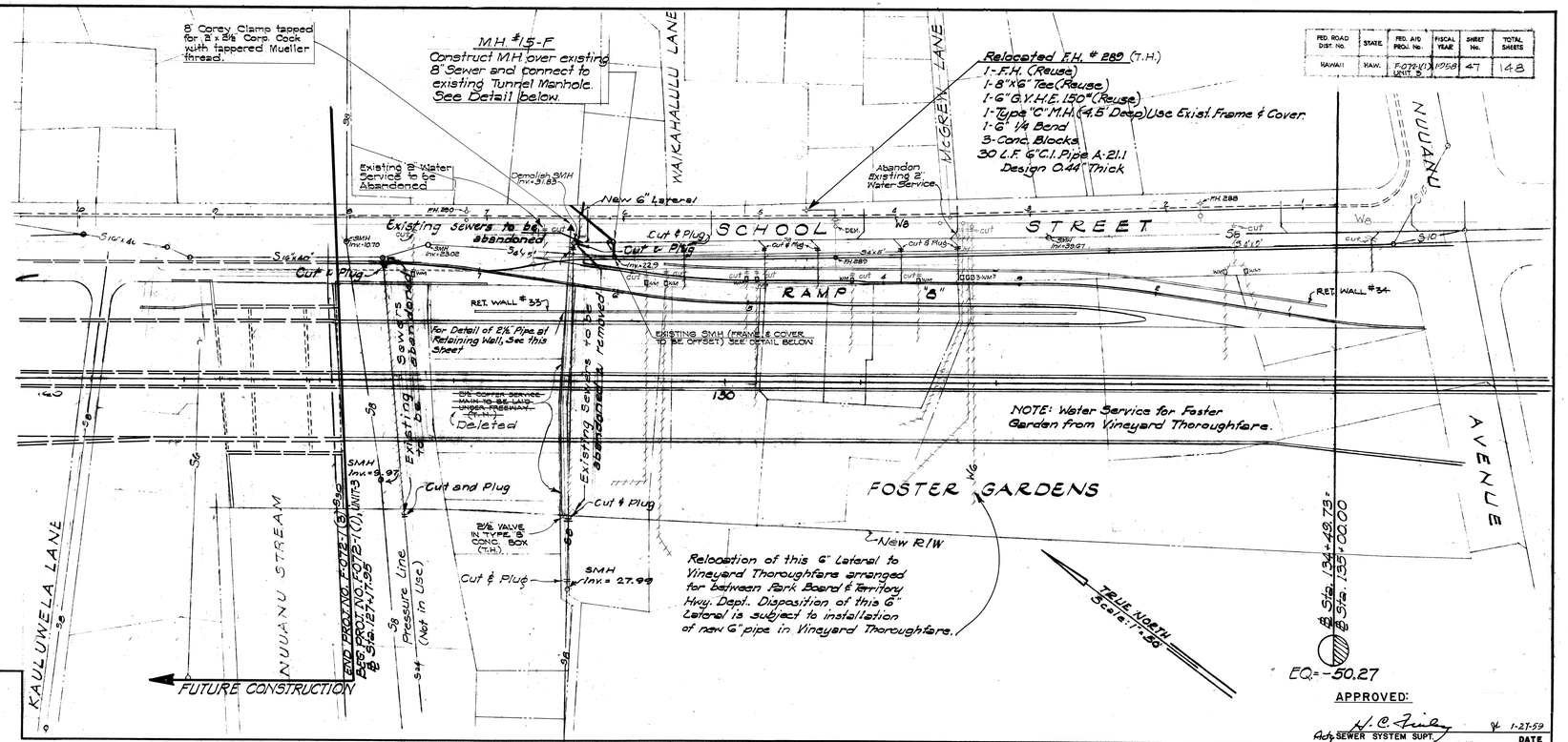
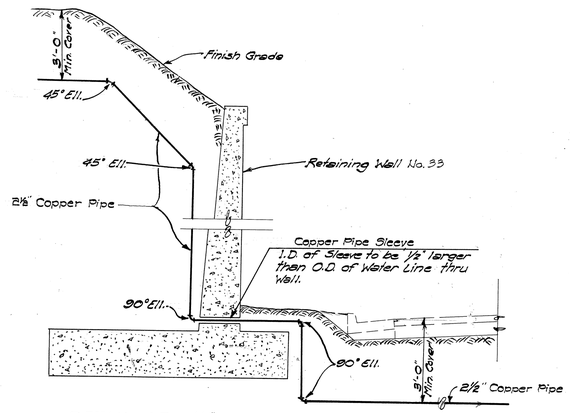
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-078-1(1) UNIT 3	1958	47	148

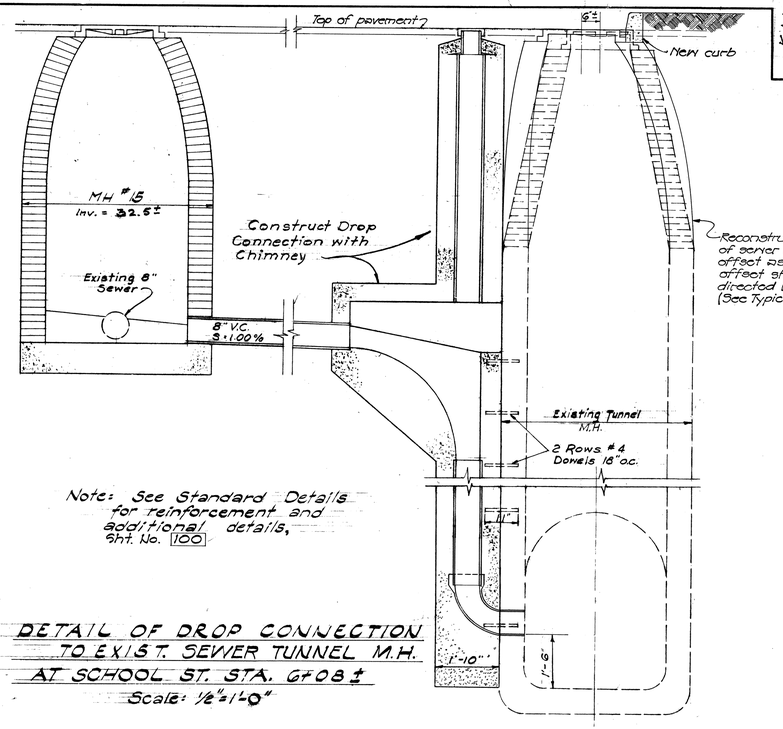


APPROVED:

W. C. Furley 1-27-59
Actg. SEWER SYSTEM SUPT. DATE

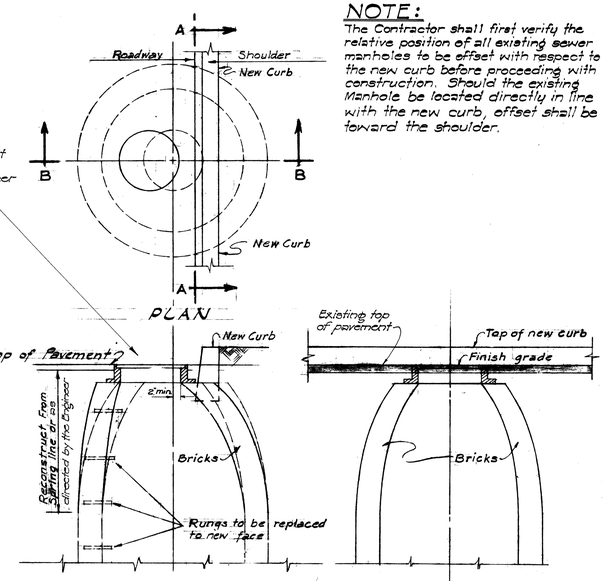


DETAIL OF 2½" SERVICE MAIN at RETAINING WALL, "S-S" 6+40±
(Not to Scale)



Note: See Standard Details for reinforcement and additional details, Sht. No. 100

DETAIL OF DROP CONNECTION TO EXIST. SEWER TUNNEL M.H. AT SCHOOL ST. STA. 6+08±
Scale: ½"=1'-0"



TYPICAL DETAIL FOR OFFSETTING SEWER MANHOLE COVER
Scale: ½"=1'-0"

NOTE:
The Contractor shall first verify the relative position of all existing sewer manholes to be offset with respect to the new curb before proceeding with construction. Should the existing Manhole be located directly in line with the new curb, offset shall be toward the shoulder.

GENERAL NOTES FOR WATER SYSTEM

1. BOTH THE HORIZONTAL AND VERTICAL LOCATIONS OF 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 LOCATIONS OF EXISTING LINES, AND SHALL BE REQUIRED TO MAKE ADJUSTMENT TO ANY NEW OR EXISTING WATER SYSTEM WHEREVER DIRECTED BY THE ENGINEER.
2. FOR LOCATIONS OF STORM DRAINS, SEE DETAIL PLANS OF ROADWAY.
3. FOR DETAILS OF WATER LINES ON STRUCTURES, SEE STRUCTURAL DRAWINGS.
4. ALL WATER SERVICES SHALL BE MAINTAINED AT ALL TIMES DURING CONSTRUCTION.
5. ALTERATIONS AND ADJUSTMENTS TO WATER SERVICE LINES SHALL BE DONE WITH THE LEAST AMOUNT OF DISTURBANCE TO THE EXISTING SERVICES TO THE VARIOUS HOUSES.
6. ALL TREES, LAWNS, SHRUBBERY, FENCES, ETC., DISTURBED IN THE PROCESS OF PERFORMING WORK ON WATER 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 WATER SYSTEM.
7. ALL EXISTING MANHOLE FRAMES AND COVERS WHICH ARE NOT AT REQUIRED GRADES SHALL BE ADJUSTED TO THE FINISHED ROADWAY GRADE, OR AS DIRECTED BY THE ENGINEER.
8. ALL WORK TO BE PERFORMED ON WATER LINES SHALL CONFORM TO CURRENT STANDARDS AND SPECIFICATIONS OF THE BOARD OF WATER SUPPLY.
9. THE CONTRACTOR SHALL NOTIFY THE BOARD OF WATER SUPPLY IN WRITING 72 HOURS EXCLUSIVE OF SATURDAYS, SUNDAYS, AND HOLIDAYS PRIOR TO COMMENCING WORK ON THE WATER SYSTEM.
10. TEMPORARY CLEANOUTS SHALL BE INSTALLED BY THE CONTRACTOR WHEREVER NECESSARY, AND THE COST THEREOF SHALL BE INCIDENTAL TO THE VARIOUS CONTRACT ITEMS FOR THE WATER SYSTEM.
11. CONNECTIONS TO EXISTING WATER SUPPLY SYSTEM WILL BE DONE BY THE BOARD OF WATER SUPPLY CREW.
12. ALL NECESSARY EXCAVATION SHALL BE DONE BY THE CONTRACTOR.
13. ALL VALVES, FITTINGS, PIPES, MANHOLE FRAMES AND COVERS, RUNGS, WHICH ARE REMOVED AND NOT REUSED, SHALL BE ACCOUNTED FOR WITH THE BWS ENGINEER, AND THAN CLEANED AND RETURNED BY THE CONTRACTOR TO THE BWS KALIHI YARD.
14. WHEREVER WATER LINES ARE INSTALLED ALONG CUT BANKS OF ROADWAY, SURFACES OF SUCH TRENCHES SHALL BE PROTECTED WITH GROUTED RUBBLE PAVING TO PREVENT EROSION OF BACKFILL MATERIALS.
15. ALL UNUSED WATER SERVICE LATERALS SHALL BE CUT AND PLUGGED.
16. CUTTING AND PLUGGING OF WATER LINES SHALL BE DONE PRIOR TO ROADWAY GRADING.
17. ALL DISCONNECTING OF WATER METERS WILL BE DONE BY THE BOARD OF WATER SUPPLY CREW.
18. FOR WATER CONNECTION TO SPRINKLER SYSTEM, SEE SPRINKLER SYSTEM PLANS SHEET NOS. 166 TO 171 INCL. (LUNALILO FREEWAY), AND SHEET NOS. 172 TO 176 INCL. (NUUANU HWY.)

NOTE: THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

APPROVED:

MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE 1-20-59

W. B. Gemeke 1-20-59
DIVISION ENGINEER — DATE

NOTE:
GENERAL WATER NOTES LISTED ON THIS SHEET ALSO APPLY TO NUUANU HIGHWAY PROJECT BU-061-1(6), UNIT 1

WATER AND SEWER

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY
PROJ. No. F-078-1(1), UNIT 3
STA. 127+17.95 TO STA. 135+00.00

UTILITIES

Scale: As Noted — September 1958

SHEET No. 1 OF 8 SHEETS

.$173(1).47 80

PLATE 1—PLAN—PROFILE O. P. R. & R. E
CHARLES BRUNING COMPANY, INC.

BRUNING 801R 31139

6

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	R-072(1) UNIT 3	1958	98	148

FUTURE CONSTRUCTION

TRUE NORTH
Scale: 1" = 50'

END PROJ. NO. F-072-1(3)

BEG. PROJ. NO. F-072-1(1), UNIT 3
STA. 127 + 17.95

EQ = -50.27

Sta. 132+49.73
Elev. 85'-0.00

SEE SHEET 107-196-1 FOR NEW ALIGNMENT

INSTALL 1" ANCHOR (H.E.CO.)

FROG LANE

STILLMAN LANE

WAIKAHALULU LANE

KAULUWELA SCHOOL LANE

CHUNG HOON LANE

KAULUWELA LANE

NUUANU STREAM

NUUANU AVENUE

SCHOOL STREET

KAULUWELA SCHOOL

45' P

60' P

45' Pole

60' Pole

P28-R (Rem.)

H.E. 11 (Rem.)

H.E. 12 (Rem.)

Exist. H.T.Co. M.H.

Exist. H.T. Co. M.H. #409 - See Reconstruction Detail on Sht. No. 110A

Existing H.T. Co. M.H. #411 (See Reconstruction Detail on Sht. No. 110A

Install H.T.Co. Small Pullbox (#13), 3' LRB and 1' Anchor (H.T.Co.)

Exist. Pullbox

Install H.T.Co. 2-3½" Transite Conduits.

P.17 (Rem.)

Existing Elec. conduit to be abandoned

Existing H.T. Co. 1½" pipe conduit to be abandoned

INSTALL H.T.Co. SMALL PULL BOX (#13) OVER EXIST. 1¼" PIPE (H.T.CO.)

INSTALL H.T.Co. SMALL PULL BOX (#13) AND 1 - 2" SRB (H.T.CO.)

TRENCH ONLY - H.T.Co. TO PLACE 1" PIPE DIRECT BURIAL

TRENCH ONLY - H.E.Co. TO PLACE DIRECT BURIAL CABLE.

Point Perpendicular to Centerline of Roadway

Pole to Remain Remove Anchor

EXISTING H.T.CO. M.H. #410 (SEE RECONSTRUCTION DETAIL ON SHT. NO. 110A

New R/W

E BASE LINE

CUT

S.C.

Sewer Interceptor

Existing Elec. conduit to be abandoned

Sta. 134+00

Engr's Ctr. Line

Sta. 135+00

Sta. 136+00

120

125

130

135

INSET
Scale: 1" = 100'

SCHOOL ST.

Nuuanu Stream

STILLMAN LANE

WAI

40' POLE

RIVER ST.

NOTE:
GENERAL SEWER NOTES LISTED ON THIS SHEET ALSO APPLY TO NUUANU HIGHWAY PROJECT BU-061-1(6), UNIT 4

GENERAL NOTES FOR 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 ENGR.
2. ADJUST EXISTING SEWER MANHOLES AND M.H. 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 SEWER 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 DIV. OF SEWERS, C & C 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.

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

APPROVED:

M.L.

SEWER SYSTEM SUPT. — DATE 1-27-59

PRINCPL. ELEC. ENGR., H.E. CO., LTD. — DATE 1/13/59

DISTR. ENGR., H.E. CO., LTD. — DATE 1/13/59

PLANT ENG'G. SUPV., H.T. CO., LTD. — DATE 1-13-59

NOTE:
GENERAL NOTES FOR ELECTRIC AND TELEPHONE UTILITIES COVERED IN NUUANU HIGHWAY PROJ. NO. BU-061-1(6), UNIT 4 ALSO APPLY TO THIS PROJECT. SEE "GENERAL NOTES FOR ELECTRIC AND TELEPHONE" ON SHEET NO. 98 (NUUANU HWY.)

NOTE:
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

APPROVED:

MANAGER AND CHIEF ENGINEER, DATE 1-20-59
BOARD OF WATER SUPPLY

DIVISION ENGINEER DATE 1-20-59

BELT, COLLINS & ASSOC., LTD.
Civil and Structural Engineers

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY
PROJECT NO. F-072-1(1), UNIT 3
STATION 127+17.95 TO STA. 134+49.73
UTILITIES

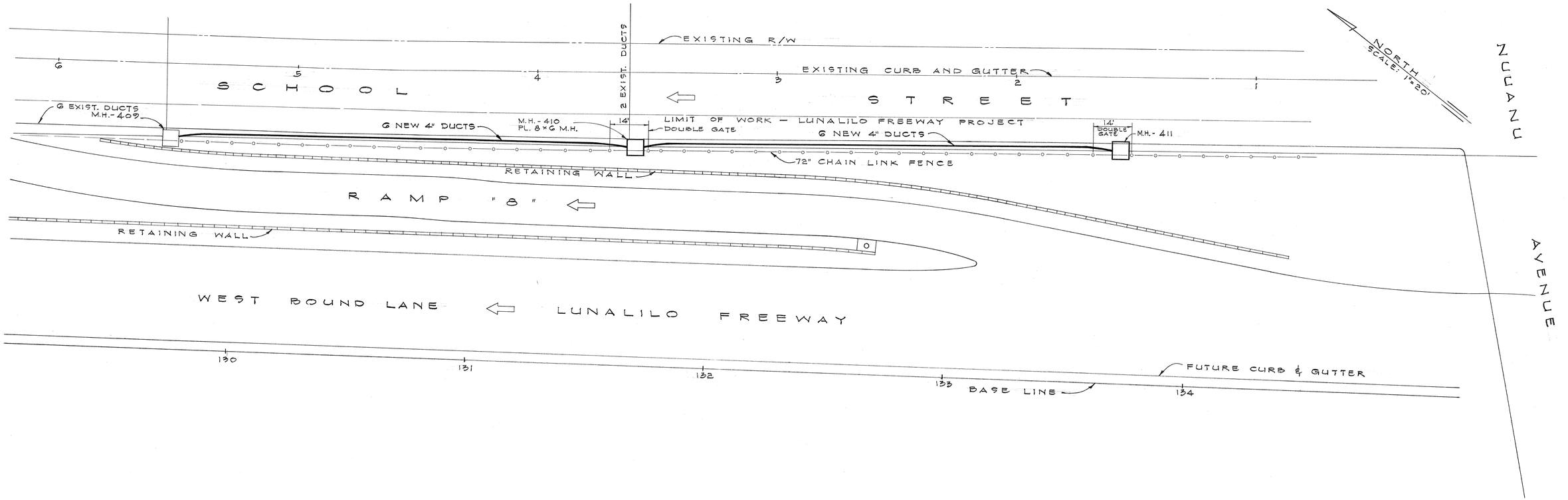
SCALE: 1"=50' SEPTEMBER, 1958

SHEET No. 2 OF 8 SHEETS

.S173(1).48 81

PRINTED ON DIEPO 1000H CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.				



(107-196-1)

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SCHOOL STREET

September 9, 1961

SHEET No. 1 OF 1 SHEETS

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

PRINTED ON CLEARPRINT 1000-H

81A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1) UNIT 3	1958	49	148

LEGEND

- Sa — NEW HON. GAS CO MAIN & VALVE M.H. (SIZES INDICATED)
- Sa — EXIST. HON. GAS CO. MAIN & VALVE M.H. (SIZES INDICATED)
- Ga — EXIST. HON. GAS CO. MAIN & VALVE M.H. TO BE ABANDONED OR REMOVED.
- Sa — NEW SEWER MAIN & M.H. (SIZES INDICATED)
- Sa — EXIST. SEWER MAIN & M.H. (SIZES INDICATED)
- Sa — EXIST. SEWER MAIN & M.H. TO BE ABANDONED OR REMOVED. (AS DIRECTED BY ENGINEER)
- Wa — NEW WATER MAIN & M.H. (SIZES INDICATED)
- Wa — EXIST. WATER MAIN & M.H. (SIZES INDICATED)
- Wa — EXIST. WATER MAIN & M.H. TO BE ABANDONED OR REMOVED (AS DIRECTED BY ENGINEER)
- EC — NEW ELEC. DUCT & BOX (DUCT SIZES INDICATED IN CROSS SECTIONS)
- EC — EXIST. ELEC. DUCT & BOX.
- EC — EXIST. ELEC. DUCT & BOX TO BE ABANDONED OR REMOVED. (AS DIRECTED BY ENGINEER)
- TC — NEW TELEPHONE DUCT & BOX (DUCT SIZES INDICATED IN CROSS SECTIONS)
- TC — EXIST. TELEPHONE DUCT & BOX.
- TC — EXIST. TELEPHONE DUCT & BOX TO BE ABANDONED OR REMOVED (AS DIRECTED BY ENGINEER)
- SCC — NEW U.S. ARMY SIGNAL CORP CABLE & M.H.
- SCC — EXIST. U.S. ARMY SIGNAL CORP CABLE & M.H.
- WVMH — TYPE 'B' OR 'C' WATER MANHOLE.
- WM — TYPE 'A' WATER MANHOLE.
- WM — WATER METER.
- GV. — GATE VALVE. (FOR WATER)
- BGGV — BEVEL GEARED GATE VALVE (FOR WATER)
- FH. — FIRE HYDRANT.
- SMH — SEWER MANHOLE.
- DSMH — DROP SEWER MANHOLE.
- GVMH — GAS VALVE MANHOLE.
- EMH — ELECTRIC MANHOLE.
- TMH — TELEPHONE MANHOLE.
- USCMH — U.S. ARMY SIGNAL CORP MANHOLE.
- PP — EXIST. POWER POLE.
- OP — NEW POWER POLE (LENGTH AS NOTED)
- LP — EXIST. LAMP POLE.
- LP — NEW LAMP POLE.
- TS — EXIST. TRAFFIC SIGNAL STANDARD.
- REM. — REMOVE.
- DEM. — DEMOLISH COMPLETELY
- ADJ. — ADJUST FRAME & COVER.
- ABD. — ABANDON
- T.P. BOX — TELEPHONE PULL BOX
- E.H. HOLE — ELECTRIC HANDHOLE.
- SW ANCHOR — SIDEWALK ANCHOR.
- LRB — LONG RADIUS BEND (H.E. CO.-G1., H.T. CO.-C.I.)
- SRB — STANDARD RADIUS BEND (H.E. CO.-B.1., H.T. CO.-C.I.)
- ANCHORS
- CUT & CAP OR PLUG
- STD. CONC. JACKET
- H.E. CO. — HAWAIIAN ELECTRIC CO.
- H.T. CO. — HAWAIIAN TELEPHONE CO.

GAS NOTE:
CUTTING AND PLUGGING OF LIVE GAS LINES WILL BE DONE BY THE HONOLULU GAS CO., LTD.

NOTE: FOR C & C GAMEWELL SYSTEM NOTE, SEE NUUANU HIGHWAY PROJECT SHT. NO. 58

NUUANU AVE.

(INST. 1# (SW) ANC.

RELOCATE F.H. #229 (T.H.)
1 - G.V.
1 - F.H.
1 - TYPE 'C' M.H. 4.2' (REUSE EXIST. FRAME & COVER)
80# LIN. FT. OF 6" C.I. PIPE, AB1.1 DESIGN 0.44 THICK.
1 - 6" 1/32 BEND
3 - CONC. BLOCKS.

SMH INV.= 36.53

P.P.

2-2" G.S. CONDUITS (BY C.& C.)

C.& C. PULL BOX (BY C.& C.)

INSTALL 1" ANCHOR (H.E.CO.)

CONSTRUCT H.T.CO. MANHOLE TYPE 3-S STUB OUT AND CAP ENDS OF 6"-F.T.K. 1-0" FROM M.H.

85 L.F. OF 18 C.I. PIPE
1 - 18" ½ BEND
1 - CONC. BLOCK
T.H.

INSTALL 2-4" LRB (H.E.CO.)

Exist. C.B.

(REM)

45° P

SCMH

WVMH

TMH #34

EMH

Exist. TMH = 33.92

WVMH (ADJ.) Inv.= 22.02

ADJ. WVMH #2

Exist. TMH (ADJ.)

Exist. FH #225 (RELOCATE)

DEM.

PP (REM)

8" C.I.P. (UNDER P.P.)

10+45 — 1-18" ½ BEND, 1-CONC. BLK. (T.H.); 1-CONC. BLOCK

PROVIDE 3" OF ASPHALTIC EXPANSION FELT AROUND 18" PIPE PASSING THROUGH RETAINING WALL.

10+83 — 1-18" ½ BEND, 1-CONC. BLK. (T.H.); BEGIN STD. CONC. JACKET (T.H.); 1-18" ½ BEND, 1-CONC. BLOCK (T.H.)

10+87 — END JACKET; 1-18" ½ BEND, 1-CONC. BLK. (T.H.)

11+23± — 1-18" ½ BEND, 1-CONC. BLK. (T.H.)

12+00± — 1-18" ½ BEND, 1-CONC. BLK. (T.H.)

18+50± — 1-18" ½ BEND, 1-CONC. BLK. (T.H.)

WVMH #2

WVMH #3

INSTALL ⅝" ANCHOR L=12' (H.E.CO.)

INSTALL H.T.CO. SMALL PULL BOX (#513) & 1-2" SRB (CAP END OF SRB)

SCMH INV. 32.5

Existing TMH #1GS

Existing TMH #2GS

Inv.= 38.92

TOP OF PIPE = 39.27

INSTALL H.T.CO. SMALL PULL BOX (#513) AND 2-2" SRB.

INSTALL 2-4" LRB AND 2-3 LRB (H.E.CO.)

INSTALL ⅝" ANCHOR L=30' (H.E.CO.)

Existing TMH #1GA

Inv.= 38.92

SCHOOL STREET

EXIST. CONDUIT TO BE REMOVED BY C & C

EXIST. ELEC. CONDUIT TO BE ABANDONED

PP (REMOVED)

Tel. Box (REM.)

W.M.

GVMH (DEM) Top of Pipe = 32.54

Tel. Box (REM.)

PP (REM.)

INSTALL 1" ANCHOR (H.E.CO.) (TEMPORARY)

45° P (TEMPORARY)

INSTALL ⅝" ANCHOR (H.E.CO.) (TEMPORARY)

INSTALL ⅝" ANCHOR (H.E.CO.) (TEMPORARY)

Existing FH #230 (RELOCATE)

RELOCATE F.H. #230 (T.H.)
1 - G.V. } REUSE
1 - F.H. }
1 - TYPE C M.H. 4.2' (REUSE EXIST. FRAME & COVER)
30# L.F. OF 6" C.I. PIPE, AB1.1 DESIGN, 0.44 THICK.
2 - CONC. BLOCKS.

