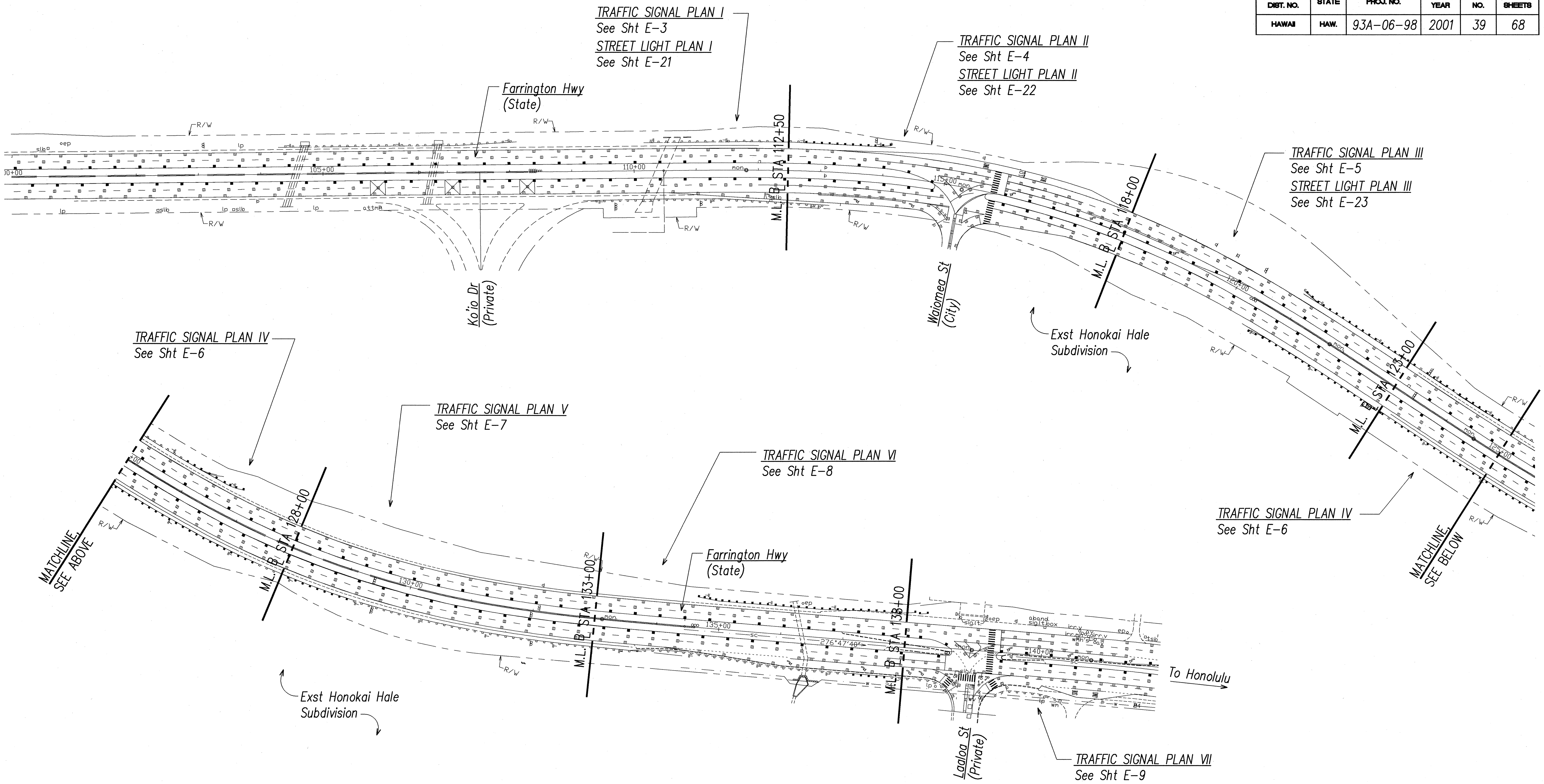
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	39	68



NORTH

STREET LIGHT AND TRAFFIC SIGNAL SITE PLAN

SCALE: 1" = 80'-0"

80' 40' 0 80' 160' 240'

SCALE: 1"=80'

GRAPHIC SCALE

STEVEN H. SAKAI — LICENSED PROFESSIONAL ENGINEER No. 7637-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT AND TRAFFIC SIGNAL SITE PLAN

FARRINGTON HIGHWAY

Intersection Improvements at Waiomea Street

Project No. 93A-06-98

Scale: As Noted — Date: AUGUST 2000

SHEET No. E-1 OF 30 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	40	68

TRAFFIC SIGNAL NOTES

1. The locations of the Traffic Signal Standards, Traffic Signal Standards w/Mast Arms, Pedestrian Push Buttons, Traffic Controller, Pullboxes, Conduits and Loop Detectors shall be staked out in the field by the Contractor and approval of the locations shall be obtained from the Engineer prior to construction and installation.

2. All splicing shall be done in the pullboxes.

3. Furnishing and installing the conduit stubouts (pullboxes to edge of pavement) will not be paid for separately but shall be considered incidental to the various contract items.

4. A solid #8 bare copper wire shall be pulled with the traffic signal control cable for equipment ground. Cost shall be incidental to the installation of the control cable.

5. All Traffic signal controller equipment shall be completely wired in the cabinet and shall control the traffic signals as called for in the plans.

6. The loop amplifier units furnished for this project shall be capable of operating the loop detector configurations shown on the plans. Cost for the loop amplifier shall be incidental to the installation of the loop detector.

7. Should any defect be encountered during the warranty period, the manufacturer will be notified and he shall promptly correct such defect. Service call (by factory qualified representative) during the warranty period for repairs or other maintenance shall be answered within 24 hours and shall be done at no expense to the State. All repairs shall be done as soon as possible.

8. All traffic signal work shall conform to the requirements of the "Manual On Uniform Traffic Control Devices For Streets And Highways", Federal Highway Administration (1988) and Amendments.

9. Locations of pavement markings and markers (lane lines, Stop lines, crosswalk, etc.) shown on the plans shall be verified with the Engineer prior to the installation of the traffic signal system.

10. The Contractor shall notify the Traffic Control Branch, Department of Transportation Services, City & County of Honolulu, (phone no. 523-4589) two weeks prior to commencing any work on the traffic signal system.

11. The Department of Transportation Services, City & County of Honolulu, will assist the Engineer in construction inspection for the traffic signal system. The Contractor shall notify the Traffic Control Branch, Department of Transportation Services, three (3) working days prior to commencing work on the traffic signal system (phone no. 523-4589).

12. Connecting into existing traffic signal system and making all necessary adjustments shall not be paid for separately, but considered incidental to the various traffic signal contract items.

13. All conduits between pullboxes and Traffic Signal Standards shall not be paid for separately but considered incidental to the various contract items.

14. All Signal-Drop Cables (Type 5 cable) from the various types traffic signal head on the traffic signal standards and mast arms to the pullboxes shall not be paid for separately but considered incidental to the traffic signal head.

15. After installing the cables in the conduits, the Contractor shall duct seal all conduits in the controller cabinet, pullboxes and standards with an Engineer approved product. The cost for duct sealing the conduits shall not be paid for separately but considered incidental to the various contract items.

TRAFFIC SIGNAL LEGEND

- M — New Traffic Signal Master & Local Controller
- SL/TS — New Street Light & Traffic Signal Conduits & Cables
- TS — New Traffic Signal Conduits & Cables
- New 12" ← ← ← Traffic Signal Head
- New 12" RYG Traffic Signal Head
- New 12" RY↑ Traffic Signal Head
- New 12" RY← Traffic Signal Head
- New 12" RY← Traffic Signal Head (Programmed Visibility)
- New 12" RYG←G/Y Fiber Optic Traffic Signal Head
- New Type I Traffic Signal Standard w/Traffic Signal Head as specified on plan
- 24' / 12' — New Type II Traffic Signal Standard w/Mast Arm and Traffic Signal Heads (length of mast arm & distance between signal heads as specified on plan)
- 8' / 24' / 12' — New Type III Traffic Signal Standard w/mast arm, Highway Lighting Arm and Traffic Signal Heads. (Length of traffic signal and highway lighting arm & distance between signal heads as specified on plans)
- New Pedestrian Signal Head
- New Type A (Old Type B) Pullbox
- New Type B (Old Type C) Pullbox
- New Type C (Old Type D) Pullbox
- S — New Concrete Stub-out Marker, See Det A/E-24
- J — New Stainless Steel J-box, WP, See Plan for Size
- New Loop Detectors
- Existing Loop Detectors
- New Opticom Receiver

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY JK	
NOTE BOOK	TRACED BY	
	DESIGNED BY JOHN HO & ASSOC.	
	QUANTITIES BY	
	CHECKED BY	

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL LEGEND

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-2 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	41	68

CONDUIT & WIRE SCHEDULE

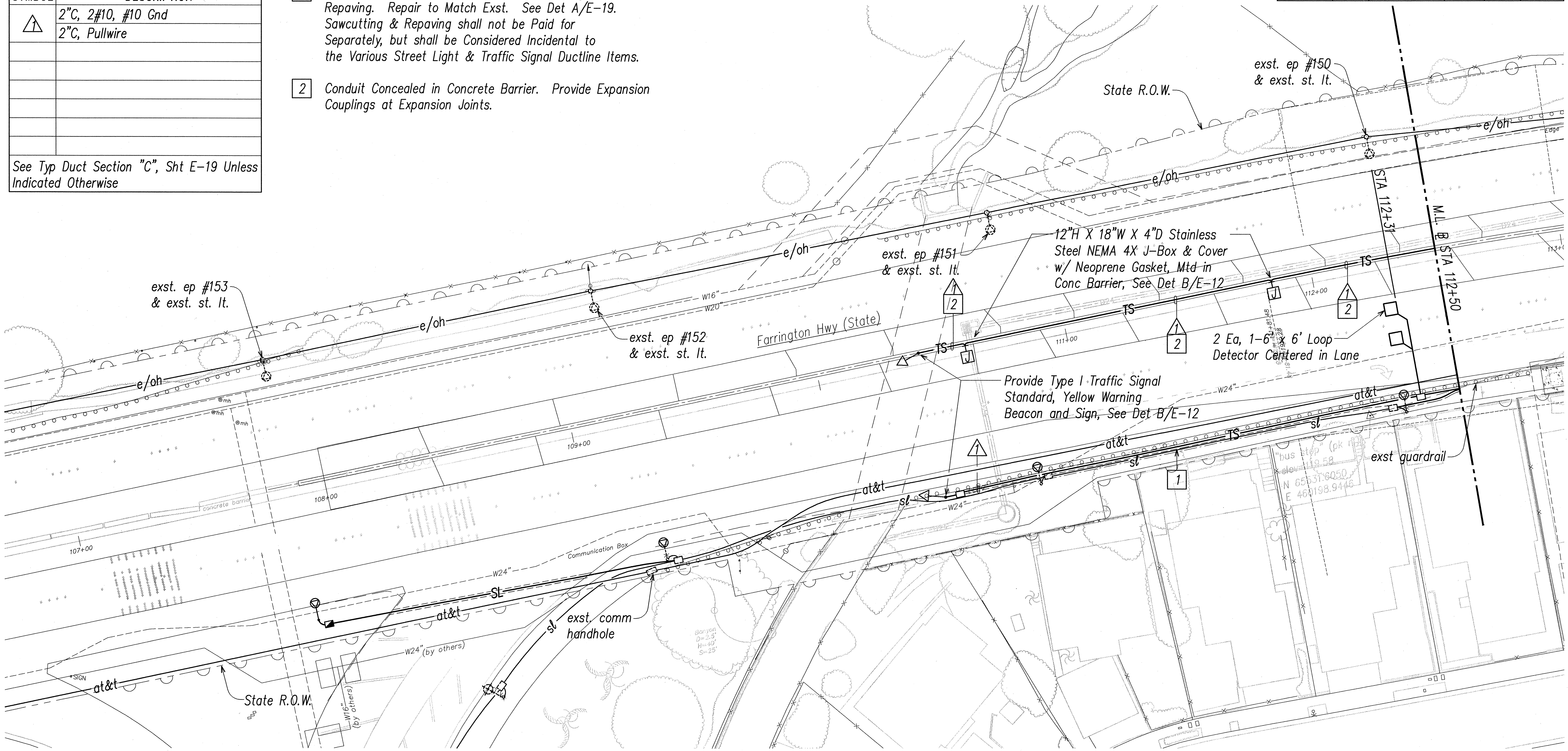
SYMBOL	DESCRIPTION
△1	2"C, 2#10, #10 Gnd
	2"C, Pullwire

See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise

NOTES:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving shall not be Paid for Separately, but shall be Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.

2. Conduit Concealed in Concrete Barrier. Provide Expansion Couplings at Expansion Joints.



NORTH

TRAFFIC SIGNAL PLAN I

SCALE: 1"=20'

APPROVED:

Catherine Dungca 3/20/01

for CHIEF, PLANNING & ENGINEERING, BNS

DATE

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Steven H. Sakai

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN I

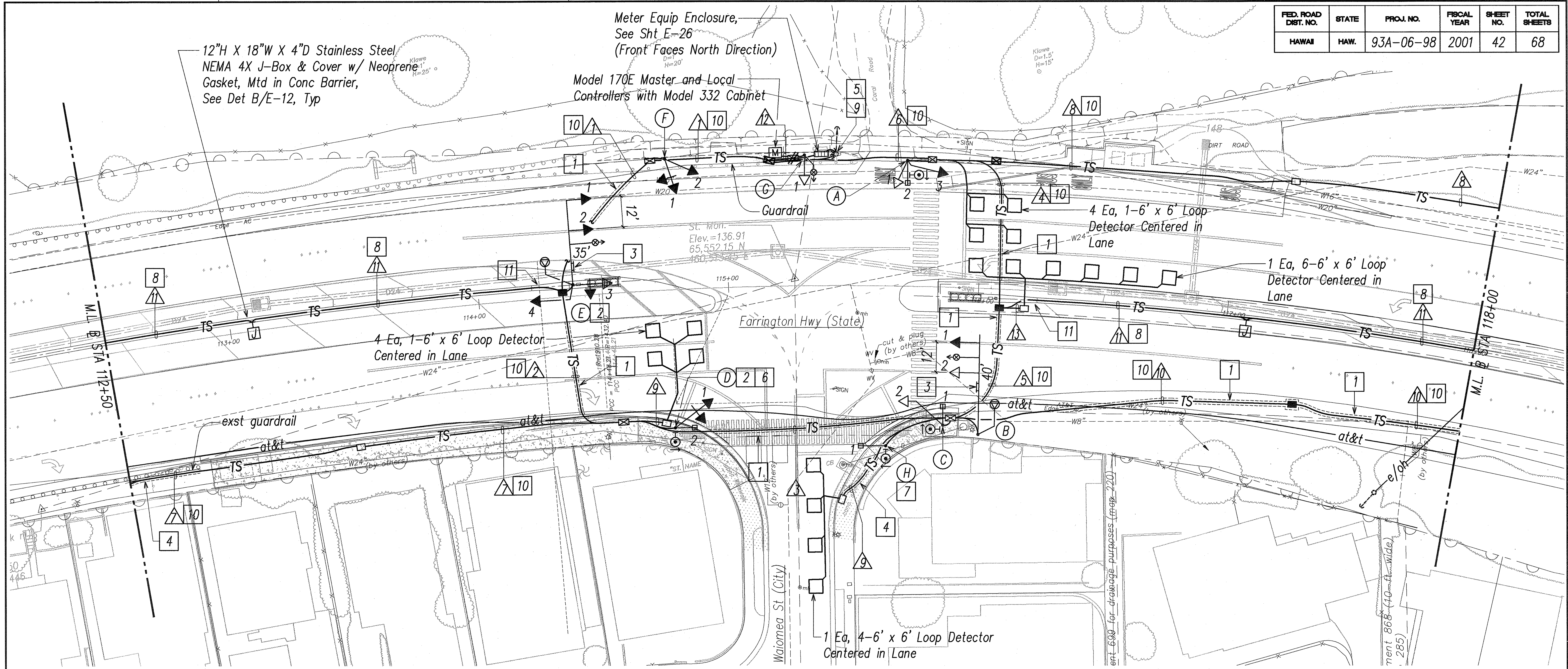
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: AS NOTED Date: AUGUST 2000

SHEET No. E-3 OF 30 SHEETS

ORIGINAL PLAN | NOTE BOOK | 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.	93A-06-98	2001	42	68



NOTES:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving Exst A.C. Pavement shall not be Paid for Separately, but shall be Considered Incidental to the Various Traffic Signal Ductline Items.
2. Provide "On Left Arrow Only No U Turn" R17-3 (30" x 48") Sign.
3. Provide Street Name Sign, See Sht No. 35.
4. Sawcut Exst Conc Sidewalk at Scoreline Prior to Trenching. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving Exst Conc Pavement shall not be Paid for Separately, but shall be Considered Incidental to the Various Traffic Signal Ductline Items.
5. Stub 2"C & 3"C Up Exst Pole +10'-0" for HECO Service; 2"C +1'-0" for Future HTCO Service, See Det C/E-12.
6. 13' Type I Std.
7. 8' Type I Std.
8. Conduit Concealed in Concrete Barrier. Provide Expansion Couplings at Expansion Joints.
9. Prior to Trench & Excavation Near Exst Pole, Contractor shall Coordinate Temporary Pole Bracing with HECo, See HECo Note 6, Sht 5.
10. Route Traffic Signal Ductline w/ Street Light Ductline, See Sht E-22
11. Transition to Concrete Barrier, See Det B/E-24.

NORTH

TRAFFIC SIGNAL PLAN II

SCALE: 1"=20'

GENERAL NOTE:

1. See Sht E-10 for Phase Diagrams, Conduit & Wiring Schedule and Signal Head Legend; Sht E-14 for Ped Pushbutton Orientation.
2. Exst Overhead & Street Light System not Indicated for Clarity, See Sht E-22.

APPROVED:
Catherine Dungca 3/20/01
for CHIEF, PLANNING & ENGINEERING, BWS mb DATE

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

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

DATE	REVISION
10/4/00	Del Street Name Sign Near TS Std "G"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN II

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: As Noted Date: AUGUST 2000

SHEET No. E-4 OF 30 SHEETS

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

LAST SAVE: 10/05/00 @ 15:52:27 BY: GN PLOT SC 1=20
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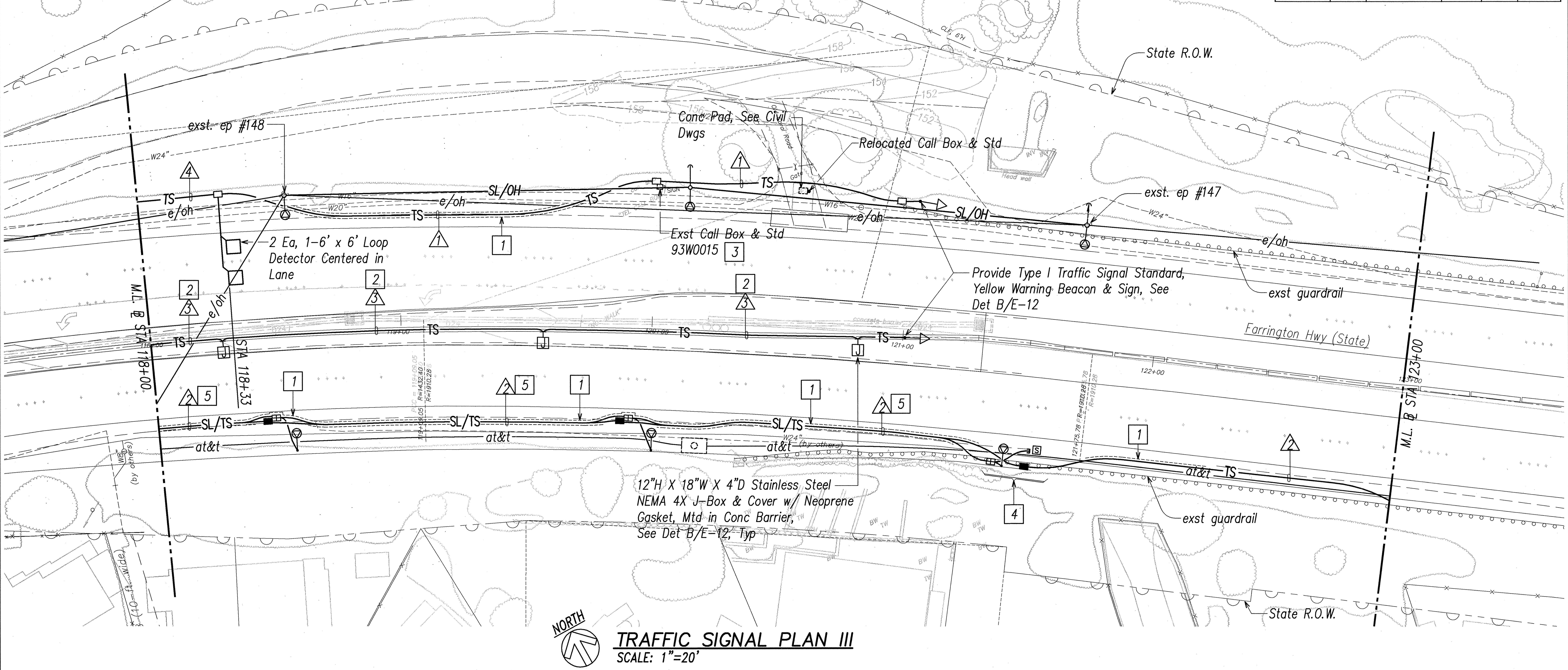
"AS-BUILT"

ADD. 42

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	43	68



TRAFFIC SIGNAL PLAN III

SCALE: 1"=20'

CONDUIT & WIRE SCHEDULE	
SYMBOL	DESCRIPTION
1	2"C, 2#10, #10 Gnd
2	2"C, Pullwire
	2"C, 1-12 Pair #19
3	2"C, 2#10, #10 Gnd
	2"C, Pullwire
4	2"C, 1-2/C#14, 2#10, #10 Gnd
See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise	

NOTES:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving shall not be Paid for Separately, but shall be Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.
2. Conduit Concealed in Concrete Barrier. Provide Expansion Couplings at Expansion Joints.
3. Excavate Around Exst Conc Foundation (24"D x 6"D Nom) & Relocate Exst Call Box Standard & Conc Foundation as Indicated on Plan. Provide Backfill & Compact to Match Exst.
4. Remove Exst Guardrail as Required to Install Ductline. Reinstall per State Std Details. Removal & Installation of Exst Guardrail shall not be Paid for Separately, but Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.
5. Route Traffic Signal Ductline w/ Street Light Ductline, See Sht E-23

APPROVED:
Catherine R. Dungca 3/20/01
for CHIEF, PLANNING & ENGINEERING, BWS DATE

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

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN III

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

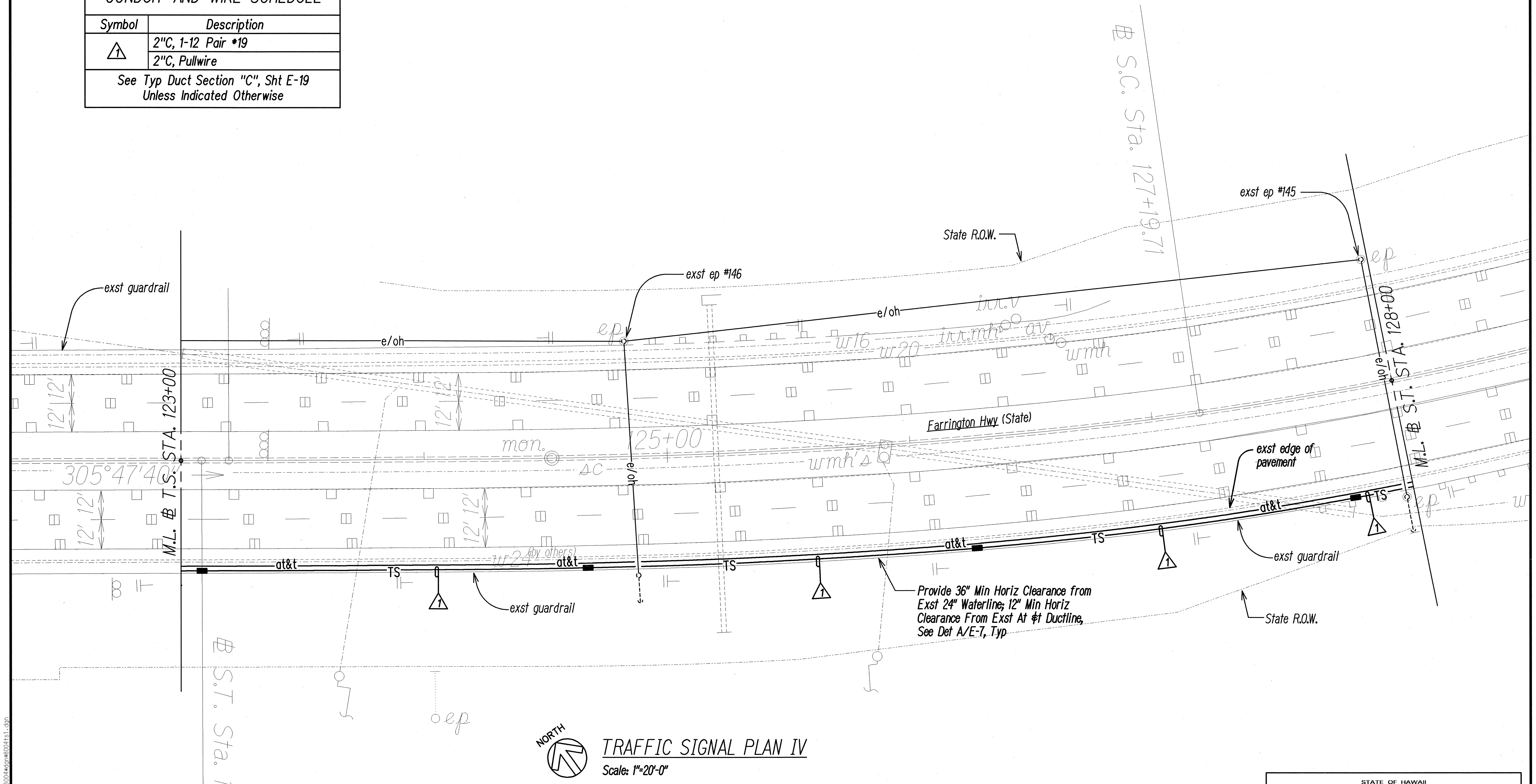
Scale: As Noted Date: AUGUST 2000

SHEET No. E-5 OF 30 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	44	68

CONDUIT AND WIRE SCHEDULE	
Symbol	Description
1 (triangle)	2"C, 1-12 Pair #19
	2"C, Pullwire
See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise	



TRAFFIC SIGNAL PLAN IV

Scale: 1"=20'-0"

APPROVED:

Catherine Dunaga 3/20/01

for CHIEF, PLANNING & ENGINEERING, BWS MD DATE

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

STEVEN H. SAKAI — LICENSED PROFESSIONAL ENGINEER No. 7037-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Steven H. Sakai

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN IV

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-6 OF 30 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY ___ DATE ___
NOTE BOOK	DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY
No. 8001tsi.dgn	

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	45	68

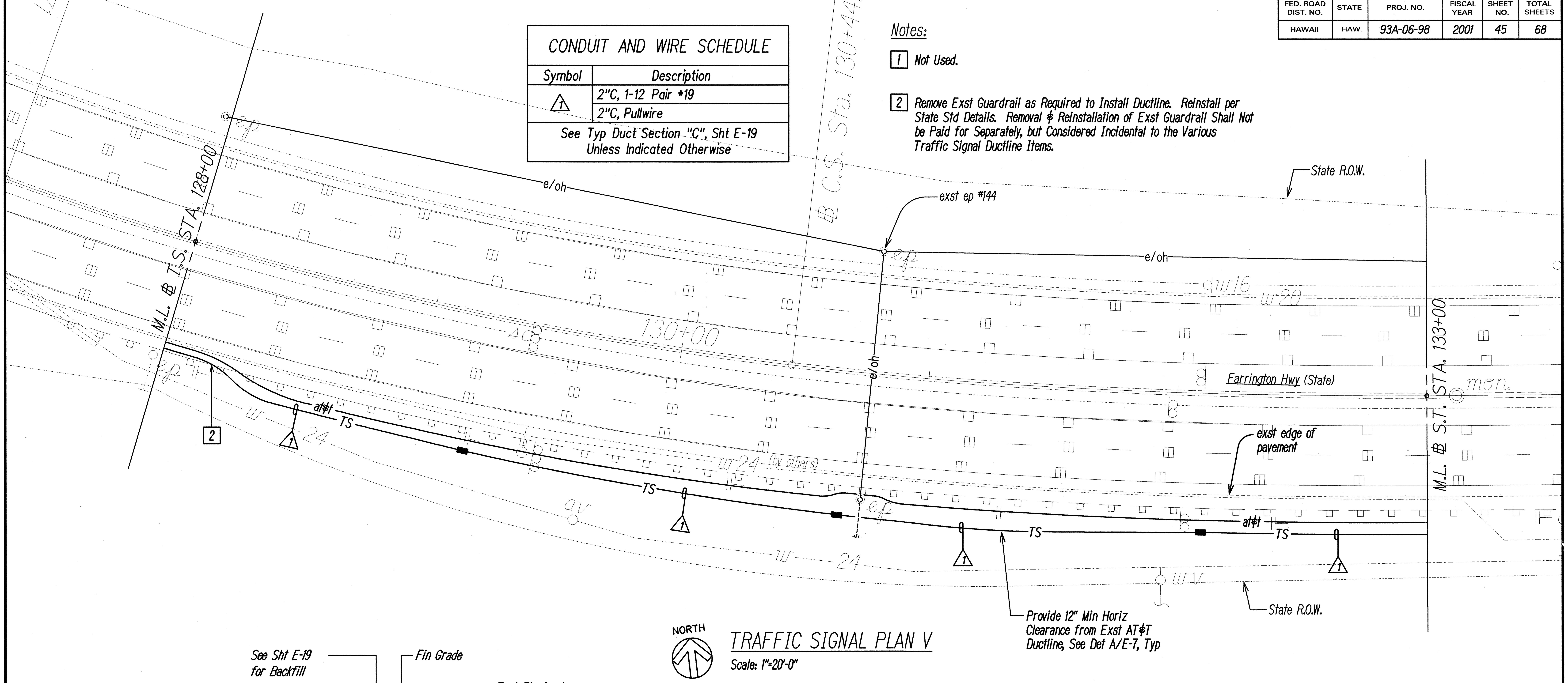
CONDUIT AND WIRE SCHEDULE

Symbol	Description
1 (triangle)	2"C, 1-12 Pair #19
	2"C, Pullwire
See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise	

Notes:

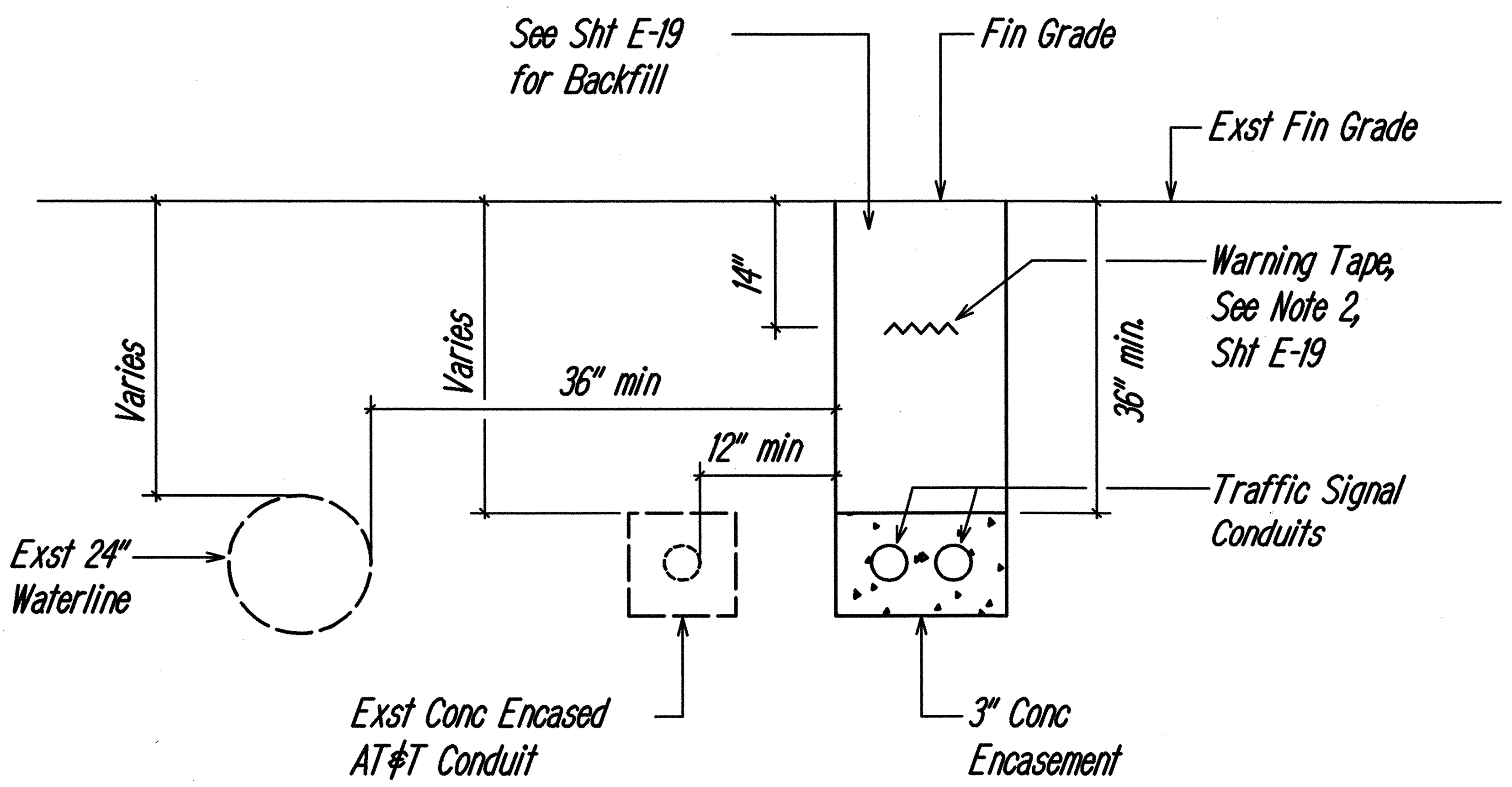
1. Not Used.

2. Remove Exst Guardrail as Required to Install Ductline. Reinstall per State Std Details. Removal & Reinstallation of Exst Guardrail Shall Not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Ductline Items.



TRAFFIC SIGNAL PLAN V

Scale: 1"=20'-0"



(A/E-7) TYPICAL SECTION (X)

NOT TO SCALE

APPROVED:

Catherine Dungeo 3/20/01

for CHIEF, PLANNING & ENGINEERING, BWS DATE

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN V

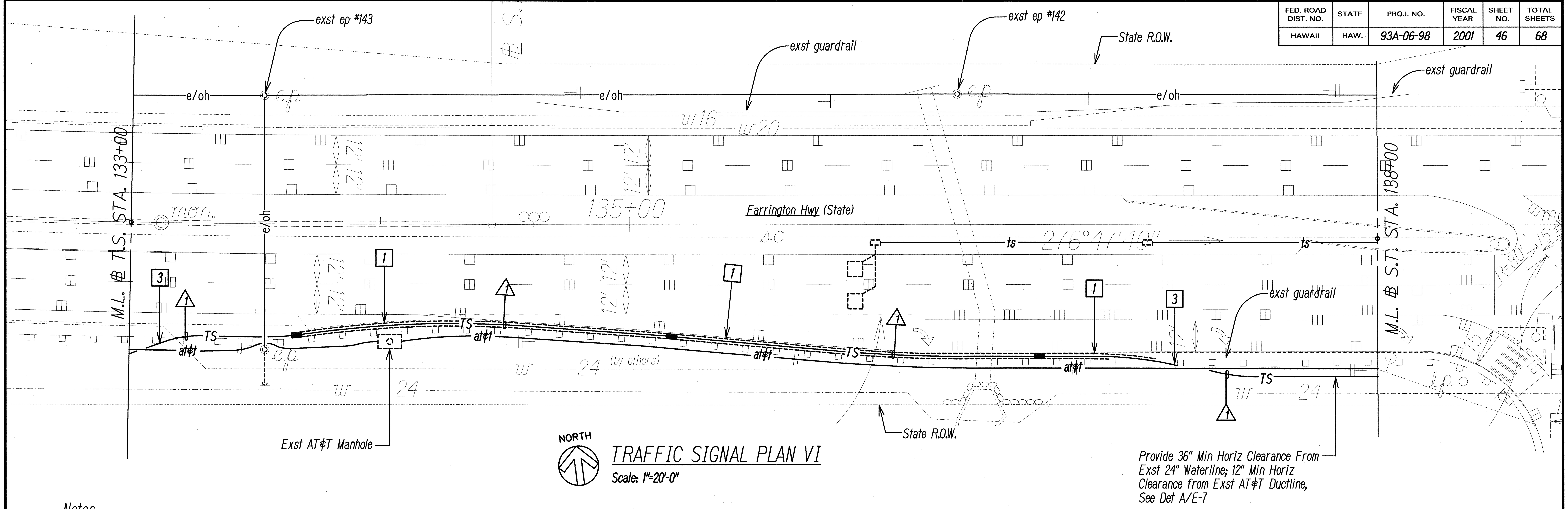
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-7 OF 30 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	46	68



TRAFFIC SIGNAL PLAN VI

Scale: 1"=20'-0"

Notes:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst, See Det A/E-19. Sawcutting & Repaving of Exst A.C. Pavement Shall Not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Ductline Items.

2. Not Used.

3. Remove Exst Guardrail as Required to Install Ductline. Reinstall per State Std Details. Removal & Reinstallation of Exst Guardrail shall not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Ductline Items.

