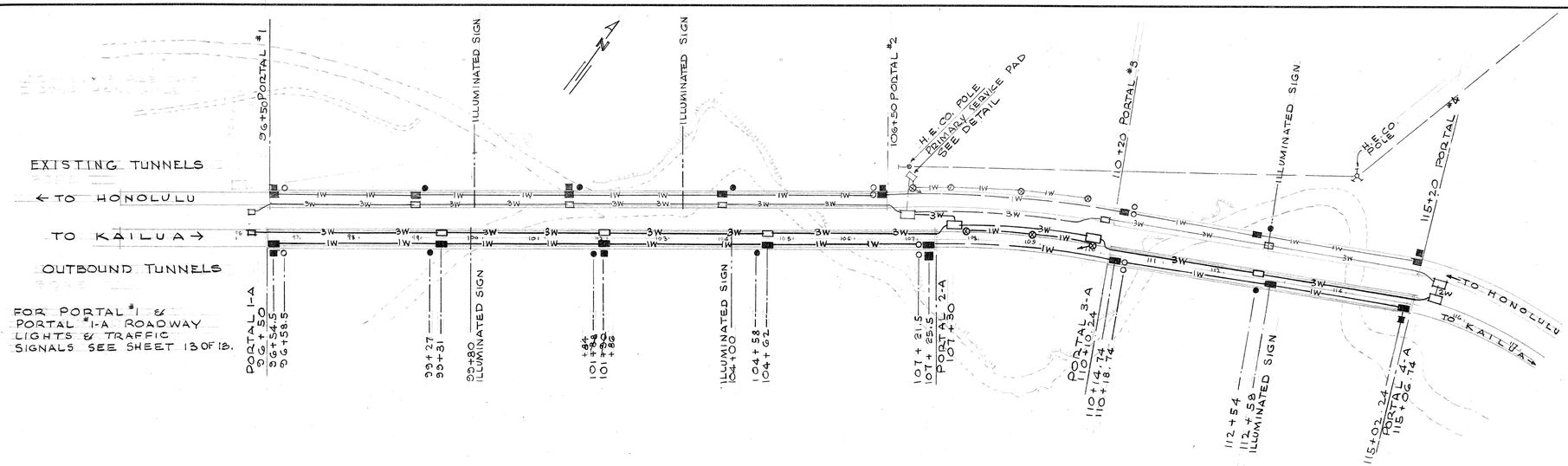
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-0G1-1(3)	1957	43	79



ELECTRICAL KEY MAP • OUTBOUND TUNNELS

SCALE: 1" = 100'-0"

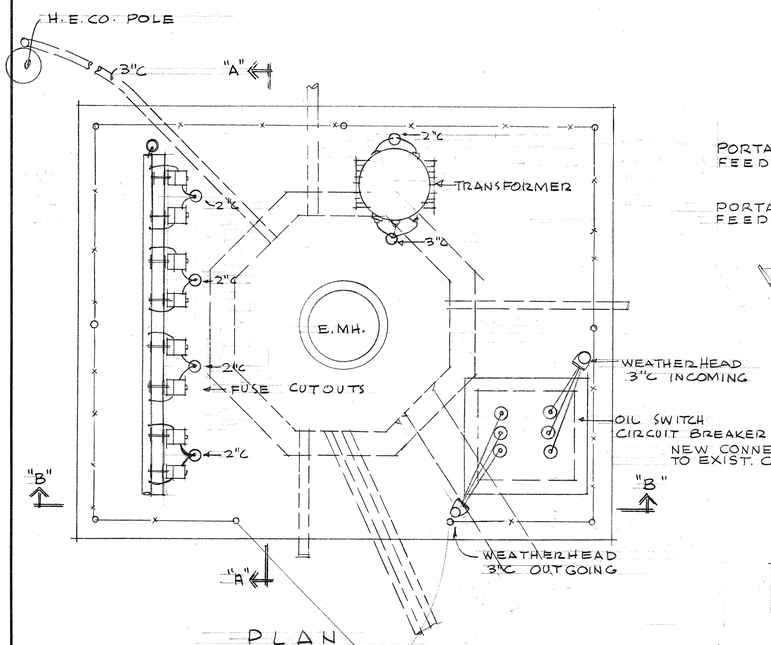
LEGEND

- H.T. CO. HANDHOLE
- H.T. CO. WALL PHONE BOX, FIRE EXTINGUISHER & EMERGENCY LIGHT STATION.
- H.T. CO. SIDEWALK JUNCTION BOX
- T.H.D. SIDEWALK ELECTRIC JUNCTION BOX.
- T.H.D. HANDHOLE
- C.O. SAMPLER
- C.O. SIDEWALK OR WALL JUNCTION BOX.
- ROADWAY LIGHT. FOR STATION NUMBER SEE LIGHTING PLAN.
- ROADWAY LIGHT WITH TRAFFIC SIGNAL
- 2W — CONDUIT RUN - 3W INDICATES 3-2" C, 2W INDICATES 2-2" C, ETC.

NOTE:
ELECTRICAL SYSTEM SHOWN ON THE INBOUND OR HONOLULU BOUND LANES IS EXISTING.

SCHEDULE OF DRAWINGS

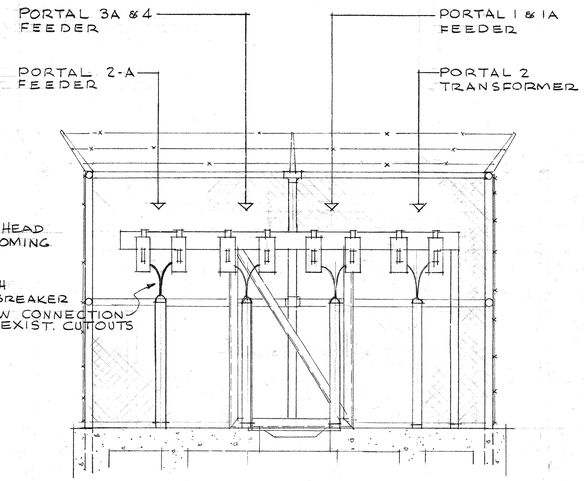
SHEET	TITLE
1	ELECTRICAL KEY MAP & SCHEDULE OF DWGS.
2	ELECTRIC DISTRIBUTION SYSTEM
3	LIGHTING PLAN
4	LIGHTING CONTROLS SCHEMATIC DIAGRAMS
5	TUNNEL SECTION & TYPICAL LUMINAIRE WIRING
6	PORTAL 1-A
7	PORTAL 2-A & PORTAL 3-A
8	PORTAL 4-A
9	CARBON MONOXIDE SAMPLING SYSTEM
10	ELECTRICAL DETAILS
11	ELECTRICAL DETAILS
12	ELECTRICAL DETAILS
13	HIGHWAY LIGHTING, TRAFFIC LIGHTS LAYOUT & DETAILS



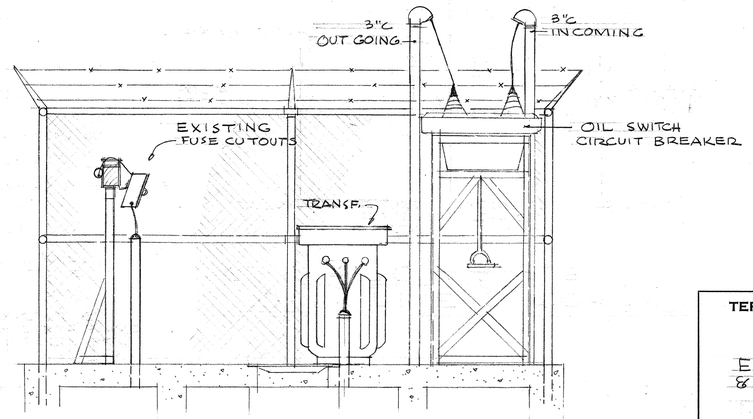
PLAN

EXISTING PRIMARY SERVICE PAD & NEW CONNECTION

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



SECTION "A-A"



SECTION "B-B"

ORIGINAL PLAN

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

JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL
ELECTRICAL KEY MAP & SCHEDULE OF DWGS.
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-0G1-1(3)

SCALE: AS NOTED DATE: MAY 1957

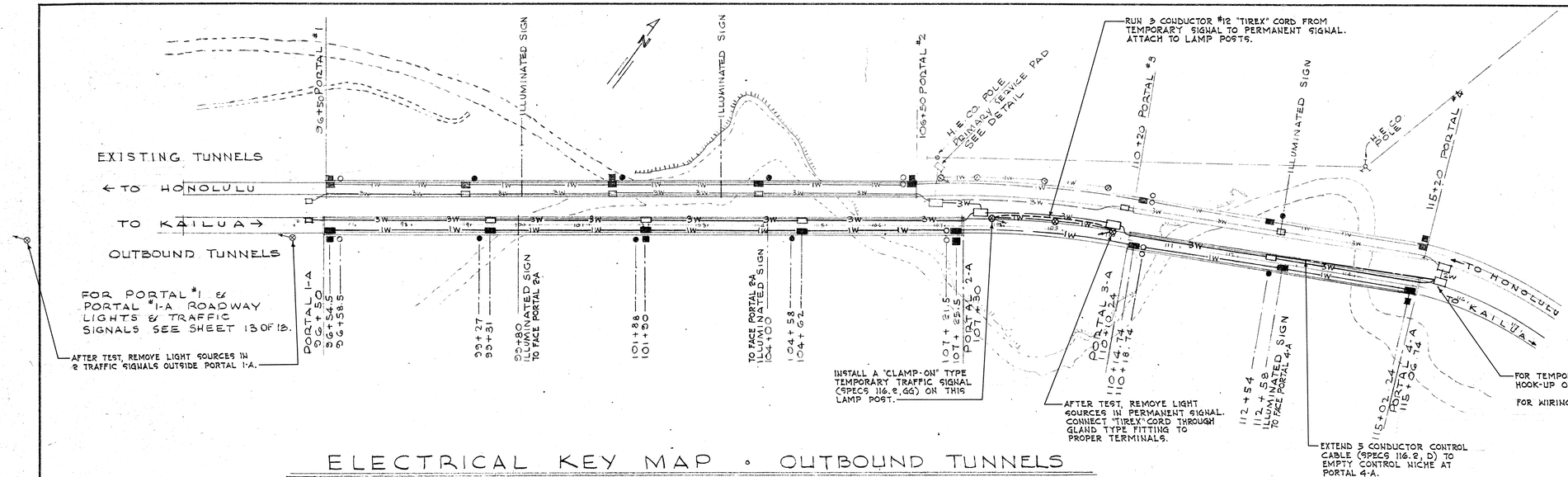
SHEET No. 1 OF 13 SHEETS

5896.43

PRINTED ON DIEPO 1000H CLEARPRINT

6d7-61

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-OCI-1(5)	1957	43A	73



ELECTRICAL KEY MAP • OUTBOUND TUNNELS

SCALE: 1" = 100'-0"

LEGEND

- H.T. CO. HANDHOLE
- H.T. CO. WALL PHONE BOX, FIRE EXTINGUISHER & EMERGENCY LIGHT STATION.
- H.T. CO. SIDEWALK JUNCTION BOX
- T.H.D. SIDEWALK ELECTRIC JUNCTION BOX.
- T.H.D. HANDHOLE
- C.O. SAMPLER
- C.O. SIDEWALK OR WALL JUNCTION BOX.
- ROADWAY LIGHT. FOR STATION NUMBER SEE LIGHTING PLAN.
- ROADWAY LIGHT WITH TRAFFIC SIGNAL
- —2W— CONDUIT RUN - 3W INDICATES 3-2" C, 2W INDICATES 2-2" C, ETC.

NOTE:
ELECTRICAL SYSTEM SHOWN ON THE INBOUND OR HONOLULU BOUND LANES IS EXISTING.

SCHEDULE OF DRAWINGS

SHEET	TITLE
1	ELECTRICAL KEY MAP & SCHEDULE OF DWGS.
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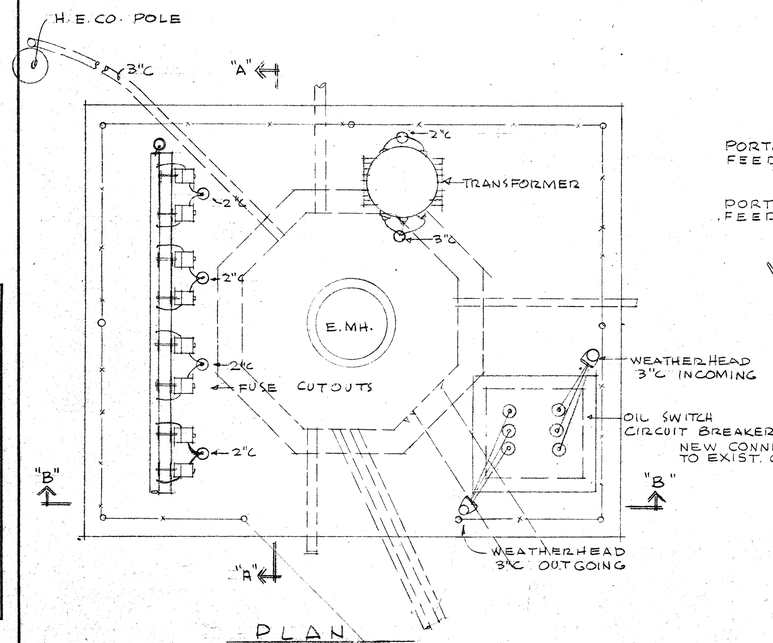
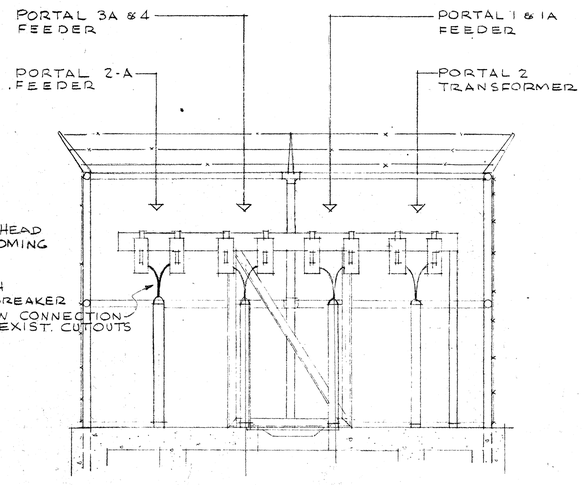
7	PORTAL 2-A & PORTAL 3-A
8	PORTAL 4-A
9	CARBON MONOXIDE SAMPLING SYSTEM
10	ELECTRICAL DETAILS
11	ELECTRICAL DETAILS
12	ELECTRICAL DETAILS
13	HIGHWAY LIGHTING, TRAFFIC LIGHTS LAYOUT & DETAILS



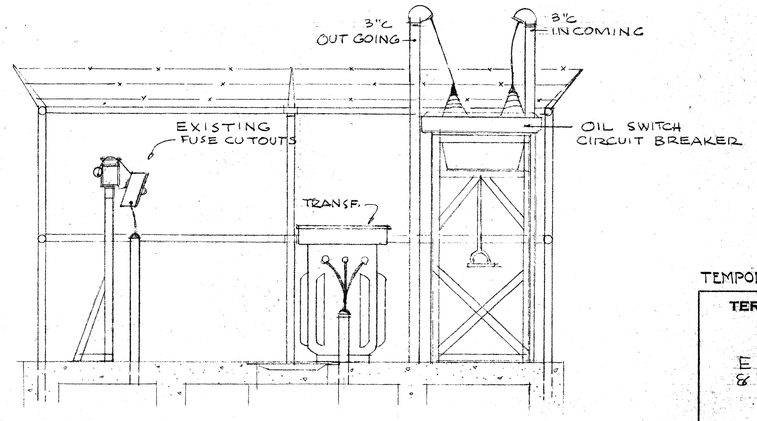
PLAN

EXISTING PRIMARY SERVICE PAD & NEW CONNECTION

SCALE: ½" = 1'-0"



SECTION "A-A"



SECTION "B-B"

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

TEMPORARY REVERSE TRAFFIC CONTROL

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL
ELECTRICAL KEY MAP & SCHEDULE OF DWGS.
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-OCI-1(5)
SCALE: AS NOTED DATE: MAY 1957

JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SHEET No. 1 OF 13 SHEETS

5896.43A

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BF-061-1(5)	1957	44	79

ONE LINE DIAGRAM - ELECTRIC DISTRIBUTION SYSTEM

NOTE: CONSTRUCTION OF SPLIT BUS PANELS SHALL BE SUCH THAT BOTH CIRCUIT 4 AND CIRCUIT 10 ARE OF OPPOSITE POLARITY FROM CIRCUIT 2.