SPECIAL WATER NOTES

1. ALL VERTICAL BENDS TO BE L.R. (LONG PATTERN)
2. ALL BELL JOINTS EMBEDDED IN CONCRETE TO HAVE 2½" OF LEAD.
3. CONTRACTOR SHALL PROVIDE ACCESSIBILITY TO EXISTING METERS AND BOXES TO THE B.W.S. FOR READING AND REMOVAL.
4. WATER LINES DESIGNATED THUS (—W—) TO BE CUT ARE TO BE EXPOSED AT MAIN BY THE CONTRACTOR AND TO BE CUT BY B.W.S. AND PAID FOR BY CONTRACTOR. FEASIBLE CUT-OFFS PRIOR TO CONSTRUCTION SHALL BE DONE BEFORE COMMENCEMENT OF GRADING OPERATION.
5. WHERE CRM WALLS OR MASONRY WALLS ARE TO BE CONSTRUCTED ALONG R/W LINES FRONTING PRIVATE PROPERTY, THE CONTRACTOR SHALL PROVIDE PROPER SIZE SLEEVE INSERTIONS WHERE NECESSARY AND SATISFACTORY TO THE B.W.S. ENGINEER FOR WATER SERVICE RECONNECTIONS TO THE PROPERTY PIPE.
6. ALL SALVAGEABLE WATER METER BOXES SHALL BE ACCOUNTED FOR WITH THE B.W.S. ENGINEER AND THEN ARRANGED FOR SALVAGING BY B.W.S.
7. T.H. DENOTES TERRITORY'S SHARE, B.W.S. DENOTES B.W.S. SHARE.
8. WHERE PIPE IS TO BE LAID IN FILL AREA, PROVIDE WIDE SLABS (8" REINF.) TO GIVE LARGER BEARING AREAS UNDER PIPE. 8" SAND CUSHION TO BE USED UNDER PIPE.
9. ALL MATERIALS TO BE HAULED FROM B.W.S. STORE YARDS TO JOB SITE SHALL BE DONE BY CONTRACTOR AND THE COST SHALL BE INCIDENTAL TO PIPE WORK.
10. EXIST. FIRE HYDRANTS TO BE SALVAGED SHALL BE REMOVED AND HAULED TO B.W.S. KALIHI YARD BY B.W.S. CREW.
11. WHERE EXISTING WATER FACILITIES UNALTERED UNDER THIS PLAN NEED TO BE REVISED, THE CONTRACTOR SHALL COOPERATE WITH B.W.S. IN ITS WORK. THIS SHALL INCLUDE SPECIAL WORK TO BE UNDERTAKEN BY B.W.S.

H.E. & H.T. Co. LINES REVISED IN STR. #11
SEE PLANS FOR CHANGE ORDER #32, SHT. NOS. 82A & 82B

NOTE:
FOR LOCATION & DETAILS OF UTILITIES RELOCATED ON BRIDGE, SEE STRUCTURE #11 DRAWINGS, SHT. NOS. 226 TO 235 INCL.

NOTE:
INSTALLATION OF THAT PORTION OF GALV. STEEL CONDUITS WITHIN A GRADE SEPARATION STRUCTURE SHALL BE CONSIDERED AS PART OF THE RESPECTIVE DUCTS INSTALLED IN THE DECK SLAB OR IN THE CONCRETE JACKET WITHIN THE STRUCTURE AS THE CASE MAY BE.

STRUCTURE No. 11

CONSTRUCT H.T.CO. MANHOLE TYPE 3-S (Revised) Inv.= 29.67

CONNECT TO EXIST. MAIN (T.H.)
1 - 18" ½ BEND
1 - CONC. BLOCK
8' L.F. OF 18" C.I. PIPE

CONST. SMH ON 8" LINE. INV.= 31.5±

INSTALL H.T.CO. SMALL PULL BOX (#513), ⅝" ANCHOR, AND 1-2" SRB (H.T.CO.)

INSTALL ⅝" SW ANCHOR (H.E.CO.) (TEMPORARY)

2-2" G.S. CONDUITS (BY C.& C.)

C.& C. PULL BOX (BY C.& C.)

TP (REM.)

2-2" G.S. CONDUITS INSTALLED BY C.& C. (SEE PLANS FOR TRENCHES) TO BE TURNED OVER TO THE HON. GAS CO., LTD.

CENTER LINE

JOHNSON

6"W.

EXIST. 36" C.M.P.

EXIST. 72" C.M.P.

EXIST. P.P. #25 INSTALL 2-4" LRB (H.E.CO.)

18" C.I. B.S. PIPE (AB1.1 DESIGN 0.65 THICK "C-D" PATTERN) (T.H.)

CONSTRUCT H.T.CO. MANHOLE TYPE 3-S

TO BE MAIN

ALL 18 C.I. FITTINGS SHALL BE CLASS "D"

R/W LINE

1-3/4" AIR VALVE, H.P.
1-TYPE 'B' M.H. 3.5' T.H.

DEMOLISH EXIST. H.T.CO. MANHOLE

TO RELOCATE F.H. #228 (T.H.)
1-18"x18"x6" TEE (BLOW-OFF)
1-6" ¼ BEND
16± LIN. FT. 6" C.I. PIPE, AB1.1 DESIGN 0.44 THICK.
1-TYPE 'C' M.H. 4.5' (REUSE EXIST. FRAME & COVER)
1-6" G.V. } REUSE.
1-F.H. }
3-CONC. BLOCKS

NUUANU AVE.

BASE LINE

135 136 137 138 139 140 141

PP (REM)

ABOVE "SPECIAL WATER NOTES" ALSO APPLY TO NUUANU HIGHWAY PROJECT NO. BU-061-1(6), UNIT 4

APPROVED:

SEWER SYSTEM SUPT. — DATE 9A 1-27-57

PRINCPL. ELEC. ENGR., H.E.CO., LTD. — DATE 1/31/57

DISTR. ENGR., H.E.CO., LTD. — DATE 1/31/57

PLANT ENG'G. SUPV., H.T.CO., LTD. — DATE 1-13-57

APPROVED:

MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE 1-20-57

DIVISION ENGINEER — DATE 1-20-57

NOTE:
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

SECTION T/A — 8-4' Transite Korduct (H.T.Co)

SECTION T/B — 8-4" GS Conduit (H.T.Co)

SECTION T/C — 2-3½" Transite Korduct (H.T.Co)

SECTION E/A — 2-4 Transite Korduct (H.E.Co)

SECTION E/B — 4-4" Transite Korduct (H.E.Co)

SECTION E/C — 4-4" GS Conduit (H.E.Co)

SECTION ET/A — 2-3 Transite Korduct (H.E.Co); 2-4 Transite Korduct (H.E.Co); 1-3½ Transite Korduct (H.T.Co)

SECTION T/O — G-3½ Transite Korduct (H.T.Co)

DETAIL OF CONC. JACKET FOR 18" WATER MAIN
Scale: ½" = 1'-0"

#4 HOOPS 12" O.C.
12-#5 LONGITUDINAL BARS.
CLASS 'A-1' CONCRETE
4" CLEAR
3'-6"
6"
18"
Trench

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY
PROJECT NO F-072-1 (1), UNIT 3
STATION 135+00 TO STATION 141+00
UTILITIES

SCALE: 1"=20' — SEPTEMBER, 1957

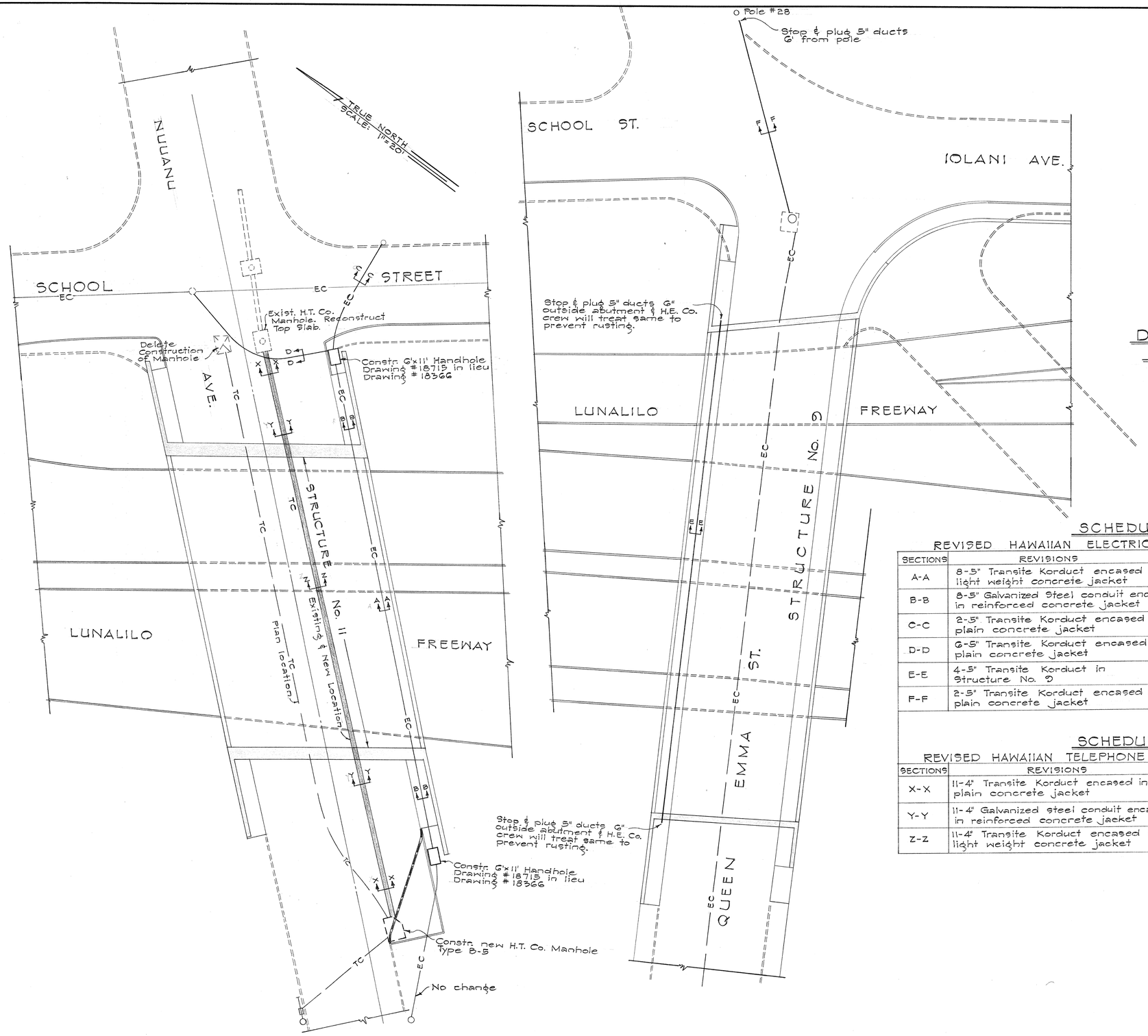
LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER No. 584
DATE July 2, 1957

SHEET No. 3 OF 8 SHEETS

.S173(1).49 82

PRINTED ON DIEPO 1000M CLEARPRINT

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.				



DETAILS SHOWN ON STRUCTURE PLANS.

SCHEDULE "A"

REVISED HAWAIIAN ELECTRIC Co. UNDERGROUND DUCT SYSTEM

SECTIONS	REVISIONS	ORIGINAL
A-A	8-5" Transite Korduct encased in light weight concrete jacket	4-4" Transite Korduct encased in plain concrete jacket
B-B	8-5" Galvanized Steel conduit encased in reinforced concrete jacket	4-4" Galvanized steel conduit encased in reinforced concrete jacket
C-C	2-5" Transite Korduct encased in plain concrete jacket	2-4" Transite Korduct encased in plain concrete jacket
D-D	6-5" Transite Korduct encased in plain concrete jacket	None
E-E	4-5" Transite Korduct in Structure No. 9	None
F-F	2-5" Transite Korduct encased in plain concrete jacket	None

SCHEDULE "B"

REVISED HAWAIIAN TELEPHONE Co. UNDERGROUND DUCT SYSTEM

SECTIONS	REVISIONS	ORIGINAL
X-X	11-4" Transite Korduct encased in plain concrete jacket	8-4" Transite Korduct encased in plain concrete jacket
Y-Y	11-4" Galvanized steel conduit encased in reinforced concrete jacket	8-4" Galvanized steel conduit encased in reinforced concrete jacket
Z-Z	11-4" Transite Korduct encased in light weight concrete jacket	8-4" Transite Korduct encased in plain concrete jacket

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REVISION OF ELECTRIC AND TELEPHONE DUCT LINES LUNALILO FREEWAY

PROJ. No. F-072-1(1), UNIT 3

PLAN TO ACCOMPANY CONTRACT CHANGE ORDER No. 32

SHEET No. OF SHEETS

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

PRINTED ON CLEARPRINT 1000-H

82A

82A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.				

TRUE NORTH
SCALE: 1" = 20'

SCHOOL ST.

2-5" L.R.B.

EC

TMH

WVMH

6'x 11' Handhole
Drawing #18715

NUUANU AVE.

136

137

EC

SECTION "E-E"
4-5" Transite Korduct
N.T.S.

DETAILS SHOWN ON STRUCTURE PLANS.

SECTION "A-A"
2-5" Transite Korduct
N.T.S.

SECTION "B-B"
6-5" Transite Korduct
N.T.S.

SECTION "C-C"
8-5" G.S. Conduit
N.T.S.

SECTION "D-D"
8-5" G.S. Conduit
N.T.S.

6'x 11' Handhole
Drawing #18715
Provide window on makai
side for future 6'-5"
Transite Korducts

No Change
See Lunalilo Freeway
Utility Plan

NOTE:
Refer to State Utility drawing
Sheet 3 of 8 Construction Standard
Transite Korducts Underground
duct lines.

P. 28
Stop & plug 5" ducts
6' from pole.

SCHOOL ST.

126

IOLANI AVE.

EMH #456

Stop & plug 5" ducts
6" outside abutment
and H.E.Co. crew will
treat same to prevent
rusting.

152

153

EMMA ST.

QUEEN

Stop & plug 5" ducts
6" outside abutment
and H.E.Co. crews will
treat same to prevent
rusting.

NOTE:
Original Tracing At:
Engineering Department
THE HAWAIIAN ELECTRIC CO., LTD.
Honolulu, Hawaii

NO.	DATE	REVISIONS	BY	CHK'D	APP'D
5	3-16-61	Added 4-5" Transite Korduct	R.N.		
4	3-16-61	Added 6-5" Transite Korduct	R.N.		
3	3-16-61	Change both 4'x6' handholes drwng. #U-18366 to 6'x11' handholes drwng.#	R.N.		
2	3-16-61	Change 4-4" to 8-5" Transite Korducts	R.N.		
1	3-16-61	Change 2-4" to 2-5" Transite Korducts	R.N.		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

REVISION OF ELECTRIC DUCT LINES

LUNALILO FREEWAY
PROJ. No. F-072-1(1), UNIT 3

March 16, 1961

SHEET No. OF SHEETS

82B

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

PRINTED ON CLEARPRINT 1000-H

82B

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	F-072-1(1) UNIT 3	1958	50	148

INSTALL 1-¾" ANCHOR (H.E.CO.)

RAMP "H"

NOTE:
NEW UTILITY LINES CROSSING NEW STRUCTURE #10 AND IN SERVICE ROAD SHOWN DASHED, ARE PART OF NUUANU HWY. PROJ. NO. BU-OG1-1(G), UNIT 4. SEE NUUANU HIGHWAY UTILITY PLANS.

SIGNAL CORPS MANHOLE #229 IS LOCATED AT SCHOOL ST. STA. 25+44 ± (SEE SHT. NO. 84).

NOTE: CUT-OFF OF EXISTING WATER SERVICES IS SUBJECT TO CONSTRUCTION AT SERVICE ROAD WITH WATER MAIN AS COVERED IN NUUANU HIGHWAY PLANS.

RAMP "G"

INSTALL 1 ANCHOR AND 4 SRB (H.E.CO.) (TEMPORARY)

INSTALL 1-4" TRANSITE CONDUIT, DIRECT BURIAL (TEMPORARY) H.E.CO (MIN. DEPTH 3' TO TOP OF DUCT)

LOCATE TO CLEAR PIER FOOTING.

RELOCATE 4 GSB TO CLEAR C&C (UNDER NUUANU)

RELOCATE 6" GV & REMOVE MH (UNDER NUUANU)

RELOCATE 24.5"/8 CMP TO CLEAR MH & REMOVE MH (UNDER NUUANU)

INSTALL 2-4" 1-3" TRANSITE CONDUITS DIRECT BURIAL (TEMPORARY) H.E.CO (WITH TOPS 3' TO TOP OF DUCTS)

INSTALL 1 ANCHOR H.E.CO (TEMPORARY)

INSTALL 2-4" URD & 1-2" SRB (H.E.CO) (TEMPORARY)

INSTALL 35' P (TEMPORARY)

INSTALL 1-3" SRB (H.E.CO) INSTALL 1-2" SRB (H.T.CO.)

INSTALL ¾" ANCHOR

INSTALL H.E.CO. SMALL PULL BOX (U-105-S)

INSTALL H.T.CO. SMALL PULL BOX (#515)

H.E.CO., H.T.CO. & C&C TO SHARE TRENCH

INSTALL 1-3" SRB (H.E.CO) AT BUILDING WALL

CONSTRUCT H.E.CO U-1838G TYPE II MANHOLE

INSTALL H.T.CO. SMALL PULL BOX (#515)

SEE PROFILE

H.E.CO AND C&C TO SHARE TRENCH TO HERE

SCHOOL STREET

CONST. EC INV.= 21.2 ± CUT

SWMH - ADJ.

S 4.5% TUNNEL

ABANDON

EXIST. EMH

WWMH #4 TOP OF PIPE 40.7

RELOCATE FH #231 SALVAGE & REUSE: GATE VALVE, F.H., MH. FRAME & COVER

CONTRACTOR SHALL USE MAXIMUM CAUTION TO AVOID DISRUPTION OF & AUTOMATIC FIRE SPRINKLER LATERAL TO GOLDEN MALL THEATRE.

NOTE:
NEW WATER LINES & MANHOLES SHOWN DASHED ARE PART OF NUUANU HIGHWAY PROJECT NO. BU-OG1-1(G), UNIT 4. SEE NUUANU HIGHWAY WATER PLANS.

TO RELOCATE F.H. #231 (T.H.)
1-6" G.V. } REUSE
1-F.H.
1-TYPE 'C' M.H. 48" (REUSE EXIST. FRAME & COVER)
328 LIN. FT. OF 6" C.I. PIPE, DESIGN 0.44 THICK.
1-6" x 8" x ⅛" BEND
3-CONC. BLOCKS.

STRUCTURE #10
NUUANU HWY. PROJ. NO. BU-OG1-1(G), UNIT 4
RECONSTRUCT 6'-4" x 5'-3" SEWER TUNNEL (UNDER NUUANU)

CUTTING OFF THIS 8" WATER MAIN IS SUBJECT TO CONNECTION IS SUBJECT TO PRIOR INSTALLATION OF 8" & COPPER LINE OFF PORT ST. AS COVERED IN NUUANU PLAN.

STA. 24+15

EMH

SMH REM.

FORT STREET

ABANDON

RAMP "I"

BASE LINE

NOTE:
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

SUB-STATION

INSTALLATION OF THIS LINE IS COVERED IN NUUANU HWY. PLAN. CUTTING OFF EXISTING 8" WATER SERVICE MAIN AT SCHOOL ST. CONNECTION IS SUBJECT TO PRIOR INSTALLATION OF THIS NEW 2½" COPPER SERVICE MAIN.

1-2½" COPPER MAIN

KAULANA LANE

RAMP "D"

HAUHAUHAH HWY.

SECTION ET/B
1-3" Transite Korduct (H.E.Co.)
1-3½" Transite Korduct (H.T.Co.)

APPROVED:

SEWER SYSTEM SUPT. — DATE 1-27-59

PRINCPL. ELEC. ENGR., H.E.CO., LTD. — DATE 1/13/59

DISTR. ENGR., H.E.CO., LTD. — DATE 1/15/59

PLANT ENG'G. SUPV., H.T.CO., LTD. — DATE 1-13-59

APPROVED:

HONORARY AND CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE 1-20-59

DIVISION ENGINEER — DATE 1-20-59

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER No. 584
DATE July 2, 1957

ORIGINAL PLAN
SURVEY PLOTTED BY — DATE 5-1957
DESIGNED BY RCG — 5-1957
DRAWN BY RCG
TRACED BY DLG
QUANTITIES BY
QUANTITIES CHECKED BY
CHECKED BY
NOTE BOOK No.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY

PROJECT NO. F-072-1 (1), UNIT 3

STATION 142+00 TO STATION 148+00

UTILITIES

SCALE: 1"=20'

SEPTEMBER, 1957.

SHEET No. 4 OF 8 SHEETS

.S173 (1).50 83

PRINTED ON DIEPO 1000H CLEARPRINT

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	F-072-1(1) UNIT 3	1958	51	148

INSTALL H.T.Co. SMALL PULL BOX (#513) AND 1-2' SRB (H.T.Co.)

INSTALL ¾" S.W. ANCHOR H.E.Co.

RELOCATE F.H. #234 (T.H.)
1-6" G.V. } REUSE
1-F.H.
1-TYPE 'C' M.H. (REUSE EXIST. FRAME & COVER) 4.0'
34.2± LIN. FT. OF 6" C.I. PIPE, A21.1 DESIGN, 0.44" THICK.
2-CONC. BLOCKS.

CONST. PLAIN S.M.H. OVER EXIST. 8" SEWER PLUG & ABANDON

S.M.H. #3 Inv. = 65.85

INSTALL 1" ANCHOR (TEMPORARY)

INSTALL 1" ANCHOR (H.E.Co.)

45° P (NEW)

60 P (TEMPORARY) S.C.M.H. #529

S.C.M.H. INV. = 58?

S.M.H. #3 INV. = 85.65 ± 07.5±

25.95± LEFT

CONST. SPECIAL DROP INLET STRUCTURE ON SIDE OF S.M.H. #3 (SEE DETAIL ON UTILITY SHT. NO. 35) INV. 55 = 66.40 (BOTH LINES)

SEE WALL DETAIL SHOWING NEW DUCT ENTRANCE

BG+GG ± (SCHOOL) = 10+18 ± (EMMA) (T.H.)
CONNECT TO EXIST. 12" MAIN.
1-12"xG WYE, ALL BELL TYPE II (TILT DOWN 6° BRANCH)
1-12" SLEEVE, 14' LONG
2-CONC. BLOCKS.
162± LIN. FT. OF 12" C.I. PIPE, A21.1 DESIGN, 0.65" THICK, A-B PATTERN.
80± LIN. FT. OF 6" C.I. PIPE, A21.1 DESIGN

SCHOOL STREET

TOP OF PIPE = 53± WVMH

TOP OF PIPE = 54± WVMH

TOP OF PIPE = 55± WVMH (ADJ.)

EMH INV. = 49?

60 P (TEMPORARY)

W.M.

F.H. #234 (RELOCATE) SALVAGE 6" G.V., FIRE HYDRANT

WVMH (Top of Pipe = 58?)

INSTALL 4-1" ANCHORS (H.E.Co) (TEMPORARY)

10+33 (EMMA) (T.H.)
1-6" G.V. (REUSE)
1-TYPE 'C' M.H. 6.2' (REUSE EXIST. FRAME & COVER)

10+40 (EMMA) (T.H.)
1-6" ⅛ BEND
1-CONC. BLOCK

PROFILE OF 6" WATER TO BE ADJUSTED TO PROVIDE 3.2± FT. MINIMUM COVER.

6" PLUG/HUB CLAMP
1-CONC. BLOCK

MAGELLAN AVE.

IOLANI AVE

H.T.Co. AND C&C TO SHARE TRENCH

NEW RET. WALL

SMH (REM.)

TO RECONNECT 6" WATER
1-CONC. BLK.
12-L.F. C.I. PIPE

INSTALL H.T.CO. LARGE PULL BOX (#510)

P.P. (REM.)

RELOCATE (T.H.)
1-12" G.V. (REUSE)
1-TYPE 'B' M.H. 4.2' (USE EXIST. FRAME & COVER)

10+54 (EMMA) (T.H.)
1-6" ⅛ BEND, LONG PATTERN, (CHORIZ & VERT.)
1-CONC. BLOCK

10+57 (EMMA) (T.H.)
1-6" ⅛ BEND (BOTTOM VERT.)
1-CONC. BLOCK

10+62 (EMMA) (T.H.)
1-6" ⅛ BEND (LONG PATTERN), TOP VERT.
1-CONC. BLOCK

INSTALL 2-1" ANCHORS (H.E.Co) (TEMPORARY)

60 P

11-12" ⅛ BEND (BOTTOM VERT.)
1-CONC. BLK.

1-12" ⅛ BEND (LONG PATTERN) TOP VERT.
1-12" ⅛ BEND (LONG PATTERN) TOP VERT.
2-CONC. BLOCKS

EXISTING 12" TO REMAIN

LUSITANA STREET

WATER MAIN (SEE PROFILES FOR FITTINGS)

SECTION T/P
8-5' Transite Korduct (H.T.Co)

6'-0"
#4 TRANSV. 12" O.C.
CLASS 'B-1' CONCRETE
3" CLEAR
#5 LONGIT { 6-#5 FOR 6' WIDTH, 8-#5 FOR 8' WIDTH

CONC. MAT UNDER PIPE AT FILL GROUNDS
SCALE: ½" = 1'-0"
(SIZE OF MATS TO VARY AS DIRECTED BY ENGINEER TO MEET EXISTING CONDITIONS)

CUT ABANDON

S.M.H. INV. = 57?

FOR REINFORCEMENT SEE TEL. DUCT SHT. NO. 835

SECTION T/F
8-5' Transite Korduct (H.T.Co.)

SECTION T/G
8-5' Transite Korduct (H.T.Co.)

FOR REINFORCEMENT SEE STRUCTURE #11 DRAWINGS.

SECTION E/G
8-4½" Transite Korduct (H.E.Co.)

SECTION E/H
8-4½" Transite Korduct (H.E.Co.)

MATCH LINE 15+00

Cut & Plug S.M.H.

INSTALL ¾" ANCHOR (H.T.Co.)

H.T.Co. R.40

R/W LINE

INSTALL 1" ANCHOR (H.E.Co.)

15+92 CONSTRUCT H.T.CO. MANHOLE, TYPE 'B-T'

INSTALL 1" ANCHOR (H.E.Co) (TEMPORARY)

60 P (TEMPORARY)

INSTALL 3-4" LRB & 1-2 SRB (H.E.Co) (TEMPORARY)

INSTALL 2-4" LRB (H.E.Co) (TEMPORARY)

INSTALL 1-4" TRANSITE CONDUIT, DIRECT BURIAL (H.E.Co) (TEMPORARY) MIN. DEPTH 3' TO TOP OF DUCT.