CONDUIT AND WIRING SCHEDULE	
Symbol	Description
△1	2"C, 1-12 Pair #19
	2"C, Pullwire
See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise	

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 11-7-95
	DRAWN BY M. Takatani	
	TRACED BY	
NOTE BOOK	DESIGNED BY G. Kaleo	
	QUANTITIES BY	
8004ts3.dgn	CHECKED BY	

APPROVED:

Catherine Dungca 3/20/01

for CHIEF, PLANNING & ENGINEERING, BWS DATE

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

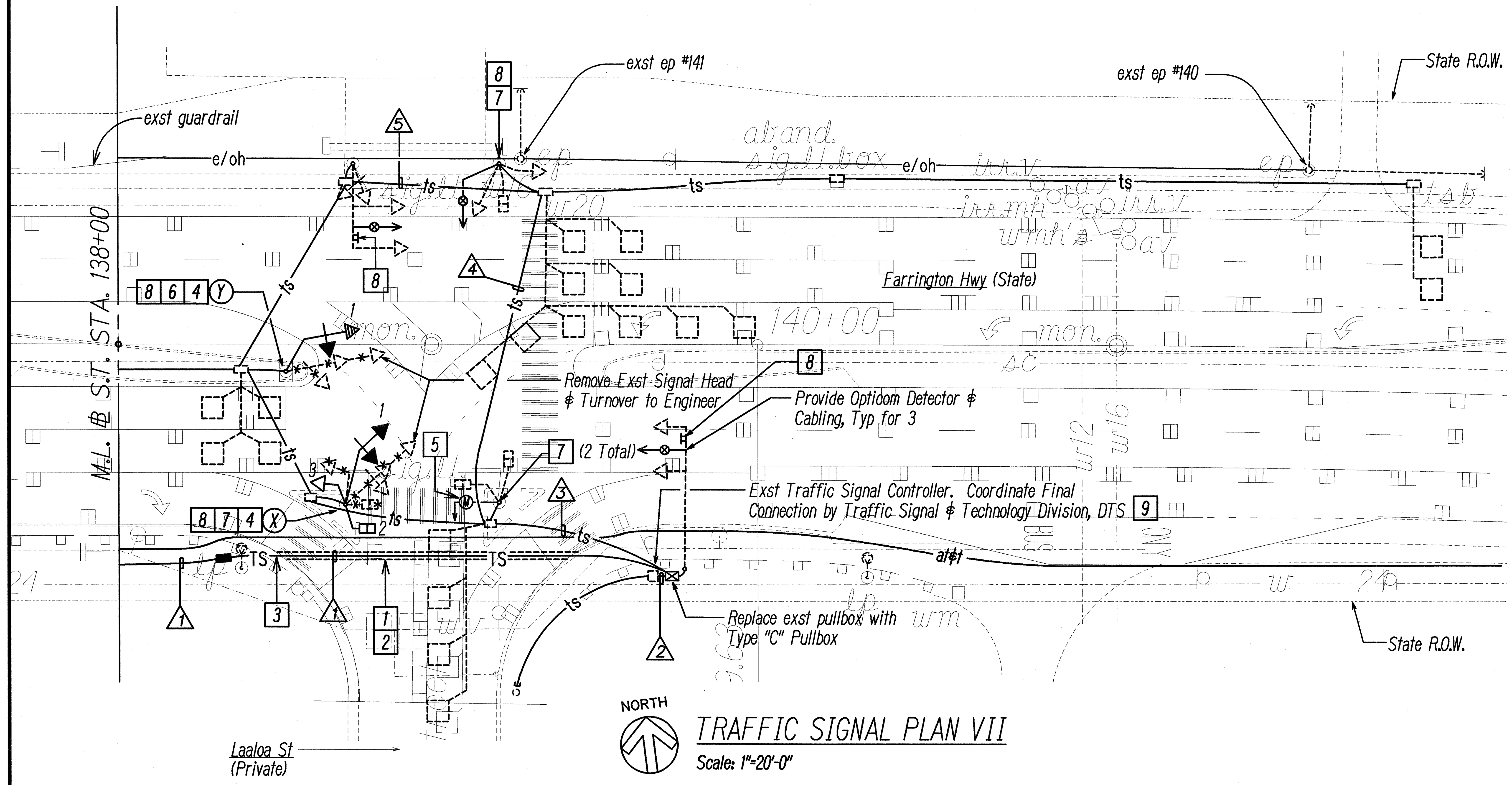
TRAFFIC SIGNAL PLAN VI

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-8 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	47	68



TRAFFIC SIGNAL PLAN VII

Scale: 1"=20'-0"

CONDUIT AND WIRING SCHEDULE

Symbol	Description
1	2"C, 1-12 Pair #19
	2"C, Pullwire
2	Exst 2"C, Exst 1-26/C #14
	Exst 2"C, Exst 1-26/C #14
	Exst 2"C, Exst 1-3/C #6
	Exst 2"C, Exst 8-2/C #14
	Exst 2"C; Provide 3-Opticom Cable
	1-12 Pair #19
3	Exst 2"C, Exst 1-26/C #14
	Exst 2"C, Exst 1-26/C# 14; Provide
	2-Opticom Cable
	Exst 2"C, Exst 8-2/C #14
4	Exst 2"C, Exst 1-26/C #14
	Exst 2"C, Exst 4-2/C #14; Provide
	2-Opticom Cable
5	Exst 2"C, Exst 1-26/C #14
	Exst 2"C; Provide 1-Opticom Cable

See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise

Notes:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst, See Det A/E-19. Sawcutting & Repaving of Exst A.C. Pavement Shall not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Ductline Items.
2. Provide Striping & Loop Detectors Damaged by Trenching to Match Exst. Replacement Striping & Loop Detectors shall not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Contract Items.
3. Remove Exst Guardrail as Required to Install Ductline. Reinstall per State Std Details. Removal & Reinstallation of Exst Guardrail shall not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Ductline Items.
4. Remove Exst Traffic Signal Std. Provide 13' Type I Std, Traffic Signal Head as Indicated, "On Left Arrow Only & No U Turn" R17-3 Sign.
5. Provide Temp Approach-Only Microwave Detector, Mounting Bracket & Wiring During Replacement of Laaloa St Loop Detectors. Temp Detector shall not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Contract Items.
6. Provide Stainless Steel Straps & Reinstall Exst "No U Turn" Sign. Reinstalling Sign shall not be Paid for Separately, but Considered Incidental to the Various Traffic Signal Items
7. Replace Exst Ped Pushbutton w/ New Ped Pushbutton, See Det C/E-11
8. Provide "Caution Signals Modified" Warning Sign. Sign shall not be Paid for Separately, but Considered Incidental to the various Traffic Signal Items
9. Provide 2 Each Model M752 Preemption Cards with 758 Aux. Interface Panel. Pre-emption card shall not be Paid for Separately but Considered Incidental to the Traffic Signal Controller Item.

APPROVED:

Catherine Dungca 3/20/01

CHIEF, PLANNING & ENGINEERING, BWS — DATE

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

STEVEN H. SAKAI — LICENSED PROFESSIONAL ENGINEER No. 7637-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN VII

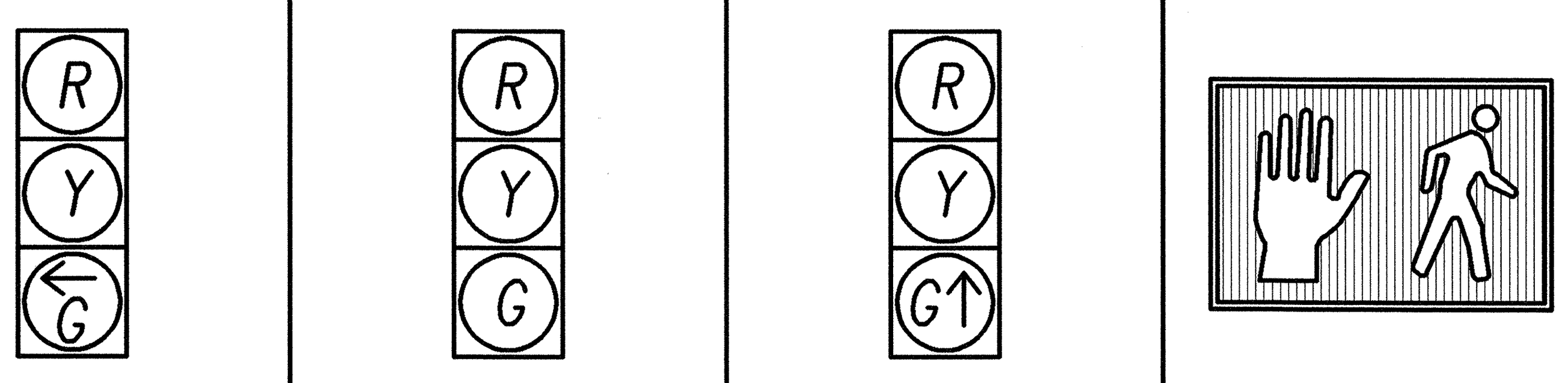
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None — Date: AUGUST 2000

SHEET No. E-9 OF 30 SHEETS

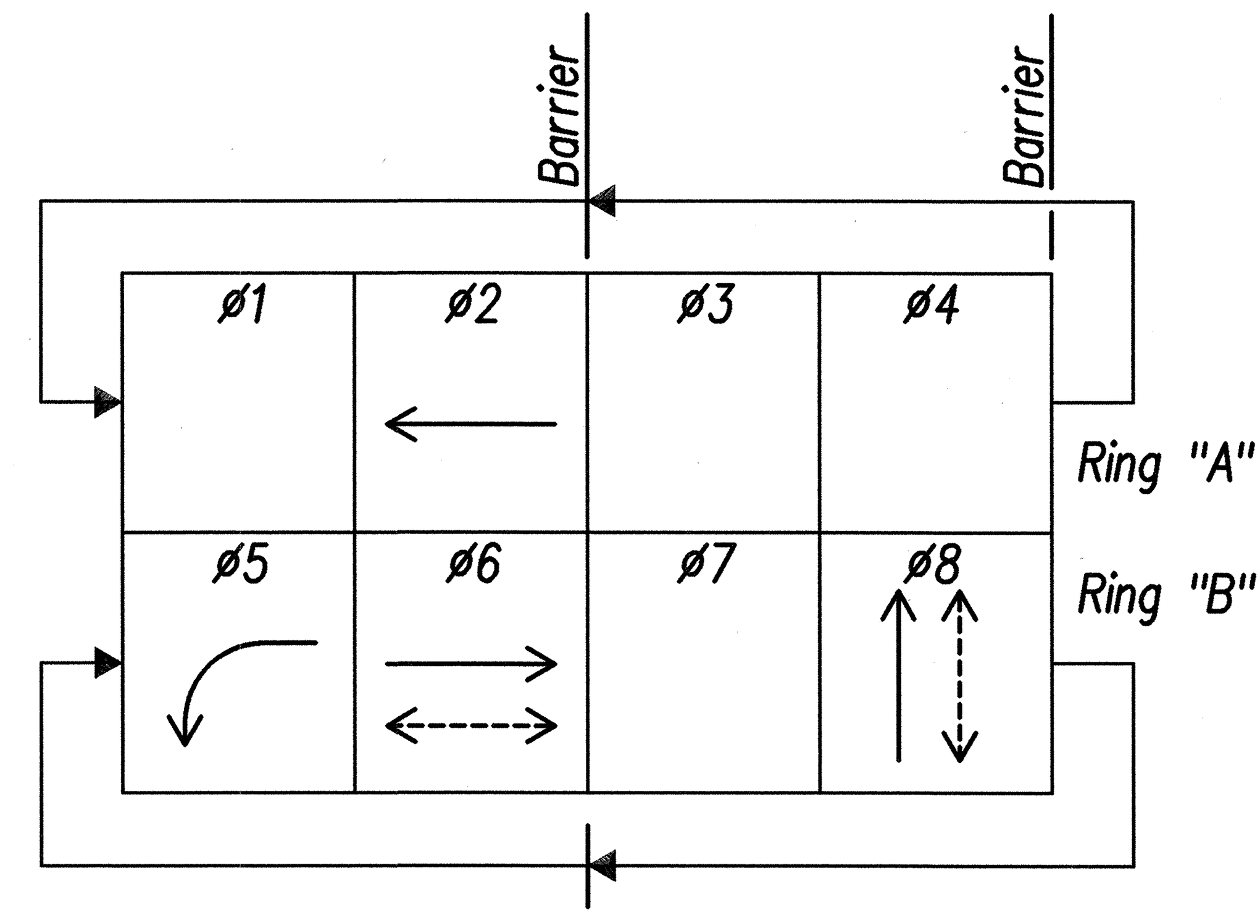
ORIGINAL PLAN / NOTE BOOK / SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY / DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	48	68

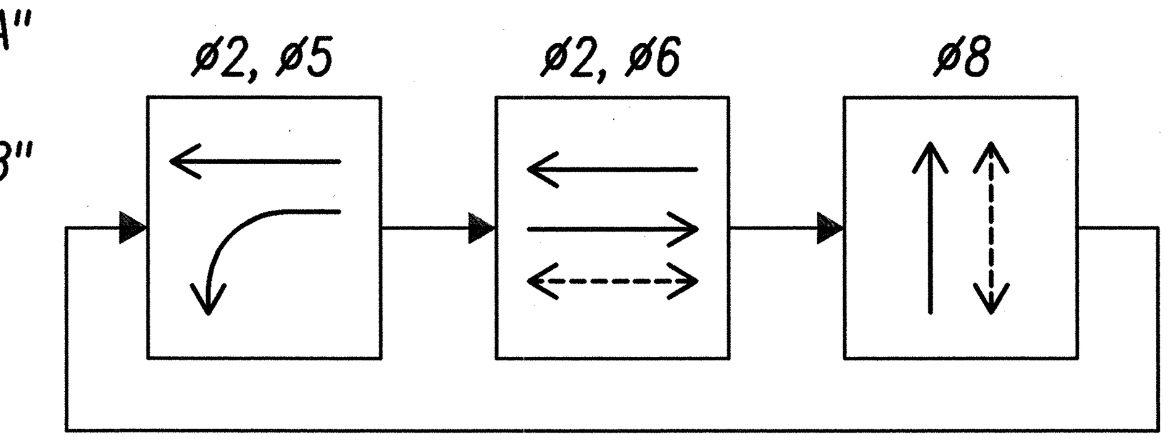


(RYGA)	(RYG)	(RYGA)	(Ped)	Signal Indication
12" RYGA Traffic Signal Head (L.E.D. Signal Assembly Except for Programmed Visibility Head)	12" RYG Traffic Signal Head (L.E.D. Signal Assembly Except for Programmed Visibility Head)	12" RYGA Traffic Signal Head (L.E.D. Signal Assembly Except for Programmed Visibility Head)	Pedestrian Signal Head	Description
D-1 E-3 (a), (c) F-1 X-1 (b) Y-1 (a), (b), (c)	A-1 X-3 (b) B-2 (a) C-2 G-1	A-3 B-1 (a) E-1 (a) E-2 (a) E-4 (a) F-2	A-2 C-1 D-2 H-1 X-2 (b)	Pole Letter-Signal Head Number

(a) Provide Back Plate for Signal Head. Back Plate shall not be paid for Separately, but Considered Incidental to the Signal Assembly Items
(b) Signal Head at Laaloa St Intersection
(c) Programmed Visibility Signal Head



PHASE ASSIGNMENT DIAGRAM



PHASING DIAGRAM

CONDUIT AND WIRING SCHEDULE (For Sheet E-4)

Symbol	Description	Symbol	Description	Symbol	Description
1	2"C, 1-26/C *14, *8 Gnd	6	2"C, 1-26/C *14, *8 Gnd	13	2"C, 2-2/C *14
	2"C, 1-Opticom Cable		2"C, 7-2/C *14		
	2"C, 2-2/C *14, 2*10, *10 Gnd		2"C, 2*10, *10 Gnd		
	2"C, Pullwire		2"C, 1-12 Pair *19		
2	2"C, 1-26/C *14, *8 Gnd		2"C, 1-Opticom Cable		
	2"C, 2-2/C *14, 2*10, *10 Gnd				
	2-2"C, Pullwire in Each	7	2"C, 1-2/C *14, 2*10, *10 Gnd		
			2"C, Pullwire		
3	2"C, 1-26/C *14, *8 Gnd	8	2"C, 1-2/C *14, 2*10, *10 Gnd		
	2"C, 1-2/C *14	9	2"C, 1-2/C *14		
	2-2"C, Pullwire in Each	10	2"C, 1-12 Pair *19		
4	2"C, 1-26/C *14, *8 Gnd		2"C, Pullwire		
	2"C, 5-2/C *14, 1-Opticom Cable				
	2"C, 2*10, *10 Gnd	11	2"C, 2*10, *10 Gnd		
	2"C, 1-12 Pair *19		2"C, Pullwire		
	2"C, Pullwire	12	2"C, 3*8, *8 Gnd		
5	2"C, 1-26/C *14, *8 Gnd		3"C, 2-26/C *14, *8 Gnd		
	2"C, 3-2/C *14, 1-Opticom Cable		3"C, 1-12 Pair *19		
	2"C, 1-12 Pair *19		3"C, 9-2/C *14		
	2"C, Pullwire		2"C, 3-Opticom Cable		
			2"C, 4*10, *10 Gnd		
			2"C, 3"C, Pullwire in Each		

See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise.

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7037-E
HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

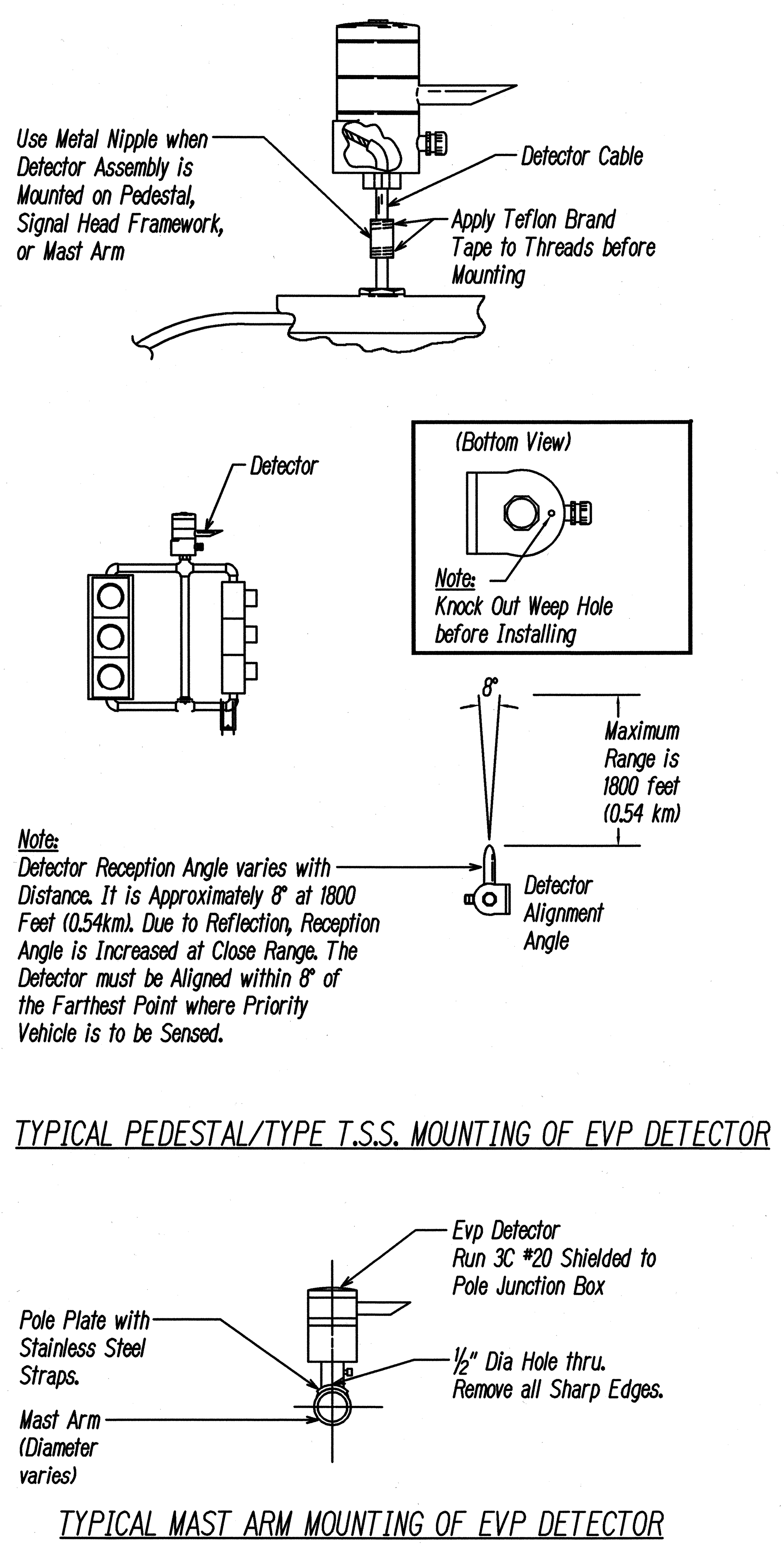
TRAFFIC SIGNAL DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

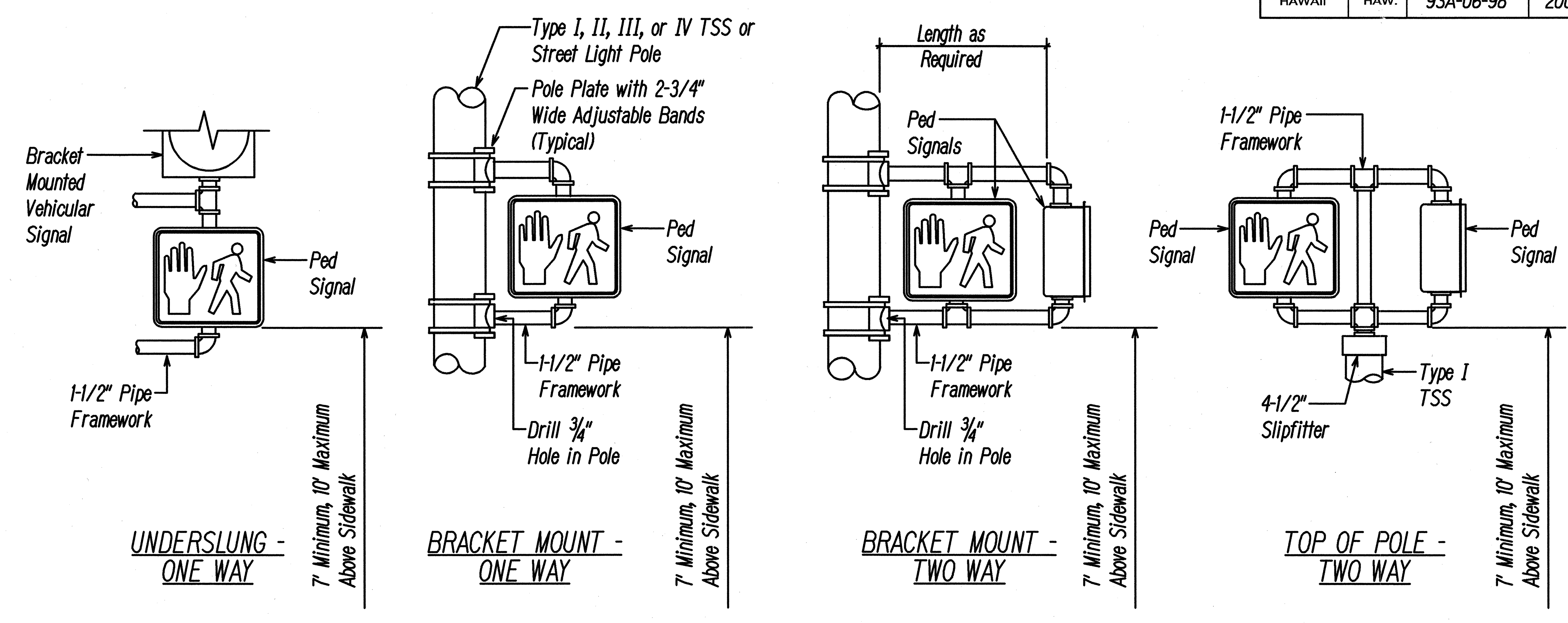
Scale: None Date: AUGUST 2000

SHEET No. E-10 OF 30 SHEETS

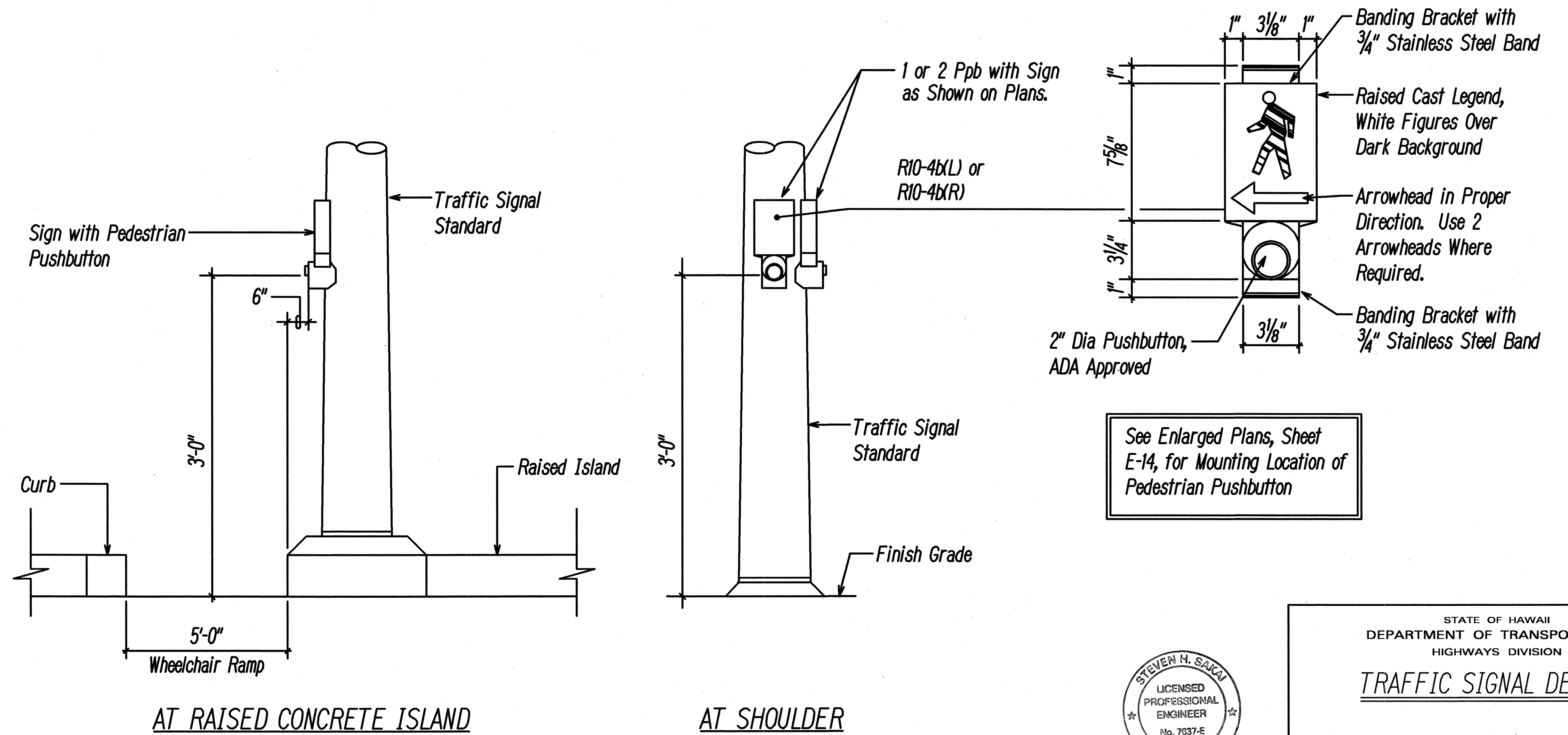
ORIGINAL PLAN | NOTE BOOK No. 8004d11.dgn | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE



A E-11 EVP DETECTOR MOUNTING
Not to Scale



B E-11 PEDESTRIAN SIGNAL MOUNTINGS
Not to Scale



See Enlarged Plans, Sheet E-14, for Mounting Location of Pedestrian Pushbutton

C E-11 PEDESTRIAN PUSHBUTTON DETAILS
Not to Scale

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STATE OF HAWAII
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HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

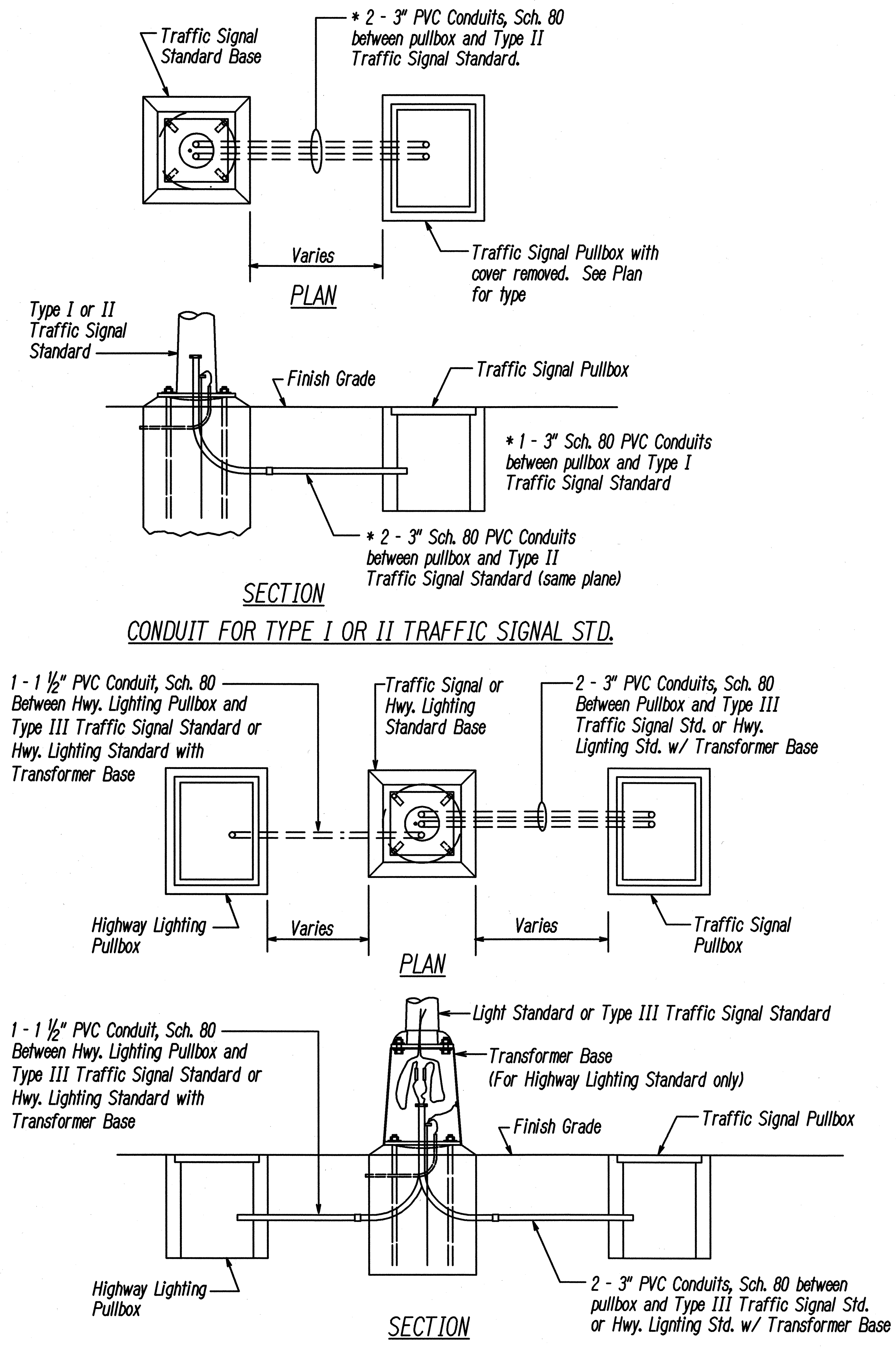
Scale: None Date: AUGUST 2000

SHEET No. E-11 OF 30 SHEETS

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

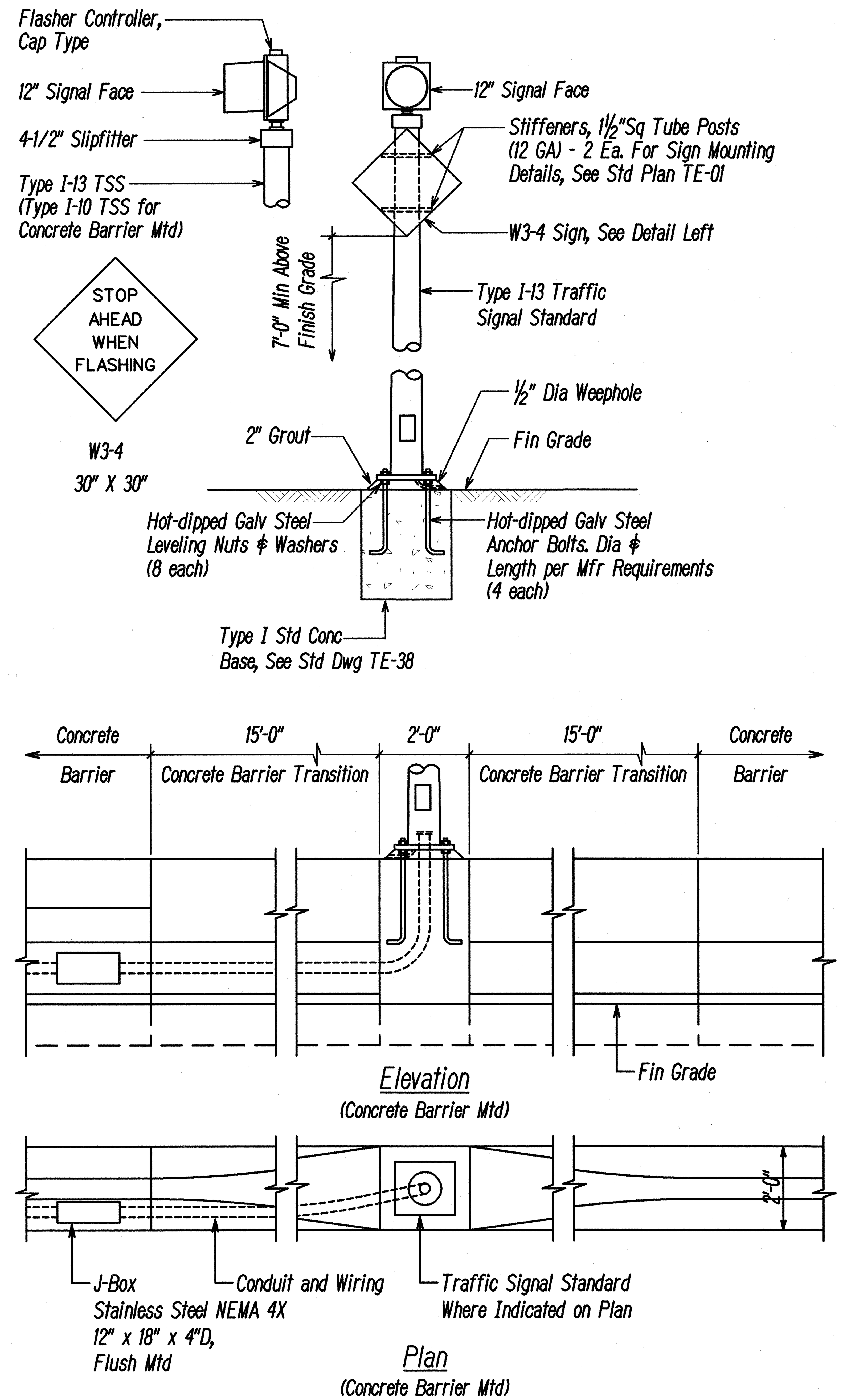
09 AUG 100 06:44:50 LA z:\cadprojects\98004\dgn\e004e09.dgn

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	50	68



A / E-12 CONDUIT DETAILS FOR TRAFFIC SIGNAL/HWY. LIGHTING STANDARD

N.T.S.

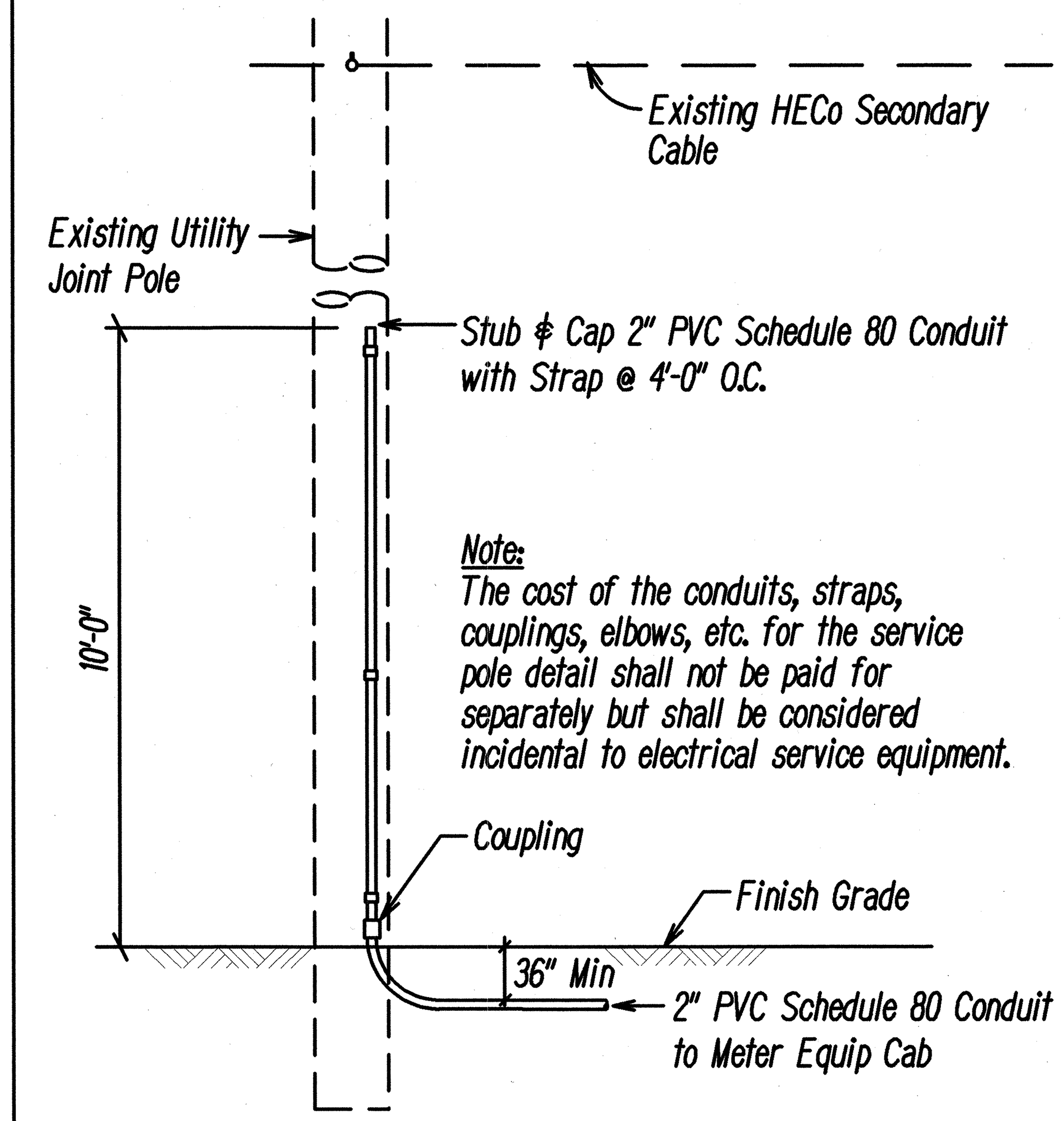


Notes:

1. J-Box and Standard shall be located Min 5'-0" From Expansion and Construction Joints.
2. Provide Expansion Couplings at Expansion Joints

B / E-12 STOP AHEAD WARNING FLASHER

Not To Scale



C / E-12 RISER POLE DETAIL

N.T.S.

