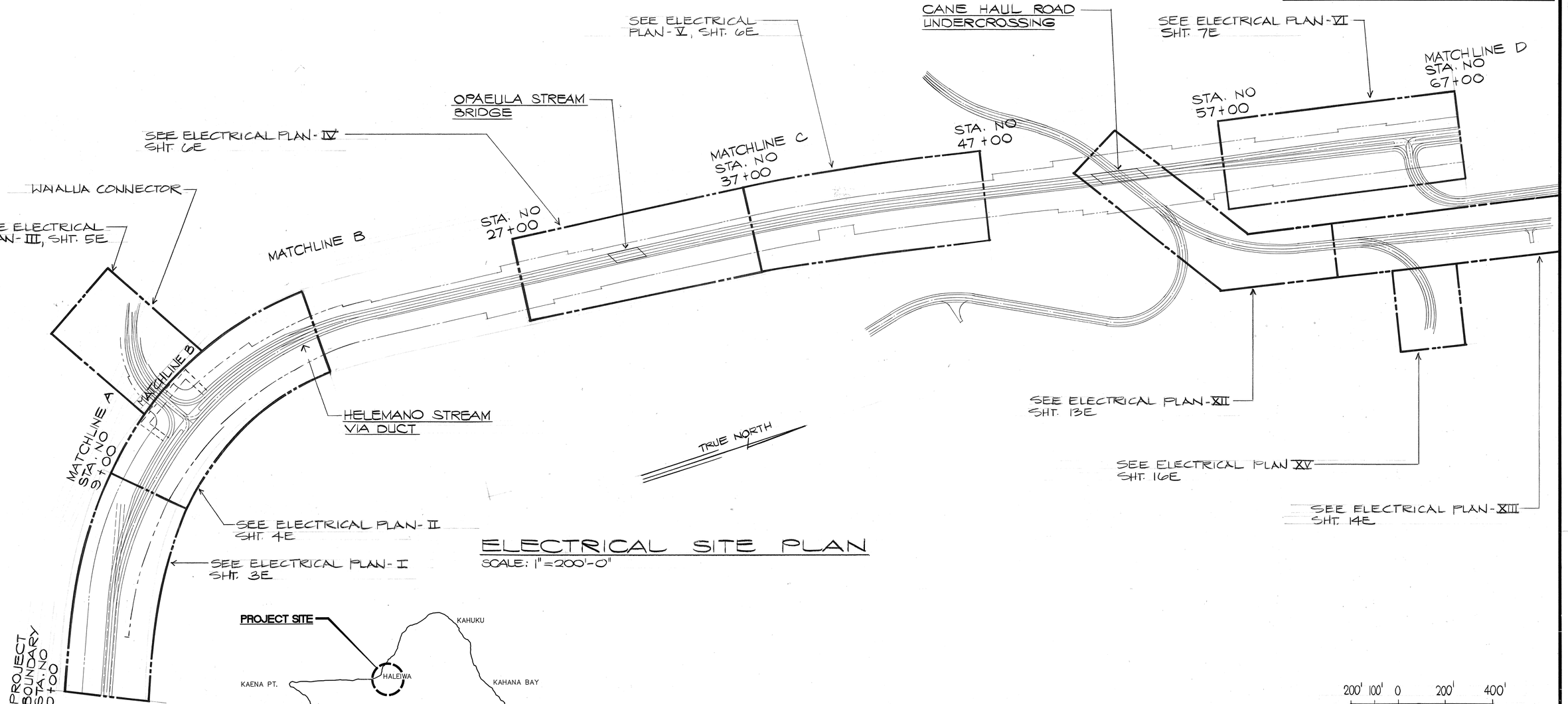
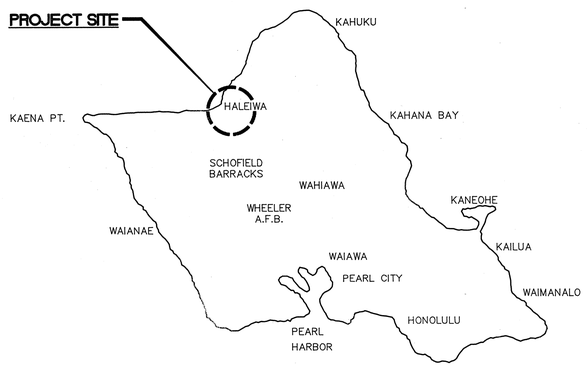
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	124	162



ELECTRICAL SITE PLAN

SCALE: 1"=200'-0"



NORTH

LOCATION MAP

200' 100' 0 200' 400'

SCALE: 1"=200'-0"

GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SITE PLAN I & LOCATION MAP

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: 1"=200'-0" DATE:

SHEET No. 1E OF 38 SHEETS

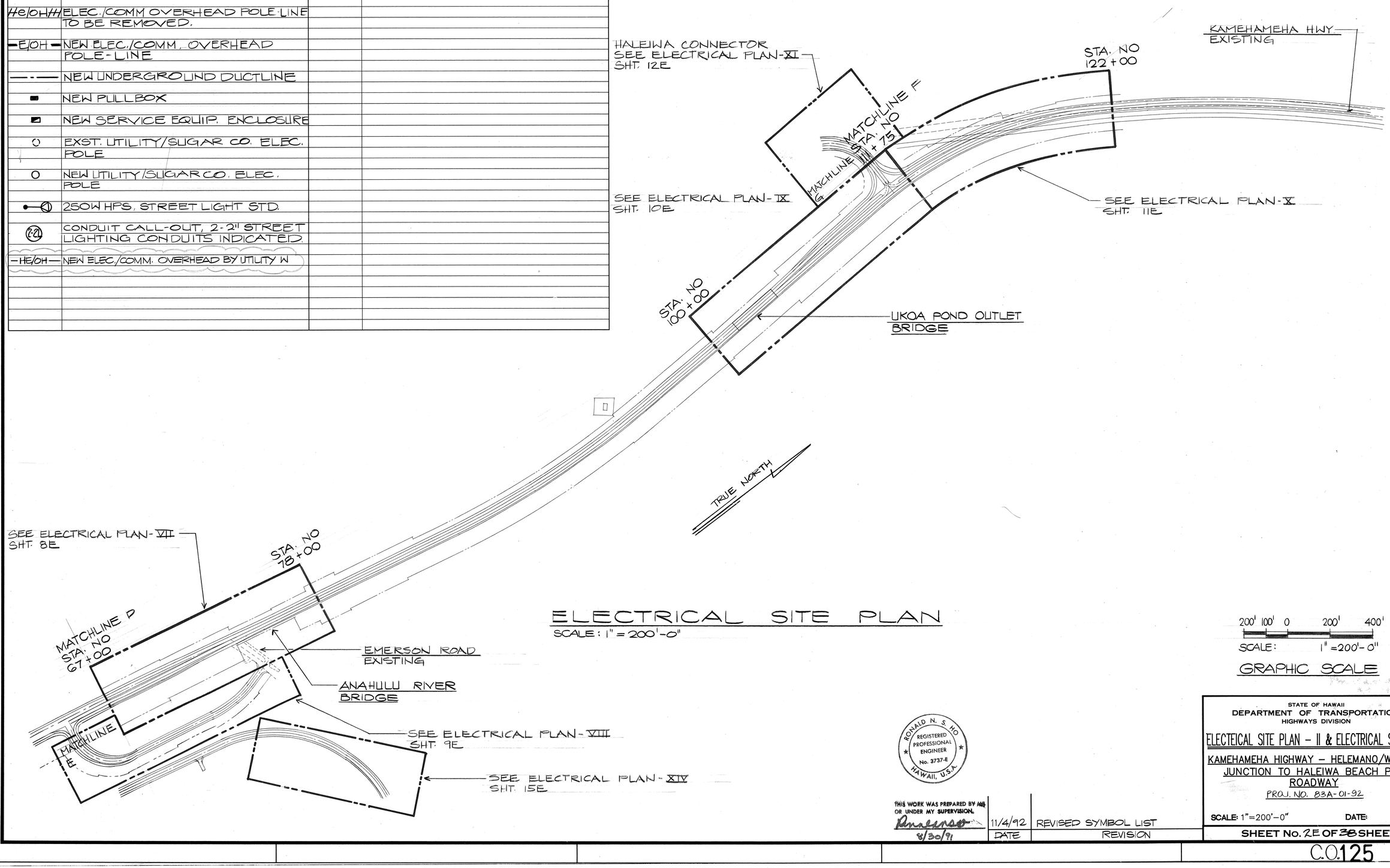
ORIGINAL PLAN
NOTE BOOK
No.

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	125	162

ELECTRICAL SYMBOLS

ITEM	DESCRIPTION	ITEM	DESCRIPTION
—e/OH—	EXISTING ELEC./COMM OVERHEAD POLE-LINE		
//e/OH//	ELEC./COMM OVERHEAD POLE-LINE TO BE REMOVED.		
—E/OH—	NEW ELEC./COMM. OVERHEAD POLE-LINE		
—·—·—	NEW UNDERGROUND DUCTLINE		
■	NEW PULLBOX		
◪	NEW SERVICE EQUIP. ENCLOSURE		
○	EXST. UTILITY/SUGAR CO. ELEC. POLE		
O	NEW UTILITY/SUGAR CO. ELEC. POLE		
●—◐	250W HPS, STREET LIGHT STD.		
(2-2)	CONDUIT CALL-OUT, 2-2" STREET LIGHTING CONDUITS INDICATED.		
—HE/OH—	NEW ELEC./COMM. OVERHEAD BY UTILITY W		



ELECTRICAL SITE PLAN

SCALE: 1" = 200'-0"

200' 100' 0 200' 400'

SCALE: 1" =200'-0"

GRAPHIC SCALE

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

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HAWAII, U.S.A.

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DATE	REVISION
11/4/92	REVISED SYMBOL LIST

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTEICAL SITE PLAN – II & ELECTRICAL SYMBOLS

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: 1"=200'-0" DATE:

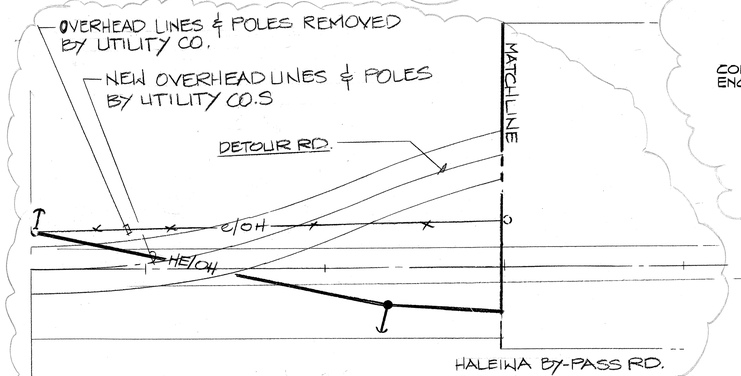
SHEET No. 2E OF 38 SHEETS

C.O. 125

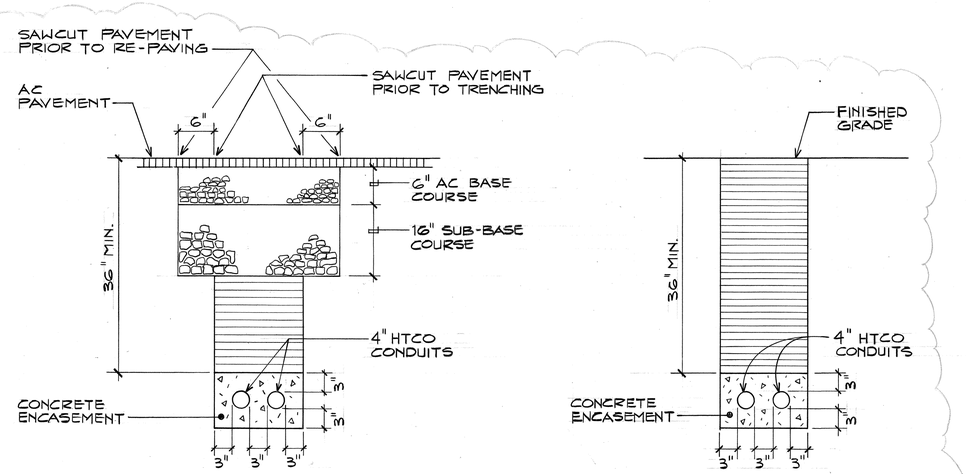
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	126	162

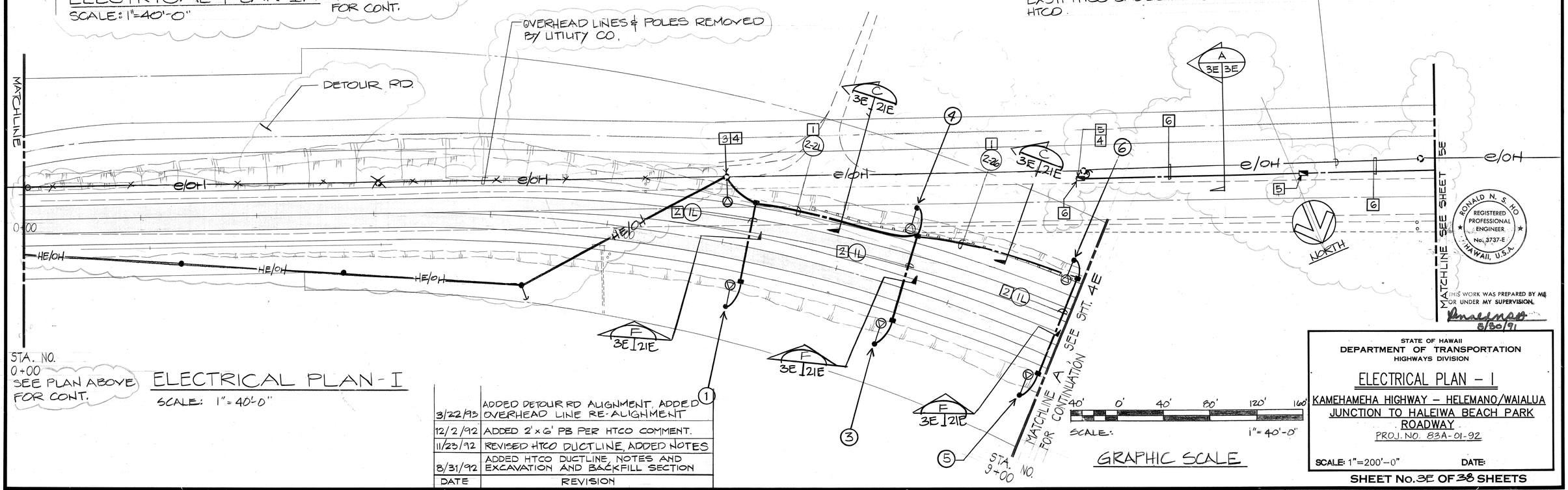
NOTES:

1. 2"C., 3-#1 & #2 GND
   2"C., SPARE PULLWIRE
2. 1"C., 2#6 & #8GND
3. PROVIDE 1"GRS RISER W/2-#6 & #8 GND UP POLE.
4. PROVIDE 1-4" GRS RISER & PULLWIRE UP EXST UTILITY POLE.
5. 2' x 6' HTCO HANDHOLE, SEE A / 3E | 38AE
6. DUCTLINE AND PULLBOXES BY CONTRACTOR. OVERHEAD CABLE REMOVAL BY HTCO.



ELECTRICAL PLAN-IA
SCALE: 1"=40'-0"





ELECTRICAL PLAN - I
SCALE: 1" = 40'-0"

GRAPHIC SCALE
40' 0' 40' 80' 120' 160'
SCALE: 1" = 40'-0"

DATE	REVISION
3/22/93	ADDED DETOUR RD ALIGNMENT, ADDED OVERHEAD LINE RE-ALIGNMENT
12/2/92	ADDED 2' x 6' PB PER HTCO COMMENT.
11/23/92	REVISED HTCO DUCTLINE, ADDED NOTES
8/31/92	ADDED HTCO DUCTLINE, NOTES AND EXCAVATION AND BACKFILL SECTION

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

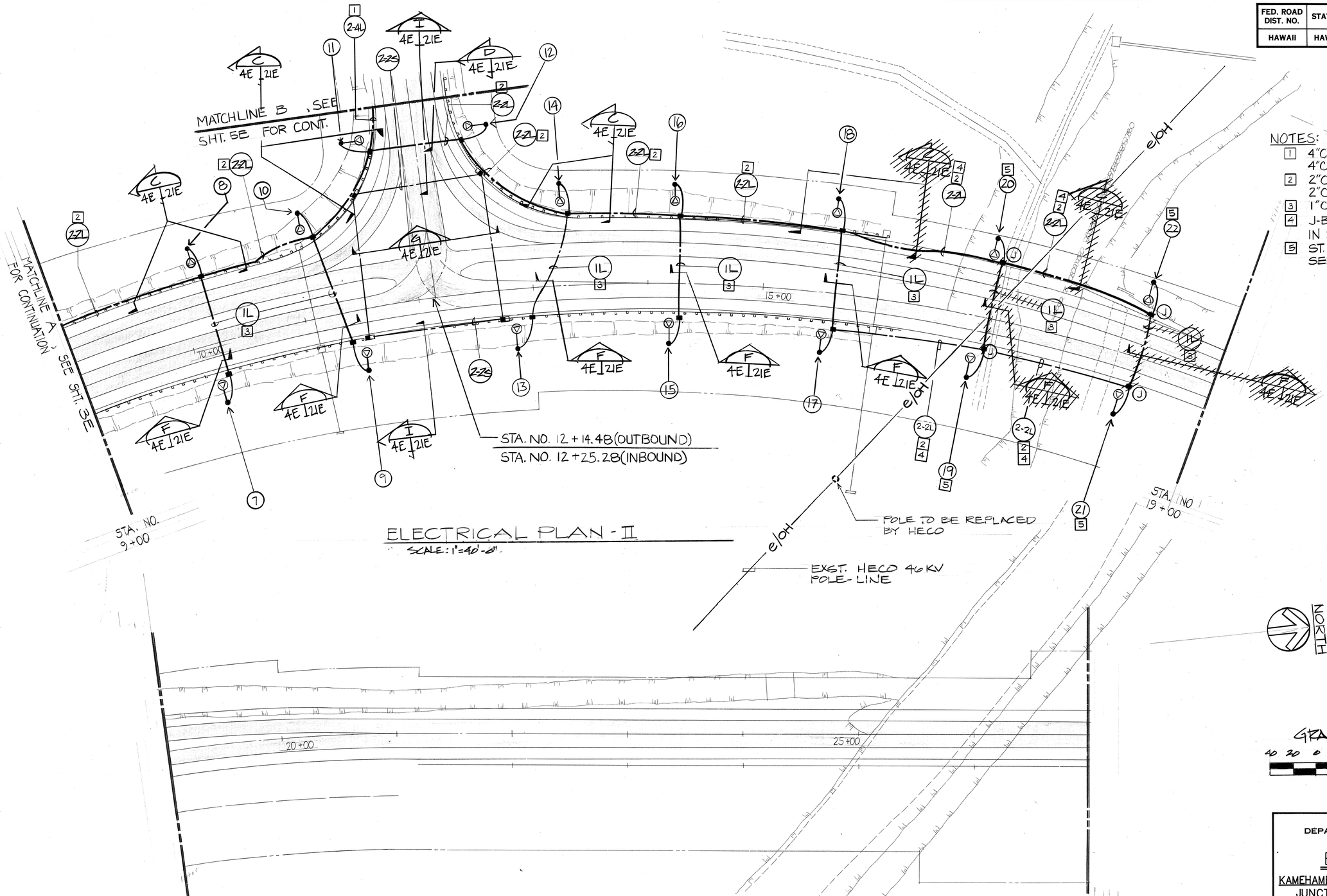
ELECTRICAL PLAN - I
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=200'-0" DATE:

SHEET No. 3E OF 38 SHEETS

C.O. 126

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	127	162



ELECTRICAL PLAN - II

SCALE: 1"=40'-0"

NOTES:

1. 4"C., 6#1 & #8 GND
   4"C., SPARE W/ PULLWIRE
2. 2"C., 3#1 & #8 GND
   2"C., SPARE W/ PULLWIRE
3. 1"C., 2#6 & #8 GND
4. J-BOX AND CONDUIT MTD. IN BRIDGE PARAPET
5. ST. LT. MTD. ON PARAPET, SEE DETAIL A

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

ORIGINAL PLAN | NOTE BOOK | No. ____

DATE	REVISION
8/31/92	DELETE 4 STREET LIGHTS W/ SLIP BASE, ADD 4 STREET LIGHTS MOUNTED TO HELEMANO VIADUCT STRUCTURE

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HAWAII, U.S.A.

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8/30/91

GRAPHIC SCALE
40 20 0 40 80 120

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN – II

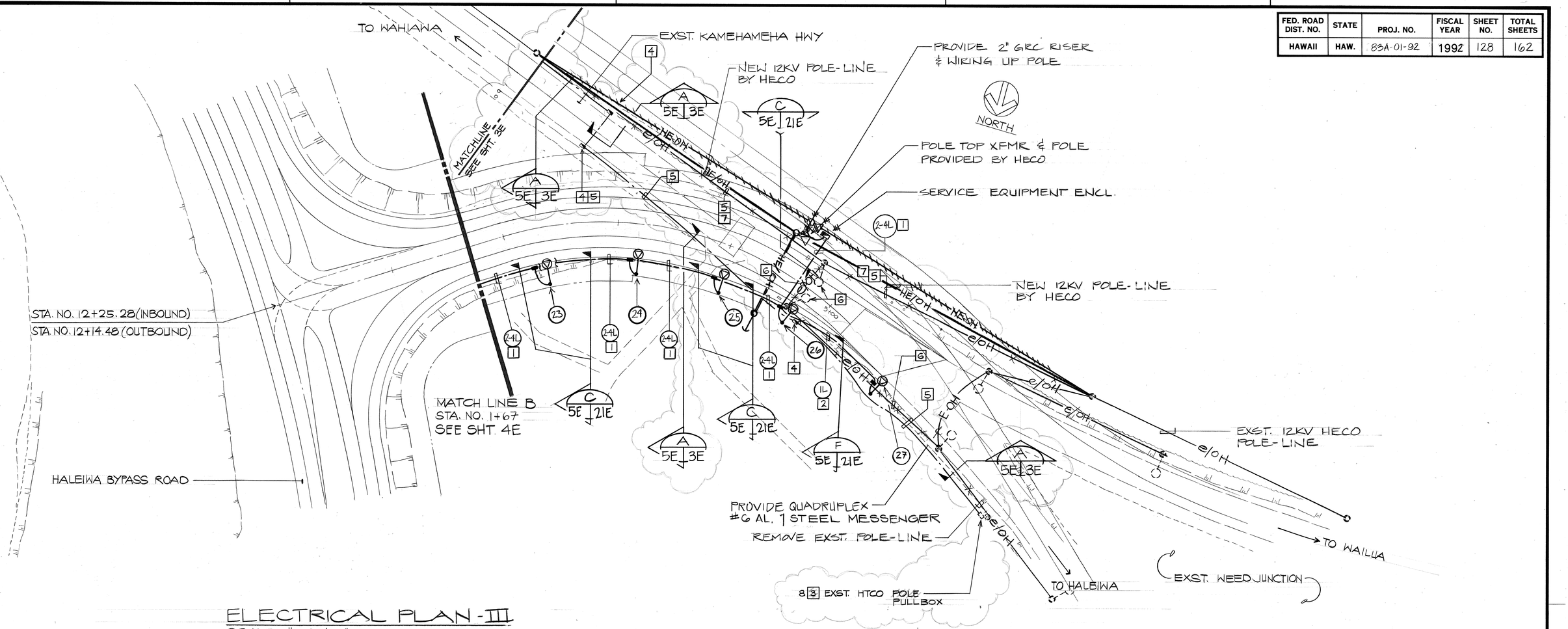
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=40' –0" DATE:

SHEET No. 4E OF 38 SHEETS

C.O. 127

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	128	162



ELECTRICAL PLAN - III

SCALE: 1"=40'-0"

NOTES:

1. 4"C., 9-#1 & #2 GND
   4"C., SPARE W/PULLWIRE
2. 1"C., 2-#6 & #8 GND
3. PROVIDE 4" GRS RISER UP EXST. UTILITY POLE NOT USED
4. PROVIDE HTCO 2'XG' HANDHOLE SEE DETAIL A 5E | 38AE
5. DUCTLINE AND PULLBOXES BY CONTRACTOR. OVERHEAD CABLE REMOVAL BY HTCO
6. OVERHEAD REMOVAL OF ST. LT. ST. LT. WIRE AND POLE BY CONTRACTOR.
7. REMOVAL OF OVERHEAD LINES BY HECO.
8. PENETRATE EXST HTCO PULLBOX FOR CONDUIT ROUTING.

ORIGINAL PLAN

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

DATE	REVISION
3/22/93	ADDED DETOUR RD ALIGNMENT, REVS'D OVERHEAD ALIGNMENT
12/2/92	REVISED OVERHEAD SYMBOL, REVISED DWG PER HTCO.
11/23/92	REVISED HTCO DUCTLINE, ADDED NOTES
8/31/92	ADDED HTCO DUCTLINE AND NOTES

GRAPHIC SCALE

40' 20' 0 40' 80' 120'

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/20/92

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN - III

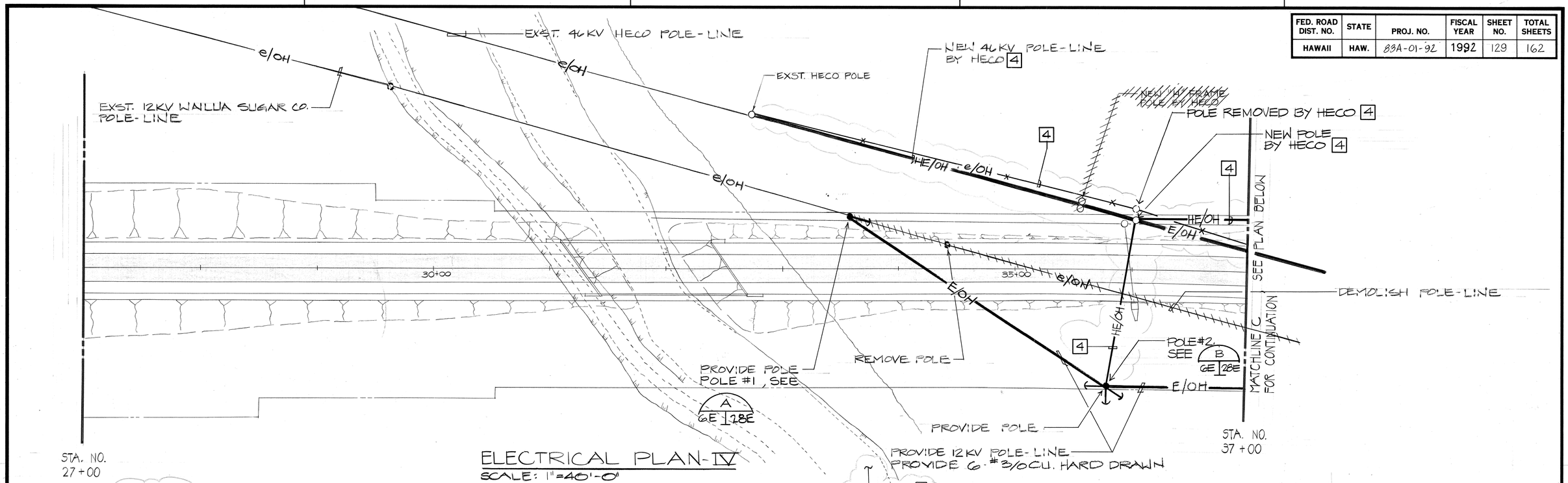
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=40' -0" DATE:

SHEET No. 5E OF 38 SHEETS

C.O. 128

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	129	162



DATE	REVISION
11/23/92	REVISED SYMBOL, REVISED HECO OVERHEAD LINE ROUTE
8/31/92	ADDED HTCO DUCTLINE, NOTES

NORTH

RONALD N. S HO REGISTERED PROFESSIONAL ENGINEER No. 3737-E HAWAII, U.S.A.

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8/20/91

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN – IV & V

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

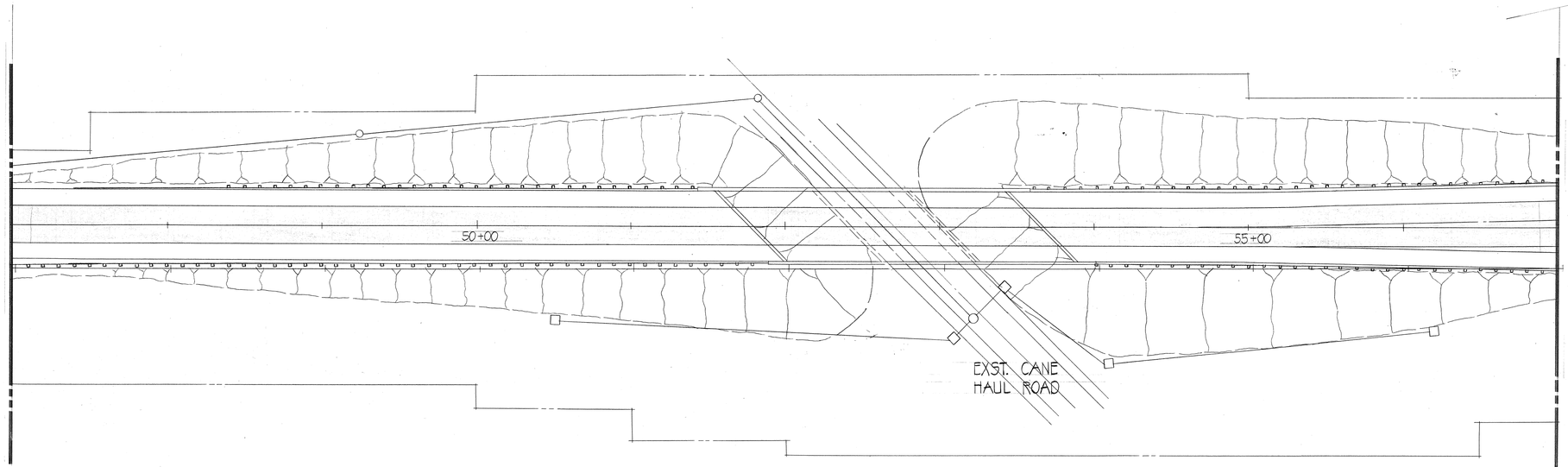
PROJ. NO. 83A-01-92

SCALE: 1"=40'-0" DATE:

SHEET No. 6E OF 38 SHEETS

C.O.129

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	130	162



NOTES:

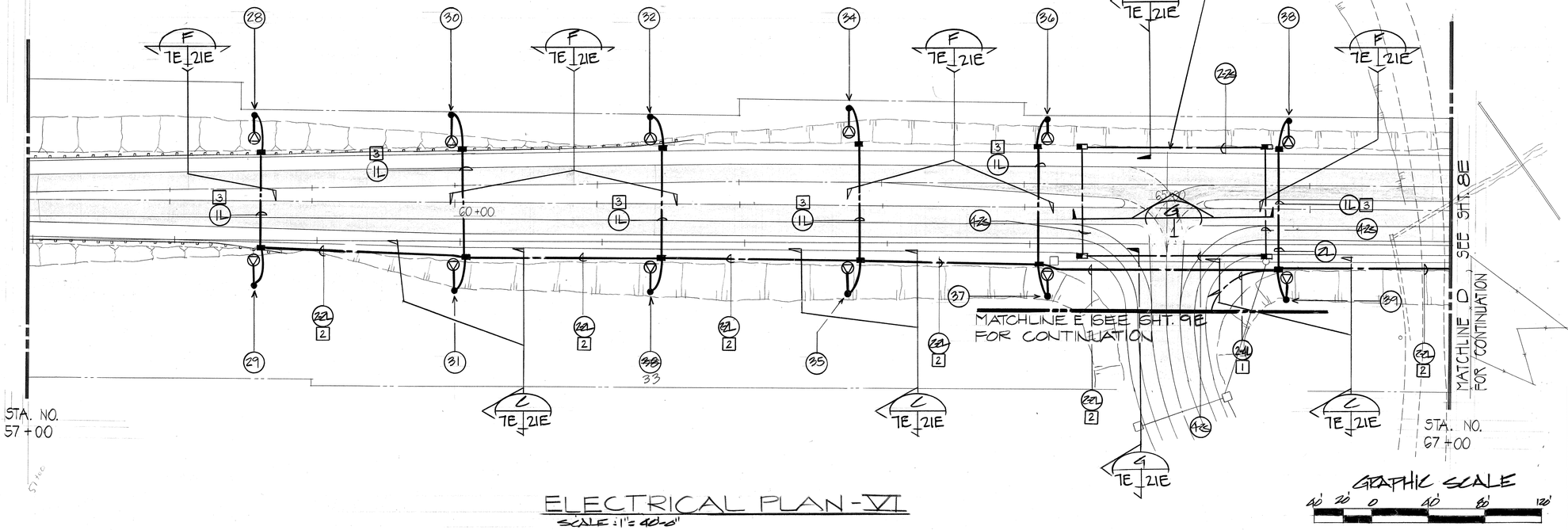
1. 4"C., 6-#1 & #2 GND
   4"C., SPARE W/ PULLWIRE
2. 2"C., 3-#1 & #2 GND
   2"C., SPARE W/ PULLWIRE
3. 1"C., 2-#6 & #8 GND

STA. NO. 47+00

STA. NO. 65100 (INBOUND)
STA. NO. 65100 (OUTBOUND)

STA. NO. 57+00

NORTH



ELECTRICAL PLAN - VI
SCALE: 1"= 40'-0"

GRAPHIC SCALE
40' 20' 0 40' 80' 120'

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN - IV

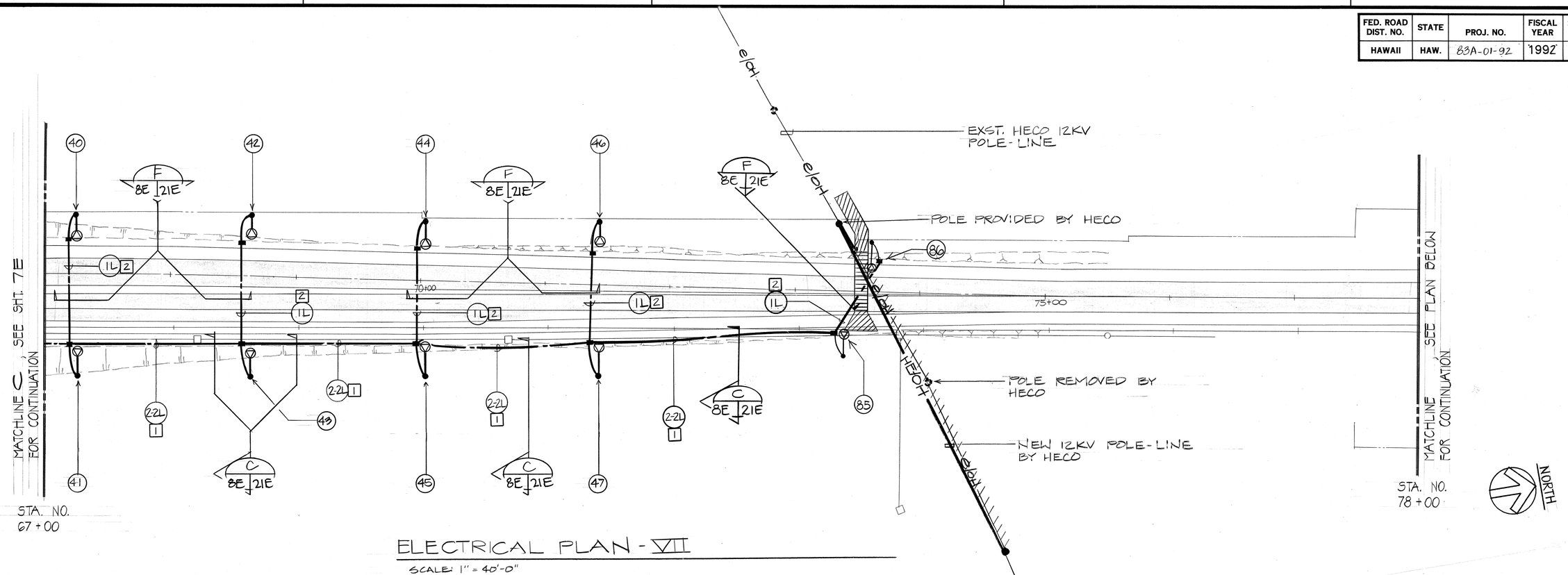
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=40' -0" DATE:

SHEET No. 7E OF 38 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	131	162



ELECTRICAL PLAN - VII

SCALE: 1" = 40'-0"

NOTES:

1. 2"C., 3-#1 & #2 GND 2"C., SPARE W/PULLWIRE
2. 1"C., 2-#6 & #8 GND

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8/24/91

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

DATE	REVISION
11/23/92	REVISED SYMBOL

40' 0' 40' 80' 120' 160'

SCALE: 1" = 40'-0"

GRAPHIC SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN – VII

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: 1"=40' -0" DATE:

SHEET No. 8E OF 38 SHEETS

C.O. 131

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	132	162

HALEIWA BYPASS RD.

STA. NO. 65+00 (INBOUND)
STA. NO. 65+00 (OUTBOUND)

NOTES:

1. 4"C., 9-#1 & #2 GND
   4"C., SPARE W/PULLWIRE
2. 2"C., 3-#2 & #4 GND.
3. PROVIDE 1-4" GRS RISER UP EXST. UTILITY POLE
4. PROVIDE 2'X6' HTCO HANDHOLE SEE A 9E | 38AE
5. DUCTLINE AND PULLBOXES BY CONTRACTOR, OVERHEAD CABLE REMOVAL BY HTCO.

MATCH LINE E
EMERSON RD.
STA. NO. 1+00
SEE SHT. 7E

EXST. EMERSON RD

POLE TOP XFMR PROVIDED BY HECO ON EXST. POLE

ELEC. SERVICE EQUIP.

