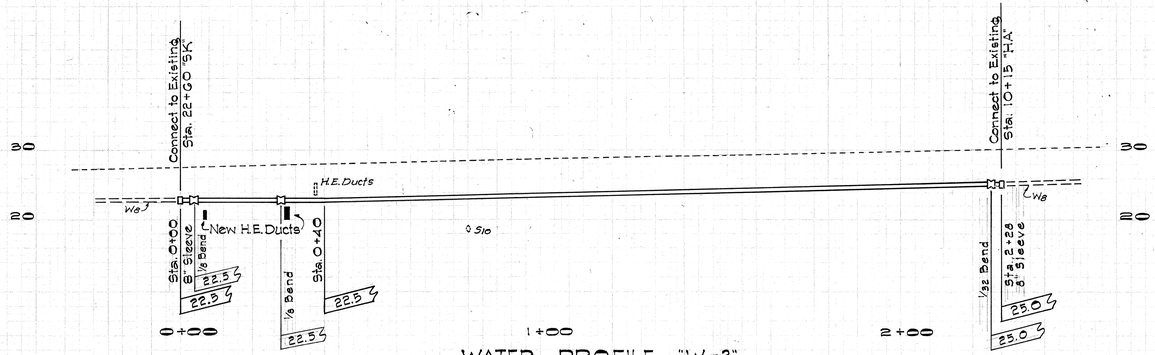
WATER PROFILE "W-7"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



WATER PROFILE "W-8"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



WATER PROFILE "W-3"

Scale: Hor. - 1" = 20'-0"
Vert. - 1" = 10'-0"

APPROVED:

D. K. Judd — 5-10-65
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE

H. F. Smith — 5-14-65
ASSISTANT CHIEF ENGINEER B.W.S. — DATE

Paul C. Jog — 5/12/65
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, Ltd — DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
WATER

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

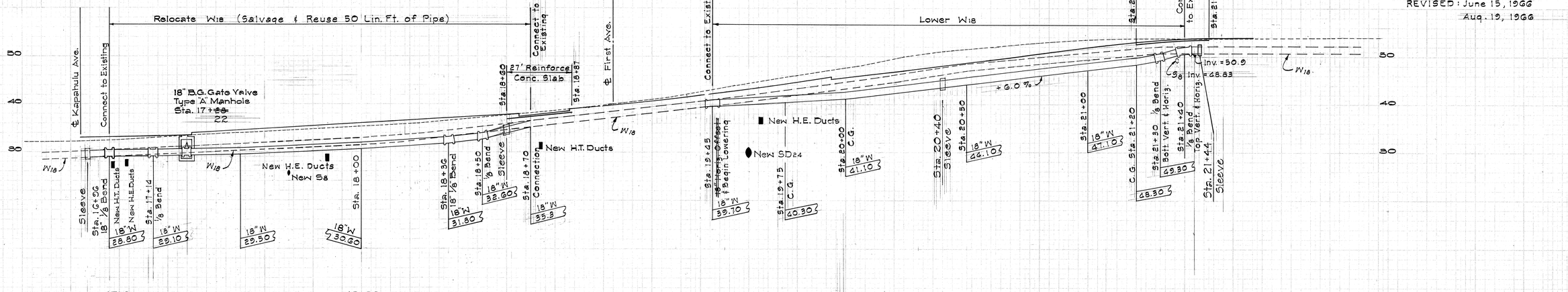
Scale: As Shown — Date: May, 1964.

SHEET NO. 14 OF 50 SHEETS

70

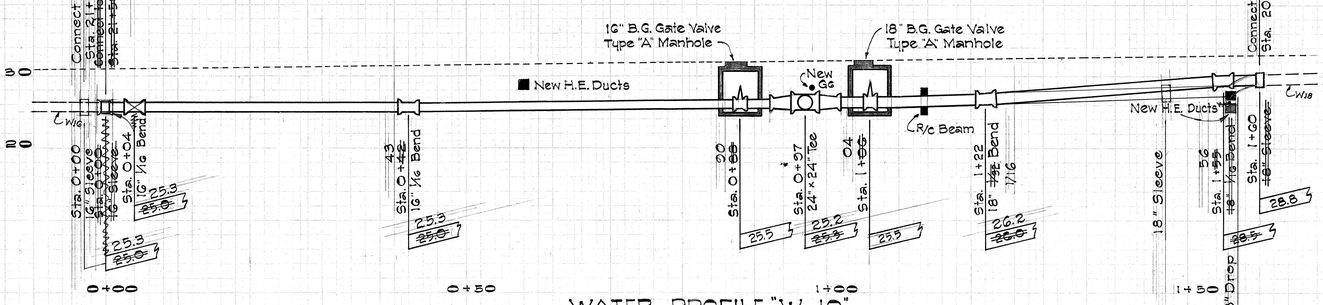
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	I-HI-1(5)24 Unit 2	1965	71	276

REVISED: June 15, 1966
Aug. 19, 1966



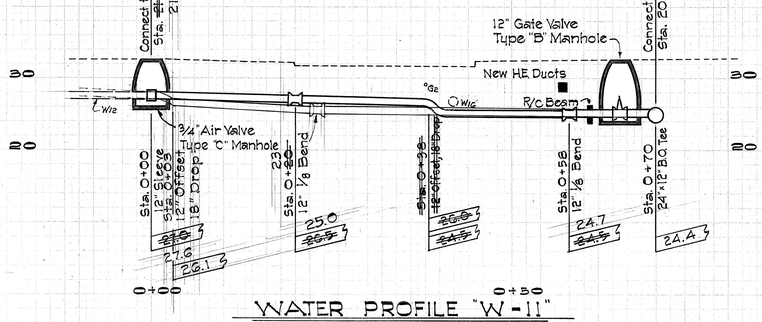
WATER PROFILE "W-12"

Scale: Hor. - 1" = 20'-0"
Vert. - 1" = 10'-0"



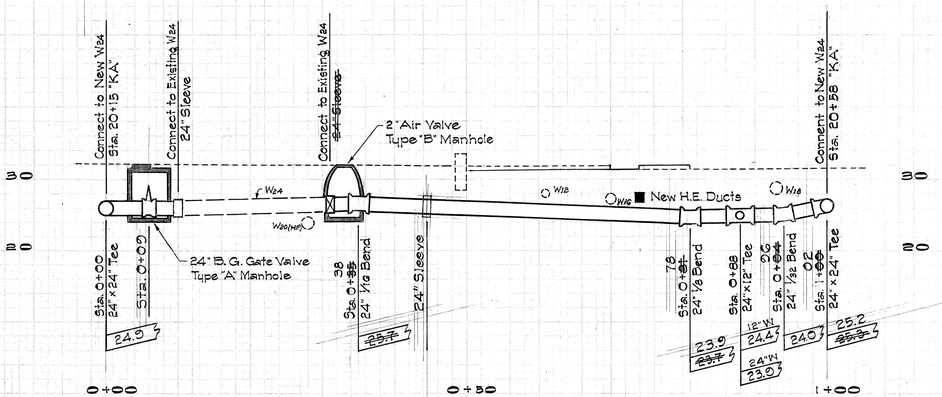
WATER PROFILE "W-10"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



WATER PROFILE "W-11"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"



WATER PROFILE "W-9"

Scale: Hor. - 1" = 10'-0"
Vert. - 1" = 10'-0"

APPROVED:

PRINCPL. ELECTRICAL ENGR., H.E. Co., Inc.	5/6/65 DATE
PRINCPL. DISTRIBUTION ENGR., H.E. Co., Inc.	5/15/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
ASSISTANT CHIEF ENGINEER B.W.S.	5-14-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, Ltd.	5/13/65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
WATER

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

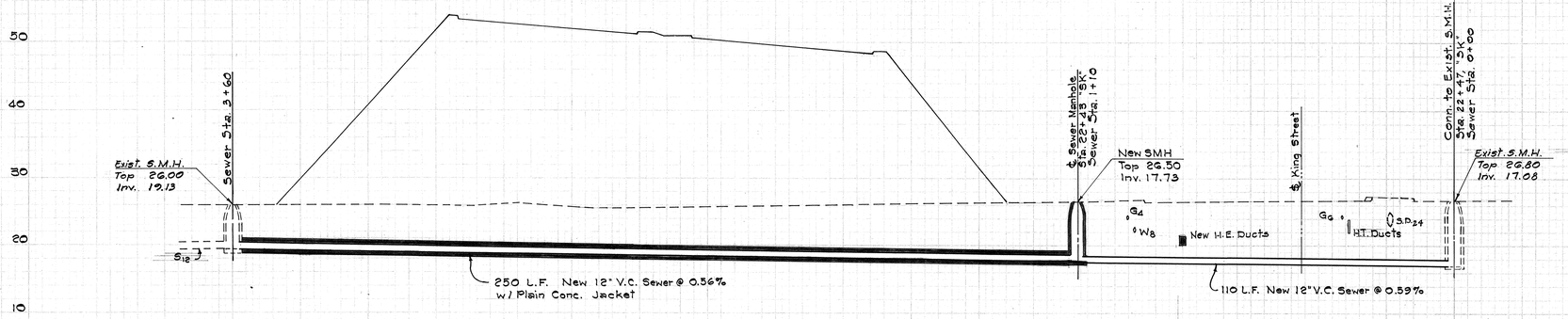
Scale: As Shown Date: May, 1964.

SHEET NO 15 OF 50 SHEETS

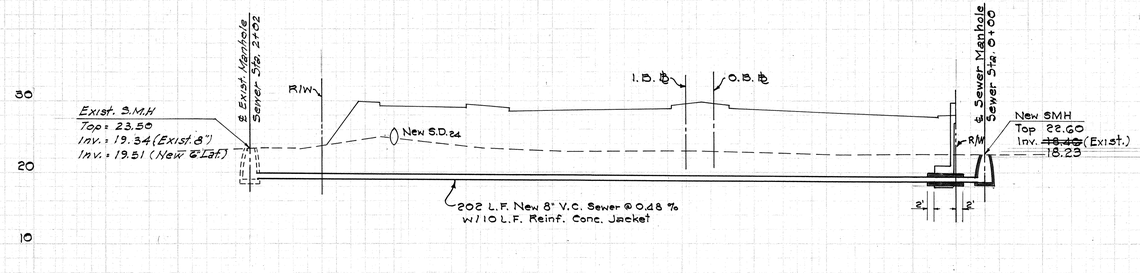
CO 71

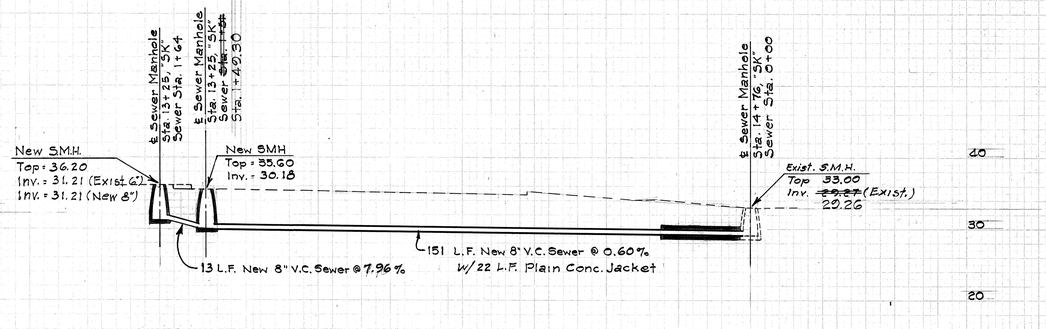
PLATE 3—CROSS SECTION O. P. W. A. A. STANDARD
J. W. HOOK CO., PHILADELPHIA

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5):24 Unit 2	1965	72	276

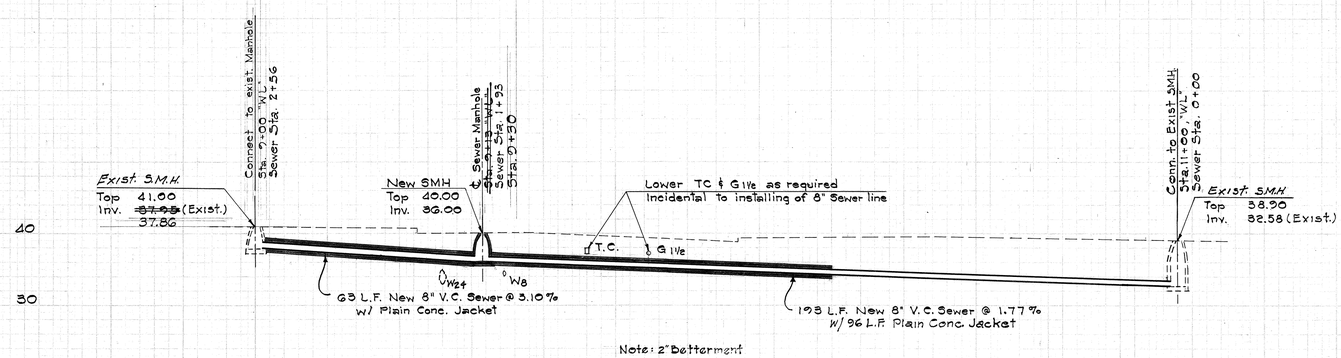


SEWER PROFILE "S-4"





SEWER PROFILE "S-2"



Note: 2" Betterment

SEWER PROFILE "S-1"

SEWER PROFILE "S-3"

APPROVED:

F. H. Judd — 5-12-65
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE

R. Lloyd — 5-12-65
SEWER SYSTEM DIRECTOR DIV. OF SEWERS — DATE

Maud C. Jay — 5/12/65
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD — DATE

SCALE: HOR. = 1" = 20'
VER = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
SEWER

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown — Date: May 1964

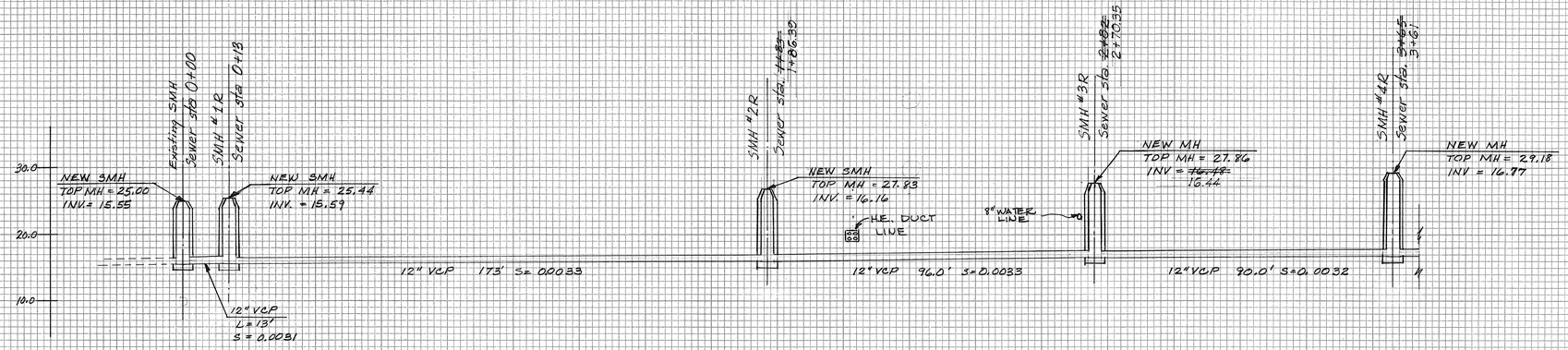
SHEET NO. 16 OF 50 SHEETS

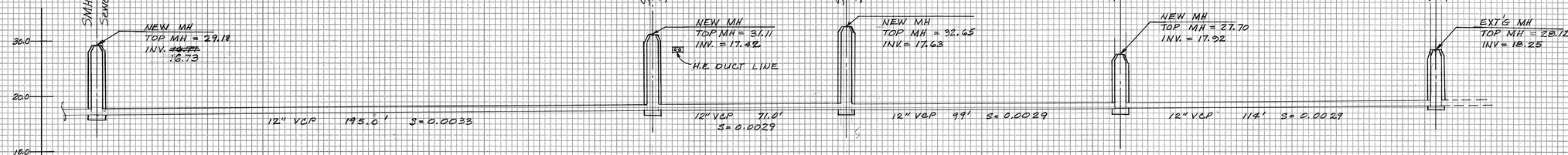
72

PLATE S-C0355 SECTION O. F. U. A. S. C. STANDARD
1-14-1958, CH. PHILADELPHIA.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(6):24, Unit 2	1969	C072S-1	276

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS, CROSS CHECKED, NOTE BOOK, NO., BY, DATE





PROFILE – RELOCATED SEWER LINE S-4

ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, AREAS CHECKED, NOTE BOOK, NO., BY, DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

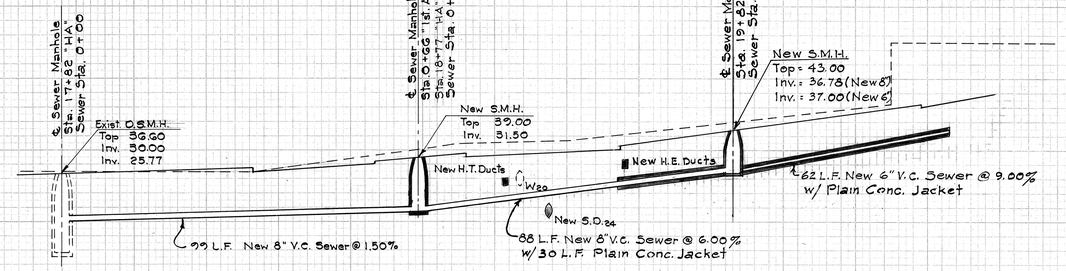
UTILITIES PROFILES
SEWER

INTERSTATE HIGHWAY
PROJ. NO. I-HI-1(6):24, UNIT 2
AUGUST 22, 1967

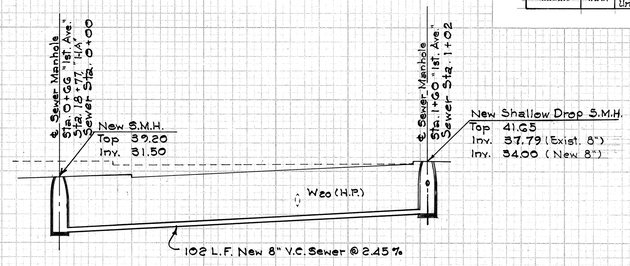
PLATE 3 - CROSS SECTION, F.A.S.
CLEARPRINT PAPER CO., S. F. CAL. NO. 1000H-3

C.O. 72S-1

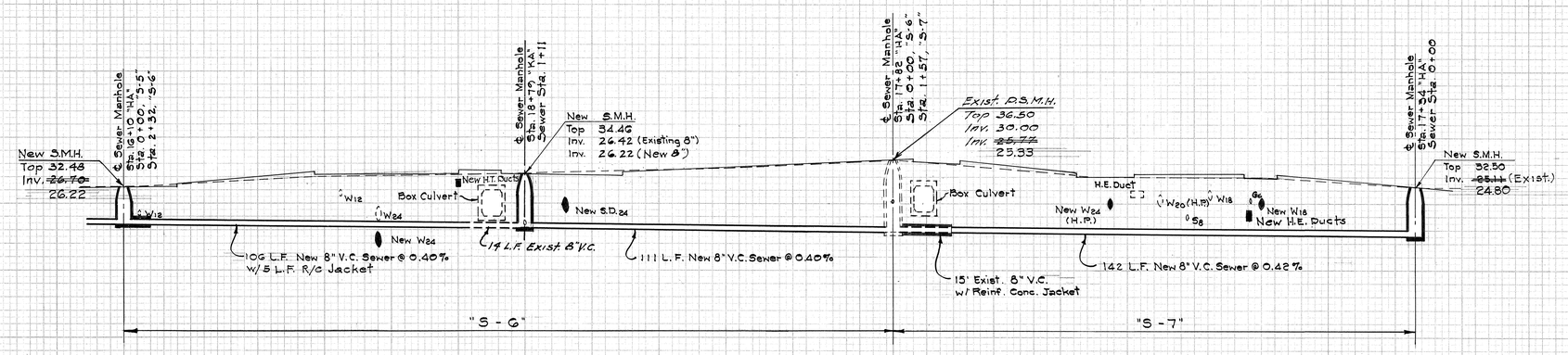
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	73	276



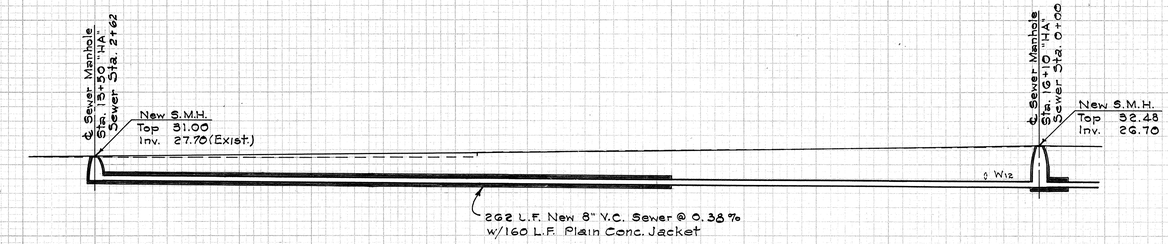
SEWER PROFILE "S-8"



SEWER PROFILE "S-9"



SEWER PROFILE "S-6 & 7"



SEWER PROFILE "S-5"

APPROVED:

OUTSIDE PLANT ENGINEER, HT Co, Ltd — DATE 5-12-65

SEWER SYSTEM DIRECTOR DIV OF SEWERS — DATE 5-12-65

DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD — DATE 5/12/65

SCALE: HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
SEWER

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown — Date: May 1964

SHEET NO. 17 OF 50 SHEETS

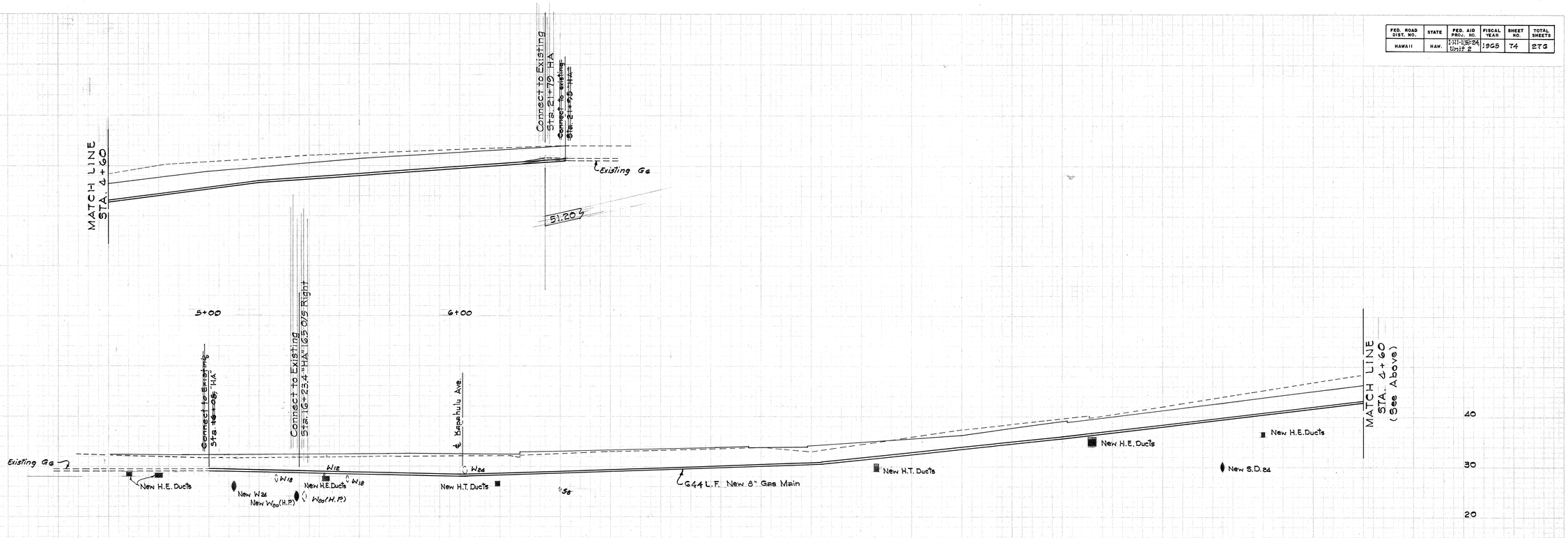
73

FINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, MAPS, NOTE BOOK, AREAS CHECKED, BY, DATE, NO.

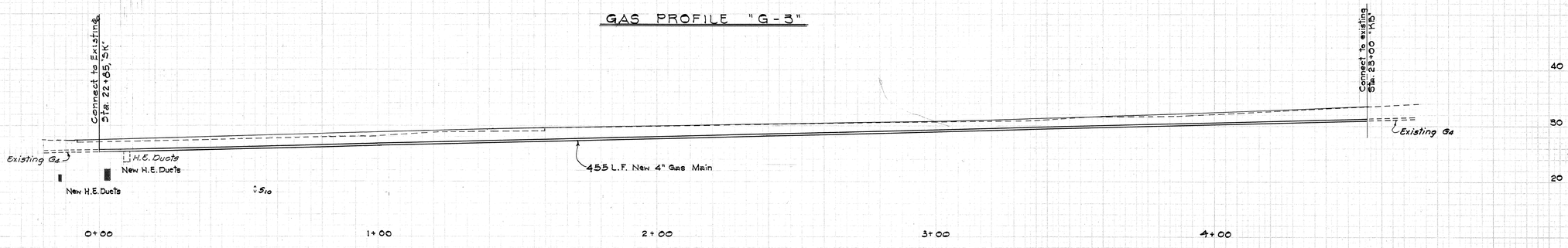
ORIGINAL SURVEY — SURVEYED, PLOTTED, TEMPLATE, MAPS, NOTE BOOK, AREAS CHECKED, BY, DATE, NO.

PLATE 3—CROSS SECTION O. P. R. & R. E. STANDARD
J. H. WEIL CO., PHILADELPHIA.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5):24 Unit 2	1965	74	273



GAS PROFILE "G-3"



GAS PROFILE "G-2"

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5-12-65

DIRECTOR OF DEVELOPMENT, HONOLULU GAS COMPANY, LTD. — DATE 5/11/65

SCALE: HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
GAS

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

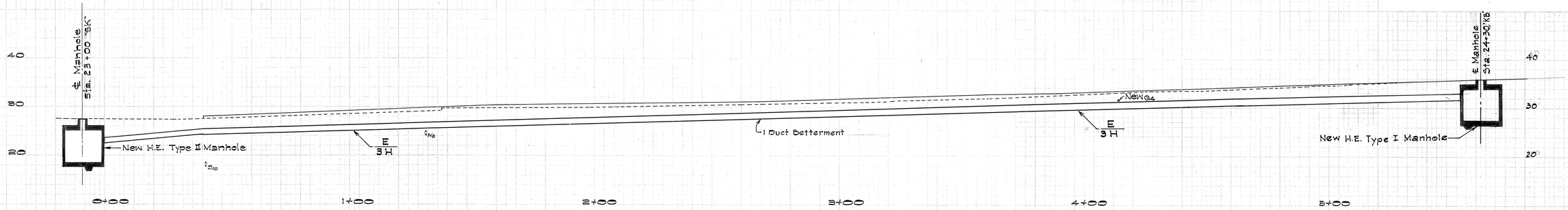
Scale: As Shown — Date: May 1964

SHEET NO. 18 OF 50 SHEETS

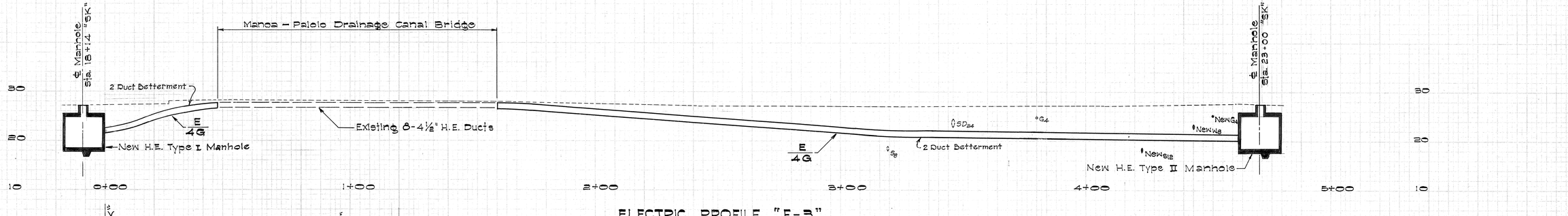
74

PLATE 3—CROSS SECTION O. P. R. & R. E. STANDARD
J. H. WEIR CO., PHILADELPHIA.

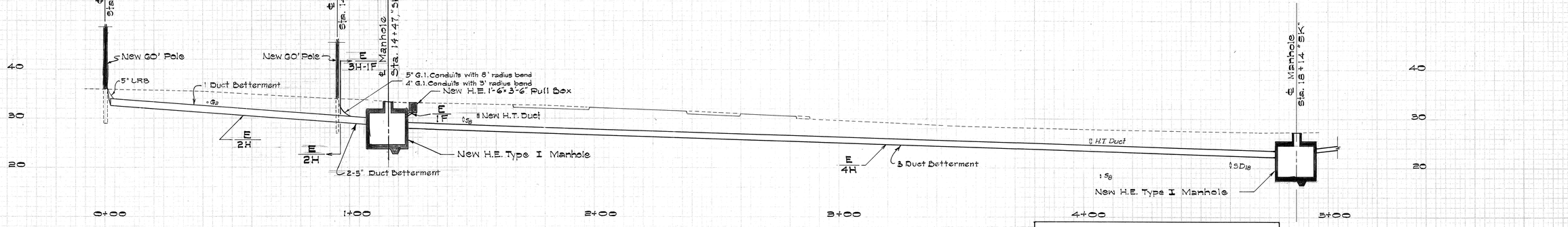
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	75	276



ELECTRIC PROFILE "E-4"



ELECTRIC PROFILE "E-3"



ELECTRIC PROFILE "E-2"

APPROVED:

PRINCPL. ELECTRICAL ENG'R, H.E. Co., Inc.	5/11/65 DATE
PRINCPL. DISTRIBUTION ENG'R, H.E. Co., Inc.	5/11/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD.	5/12/65 DATE

SCALE. HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
ELECTRIC

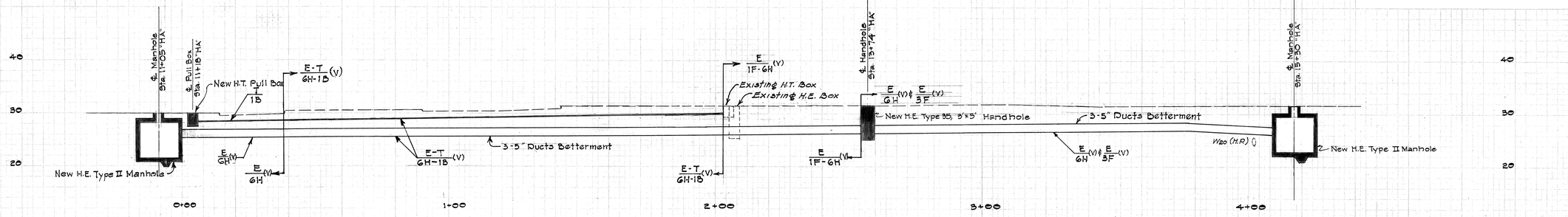
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2
Scale: As Shown Date: May 1964

SHEET NO. 19 OF 50 SHEETS

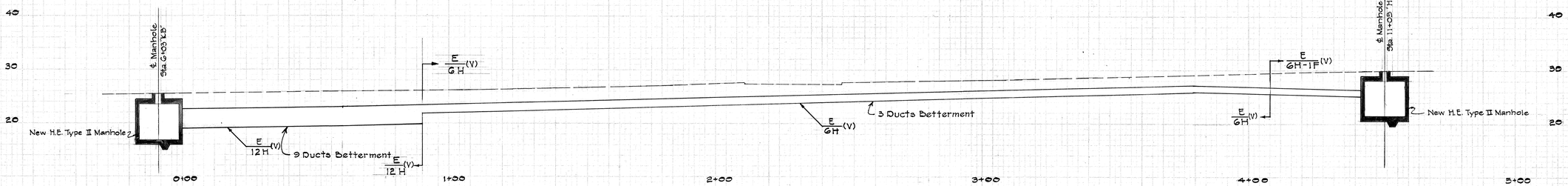
75

PLATE 3—CROSS SECTION G. P. B. & E. K. STANDARD.
I. E. WOLK CO., PHILADELPHIA.

