FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	61	74

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 work shall conform to the requirements of the "Manual On Uniform Traffic Control Devices For Streets And Highways", Federal Highway Administration (1988) and Amendments.
6. Locations of traffic 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.
7. All Conduits between pullboxes and Traffic Signal/Highway Lighting Standards shall not be paid for separately but shall be considered incidental to the various contract items.
8. All Signal-Drop Cables (Type 5 Cables) from the various Types of 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.
9. 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.
10. After installing the Traffic Signal System, the Contractor shall apply grease to all parts of the Traffic Signal System (i.e. fittings, brackets, nipples, elbows, screws, signal head assemblies, bolts, hinges, etc.) as directed by the Traffic Signal Inspector, to prevent rust and corrosion. The grease material shall be approved by the Signal Inspector, and shall not be paid for separately but considered incidental to the various Traffic Signal items.
11. 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.
12. The Contractor shall notify the Traffic Control Branch, Department of Transportation Services, City & County of Honolulu, (Phone No. 523-4589) three (3) working days prior to commencing any work on the traffic signal system.
13. The traffic signal system shall be kept operational during construction. Any temporary traffic signal relocation required shall be approved by the Traffic Control Branch, Department of Transportation Services, and paid for by the Contractor.
14. Existing traffic signal pullboxes in sidewalks shall be removed by demolishing the top 6" of box, filling with #3 rock, and patching with 4" concrete to match existing.
15. The concrete jacket for the Conduit By-Pass Details shown on Sheet TS5, shall not be paid for separately but considered incidental to the various contract items. The Engineer shall determine if a concrete jacket is required.
16. Locations and configurations of traffic signal loop detectors shown on the plans shall be verified with the Engineer prior to installation.
17. All existing traffic signal pullboxes shown on the plans are approximate only. It is not the intent of these plans to show the exact location. It is the Contractors responsibility to verify the new traffic signal loop detector connections to the existing traffic signal pullboxes.

TRAFFIC SIGNAL LEGEND

NEW	EXISTING	
		Traffic Signal Conduit
1 2 3	1 2 3	Conduit Run Numbers
A B C	A B C	Equipment description, installation or item no.
M	M	Traffic Signal Master Controller Door Indicates Front of Cabinet
C	C	Traffic Signal Controller Door Indicates Front of Cabinet
		Meter Pedestal
		12" RYG Traffic Signal Head
		12" RY↑ Traffic Signal Head
		12" R ← Y G Traffic Signal Head
		12" R ← Y G Traffic Signal Head (Programmed Visibility)
		12" RYG ← G/Y Fiber Optic Traffic Signal Head
		Type I Standard and Attached Signals
24' 12'		Type II Standard with Signal Mast Arm and Attached Signals (Nos. indicates mast arm length & distance between signal heads as specified on plans)
8' 24' 12'		Type III Standard with Luminaire and Signal Mast Arm and Attached Signals (Nos. indicates mast arm lengths & distance between signal heads as specified on plans)
Y	Y	Flashing Beacon, One Signal Section, "Y" indicates 12" Yellow Lens
		Opticom Receiver (Arrow indicates direction detector faces)
		Pipe Guard
		Pedestrain Signal Head
	tspb	Type A Pullbox
	tspb	Type B Pullbox
	tspb	Type C Pullbox
		Loop Detectors

HIGHWAY LIGHTING LEGEND

NEW	EXISTING	
HL	hl	Highway Lighting Conduit
	hl	Type A Pullbox (Hwy. Ltg.)
		Highway Lighting Standard

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Takaki	
NOTE BOOK	TRACED BY	
tg2.may	DESIGNED BY P. Chan	
No. starting	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL LEGEND AND NOTES

FARRINGTON HIGHWAY REHABILITATION,
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY
Project No. 7101A-01-04M

Scale: As Shown Date: July 2005

SHEET No. TS1 OF 14 SHEETS

NEW DESIGN REQUIREMENTS FOR LUMINAIRES, POLE STANDARDS AND TRAFFIC SIGNAL STANDARDS

1. Highway Lighting Pole Standards, Bracket Arms, Traffic Signal Standards and Mast Arms to be furnished for this project shall conform to the 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", 4th Edition, and the 2002 Interim Revisions, published by the American Association of State Highway and Transportation Officials.

2. In addition, the following modifications for the 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals" shall be used in the design and manufacture of structural supports for highway luminaires and traffic signals.

3. Basic Wind Speed [Article 3.8.2] to determine the design wind pressure shall be 105 mph. For unusual or differing exposure conditions, the Basic Wind Speed should be increased using rational procedures and sound engineering judgement. Alternatively, the design wind pressure may be increased by using a higher Wind Importance Factor [Table 3-2] corresponding to a recurrence interval of at least one level greater than recommended.

4. Wind Importance Factor [Article 3.8.3] noted in Table 3-2 used to determine the design wind pressure for overhead cantilevered sign support structures over:

   a. freeways shall be based on a recurrence interval of 100 years.

   b. ramps and other highways with "high" ADT shall be based on a recurrence interval of 100 years unless otherwise directed.

5. Height and Exposure Factor [Article 3.8.4]. For sign and luminaire support structures on bridges, the Height and Exposure Factor shall be determined based on the maximum height they are above the surrounding ground. For severe exposure conditions such as along the coastline, the factor shall be increased based on the latest ASCE Standard No. 7, Minimum Design Loads for Buildings and Other Structures.

6. Fatigue Importance Factors [Article 11.6] noted in Table 11-1 for Overhead Cantilevered Sign, Traffic Signal and Luminaire Support Structures shall be based on the following:

   a. Fatigue Category I - for all structures where failure would result in the structure falling onto the travel way.

   b. Fatigue Category II - for all others.

7. Galloping [Article 11.7.1]. Overhead cantilevered sign and traffic signal support structures shall be designed for Galloping-induced cyclic loads unless approved vibration mitigation devices are installed.

8. Vortex Shedding [Article 11.7.2]. Nontapered lighting structures shall be designed to resist Vortex Shedding-induced loads including cantilevered mast arms and lighting structures that have tapers less than 0.14 in/ft.

9. Natural Wind Gust [Article 11.7.3]. Overhead cantilevered sign, traffic signal and high-level lighting support structures shall be designed to resist an equivalent static Natural Wind Gust pressure. For unusual or differing exposure conditions, the equivalent static Natural Wind Gust pressure should be increased using references noted in the specifications.

10. Truck-Induced Gust [Article 11.7.4]. Overhead cantilevered sign and traffic signal support structures shall be designed to resist an equivalent static Truck Gust pressure range based on a truck speed of 65 mph. At the option of the State of Hawaii, Department of Transportation, a lower truck speed may be used in areas with design speeds not exceeding 45 mph.

11. The Contractor shall submit shop drawings accompanied by complete and detailed engineering computations from the equipment manufacturer to the Engineer for approval.

ORIGINAL PLAN
NOTE BOOK
SURVEY PLOTTED BY
DRAWN BY M. Fujita
TRACED BY
DESIGNED BY E. Chan
QUANTITIES BY
CHECKED BY
DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL
LEGEND AND NOTES

FARRINGTON HIGHWAY REHABILITATION,
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY
Project No. 7101A-01-04M

Scale: As Shown Date: July 2005

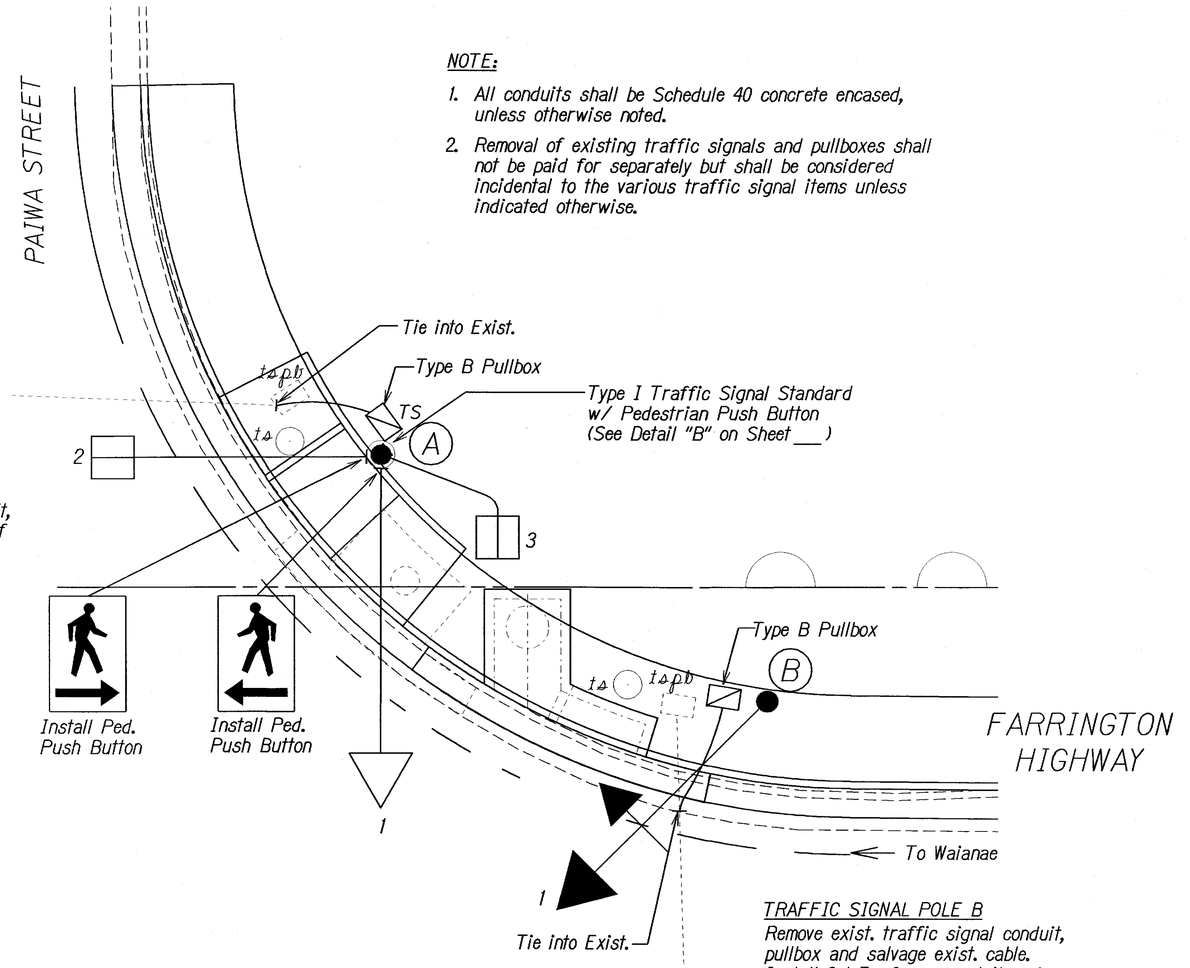
SHEET No. TS2 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	63	74

TRAFFIC SIGNAL HEAD SCHEDULE

Traffic Signal Head Type and Description	12" RYG Traffic Signal Head	12" RY↑ Traffic Signal Head	12" R←Y ←G Traffic Signal Head	Pedestrian Signal Head
Pole Letter Signal Head Number	A-1		B-1	A-2 A-3

* With Programmed Visibility



NOTE:

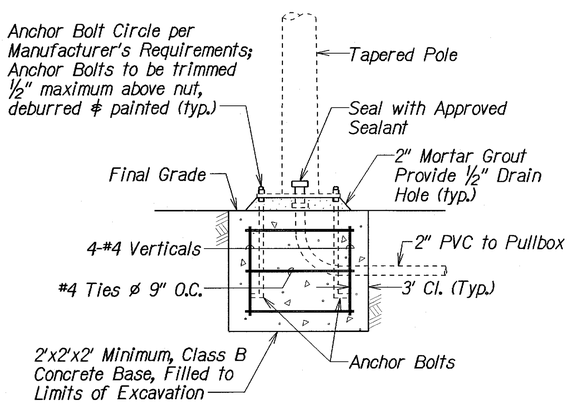
1. All conduits shall be Schedule 40 concrete encased, unless otherwise noted.
2. Removal of existing traffic signals and pullboxes shall not be paid for separately but shall be considered incidental to the various traffic signal items unless indicated otherwise.

