

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	32	47

TRAFFIC SIGNAL NOTES

- 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.
- All splicing shall be done in the pullboxes.
- 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.
- 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.
- All Traffic signal controller equipment shall be completely wired in the cabinet and shall control the traffic signals as called for in the plans.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- The Contractor shall notify the Traffic Signal 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.
- 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 Transportation Services, three (3) working days prior to commencing work on the traffic signal system (phone no. 523-4589).

TRAFFIC SIGNAL NOTES (CONTINUED)

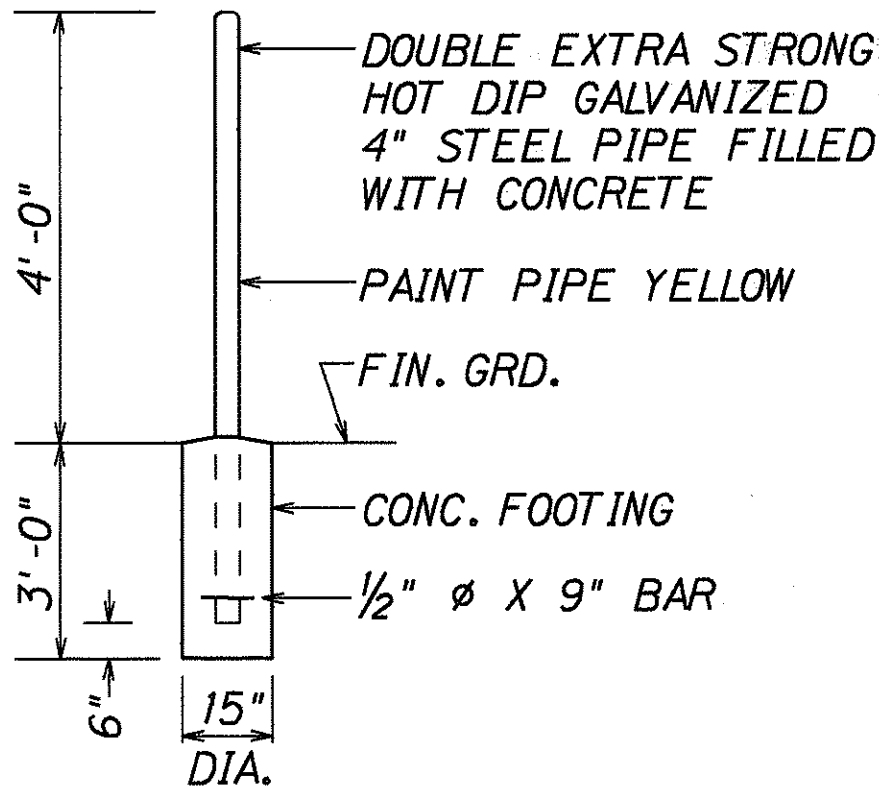
- The cost of installing 3 pipe guards near the new Traffic Controller shall not be paid for separately but considered incidental to the Various Traffic Signal Items.
- The concrete jacket for the Conduit By-Pass Details shown on Sheet 44, shall not be paid for separately but considered incidental to the various contract items. The Engineer shall determine if a concrete jacket is required.