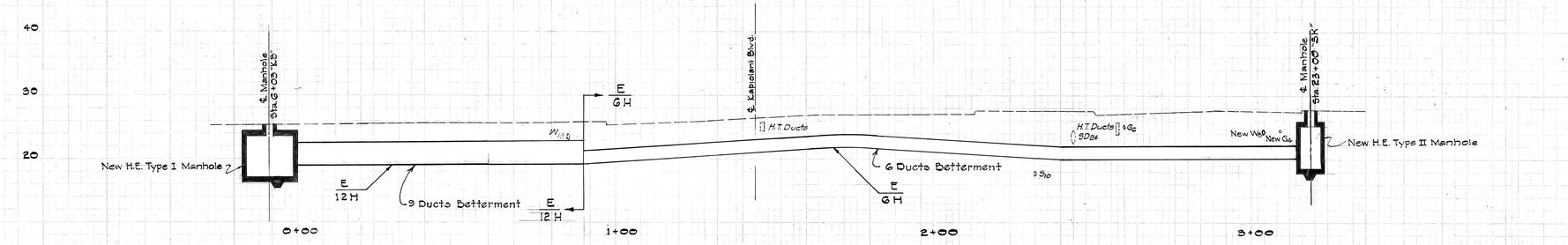
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	TG	276



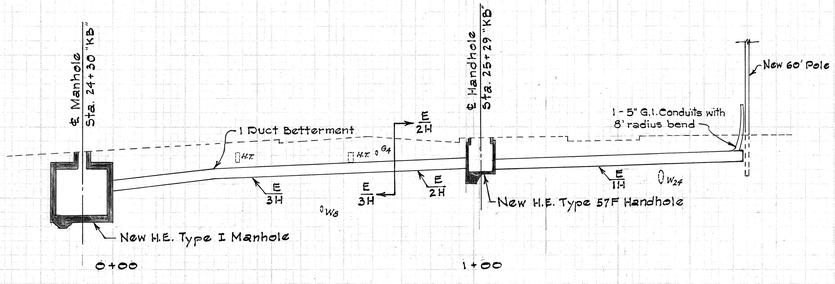
ELECTRIC PROFILE "E-9"



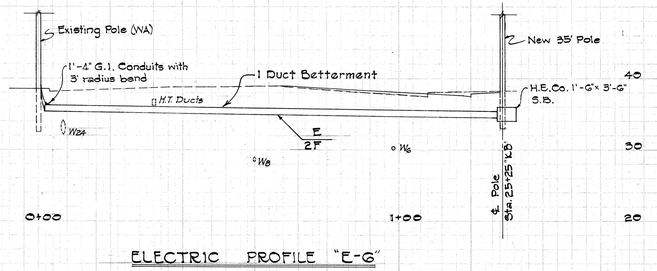
ELECTRIC PROFILE "E-8"



ELECTRIC PROFILE "E-7"



ELECTRIC PROFILE "E-5"



ELECTRIC PROFILE "E-6"

APPROVED

PRINCPL. ELECTRICAL ENGR., H E Co., Inc.	5/18/65 DATE
PRINCPL DISTRIBUTION ENGR., H E Co., Inc.	5/17/65 DATE
OUTSIDE PLANT ENGINEER, HT Co. Ltd	5/24-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY LTD	5/18/65 DATE

SCALE: HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
ELECTRIC

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

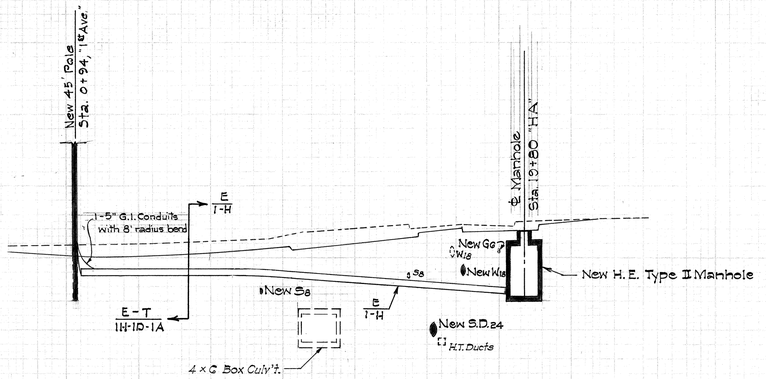
Scale: As Shown Date: May 1964

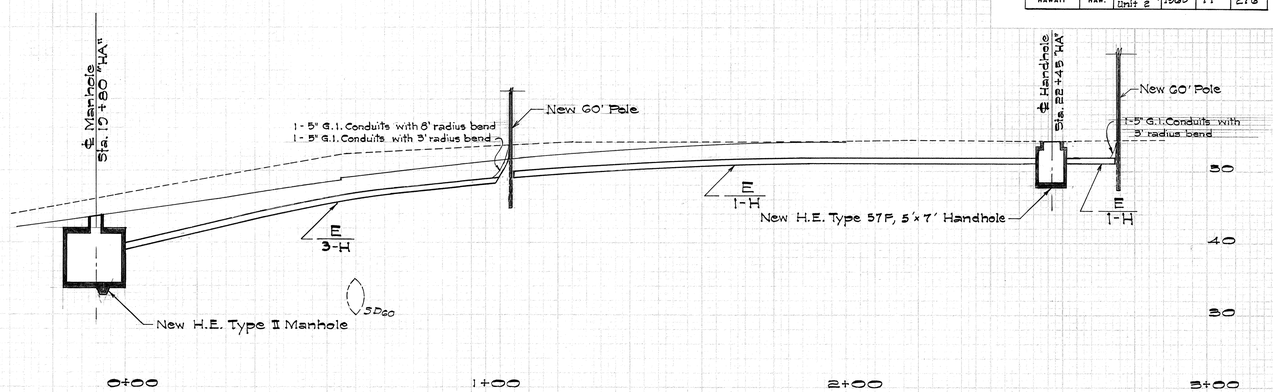
SHEET NO. 20 OF 50 SHEETS

TG

PLATE 3—CROSS SECTION U. P. R. & R. E. STANDARD
J. W. VIERL CO., PHILADELPHIA

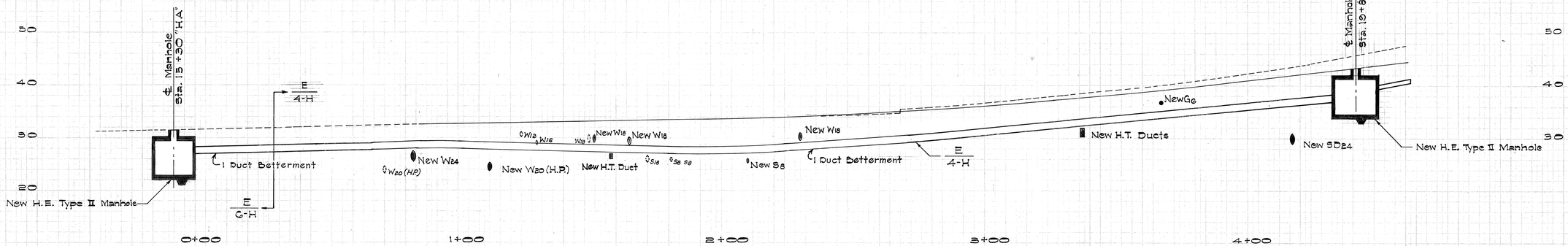
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	77	276



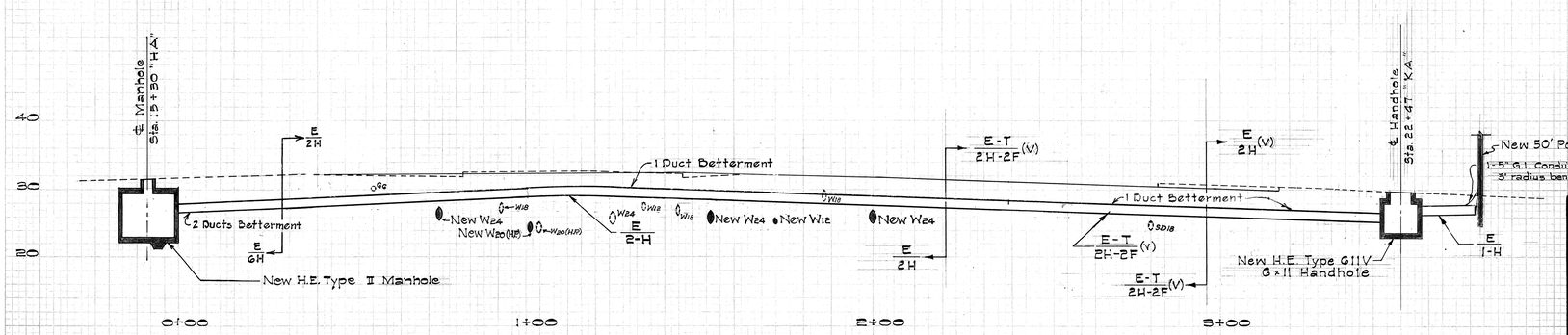


ELECTRIC PROFILE "E-12"

ELECTRIC PROFILE "E-13"



ELECTRIC PROFILE "E-11"



ELECTRIC PROFILE "E-10"

APPROVED:

PRINCPL. ELECTRICAL ENG R., H.E. Co., Inc.	5/11/65 DATE
PRINCPL. DISTRIBUTION ENG R., H.E. Co., Inc.	5/11/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE
DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD	5/12/65 DATE

SCALE: HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES ELECTRIC

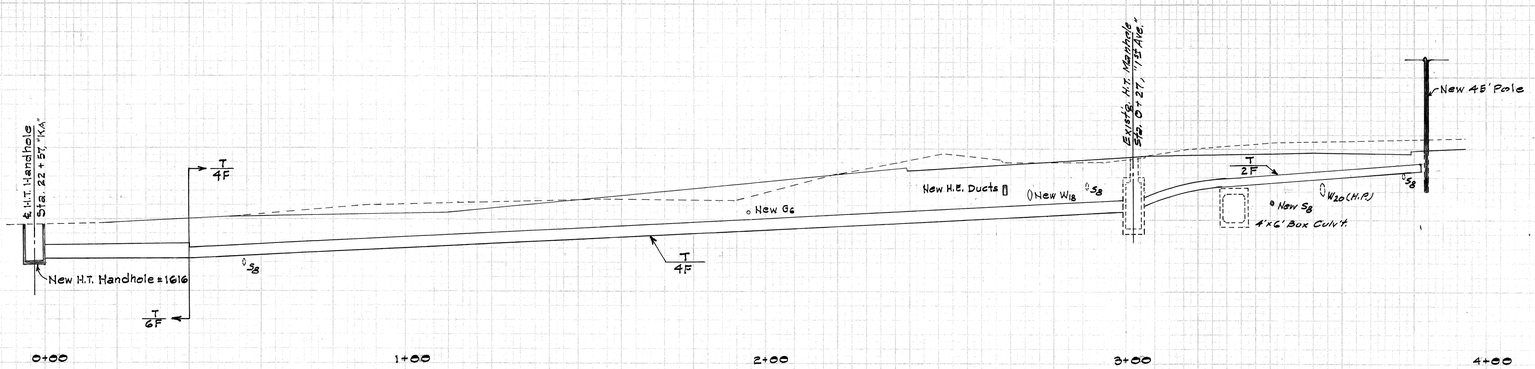
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5) : 24, Unit 2

Scale: As Shown Date: May 1964

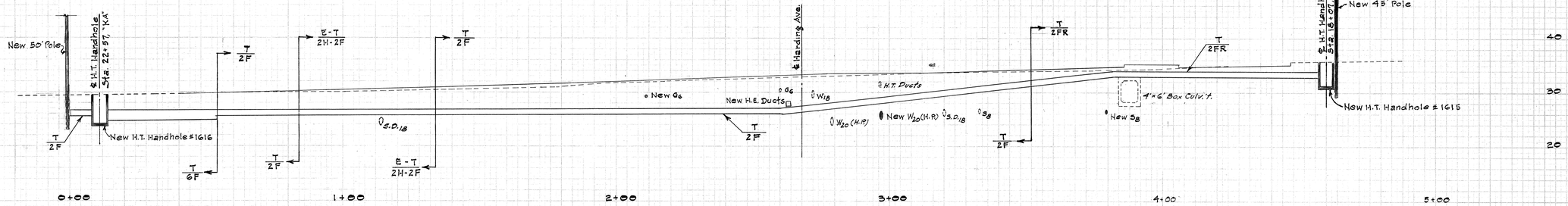
SHEET NO. 21 OF 50 SHEETS

PLATE 3-CROSS SECTION O. P. R. & E. E. STANDARD
J. H. WEIL CO., PHILADELPHIA

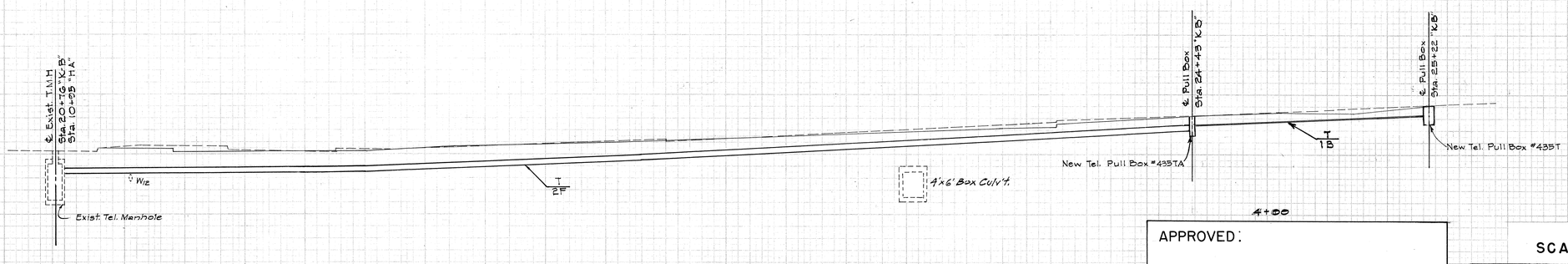
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	78	276



TELEPHONE PROFILE "T-4"



TELEPHONE PROFILE "T-3"



TELEPHONE PROFILE "T-2"

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5-12-65

DIRECTOR OF DEVELOPMENT HONOLULU GAS COMPANY, LTD. — DATE 5/11/65

SCALE: HOR. = 1" = 20'
VER. = 1" = 10'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UTILITY PROFILES
TELEPHONE

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown — Date: May 1964

SHEET NO. 22 OF 50 SHEETS

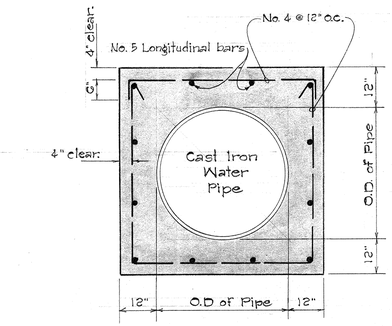
78

FINAL SURVEY — DATE, BY, SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED, NOTE BOOK, NO.

ORIGINAL SURVEY — DATE, BY, SURVEYED, PLOTTED, TEMPLATE, AREAS, AREAS CHECKED, NOTE BOOK, NO.

PLATE 3—CROSS SECTION O. P. R. & R. E. STANDARD
J. H. WEIL CO., PHILADELPHIA

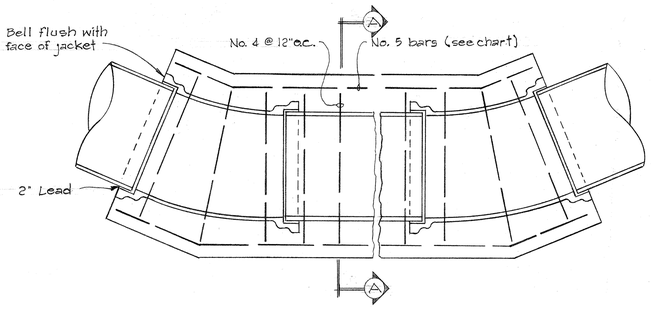
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	75	276



I.D. of Pipe	Size of Jacket	No. 4 Bars	No. 5 Longitudinal Bars Top & Bottom	Sides	Total
42"	G8"×68"	12" o.c.	12	8	20
36"	G2"×62"	" "	12	8	20
30"	56"×56"	" "	10	G	16
24"	50"×50"	" "	10	G	16
20"	46"×46"	" "	10	G	16
16"	42"×42"	" "	8	4	12
12"	38"×38"	No.3, 12o.c	8	4	12
8"	34"×34"	" "	8	4	12
6"	32"×32"	" "	G	2	8
4"	30"×30"	" "	G	2	8

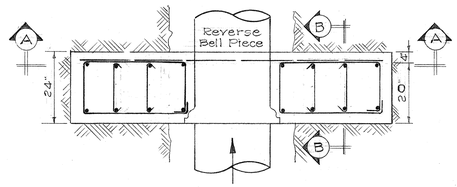
Jacket to be poured after completion of test.
Lead joint required at both faces of jacket.
2½" depth of lead required at all embeded joints.

SECTION A-A

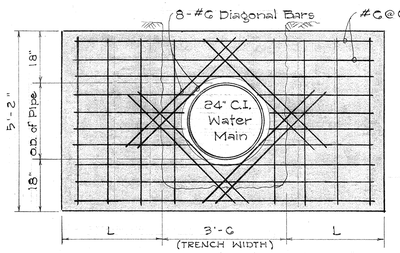


REINFORCED CONCRETE JACKET

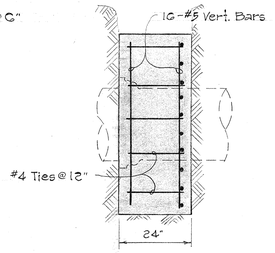
Not to Scale



PLAN



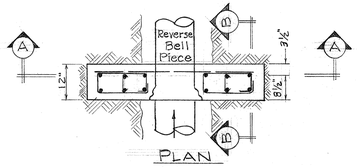
SECTION A-A



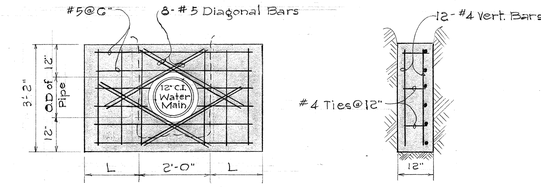
SECTION B-B

REINF. CONC. REACTION BEAM DETAILS FOR 24" C.I. WATER MAIN AT KAPAHULU AVE. - HARDING AVE. INTERSECTION

Scale: ½" = 1'-0"



PLAN

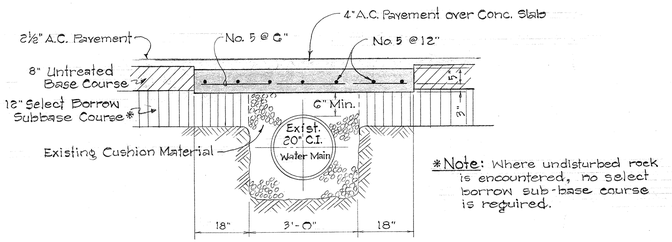


SECTION A-A

SECTION B-B

REINF. CONC. REACTION BEAM DETAILS FOR 12" C.I. WATER MAIN AT KAPAHULU AVE. - HARDING AVE. INTERSECTION

Scale: ½" = 1'-0"

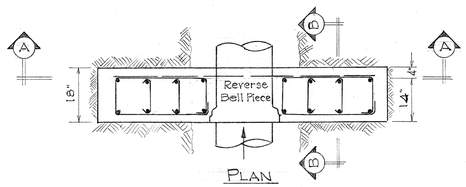


*Note: Where undisturbed rock is encountered, no select borrow sub-base course is required.

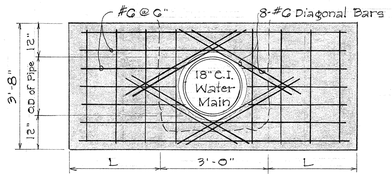
SECTION

REINF. CONC. SLAB OVER EXISTING 20" H.P. MAIN ALONG HARDING AVE.

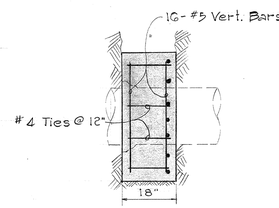
Scale: ⅛" = 1'-0"



PLAN



SECTION A-A



SECTION B-B

REINF. CONC. REACTION BEAM DETAIL FOR 18" C.I. WATER MAIN AT KAPAHULU AVE. - HARDING AVE. INTERSECTION

Scale: ½" = 1'-0"

General Notes For Concrete Reaction Beams:

1. Distance "L" to be determined in field according to soil conditions.
2. Design Test Pressure: 150 psi
3. Min. 3" clear cover all around reinforcing steel.
4. Conc. to be placed against solid original ground except within pipe trench.
5. Conc. shall be Class "B-1".

APPROVED:

ASSISTANT CHIEF ENGINEER — B.W.S. — DATE 5-14-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES REINFORCED CONCRETE JACKET AND REACTION BEAM FOR WATER MAINS

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

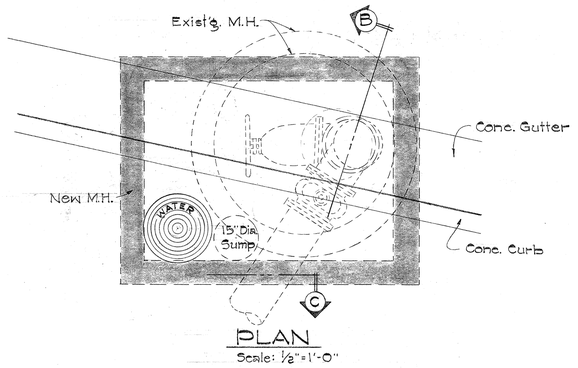
Scale: As Shown — Date: May, 1964

SHEET No. 23 OF 50 SHEETS

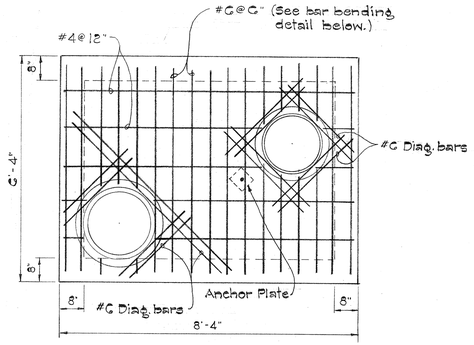
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

PRINTED ON CLEARPRINT 1000-H

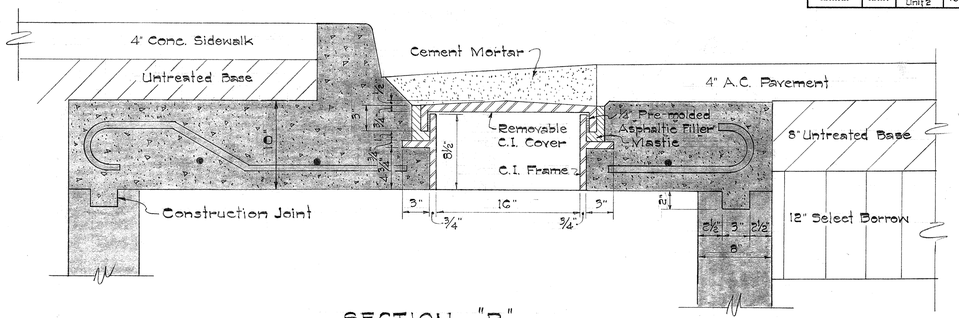
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	80	276



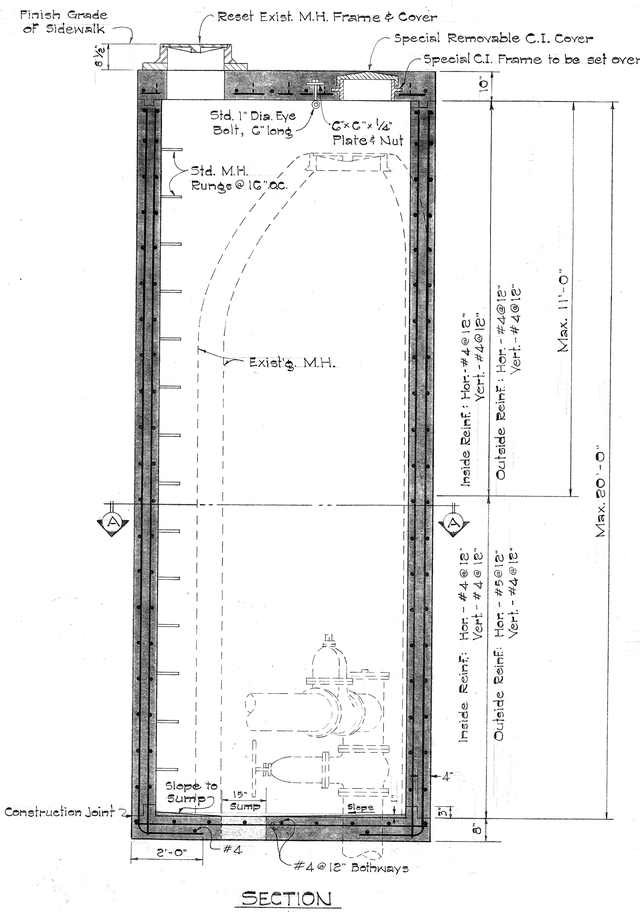
PLAN
Scale: ½"=1'-0"



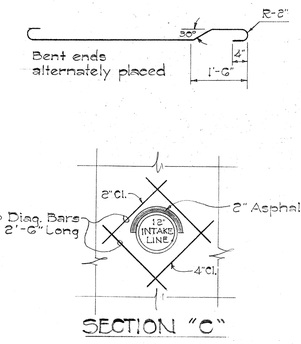
PLAN ~ TOP SLAB
Scale: ½" = 1'-0"



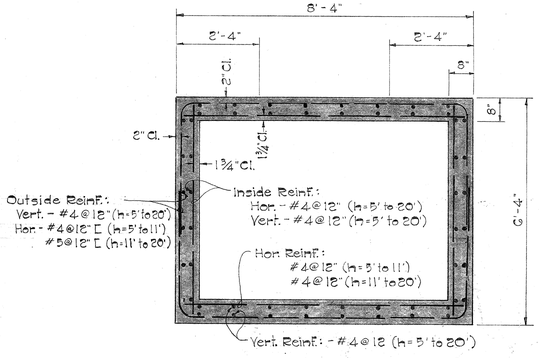
SECTION "B"
Scale: 1½" = 1'-0"



SECTION
Scale: ½"=1'-0"



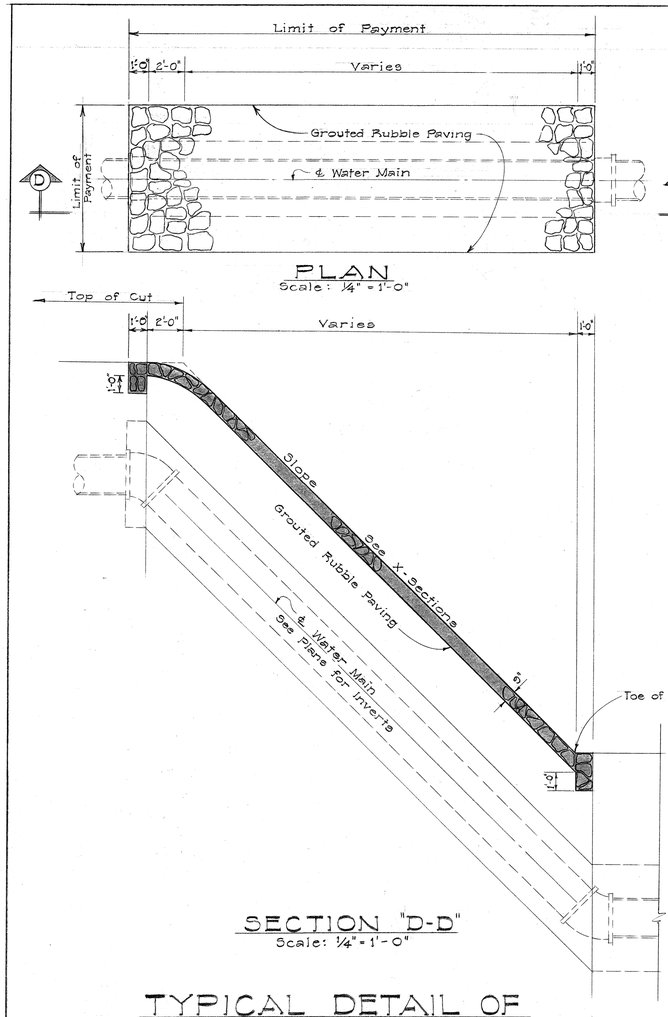
SECTION "C"



SECTION "A-A"
Scale: ½"=1'-0"

SPECIAL TYPE "A" MANHOLE DETAILS FOR WELL AT KAPAHULU AVE. ℄ STA. 20+84±

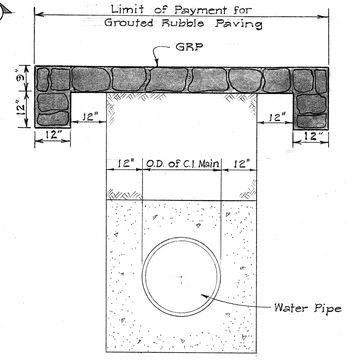
Scale: As Shown



PLAN
Scale: ¼" = 1'-0"

SECTION "D-D"
Scale: ¼"=1'-0"

NOTE:
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.



SECTION "E-E"
Scale: ½" = 1'-0"

TYPICAL DETAIL OF GROUTED RUBBLE PAVING SEAL OVER WATER MAIN

Scale: As Shown

APPROVED:

ASSISTANT CHIEF ENGINEER B.W.S. — DATE 5-14-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
SPECIAL TYPE 'A' WATER MANHOLE AND TYPICAL GRP SEAL

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Scale: As Shown Date: May, 1964

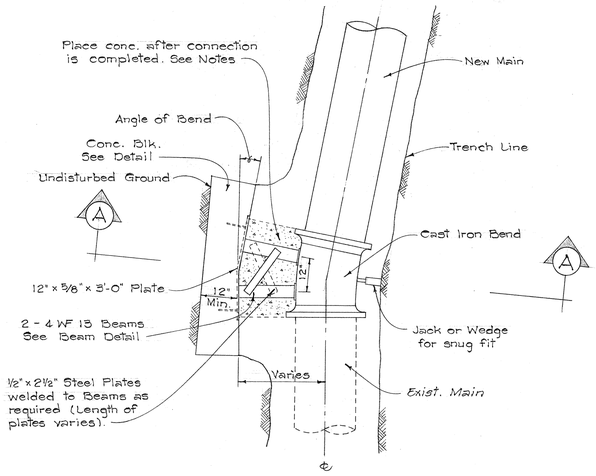
SHEET No. 24 OF 50 SHEETS

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

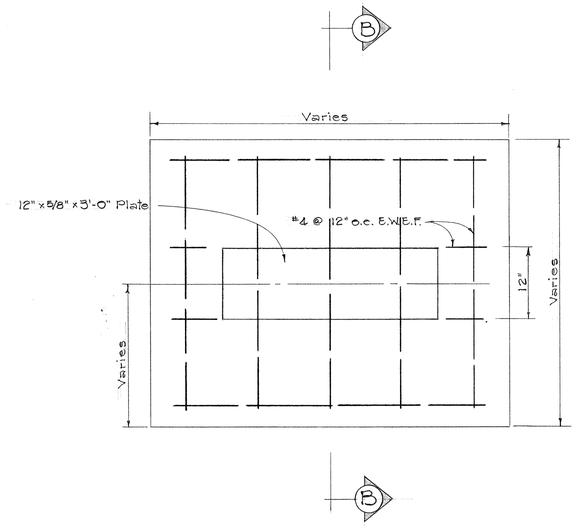
PRINTED ON CLEARPRINT 1000-H

S 0

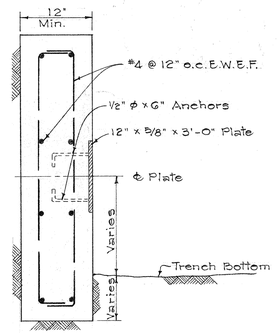
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HH-1(5)-24 Unit 2	1965	81	2TG



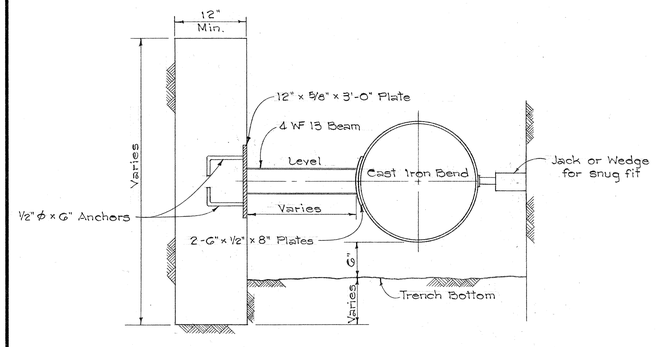
PLAN
Scale: ½" = 1'-0"



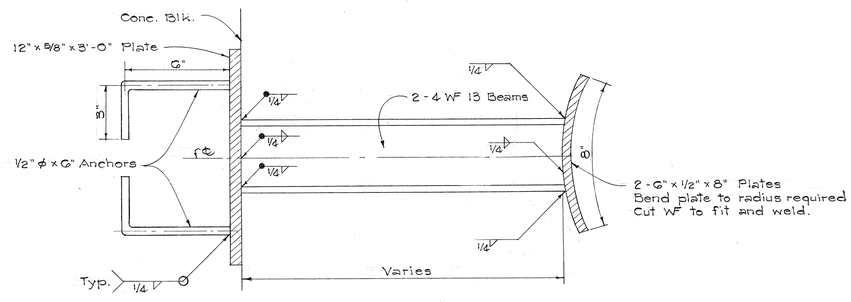
ELEVATION
Scale: 1" = 1'-0"



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



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



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

NOTES:
1. All dimensions marked "Varies" shall be determined in the field by the Engineer.
2. Min. cover over Reinf. shall be 3".
3. Conc. shall be Class "B-1".
4. Dotted area to be filled with conc. after connection is completed.