TRAFFIC SIGNAL POLE A

Remove exist. traffic signal conduit, cable and pullbox. Install 7 L.F. of new conduit and Type B pullbox. Install new cable in new system and connect.

TRAFFIC SIGNAL POLE B

Remove exist. traffic signal conduit, pullbox and salvage exist. cable. Install 8 L.F. of new conduit and Type B pullbox. Install exist. cable in new system and connect.



TYPE I

FOUNDATION DETAIL

ORIGINAL PLAN	SURVEY PLOTTED BY M. Tabrigi	DATE x
	DRAWN BY	x
NOTE BOOK	TRACED BY Peter Chan	
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

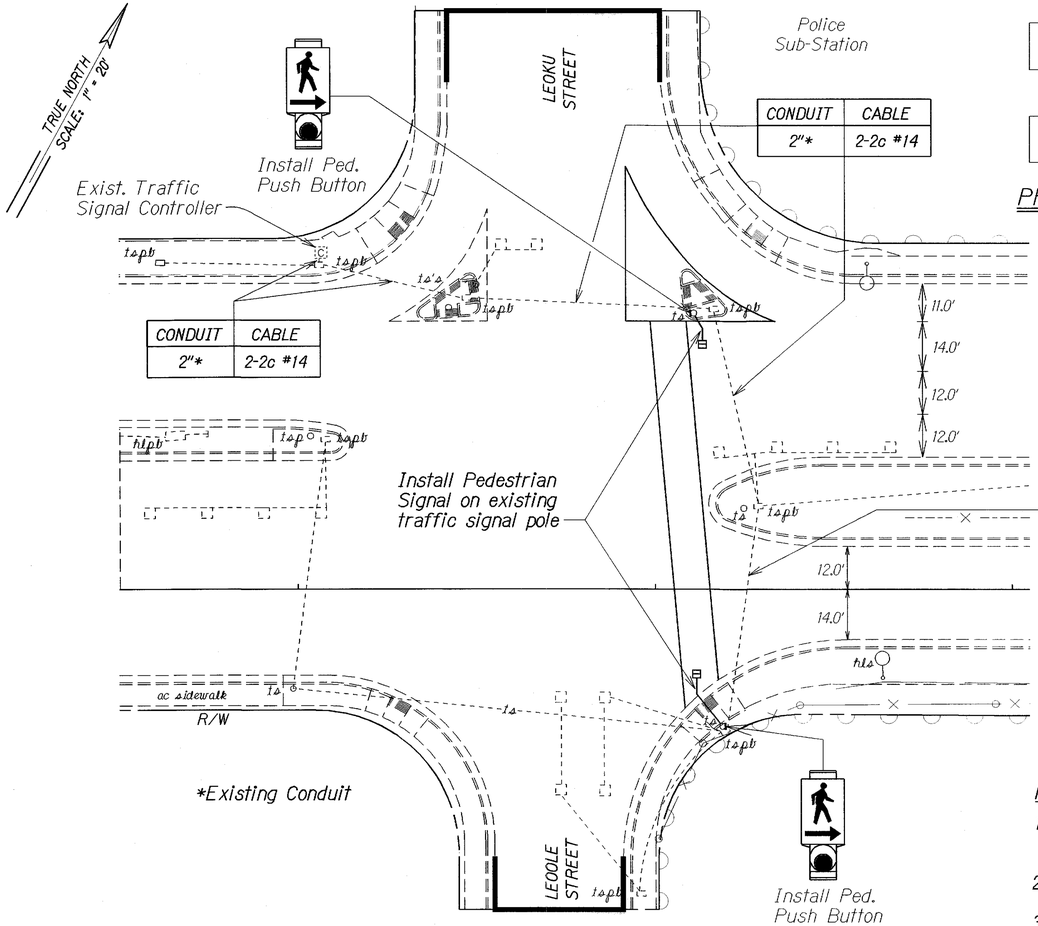
FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY

PROJECT NO.: 7101A-01-04M

Scale: 1" = 5' Date: July 2005

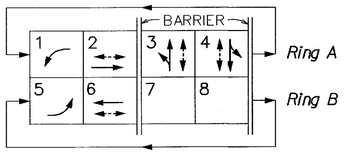
SHEET No. TS3 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	C.O. 63S-1	74



*Existing Conduit

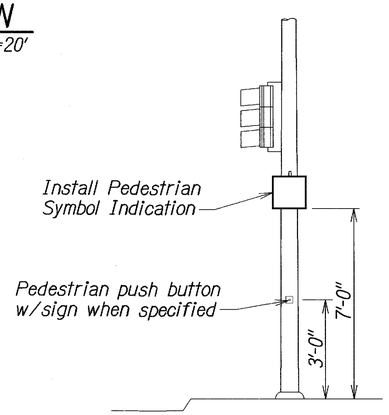
PLAN
Scale: 1"=20'



PHASE DIAGRAM (REVISED)

Right

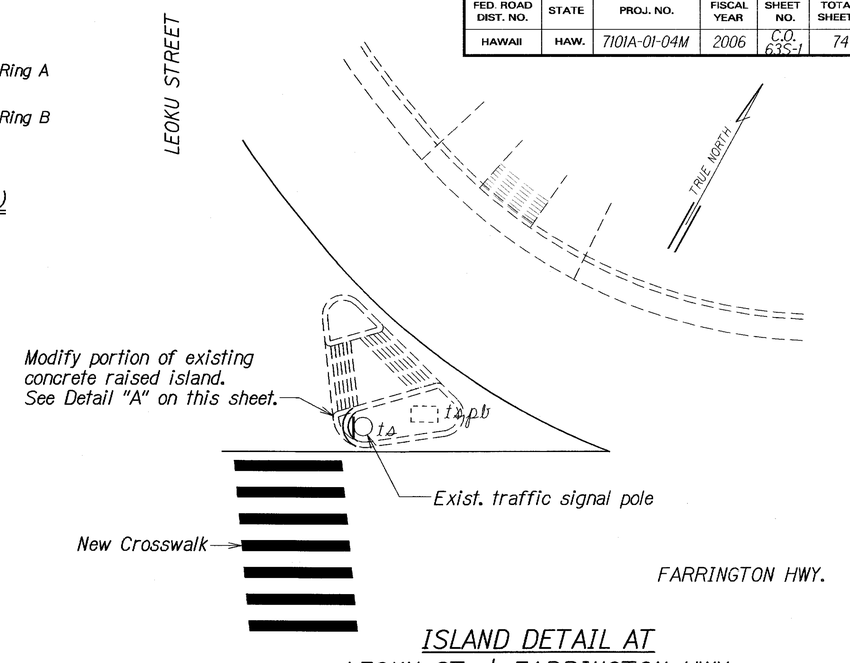
PEDESTRIAN PUSH BUTTON WITH SIGN
Man, Arrow & Push Button - White
Background - Black



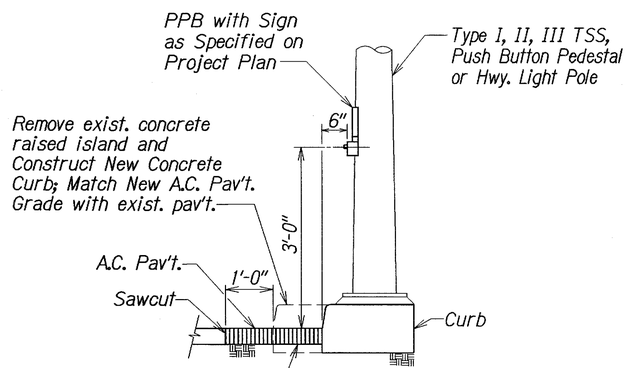
ON MAST ARM OR SPAN WIRE STANDARD

NOTES:

1. Install New Pedestrian Signals and Push Buttons on existing traffic signal poles.
2. Install New Cables in existing conduits.
3. Conenct New Pedestrian Signals and Push Buttons to existing traffic signal controller cabinet.
4. 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 Electrical and Maintenance Services Division, Department of Transportaiton Services, three (3) working days prior to commencing work on the traffic signal system (phone no. 523-4589).
5. Modify portion of existing concrete raised island. Construct New Concrete Curb and Patch exsiting pavement with A.C. This work will not be paid for separately and shall be considered incidental to other contract items.



ISLAND DETAIL AT LEOKU ST. & FARRINGTON HWY.
Not to Scale



DETAIL "A"

ORIGINAL PLAN
NOTE BOOK
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE 9/27/06
S:\Traffic\2_CO_Sk

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN
FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY
PROJECT NO.: 7101A-01-04M