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
ELECTRICAL
ONE LINE DIAGRAM
ELECTRIC DISTRIBUTION SYSTEM
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1 (5)

JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SCALE: AS NOTED DATE: MAY 1957

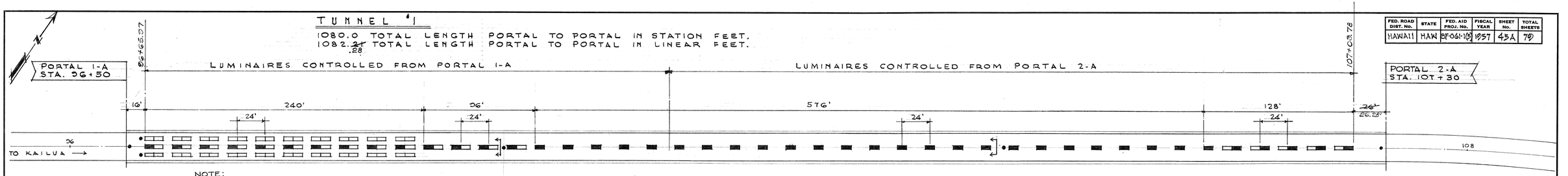
SHEET No. 2 OF 13 SHEETS

5896.44

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-061-1(5)	1957	45A	78

TUNNEL #1

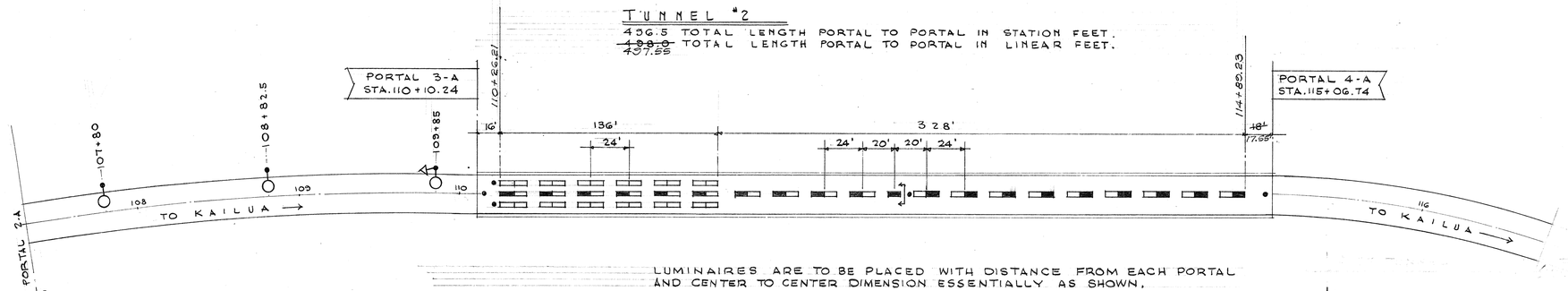
1080.0 TOTAL LENGTH PORTAL TO PORTAL IN STATION FEET.
1082.~~27~~ .28 TOTAL LENGTH PORTAL TO PORTAL IN LINEAR FEET.



NOTE:
DISTANCES SHOWN ON TUNNEL LIGHTING LAYOUT ARE SLOPE DISTANCES.

TUNNEL #2

409.5 TOTAL LENGTH PORTAL TO PORTAL IN STATION FEET.
~~410.0~~ 407.55 TOTAL LENGTH PORTAL TO PORTAL IN LINEAR FEET.



MATCH LINE FOR PORTAL 2-A STA. 107+30

LUMINAIRES ARE TO BE PLACED WITH DISTANCE FROM EACH PORTAL AND CENTER TO CENTER DIMENSION ESSENTIALLY AS SHOWN.

TUNNEL LIGHTING LAY OUT

SCALE: 1" = 40'

ELECTRICAL LEGEND

- 3 LAMP LUMINAIRE WITH CENTER LAMP ON CONTINUOUS SCHEDULE AND TWO OUTER LAMPS ON DAY SCHEDULE.
- 3 LAMP LUMINAIRE WITH ALL LAMPS ON DAY SCHEDULE.
- 18000 LUMEN COLOR CORRECTED MERCURY VAPOR LAMP ON METAL LAMP POST 30' ABOVE ROADWAY
- SAME WITH TRAFFIC SIGNAL
- ILLUMINATED SIGN.
- LIGHTING FEEDER JUNCTION BOX.

IN ADDITION TO FEEDER WIRES, A #8 BARE GROUND WIRE SHALL BE RUN THROUGH FEEDER CONDUITS AND JUNCTION BOXES FROM CONTROL NICHE.

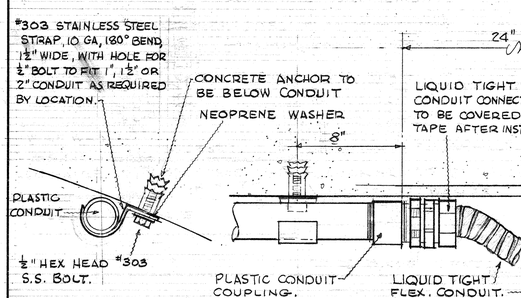
WIRE SIZE & LAMP HOOK-UP SCHEDULE (BASED ON 36" - 800 MA LAMPS)

	PORTAL 1-A										PORTAL 2-A					PORTAL 3-A								
	SOUTH ROW			CENTER ROW					NORTH ROW			CENTER ROW					SOUTH ROW		CENTER ROW				NORTH ROW	
CIRCUIT NUMBER	N	5	7	N	1	3	2	4	N	6	8	N	1	3	2	10	N	5	T	N	1	3	2	4	N	6	8
MAIN LIGHTING FEEDER WIRE SIZE	#4	#4	#4	#2	#2	#2	#4	#4	#4	#4	#4	#2	#2	#2	#4	#4	#8	#8	#8	#2	#2	#2	#4	#4	#8	#8	#8
CONTINUOUS SCHEDULE LAMPS							10								13	12							20				
DAY SCHEDULE LAMPS		30	30		~~33~~ 25	~~33~~ 26				30	30		33	32				18	18		38	40				18	18
DAY SCHEDULE LAMPS								14																10			
MAIN LIGHTING FEEDER CONDUIT SIZE	1½"			2"					1½"			2"					1"			2"					1"		
TYPE JUNCTION BOX FOR LUMINAIRE TAP *	PRX 53			PRX G3					PRX 53			PRX G3					PRT			PRX G3					PRT		

* CROUSE HINDS DESIGNATIONS USED FOR DESCRIPTIVE PURPOSES.

NOTE: CONTRACTOR MAY USE ANY TYPE OF BOLTED FITTING THAT DOES NOT REQUIRE CUTTING OF THE MAIN FEEDER CONDUCTORS AND STILL LEAVES AMPLE SPACE IN THE JUNCTION BOX AFTER TAPEING.

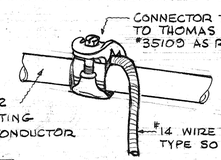
NOTE: CIRCUIT LEGS OF OPPOSITE POLARITY SHALL BE TAPPED IN ADJACENT JUNCTION BOXES TO PROVIDE CONTINUOUS BALANCE OF LOAD ON MAIN LIGHTING FEEDER CONDUCTORS.



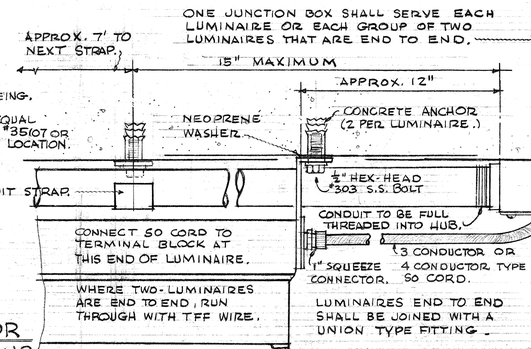
CONDUIT MOUNTING

SCALE: 3" = 1'-0"

CONNECTION TO CONDUIT SYSTEM AT PORTALS. SCALE: 3" = 1'-0"

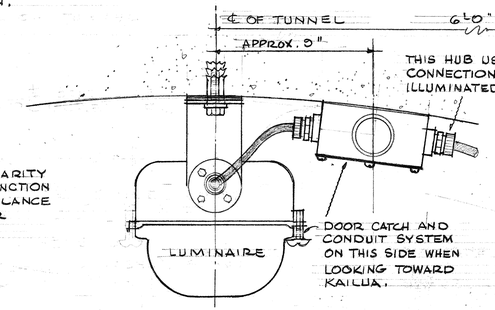


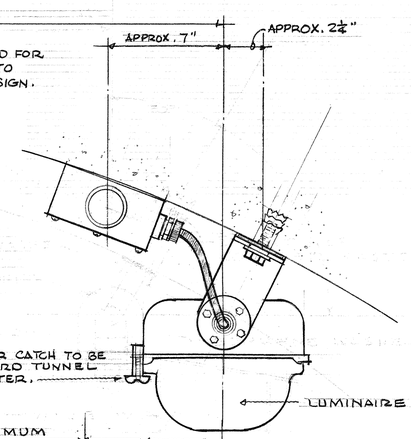
TYPICAL METHOD FOR TAPPING MAIN LIGHTING FEEDER IN JUNCTION BOX. NOT TO SCALE.



CONDUIT, JUNCTION BOX AND LUMINAIRE MOUNTING DETAIL

SCALE: 3" = 1'-0"





THIS SHEET REPLACES THE FOLLOWING:
SHEET 5896.45 - IN ITS ENTIRETY
5896.47 - THE FOLLOWING DETAILS:
"COMPOSITE TUNNEL SECTION"
"TYPICAL LUMINAIRE WIRING"
5896.53 - DETAIL (5)

JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

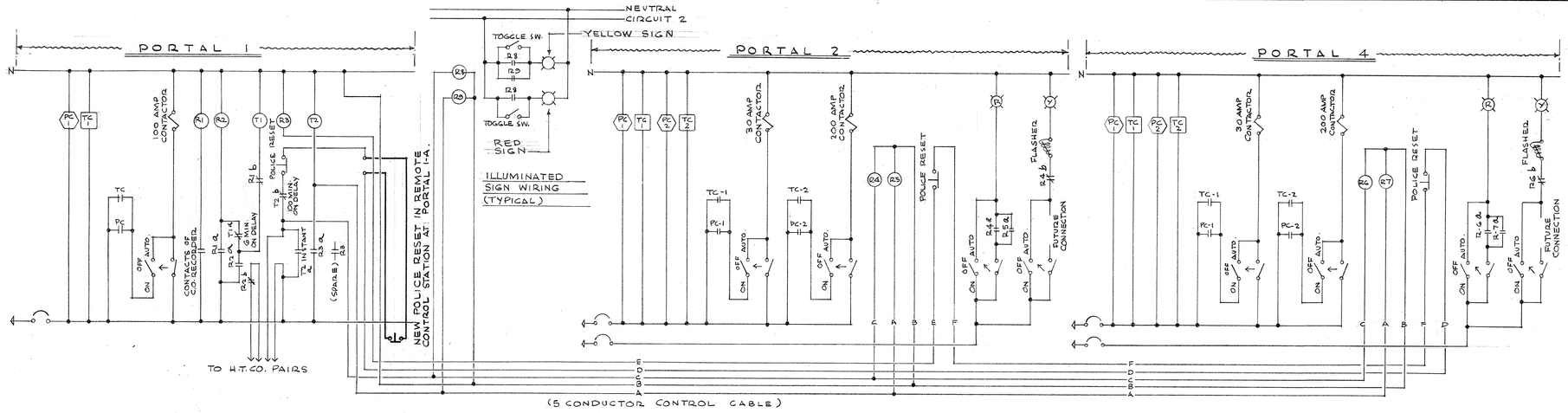
ELECTRICAL LIGHTING PLAN PALI ROAD OUTBOUND TUNNELS PROJ. No. BF-061-1(5)

SCALE: AS NOTED DATE: SEPT. 1958

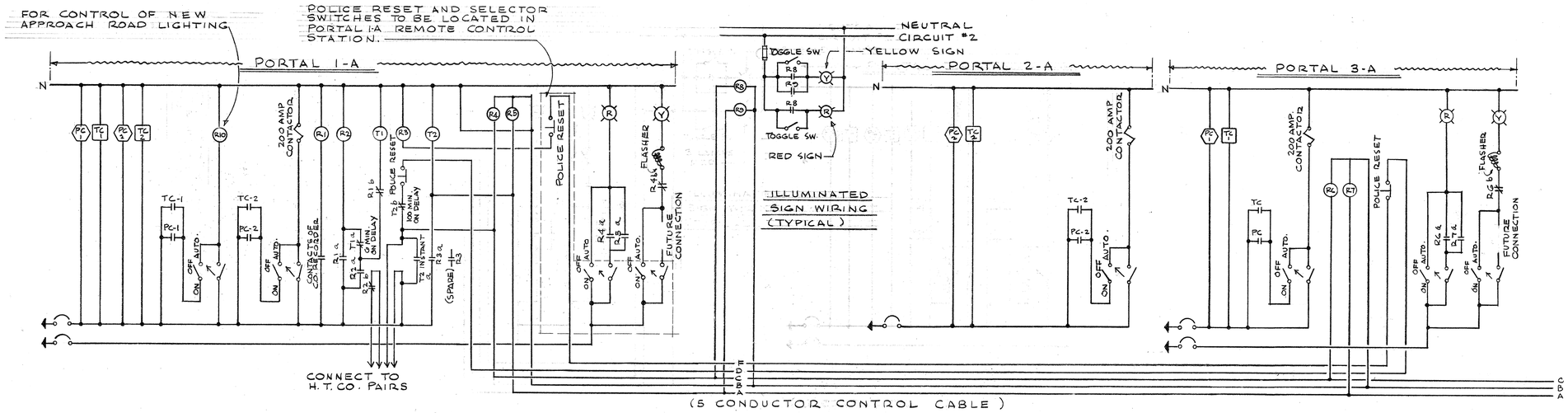
SHEET No. 5896.45A OF SHEETS

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

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-061-1(7)	1957	46	79



EXISTING • TUNNELS



OUTBOUND TUNNELS

LIGHTING CONTROLS SCHEMATIC DIAGRAM

CONTROL LEGEND

- 3 POSITION SELECTOR SWITCH, OIL TIGHT
- (R1) RELAY - FOR CHARACTERISTICS, SEE RELAY SCHEDULE
- (R) TRAFFIC SIGN OR ILLUMINATED SIGN
- OPERATING COIL OF MAGNETICALLY HELD CONTACTOR
- (PC) PHOTO - CELL
- (TC) TIME SWITCH
- NORMALLY OPEN CONTACTS
- NORMALLY CLOSED CONTACTS
- CIRCUIT BREAKER
- PUSH BUTTON, NORMALLY CLOSED, OIL TIGHT

RELAY SCHEDULE

R1, R2, R4, R6. - 1 SET OF N.O. & 1 SET OF N.C. CONTACTS.