DETAIL OF CONC. BLOCK W/STRUCTURAL STRUT
Scale: As Shown

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

APPROVED:

ASSISTANT CHIEF ENGINEER B.W.S. DATE 5-14-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DETAILS OF CONCRETE BLOCK WITH STRUCTURAL STRUT

INTERSTATE HIGHWAY
Proj. No. I-H1-1(5):24, UNIT 2

Scale: As Shown Date: May, 1964.

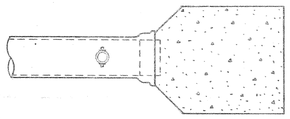
SHEET No. 25 OF 50 SHEETS

S1

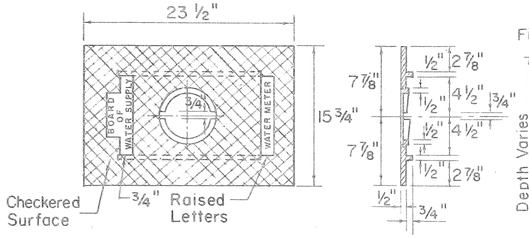
PRINTED ON NO. 1000H CLEARPRINT

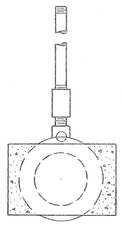
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	82	270

NOTE:
Contractor to furnish 1½" brass plug (Tapered thread) to replace corporation stop upon completion of chlorination.

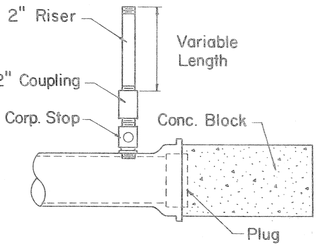


TOP VIEW



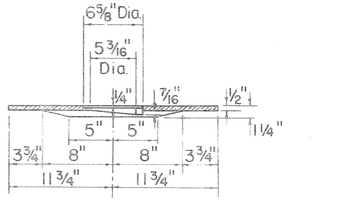


END VIEW

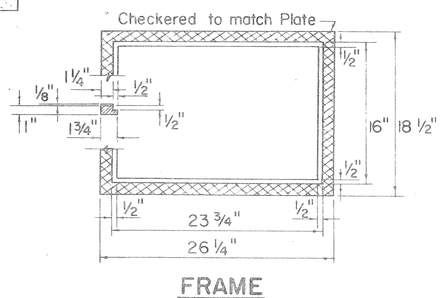


SIDE VIEW

DETAIL OF TEMPORARY 2" CLEANOUT
Not to Scale

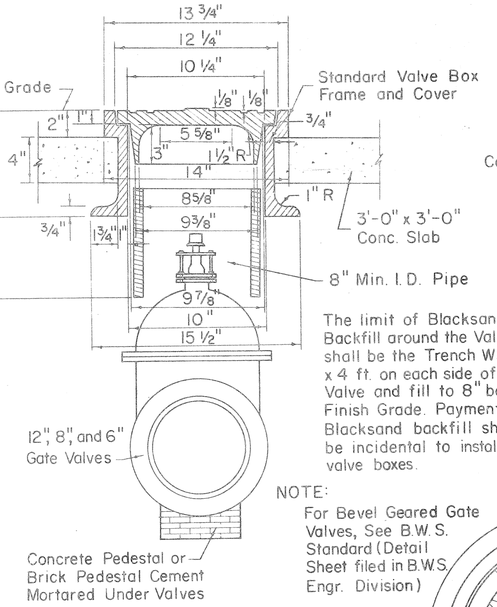


COVER PLATE



FRAME

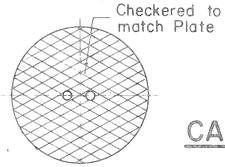
CAST IRON FRAME AND PLATE TYPE II
Scale: 1½" = 1'-0"

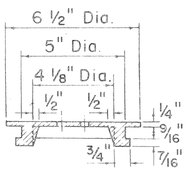


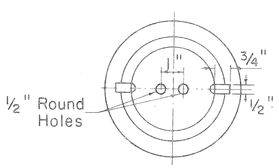
The limit of Blacksand Backfill around the Valve shall be the Trench Width x 4 ft. on each side of Valve and fill to 8" below Finish Grade. Payment for Blacksand backfill shall be incidental to installing valve boxes.

NOTE:
For Bevel Geared Gate Valves, See B.W.S. Standard (Detail Sheet filed in B.W.S. Engr. Division)

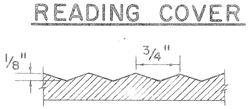
INSTALLATION OF VALVE BOX FOR GATE VALVES
Not to Scale





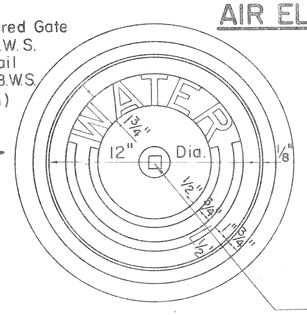


READING COVER

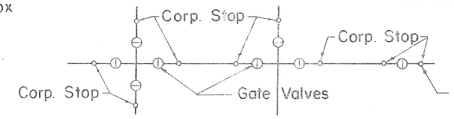


CHECKERED PATTERN

CAST IRON COVER FOR TYPE II FRAME
Not to Scale

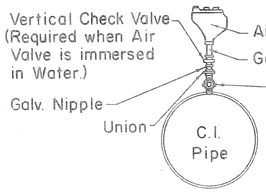


CAST IRON FRAME AND COVER
Scale: 3" = 1'-0"



CORP. STOP LAYOUT
Not to Scale

Size of one Corp. Stop given in Table "A". Extra Corp. Stop required at valves located on the "run" shall be 1" x 1¼" for all sizes of pipes and shall be installed as directed by the Engineer.



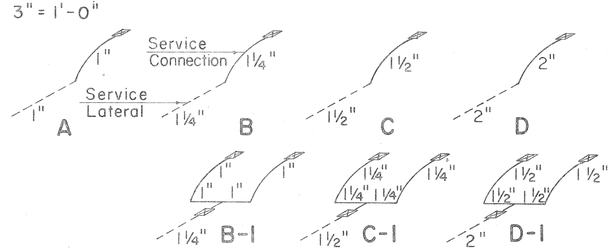
For ¾" Air Valve - ¾" x 1" Corp. Stop w/Bushing
For 2" Air Valve - 1½" x 2" Corporation Stop

For Vertical Check Valve Fig. 490 from Kennedy Valve Mfg. Co., Cat. No. 78, or Fig. 24, from Crane Co., Cat. No. 53 or approved equal.

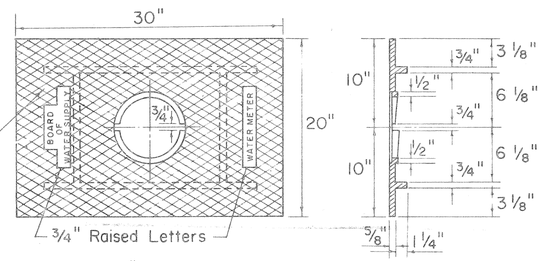
DETAIL OF CONNECTION FOR AIR ELIMINATING TRAP
Not to Scale

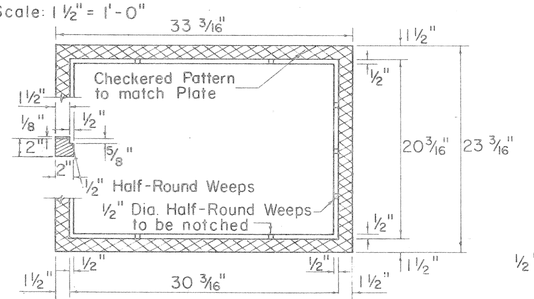
Offset word "WATER" 1¾" high, ⅛" deep

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.

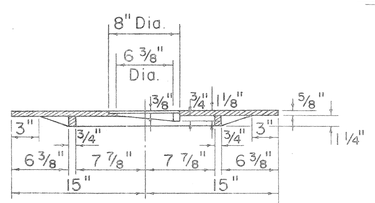


TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS
Not to Scale

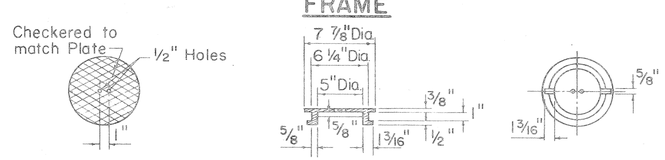




FRAME



COVER PLATE



READING COVER

CAST IRON FRAME, PLATE AND COVER TYPE III
Scale: 1½" = 1'-0"

APPROVED:

H. S. Finch 5-14-65
ASSISTANT CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE

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

STANDARD DETAILS
WATER SYSTEM

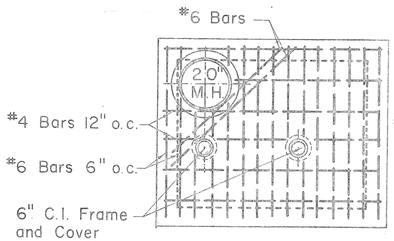
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

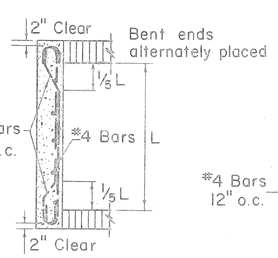
Scale: As Noted — Date April 1965

SHEET NO. 26 OF 50 SHEETS

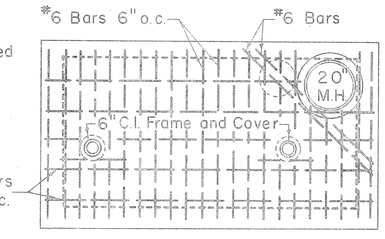
S 2

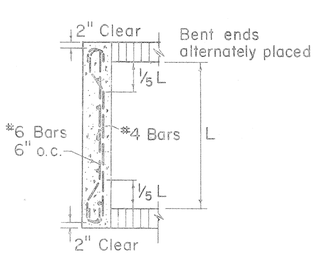
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-I(5):24, Unit 2	1965	83	276



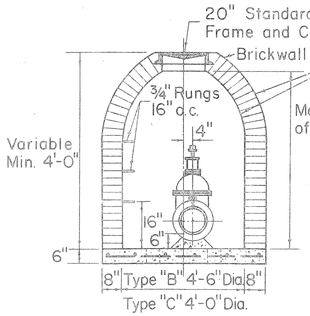


PLAN OF TOP SLAB

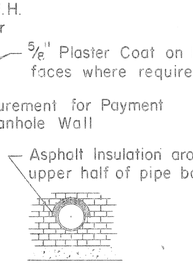


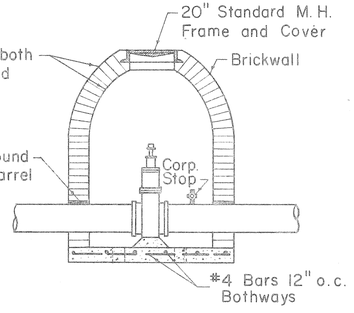


PLAN OF TOP SLAB

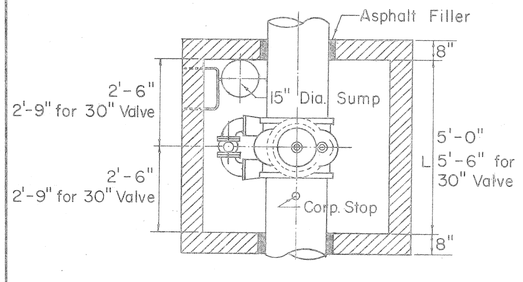


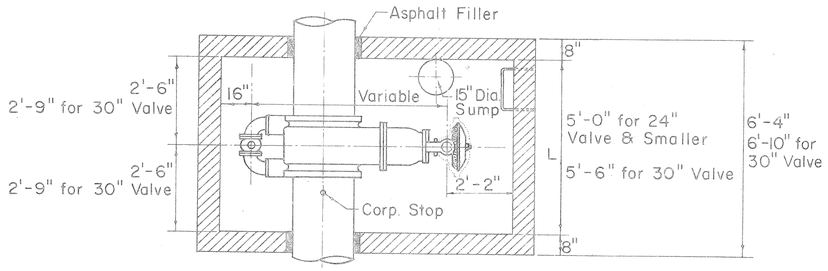
SECTION A-A

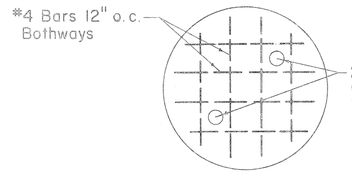




DETAIL OF ASPHALT FILLER





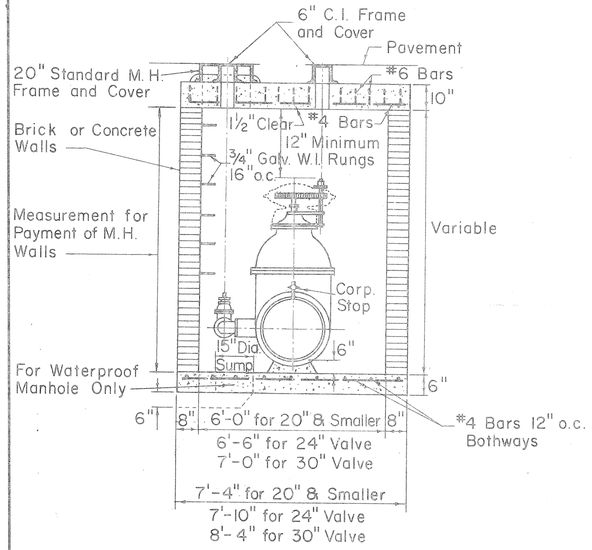


STEEL DETAIL IN BOTTOM SLAB

TABLE "A"

REQUIRED CORPORATION STOP SIZES AT GATE VALVE

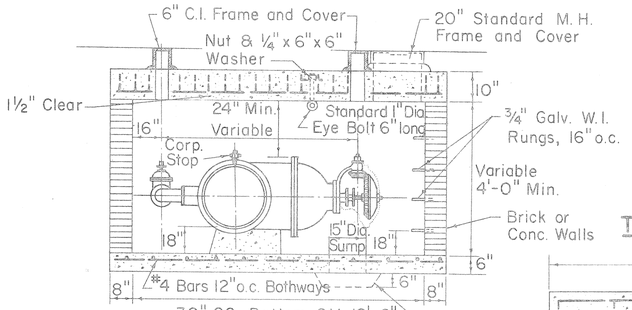
DIA. OF MAIN INCHES	SIZE OF CORP. STOP
4	1" x 1¼"
6	1" x 1¼"
8	1" x 1¼"
12	1" x 1¼"
16	1" x 1¼"
20	1" x 1¼"
24	1½" x 2"
36	1½" x 2"
42	1½" x 2"



SECTION

TYPE "A" MANHOLE

FOR SPUR GEARED GATE VALVES

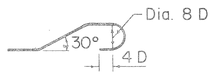


30" SQ. Bottom G.V.	12'-6"
30" G.V.	11'-6"
24" G.V.	9'-7"
20" G.V.	8'-8"
18" G.V.	8'-2"
16" G.V.	7'-10"
12" G.V.	6'-6"

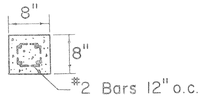
SECTION

TYPE "A" MANHOLE

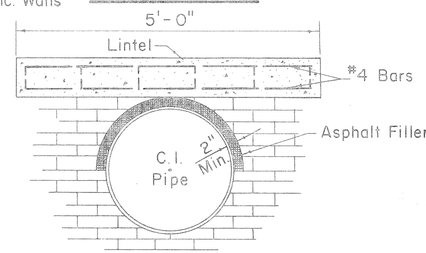
FOR BEVEL GEARED GATE VALVES



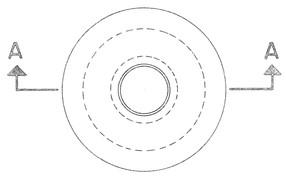
BAR BENDING DETAIL



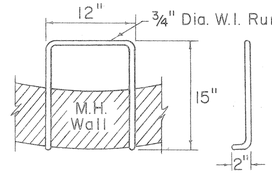
SECTION THRU LINTEL



DETAIL OF LINTEL AND ASPHALT FILLER



PLAN



DETAIL OF RUNG

TYPE "B" AND "C" MANHOLES

TYPE "B" 4'-6" DIA. (FOR 12" G.V.)

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

APPROVED:

ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY

5-14-65
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BOARD OF WATER SUPPLY
CITY & COUNTY OF HONOLULU

STANDARD DETAILS
WATER SYSTEM

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Not to Scale

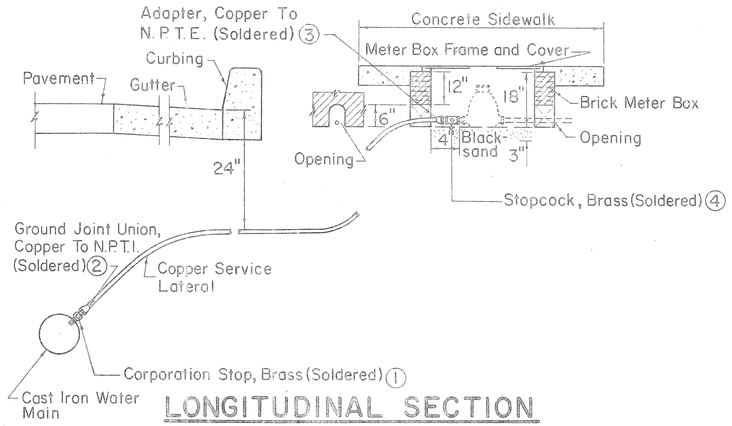
Date April 1965

SHEET NO. 27 OF 50 SHEETS

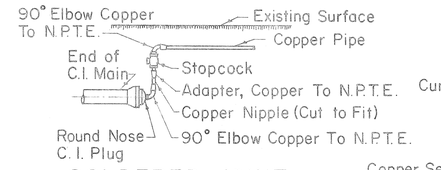
S 3

LIETZ 1103 ARKWRIGHT TRACING CLOTH 30-60 20SP

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	84	276

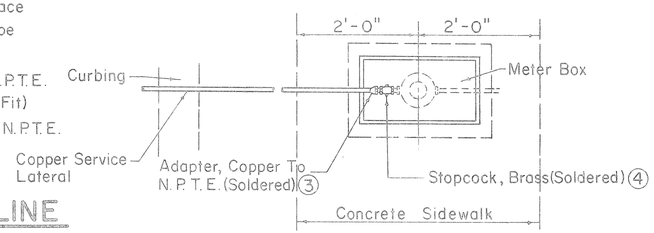


LONGITUDINAL SECTION

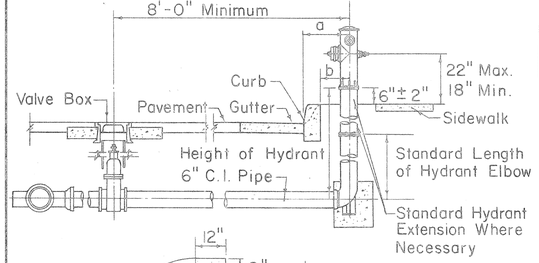


SOLDERED JOINT

SERVICE LATERAL CONNECTION AT END OF LINE



SINGLE SERVICE CONNECTION



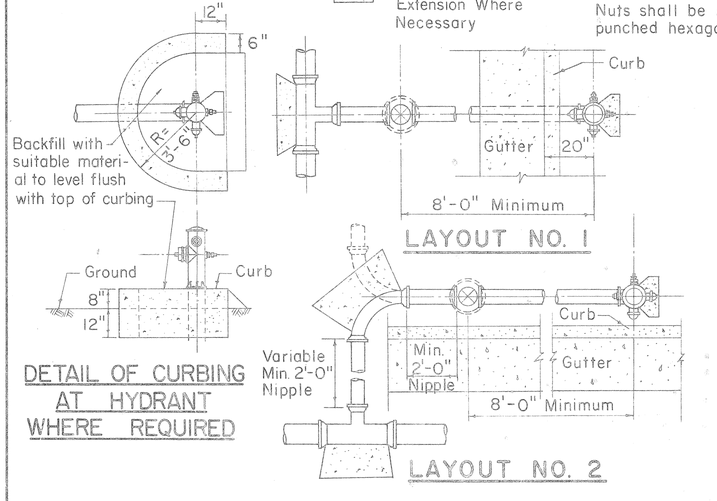
a	20" Min. (Standard Curb)
b	20" Min. (Roll Curb)

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.



LAYOUT NO. 1

DETAIL OF CURBING AT HYDRANT WHERE REQUIRED

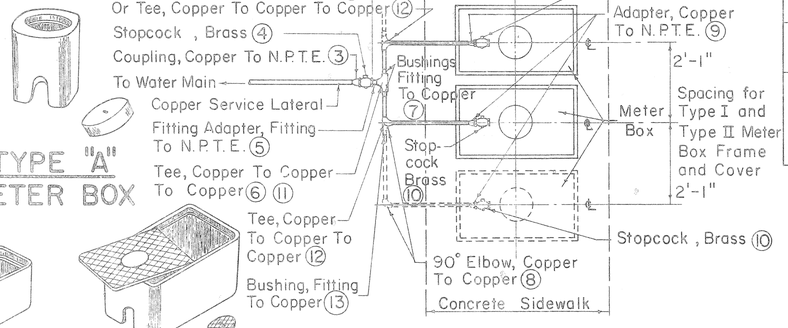
LAYOUT NO. 2

STANDARD FIRE HYDRANT LAYOUT

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

Standard Hydrant Extensions are available in the following Lengths:

6 to 30 inches long in in increments of 6 inches



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"

SCHEDULE OF COPPER FITTINGS (SOLDERED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV. CONN. TWO SERVICES	MULTIPLE SERV. CONN. THREE SERVICES
1	Corporation Stop Brass (H-10003)	1	1	1
2	Ground Joint Union (Style Copper To N.P.T.E. No. C-109)	1	1	1
3	Adapter, Copper To N.P.T.E. (Style No. C-101)	2	1	1
4	Stopcock Brass (B.W.S 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 (B.W.S. 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.

APPROVED:

ASSISTANT CHIEF ENGINEER
BOARD OF WATER SUPPLY

DATE 5-4-65

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

STANDARD DETAILS WATER SYSTEM

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

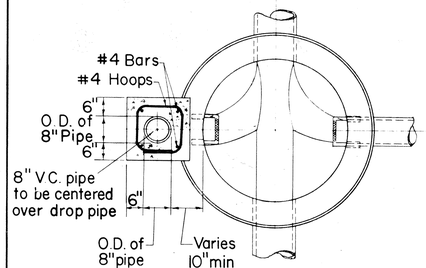
Not to Scale

Date April 1965

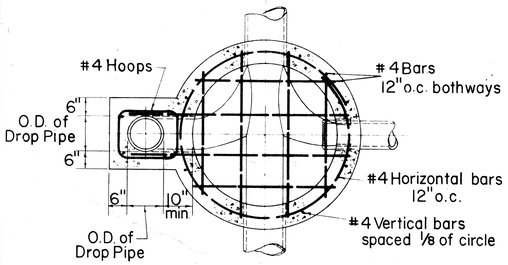
S 4

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

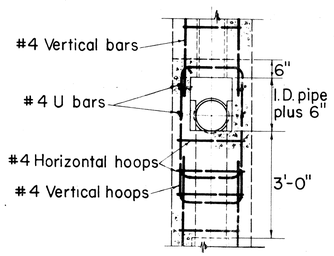
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	85	276



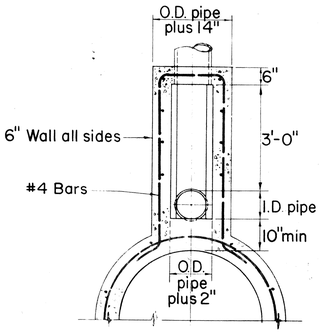
SECTION A-A



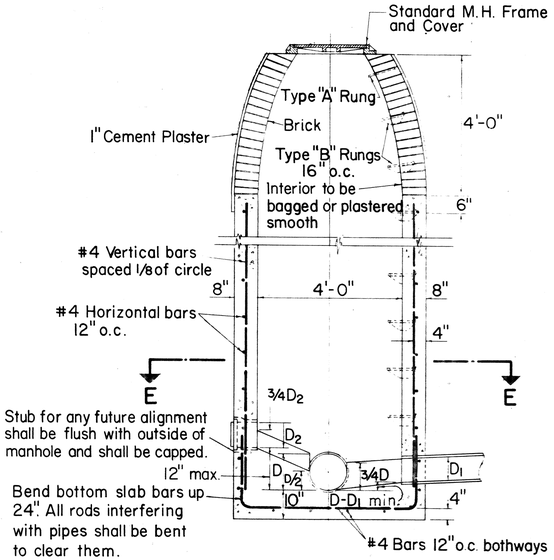
SECTION B-B



SECTION C-C

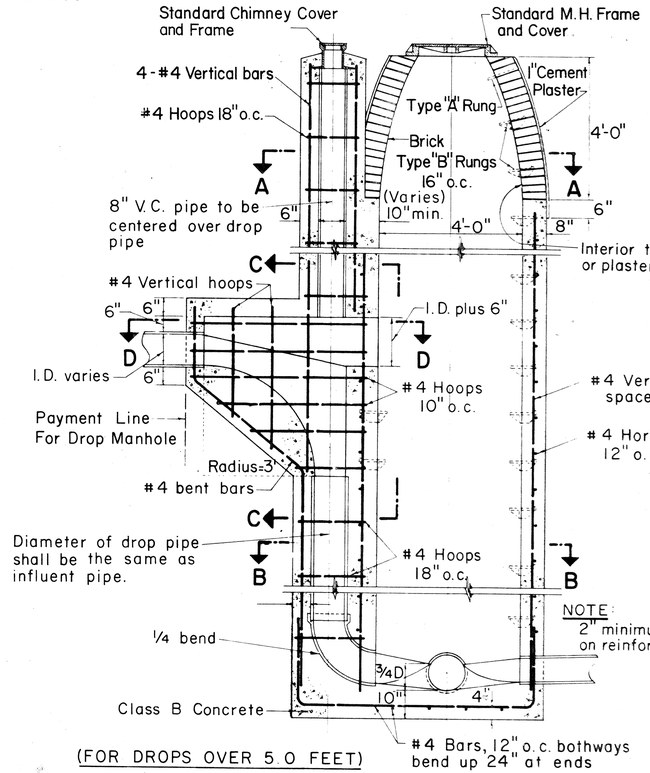


SECTION D-D



PLAIN MANHOLE

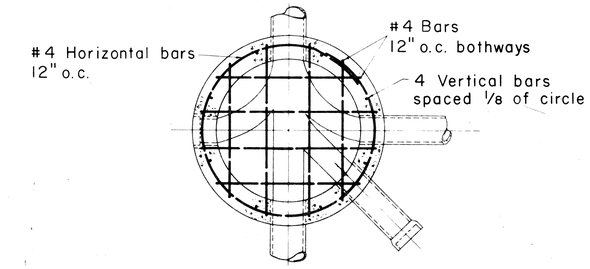
Scale: 1/2"=1'-0"



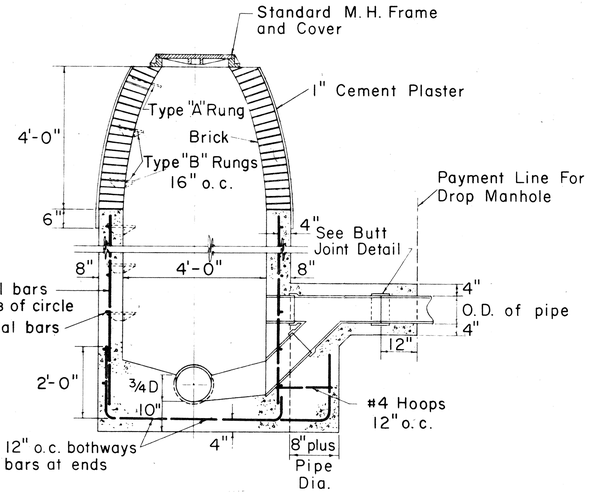
(FOR DROPS OVER 5.0 FEET)

DROP MANHOLE

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



SECTION E-E



(FOR DROPS UNDER 5.0 FEET)

SHALLOW DROP MANHOLE

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

NOTE:

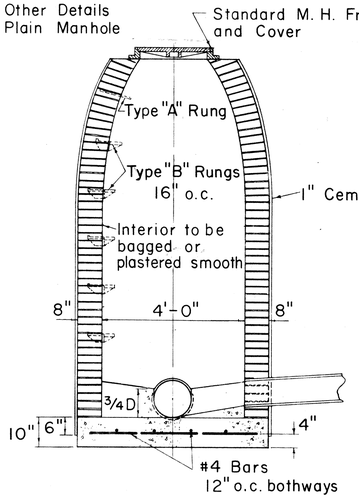
1. Manhole rungs shall not be aligned above any flow line.
2. No rungs shall be installed in manholes less than 3' high.
3. When not otherwise noted, manhole stubs shall be sloped as follows:

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

4. All reinforcing rods interfering with pipes shall be bent to clear them.
5. Bar laps to be 40 diameters in length.
6. Data for special manholes not shown shall be similar to that for plain manholes.
7. Size of drop pipe in all Drop Manholes shall be same as influent line.
8. Manhole wall to be of reinforced concrete to height 1' above normal ground water table.

NOTE:

For Other Details See Plain Manhole



(MAXIMUM HEIGHT - 10.0 FEET)

BRICK MANHOLE

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

Payment for excavation for manholes shall be made under unit price for trench excavation and shall be measured to one foot outside of walls from original ground elevation to authorized bottom elevation.

Payment for manhole walls (brick, precast concrete or cast-in-place concrete) shall include brick, precast concrete pipe sections, mortar, concrete, reinforcing steel, cast-iron steps, galvanized wrought iron rungs, and plastering.

Payment for manhole bases shall include concrete, reinforcing steel, and the construction of inverts.