EXST. HECO 12KV LINE

EXST. HECO 46 KV POLE LINE

EXST. WAIALUA SUGAR CO POLE LINE

e/oH

NORTH

ELECTRICAL PLAN - VIII

SCALE: 1"=40'-0"

40' 0' 40' 80' 120' 160'

SCALE: 1"= 40'-0"

GRAPHIC SCALE

DATE	REVISION
12/2/92	ADDED 2'x6' PB PER HTCO COMMENT
11/23/92	REVISED HTCO DUCTLINE, REVISED HECO OVERHEAD LINE ROUTE
8/31/92	ADDED HTCO DUCTLINE, NOTES AND REVISED BACKGROUND

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 2737-E
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN - VIII

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

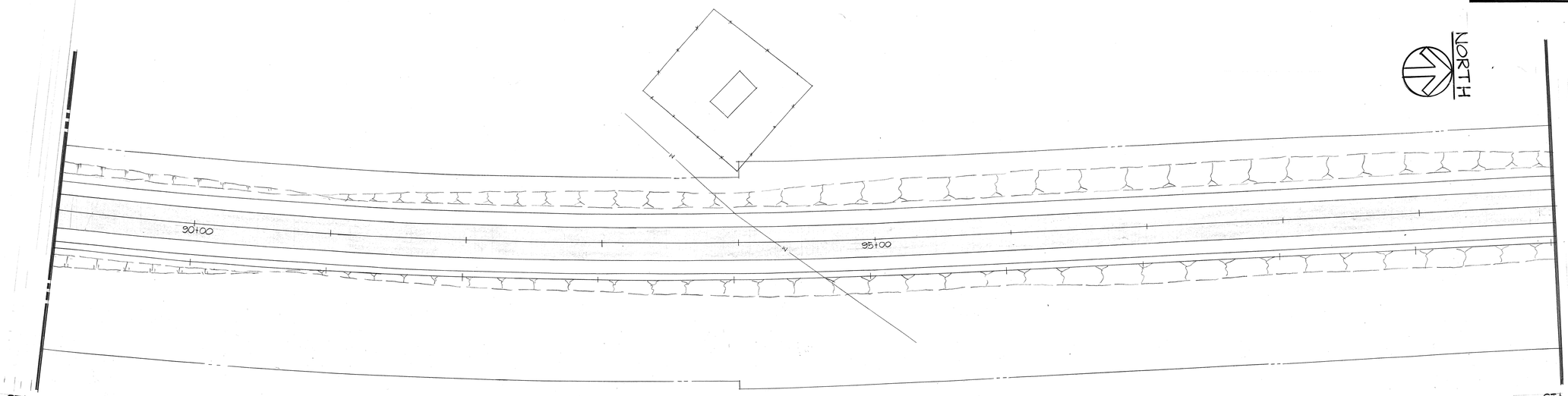
PROJ. NO. 83A-01-92

SCALE: 1"=40'-0" DATE:

SHEET No. 9E OF 38 SHEETS

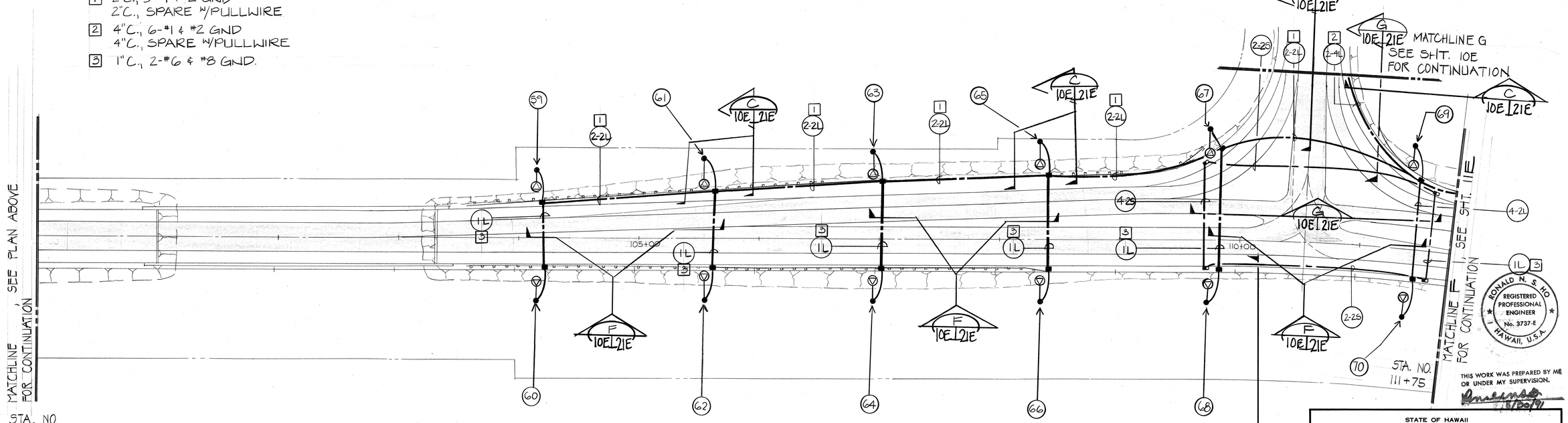
C.O. 132

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	133	162



NOTES:

1. 2"C., 3-#1 & #2 GND
   2"C., SPARE W/PULLWIRE
2. 4"C., 6-#1 & #2 GND
   4"C., SPARE W/PULLWIRE
3. 1"C., 2-#6 & #8 GND.



ELECTRICAL PLAN-IX

SCALE: 1"= 40'-0"

40' 0' 40' 80' 120' 160'

SCALE: 1"= 40'-0"

GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN – IX

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

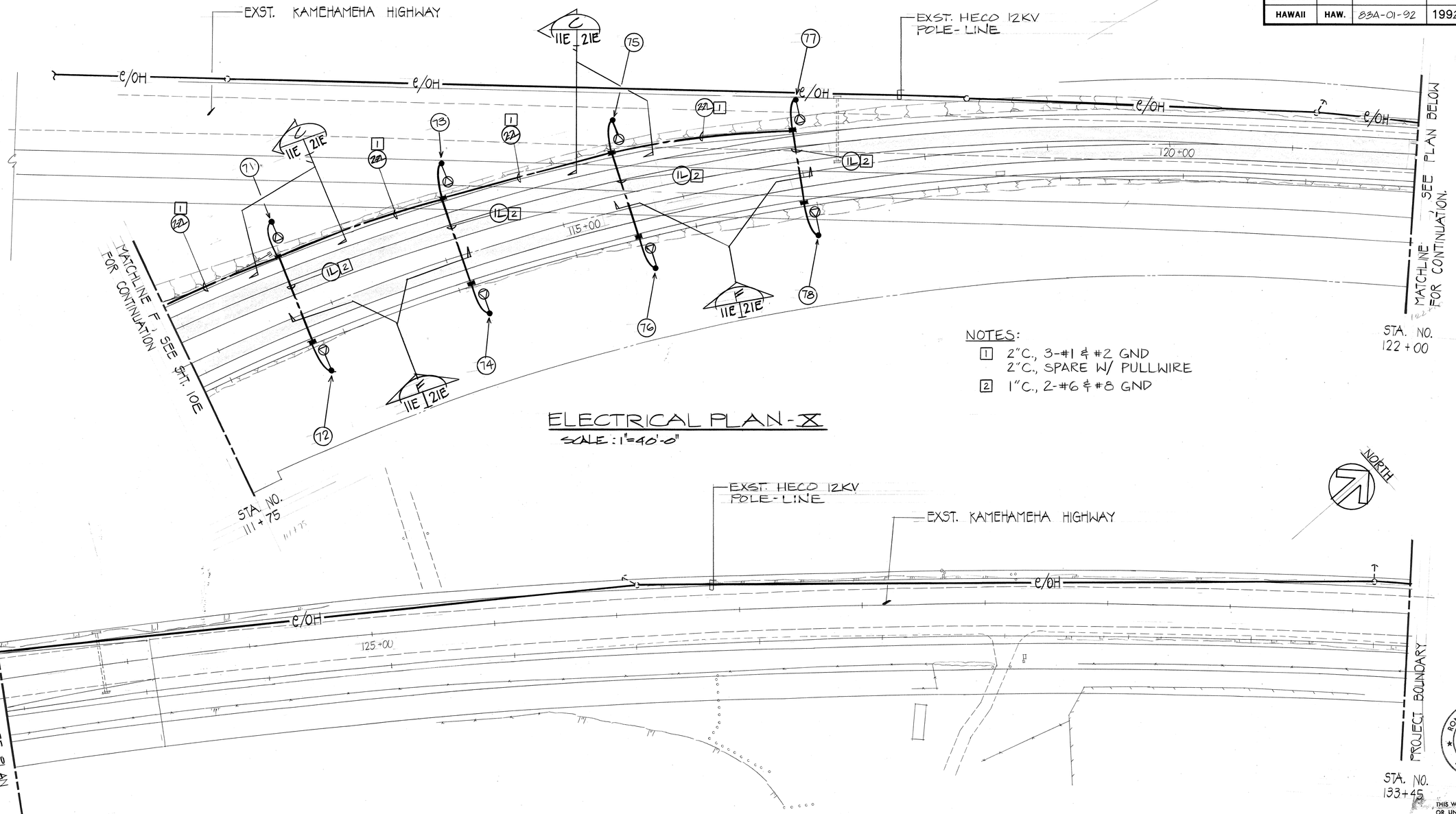
SCALE: 1"=40' --0" DATE:

SHEET No. 10E OF 38 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	134	162



ELECTRICAL PLAN - X

SCALE: 1"=40'-0"

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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GRAPHIC SCALE

40' 20' 0 40' 80' 120'

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN - X

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

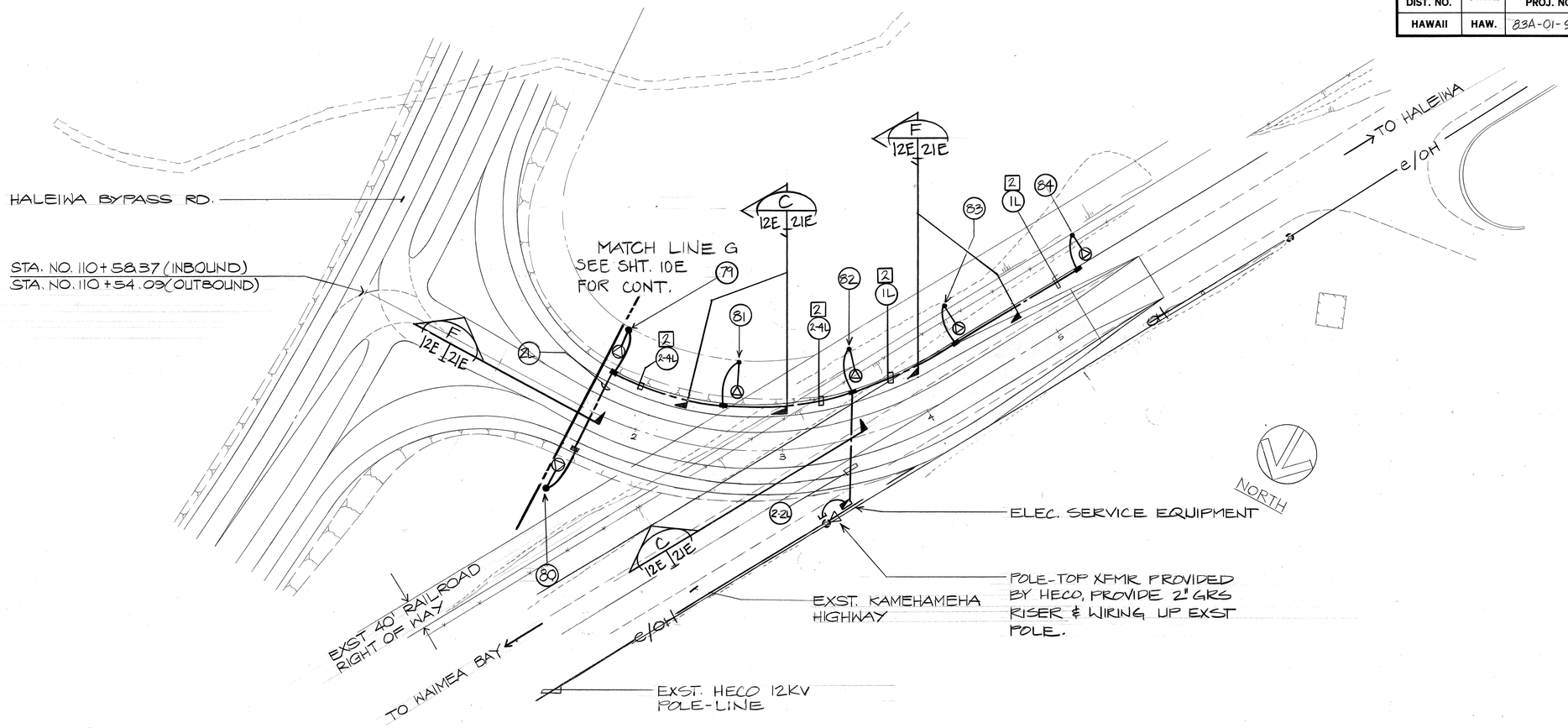
SCALE: 1"=40' -0" DATE:

SHEET No. 11E OF 38 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	135	162



ELECTRICAL PLAN - XI

SCALE: 1"=40'-0"

NOTES:

1. 4"C., 9-#1 & #2GND
   4"C., SPARE W/PULLWIRE

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

GRAPHIC SCALE
40' 20' 0 40 80 120

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

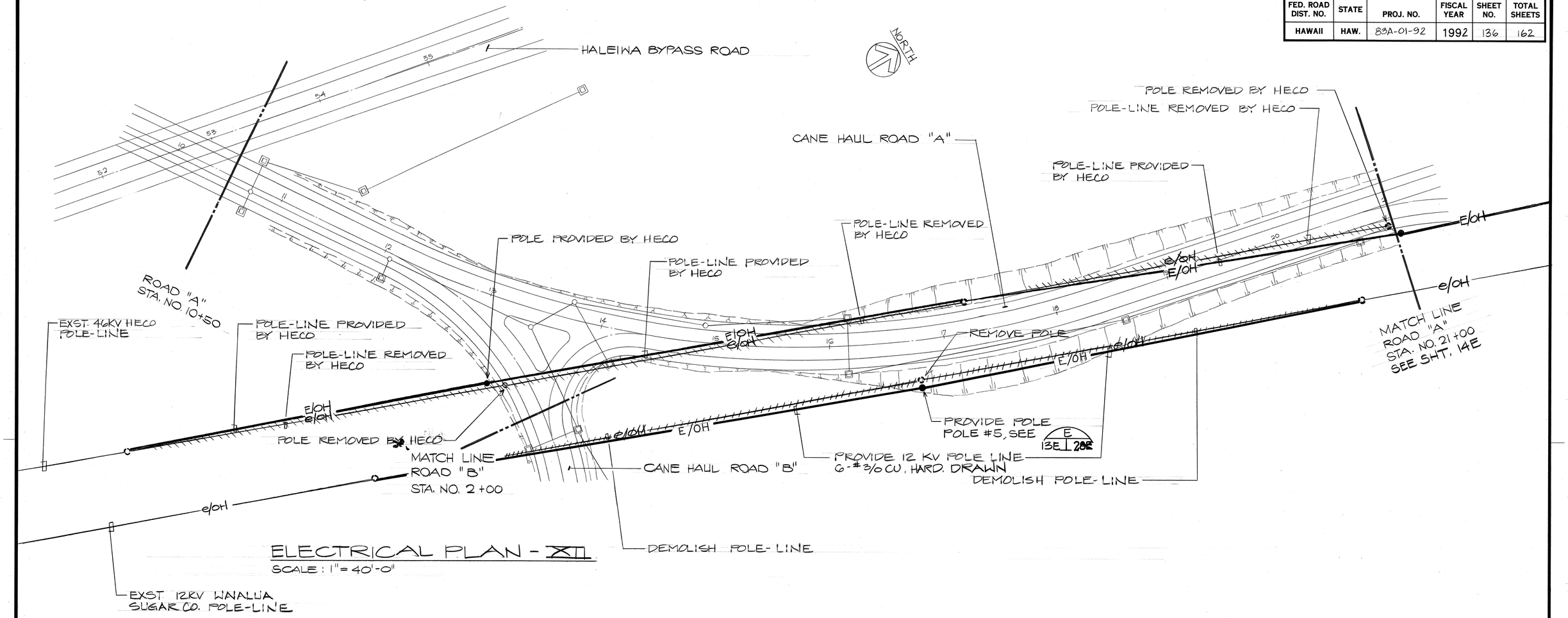
ELECTRICAL PLAN - XI

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=40' -0" DATE:

SHEET No. 12E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	136	162



ELECTRICAL PLAN - XII

SCALE : 1" = 40'-0"

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

ORIGINAL PLAN
NOTE BOOK
No. ____

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/20/91

40' 0' 40' 80' 120'
SCALE: 1" = 40'-0"
GRAPHIC SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

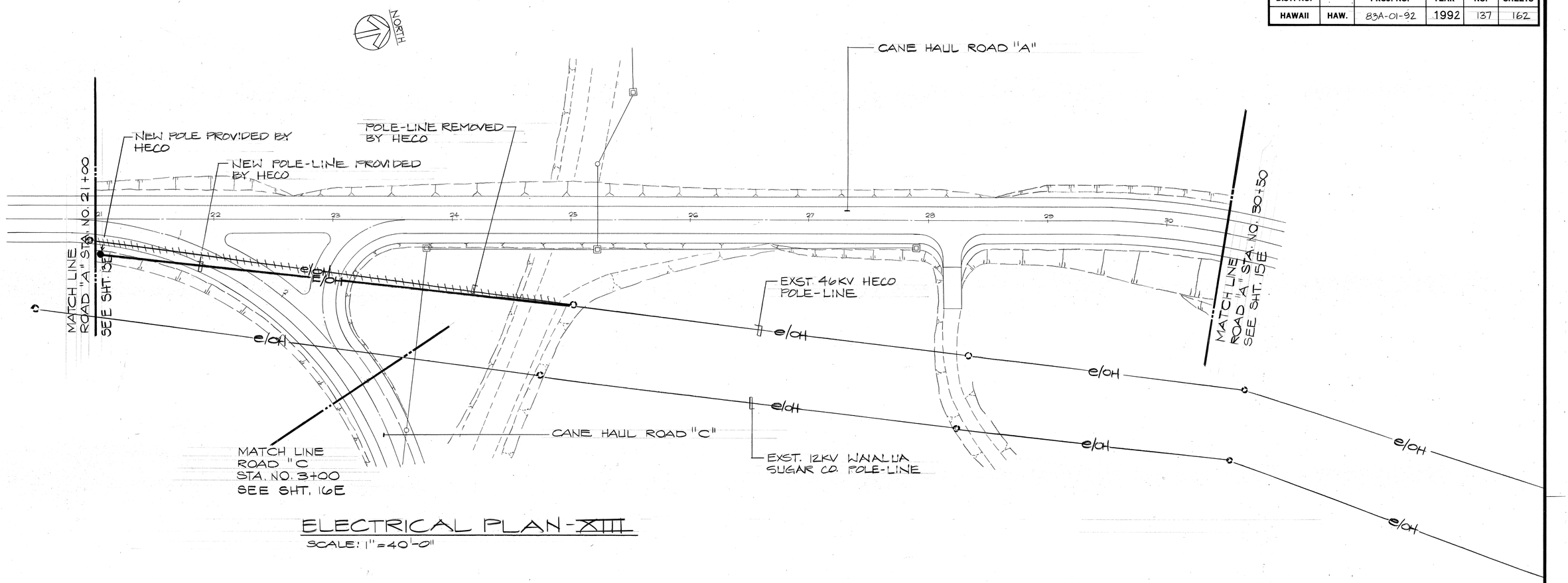
ELECTRICAL PLAN - XII

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=40' -0" DATE:

SHEET No. 13E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	137	162



ELECTRICAL PLAN - XIII

SCALE: 1"=40'-0"

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

RONALD N. S. MO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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4/30/91

40' 0' 40' 80' 120'

SCALE: 1"=40'-0"

GRAPHIC SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN – XIII

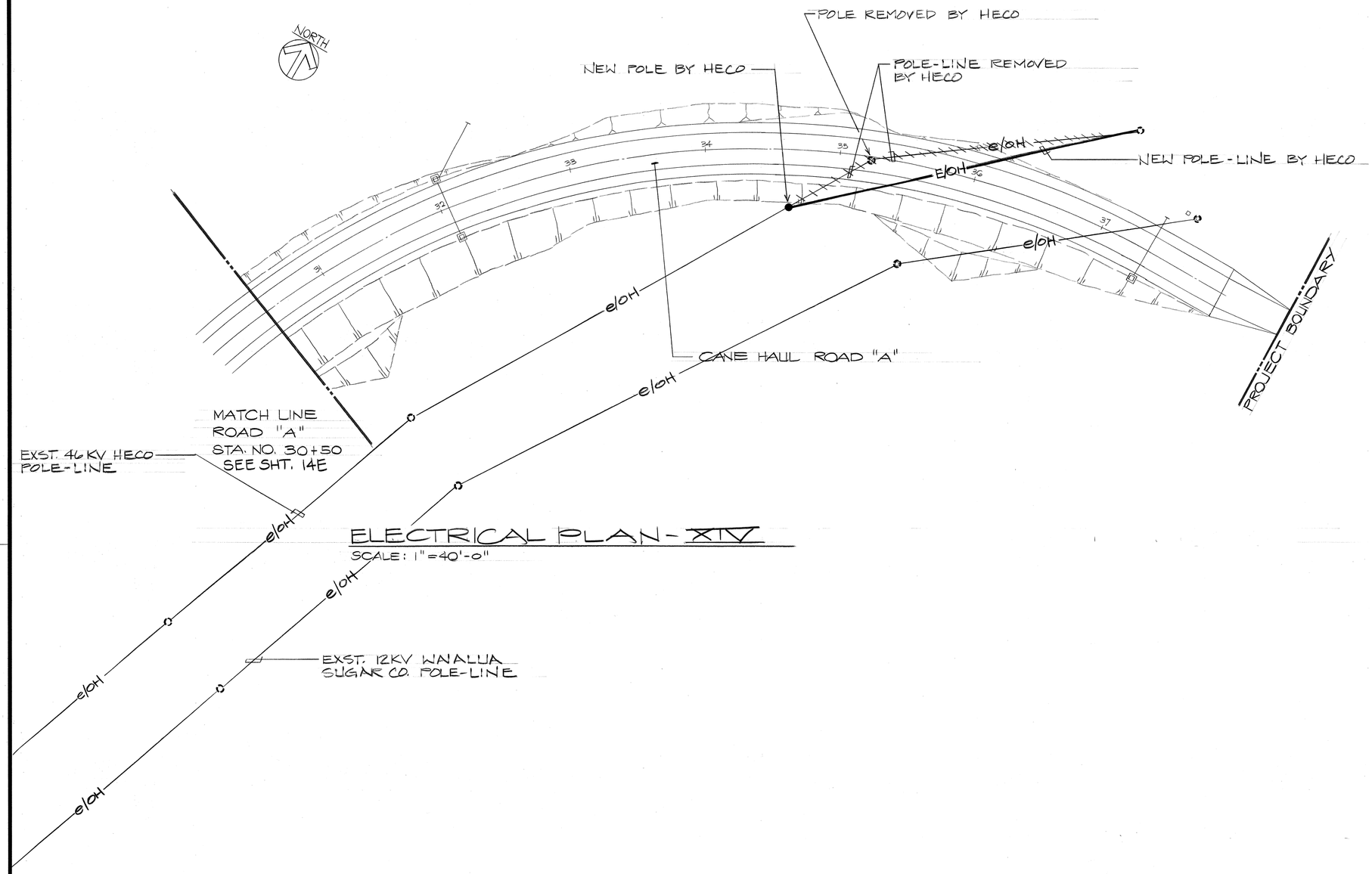
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: 1"=40' -0" DATE:

SHEET No. 14E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	138	162



ELECTRICAL PLAN - XIV

SCALE: 1"=40'-0"

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

ORIGINAL PLAN
NOTE BOOK
No. ____

40' 0' 40' 80' 120'

SCALE: 1"=40'-0"

GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

I HEREBY CERTIFY THAT THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

8/24/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN – XIV

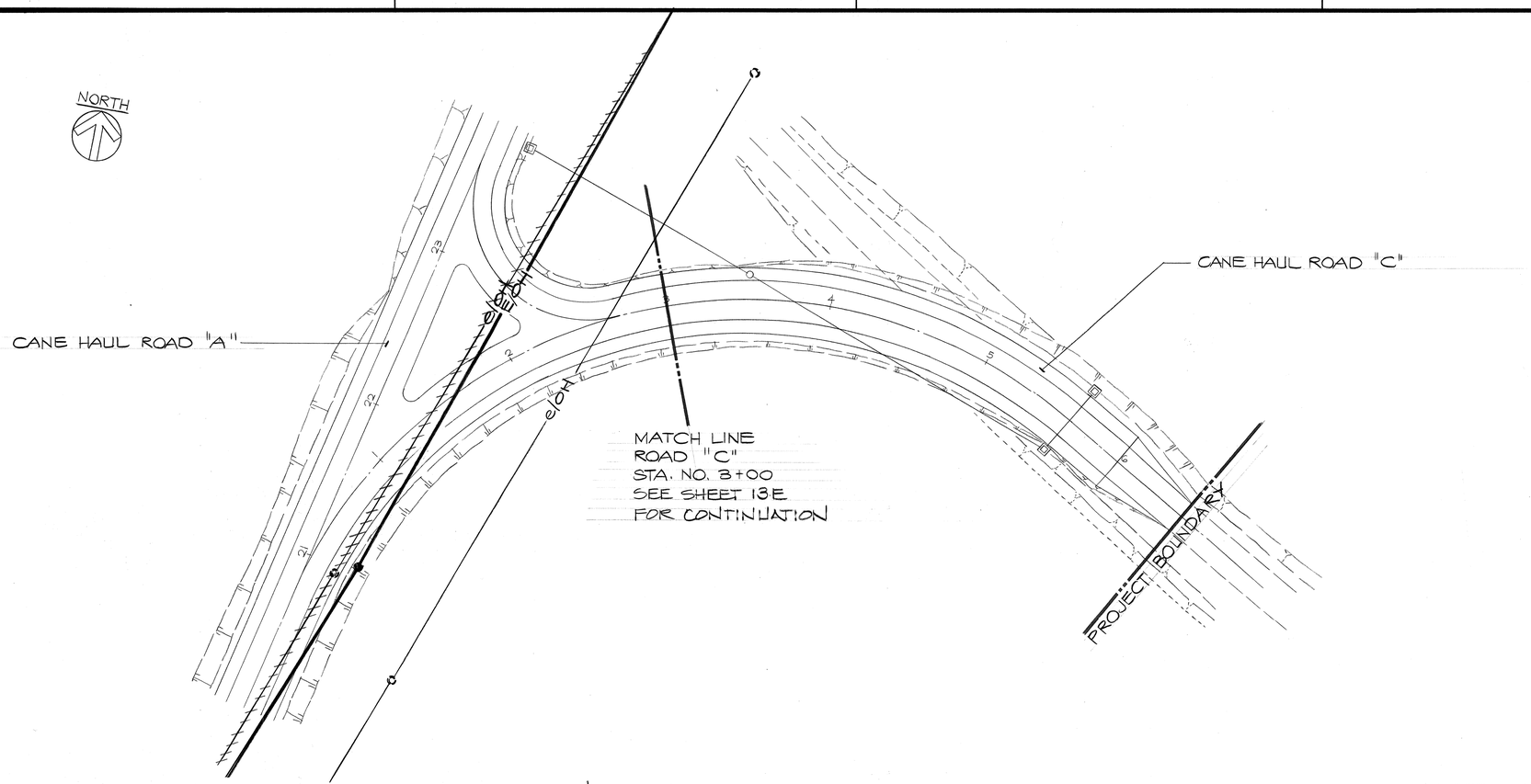
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: 1"=40' –0" DATE:

SHEET No. 15E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	139	162



ELECTRICAL PLAN - XV

SCALE: 1"=40'-0"

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

8/26/91

40' 0' 40' 80' 120'

SCALE: 1"=40'-0"

GRAPHIC SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN - XV

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: 1"=40'-0" DATE:

SHEET No. 16E OF 38 SHEETS

STREET LIGHT STANDARD SCHEDULE

STREET LIGHT NO.	SEE CONCRETE BASE ELEVATION D (17E 24E)	E (17E 24E)	F (17E 24E)	G (17E 23E)	SEE ST. LT. STD. A (17E 23E)	B (17E 23E)	STREET LIGHT ARM LENGTH/DESCRIPTION
1		▨			▨		15' – TRUSS ARM
2		▨			▨		15' – TRUSS ARM
3 *							15' – TRUSS ARM
4	▨					▨	15' – TRUSS ARM
5		▨			▨		15' – TRUSS ARM
6	▨					▨	15' – TRUSS ARM
7	▨					▨	15' – TRUSS ARM
8	▨					▨	15' – TRUSS ARM
9	▨					▨	15' – TRUSS ARM
10	▨					▨	15' – TRUSS ARM
11				▨	▨		15' – TRUSS ARM
12				▨	▨		15' – TRUSS ARM
13	▨					▨	15' – TRUSS ARM
14	▨					▨	15' – TRUSS ARM
15	▨					▨	15' – TRUSS ARM
16	▨					▨	15' – TRUSS ARM
17	▨					▨	15' – TRUSS ARM
18	▨					▨	15' – TRUSS ARM
19	▨					▨	15' – TRUSS ARM
20	▨					▨	15' – TRUSS ARM
21		▨			▨		15' – TRUSS ARM
22		▨			▨		15' – TRUSS ARM
23				▨	▨		15' – TRUSS ARM
24				▨	▨		15' – TRUSS ARM
25				▨	▨		15' – TRUSS ARM
26				▨	▨		15' – TRUSS ARM
27				▨	▨		15' – TRUSS ARM
28			▨		▨		15' – TRUSS ARM
29			▨		▨		15' – TRUSS ARM
30			▨		▨		15' – TRUSS ARM
31			▨		▨		15' – TRUSS ARM
32			▨		▨		15' – TRUSS ARM
33			▨		▨		15' – TRUSS ARM
34		▨			▨		15' – TRUSS ARM
35		▨			▨		15' – TRUSS ARM
36		▨			▨		15' – TRUSS ARM
37			▨		▨		15' – TRUSS ARM
38		▨			▨		15' – TRUSS ARM
39		▨			▨		15' – TRUSS ARM
40	▨					▨	15' – TRUSS ARM
41	▨					▨	15' – TRUSS ARM
42	▨					▨	15' – TRUSS ARM
43			▨		▨		15' – TRUSS ARM
44		▨			▨		15' – TRUSS ARM
45			▨		▨		15' – TRUSS ARM
46		▨			▨		15' – TRUSS ARM
47			▨		▨		15' – TRUSS ARM
48	▨					▨	15' – TRUSS ARM
49	▨					▨	15' – TRUSS ARM
50	▨					▨	15' – TRUSS ARM

STREET LIGHT NO.	SEE CONCRETE BASE ELEVATION D (17E 24E)	E (17E 24E)	F (17E 24E)	G (17E 23E)	SEE ST. LT. STD. A (17E 23E)	B (17E 23E)	STREET LIGHT ARM LENGTH/DESCRIPTION
51	▨					▨	15' – TRUSS ARM
52	▨					▨	15' – TRUSS ARM
53	▨					▨	15' – TRUSS ARM
54	▨					▨	15' – TRUSS ARM
55		▨			▨		15' – TRUSS ARM
56	▨					▨	15' – TRUSS ARM
57		▨			▨		15' – TRUSS ARM
58	▨					▨	15' – TRUSS ARM
59	▨					▨	15' – TRUSS ARM
60	▨					▨	15' – TRUSS ARM
61	▨					▨	15' – TRUSS ARM
62	▨					▨	15' – TRUSS ARM
63	▨					▨	15' – TRUSS ARM
64	▨					▨	15' – TRUSS ARM
65	▨					▨	15' – TRUSS ARM
66	▨					▨	15' – TRUSS ARM
67		▨			▨		15' – TRUSS ARM
68		▨			▨		15' – TRUSS ARM
69	▨					▨	15' – TRUSS ARM
70		▨			▨		15' – TRUSS ARM
71			▨		▨		15' – TRUSS ARM
72		▨			▨		15' – TRUSS ARM
73		▨			▨		15' – TRUSS ARM
74		▨			▨		15' – TRUSS ARM
75			▨		▨		15' – TRUSS ARM
76			▨		▨		15' – TRUSS ARM
77			▨		▨		15' – TRUSS ARM
78			▨		▨		15' – TRUSS ARM
79				▨	▨		15' – TRUSS ARM
80				▨	▨		15' – TRUSS ARM
81				▨	▨		15' – TRUSS ARM
82				▨	▨		15' – TRUSS ARM
83				▨	▨		15' – TRUSS ARM
84				▨	▨		15' – TRUSS ARM
85		▨			▨		10' - TRUSS ARM
86		▨			▨		10' - TRUSS ARM

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	140	162

*-SEE DETAIL (A 17E 30E) FOR STREET LIGHT MOUNTING DETAIL

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT STANDARD SCHEDULE

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

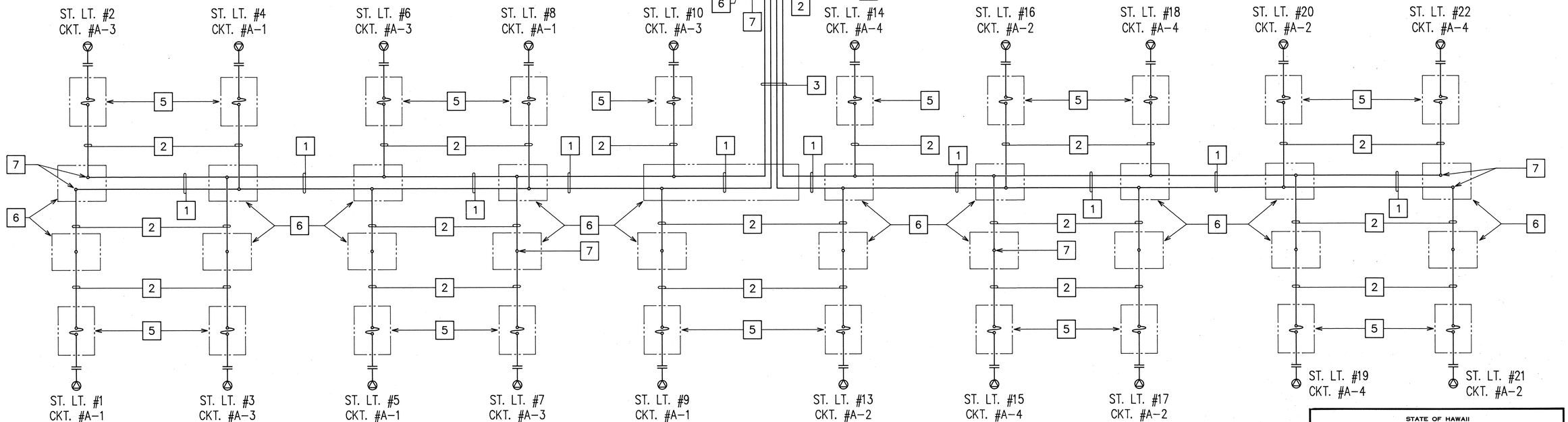
SCALE: NONE DATE:

SHEET No. 17E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	141	162

NOTES:

1. 2"C., 3–#1 & #4 GND.
2. 1"C., 2–#6 & #8 GND.
3. 4"C., 6–#1 & #2 GND.
4. 4"C., 9–#1 & #2 GND.
5. 250W, HPS ST. LT. WITH PHOTOCELL & 6A FUSE & WATERPROOF FUSEHOLDER.
6. PULLBOX
7. WATERPROOF SPLICE, TYPICAL.
8. FOR CONTINUATION, SEE SHEET 22E, PROVIDE 12 CKT. 120/240V, 1Φ 3W PANEL