R5, R7, R9, R10 - 1 SET OF N.O. CONTACTS

R3, R8 - 2 SET OF N.O. CONTACTS

T2 - TIMING RELAY, 3 TO 100 MIN. 1 INSTANTANEOUS CONTACT; 1 NO. & 1 N.C. TIMED CONTACT.

T1 - TIMING RELAY, 12 SECONDS TO 6 2/3 MINUTES, 1 INSTANTANOUS CONTACT, 1-NO. & 1-N.C. TIMED CONTACT.

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

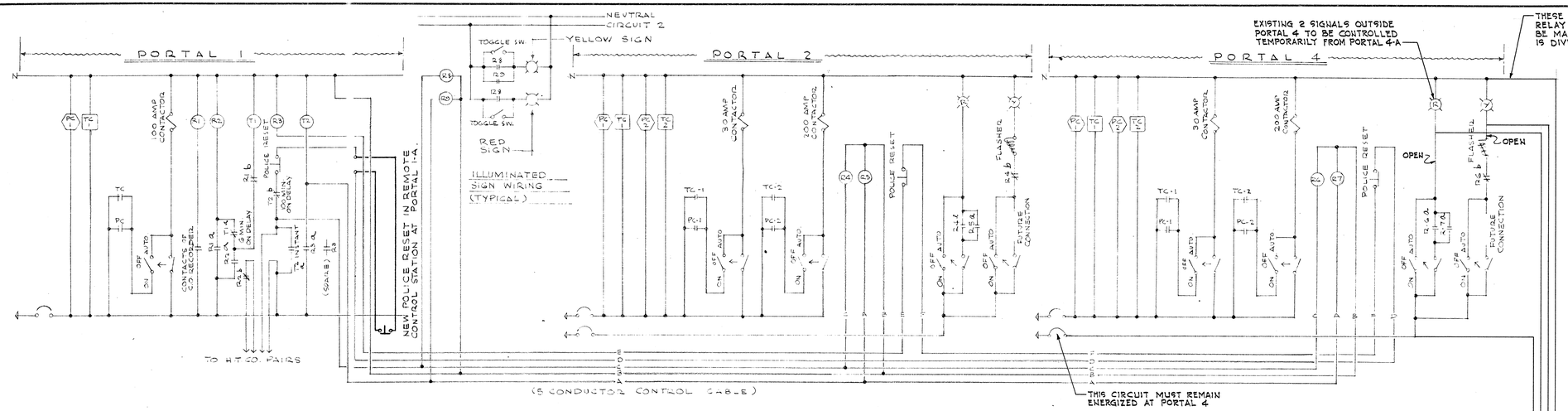
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
ELECTRICAL
LIGHTING CONTROLS SCHEMATIC WIRING DIAGRAMS
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1(5)
SCALE: AS NOTED DATE: MAY 1957

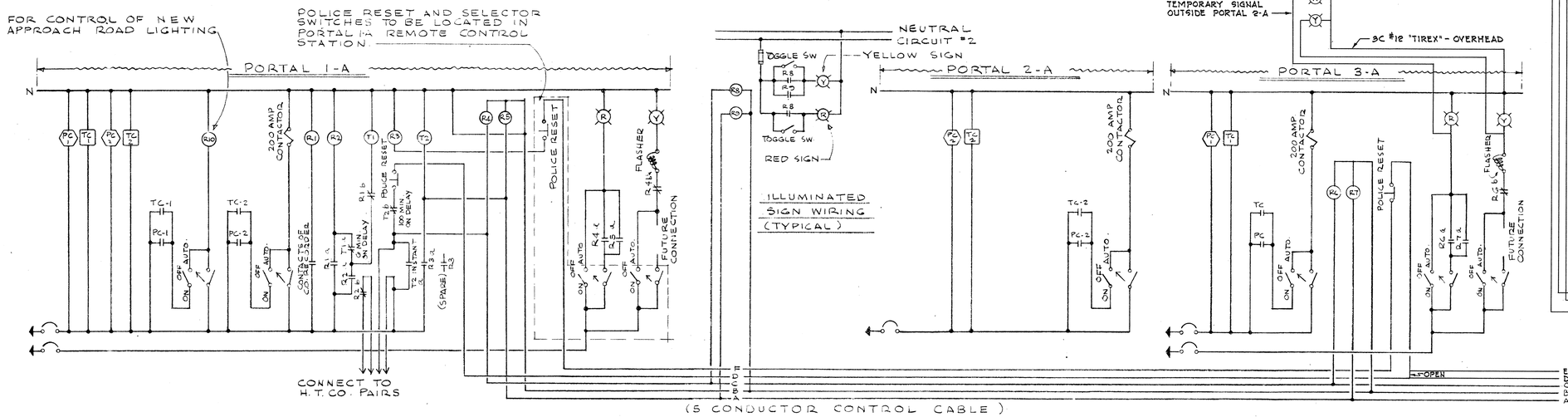
SHEET No. 4 OF 13 SHEETS

5596.46

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-061-1(7)	1957	46A	75



EXISTING TUNNELS



OUTBOUND TUNNELS

LIGHTING CONTROLS SCHEMATIC DIAGRAM

CONTROL LEGEND

- 3 POSITION SELECTOR SWITCH, OIL TIGHT
- (R) RELAY - FOR CHARACTERISTICS, SEE RELAY SCHEDULE
- (R) TRAFFIC SIGN OR ILLUMINATED SIGN
- OPERATING COIL OF MAGNETICALLY HELD CONTACTOR
- (PC) PHOTO-CELL
- (TC) TIME SWITCH
- NORMALLY OPEN CONTACTS
- NORMALLY CLOSED CONTACTS
- CIRCUIT BREAKER
- PUSH BUTTON, NORMALLY CLOSED, OIL TIGHT

RELAY SCHEDULE

R1, R2, R4, R6, R11	- 1 SET OF N.O. & 1 SET OF N.C. CONTACTS.
R5, R7, R9, R10, R12	- 1 SET OF N.O. CONTACTS
R3, R8	- 2 SET OF N.O. CONTACTS
T2	- TIMING RELAY, 3 TO 100 MIN. 1 INSTANTANEOUS CONTACT; 1 N.O. & 1 N.C. TIMED CONTACT.
T1	- TIMING RELAY, 12 SECONDS TO 6 2/3 MINUTES; 1 INSTANTANOUS CONTACT, 1-N.O. & 1-N.C. TIMED CONTACT.

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL
LIGHTING CONTROLS SCHEMATIC WIRING DIAGRAMS
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1(5)
SCALE: AS NOTED DATE: MAY 1957

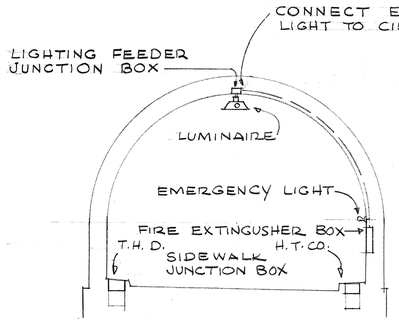
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SHEET No. 4 OF 13 SHEETS

5596.46A

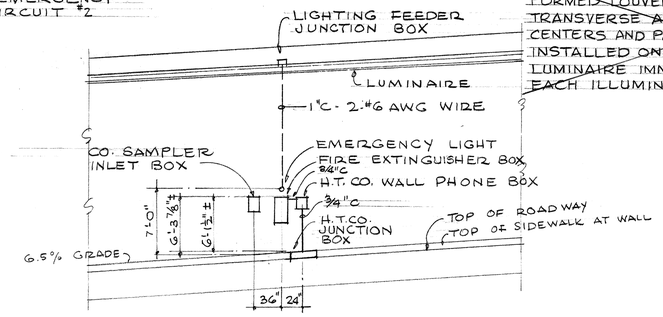
PRINTED ON DIEPO 1000H CLEARPRINT

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF06H(2)	1957	47	79



SECTION

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



ELEVATION

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

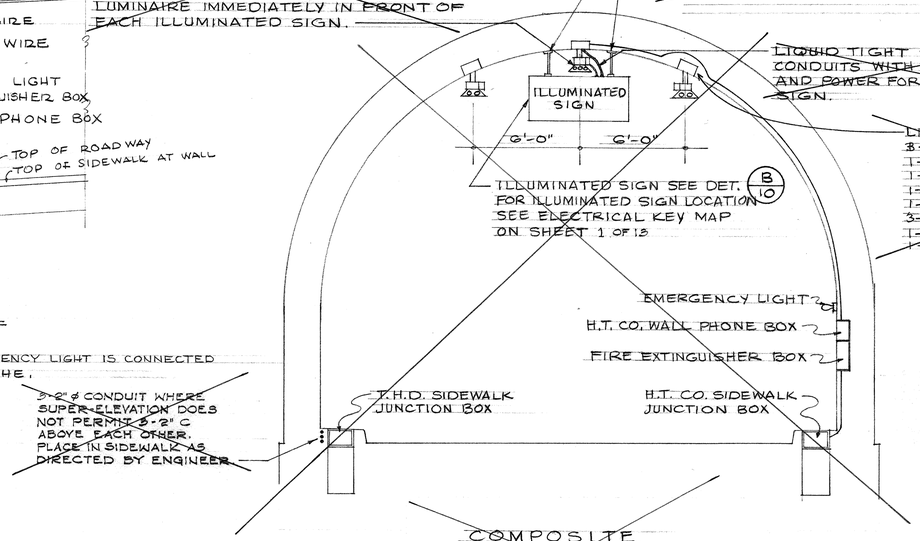
NOTE : AT PORTALS 1-A AND 2-A EMERGENCY LIGHT IS CONNECTED WITH 2-#12 AWG WIRE FROM NICHE.

NOTE: A 4 FOOT LONG REMOVABLE FORMED LOUVER SECTION 2" WIDE 18"GAUGE TRANSVERSE ALUMINUM STRIPS ON 2" CENTERS AND PAINTED BLACK SHALL BE INSTALLED ON THE TUNNEL LIGHTING LUMINAIRE IMMEDIATELY IN FRONT OF EACH ILLUMINATED SIGN.

CONCRETE INSERTS TO BE SAME AS FOR TUNNEL LIGHTING LUMINAIRE SWIVEL, HANGERS, CANOPY, AND TUNNEL INSERTS TO BE FURNISHED AS REQUIRED FOR SIGNS.

LIQUID TIGHT FLEXIBLE CONDUITS WITH CONTROL AND POWER FOR ILLUMINATED SIGN.

LIGHTING FEEDER JUNCTION BOX
B - PORTAL 1-A
1 - ILLUMINATED SIGN AT STA. 99+20
1 - EMERGENCY LIGHT AT 101+90 STA.
1 - ILLUMINATED SIGN AT STA. 104+00
1 - PORTAL 2-A
3 - PORTAL 3-A
1 - ILLUMINATED SIGN AT STA. 112+58
1 - EMERGENCY LIGHT AT PORTAL 4-A



3-2" ϕ CONDUIT WHERE SUPER-ELEVATION DOES NOT PERMIT 3-2" C ABOVE EACH OTHER. PLACE IN SIDEWALK AS DIRECTED BY ENGINEER

COMPOSITE

TUNNEL SECTION

(LOOKING TOWARD KAILUA)

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

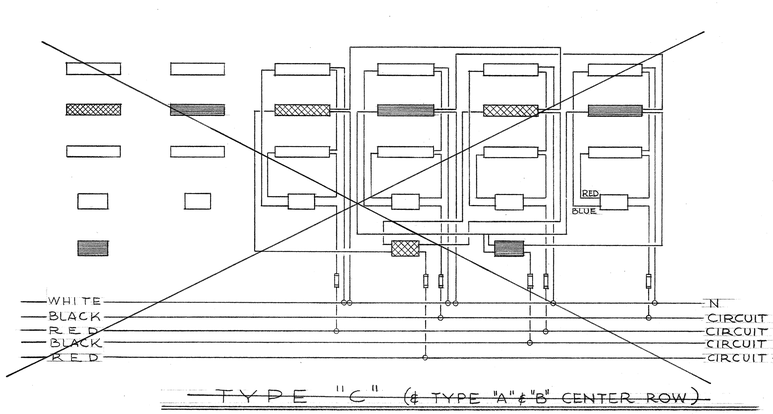
DELETE

(See Sheet No. 5806.45A)

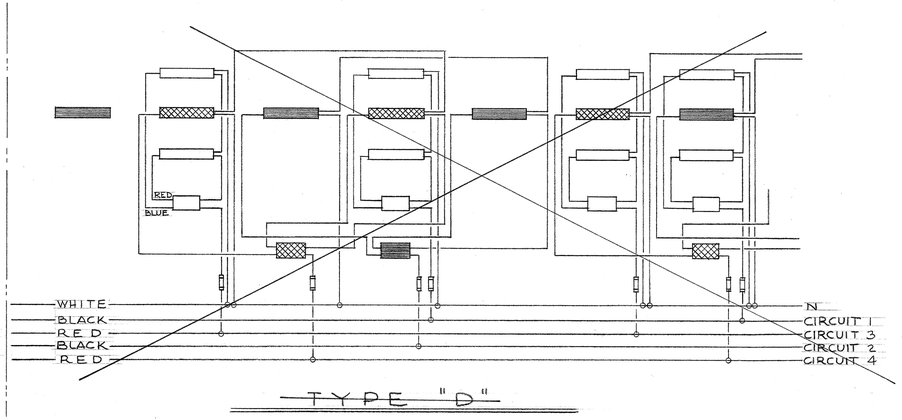
SYMBOLS

- LAMP ON CONTINUOUS SCHEDULE
- LAMP ON DAY SCHEDULE
- LAMP ON DAY SCHEDULE WITH PROVISION FOR CONNECTING TO CONTINUOUS SCHEDULE.
- BALLAST FOR 2 LAMPS ON CONTINUOUS SCHEDULE
- BALLAST FOR 2 LAMPS ON DAY SCHEDULE.
- BALLAST FOR 2 LAMPS ON DAY SCHEDULE WITH PROVISION FOR CONNECTING TO CONTINUOUS SCHEDULE AT PORTAL.
- —□— FUSE.

1. CENTER LAMP IN LUMINAIRE NEAREST TO PORTAL 1-A AND 3-A AND THEN IN EVERY OTHER LUMINAIRE THROUGHOUT TUNNEL SHALL BE ON CONTINUOUS SCHEDULE.
2. ALL WIRING BETWEEN BALLASTS AND LAMPS SHALL BE #14 AWG. 1000 VOLT, THERMOPLASTIC FIXTURE WIRE WITH UL APPROVED INSULATION FOR 80°C. WIRE SHALL BE CODED AS INDICATED.
3. EACH CUTOUT TYPE LAMPHOLDER SHALL BE TOWARD HONOLULU END OF TUNNEL.
4. ONE SINGLE LAMP HIGH POWER FACTOR BALLAST SHALL BE INSTALLED ON EACH CIRCUIT HAVING AN UNEVEN NUMBER OF LAMPS.
5. FOR WIRE SIZE OF LIGHTING FEEDERS FROM EACH PORTAL, SEE SCHEDULE ON "LIGHTING PLAN."



TYPE "C" (& TYPE "A" & "B" CENTER ROW)



TYPE "D"

TYPICAL LUMINAIRE WIRING

NOTE : □ INDICATES LOCATION OF FUSES TO BE INSTALLED IN FIRST BORE CIRCUITS. BALLASTS FOR SECOND BORE TO HAVE BUILT-IN THERMAL PROTECTION.