APPROVED:

SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE 5-12-66

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

STANDARD DETAILS

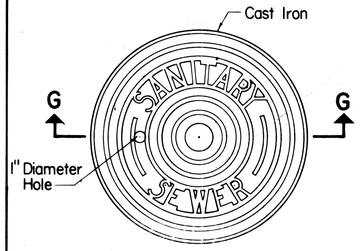
SEWERS - DROP MANHOLE AND BRICK MANHOLE DETAILS

F.A.I. Proj. No. I-HI-1(5):24, Unit 2
Scales: As Noted — Date May, 1965

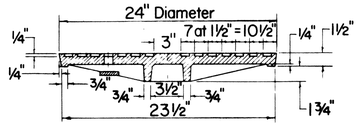
SHEET NO. 29 OF 50 SHEETS

S 5

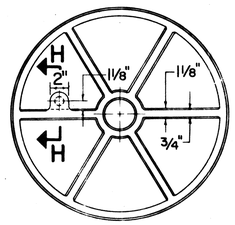
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5)-24, Unit 2	1965	86	276



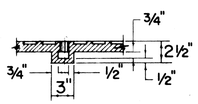
PLAN OF MANHOLE COVER



SECTION G-G



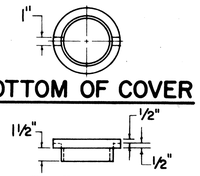
BOTTOM VIEW OF COVER



SECTION H-H

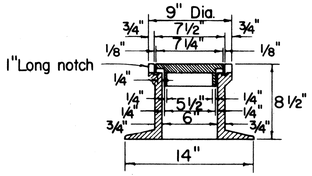


PLAN OF COVER



BOTTOM OF COVER

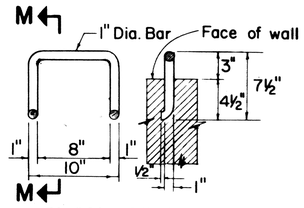
ELEVATION



SECTION

DROP MANHOLE CHIMNEY CASTINGS

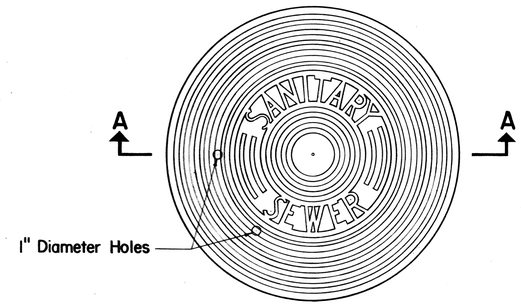
Scale: 1 1/2" = 1'-0"



PLAN SECTION M-M

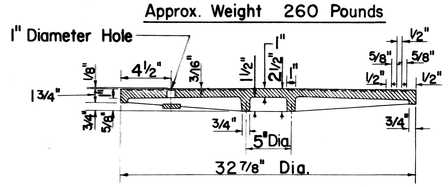
TYPE "A" MANHOLE RUNGS WROUGHT IRON

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

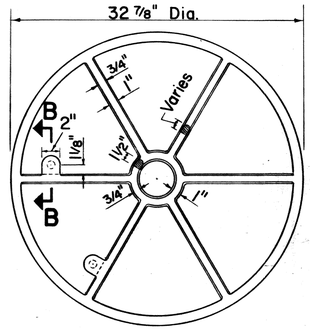


PLAN OF MANHOLE COVER

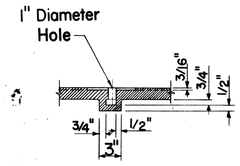
Approx. Weight 260 Pounds



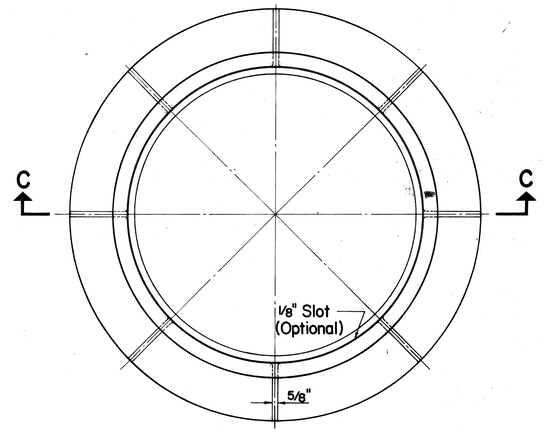
SECTION A-A



BOTTOM VIEW OF COVER

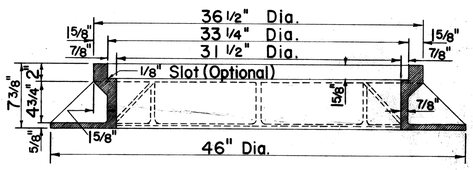


SECTION B-B

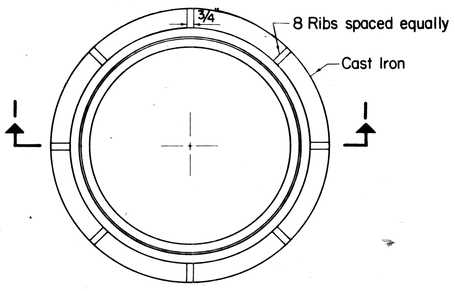


PLAN OF MANHOLE FRAME

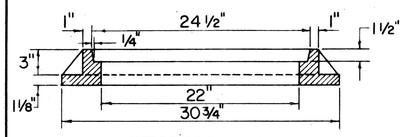
Approx. Weight 437 Pounds



SECTION C-C



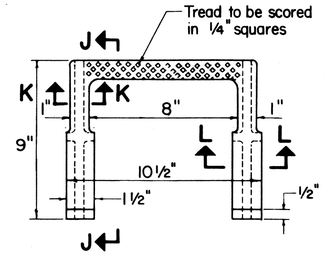
PLAN OF MANHOLE FRAME



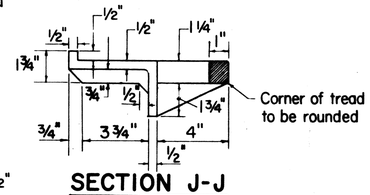
SECTION I-I

TYPE "A" SEWER MANHOLE FRAME AND COVER

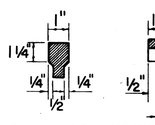
Scale: 1 1/2" = 1'-0"



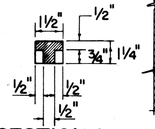
PLAN



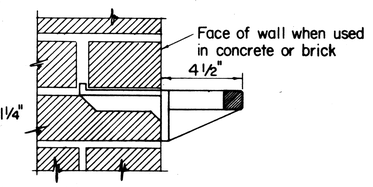
SECTION J-J



SECTION K-K



SECTION L-L



METHOD OF INSTALLATION

TYPE "B" MANHOLE RUNGS (CAST IRON)

Scale 3" = 1'-0"

TYPE "B" SEWER MANHOLE FRAME AND COVER

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

APPROVED:

R. Moriya — SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIVISION OF SEWERS
CITY & COUNTY OF HONOLULU

STANDARD DETAILS

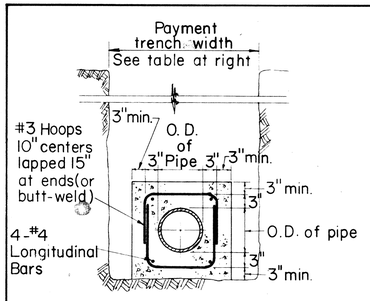
F.A.I. Proj. No. I-HI-1(5):24, Unit 2

Scales: As Noted — Date May, 1965

SHEET NO. 30 OF 50 SHEETS

IMPERIAL TR K DIE CO., N.Y.
TRADE MARK

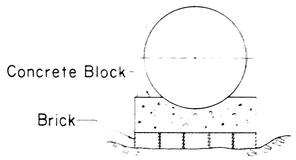
FED AID DIST. NO.	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5)24, Unit 2	1965	87	276



DETAIL OF CONCRETE JACKET

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

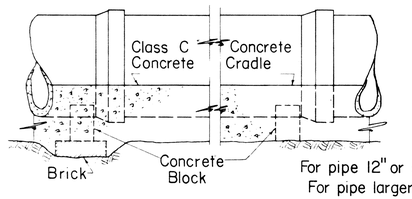
NOTE:
Payment width of cradle shall be payment trench width.

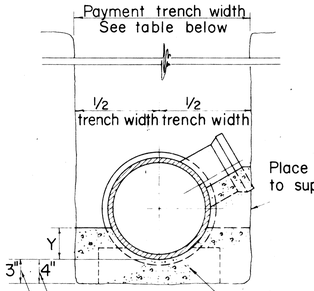


METHOD OF USING BRICKS UNDER CONCRETE BLOCKS

Not To Scale

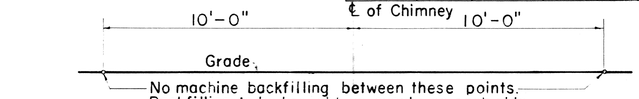
Contractor shall set Concrete Blocks on undisturbed ground. Where ground is too low, the contractor shall not heap up dirt under the Concrete Block but use Concrete Bricks to take up the deficiency, scraping away beneath Concrete Block to give sufficient room for Brick.

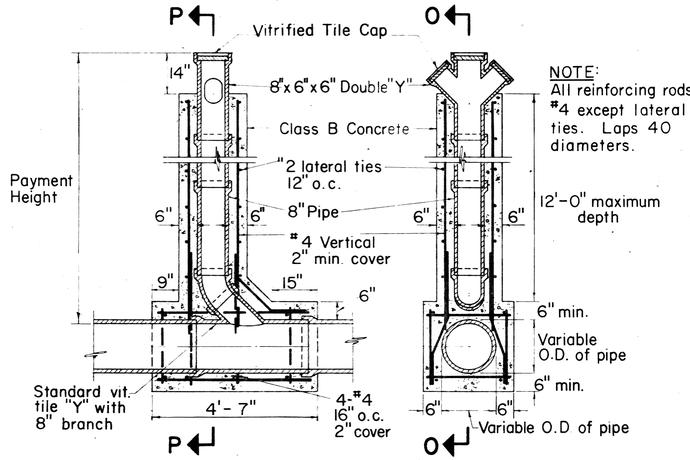




ELEVATION SHOWING METHOD OF LAYING PIPE

Not To Scale



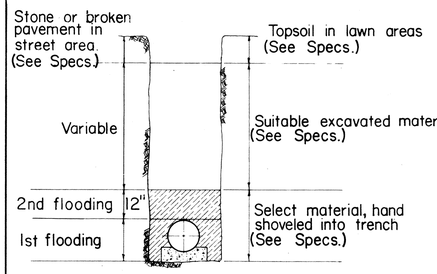


SECTION O-O

SECTION P-P

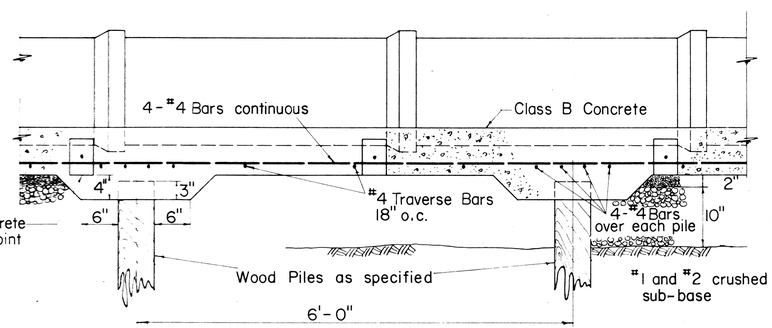
DETAILS OF CHIMNEY

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

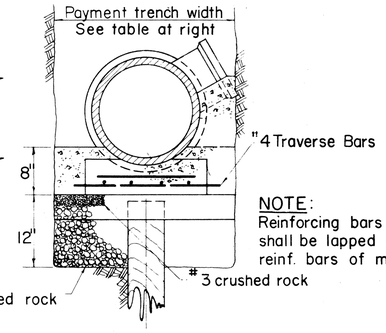


METHOD OF BACKFILL

Not To Scale



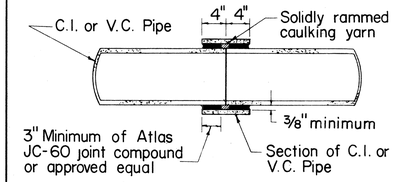
Scale: 1" = 1'-0"



NOTE:
Reinforcing bars of laterals shall be lapped 40 dia. to reinf. bars of mains.

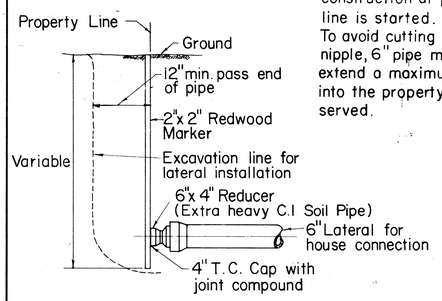
DETAIL OF REINFORCED CONCRETE CRADLE ON WOOD PILES (FOR 6, 8, 10 & 12 IN. V.C. PIPE)

DETAIL OF REINFORCED CONCRETE CRADLE WITHOUT PILES SIMILAR EXCEPT FOR WOOD PILES AND PILE CAPS



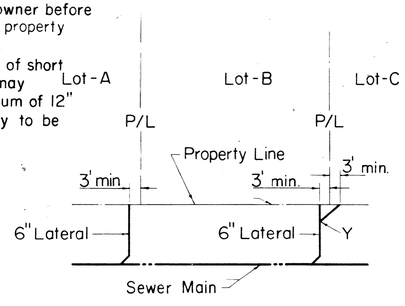
BUTT JOINT DETAIL

Scale: 1" = 1'-0"



NOTE: Permission is to be secured from property owner before construction at property line is started. To avoid cutting of short nipple, 6" pipe may extend a maximum of 12" into the property to be served.

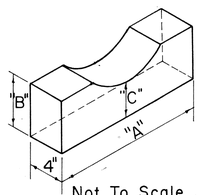
DETAIL AT PROPERTY LINE



LAYOUT

CONSTRUCTION OF LATERAL

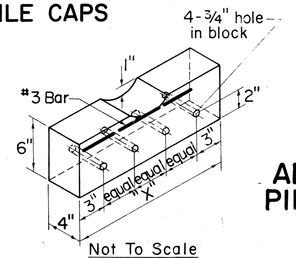
Not To Scale



Not To Scale

DETAIL OF PRECAST CONC. PIPE BLOCK

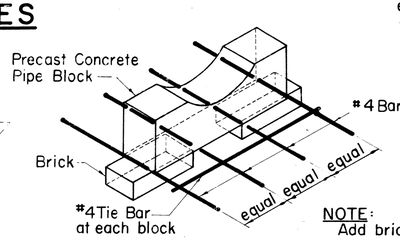
CONCRETE BLOCK DIMENSIONS			
PIPE SIZE	"A"	"B"	"C"
6"	1'-2"	6"	3"
8"	1'-5"	6"	3"
10"	1'-7"	6"	3"
12"	1'-7"	6"	3"
15"	1'-8"	6"	4"
18"	1'-9"	6"	4"
21"	1'-10"	6"	4"
24"	1'-11"	6"	4"
27"	2'-0"	6"	4"
30"	2'-3"	6"	4"



Not To Scale

DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

DIM. OF REINF. CONC. BLOCK	
PIPE SIZE	"X"
6"	1'-6"
8"	1'-6"
10"	1'-8"
12"	1'-8"
15"	1'-10"
18"	1'-10"
21"	1'-10"
24"	2'-0"
27"	2'-0"
30"	2'-0"



NOTE:
Add brick for larger size pipe

Not To Scale

ALTERNATE DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

TRENCH WIDTHS	
PIPE SIZE	PAY. WIDTH
6"	24"
8"	24"
10"	24"
12"	30"
15"	30"
18"	36"
21"	36"
24"	45"
27"	45"
30"	50"

DIM. OF CONC. CRADLE		
PIPE SIZE	"Y"	WIDTH
6"	3"	24"
8"	3"	24"
10"	3"	24"
12"	3"	30"
15"	4"	30"
18"	5"	36"
21"	5"	36"
24"	6"	45"
27"	7"	45"
30"	7"	50"

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

APPROVED:

Z. Moniz — SEWER SYSTEM DIRECTOR, DIVISION OF SEWERS — DATE 5/31/65

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

STANDARD DETAILS

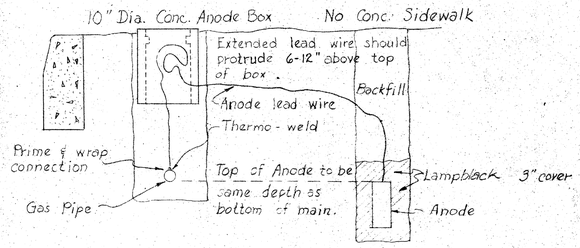
SEWERS - CONCRETE JACKET & MISCELLANEOUS DETAILS

F.A.I. Proj. No. I-HI-1(5)24, Unit 2
Scales: As Noted — Date: May, 1965

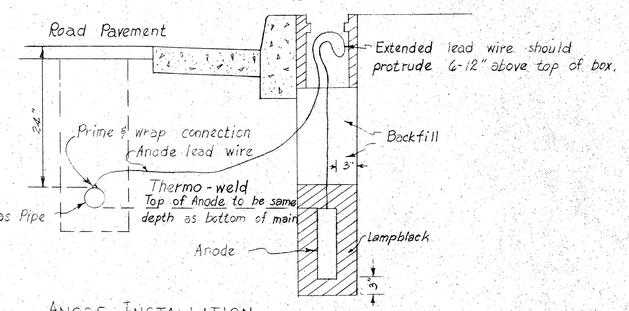
SHEET NO. 31 OF 50 SHEETS

IMPERIAL TM K & E CO., N.Y. TRADE MARK

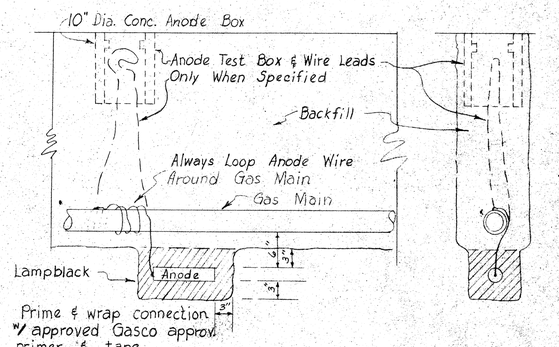
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	88	276



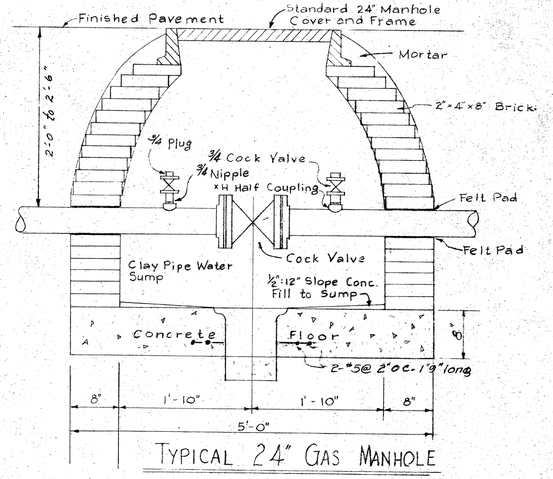
ANODE INSTALLATION
TYPE "A"
Not to Scale



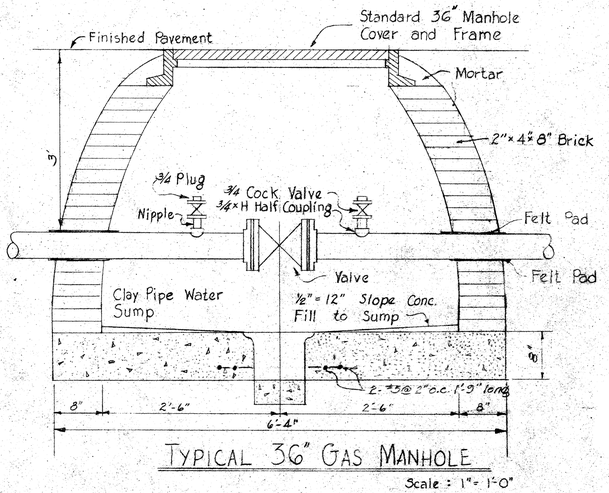
ANODE INSTALLATION
TYPE B
Not to Scale



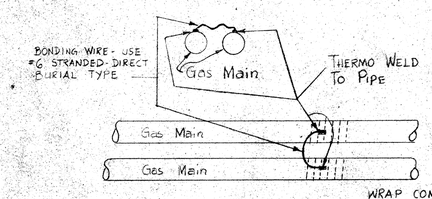
ANODE INSTALLATION
TYPE "C"
Not to Scale



TYPICAL 24" GAS MANHOLE
Scale : 1"= 1'-0"



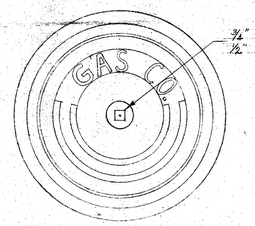
TYPICAL 36" GAS MANHOLE
Scale : 1"= 1'-0"

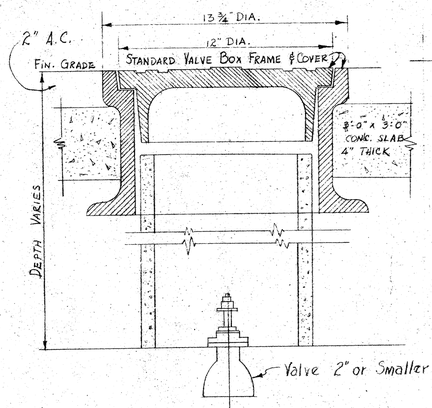


WRAP COMPLETED CONNECTION WITH GASCO APPROVED PRIMER AND TAPE.

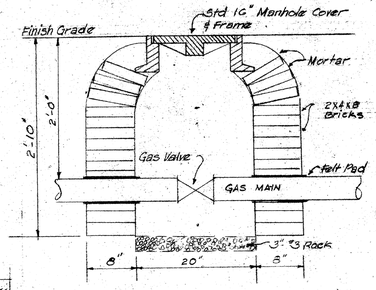
TYPICAL BOND CONNECTION
Not to Scale

Note :
Offset word Gasco 1¾" high ⅞" deep.





TYPICAL DETAIL OF VALVE BOX FOR 2" GAS VALVE- AND SMALLER



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

APPROVED:
Paul C. Joy
DIRECTOR OF DEVELOPMENT
HONOLULU GAS CO., LTD.
5/7/65
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

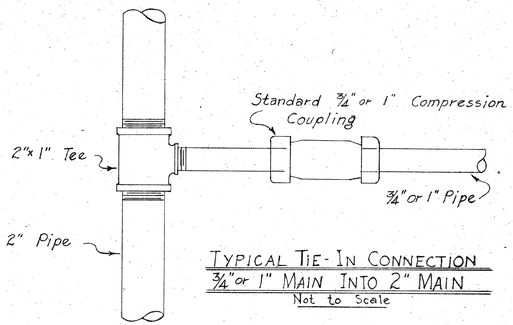
STANDARD DETAILS
HONOLULU GAS COMPANY
MANHOLES, VALVE BOX, & ANODE INSTALLATION DETAILS

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, UNIT 2

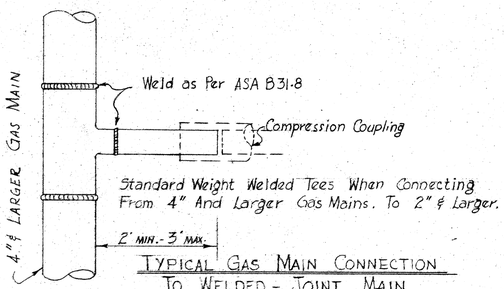
Not to Scale
Date: May, 1964.

SHEET No. 32 OF 50 SHEETS

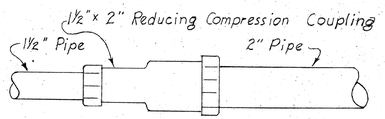
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	FAI-1(6)24 Unit 2	1965	80	276



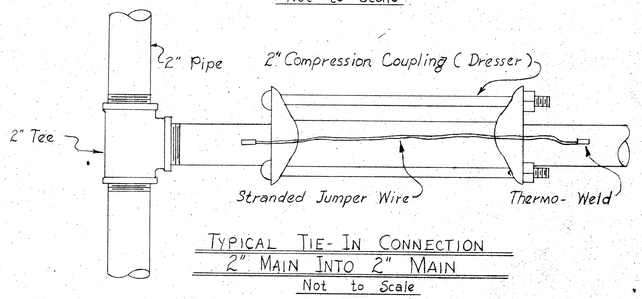
TYPICAL TIE-IN CONNECTION
¾" or 1" MAIN INTO 2" MAIN
Not to Scale



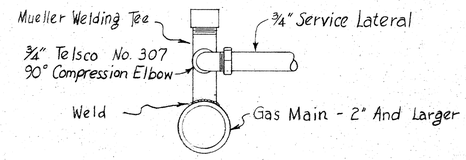
TYPICAL GAS MAIN CONNECTION
TO WELDED-JOINT MAIN
Not to Scale

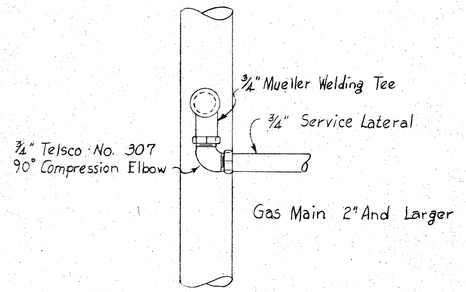


TYPICAL IN-LINE TIE-IN
1½" MAIN TO 2" MAIN
Not to Scale



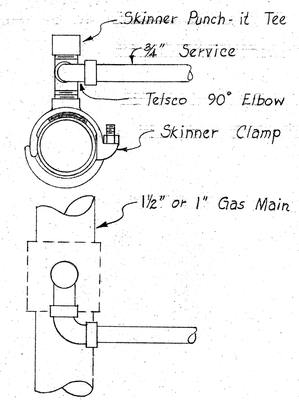
TYPICAL TIE-IN CONNECTION
2" MAIN INTO 2" MAIN
Not to Scale



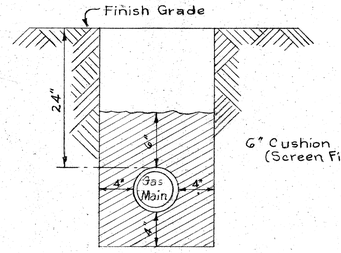


TYPICAL MAIN-SERVICE CONNECTION
Not to Scale

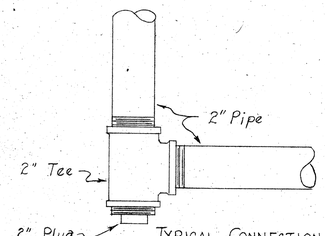
All gas service connections will consist of:
1. ¾" Mueller Welding Tee Welded to Main as shown.
2. ¾" Telsco No. 307, 90° Compression Elbow. This is for services connections at Mains only.



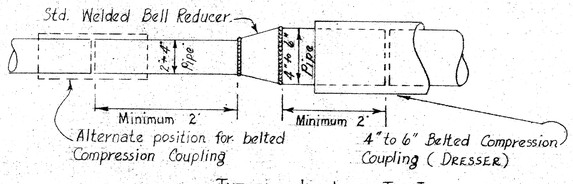
TYPICAL MAIN-SERVICE CONNECTION
1½" OR 1" MAIN
Not to Scale



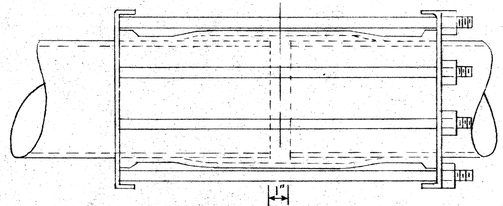
TYPICAL TRENCHING DETAIL
Not to Scale



TYPICAL CONNECTION, 2" MAIN AT STREET CORNER. PLUGGED TEE FOR PURGING
Not to Scale



TYPICAL IN-LINE TIE-IN.
2" MAIN AND LARGER
Not to Scale



TYPICAL 6"-10" STYLE 40 DRESSER FOR EXPANSION JOINT
Not to Scale

TYPICAL CONNECTIONS OF GAS MAINS
Not to Scale

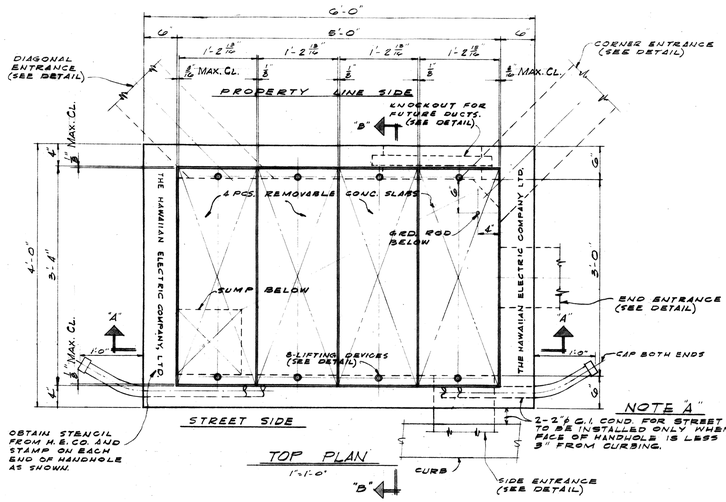
1. Compression couplings may be of insulating or non-insulating type. All such fittings to be primed & wrapped with Gasco approved materials.
2. #12 stranded jumper wire will installed across all non-insulating compression couplings for 2" pipe & smaller. #6 stranded wire for larger pipes.
3. Unless specified install non-insulating type of compression coupling.

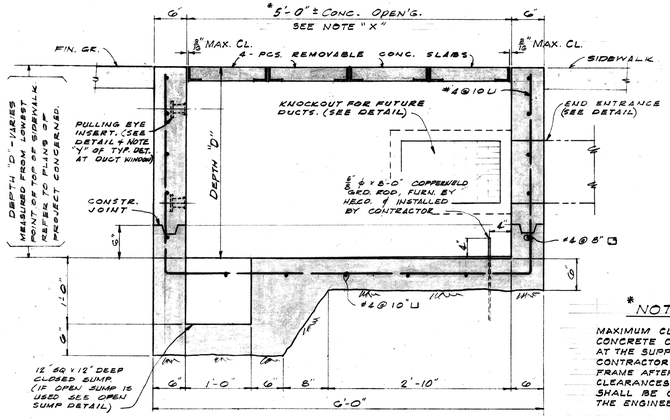
APPROVED:
DIRECTOR OF DEVELOPMENT
HONOLULU GAS CO., LTD.
5/17/65
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
HONOLULU GAS COMPANY
TYPICAL CONNECTIONS AND TRENCHING DETAILS
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, UNIT 2
Not to Scale
Date: May, 1964.

SHEET No. 33 OF 50 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	90	276

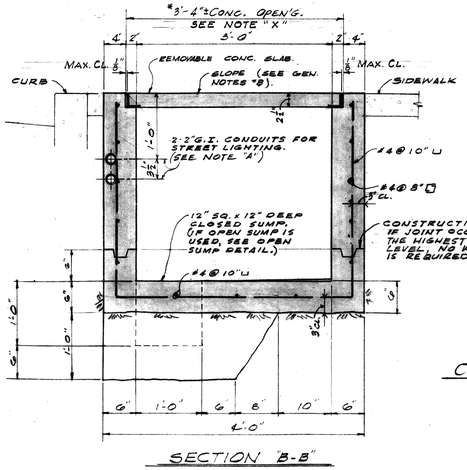




SECTION "A-A"
1"=1'-0"

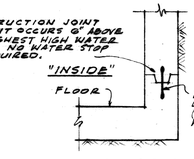
*NOTE "X" IMPORTANT

MAXIMUM CLEARANCES BETWEEN REMOVABLE CONCRETE COVER SLABS AND CONCRETE OPENING AT THE SUPPORTS MUST BE KEPT. CONCRETE CONTRACTOR SHALL MEASURE COVER SLAB STEEL FRAME AFTER FABRICATION TO OBTAIN PROPER CLEARANCES. ANY VARIATION IN CLEARANCES SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT CONTRACTOR'S EXPENSE.

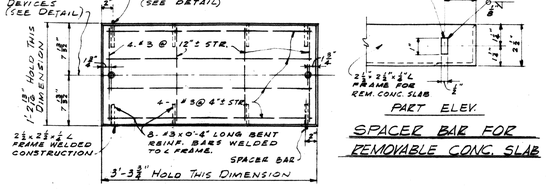


SECTION "B-B"
1"=1'-0"

REDUCED PLANS
SCALES REDUCED ACCORDINGLY



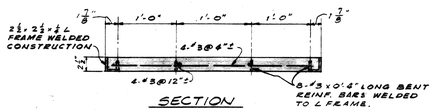
CONSTRUCTION JOINT
TYPICAL
1"=1'-0"



TOP PLAN

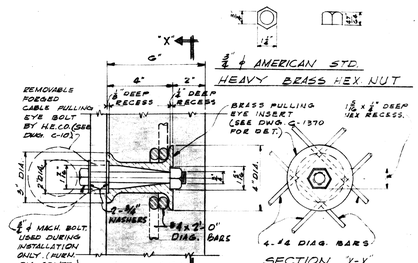
PART ELEV.

SPACER BAR FOR REMOVABLE CONC. SLAB



SECTION

REMOVABLE CONC. SLAB
1"=1'-0"



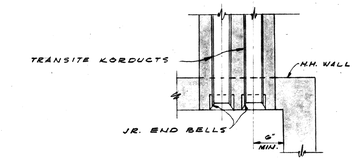
3/4" ø AMERICAN STD. HEAVY BRASS HEX NUT

SECTION "X-X"

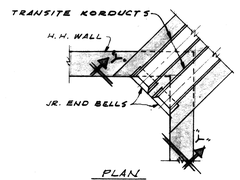
SECTION ELEV.

NOTE:
CONTRACTOR SHALL PLACE ADVANCE ORDERS FOR CAST BRASS PULLING EYE INSERTS. ORDERS MAY BE PLACED AT NOVELTY FOUNDRY, 536 KAMANI ST. PHONE 502316

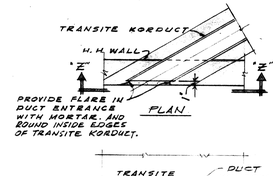
BRASS PULLING EYE INSERT
3"=1'-0"



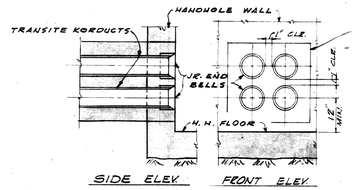
PLAN



PLAN

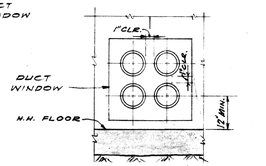


PLAN



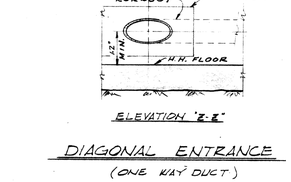
SIDE ELEV. FRONT ELEV.

END & SIDE ENTRANCES
(FOUR WAY DUCT)



ELEVATION "Y-Y"

CORNER ENTRANCE
(FOUR WAY DUCT)

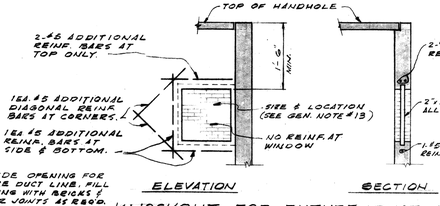


ELEVATION "Z-Z"

DIAGONAL ENTRANCE
(ONE WAY DUCT)

NOTE:
FOR SIZE & LOCATION OF DUCTS, SEE PLAN OR PROJECT CONCERNED.

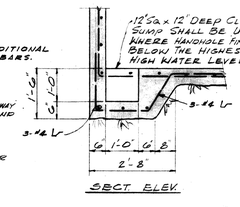
TYPICAL DUCT LINE ENTRANCE DETAILS
N.T.S.



ELEVATION SECTION

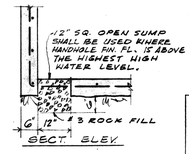
NOTE:
PROVIDE OPENING FOR FUTURE DUCT LINE, FILL OPENING WITH BRICKS & MORTAR. JOINTS AS REQ'D.

KNOCKOUT FOR FUTURE DUCT LINE
1/2"=1'-0"



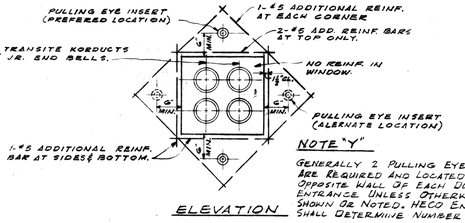
SECT. ELEV.

CLOSED SUMP
1/2"=1'-0"



SECT. ELEV.