WAIALUA CONNECTOR STREET LIGHT DIAGRAM

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/30/91

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

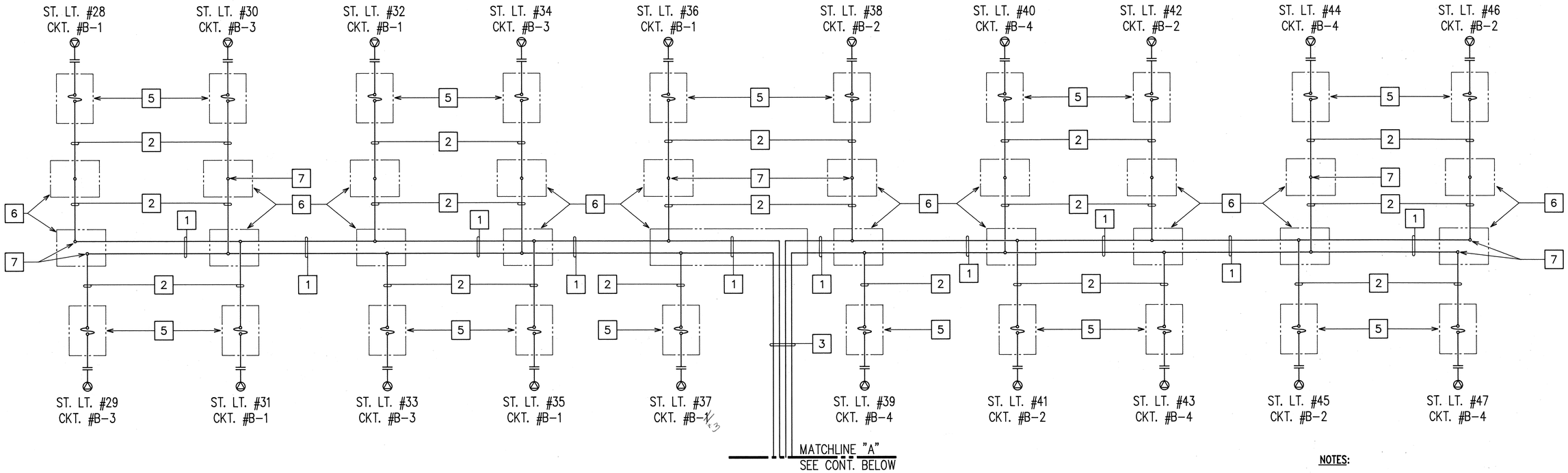
WAIALUA CONNECTOR STREET LIGHT DIAGRAM

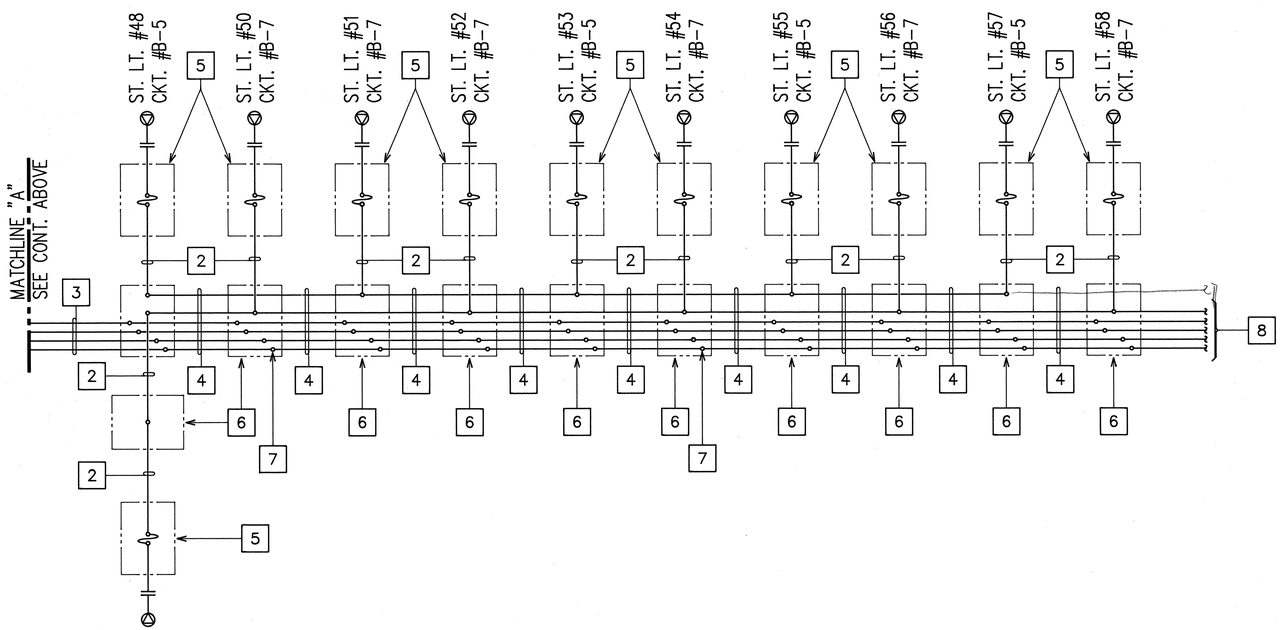
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: 1"=40' –0" DATE:

SHEET No. 18E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	142	162





NOTES:

1. 2"C., 3-#1 RHW-USE & #4 GND.
2. 1"C., 2-#6 RHW-USE & #8 GND.
3. 4"C., 6-#2 RHW-USE & #2 GND.
4. 4"C., 9-#1 RHW-USE & #2 GND.
5. 250W, HPS ST. LT. WITH PHOTOCELL & 6A FUSE & WATERPROOF FUSEHOLDER.
6. PULLBOX
7. WATERPROOF SPLICE, TYPICAL.
8. FOR CONTINUATION, SEE SHEET 22E PROVIDE 12CKT. 120/240V, 1Φ, 3W PANEL

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

EMERSON ROAD CONNECTOR STREET LIGHT DIAGRAM

RONALD N. S. NO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EMERSON ROAD CONNECTOR STREET LIGHT DIAGRAM

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

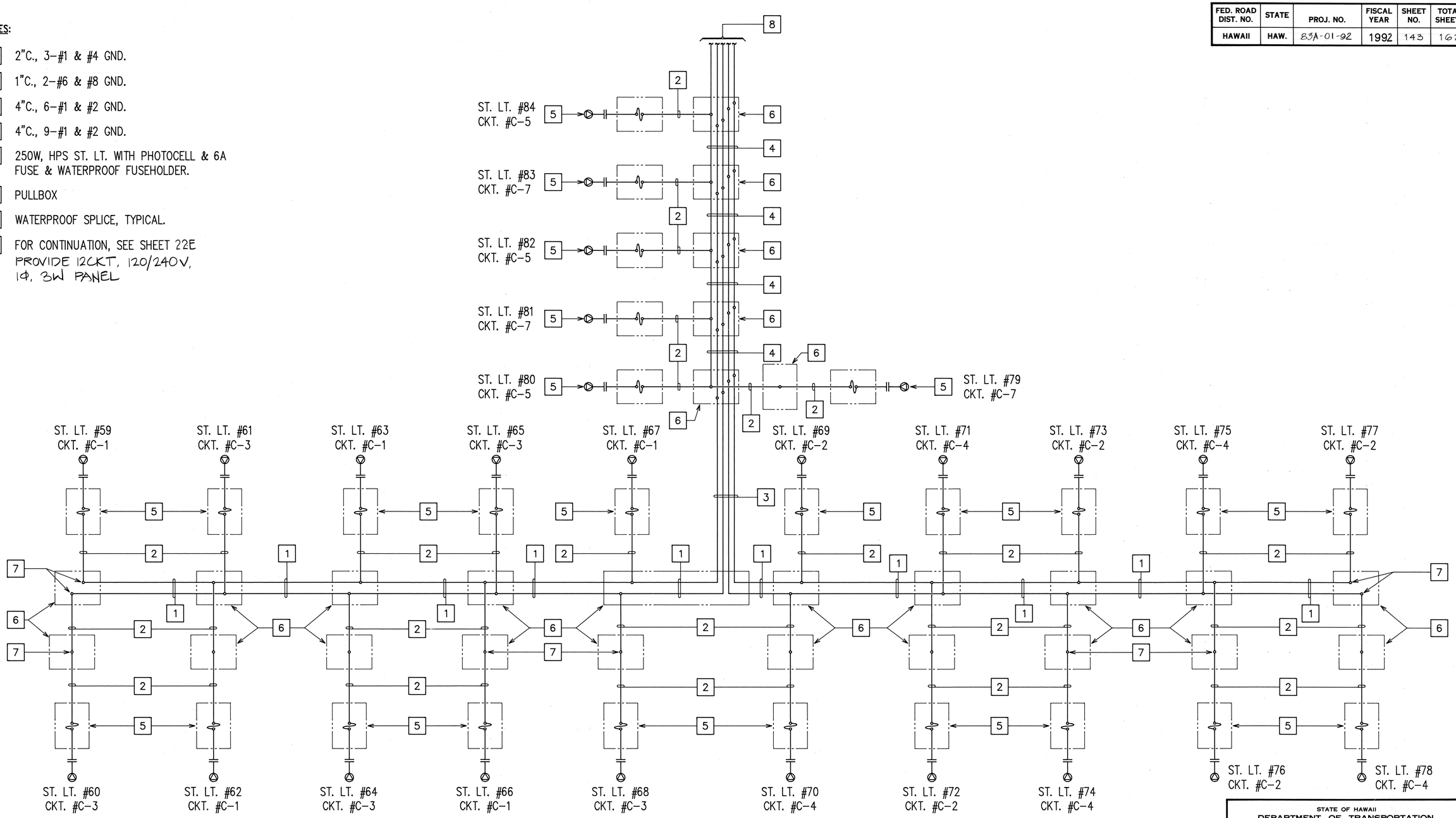
SCALE: 1"=40' -0" DATE:

SHEET No. 19E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	143	162

NOTES:

1. 2"C., 3-#1 & #4 GND.
2. 1"C., 2-#6 & #8 GND.
3. 4"C., 6-#1 & #2 GND.
4. 4"C., 9-#1 & #2 GND.
5. 250W, HPS ST. LT. WITH PHOTOCELL & 6A FUSE & WATERPROOF FUSEHOLDER.
6. PULLBOX
7. WATERPROOF SPLICE, TYPICAL.
8. FOR CONTINUATION, SEE SHEET 22E
   PROVIDE 12CKT, 120/240V, 1Φ, 3W PANEL



HALEIWA CONNECTOR STREET LIGHT DIAGRAM

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

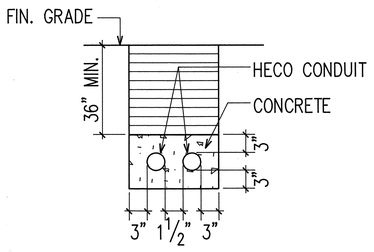
HALEIWA CONNECTOR STREET LIGHT DIAGRAM

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

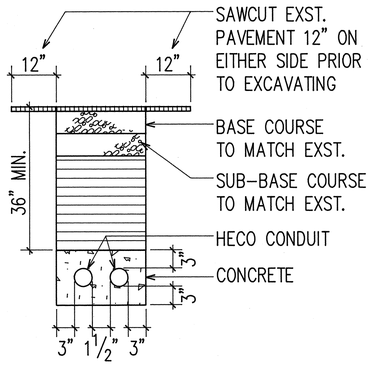
SCALE: 1"=40' -0" DATE:

SHEET NO. 20E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	144	162



SECTION (A)



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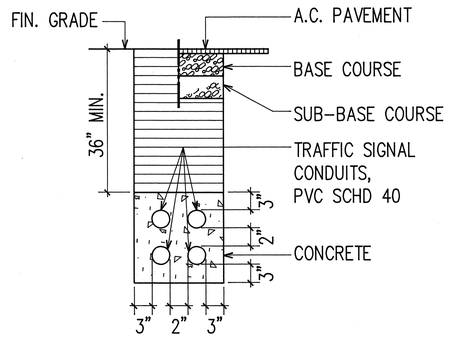

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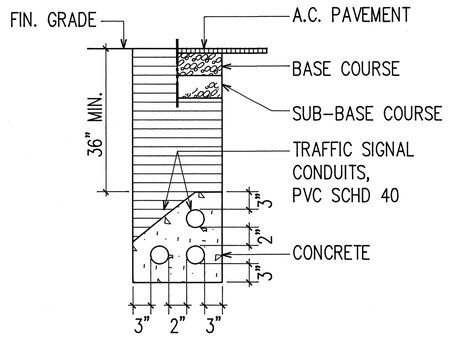

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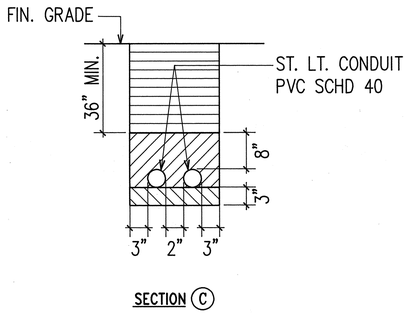

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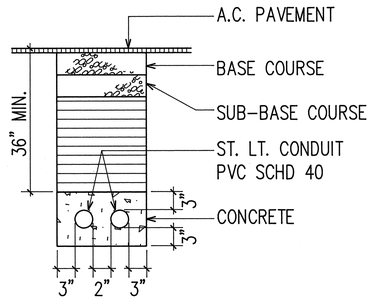

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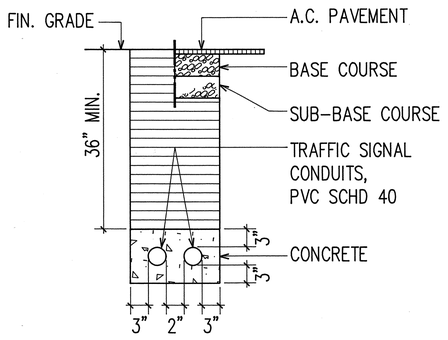
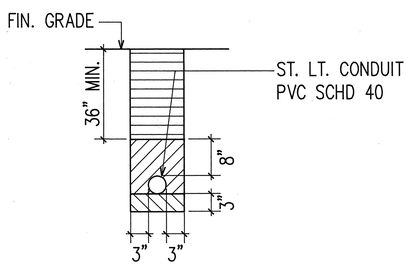
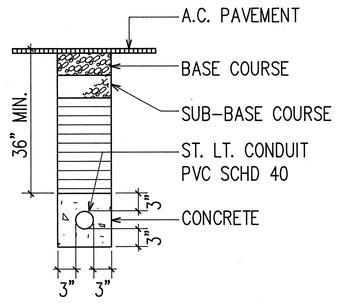


SECTION (I)



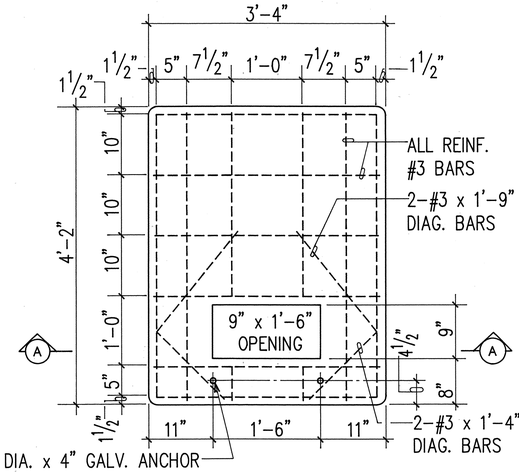
SECTION (D)



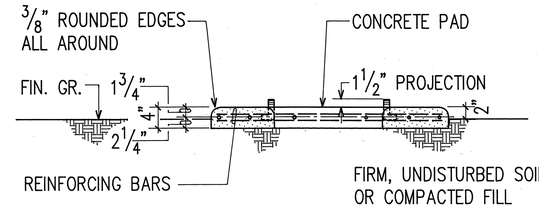
SECTION (F)

CONDUIT SCHEDULE

ITEM	DESCRIPTION
1L	1"C., STREET LIGHT
2L	2"C., STREET LIGHT
2-7L	2-2"C., STREET LIGHT
2-4L	2-4C., STREET LIGHT
2S	2"C., TRAFFIC SIGNAL
2-2S	2-2"C., TRAFFIC SIGNAL
3-2S	3-2"C., TRAFFIC SIGNAL
4-2S	4-2"C., TRAFFIC SIGNAL
2-2C	2-2"C., HECO
2P	2"C., POWER



PLAN VIEW



SECTION "A-A"

NOTES:

1. COMPRESSIVE STRENGTH OF CONCRETE: 3000 PSI IN 28 DAYS.
2. REINFORCING BAR SHALL BE CLEAN & NEW.
3. CURE CONCRETE BY APPROVED METHOD.
4. TOP OF CONC. PAD TO BE SMOOTH, TRUE & LEVEL, FREE FROM DEFECTS.
5. CONTRACTOR HAS OPTION OF FURNISHING CAST-IN-PLACE OR PRECAST CONCRETE TRANSFORMER PAD.
6. SIMILAR TO HECO DRAWING NO. 30-5001.

A 21E | 21E

CONCRETE TRANSFORMER PAD DETAIL

NOT TO SCALE

STATE RIGHT-OF-WAY BACKFILL NOTES

TRENCH BACKFILL MATERIAL "B"
1. SAND EQUIVALENT ≥ 2
2. 8" MAX. LIFT
3. 95% COMPACTION

TRENCH BACKFILL MATERIAL "A"
1. SAND EQUIVALENT ≥ 20
2. 8" MAX. LIFT
3. 95% COMPACTION

IF MATERIAL BELOW DUCT IS NOT EQUIVALENT TO BACKFILL MATERIAL "A", EXCAVATE MATERIAL & PROVIDE 3" BACKFILL MATERIAL "A". SEE ABOVE.

CONCRETE - 3" ENCASEMENT. 3000 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

NOTE:
BASE COURSE & SUB-BASE COURSE PER 1985 STATE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

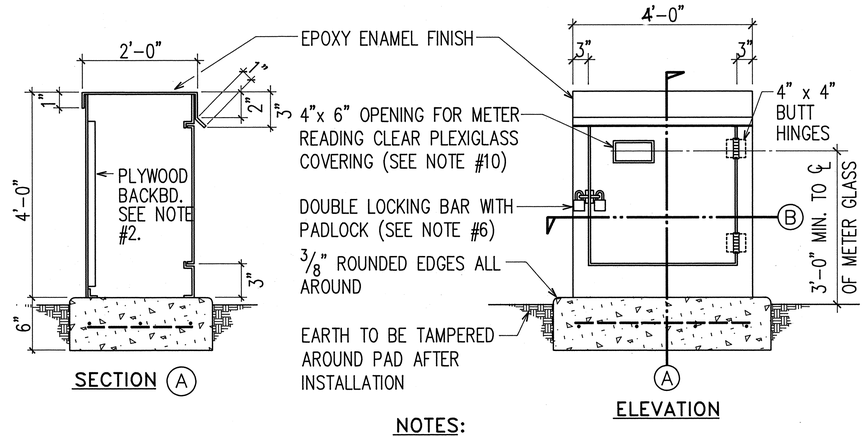
DUCT SECTIONS, DETAILS & CONDUIT SCHEDULE

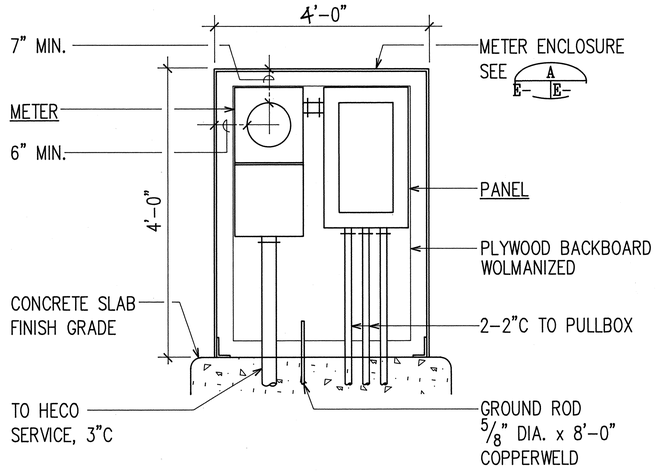
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. 21E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	145	162



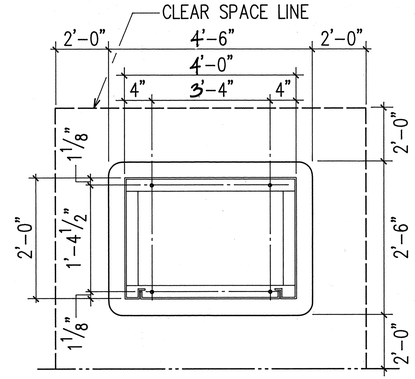


SEE THIS SHEET FOR ONE-LINE DIAGRAM

B 22E | 22E

SERVICE ELEVATION METER ENCLOSURE

NOT TO SCALE



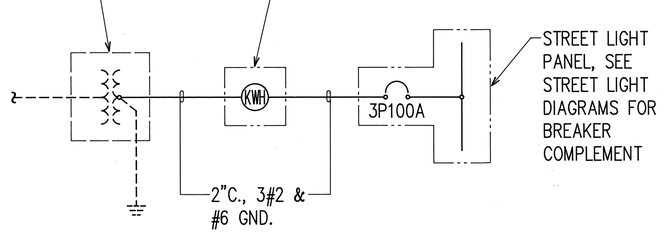
PLAN SECTION (B)
(ANGLE FRAME)

1. CABINET TO BE PRIMED WITH ONE COAT SHOP PRIMER.
2. PLYWOOD BACKBOARD SHALL BE 3/4" THK. x 48" x 42" WOLMANIZED TREATED.
3. MADE FROM 10 GA GALV SHEET STEEL.
4. TWO COATS OF EPOXY ENAMEL FINISH.
5. SECURE TO CONCRETE PAD WITH 4-5/8" DIA ANCHOR BOLTS.
6. ONE CORBIN SESAME COMBINATION LOCK PROVIDED BY CONTRACTOR; ONE PADLOCK PROVIDED BY HECO.
7. METER CABINET SHALL BE NEMA 3R CONSTRUCTED.
8. SHOP DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.
9. 6" CONCRETE PAD WITH REINF #4 BARS @ 12" O. C. BOTHWAYS & CONCRETE WITH 3000 psi STRENGTH @ 28 DAYS.
10. LOCATION OF OPENING FOR METER READER TO CORRESPOND WITH LOCATION OF METER.
11. CONTRACTOR SHALL PROVIDE NUMBER OF CONDUITS REQUIRED. BY CONTROLLER SUPLIER BEFORE POURING CONCRETE PAD.
12. MOUNT METERING EQUIPMENT SECURELY TO PLYWOOD BACKBOARD.
13. PROVIDE 7" TOP, 6" SIDE & 6" FRONT MIN CLEARANCE FOR METER GLASS.

A 22E | 22E

METERING EQUIPMENT CABINET

NOT TO SCALE



C 22E | 22E

SINGLE LINE DIAGRAM

ORIGINAL PLAN | NOTE BOOK | No. ____

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

RONALD N. S. HO
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HAWAII, U.S.A.

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8/20/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EQUIPMENT DETAILS

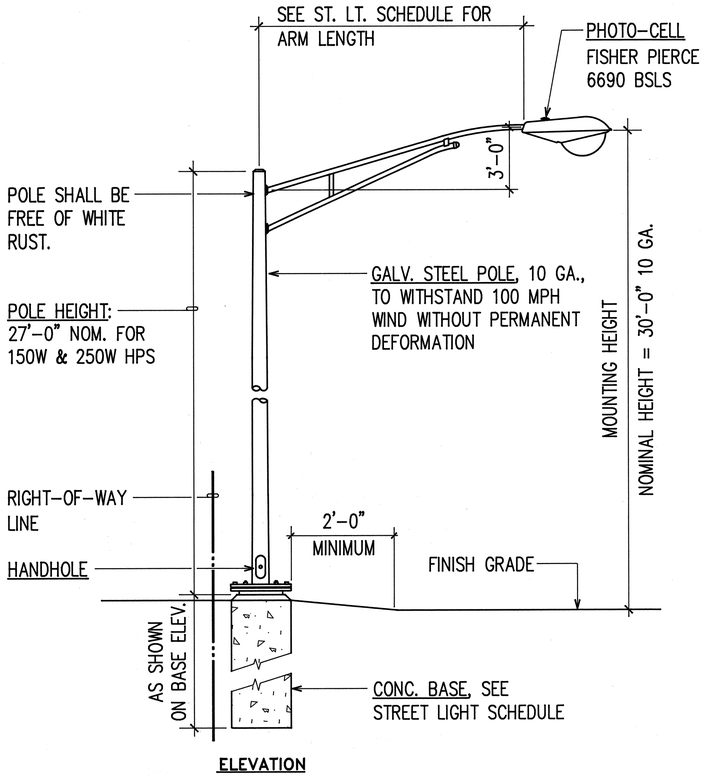
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

PROJ. NO. 83A-01-92

SCALE: AS NOTED" DATE:

SHEET No. 22E OF 28 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	146	162

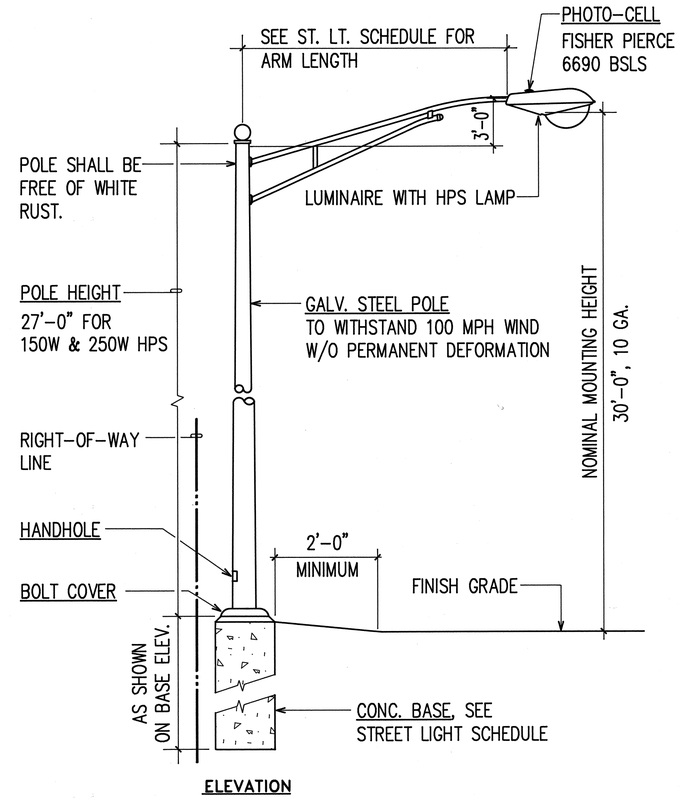


ELEVATION

A 17E 23E

STREET LIGHT STANDARD (w/ SLIP BASE)

NOT TO SCALE

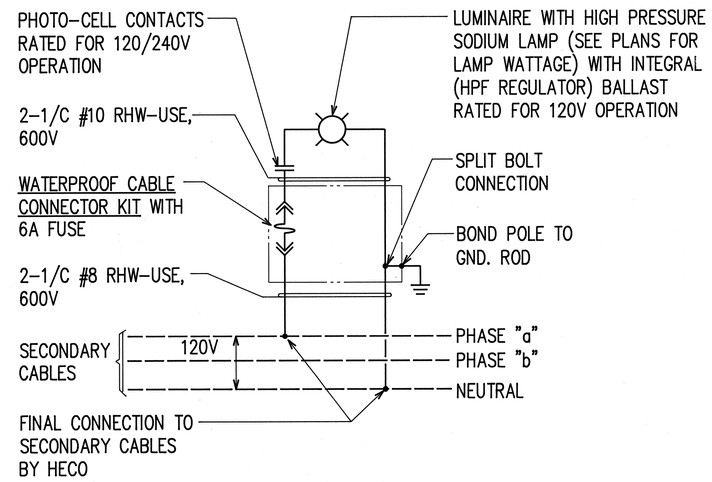


ELEVATION

B 17E 23E

STREET LIGHT STANDARD (w/ ANCHOR BASE)

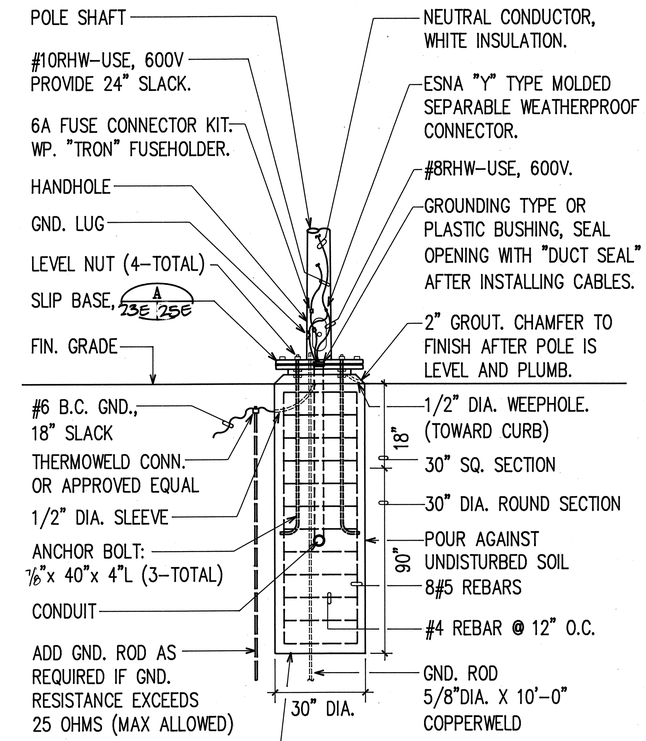
NOT TO SCALE



C 23E 23E

SINGLE STREET LIGHT CONNECTION DIAGRAM

NOT TO SCALE



G 17E 23E

CONCRETE BASE ELEVATION

NOT TO SCALE

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____ . . . . .
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

ORIGINAL PLAN
NOTE BOOK ____ No. ____

RONALD N. S. HO
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8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

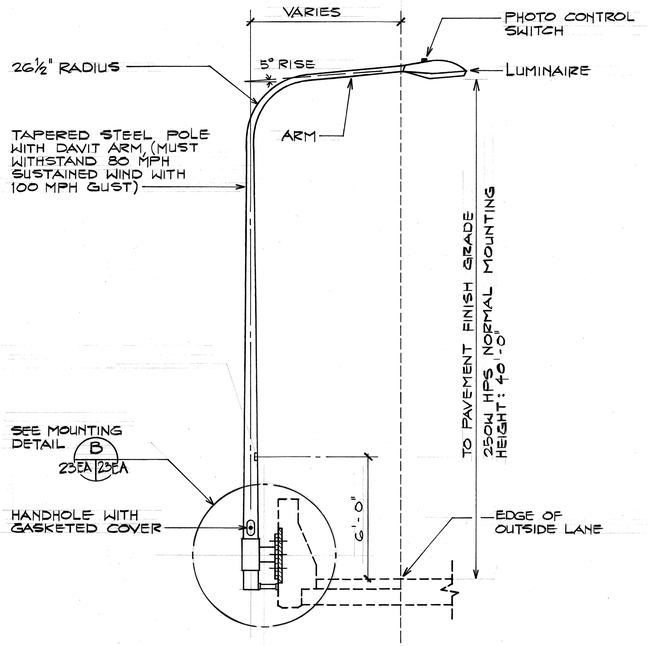
STREET LIGHT DETAILS

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

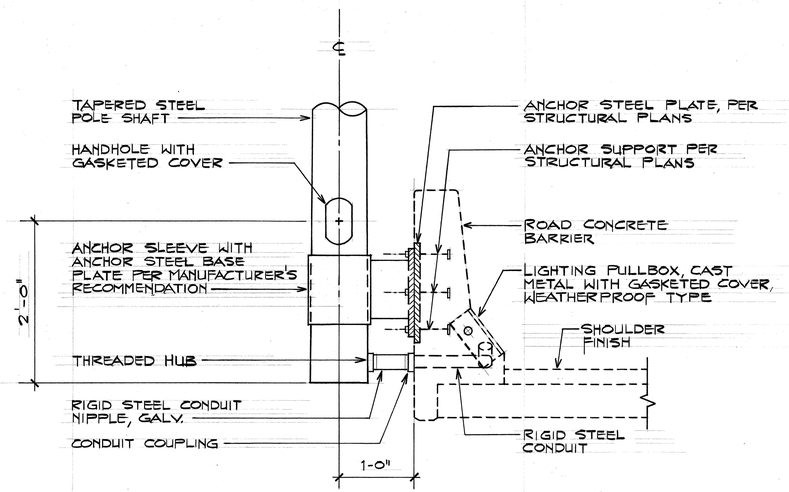
SCALE: NONE DATE:

SHEET No. 23E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992		162



A HIGHWAY LIGHTING STANDARD
4E 23EA NOT TO SCALE



NOTE: REFER TO STRUCTURAL DRAWING FOR ANCHOR STEEL PLATE INSTALLATION REQUIREMENT.

B LIGHTING STANDARD MOUNTING DETAIL
23EA 12EA NOT TO SCALE

ORIGINAL PLAN	NOTE BOOK	No.

SURVEY PLOTTED BY _____ DATE
DRAWN BY _____
TRACED BY _____
DESIGNED BY _____
QUANTITIES BY _____
CHECKED BY _____

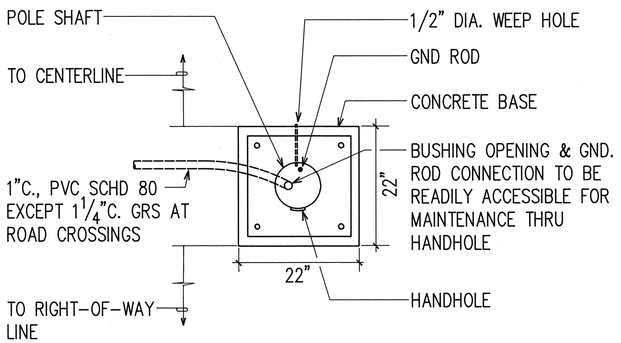
Date	Revision
8/31/92	ADDED THIS SHEET

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

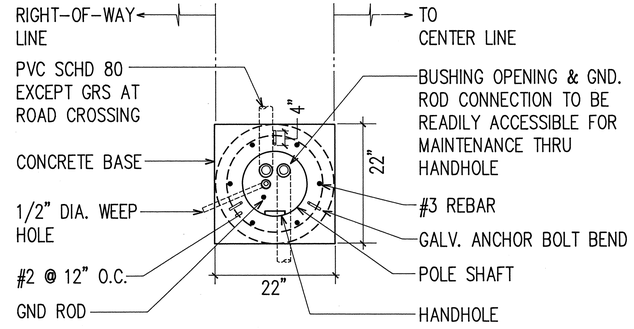
STREET LIGHT DETAIL
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA
JUNCTION TO HALEIWA BEACH PARK
ROADWAY
PROJ. NO. 83A-01-92

SHEET No. 23EA OF 38 SHEETS

C.O. 146S-1



A 24E 24E **CONCRETE BASE PLAN**
NOT TO SCALE



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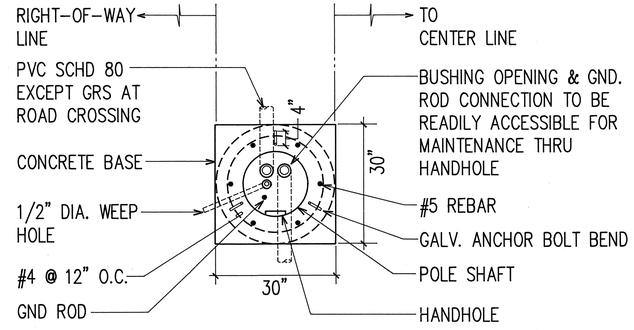

C 24E 24E **CONCRETE BASE PLAN**
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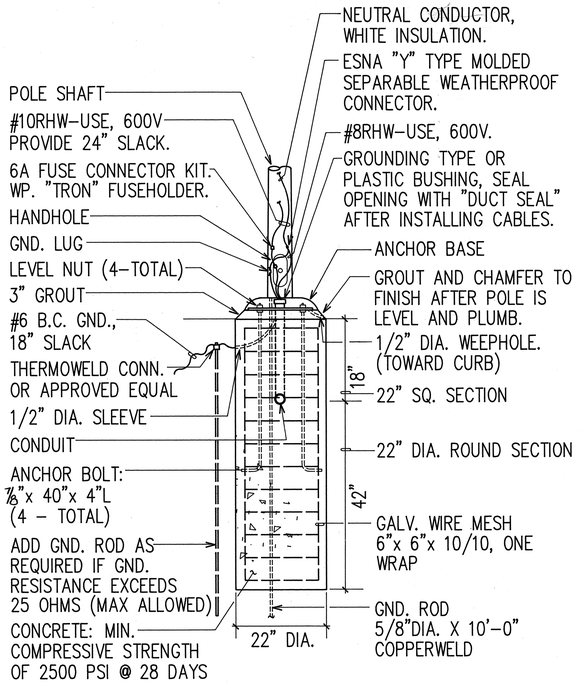
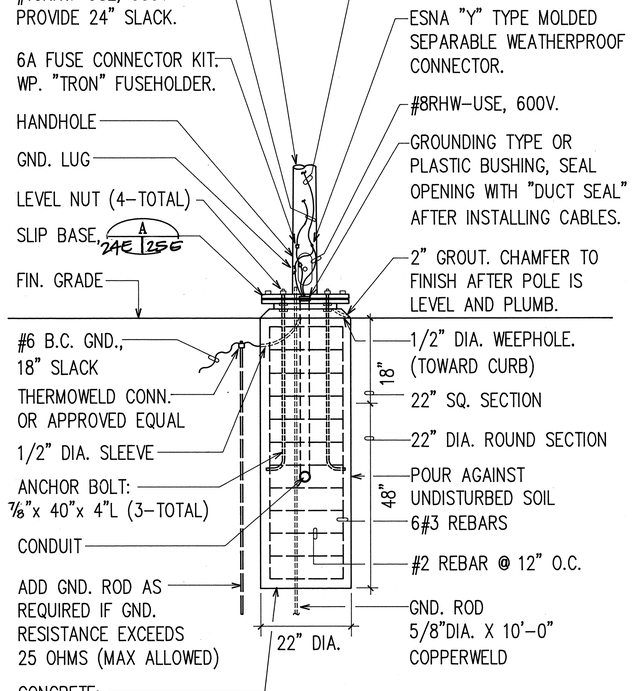


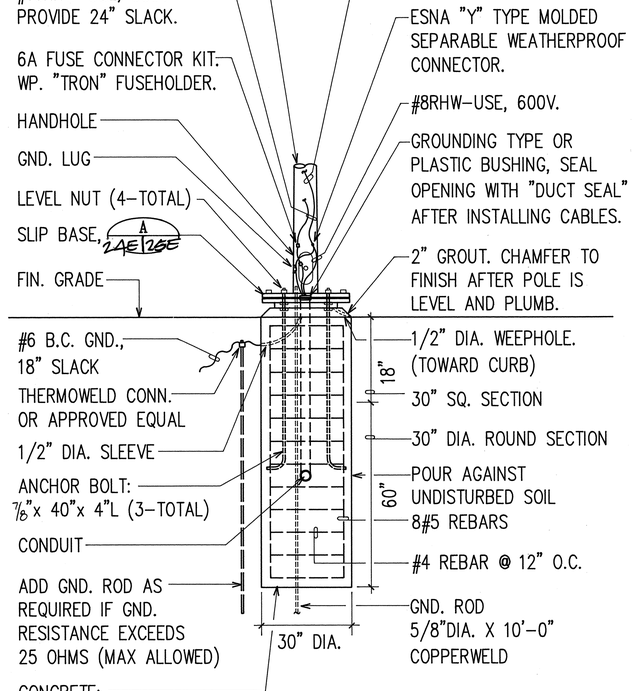
NOTE: SEE BASE PLAN, A 24E 24E

D 17E 24E **CONCRETE BASE ELEVATION**
NOT TO SCALE



NOTE: SEE BASE PLAN, B 24E 24E

E 17E 24E **CONCRETE BASE ELEVATION**
NOT TO SCALE



NOTE: SEE BASE PLAN, C 24E 24E

F 17E 24E **CONCRETE BASE ELEVATION**
NOT TO SCALE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	147	162

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

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HAWAII, U.S.A.