DELETE

(See Sheet No. 5806.45A)

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL
TUNNEL SECTIONS & TYPICAL LUMINAIRE WIRING
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-0G1-1(5)

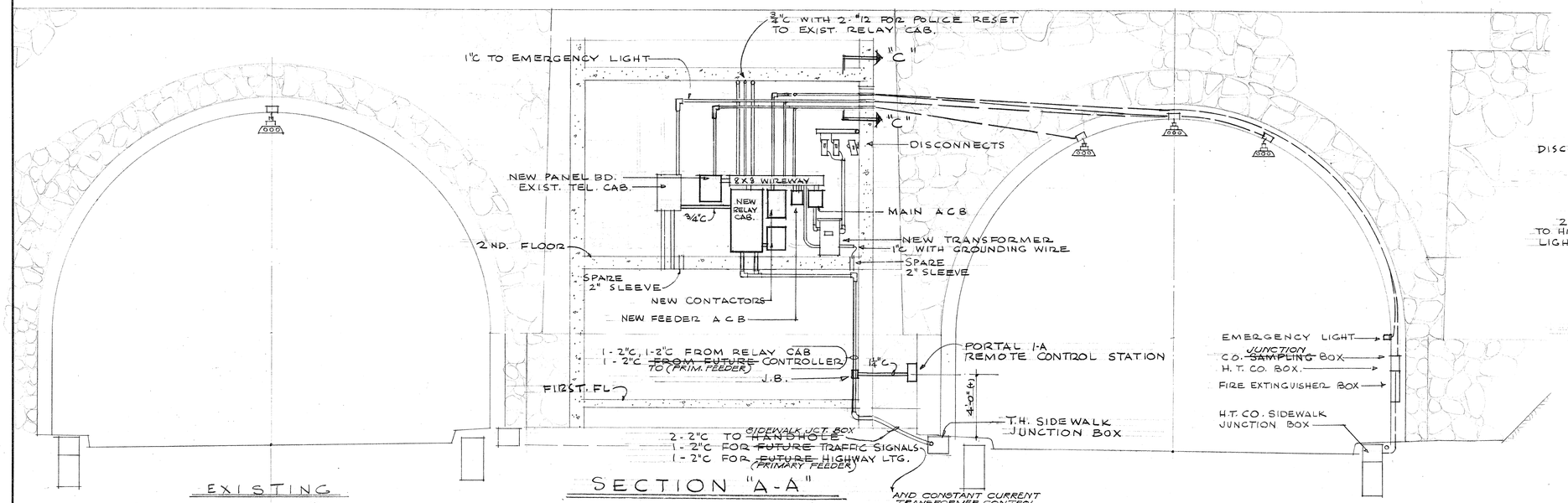
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SCALE : AS NOTED DATE : MAY 1957

SHEET No. 5 OF 13 SHEETS

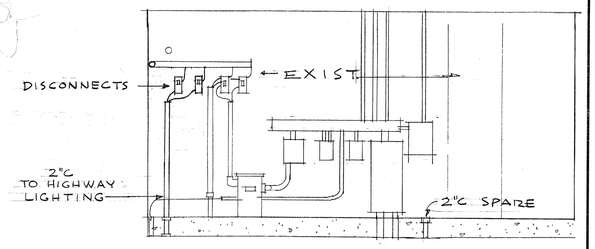
5596.47

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BFOG1(5)	1957	48	70

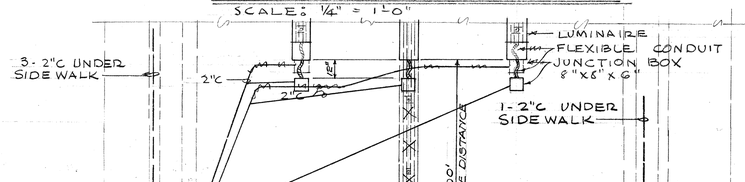


EXISTING
ELEVATION • PORTAL 1
SCALE: 1/4" = 1'-0"

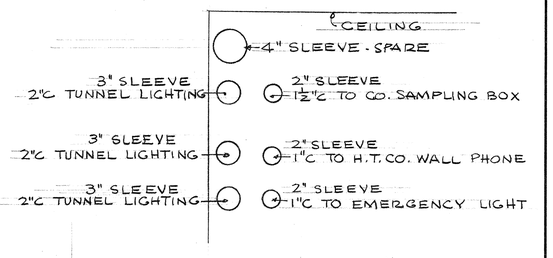
SECTION "A-A"



SECOND FLOOR
SECTION "B-B"
SCALE: 1/4" = 1'-0"



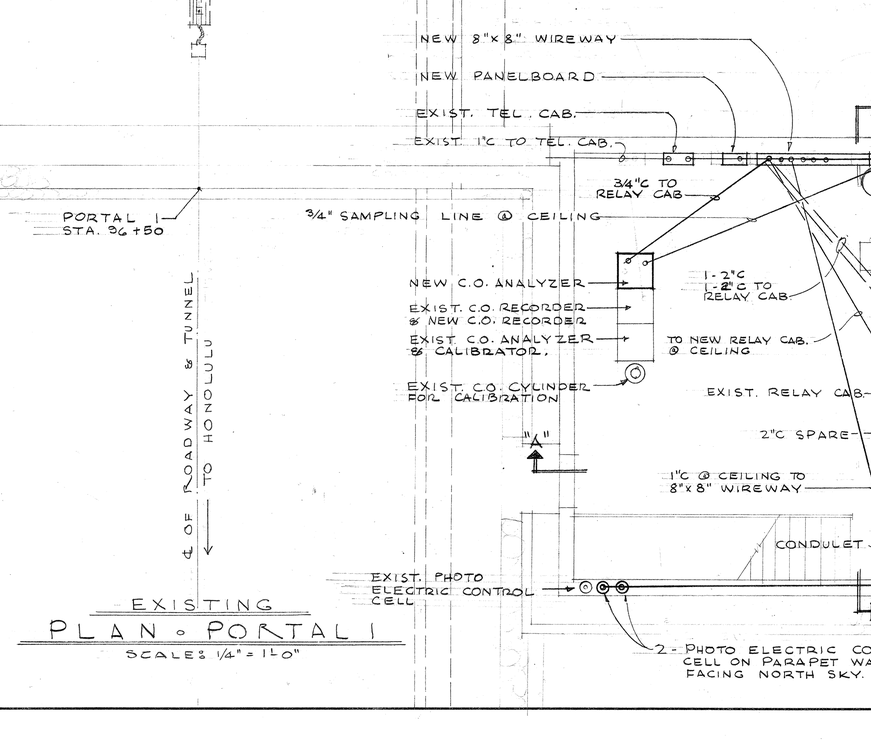
ELEVATION • PORTAL 1-A
SCALE: 1/4" = 1'-0"



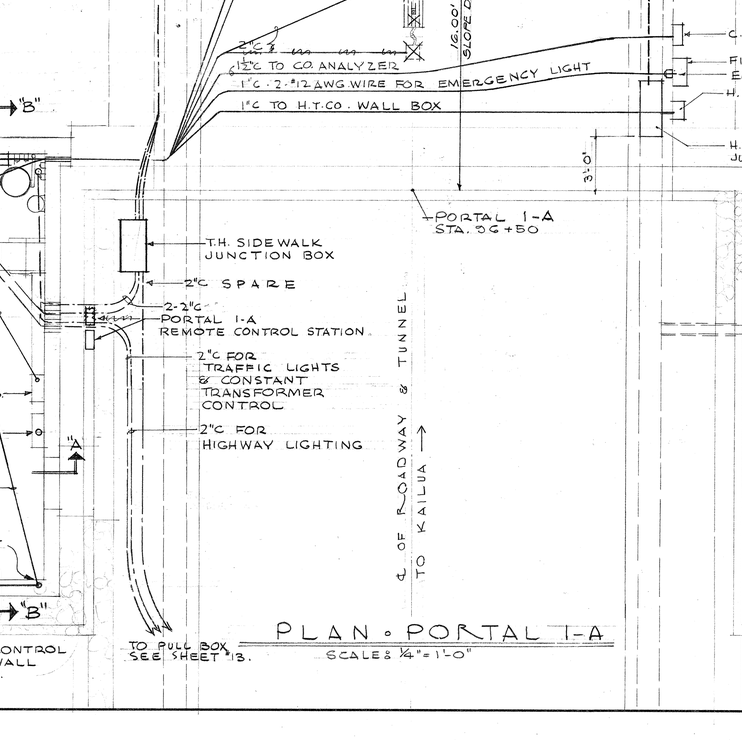
SECTION "C-C"
SHOWING CONDUITS ASSIGNMENTS IN EXISTING SLEEVES AT WALL
SCALE: 1 1/2" = 1'-0"

NOTES:

ALL NEW CONDUITS WILL RUN THROUGH MASONRY THROUGH EXISTING SLEEVES.



EXISTING
PLAN • PORTAL 1
SCALE: 1/4" = 1'-0"



PLAN • PORTAL 1-A
SCALE: 1/4" = 1'-0"

PORTAL 1-A STA. 36+50

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

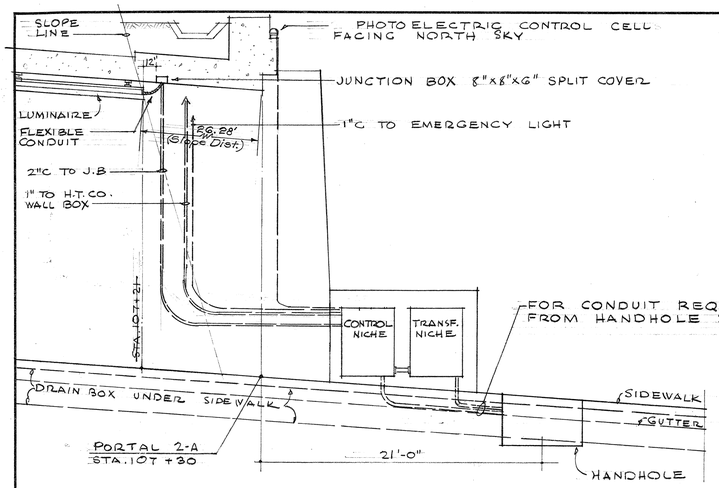
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
ELECTRICAL
PORTAL 1-A
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-0G1-1(5)
SCALE: AS NOTED DATE: MAY 1957

SHEET No. 6 OF 13 SHEETS

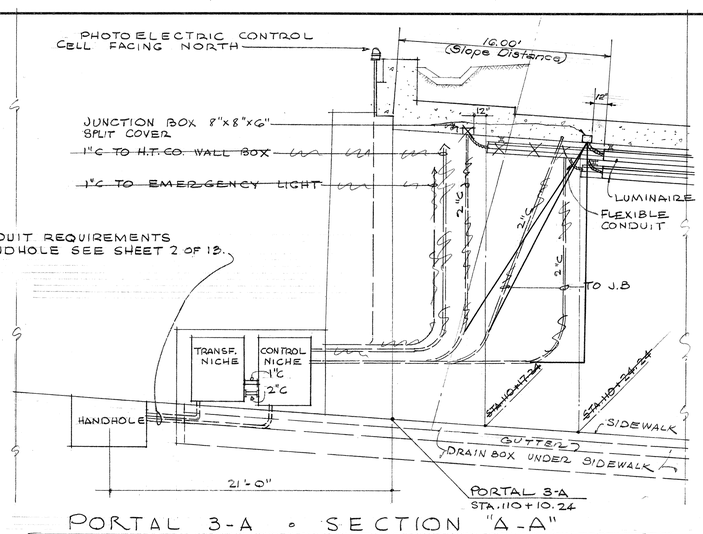
5996.48

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF06H(7)	1957	49	79



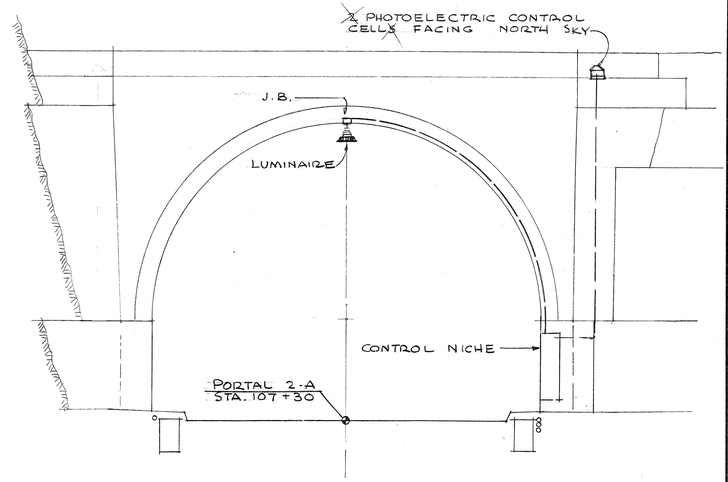
PORTAL 2-A ◦ SECTION "A-A"

SCALE: 3/16" = 1'-0"



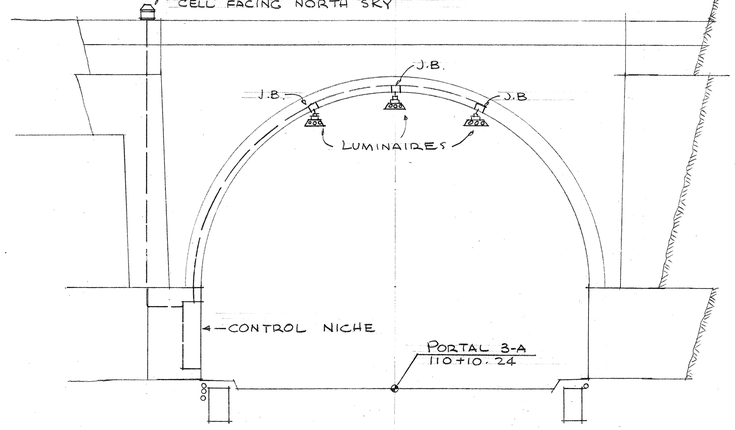
PORTAL 3-A ◦ SECTION "A-A"

SCALE: 3/16" = 1'-0"



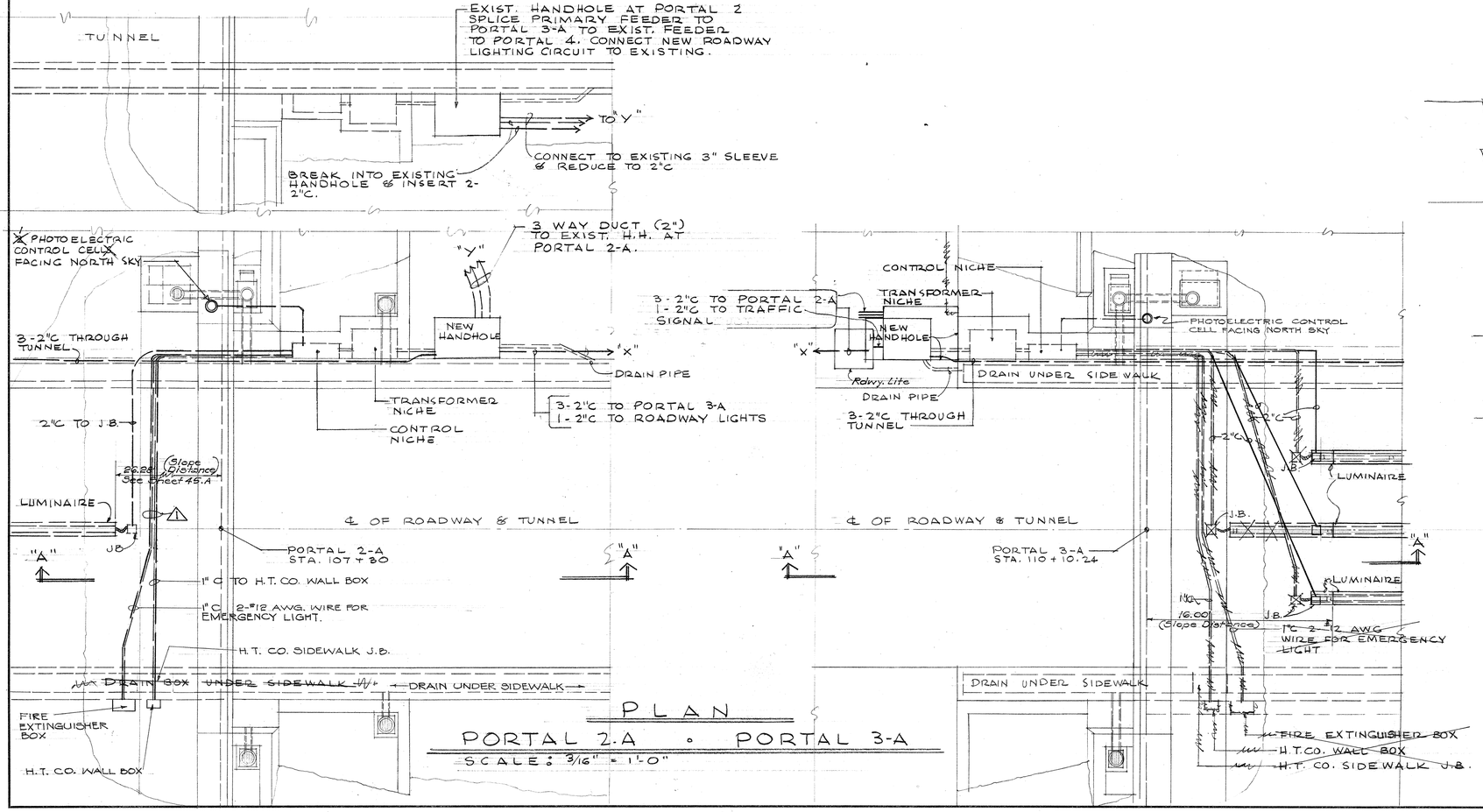
PORTAL 2-A ◦ ELEVATION

SCALE: 3/16" = 1'-0"