OPEN SUMP
1/2"=1'-0"

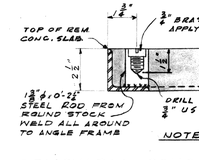


ELEVATION

NOTE "Y"

GENERALLY 2 PULLING EYE INSERTS ARE REQUIRED AND LOCATED ON OPPOSITE WALL OF EACH DUCT ENTRANCE UNLESS OTHERWISE SHOWN OR NOTED. HECO ENGINEER SHALL DETERMINE NUMBER REQUIRED.

TYPICAL DETAIL AT DUCT WINDOW
1/2"=1'-0"



NOTE: GALVANIZE L FRAME AFTER FABRICATION.

REMOVABLE CONC. COVER SLAB
LIFTING DEVICE
3"=1'-0"

GENERAL NOTES

1. CONCRETE SHALL BE CLASS A-1 CONFORMING TO THE REQUIREMENTS OF SECTION 47 OF THE SPECIAL PROVISIONS.
2. CONCRETE FINISH:
   TOP OF MH. - WOOD FLOATED (SIDEWALK FINISH) ACCORDING TO DIVISION OF HIGHWAYS, STATE OF HAWAII.

   FLOOR - SMOOTH METAL TROWELLED.

   EXPOSED WALL SURFACES & EDGES - SMOOTH AND FREE FROM DEFECTS.

   CONCRETE POURING - NOTIFY THE HAWN. ELEC. CO. LTD. ENG. DEPT. 24 HRS. BEFORE POURING ANY CONC. ALL CONC. SHALL BE POURED IN THE PRESENCE OF H.E. CO. ENGINEER OR ITS REPRESENTATIVE.
3. REINFORCING: ROUND DEFORMED BARS, NEW BILLET, STOCK INTERMEDIATE GRADE 33TH A15. ALL HOOKED BARS SHALL HAVE 90° STD. HOOK UNLESS OTHERWISE SHOWN.
4. FORMS: FORM HANDHOLE TO SIZE & SHAPE AS SHOWN. EXTERIOR FACE OF HANDHOLE WALLS SHALL BE FORMED EXCEPT:
   a) EXCAVATION IN SOLID MATERIAL SUCH AS CORAL OR ROCK - NEAT CUT NO FORMS REQUIRED
   b) EXCAVATION IN SOLID MATERIAL OTHER THAN CORAL OR ROCK - LINING SUCH AS SALVAGED CORRUGATED IRON, CANEC, ETC. SHALL BE USED
5. PULLING EYE INSERTS: LOCATION AND NUMBER REQUIRED SHALL BE DETERMINED BY THE ENGINEER.
6. DRAINAGE: SLOPE FLOOR DOWN 1/2" TO SUMP.
7. SLOPE TOP OF HANDHOLE TO MATCH FINISHED GRADE.
8. FINISH STEEL WORK: ANGLE IRON FRAMES & LIFTING DEVICES FOR REMOVABLE CONCRETE SLABS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
9. EXCAVATION: EXCAVATE FOR HANDHOLE TO ACCURATE ALIGNMENT GRADES AND DIMENSIONS AS SHOWN ON DRAWING. ALL EXCAVATION MUST BE APPROVED BY THE ENGINEERING DEPT., THE HAWAIIAN ELECTRIC CO. LTD. BEFORE ANY CONC. IS POURED. ALL EXCESS CUT SHALL BE BACK-FILLED WITH CONC. OR ROCK.
10. BACKFILL: REMOVE ALL DEBRIS BEFORE BACKFILLING. BACKFILL IN ACCORDANCE WITH LATEST SPECIFICATIONS OF AND SUBJECT TO APPROVAL OF DIV. OF HWYS., STATE OF HAWAII.
11. FOR DUCT LINE CONSTRUCTION, SEE STANDARD DETAIL SHEETS.
12. DUCTS: FOR SIZE LOCATION AND NUMBER REQUIRED, SEE PLAN & PROFILE SHEETS.
13. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.

REINFORCED CONC. QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH "D" = 4'-0"
CONCRETE = 2.2 CU. YDS.
REINF. STEEL = 361 LBS.

WEIGHT PER REMOVABLE CONC. SLAB,
CONCRETE = 123 LBS.
ANGLE FRAME = 37 "
REINF. + MISC. STEEL = 7 "
TOTAL 167 LBS.

MATERIALS FOR 6" DEPTH OF 6" THICK WALL,
CONCRETE = 0.2 CU. YDS.
REINF. STEEL = 17 LBS.

FOR USE IN AREAS NOT SUBJECT TO VEHICULAR TRAFFIC

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC UTILITIES

INTERSTATE HIGHWAY — PROJ. NO. I-HI-1(5)24, Unit 2
SCALE: AS SHOWN — DATE: May, 1965.

HANDHOLE TYPE 35 (3'-0" x 5'-0")
UNDERGROUND STANDARDS

DESIGNED	DRAWN	DATE	SCALE
CHECKED (ELEC. MECH. STRUCT.)			
APPROVAL		ENGINEERING DEPARTMENT THE HAWAIIAN ELECTRIC CO., LTD. HONOLULU, HAWAII	
		DRAWING NUMBER 18841	

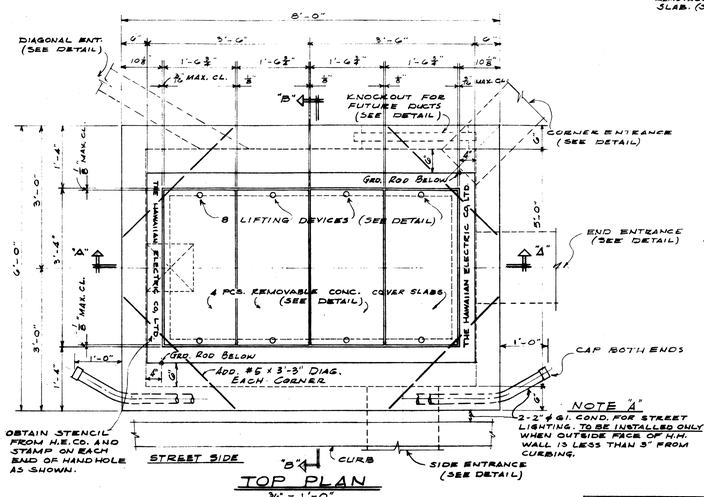
SURVEY PLOTTED BY — DATE
DRAWN BY "
TRACED BY "
DESIGNED BY "
QUANTITIES BY "
CHECKED BY "

ORIGINAL PLAN
NOTE BOOK
No.

SHEET No. 34 OF 50 SHEETS

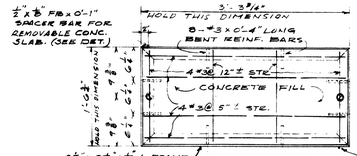
PRINTED ON DIEPO NO. 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-I(5)24 Unit 2	1965	91	270

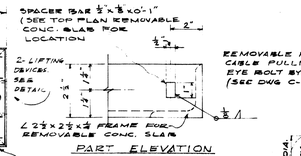


TOP PLAN

3/4" = 1'-0"



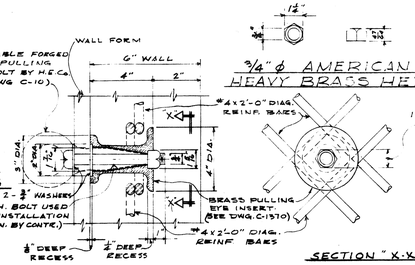
PLAN



PART ELEVATION

SPACER BAR FOR REMOVABLE CONC. SLAB

N.T.S.



SECT. ELEVATION

SECTION "X-X"

NOTE:
CONTRACTOR SHALL PLACE ADVANCE ORDERS FOR CAST BRASS PULLING EYE INSERTS. ORDERS MAY BE PLACED AT NOVELTY FOUNDRY. 556 KAMANI ST., PH. 502314.

BRASS PULLING EYE INSERT

3" = 1'-0"

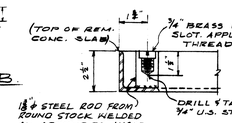
¾" ϕ AMERICAN STD. HEAVY BRASS HEX NUT



SECTION

REMOVABLE CONC. SLAB

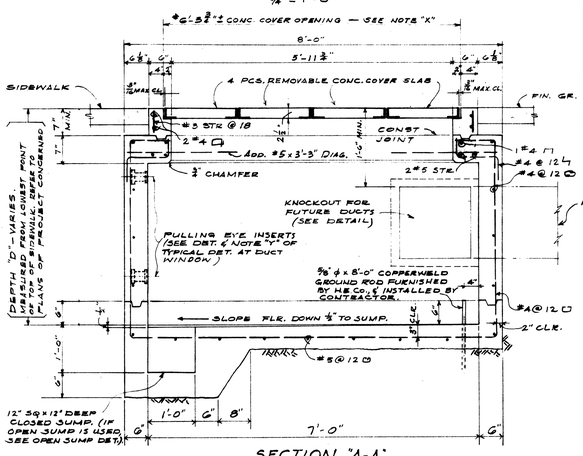
1" = 1'-0"



NOTE: GALVANIZE ANGLE FRAME AFTER FABRICATION.

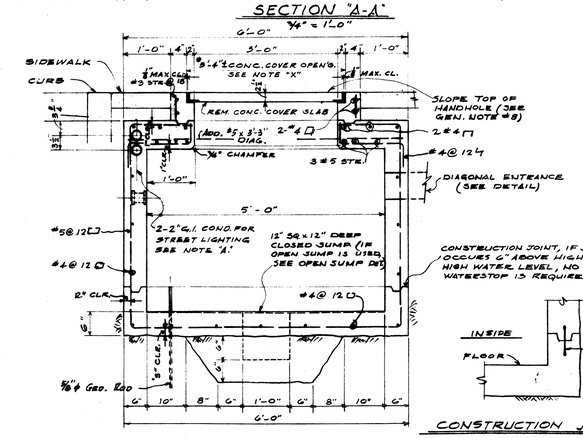
REMOVAL CONC. COVER SLAB LIFTING DEVICE

3" = 1'-0"



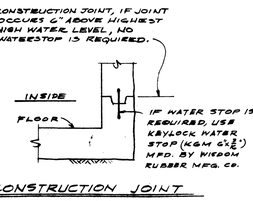
SECTION "A-A"

¾" = 1'-0"



SECTION "B-B"

¾" = 1'-0"



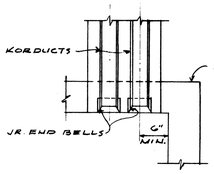
CONSTRUCTION JOINT

TYPICAL

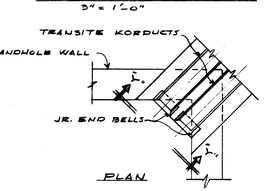
1" = 1'-0"

*NOTE "X" IMPORTANT

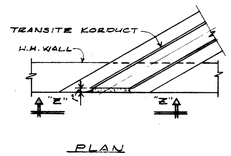
MAXIMUM CLEARANCES BETWEEN REMOVABLE CONCRETE COVER SLABS & CONCRETE OPENING AT THE SUPPORTS MUST BE KEPT. CONCRETE CONTRACTOR SHALL MEASURE COVER SLAB STEEL FRAME AFTER FABRICATION TO OBTAIN PROPER CLEARANCES. ANY VARIATION IN CLEARANCES SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT CONTRACTORS EXPENSE.



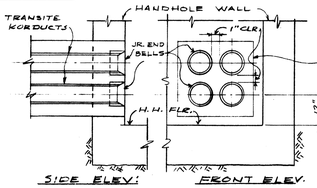
PLAN



PLAN



PLAN

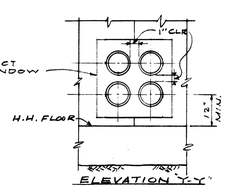


SIDE ELEV.

FRONT ELEV.

END & SIDE ENTRANCES

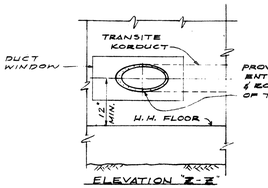
(FOUR WAY DUCT)



ELEVATION "Y-Y"

CORNER ENTRANCE

(FOUR WAY DUCT)



ELEVATION "Z-Z"

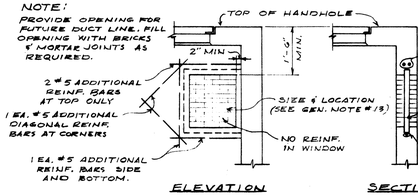
DIAGONAL ENTRANCE

(ONE WAY DUCT)

TYPICAL DUCT LINE ENTRANCE DETAILS

N.T.S.

NOTE:
PROVIDE OPENING FOR FUTURE DUCT LINE. FILL OPENING WITH BRICKS & MORTAR JOINTS AS REQUIRED.

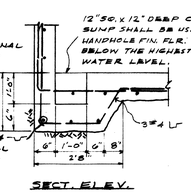


ELEVATION

SECTION

KNOCKOUT FOR FUTURE DUCT LINE

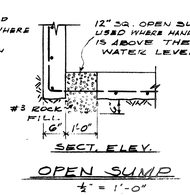
½" = 1'-0"



SECT. ELEV.

CLOSED SUMP

½" = 1'-0"

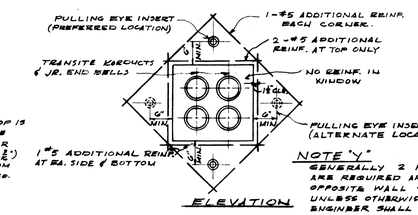


SECT. ELEV.

OPEN SUMP

½" = 1'-0"

NOTE:
EXACT LOCATION OF SUMP TO BE DETERMINED IN FIELD.



ELEVATION

NOTE "Y"

GENERALLY 2 PULLING EYE INSERTS ARE REQUIRED AND LOCATED ON OPPOSITE WALL OF EACH DUCT WINDOW UNLESS OTHERWISE SHOWN OR NOTED. H.E.Co. ENGINEER SHALL DETERMINE NUMBER REQUIRED.

TYPICAL DETAIL AT DUCT WINDOW

½" = 1'-0"

GENERAL NOTES

1. CONCRETE SHALL BE CLASS A-1 CONFORMING TO THE REQUIREMENTS OF SECTION 47 OF THE SPECIAL PROVISIONS.
2. CONCRETE FINISH:
   TOP OF HANDHOLE - WOOD FLOATED (SIDEWALK FINISH) ACCORDING TO DIVISION OF HIGHWAYS, STATE OF HAWAII.

   FLOOR - SMOOTH METAL TROWELLED.

   EXPOSED WALL SURFACE AND EDGES - SMOOTH & FREE FROM DEFECTS.
3. CONCRETE POURING:
   NOTIFY THE HAWAIIAN ELECTRIC CO., LTD. ENGINEERING DEPARTMENT 24 HOURS BEFORE POURING ANY CONCRETE. ALL CONCRETE SHALL BE POURED IN THE PRESENCE OF H.E.CO. ENGR., OR ITS REPRESENTATIVE.
4. REINFORCING: ROUND DEFORMED BARS, NEW BILLET STOCK INTERMEDIATE GRADE ASTM A15. ALL HOOKED BARS SHALL HAVE A.C.I. STD HOOK UNLESS OTHERWISE SHOWN.
   FORMS: FORM HANDHOLE TO SIZE & SHAPE AS SHOWN. EXTERIOR FACE OF HANDHOLE WALLS SHALL BE FORMED EXCEPT:
   A) EXCAVATION IN SOLID MATERIAL SUCH AS CORAL OR ROCK - NEAT CUT - NO FORMS REQUIRED.
   B) EXCAVATION IN SOLID MATERIALS OTHER THAN CORAL & ROCK - LINING SUCH AS SALVAGED CORRUGATED IRON, CAN &C, ETC. SHALL BE USED.
5. PULLING EYE INSERTS: THE LOCATION & NUMBER REQUIRED SHALL BE DETERMINED BY THE ENGINEER.
6. DRAINAGE: SLOPE FLOOR DOWN ½" TO SUMP.
7. THE SLOPE OF TOP OF HANDHOLE SHALL MATCH THE FINISHED GRADE.
8. FINISH STEEL WORK:
   ANGLE IRON FRAMES, LIFTING DEVICE FOR REMOVABLE CONCRETE SLABS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
9. EXCAVATION:
   EXCAVATE FOR HANDHOLE TO ACCURATE ALIGNMENT GRADES & DIMENSIONS AS SHOWN ON DRAWING. ALL EXCAVATION MUST BE APPROVED BY THE ENGINEERING DEPARTMENT, THE HAWAIIAN ELECTRIC CO., LTD., BEFORE ANY CONCRETE IS POURED. ALL EXCESS CUT SHALL BE BACKFILLED WITH CONCRETE OR ROCK.
10. BACKFILL:
    REMOVE ALL DEBRIS BEFORE BACKFILLING. BACKFILL IN ACCORDANCE WITH LATEST SPECIFICATIONS OF AND SUBJECT TO APPROVAL OF DIVISION OF HIGHWAYS, STATE OF HAWAII.
11. FOR DUCT LINE CONSTRUCTION SEE STANDARD DETAIL SHEETS.
12. DUCTS: FOR SIZE, LOCATION & NUMBER REQUIRED SEE PLAN & PROFILE SHEETS.
13. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.

REINFORCED CONC. QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH "D" = 5'-0",
CONCRETE = 4 CU. YDS.
REINF. STEEL = 640 LBS.

WEIGHT PER REMOVABLE CONC. SLAB,
CONCRETE = 150 LBS.
ANGLE FRAME = 40 LBS.
REINF. + MISC. STEEL = 10 LBS.
TOTAL 200 LBS.

MATERIALS FOR 6" DEPTH OF 6" THICK WALL,
CONCRETE = 0.24 CU. YDS.
REINF. STEEL = 23 LBS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC UTILITIES

INTERSTATE HIGHWAY — PROJ. NO. I-HI-I(5)24, Unit 2
SCALE: AS SHOWN — DATE: May 1965

NO.	DATE	REVISIONS	BY	CHK'D	APP'D
2	7-12-65	ADDED NOTE "X" FOR CONC. COVER OPENS.	M.S.	WK.W.	W.K.W.
1	1-31-68	REV. SPEC. SHT NO. 18244 TO 16190	T.Y.	W.K.W.	W.K.W.

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

DESIGNED M.M.S. — DRAWN H.C. — DATE 8-18-61 — SCALE As Shown
CHECKED — ELEC. — MECH. — STRUCT. — T.Y.Y.
APPROVAL: M. M. Lee, H. K. Stewart

ENGINEERING DEPARTMENT
THE HAWAIIAN ELECTRIC CO., LTD.
HONOLULU, HAWAII

STD. DRAWING NUMBER
18850

FOR USE IN AREAS NOT SUBJECT TO VEHICULAR TRAFFIC IN FUTURE

REDUCED PLANS
SCALES REDUCED ACCORDINGLY

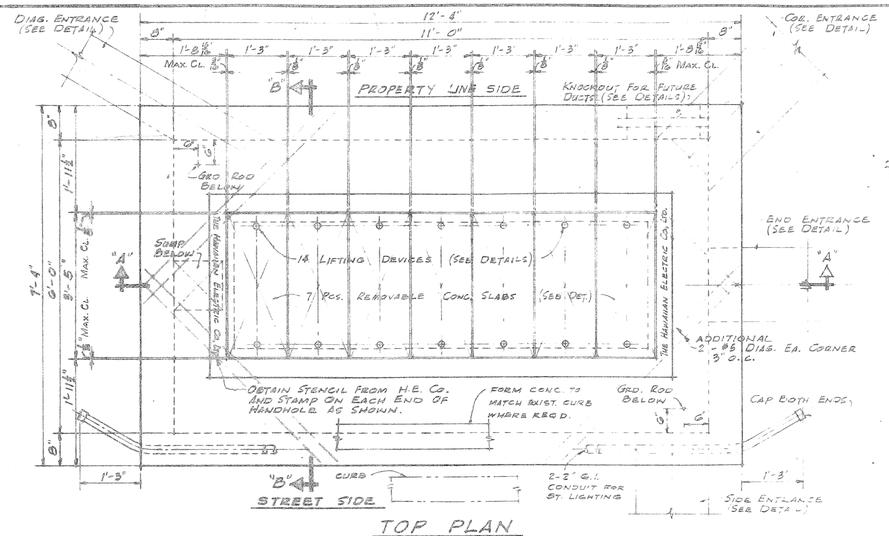
SHEET No. 35 OF 50 SHEETS

ORIGINAL PLAN

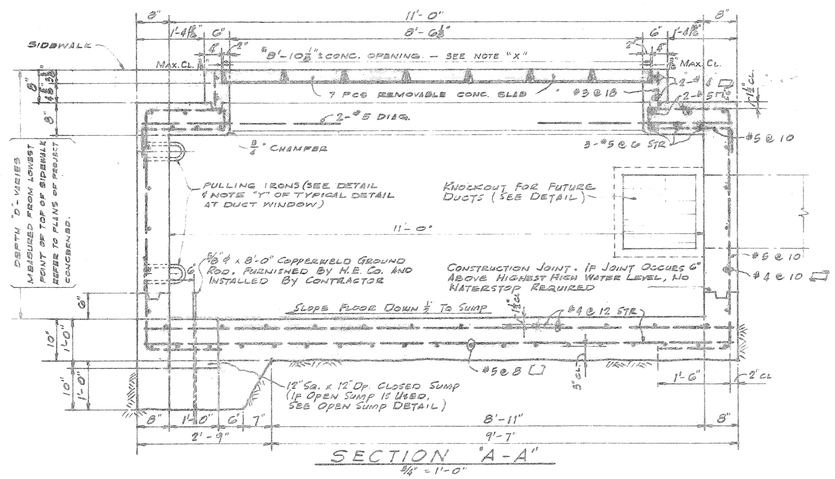
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
NOTE BOOK
QUANTITIES BY
CHECKED BY
DATE
No.

91

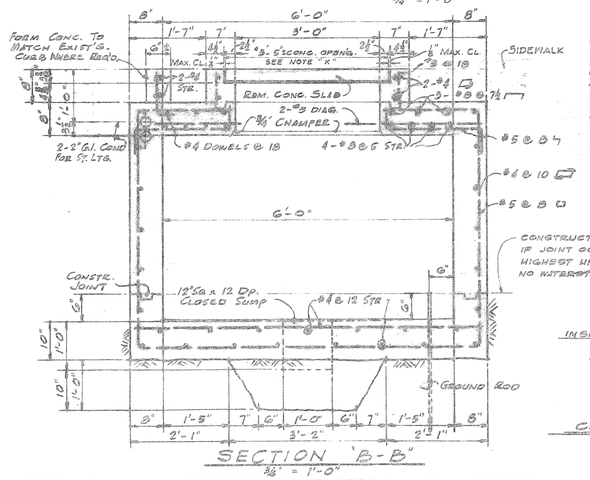
FED ROAD DIST NO	STATE	FED AID PROJ NO	FISCAL YEAR	SHEET NO	TOTAL SHEETS
HAWAII	HAW	I-HI-1(5)24 Unit 2	1965	92	276



TOP PLAN
3/4" = 1'-0"



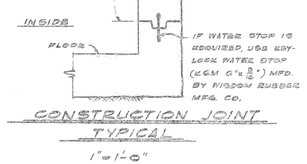
SECTION "A-A"
¾" = 1'-0"



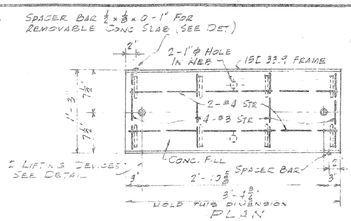
SECTION "B-B"
¾" = 1'-0"

* NOTE "X" IMPORTANT

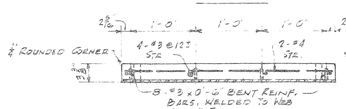
MAXIMUM CLEARANCES BETWEEN REMOVABLE CONCRETE COVER SLABS AND CONCRETE OPENING AT THE SUPPORTS MUST BE KEPT. CONCRETE CONTRACTOR SHALL MEASURE COVER SLAB STEEL FRAME AFTER FABRICATION TO OBTAIN PROPER CLEARANCES. ANY VARIATION IN CLEARANCES SHALL BE CORRECTED TO THE SATISFACTION OF THE ENGINEER AT CONTRACTOR'S EXPENSE.



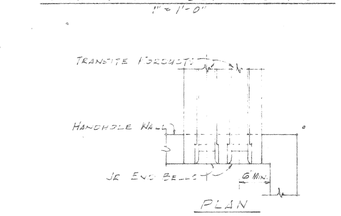
CONSTRUCTION JOINT TYPICAL
1" = 1'-0"



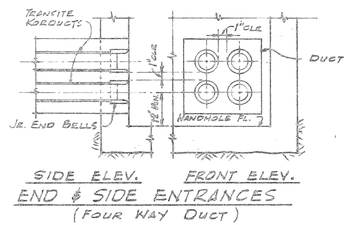
PLAN



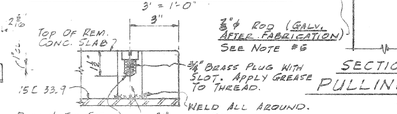
SECTION
REMOVABLE CONC. SLAB
1" = 1'-0"



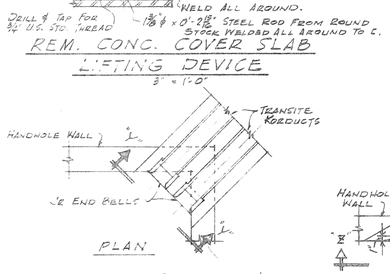
PLAN



SIDE ELEV. FRONT ELEV.
END & SIDE ENTRANCES
(FOUR WAY DUCT)

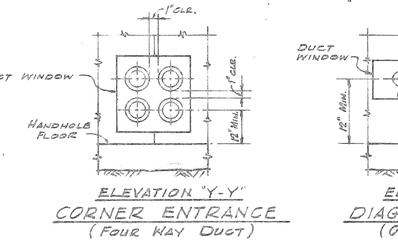


PART ELEV.
SPACER BAR FOR REMOVABLE CONC. SLAB
3" = 1'-0"

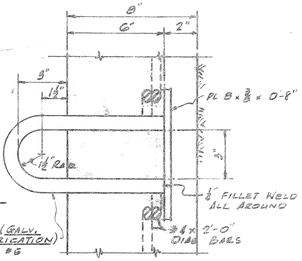


REM. CONC. COVER SLAB
LIFTING DEVICE
3" = 1'-0"

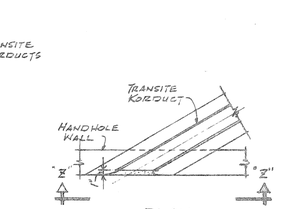
PLAN



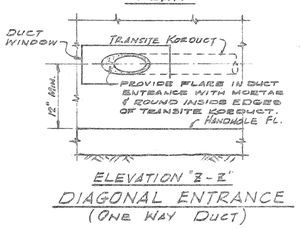
ELEVATION "Y-Y"
CORNER ENTRANCE
(FOUR WAY DUCT)



SECTION ELEV.
PULLING IRON
3" = 1'-0"

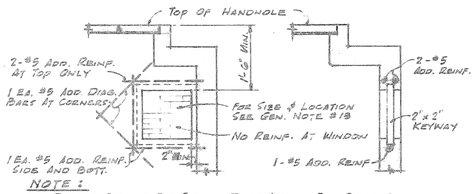


PLAN



ELEVATION "Z-Z"
DIAGONAL ENTRANCE
(ONE WAY DUCT)

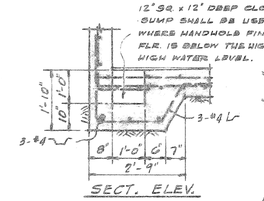
TYPICAL DUCT LINE ENTRANCE DETAILS
N.T.S.



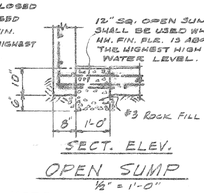
NOTE:
Provide Opening For Future Duct Line. Fill Opening With Bricks And Mortar Joints As Required.

ELEVATION SECTION

KNOCKOUT FOR FUTURE DUCT LINE
½" = 1'-0"

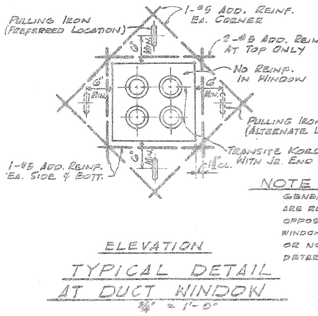


SECT. ELEV.
CLOSED SUMP
½" = 1'-0"



SECT. ELEV.
OPEN SUMP
½" = 1'-0"

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



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.

ELEVATION
TYPICAL DETAIL AT DUCT WINDOW
¾" = 1'-0"

GENERAL NOTES

1. CONCRETE SHALL BE CLASS A-1 CONFORMING TO THE REQUIREMENTS OF SECTION 47 OF THE SPECIAL PROVISIONS.
2. CONCRETE FINISH:
   TOP OF HANDHOLE - WOOD FLOATED (SIDEWALK FINISH) ACCORDING TO DIVISION OF HIGHWAYS, STATE OF HAWAII.

   FLOOR - SMOOTH METAL TROWELLED.

   EXPOSED WALL SURFACES, AND EDGES - SMOOTH AND FREE FROM DEFECTS.
3. CONCRETE POURING:
   NOTIFY THE HAWAIIAN ELECTRIC CO. LTD., ENGINEERING DEPARTMENT 24 HOURS BEFORE POURING ANY CONCRETE.
   ALL CONCRETE SHALL BE POURED IN THE PRESENCE OF H.E.CO. ENG'S OR ITS REPRESENTATIVE.
4. REINFORCING:
   ROUND DEFORMED BARS, NEW BILLET STOCK INTERMEDIATE GRADE ASTM A15. ALL HOOKED BARS SHALL HAVE A.C.I. STD. HOOK UNLESS OTHERWISE SHOWN.
5. FORMS:
   FORM HANDHOLE TO SIZE & SHAPE AS SHOWN. EXTERIOR FACE OF HANDHOLE WALLS SHALL BE FORMED EXCEPT:
   A) EXCAVATION IN SOLID MATERIAL (SUCH AS CORAL OR ROCK - WHAT CUTTING FORMS REQUIRED.
   B) EXCAVATION IN SOLID MATERIALS OTHER THAN CORAL & ROCK - LINING SUCH AS SLIVERED CORRUGATED IRON, CANVAS, ETC. SHALL BE USED.
6. PULLING IRON:
   LOCATION & NUMBER REQUIRED, SHALL BE DETERMINED BY THE ENGINEER.
7. DRAINAGE:
   SLOPE FLOOR DOWN ½" TO SUMP.
8. SLOPE TOP OF HANDHOLE TO MATCH FINISHED GRADE.

   FINISH STEEL WORK:
   CHANNEL FRAMES FOR REMOVABLE CONCRETE SLABS, LIFTING DEVICE & PULLING IRONS SHALL BE HOT DIP GALVANIZED AFTER FABRICATION.
9. EXCAVATION:
   EXCAVATE FOR HANDHOLE TO ACCURATE ALIGNMENT GRADES & DIMENSIONS AS SHOWN ON DRAWING. ALL EXCAVATION MUST BE APPROVED BY THE ENGINEERING DEPT., THE HAWAIIAN ELECTRIC CO., LTD.: BEFORE ANY CONCRETE IS POURED. ALL EXCESS CUT SHALL BE BACKFILLED WITH CONCRETE OR ROCK.
10. BACKFILL:
    REMOVE ALL DEBRIS BEFORE BACKFILLING. BACKFILL IN ACCORDANCE WITH LATEST SPECIFICATIONS OF AND SUBJECT TO APPROVAL OF DIV. OF HWYS., STATE OF HAWAII.
11. FOR DUCT LINE CONSTRUCTION SEE STANDARD DETAIL SHEETS.
12. DUCTS:
    FOR SIZE, LOCATION & NUMBER REQUIRED SEE PLAN & PROFILE SHEETS.
13. ALL MATERIALS SHALL BE NEW AND SHALL BE MANUFACTURED IN THE UNITED STATES OF AMERICA.
14. THIS HANDHOLE IS DESIGNED FOR LIGHT VEHICULAR LOADING - MAXIMUM LOAD 5000 LBS. CONCENTRATED.

REINFORCED CONC. QUANTITIES

QUANTITY OF MATERIALS FOR DEPTH "D" = 5'-0"
CONCRETE = 9.2 CU. YDS.
REINF. STEEL = 2000 LBS.

WEIGHT PER REMOVABLE CONC. SLAB
CONCRETE = 137 LBS.
15C 33.9 = 115 "
REINF. & MISC. STEEL = 10 "
TOTAL 262 LBS.

MATERIALS FOR 6" DEPTH OF 8" THICK WALL
CONCRETE = 0.5 CU. YD.
REINF. STEEL = 53 LBS.