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8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

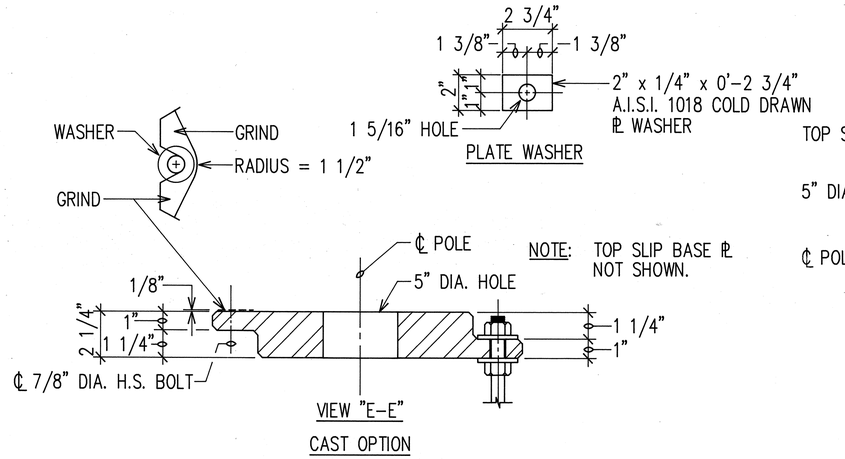
CONCRETE BASE DETAILS

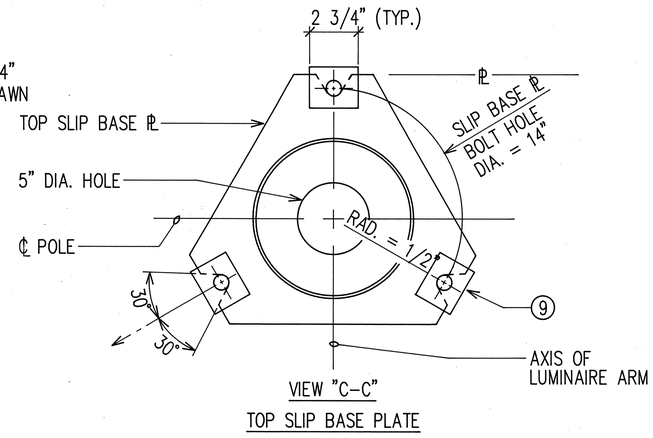
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

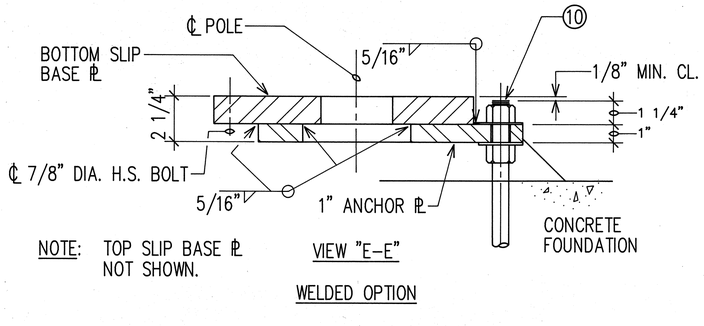
SCALE: ~~AS NOTED~~" DATE:

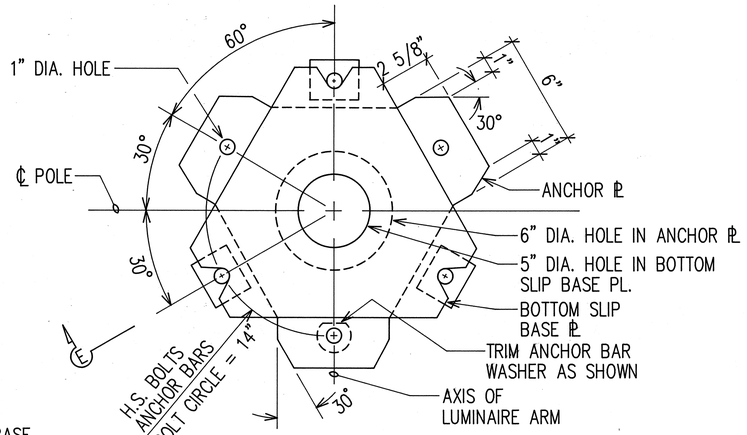
SHEET No. 24E OF 38 SHEETS

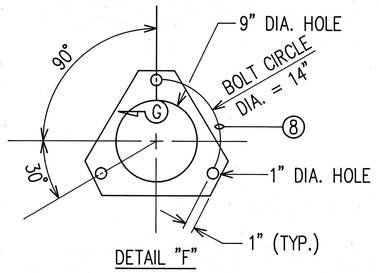
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	148	162

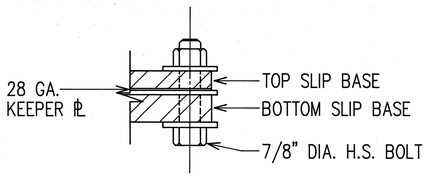


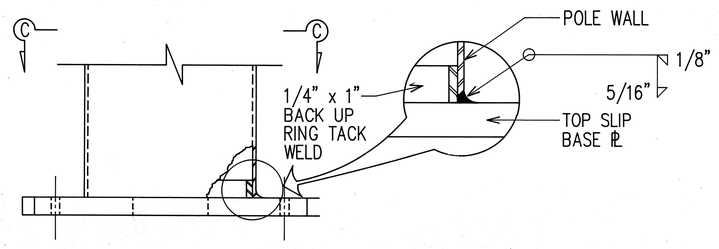


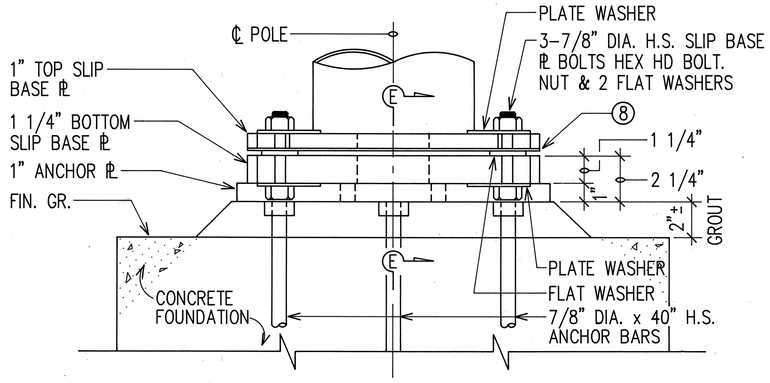












A SLIP BASE DETAIL
235, 245, 255 NOT TO SCALE

NOTES:

1. ALL STEEL SHAFTS, PLATES, MAST ARMS, BOLTS, SCREWS, NUTS & WASHERS TO BE GALVANIZED AFTER FABRICATION OR MODIFICATION.
2. PLATES TO CONFORM TO ASTM A-36.
3. CAST OPTION TO CONFORM TO ASTM A-486 CL. 90.
4. TORQUE 7/8" DIAMETER H.S. SLIP BASE PLATE BOLTS TO 84 FEET PER POUND.
5. 7/8" DIAMETER H.S. ANCHOR BARS, WRENCH TIGHTEN - TORQUE REQUIREMENT WAIVED.
6. FABRICATORS ELECTING LARGER THAN MINIMUM ARM DIAMETERS MUST ADJUST DETAILS AS REQUIRED TO PERMIT SOLID SEATING OF CAP SCREWS. IN LIEU OF TORQUE REQUIREMENTS FOR H.S. BOLTS, CAP SCREWS SHALL BE TIGHTENED BY THE TURN OF NUT METHOD 1/6 TURN FROM SNUG CONDITION. NO WASHER WILL BE REQUIRED.
7. 4" x $6\frac{1}{2}$" HANDHOLE REINFORCED WITH #3 GAUGE RING $\frac{1}{2}$" WIDE WELDED TO OUTSIDE OF POLE COVER OF 10 GAUGE PLATE LOCATE 90 DEGREES OF MAST ARM UNLESS SHOWN OTHERWISE.
8. 28 GAUGE KEEPER PLATE, PLACE ON TOP OF MIDDLE FLAT WASHER, ASTM A-526 125 COMMERCIAL.
9. PLATE WASHER.
10. 3 - 7/8" DIAMETER H.S. BARS, THREAD 6" & GALVANIZED 10", WITH HEX., HEAD, NUT, LEVELING NUT & WASHER.
11. HEX. HEAD NUT SHOWN OR AS AN ALTERNATE DETAIL ANCHOR PLATES MAY BE RETAINED WITH 5/16" FILLET WELDS ALL AROUND OR FORMED HEADS.
12. ROUND TAPERED STEEL TUBE WITH MAXIMUM TAPER OF 0.15"/FOOT.
13. NO. 11 GAUGE SHEET STEEL OF WELDABLE GRADE ACCEPTABLE IF STEEL AFTER FABRICATION HAS A MINIMUM YIELD STRENGTH OF 40,000 P.S.I.

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

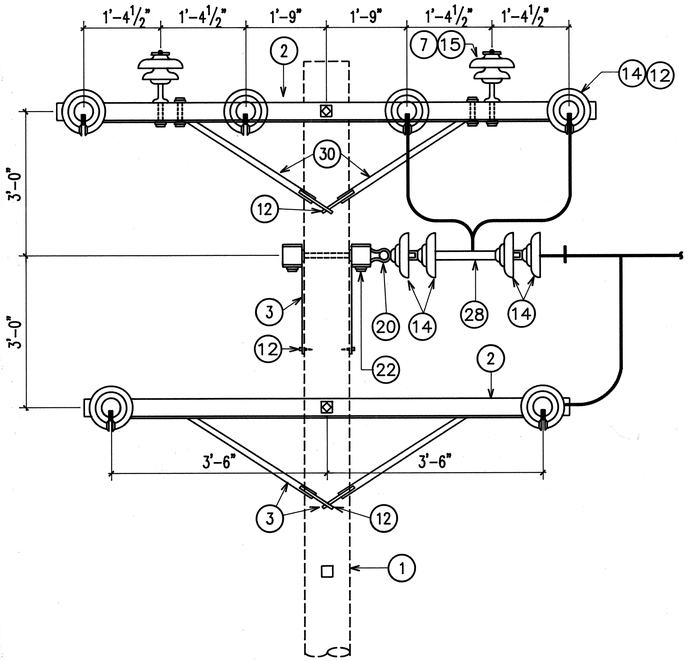
SLIP BASE DETAILS

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

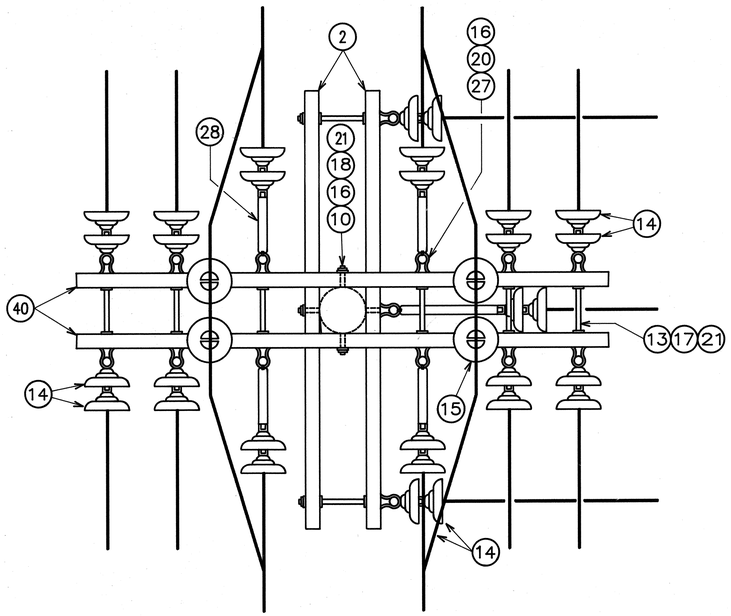
SCALE: 1"=40' -0" DATE:

SHEET NO. 25 OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	149	162



ELEVATION



PLAN

DOUBLE 12KV CKT. WITH 3-PHASE TAP

NOT TO SCALE

A
28E | 26E

LIST OF MATERIALS

PART NO.	DESCRIPTION
1	WOOD POLE, CLASS 2, ~~40'-0"~~ 65'-0" UNLESS OTHERWISE INDICATED , ~~PENTA~~ CREOSOTE TREATED
2	CROSSARM, DOUGLAS FIR, $3\frac{1}{2}$" x $4\frac{1}{2}$" x 8'-0".SEE DETAIL ON SHEET E-19
3	BRACE, FLAT CROSSARM, $1\frac{1}{4}$" x $\frac{1}{4}$" x 28" SPAN STRUCTURAL GRADE STEEL, 10,000 LBS. BREAKING STRENGTH.
4	CARRIAGE BOLT, $\frac{3}{8}$" x $4\frac{1}{2}$". EEI SPEC TD-1.
5	#8 MHD COPPER, BOND TO INSULATOR PINS OR BOLTS.
6	CLAMP, HOT LINE TAP ASSEMBLY
7	INSULATOR PIN, FORGED STL HIGH TENSION. $1\frac{3}{8}$" LEAD THDS, EEI SPEC TDJ-17
8	#4 SOFT DRAWN COPPER GROUND WIRE.
9	MACHINE BOLT, $\frac{5}{8}$" x 14"
10	MACHINE BOLT, $\frac{5}{8}$" x 18"
11	STRAIN CLAMP, ENVELOPE TYPE, ULTIMATE STRENGTH 8,000 LBS.
12	LAG SCREW, $\frac{1}{2}$" x 4", FETTER DRIVE
13	DOUBLE ARMING BOLT 5/8"x18" WITH 4 NUTS
14	SUSPENSION INSULATOR, 10" DIA. CLEVIS TYPE, EEI-NEMA CLASS 52-2
15	PIN TYPE INSULATOR, $1\frac{3}{8}$" DIA. PINHOLE, EEI-NEMA CLASS 55-5
16	SQUARE WASHER, $2\frac{1}{4}$" x $2\frac{1}{4}$" x $\frac{3}{16}$" , $\frac{11}{16}$" DIA. HOLE
17	SQUARE WASHER, $2\frac{1}{4}$" x $2\frac{1}{4}$" x $\frac{3}{16}$" , $1\frac{3}{16}$" DIA. HOLE
18	ROUND WASHER, 1" DIA. $\frac{7}{16}$" DIA. HOLE
19	ROUND WASHER, $1\frac{1}{4}$" DIA., $\frac{9}{16}$" DIA. HOLE, USE UNDER HEAD OF CARRIAGE BOLT.
20	EYENUT, $\frac{5}{8}$" BOLT SIZE
21	M-F LOCKNUT, SQUARE $\frac{5}{8}$" BOLT SIZE
22	M-F LOCKNUT, SQUARE $\frac{3}{4}$" BOLT SIZE
23	FUSE CUTOUT, OPEN TYPE, LOAD BREAK, HOOK STICK OPERATED, 15KV
24	TRANSFORMER, OIL FILLED, SEE SPECS
25	SURGE ARRESTER, ZINC OXIDE, 9KV
26	MACHINE BOLT, $\frac{3}{4}$" x 10"
27	SHACKLE, ULTIMATE STRENGTH - 18,000 LBS.
28	EXTENSION LINK, $1\frac{3}{4}$" x $\frac{3}{8}$" x 24"
29	THIMBLEYE BOLT, $\frac{5}{8}$" x 10"
30	BRACE, FLAT CROSSARM, $1\frac{1}{4}$" x $\frac{1}{4}$" x 60" SPAN, STRUCTURAL GRADE
31	STEEL, 10,000 LBS. BREAKING STRENGTH
32	CONCRETE ANCHOR
33	GALVANIZED GUY WIRE, 7 STRAND, UTILITIES GRADE, $\frac{7}{16}$" SIZE.
34	ANCHOR ROD, THREADED THIMBLEYE $\frac{5}{8}$" x 8'-0", TWINEYE $\frac{3}{4}$" x 8'-0"
35	
36	GUY PROTECTOR, 8 FEET, 16 GAGE STEEL
37	LIFT PLATE, 3-HOLE, $\frac{1}{4}$" STEEL PLATE
38	GUY STRAIN INSULATOR
39	GUY CLAMP, 6" 3-BOLT, $\frac{5}{8}$" BOLT
40	CROSSARM, DOUGLAS FIR, $3\frac{3}{4}$" x $4\frac{3}{4}$" x 10'-0". SEE DETAIL ON SHEET E-
41	CONNECTOR, SPLIT BOLT, COPPER ALLOY
42	TERMINATOR, SINGLE CONDUCTOR, SLIP-ON TYPE, 15KV.
43	CONDUIT STRAP, TWO HOLE TYPE
44	WOOD MOLDING, HALF ROUND, STAPLE EVERY 12" WITH COPPERCLAD STAPLES

DATE	REVISION
8/31/92	REVISED POLE HEIGHT

RONALD N. S. HO
STATE OF HAWAII
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

8/20/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

POLE LINE DETAIL

KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

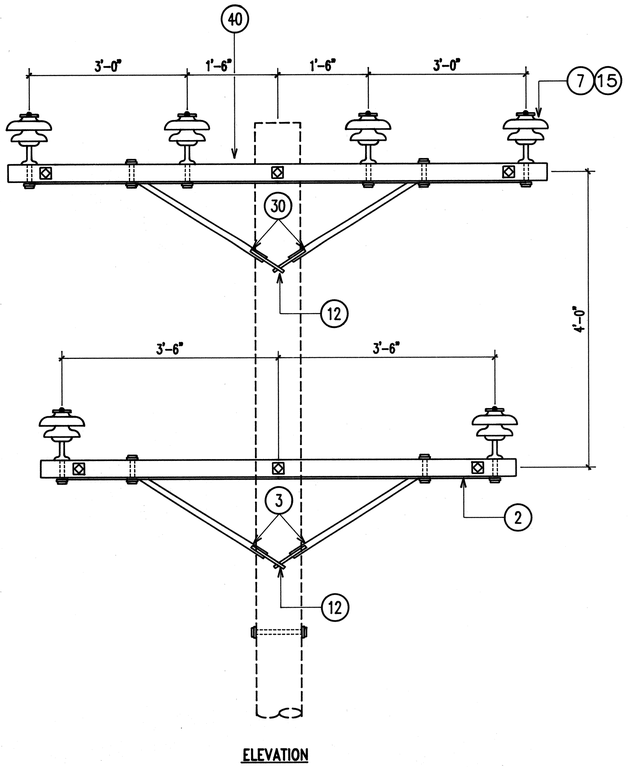
PROJ. NO. 83A-01-92

SHEET No. 26E OF 38 SHEETS

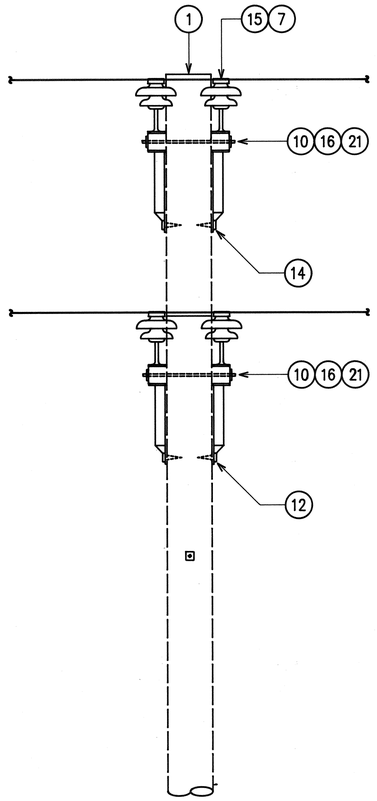
ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

C.O.149

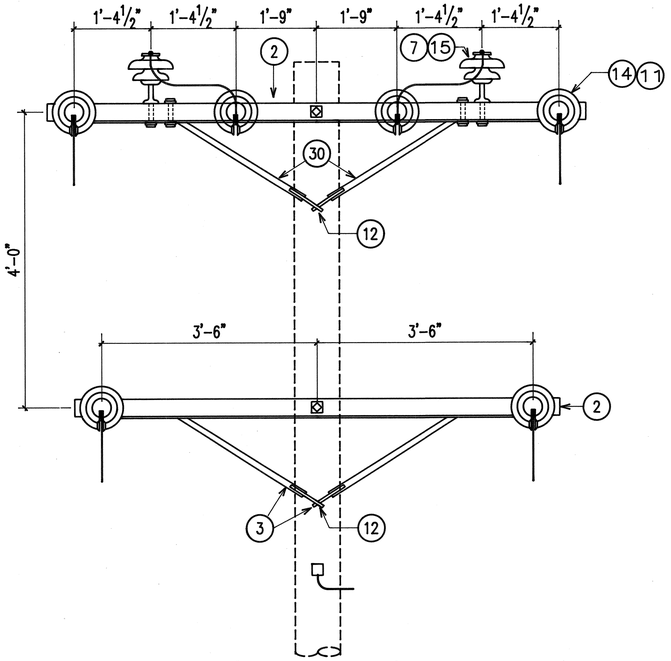
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	150	162



ELEVATION



SIDE ELEVATION



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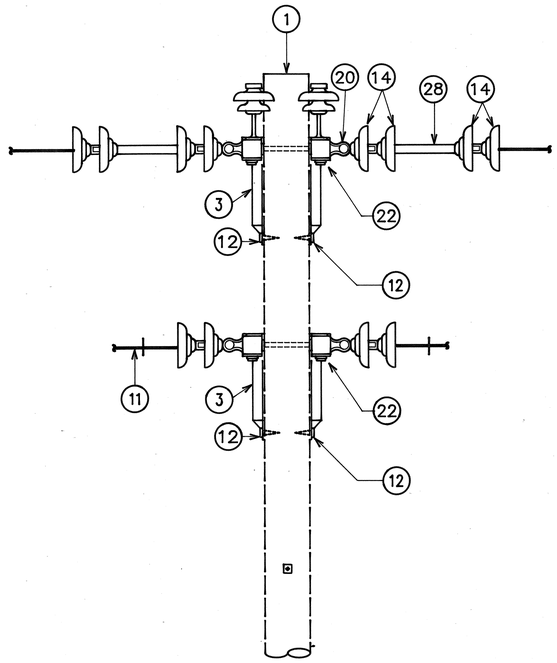
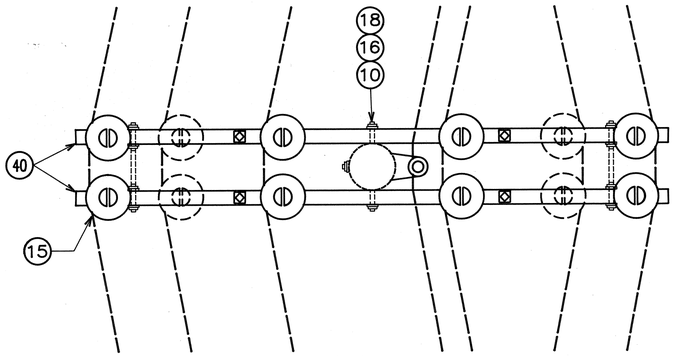


SIDE ELEVATION

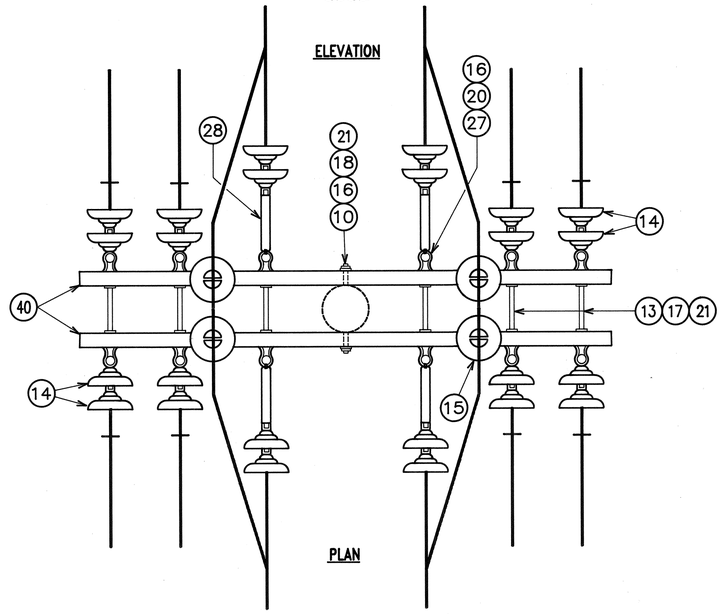


PLAN

D
28E | 27E

DOUBLE 12KV CKT. – IN-LINE

NOT TO SCALE



PLAN

B
28E | 27E

DOUBLE 12KV CKT. – DOUBLE DEAD-END

NOT TO SCALE

ORIGINAL PLAN

NOTE BOOK

SURVEY PLOTTED BY ____ DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
No. ____

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

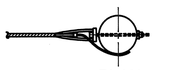
POLE LINE DETAIL

KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

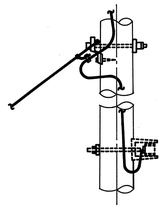
PROJ. NO. 83A-01-92

SHEET NO. 27E OF 38 SHEETS

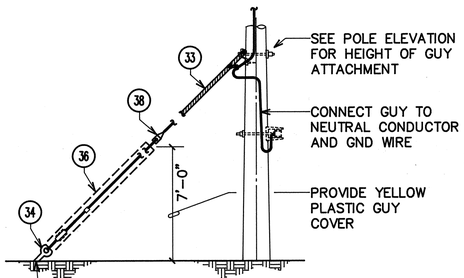
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	151	162



PLAN

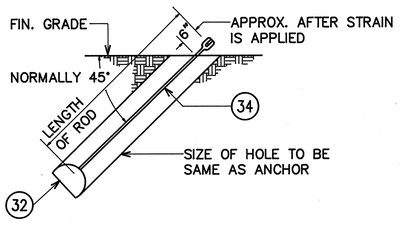


ELEVATION



SINGLE DOWN GUY

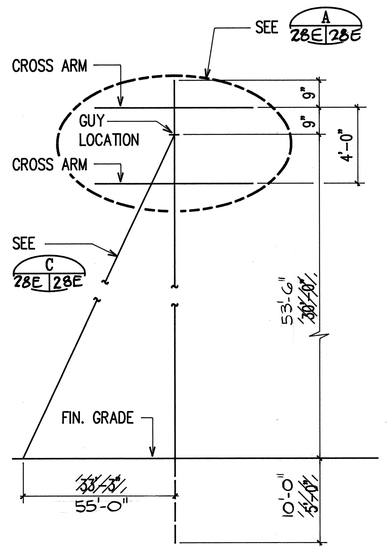
NOT TO SCALE



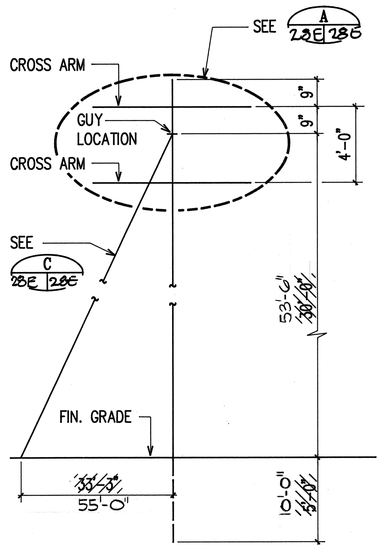
C 28E 28E

LINE ANCHOR DETAIL

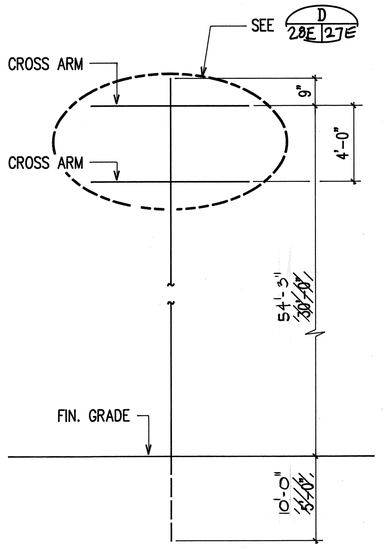
NOT TO SCALE



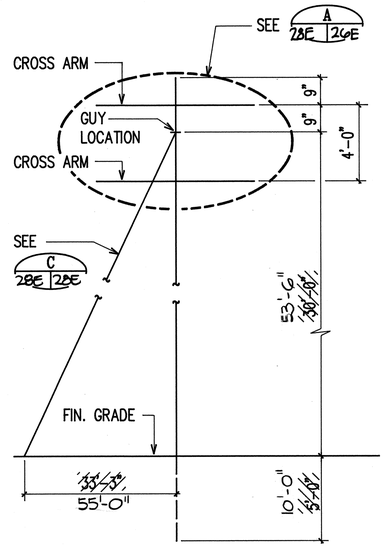
POLE #1 A 6E 28E



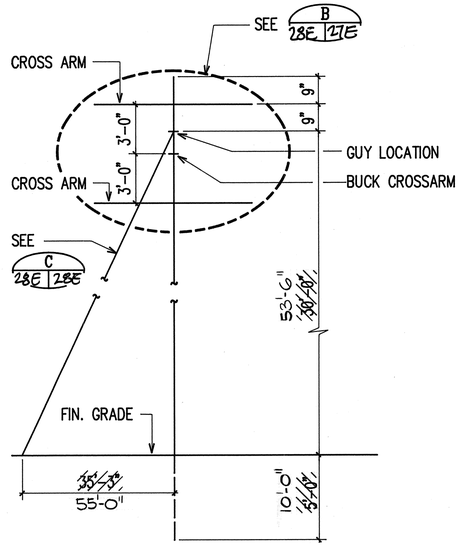
POLE #2 B 6E 28E



POLE #5 E 13E 28E



POLE #3 C 6E 28E



POLE #4 D 6E 28E

POLE ELEVATIONS

NOT TO SCALE

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

DATE	REVISION
11/23/92	REVISED POLE HEIGHT
8/31/92	REVISED POLE HEIGHT AND GUY DISTANCE PER WAIALUA SUGAR CO. REQUIREMENTS.

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

POLE LINE DETAIL

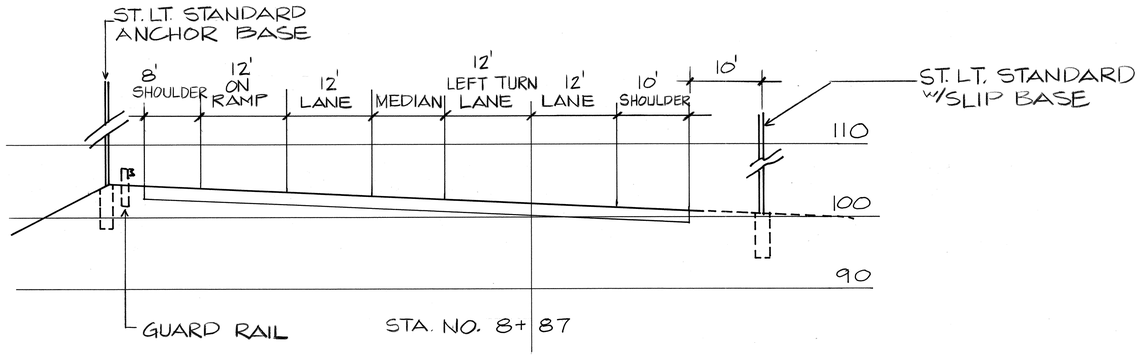
KAMEHAMEHA HIGHWAY – HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY

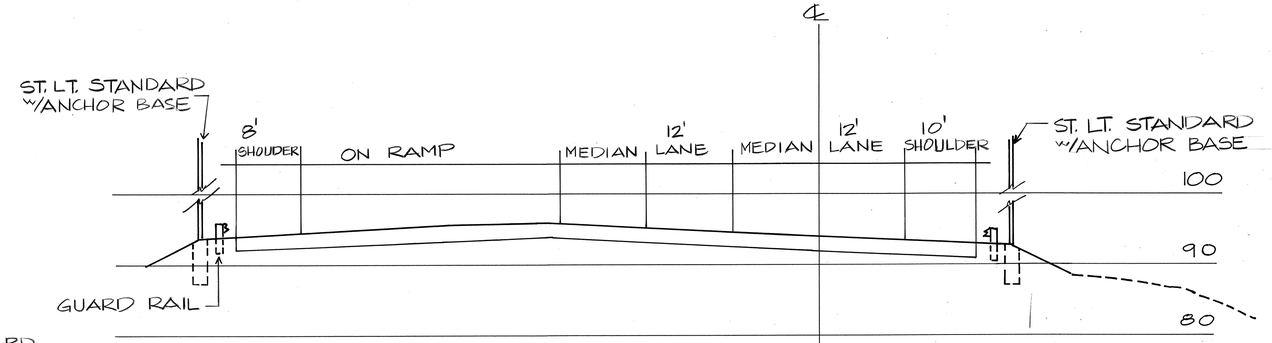
PROJ. NO. 83A-01-92

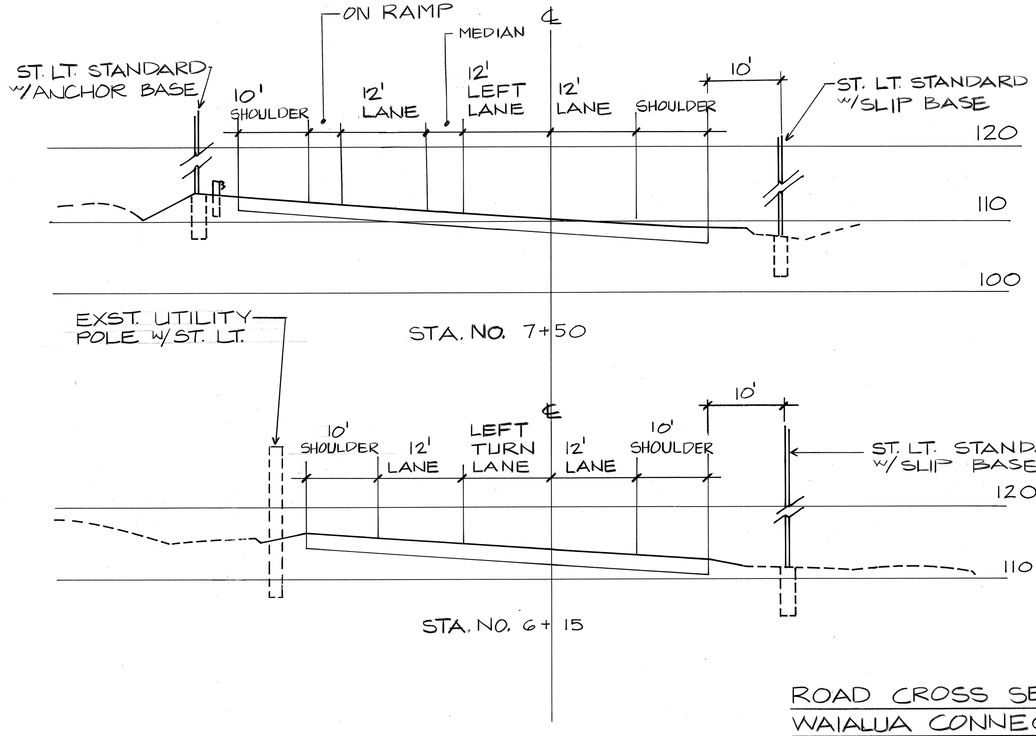
SHEET No. 28E OF 38 SHEETS

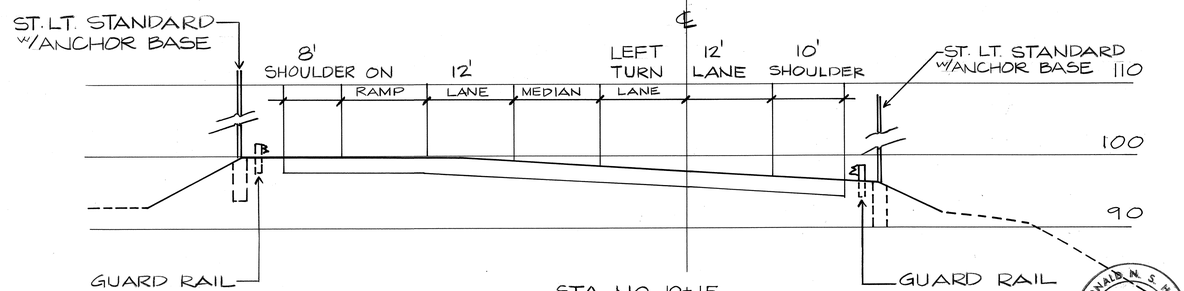
C.O. 151

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	152	162









ROAD CROSS SECTION
WAIALUA CONNECTOR

HORIZ: 1"=1'-0"
VERT: 1"=1'-0"

10' 0' 10' 20' 30'

GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

4/15/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROAD CROSS SECTION - WAIALUA CONNECTOR

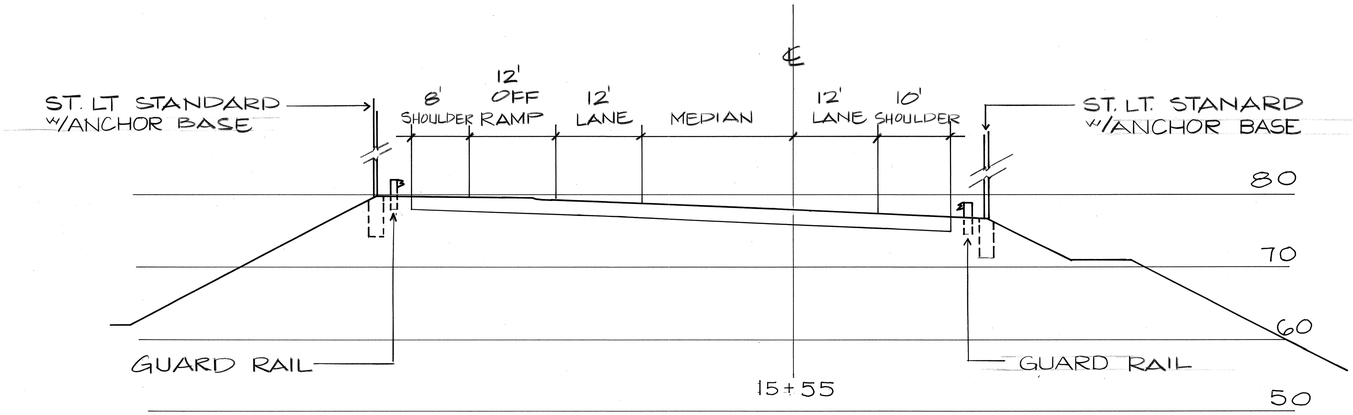
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

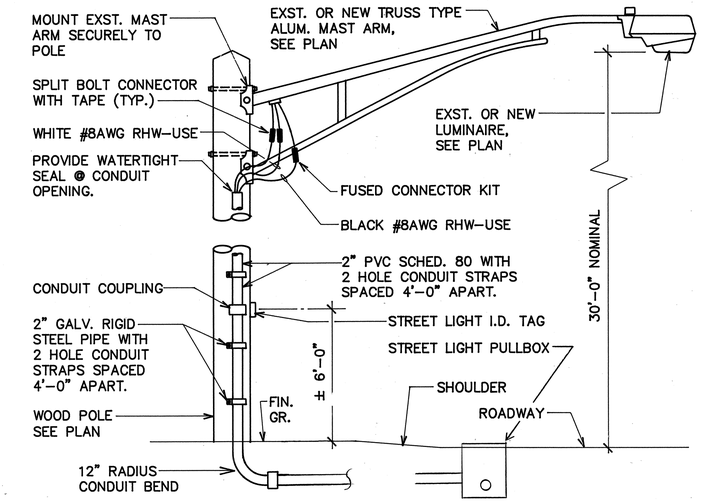
SHEET No. 29E OF 38 SHEETS

ORIGINAL PLAN
NOTE BOOK
No. _____

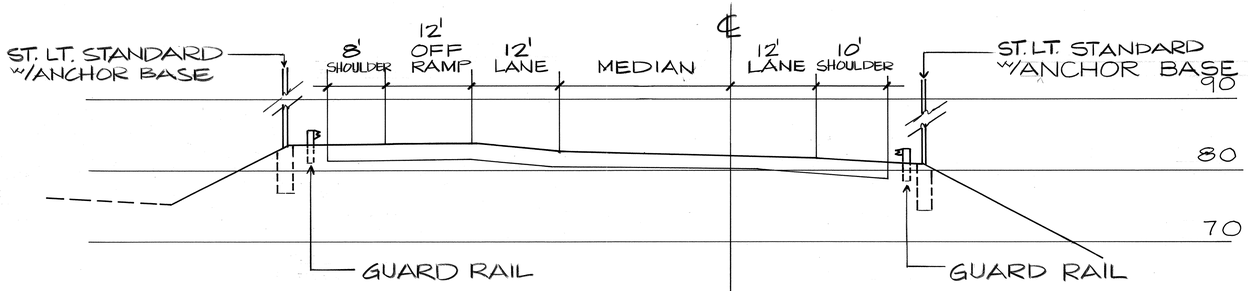
SURVEY PLOTTED BY _____ DATE _____
DRAWN BY _____
TRACED BY _____
DESIGNED BY _____
QUANTITIES BY _____
CHECKED BY _____

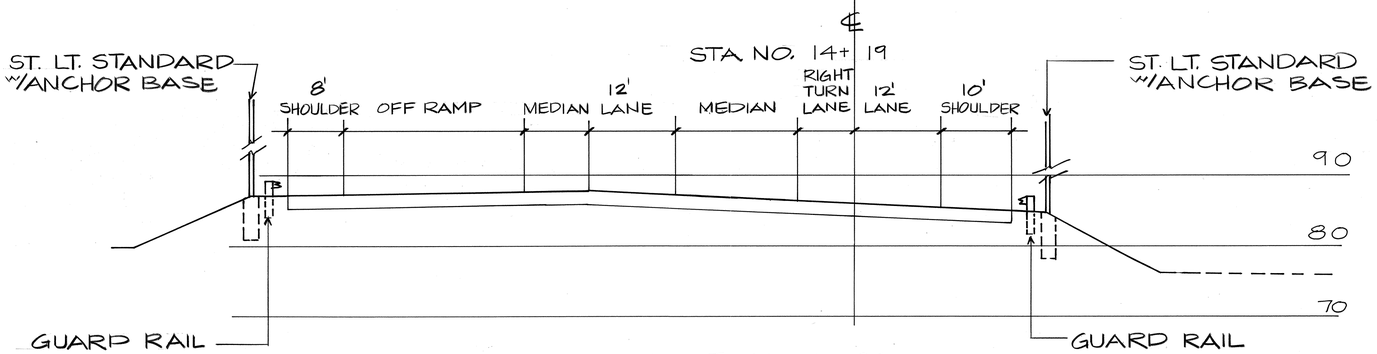
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	153	162





A 7E30E **JOINT POLE STREET LIGHT MOUNTING DETAIL**
N.T.S.