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TRAFFIC SIGNAL DETAILS

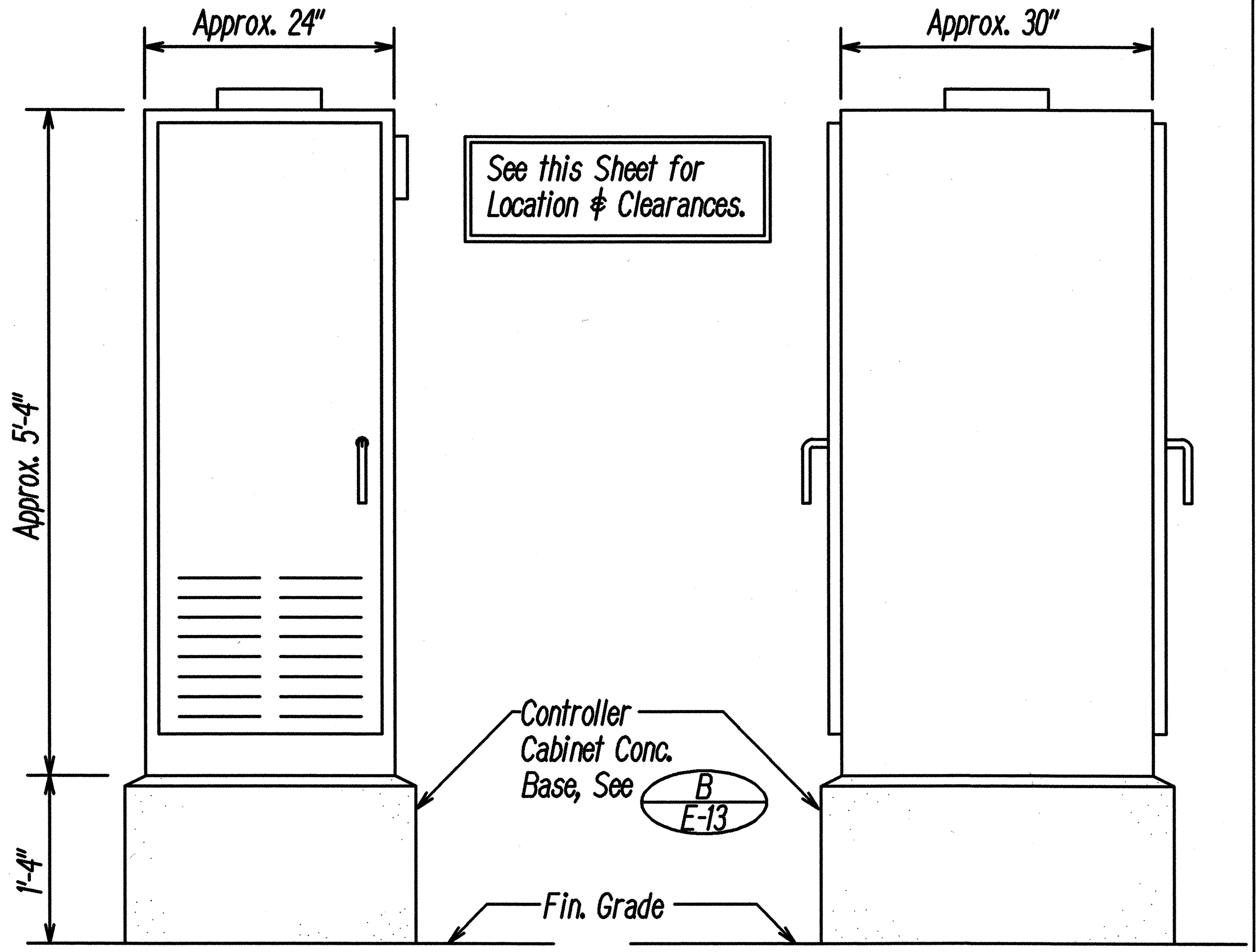
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-12 OF 30 SHEETS

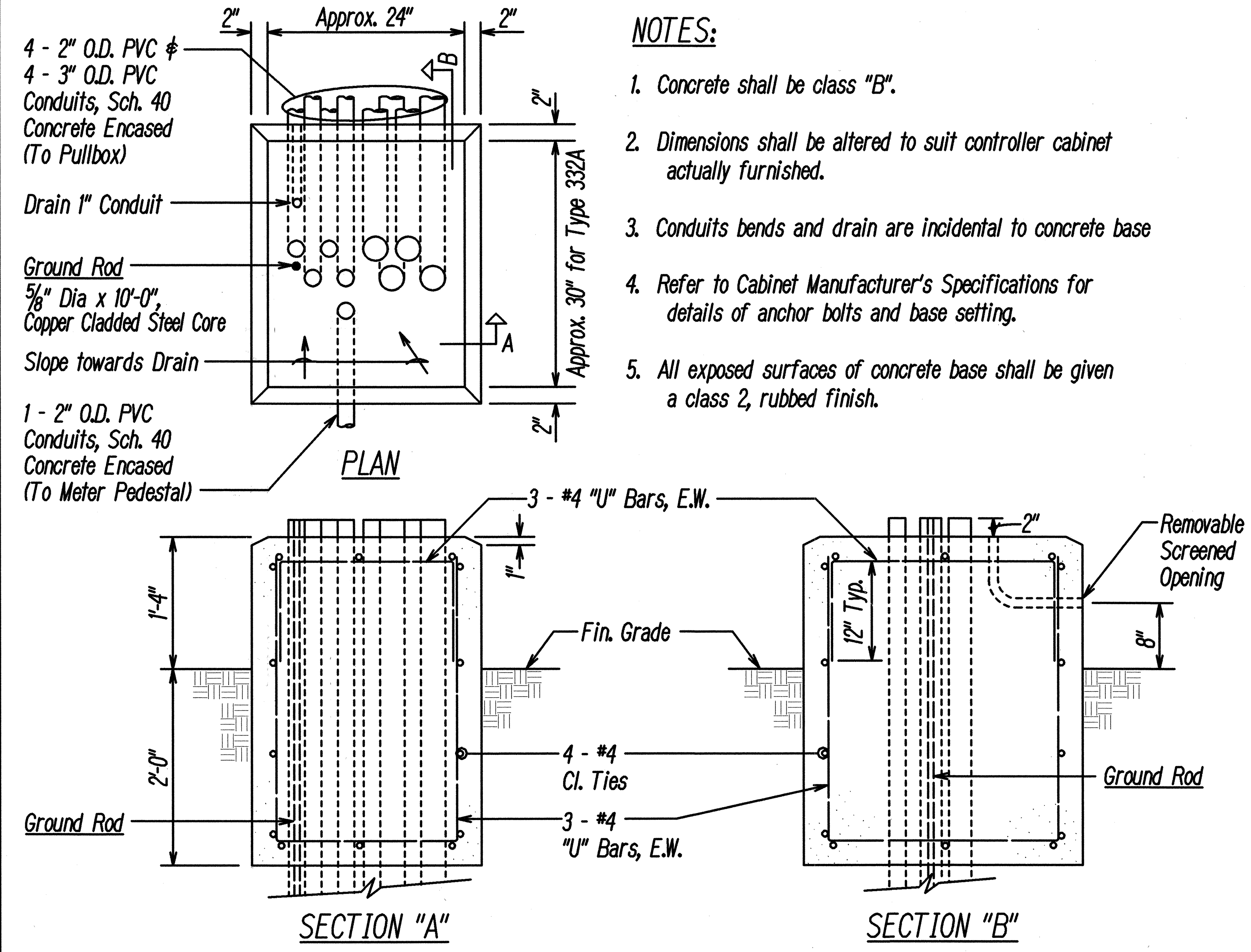
ORIGINAL PLAN / NOTE BOOK / No.
SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY / DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	51	68



A/E-13 TYPE 332A TRAFFIC SIGNAL CONTROLLER CABINET DETAIL

N.T.S.

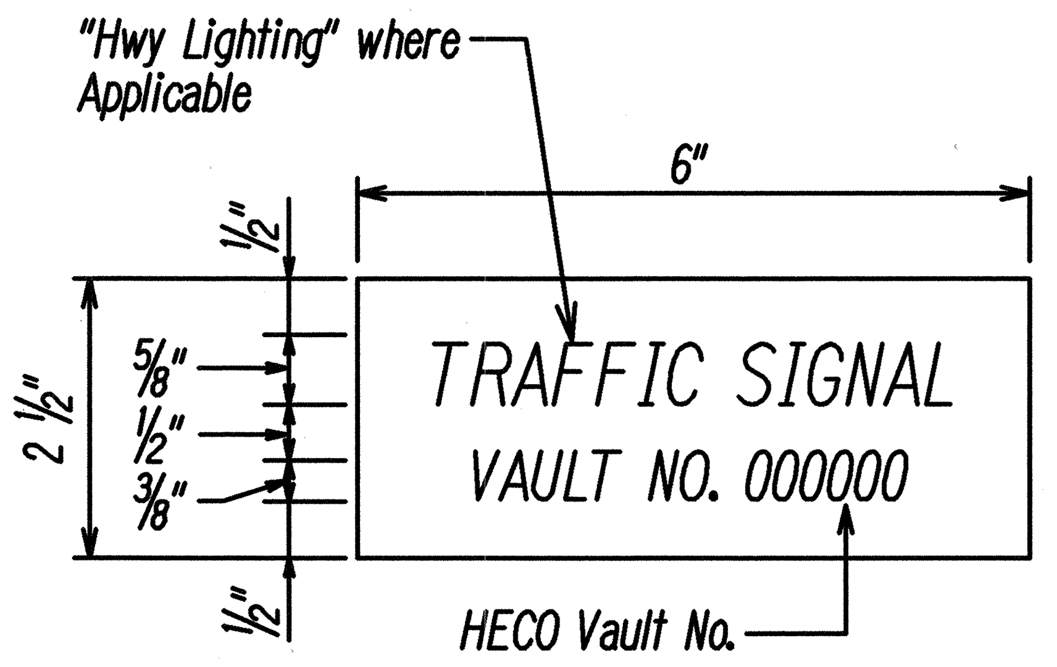


B/E-13 CONTROLLER CABINET CONCRETE BASE

N.T.S.

NOTES:

1. Concrete shall be class "B".
2. Dimensions shall be altered to suit controller cabinet actually furnished.
3. Conduits 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.

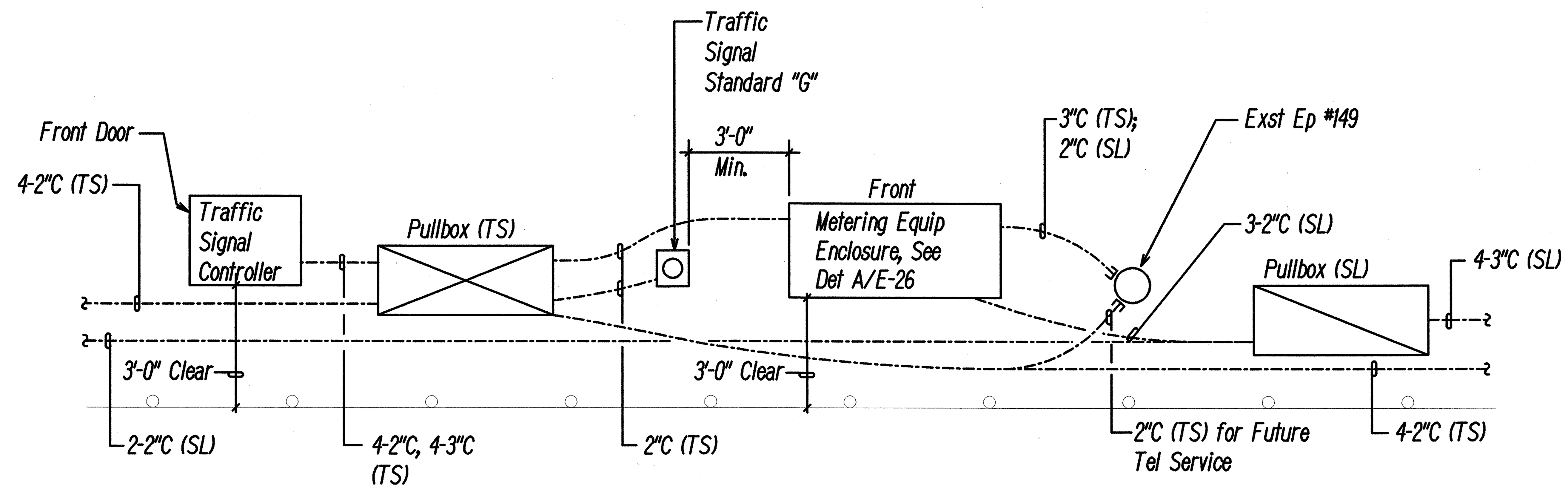


NOTES:

1. Use 3-ply laminated flexible plastic, black-white-black thickness: black cap sheet - 0.010", white base sheet - 0.052", black base sheet - 0.010".
2. Attach to Meter Socket using Scotch 3M Brand very high bond (VHB) double coated acrylic foam tape or equivalent.
3. Letters/Numbers shall be 1/16 " stroke, (white in color).
4. Letters/Numbers area inscribed by cutting through "black cap sheet" to expose white letters/numbers.

C/E-13 METER I.D. TAG DETAIL

N.T.S.



Notes:

1. Controller & Meter Equipment Enclosure shall be 36" Clear from Guardrail
2. See Plans for Wiring Requirements
3. See Sht E-24 for One-Line Diagram

D/E-13 ENLARGED EQUIPMENT PLAN

N.T.S.

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

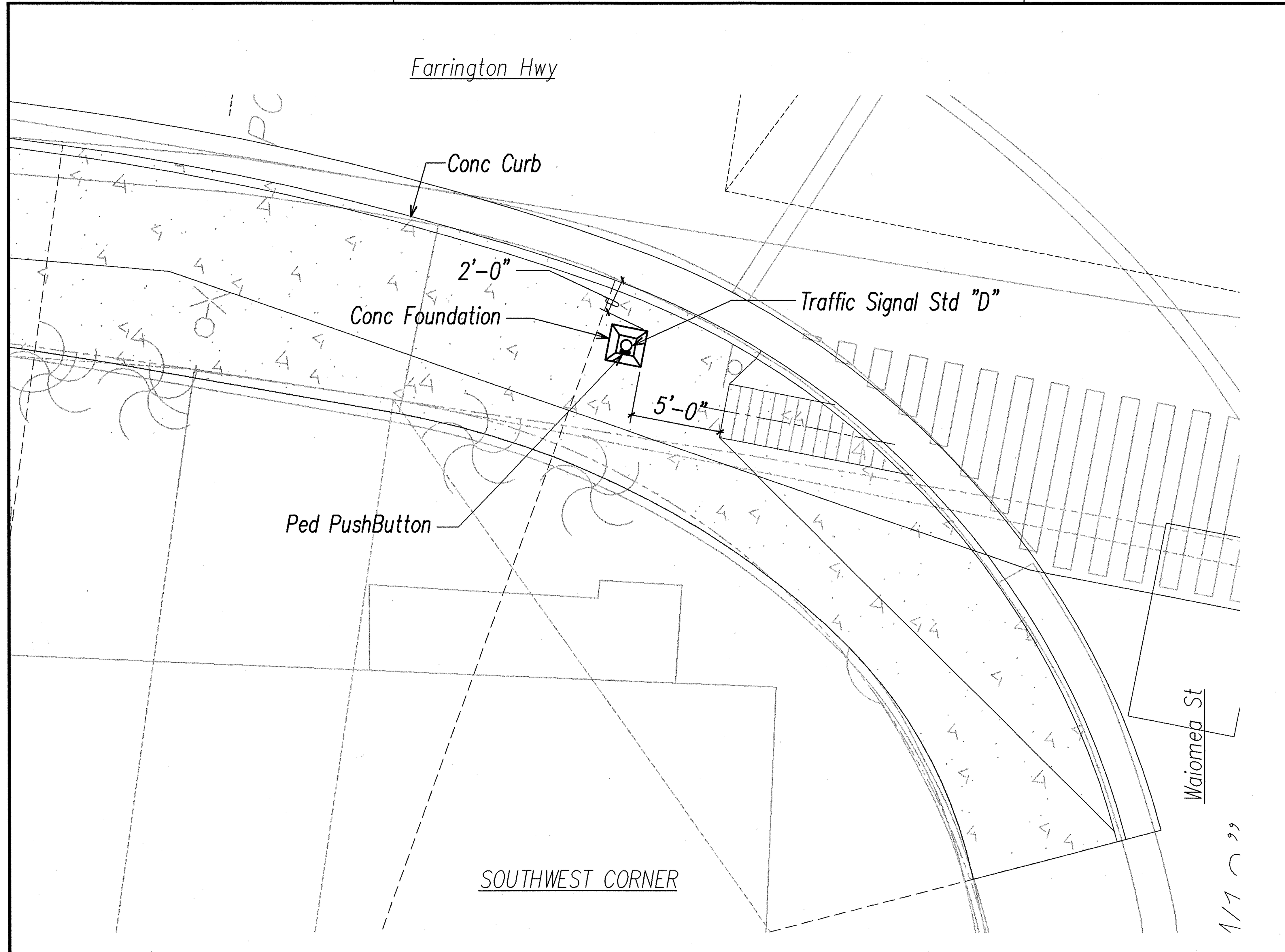
TRAFFIC SIGNAL DETAILS

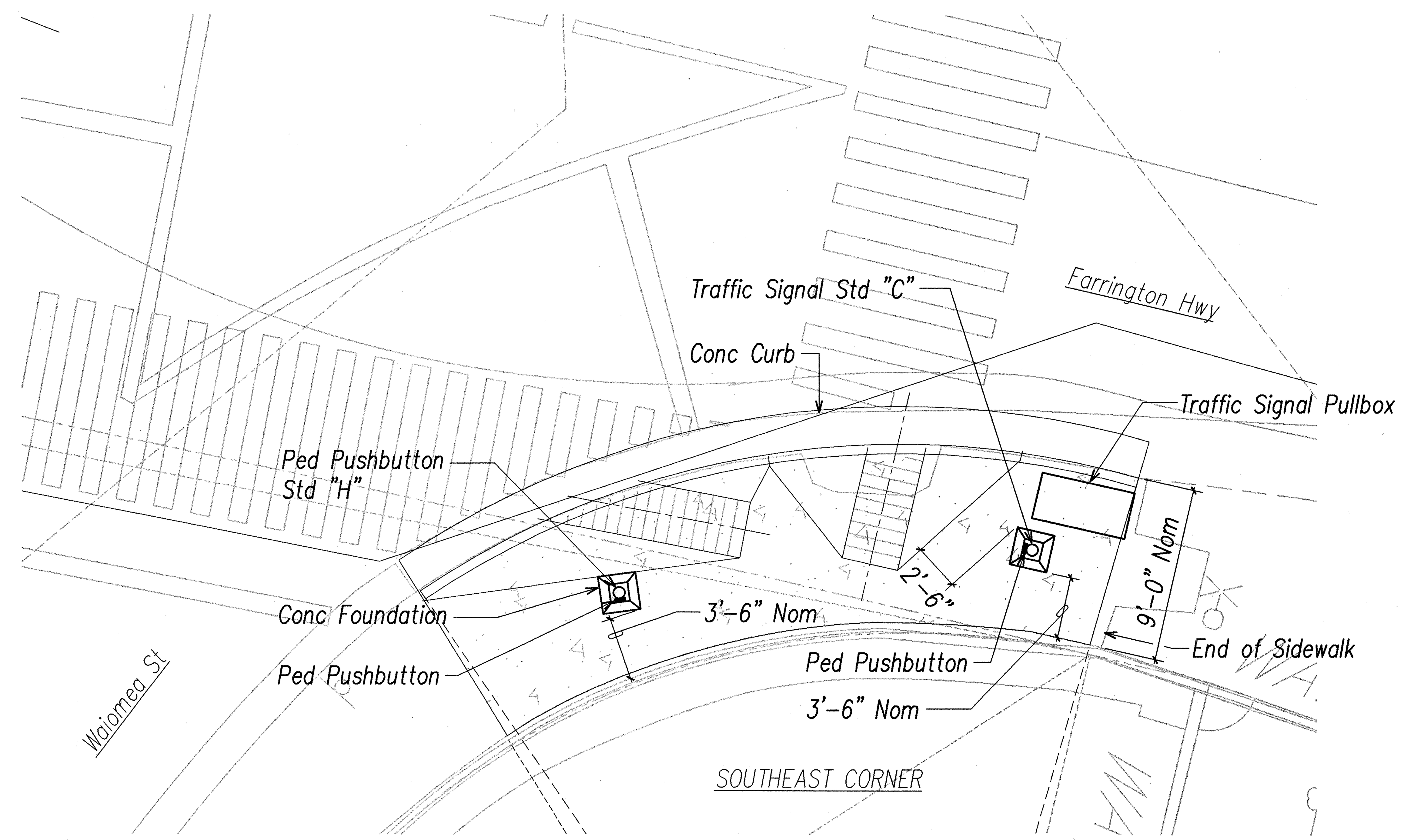
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: Shown | Date: AUGUST 2000

SHEET No. E-13 OF 30 SHEETS

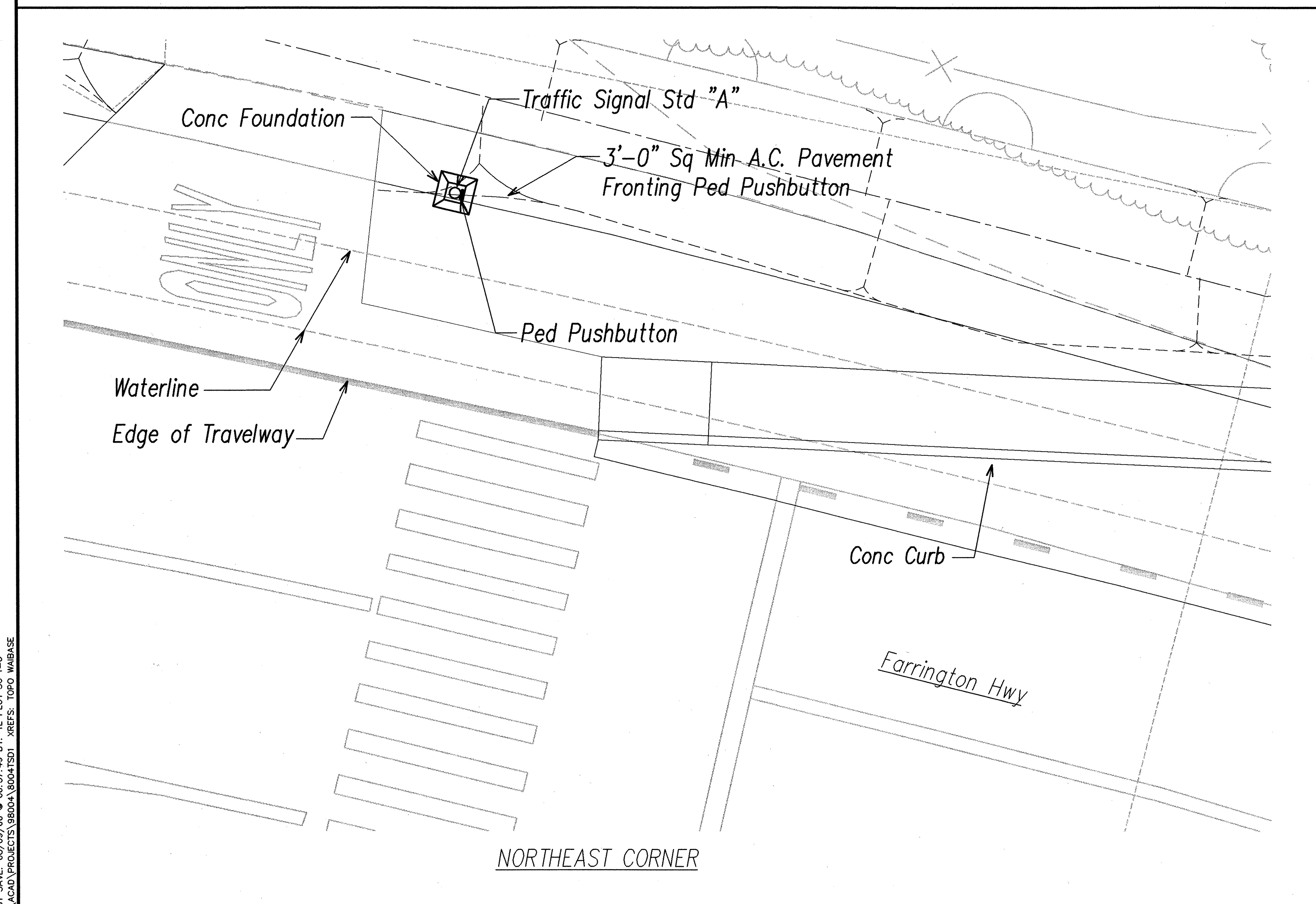
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	52	68





A / E-14 **PEDESTRIAN PUSHBUTTON ORIENTATION DETAILS**

NOT TO SCALE



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STATE OF HAWAII
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HIGHWAYS DIVISION

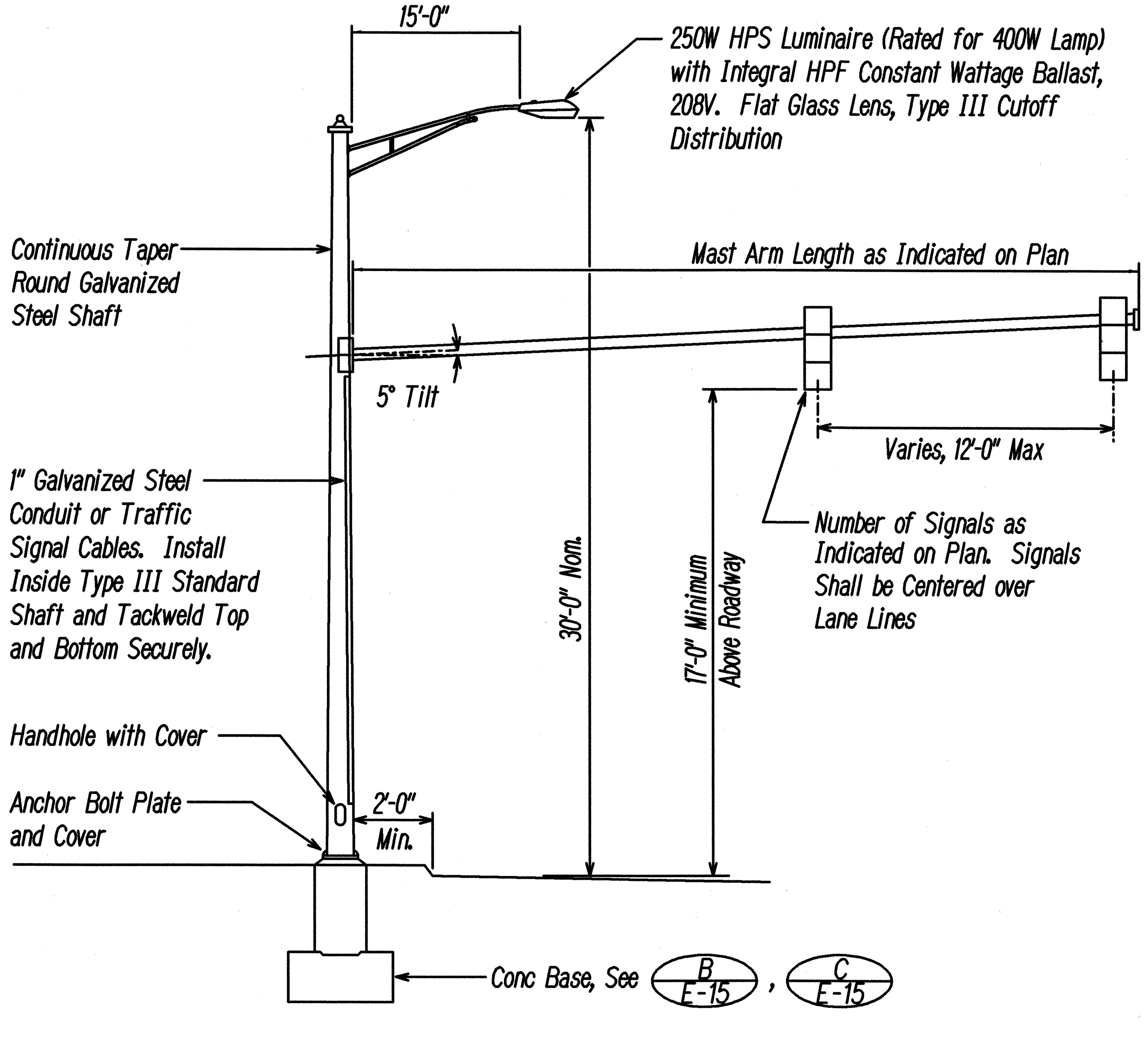
TRAFFIC SIGNAL DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-14 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	53	68



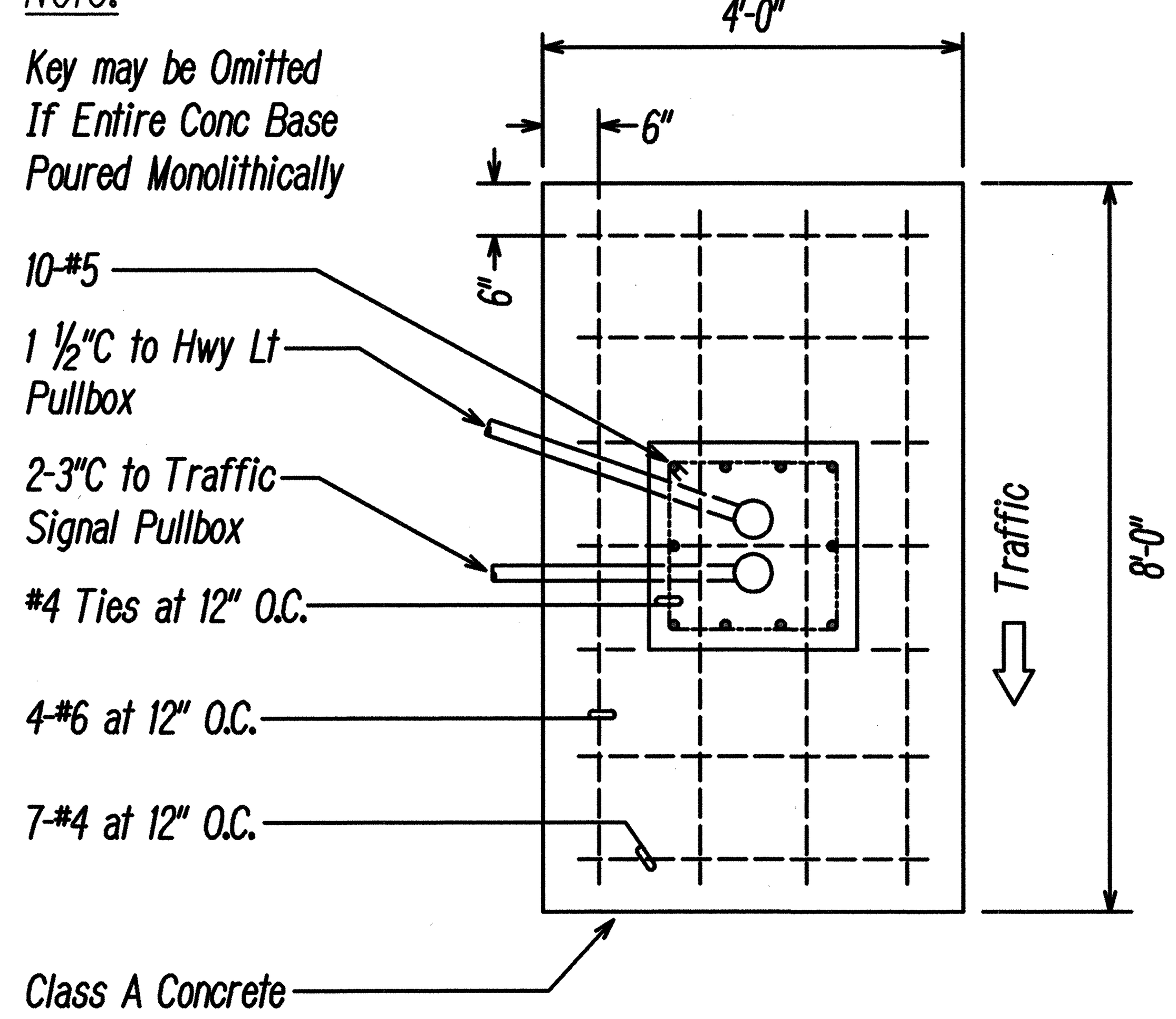
ELEVATION

Notes:

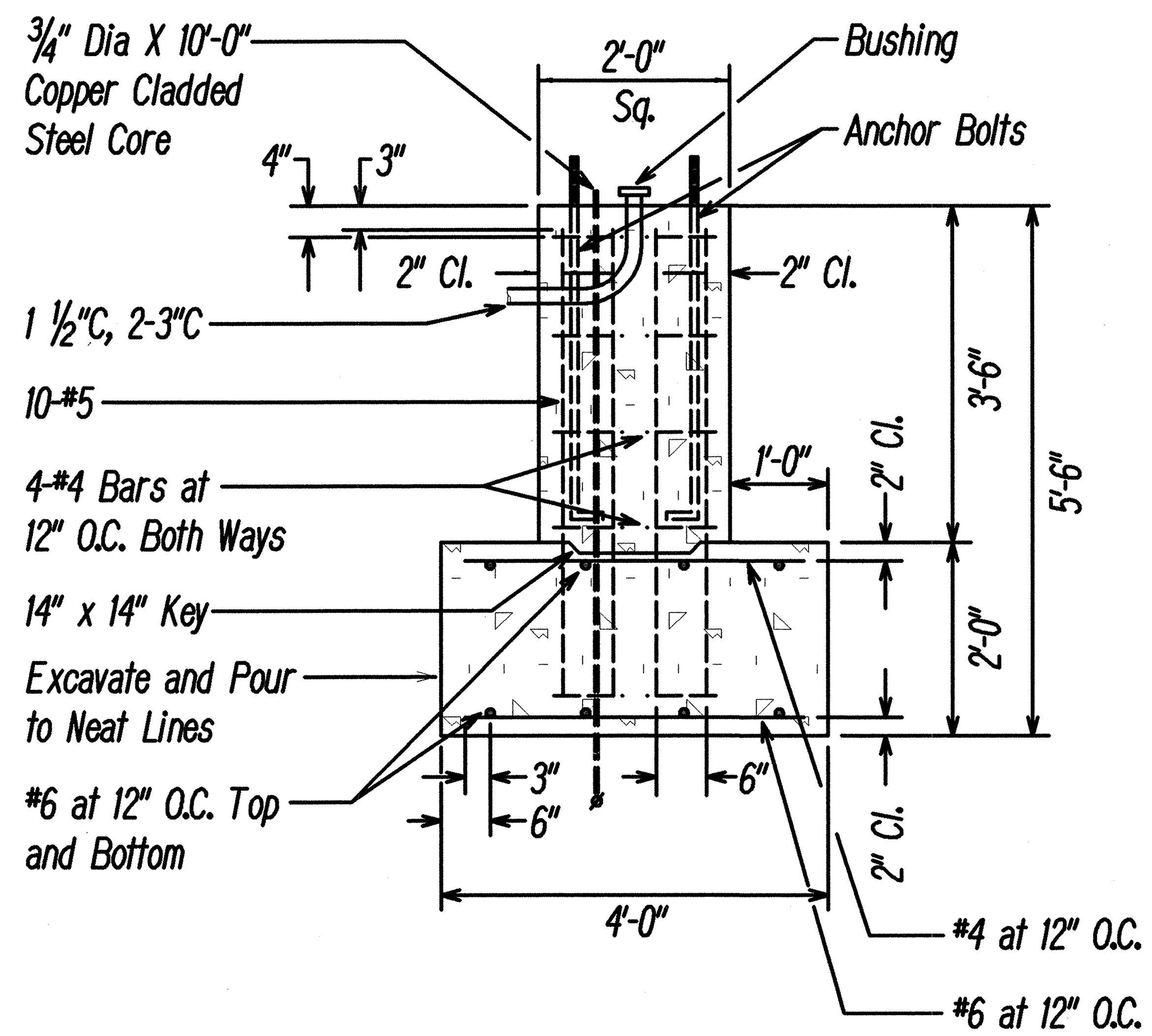
1. Item for Type III Traffic Sgnal Standard with Mast Arm and Foundation includes Highway Lighting Bracket Arm.
2. Highway Lighting Luminaire to be Paid for Under Respective Items in Section 622.
3. For Additional Details See Standard Plan TE-38.
4. Size, Length and Diameter of Anchor Bolts shall be as Recommended by the Manufacturer. Contractor shall Submit Catalog Cuts to the Engineer for Approval.
5. Handhole shall be Opposite of Traffic Flow.