PORTAL 3A ◦ ELEVATION

SCALE: 3/16" = 1'-0"



PLAN

PORTAL 2-A ◦ PORTAL 3-A

SCALE: 3/16" = 1'-0"

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

REVISION: 12/27/57 ⚠ CORRECTION

TERRITORIAL HIGHWAY DEPARTMENT

TERRITORY OF HAWAII

ELECTRICAL PORTAL 2-A & PORTAL 3-A

PALI ROAD

OUTBOUND TUNNELS

PROJ. NO. BF-06H-1(5)

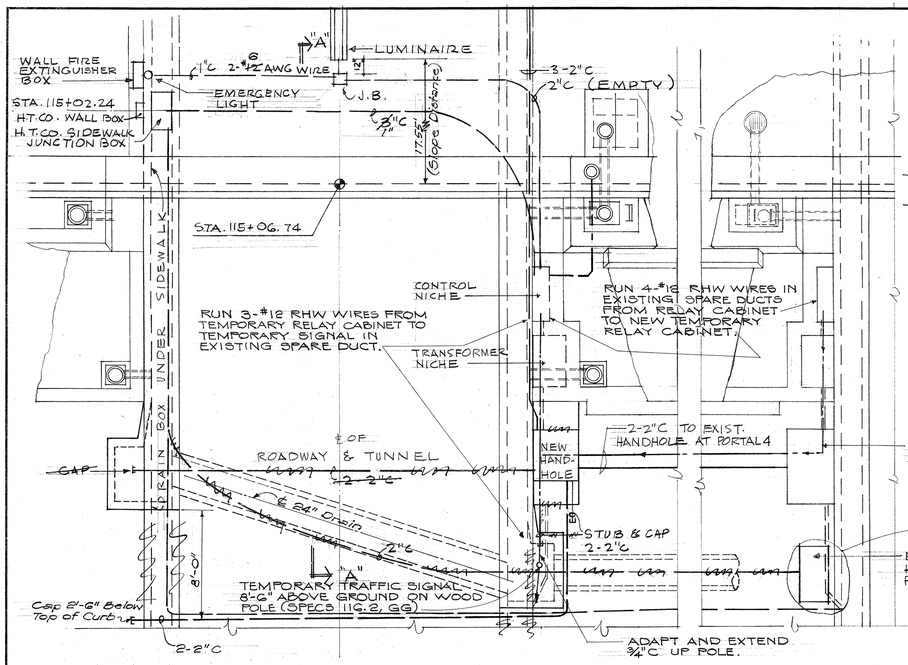
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SCALE: AS NOTED DATE: MAY 1957

SHEET No. 7 OF 13 SHEETS

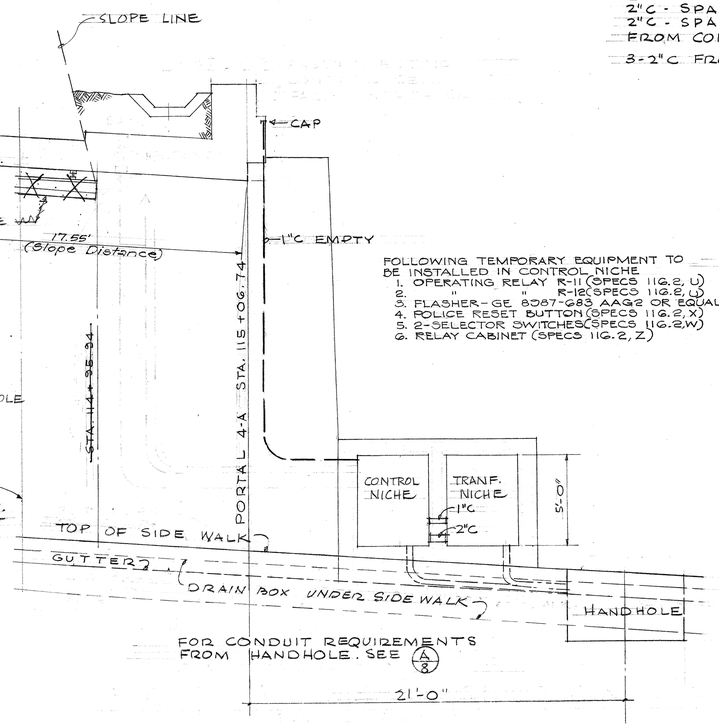
5596.49

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-061-1(5)	1957	50	79



PLAN AT PORTAL 4-A

SCALE: 3/16" = 1'-0"



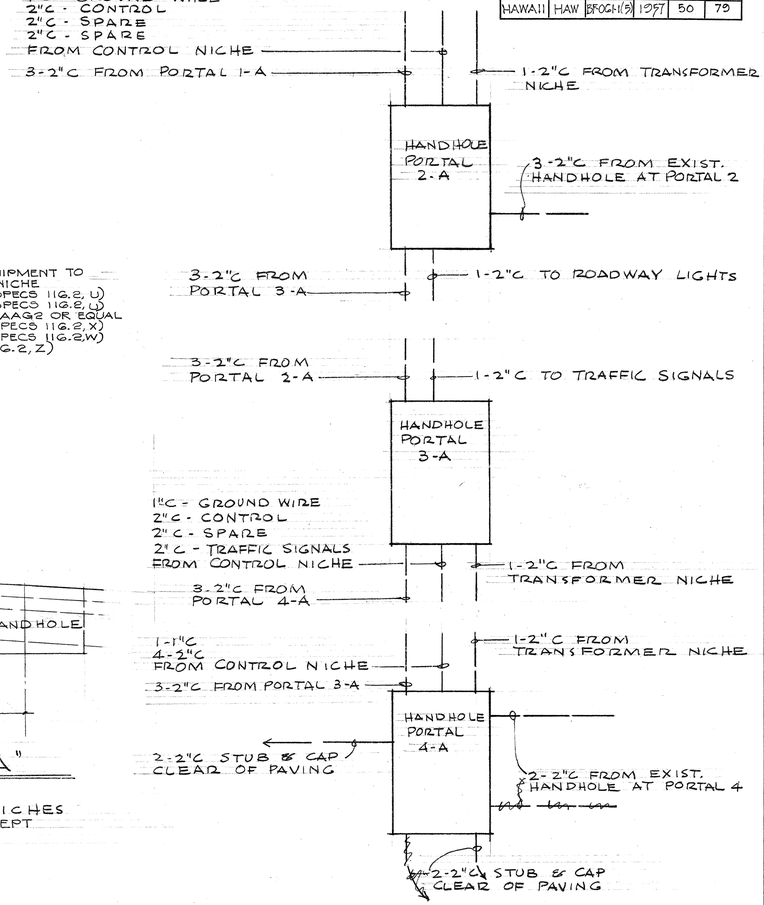
FOR CONDUIT REQUIREMENTS FROM HANDHOLE. SEE (A/8)

FOLLOWING TEMPORARY EQUIPMENT TO BE INSTALLED IN CONTROL NICHE
1. OPERATING RELAY R-11 (SPECS 116.2, U)
2. " " R-12 (SPECS 116.2, U)
3. FLASHER - GE. 8D87-G83 AAG2 OR EQUAL
4. POLICE RESET BUTTON (SPECS 116.2, X)
5. 2-SELECTOR SWITCHES (SPECS 116.2, W)
6. RELAY CABINET (SPECS 116.2, Z)

PORTAL 4-A ◦ SECTION "A-A"

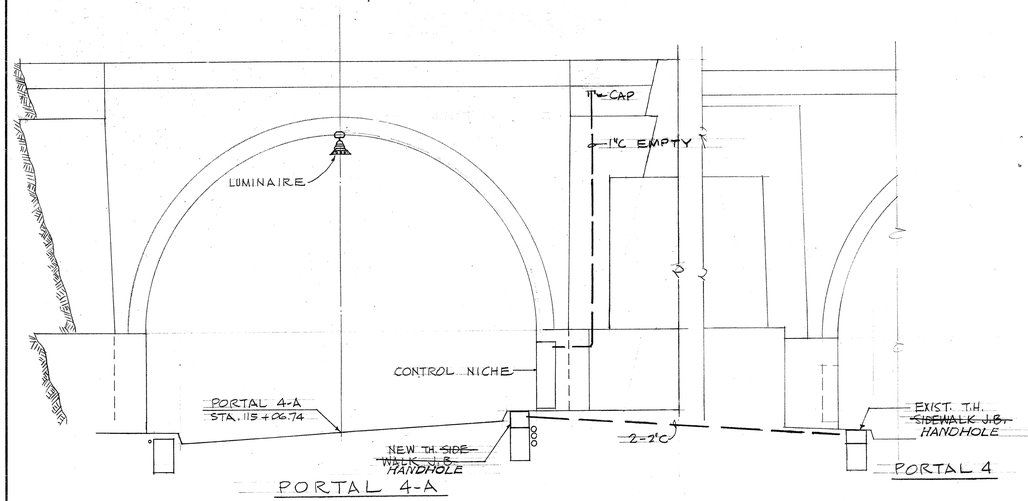
SCALE: 1/4" = 1'-0"

NO EQUIPMENT SHALL BE INSTALLED IN NICHES AT PORTAL 4-A UNDER THIS CONTRACT, EXCEPT FOR TEMPORARY TRAFFIC SIGNAL CONTROL.



CONDUIT PLANS FOR HANDHOLE. (A/8)

NOT TO SCALE:



PORTAL 4-A

ELEVATION AT PORTAL 4-A

SCALE: 3/16" = 1'-0"

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL
PORTAL 4-A
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1(5)

JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SCALE: AS SHOWN DATE: MAY 1957

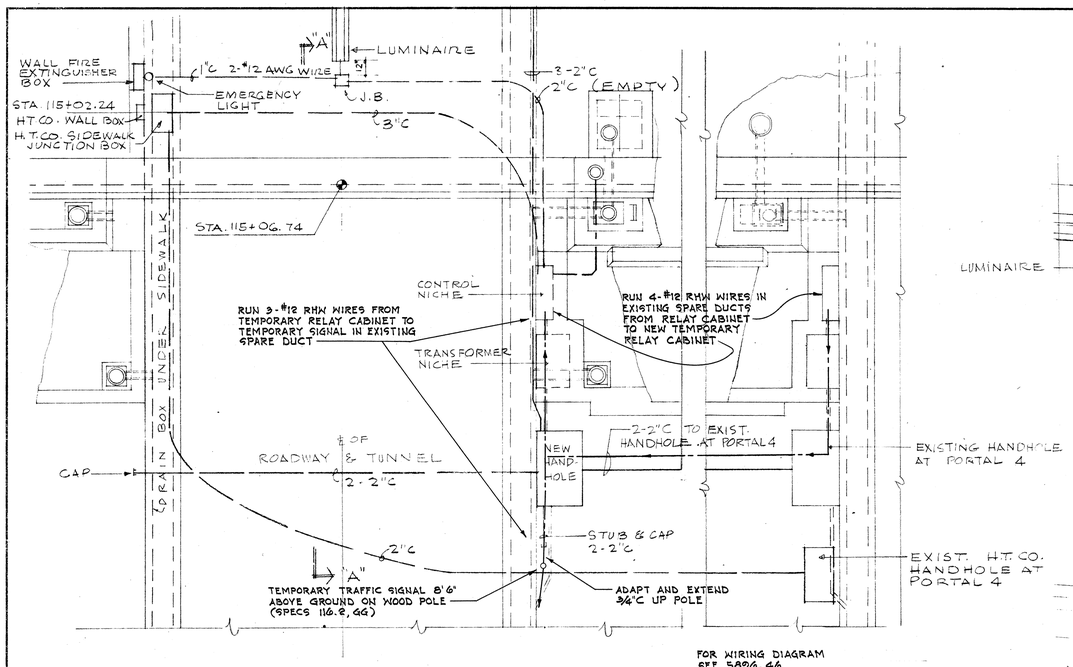
SHEET No. 8 OF 13 SHEETS

5896.50

PRINTED ON DIEPO 1000H CLEARPRINT

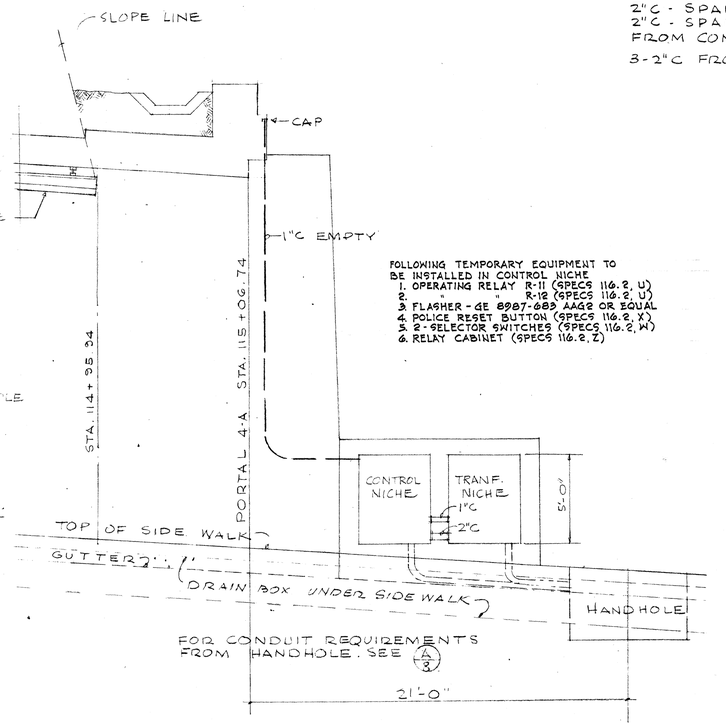
Job 687-01

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BRG(16)5	1957	30 A	79



PLAN AT PORTAL 4-A

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

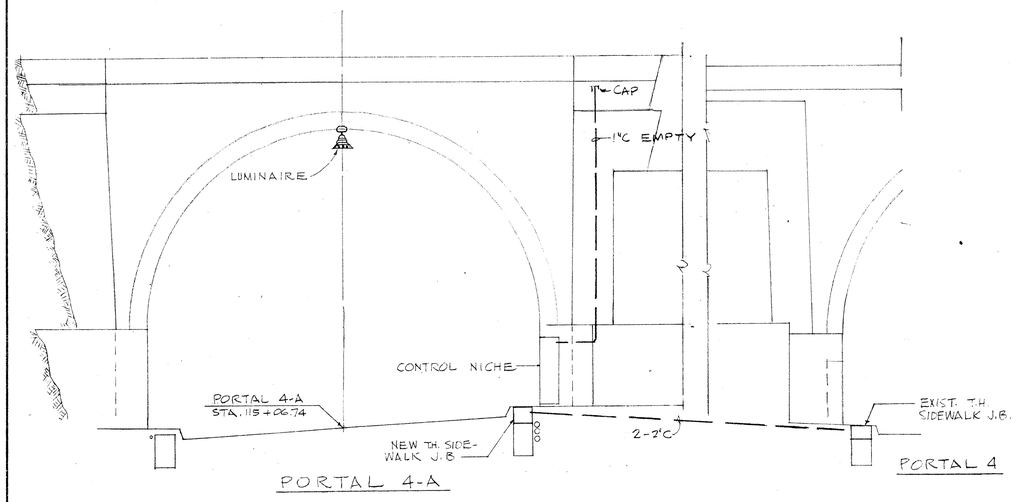


FOLLOWING TEMPORARY EQUIPMENT TO BE INSTALLED IN CONTROL NICHE
1. OPERATING RELAY R-11 (SPECS 116.2, U)
2. " " R-12 (SPECS 116.2, U)
3. FLASHER - GE 8987-6B3 AAG2 OR EQUAL
4. POLICE RESET BUTTON (SPECS 116.2, X)
5. 2-SELECTOR SWITCHES (SPECS 116.2, W)
6. RELAY CABINET (SPECS 116.2, Z)

PORTAL 4-A ◦ SECTION "A-A"

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

NO EQUIPMENT SHALL BE INSTALLED IN NICHES AT PORTAL 4-A UNDER THIS CONTRACT. EXCEPT FOR TEMPORARY TRAFFIC SIGNAL CONTROL.