INSTALL 1" LONG ANCHOR, L=60"± (H.E.Co) (TEMPORARY)

55 P (TEMPORARY)

Exist. EMH #455

INSET - "A"
Scale: 1"=20'

G²₄ FT. WIDE REINF. SLAB (8") UNDER PIPE IN FILL AREA TO PROVIDE EXTRA BEARING. ALSO USE 6" SAND CUSHION UNDER PIPE. (USE #4 REINF. 12" O.C. BOTH WAYS FOR SLAB) (SEE DETAIL THIS SHEET)

H.E. & H.T.Co. Lines Revised in 5th ₱ See Plans for Change Order #32 Sheet 82-B, 82-A.

RELOCATE 8"-48" TYP. IN BRIDGE DECK

RELOCATE BY OTHERS

INSTALL 8-48" TYP. 0.44" THICK A PATTERN C.I. PIPE, GAS LINES BY THE HONOLULU GAS CO., LTD.

STRUCTURE #9

QUEEN EMMA ST.

UTILITY BOX STRUCTURE #9

INSTALLATION OF 2" AND 6" GAS LINES

NOTE:
FOR LOCATION & DETAILS OF UTILITIES RELOCATED ON BRIDGE SEE STRUCT. #9 DRAWINGS, SHT. NOS. [215] TO [225] INCL.

LINES GE, GG, & NG ARE ABOVE TC AND LAID IN BRACKETS

GO P (TEMPORARY)

TELEPHONE DUCTS ENCASED IN REINF. CONC. JACKET

RET. WALL #24

DEMOLISH EXIST. H.T.CO. MANHOLE

NEW R/W LINE

12+98 ± (EMMA) (T.H.)
1-6" ⅛ BEND
1-CONC. BLOCK

13+03 ± (EMMA) (T.H.)
1-6" OFFSET 24" DROP, B.S.
1-CONC. BLOCK

3.2± FT. MINIMUM COVER REQUIRED

13+55 ± (EMMA) (T.H.)
1-6" ⅛ BEND L.R.
1-6" SLEEVE, 15" LONG
1-CONC. BLOCK
80 LIN. FT. OF 6" C.I. PIPE, A21.1 DESIGN.

SEE INSET "A" THIS SHEET

NOTE:
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

APPROVED:

A.H. SEWER SYSTEM SUPT. — DATE 12-27-57

PRINCPL. ELEC. ENGR., H.E.CO., LTD. — DATE

DISTR. ENGR., H.E.CO., LTD. — DATE 11/13/57

PLANT ENG'G. SUPV., H.T.CO., LTD. — DATE 1-13-58

MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE 1-20-58

DIVISION ENGINEER — DATE 1-20-58

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY

PROJECT NO. F-072-1 (1), UNIT 3

STATION 148+00 TO STATION 154+00

UTILITIES

SCALE: 1"=20'

SEPTEMBER, 1957.

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER
No. 584
DATE July 2, 1957

SHEET No. 5 OF 8 SHEETS

ORIGINAL PLAN — DRAWING PLOTTED BY — DATE 5-24-57
DRAWN BY — 5-24-57
TRACED BY — 5-24-57
NOTE BOOK — QUANTITIES BY — 10-15-57
No. — QUANTITIES CHECKED BY
CHECKED BY

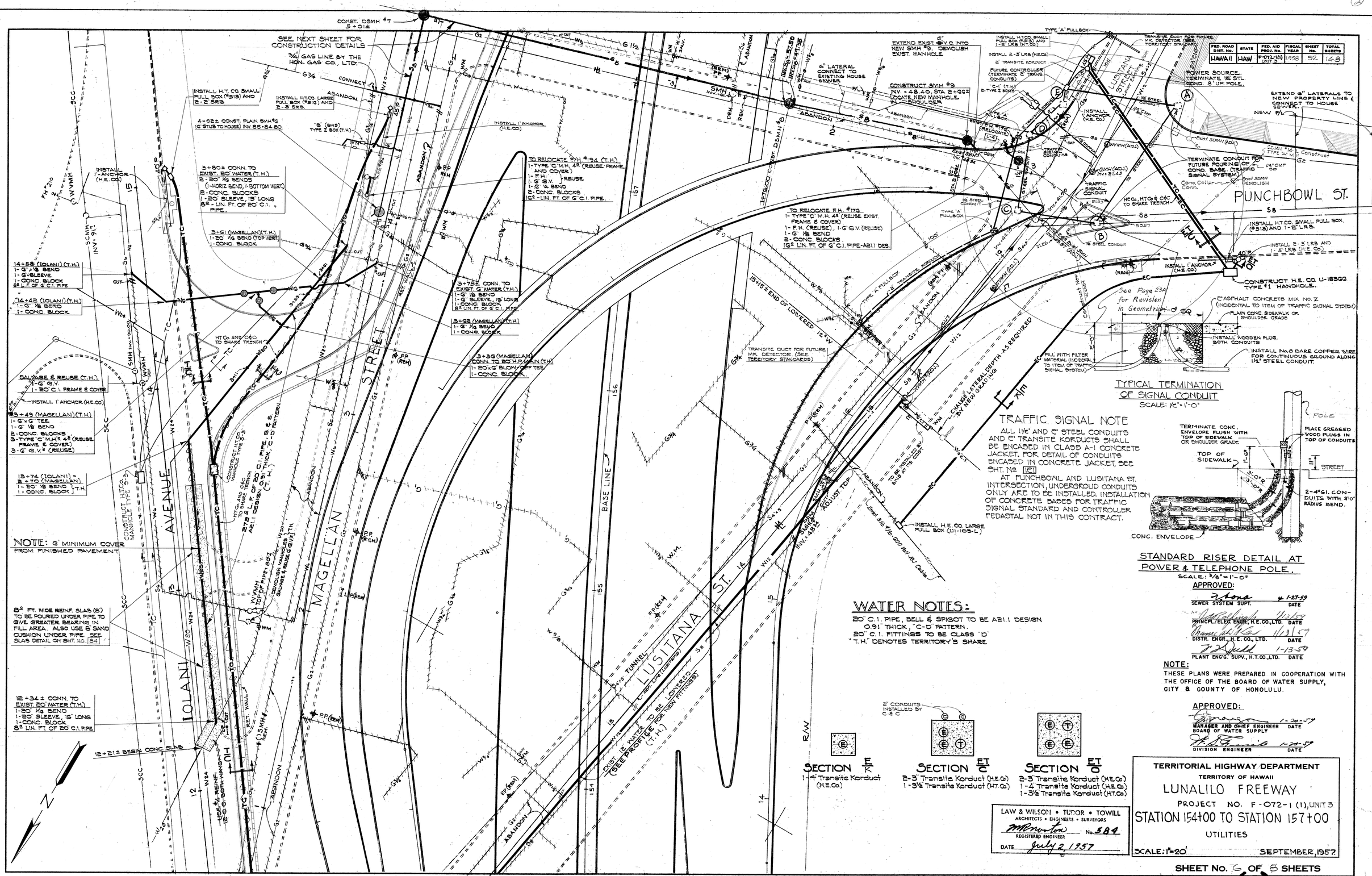
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41

(2)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW	F-072-1(1) UNIT 3	1958	52	148



TYPICAL TERMINATION OF SIGNAL CONDUIT

SCALE: ½"=1'-0"

TRAFFIC SIGNAL NOTE

ALL 1½" AND 6" STEEL CONDUITS AND 6" TRANSITE KORDUCTS SHALL BE ENCASED IN CLASS A-1 CONCRETE JACKET. FOR DETAIL OF CONDUITS ENCASED IN CONCRETE JACKET, SEE SHT. No. 61

AT PUNCHBOWL AND LUSITANA ST. INTERSECTION, UNDERGROUND CONDUITS ONLY ARE TO BE INSTALLED. INSTALLATION OF CONCRETE BASES FOR TRAFFIC SIGNAL STANDARD AND CONTROLLER PEDASTAL NOT IN THIS CONTRACT.

STANDARD RISER DETAIL AT POWER & TELEPHONE POLE.

SCALE: 3/8"=1'-0"

WATER NOTES:

20" C.I. PIPE, BELL & SPIGOT TO BE A21.1 DESIGN 0.91" THICK, "C-D" PATTERN.
20" C.I. FITTINGS TO BE CLASS "D"
"T.H." DENOTES TERRITORY'S SHARE

2" CONDUITS INSTALLED BY C&C

SECTION E — 1-4" Transite Korduct (H.E.Co)

SECTION ET C — 2-3" Transite Korduct (H.E.Co) 1-3½ Transite Korduct (H.T.Co)

SECTION ET D — 2-3" Transite Korduct (H.E.Co) 1-4" Transite Korduct (H.E.Co) 1-3½ Transite Korduct (H.T.Co)

APPROVED:

SEWER SYSTEM SUPT.	DATE 4-27-59
PRINCPL./ELEC. ENGR., H.E.CO.,LTD.	DATE 4-30-59
DISTR. ENGR., H.E. CO., LTD.	DATE 4/23/59
PLANT ENG'G. SUPV., H.T.CO.,LTD.	DATE 1-13-59

NOTE:
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

APPROVED:

MANAGER AND CHIEF ENGINEER BOARD OF WATER SUPPLY	DATE 1-20-59
DIVISION ENGINEER	DATE 1-20-59

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY: AOG	
DESIGNED BY: AOG	
DRAWN BY: AOG	4-15-57
TRACED BY:	4-16-57
QUANTITIES BY:	9-12-57
NOTE BOOK:	
QUANTITIES CHECKED BY:	
No.	

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER No. 584
DATE July 2, 1957

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
LUNALILO FREEWAY
PROJECT NO. F-072-1 (1), UNIT 3
STATION 154+00 TO STATION 157+00
UTILITIES
SCALE: 1"=20' SEPTEMBER, 1957

SHEET No. 6 OF 8 SHEETS

.8173(1).52 85

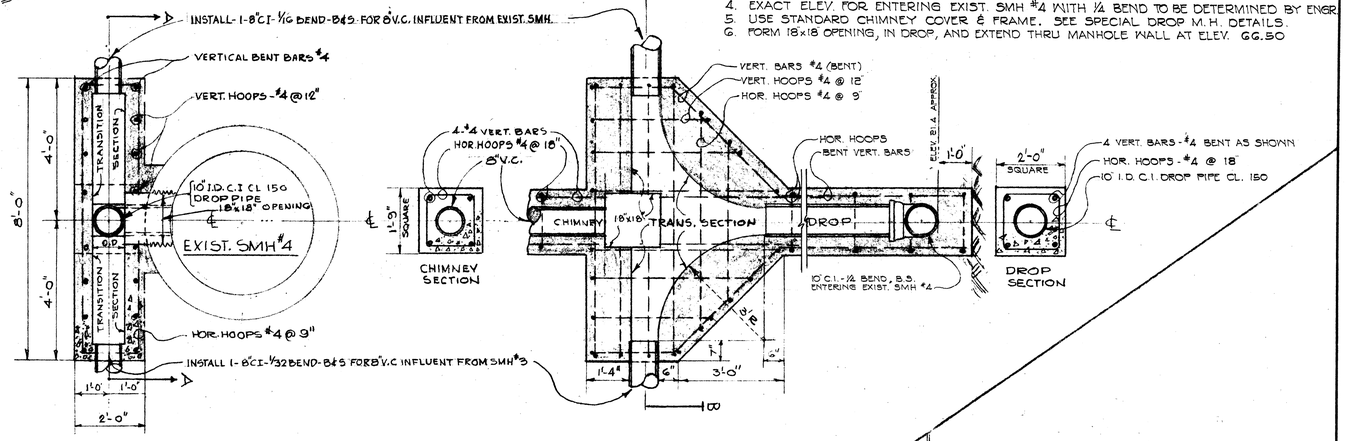
PRINTED ON DIEPO 1000H CLEARPRINT

42

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	F-072-1(1) UNIT 3	1958	53	148

NOTE:

1. CONCRETE: CL "B-1"
2. COVER OVER REINF. STEEL - 2" MIN.
3. BUTT WELD ALL HOOPS OR SPLICE 24 DIAMETERS
4. EXACT ELEV. FOR ENTERING EXIST. SMH #4 WITH ¼ BEND TO BE DETERMINED BY ENGR.
5. USE STANDARD CHIMNEY COVER & FRAME. SEE SPECIAL DROP M.H. DETAILS.
6. FORM 18"x18" OPENING, IN DROP, AND EXTEND THRU MANHOLE WALL AT ELEV. 66.50



SPECIAL DROP FOR SMH #4 SCALE: ½"-1' (BASED ON SPECIAL DROP M.H.)

END OF PROJ. NO. F-072-1(1), UNIT 3
℄ STA 159+20

NOTE:
SEE PRECEDING SHEET FOR RELOCATION OF WATER & GAS LINES AND NEW TEL. AND ELEC. CONDUITS.

KAMAMALU

IOLANI AVENUE

MAGELLAN

7 STREET

PELE ST.

RAMP "G"

PIONEER ST.

BASE LINE

REPLACE EXIST. 6" SEWER WITH 8" V.C. LINE REVERSING FLOW. ADJUST EXIST. HOUSE SERVICE CONNECTIONS TO NEW GRADIENT.

4+08.00 CONST. PLAIN SMH OVER EXIST. SEWER INV. 8'S = 84.85 77.70

INSTALL 6" LATERAL

CONNECT

SMH #6 Rim FH"194

SMH #7

5+01.00 CONST. DSMH OVER EXIST. SEWER INV. OUTLET = 68.05 (TOP = 84.62) INV. INLETS = 78.62

0+00 PIONEER INV. = 77.70

SMH INV.= 79.00 Existing curb ADJ.

SMH INV.= 83.82

0+00 PELE

¾" GAS LINE BY THE HON. GAS CO., LTD.

A.C. ROLL CURB

RETAINING WALL #87

PP (REM)

2 WM

JACKET UNDER AND 1' BEYOND FOOTING

EXIST. CURB

ABANDON EXISTING GAS

ABANDON EXIST. 6" SEWER

OPENING THROUGH RET. WALL SEE DETAIL SHT. NO. 121d

INSTALL 1-12"C.I. SLEEVE-10' LONG

RETAINING WALL #3

14'6.0" CONST. DSMH #8 INV. INLET = 57.50 INV. OUTLET = 49.35

ABANDON

SEE PRECEDING SHEET

SMH (REM) INV. = 61.2

ABANDON

SMH (REM) INV. = 65.9

CUT & CAP AT LAST SERVICE

EXIST. WVMH

EXIST. SMH Rim 78.9

INSTALL ⅝" ANCHOR (H.T. CO.)

INSTALL 1" ANCHOR (H.E. CO.)

EXIST. POLE TO REMAIN

APPROVED:

SEWER SYSTEM SUPT. — DATE 1-27-59

PRINCPL. ELEC. ENGR., H.E.CO., LTD. — DATE 1/13/59

DISTR. ENGR., H.E.CO., LTD. — DATE 1/13/59

PLANT ENG'G. SUPV., H.T.CO., LTD. — DATE 1-13-59

NOTE:
THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY AND COUNTY OF HONOLULU.

APPROVED:

MANAGER - AND CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE 1-20-59

DIVISION ENGINEER — DATE 1-20-59

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER No. 584
DATE July 2, 1957

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 2-26-57
	DESIGNED BY: ROG	
	DRAWN BY: ROG	
	TRACED BY: ROG	
NOTE BOOK	QUANTITIES BY:	
No.	QUANTITIES CHECKED BY:	
	CHECKED BY:	

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY

PROJECT NO. F-072-1 (1), UNIT 3

STATION 156+00 TO STATION 162+00

UTILITIES

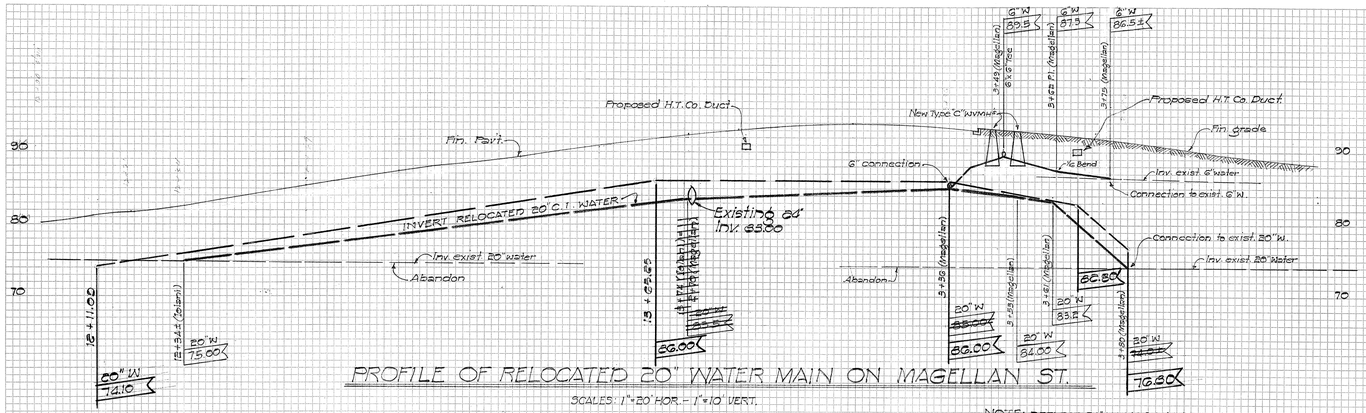
SCALE: 1"=20' SEPTEMBER, 1957

SHEET No. 7 OF 8 SHEETS

.S173 (1).53 86

PRINTED ON DIEPO 1000H CLEARPRINT

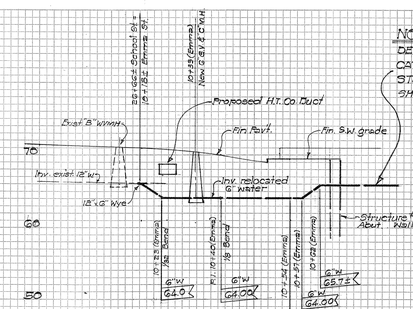
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(11) UNIT 3	1958	54	148



PROFILE OF RELOCATED 20" WATER MAIN ON MAGELLAN ST.

SCALES: 1"=20' HOR. - 1"=10' VERT.

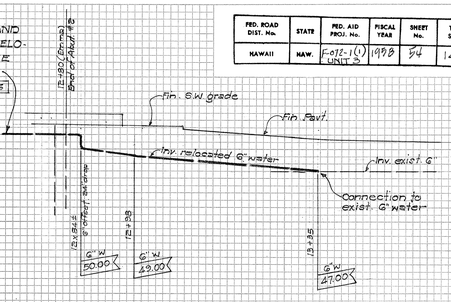
NOTE: DEFLECT 20" MAIN TO MAINTAIN A MINIMUM COVER OF 6'. SEE UTILITY SHEET NO. 83



NOTE: FOR LOCATION AND DETAILS OF UTILITES RELOCATED ON BRIDGE, SEE STRUCT. #9 DRAWINGS, SHT. NOS. 215 TO 225

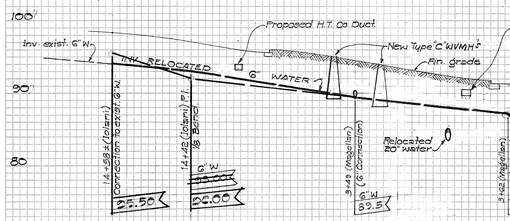
PROFILE OF RELOCATED 6" WATER
NORTH END OF STRUCTURE #9

SCALE: 1"=20' HOR. - 1"=10' VERT.



PROFILE OF RELOCATED 6" WATER
SOUTH END OF STRUCTURE #9

SCALE: 1"=20' HOR. - 1"=10' VERT.

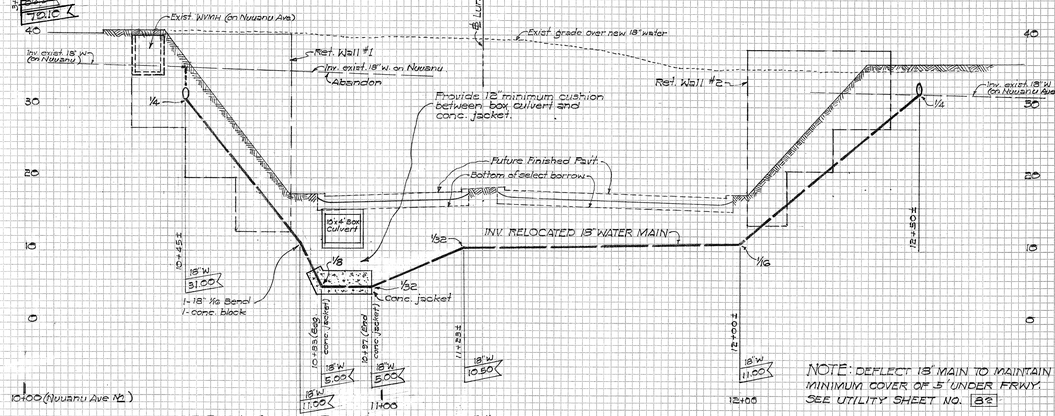


PROFILE OF RELOCATED 6" WATER MAIN ON MAGELLAN ST.

SCALES: 1"=20' HOR. - 1"=10' VERT.

(SEE UTILITY SHT. NO. 85)

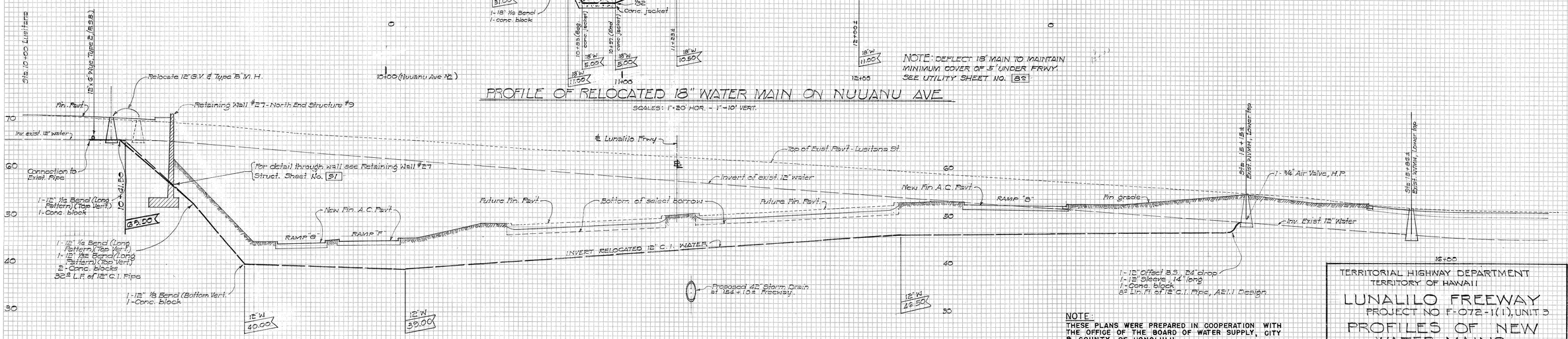
NOTE: PROFILE OF WATER MAINS SHOWN TO BE VERIFIED IN FIELD PRIOR TO EXCAVATION SUCH THAT THE CAST IRON MAINS WILL HAVE SUFFICIENT COVER.



NOTE: DEFLECT 18" MAIN TO MAINTAIN MINIMUM COVER OF 5' UNDER FRWY. SEE UTILITY SHEET NO. 82

PROFILE OF RELOCATED 18" WATER MAIN ON NUUANU AVE.

SCALES: 1"=20' HOR. - 1"=10' VERT.



NOTE: DEFLECT 12" MAIN TO MAINTAIN A MINIMUM COVER OF 5' SEE UTILITY SHEET NOS. 84 & 85

PROFILE OF LOWERED 12" WATER MAIN ON LUSITANA ST.

SCALES: 1"=20' HOR. - 1"=10' VERT.

(BASED ON MINIMUM COVER OF 5')

10+00 (LUSITANA ST. STATIONS) 11+00 12+00 13+00 14+00

NOTE: THESE PLANS WERE PREPARED IN COOPERATION WITH THE OFFICE OF THE BOARD OF WATER SUPPLY, CITY & COUNTY OF HONOLULU.

APPROVED:

MANAGER AND CHIEF ENGINEER, BOARD OF WATER SUPPLY — DATE 1-20-59

DIVISION ENGINEER — DATE 1-20-59

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY
PROJECT NO F-072-1(11), UNIT 3

PROFILES OF NEW WATER MAINS UTILITIES

SCALE: AS NOTED — OCT. 1958

SHEET NO. 5 OF 8 SHEETS

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

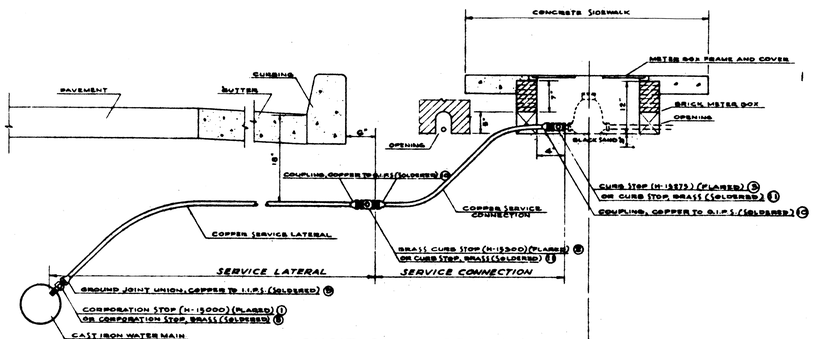
PLATE 3 CROSS SECTION O. P. R. & R. E. STANDARD
100% RAG PAPER-MADE AND PRINTED IN U. S. A.
EUGENE DIETZGEN CO.