TRAFFIC SIGNAL LEGEND

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

HIGHWAY LIGHTING LEGEND

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



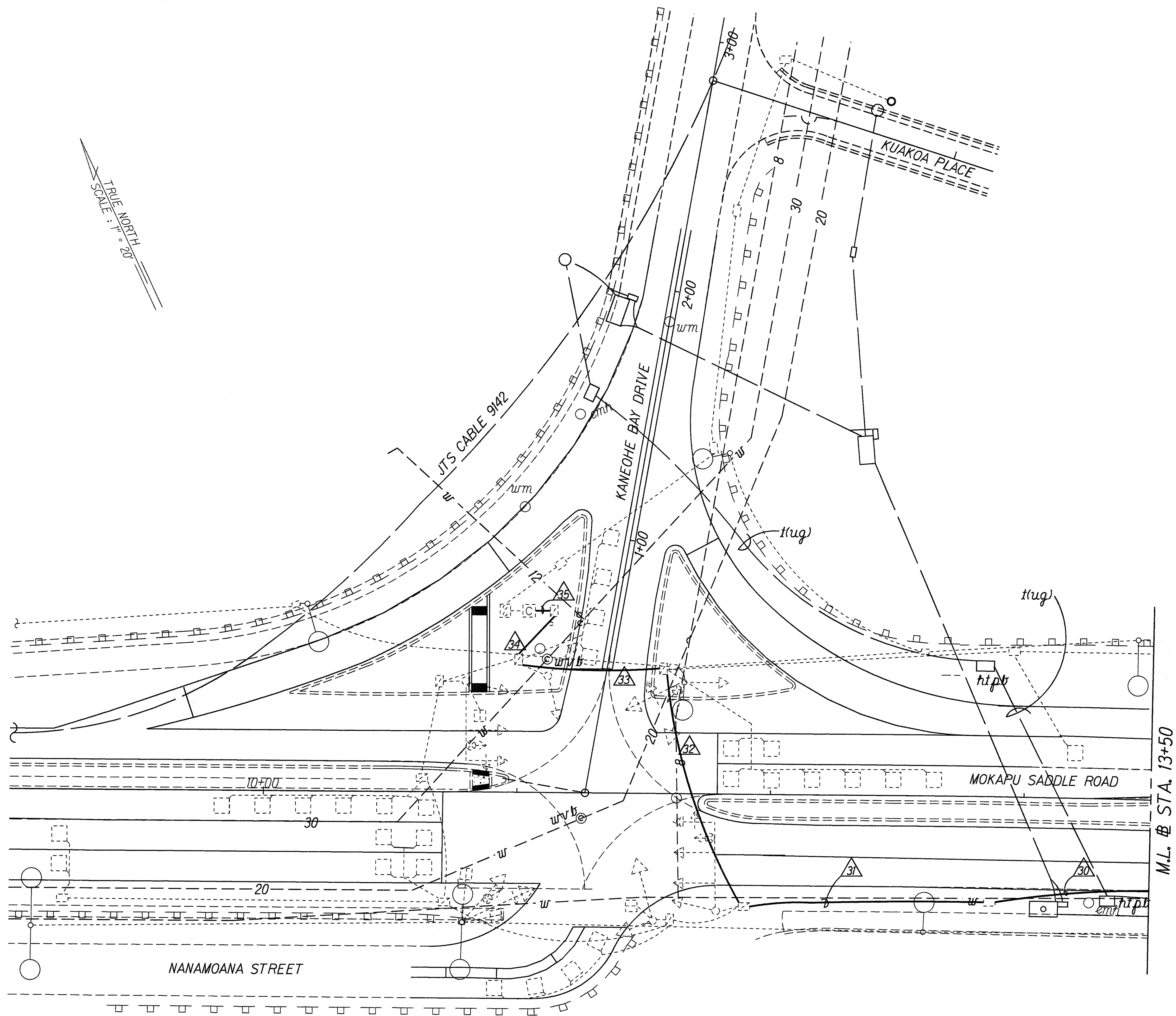
TYP. ELEVATION

PIPE GUARD DETAIL

Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TRAFFIC SIGNAL LEGEND
AND NOTES**
MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)
Date: April, 1999

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	33	47



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	1/1
10/10/99	TRACED BY	1/1
10/10/99	CHECKED BY	1/1
10/10/99	QUANTITIES BY	1/1
10/10/99	CHECKED BY	1/1