PORTAL 4-A

ELEVATION AT PORTAL 4-A

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

1"C - GROUND WIRE
2"C - CONTROL
2"C - SPARE
2"C - SPARE
FROM CONTROL NICHE
3-2"C FROM PORTAL 1-A
1-2"C FROM TRANSFORMER NICHE
HANDHOLE PORTAL 2-A
3-2"C FROM EXIST. HANDHOLE AT PORTAL 2
3-2"C FROM PORTAL 3-A
1-2"C TO ROADWAY LIGHTS
3-2"C FROM PORTAL 2-A
1-2"C TO TRAFFIC SIGNALS
HANDHOLE PORTAL 3-A
1"C - GROUND WIRE
2"C - CONTROL
2"C - SPARE
2"C - TRAFFIC SIGNALS
FROM CONTROL NICHE
1-2"C FROM TRANSFORMER NICHE
3-2"C FROM PORTAL 4-A
1-1"C
4-2"C
FROM CONTROL NICHE
1-2"C FROM TRANSFORMER NICHE
3-2"C FROM PORTAL 3-A
HANDHOLE PORTAL 4-A
2-2"C STUB & CAP CLEAR OF PAVING
2-2"C FROM EXIST. HANDHOLE AT PORTAL 4
2-2"C STUB & CAP CLEAR OF PAVING

CONDUIT PLANS FOR HANDHOLE. A/8

NOT TO SCALE:

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL

PORTAL 4-A

PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1(5)

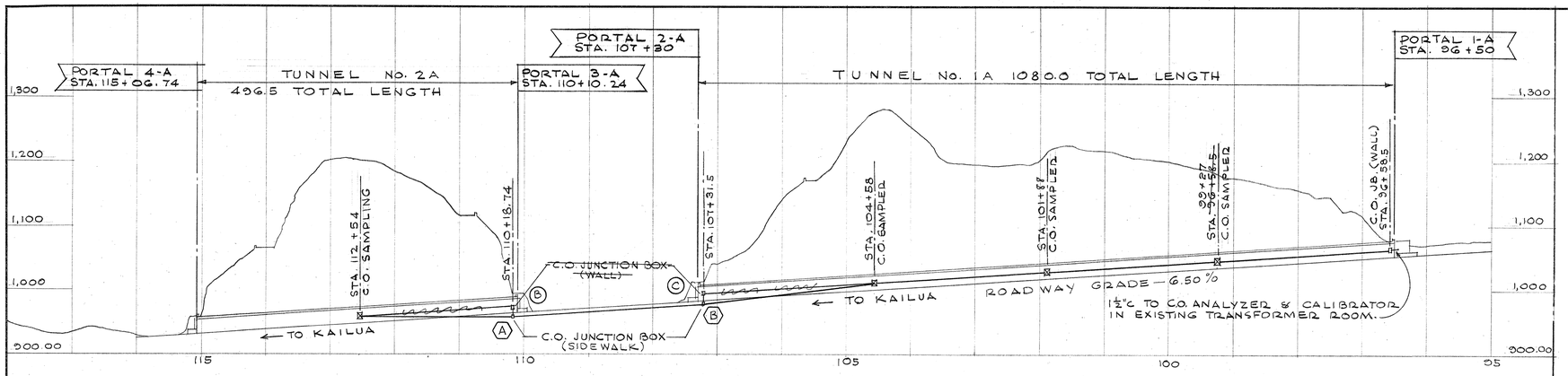
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SCALE: AS SHOWN DATE: MAY 1957

SHEET No. 8 OF 13 SHEETS

5896.50A

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BFOGH(5)	1957	51	70

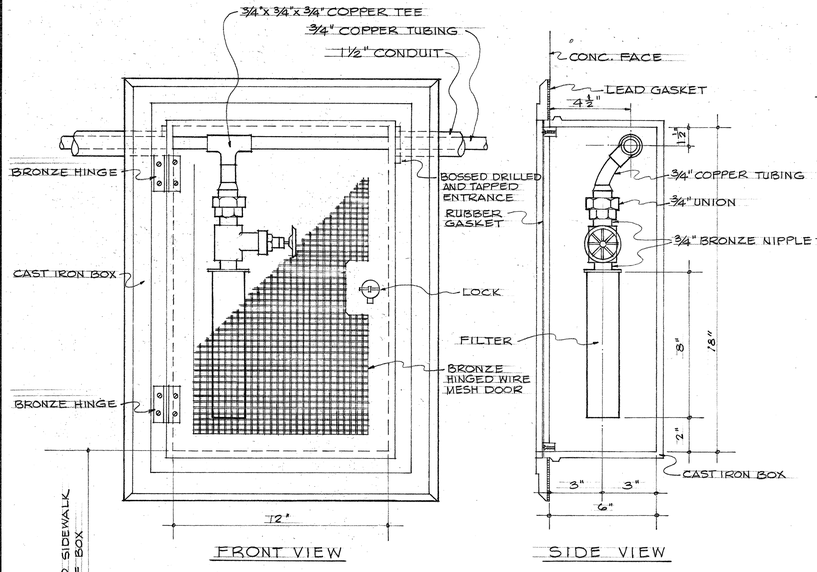


SECTION ALONG CENTER LINE

C.O. SAMPLING SYSTEM • LOCATIONS OF C.O. SAMPLING BOX & C.O. JUNCTION BOX

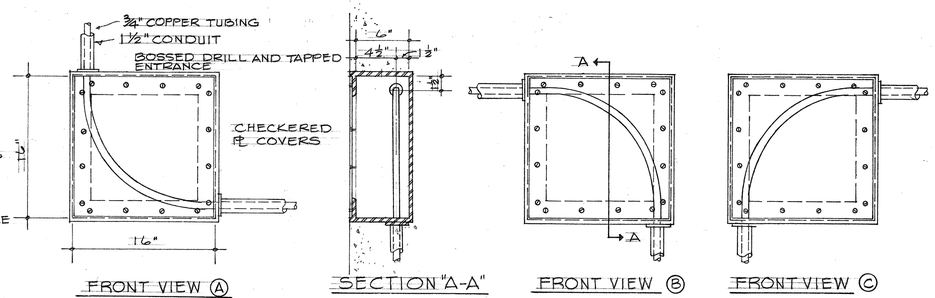
NOTES

1. SEE ELECTRICAL KEY PLAN FOR CO. SAMPLER LOCATIONS — SHEET 1 OF 13.
2. FOR EXISTING & NEW EQUIPMENT LAYOUT OF C.O. ANALYZER & CALIBRATOR SEE SHEET 6 OF 13.



TYPICAL CO SAMPLING INLET BOX DETAIL (A/9)

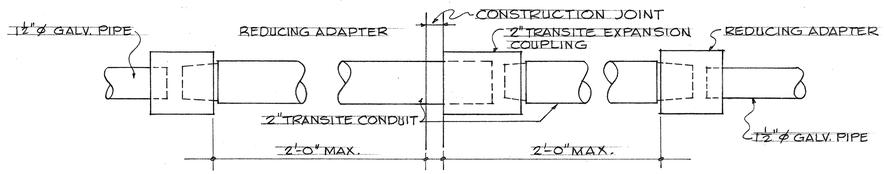
SCALE: 3"=1'-0"



TYPICAL JUNCTION BOX (B/9)

SCALE: 1½"=1'-0"

NOTE: WHERE JUNCTION BOX IS USED AS SIDEWALK BOX DRILL ¼" WEEPHOLE IN LOWEST CORNER INTO BOX DRAIN UNDER SIDEWALK.



EXPANSION COUPLING AT EACH TUNNEL CONSTRUCTION JOINT

SCALE: 3" = 1'-0"

NOTE: WHERE JUNCTION BOX IS USED AS SIDEWALK BOX DRILL ¼" WEEPHOLE IN LOWEST CORNER INTO BOX DRAIN UNDER SIDEWALK.

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL CARBON MONOXIDE SAMPLING SYSTEM

PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1(5)

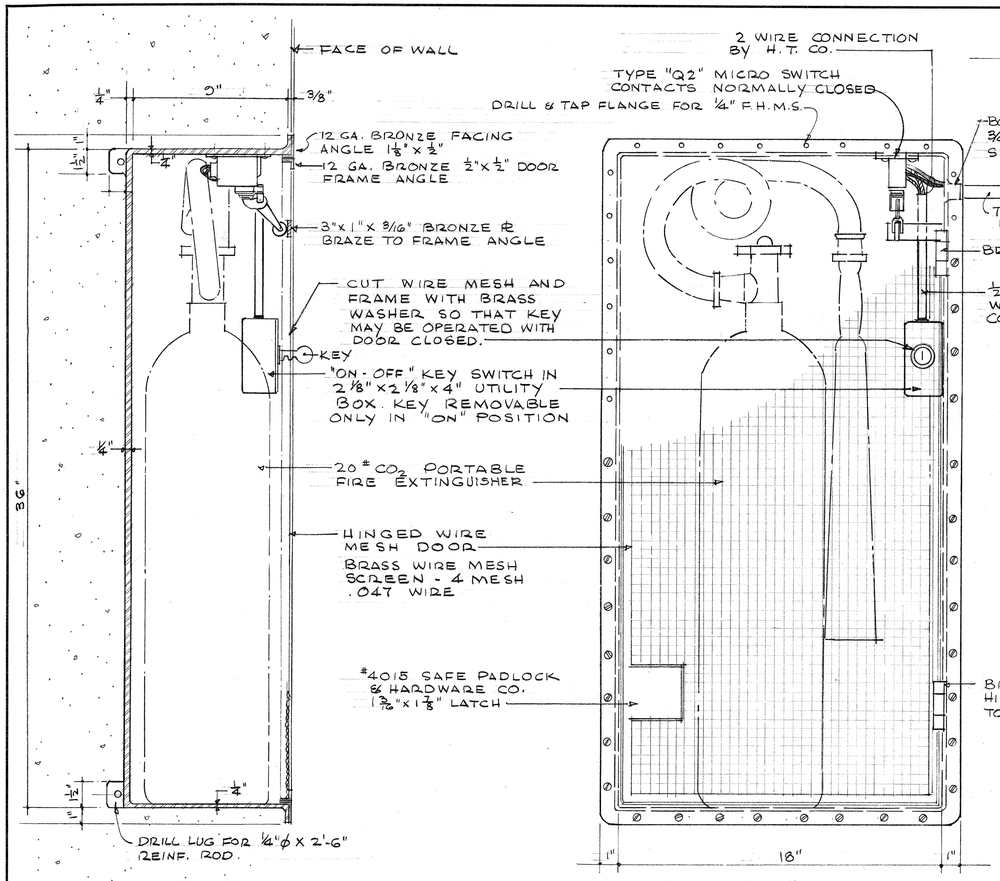
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