.S173(1).54 87

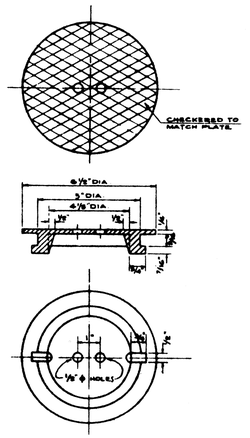
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1) UNIT 3	1958	55	148

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-061-1(6) UNIT 4	1958	42	148

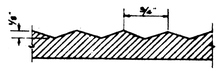
Revised 5-12-58



LONGITUDINAL SECTION

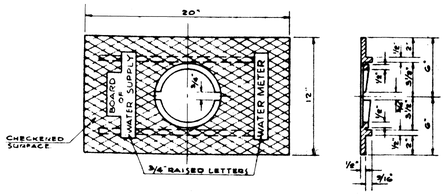


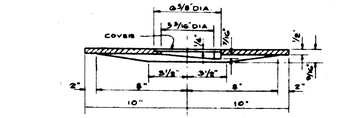
READING COVER



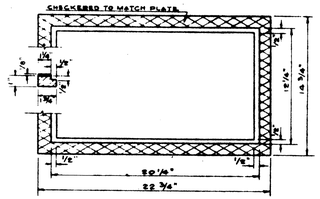
CHECKERED PATTERN

CAST IRON COVER FOR TYPE I & TYPE II FRAMES



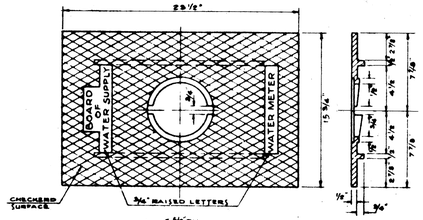


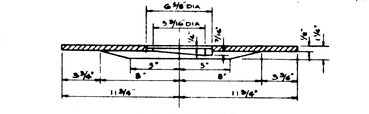
COVER PLATE



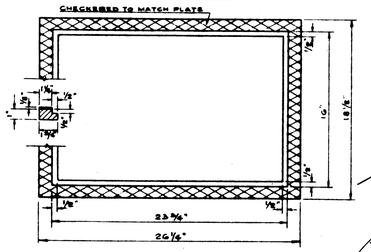
FRAME

CAST IRON FRAME AND PLATE TYPE I



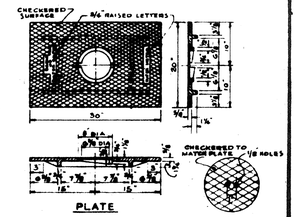


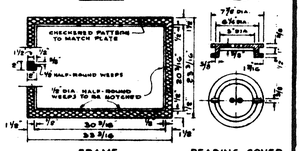
COVER PLATE



FRAME

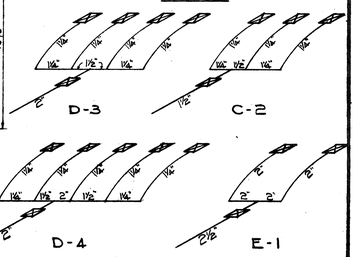
CAST IRON FRAME AND PLATE TYPE II

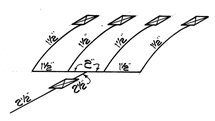


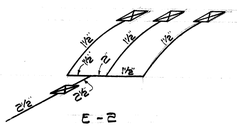


FRAME READING COVER

CAST IRON FRAME, PLATE & COVER TYPE III

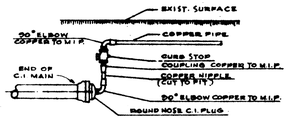








FLARED JOINT



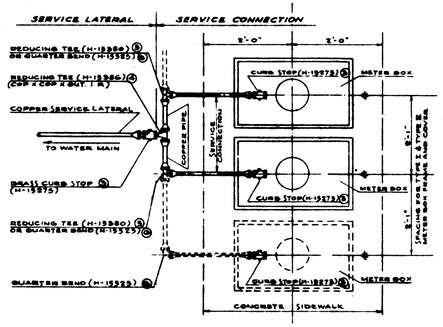
SOLDERED JOINT

SERVICE LATERAL CONNECTION AT END OF LINE

SCHEDULE OF COPPER FITTINGS (FLARED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN	MULTIPLE SERV CONN TWO SERVICES	MULTIPLE SERV CONN THREE SERVICES
1	CORPORATION STOP WITH STRAIGHT COUPLING NUT (H-15000)	1	1	1
2	BRASS CURB STOP (H-15300)	1	–	–
3	CURB STOP WITH TUBE NUT COPPER TO INSIDE I.P. (H-15273)	1	2	3
4	REDUCING TEE WITH TUBE NUTS - COPPER TO COPPER TO OUTSIDE I.P. (H-15386)	–	1	1
5	REDUCING TEES WITH TUBE NUTS - COPPER TO COPPER TO COPPER. (H-15380)	–	–	1
6	1/8 BEND UNION COUPLING WITH TUBE NUTS - COPPER TO COPPER (H-15323)	–	2	2
7	THREE PART UNION COUPLING (H-15400) OR SOLDER COUPLING.	TO BE USED IN SPLICING ODD LENGTHS OF COPPER PIPE.		

NOTE:
REFERENCE NUMBERS SHOWN ARE FROM MUELLER CATALOG "H" FOR PURPOSES OF IDENTIFYING FITTINGS. APPROVED EQUAL MAY BE USED.

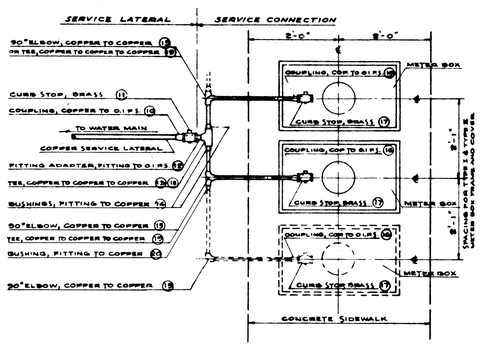


MULTIPLE SERVICE CONNECTION FLARED JOINTS

SCHEDULE OF COPPER FITTINGS (SOLDERED JOINT)

ITEM NO.	DESCRIPTION	SINGLE SERVICE CONN.	MULTIPLE SERV CONN TWO SERVICES	MULTIPLE SERV CONN THREE SERVICES
8	CORPORATION STOP, BRASS (H-15000)	1	1	1
9	GROUND JOINT UNION (A-11466 TO COPPER TO I.I.P.S. (A-11467)	1	1	1
10	COUPLING, COPPER TO G.I.P.S. (A-1533 TO A-1678)	2	1	1
11	CURB STOP, BRASS (B.W.S. STANDARD)	1	1	1
12	FITTING ADAPTER, (A-1533 TO FITTING TO G.I.P.S. (A-1676	–	1	1
13	TEE, COPPER TO COPPER (A-1566 TO A-2710)	–	1	1
14	BUSHINGS, FITTING TO COPPER (W-1342 TO W-1568)	–	2	2
15	90° ELBOW, COPPER TO COPPER (A-1557 TO A-2782)	–	2	2
16	COUPLING, COPPER TO G.I.P.S. (A-1533 TO A-1672)	1	2	3
17	CURB STOP, BRASS (B.W.S. STANDARD)	1	2	3
18	REDUCING TEE, COPPER TO COPPER TO COPPER (SUBSTITUTE FOR ITEMS NUMBER 13 & 14). (A-1566 TO A-2710)	–	1	1
19	TEE, COPPER TO COPPER TO COPPER (A-1566 TO A-2710)	–	–	1
20	BUSHING, FITTING TO COPPER (W-1342 TO W-1568)	–	–	1
21	REDUCING TEE, COPPER TO COPPER TO COPPER (SUBSTITUTE FOR ITEMS NUMBER 13 & 20 (A-1566 TO A-2710)	–	–	1

NOTE:
REFERENCE NUMBERS SHOWN ARE FROM MUELLER CATALOG "H" FOR PURPOSES OF IDENTIFYING FITTINGS. APPROVED EQUAL MAY BE USED.



MULTIPLE SERVICE CONNECTION SOLDERED JOINTS

NOTE:
USE OF COPPER PIPE AND FITTINGS WITH "SOLDERED" JOINTS OPTIONAL UNTIL FURTHER NOTICE.



TYPICAL LAYOUT OF SERVICE LATERALS AND CONNECTIONS

STANDARD DETAILS

COPPER SERVICE LATERALS AND CONNECTIONS

C. I. METER BOX FRAME AND COVER

DRAWN BY	R O
TRACED BY	R O
CHECKED BY	T I
ENGINEER	T I
DRAWING NO	

APPROVED _____ MANAGER AND CHIEF ENGINEER

FILE 2

SCALE: DATE: Jan. 27, 1953

POCKET	FOLDER	NO.
8		24 b

BOARD OF WATER SUPPLY
HONOLULU, T. H.

SHEET 1 OF 2 SHEETS

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY ····· PROJ. NO. F-072-1(1) UNIT 3
NUUANU HIGHWAY ····· PROJ. NO. BU-061-1(6) UNIT 4

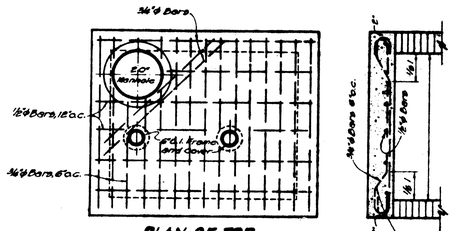
SCALE: AS NOTED

.S173(1).55 .S146(2).42 92

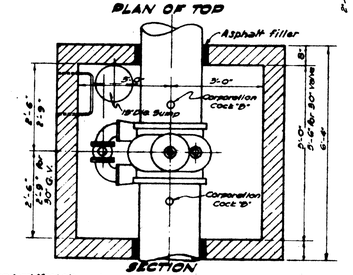
33

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-061-1(6) UNIT 4	1958	43	148

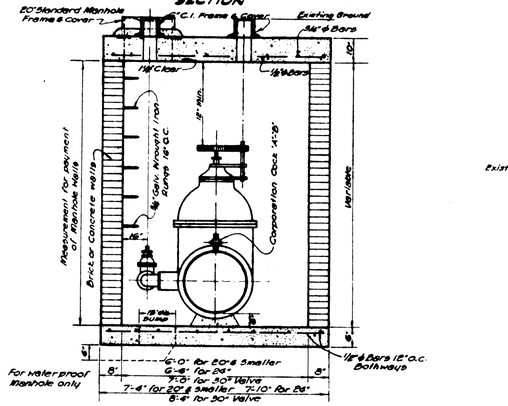
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1) UNIT 3	1958	56	148



PLAN OF TOP



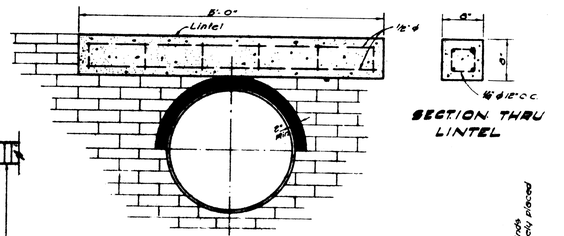
SECTION



SECTION

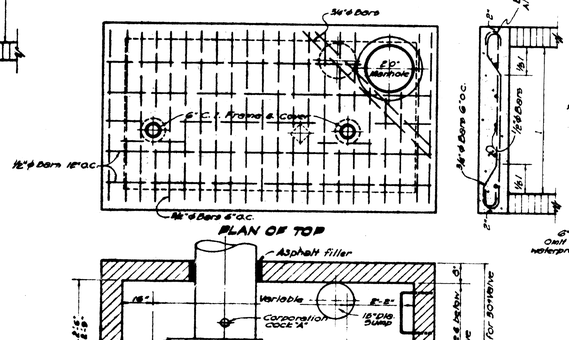
BAR BENDING DETAIL

TYPE "A" MANHOLE
FOR SPUR-GEARED GATE VALVES

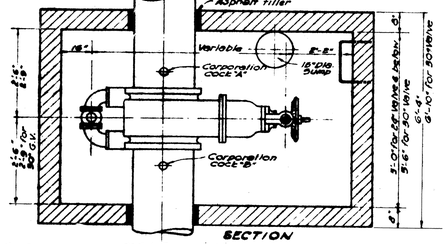


DETAIL OF LINTEL & ASPHALT FILLER

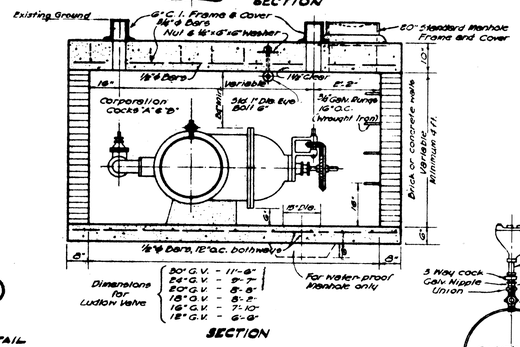
SECTION THRU LINTEL



PLAN OF TOP

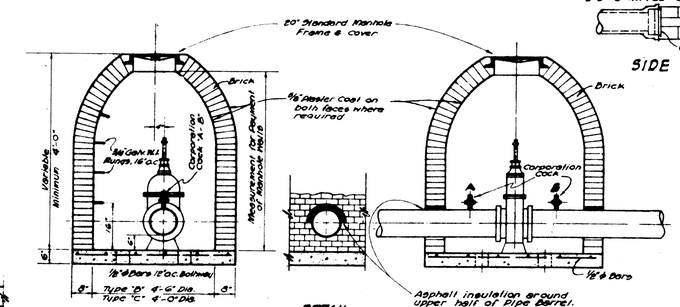


SECTION



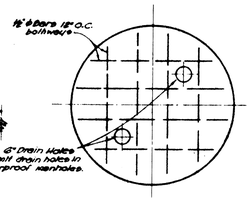
SECTION

TYPE "A" MANHOLE
FOR BEVEL GEARED GATE VALVES



SECTION A-A

DETAIL OF ASPHALT FILLER

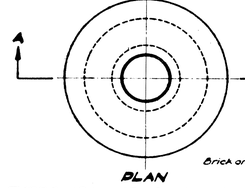


STEEL DETAIL IN BOTTOM SLAB

TABLE "A"

REQUIRED CORPORATION COCK SIZES

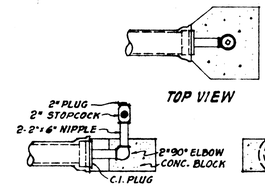
DIA. OF MAIN INCHES	INLET SIZE CORP COCK A	B
4	1"	1"
6	1"	1"
8	1"	1"
12	1"	1"
16	1"	1"
20	1"	1"
24	1½"	1"
36	1½"	1"
42	1½"	1"



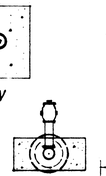
PLAN

TYPES "B" AND "C" MANHOLES
TYPE "B" 4'-6" DIA. (FOR 12" VALVE)
TYPE "C" 4'-0" DIA. (FOR 6" & 8" VALVES)

DETAIL OF RUNG

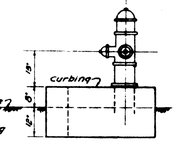


SIDE VIEW



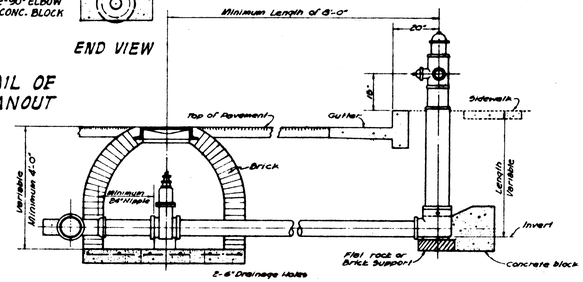
END VIEW

TOP VIEW

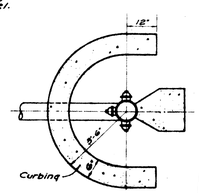


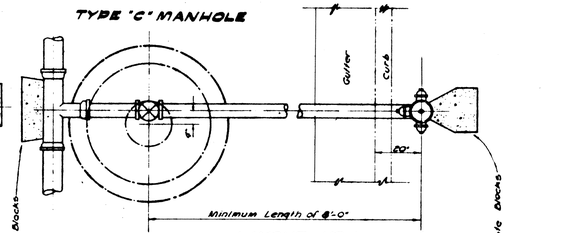
DETAIL OF CURBING AT HYDRANT WHERE REQUIRED

DETAIL OF CLEANOUT

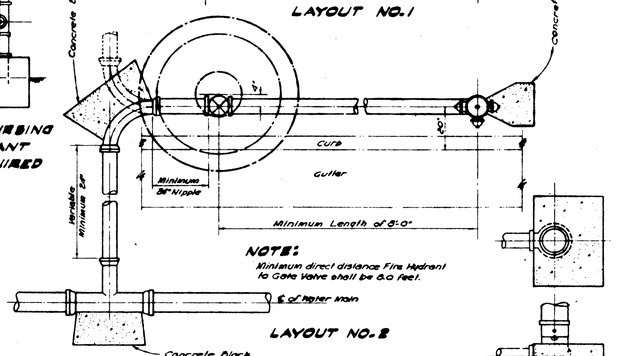


TYPE "C" MANHOLE





LAYOUT NO. 1

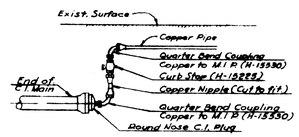


NOTE:
Minimum direct distance Fire Hydrant to Gate Valve shall be 6.0 feet.

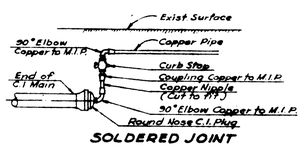
LAYOUT NO. 2

STANDARD FIRE HYDRANT LAYOUT

CONCRETE BLOCK FOR MATHEWS HYDRANT ONLY

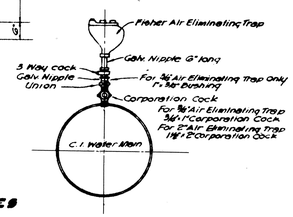


FLARED JOINT

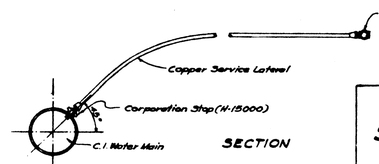


SOLDERED JOINT

SERVICE LATERAL CONNECTION AT END OF LINE



DETAIL OF CONNECTION FOR FISHER AIR ELIMINATING TRAP



SECTION

TYPICAL CONNECTION FOR COPPER SERVICE LATERALS

STANDARD DETAILS

DRAWN BY: D.A.A.
TRACED BY: P.H.
CHECKED BY: S.K.
ENGINEER: W.S.F.
DRAWING NO. 1967
FILE 1

APPROVED _____ MANAGER & CHIEF ENGINEER

SCALE: DATE: Oct. 31, 1958

POCKET	FOLDER	NO.
10	2	10

BOARD OF WATER SUPPLY
HONOLULU, T.H.

_____ Division Engineer

SHEET 2 OF 2 SHEETS

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY ..... PROJ. NO. F-072-1(1) UNIT 3
NUUANU HIGHWAY ..... PROJ. NO. BU-061-1(6) UNIT 4

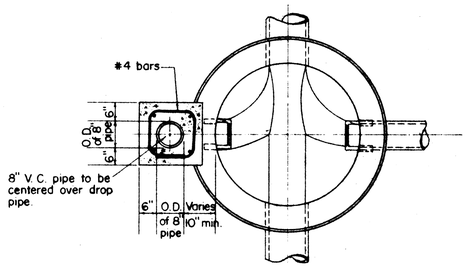
SCALE: AS NOTED

.S173(1).56 .S146(2).43 93

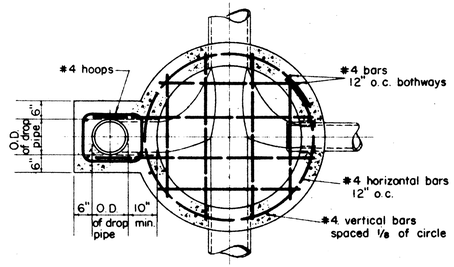
34

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-061-(6)	1958	50	148

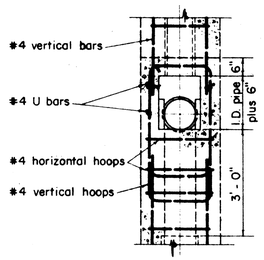
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-(1)	1958	57	148



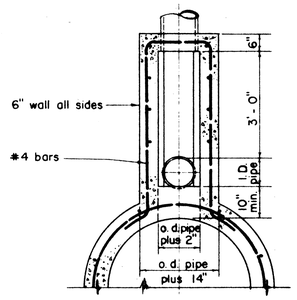
SECTION A-A



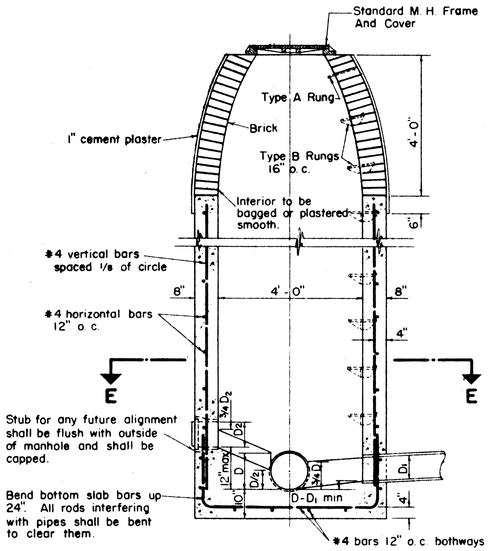
SECTION B-B



SECTION C-C

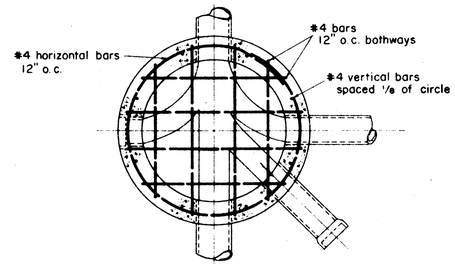


SECTION D-D



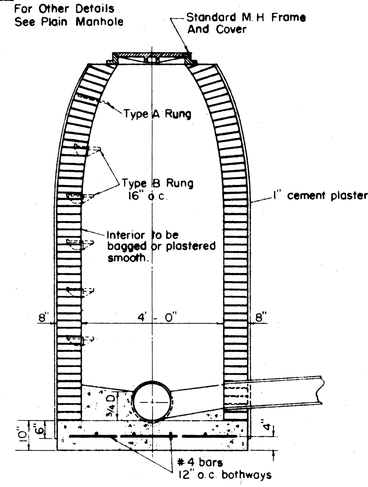
PLAIN MANHOLE

Scale 1/2" = 1'-0"



SECTION E-E

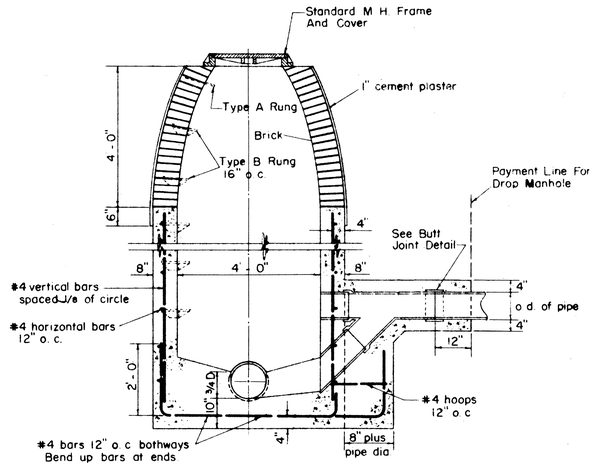
NOTE:
For Other Details See Plain Manhole



(MAXIMUM HEIGHT - 10.0 FEET)

BRICK MANHOLE

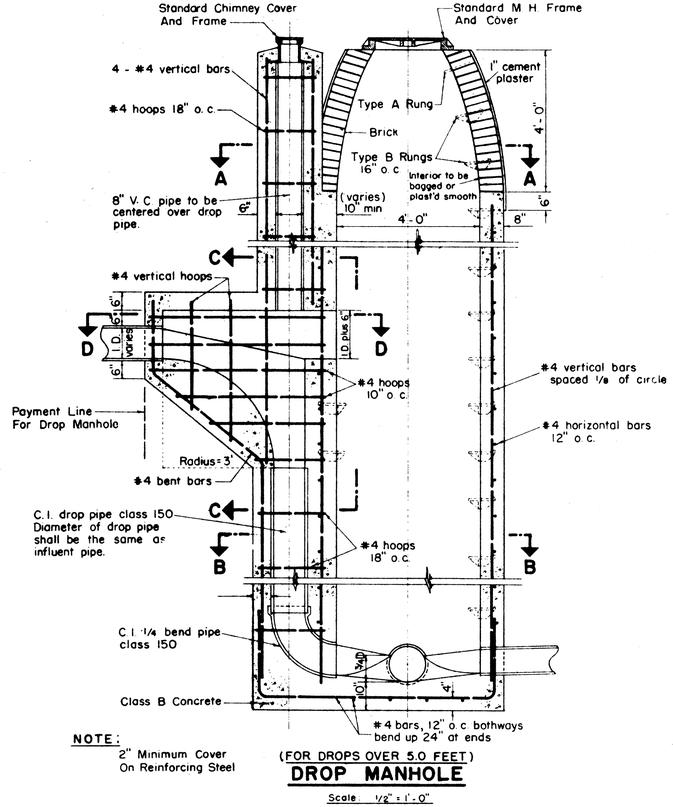
Scale 1/2" = 1'-0"



(FOR DROPS UNDER 5.0 FEET)

(SHALLOW) DROP MANHOLE

Scale 1/2" = 1'-0"



NOTE:
2" Minimum Cover On Reinforcing Steel

(FOR DROPS OVER 5.0 FEET)

DROP 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.

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.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
DIVISION OF SEWERS

REVISED
STANDARD DETAILS
(SUPERSEDES STANDARD DATED 11-1-54)

ENGINEER	A. Tengo	DATE	October 4, 1957
DRAFTSMAN	T. Yukita	CHECKED BY	H. Pinkey
SCALE	1/2" = 1'-0"	TRACER	T.Y.
APPROVED		APPROVED	
	CHIEF ENGINEER		DIVISION ENGINEER

Actg.