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

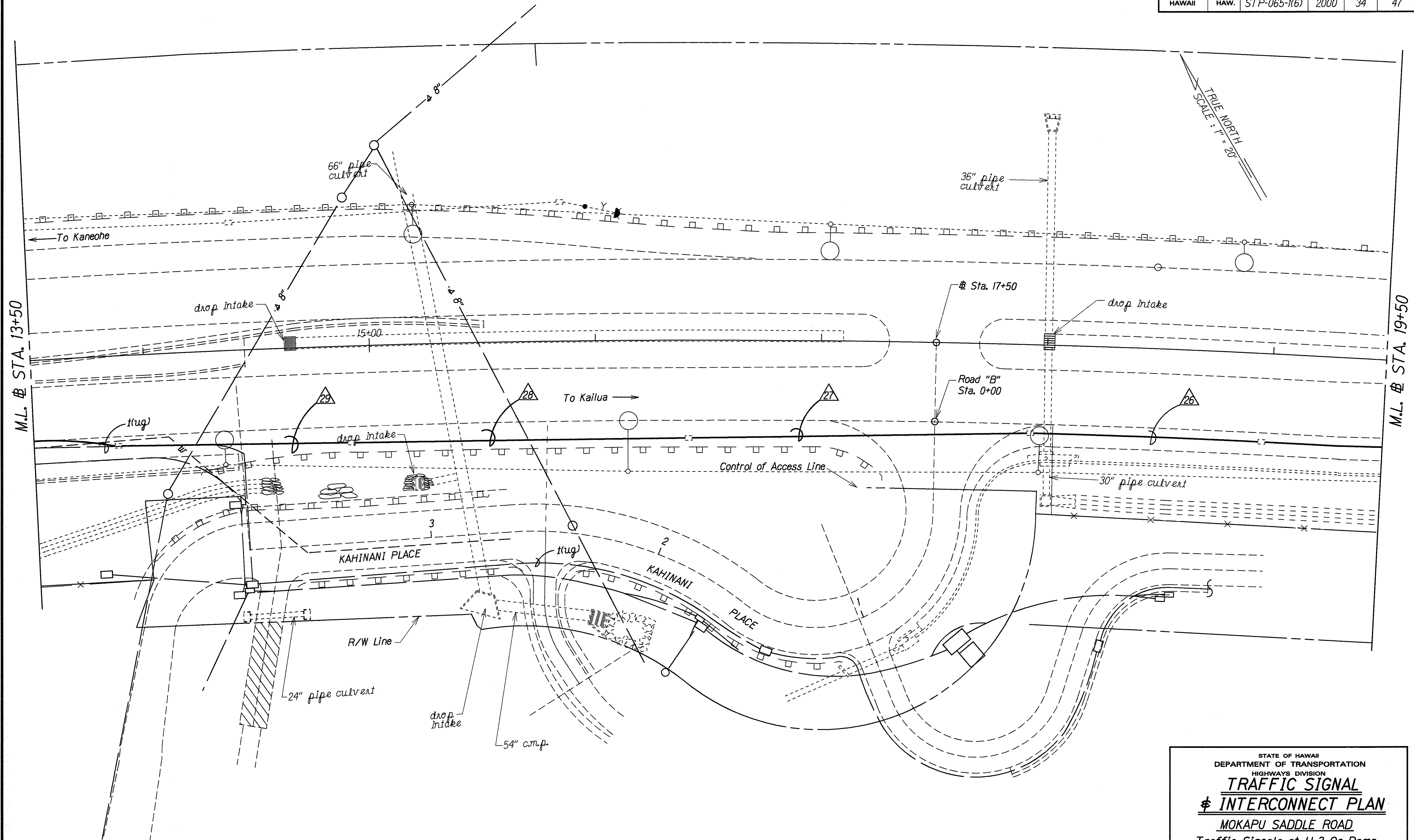
TRAFFIC SIGNAL
INTERCONNECT PLAN

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

Scale: 1"=20' Date: April, 1999

SHEET No. 1 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	34	47