A/E-15 TRAFFIC SIGNAL TYPE III STANDARD
NOT TO SCALE

Note:
Key may be Omitted If Entire Conc Base Poured Monolithically



B/E-15 CONCRETE BASE PLAN
NOT TO SCALE



Note: See Details B/E-15

C/E-15 CONCRETE BASE ELEVATION
NOT TO SCALE

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STATE OF HAWAII
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HIGHWAYS DIVISION

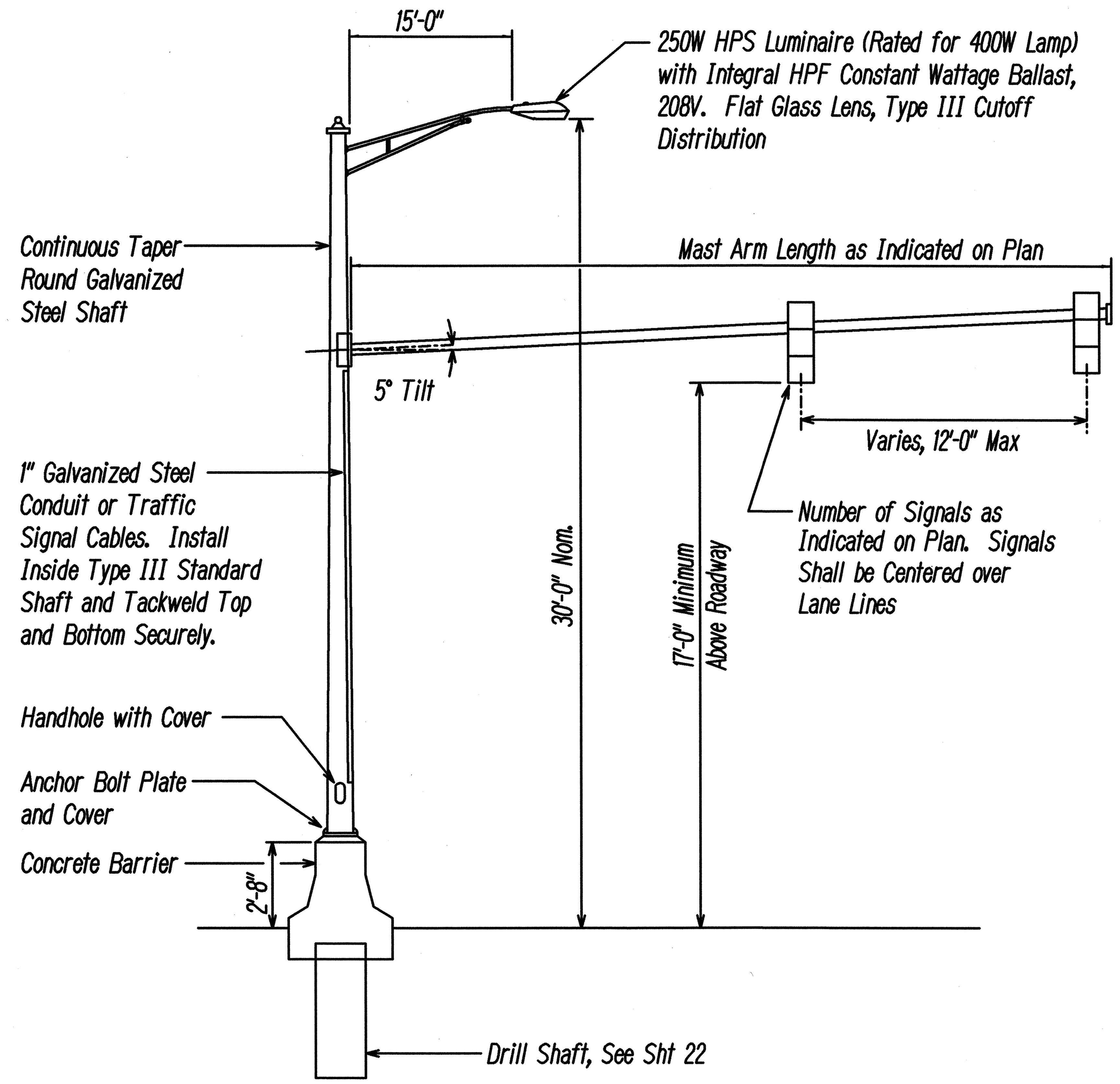
TRAFFIC SIGNAL DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

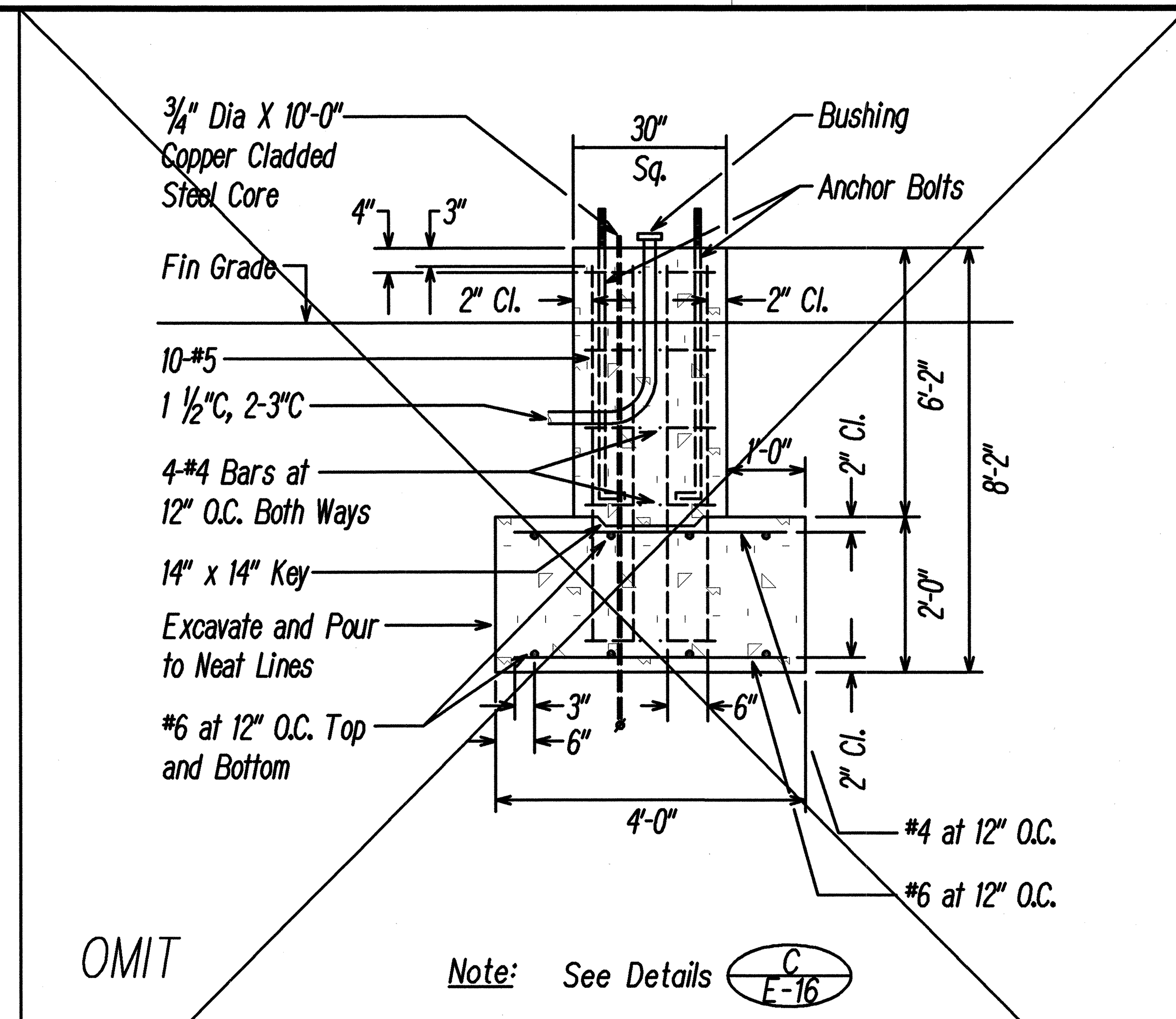
Scale: None Date: AUGUST 2000

SHEET No. E-15 OF 30 SHEETS

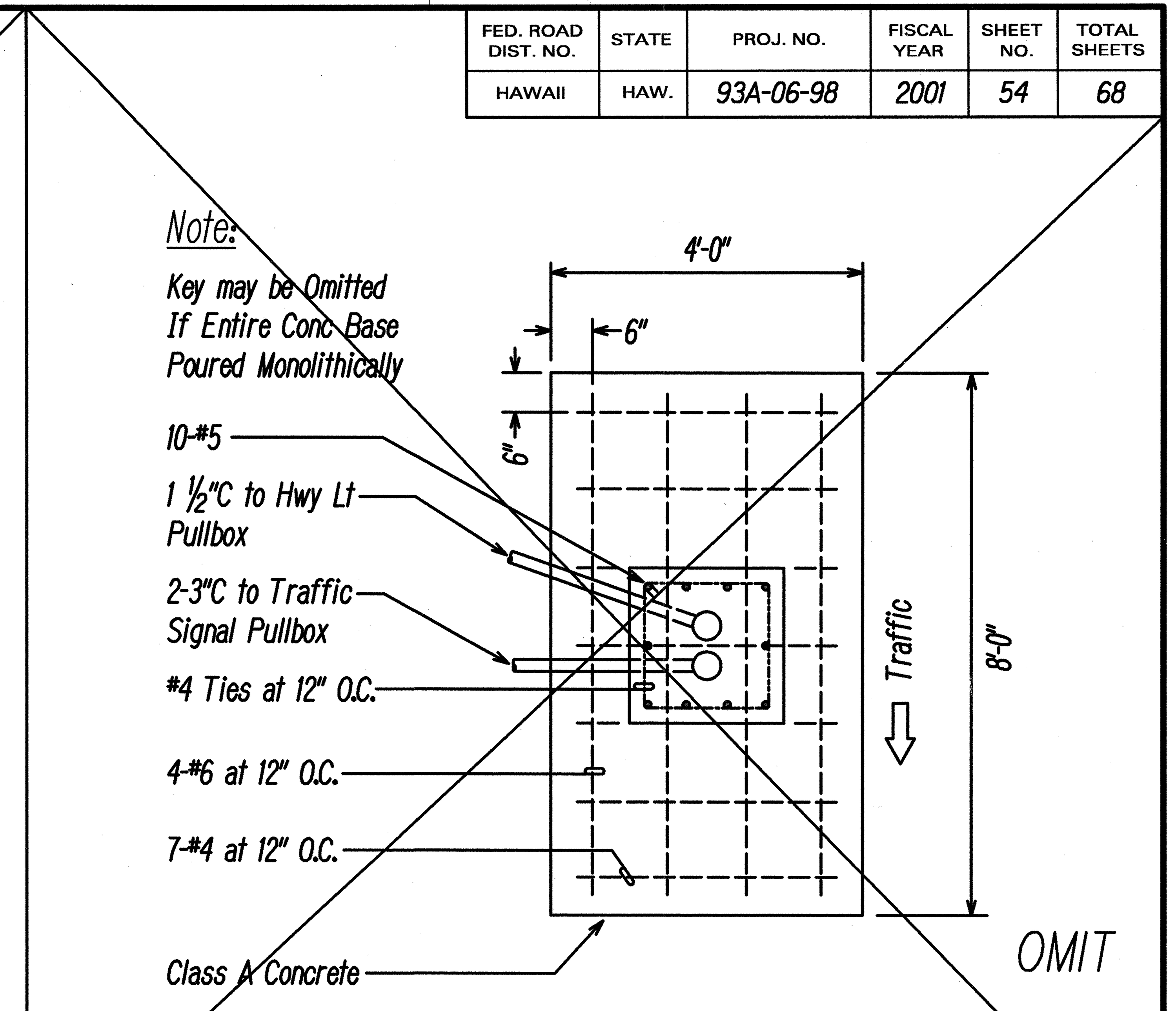
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	54	68



ELEVATION



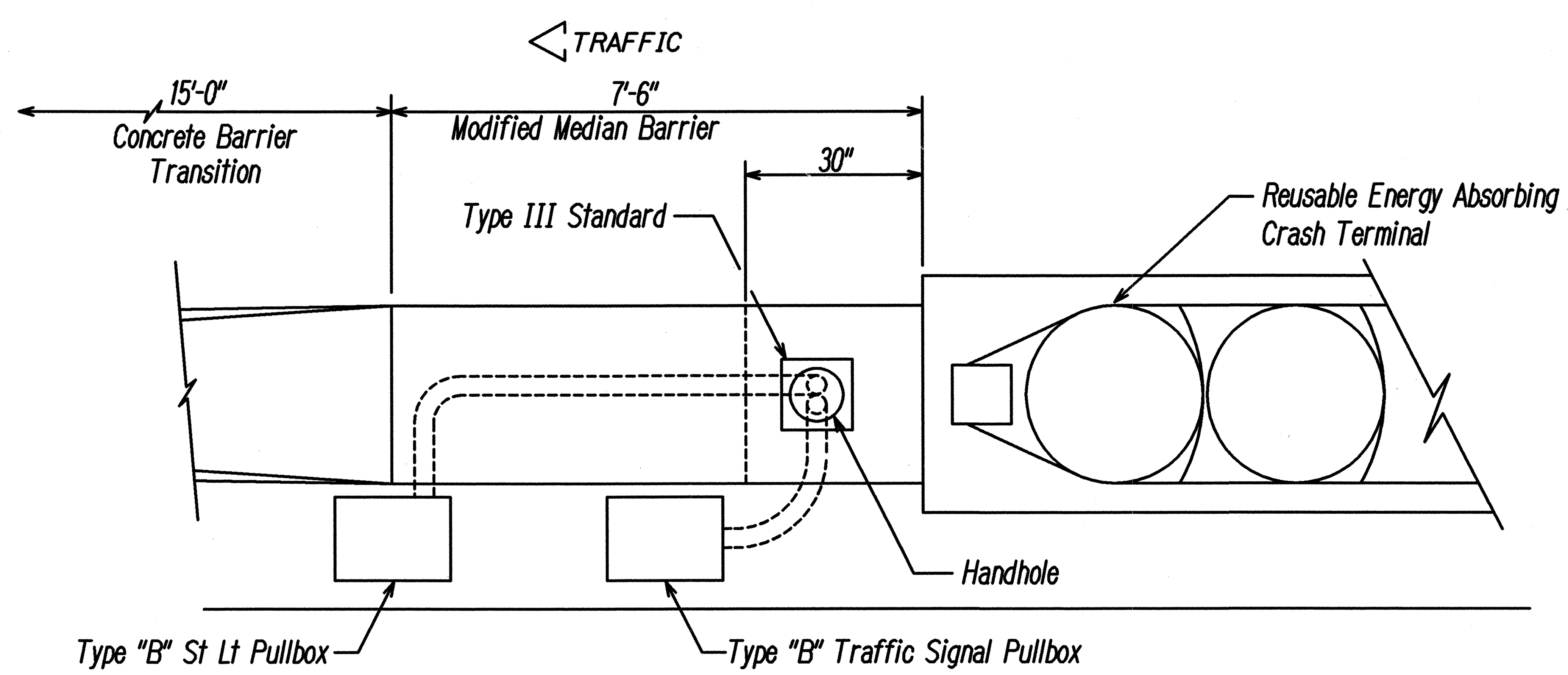
B E-16 CONCRETE BASE ELEVATION
NOT TO SCALE



C E-16 CONCRETE BASE PLAN
NOT TO SCALE

Notes:

1. Item for Type III Traffic Sgnal Standard with Mast Arm and Foundation includes Highway Lighting Bracket Arm.
2. Highway Lighting Luminaire to be Paid for Under Respective Items in Section 622.
3. For Additional Details See Standard Plan TE-38.
4. Size, Length and Diameter of Anchor Bolts shall be as Recommended by the Manufacturer. Contractor shall Submit Catalog Cuts to the Engineer for Approval.
5. Handhole shall Face Travelway.



PLAN VIEW

A E-16 TRAFFIC SIGNAL TYPE III STANDARD ON CONCRETE BARRIER
NOT TO SCALE

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

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DATE	DESCRIPTION
10/9/00	Clarified TS Std Foundation

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

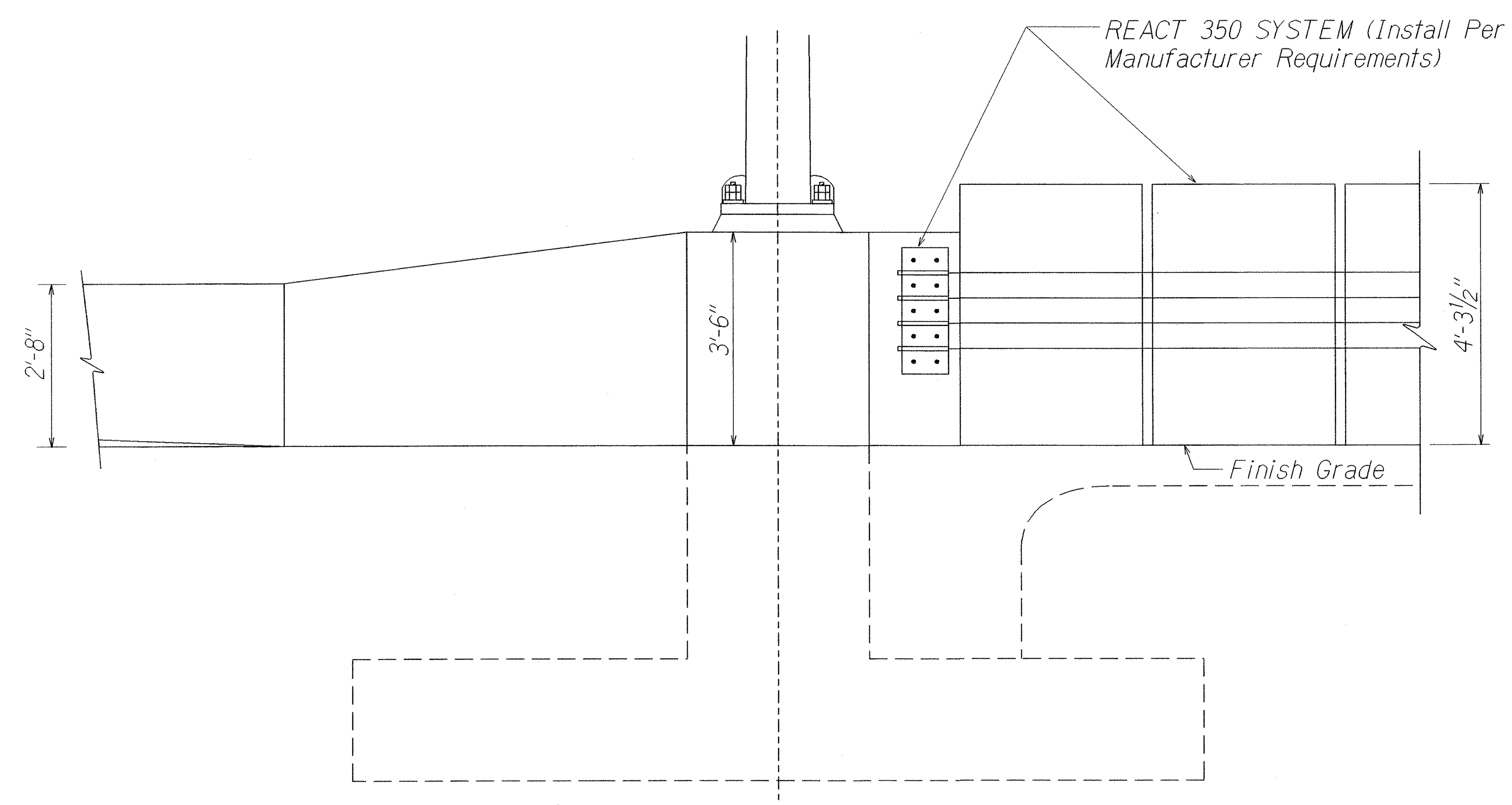
TRAFFIC SIGNAL DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

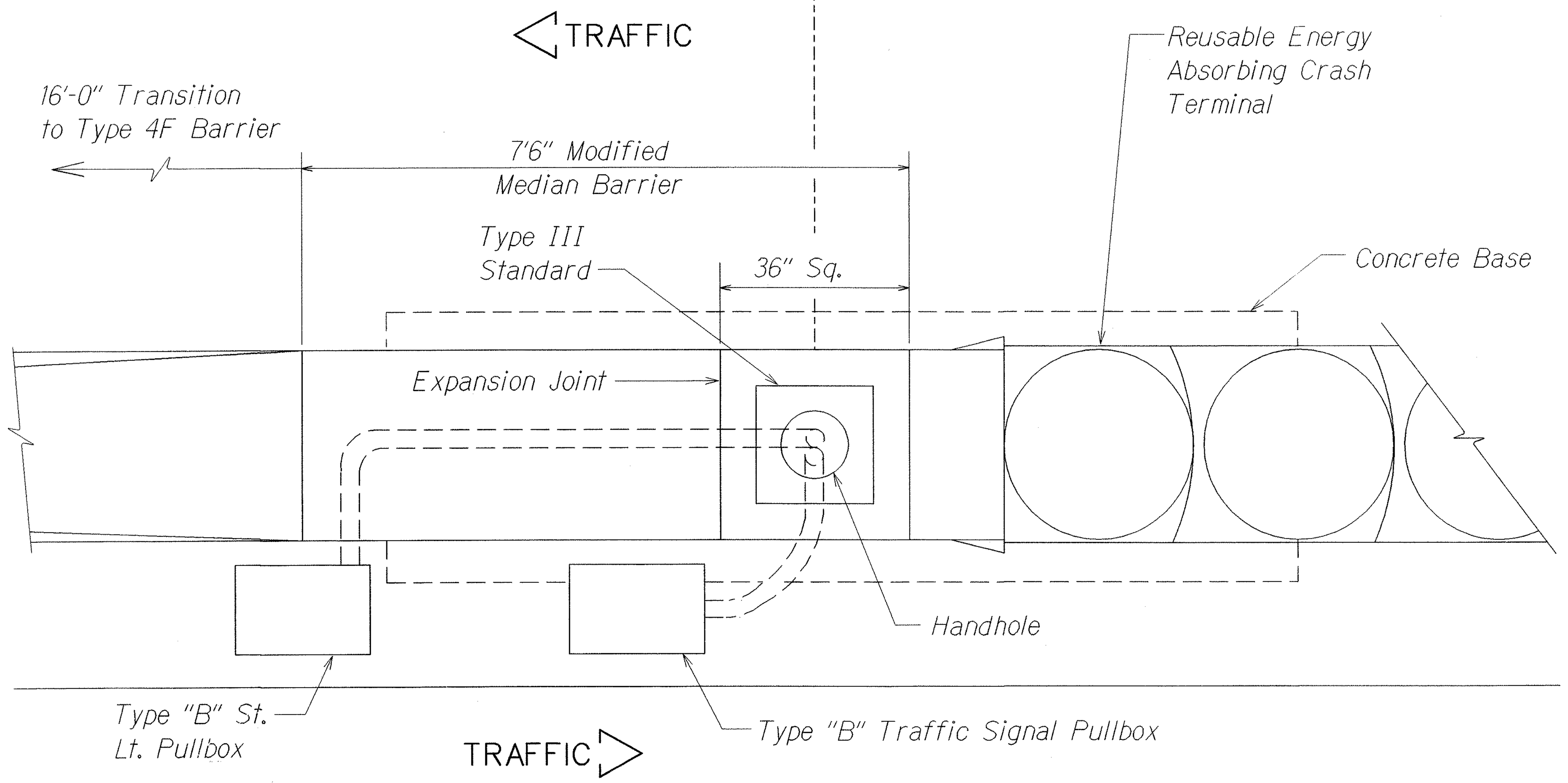
Scale: None — Date: AUGUST 2000

SHEET No. E-16 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	C.O. 54 S-1	68



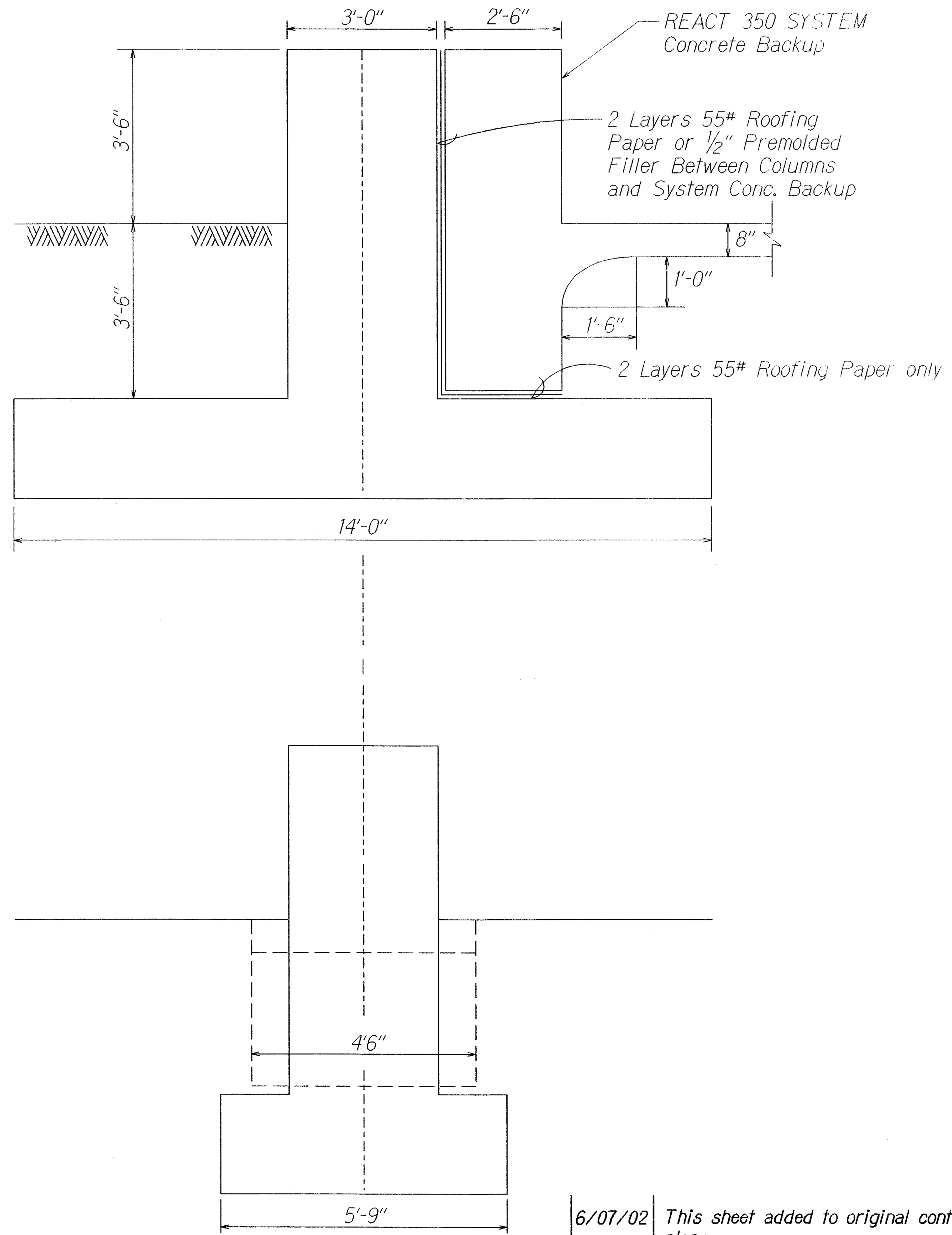
PROFILE VIEW



PLAN VIEW

A / E-16 TRAFFIC SIGNAL TYPE III STANDARD ON CONCRETE BARRIER

Not to Scale



DATE	REVISION
6/07/02	This sheet added to original contract plans.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

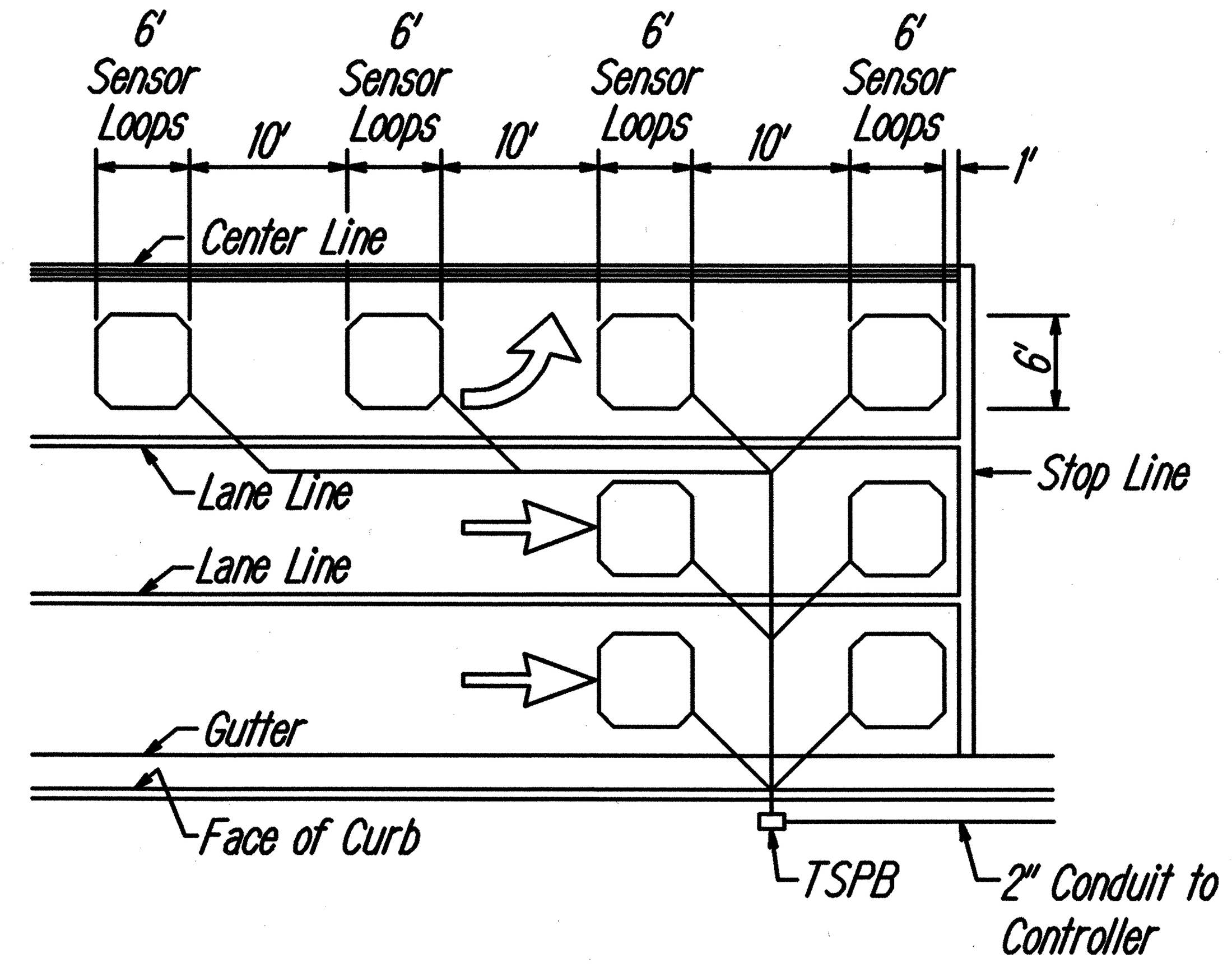
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Not to Scale — Date: August 2000

SHEET No. E-16 OF 30 SHEETS

C.O. ADD. 54 S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	55	68

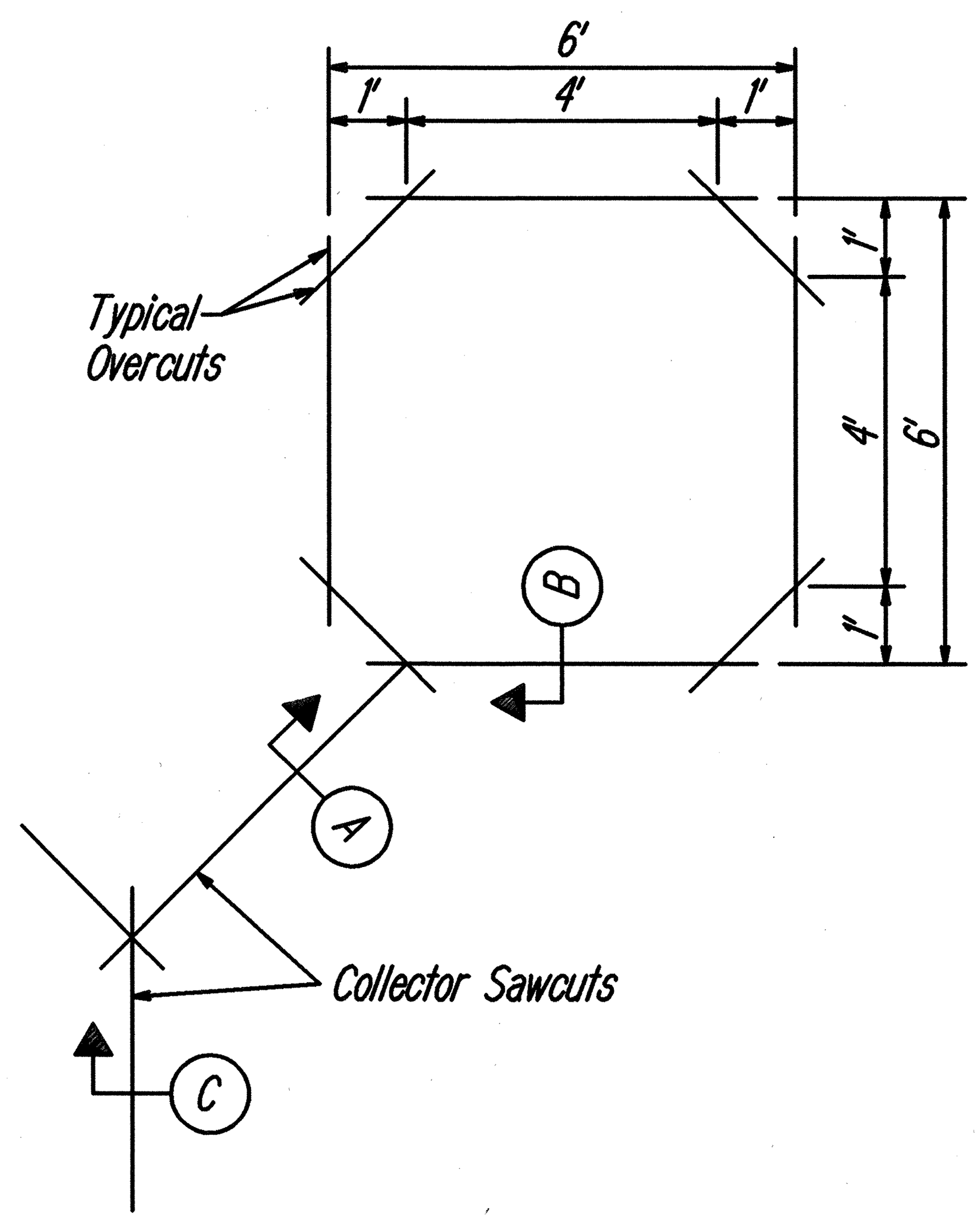


NOTES:

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.

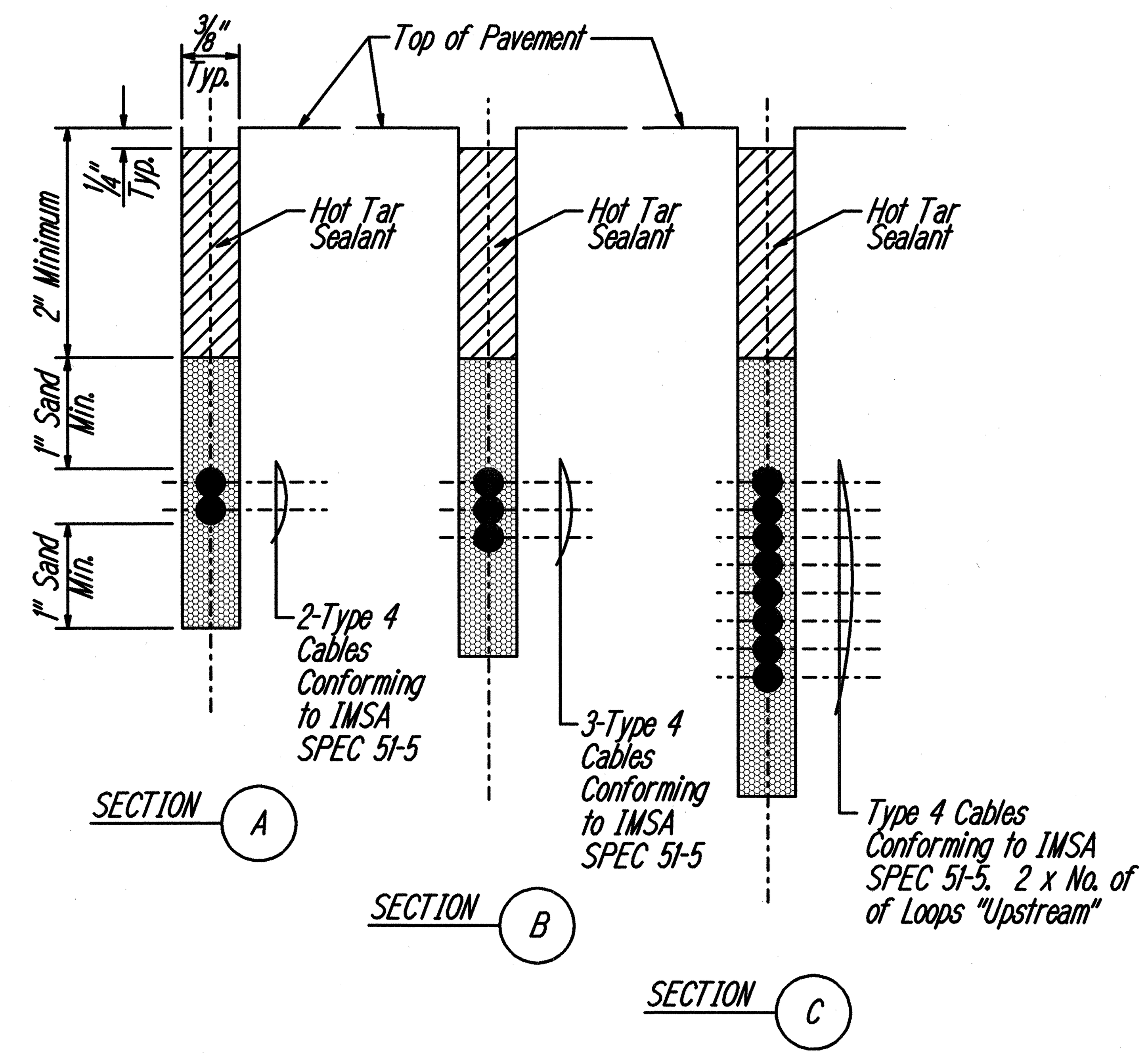
A / E-17 TYPICAL SENSOR LOOP LAYOUT

N.T.S.



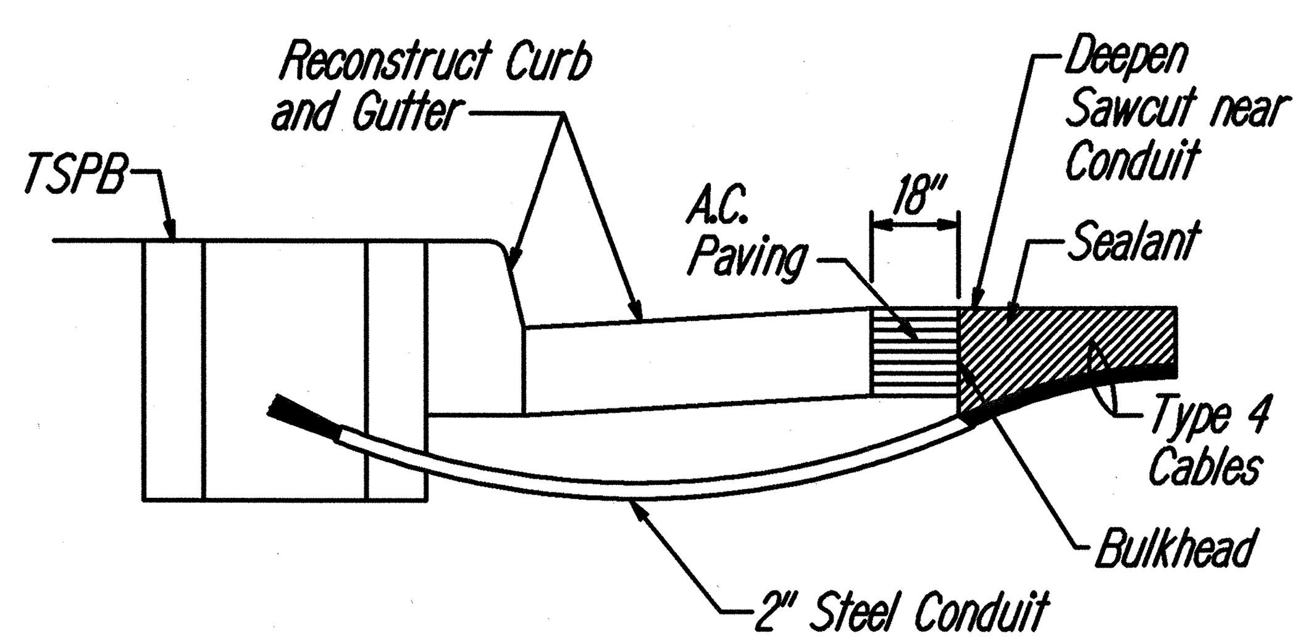
NOTE:

Length of overcuts shall be kept to a minimum.
All overcuts shall be back filled with hot tar.