W. S.	PROFILE	C. S.
CR. SEC.	F. S.	B. S.
W. M. BY:	F. W. BY:	S. BY:

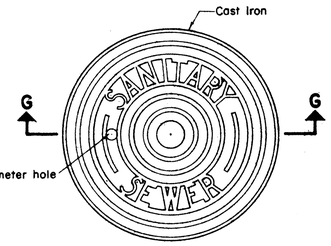
IMPERIAL TSE K & E CO., N.Y. TRADE MARK

41

.S173(1).57 .S146(2).50 100

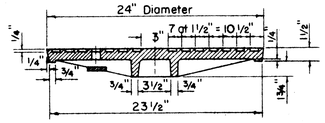
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	RU-061-(6) Unit 4	1958	51	148

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-(1) Unit 5	1958	58	148

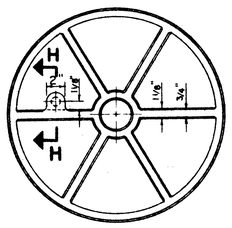


PLAN OF MANHOLE COVER

Scale: 1½" = 1'-0"

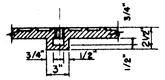


SECTION G-G

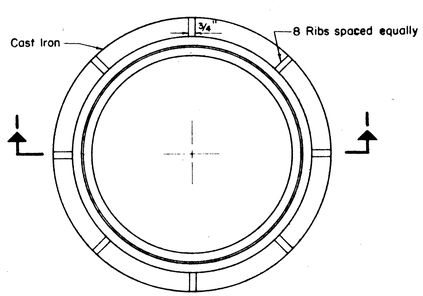


BOTTOM VIEW OF COVER

Scale: 1½" = 1'-0"

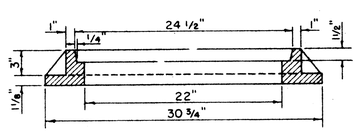


SECTION H-H



PLAN OF MANHOLE FRAME

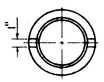
Scale: 1½" = 1'-0"



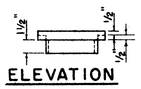
SECTION I-I



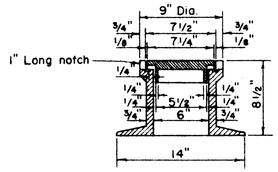
PLAN OF COVER



BOTTOM OF COVER



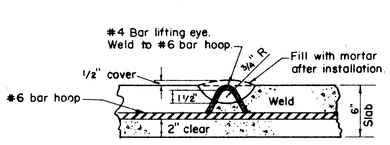
ELEVATION



SECTION

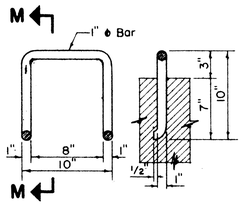
DROP MANHOLE CHIMNEY CASTINGS

Scale: 1½" = 1'-0"



SECTION OF LIFTING EYE

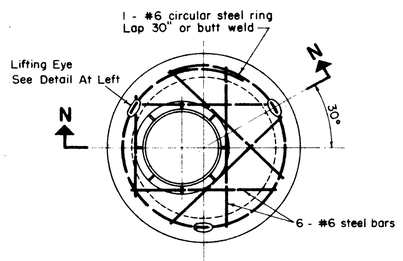
Scale: 1½" = 1'-0"



PLAN SECTION M-M

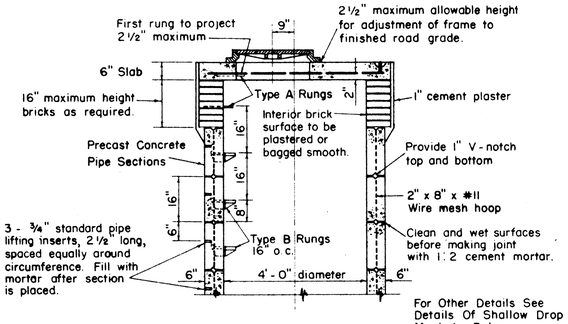
TYPE A MANHOLE RUNGS WROUGHT IRON

Scale: 1½" = 1'-0"

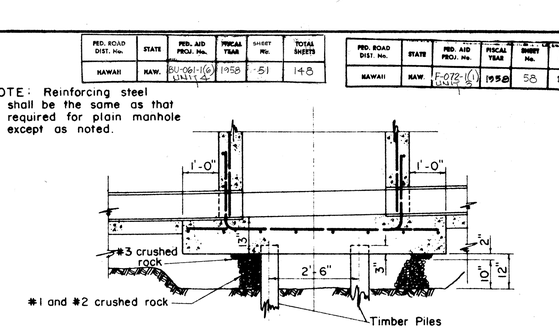


PLAN
PRECAST MANHOLE

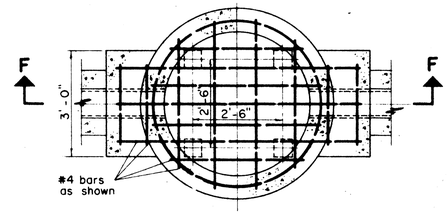
Scale: ½" = 1'-0"



SECTION N-N

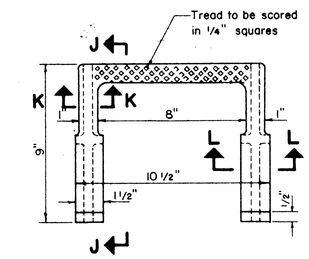


SECTION F-F

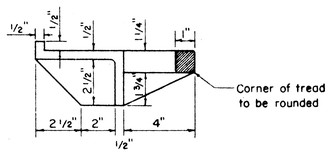


PLAN
DETAIL OF PILES UNDER MANHOLES

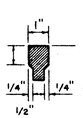
Scale: ½" = 1'-0"



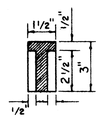
PLAN



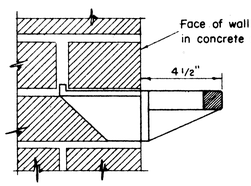
SECTION J-J



SECTION K-K



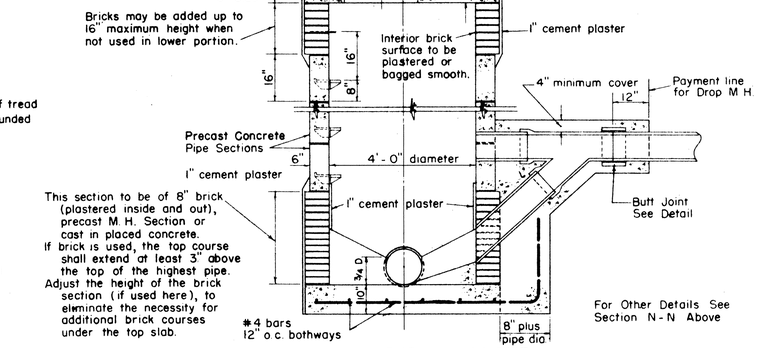
SECTION L-L



METHOD OF INSTALLATION

TYPE B MANHOLE RUNGS (CAST IRON)

Scale: 3" = 1'-0"



(MAXIMUM HEIGHT OF M. H. 10.0 FEET)
(MAXIMUM HEIGHT OF DROP 5.0 FEET)

SHALLOW DROP MANHOLE
USING PRECAST CONCRETE PIPE SECTIONS

Scale: ½" = 1'-0"

NOTE:

1. When backfilling around Precast Manhole, material shall be deposited in such a manner that the difference in elevation on one side of the manhole shall not exceed the elevation on the other side by more than 5 feet.
2. Pipe Sections may be made in heights other than 16 inches if desired.
3. Size of drop pipe shall be same as influent pipe.

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
DIVISION OF SEWERS

REVISED
STANDARD DETAILS
(SUPERSEDES STANDARD DATED 11-1-54)

ENGINEER: A. Tanji	DATE: October 4, 1957
DRAFTSMAN: T. Yasuda	CHECKED BY: W. Finley
SCALE: As Shown	TRACER: Rm
APPROVED: Acty. CHIEF ENGINEER	APPROVED: DIVISION ENGINEER

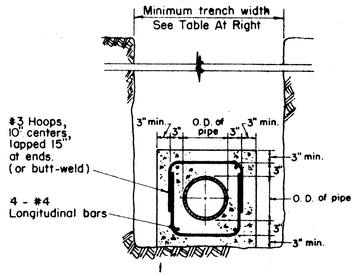
W. S.	PROFILE	C. S.
CR. SEC.	F. S.	S. S.
W. M. BY:	F. W. BY:	S. BY:

.S173(1).58 .S146(2).51 101

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

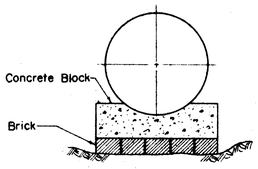
42

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	RHOOI-(6) UNIT 2	1958	52	148
HAWAII	HAW.	F-072-1(1) UNIT 2	1958	59	148



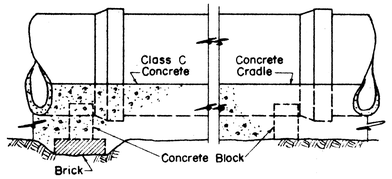
DETAIL OF CONCRETE JACKET

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



METHOD OF USING BRICKS UNDER CONCRETE BLOCKS

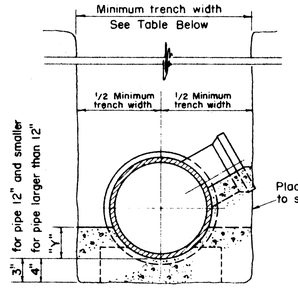
NOTE: Minimum width of cradle shall be minimum trench width.



ELEVATION SHOWING METHOD OF LAYING PIPE

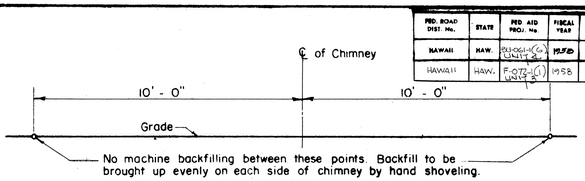
Not To Scale

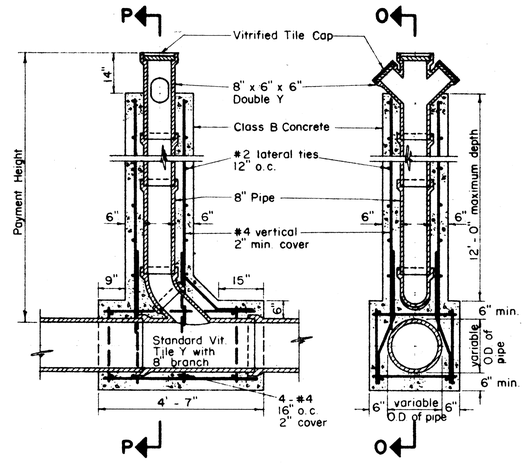
Contractor shall set Concrete Blocks on undisturbed ground. Where ground is too low, the contractor shall not heap up dirt under the Concrete Block but use Concrete Bricks to take up the deficiency, scraping away beneath Concrete Block to give sufficient room for Brick.



TRENCH WIDTHS	
Pipe Size	Min. Width
6"	24"
8"	24"
10"	24"
12"	30"
15"	30"
18"	36"
21"	36"
24"	45"
27"	45"
30"	50"

DIMENSIONS 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"



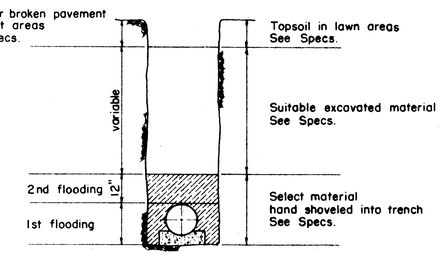


SECTION O-O SECTION P-P

DETAILS OF CHIMNEY

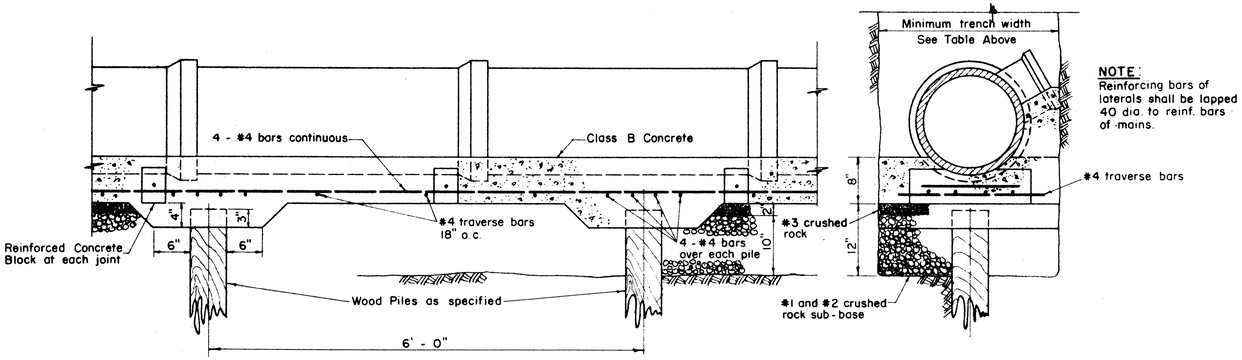
Scale: 1/2" = 1'-0"

NOTE: All Reinforcing Rods #4 Except Lateral Ties. Laps - 40 Diameters



METHOD OF BACKFILL

Not To Scale



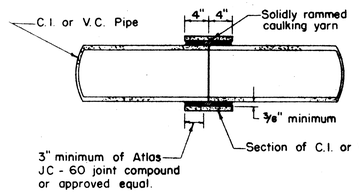
Scale: 1" = 1'-0"

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

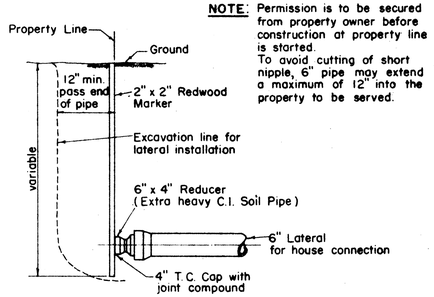
NOTE: Reinforcing bars of laterals shall be lapped 40 dia. to reinf. bars of mains.

Payment quantities for trench excavation, crushed rock fill, crushed rock cradle, and crushed rock sub-base shall be computed using minimum 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 minimum shown.



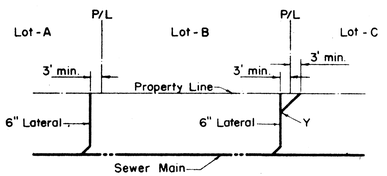
BUTT JOINT DETAIL

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.

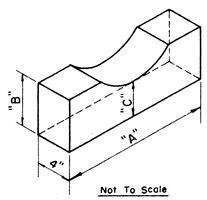
DETAIL AT PROPERTYLINE



LAYOUT

CONSTRUCTION OF LATERALS

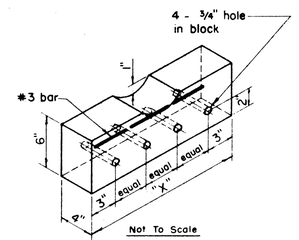
Not To Scale



Not To Scale

DETAIL OF PRECAST CONCRETE PIPE BLOCK

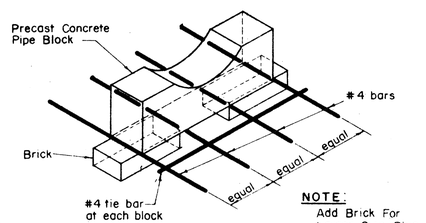
CONCRETE BLOCK DIMENSIONS			
Pipe Size	"A"	"B"	"C"
6"	1' - 2"	6"	3"
8"	1' - 5"	6"	3"
10"	1' - 7"	6"	3"
12"	1' - 7"	6"	3"
15"	1' - 8"	6"	4"
18"	1' - 9"	6"	4"
21"	1' - 10"	6"	4"
24"	1' - 11"	6"	4"
27"	2' - 0"	6"	4"
30"	2' - 3"	6"	4"



Not To Scale

DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

DIM. OF REINF. CONCRETE 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"



Not To Scale

NOTE: Add Brick For Larger Size Pipe

ALTERNATE DETAIL OF CONC. PIPE BLOCK FOR REINF. CRADLE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
DIVISION OF SEWERS

REVISED
STANDARD DETAILS
(SUPERSEDES STANDARD DATED 11-1-54)

ENGINEER: A. Tamura
DRAFTSMAN: K. Maeda
SCALE: As Shown
APPROVED: (Acting) CHIEF ENGINEER
DATE: October 4, 1957
CHECKED BY: H. F. Kelly
TRACER: T.M.
APPROVED: D. Rona DIVISION ENGINEER

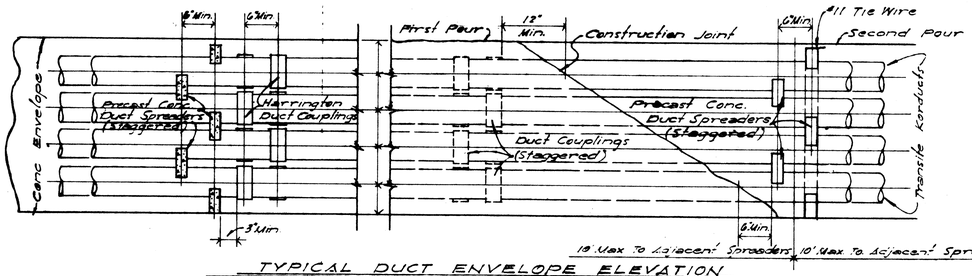
W. S.	PROFILE	C. S.
CR. SEC.	F. S.	S. S.
W. M. BY:	F. W. BY:	S. BY:

.S173(1).59 .S146(2).52 102

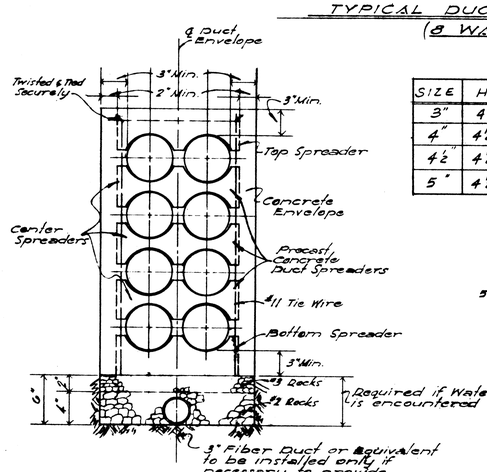
IMPERIAL TIR K & E CO., N.Y. ® TRADE MARK

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FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	RU-061-1(G) UNIT 3	1958	55	148
HAWAII	HAW.	F-072-1(1) UNIT 3	1958	60	148

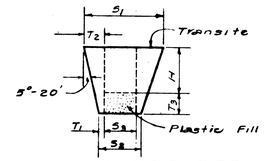


TYPICAL DUCT ENVELOPE ELEVATION
(8 WAY DUCT SHOWN)
1" = 1'-0"

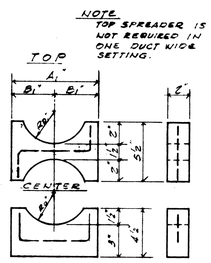


TYPICAL DUCT SPREADERS & DRAINAGE SECTION
(8 WAY DUCT SHOWN)
1½" = 1'-0"

SIZE	H	S_1	S_2	S_3	T_1	T_2	T_3
3"	4	3 3/8	2 5/8	2	5/16	11/16	3/4
4"	4½	4 57/64	3 37/64	2 3/4	13/32	27/32	3/4
4½"	4½	4 29/64	4 7/64	3	25/64	31/32	3/4
5"	4½	5 27/64	4 37/64	3½	25/64	31/32	3/4

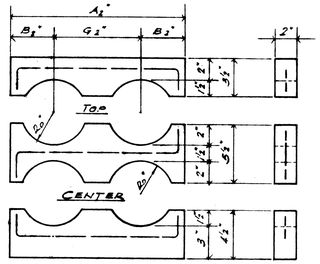


PLUGS FOR TRANSITE KORDUCTS
No Scale

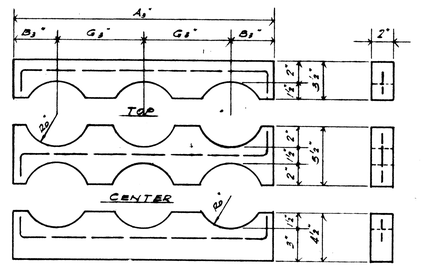


1 DUCT WIDE

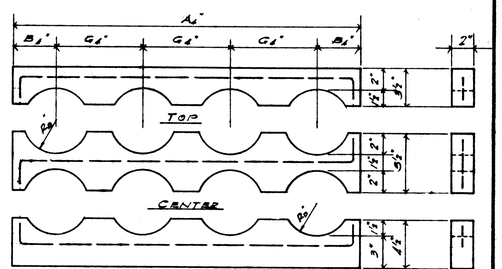
NOTE
TOP SPREADER IS NOT REQUIRED IN ONE DUCT WIDE SETTING.



2 DUCTS WIDE



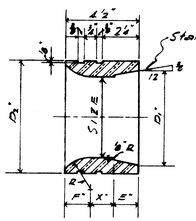
3 DUCTS WIDE



4 DUCTS WIDE

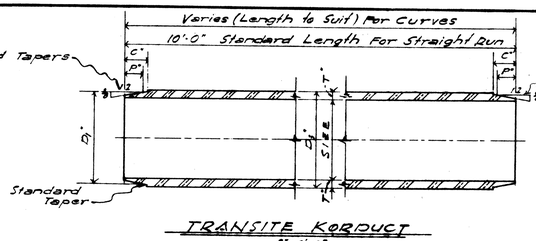
PRECAST CONCRETE DUCT SPREADER DETAILS
2" = 1'-0"

SIZE	R_0"	1 DUCT WIDE A_1"	1 DUCT WIDE B_1"	2 DUCTS WIDE A_2"	2 DUCTS WIDE B_2"	2 DUCTS WIDE G_2"	3 DUCTS WIDE A_3"	3 DUCTS WIDE B_3"	3 DUCTS WIDE G_3"	4 DUCTS WIDE A_4"	4 DUCTS WIDE B_4"	4 DUCTS WIDE G_4"
3"	2	6	3	12	3¼	5½	17½	3¼	5½	23	3¼	5½
4"	2½	7	3½	14	3¾	6½	20½	3⅜	6½	27	3⅜	6½
4½"	2½	8	4	15	4	7	22	4	7	29	4	7
5"	3	9½	4½	16	8¼	7½	23½	4¼	7½	31	4¼	7½



JUNIOR END BELLS
3¼" = 1'-0"

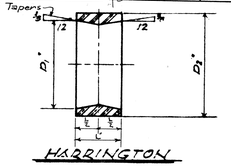
SIZE	D_1"	D_2"	F"	X"	E"	R"
3"	3 3/32	4½	1 11/32	1 3/32	1¼	1⅜
4"	4 3/32	5¼	1 7/16	1 7/16	1⅜	2
4½"	4 29/32	6¼	1 7/16	1 7/16	1⅜	2
5"	5 7/32	7	1 7/16	1 7/16	1½	2



TRANSITE KORDUCT
3"-1'-0"

STANDARD TAPERS

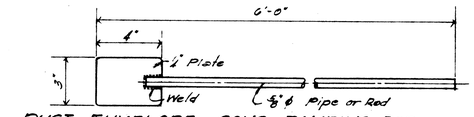
SIZE	D_1"	D_2"	C"	P"	T"
3"	3 3/32	3 3/64	1½	⅞	17/64
4"	4 3/32	4 3/64	1½	1	17/64
4½"	4 3/32	5 5/64	1½	1	17/64
5"	5 3/32	5 3/64	1 3/64	1⅛	17/64



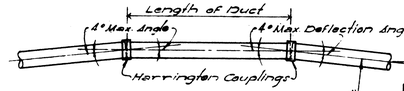
HARRINGTON COUPLINGS
3"-1'-0"

SIZE	D_1"	D_2"	L"
3"	3 3/32	4 11/64	2 7/8
4"	4 3/32	5 7/16	2 7/8
4½"	4 3/32	5 3/64	2 7/8
5"	5 3/32	6 21/64	2 7/8

NOTES: DUCT SPREADERS
Reinforcing
1-½"ϕ Bar each Spreader
Concrete Mix
One Part Cement
Two Parts Beach Sand
Two Parts Gravel ¾" (Fine)
Measurements by Weight.

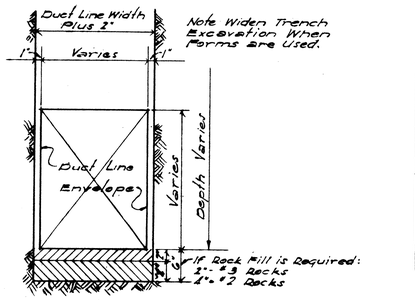


DUCT ENVELOPE CONC. TAMPING ROD
3"-1'-0"



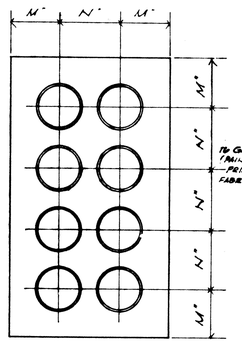
METHOD OF FORMING CURVES
2" = 1'-0"

MIN. RAD. To Form Curves Lg of Duct	MIN Rad. R_0
1'-0"	14'-4"
1'-6"	21'-6"
2'-0"	28'-8"
2'-6"	35'-10"
3'-0"	42'-11"
3'-6"	50'-1"
4'-0"	57'-3"
4'-6"	64'-5"
5'-0"	71'-7"
5'-6"	78'-9"
6'-0"	85'-11"
6'-6"	93'-1"
7'-0"	100'-3"
7'-6"	107'-5"
8'-0"	114'-7"
8'-6"	121'-8"
9'-0"	128'-10"
9'-6"	136'-0"
10'-0"	143'-2"

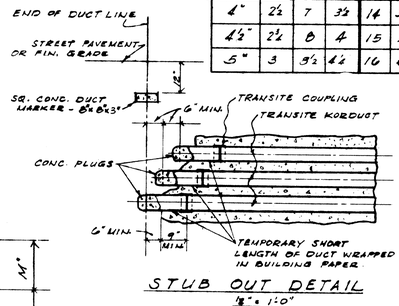


TYPICAL EXCAVATION DETAIL
N.T.S.

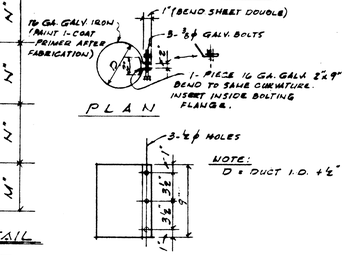
SIZE	M"	N"
3"	5	6
4"	5½	7
4½"	5½	7½
5"	6	8



TYPICAL DUCT DETAIL AT MANHOLE WALL
(8 WAY DUCT SHOWN)
1½" = 1'-0"



STUB OUT DETAIL
½" = 1:0"



3-BOLT CLAMP - DETAIL
1½" = 1:0"

REDUCED PLANS
SCALES REDUCED
ACCORDINGLY

No	Date	Revision	Init's
1	5-2-56	ADDED 3" DUCT, CENTER SPREADER FOR 1 DUCT WIDE FOR UNIT 3	R.T.
2	1-9-57	REVISED DEFLECTION ANGLE 6° TO 4°	R.Y.