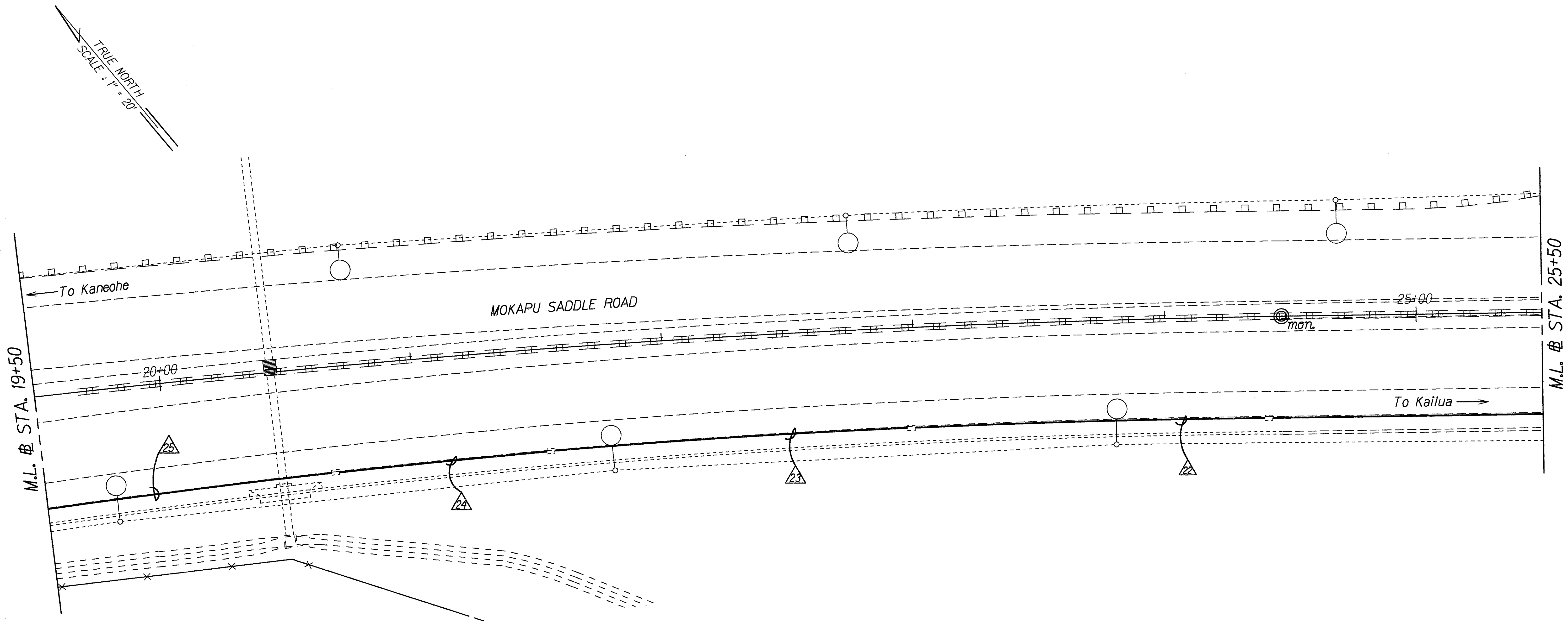
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
2nd/1st/2nd	CHECKED BY	
	QUANTITIES BY	
	REVISIONS BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL
INTERCONNECT PLAN
MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)
Scale: 1"=20' Date: April, 1999