ROAD CROSS SECTION
WAIALUA CONNECTOR
HORIZ : 1"=10'-0"
VERT : 1"=10'-0"

10' 0' 10' 20' 30'
GRAPHIC SCALE

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

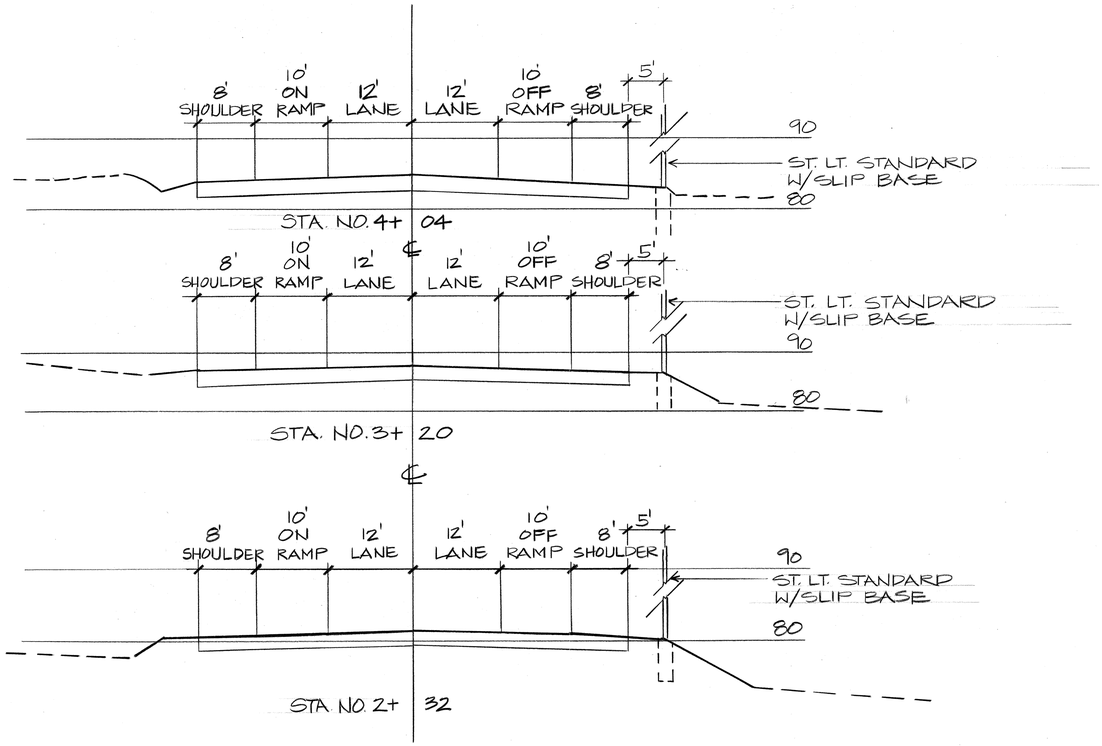
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/20/91

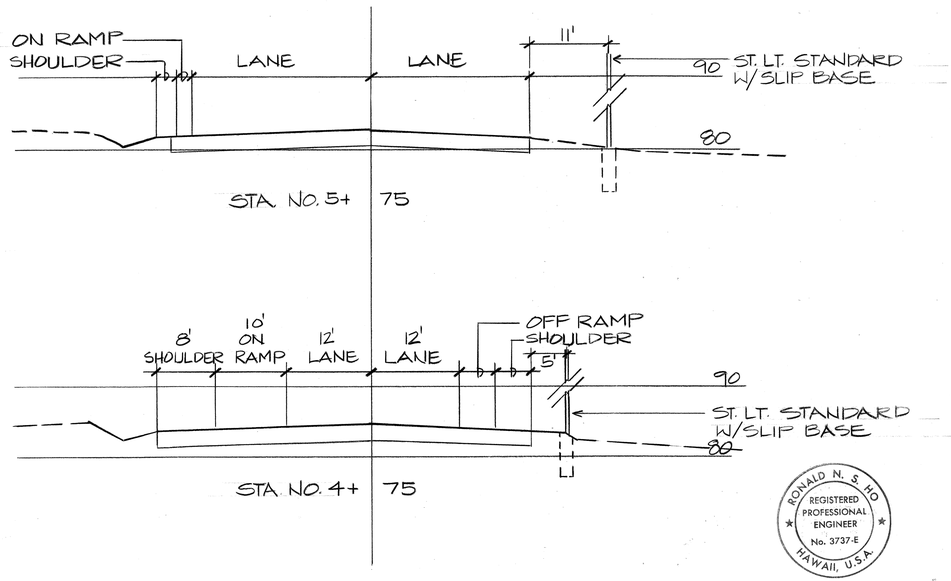
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROAD CROSS SECTION - WAIALUA CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SHEET No.30E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	154	162





ROAD CROSS SECTION
WAIALUA CONNECTOR
HORIZ: 1"= 10'-0"
VERT: 1"= 10'-0"

10' 0' 10' 20' 30'
SCALE: 1"= 10'-0"
GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
6/30/91

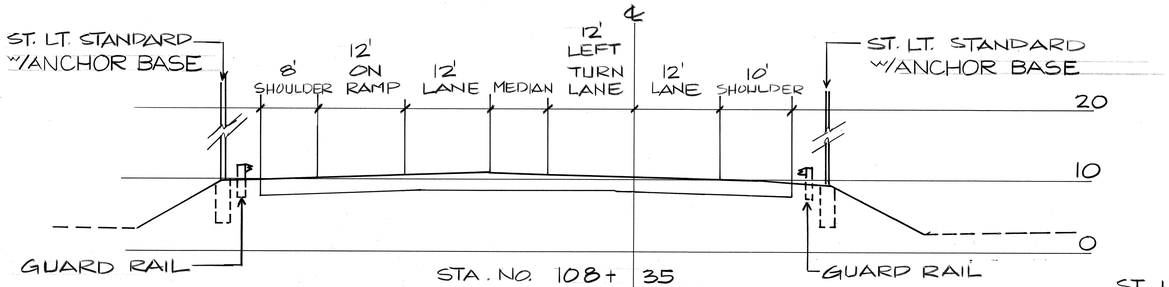
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROAD CROSS SECTION - WAIALUA CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

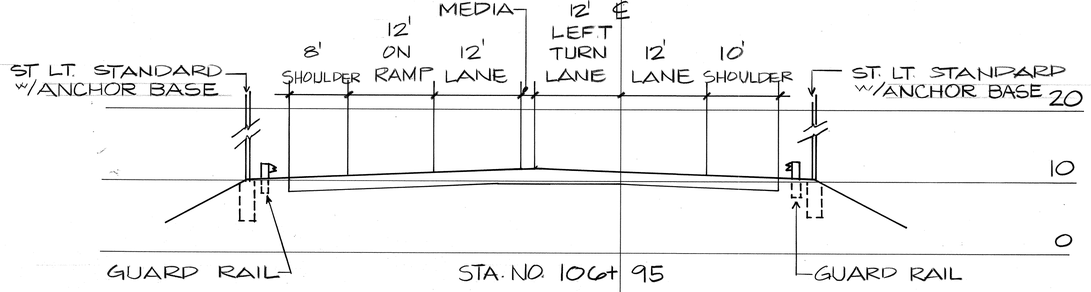
SHEET No. 31 OF 38 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	155	162



STA. NO. 108+35



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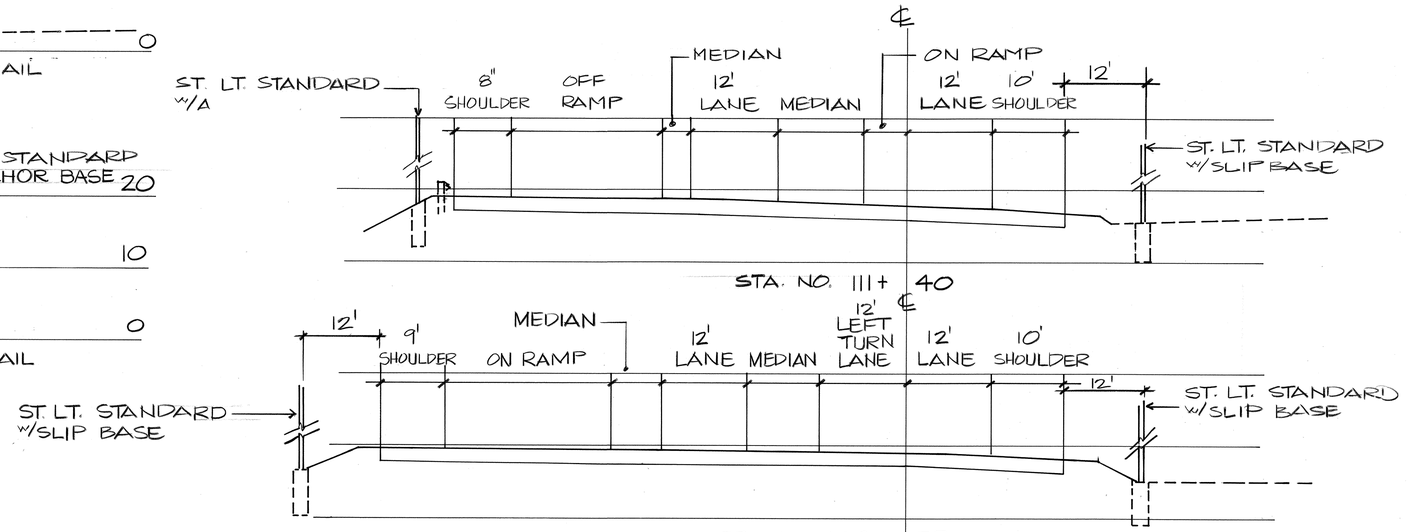
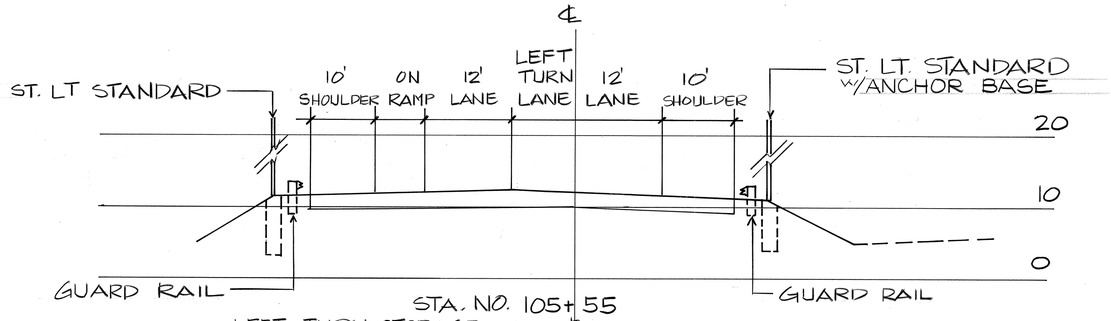


STA. NO 111+40

STA. NO 109+75



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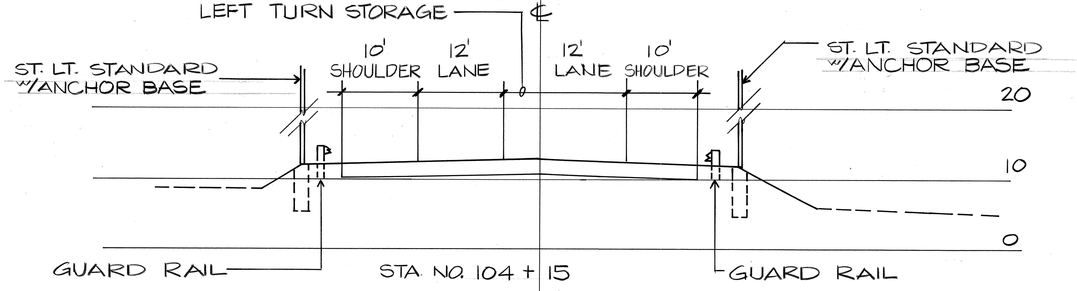


STA. NO. 104+15

ROAD CROSS SECTION
HALEIWA CONNECTOR

HORIZ : 1"=1'-0"
VERT. : 1"=1'-0"

GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

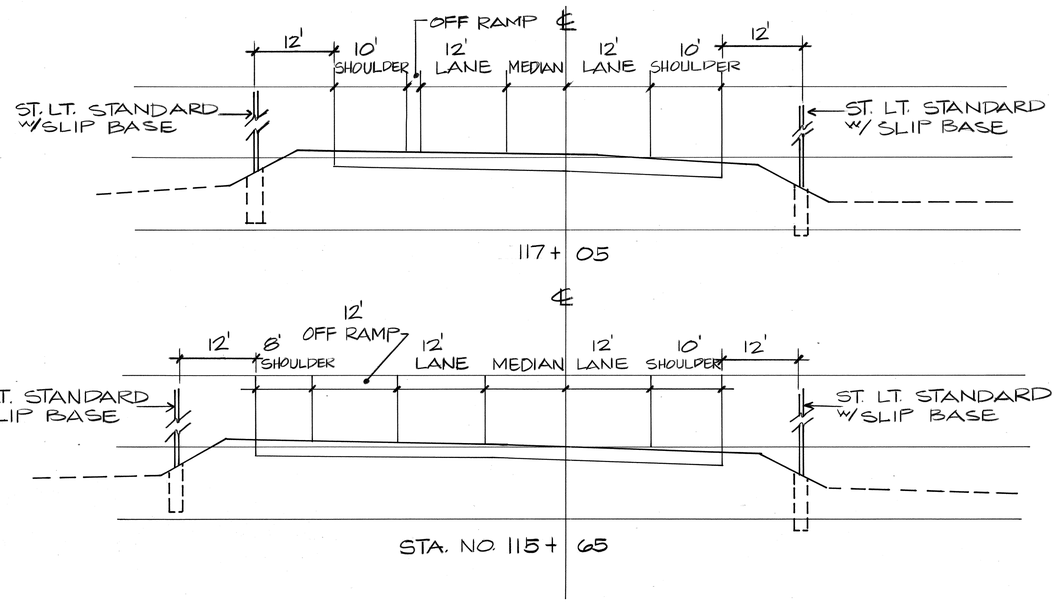
ROAD CROSS SECTION - HALEIWA CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

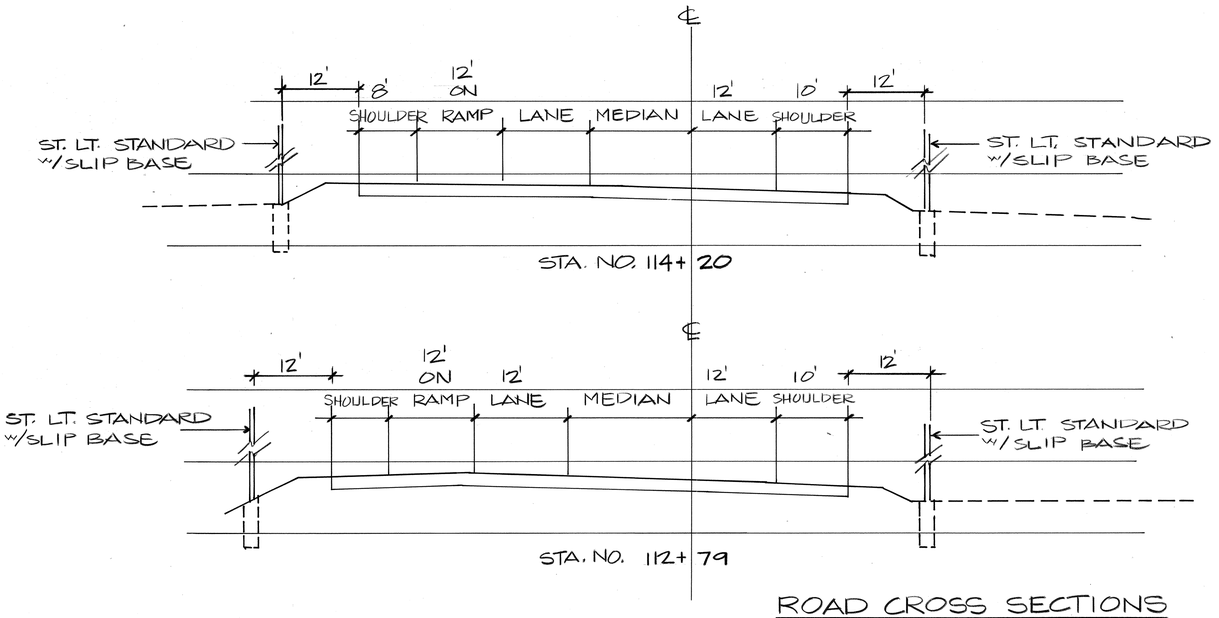
SHEET No. 32 OF 38 SHEETS

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

ORIGINAL PLAN
NOTE BOOK
No.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	156	162





ROAD CROSS SECTIONS
HALEIWA CONNECTOR
HORIZ: 1"=10'-0"
VERT: 1"=10'-0"

GRAPHIC SCALE

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

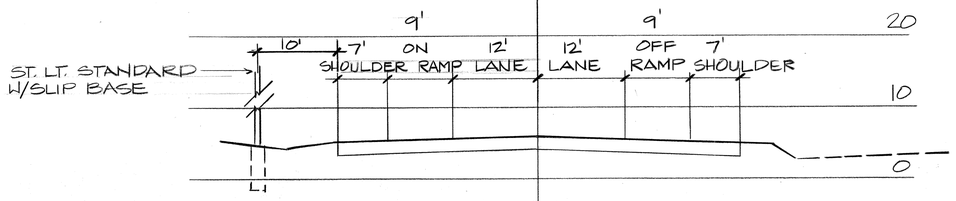
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Ronald N. S. Ho
3/30/92

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

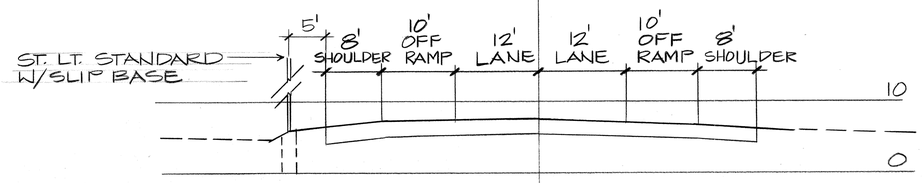
ROAD CROSS SECTION - HALEIWA CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SHEET No. 33 OF 38 SHEETS

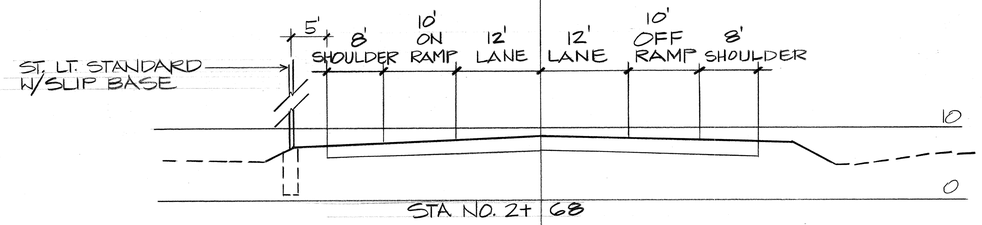
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	157	162



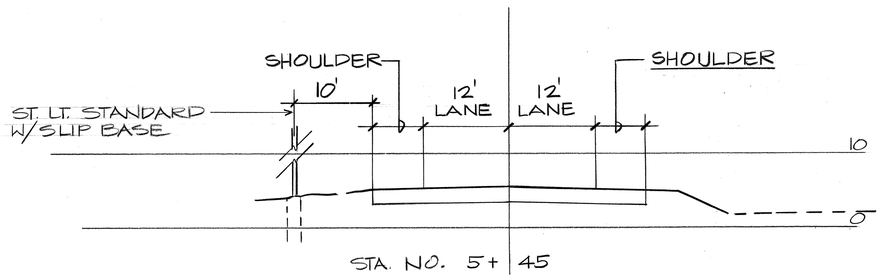
STA NO.4+ 47



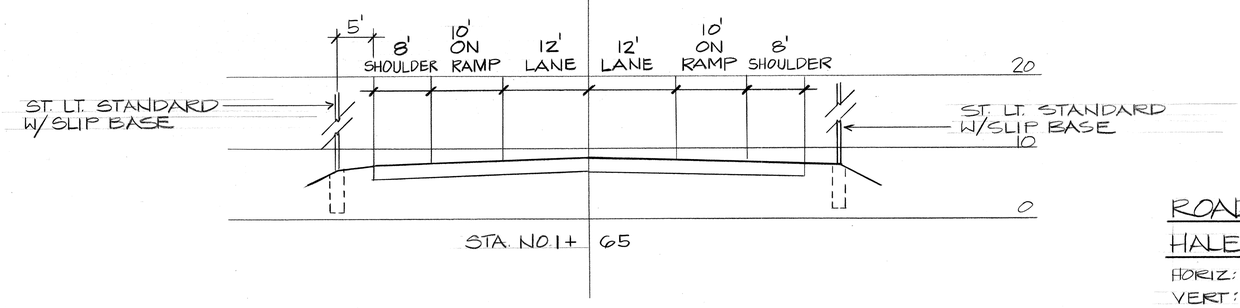
STA. NO. 3+ 68



STA. NO. 2+ 68



STA. NO. 5+ 45



STA. NO. 1+ 65

ROAD CROSS SECTION
HALEIWA CONNECTOR

HORIZ: 1" = 10'-0"
VERT: 1" = 10'-0"

10' 0' 10' 20' 30'

SCALE: 1" = 10'-0"

GRAPHIC SCALE

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

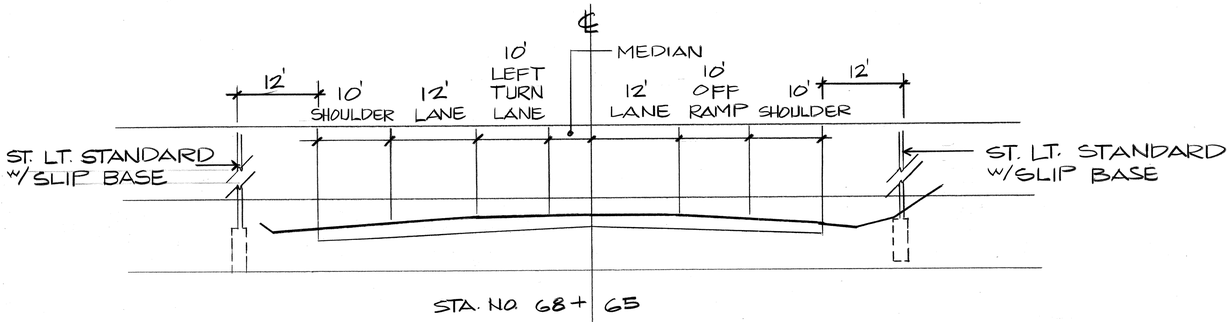
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

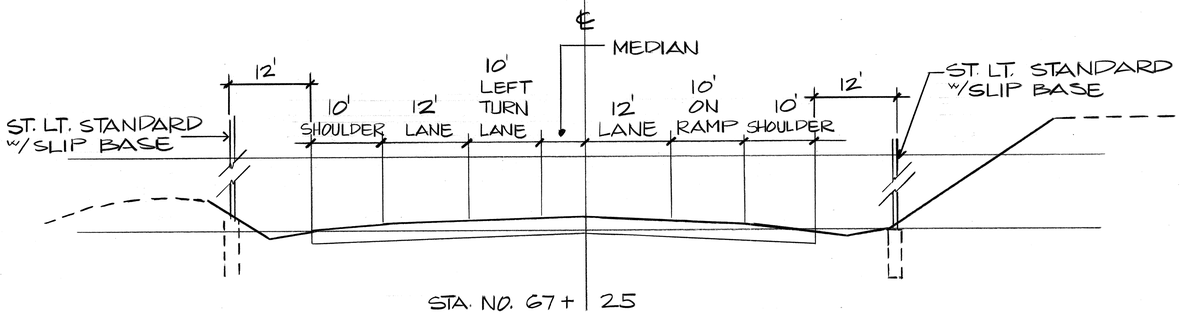
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

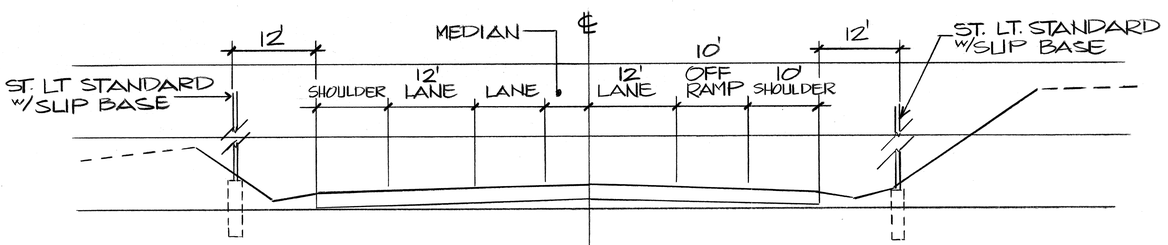
ROAD CROSS SECTION - HALEIWA CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

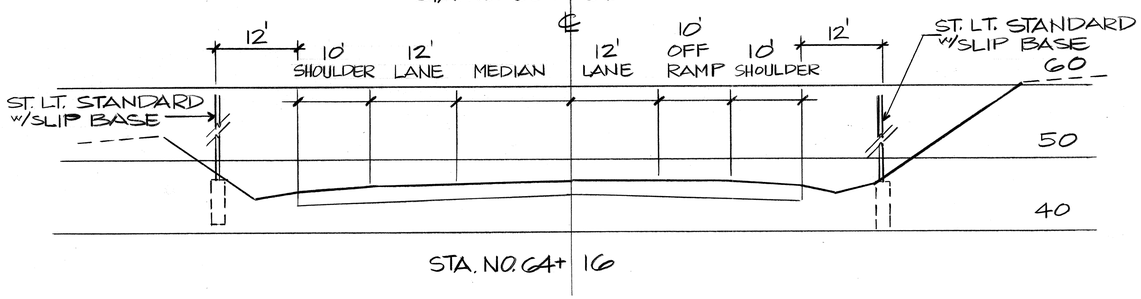
SHEET No. 34 OF 38 SHEETS

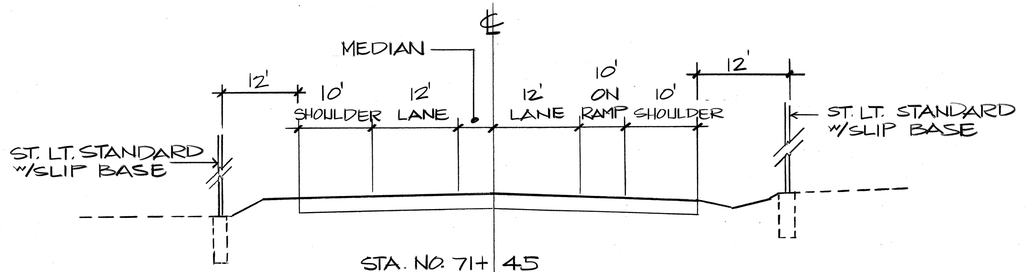
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	158	162

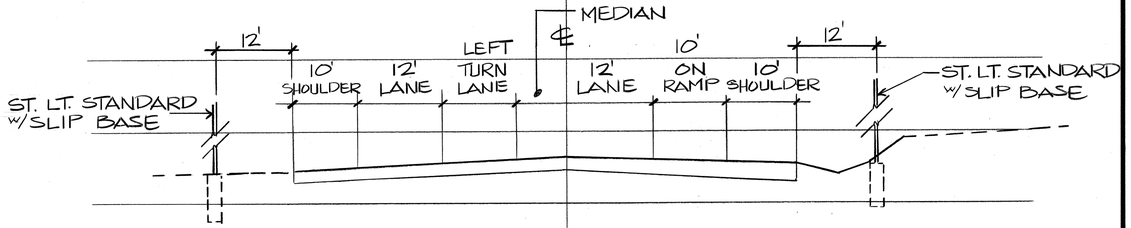












ROAD CROSS SECTIONS
EMERSON RD. CONNECTOR

HORIZ: 1"=10'-0"
VERT: 1"=10'-0"

GRAPHIC SCALE

ORIGINAL PLAN
NOTE BOOK
No.