Scale: As Shown | Date 2-20-56
Drawn: JP | Checked: H. M. M.
Approved: for Chief Engineer
Final Approval: C. H. Miller

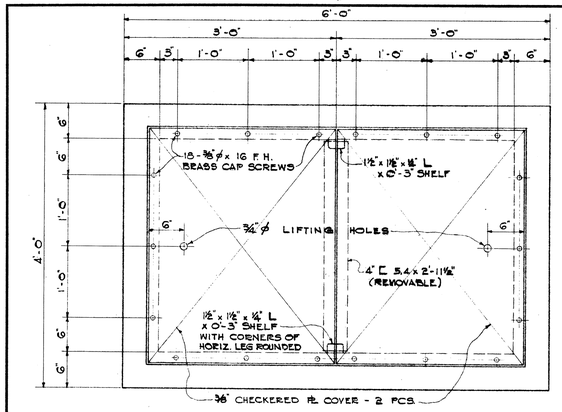
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
HAWAIIAN ELECTRIC CO.
STANDARD DETAILS
LUNALILO FREEWAY
PROJECT NO. F-072-1(1) UNIT 3
NUUANU HIGHWAY
PROJECT NO. RU-061-1(G) UNIT 4
Scale: As Noted | Feb. 28, 1958

SHEET No. OF SHEETS

CONSTRUCTION STANDARDS
TRANSITE KORDUCTS
UNDERGROUND DUCTLINES

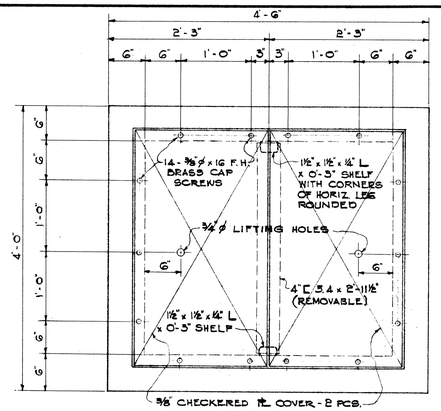
Engineering Department
The Hawaiian Electric Company, Ltd.
Honolulu, T.H.
U-18244

.S173(1).60 .S146(2).53 103



TOP PLAN

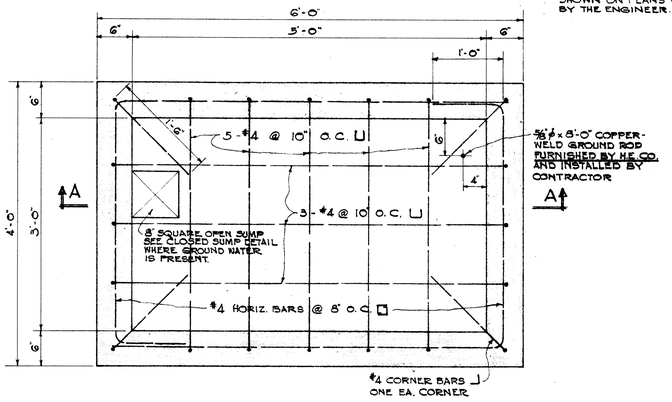
Scale: 1" = 1'-0"



TOP PLAN

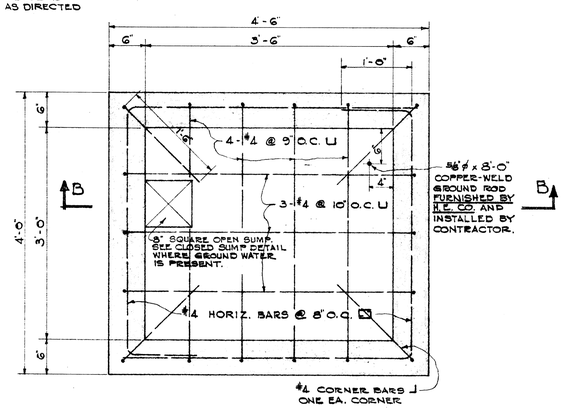
Scale: 1" = 1'-0"

NOTE:
SIZE & LOCATION OF DUCTS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.



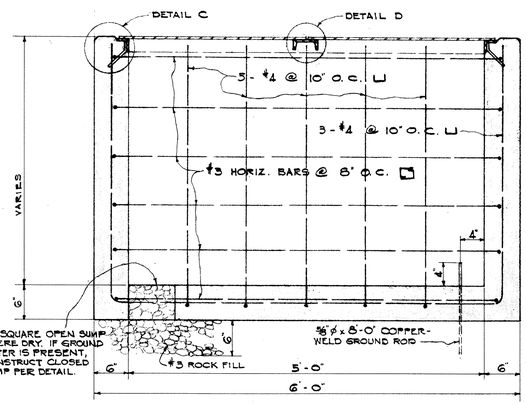
SECTIONAL PLAN

Scale: 1" = 1'-0"



SECTIONAL PLAN

Scale: 1" = 1'-0"



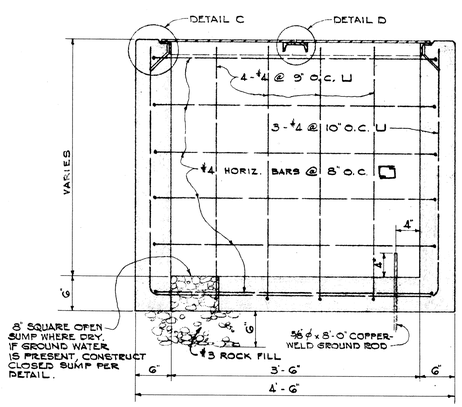
SECTION A-A

Scale: 1" = 1'-0"

U-18366

HANDHOLE TYPE #1

(3'-0" x 5'-0" INSIDE)



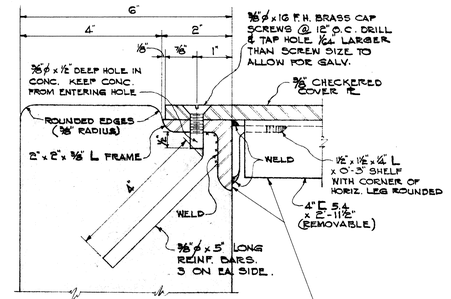
SECTION B-B

Scale: 1" = 1'-0"

U-18366

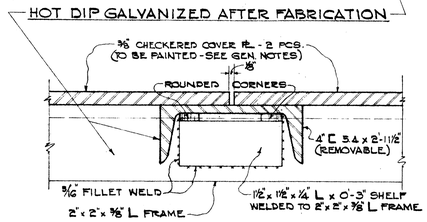
HANDHOLE TYPE #2

(3'-0" x 3'-6" INSIDE)



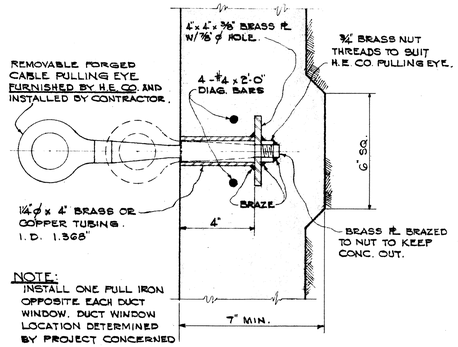
DETAIL C

½ SIZE.



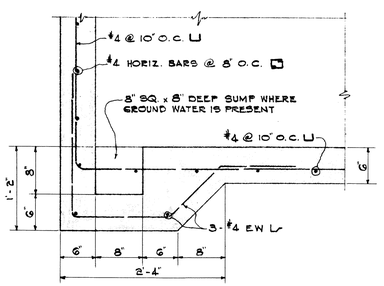
DETAIL D

½ SIZE.



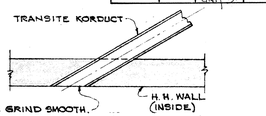
PULL IRON DETAIL

Scale: 3" = 1'-0"

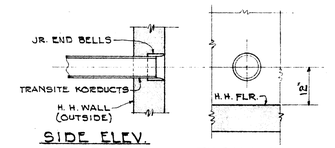


DETAIL OF CLOSED SUMP

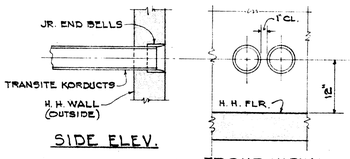
Scale: 1" = 1'-0"



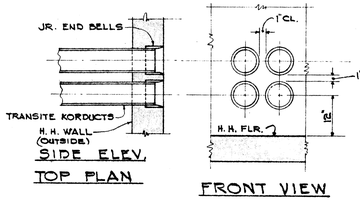
DIAGONAL ENTRANCE



1 - DUCT



2 - DUCTS



4 - DUCTS

DUCT ENTRANCE DETAILS

NOT TO SCALE.

NOTE:
SIZE & LOCATION OF DUCTS AS SHOWN ON PLANS OR AS DIRECTED BY THE ENGINEER.

GENERAL NOTES:

1 - CONCRETE FINISH:
FLOORS - SMOOTH METAL TROWELLED.
EXPOSED WALL SURFACES & EDGES - SMOOTH AND FREE FROM DEFECTS.
2 - CONCRETE TO DEVELOP COMPRESSIVE STRENGTH OF 3000 P.S.I. IN 28 DAYS.
3 - FINISH STEEL WORK AS FOLLOWS:
A. 2" ANGLE FRAME & 4" CHANNEL TO BE HOT DIP GALVANIZED AFTER FABRICATION. SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
B. 3/8" CHECKERED PL COVERS ~~TO BE THOROUGHLY CLEANED AND~~ (SEE ADD 3/10/59) ~~GIVEN ONE BASE COAT OF "QUIGLEY'S TRIPLE A NS-10 AND" 2~~ ~~ONE FINISH COAT OF "QUIGLEY'S TRIPLE A NS-20".~~
4 - FOR DUCT LINE CONSTRUCTION STANDARDS, SEE H.E. CO. DWG. U-18244
5 - THESE HANDHOLES ARE DESIGNED FOR INSTALLATION IN AREAS OTHER THAN ROADWAYS.
6 - CONTRACTOR TO FURNISH & INSTALL ALL MATERIALS FOR HANDHOLE EXCEPT ITEMS AS SHOWN ON DRAWING.

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
Hawaii	HAW.	BU-061-1(6) UNIT 4	1958	54	148
HAWAII	HAW.	F-072-1(1) UNIT 3	1958	61	148

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DETAILS OF HAWAIIAN ELEC. CO. HANDHOLE

LUNALILO FREEWAY
PROJECT NO. F-072-1(1), UNIT 3
NUUANU HIGHWAY
PROJECT NO. BU-061-1(6), UNIT 4

SCALE: AS NOTED

H.E. CO. APPROVED: Frank A. Kerr
TITLE: Distr. Eng. DATE 4/17/58

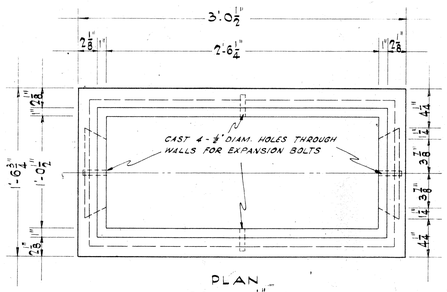
SHEET No. OF SHEETS

.$173 (1).61 .$146 (2).54 104

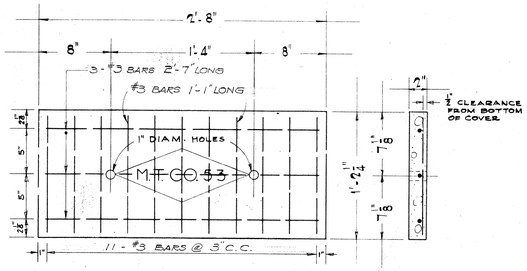
PRINTED ON DIEPO 1000H CLEARPRINT

45

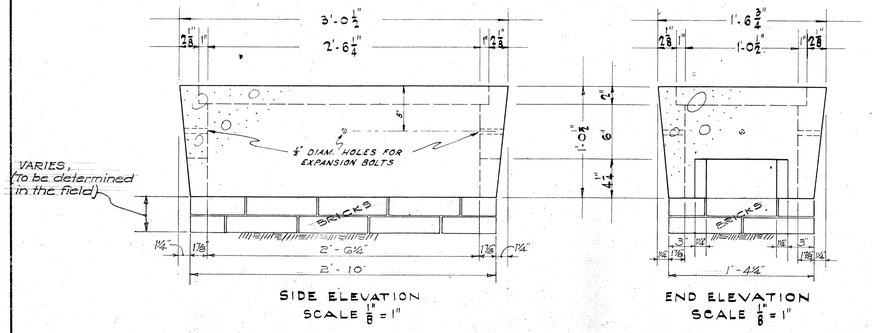
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BU-061-1(6) UNIT 4	1958	55	148
HAWAII	HAW.	F-072-1(1) UNIT 3	1958	92	148



PLAN
SCALE 1" = 1"



PLAN OF COVER
SCALE 1" = 1"



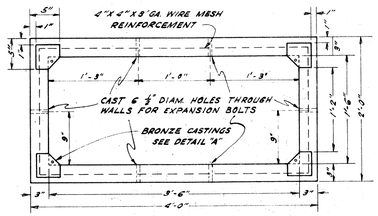
SIDE ELEVATION
SCALE 1" = 1"

END ELEVATION
SCALE 1" = 1"

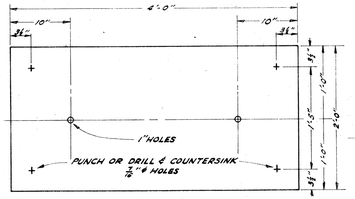
H. E. CO. PULLBOX Nº U1-103-S
H. T. CO. PULLBOX Nº 513

NOTE:

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



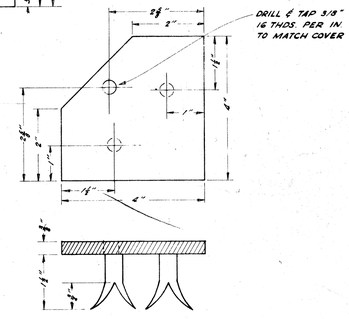
TOP VIEW



¼" CHECKERED PLATE COVER
⅜" FOR DRIVEWAYS

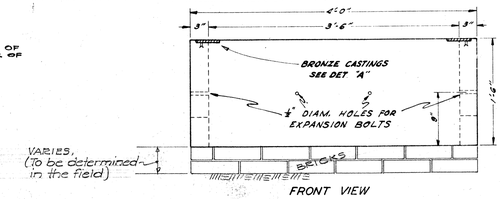
NOTE:

CHECKERED PLATE COVER SHALL BE ¼" THICK AT SIDEWALK AREAS AND ⅜" THICK AT DRIVEWAYS.

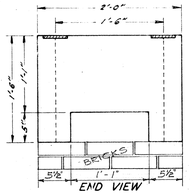


DETAIL "A"
MANGANESE BRONZE CASTING CORNER PLATES
SCALE: 6" = 1'-0"

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



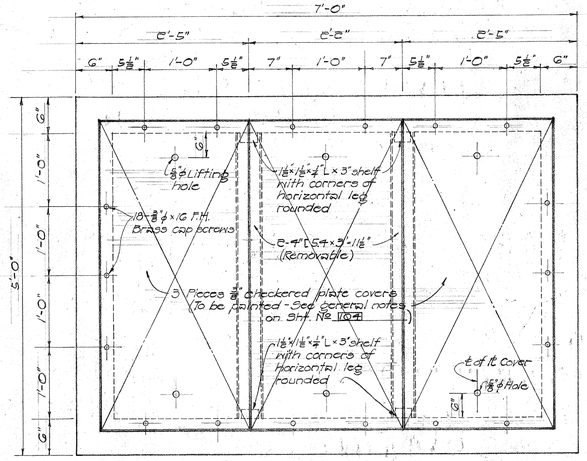
FRONT VIEW



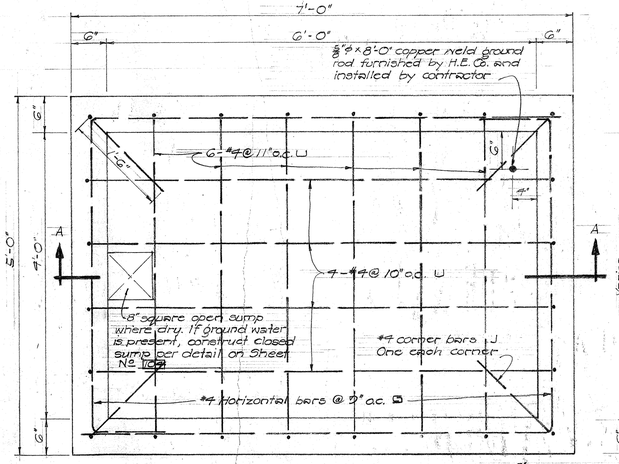
END VIEW

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

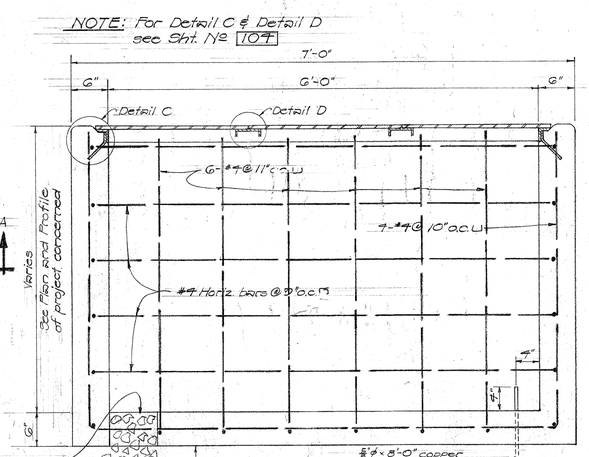
SCALE: 1" = 1'-0"



PLAN



SECTIONAL PLAN



SECTION A-A

H. E. CO. HANDHOLE TYPE #3
(9'-0" x 6'-0" INSIDE)
Scale: 1" = 1'-0"

APPROVED:

PRINCPL. ELEC. ENGR., H. E. CO., LTD.	1/13/59 DATE
DISTR. ENGR., H. E. CO., LTD.	1/13/59 DATE
PLANT ENG'G. SUPV., H. T. CO., LTD.	1-13-59 DATE

JAMES B. WILSON
REGISTERED PROFESSIONAL ENGINEER
No. 379
HAWAII, U.S.A.

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER
No.
DATE JUL 3 1957

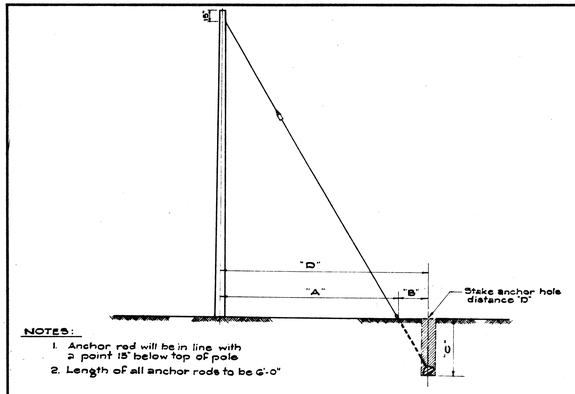
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
DETAIL OF HAW'N ELEC. CO. HANDHOLE, & HAW'N ELEC. CO. & HAWN TEL. CO. PULLBOXES.
LUNALILO FREEWAY
PROJECT NO. F-072-1(1), UNIT 3
NUUANU HIGHWAY
PROJECT NO. BU-061-1(6), UNIT 4
SCALE: AS SHOWN SEPT. 1957

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	QUANTITIES BY	
No.	QUANTITIES CHECKED BY	C.S.K.
	CHECKED BY	

SHEET No. 105 OF SHEETS

.S173(1).62 .S146(2).55

PRINTED ON DIEPO 1000H CLEARPRINT



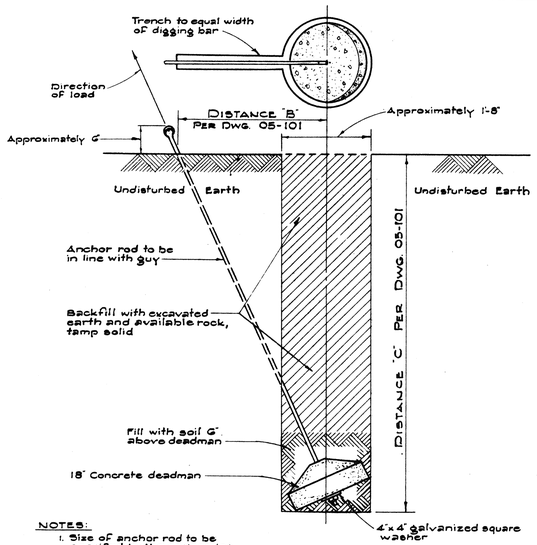
NOTES:
1. Anchor rod will be in line with a point 15" below top of pole
2. Length of all anchor rods to be 6'-0"

FOR 35', 40', 45', 50' & 55' POLES				
LEAD ANCHOR ROD TO ℄ OF POLE "A"	ANCHOR ROD TO ℄ OF HOLE "B"	VERTICAL DEPTH 18" D.M. "C"	VERTICAL DEPTH 24" D.M. "C"	TOTAL DISTANCE POLE TO HOLE "D" (A+B)
5'-0"	1'-0"	7'-5"	7'-4"	6'-0"
10'-0"	1'-11"	7'-1"	7'-3"	11'-11"
15'-0"	2'-8"	6'-5"	7'-1"	17'-8"
20'-0"	3'-3"	6'-6"	6'-10"	23'-3"
25'-0"	3'-10"	6'-2"	6'-7"	28'-10"
FOR 25' & 30' POLES				
5'-0"	1'-8"	7'-1"	7'-4"	6'-8"
10'-0"	3'-0"	6'-7"	7'-0"	13'-0"
15'-0"	4'-0"	6'-1"	6'-6"	19'-0"
20'-0"	4'-8"	5'-6"	5'-10"	24'-8"
25'-0"	5'-2"	4'-11"	5'-4"	30'-2"

D.M. = DEADMAN
Lead (Dimension "A") For H.T.Co. anchors (H.T.Co. ONLY) shown on plan.

ANCHORING DATA
Not to Scale

05-101



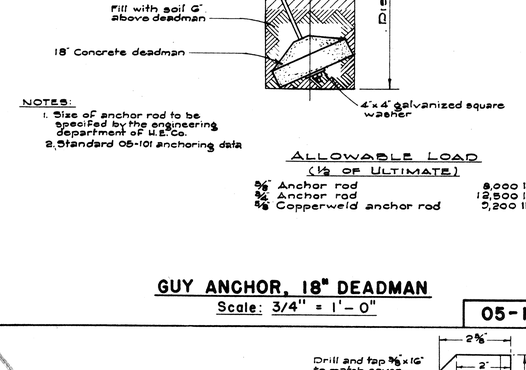
NOTES:
1. Size of anchor rod to be specified by the engineering department of H.E.Co.
2. Standard 05-101 anchoring data

ALLOWABLE LOAD
(½ OF ULTIMATE)

⅝" Anchor rod	8,000 lbs.
¾" Anchor rod	12,500 lbs.
⅝" Copperweld anchor rod	5,200 lbs.

GUY ANCHOR, 18" DEADMAN
Scale: 3/4" = 1'-0"

05-102



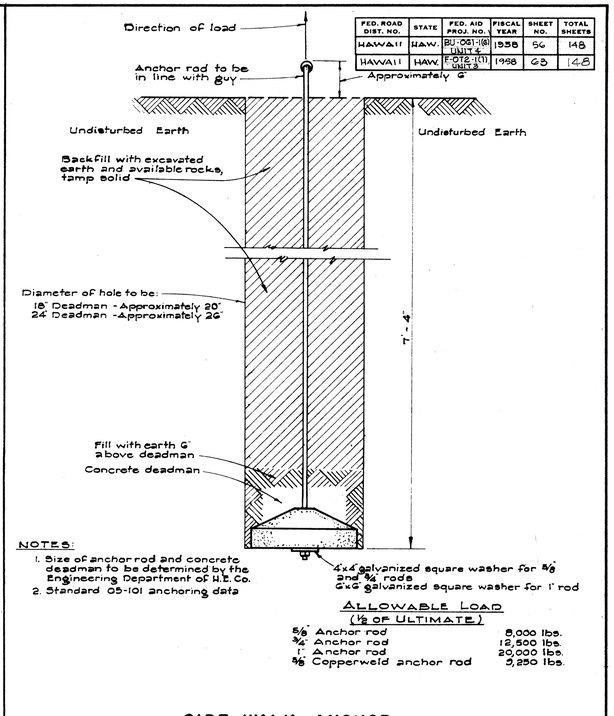
NOTE:
1. Standard 05-101 anchoring data

ALLOWABLE LOAD
(½ OF ULTIMATE)

1" Anchor rod	20,000 lbs.
⅝" Copperweld anchor rod	5,250 lbs.

GUY ANCHOR, 24" DEADMAN
Scale: 3/4" = 1'-0"

05-103



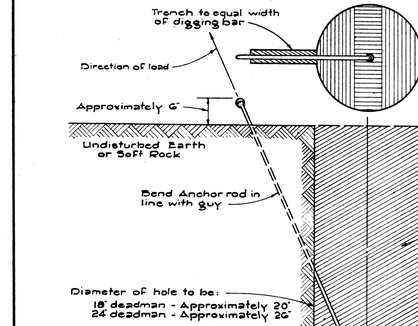
NOTES:
1. Size of anchor rod and concrete deadman to be determined by the Engineering Department of H.E.Co.
2. Standard 05-101 anchoring data

ALLOWABLE LOAD
(½ OF ULTIMATE)

⅝" Anchor rod	8,000 lbs.
¾" Anchor rod	12,500 lbs.
1" Anchor rod	20,000 lbs.
⅝" Copperweld anchor rod	5,250 lbs.

SIDE-WALK ANCHOR
Scale: 1" = 1'-0"

05-104



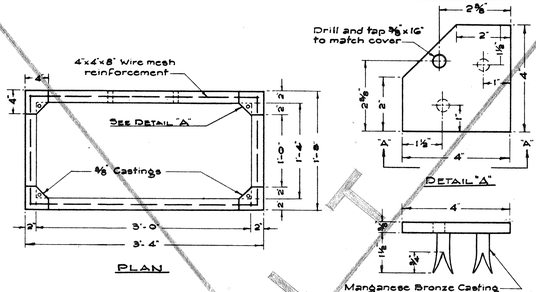
NOTES:
1. Size of anchor rod to be specified by the Engineering Department of H.E.Co.
2. "A" should not be less than 24". If "A" is less than 24", complete hole and install anchor per C.H. Standard 05-103, 105, or 104.
3. "B" ⅝" anchor rod drill 2" hole. ¾" anchor rod drill 2" hole. 1" anchor rod drill 2½" hole.
4. Standard 05-101 anchoring data.

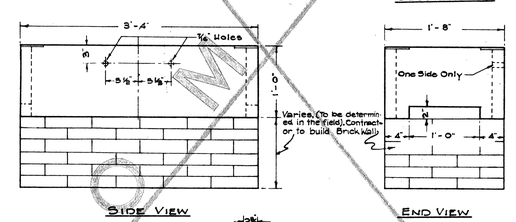
ALLOWABLE LOAD
(½ OF ULTIMATE)

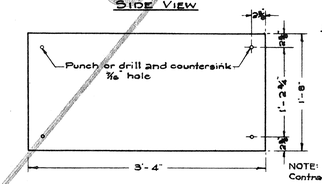
⅝" anchor rod	8,000 lbs.
¾" anchor rod	12,500 lbs.
1" anchor rod	20,000 lbs.

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

05-105





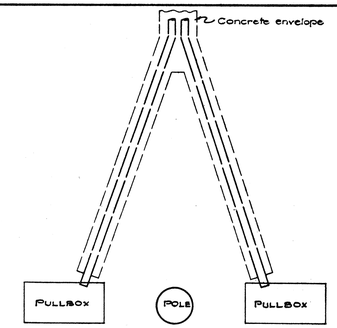


NOTES
Use ⅜ plate for driveways
Concrete box 225 lbs.
¼" checker plate 62 lbs.