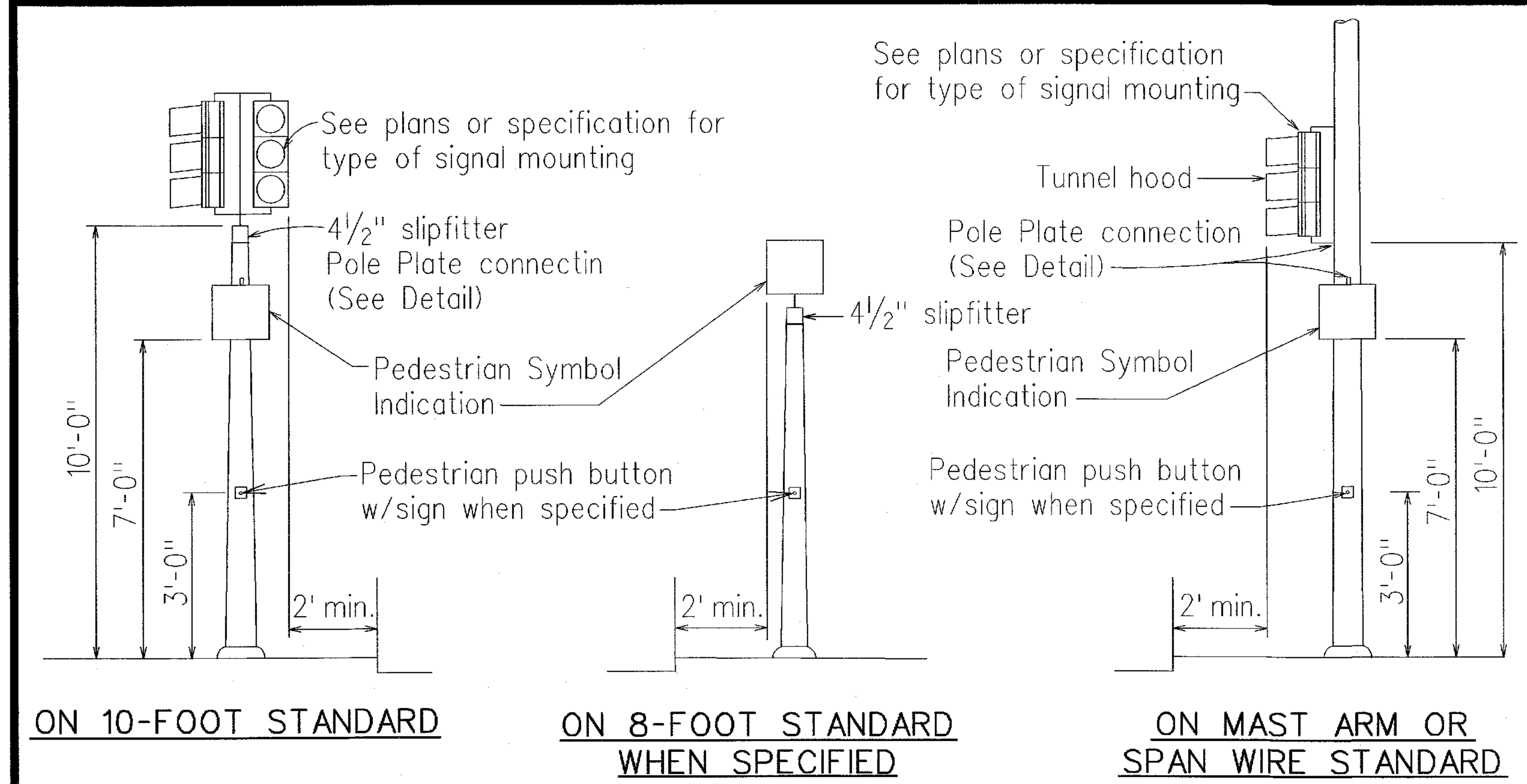
Scale: As Noted — Date: Sept. 2006

SHEET No. TS3A OF 14 SHEETS

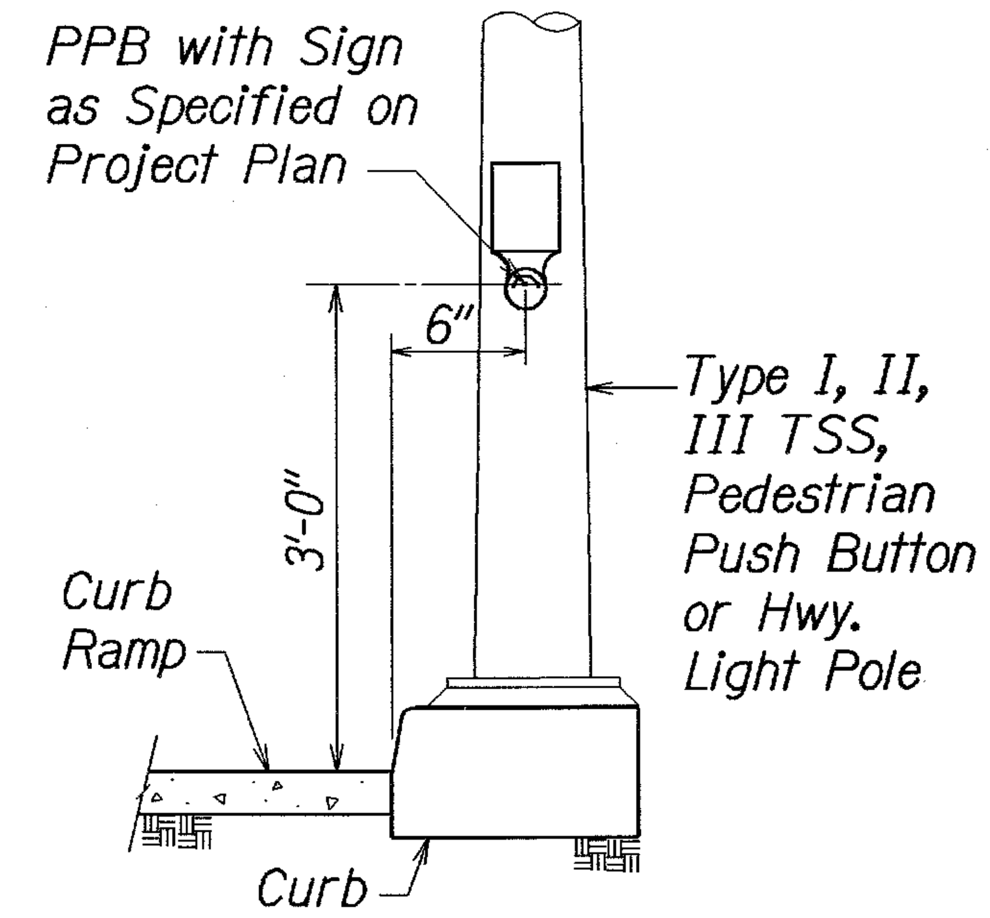
DATE	REVISION
9/27/06	This sheet added to contract plans.

C.O. 63S-1

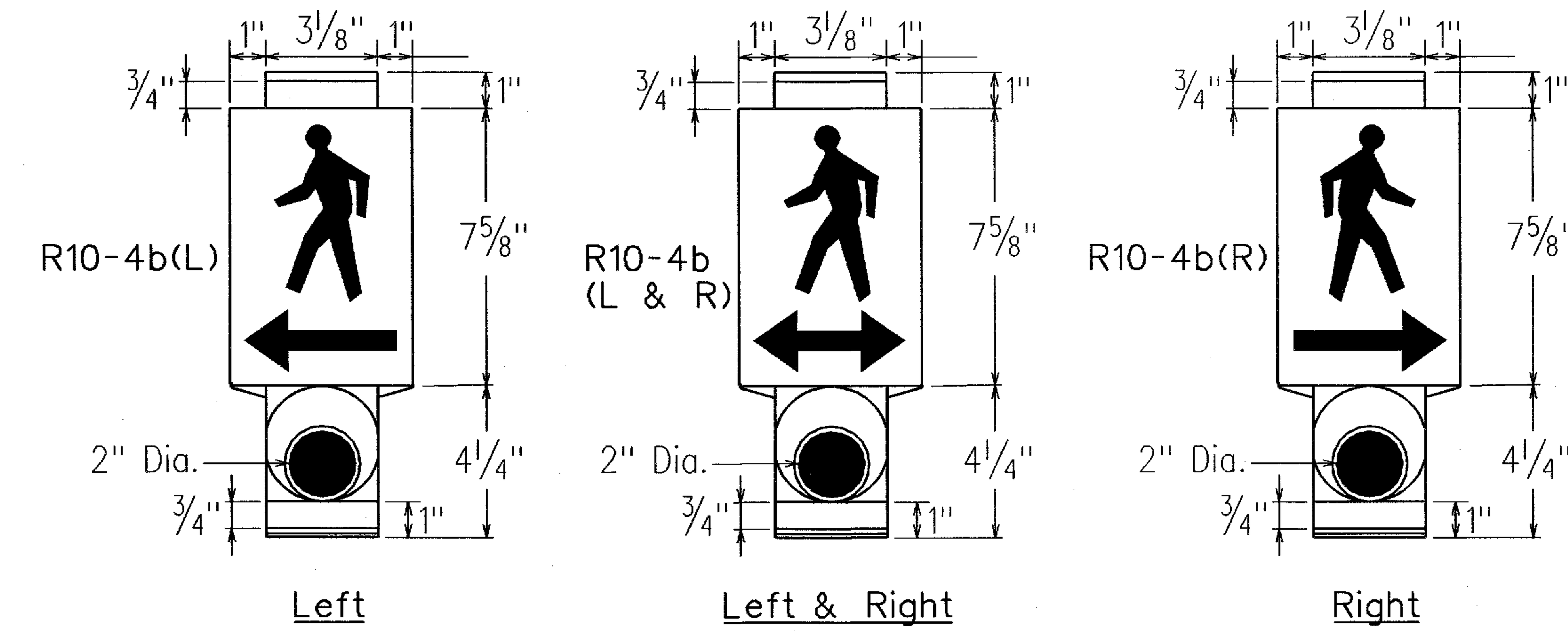
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	64	74



TYPICAL EQUIPMENT MOUNTINGS



DETAIL "B"

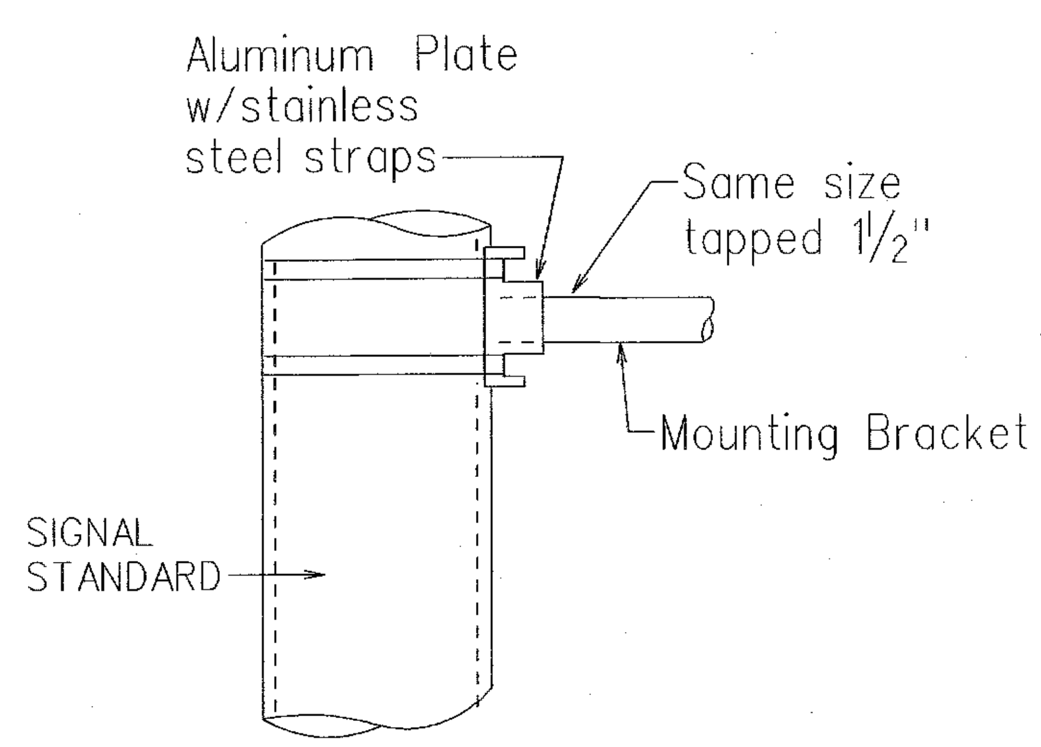


PEDESTRIAN PUSH BUTTON WITH SIGN

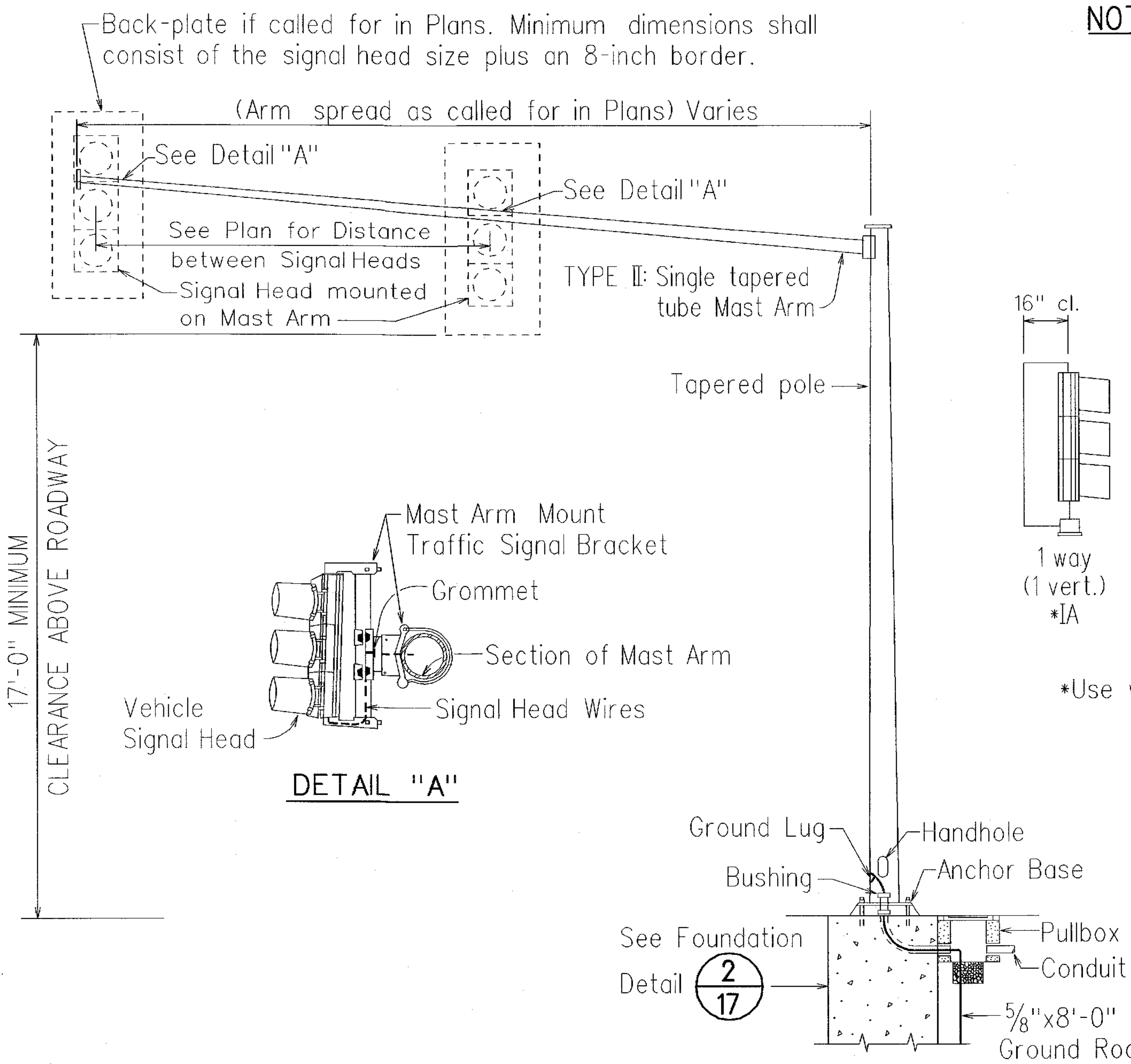
Man, Arrow & Push Button - White
Background - Black