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

REDUCED PLANS
SCALES REDUCED ACCORDINGLY

FOR USE IN AREAS SUBJECT TO PRESENT AND FUTURE VEHICULAR TRAFFIC

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRIC UTILITIES

INTERSTATE HIGHWAY — PROJ. NO. I-HI-1(5):24, Unit 2
SCALE: AS SHOWN — DATE: May, 1965

HANDHOLE TYPE 6IIV (6'-0" x 11'-0")
UNDERGROUND STANDARDS

DESIGNED H.W.H. | DRAWN R.Y. | DATE 8-18-61 | SCALE AS SHOWN
CHECKED

APPROVAL
M. M. Usher
H.K. Stewart

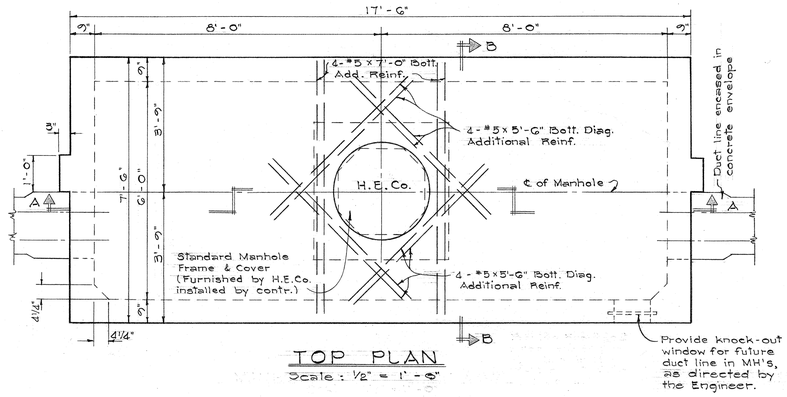
ENGINEERING DEPARTMENT
THE HAWAIIAN ELECTRIC CO., LTD.
HONOLULU, HAWAII

DRAWING NUMBER
18849

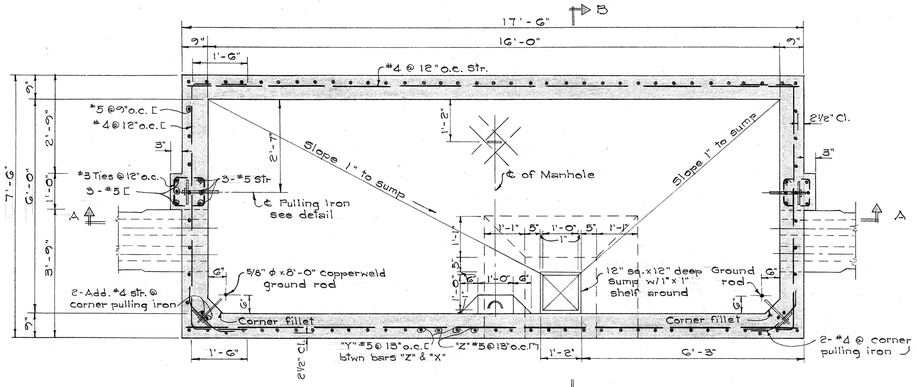
SHEET No. 36 OF 50 SHEETS

PRINTED ON BRUNO CO. VIDEX ELEMENTARY

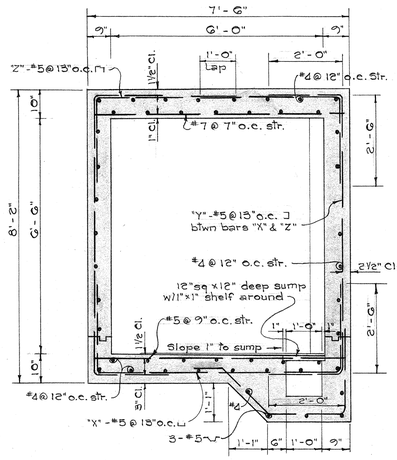
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H1-1(5) 24 Unit 2	1965	93	276



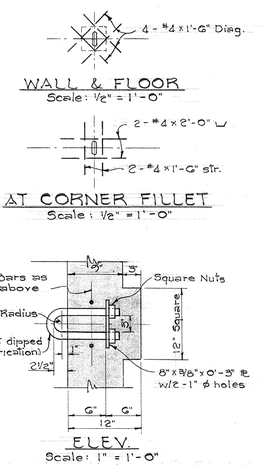
TOP PLAN
Scale : 1/2" = 1'-0"



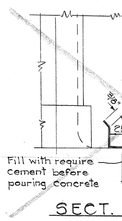
SECTIONAL PLAN "Z"
Scale : 1/2" = 1'-0"



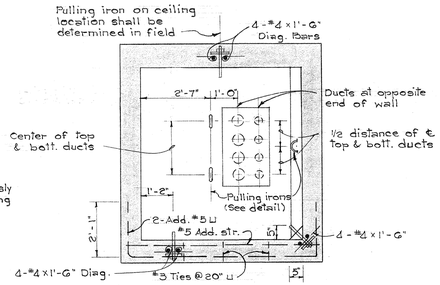
SECTION "B-B"
Scale : 1/2" = 1'-0"



PULLING IRON DETAILS
Scale : As shown



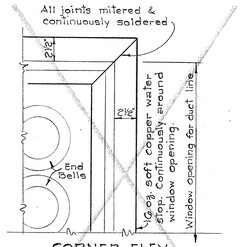
SECT. PLAN



TYPICAL PULLING IRON LOCATIONS
Scale : 3/8" = 1'-0"

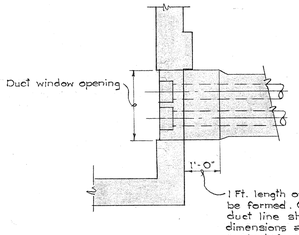
GENERAL NOTES

1. Concrete shall be Class A-1 conforming to the requirements of Section 47 of the Special Provisions.
2. Bar splices: Lap 30 bar diameters staggered.
3. Install all inserts including pulling irons, ground rods, etc. before pouring concrete.
4. H.E.Co. shall furnish all manhole frames and covers.
5. Top of manhole floor to be sloped down 1" toward sump from finish floor elevation shown.
6. Concrete finish: Floors - Smooth metal trowelled. Exposed edges - Smooth and free from defects.
7. The number and location of pulling irons required shall be determined by the Engineer.

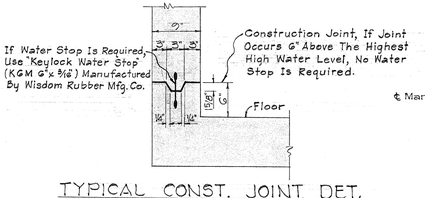


CORNER ELEV.

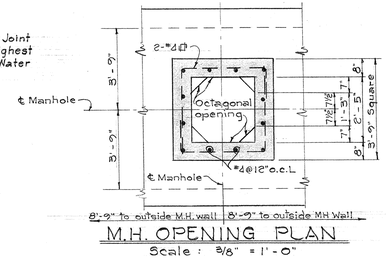
TYPICAL MANHOLE EXPANSION JOINT DET. AT WINDOW OPENING
Scale : 1½" = 1'-0"



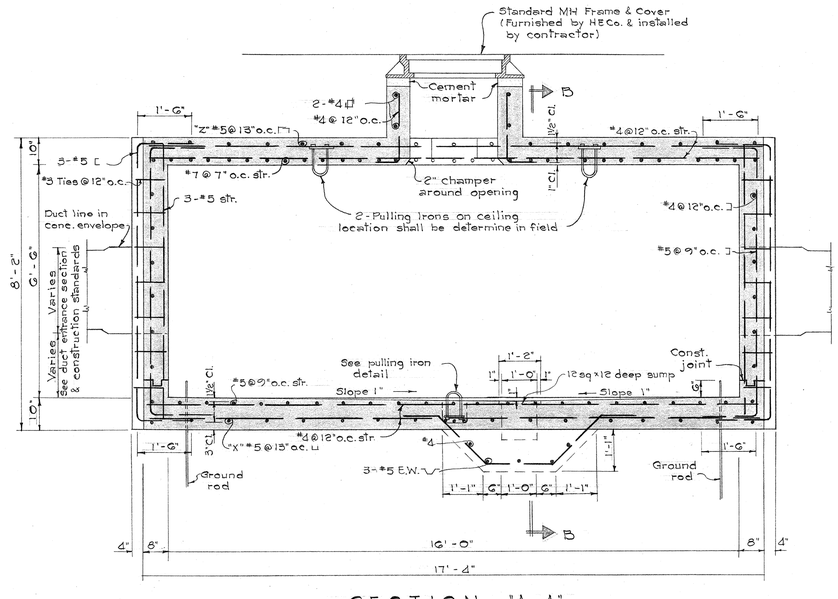
TYPICAL DUCT ENTRANCE DETAIL
Scale : 1/2" = 1'-0"



TYPICAL CONST. JOINT DET.
Scale : 1" = 1'-0"



M.H. OPENING PLAN
Scale : 3/8" = 1'-0"



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

APPROVED:

PRINCPL. ELECTRICAL ENG'R., H.E.Co., Ltd. — DATE 5/14/65

PRINCPL. DISTRIBUTION ENG'R., H.E.Co., Ltd. — DATE 5/17/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TYPE I ELECTRIC MANHOLE

INTERSTATE HIGHWAY
Proj. No. I-H1-1(5):24, Unit 2

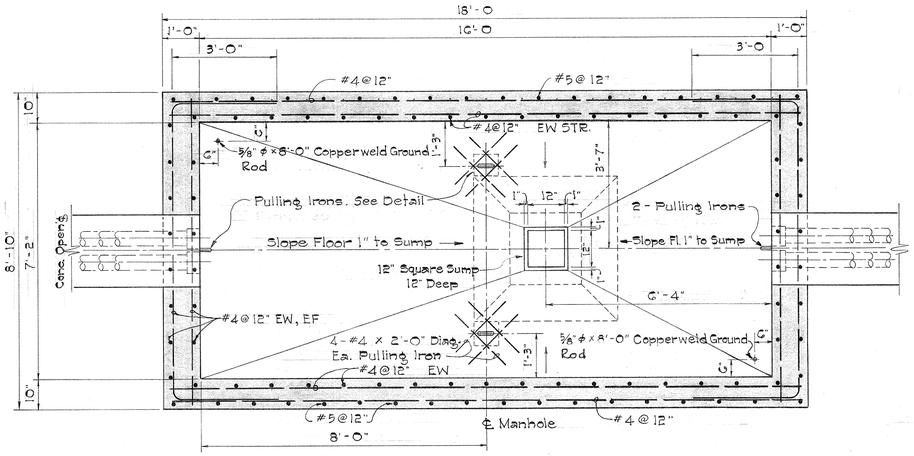
Scale: As Shown — Date: May, 1964

SHEET No. 37 OF 50 SHEETS

ORIGINAL PLANS	NOTE BOOK	DRAWN BY	TRACED BY	DESIGNED BY	QUANTITIES BY	CHECKED BY
	No.					

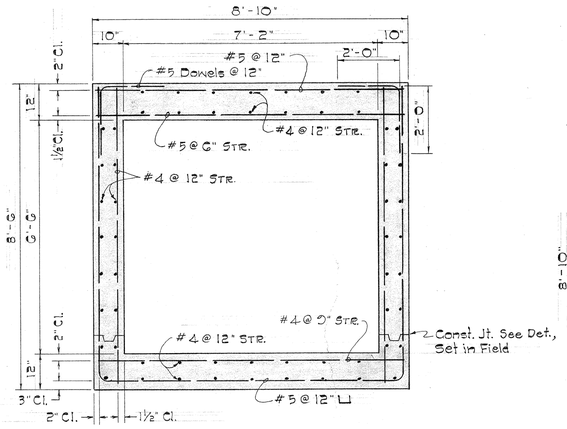
PRINTED ON CLEARPRINT 1000-H

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-(5)-24 Unit 2	1965	24	276



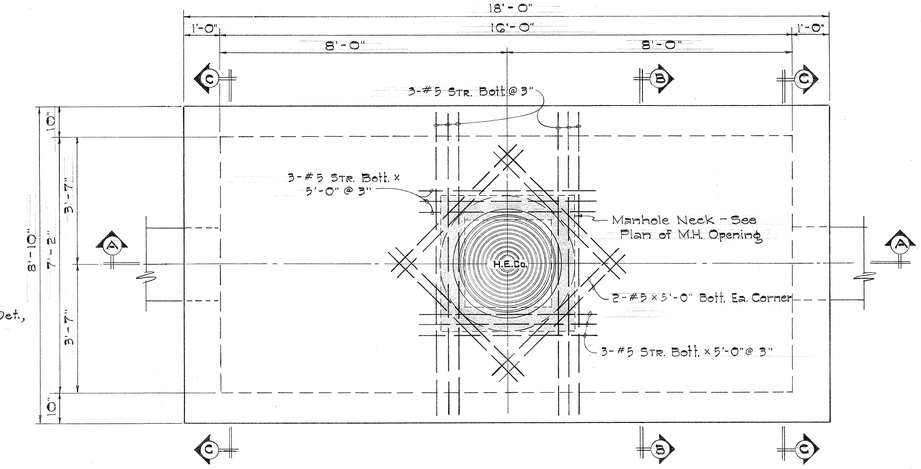
SECTIONAL PLAN

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



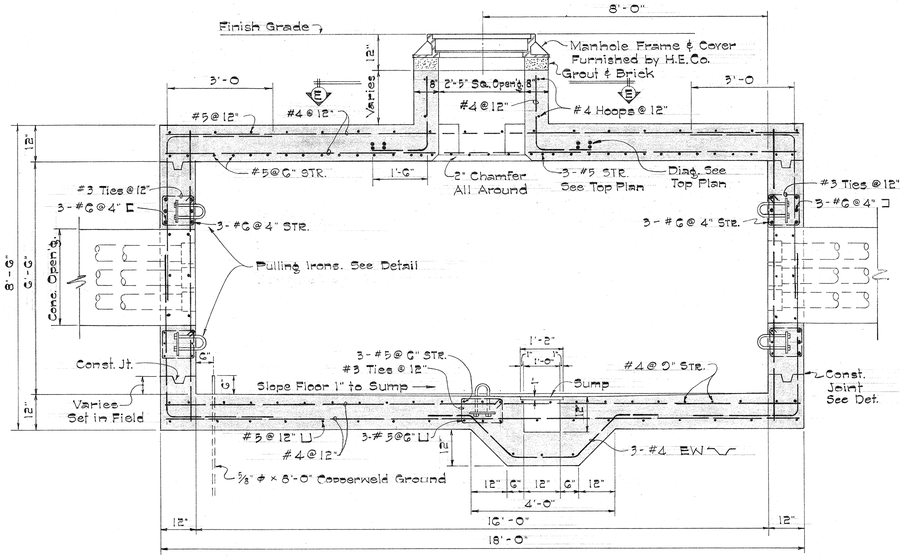
SECTION "B-B"
TYPICAL REINF. SECTION

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



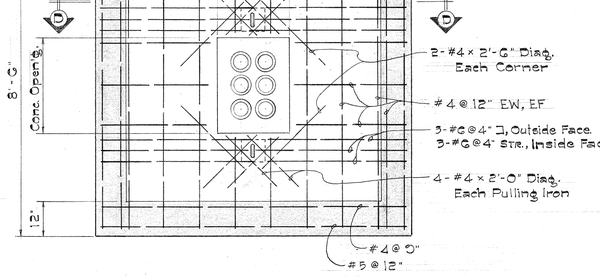
TOP PLAN

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



SECTION "A-A"

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



SECTION "C-C"
END WALL REINFORCING

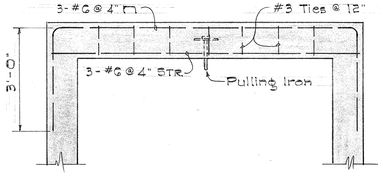
Scale: 1/2" = 1'-0"

SECTION "E-E"
PLAN OF M.H. OPENING

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

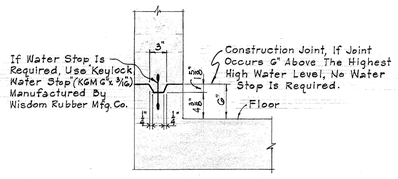
ELEV. - PULLING IRON DETAIL

Scale: 3" = 1'-0"



SECTION "D-D"

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



TYPICAL CONST. JOINT. DET.

Scale: 1" = 1'-0"

GENERAL NOTES

1. Concrete shall be Class A-1 Conforming to the requirements of Section 47 of the Special Provisions.
2. Bar splices: Lap 30 bar diameters staggered.
3. Install all inserts including pulling irons, ground rods, etc. before pouring concrete.
4. H.E.Co. shall furnish all manhole frames and covers.
5. Top of manhole floor to be sloped down 1" toward sump from finish floor elevations shown.
6. Concrete finish: Floors - Smooth metal trowelled. Exposed edges - Smooth and free from defects.
7. The number and location of pulling irons required shall be determined by the Engineer.

APPROVED:

PRINCPL. ELECTRICAL ENG'R., H.E. Co., Ltd. — DATE 5/26/65

PRINCPL. DISTRIBUTION ENG'R., H.E. Co., Ltd. — DATE 5/27/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TYPE II ELECTRIC MANHOLE

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown — Date: May, 1964

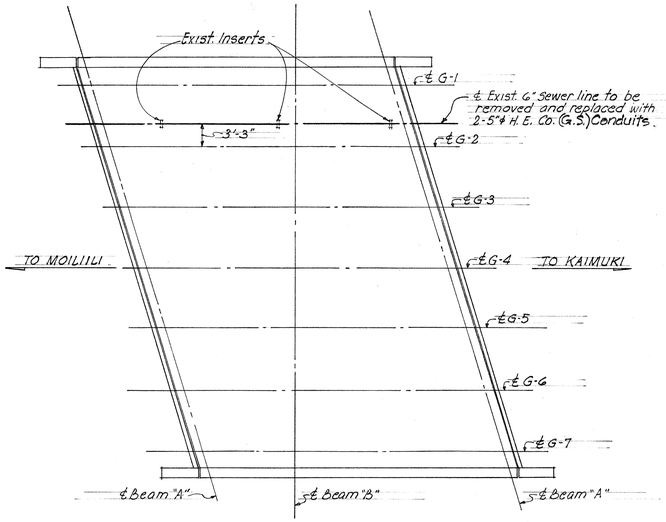
SHEET No. 38 OF 50 SHEETS

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

PRINTED ON CLEARPRINT 1000-H

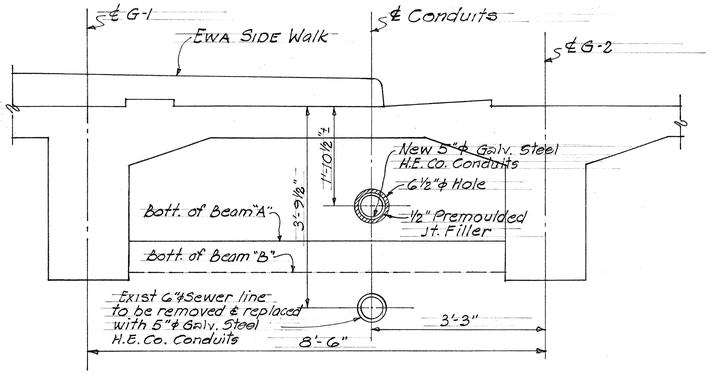
9) 4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	93	276



LOCATION PLAN of H.E. CONDUITS AT EXISTING STRUCTURE

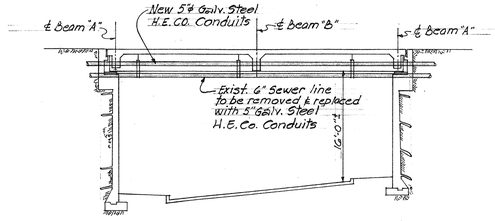
Scale 1"=10'-0"



TYPICAL TRANSVERSE BEAM "A" ELEVATION AT HAWAIIAN ELECTRIC CONDUITS

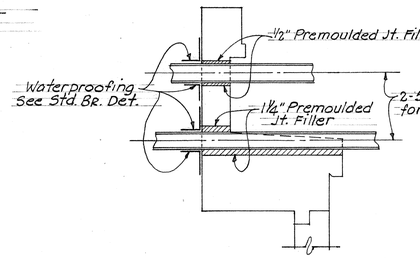
Transverse Beam "B" Similiar Except As Otherwise Noted

Scale ¾"=1'-0"



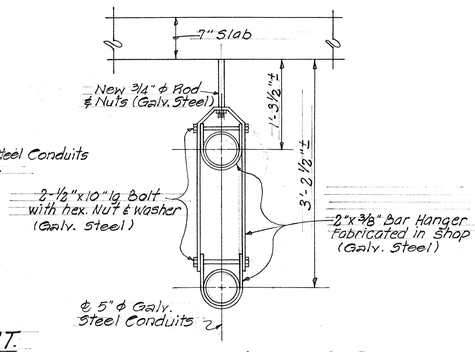
LONGITUDINAL SECTION of H.E. Co. CONDUITS @ EXIST. STRUCTURE

Scale 1"=10'-0"



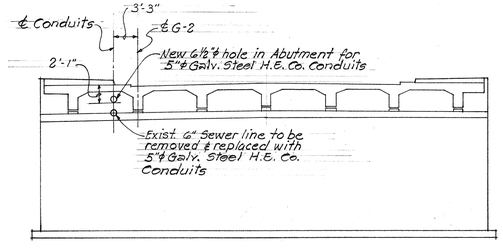
TYPICAL SECTION THRU ABUT. WALL AT H. E. Co. CONDUITS

Scale ½"=1'-0"



TYPICAL HANGER DETAIL for HAW. ELEC. Co. CONDUITS

Scale 1"=1'-0"

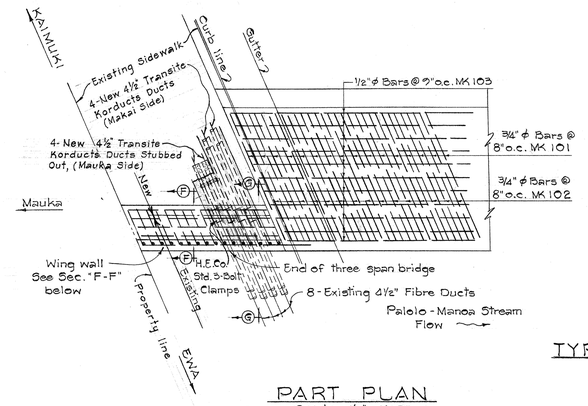


LOCATION ELEVATION of H.E. Co. CONDUITS @ EXISTING STRUCTURE

Scale 1"=10'-0"

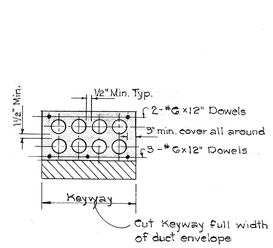
GENERAL NOTES:

1. Existing Hanger Rods shall be replaced with new ¾" ϕ Galv. Steel Rods.
2. All materials for hangers shall be Galvanized Steel.
3. Paint exposed threads at couplings with a cold Galvanizing compound. See Special provisions.



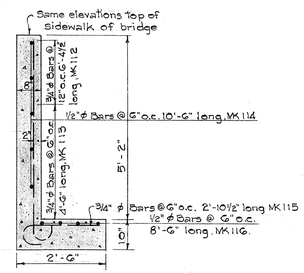
PART PLAN

Scale : ¼" = 1'-0"



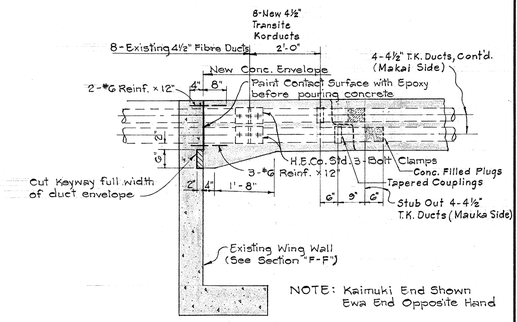
TYPICAL DUCT SECTION

Scale: ½" = 1'-0"



SECTION "F-F"

Scale: ½" = 1'-0"



SECTION "G-G"

Scale: ½" = 1'-0"

DUCT CONNECTION DETAILS AT ENDS OF MANOA-PALOLO STREAM BRIDGE

Scale: As Shown

NOTE:
All materials, labor, equipment and incidentals necessary to complete the special connections shall be considered incidental to duct line construction.

APPROVED:

PRINCPL. ELECTRICAL ENGR., H.E. Co., Ltd. — DATE 5/20/65

PRINCPL. DISTRIBUTION ENGR., H.E.Co., Ltd. — DATE 5/17/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES ELECTRIC

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Scale: As Shown — Date: May, 1964

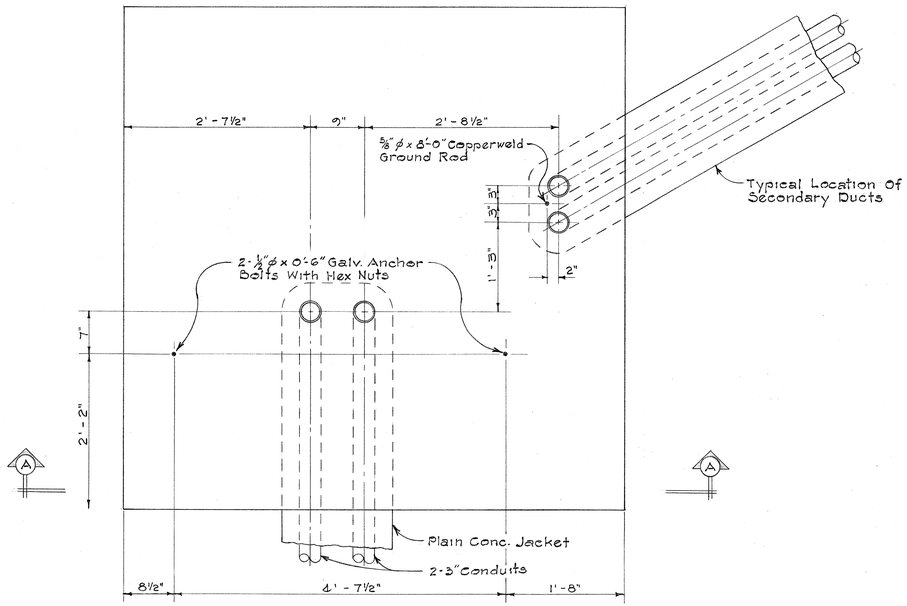
SHEET No. 39 OF 50 SHEETS

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

93
95

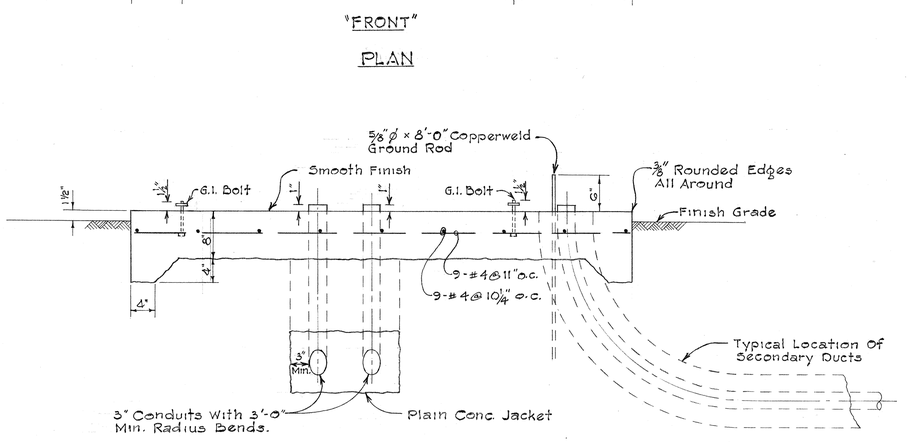
D ON CLEARPRINT 1000-H

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	39	272



"FRONT"

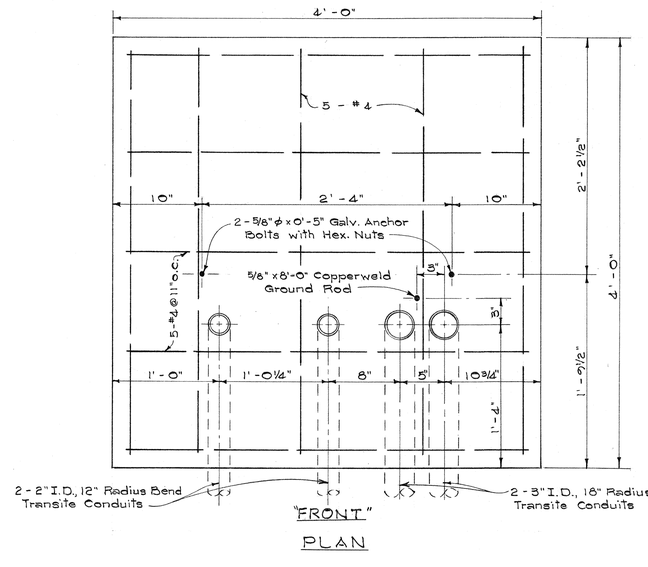
PLAN



SECTION A-A

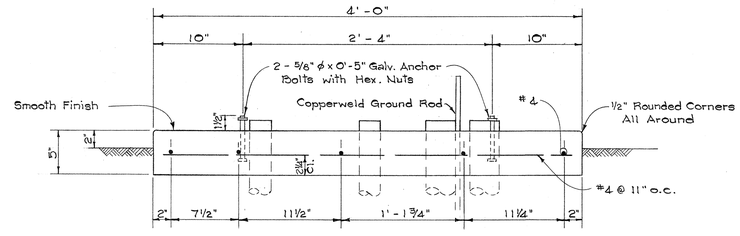
7' x 7' TRANSFORMER PAD

Scale: 1" = 1'-0"



"FRONT"

PLAN



FRONT ELEVATION

4' x 4' TRANSFORMER PAD

Scale: 1½" = 1'-0"

GENERAL NOTES

1. Concrete shall be Class A-1 conforming to the requirements of Section 47 of the Special Provisions.
2. Reinforcing shall be round deformed bars, new billet stock intermediate grade ASTM A15.
3. Bends due to change of grade shall have a minimum radius of 20'-0".
4. The side of the pad marked "front" shall always be located to face the vehicular access.
5. Ducts will be furnished by H.E.Co., and installed by the Contractor.
6. Any excavation shall be considered incidental to and paid for under the pad mount construction.

APPROVED:

PRINCPL. ELECTRICAL ENG'R., H.E.Co., Ltd. — DATE 5/18/65

PRINCPL. DISTRIBUTION ENG'R, H.E.Co., Ltd. — DATE 5/17/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HAWAIIAN ELECTRIC COMPANY

TRANSFORMER PAD DETAILS

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, UNIT 2

Scale: As Shown Date: May, 1964.

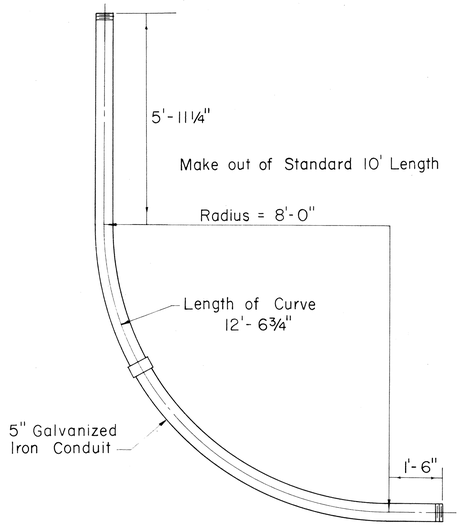
SHEET No. 40 OF 50 SHEETS

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

PRINTED ON NO. 1000H CLEARPRINT

39 G

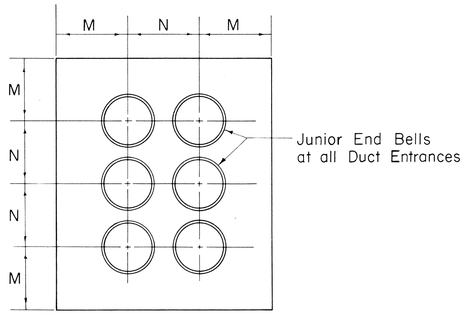
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	97	276



46 KV RISER CONDUIT BEND

(8'-0" RADIUS)

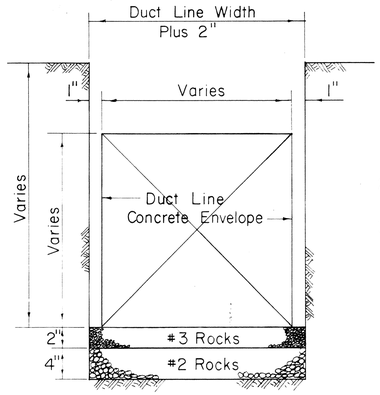
Not to Scale



TYPICAL DUCT DETAIL AT MANHOLE WALL

Not to Scale

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

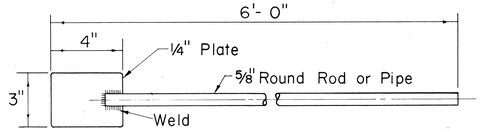


TYPICAL EXCAVATION DETAIL

Not to Scale

NOTES

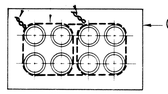
1. Size of Concrete Envelope and Depth of Excavation to be determined by Project concerned.
2. Widen Trench Excavation when Forms are used.
3. Rock Foundation required only when Water is encountered.



CONCRETE DUCT ENVELOPE TAMPING ROD

Scale: 3" = 1'-0"

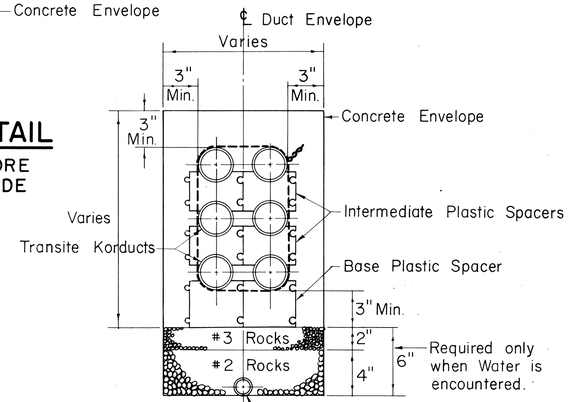
#14 Tie Wire twisted and tied securely at each set of Plastic Spacers.