SURVEY PLOTTED BY ____ DATE
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

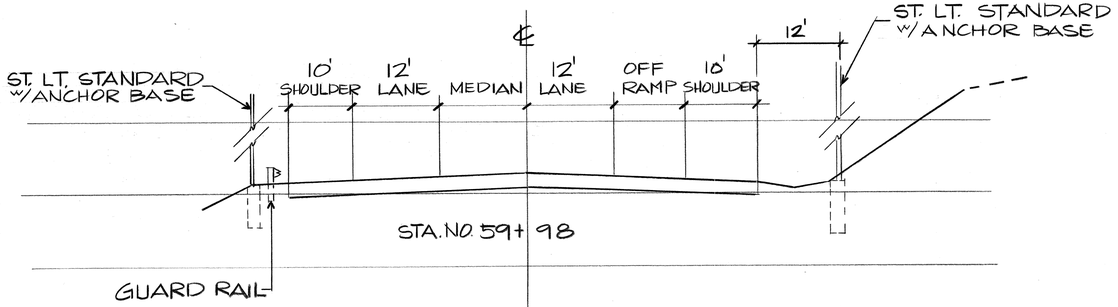
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Drawings
12/20/91

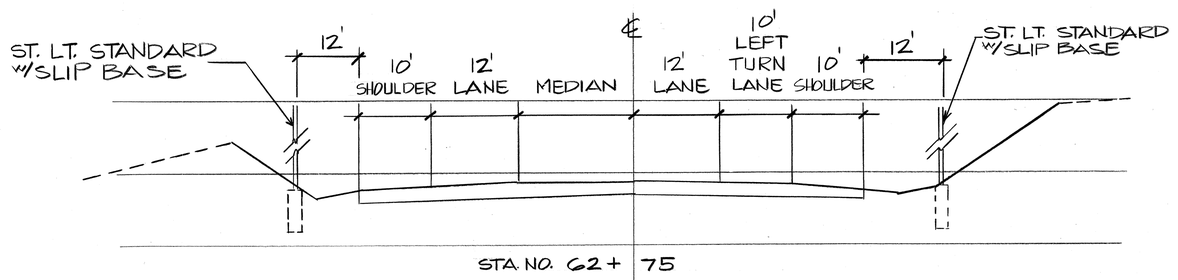
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

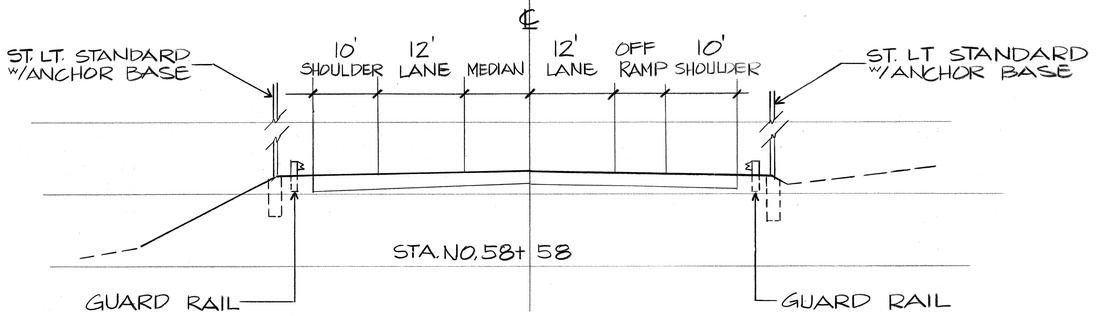
ROAD CROSS SECTION - EMERSON CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

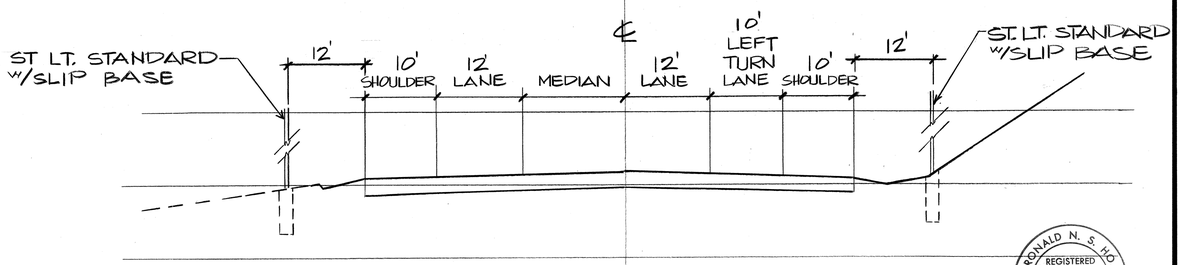
SHEET No. 35E OF 38 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	159	162









ROAD CROSS SECTION
EMERSON RD. CONNECTOR

HORZ: 1"=1'-0"
VERT: 1"=1'-0"

10' 0' 10' 20' 30'
GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
5/20/91

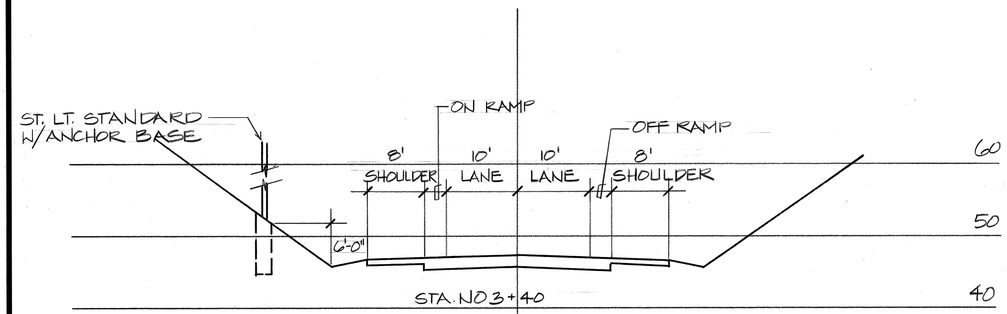
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

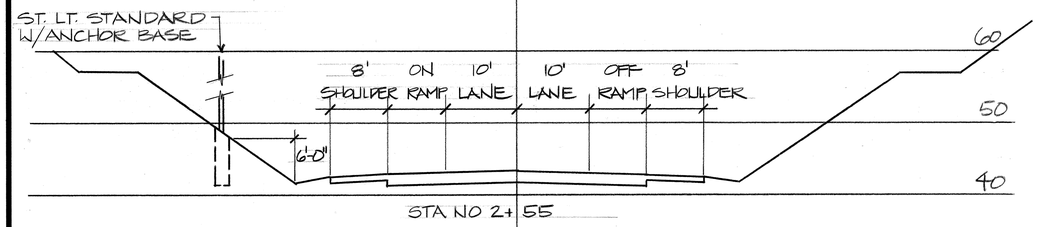
ROAD CROSS SECTION - EMERSON CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

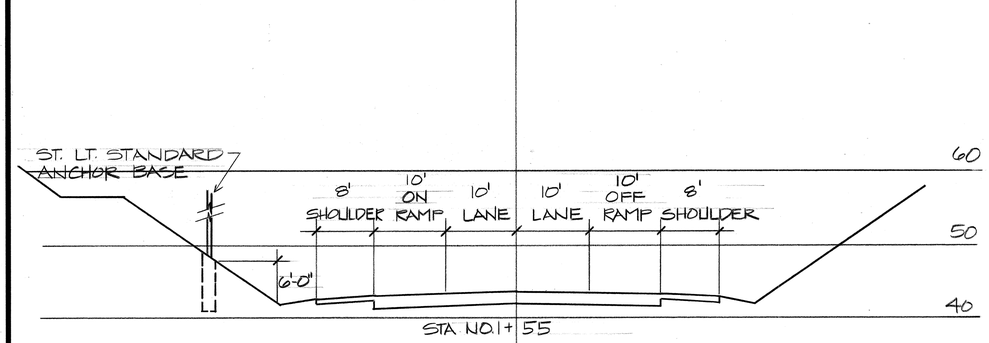
SHEET NO. 36 OF 38 SHEETS

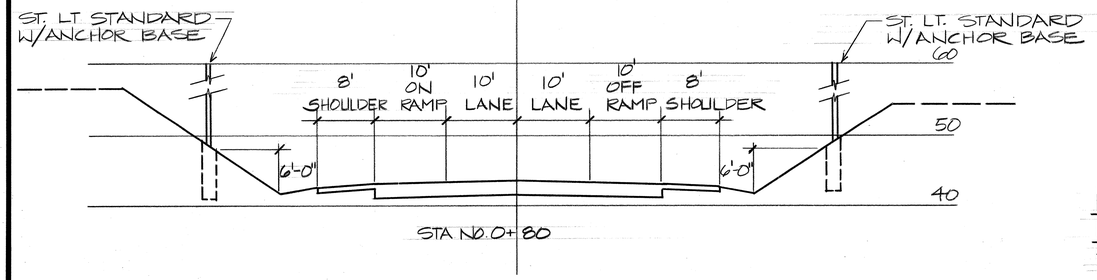
ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

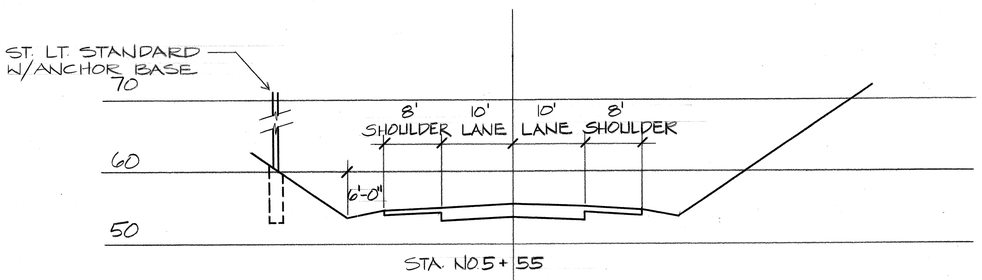
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	160	162

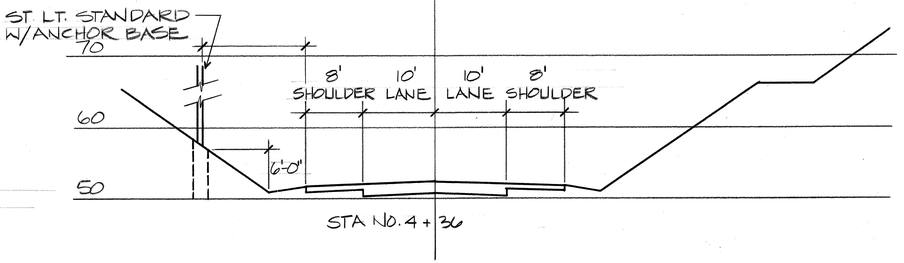












REDUCED PLAN
(HALF SIZE)
0 1 2 3
3 INCHES ON ORIGINAL PLAN

ROAD CROSS SECTION
EMERSON ROAD CONNECTOR
HORIZ. : 1"=10'-0"
VERT. : 1"=10'-0"

10' 0' 10' 20' 30'
SCALE: 1"=10'-0"
GRAPHIC SCALE

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

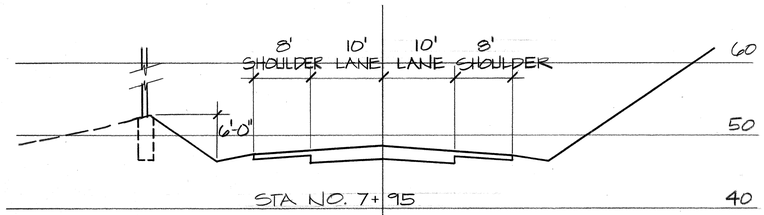
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROAD CROSS SECTION - EMERSON CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

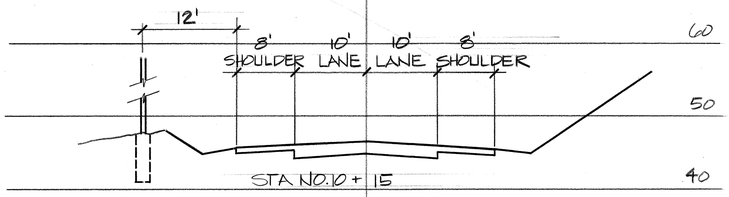
SHEET No. 31 OF 38 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1992	161	162



STA NO. 7+95



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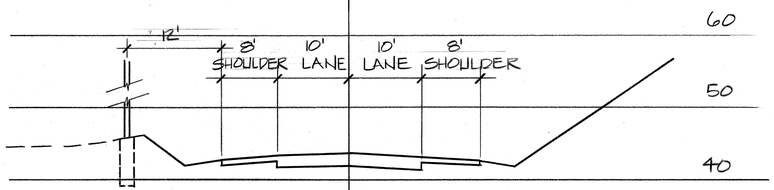

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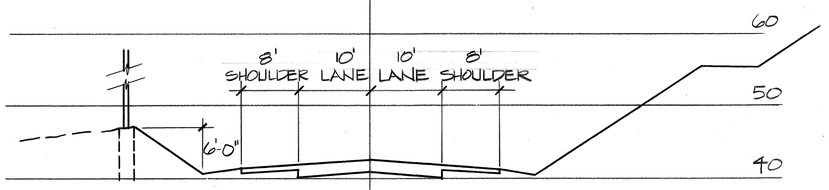


STA NO. 9+15

ROAD CROSS SECTION
EMERSON ROAD CONNECTOR

HORIZ. : 1"=10'-0"
VERT. : 1"=10'-0"

10' 0' 10' 20' 30' 40'

SCALE: 1"=10'-0"

GRAPHIC SCALE

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

RONALD N. S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

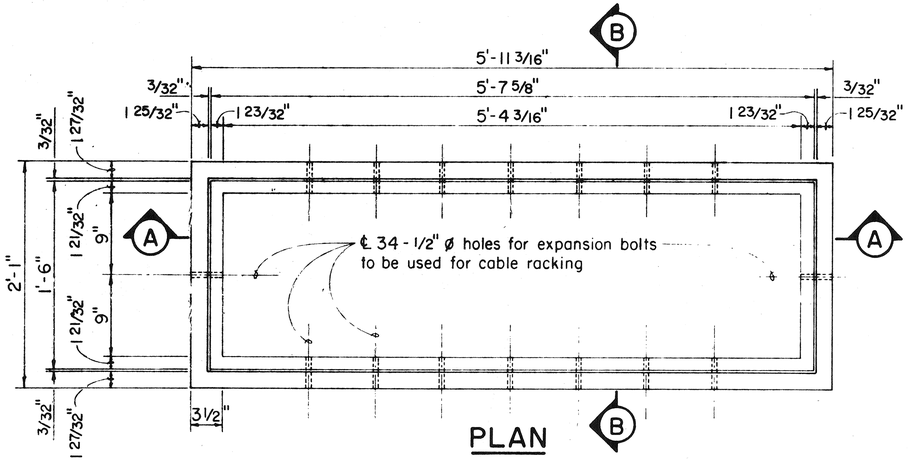
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/30/91

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROAD CROSS SECTION - EMERSON CONNECTOR
KAMEHAMEHA HIGHWAY - HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

SHEET No.38E OF 38 SHEETS

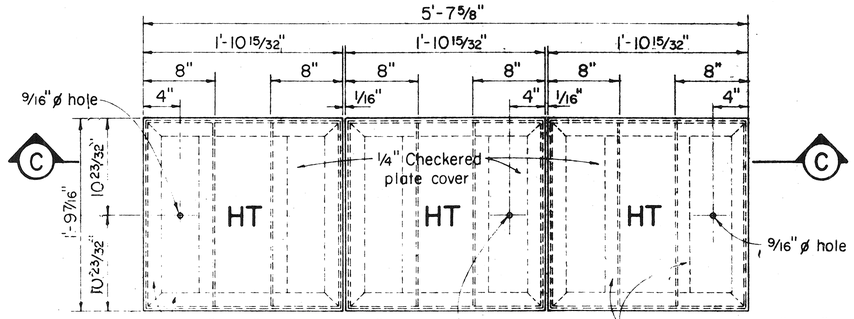
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.				



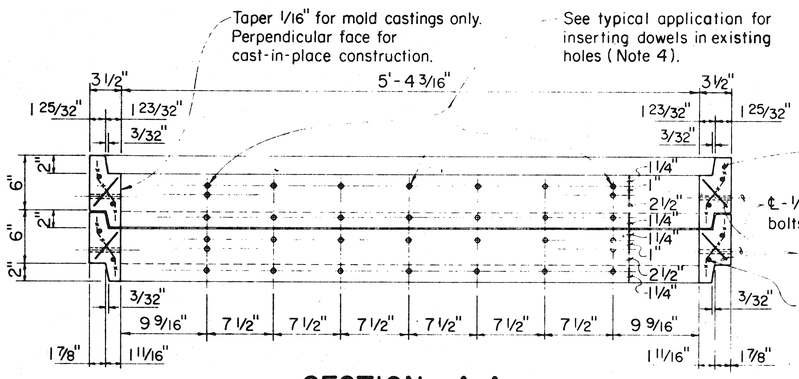
PLAN

INSTALLATION NOTES:

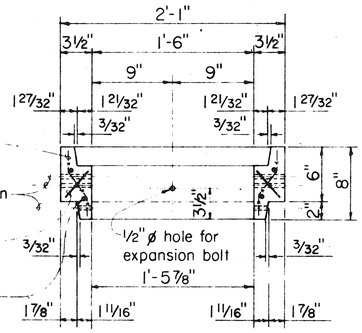
1. A minimum of two (2) precast sections must be used on all installations.
2. The minimum layers of bricks to be used shall always be at least one (1) layer lower than the lowest duct entering the pullbox. At no time, however, shall there be less than two (2) layers of bricks on each installation.
3. At no time shall cement mortar, wood of any other material be used between precast sections. Leveling or raising of boxes to grade must be done at brickwork section using cement mortar. The permanent installation of wooden wedges to accomplish this purpose will not be accepted.
4. Insert dowels (1/2" galv. bolts) into existing top 1/2" ø holes in sides of boxes as shown in typical application figure. This is a method of keying the installed box to the surrounding concrete that may be placed.
5. Concrete precasted base may be used as an alternative to bricks.



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



SECTION A-A



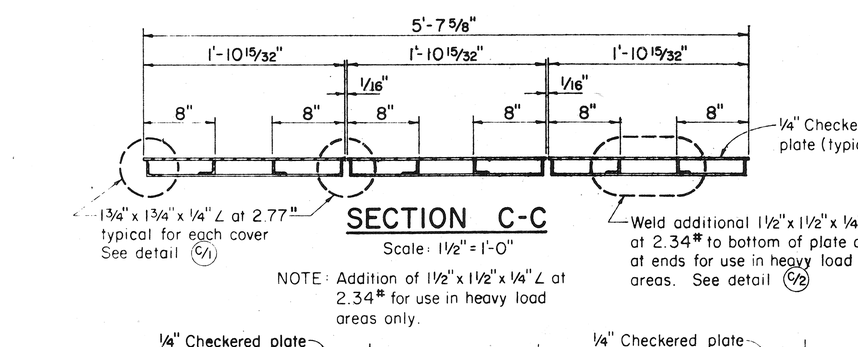
SECTION B-B

A
3E | 38AE
9E,6E,5E

MODIFIED 3-COVER 435TB PULLBOX

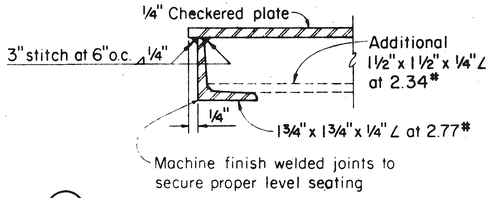
Scale: 1 1/2" = 1'-0"

SEE DETAILS ON THIS SHEET FOR ADDITIONAL INFORMATION

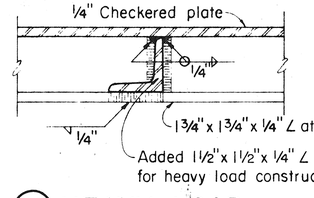


SECTION C-C
Scale: 1 1/2" = 1'-0"

NOTE: Addition of 1 1/2" x 1 1/2" x 1/4" ∠ at 2.34# for use in heavy load areas only.



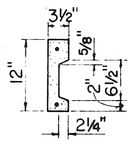
C/1 TYPICAL COVER DETAIL
Scale: 6" = 1'-0"



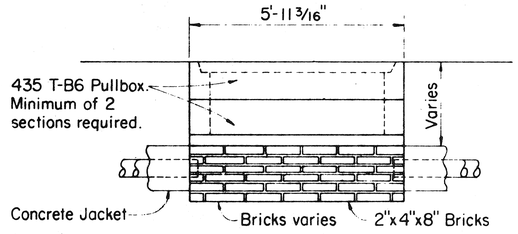
C/2 HEAVY LOAD CONSTRUCTION DETAIL
Scale: 6" = 1'-0"

MANUFACTURER NOTES:

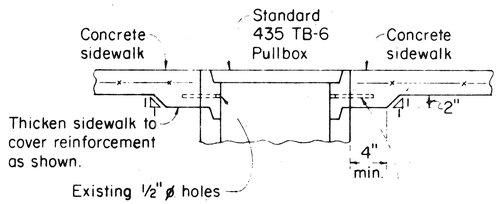
Concrete compressive strength is 3,000 psi on lower 6" of pullbox section and 5,000 psi at 28 days on upper 2" (to reduce chipping).



TYPICAL SECTION OF DUCT ENTRANCE

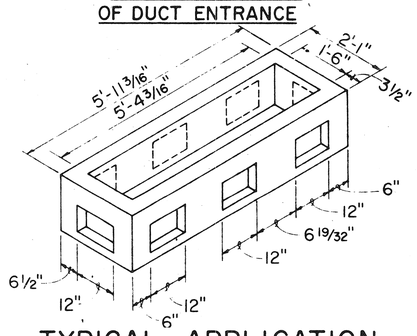


TYPICAL APPLICATION BRICK BASE
(See Note No. 5)



Insert dowels (min. 6" long) into existing top 1/2" ø holes in sides of standard 435T-B6 pullbox. Contractor to supply dowels (1/2" galv bolts).

TYPICAL APPLICATION SIDEWALK INSTALLATION
Scale: 1" = 1'-0"



TYPICAL APPLICATION PRECASTED BASE
(W/ FUTURE DUCTS ON ALL SIDES)
Concrete strength 3,000 psi at 28 days, reinforced with 1 ea. #3 rebar continuous top

TYPICAL CHECKERED STEEL PLATE COVER

NOTE:

After fabrication of cover, apply 2 coats of ZRC (zinc. rich coating) to both sides or double dipped hot galvanized.

FOR LIGHT LOADING AREAS

Approximate weight 55 lbs.
Maximum concentrated load over cover = 3,000 lbs.

FOR HEAVY LOADING AREAS

Approximate weight 65 lbs.
Maximum concentrated load over cover = 16,000 lbs.

DATE	REVISION
8/31/92	ADDED THIS SHEET

H.T. Co., Ltd. Drawing No. 34078

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK ROADWAY
PROJ. NO. 83A-01-92

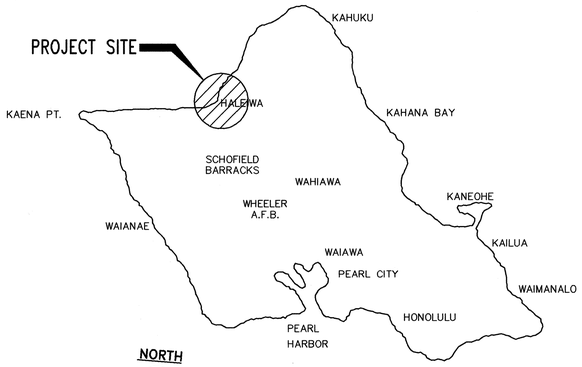
435-TB PULLBOX (3 COVER)

SHEET NO. 38AE OF 38 SHEETS

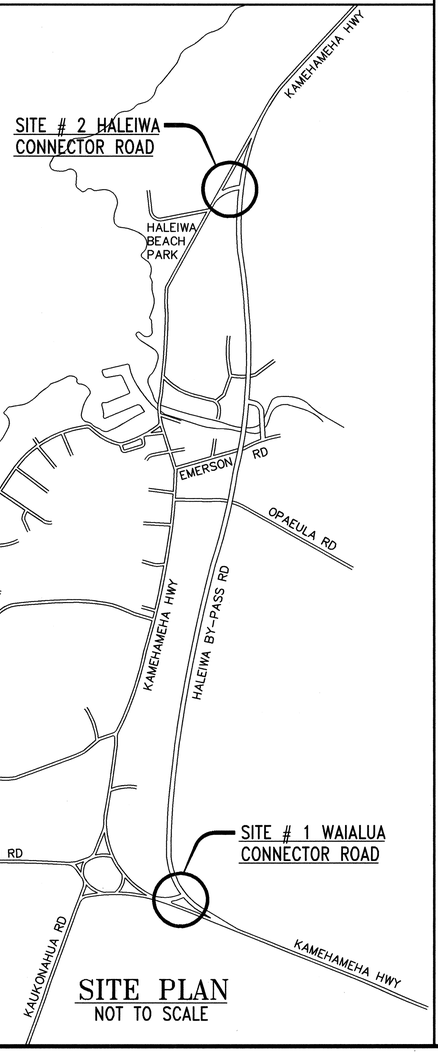
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | NOTE BOOK | QUANTITIES BY | CHECKED BY | No. | DATE

C.O. 161S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-1	182



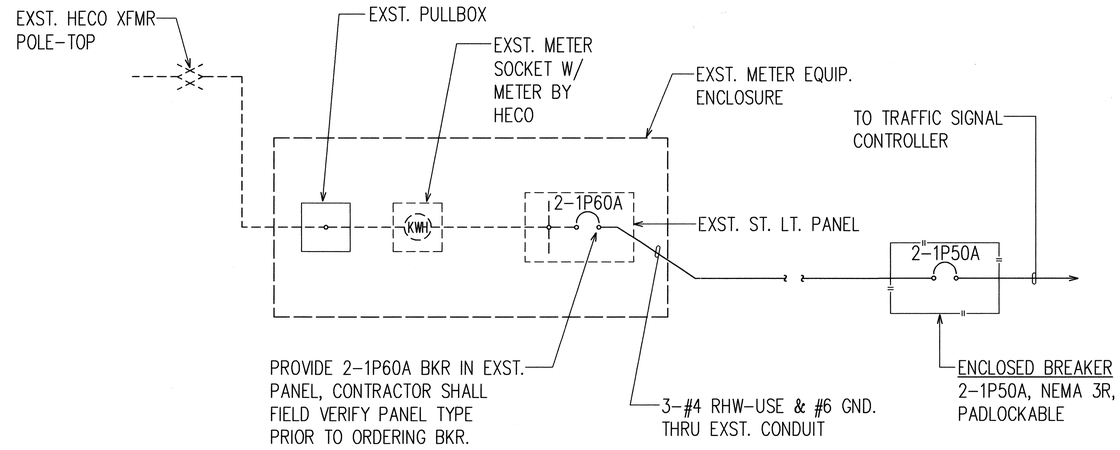
LOCATION MAP



SITE PLAN
NOT TO SCALE

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

Last Save: 08/17/94 15:15:49 SM
K:\DGN\SURVEY\SURVEY01.DGN SM



SINGLE-LINE DIAGRAM, TYPICAL
(TYPICAL FOR WAIALUA & HALEIWA CONNECTORS)

NOTES FOR CONSTRUCTION WITHIN STATE RIGHT-OF-WAY

1. THE CONTRACTOR SHALL OBTAIN A CONSTRUCTION PERMIT FROM THE STATE'S HIGHWAY DISTRICT ENGINEER AT 727 KAKOI STREET PRIOR TO COMMENCEMENT OF WORK WITHIN THE STATE HIGHWAY RIGHT-OF-WAY.

2. CONSTRUCTION AND RESTORATION OF ALL EXISTING HIGHWAY FACILITIES WITHIN THE STATE RIGHT-OF-WAY SHALL BE DONE IN ACCORDANCE WITH ALL APPLICABLE SECTIONS OF THE CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, AND THE SPECIFICATION FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, OF THE STATE HIGHWAYS DIVISION.

3. THE CONTRACTOR SHALL PROVIDE, INSTALL AND MAINTAIN ALL NECESSARY SIGNS, LIGHTS, FLARES, BARRICADES, MARKERS, CONES AND OTHER PROTECTIVE FACILITIES AND SHALL TAKE ALL NECESSARY PRECAUTIONS FOR THE PROTECTION AND FOR THE CONVENIENCE AND SAFETY OF PUBLIC TRAFFIC. ALL SUCH PROTECTIVE DEVICES SHALL CONFORM WITH THE "ADMINISTRATIVE RULES OF HAWAII GOVERNING THE USE OF TRAFFIC CONTROL DEVICES AT WORK SITES ON OR ADJACENT TO PUBLIC STREETS AND HIGHWAYS" ADOPTED BY THE DIRECTOR OF TRANSPORTATION, AND THE CURRENT U.S. FEDERAL HIGHWAY ADMINISTRATION "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS, PART VI - TRAFFIC CONTROL FOR HIGHWAY CONSTRUCTION AND MAINTENANCE OPERATIONS".

4. THE MINIMUM PAVEMENT STRUCTURE SHALL CONSIST OF:

   A. CHANNELIZED INTERSECTIONS AND UTILITY INSTALLATIONS ON MAJOR HIGHWAYS.

      3-1/2" MIX V, ASPHALT CONCRETE PAVEMENT, 6" ASPHALT CONCRETE BASE AND 16" AGGREGATE SUBBASE COURSE.

5. NO MATERIAL AND/OR EQUIPMENT SHALL BE STOCKPILED OR OTHERWISE STORED WITHIN HIGHWAY RIGHT-OF-WAYS EXCEPT AT LOCATIONS DESIGNATED IN WRITING AND APPROVED BY THE DISTRICT ENGINEER.

6. COMPACTION TESTS SHALL BE TAKEN IN ACCORDANCE WITH THE SPECIFICATIONS FOR INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS, AS FOLLOWS:

   A. SUBBASE: ONE COMPACTION TEST

   B. BASE COURSE: ONE COMPACTION TEST

   C. ONE COMPACTION TEST FOR EVERY 300 LINEAL FEET OF TRENCH

7. NO TRENCH SHALL BE OPEN FOR MORE THAN 300 FEET IN ADVANCE OF THE INSTALLED AND TESTED DUCTLINE.

8. LONGITUDINAL DRAINAGE ALONG THE HIGHWAY SHALL BE MAINTAINED.

9. PAVEMENT STRIPING SHALL BE DONE BY THE CONTRACTOR.

10. APPROVAL OF THE PERMIT CONSTRUCTION PLANS SHALL BE VALID FOR A PERIOD OF ONE YEAR THEREOF FROM THE DATE OF NOTIFICATION OF APPROVAL TO THE APPLICANT. IN THE EVENT CONSTRUCTION DOES NOT COMMENCE WITHIN THIS ONE-YEAR PERIOD, THE APPLICANT WILL BE REQUIRED TO RESUBMIT HIS CONSTRUCTION APPROVAL PLANS FOR THE DIVISION'S REVIEW AND APPROVAL.

11. ALL REGULATORY, GUIDE AND CONSTRUCTION SIGNS AND BARRICADES SHALL BE OF HIGH INTENSITY REFLECTIVE MATERIAL.

THE CONTRACTOR IS HEREBY ADVISED TO ANTICIPATE THAT ALL EXCAVATION FOR INSTALLATION OF TRAFFIC SIGNAL STANDARD BASES, HANDHOLES AND DUCTLINES IS LIKELY TO ENCOUNTER SOLID ROCK REQUIRING DRILLING AND BLASTING. ALL DRILLING AND BLASTING SHALL BE CONSIDERED INCIDENTAL TO THE WORK AND SHALL BE DONE AT NO ADDITIONAL COST TO THE STATE.

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	EXST. STREET LIGHT
	EXST. UTILITY POLE
	EXST. PULLBOX
—e/SL—	EXST. UNDERGROUND STREET LIGHT DUCTLINE
—e/ts—	EXST. UNDERGROUND TRAFFIC SIGNAL DUCTLINE
—e/OH—	EXST. ELEC/COMM OVERHEAD LINES
—TS—	TRAFFIC SIGNAL DUCTLINE
	TRAFFIC SIGNAL PULLBOX STATE TYPE "B", SEE SHEET E-13
	TRAFFIC SIGNAL PULLBOX STATE TYPE "A", SEE SHEET E-13
	LOOP DETECTORS, SEE SHEET E-12
	PROGRAMMED VISIBILITY TRAFFIC SIGNAL HEAD
	RYGA TRAFFIC SIGNAL HEAD
	RYG TRAFFIC SIGNAL HEAD
	OPTICOM DETECTOR
1 2 A	10'-0", TYPE I TRAFFIC SIGNAL STANDARD WITH I-RYG TRAFFIC SIGNAL HEAD ("A-1") AND I-PEDESTRIAN HEAD ("A-2"). TRAFFIC SIGNAL STANDARD "A" WITH SIGNAL HEAD CALL-OUTS ("A-1" & "A-2")
3 2 1 35' B	TYPE 2 TRAFFIC SIGNAL STANDARD WITH 35'-0" MAST ARM, 2-RYG TRAFFIC SIGNAL HEADS ("B-2" & "B-3") AND PROGRAMMED VISIBILITY SIGNAL HEAD ("B-1"), TRAFFIC SIGNAL STANDARD "B" WITH SIGNAL HEAD CALL-OUTS ("B-1", "B-2" & "B-3")
HB	ENCLOSED BREAKER, POLE MTD
	TRAFFIC SIGNAL CONTROLLER, TYPE 332 CABINET, SEE SHEET E-14
	EXST. METER EQUIP. ENCL.

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

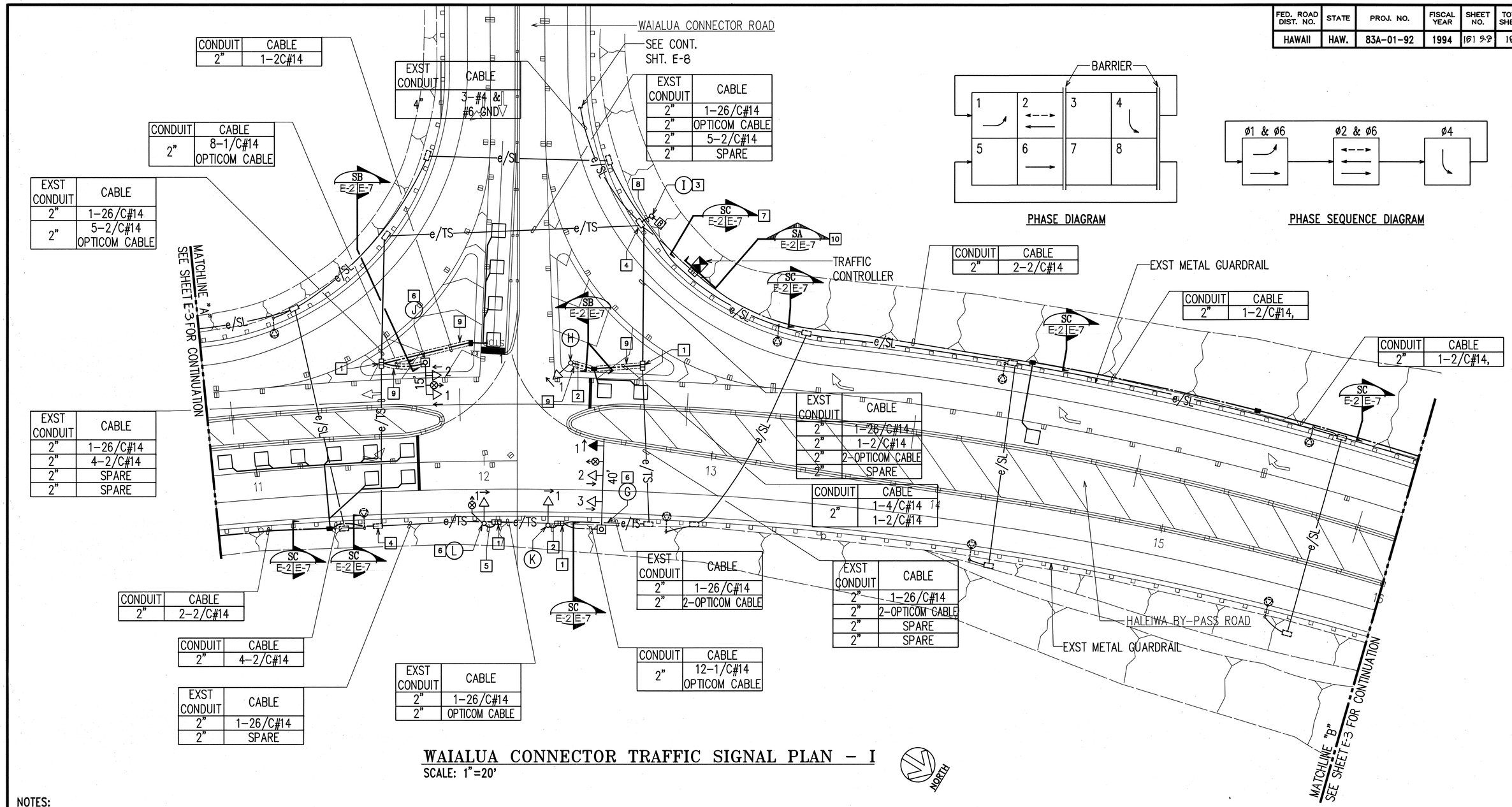
LOCATION MAP, SITE PLAN, ELEC. SYMBOLS AND SINGLE-LINE DIAGRAM
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. E-1 OF 16 SHEETS

C.O. 161 S-1A

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-2	162



CONDUIT	CABLE
2"	1-2C#14

EXST CONDUIT	CABLE
4"	3-#4 & #6 GND

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	OPTICOM CABLE
2"	5-2/C#14
2"	SPARE

CONDUIT	CABLE
2"	8-1/C#14 OPTICOM CABLE

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	5-2/C#14 OPTICOM CABLE

CONDUIT	CABLE
2"	2-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	4-2/C#14
2"	SPARE
2"	SPARE

CONDUIT	CABLE
2"	4-2/C#14

CONDUIT	CABLE
2"	4-1/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	SPARE

CONDUIT	CABLE
2"	2-2/C#14

CONDUIT	CABLE
2"	1-2/C#14,

CONDUIT	CABLE
2"	1-2/C#14,

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	1-2/C#14
2"	2-OPTICOM CABLE
2"	SPARE

CONDUIT	CABLE
2"	1-4/C#14
	1-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	2-OPTICOM CABLE

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	2-OPTICOM CABLE
2"	SPARE
2"	SPARE

CONDUIT	CABLE
2"	12-1/C#14 OPTICOM CABLE

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	OPTICOM CABLE

PHASE DIAGRAM

PHASE SEQUENCE DIAGRAM

WAIALUA CONNECTOR TRAFFIC SIGNAL PLAN – I

SCALE: 1"=20'

NORTH

NOTES:

1. EXCAVATE AND EXPOSE EXST. CONDUIT BANK, CHIP OUT EXST. CONC. JACKET, INTERCEPT EXISTING CONDUIT BANK WITH PULLBOX.
2. | CONDUIT | CABLE |
   |---|---|
   | 2" | 4-1/C#14 |
3. PROVIDE 2-1P50A BREAKERS IN PADLOCKABLE NEMA 3R ENCLOSURE AT ±6'-6" ABOVE FIN GRADE. BREAKER ENCLOSURE SHALL FACE TRAFFIC SIGNAL CONTROLLER
4. PENETRATE EXST. PULLBOX FOR CONDUIT ENTRY. REPAIR TO MATCH EXST.
5. | CONDUIT | CABLE |
   |---|---|
   | 2" | 4-1/C#14 OPTICOM CABLE |
6. PROVIDE OPTICOM DETECTOR AND MOUNTING HARDWARE.
7. | CONDUIT | CABLE |
   |---|---|
   | 2" | 1-26C#14 |
   | 2" | 1-26C#14 |
   | 2" | 3-OPTICOM CABLE |
   | 2" | 6-2C#14 |
   | 2" | 3#4 & #6 GND |
8. | CONDUIT | CABLE |
   |---|---|
   | 2" | 6#4 & #6 GND |
9. SAWCUT EXST. AC PAVEMENT FOR CONDUIT INSTALLATION. REPAIR TO MATCH EXST.
10. | CONDUIT | CABLE |
    |---|---|
    | 2" | 1-26/C#14 |
    | 2" | 1-26C#14 |
    | 2" | 8-2/C#14 |
    | 2" | 3-OPTICOM CABLE |
    | 2" | SPARE |
    | 2" | 3#4 & #6 GND |

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

RONALD N.S. HO REGISTERED PROFESSIONAL ENGINEER No. 3737-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WAIALUA CONNECTOR TRAFFIC SIGNAL PLAN – I

KAMEHAMEHA HIGHWAY–HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)

FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. E-2 OF 16 SHEETS

C.O. 161 S-2

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

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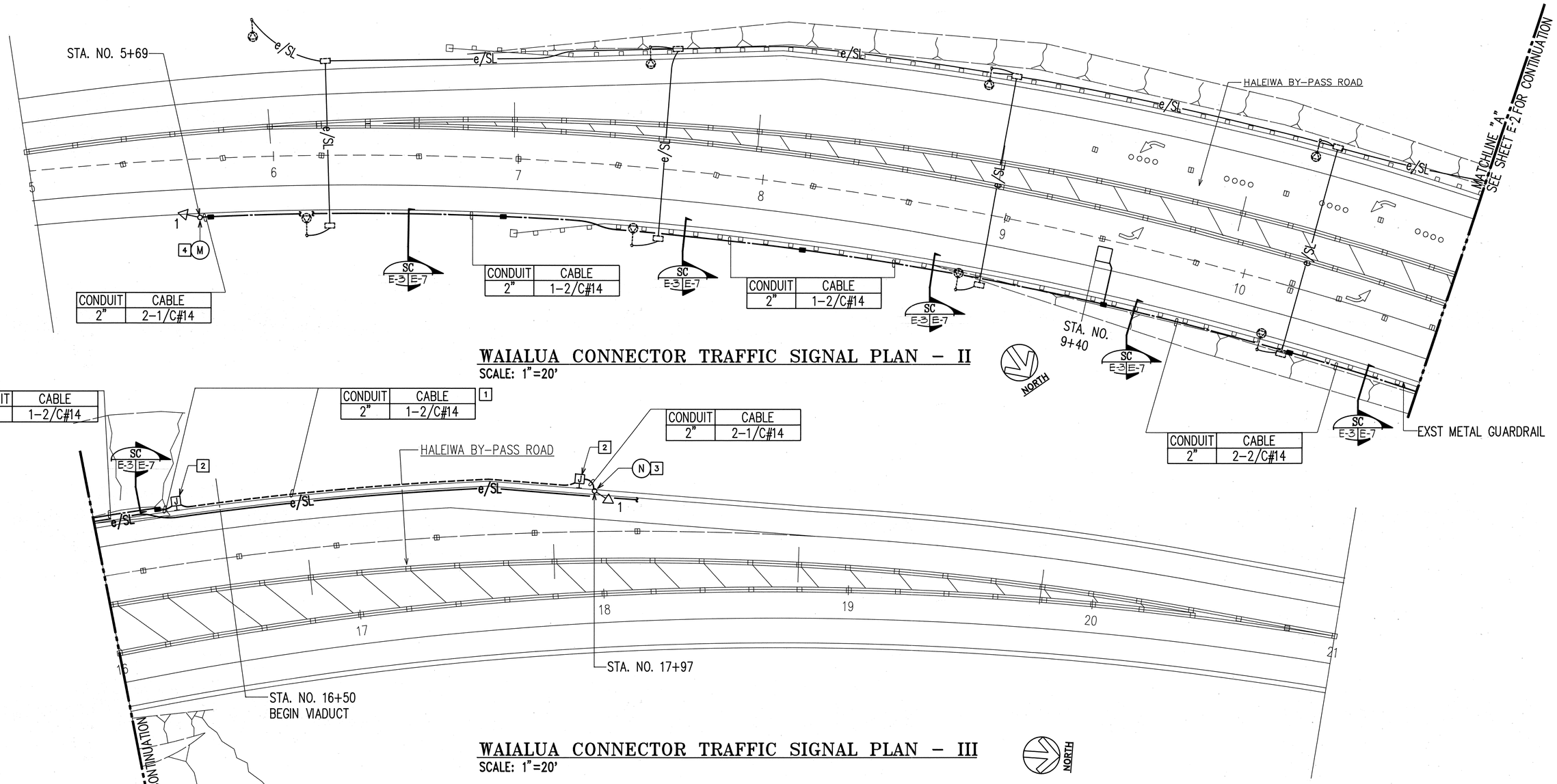
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-3	162



WAIALUA CONNECTOR TRAFFIC SIGNAL PLAN – II

SCALE: 1"=20'

WAIALUA CONNECTOR TRAFFIC SIGNAL PLAN – III

SCALE: 1"=20'

NOTES:

1. 2" GRSC WITH WIRING MTD. TO PARAPET.
2. PROVIDE CAST METAL. 18" X 6" X 6" JUNCTION BOX.
3. SEE CIVIL SHEET C-1 FOR POLE MOUNTING DETAILS.
4. SEE FLASHER DETAIL B/E-10. PROVIDE BREAKAWAY TYPE STANDARD.