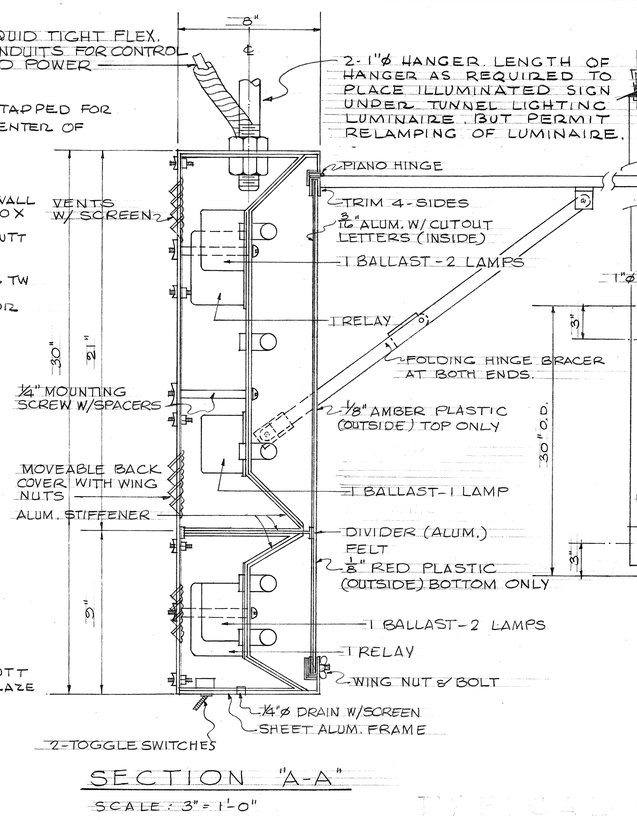
SCALE: AS NOTED DATE: MAY 1957

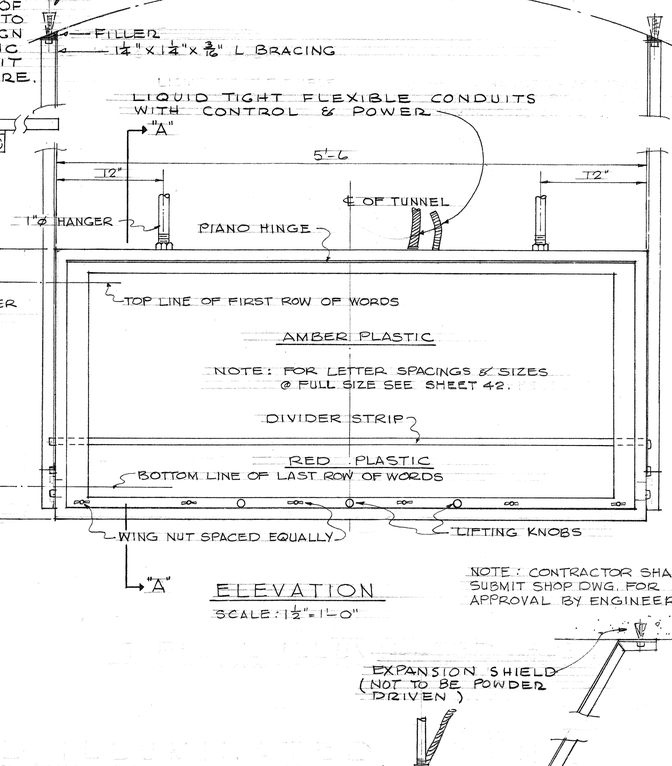
SHEET No. 9 OF 13 SHEETS

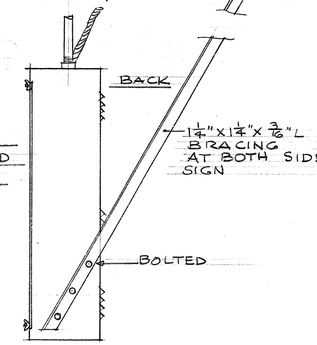
5596.51

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BF-06H(5)	1957	52	79

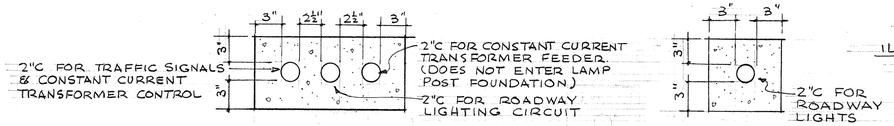


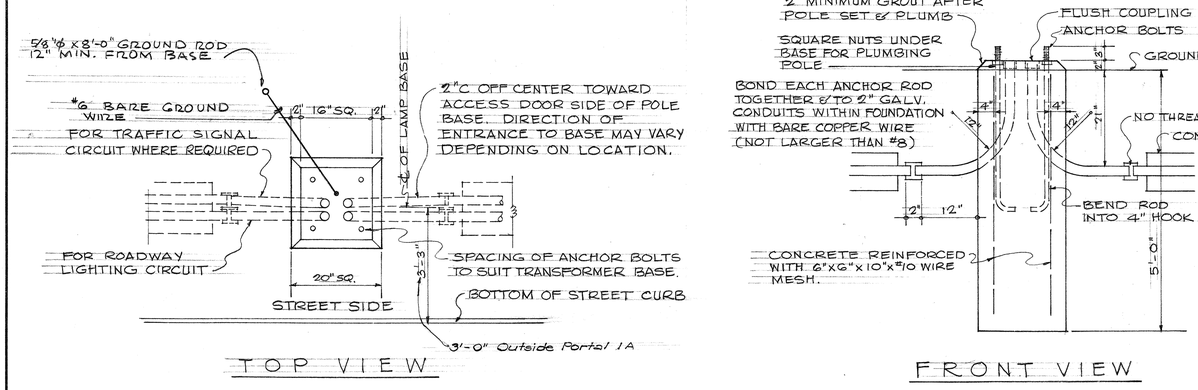


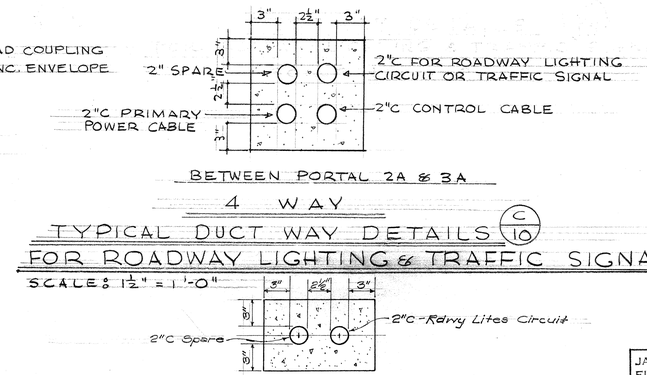




TYPICAL ILLUMINATED SIGN DETAIL B/10







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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII

ELECTRICAL
ELECTRICAL DETAILS

PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-06H-1(5)
SCALE : AS NOTED DATE : MAY 1957

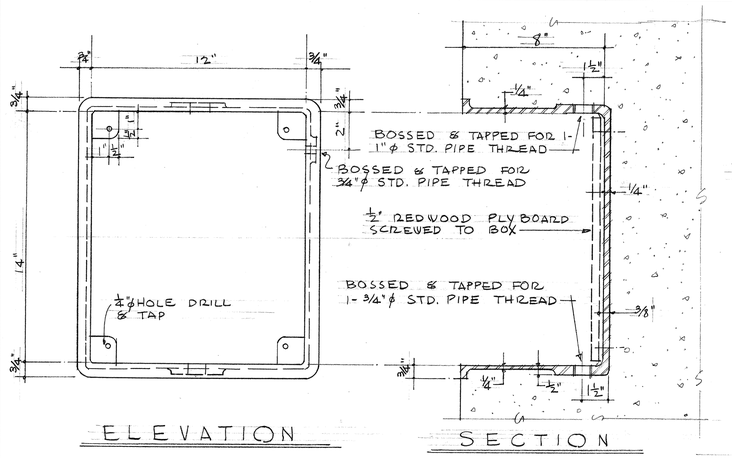
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SHEET No. 10 OF 3 SHEETS

5996.52

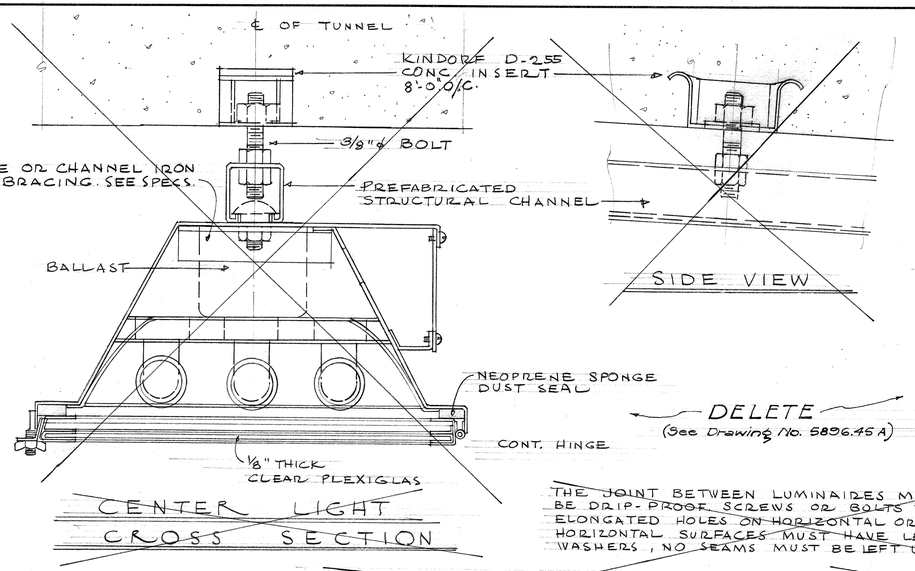
PRINTED ON DIEPO 1000H CLEARPRINT

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BFOG1(3)	1957	53	72



DETAILS OF H.T. CO. WALL PHONE BOX (A/11)

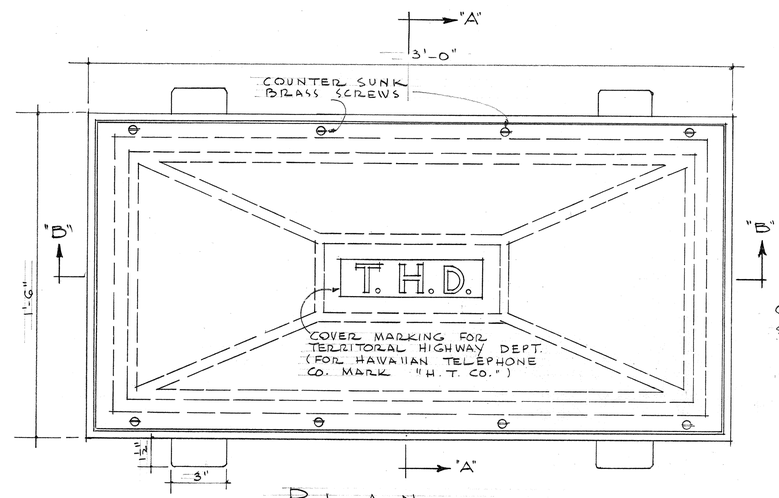
SCALE: 3" = 1'-0"

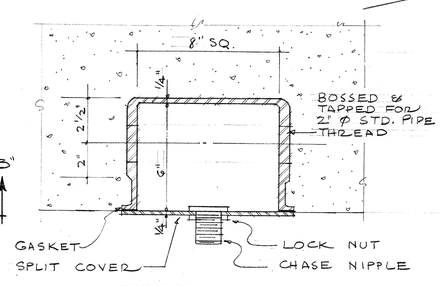


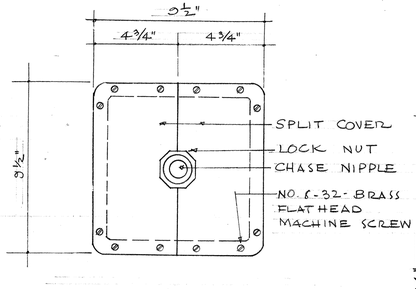
THE JOINT BETWEEN LUMINAIRES MUST BE DRIP-PROOF SCREWS OR BOLTS THROUGH ELONGATED HOLES ON HORIZONTAL OR NEAR HORIZONTAL SURFACES MUST HAVE LEAD WASHERS, NO SEAMS MUST BE LEFT UNPROTECTED.

TYPICAL LIGHT MOUNTING DETAILS (B/11)

HALF SCALE:

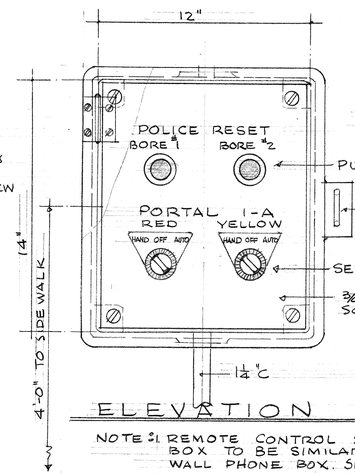


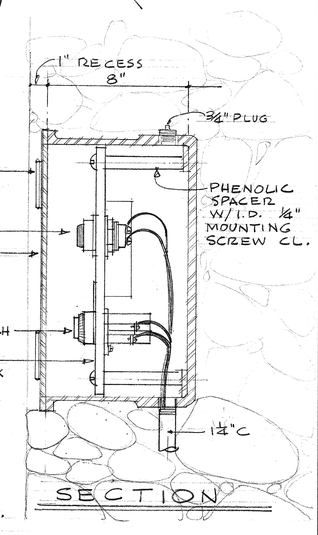




LIGHTING FEEDER JUNCTION BOX (C/11)

SCALE: 3" = 1'-0"

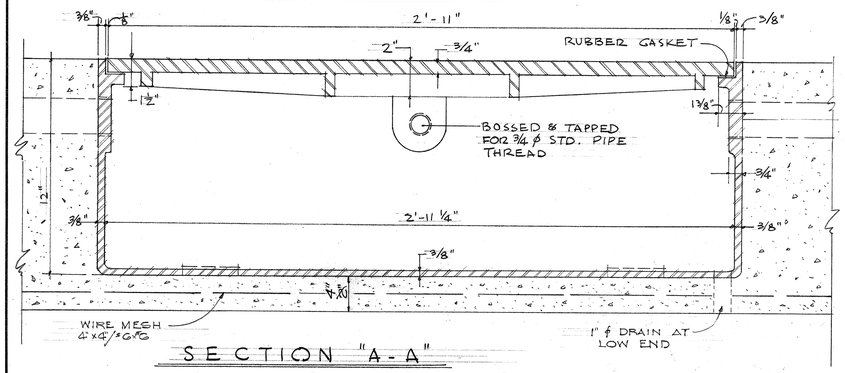


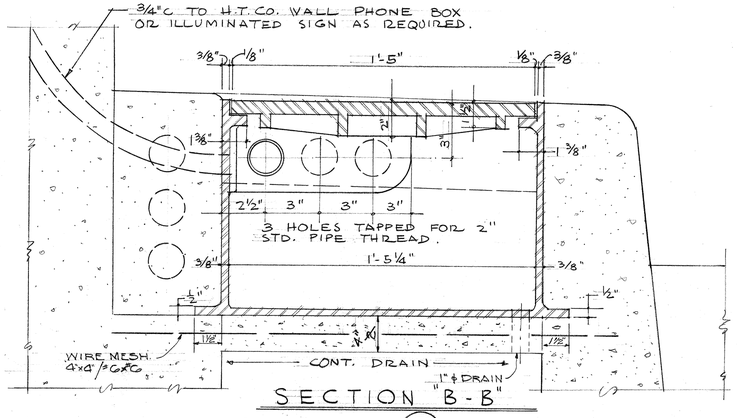


NOTE: 1. REMOTE CONTROL STATION BOX TO BE SIMILAR TO H.T.CO. WALL PHONE BOX. SEE DET. (A/11)

2. COVER TO BE CAST IRON & WITH PADLOCK HASP.

PORTAL 1-A · REMOTE CONTROL STATION BOX DETAIL (E/11)





DETAILS OF SIDEWALK JUNCTION BOX (D/11)

SCALE: 3" = 1'-0" NOTE: HAWAIIAN TELEPHONE CO. SIDEWALK JUNCTION BOX SIMILAR

NOTE: FOR STRUCTURAL DETAIL NOT SHOWN SEE "PORTAL DETAIL 1" SHEET 22.

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

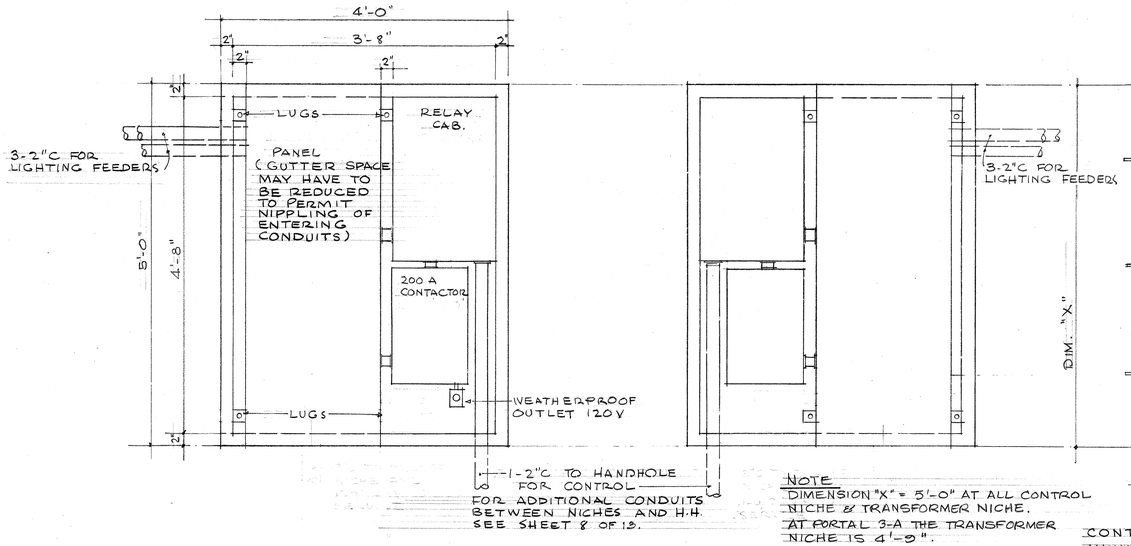
TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
ELECTRICAL
ELECTRICAL DETAILS
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1 (5)

JAMES J. OBERHAUSEN, ELECTRICAL ENGINEER
SCALE: AS NOTED DATE: MAY 1957

SHEET No. 11 OF 13 SHEETS

5896.53

FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW	BFOCH(5)	1957	54	70



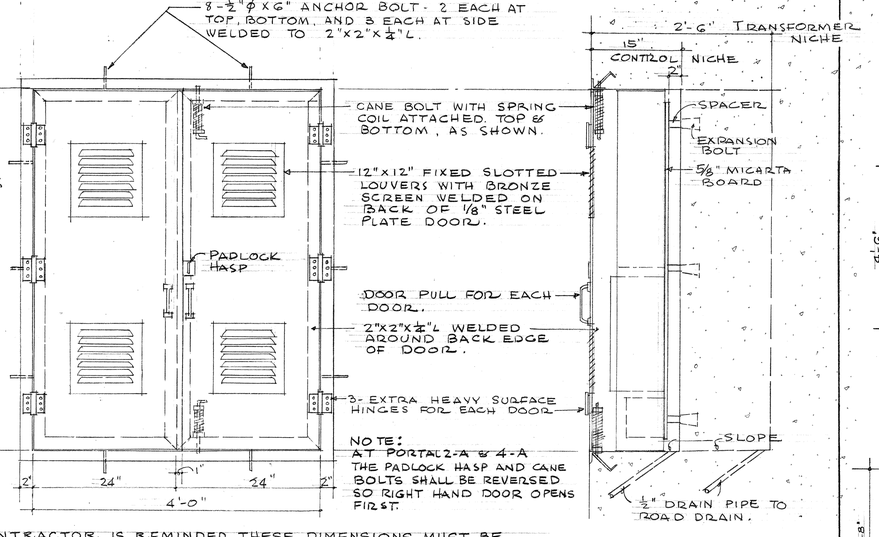
NOTE
DIMENSION "X" = 5'-0" AT ALL CONTROL NICHE & TRANSFORMER NICHE.
AT PORTAL 3-A THE TRANSFORMER NICHE IS 4'-0".