B / E-17 TYPICAL SENSOR LOOP SAWCUT DETAIL

N.T.S.

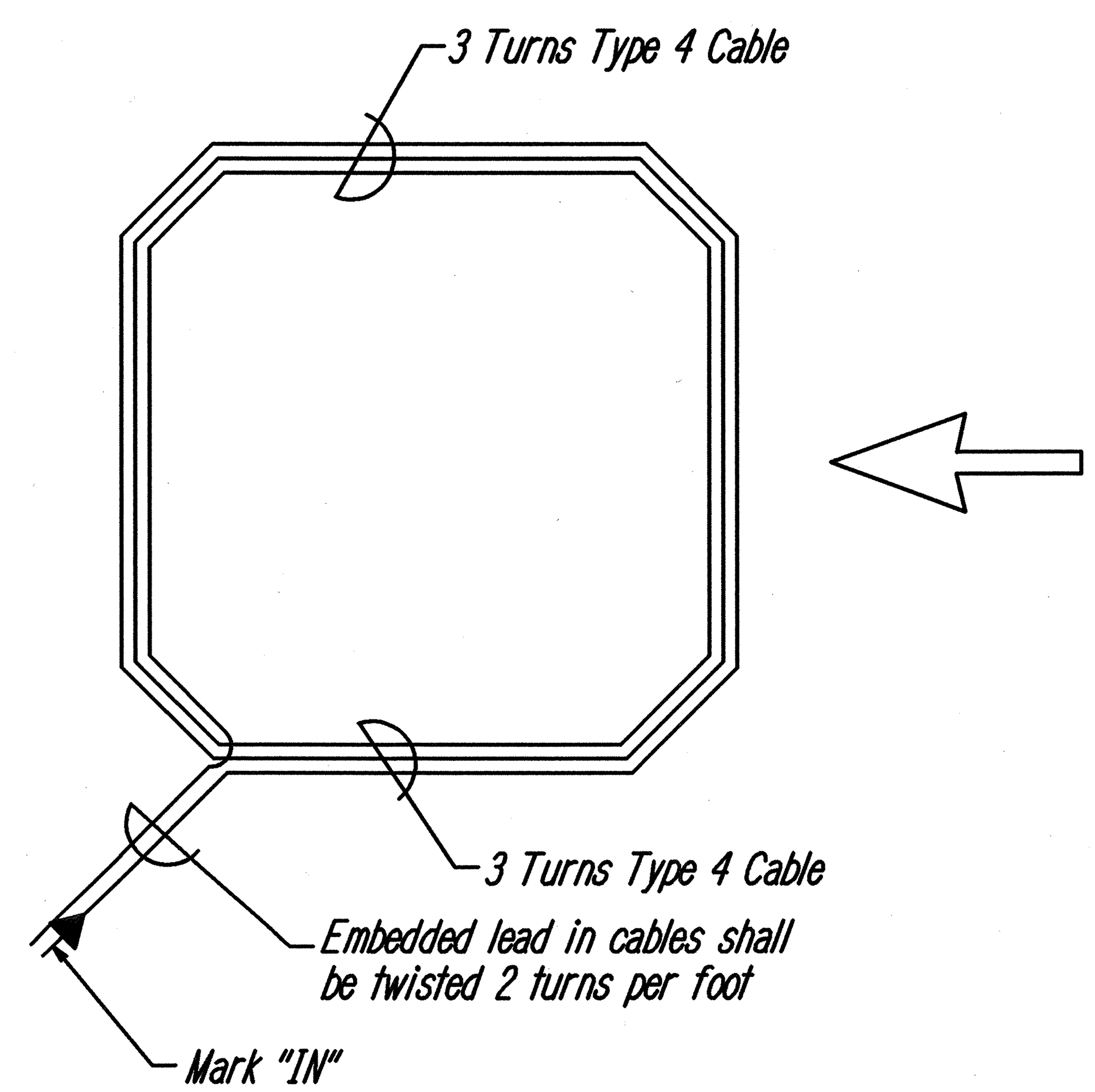


NOTES ON CONSTRUCTION AT END OF SAWCUT

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.

C / E-17 DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF ROADWAY

N.T.S.



D / E-17 TYPICAL SENSOR LOOP WIRING DIAGRAM

N.T.S.

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

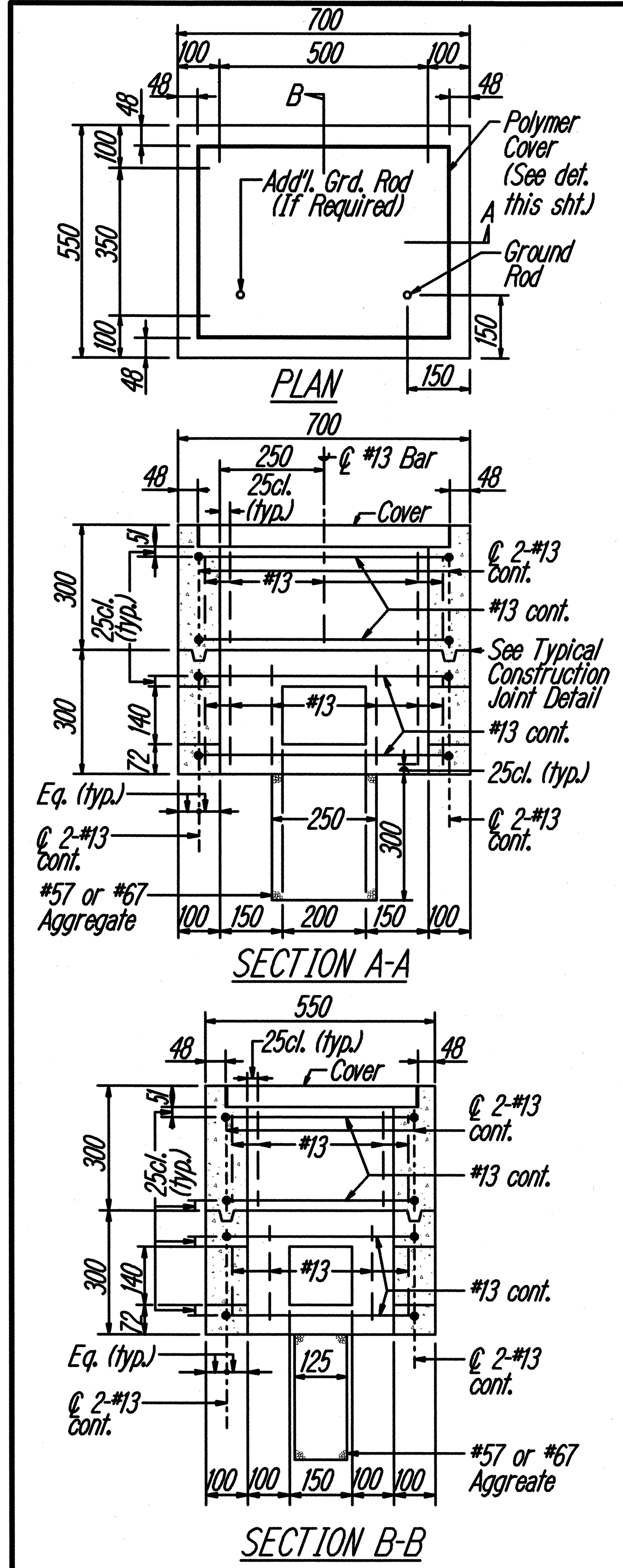
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-17 OF 30 SHEETS

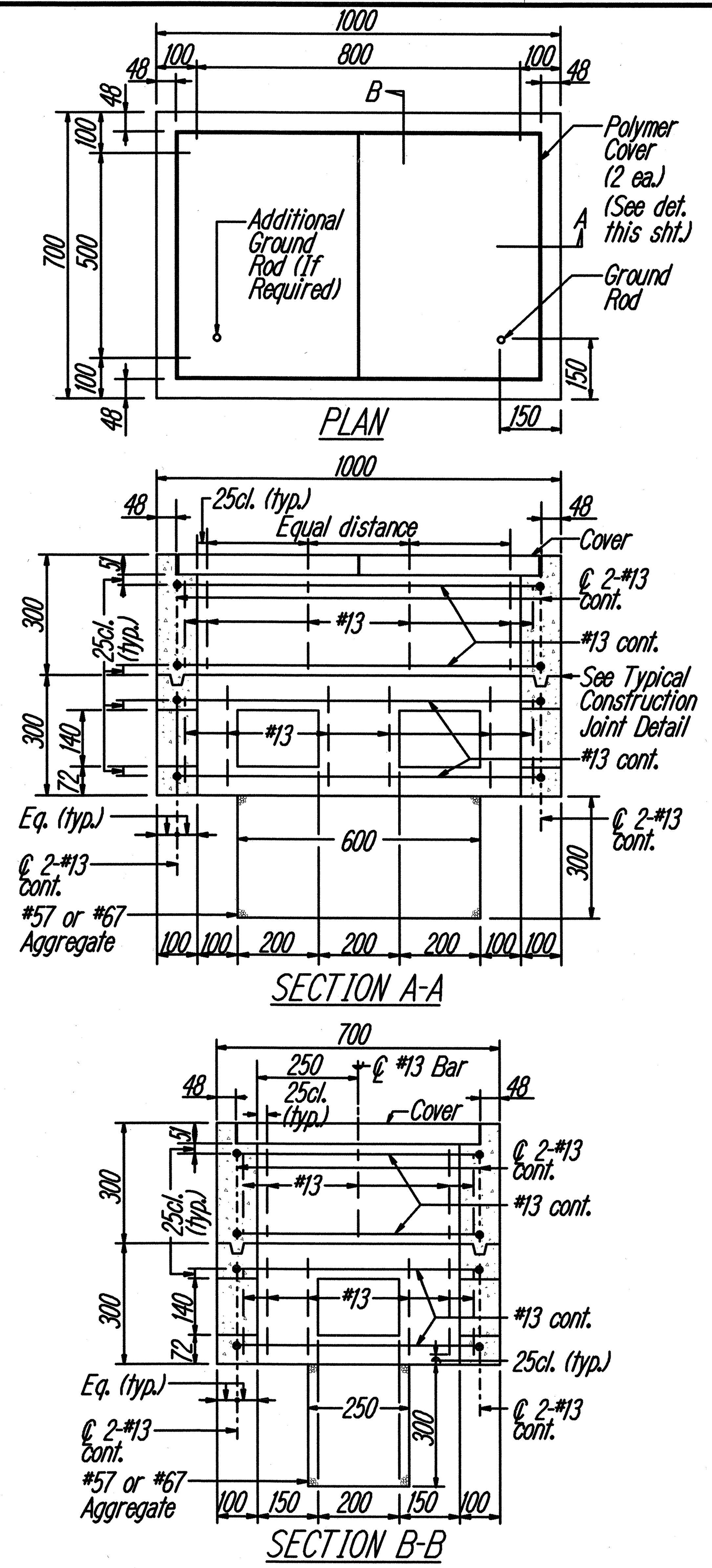
ORIGINAL PLAN / NOTE BOOK / SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY / DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	56	68



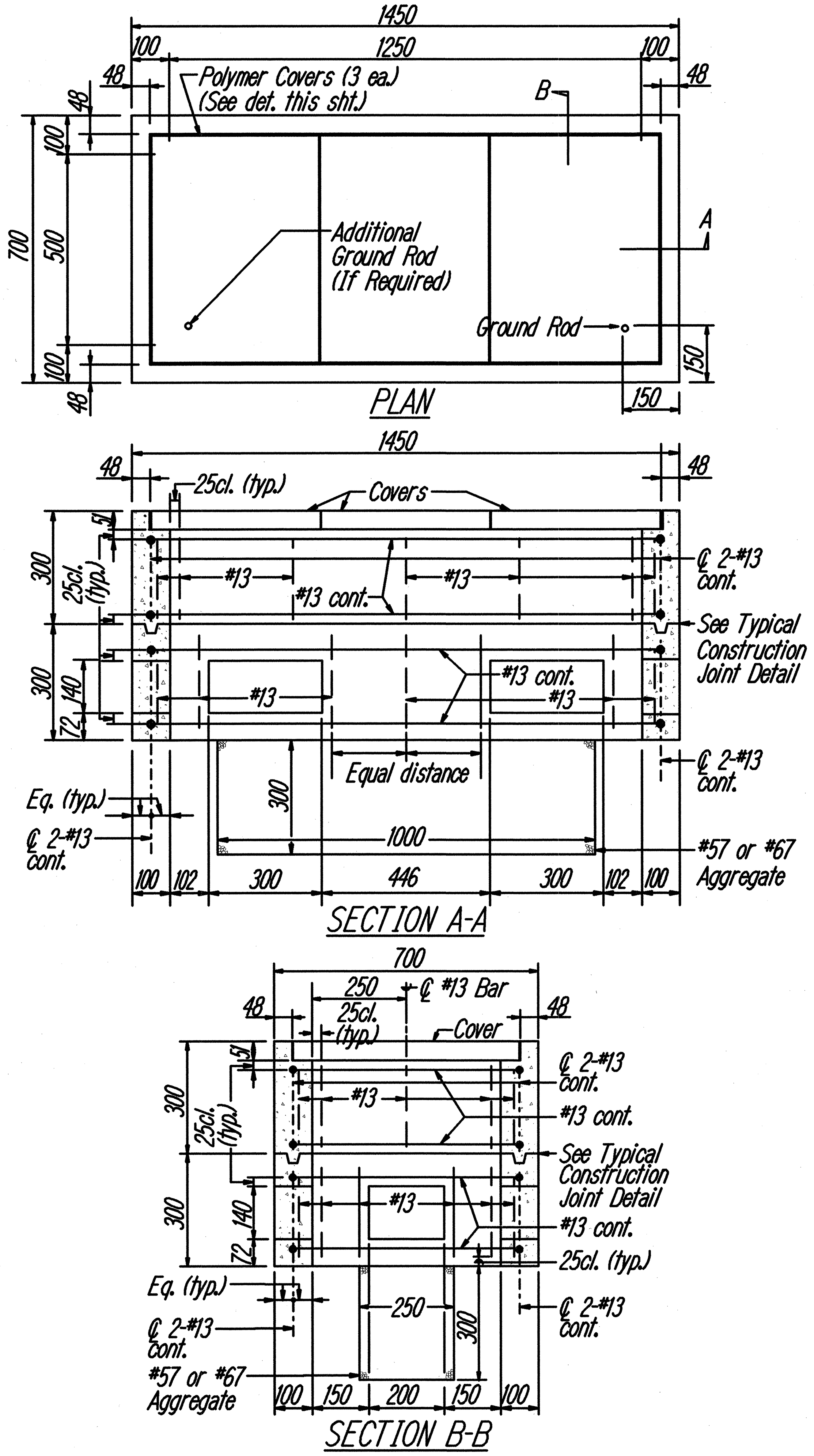
A E-18 TYPE "A" PULLBOX (Old Type "B")

N.T.S.



B E-18 TYPE "B" PULLBOX (Old Type "C")

N.T.S.

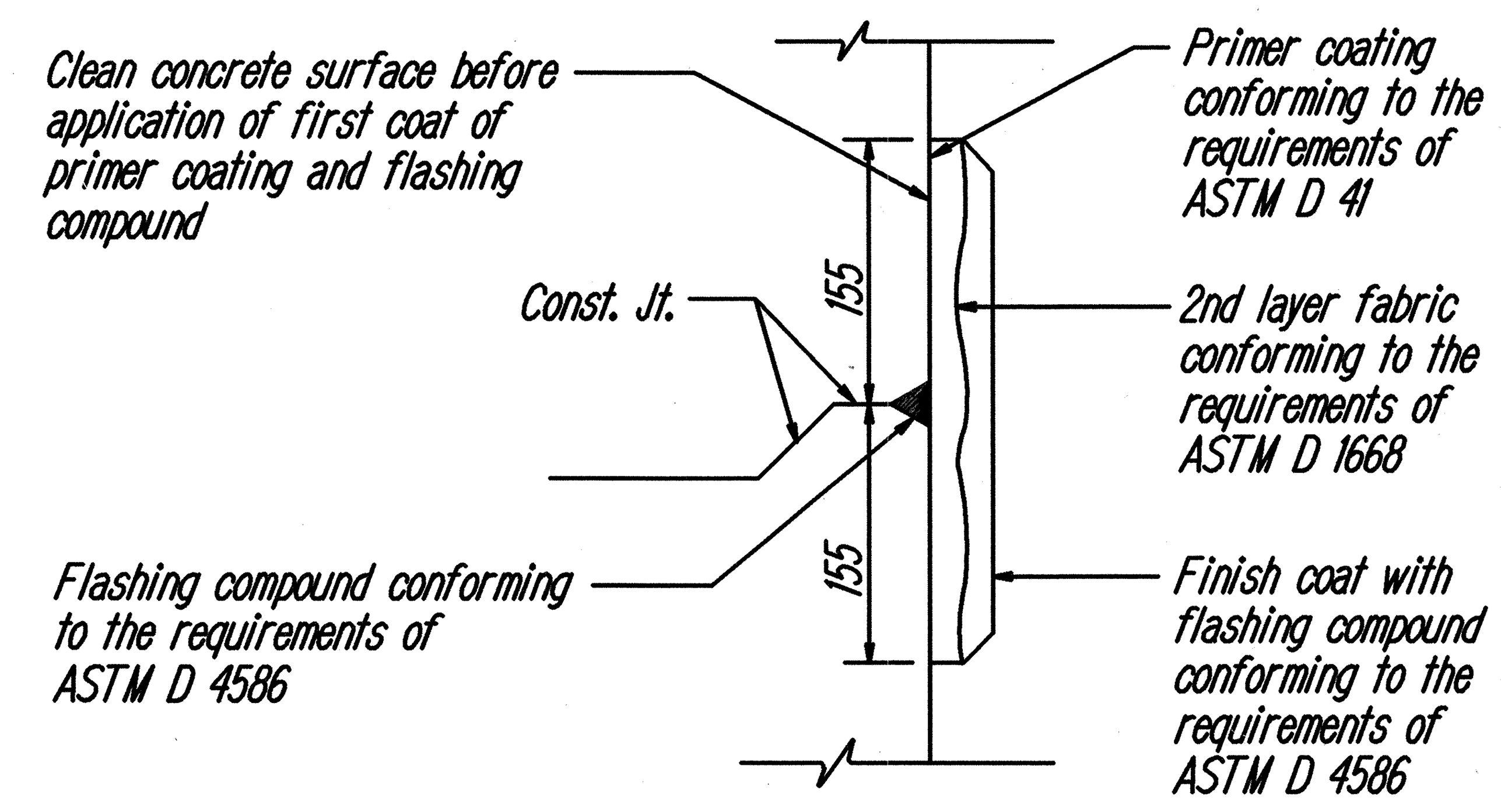


C E-18 TYPE "C" PULLBOX (Old Type "D")

N.T.S.

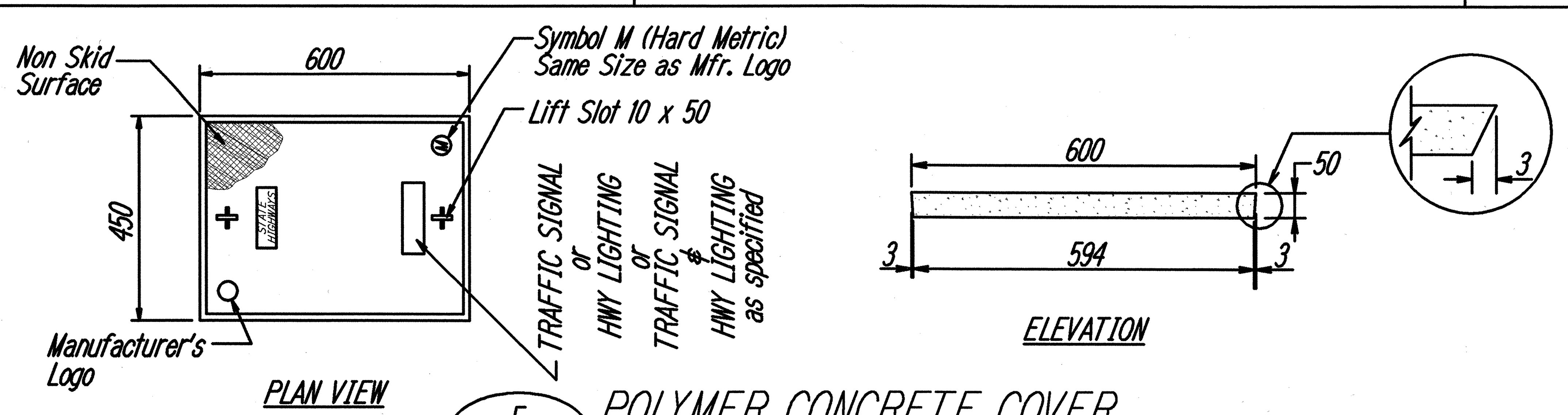
GENERAL NOTES

1. Provide a minimum of one 16 dia. x 2.5m Copperweld Ground Rod in each pullbox. When directed by the Traffic Signal Inspector/Engineer, install additional Ground Rods. Cost of Ground Rods shall be incidental to the pullboxes.
2. All pre-cast concrete pullboxes shall be manufactured in two pieces.
3. The pullbox with cover shall be capable of supporting an MS 18 Loading.
4. The maximum weight of the pullbox cover shall not exceed 27 kilograms.
5. The openings for the conduits on all pullboxes shall be pre-cast concrete knockouts.
6. After installing the conduits in the openings of the pullboxes, the Contractor shall fill the excess opening in the pre-cast knockouts with concrete mortar.
7. Prior to installing the pullboxes, the Contractor shall level the bottom of the trench and achieve a minimum of 95% relative compaction of the bottom of the trench.
8. All concrete shall be Class A (25MPa, min.)
9. Rebars shall be Grade 300 and all lapped splices shall be 360mm minimum.
10. The #57 or #67 size aggregate shall conform to latest version of AASHTO M43 (ASTM D 448).
11. Type "C" Pullbox shall be installed in a location protected from vehicular traffic (i.e. raised sidewalk, behind A.C. curbs, traffic signal standard or pipe guards).



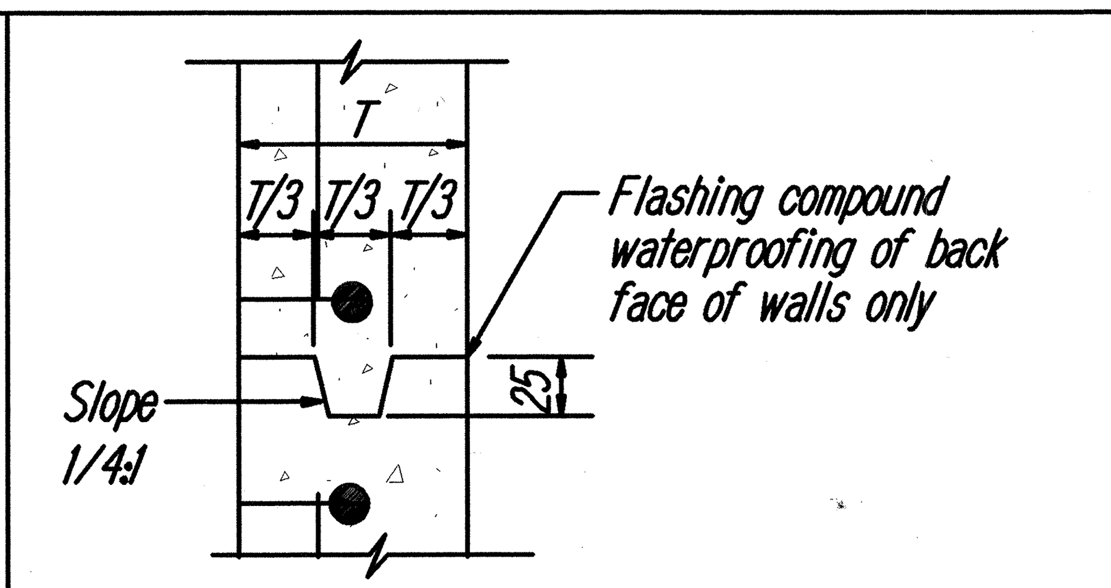
D E-18 TYPE FLASHING COMPOUND WATERPROOFING DETAILS

N.T.S.



E E-18 POLYMER CONCRETE COVER

N.T.S.



F E-18 TYPICAL CONSTRUCTION JOINT DETAIL

N.T.S.

All Dimensions are in Millimeters unless otherwise shown

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX & COVER DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-18 OF 30 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.	93A-06-98	2001	57	68

STATE RIGHT-OF-WAY BACKFILL NOTES

Trench Backfill Material "A" Beach Sand, Earth, or Earth and Gravel if Earth and Gravel used, the maximum shall contain not more than 50% by volume of rock particles. Maximum 8" loose fill per lift. Obtain 95% compaction for each lift.

Concrete
2500 PSI Compressive Strength @ 3 Days.

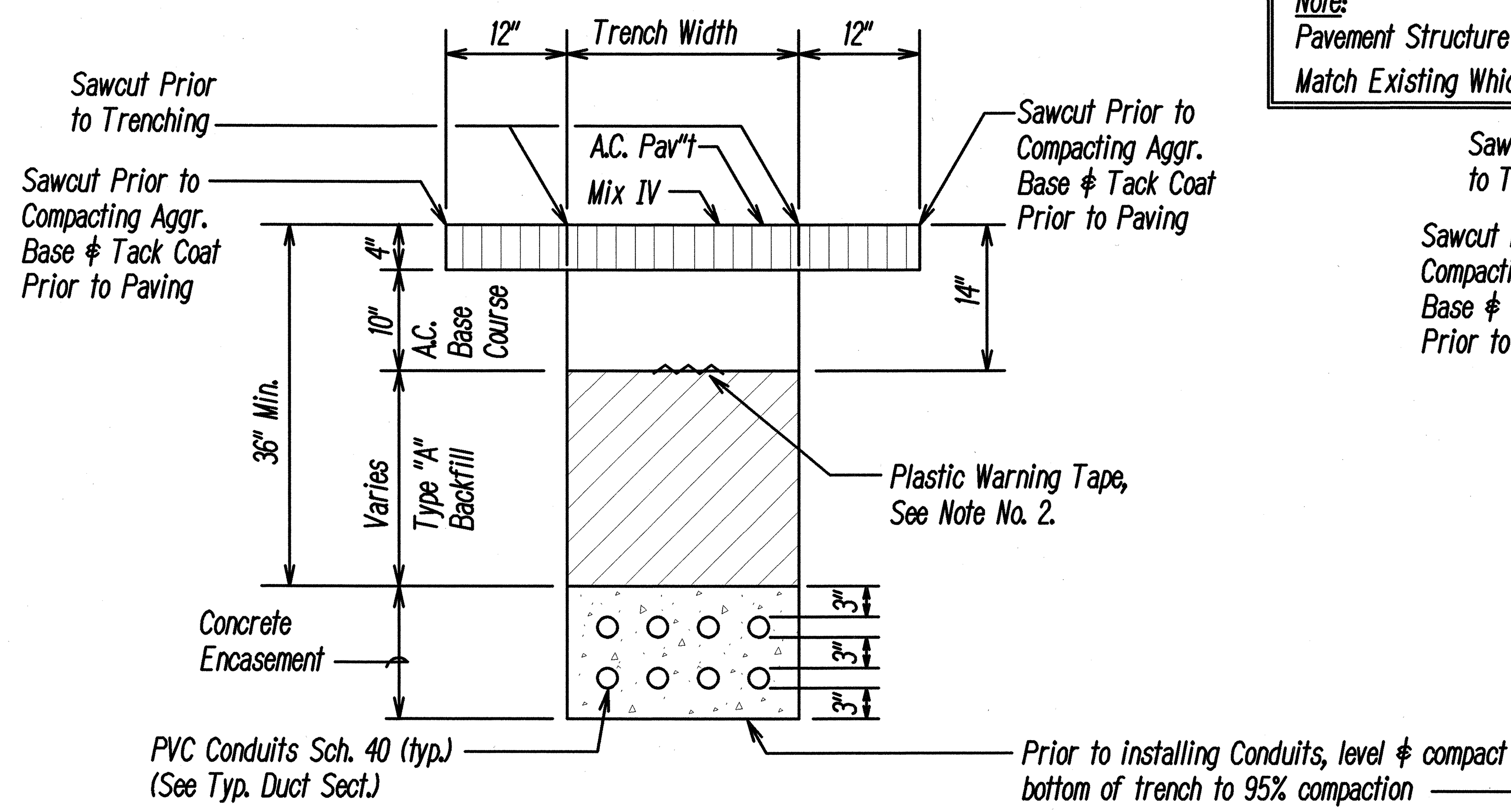
NOTE: Base Course & Sub-Base Course per 1994 State Standard Specifications for Highway Construction.

GENERAL NOTES

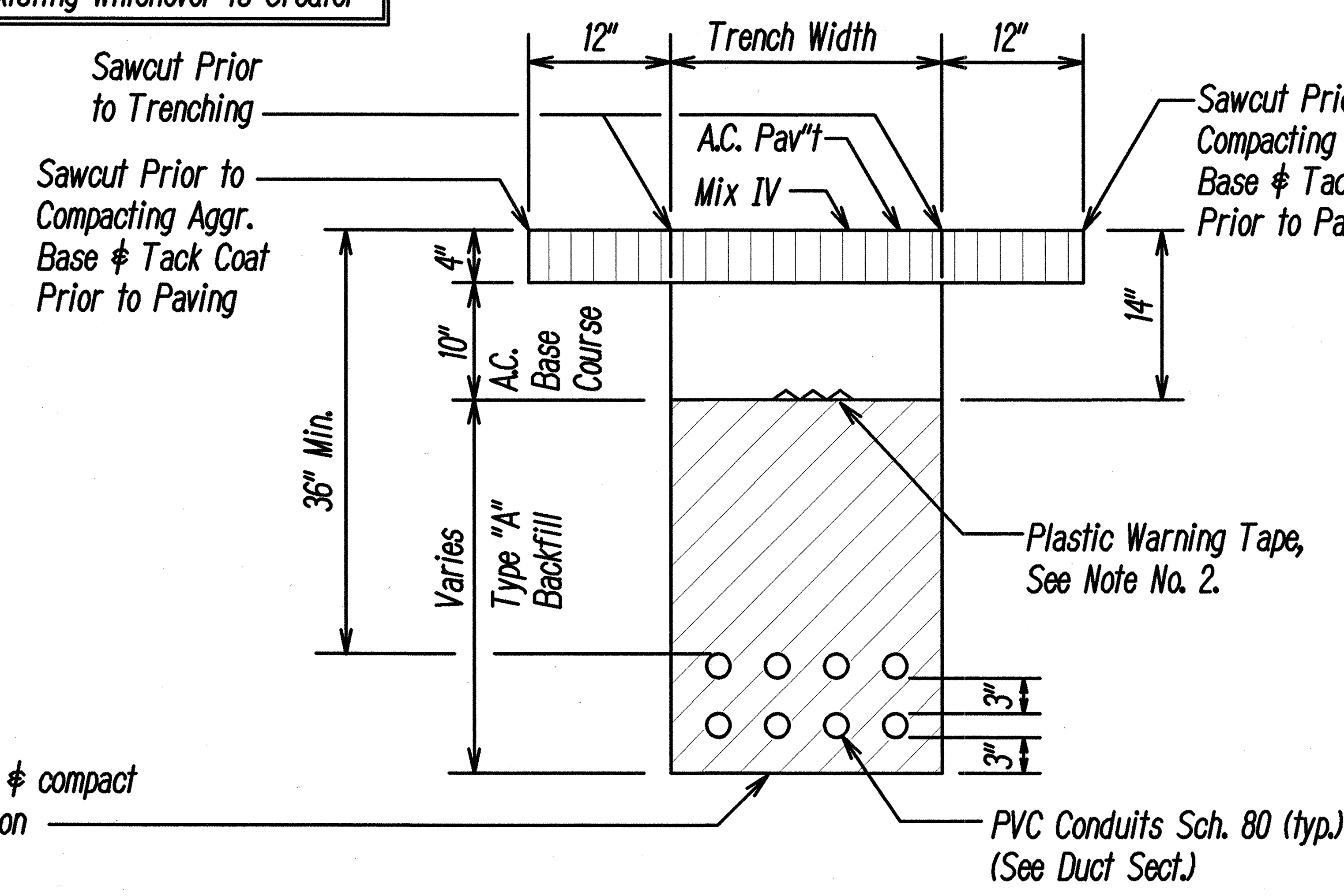
1. If trench is located on unpaved area, the Contractor shall replace 10" A.C. Base Course and 4" A.C. Pavement with Type "A" backfill material.
2. The Metal Detectable Red Plastic Warning Tape shall be a minimum 5 mils thick and 4" wide with a continuous metallic backing and corrosion resistant 1 mil thick foil core. The tape shall read, "CAUTION - STATE TRAFFIC SIGNAL AND/OR HWY LIGHTING BURIED BELOW," utilizing 3 inch series "C" lettering. The message will be repeated with a 12-inch spacing between the end and beginning of repeated message.
3. The Contractor may begin backfilling the conduit trench when the concrete reaches 3000 psi compressive strength after 3 days.
4. Maximum four (4) Conduits per Row for multiple conduit duct section.
5. For direct buried duct sections, the concrete jacket required at the conduit by-pass for various utilities, shall not be paid for separately but considered incidental to the direct buried conduits.
6. After installing all the traffic signal cables, the Contractor shall duct seal all conduits in the pullboxes, traffic signal standards and traffic signal controller cabinet concrete base. The duct seal material shall be approved by the Traffic Signal Inspector/Engineer and shall not be paid for separately but considered incidental to the direct buried and/or concrete encased conduits.

	Clearance
Water	See BWS Note 3, Sht 6
Sewer	24" Min or Provide 6" Thick Reinforced Conc Jacket
Drain	12" Min
HECO/HTCO/ CATV	3" Min
AT&T	12" Min
Traffic Signal/ Street Light	0"

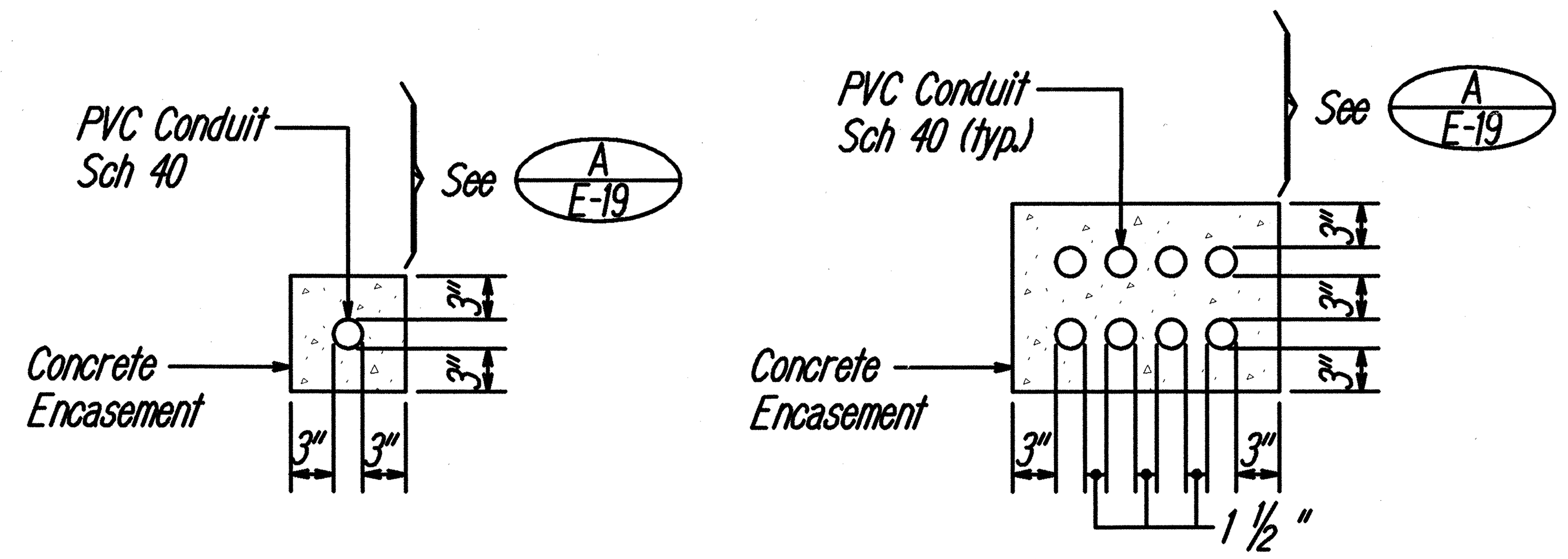
Note:
Pavement Structure as Shown or Match Existing Whichever is Greater



A/E-19 TYPICAL BACKFILL SECTION WITH CONCRETE ENCASED DUCTS
N.T.S.



B/E-19 TYPICAL BACKFILL SECTION DIRECT BURIED DUCTS
N.T.S.

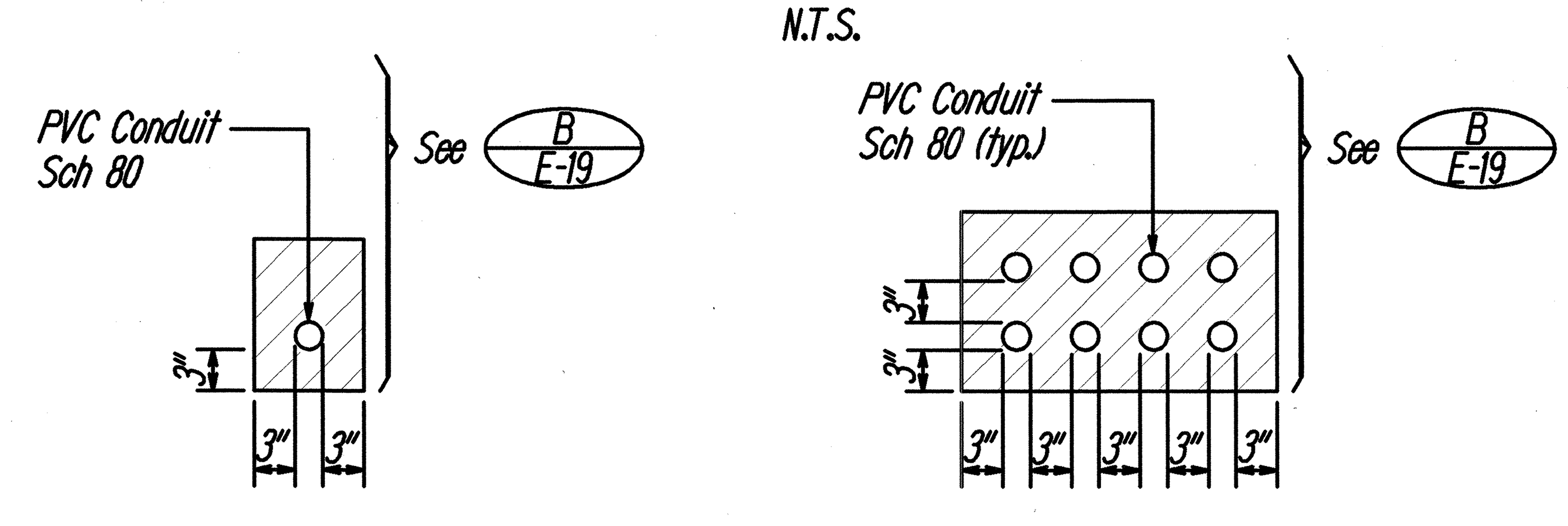


SINGLE CONDUIT

MULTIPLE CONDUIT

C/E-19 TYPICAL DUCT SECTIONS - CONC. ENCASED
N.T.S.