SHEET No. 2 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	35	47



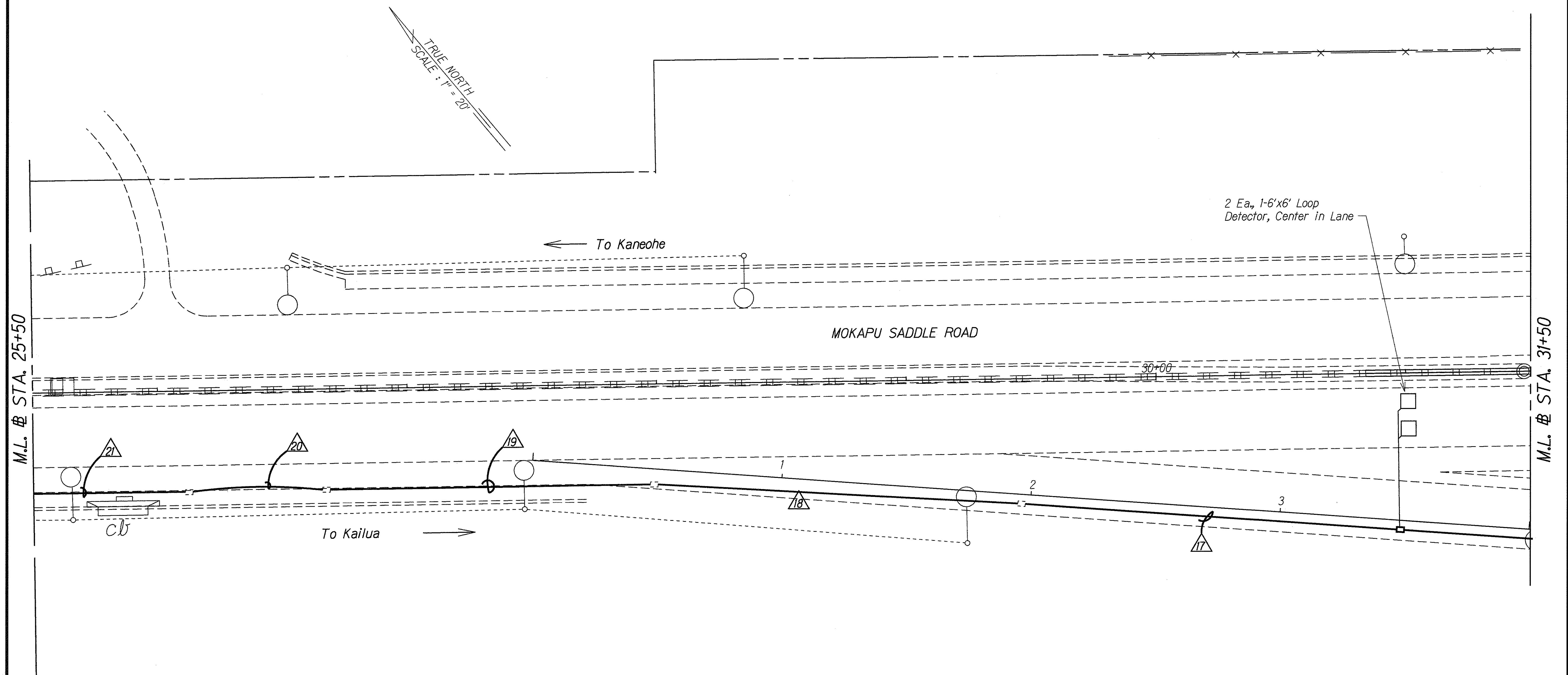
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY <i>H. Eshelji</i>	<i>X</i>
DESIGNED BY <i>Richard Akana</i>	TRACED BY	
QUANTITIES BY	CHECKED BY	
<i>2/26/1993</i>		

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**TRAFFIC SIGNAL
AND INTERCONNECT PLAN**
MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)
Scale: 1"=20' Date: April, 1999

SHEET No. 3 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	36	47



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	1
10/2/99	DESIGNED BY	Richard Akana
10/2/99	QUANTITIES BY	
10/2/99	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