NOTE: The pedestrian push button shall meet operational and reach requirements of the American with Disabilities Act Accessibility Guidelines (ADAAG):

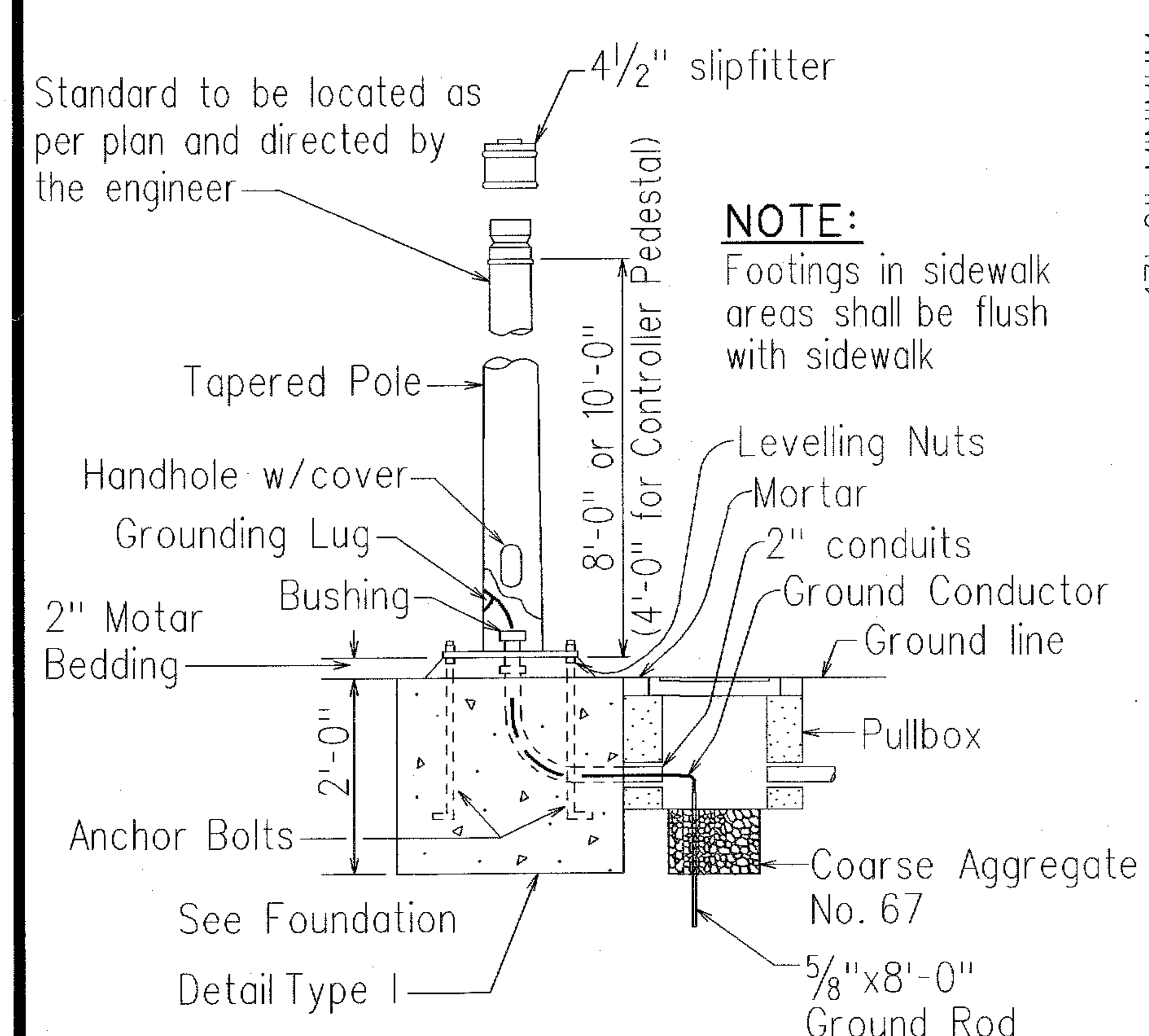
a) Forward Reach. The maximum height for forward reach shall be 48".
b) Side Reach. The maximum height for side reach shall be 54".
c) Operation. Controls and operating mechanisms shall be operable with one hand and shall not require tight grasping, pinching or twisting of the wrist. The force required to activate controls shall be no greater than 5 lbf.



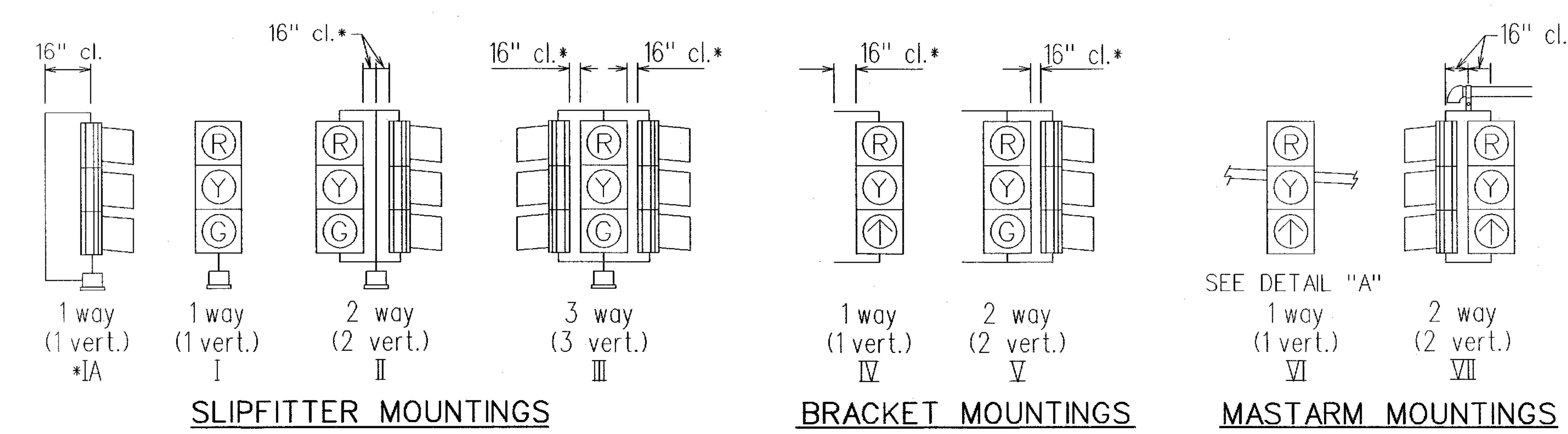
DETAIL OF POLE PLATE CONNECTIONS



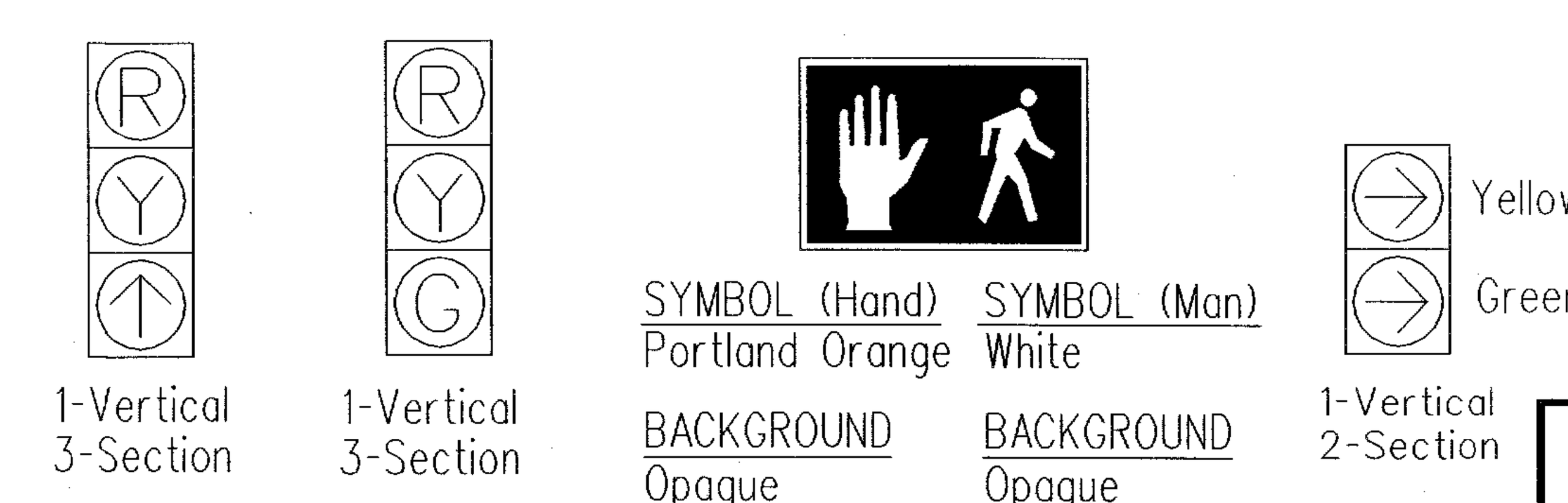
TYPE II MAST ARM AND STANDARD



TYPE I SIGNAL STANDARD AND FOOTING



TYPICAL VEHICULAR AND PEDESTRIAN SIGNAL MOUNTINGS



TYPICAL SIGNAL ARRANGEMENTS

NOTES:
1. Standard shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on Plan Sheet No. 15.
2. Submit shop drawings for approval.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL SYSTEM
MISCELLANEOUS DETAILS

FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY
Project No. 7101A-01-04M

Scale: As Shown | Date: July 2005

SHEET No. TS4 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	65	74

STATE RIGHT-OF-WAY BACKFILL NOTES

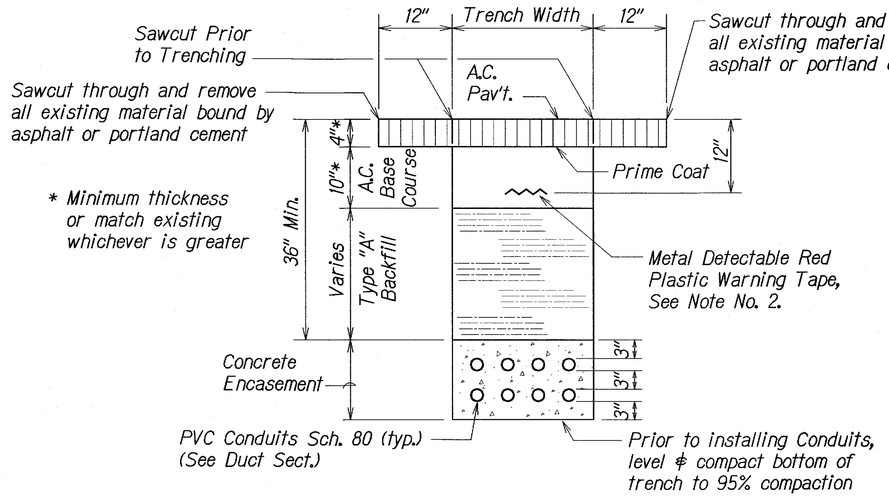
Trench Backfill Material "A"
CLSM, Earth, or Earth and Gravel. If Earth and Gravel used, the maximum shall contain not more than 50% by volume of rock particles. Maximum 8" loose fill per lift. Obtain 95% compaction for each lift.

Concrete
3000 psi compressive strength @ 3 days.