20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALE

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

Last save: 08/16/94 @ 08:28:15 by EA
L:\ACAD\WAIALUA\WAIA01.PLAN Xrefs: XR-1

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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

WAIALUA CONNECTOR TRAFFIC SIGNAL PLANS II & III
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. E-3 OF 16 SHEETS

C.O. 161 S-3

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-4	162

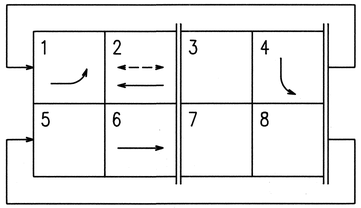
HALEIWA CONNECTOR ROAD

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	4-2/C#14 OPTICOM CABLE

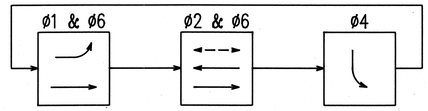
CONDUIT	CABLE
2"	8-1/C#14 OPTICOM CABLE

CONDUIT	CABLE
2"	1-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	3-2/C#14



PHASE DIAGRAM



PHASE SEQUENCE DIAGRAM

SEE CONT. SHT. E-9

EXST METAL GUARDRAIL

TRAFFIC CONTROLLER

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	2-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	4-2/C#14
2"	2-OPTICOM CABLE
2"	SPARE

MATCHLINE "C" SEE SHEET E-5 FOR CONTINUATION

EXST METAL GUARDRAIL

CONDUIT	CABLE
2"	2-2/C#14

CONDUIT	CABLE
2"	4-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	2-OPTICOM CABLE

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	OPTICOM CABLE

CONDUIT	CABLE
2"	12-1/C#14 OPTICOM CABLE

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	2-2/C#14

CONDUIT	CABLE
2"	1-4/C#14 1-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	2-2/C#14

CONDUIT	CABLE
2"	2-2/C#14

CONDUIT	CABLE
2"	1-2/C#14

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	SPARE

EXST CONDUIT	CABLE
2"	1-26/C#14
2"	SPARE
2"	SPARE
2"	SPARE

STA. NO. 112+90

HALEIWA BY-PASS ROAD

EXST METAL GUARDRAIL

MATCHLINE "D" SEE SHEET E-5 FOR CONTINUATION

HALEIWA CONNECTOR TRAFFIC SIGNAL PLAN - I

SCALE: 1"=20'

NORTH

NOTES:

1. EXCAVATE AND EXPOSE EXST. CONDUIT BANK, CHIP-OUT EXST. CONC. JACKET, INTERCEPT EXISTING CONDUIT BANK WITH PULLBOX.

2. | CONDUIT | CABLE |
|---|---|
| 2" | 4-1/C#14 |

3. | CONDUIT | CABLE |
|---|---|
| 2" | 4-1/C#14 OPTICOM CABLE |

4. PENETRATE EXST. PULLBOX FOR CONDUIT ENTRY. REPAIR TO MATCH EXST.

5. | CONDUIT | CABLE |
|---|---|
| 2" | 6#4 & #6 GND |

6. PROVIDE OPTICOM DETECTOR AND MOUNTING HARDWARE.

7. PROVIDE 2-1P50A BREAKERS IN PADLOCKABLE NEMA 3R ENCLOSURE MTD. AT ±6'-6" ABOVE FINISH GRADE. BREAKER ENCLOSURE SHALL FACE TRAFFIC SIGNAL CONTROLLER.

8. SAWCUT EXST. AC PAVEMENT FOR CONDUIT INSTALLATION. REPAIR TO MATCH EXST.

9. | CONDUIT | CABLE |
|---|---|
| 2" | 1-26/C#14 |
| 2" | 1-26/C#14 |
| 2" | 8-2/C#14 |
| 2" | 3-OPTICOM CABLE |
| 2" | SPARE |
| 2" | 3#4 & #6 GND |

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Last save: 08/19/94 14:58:05 by RN
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RONALD N. S. HO
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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HALEIWA CONNECTOR TRAFFIC SIGNAL PLAN - I

KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)

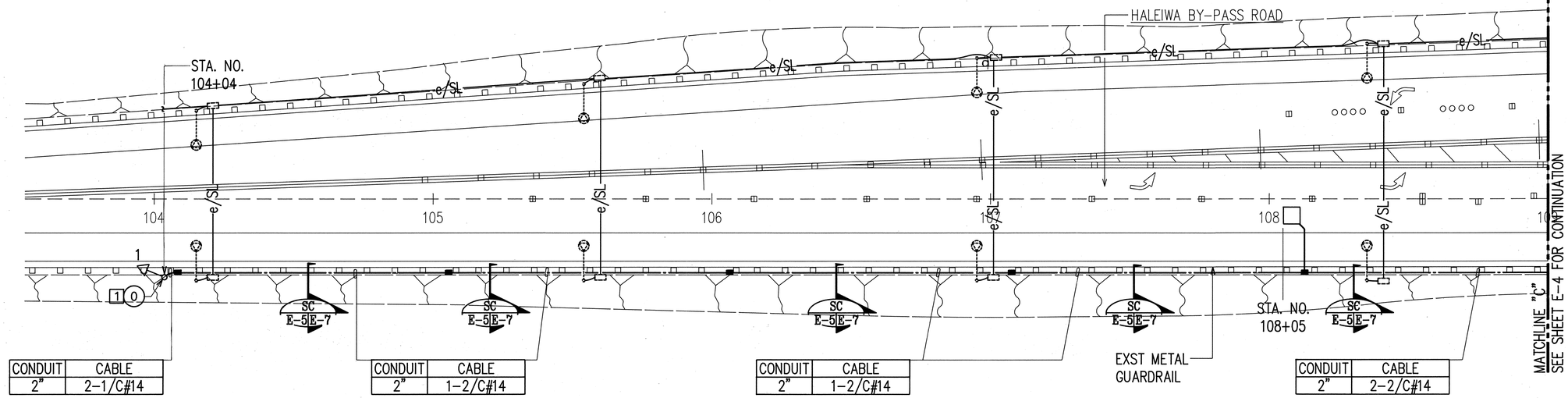
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. E-4 OF 16 SHEETS

C.O. 161 S-4

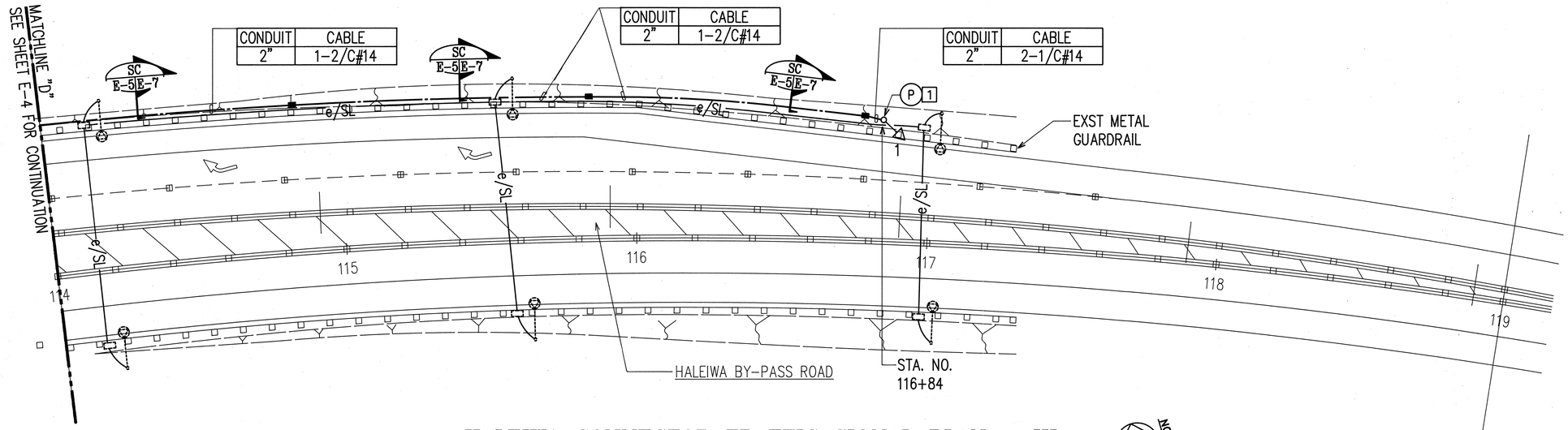
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-5	182



HALEIWA CONNECTOR TRAFFIC SIGNAL PLAN – II

SCALE: 1"=20'

NORTH



HALEIWA CONNECTOR TRAFFIC SIGNAL PLAN – III

SCALE: 1"=20'

NORTH

NOTE:

1 SEE FLASHER DETAIL B/E-10.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HALEIWA CONNECTOR TRAFFIC SIGNAL PLANS II & III

KAMEHAMEHA HIGHWAY–HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)

FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. E-5 OF 16 SHEETS

C.O. 161 S-5

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

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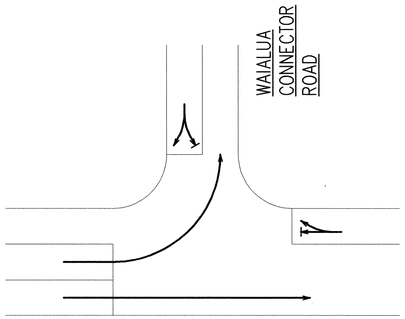
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-6	182

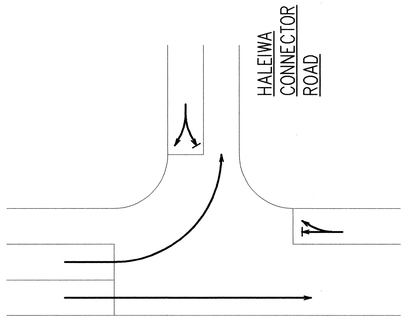
WAIALUA CONNECTOR TRAFFIC DIAGRAMS



HALEIWA BY-PASS ROAD

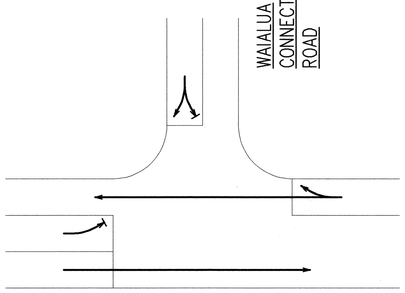
TRAFFIC DIAGRAM 1

HALEIWA CONNECTOR TRAFFIC DIAGRAMS



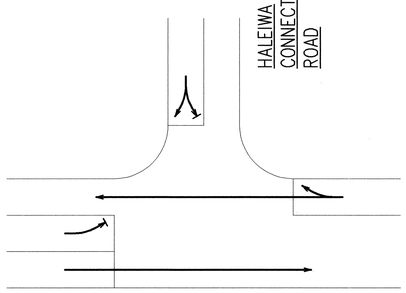
HALEIWA BY-PASS ROAD

TRAFFIC DIAGRAM 1



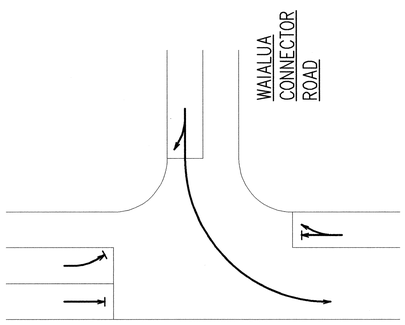
HALEIWA BY-PASS ROAD

TRAFFIC DIAGRAM 2



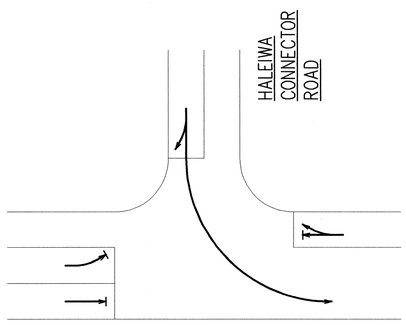
HALEIWA BY-PASS ROAD

TRAFFIC DIAGRAM 2



HALEIWA BY-PASS ROAD

TRAFFIC DIAGRAM 3



HALEIWA BY-PASS ROAD

TRAFFIC DIAGRAM 3

DESCRIPTION	12" Y TRAFFIC SIGNAL HEAD	12" RYGA TRAFFIC SIGNAL HEAD	12" RYGA TRAFFIC SIGNAL HEAD	PEDESTRIAN SIGNAL HEAD
SIGNAL INDICATION	(Y)	(R) (Y) (G←)	(R) (Y) (↑G)	
POLE-LETTER-SIGNAL HEAD NUMBER	M-1 N-1 O-1 P-1	A-1 * B-1 G-1 * H-1 L-1 K-1 F-1 E-1	A-2 D-1 G-2 J-1 G-3 J-2 A-3 D-2	NONE

* INDICATES PROGRAMMED VISIBILITY SIGNAL HEAD

SIGNAL INDICATIONS

TRAFFIC SIGNAL NOTES:

1. LOCATIONS OF EXISTING UNDERGROUND STRUCTURES AND UTILITIES SUCH AS PIPELINES, CONDUITS, CABLES, ETC. SHOWN ON PLANS ARE APPROXIMATE ONLY. IT IS NOT THE INTENT OF THE PLANS TO SHOW THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES. EXISTING UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN COST.
2. PROVIDE LEAD LEFT TURN GREEN WHEN PRESENT LOOPS ARE OCCUPIED.
3. LEAD LEFT TURN SIGNAL HEAD SHALL BE PROGRAMMED VISIBILITY TYPE.
4. CENTER ALL LOOP DETECTORS IN TRAFFIC LANES.
5. PROVIDE ALL TRAFFIC SIGNAL PULLBOXES WITH MODIFIED COVER PER DETAIL B / E-13

TYPES OF CABLES:

TYPE 1 (26/C#14)	SIGNAL LOOP CABLE: STRANDED NO. 14, 26 CONDUCTORS
TYPE 2 (2/C#14)	DETECTOR LEAD-IN CABLE AND PEDESTRIAN PUSH BUTTON CIRCUIT CABLE: STRANDED, NO. 14, 2 CONDUCTORS
TYPE 4	LOOP SENSOR CABLE: SOLID NO. 12, SINGLE CONDUCTOR TO IMSA SPEC 51-5
TYPE 5 (1/C#14)	CABLE FROM SIGNAL LOOP TO SIGNAL HEAD: STRANDED, NO. 14, SINGLE CONDUCTOR
TYPE 6	SERVICE CABLE: SOLID, NO. 4 , 3 CONDUCTORS
TYPE 7	OPTICAL DETECTOR CABLE (OPTICOM CABLE M-138)

SURVEY PLOTTED BY _____ DATE _____
DRAWN BY _____
TRACED BY _____
DESIGNED BY _____
QUANTITIES BY _____
CHECKED BY _____

ORIGINAL PLAN
NOTE BOOK _____ No. _____

LAST SCR: 08/22/94 @ 10:22:22
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RONALD N.S. HO
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No. 3737-E
HAWAII, U.S.A.

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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC DIAGRAM, TRAFFIC SIGNAL NOTES & SIGNAL INDICATORS
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. E-6 OF 16 SHEETS

C.O. 161 S-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-7	162

BACKFILL NOTES: (WITHIN STATE RIGHT-OF-WAY)

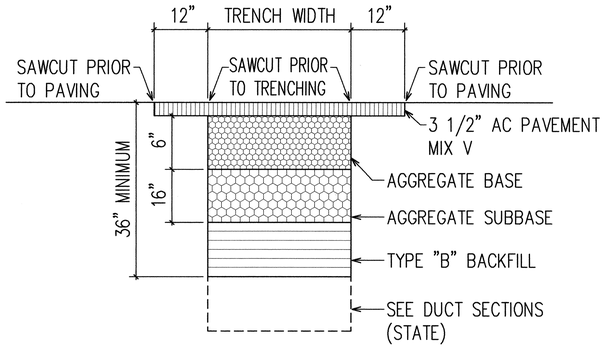
TRENCH BACKFILL MATERIAL "B"
1. SAND EQUIVALENT ≥ 2
2. 8" MAX. LIFT
3. 95% COMPACTION

TRENCH BACKFILL MATERIAL "A"
1. SAND EQUIVALENT ≥ 20
2. 8" MAX. LIFT
3. 95% COMPACTION

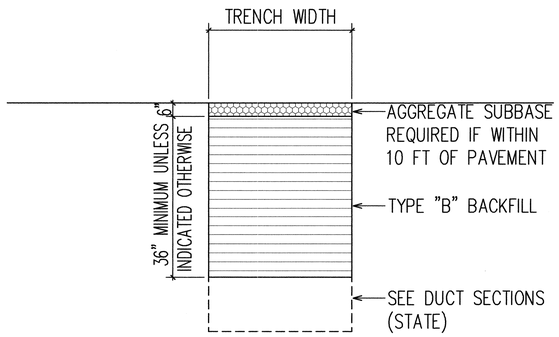
CONCRETE – 3" ENCASEMENT, 2500 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

IF MATERIAL BELOW DUCT IS NOT EQUIVALENT TO BACKFILL MATERIAL "A", EXCAVATE MATERIAL & PROVIDE 3" BACKFILL MATERIAL "A". SEE ABOVE

NOTE: BASE COURSE & SUB-BASE COURSE PER 1985 STATE STANDARD SPECIFICATIONS FOR HIGHWAY CONSTRUCTION.



(1) BACKFILL SECTION
WITHIN STATE RIGHT-OF-WAY
UNDER ROADWAY

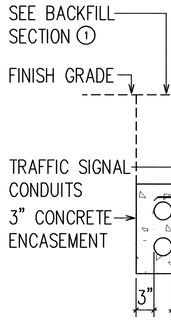


(2) BACKFILL SECTION
WITHIN STATE RIGHT-OF-WAY
UNDER ROADWAY

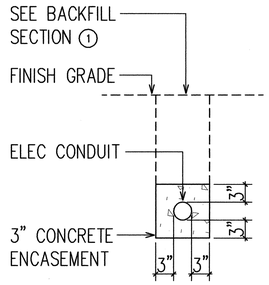
CONDUIT SCHEDULE

ITEM	DESCRIPTION
(2L)	EXST 2" STREET LIGHT CONDUIT
(2-4L)	EXST 2-4" STREET LIGHT CONDUIT
(2TS)	2" TRAFFIC SIGNAL CONDUIT
(2-2TS)	2-2" TRAFFIC SIGNAL CONDUIT
(3-2TS)	3-2" TRAFFIC SIGNAL CONDUIT
(4-2TS)	4-2" TRAFFIC SIGNAL CONDUIT
(2-2TS)	EXST 2-2" TRAFFIC SIGNAL CONDUIT
(4-2TS)	EXST 4-2" TRAFFIC SIGNAL CONDUIT

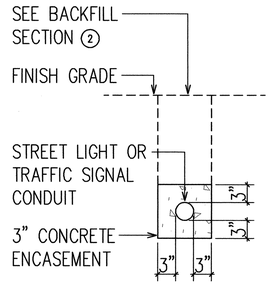
ALL CONDUITS SHALL BE PVC SCHEDULE 80 UNLESS OTHERWISE NOTED.



SECTION (SA)



SECTION (SB)



SECTION (SC)

TYPICAL DUCT SECTIONS

NOT TO SCALE (WITHIN STATE R/W)

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

Last user: DB.YOUNG
K:\ACAD\PROJECTS\83A0001A\DGN\SC1

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/22/94

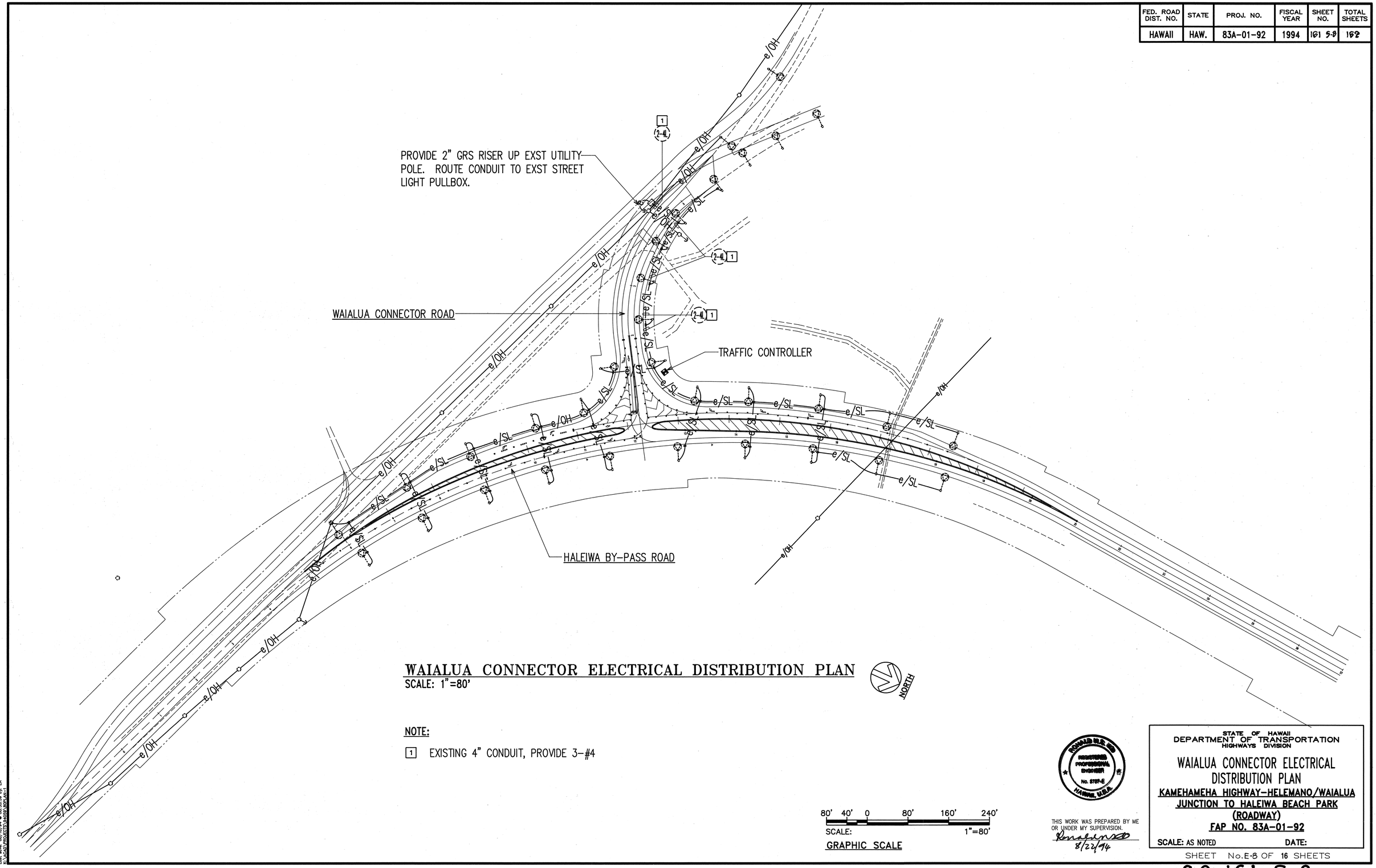
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTIONS AND CONDUIT SCHEDULE

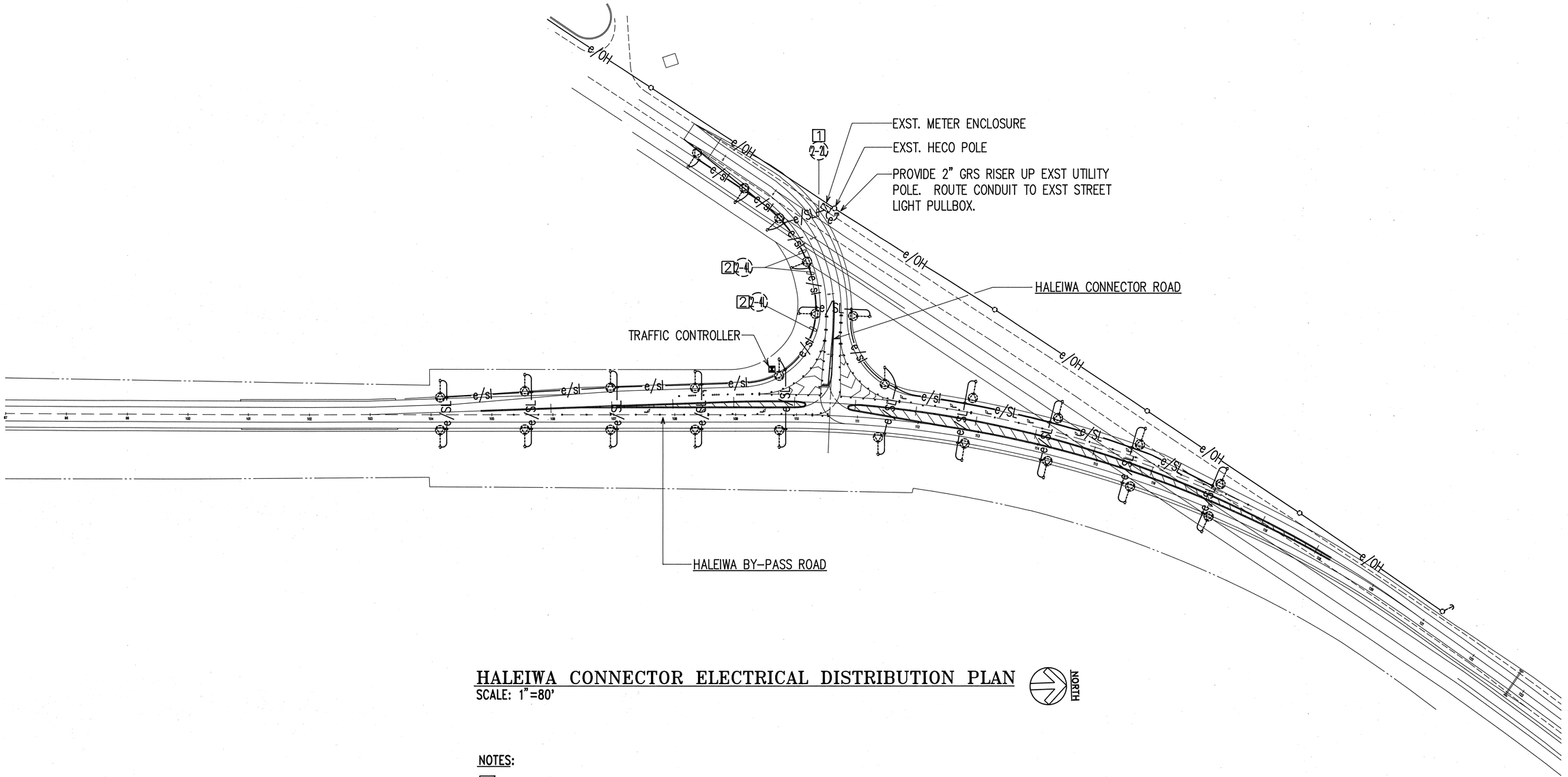
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-8	162



FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-9	182



HALEIWA CONNECTOR ELECTRICAL DISTRIBUTION PLAN

SCALE: 1"=80'

NORTH

NOTES:

1. EXST. 2" CONDUIT, PROVIDE 3-#4
2. EXST. 4" CONDUIT, PROVIDE 3-#4

80' 40' 0 80' 160' 240'

SCALE: 1"=80'

GRAPHIC SCALE

ORIGINAL PLAN
NOTE BOOK

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

Last save: 08/18/94 @ 08:38:37 by: EA
L:\HDD\PROJECTS\83A001\92\83A01-92

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 9737-E
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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

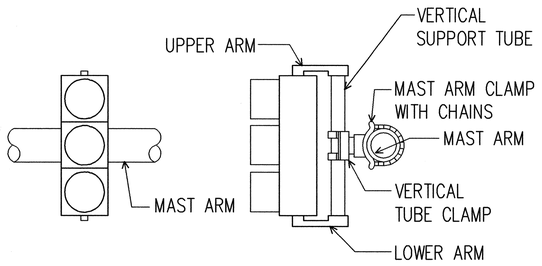
HALEIWA CONNECTOR ELECTRICAL DISTRIBUTION PLAN
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No.E-9 OF 16 SHEETS

C.O. 161 S-9

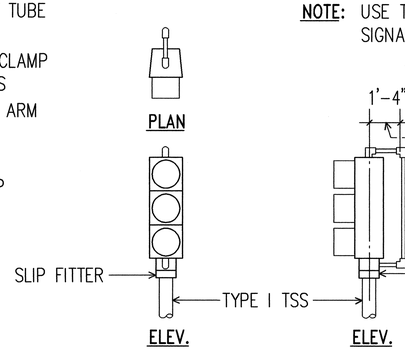
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-10	192



MA-1W(I)

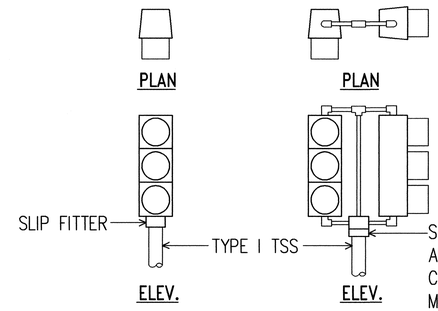
NOTES:

1. USE THIS DETAIL FOR ALL MAST ARM MOUNTINGS AT INTERMEDIATE POINTS ALONG MAST ARM.
2. USE "CONCEALED" WIRING.
3. FURNISH MOUNTING THAT IS COMPATIBLE WITH TYPE OF SIGNAL TO BE INSTALLED.



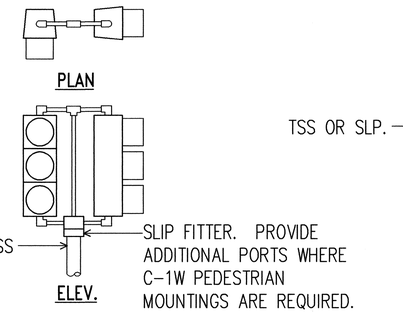
NOTE: USE THIS DETAIL FOR PROGRAMMED SIGNAL FACES ONLY.

MODIFIED TOP OF POLE – 1 WAY
(TP-1W)



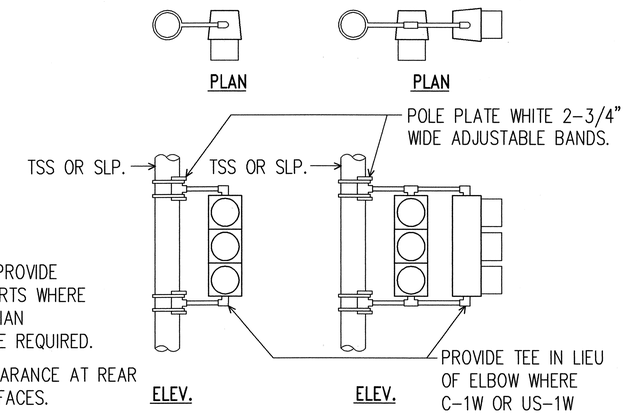
NOTE: SEE DETAIL AT RIGHT FOR PROGRAMMED SIGNAL FACES.

TOP OF POLE – 1 WAY
(TP-1W)



NOTE: MAINTAIN 16" MIN. CLEARANCE AT REAR OF ALL PROGRAMMED FACES.

TOP OF POLE – 2 WAY
(TP-2W)

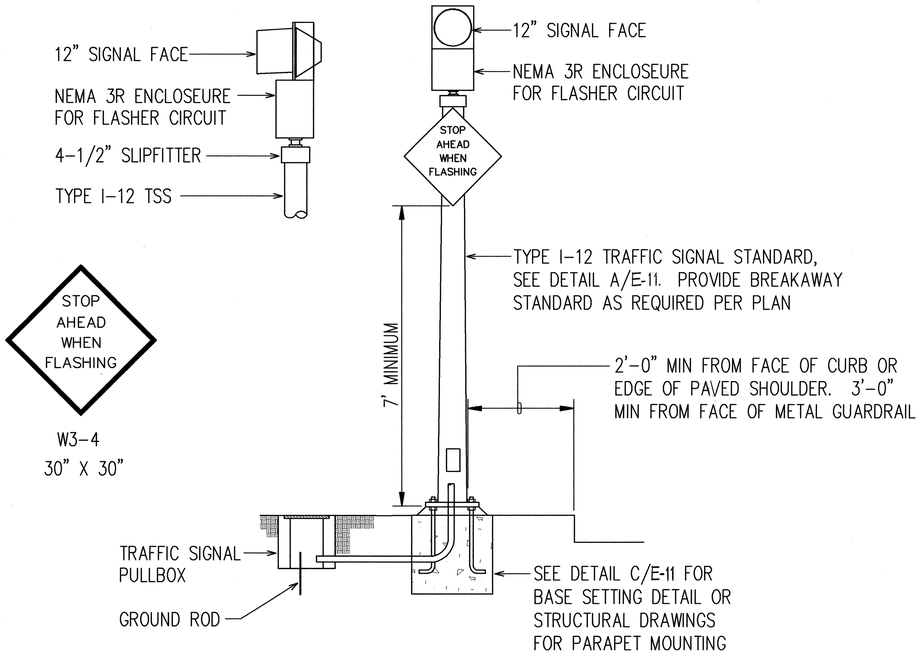


NOTE: MAINTAIN 16" MIN. CLEARANCE AT REAR OF ALL PROGRAMMED FACES.

BRACKET – 1 WAY
(B-1W)

BRACKET – 2 WAY
(B-2W)

A / E-10 **VEHICULAR SIGNAL MOUNTING DETAILS**
NOT TO SCALE



B / E-10 **STOP AHEAD WARNING FLASHER**
NOT TO SCALE

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

Last Save: 08/17/94 4:03:36 PM By: TM
K:\PROJECTS\83A0192\TRAFFIC\MOUNTING.DGN

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8/22/94

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL MOUNTING DETAILS

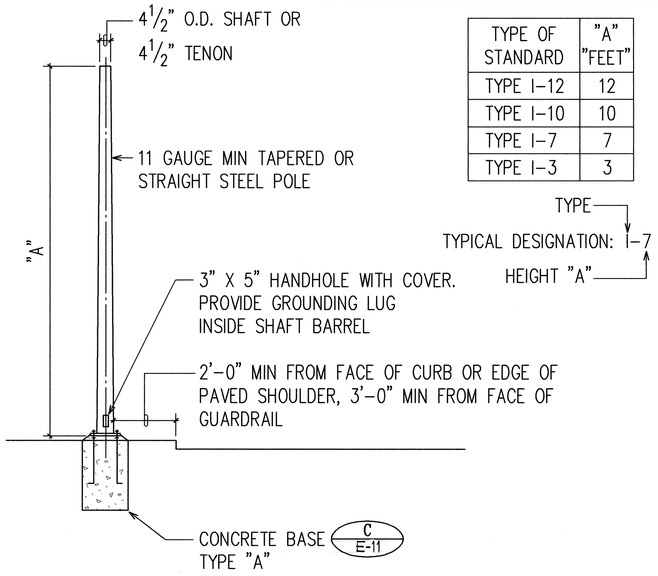
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No.E-10 OF 16 SHEETS

C.O. 161 S-10

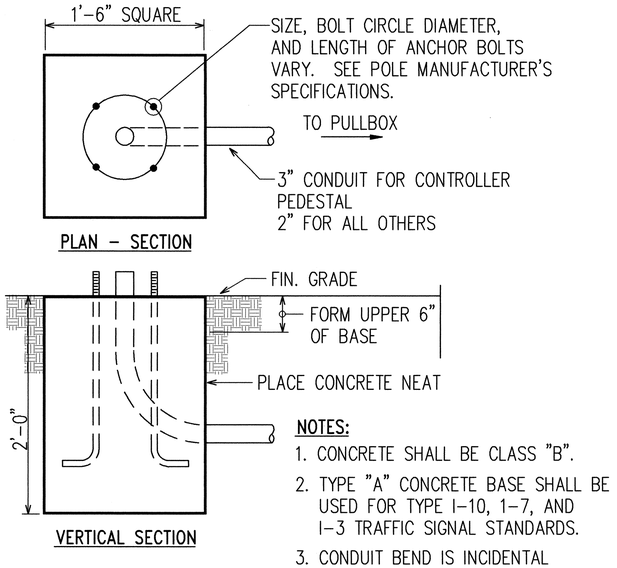
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-11	162



TYPE OF STANDARD	"A" "FEET"
TYPE I-12	12
TYPE I-10	10
TYPE I-7	7
TYPE I-3	3

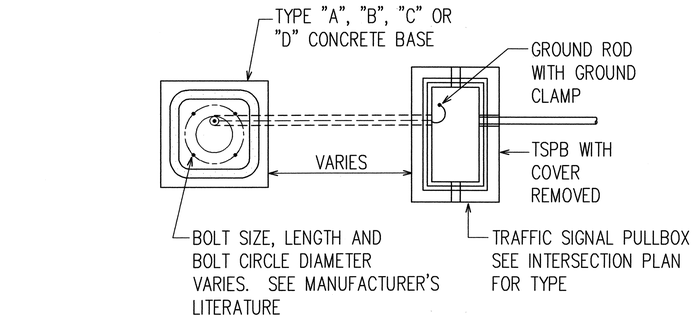
TYPICAL DESIGNATION: TYPE I-7, HEIGHT "A"

A E-11 **TYPE I TRAFFIC SIGNAL STANDARD**
NOT TO SCALE

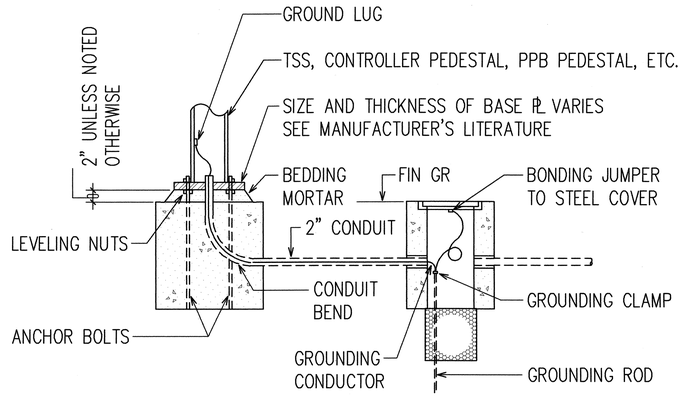


NOTES:
1. CONCRETE SHALL BE CLASS "B".
2. TYPE "A" CONCRETE BASE SHALL BE USED FOR TYPE I-10, 1-7, AND I-3 TRAFFIC SIGNAL STANDARDS.
3. CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE.