CONCRETE SERVICE BOX
Scale: 1"= 1'-0"

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

UI-103



TYPICAL BOX AND DUCT DETAIL
Scale: ⅜"= 1'-0"

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

SOUTHERN PINE & DOUGLAS FIR 8lb. CREOSOTED TREATMENT										
LENGTH IN FEET	CLASS	APPROXIMATE MINIMUM DIMENSIONS — INCHES				AVERAGE WEIGHT IN POUNDS		POLE SETTING DEPTH		BREAKING LOAD 2'-0" BELOW TOP OF POLE (LBS.)
		AT TOP		6'0" FROM BUTT				DEPTH IN SOIL	DEPTH IN ROCK	
		DIA.	CIR.	DIA.	CIR.	S.P.	D.F.			
JOINT POLES (J.P. POLES)										
25	5	6.05	19	8.28	26.0	491	525	4'-6"	3'-0"	1,900
30	5	6.05	19	8.92	28.0	660	600	5'-0"	3'-0"	1,900
35	5	6.05	19	9.55	30.0	862	770	5'-0"	3'-6"	1,900
40	3	7.32	23	11.79	37.0	1403	1320	5'-6"	3'-6"	3,000
45	3	7.32	23	12.26	38.5	1664	1575	6'-0"	4'-0"	3,000
50	3	7.32	23	12.73	40.0	1925	1850	6'-6"	4'-0"	3,000
55	3	7.32	23	13.23	41.5	2200	2145	7'-0"	4'-6"	3,000
TRANSMISSION POLES (T POLES)										
45	2	7.96	25	13.23	41.5	1911	1845	6'-0"	4'-0"	3,700
50	2	7.96	25	13.69	43.0	2214	2150	6'-6"	4'-0"	3,700
60	1	8.59	27	15.77	49.5	3451	3360	7'-0"	4'-6"	4,500

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

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

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

WOOD POLE DATA

05-501

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	BU-061-(8) UNIT 6	1958	56	148
HAWAII	HAW.	F-072-1(1) UNIT 8	1958	63	148

Hawaii Ch. 1 Gen. 111 to 1157

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
HAWAIIAN ELECTRIC CO.

STANDARD DETAILS

Scale: As Noted — Oct. 17, 1957

SHEET Nº OF SHEETS

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

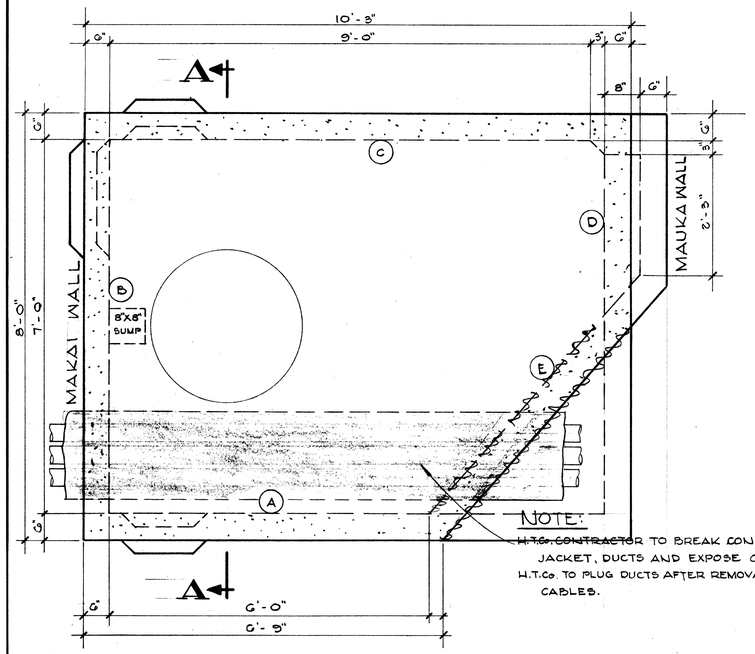
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.S173 (1).63 .S146 (2).56 106

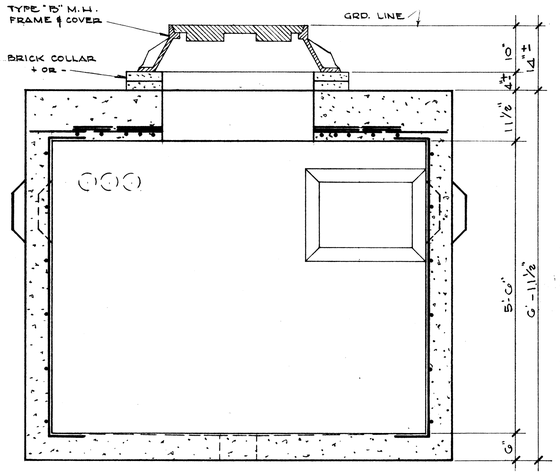
47

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1)	1958	64	148

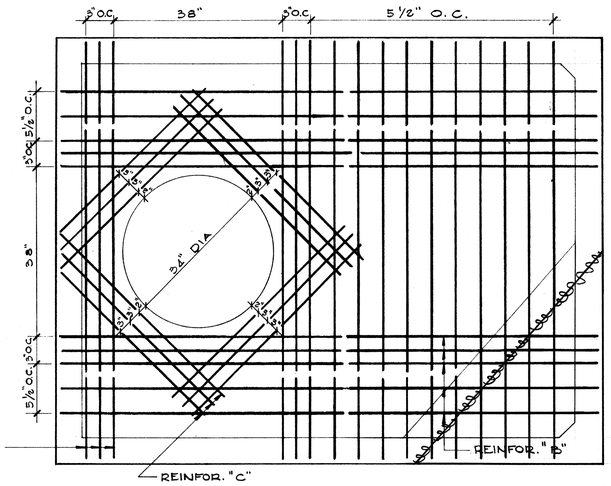
UNIT 3



NOTE:
H.T.Co. CONTRACTOR TO BREAK CONCRETE JACKET, DUCTS AND EXPOSE CABLES. H.T.Co. TO PLUG DUCTS AFTER REMOVAL OF CABLES.



NOTES:
1. ALL WALL REINFORCING TO BE OF ½" ROUND DEFORMED BARS 12" O.C. BOTH WAYS.
2. BEND END OF BARS 20" & OVERLAP 5".
3. AT EACH DUCT ENTRANCE, PLACE 3-⅝" HORIZ. REINFORCING BARS BOTH ABOVE & BELOW THE DUCT ENTRANCE. BARS TO BE SPACED 3" ON CENTERS & EXTENDED 18" BEYOND BOTH SIDES OF THE DUCT ENTRANCE.
4. UPON COMPLETION OF EXCAVATION, NOTIFY THE PLANT ENGINEER IF THE GROUND IS FOUND TO BE OF A FLUID NATURE. IF SO, REINFORCING BARS WILL BE REQUIRED IN THE FLOOR SLAB.
5. SEE DEVELOPED VIEW FOR DUCT, CABLE RACKS & PULLING IRON PLACEMENT.



SECTION "A-A"

SCALE: ½" = 1'-0"

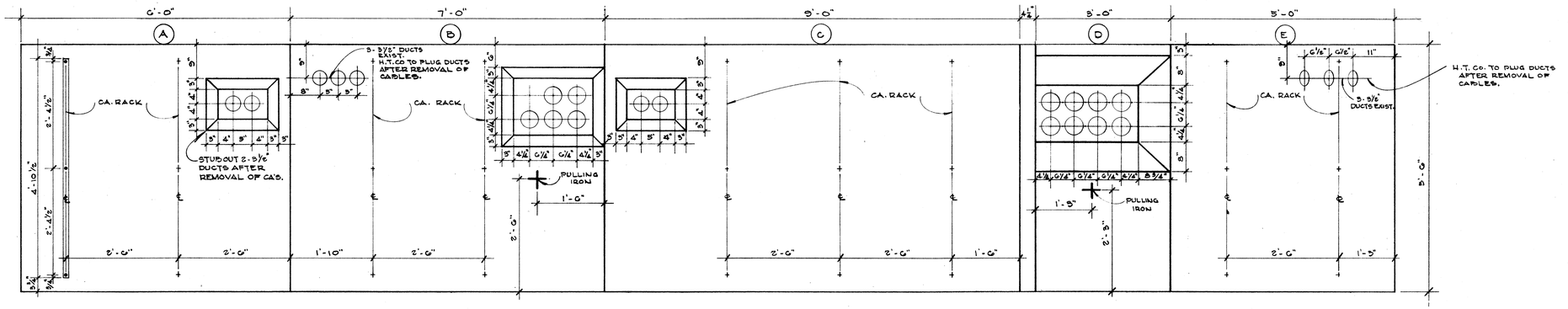
ROOF REINFORCEMENT

REVISED TYPE B-5 FOR MANHOLE AT 12+60± NUUANU ST.

SCALE: ½" = 1'-0"

TOP VIEW

SCALE: ½" = 1'-0"



NOTES:
1. PLACE STANDARD 30" CABLE RACKS ON WALLS. REFER TO WALL "A" FOR BOLT SPACINGS.
2. USE STANDARD PULLING IRON # 5113.

DEVELOPED VIEW OF WALLS

SCALE: ½" = 1'-0"

APPROVED:
T. H. Field 1-13-59
PLANT ENG'G. SUPV., H.T. CO., LTD. DATE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DETAILS OF
TELEPHONE MANHOLE TYPE "B-5"

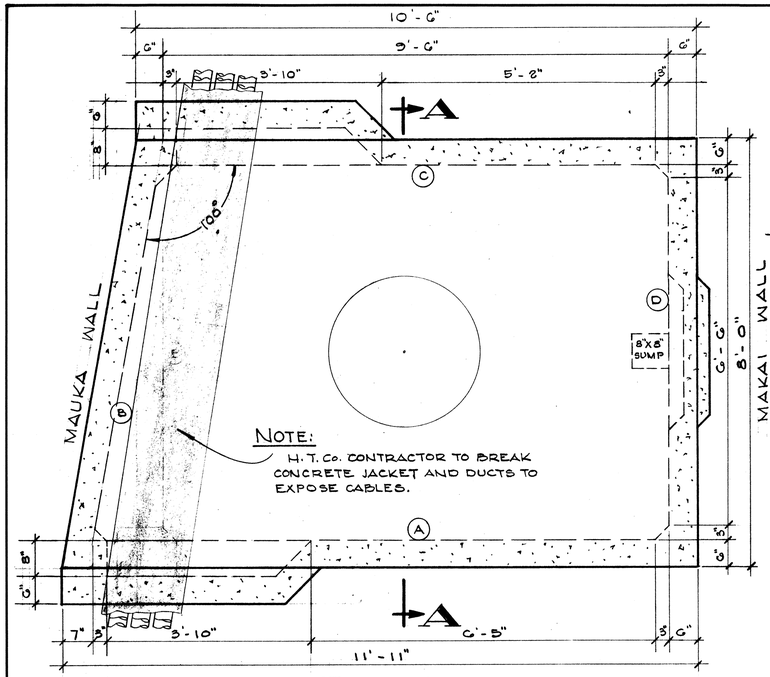
LUNALILO FREEWAY
PROJ. NO. F-072-1(1)
UNIT 3

SCALE: AS NOTED Oct. 1958

.8173(1).64 107

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1)	1958	65	148

UNIT 3

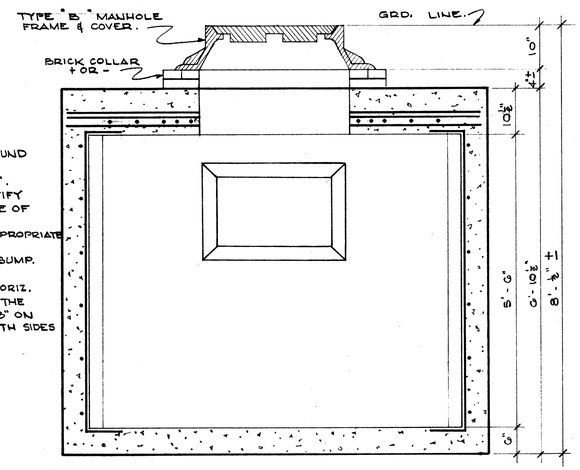


TOP VIEW

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

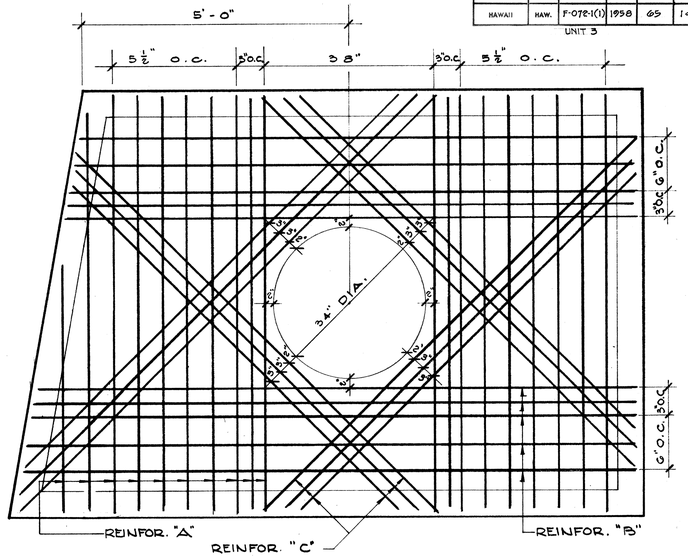
NOTES:

1. ALL WALL REINFORCING TO BE OF ½" ROUND DEFORMED BARS 12" O.C. BOTH WAYS.
2. BEND ENDS OF BARS 90° & OVERLAP 8".
3. UPON COMPLETION OF EXCAVATION, NOTIFY THE ENGINEER IF GROUND IS FOUND TO BE OF A FLUID NATURE.
4. SEE DEVELOPED VIEW OF WALLS FOR APPROPRIATE DUCT ENTRANCES & CABLE RACKING.
5. SLOPE FLOOR ½" TOWARDS DRAINAGE SUMP. SEE TOP VIEW FOR LOCATION.
6. AT EACH DUCT ENTRANCE, PLACE 3-⅜" HORIZ. REINFORCING BARS BOTH ABOVE & BELOW THE DUCT ENTRANCE. BARS TO BE SPACED 3" ON CENTERS & EXTENDED 18" BEYOND BOTH SIDES OF THE DUCT ENTRANCE.



SECTION "A-A"

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



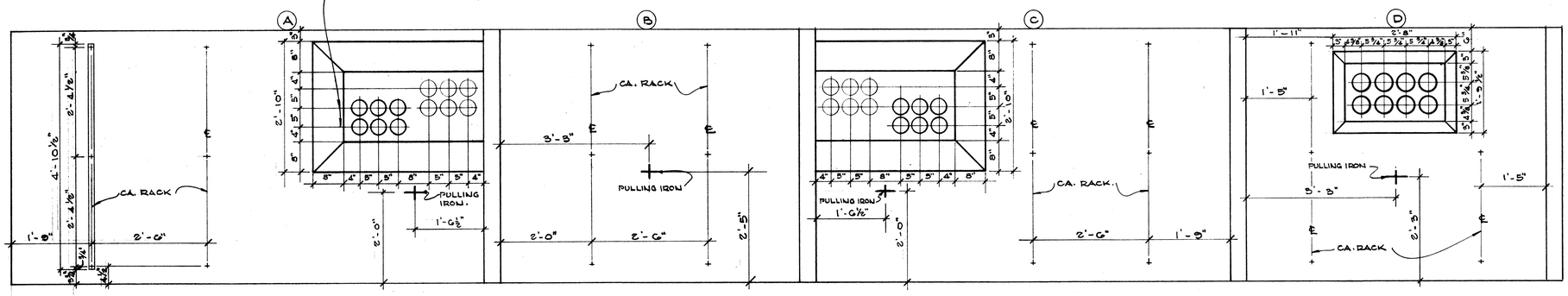
ROOF REINFORCEMENT

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

NOTES:

1. ALL BARS TO BE ½" DEFORMED BARS.
2. PLACE "A" BARS 1" FROM INNER SURFACE OF ROOF
3. PLACE "B" BARS ON TOP OF "A" BARS AND "C" BARS ON TOP OF "B" BARS.

NOTE:
STUB OUT 6-PROPOSED DUCTS 1'-0" FROM M.H.



DEVELOPED VIEW OF WALLS

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

NOTES:

1. ALL PULLING IRONS ARE STANDARD # 5119.
2. PLACE STANDARD 30" CABLE RACKS. REFER TO WALL "A" FOR BOLT SPACINGS.

APPROVED:

T. H. Judd 1-13-59

PLANT ENG'G. SUPV., H.T.CO.,LTD. DATE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DETAILS OF
TELEPHONE MANHOLE TYPE "B-6"

LUNALILO FREEWAY
PROJ. NO. F-072-1(1)
UNIT 3

SCALE: AS NOTED

Oct. 17, 58

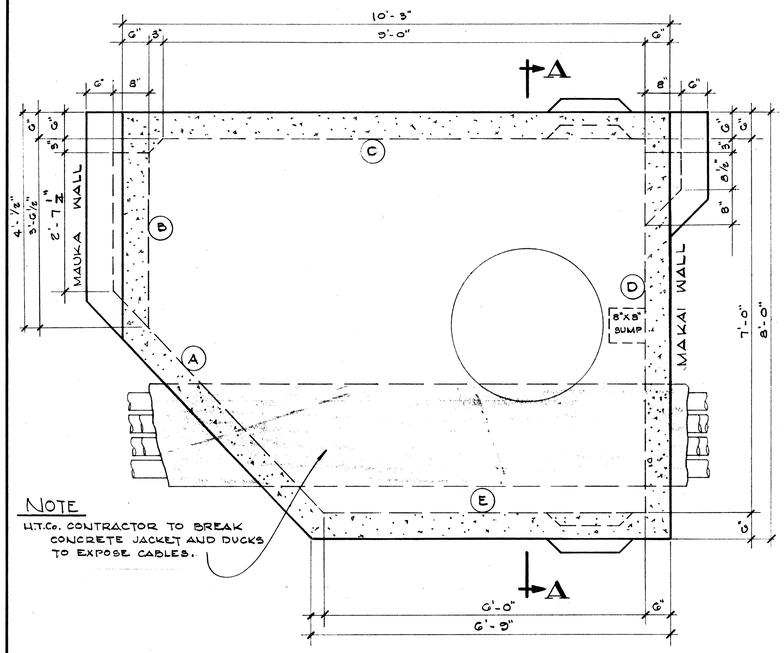
.8173(1).65 108

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1)	1958	66	148

UNIT 3

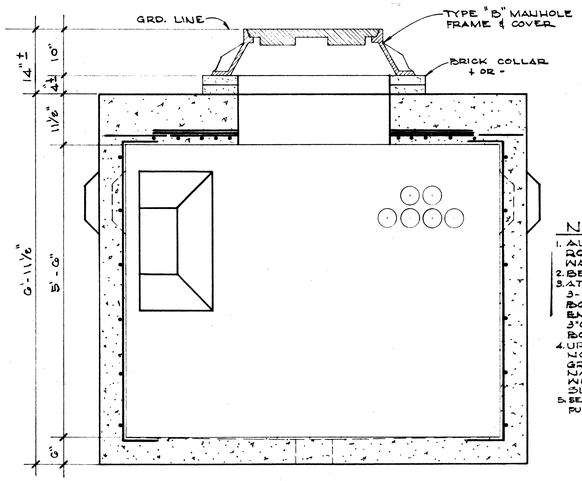
NOTES:

1. ALL BARS TO BE ¾" ROUND DEFORMED BARS.
2. PLACE "B" BARS 1" FROM INNER SURFACE OF ROOF.
3. PLACE "A" BARS ON TOP OF "B" BARS AND "C" BARS ON TOP OF "A" BARS.



NOTE
H.T.Co. CONTRACTOR TO BREAK CONCRETE JACKET AND DUCKS TO EXPOSE CABLES.

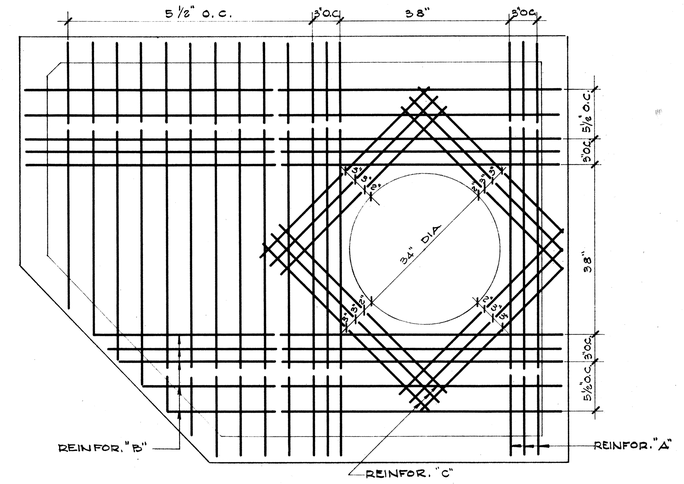
TOP VIEW
SCALE: ¾"=1'-0"



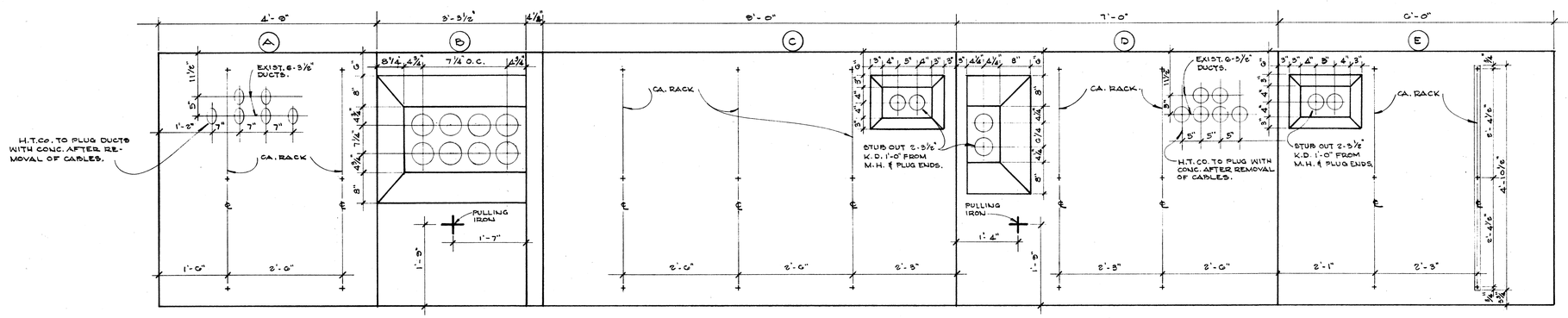
NOTES:

1. ALL WALL REINFORCING TO BE OF ½" ROUND DEFORMED BARS 12" O.C. BOTH WAYS.
2. BEND END OF BARS 50° & OVERLAP 2'.
3. AT EACH DUCT ENTRANCE, PLACE 3-⅝" HORIZ. REINFORCING BARS BOTH ABOVE & BELOW THE DUCT ENTRANCE. BARS TO BE SPACED 3" ON CENTERS & EXTENDED 18" BEYOND BOTH SIDES OF THE DUCT ENTRANCE.
4. UPON COMPLETION OF EXCAVATION, NOTIFY THE PLANT ENGINEER IF THE GROUND IS FOUND TO BE OF A FLUID NATURE. IF SO, REINFORCING BARS WILL BE REQUIRE IN THE FLOOR SLAB.
5. SEE DEVELOPED VIEW FOR DUCTS, CABLE RACKS & PULLING IRON PLACEMENT.

SECTION "A-A"
SCALE: ¾"=1'-0"



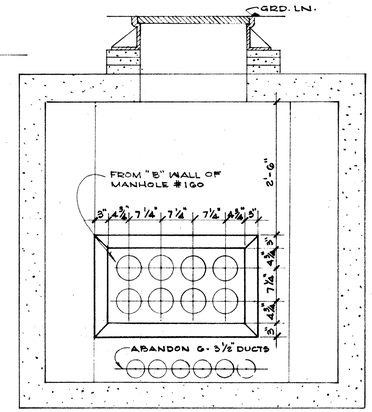
ROOF REINFORCEMENT
SCALE: ¾"=1'-0"



NOTES:

1. PLACE STANDARD 30" CABLE RACKS ON WALLS. REFER TO WALL "E" FOR BOLT SPACINGS.
2. PLACE STANDARD PULLING IRON* 9119.

DEVELOPED VIEW OF WALLS
SCALE: ¾"=1'-0"



INSIDE VIEW OF MANHOLE #1G1
MAKAI WALL
SCALE: ¾" = 1'-0"

APPROVED:
F. A. Judd 1-13-59
PLANT ENG'G. SUPV., H.T.CO., LTD. DATE

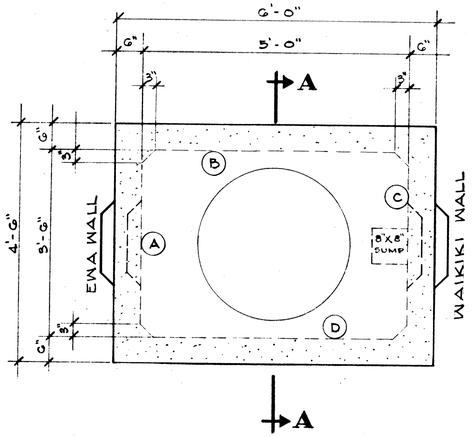
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

DETAILS OF
TELEPHONE MANHOLE TYPE "B-7"

LUNALILO FREEWAY
PROJ. NO. F-072-1(1), UNIT 3

SCALE: AS NOTED Oct. 1958

.S173(1).66 109

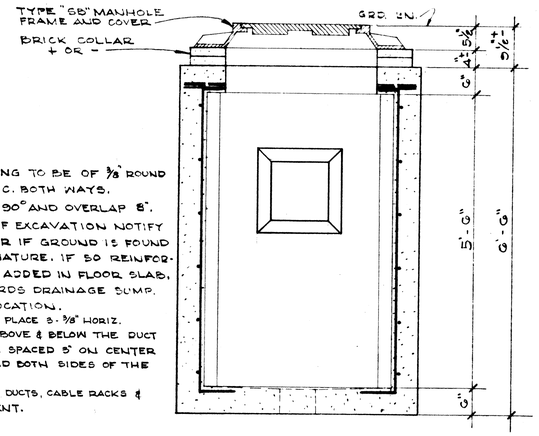


TOP VIEW

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

NOTES:

1. ALL WALL REINFORCING TO BE OF 3/8" ROUND DEFORMED BARS 12" O.C. BOTH WAYS.
2. BEND END OF BARS 90° AND OVERLAP 8".
3. UPON COMPLETION OF EXCAVATION NOTIFY THE PLANT ENGINEER IF GROUND IS FOUND TO BE OF A FLUID NATURE. IF SO REINFORCING BARS WILL BE ADDED IN FLOOR SLAB.
4. SLOPE FLOOR 1/2" TOWARDS DRAINAGE SUMP. SEE TOP VIEW FOR LOCATION.
5. AT EACH DUCT ENTRANCE, PLACE 3-3/8" HORIZ. REINFORCING BARS BOTH ABOVE & BELOW THE DUCT ENTRANCE. BARS TO BE SPACED 5" ON CENTER & EXTENDED 18" BEYOND BOTH SIDES OF THE DUCT ENTRANCE.
6. SEE DEVELOPED VIEW FOR DUCTS, CABLE RACKS & PULLING IRON PLACEMENT.