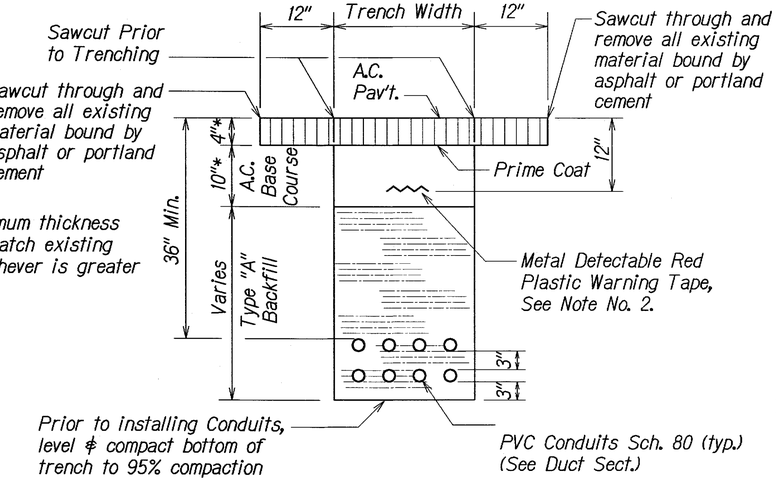
NOTE: Base Course & Sub-Base Course per 1994 State Standard Specifications for Highway Construction.

GENERAL NOTES

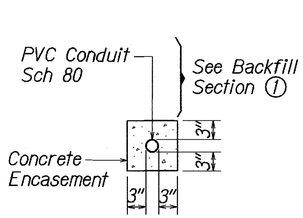
1. If trench is located on unpaved area, the Contractor shall replace 10" A.C. Base Course and 4" A.C. Pavement with Type "A" backfill material.
2. The Metal Detectable Red Plastic Warning Tape shall be a minimum 5 mils thick and 4" wide with a continuous metallic backing and corrosion resistant 1± mil thick foil core. The message on the tape shall read, "CAUTION - STATE TRAFFIC SIGNAL AND/OR HWY LIGHTING BURIED BELOW," utilizing 1½ inches series "C" black lettering. The message will be repeated with a 4¼" spacing between top line of message and start of next repeat.
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.



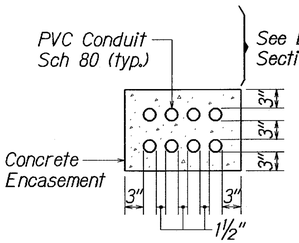
① TYPICAL BACKFILL SECTION WITH CONCRETE ENCASED DUCTS



② TYPICAL BACKFILL SECTION DIRECT BURIED DUCTS



SINGLE CONDUIT

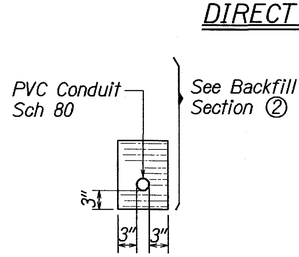


MULTIPLE CONDUIT

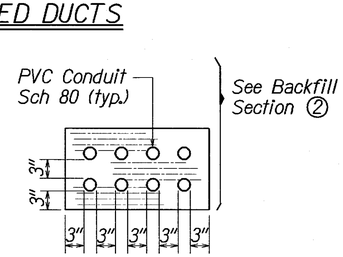
DUCT SECTIONS - CONC. ENCASED

UTILITY	CLEARANCE
Water	See Note**
Sewer	24" Min. or Provide 6" Thick Reinforced Conc. Jacket
Drain	12" Min.
HECO/HTCO/CATV	3" Min.
AT&T	12" Min.

**At the electrical/signal ductline water crossing, install all electrical/signal ductline elevations to maintain 6" vertical clear separation from all waterlines (12" clear for all electrical/signal ductline structures larger than 16") at no cost to the Board of Water Supply.

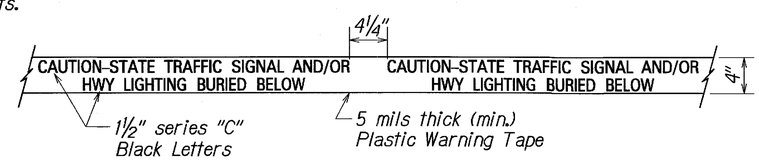


SINGLE CONDUIT



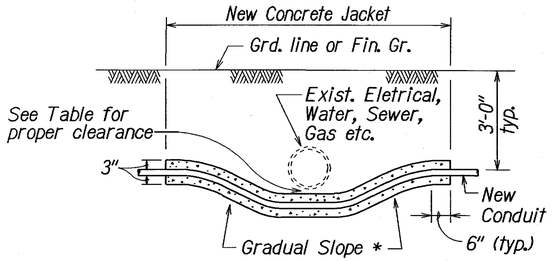
MULTIPLE CONDUIT

DUCT SECTIONS - DIRECT BURIED



For additional information see note no. 2.

METAL DETECTABLE RED PLASTIC WARNING TAPE



* To be determined by County Electrical Inspector/Engineer

CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES

Not to Scale

SURVEY PLOTTED BY
DRAWN BY M. Takahashi
TRACED BY
DESIGNED BY Eddie Otani
QUANTITIES BY
CHECKED BY
NOTE BOOK 142 mby
No. Varied
DATE
ORIGINAL PLAN

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

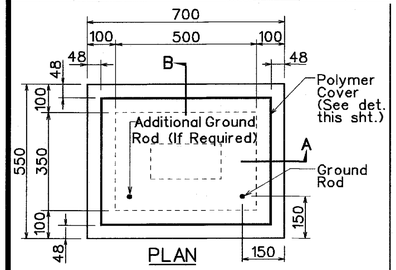
FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY

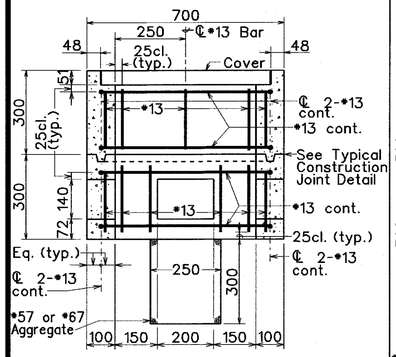
Project No. 7101A-01-04M

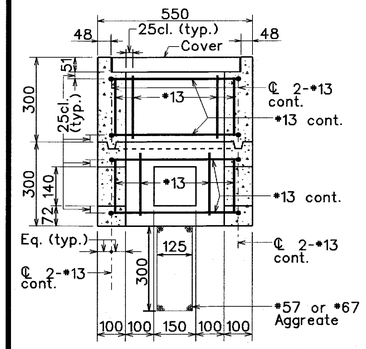
Scale: As Shown Date: July 2005

SHEET No. TS5 OF 14 SHEETS

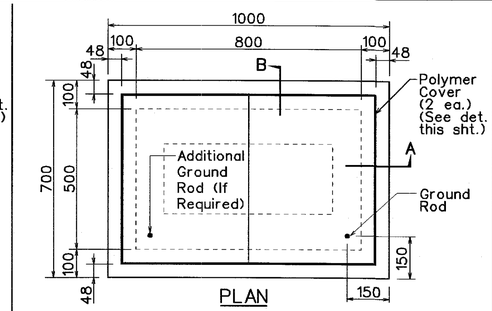
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	66	74

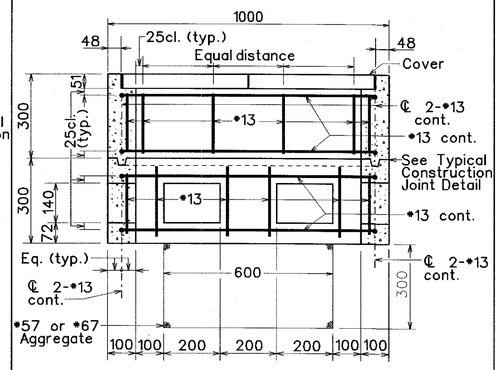


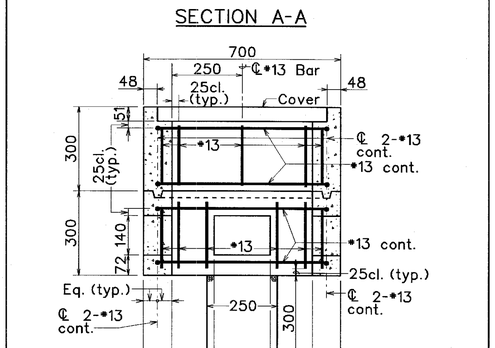




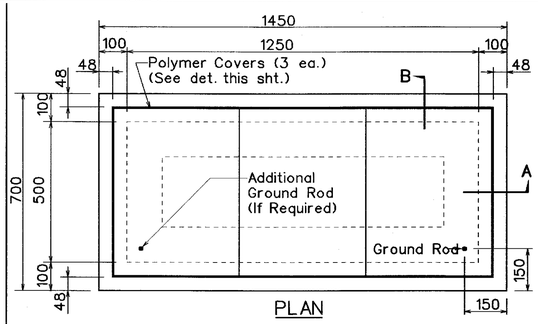
TYPE "A" PULLBOX
(Old Type "B")

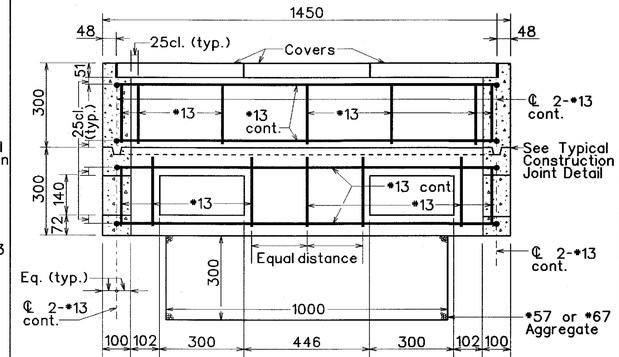


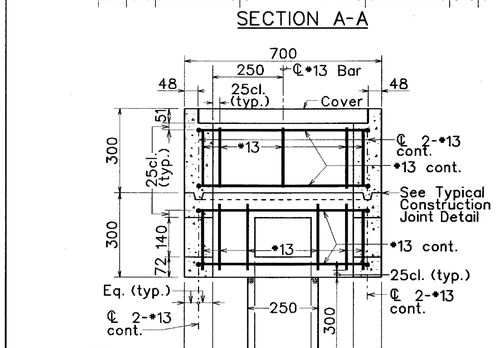




TYPE "B" PULLBOX (Old Type "C")



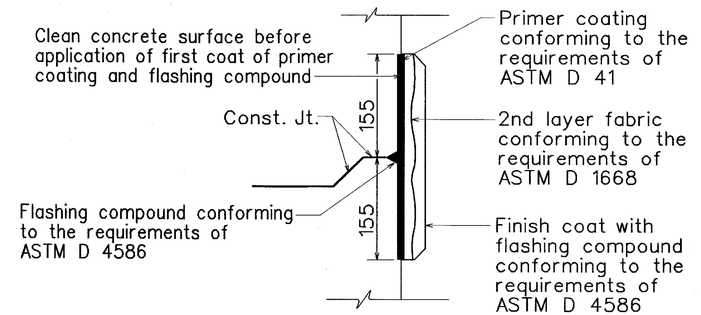




TYPE "C" PULLBOX (Old Type "D")

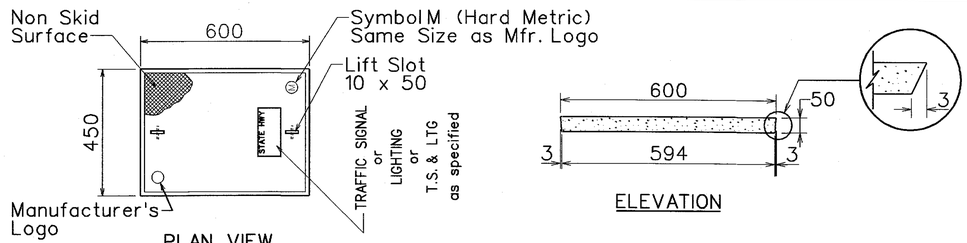
GENERAL NOTES

1. Provide a minimum of one 16 ø 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 (21 MPa (3,000 psi), 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).