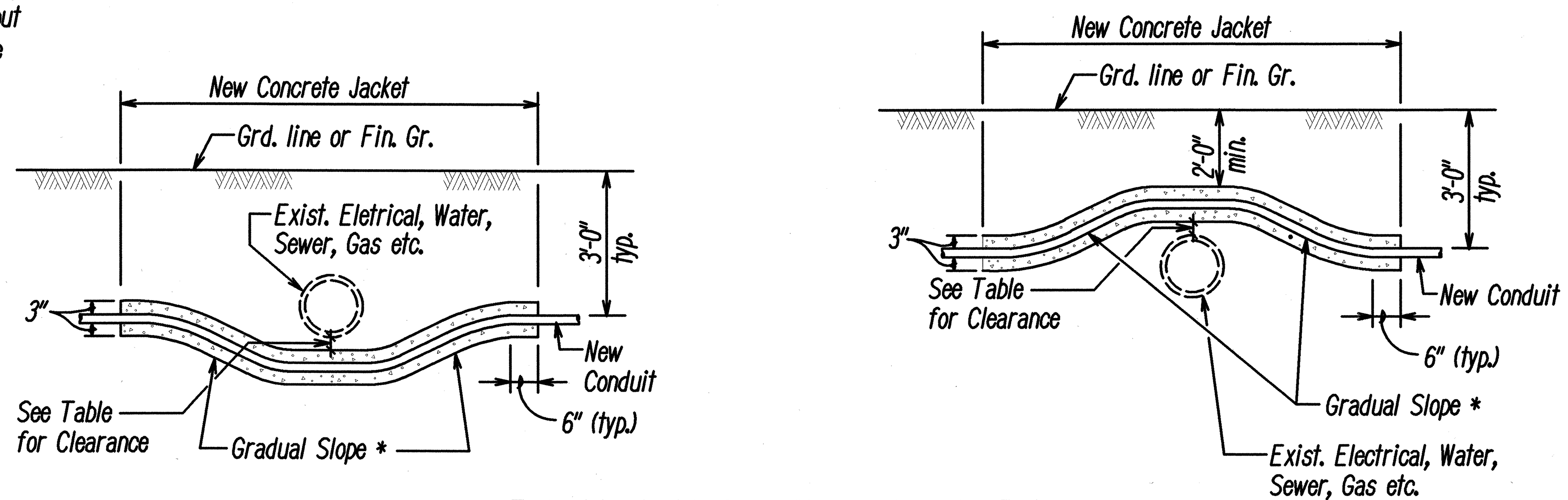
See Plan for Quantity & Diameter of Conduits



SINGLE CONDUIT

MULTIPLE CONDUIT

D/E-19 TYPICAL DUCT SECTIONS - DIRECT BURIED
N.T.S.



* To be determined by County Electrical Inspector/Engineer

E/E-19 CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES
N.T.S.

APPROVED:
Catherine Dungea 3/20/01
for CHIEF, PLANNING & ENGINEERING, BWS DATE

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL BACKFILL SECTION DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-19 OF 30 SHEETS

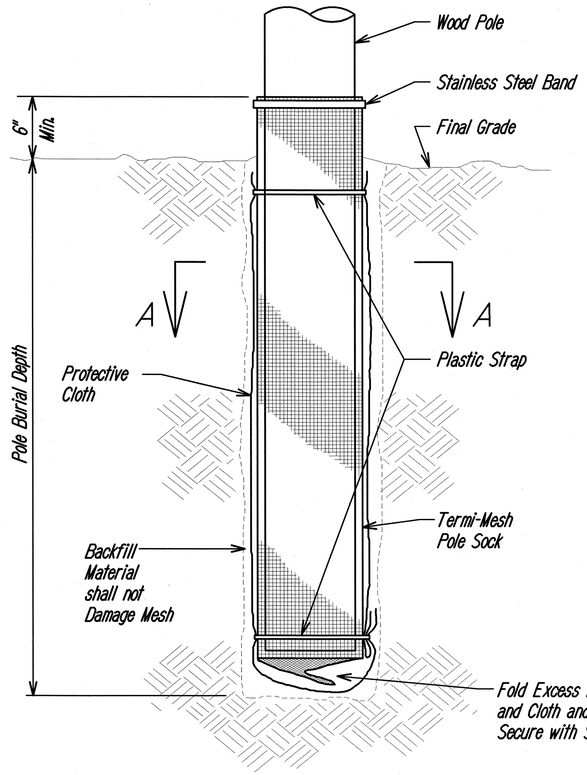
ORIGINAL PLAN / NOTE BOOK / No. — SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY — DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	58	68

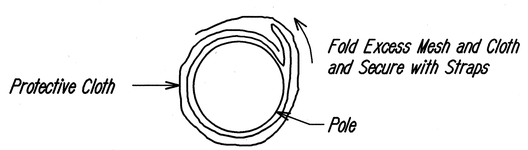
GENERAL NOTES:

Termi-Mesh is a Physical Barrier System that Prevents Ground Termites from Attacking Wood Poles Below Grade. Careful Installation is Essential to Insure Effective Termite Protection.

Termi-Mesh is a Preformed Stainless Steel Mesh Sock that is Installed Over the Butt of the Pole. The Sock is Tightly Secured to the Pole with all Excess Mesh Folded Over to Prevent Termites from Penetrating Through Voids or Checks in the Wood. The Sock Covers The Butt of the Pole up to 6 Inches Above Grade to Prevent Termites From Forming Mud Tunnels Over The Barrier.

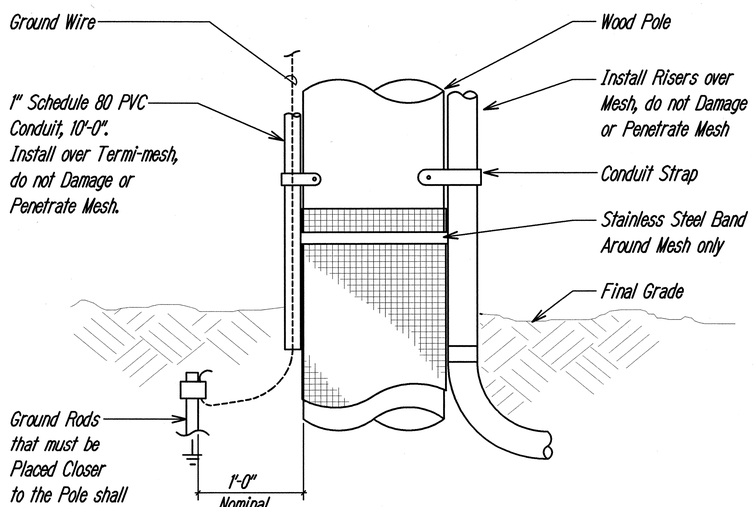


ELEVATION



SECTION A-A

A / E-20 TYPICAL BARRIER INSTALLATION
N.T.S.



B / E-20 GROUND WIRE/RISER DETAIL
N.T.S.

STREET LIGHT LEGEND

- —SL/OH— New Street Light Overhead Lines
- 1 SL/TS— New Street Light & Traffic Signal Conduits & Cables
- New Type A (Old Type B) Pullbox
- New Type B (Old Type C) Pullbox
- New Type C (Old Type D) Pullbox
- S New Concrete Stub-out Marker, See Det A/E-24
- New St Lt Luminaire & Bracket Arm Mounted on Wood Pole, See Det A/E-28, A/E-29
- New Street Light Standard, See Det A/E-27
- New Street Light Luminaire & Bracket Arm, See Det A/E-28

1	St Lt No.
2	St Lt Location
3	Ckt No.
4	Bracket Arm Length, B = Breakaway Xfmr Base, N = Xfmr Base
5	

Distribution Type

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY JK	
NOTE BOOK	TRACED BY	
	DESIGNED BY KEIN HO & ASSOC.	
	QUANTITIES BY	
	CHECKED BY	

STEVEN K. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT LEGEND & DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-20 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	59	68

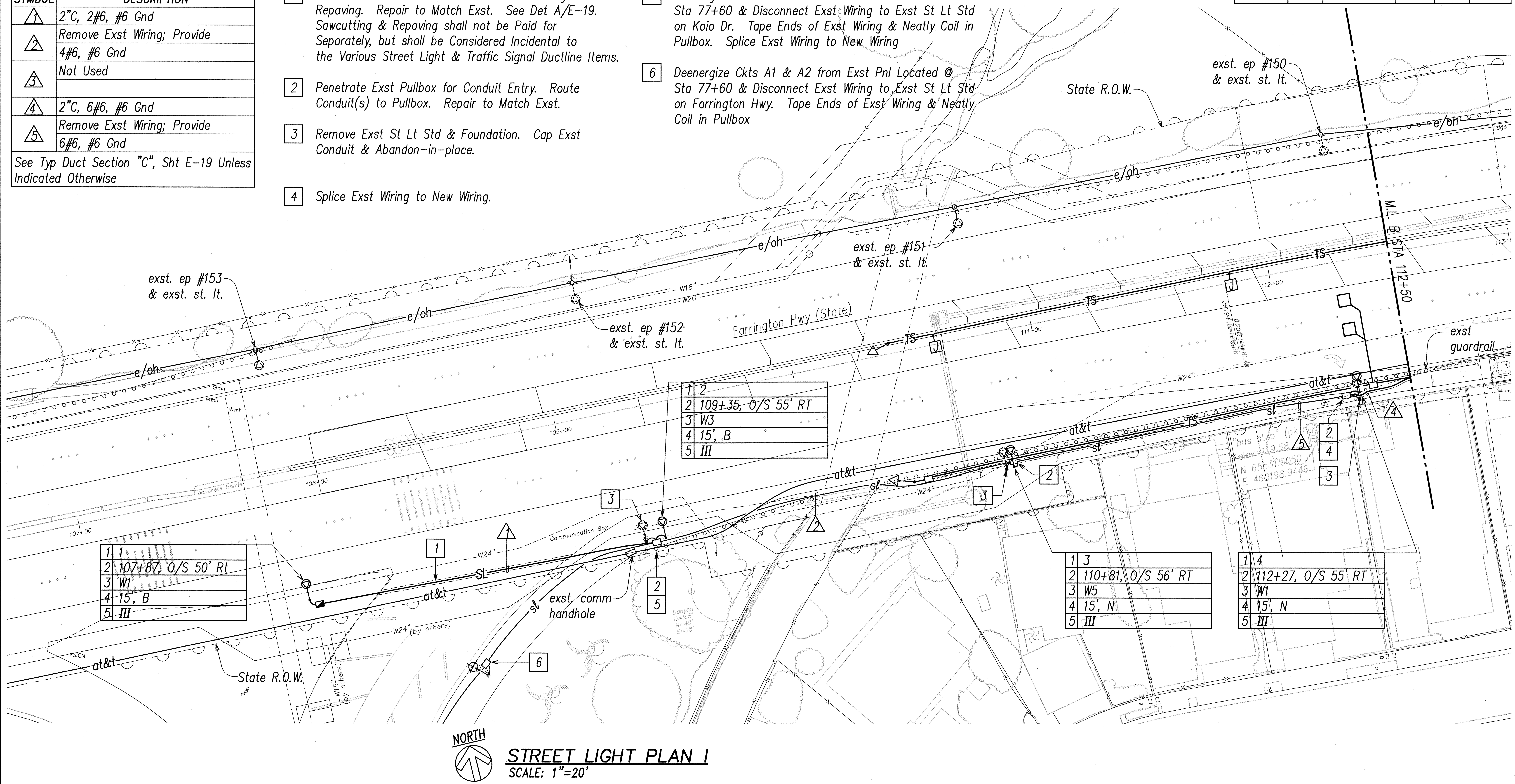
CONDUIT & WIRE SCHEDULE

SYMBOL	DESCRIPTION
1	2"C, 2#6, #6 Gnd
2	Remove Exst Wiring; Provide 4#6, #6 Gnd
3	Not Used
4	2"C, 6#6, #6 Gnd
5	Remove Exst Wiring; Provide 6#6, #6 Gnd

See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise

NOTES:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving shall not be Paid for Separately, but shall be Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.
2. Penetrate Exst Pullbox for Conduit Entry. Route Conduit(s) to Pullbox. Repair to Match Exst.
3. Remove Exst St Lt Std & Foundation. Cap Exst Conduit & Abandon-in-place.
4. Splice Exst Wiring to New Wiring.
5. Deenergize Ckts A1 & A2 from Exst Pnl Located @ Sta 77+60 & Disconnect Exst Wiring to Exst St Lt Std on Koio Dr. Tape Ends of Exst Wiring & Neatly Coil in Pullbox. Splice Exst Wiring to New Wiring
6. Deenergize Ckts A1 & A2 from Exst Pnl Located @ Sta 77+60 & Disconnect Exst Wiring to Exst St Lt Std on Farrington Hwy. Tape Ends of Exst Wiring & Neatly Coil in Pullbox



STREET LIGHT PLAN I

SCALE: 1"=20'

APPROVED: Catherine Ounaya 3/20/01
for CHIEF, PLANNING & ENGINEERING, BNS DATE

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

STEVEN H. SAKAI, LICENSED PROFESSIONAL ENGINEER No. 7637-E, HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

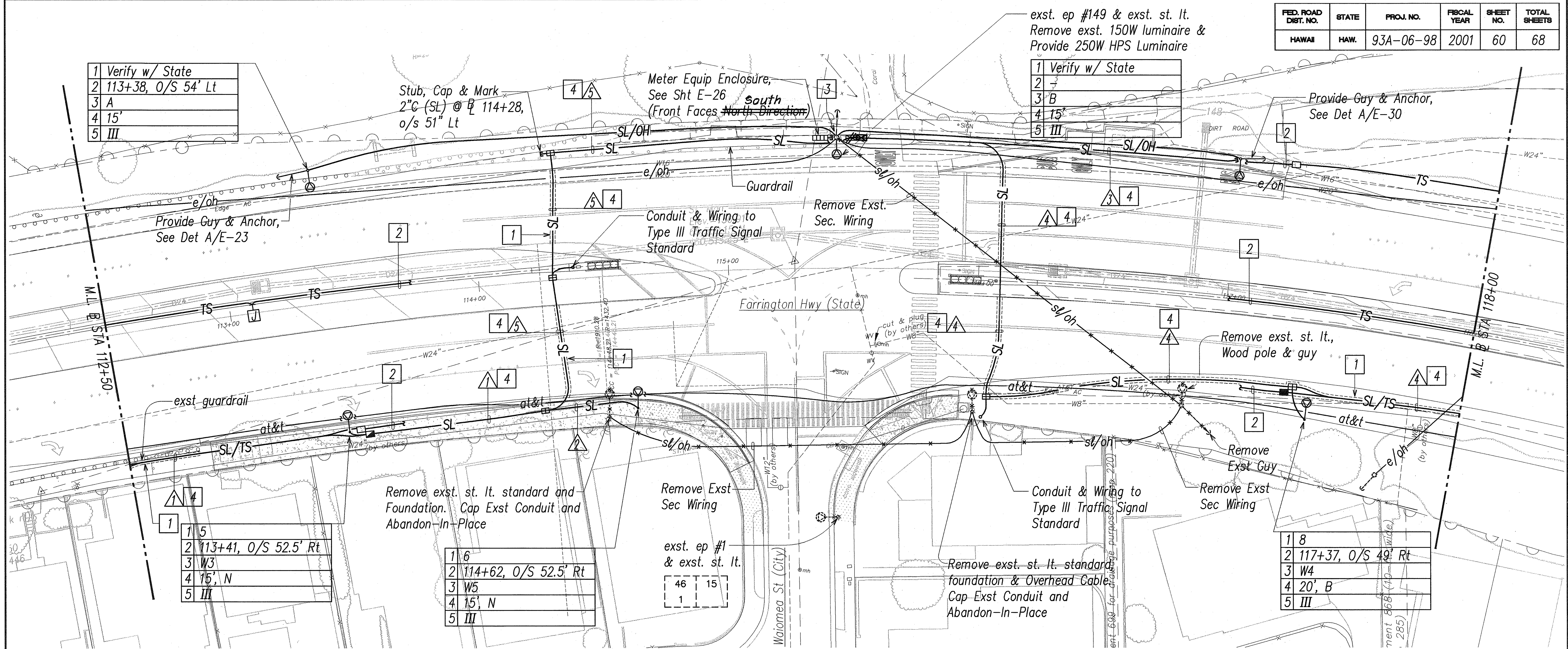
STREET LIGHT PLAN I

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: AS NOTED — Date: AUGUST 2000

SHEET No. E-21 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	60	68



CONDUIT & WIRE SCHEDULE

SYMBOL	DESCRIPTION
1	2"C, 6#6, #6 Gnd
2	1 1/2"C, 2#8, #8 Gnd
3	2-3"C, Pullwire in Each
4	3"C, 6#1/0, #2 Gnd 3"C, Pullwire
5	2"C, 6#6, #6 Gnd 2"C, Pullwire

See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise

NORTH

STREET LIGHT PLAN II

SCALE: 1"=20'

NOTES:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving Exst A.C. Pavement shall not be Paid for Separately, but shall be Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.
2. See Traffic Signal Plan II for Continuation
3. Prior to Trench & Excavation Near Exst Pole, Contractor shall Coordinate Temporary Pole Bracing w/ HECo, See HECo Note 6, Sht 5.
4. Route Street Light Ductline w/ Traffic Signal Ductline, See Sht E-4. Street Lighting Ductline shall be Paid Under Traffic Signal/Street Light Ductline in Section 623.

APPROVED:

Catherine Dunga 3/20/01

for CHIEF, PLANNING & ENGINEERING, BWS DATE

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT PLAN II

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

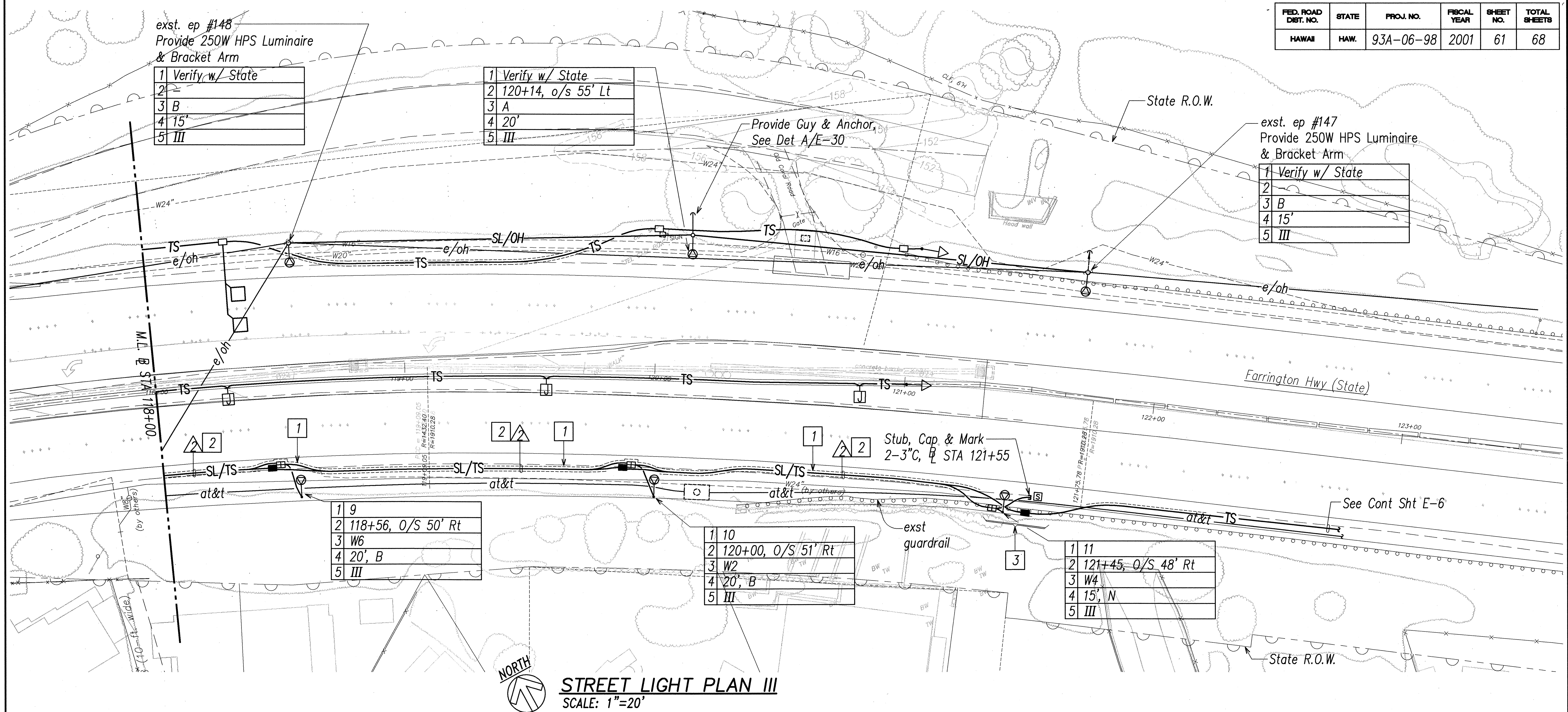
Scale: As Noted Date: AUGUST 2000

SHEET No. E-22 OF 30 SHEETS

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

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	61	68



STREET LIGHT PLAN III

SCALE: 1"=20'

CONDUIT & WIRE SCHEDULE	
SYMBOL	DESCRIPTION
1 (triangle)	Not Used
2 (triangle)	3"C, 6#1/0, #2 Gnd 3"C, Pullwire

See Typ Duct Section "C", Sht E-19 Unless Indicated Otherwise

NOTES:

1. Sawcut Exst A.C. Pavement Prior to Trenching & Repaving. Repair to Match Exst. See Det A/E-19. Sawcutting & Repaving shall not be Paid for Separately, but shall be Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.
2. Route Street Light Ductline w/ Traffic Signal Ductline, See Sht E-5. Street Light Ductline shall be Paid Under Traffic Signal/Street Light Ductline in Section 623.
3. Remove Exst Guardrail as Required to Install Ductline. Reinstall per State Std Details. Removal & Installation of Exst Guardrail shall not be Paid for Separately, but Considered Incidental to the Various Street Light & Traffic Signal Ductline Items.

APPROVED:

[signature] 3/20/01

for CHIEF, PLANNING & ENGINEERING, BWS — DATE

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

STEVEN H. SAKAI — LICENSED PROFESSIONAL ENGINEER No. 7037-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

[signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

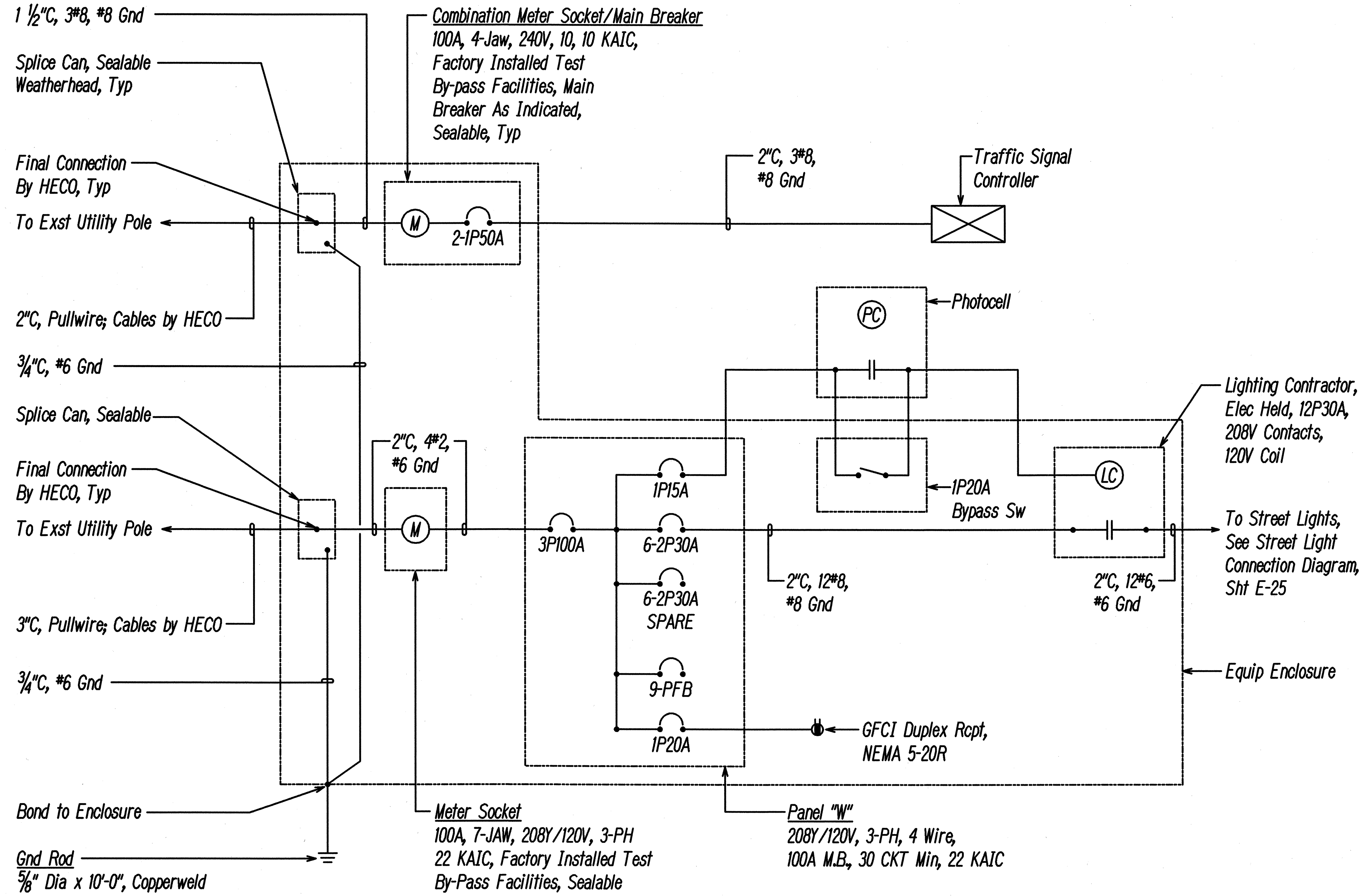
STREET LIGHT PLAN III

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: As Noted — Date: AUGUST 2000

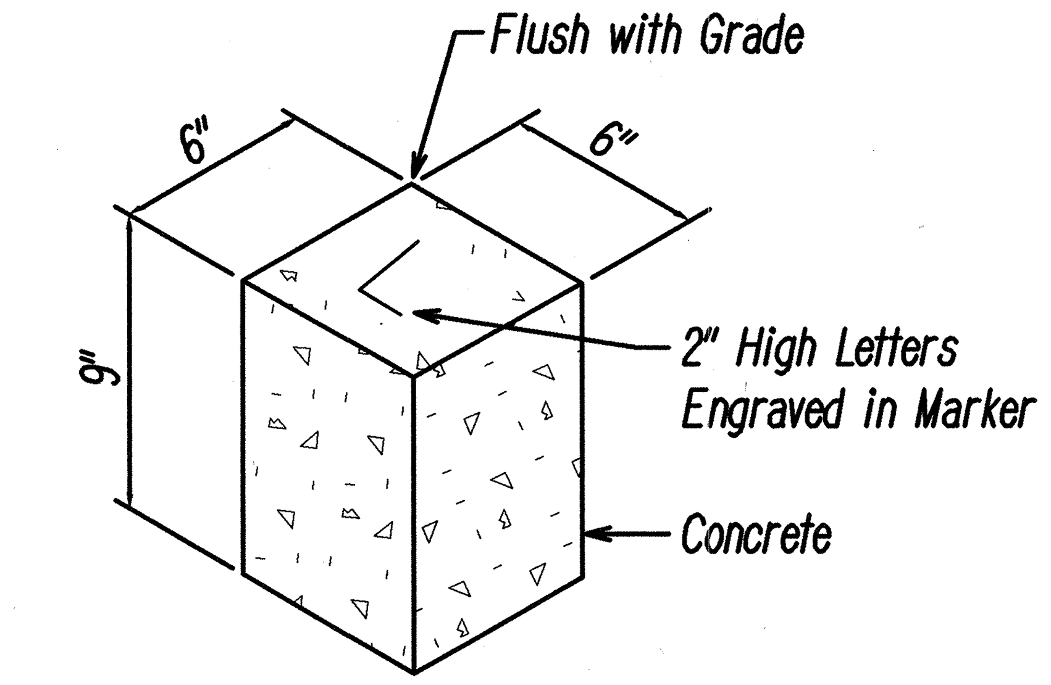
SHEET No. E-23 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	62	68

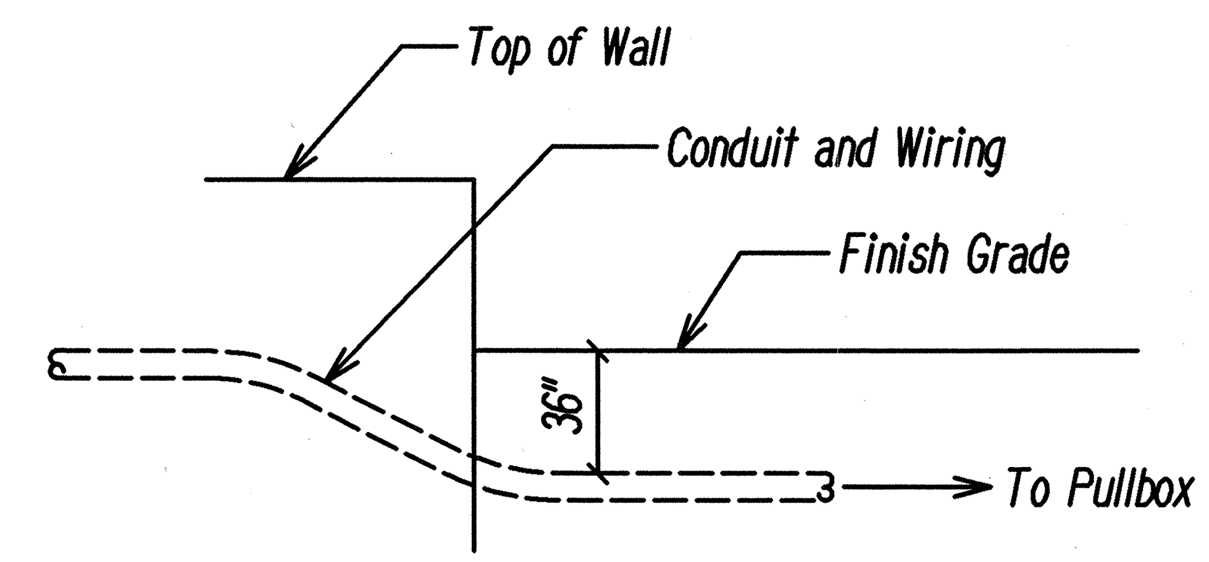


ONE-LINE DIAGRAM

Note: Cost of the Marker shall be Incidental to the Various Ductline Items



A / E-24 CONCRETE CONDUIT STUB-OUT MARKER
Not to Scale



B / E-24 BARRIER WALL CONDUIT TRANSITION DETAIL
Not to Scale

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

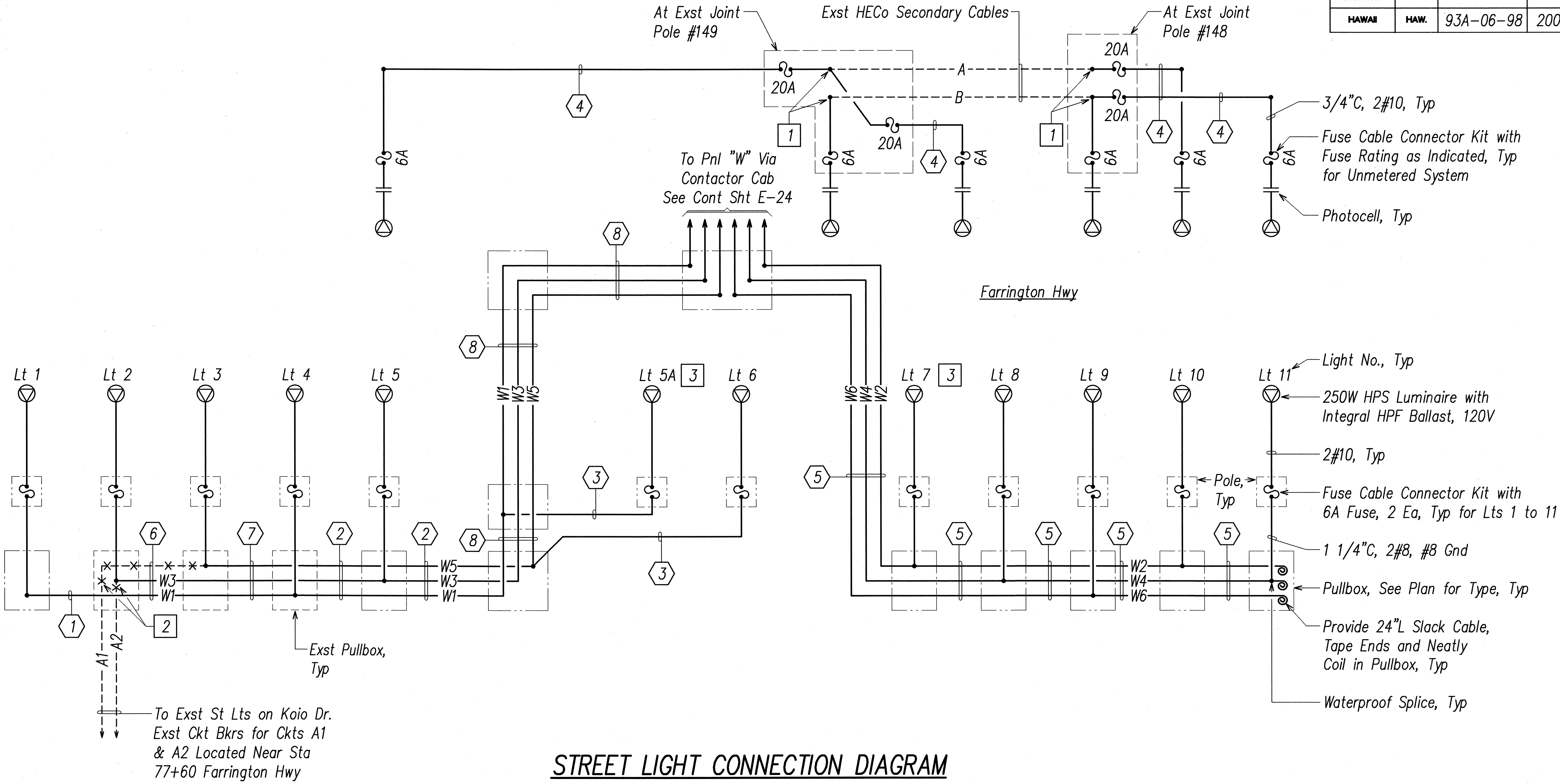
ONE-LINE DIAGRAM AND MISCELLANEOUS DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None — Date: AUGUST 2000

SHEET No. E-24 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	63	68



STREET LIGHT CONNECTION DIAGRAM

CONDUIT AND WIRE SCHEDULE

ITEM	DESCRIPTION
1	2"C, 2#6, #6 Gnd
2	2"C, 6#6, #6 Gnd
3	2"C, 2#8, #8 Gnd
4	Triplex, #6 RHW-USE, ACSR Messenger
5	3"C, 6#1/0, #2 Gnd; 3"C, Pullwire
6	Exst 3"C; Remove Exst Wiring & Provide 4#6, #6 Gnd
7	Exst 3"C; Remove Exst Wiring & Provide 6#6 & #6 Gnd
8	2"C, 6#6, #6 Gnd; 2"C, Pullwire

NOTES:

1 Final Connection by HECo

2 Disconnect Exst Wiring, Tape Ends of Exst Wiring & Neatly Coil in Exst Pullbox

3 Mtd on Traffic Signal Standard

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT CONNECTION DIAGRAM

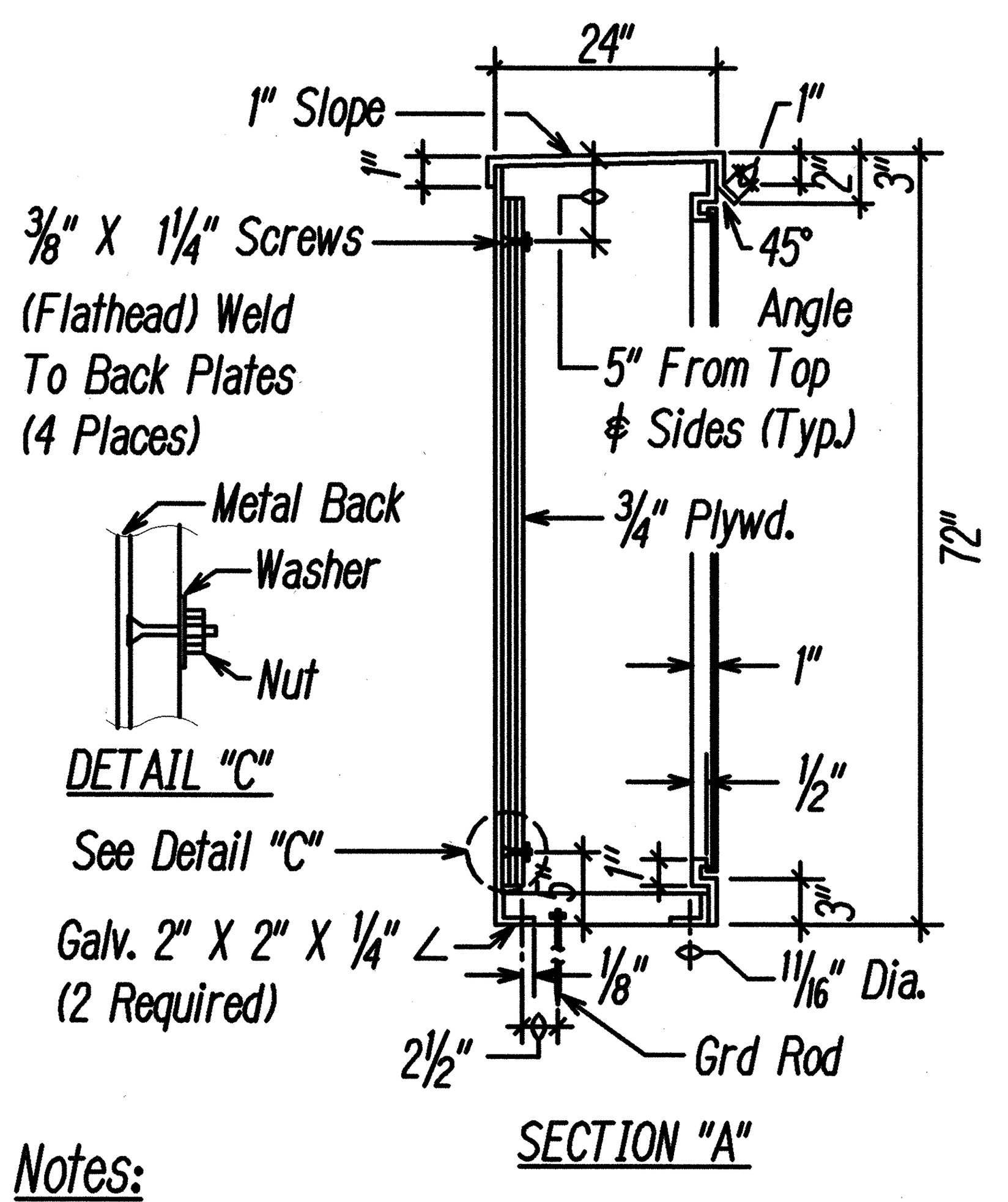
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