TIE WIRE DETAIL

FOR DUCT LINE MORE THAN 4 DUCTS WIDE

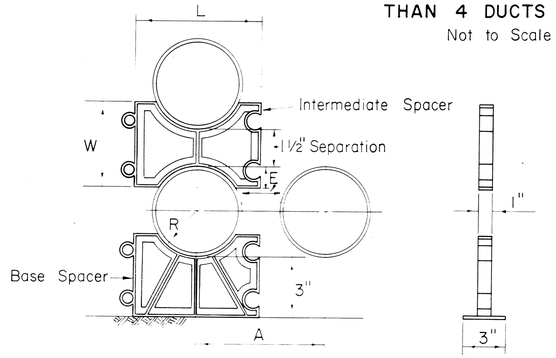
Not to Scale



TYPICAL DUCT PLASTIC SPACERS & DRAINAGE SECTION

(6 WAY DUCT SHOWN - 3 HIGH - 2 WIDE)

Not to Scale

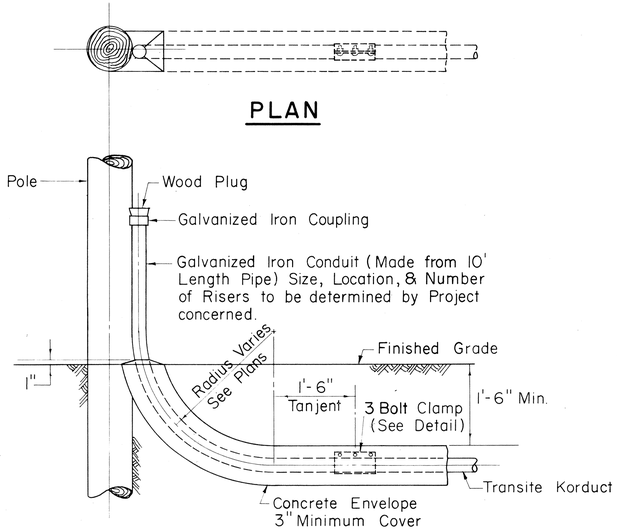


TYPICAL PLASTIC SPACERS

Not to Scale

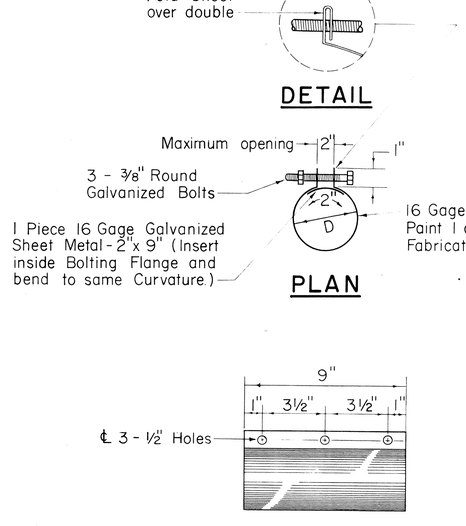
SIZE	R	E	W	A	L
3"	1 27/32"	⅞"	3¼"	5⅛"	5"
4"	2 13/32"	1⅛"	3¾"	6¼"	6⅛"
4½"	2 23/32"	1¼"	4"	6⅞"	6¾"
5"	3 1/16"	1⅜"	4¼"	7⅝"	7½"

For 1½" Separation



TYPICAL POLE RISER DETAIL

Scale: ¾" = 1'-0"



3 BOLT CLAMP DETAIL

Scale: 3" = 1'-0"

APPROVED:

HAWAIIAN ELECTRIC CO., LTD. — DATE 5/11/65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

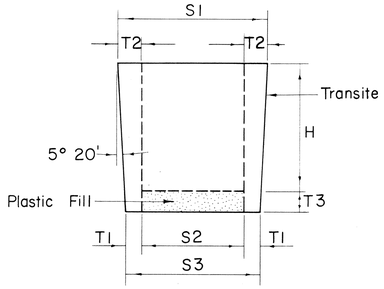
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2
Scales: As Noted — Date May, 1965

SHEET NO. 41 OF 50 SHEETS

97

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

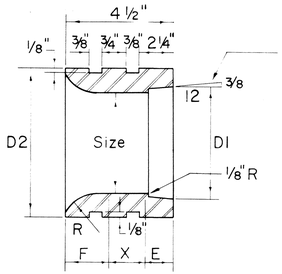
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	98	276



PLUGS FOR TRANSITE KORDUCTS

Not to Scale

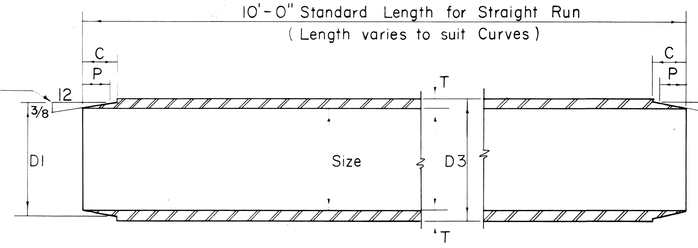
SIZE	H	S1	S2	S3	T1	T2	T3
3"	4"	3 3/8"	2"	2 5/8"	5/16"	11/16"	3/4"
4"	4 1/2"	4 27/64"	2 3/4"	3 37/64"	13/32"	27/32"	3/4"
4 1/2"	4 1/2"	4 59/64"	3"	4 5/64"	35/64"	31/32"	3/4"
5"	4 1/2"	5 27/64"	3 1/2"	4 37/64"	35/64"	31/32"	3/4"



JUNIOR END BELLS

Not to Scale

SIZE	D1	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"



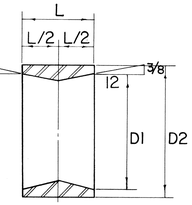
TRANSITE KORDUCTS

Not to Scale

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.

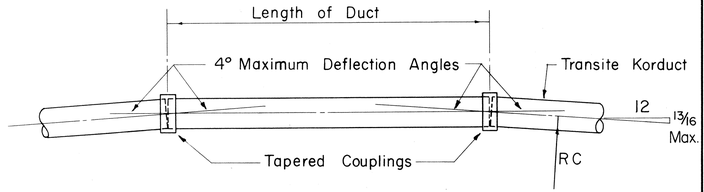
SIZE	D1	D3	C	P	T
3"	3 25/64"	3 35/64"	1 1/8"	7/8"	17/64"
4"	4 25/64"	4 35/64"	1 1/4"	1"	17/64"
4 1/2"	4 57/64"	5 3/64"	1 1/4"	1"	17/64"
5"	5 29/64"	5 39/64"	1 25/64"	1 1/8"	19/64"



SIZE	D1	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"

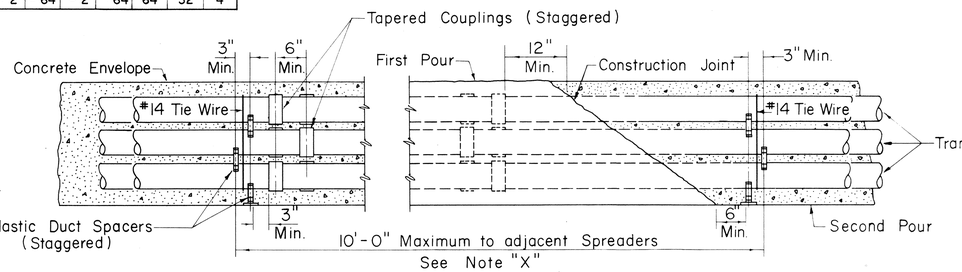
TAPERED COUPLINGS

Not to Scale



METHOD OF FORMING CURVES

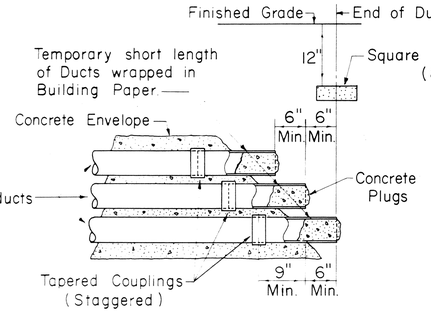
Not to Scale



TYPICAL DUCT ENVELOPE ELEVATION

(6 WAY DUCT LINE SHOWN)

Not to Scale

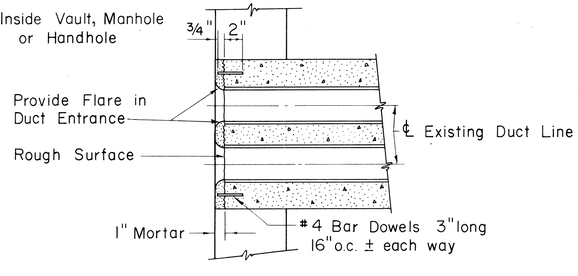


TYPICAL STUB OUT DETAIL

Not to Scale

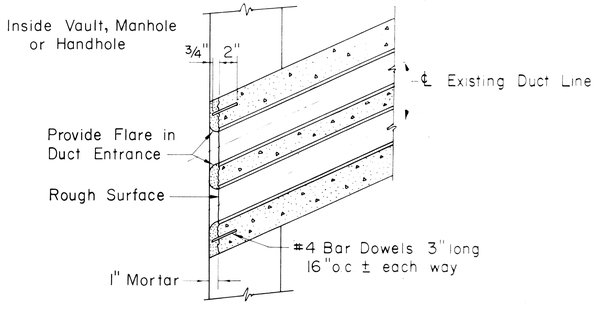
MINIMUM RADIUS TO FORM CURVES

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:

J. W. Robinson Jr. 5/11/65

HAWAIIAN ELECTRIC CO. LTD. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCT LINES

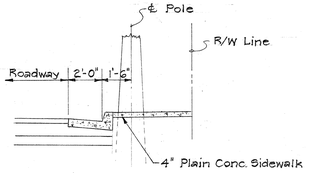
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2
Scales: As Noted Date: May, 1965

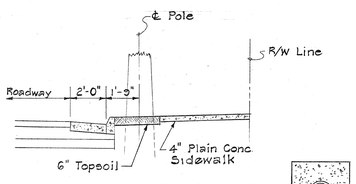
SHEET NO. 42 OF 50 SHEETS

LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24 Unit 2	1965	99A	276

Revised: July 16, 1965

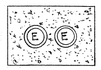




TYPICAL DETAIL OF POLE OFFSETS
Scale: 1/4" = 1'-0"



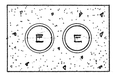
E / 1D — 1-3" T.K. Conduit



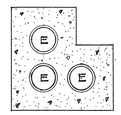
E / 2D — 2-3" T.K. Conduit



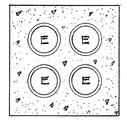
E / 1F — 1-4" T.K. Conduit



E / 2F — 2-4" Transite Korduct



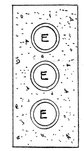
E / 3F — 3-4" Transite Korduct



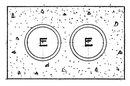
E / 4G — 4-4½" Transite Korduct



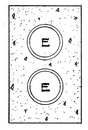
E / 1H — 1-5" Transite Korduct



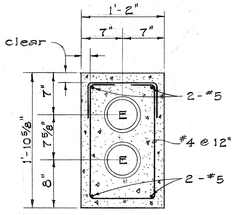
E / 3F(V) — 3-4" T.K. Conduits



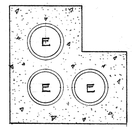
E / 2H — 2-5" Transite Korduct



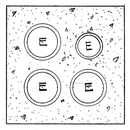
E / 2H(V) or E / 2H G.S. — 2-5" Transite Korduct or G.S. Conduit



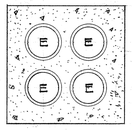
E / 2HR(V) — 2-5" Galvanized Steel Conduit Reinforced Concrete Jacket



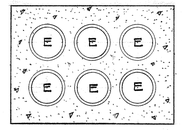
E / 3H — 3-5" Transite Korduct



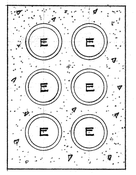
E / 3H-1F — 3-5" Transite Korduct 1-4" Transite Korduct



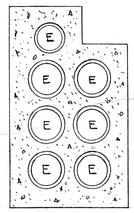
E / 4H — 4-5" Transite Korduct



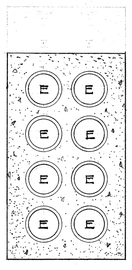
E / 6H — 6-5" Transite Korduct



E / 6H(V) — 6-5" Transite Korduct



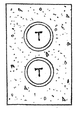
E / 6H-1F(V) — 6-5" T.K. Conduits 1-4" T.K. Conduit



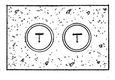
E / 8H(V) — 8-5" Transite Korduct



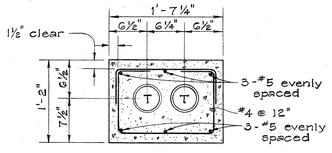
T / 1F — 1-4" Plastic Duct



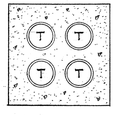
T / 2F(V) — 2-4" Plastic Ducts



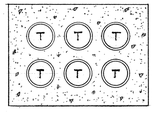
T / 2F — 2-4" Plastic Ducts



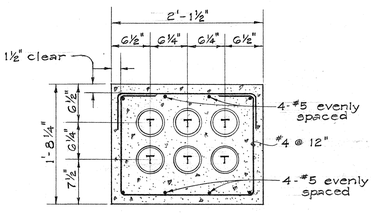
T / 2FR — 2-4" Plastic Ducts Reinforced Conc. Jacket



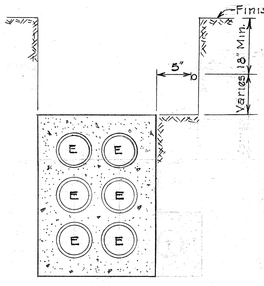
T / 4F — 4-4" Plastic Ducts



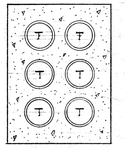
T / 6F or T / 6F E.S. — 6-4" Plastic Ducts or E.S. Conduit



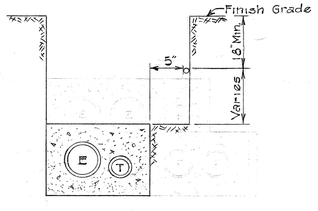
T / 6FR — 6-4" Plastic Ducts Reinforced Conc. Jacket



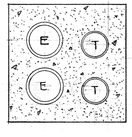
E-T / 6H-1B(V) — 6-5" Transite Korduct 1-1" G.I. Pipe, Direct Burial



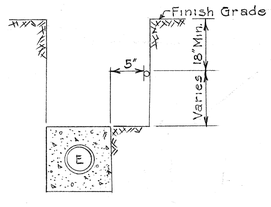
T / 6F (V) — 6-4" Plastic Ducts



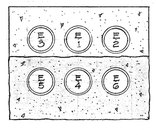
E-T / 1H-1D-1A — 1-5" Transite Korduct 1-3" Plastic Duct 1-¾" G.I.P., Direct Burial



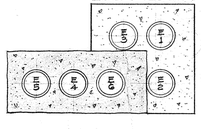
E-T / 2H-2F — 2-5" Transite Korduct 2-4" Plastic Ducts



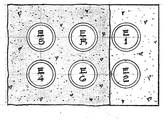
E-T / 1D-1A or E-T / 1D-1B — 1-3" Transite Korduct 1-¾" or 1-1" G.I.P., Direct Burial



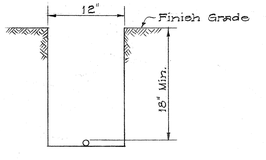
E / 3F — 3-4" Transite Korduct



E / 3F — 3-4" Transite Korduct



E / 2F(V) — 2-4" Transite Korduct



T / 1B G.I. — 1-1" G.I. Pipe, Direct Burial

NOTE:
1. Duct No. 4, 5, 6, & Duct "R" contain cables energized at 4 K.V.
2. The three sections above for work along Kapiolani Blvd. near Kaimuki Ave. only.
3. Shaded portions are existing duct sections.

LEGEND FOR CONDUIT

Conduit Size	Symbol
¾"	A
1"	B
2"	C
3"	D
3½"	E
4"	F
4½"	G
5"	H

APPROVED:

PRINCPL. ELECTRICAL ENG'R., HE. Co., Ltd.	5/11/65 DATE
PRINCPL. DISTRIBUTION ENG'R., H.E. Co., Ltd.	5/11/65 DATE
OUTSIDE PLANT ENGINEER, H.T. Co., Ltd.	5-12-65 DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
ELECTRIC & TELEPHONE DUCTS

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown Date: May, 1964

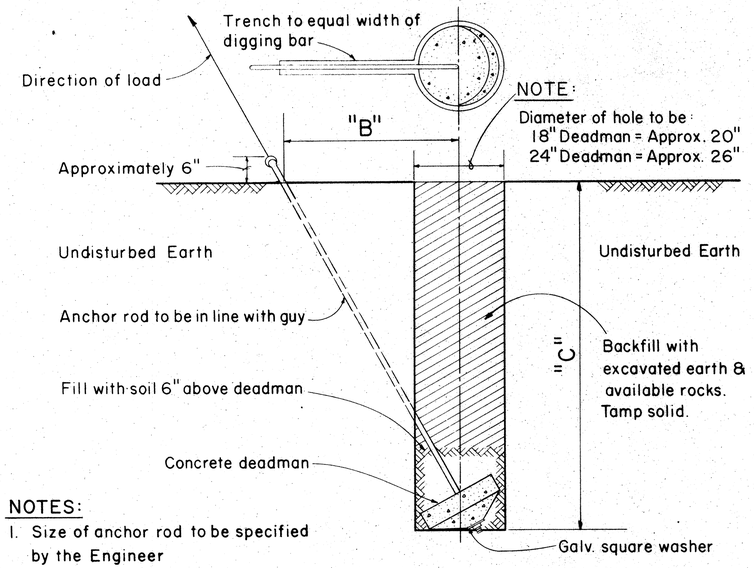
SHEET No. 43 OF 50 SHEETS

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

PRINTED ON CLEARPRINT 1000-H

99A

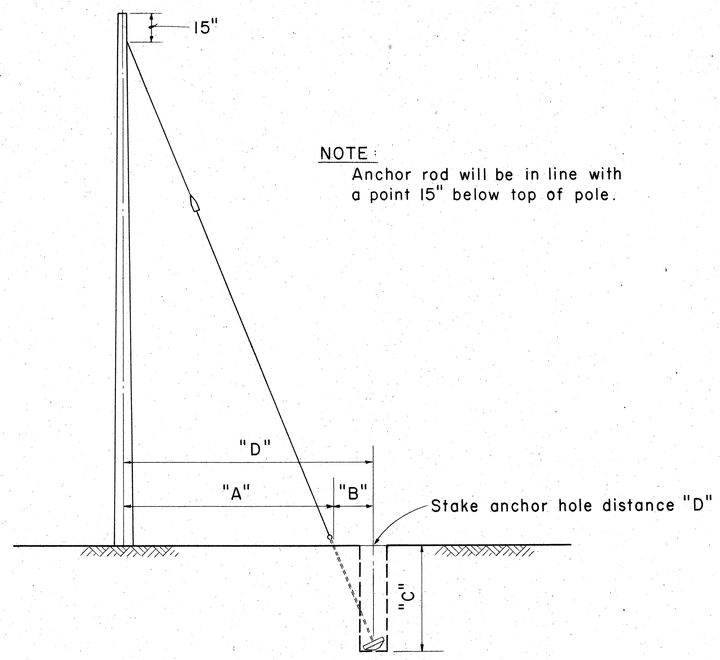
FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	100	276



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

GUY ANCHOR DEADMAN

Scale: 3/4" = 1' – 0"



Not to Scale

FOR 25', & 30' POLES WITH 8'-0" ANCHOR RODS				
"A"	"B"	"C"		"D" = ("A" + "B")
LEAD-ANCHOR ROD TO ℄ OF POLE	ANCHOR ROD TO ℄ OF HOLE	VERTICAL DEPTH 18" D.M.	VERTICAL DEPTH 24" D.M.	TOTAL DISTANCE POLE TO HOLE
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 35' THRU 70' POLES WITH 8'-0" ANCHOR RODS				
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 40' THRU 70' 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"

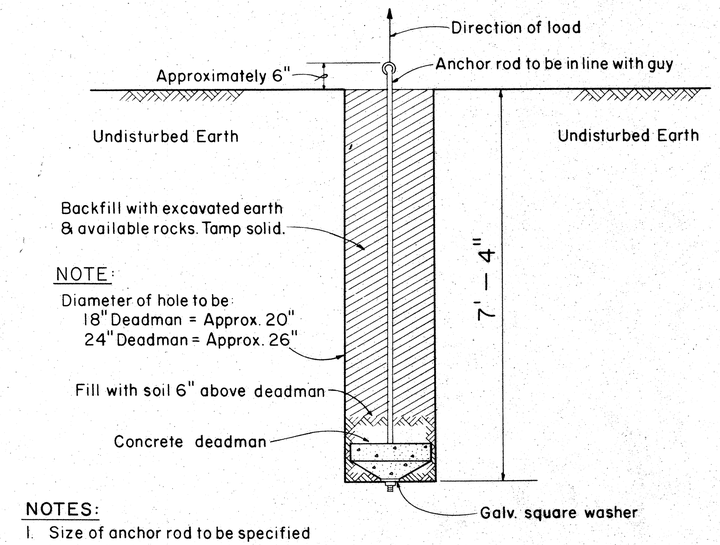
D.M. = Deadman

TABLE 2 ANCHOR ROD - ANCHOR SLUG - SQUARE WASHER COMBINATION

H.E. CODE NO.	ANCHOR ROD	WORKING TENSION 1/2 ULT (LBS.)	H.E. CODE NO.	CONC. ANC. (IN.)	H.E. CODE NO.	WASHER SIZE	QTY.
617	5/8" x 8'-0" Steel	8,000	518	18	2320	4" x 4" x 3/16"	2
615	5/8" x 8'-0" Cu Cov Stl	9,250	518	18	☆☆	3" x 3" x 1/8"	2
618	3/4" x 8'-0" Steel	11,500	518	18	2330	6" x 6" x 3/8"	1
619	1" x 8'-0" Steel	18,000	524	24	2331	6" x 6" x 1/2"	1
616	1" x 8'-0" Cu Cov Stl	22,500	524	24	☆☆	4" x 4" x 3/16"	2
613	1 1/4" x 10'-0" Steel	29,000	524	24	2330	6" x 6" x 3/8"	2

☆☆ Use bronze square washers included in anchor rod assembly on copper covered steel (Cu Cov Stl) anchor rods.

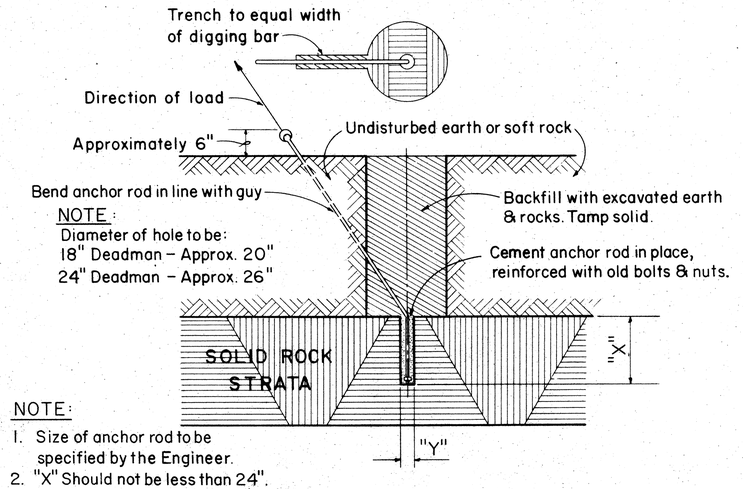
ANCHORING DATA



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

SIDE – WALK ANCHOR

Scale: 3/4" = 1' – 0"



NOTE:
1. Size of anchor rod to be specified by the Engineer.
2. "X" Should not be less than 24". If "X" is less than 24" complete hole & install anchor.
3. "Y" 5/8" Anchor rod drill 2" hole
   3/4" Anchor rod drill 2" hole
   1" Anchor rod drill 2 1/2" hole
   1 1/4" Anchor rod drill 3" hole
4. Use Anchoring Data.

ROCK ANCHOR

Not to Scale

APPROVED:

OUTSIDE PLANT ENGR. H.T.CO., LTD. — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

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

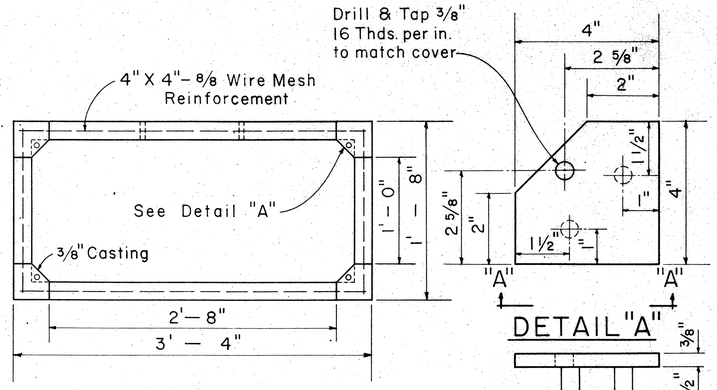
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

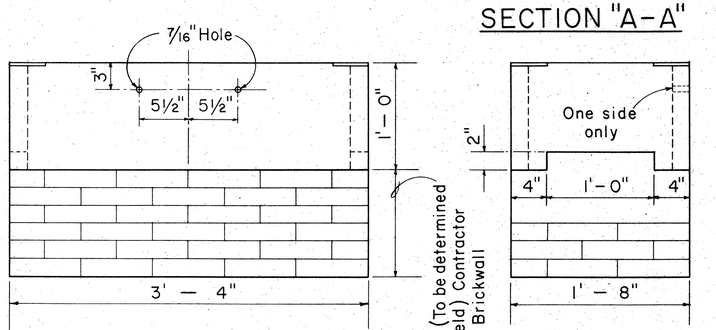
Scales: As Noted — Date May, 1965

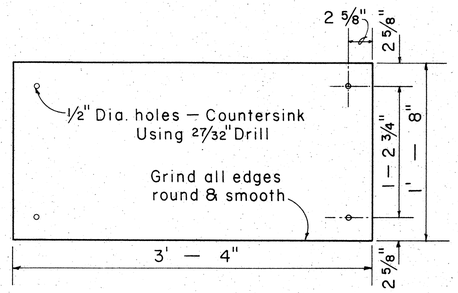
SHEET No. 44 OF 50 SHEETS

100

FED. AID DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAWAII	I-HI-1(5):24, Unit 2	1965	101	276







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

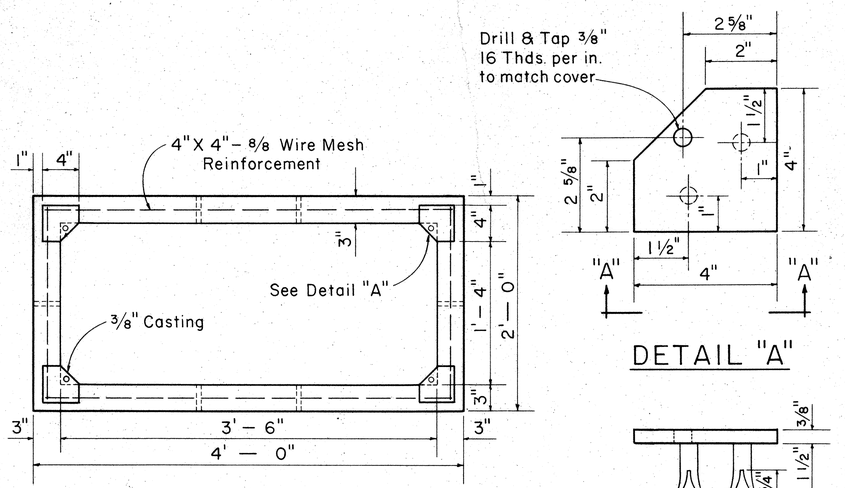
1/4" CHECKER PLATE COVER

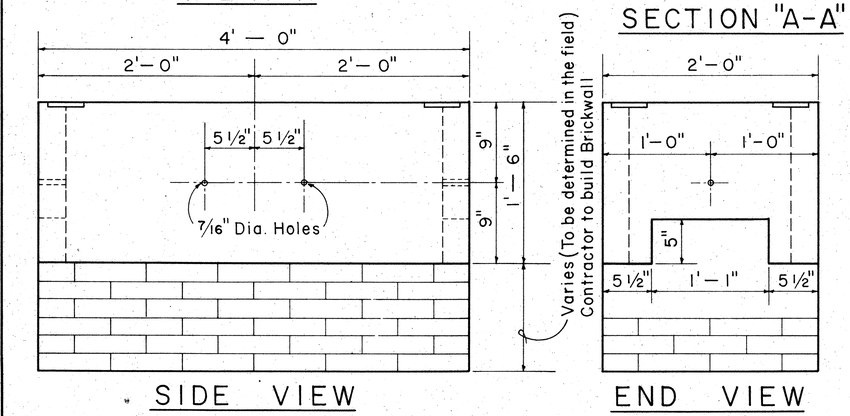
(Hot dip galvanize checkered plate after drilling, countersinking, and grinding edge)

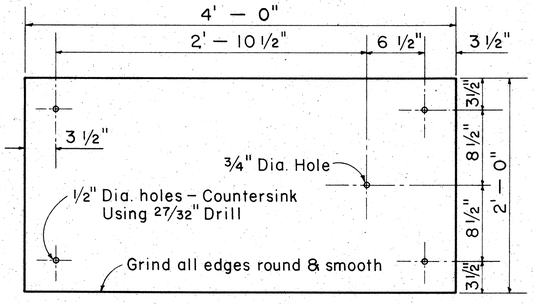
1'-4" X 3'-0" CONCRETE SERVICE BOX

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

CREOSOTED DOUGLAS FIR & YELLOW PINE POLE DATA

LENGTH IN FEET	CLASS	APPROX. MINIMUM DIMENSIONS (INCHES) AT TOP DIA.	AT TOP CIR.	6' FROM BUTT DIA.	6' FROM BUTT CIR.	AVERAGE WEIGHT (LBS.)	POLE SETTING DEPTH (FT.) IN SOIL	IN ROCK	BREAKING LOAD 2'-0" BELOW TOP OF POLE (LBS.)
25	5	6.04	19	8.26	26	525	4.5	3	1900
30	3	7.32	23	10.32	32.5	810	5	3.5	3000
	5	6.04	19	8.90	28	600	5	3.5	1900
35	2	7.96	25	12.23	37.5	1260	5	3.5	3700
	5	6.04	19	9.55	30	770	5	3.5	1900
40	3	7.32	23	11.77	37	1320	5.5	3.5	3000
45	2	7.96	25	13.20	41.5	1845	6	4.	3700
	3	7.32	23	12.25	38.5	1575	6	4	3000
50	2	7.96	25	13.70	43.	2150	6.5	4	3700
	3	7.32	23	12.70	40	1850	6.5	4	3000
55	1	8.59	27	15.11	47.5	2860	7	4.5	4500
	2	7.96	25	14.15	44.5	2475	7	4.5	3700
	3	7.32	23	13.20	41.5	2145	7	4.5	3000
60	1	8.59	27	15.75	49.5	3360	7	4.5	4500
	2	7.96	25	14.62	46	2820	7	4.5	3700
65	1	8.59	27	16.20	51	3835	7.5	5	4500
	2	7.96	25	15.11	47.5	3250	7.5	5	3700
70	1	8.59	27	16.70	52.5	4340	7.5	5	4500
	2	7.96	25	15.60	49	3640	7.5	5	3700
75	1	8.59	27	17.20	54	4800	8	5.5	4500
	2	7.96	25	16.05	50.5	4050	8	5.5	3700
80	1	8.59	27	17.50	55	5240	8	6	4500
	2	7.96	25	16.40	51.5	4400	8	6	3700
85	1	8.59	27	18.00	56.5	5780	8.5	6.5	4500
	2	7.96	25	16.88	53	4930	8.5	6.5	3700
90	1	8.59	27	18.30	57.5	6300	8.5	6.5	4500
	2	7.96	25	17.20	54	5400	8.5	6.5	3700

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
H. E. Co. Specification for Poles.

WOOD POLE DATA

APPROVED:

OUTSIDE PLANT ENGR. H.T. CO., LTD. — DATE 5-2-65

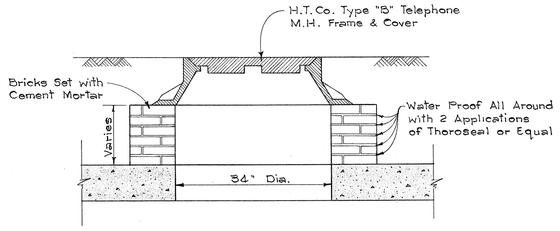
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
H.E. Co. AND H.T. Co.
SERVICE BOX DETAILS AND WOOD POLE DATA
INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2
Scales: As Noted — Date May, 1965.