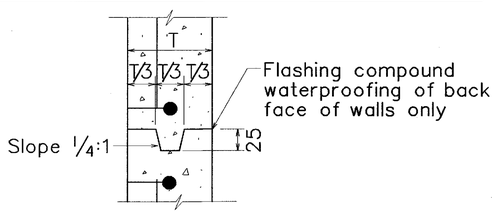


TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN



POLYMER CONCRETE COVER



TYPICAL CONSTRUCTION JOINT DETAIL

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY M Takafuji
TRACED BY
DESIGNED BY Peter Chen
QUANTITIES BY
CHECKED BY
DATE
NOTE BOOK dated May No. Farrington

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

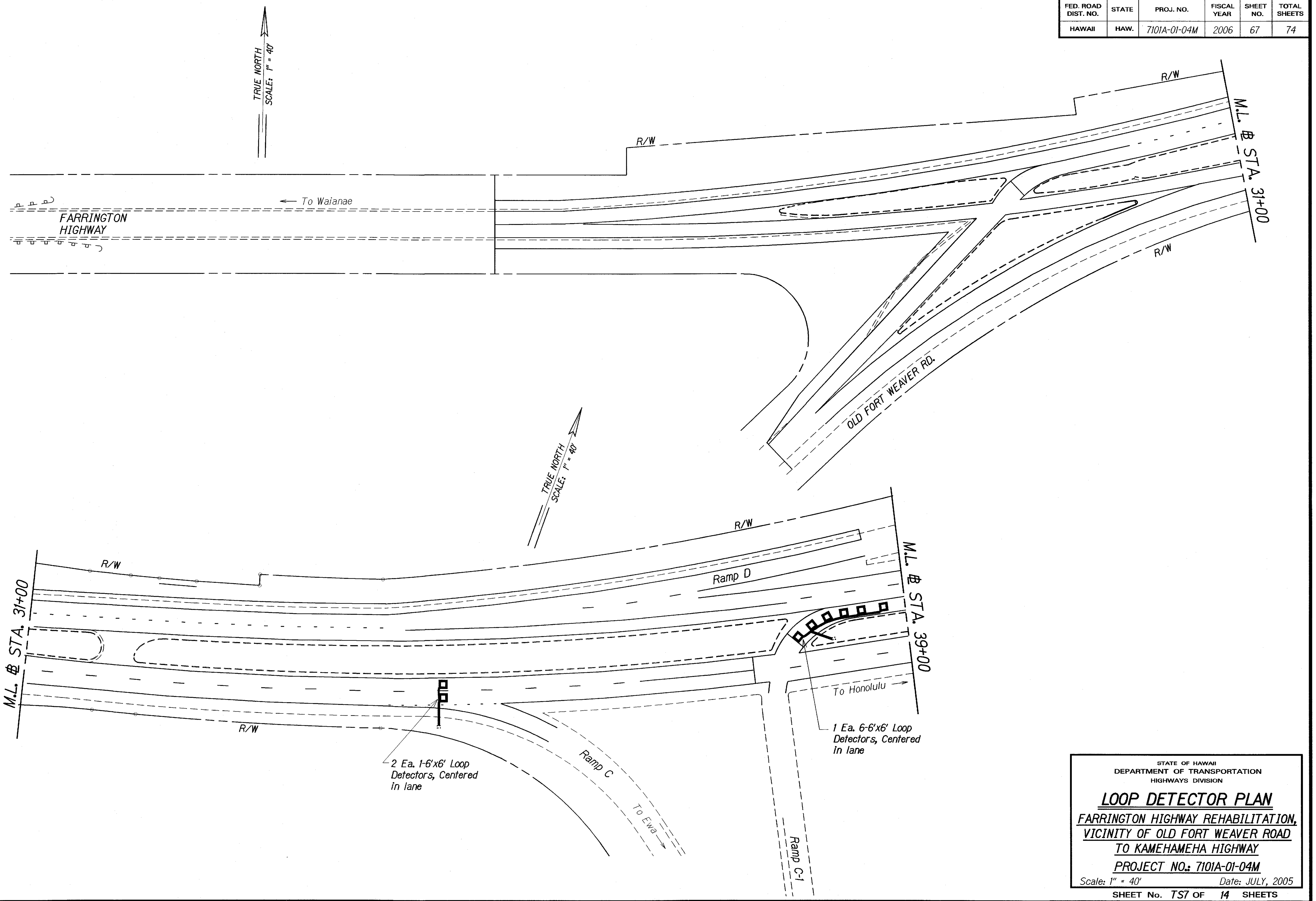
PULLBOX & COVER DETAILS

FARRINGTON HIGHWAY REHABILITATION,
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY
Project No. 7101A-01-04M

Scale: As Shown Date: July 2005

SHEET No. TS6 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	67	74



ORIGINAL PLAN	SURVEY PLOTTED BY		DATE
	DRAWN BY	M. Takatajii	9/20/02
NOTE BOOK	TRACED BY		
	DESIGNED BY	Peter Chan	9/20/02
	QUANTITIES BY		
	CHECKED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR PLAN

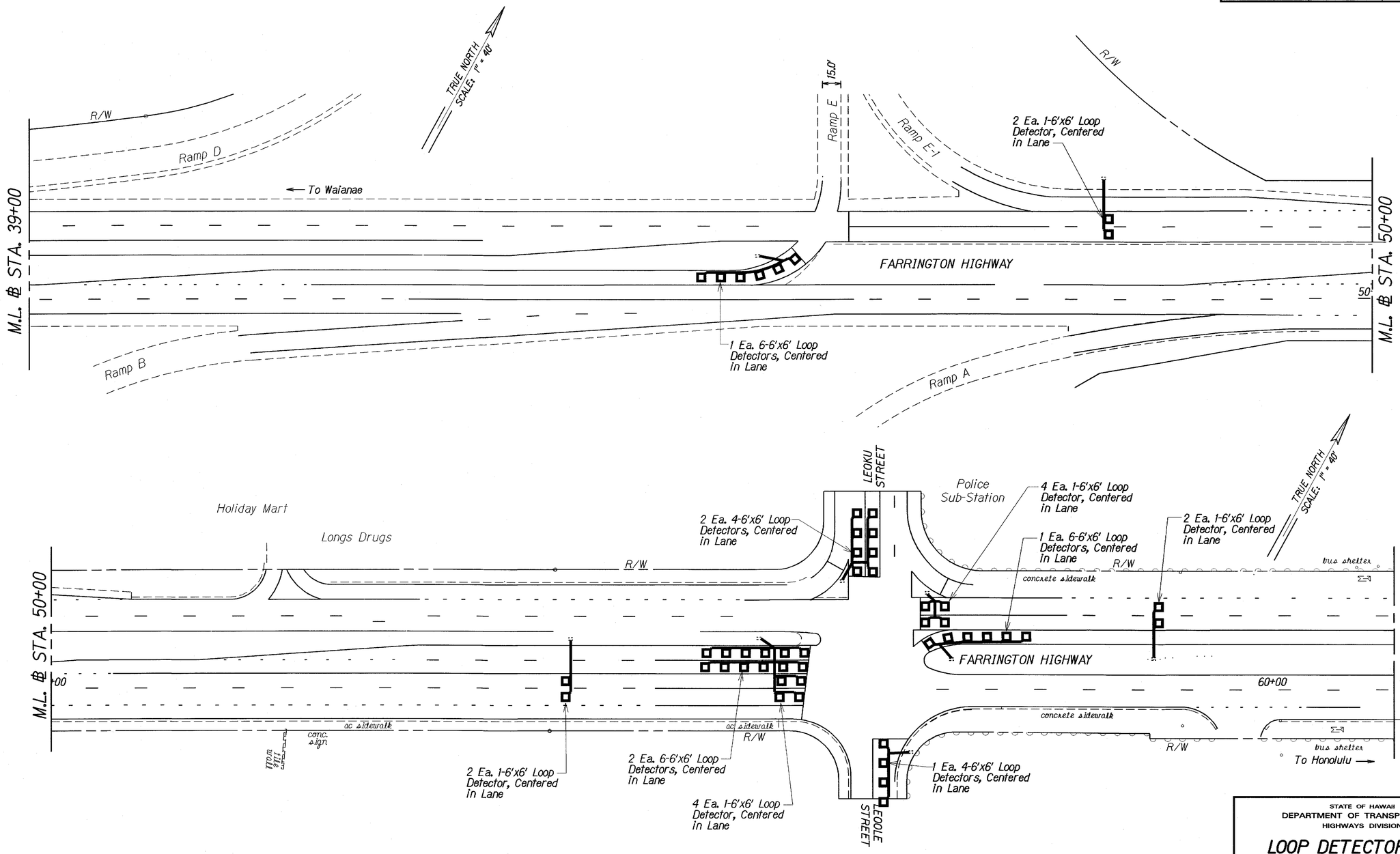
FARRINGTON HIGHWAY REHABILITATION,
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY

PROJECT NO.: 7101A-01-04M

Scale: 1" = 40'   Date: JULY, 2005

SHEET No. TS7 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	68	74



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Tatafu'i	9/28/02
NOTE BOOK dated 9/28/02	TRACED BY	
	DESIGNED BY Peter Chan	9/28/02
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR PLAN

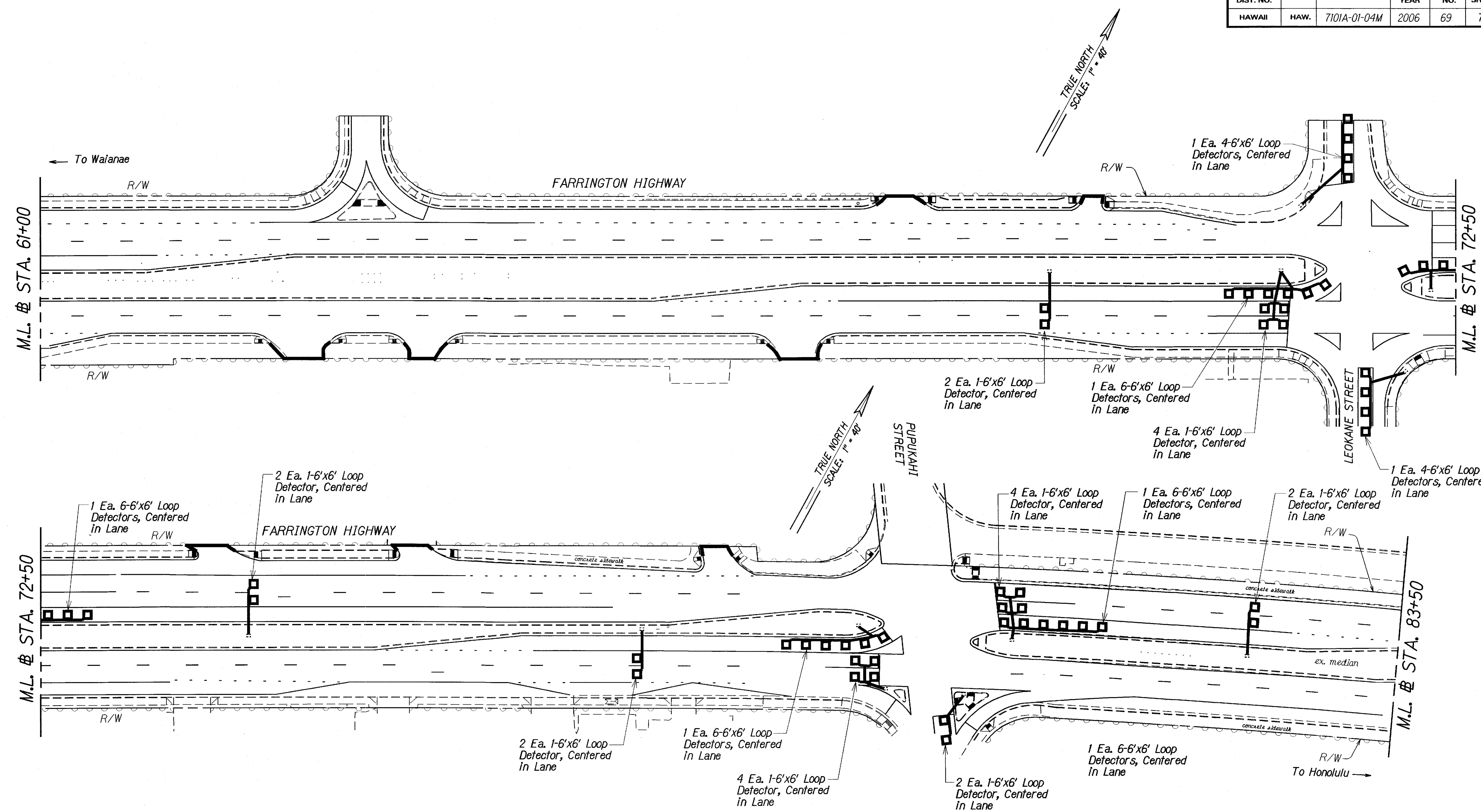
FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY