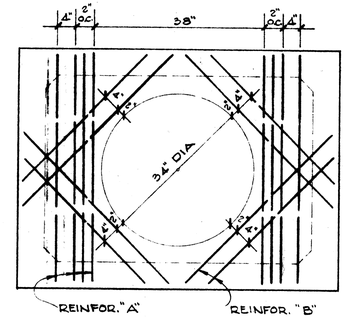


SECTION "A-A"

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

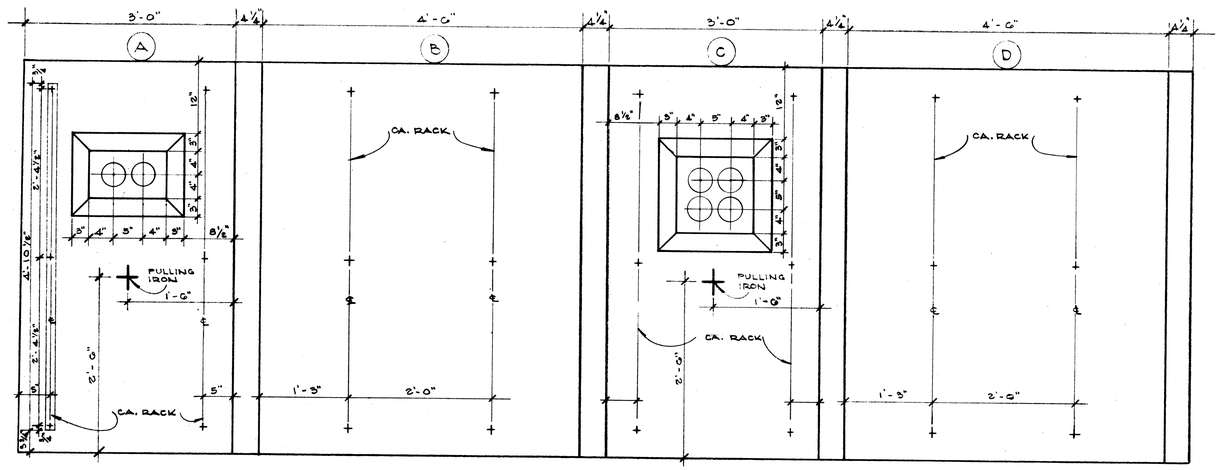
NOTES:

1. ALL BARS TO BE 1/2" ROUND DEFORMED BARS.
2. PLACE "A" BARS 1" FROM INNER SURFACE OF ROOF.
3. PLACE "B" BARS ON TOP OF "A" BARS.



ROOF REINFORCEMENT

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



NOTES:

1. PLACE 30" CABLE RACKS ON ALL WALLS. REFER TO WALL "A" FOR BOLT SPACING.
2. PLACE STANDARD PULLING IRON # 9115.

DEVELOPED VIEW OF WALLS

SCALE: 1" = 1'-0"

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1)	1958	67	148

UNIT 3

APPROVED:

1-13-59

PLANT ENG'G. SUPV., H.T. CO., LTD. DATE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

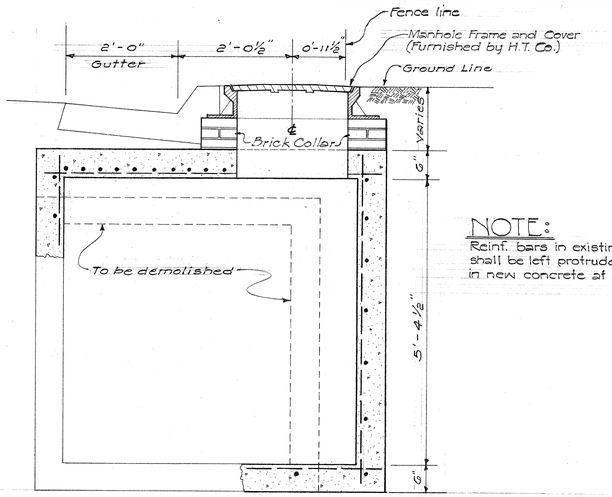
DETAILS OF
TELEPHONE MANHOLE TYPE "S-3"

LUNALILO FREEWAY
PROJ. NO. F-072-1(1)
UNIT 3

SCALE: AS NOTED Oct. 1958

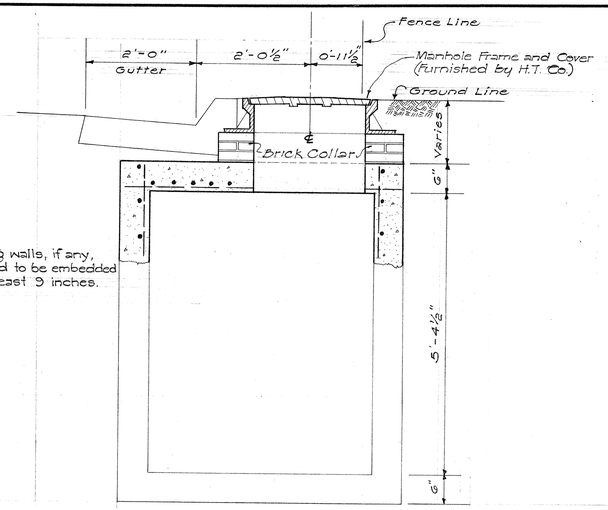
.S173(1).67 110

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	F-072-1(1) UNIT 3	1958	67A	148

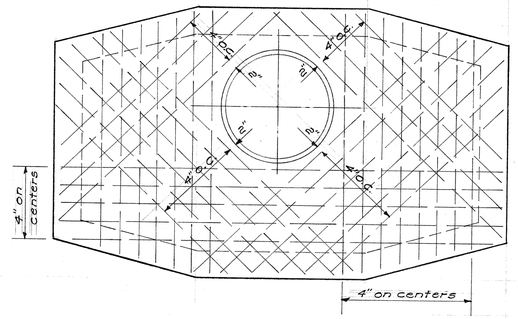


SECTION A-A
MANHOLE No. 411

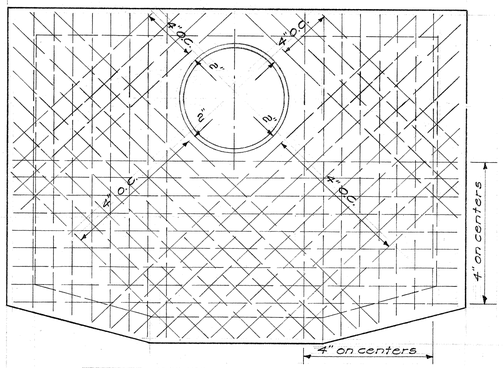
NOTE:
Reinf. bars in existing walls, if any, shall be left protruded to be embedded in new concrete at least 9 inches.



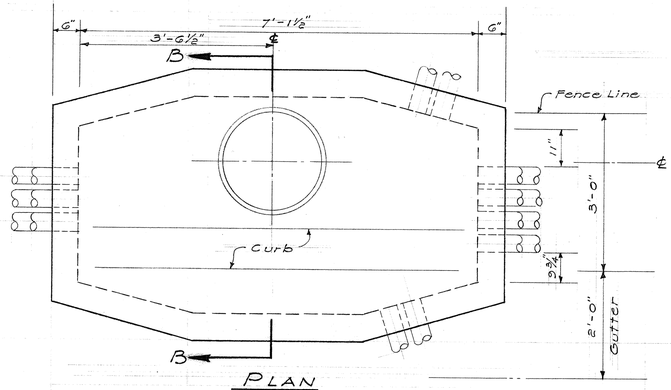
SECTION B-B
MANHOLES No. 409 & 410



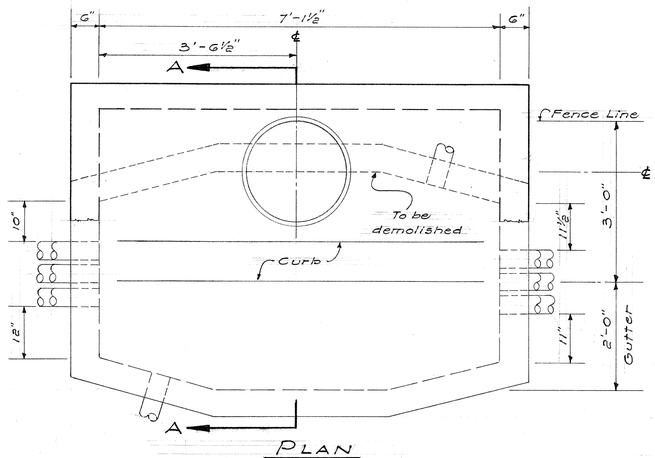
ROOF SLAB REINFORCEMENT
MANHOLES No. 409 & 410



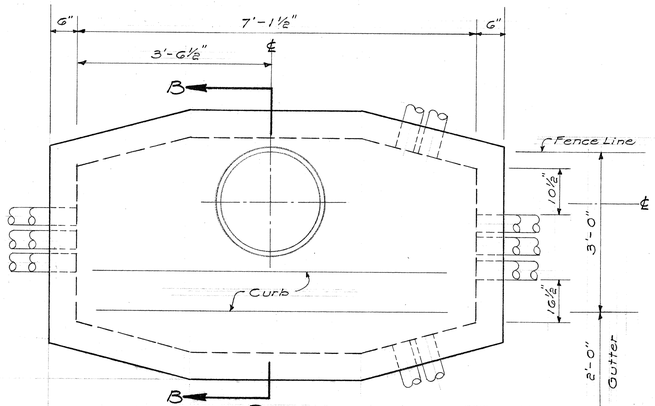
ROOF SLAB REINFORCEMENT
MANHOLE No. 411



PLAN
MANHOLE No. 409



PLAN
MANHOLE No. 411



PLAN
MANHOLE No. 410

Notes:
1. Wall reinforcement shall be #3 round deformed bars. Horiz. 12"o.c. Vert. 18"oc.
2. Roof reinforcement shall be #4 round deformed bars at 4" on centers.
3. Drawings are not to scale.
4. Partial demolition of manholes as shown shall be incidental to the item of "Excavation for Utility Structures."
5. Steel reinforcements shown will be paid under the item of "Reinforcing Steel for Utility Structures."
6. Installing of manhole frame and cover and furnishing and installing of brick collars shall be considered as incidental to the item of "Class B-1 Concrete for Utility Structures."

APPROVED:
F. J. Judd 1-13-59
PLANT ENG'G. SUPV., H.T.CO., LTD. DATE

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
LUNALILO FREEWAY
PROJECT NO. F-072-1(1), UNIT 3
DETAILS of RECONSTRUCTED HAW'N TEL. CO. MANHOLE
NOT TO SCALE NOV. 1958

SHEET No. OF SHEETS

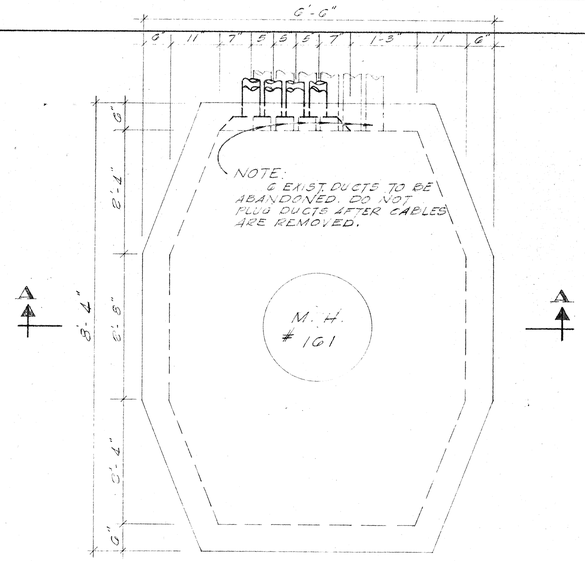
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DESIGNED BY	
	DRAWN BY	
	TRACED BY	
NOTE BOOK No.	QUANTITIES BY	
	QUANTITIES CHECKED BY	
	CHECKED BY	

.S173(1).67A 110-A

PRINTED ON DIEPO 1000H CLEARPRINT

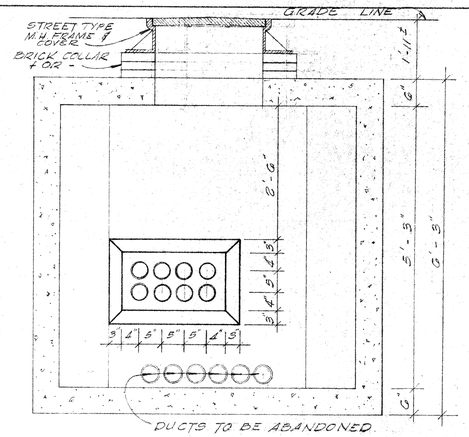
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	F-072-1(1)	1958	68	148

UNIT 3



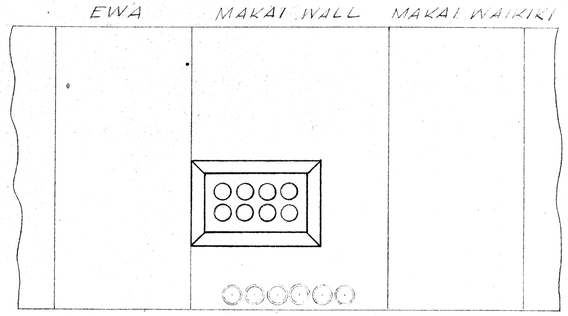
PLAN VIEW

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



SECTION "A-A"

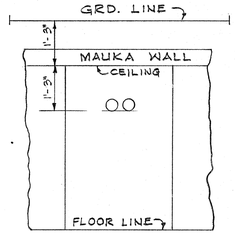
SCALE: 3/4" = 1'-0"



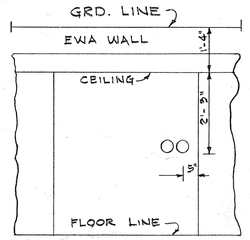
DEVELOPED VIEW

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

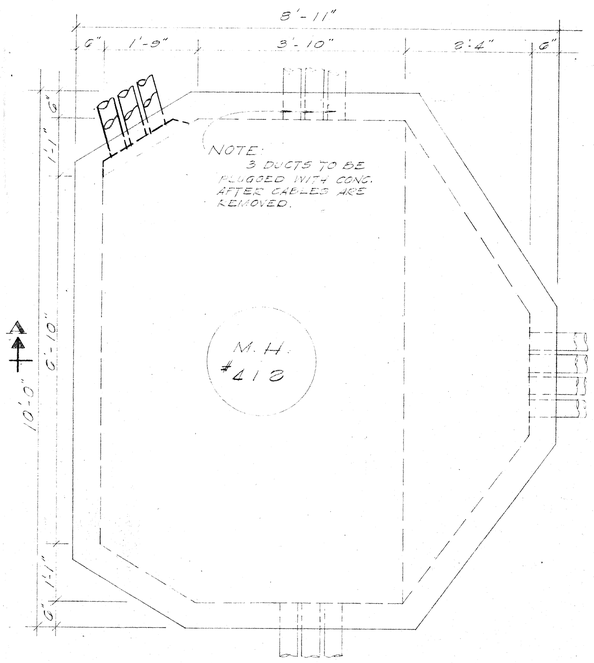
EXISTING MANHOLE Nº 161
CORNER OF EMMA SCHOOL
AND LUSITANA ST.



MANHOLE NO. 164
SCHOOL ST.
OPPOSITE
GOLDEN WALL THEATRE

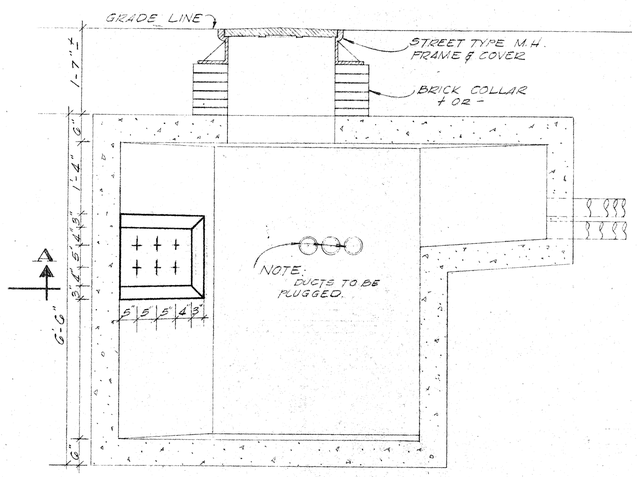


MANHOLE NO. 165
SCHOOL ST.
OPPOSITE
DIAMOND LANE



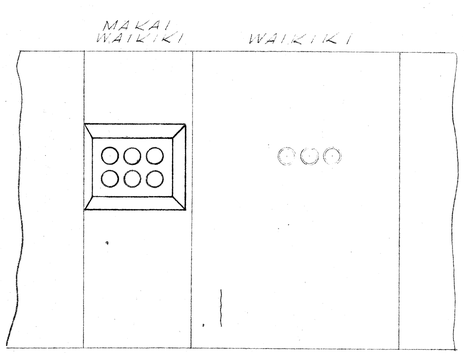
PLAN VIEW

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



SECTION "A-A"

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



DEVELOPED VIEW

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

EXISTING MANHOLE Nº 418
NUUANU AVE COR. SCHOOL ST

APPROVED:

J. J. Rudd 1-13-59

PLANT ENG'G. SUPV., H.T.CO., LTD. DATE

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS

REGISTERED ENGINEER No.

DATE

HAWAIIAN TELEPHONE COMPANY
HAWAII

PROJECT ORDER
MANHOLES
Nº 161 & 418

EXCHANGE HON	C. O. MAIN
ISLAND OAHU	ACCTG. AREA
ENGINEER E. SOUZA	TEL. NO. C 26473

DATE	DRAWN	CHECKED	CHECKED
10-10-57	W.L.K.		
APPROVED	APPROVED		

SHEET OF

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

LUNALILO FREEWAY
PROJECT NO. F-072-1 (1), UNIT 3

UTILITIES
CONNECTION TO EXISTING
TELEPHONE MANHOLES

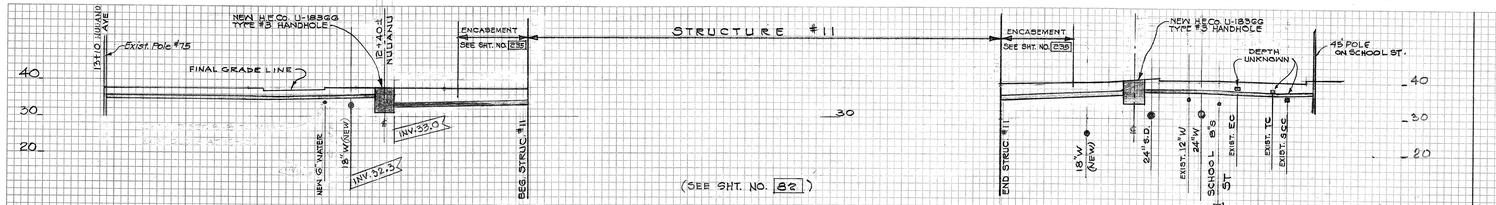
SCALE: AS NOTED SEPT. 1957

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(2)

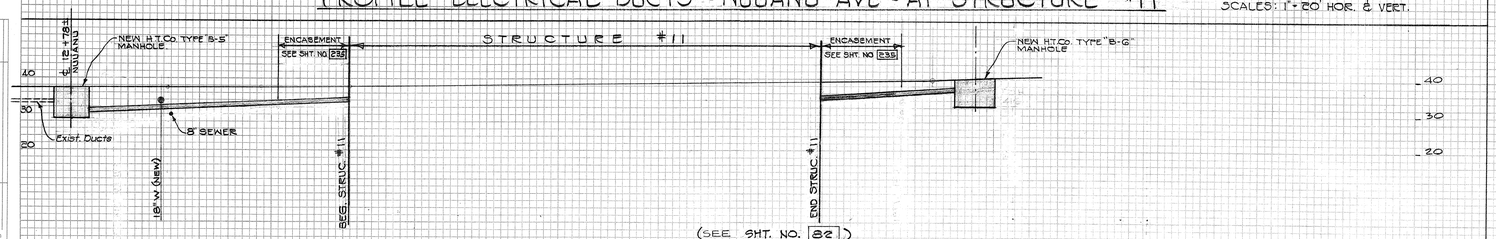
FED ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAW.	HAWAII	F-072-1(1)	1958	69	148

UNIT 3



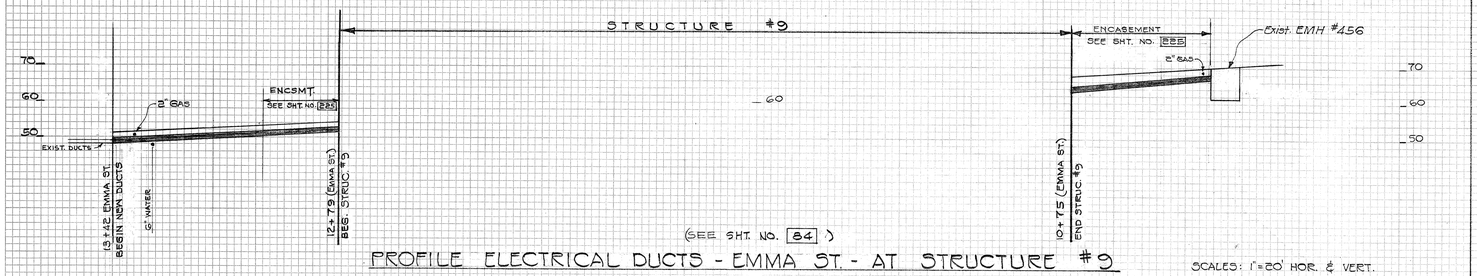
PROFILE ELECTRICAL DUCTS - NUUANU AVE - AT STRUCTURE #11

SCALES: 1"=20' HOR. & VERT.



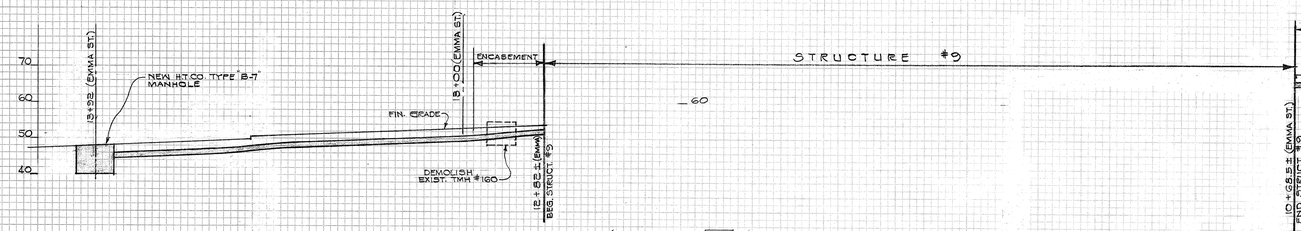
PROFILE TELEPHONE DUCTS - NUUANU AVE - AT STRUCTURE #11

SCALES: 1"=20' HOR. & VERT.



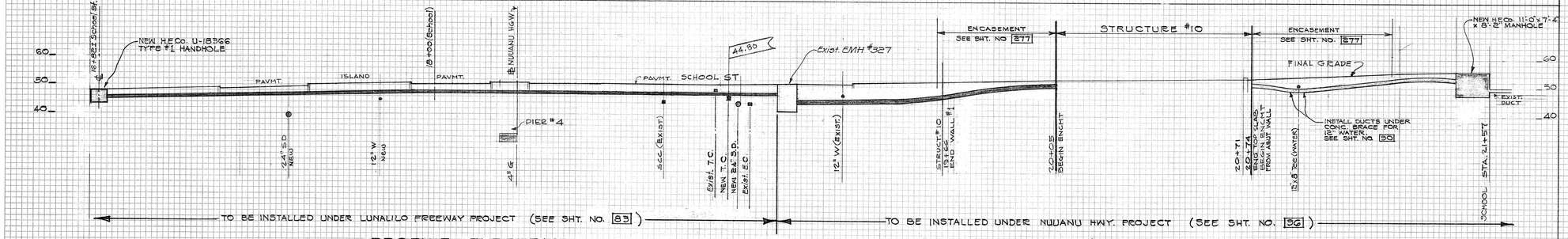
PROFILE ELECTRICAL DUCTS - EMMA ST. - AT STRUCTURE #9

SCALES: 1"=20' HOR. & VERT.



PROFILE TELEPHONE DUCTS - EMMA ST. - AT STRUCTURE #9

SCALES: 1"=20' HOR. & VERT.



PROFILE ELECTRIC DUCTS - SCHOOL ST. - VICINITY OF STRUCTURE #10

SCALES: 1"= 20' HOR & VERT

NOTE:

1. EXISTING UNDERGROUND UTILITIES SHOWN ARE FROM BEST AVAILABLE SOURCE OF INFORMATION. THE CONTRACTOR SHALL CHECK AND VERIFY ACTUAL CONDITIONS.
2. MINIMUM SLOPE OF DUCTS: 3" PER 100' WHEREVER POSSIBLE.
3. SEE ALSO "GENERAL ELECTRIC AND TELEPHONE NOTES" ON SHT. 38 OF NUUANU HWY. PROJ. NO. BU-061-1(6), UNIT 4

APPROVED:

PRINCPL. / ELEC. ENGR., H.E.CO., LTD. — DATE 1/13/59

DISTR. ENGR., H.E.CO., LTD. — DATE 1/13/59

PLANT ENG'G. SUPV., H.T.CO., LTD. — DATE 1-13-59

LAW & WILSON • TUDOR • TOWILL
ARCHITECTS • ENGINEERS • SURVEYORS
REGISTERED ENGINEER ____ No. ____
DATE ____

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
LUNALILO FREEWAY
PROJECT NO. F-072-1(1), UNIT 3
UTILITIES
ELEC. & TEL. CONDUIT PROFILES
SCALE: AS NOTED — SEPTEMBER 1957

FINAL SURVEY — ORIGINAL SURVEY
SURVEYED — PLOTTED — TRACED — AREAS — AREAS CHECKED
NOTE BOOK — NO.
BY — P.D. & AOG.
DATE — 12/26/57

PLATE 3 CROSS SECTION O. P. R. & R. E. STANDARD
1000 RAG PAPER-MADE AND PRINTED IN U. S. A.
EUGENE DIETZGEN CO.

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