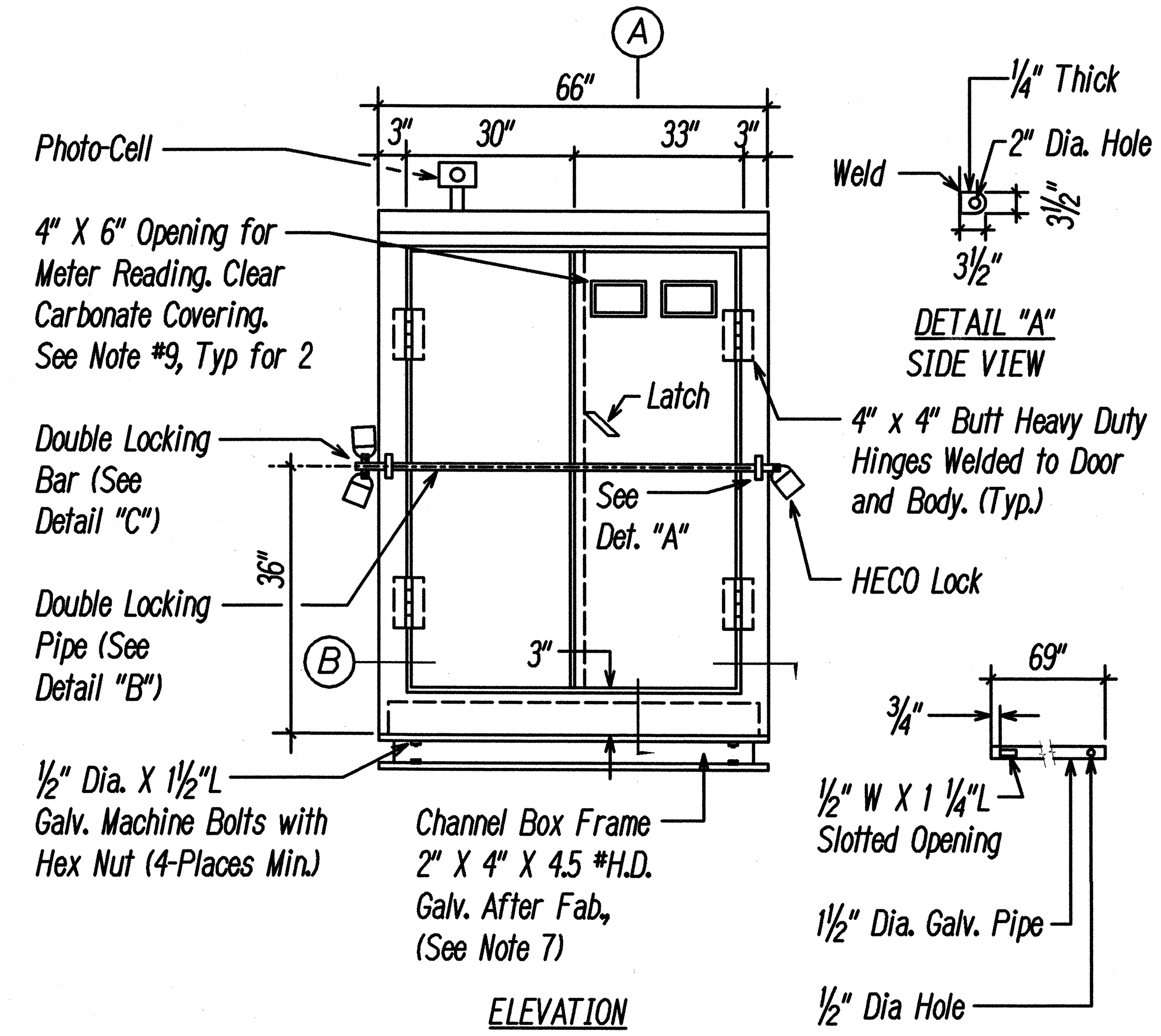
Scale: None Date: AUGUST 2000

SHEET No. E-25 OF 30 SHEETS

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

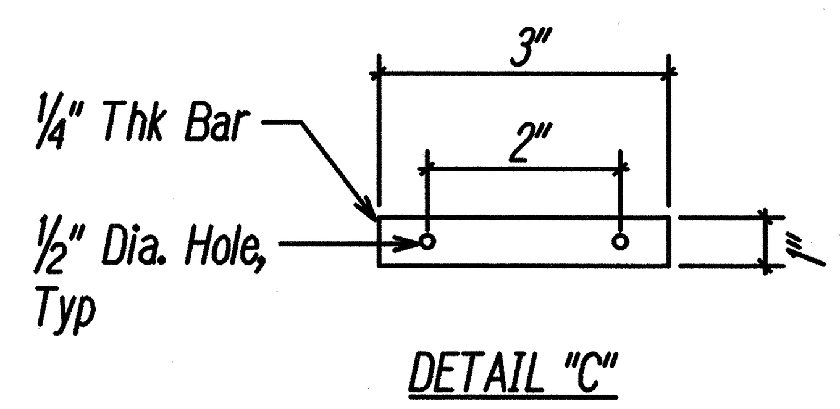
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	64	68

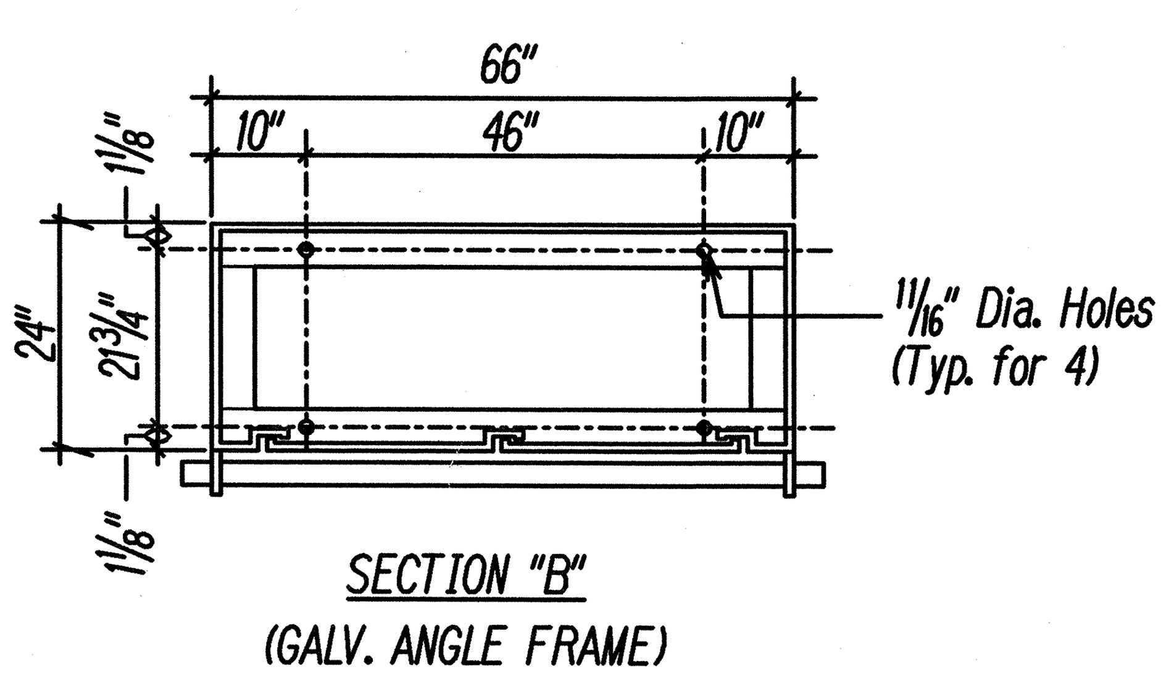


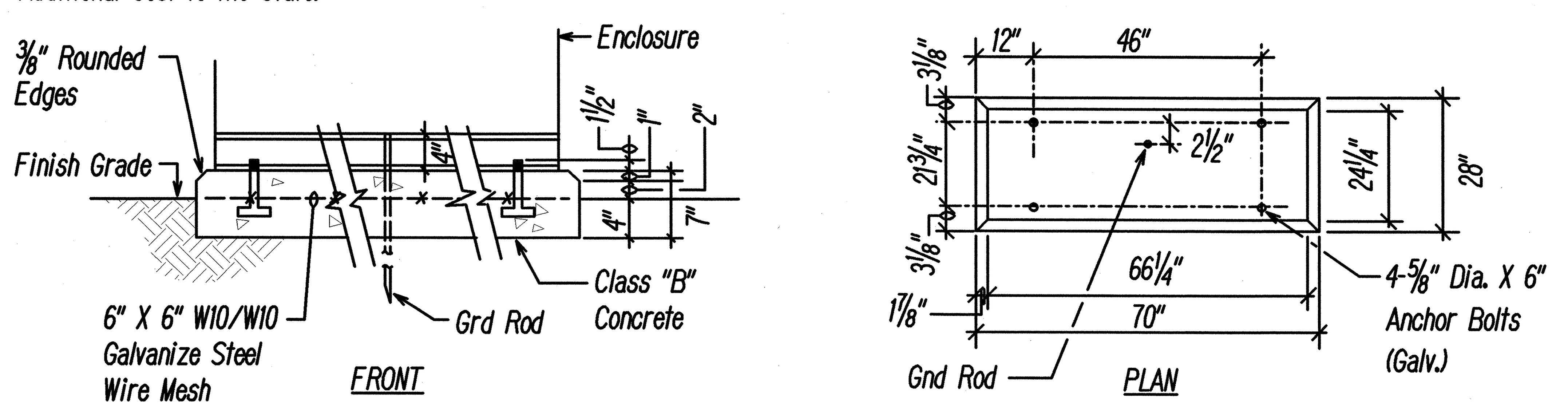


Notes:

1. Cabinet to be Primed with One Coat Shop Primer.
2. Plywood to be ¾" Thick (min.) Treated (Wolmanized) Plywood. (Exterior Grade)
3. Made From 10 Ga. Sheet Aluminum.
4. Provide Green Epoxy Enamel Finish, Color to Match Transformer. (2 Coats)
5. Enclosure Shall Be NEMA 3R With Neoprene Gasketing.
6. Padlocks:
   1 - HECO Furnished
   2 - Contractor Furnished, Brass Corbin Sesame Combination
7. Wash Channel with Solution of Chemical Phosphoric Metal Etch and Allow to Dry. Apply 2 Coats of Galvanized Metal Primer and 2 Coats of Enamel to Match Cabinet.
8. Shop Fabrication Drawings Shall be Submitted for Approval.
9. Location of Opening for Meter Reader to Correspond with Location of Meter.
10. Equip Being Provided shall Fit within Cabinet. Contractor shall Adjust Cabinet and Pad Dimensions to Allow Installation of Equip Being Provided. Ajustments shall be Made at No Additional Cost to the State.

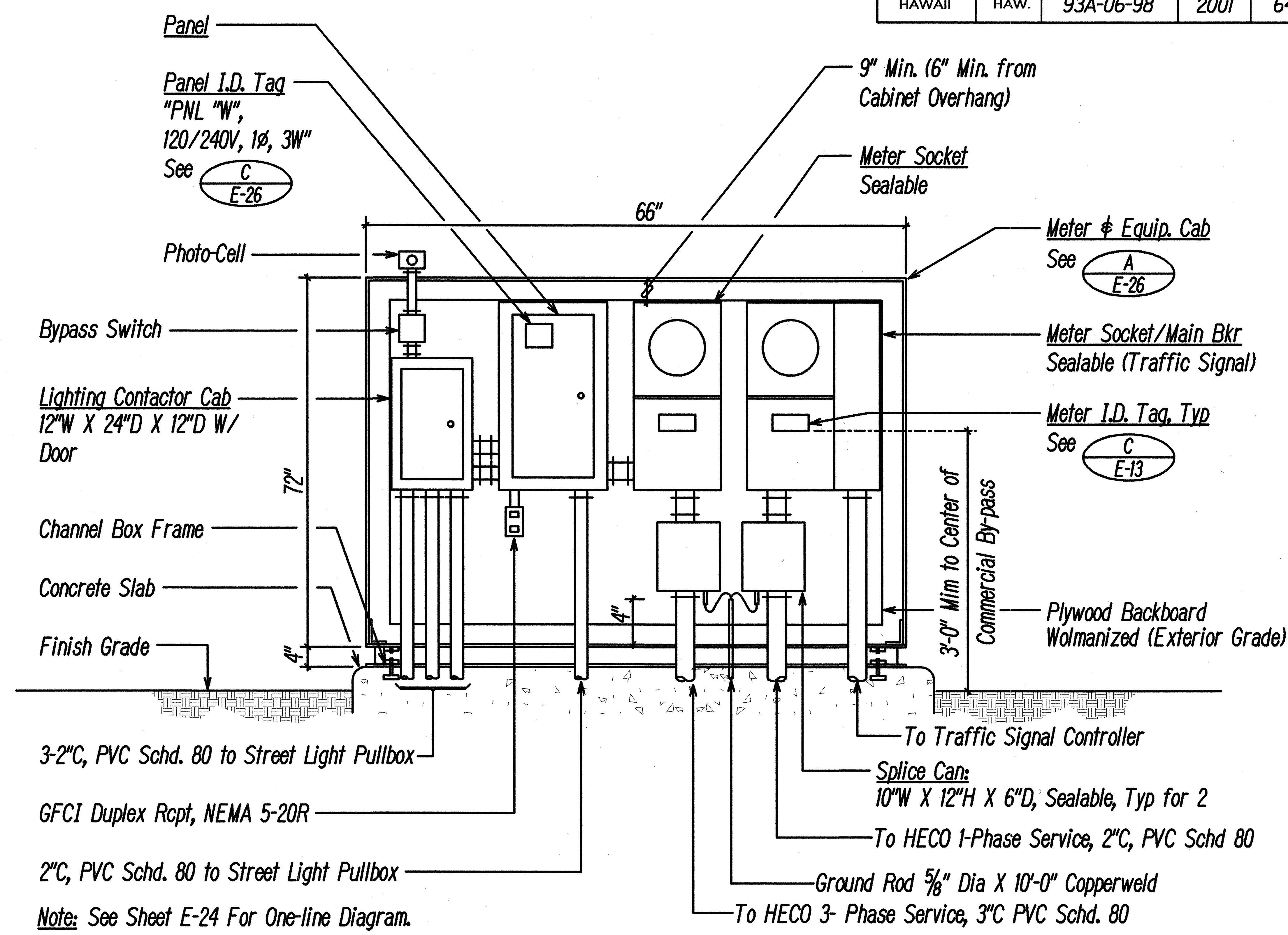






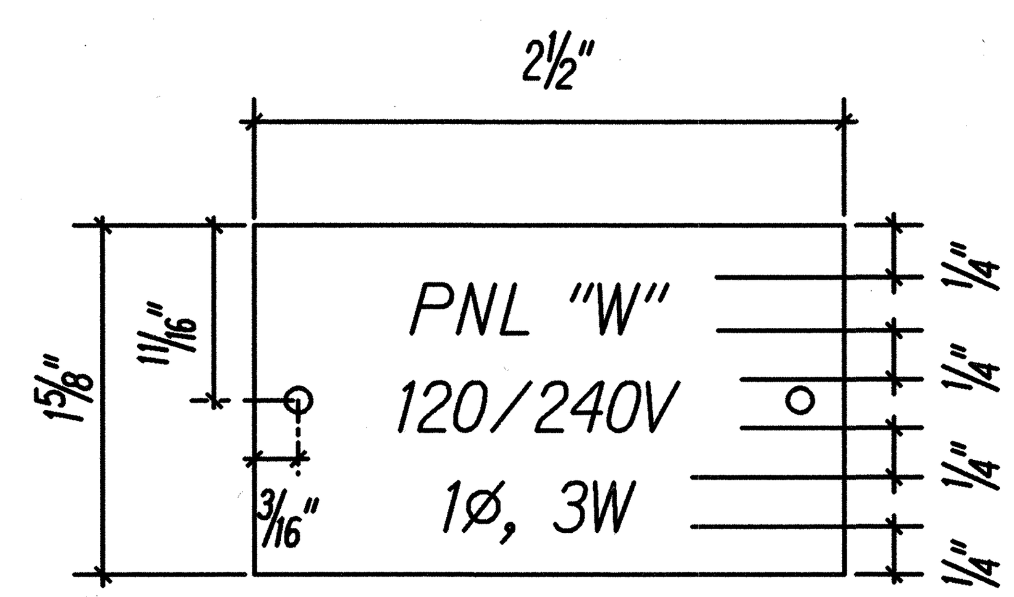
CONCRETE PAD

A / E-26 METER AND EQUIPMENT CABINET
N.T.S.



Note: See Sheet E-24 For One-line Diagram.

B / E-26 SERVICE EQUIPMENT ELEVATION
N.T.S.



NOTES:

1. Use 2 Ply Plastic - Black, White.
2. Letter Size Shall Be 1/8" High and Engraved 1/32" Wide, White in Color.
3. Attach To Panel With No.7 Stainless Steel Drive Screws.

C / E-26 PANEL I.D. TAG DETAIL
N.T.S.

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

METER & EQUIPMENT CABINET DETAILS

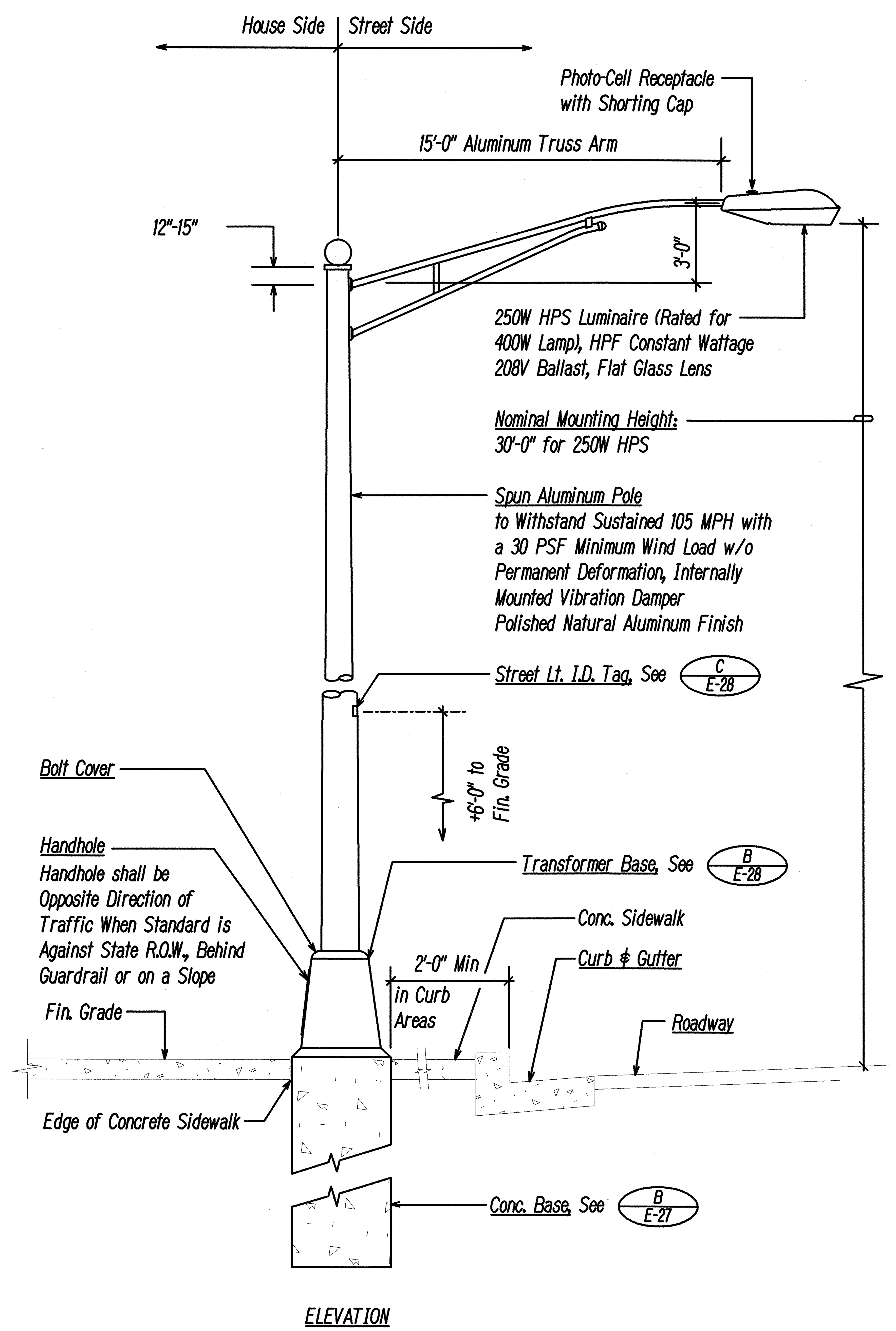
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

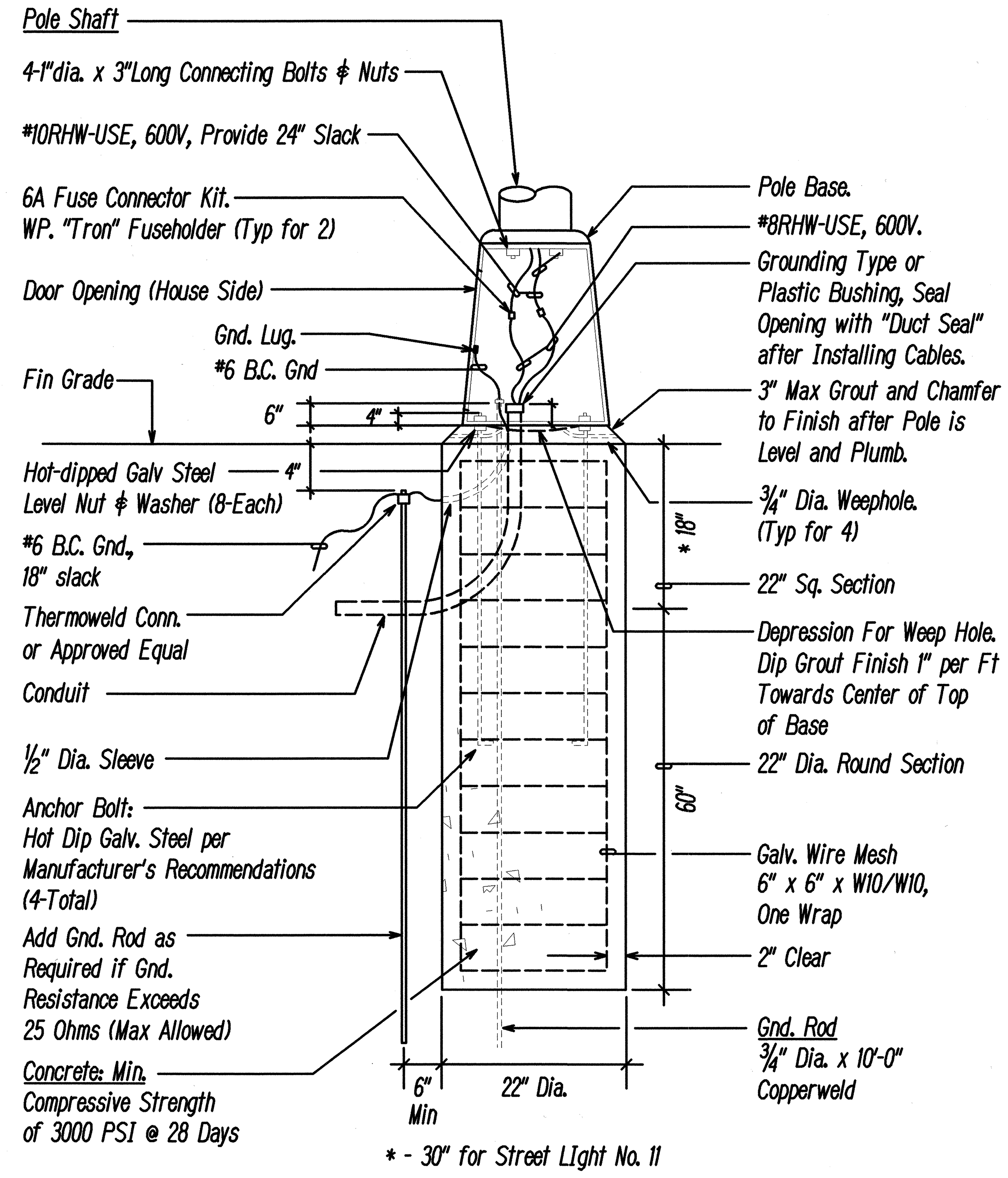
SHEET No. E-26 OF 30 SHEETS

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

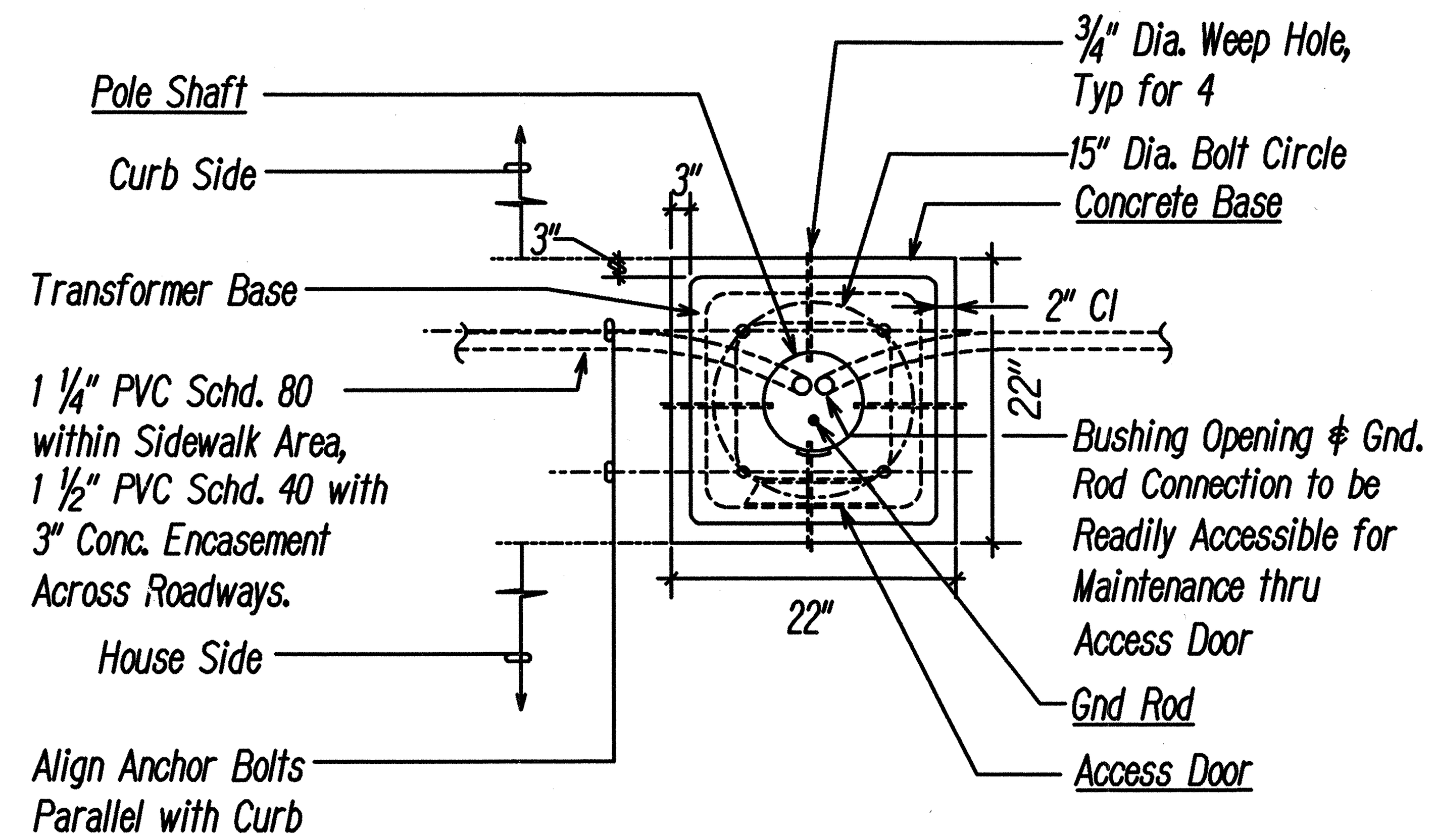
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	65	68



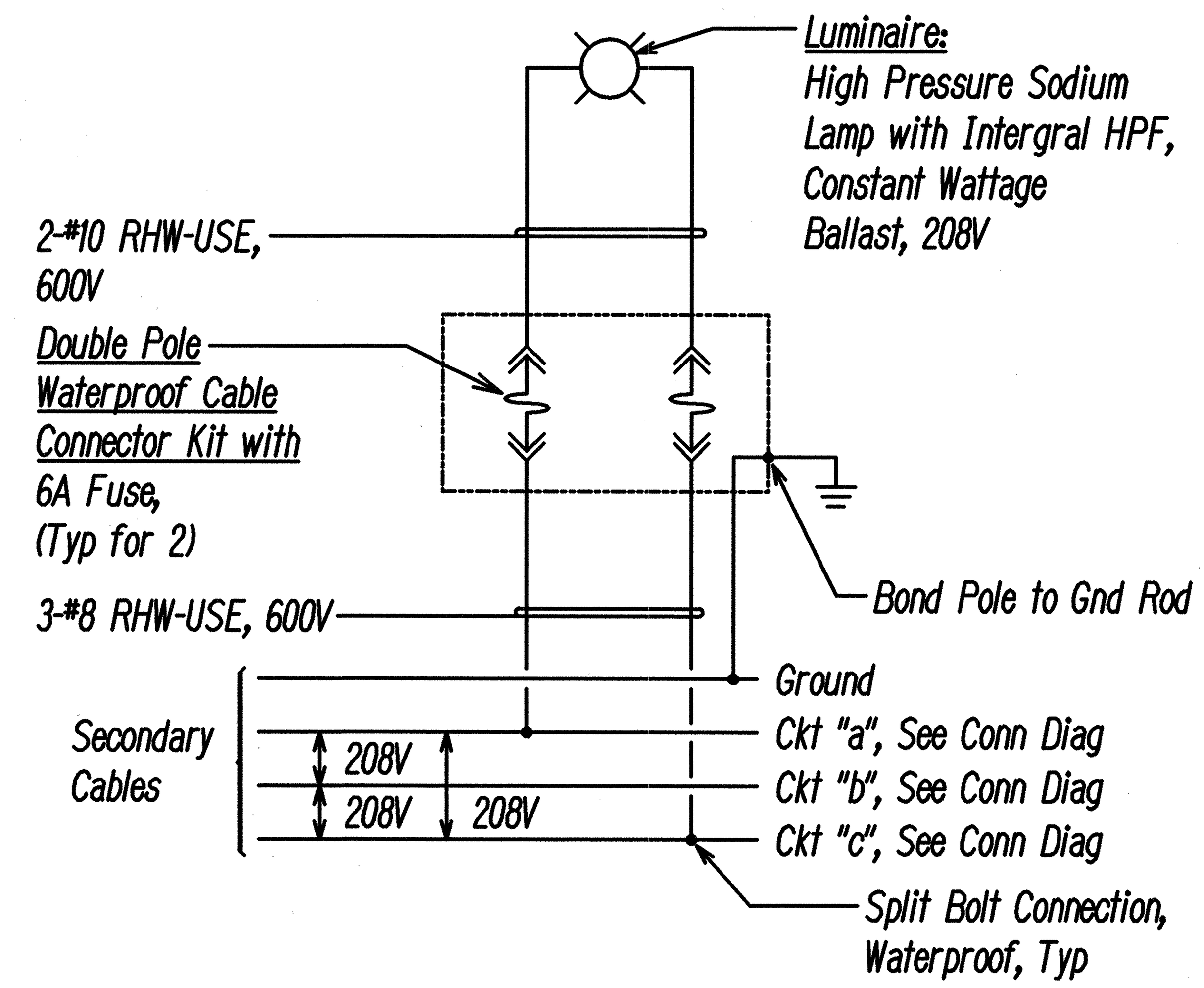
A E-27 STREET LIGHT STANDARD
NOT TO SCALE



B E-27 CONCRETE BASE DETAIL
NOT TO SCALE



C E-27 CONCRETE BASE PLAN
NOT TO SCALE



D E-27 STREET LIGHT CONNECTION DIAGRAM
(208Y/120V METERED SYSTEM)

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT DETAILS

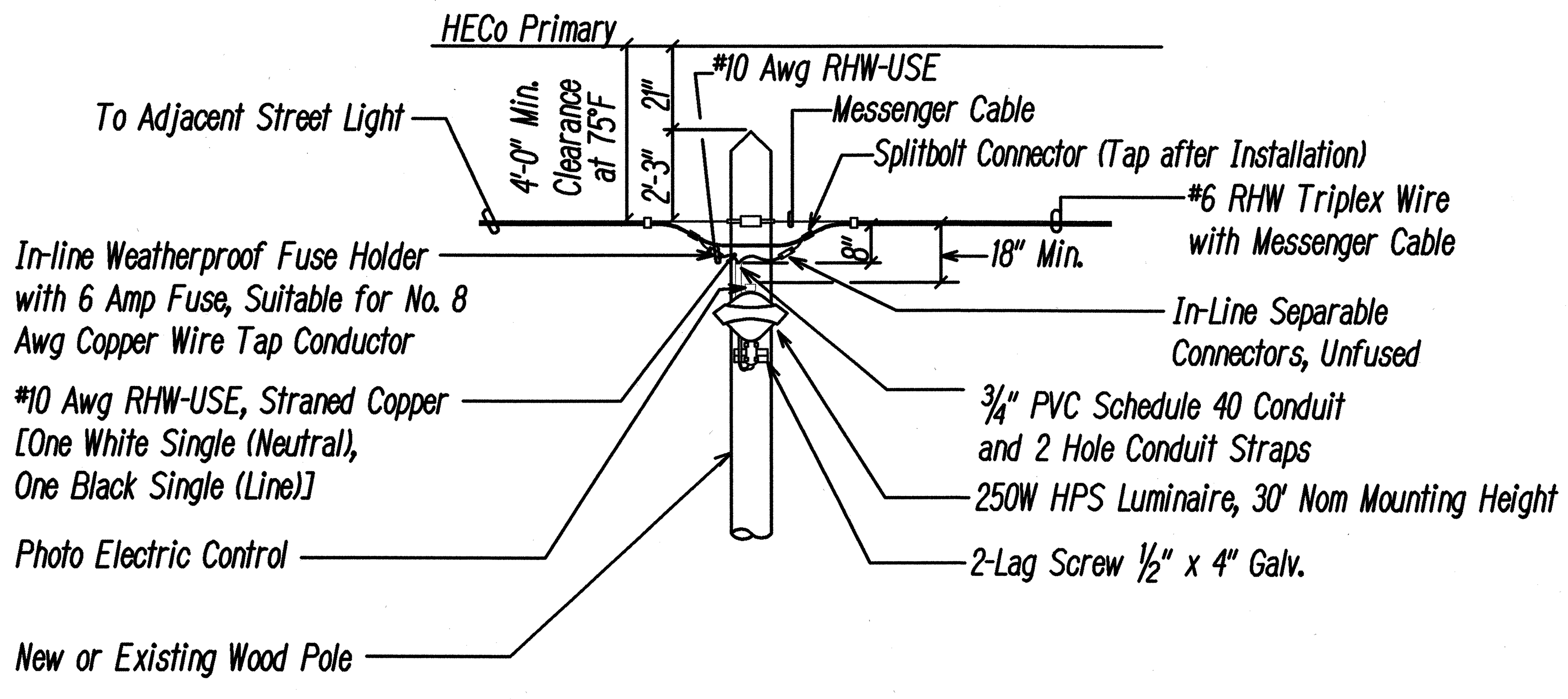
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None   Date: AUGUST 2000

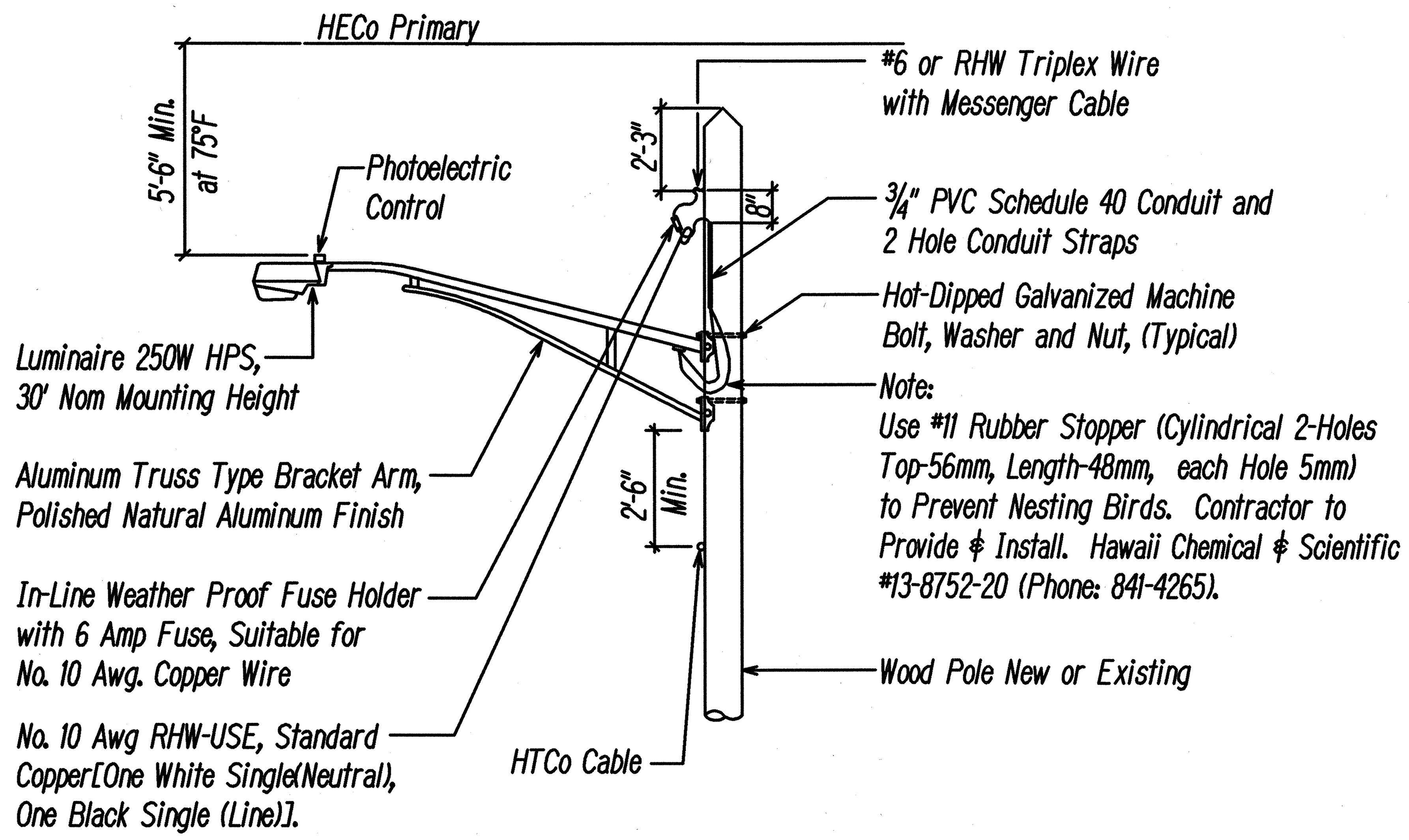
SHEET No. E-27 OF 30 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	66	68



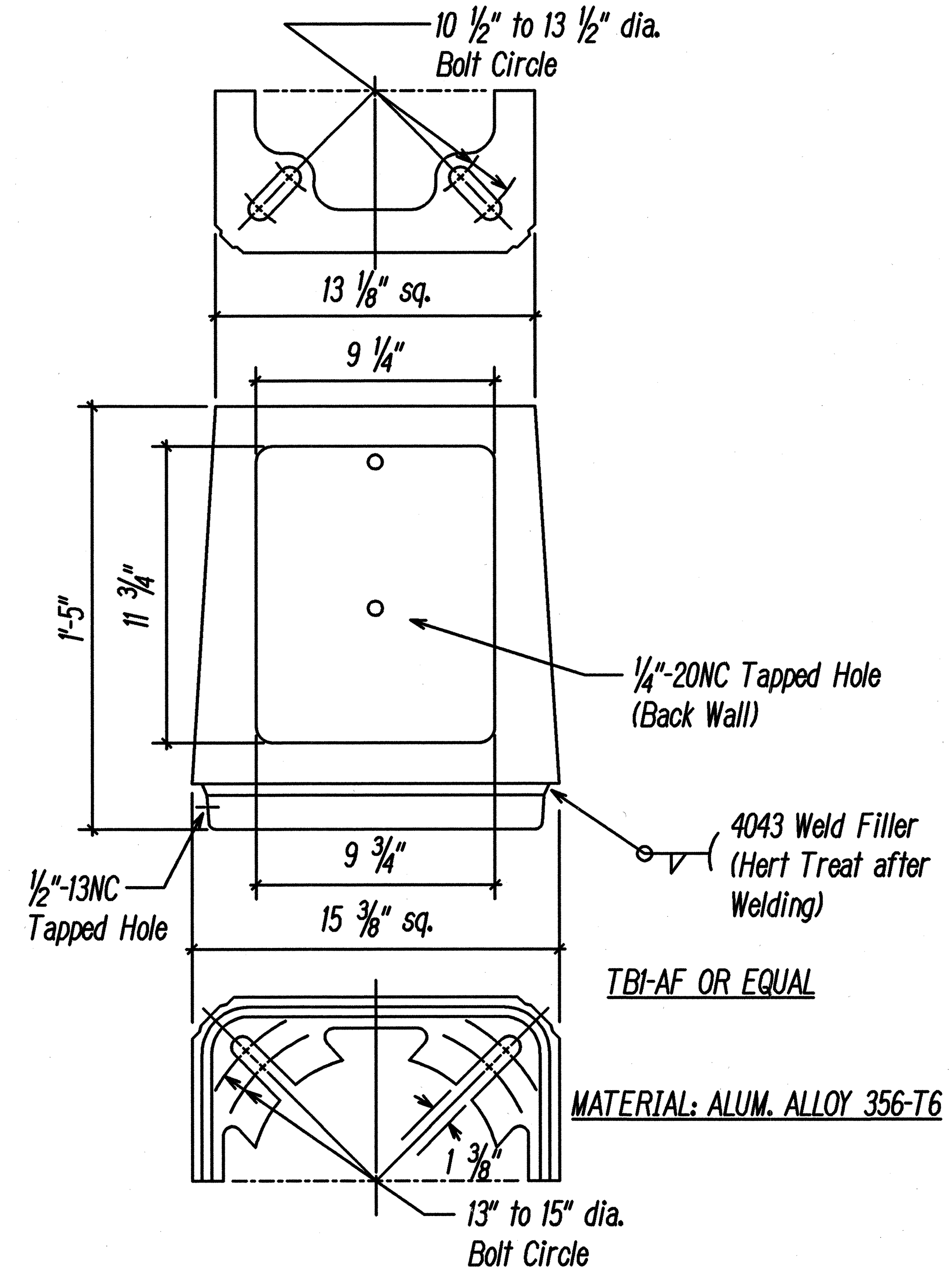
TANGENT INSTALLATION



NOTES: Mount I.D. Tag +6'-0" Above Finish Grade.