PROJECT NO.: 7101A-01-04M

Scale: 1" = 40' Date: JULY, 2005

SHEET No. TS8 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	69	74



ORIGINAL PLAN	SURVEY PLOTTED BY	M. Takatsuji	DATE 9/20/02
NOTE BOOK	DRAWN BY		
	TRACED BY		
	DESIGNED BY	Peter Chan	9/20/02
	QUANTITIES BY		
	CHECKED BY		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR PLAN

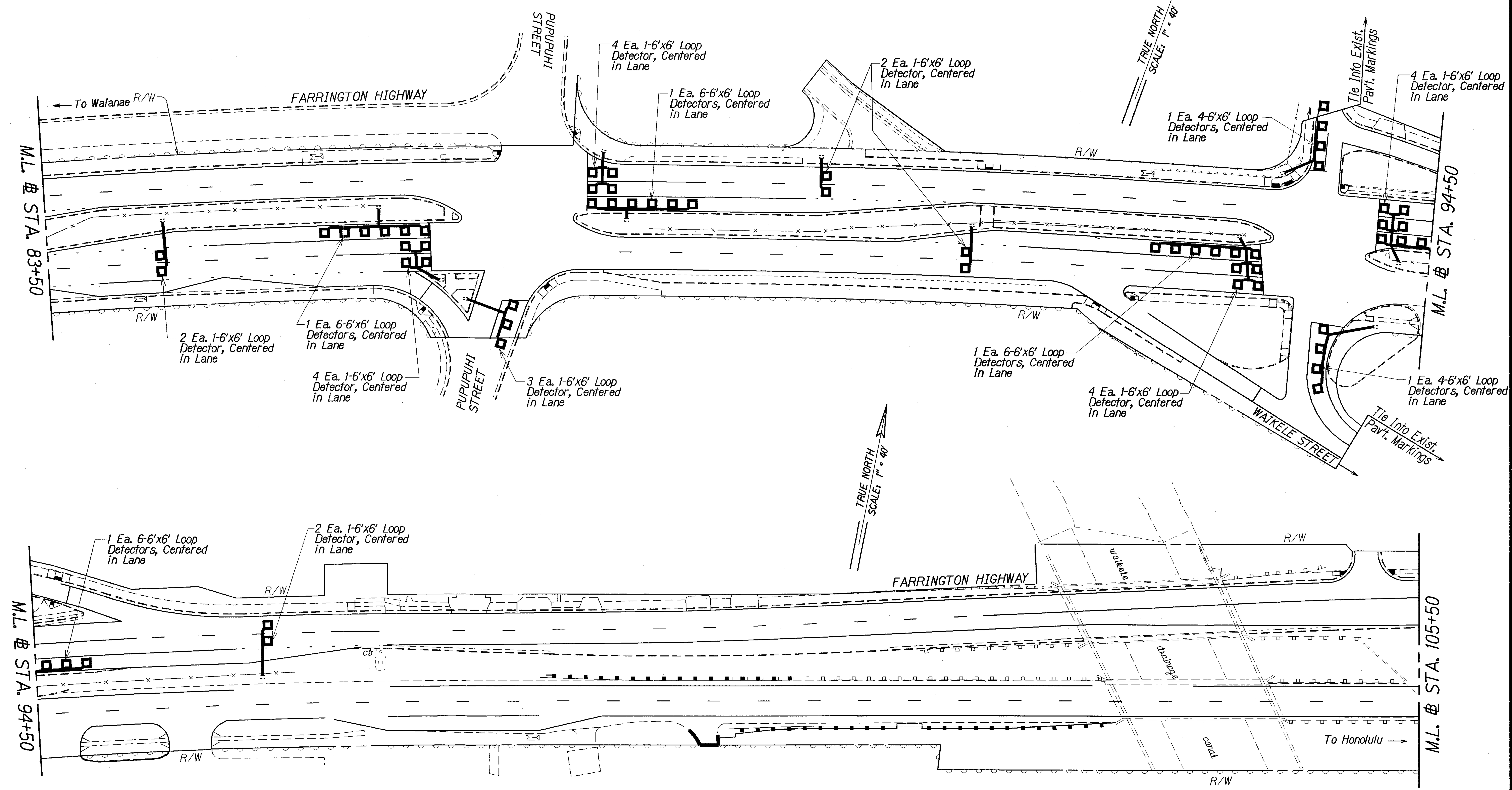
FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY

PROJECT NO.: 7101A-01-04M

Scale: 1" = 40'   Date: July 2005

SHEET No. TS9 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	70	74



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR PLAN

FARRINGTON HIGHWAY REHABILITATION,
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY

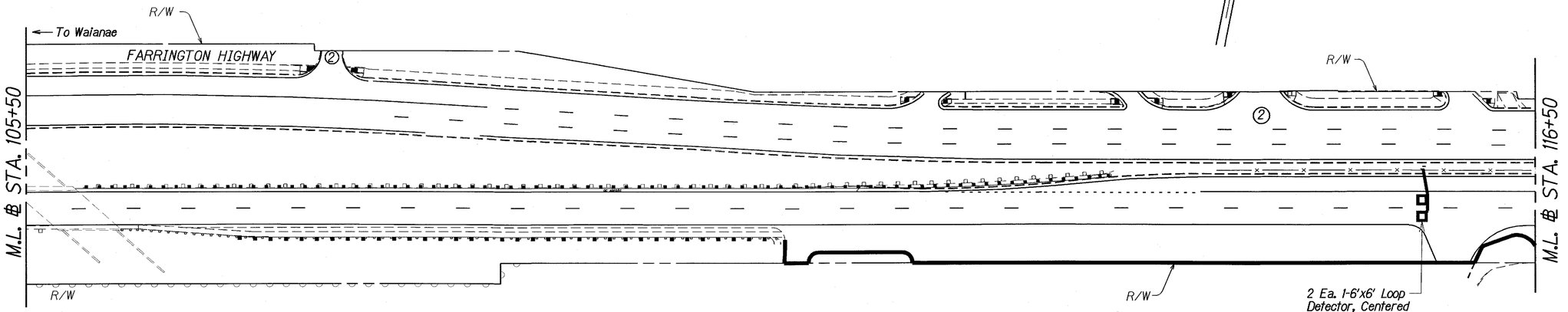
PROJECT NO.: 7101A-01-04M

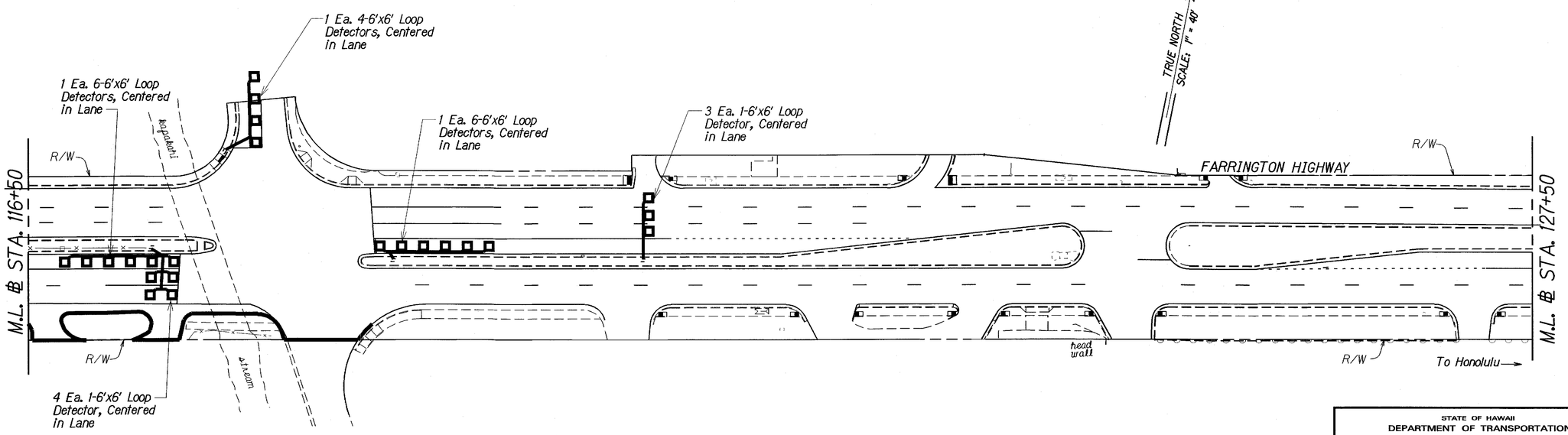
Scale: 1" = 40' Date: July 2005

SHEET No. TS10 OF 14 SHEETS

ORIGINAL PLAN		DATE
	SURVEY PLOTTED BY	
	DRAWN BY M. Takatoji	9/20/02
	TRACED BY	
	DESIGNED BY Peter Chan	9/20/02
NOTE BOOK	QUANTITIES BY	
	CHECKED BY	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	71	74





ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Takafuji	9/20/06
NOTE BOOK	TRACED BY	
	DESIGNED BY Peter Chan	9/20/06
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR PLAN

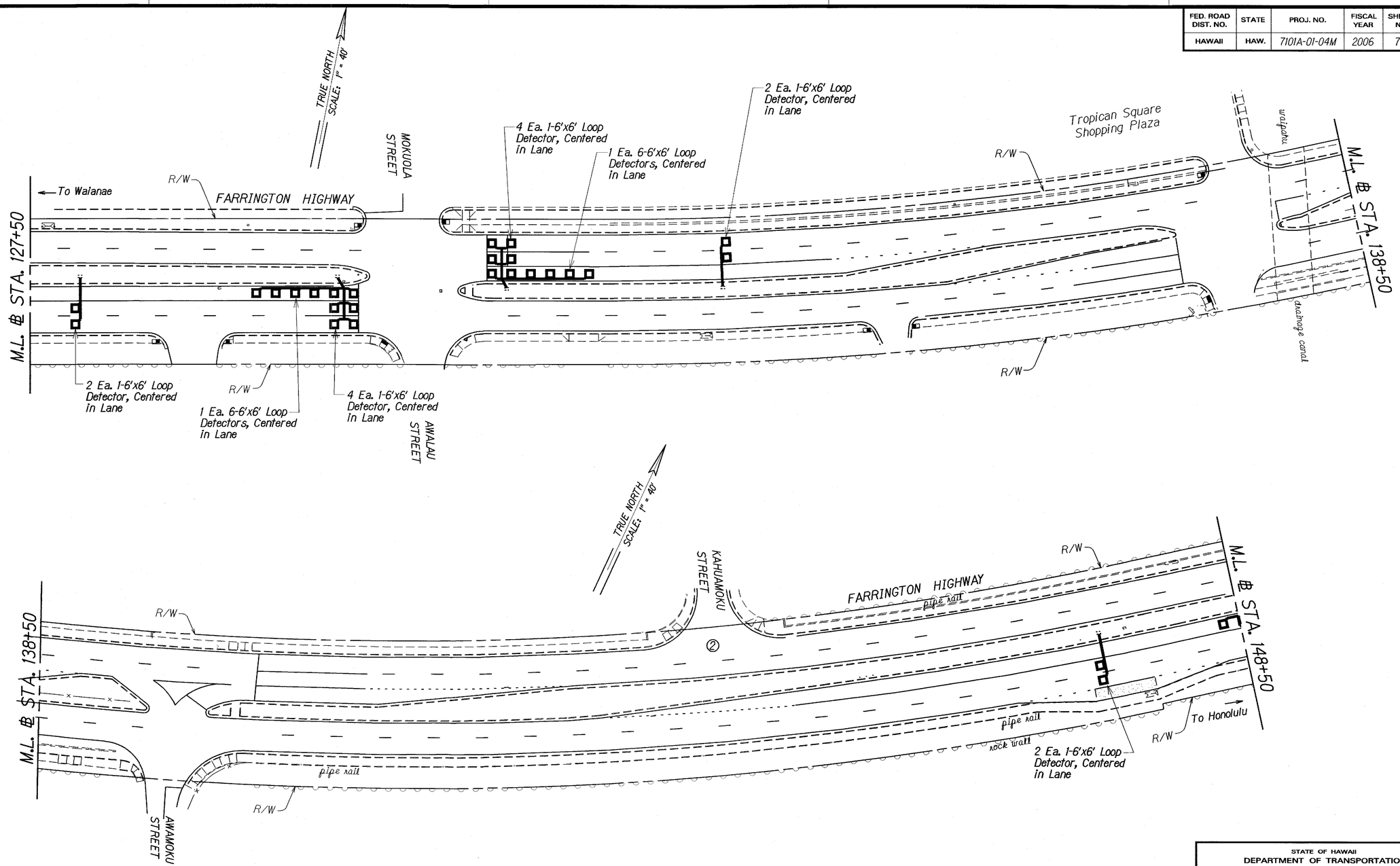
FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY

PROJECT NO.: 7101A-01-04M

Scale: 1" = 40' Date: July 2005

SHEET No. TS11 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	72	74



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Takafuji	9/20/02
	TRACED BY	
NOTE BOOK	DESIGNED BY Peter Chan	9/20/02
No.	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

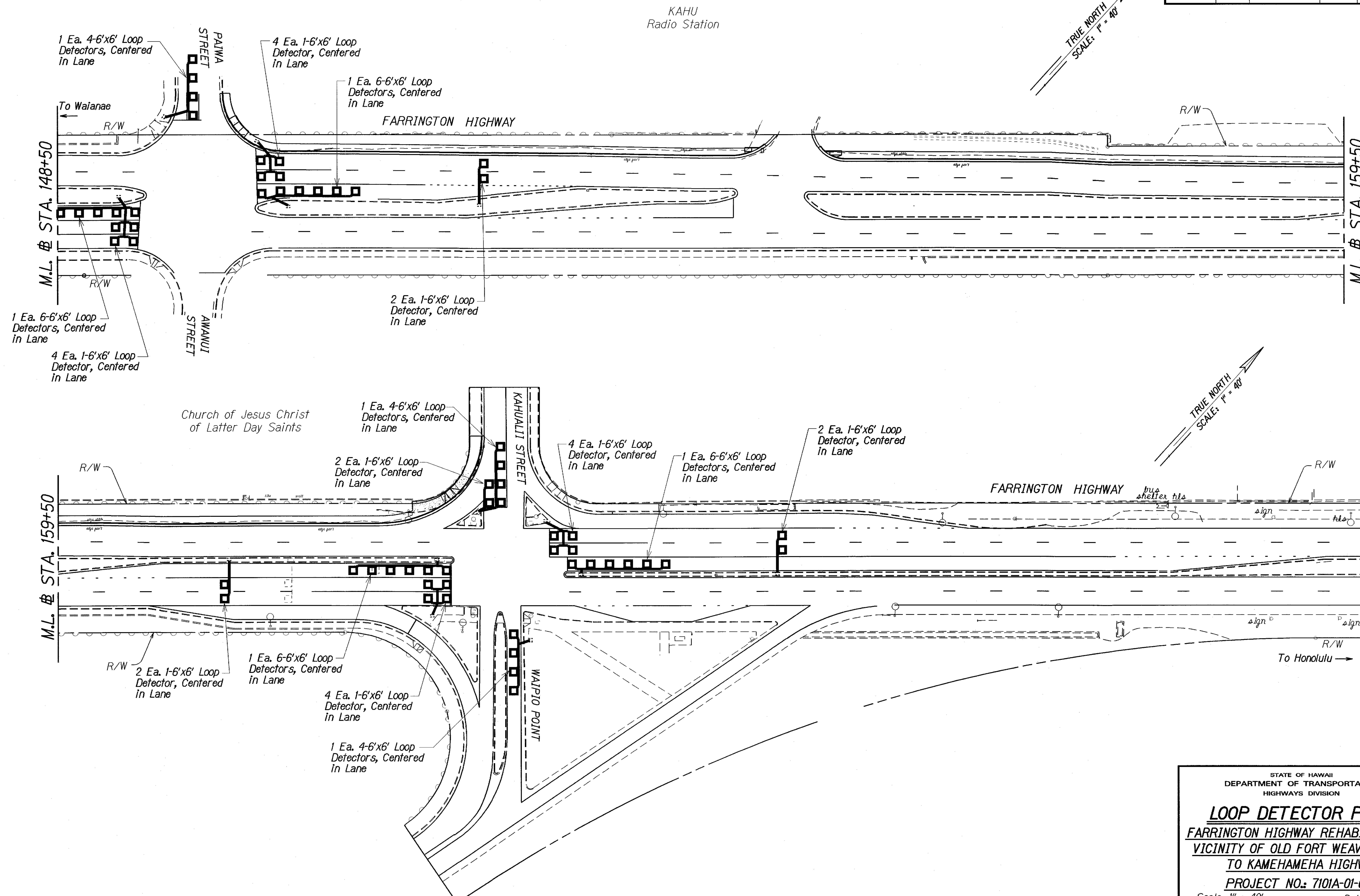
LOOP DETECTOR PLAN

FARRINGTON HIGHWAY REHABILITATION,
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY
PROJECT NO.: 7101A-01-04M

Scale: 1" = 40' Date: JULY 2005

SHEET No. TS12 OF 14 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	73	74



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR PLAN

FARRINGTON HIGHWAY REHABILITATION, VICINITY OF OLD FORT WEAVER ROAD TO KAMEHAMEHA HIGHWAY

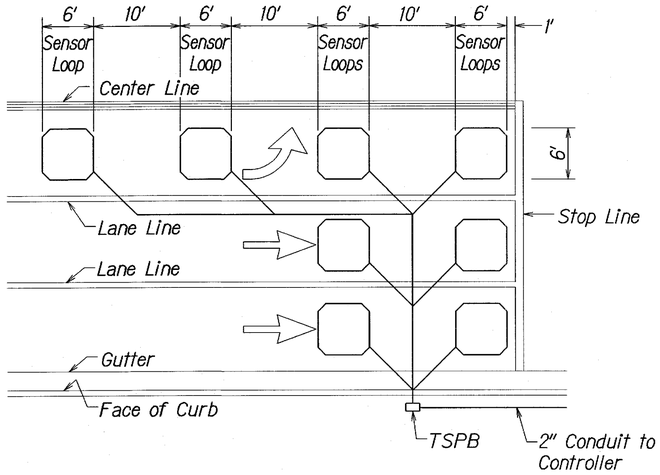
PROJECT NO.: 7101A-01-04M

Scale: 1" = 40' Date: July 2005

SHEET No. TS13 OF 14 SHEETS

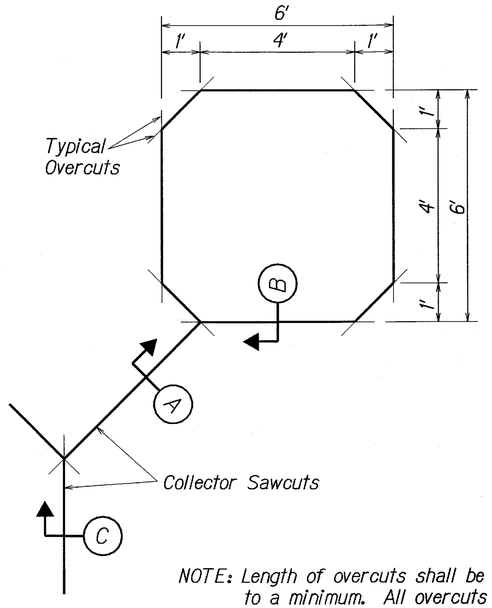
ORIGINAL PLAN | NOTE BOOK
SURVEY PLOTTED BY | DRAWN BY M. Takafuji | TRACED BY | DESIGNED BY Peter Chan | QUANTITIES BY | CHECKED BY
DATE 9/20/02

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	7101A-01-04M	2006	74	74



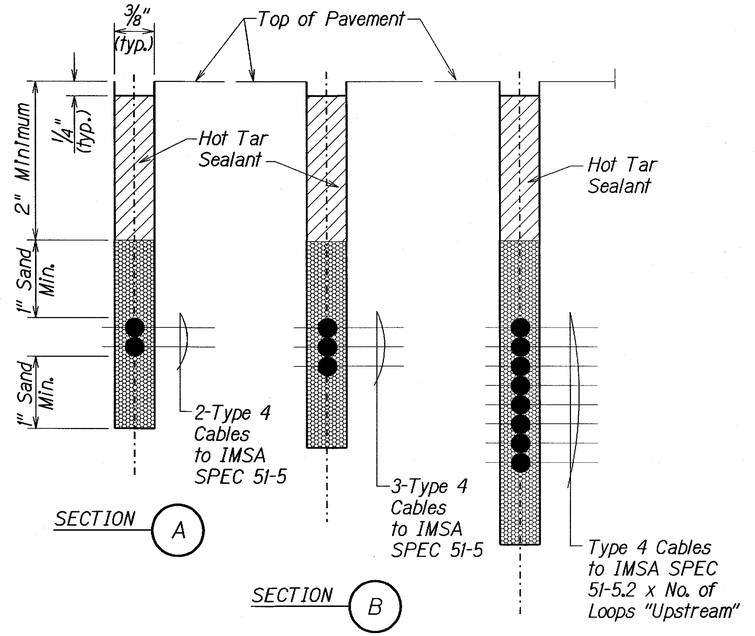
NOTES:
1. Center sensor loops in lanes.
2. Collector cables shall be twisted 2 turns per foot.
3. Number of loops and locations vary. See project plans.
4. Number and locations of collector sawcuts may be varied in the field to suit.

TYPICAL SENSOR LOOP LAYOUT

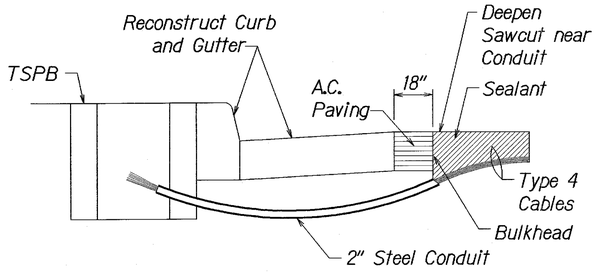


NOTE: Length of overcuts shall be kept to a minimum. All overcuts shall be back filled with hot tar.

TYPICAL SENSOR LOOP SAWCUT DETAIL



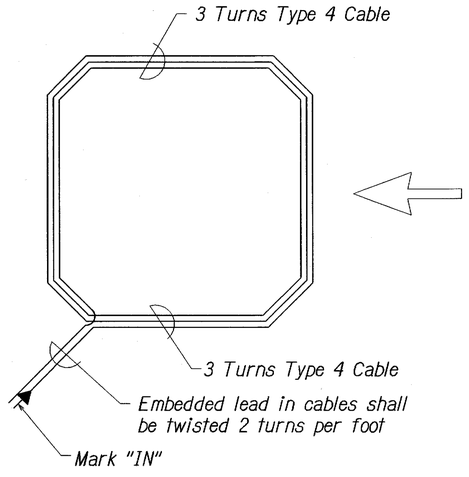
TYPICAL SECTION THROUGH SENSOR LOOP



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



TYPICAL SENSOR LOOP WIRING DIAGRAM

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Takeuchi	
NOTE BOOK 102.may	TRACED BY Peter Chan	
No. started	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

FARRINGTON HIGHWAY REHABILITATION
VICINITY OF OLD FORT WEAVER ROAD
TO KAMEHAMEHA HIGHWAY
Project No. 7101A-01-04M

Scale: As Shown Date: July 2005

SHEET No. TS14 OF 14 SHEETS