SHEET NO. 45 OF 50 SHEETS

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

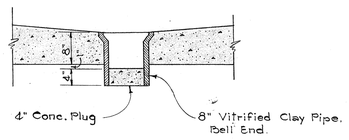
LIETZ 1103 ARKWRIGHT TRACING CLOTH 10-60 200P

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI(5)24, Unit 2	1965	102	276



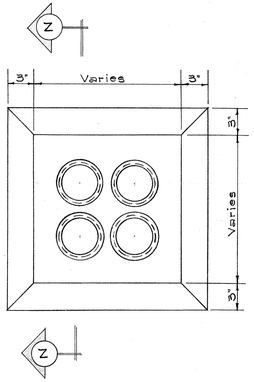
SECTION "X-X"
Scale: 3/4" = 1'-0"

TELEPHONE M.H. COVER DETAIL

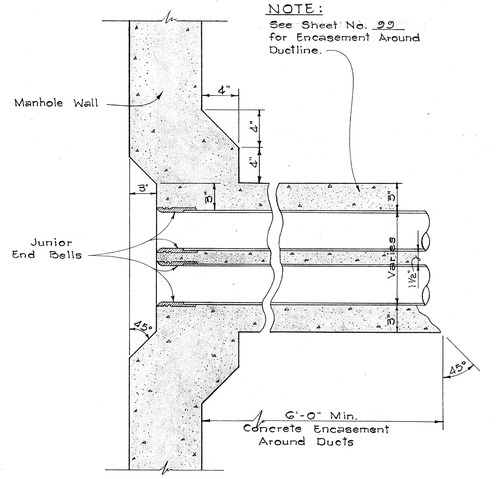


SECTION "Y-Y"
Scale: 3/4" = 1'-0"

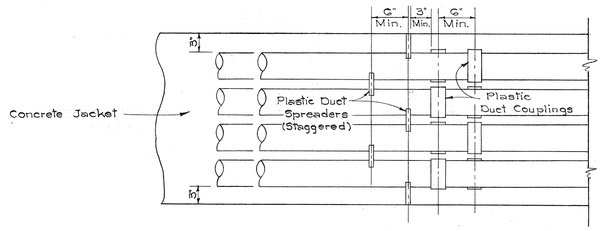
STANDARD SUMP DETAIL



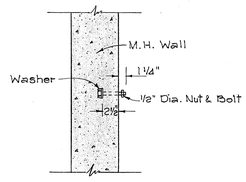
TYPICAL MANHOLE DUCT WINDOW
Scale: 1½" = 1'-0"



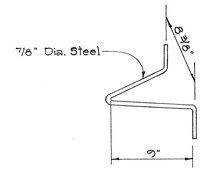
SECTION "Z-Z"
TYPICAL STUBOUT DETAIL & JUNIOR END BELL
Scale: 1½" = 1'-0"



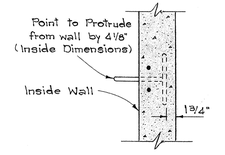
TYPICAL DUCT ENVELOPE ELEVATION
ARRANGEMENT OF COUPLING & PLASTIC SPACERS
Scale: 1" = 1'-0"



CABLE RACK STUD BOLT DETAIL
Scale: 3/4" = 1'-0"

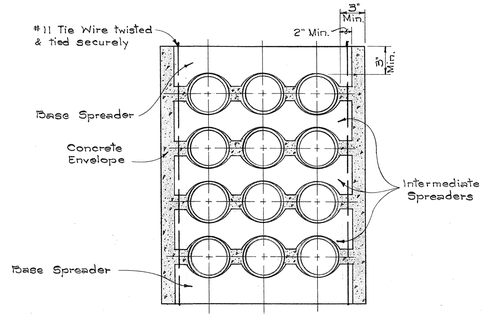


DETAIL PULLING-IN-IRON



ELEV. DETAIL OF PULLING-IN-IRON

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



SECTION SHOWING SPACERS

APPROVED:

OUTSIDE PLANT ENGINEER, H.T.Co., Ltd. — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TELEPHONE

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Noted — Date: May. 1964

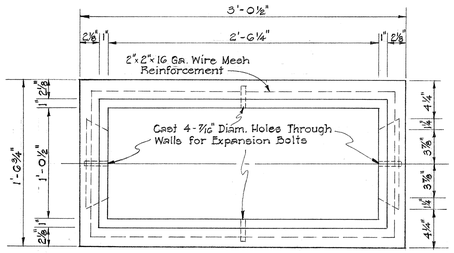
SHEET No. 46 OF 50 SHEETS

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

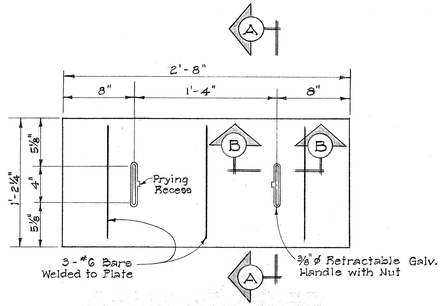
PRINTED ON NO. 1000H CLEARPRINT

102

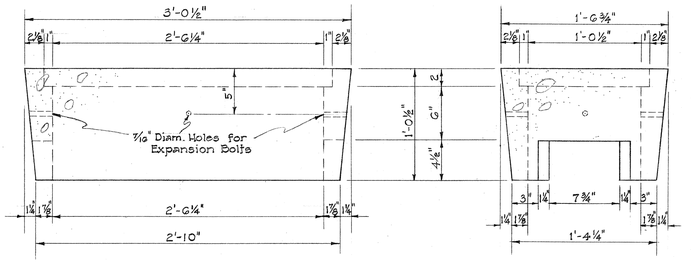
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	103	275



PLAN
Scale: 1½" = 1'-0"

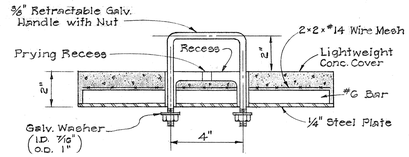


PLAN OF COVER
Scale: 1½" = 1'-0"

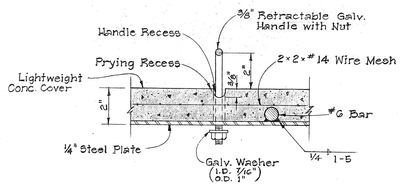


SIDE ELEVATION
Scale: 1½" = 1'-0"

END ELEVATION
Scale: 1½" = 1'-0"



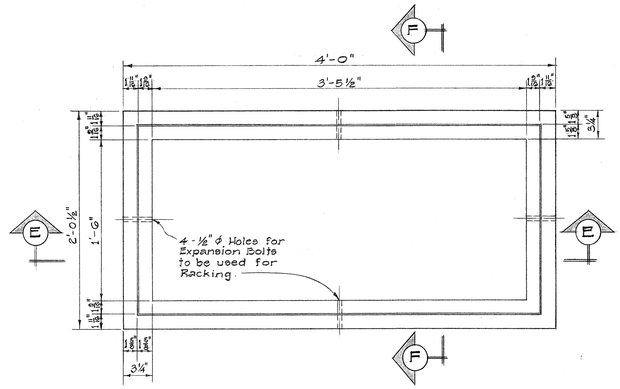
SECTION "A-A"
Scale: 3" = 1'-0"



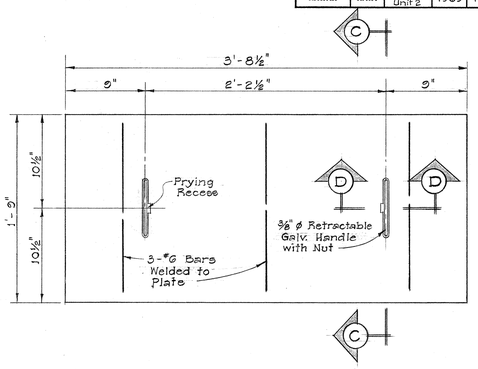
SECTION "B-B"
Scale: 3" = 1'-0"

DETAIL OF TELEPHONE PULL BOX TYPE 434T

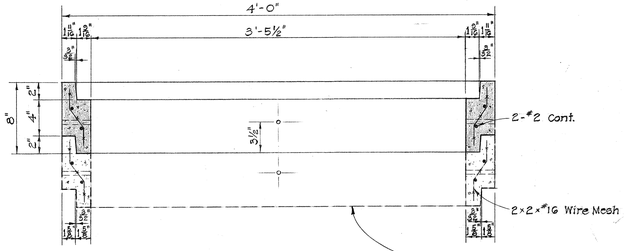
Scale: As Shown



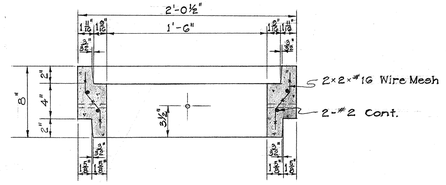
PLAN



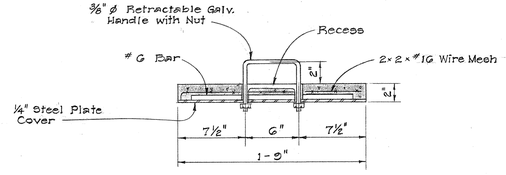
PLAN OF COVER



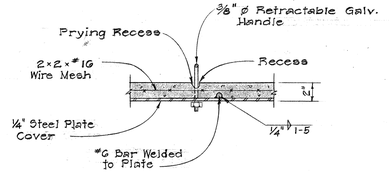
SECTION "E-E"
Additional Sections Added as Required



SECTION "F-F"



SECTION "C-C"



SECTION "D-D"

DETAIL OF TELEPHONE PULL BOX TYPE 435T-A

Scale: 1½" = 1'-0"

APPROVED:

OUTSIDE PLANT ENGINEER, H.T.Co., Ltd. — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TELEPHONE PULLBOXES 434T & 435T-A

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24, Unit 2

Scale: As Shown — Date: May, 1964

SHEET No. 47 OF 50 SHEETS

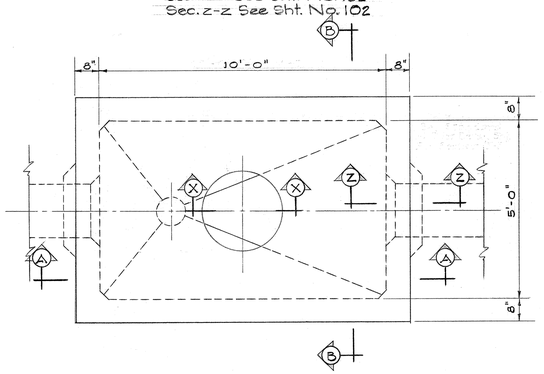
ORIGINAL PLAN	
	SURVEY PLOTTED BY ____ DATE
	DRAWN BY " "
	TRACED BY " "
NOTE BOOK	DESIGNED BY " "
	QUANTITIES BY " "
No.	CHECKED BY " "

PRINTED ON NO. 1000H CLEARPRINT

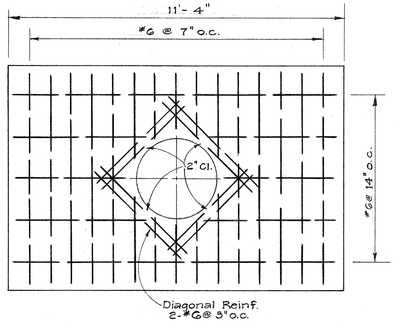
1033

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(5)24, Unit 2	1965	104	276

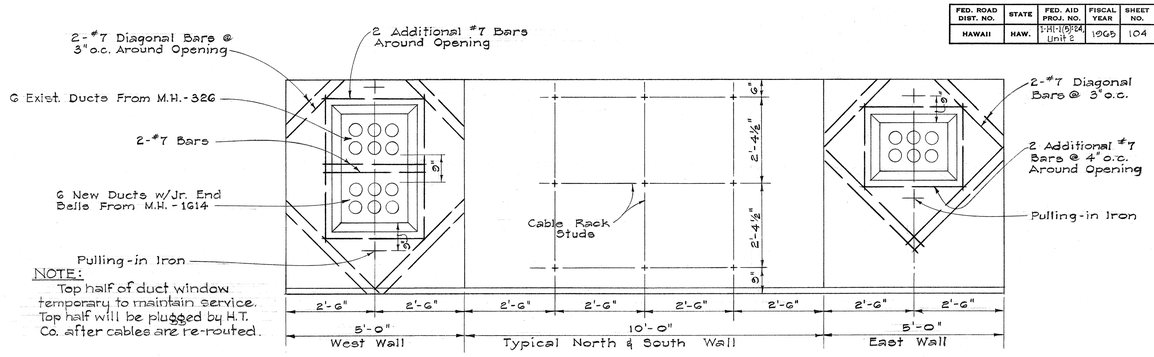
NOTE:
Sec. x-x See Sht. No. 102
Sec. z-z See Sht. No. 102



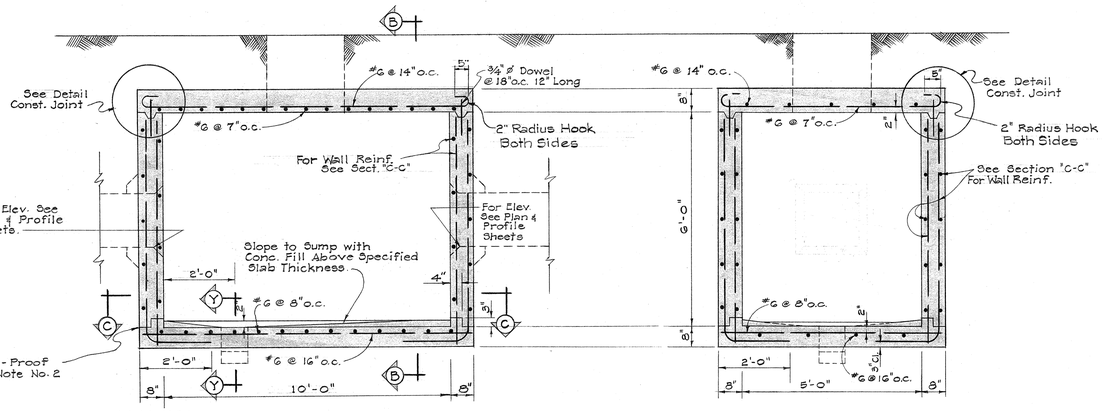
PLAN VIEW
Scale: ½" = 1'-0"



ROOF SLAB REINF. PLAN
Scale: ½" = 1'-0"



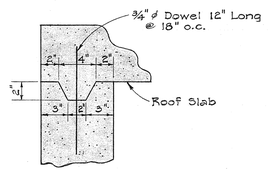
INTERIOR ELEVATION VIEW M.H. 325
Scale: ½" = 1'-0"



NOTE: Sec. Y-Y See Sht. No. 102

SECTION "A-A"
Scale: ½" = 1'-0"

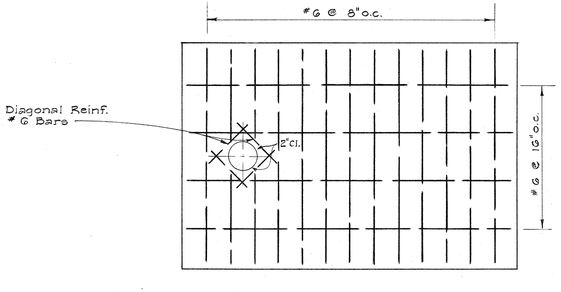
SECTION "B-B"
Scale: ½" = 1'-0"



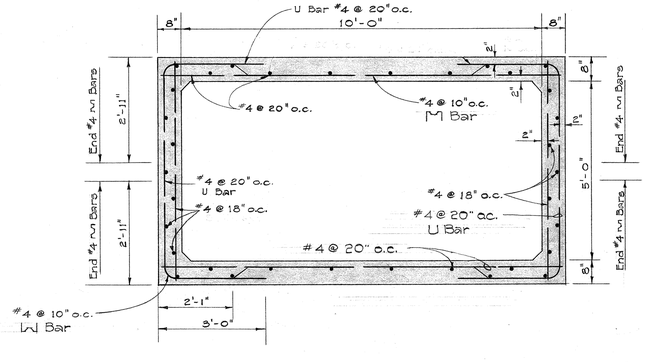
CONSTR. JOINT DETAIL
Scale: 1½" = 1'-0"

GENERAL NOTES

1. Design Data
   - fs = 20,000 psi
   - fc = 3,000 psi
   - fc = 1,200 psi
   - n = 10
   - w = Equiv. fluid pressure 30 #/ft²
2. Concrete shall be Class A-1 conforming to Section 47 of the Standard Specifications as modified by the Special Provisions. Slump shall be 3".
3. Unless otherwise indicated, for vertical location of duct windows, See profile sheets.
4. Manhole walls shall be doubled formed.
5. All concrete shall be cured by an impervious liquid membrane compound.
6. Concrete shall not be loaded, except by its own weight, until 28 days after placement.
7. All construction joints shall be waterproofed according to Section 40 of the Standard Specifications.
8. Plug all ducts in manhole.



FLOOR SLAB REINF. PLAN
Scale: ½" = 1'-0"



SECTION "C-C"
Scale: ½" = 1'-0"

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TELEPHONE MANHOLE #325

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

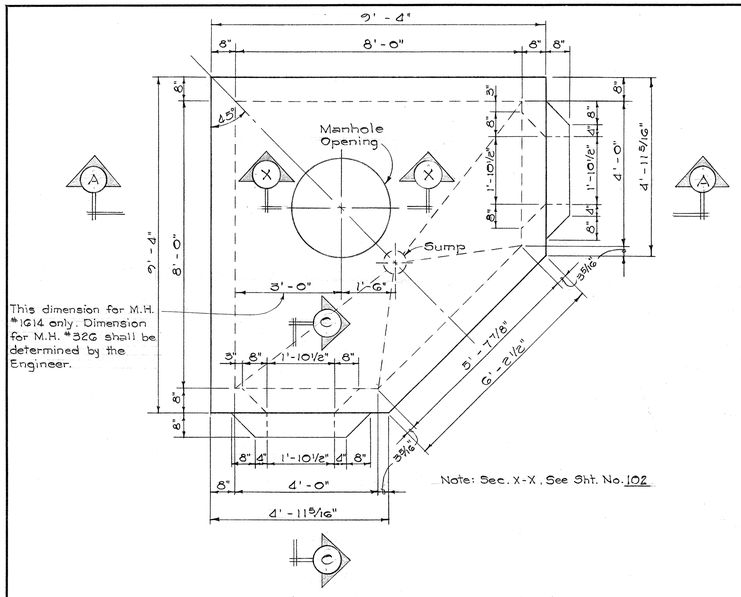
Scale: As Shown — Date: May, 1964

SHEET No. 48 OF 50 SHEETS

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

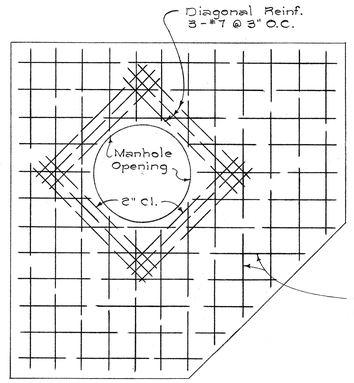
PRINTED ON CLEARPRINT 1000-H

104

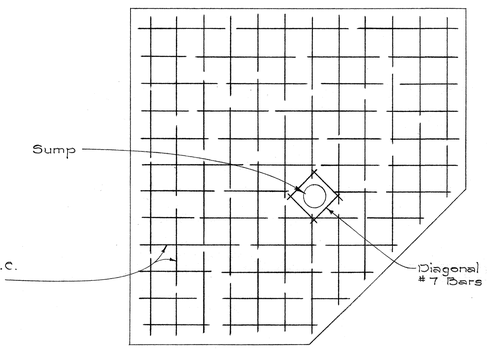


Note: Sec. X-X, See Sht. No. 102

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

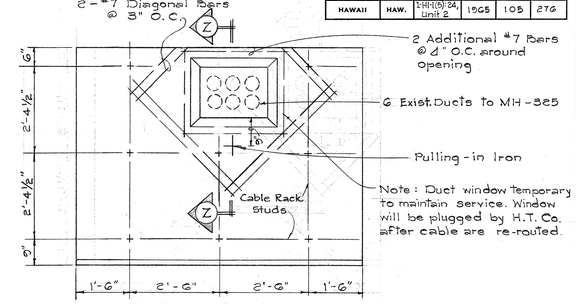


REINFORCING PLAN
ROOF SLAB
Scale: 1/2" = 1'-0"

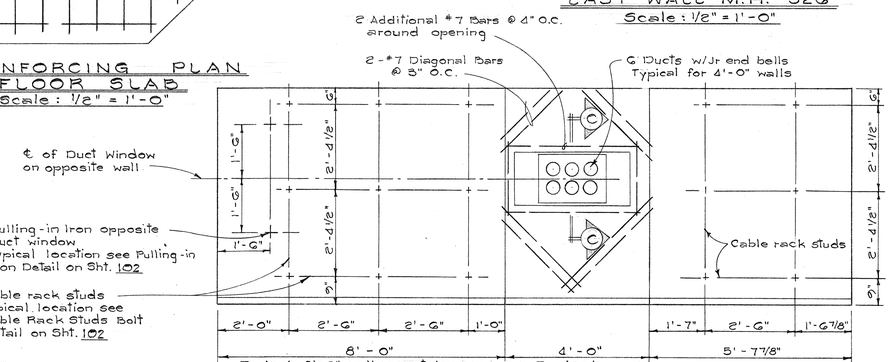


REINFORCING PLAN
FLOOR SLAB
Scale: 1/2" = 1'-0"

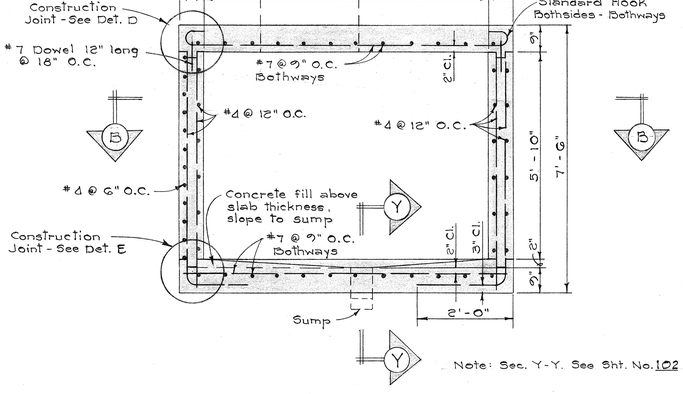
Note: Sec. Z-Z. See Sht. No. 102



INTERIOR ELEVATION VIEW
EAST WALL M.H.-326
Scale: 1/2" = 1'-0"

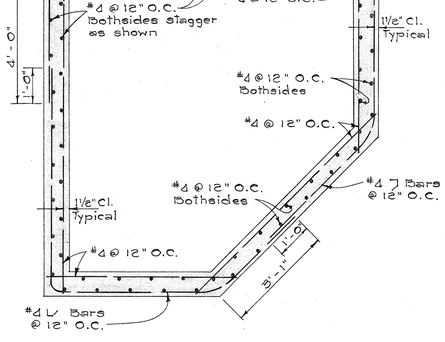


INTERIOR ELEVATION VIEW
M.H.-326 & 1614
Scale: 1/2" = 1'-0"

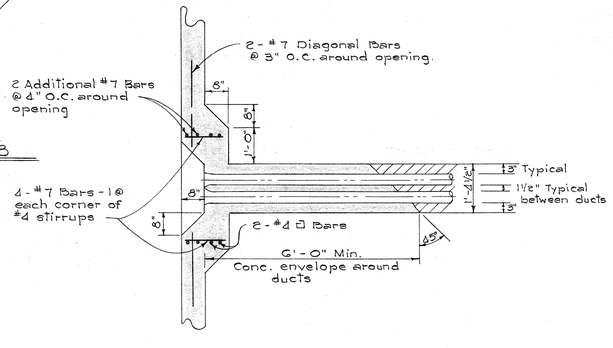


Note: Sec. Y-Y. See Sht. No. 102

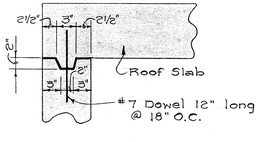
SECTION A-A
Scale: 1/2" = 1'-0"



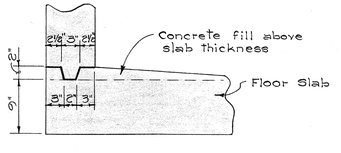
SECTION B-B
Scale: 1/2" = 1'-0"



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



DETAIL D
TOP CONSTRUCTION JOINT
Scale: 1" = 1'-0"



DETAIL E
BOTTOM CONSTRUCTION JOINT
Scale: 1" = 1'-0"

GENERAL NOTES:

1. Design Data
   - fs = 20,000 psi
   - f'c = 3,000 psi
   - fc = 1,200 psi
   - n = 10
   - w = Equiv. fluid pressure 80 #/ft³
2. Concrete shall be Class A-1 conforming to Section 47 of Standard Specifications as modified by the Special Provisions. Slump shall be 3".
3. Unless otherwise indicated, for vertical location of duct windows, see profile sheets.
4. Manhole walls shall be doubled formed.
5. All concrete shall be cured by an impervious liquid membrane compound.
6. Concrete shall not be loaded, except by its own weight, until 28 days after placement.
7. All construction joints shall be waterproofed according to Section 46 of the Standard Specifications.
8. Plug all ducts in manhole.

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES TELEPHONE MANHOLES #326 & #1614

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5): 24, Unit 2

Scale: As Noted — Date: May, 1964

SHEET No. 49 OF 50 SHEETS

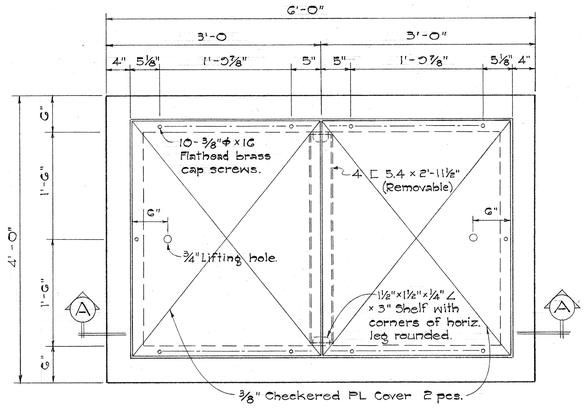
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	DHH(8)24, Unit 2	1965	105	276

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

PRINTED ON CLEARPRINT 1000-H

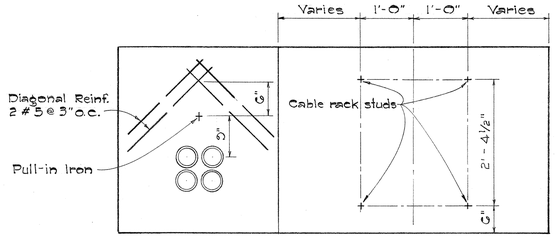
105

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(3):24, Unit 2	1965	106	276



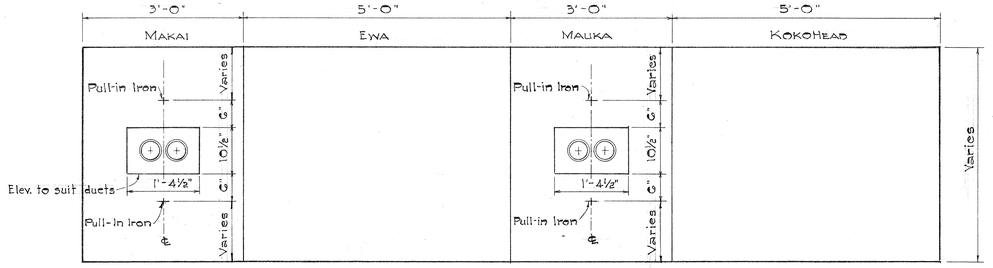
TOP PLAN

Scale: 1" = 1'-0"



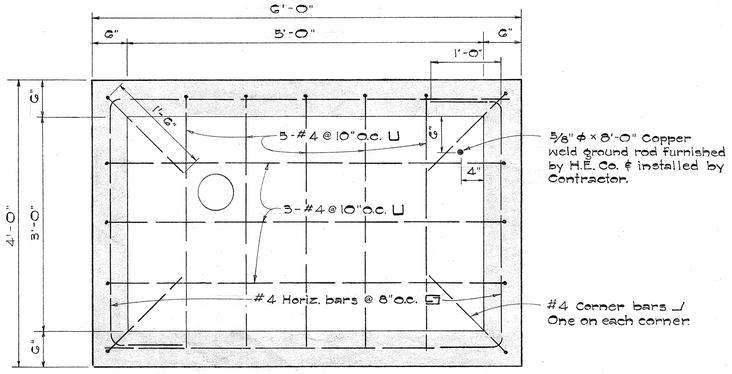
TYPICAL ELEV. OF INSIDE WALLS

(Opposite faces similar)
Scale: ¾" = 1'-0"



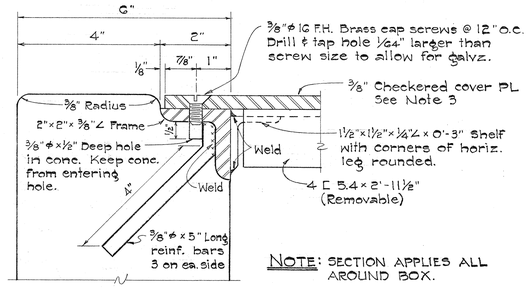
ELEV. - INSIDE WALLS HANDHOLE #1615

Scale: ¾" = 1'-0"



FLOOR PLAN

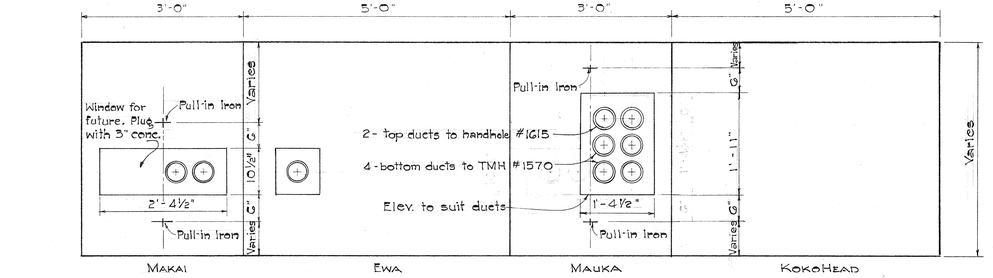
Scale: 1" = 1'-0"



NOTE: SECTION APPLIES ALL AROUND BOX.

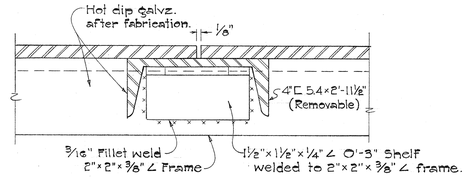
DETAIL "C"

Scale: ½ Size



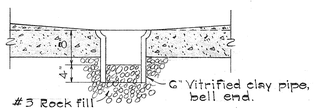
ELEV. - INSIDE WALLS HANDHOLE #1616

Scale: ¾" = 1'-0"



DETAIL "D"

Scale: ½ Size

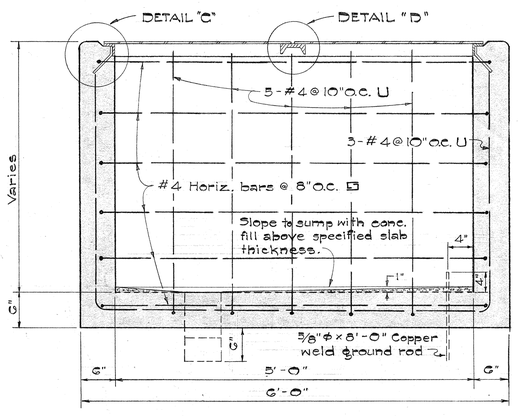


DETAIL OF SUMP

Scale: ¾" = 1'-0"

GENERAL NOTES:

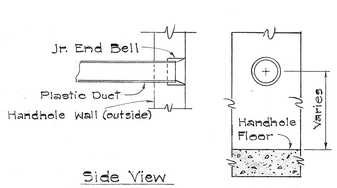
1. Conc. shall be Class A-1 conforming to Section 47 of the Standard Specifications as modified by the Special Provisions.
2. Floors shall be smooth metal trowelled finished. Exposed walls and edge shall be smooth and free from defects.
3. Angle frame, channel and checkered plate covers shall be hot dip galvanized after fabrication.

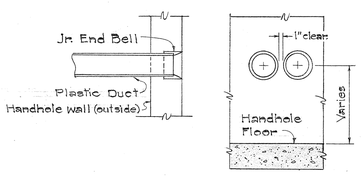


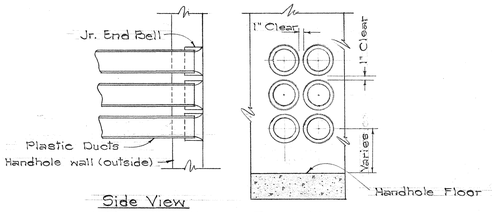
SECTION "A-A"

Scale: 1" = 1'-0"

NOTE: See Plan & Profile Sheets for size and location of ducts.







DUCT ENTRANCE DETAILS

Not to Scale

APPROVED:

OUTSIDE PLANT ENGINEER, H.T. Co., Ltd. — DATE 5-12-65

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SPECIAL DETAILS OF UTILITIES
TELEPHONE HANDHOLES #1615 & #1616

INTERSTATE HIGHWAY
Proj. No. I-HI-1(5):24 Unit 2

Scale: As Shown Date: May, 1964

SHEET No. 50 OF 50 SHEETS

106

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

PRINTED ON CLEARPRINT 1000-H