C E-11 **TYPE "A" CONCRETE BASE**
NOT TO SCALE

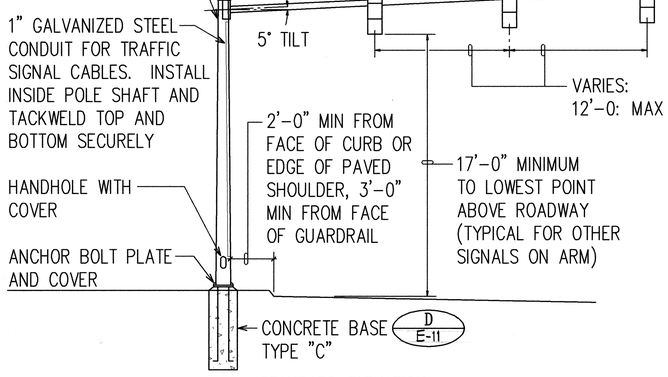


PLAN



SECTION

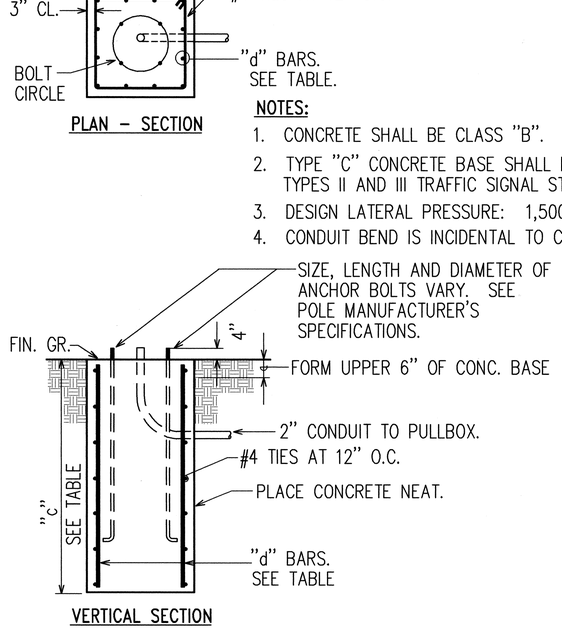
E E-11 **TYPICAL STANDARD AND PEDESTAL INSTALLATION**
NOT TO SCALE



STANDARD ELEVATION

NOTES:
1. STANDARD SHALL BE DESIGNED IN ACCORDANCE WITH "STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS."
2. MOUNTING: FOR SIGNALS AT INTERMEDIATE POINTS MAST ARM SHALL BE OF THE ADJUSTABLE TYPE.
3. SIGNALS SHALL BE CENTERED OVER LANE LINES.
4. SUBMIT SHOP DRAWINGS FOR APPROVAL.

B E-11 **TYPE II TRAFFIC SIGNAL STANDARD**
NOT TO SCALE



NOTES:
1. CONCRETE SHALL BE CLASS "B".
2. TYPE "C" CONCRETE BASE SHALL BE USED FOR TYPES II AND III TRAFFIC SIGNAL STANDARDS.
3. DESIGN LATERAL PRESSURE: 1,500 PSF.
4. CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE.

D E-11 **TYPE "C" CONCRETE BASE**
NOT TO SCALE

TYPE "C" CONCRETE BASE		
TYPE OF STANDARD	"c"	"d" BARS
II - 18	5' - 0"	12 - #6
II - 20	5' - 6"	12 - #6
II - 25	6' - 0"	12 - #6
II - 30	6' - 6"	12 - #8
II - 35	7' - 0"	12 - #8
II - 40	8' - 0"	12 - #8

TYPICAL STANDARD DESIGNATION: TYPE II - 25, MAST ARM LENGTH

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

ORIGINAL PLAN
NOTE BOOK
No.

Last Rev. 08/17/94 at 14:37:14 by M
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RONALD N.S. HO
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No. 9737-E
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS - I

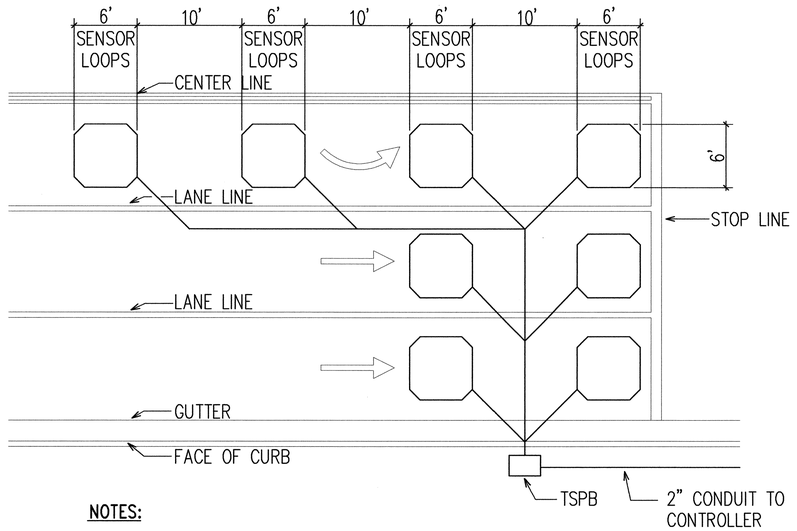
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No.E-11 OF 16 SHEETS

C.O. 161 S-11

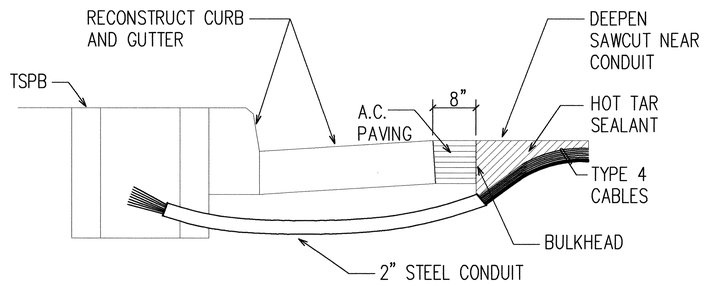
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-12	162



NOTES:

1. CENTER SENSOR LOOPS IN LANES.
2. COLLECTOR CABLES SHALL BE TWISTED 2 TURNS PER FOOT.
3. NUMBER OF LOOPS AND LOCATIONS VARY. SEE PROJECT PLANS.
4. NUMBER AND LOCATIONS OF COLLECTOR SAWCUTS MAY BE VARIED IN THE FIELD TO SUIT.

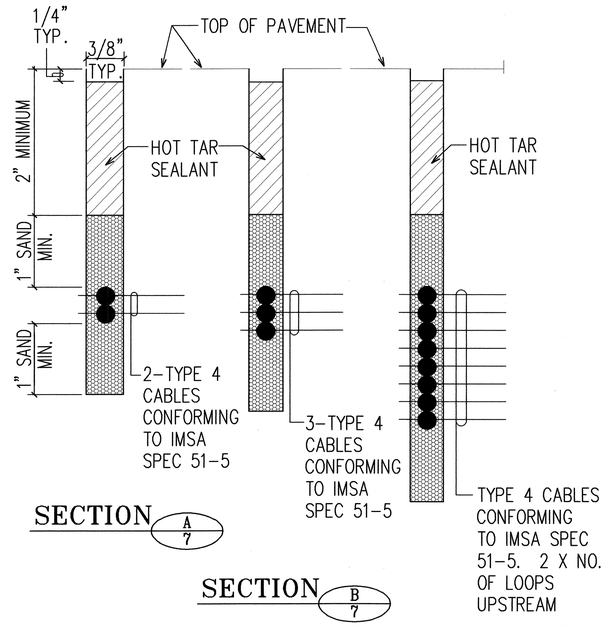
TYPICAL SENSOR LOOP LAYOUT



NOTES ON CONSTRUCTION AT END OF SAWCUT:

1. SEAL ROADWAY END OF CONDUIT AFTER INSTALLATION OF CONDUCTORS
2. INSTALL BULKHEAD ACROSS CONDUIT TRENCH.
3. PLACE HOT TAR IN SAWCUT.
4. BACKFILL OVER CONDUIT WITH NEW A.C.
5. RECONSTRUCT CURB AND GUTTER AS REQUIRED.

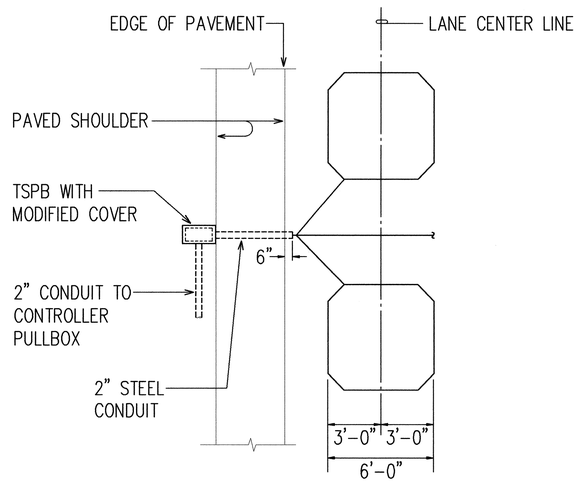
DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF ROADWAY



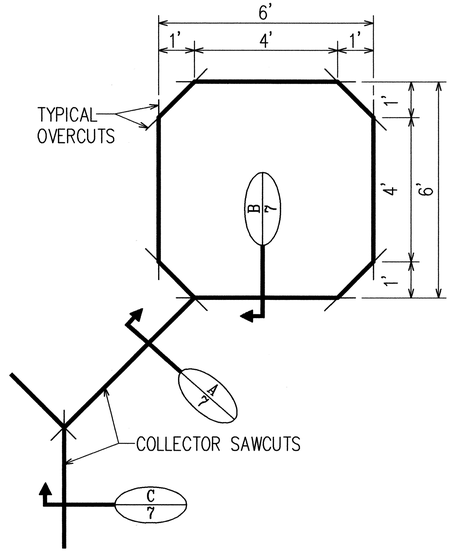
SECTION A/7

SECTION B/7

SECTION C/7

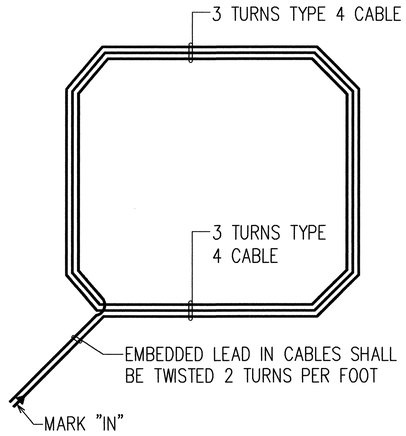


TYPICAL LAYOUT AT SHOULDER AREAS



NOTE: LENGTH OF OVERCUTS SHALL BE KEPT TO A MINIUM. ALL OVERCUTS SHALL BE BACKFILLED WITH HOT TAR.

TYPICAL SENSOR LOOP SAWCUT DETAIL



PLAN

TYPICAL SENSOR LOOP WIRING DIAGRAM

NOTE:

SEE SHEET E-15 FOR ALTERNATE SENSOR LOOP SAWCUT DETAIL & WIRING DIAGRAM

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No.E-12 OF 16 SHEETS

C.O. 161 S-12

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

LAST SAVE: 08/19/94 @ 09:32:45 by M2
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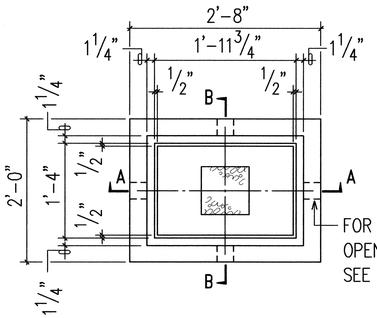
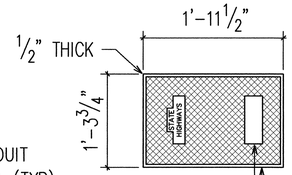
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-13	182



FOR CONDUIT OPENINGS. (TYP) SEE PLANS

NOTE:

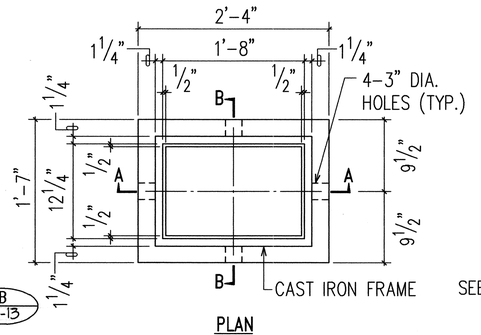
EXCEPT AS NOTED, COVER DETAILS SHALL CONFORM TO TYPE "B" PULLBOX COVER.



STREET LIGHT OR TRAFFIC SIGNAL AS APPLICABLE

SEE DETAIL B / E-13

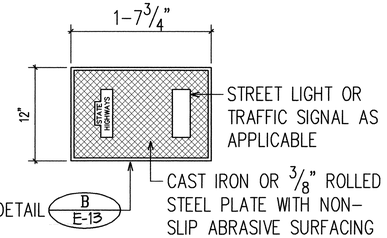
PLAN OF COVER



CAST IRON FRAME

NOTE:

STEEL ROM SHALL BE WELDED TO BOTTOM OF STEEL COVER IF NECESSARY SO THAT TOP OF COVER AND FRAME ARE FLUSH.



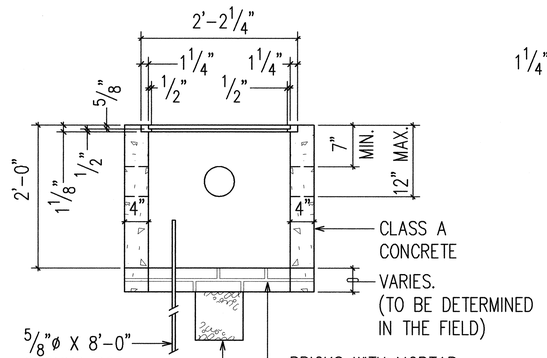
STREET LIGHT OR TRAFFIC SIGNAL AS APPLICABLE

CAST IRON OR 3/8" ROLLED STEEL PLATE WITH NON-SLIP ABRASIVE SURFACING

SEE DETAIL B / E-13

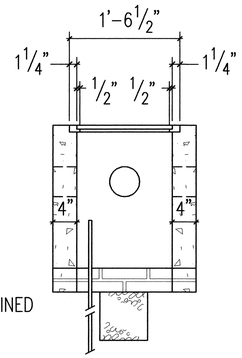
PLAN OF COVER

PLAN



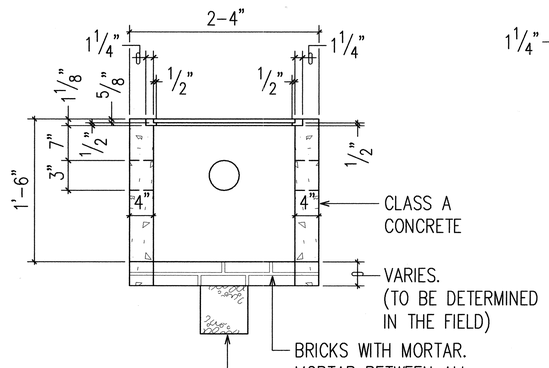
SECTION A-A

TYPE "A" PULLBOX



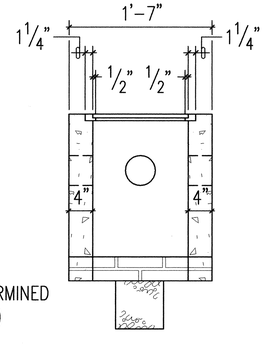
SECTION B-B

PLAN



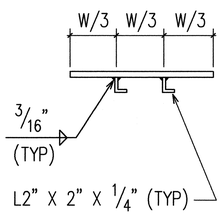
SECTION A-A

TYPE "B" PULLBOX

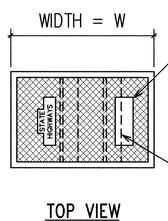


SECTION B-B

A / E-13 PULLBOX DETAILS
NOT TO SCALE



SIDE VIEW



TOP VIEW

EXCEPT WHERE NOTED, DETAILS SHALL CONFORM TO COVER DETAILS FOR TYPE "A" OR TYPE "B" PULLBOX (AS SPECIFIED ON PLANS)

STREET LIGHT OR TRAFFIC SIGNAL AS APPLICABLE

NOTE:

HOT DIP GALVANIZE AFTER FABRICATION. MODIFIED COVER SHALL BE FURNISHED WHEN CALLED FOR ON PLANS.

B / E-13 MODIFIED COVER DETAIL
NOT TO SCALE

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

Last Save: 08/18/94 @ 08:51:04 by: M2
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RONALD N.S. HO
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8/22/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX DETAILS

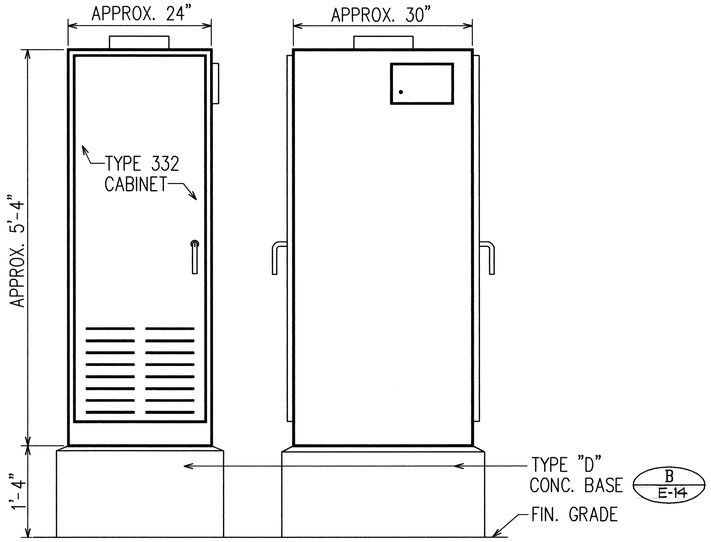
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

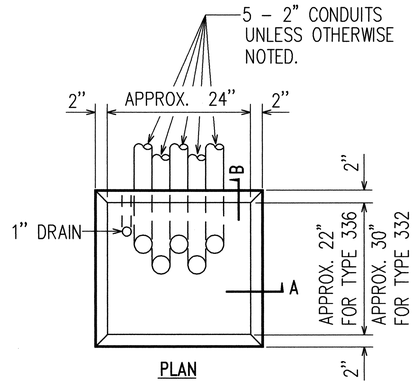
SHEET No.E-13 OF 16 SHEETS

C.O. 161 S-13

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-14	162

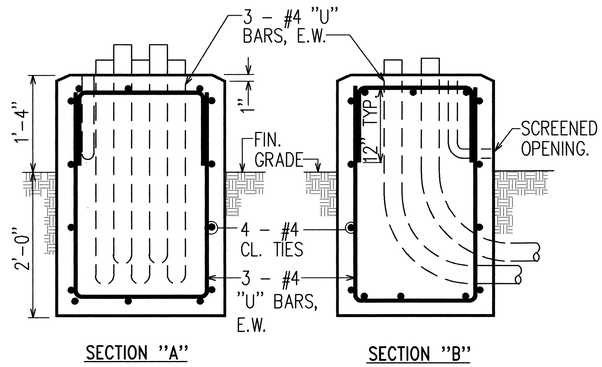


A E-14 TYPE 332 CABINET
N.T.S. (NEMA 4X)



NOTES:

1. CONCRETE SHALL BE CLASS "B".
2. DIMENSIONS SHALL BE ALTERED TO SUIT CONTROLLER CABINET ACTUALLY FURNISHED.
3. CONDUIT BENDS AND DRAIN ARE INCIDENTAL TO CONCRETE BASE.
4. REFER TO CABINET MANUFACTURER'S SPECIFICATIONS FOR DETAILS OF ANCHOR BOLTS AND BASE SETTING.
5. ALL EXPOSED SURFACES OF CONCRETE BASE SHALL BE GIVEN A CLASS 2, RUBBED FINISH.



B E-14 TYPE "D" CONC. BASE CONTROLLER CABINETS
N.T.S.

ORIGINAL PLAN
NOTE BOOK
No. ____ PAGE ____

SURVEY PLOTTED BY ____ DATE ____
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONTROLLER CABINET AND BASE DETAILS

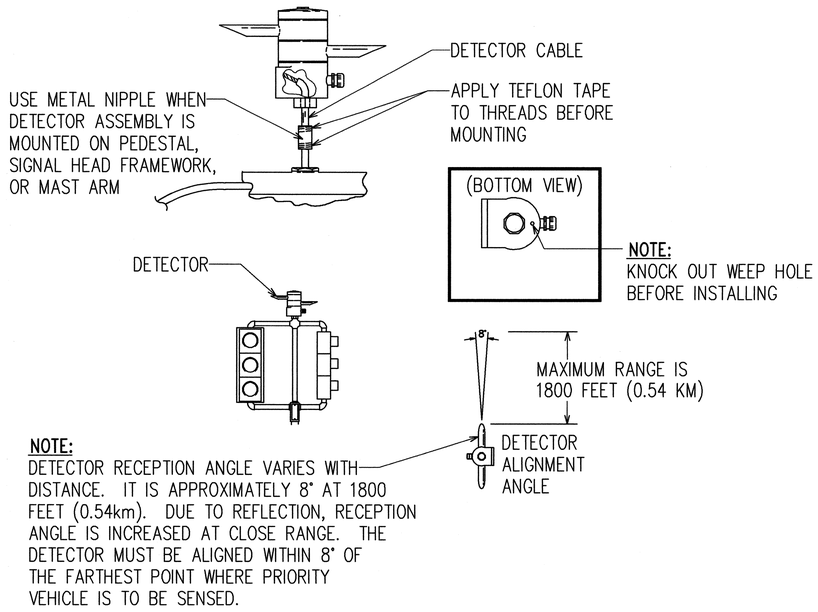
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

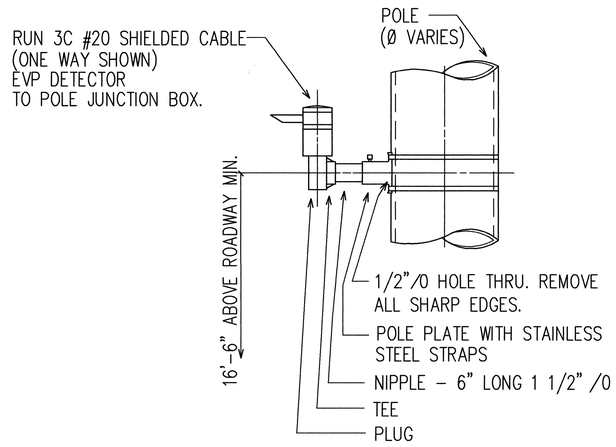
SHEET No. E-14 OF 16 SHEETS

C.O. 161 S-14

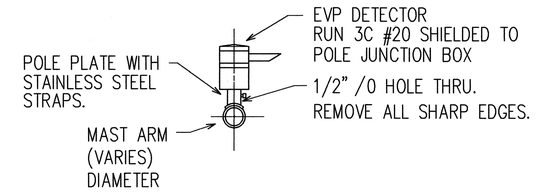
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-15	192



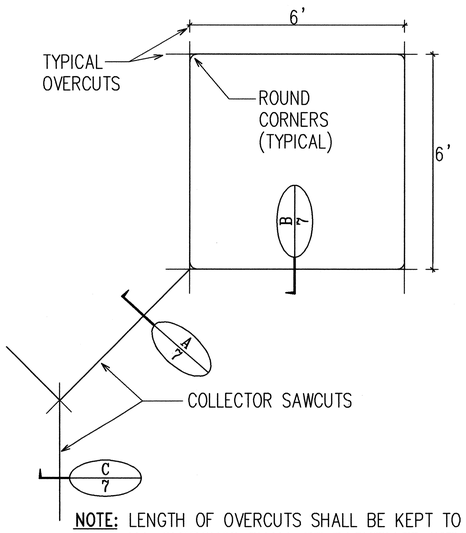
A E-15 **TYPICAL PEDESTAL/TYPE I T.S.S. MOUNTING OF EVP DETECTOR**
NOT TO SCALE



B E-15 **TYPICAL VERTICAL MOUNT OF EVP DETECTOR**
NOT TO SCALE

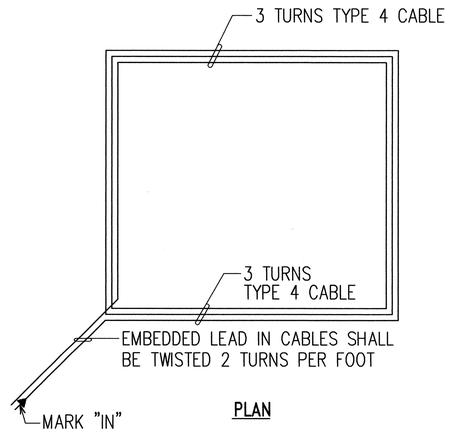


C E-15 **TYPICAL MAST ARM MOUNTING OF EVP DETECTOR**
NOT TO SCALE



NOTE: LENGTH OF OVERCUTS SHALL BE KEPT TO A MINIMUM. ALL OVERCUTS SHALL BE BACKFILLED WITH HOT TAR.

D E-15 **TYPICAL ALTERNATE SENSOR LOOP SAWCUT DETAIL**



E E-15 **TYPICAL ALTERNATE SENSOR LOOP WIRING DIAGRAM**

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
	TRACED BY	
NOTE BOOK	DESIGNED BY	
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS - 2

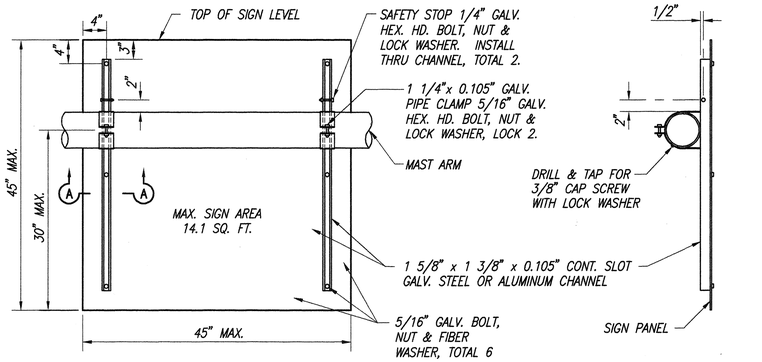
KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No.E-15 OF 16 SHEETS

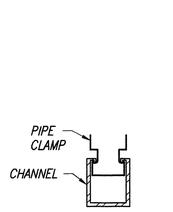
C.O. 161 S-15

FED.ROAD DIST.NO.	STATE	FED.AID PROJ.NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	83A-01-92	1994	161 S-16	162

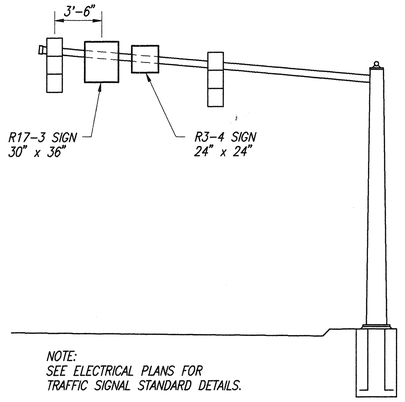


SIGN MOUNTING DETAILS

NOT TO SCALE



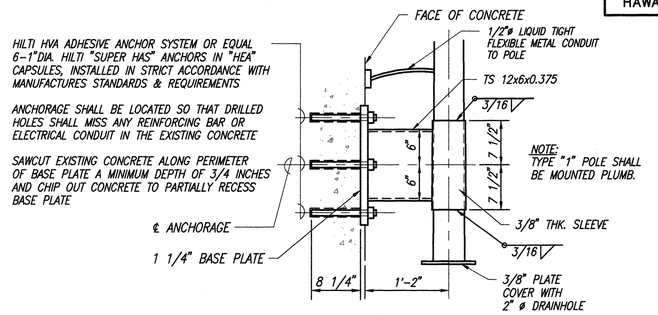
SECTION A-A



NOTE:
SEE ELECTRICAL PLANS FOR TRAFFIC SIGNAL STANDARD DETAILS.

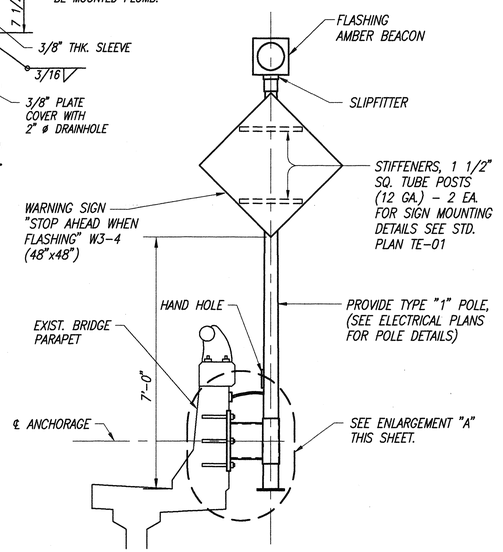
ELEVATION - SIGNS ON ARM

NOT TO SCALE



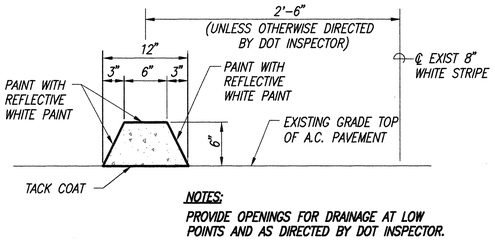
ENLARGEMENT "A"

SCALE: 1" = 1'-0"



DETAIL OF WARNING SIGN WITH FLASHING AMBER BEACON ON BRIDGE PARAPET

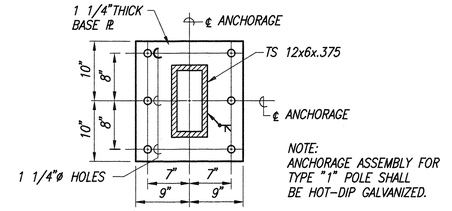
SCALE: 1/2" = 1'-0"



NOTES:
PROVIDE OPENINGS FOR DRAINAGE AT LOW POINTS AND AS DIRECTED BY DOT INSPECTOR.

TYPICAL SECTION A.C. CURB

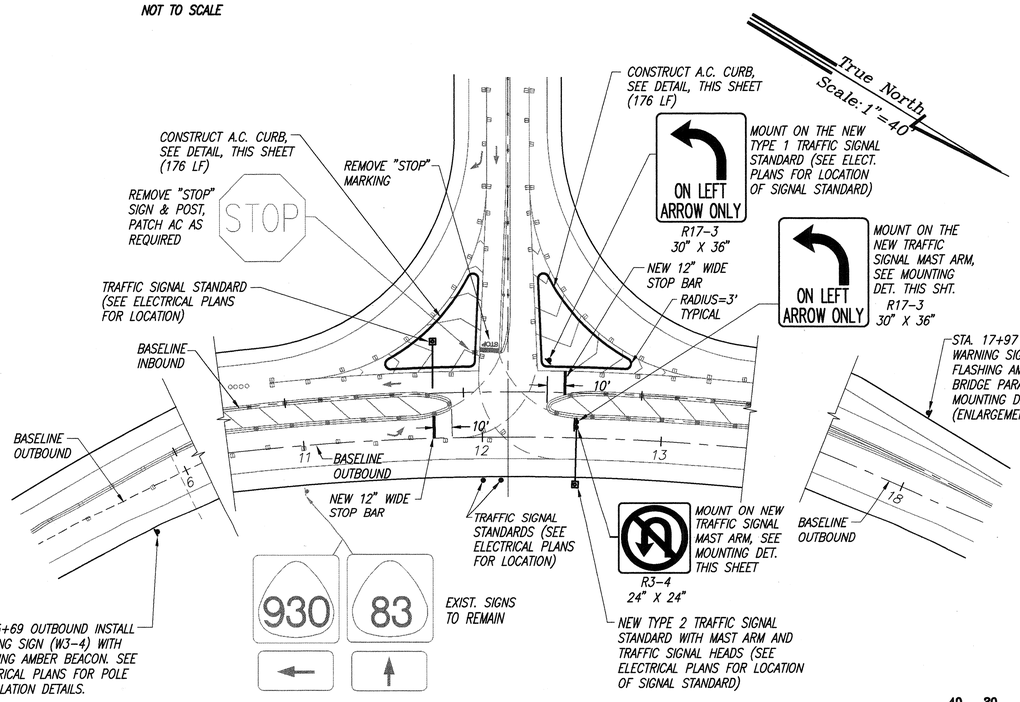
NOT TO SCALE



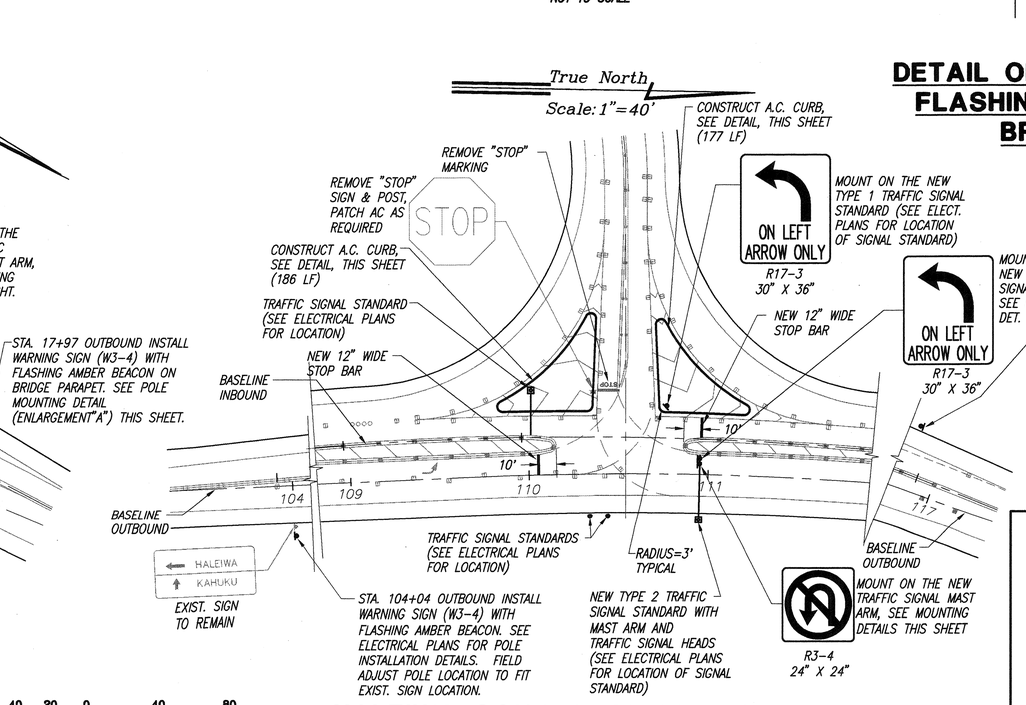
NOTE:
ANCHORAGE ASSEMBLY FOR TYPE "1" POLE SHALL BE HOT-DIP GALVANIZED.

BASE PLATE DETAIL

NOT TO SCALE



WAIALUA CONNECTOR INTERSECTION PLAN



HALEIWA CONNECTOR INTERSECTION PLAN

40 20 0 40 80
Graphic Scale in Feet

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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

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ENGINEERS SURVEYORS HAWAII, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGNING & STRIPING PLAN

KAMEHAMEHA HIGHWAY-HELEMANO/WAIALUA JUNCTION TO HALEIWA BEACH PARK (ROADWAY)
FAP NO. 83A-01-92

SCALE: AS NOTED DATE:

SHEET No. C-1 OF 1 SHEETS

C.O. 161 S-16

ORIGINAL PLAN
NOTE BOOK

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

JOB:88-68.1 FILE:SS-CONN.DWG DISK:88-68.1(5) 1=40 09/12/94 SRA