DEAD-END INSTALLATION

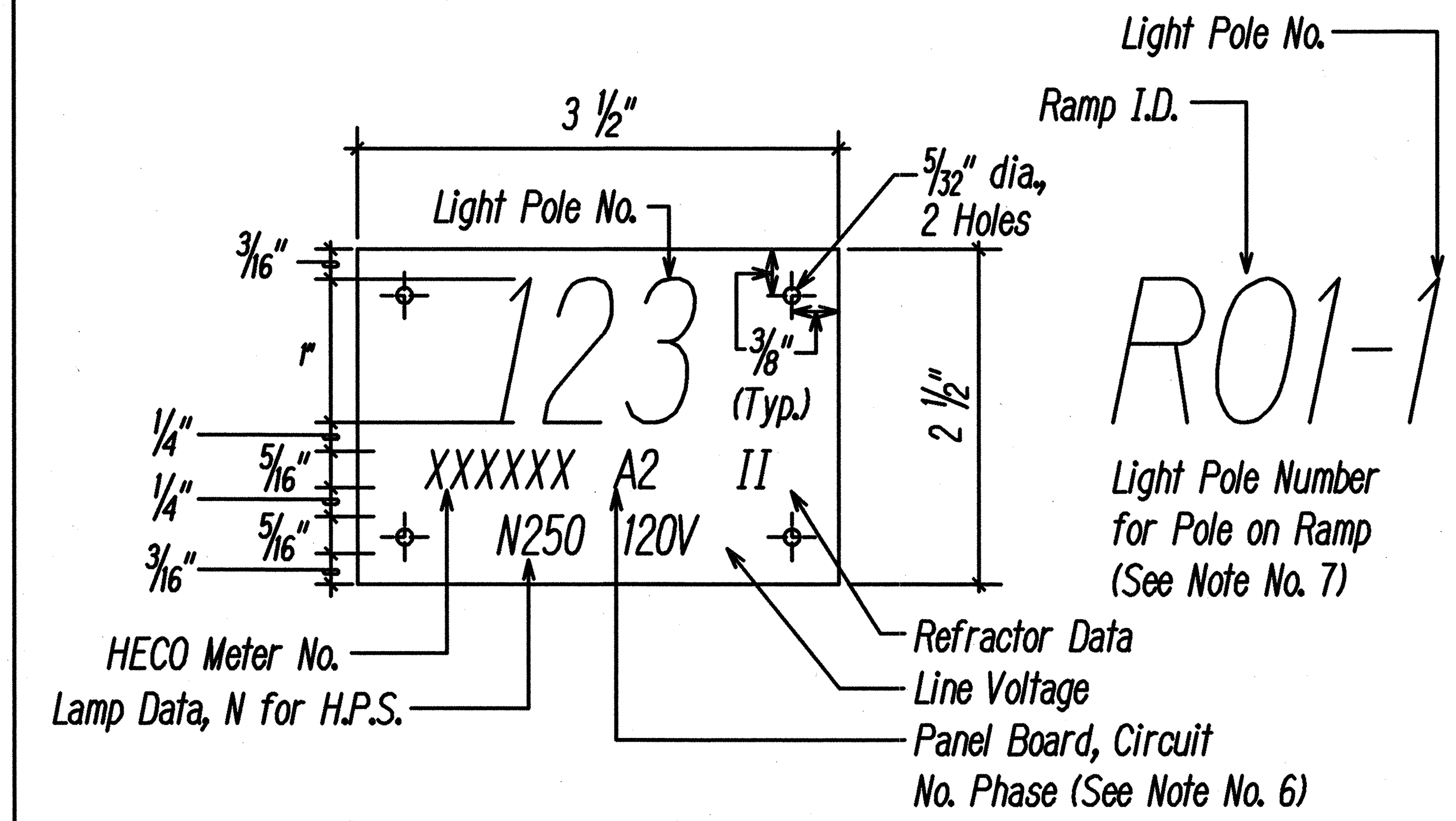
(A / E-28) OVERHEAD STREET LIGHT MOUNTING
N.T.S.



BASE SUPPLIED WITH:

1. Door and 1/4"-20NC S.S. Screw
2. Eight 1" Washers 1/2" Thick x 2 3/4" O.D. (Washers Mechanical Galvanized per ASTM B454)
3. Four 1"-8NC x 3 3/4" Long Galvanized Steel Hex. Hd. Bolts
4. Four 1"-8NC Galvanized Steel Hex. Nuts
5. Four 1" Galvanized Steel Lock Washers
6. Four 1" x 2" O.D. Galvanized Steel Flatwashers
7. Transformer Base shall be Breakaway Type for Areas Without Curb or Guardrail

(B / E-28) TRANSFORMER BASE DETAIL
N.T.S.



NOTES:

1. Use 3 Ply Laminated Flexible Plastic Black-White-Black Thickness: Black Cap Sheet-0.010", White Base Sheet-0.052", Black Base Sheet-0.010".
2. Light Pole Number Size shall be 1" High and Engraved 1/8" Wide, White in Color (Number as Required).
3. Nomenclature Size Shall be 5/16" High and Engraved 1/32" Wide, White in Color (Meter Number, Circuit Number, Line Voltage, Lamp Data and Refractor Data as Required).
4. Attach to Aluminum and Steel Poles with No. 8 Stainless Steel, 1/2" Long Drive Screw in 1/8" Drill Hole. Attach to Wood Poles with 4D Aluminum Nails.
5. Numbers are Inscribed by Cutting through "Black Cap Sheet" to Expose "White Letters".
6. Nomenclature Required for Systems with Two or more Circuits. First Letter Indicates Panel Board, Number Indicates Circuit.
7. For Light Poles Installed on Ramp, Assign Numbers to Include Ramp I.D. and Pole Number. Legend may be less than One (1) Inch in Height.

(C / E-28) STREET LIGHT I.D. TAG DETAIL
N.T.S. (208Y/120V METERED SYSTEM)

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

Scale: None Date: AUGUST 2000

SHEET No. E-28 OF 30 SHEETS

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

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	67	68

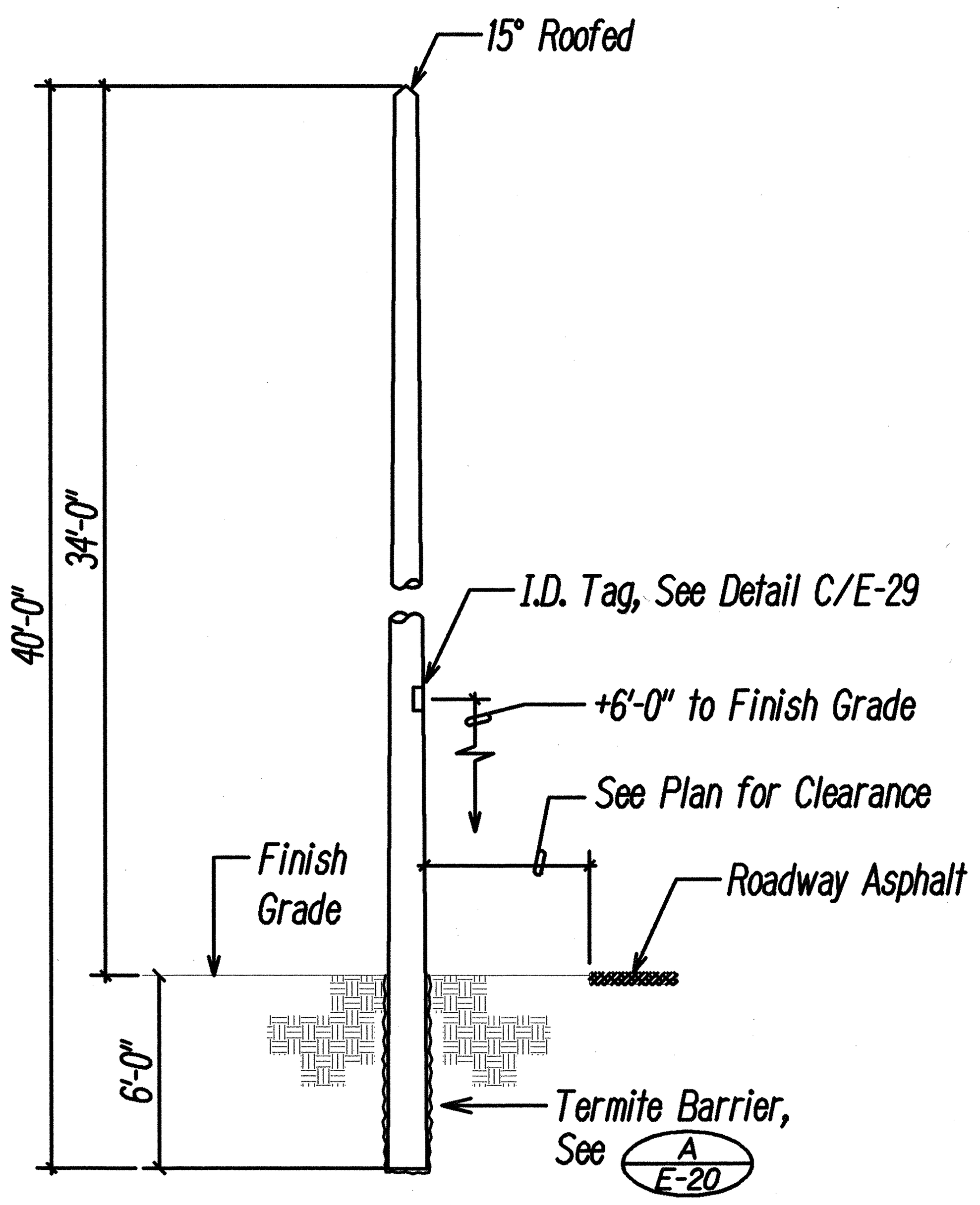
OVERHEAD STREET LIGHT NOTES

1. Connection To The HECO Secondary Circuits Shall Be Made By HECO And Paid For By The Electrical Contractor.
2. Contractor Shall Be Responsible For Coordinating And Informing HECO, HTCO and CATV Of Street Light Locations On Joint Poles Prior To The Installation Of Street Lights And Street Light Secondary Cables On Joint Poles.
3. Contractor Shall Stencil Date Of Installation On Bottom Of Photocell.
4. Contractor To Energize Street Lights A Minimum Of Six (6) Hours For Final Inspection And Acceptance. Contractor To Assume Costs.
5. Contractor Shall Have One Set Of Approved Plans At The Job Site At All Times During The Construction Work.
6. All Neutral Conductors Shall Have Solid White Insulation. Any Other Method Of Identification Is Unacceptable.
7. Contractor Shall Not Backfill Trenches Until Work Is Approved By The Engineer.
8. The Contractor Shall Inform The Inspector Of All Concrete Pours At Least Two (2) Working Days In Advance. Concrete Shall Not Be Poured Until Approval Is Granted By The Inspector.
9. Luminaire And Pole Count

Poles	New Wood Poles:	3
	Existing Wood Poles:	3
Luminaires	250W HPS:	6

Contractor Shall Verify Counts.

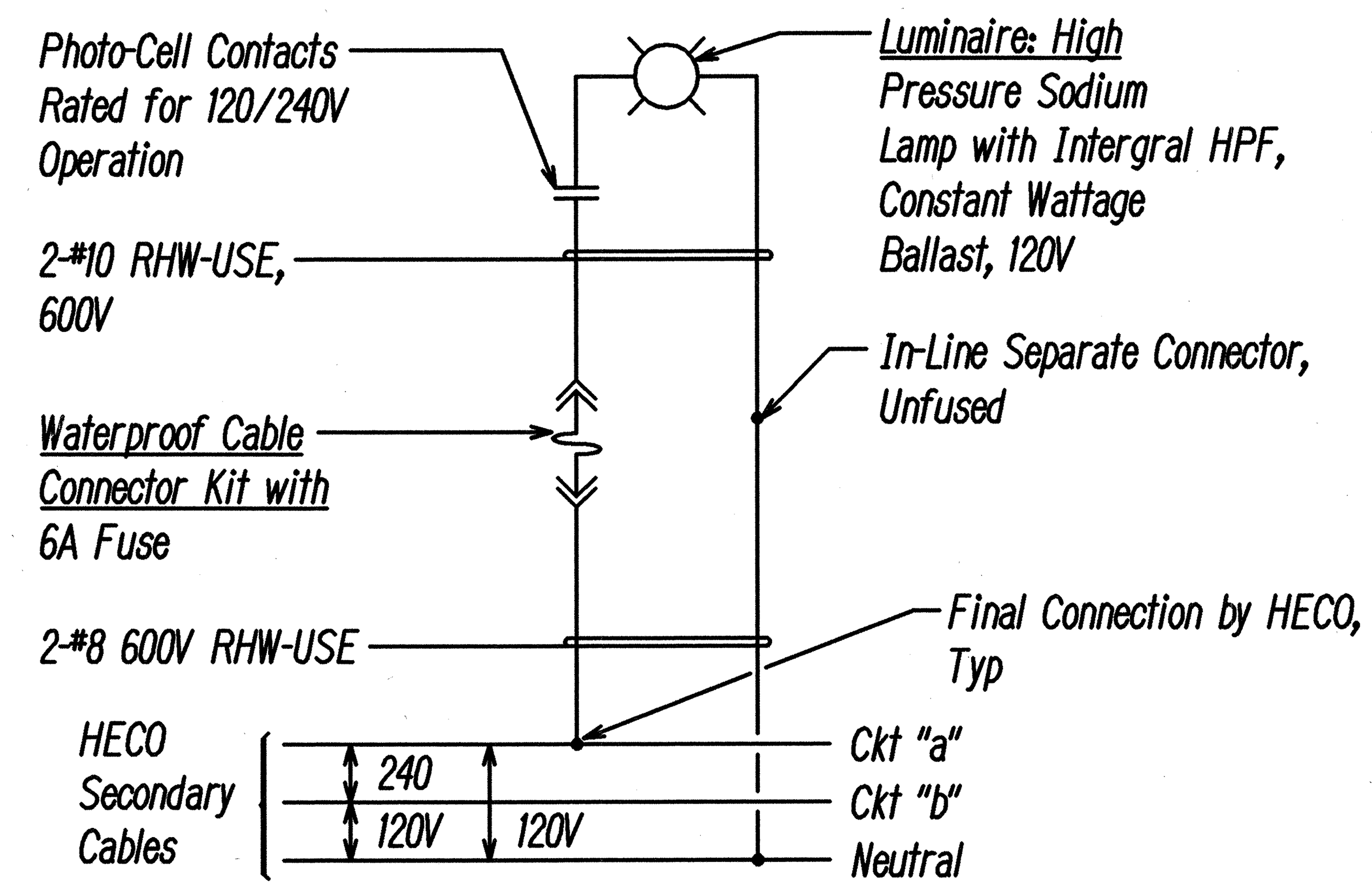
10. All Work Shall Be Done By A Duly Licensed Electrician.
11. Trench Dirt And Material Will Not Be Allowed To Be Stored On Roadway Or Shoulder.
12. Temporary Trench Patches Shall Match Grade.
13. Engineer to Determine Salvagable Material. Deliver all Salvageable Material to the Baseyard At 727 Kakoi Street. Remaining Material shall be Contractor's Property.
14. Submit Shop Drawings For All Street Lighting Components Including Luminaires, Lamps, Photocell And Mast Arms, For Approval.
15. The Contractor Shall Notify The Joint Pole Committee Two (2) Weeks In Advance Of Any Relocation Of Utility Pole(s) That Maybe Necessary.
16. Existing Street Lighting To Be Kept Operational During Dark Hours.
17. The Contractor Shall Be Responsible For Any Damages To Existing Street Lighting Facilities And Damages Shall Be Repaired By The Contractor At His Cost With No Additional Cost To The State.



NOTE:

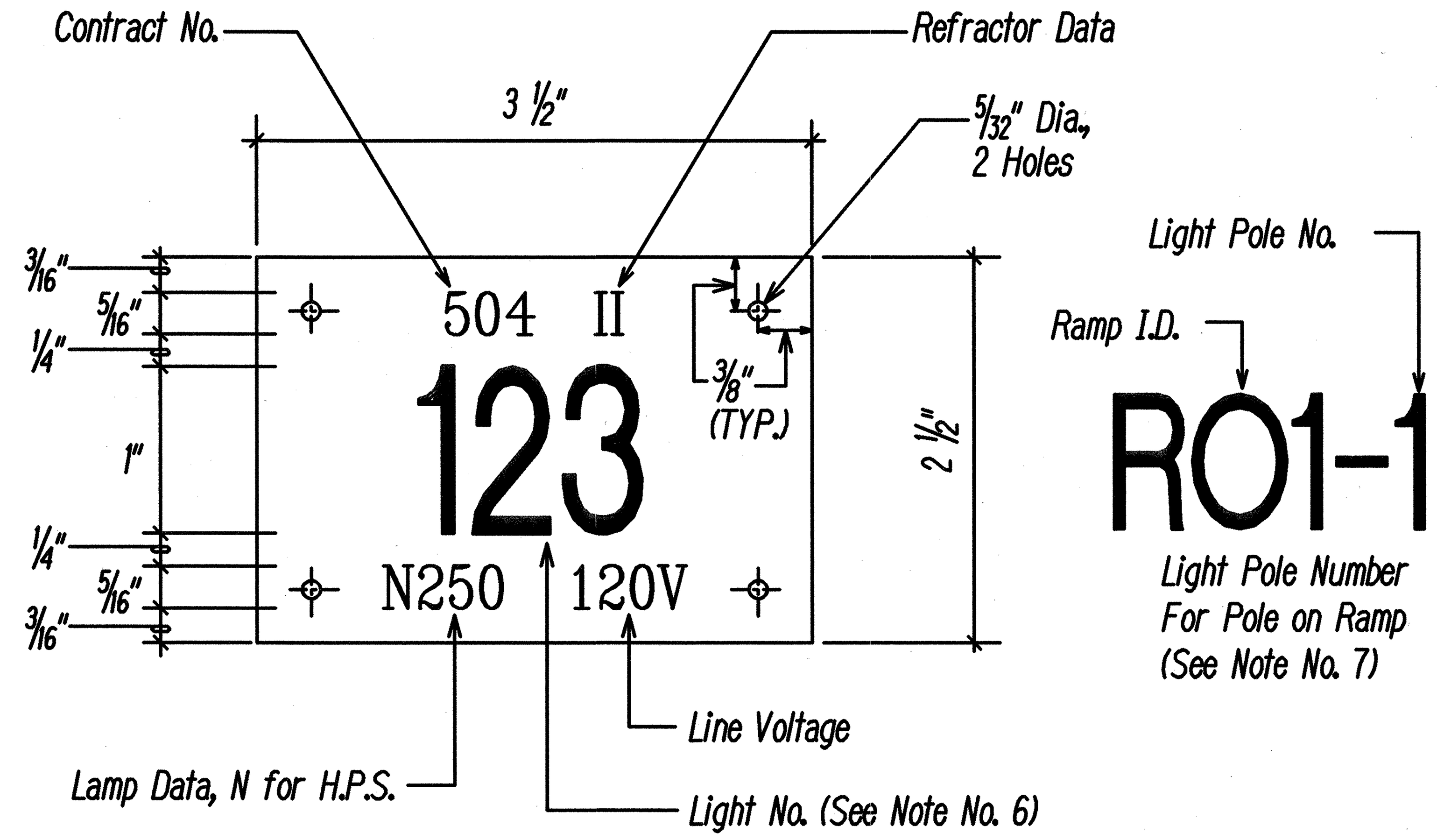
1. Wood Pole Class II
2. Pole shall be Treated with Pentachlorophenol Using the "celon" Process. by Licensed Termite Treatment Company.

A/E-29 WOOD POLE DETAILS
N.T.S.



Note: All Neutral Conductors shall be Identified with White Insulation. Other Means of Identificatoin is not Acceptable.

B/E-29 STREET LIGHT CONNECTION DIAGRAM
(120/240V UNMETERED SYSTEM)



Notes:

1. Use 3 Ply Laminated Flexible Plastic Black-White-Black Thickness: Black Cap Sheet-0.010", White Base Sheet-0.052", Black Base Sheet-0.010".
2. Light Pole Number Size shall be 1" High and Engraved 1/8" Wide, White in Color (Number as Required).
3. Nomenclature Size shall be 5/16" High and Engraved 1/32" Wide, White in Color (Contract Number, Line Voltage, Lamp Data and Refractor Data as Required).
4. Attach to Aluminum and Steel Poles with No. 8 Stainless Steel, 1/2" Long Drive Screws in 1/8" Drill Hole. Attach to Wood Poles with 4D Aluminum Nails.
5. Numbers are Inscribed by Cutting Through "Black Cap Sheet" to Expose "White Letters".
6. Contract Number & Light Number shall be Obtained from the State. Use an Alphabet Suffix to Designate Lights.
7. For Light Poles Installed on Ramp, Assign Numbers to Include Ramp I.D. and Light Number. Legend may be less than One (1) Inch in Height.

C/E-29 STREET LIGHT I.D. TAG DETAIL
N.T.S. (UNMETERED)

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7037-E HAWAII, U.S.A.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

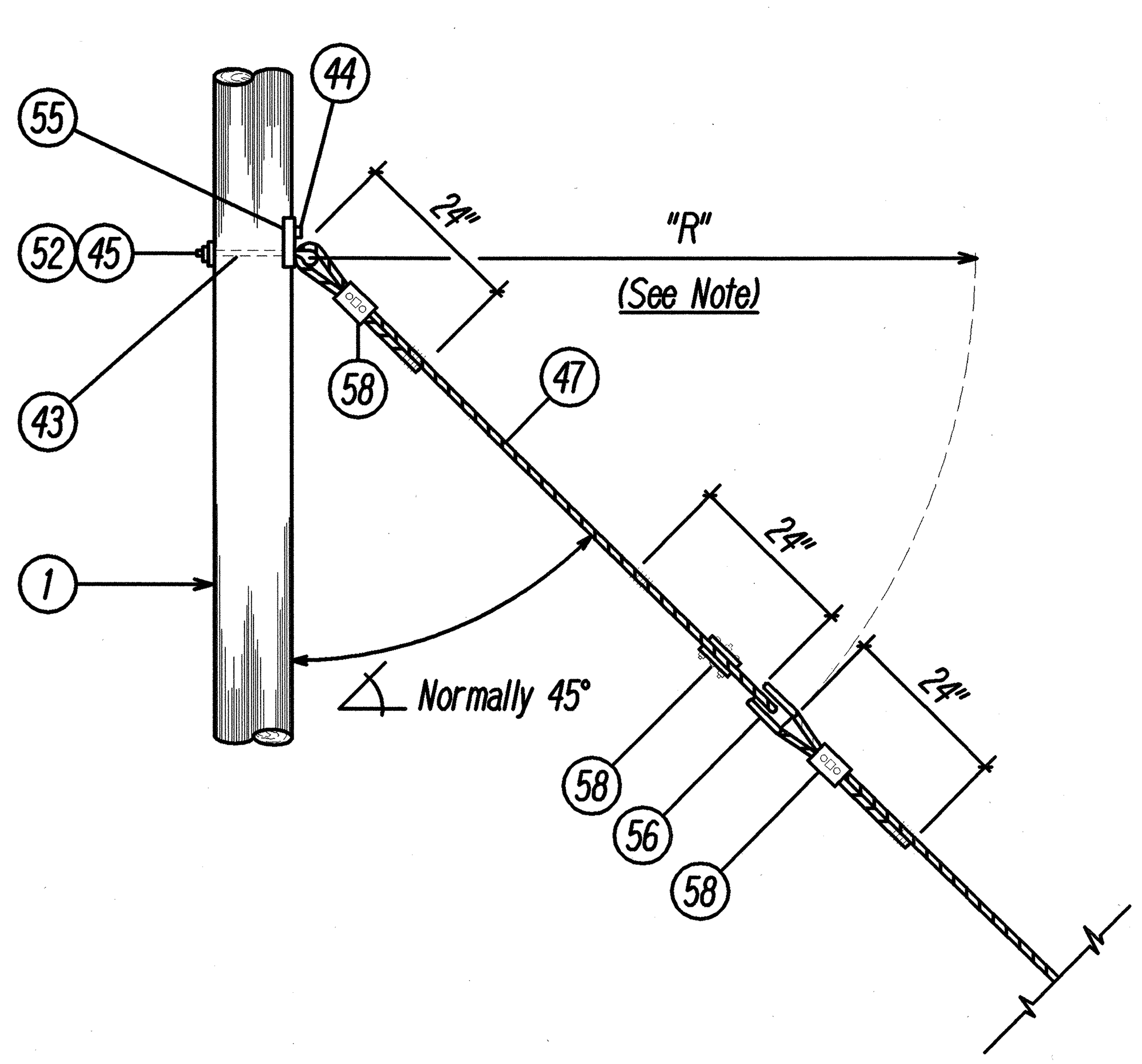
STREET LIGHT DETAILS

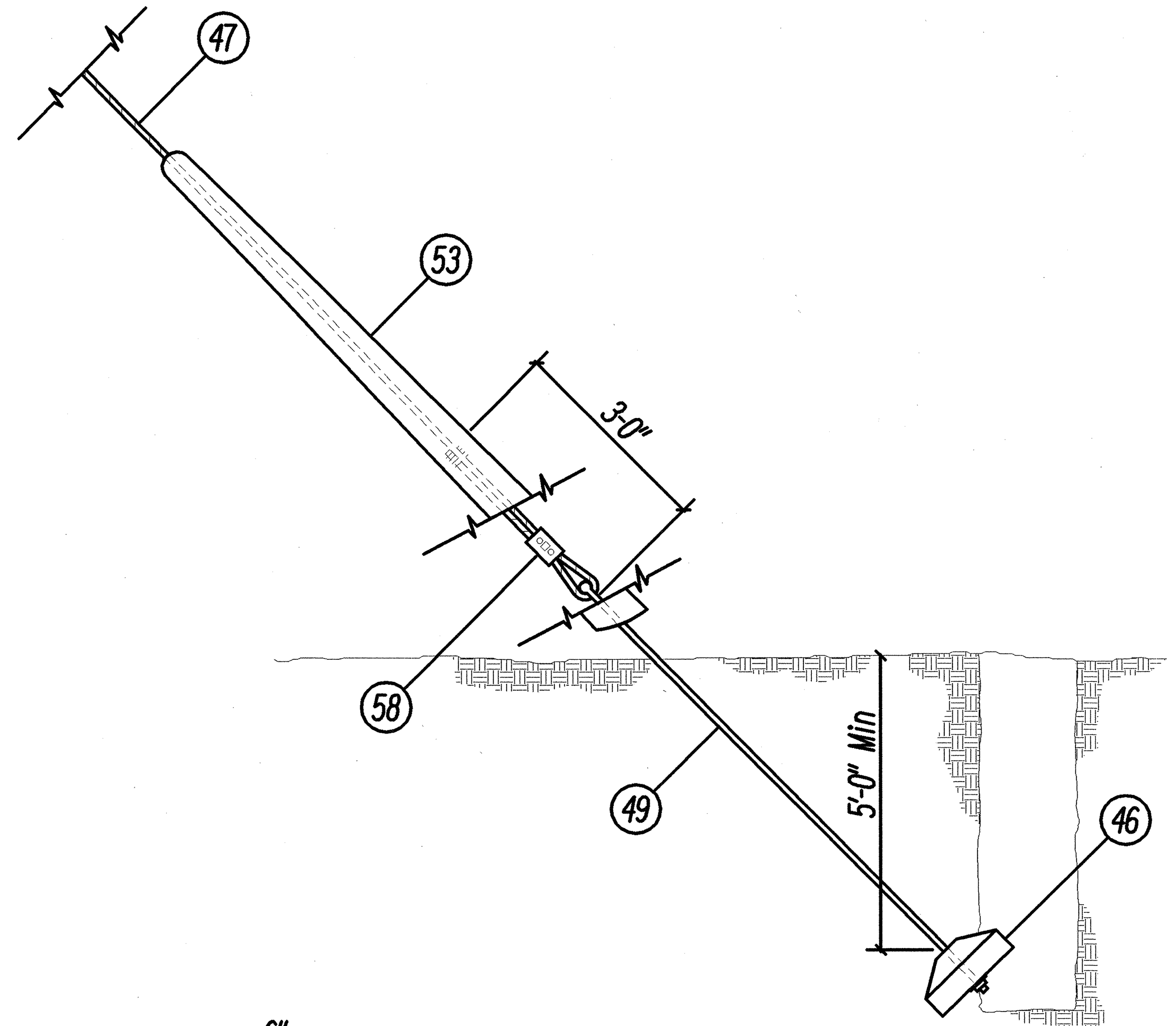
FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

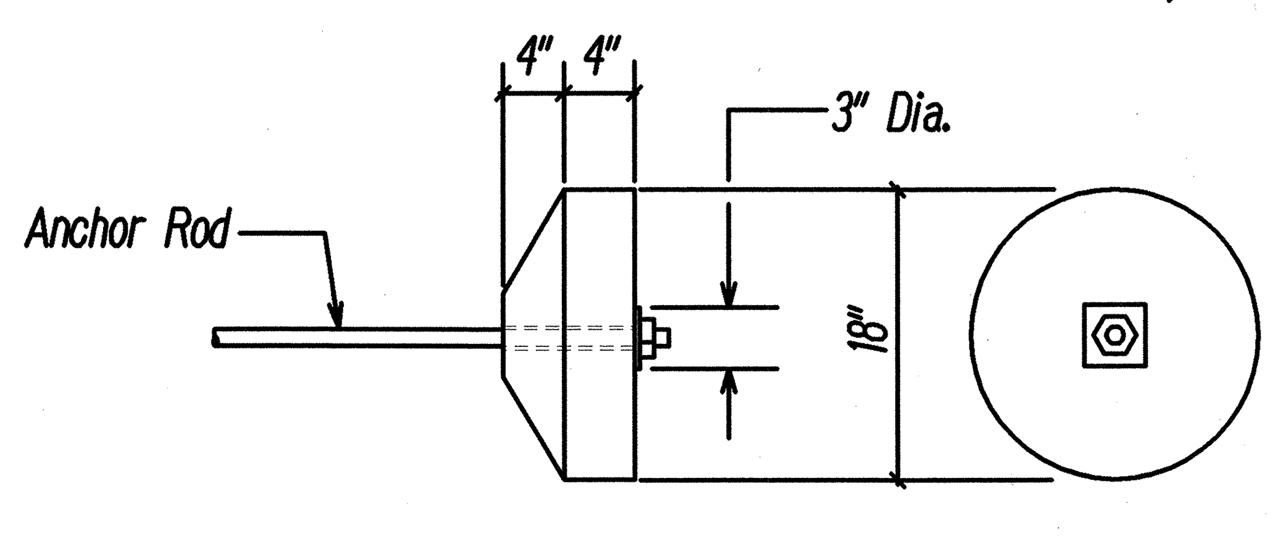
Scale: None Date: AUGUST 2000

SHEET No. E-29 OF 30 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-06-98	2001	68	68

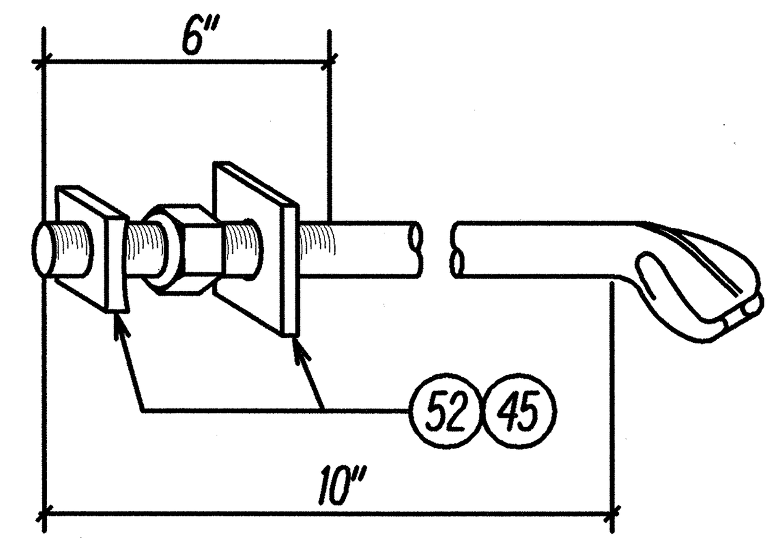




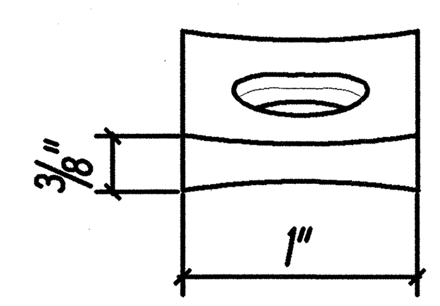


PART NO. 46

CONCRETE ANCHOR



PART NO. 43



PART NO. 52

A / E-30 TYPICAL GUY AND ANCHOR ASSEMBLY DETAIL

N.T.S.

LIST OF MATERIALS

Part No.	Description
1	Wood Pole, Class II, 40'-0" Unless Otherwise Indicated
43	Thimbleye Bolt, 5/8" X 10"
44	Lag Screw, 1/2" X 4" (Fetter Drive)
45	Washers, Square, 2 1/4" X 2 1/4" X 3/16", 11/16 " Dia. Hole
46	Concrete Anchor
47	Galvanized Guy Wire, 7 Strand Utilities, Grade, 7/16" Size.
49	Anchor Rod, Threaded Thimbleye 5/8" X 8'-0", Twineye 3/4" X 8'-0"
52	Square M-F Locknut, for 5/8" Dia. Bolt
53	Guy Protector, Round, 8 Feet, Yellow Color PVC Material
55	Lift Plate, 3-Hole, 1/4" Steel Plate
56	Guy Strain Insulator
58	Guy Clamp, 6" 3-Bolt, 5/8" Bolt

Notes:

1. All Hardware shall be Galvanised in Conformance with ASTM Designation A-153.
2. Radius "R" shall be Length Required to Locate Guy Insulator Four Feet Below Communication Conductor Level; Minimum "R" Equal to Six Feet.
3. Required Bolt Lengths Indicated are Approximate. Modify to Suit Pole Diameter.
4. Provide Drilling as Required.

ORIGINAL PLAN	SURVEY	PLOTTED BY	DATE
	DRAWN BY	X	X
	TRACED BY		
NOTE BOOK ddx.x	DESIGNED BY	X	
N. X.dgn	QUANTITIES BY		
	CHECKED BY		

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Steven H. Sakai

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STREET LIGHT DETAILS

FARRINGTON HIGHWAY
Intersection Improvements at Waiomea Street
Project No. 93A-06-98

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SHEET No. E-30 OF 30 SHEETS