PORTAL 2-A

PORTAL 3-A

CONTROL NICHE EQUIPMENT LAYOUT

SCALE: 1" = 1'-0"

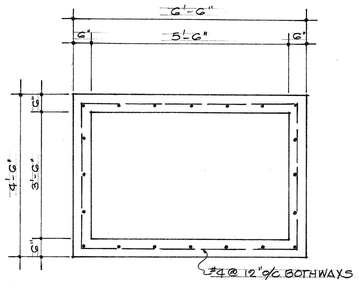


NOTE:
AT PORTAL 2-A & 4-A THE PADLOCK HASP AND CANE BOLTS SHALL BE REVERSED SO RIGHT HAND DOOR OPENS FIRST.

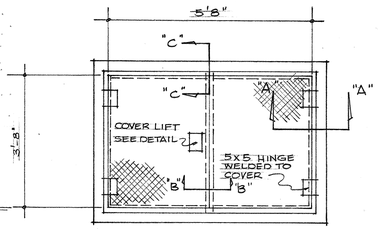
CONTRACTOR IS REMINDED THESE DIMENSIONS MUST BE MINIMUM FINISHED. DIMENSIONS IN ORDER TO ACCOMODATE EQUIPMENT.

DOOR DETAILS • FRONT VIEW (A/12) SECTION • SIDE VIEW FOR CONTROL NICHE & TRANSFORMER NICHE

SCALE: 1" = 1'-0"

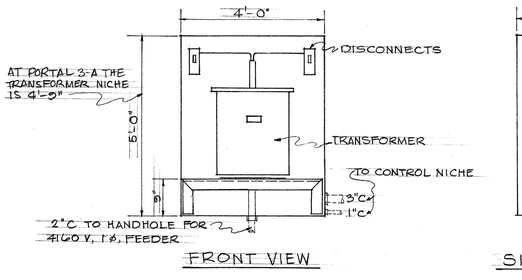


PLAN

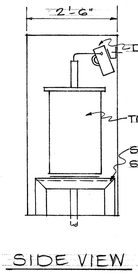


COVER PLAN

SCALE: ½" = 1'-0"



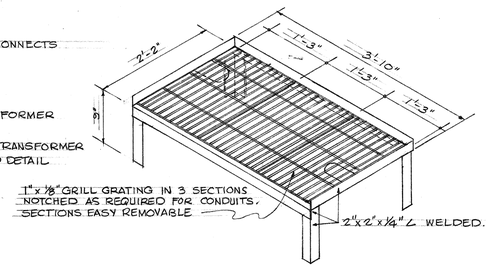
FRONT VIEW



SIDE VIEW

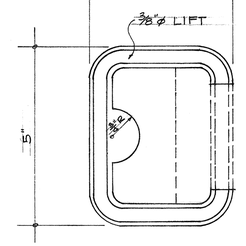
EQUIPMENT LAYOUT TRANSFORMER NICHE

SCALE: ½" = 1'-0"

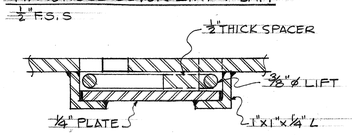


TRANSFORMER STAND

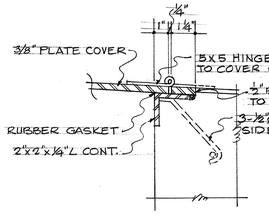
SCALE: ¾" = 1'-0"



HANDHOLE COVER LIFT PLAN
½" F.S.S

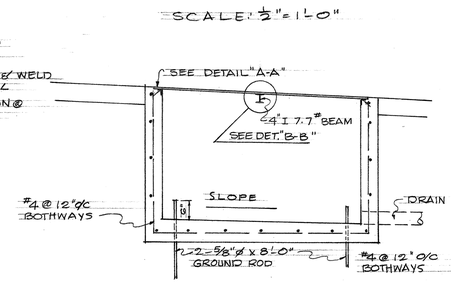


HANDHOLE COVER LIFT SECTION
½" F.S.S.



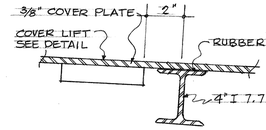
DETAIL "A-A"

SCALE: 3" = 1'-0"



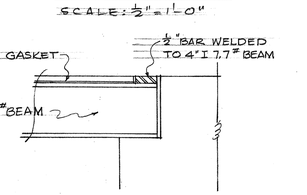
SECTION

SCALE: ½" = 1'-0"



DETAIL "B-B"

SCALE: 3" = 1'-0"



DETAIL "C-C"

SCALE: 3" = 1'-0"

HANDHOLE DETAILS (B/12)

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

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
ELECTRICAL
ELECTRICAL DETAILS
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-0G1-1(5)

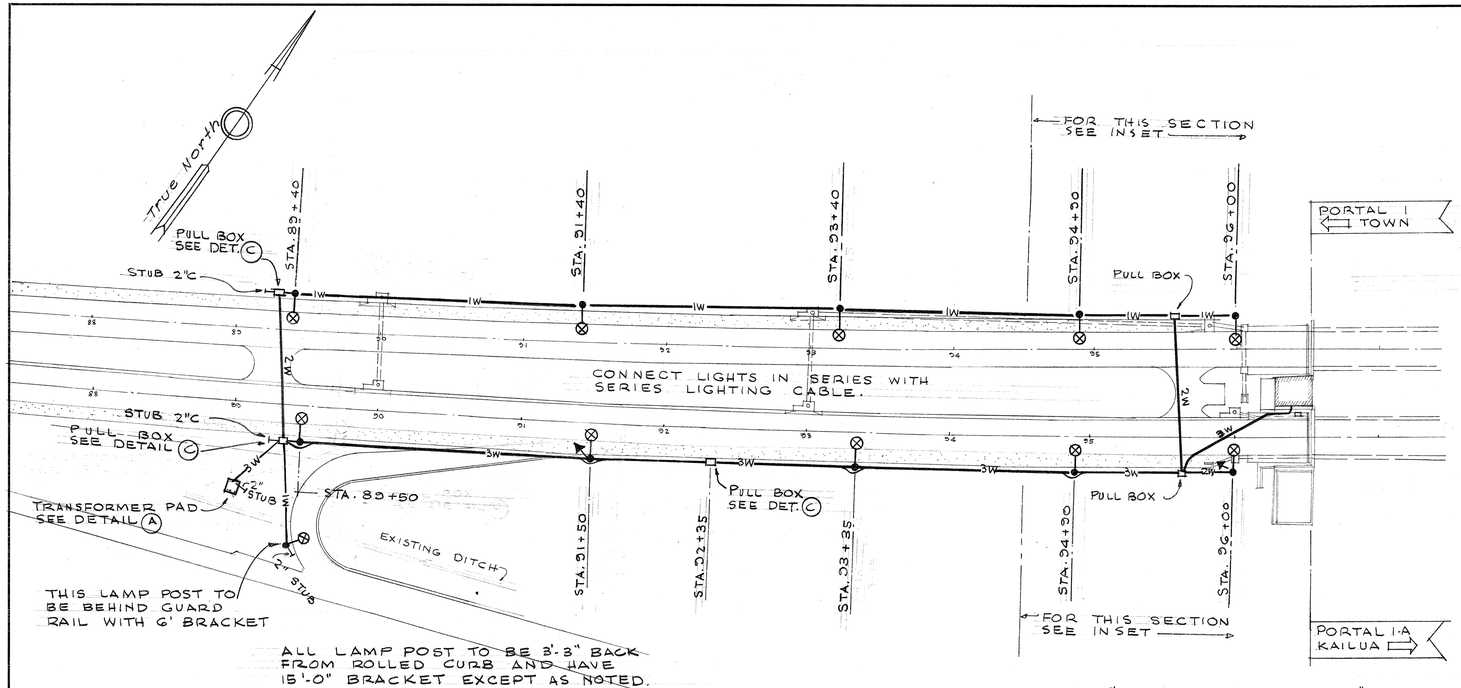
JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

SCALE: AS NOTED DATE: MAY 1957

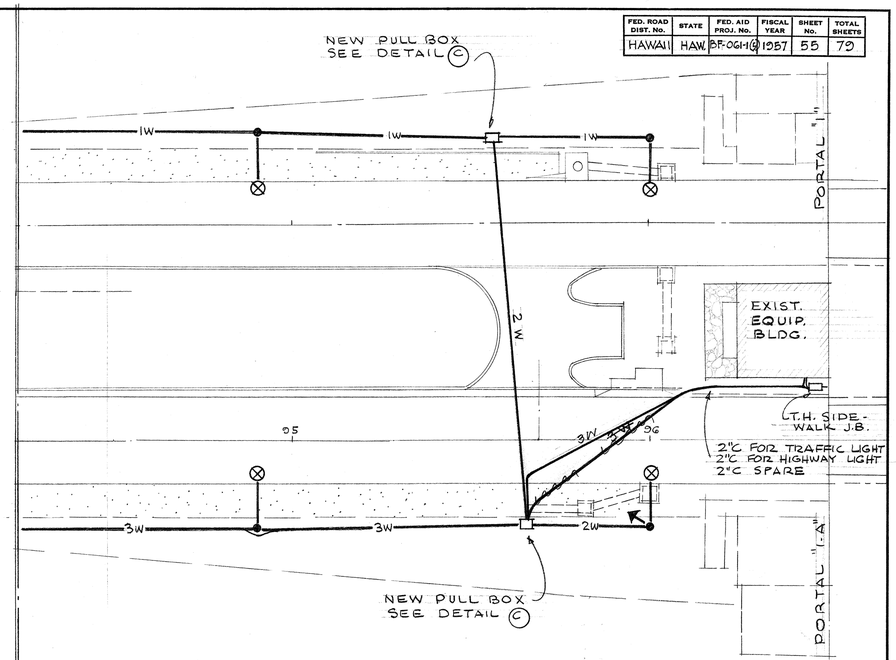
SHEET No. 12 OF 13 SHEETS

5996.54

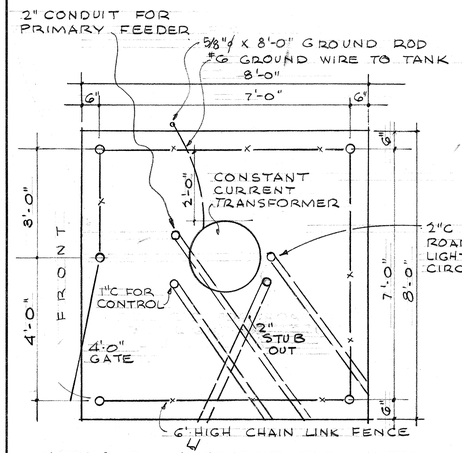
FED. ROAD DIST. No.	STATE	FED. AID PROJ. No.	FISCAL YEAR	SHEET No.	TOTAL SHEETS
HAWAII	HAW.	BF-061-1(5)	1957	55	72



PALI ROAD - APPROACH TO PORTAL "1" & PORTAL "1-A"
HIGHWAY LIGHTING & TRAFFIC LIGHTS PLAN
SCALE: 1" = 50'



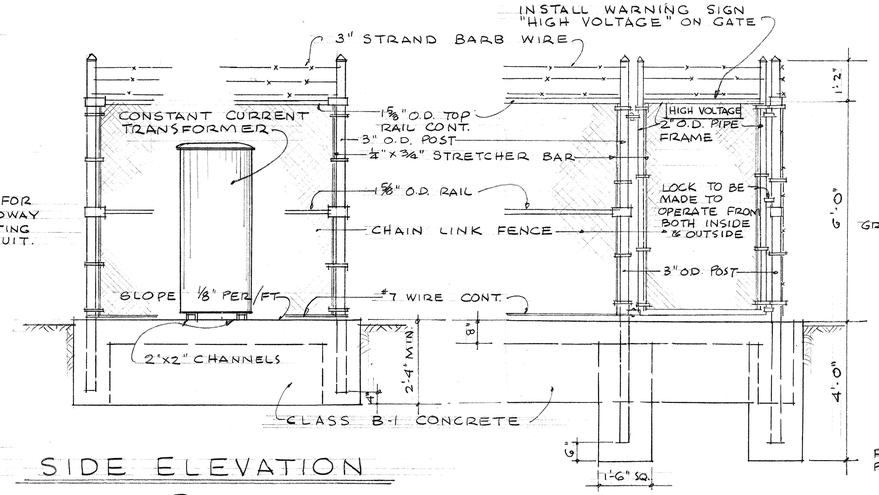
INSET
SCALE: 1" = 20'



NOTE: EACH CONDUIT TERMINATES IN FLUSH COUPLING IN PAD.

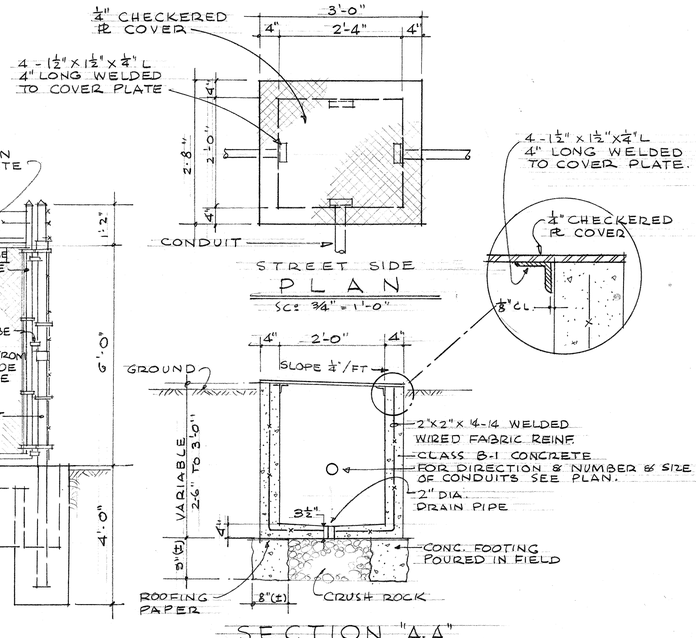
PLAN

TRANSFORMER PAD DETAIL (A)
SCALE: 1/2" = 1'-0"



SIDE ELEVATION

GATE ELEVATION
CHAIN LINK FENCE DETAIL (B)
SCALE: 1/2" = 1'-0"



PULL BOX DETAIL (C)

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

JAMES J. OBERHAUSEN
ELECTRICAL ENGINEER

TERRITORIAL HIGHWAY DEPARTMENT
TERRITORY OF HAWAII
ELECTRICAL
HIGHWAY LIGHTING, TRAFFIC LIGHTS LAYOUT & DETAILS
PALI ROAD
OUTBOUND TUNNELS
PROJ. NO. BF-061-1(5)
SCALE: AS NOTED DATE: MAY 1957

SHEET No. 13 OF 13 SHEETS

5896.55