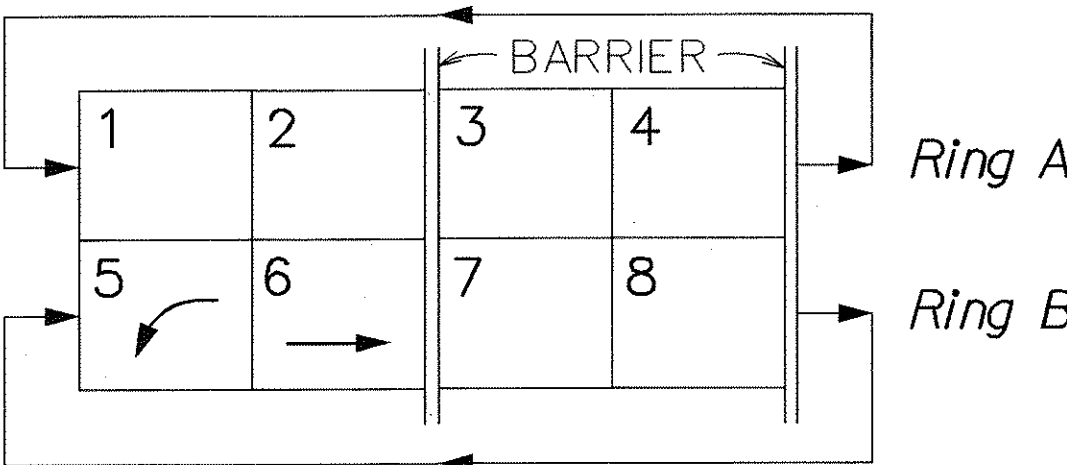
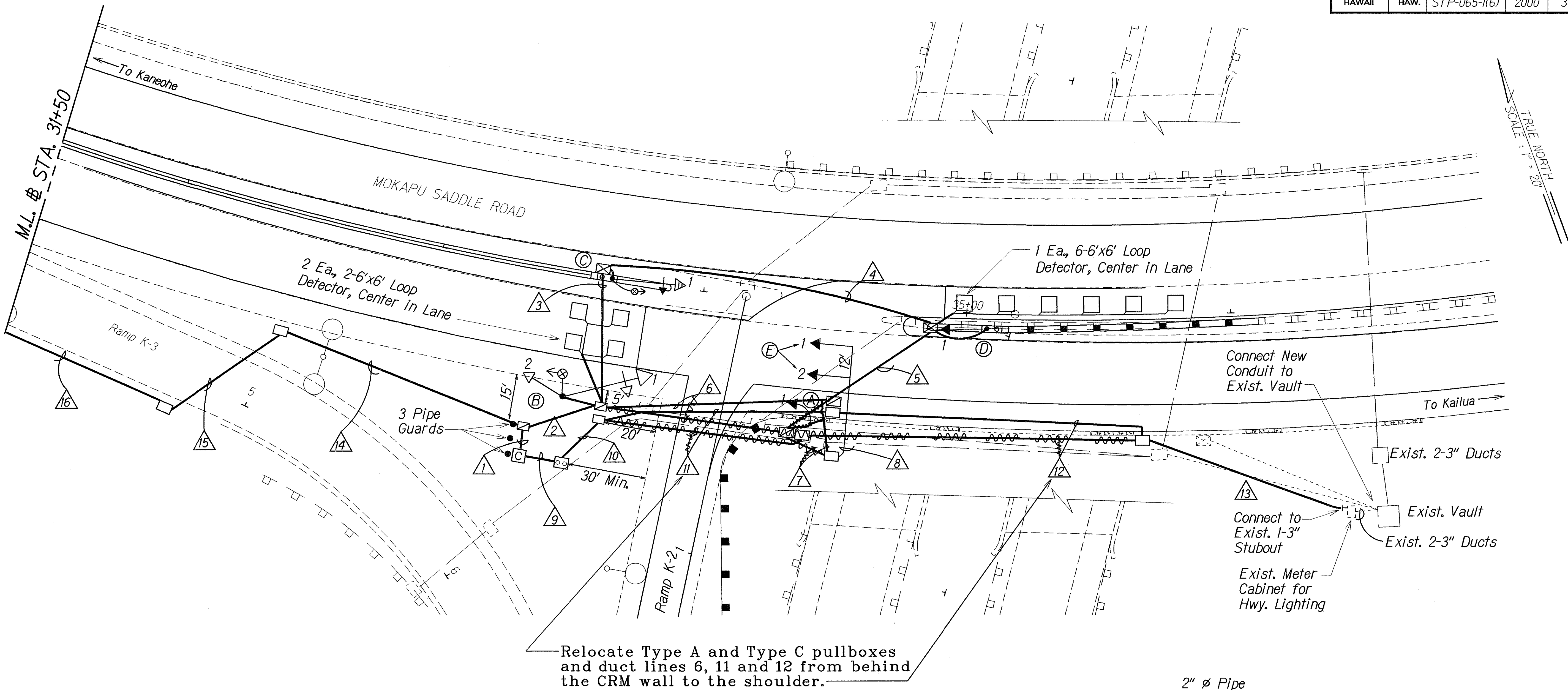
**TRAFFIC SIGNAL
AND INTERCONNECT PLAN**

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

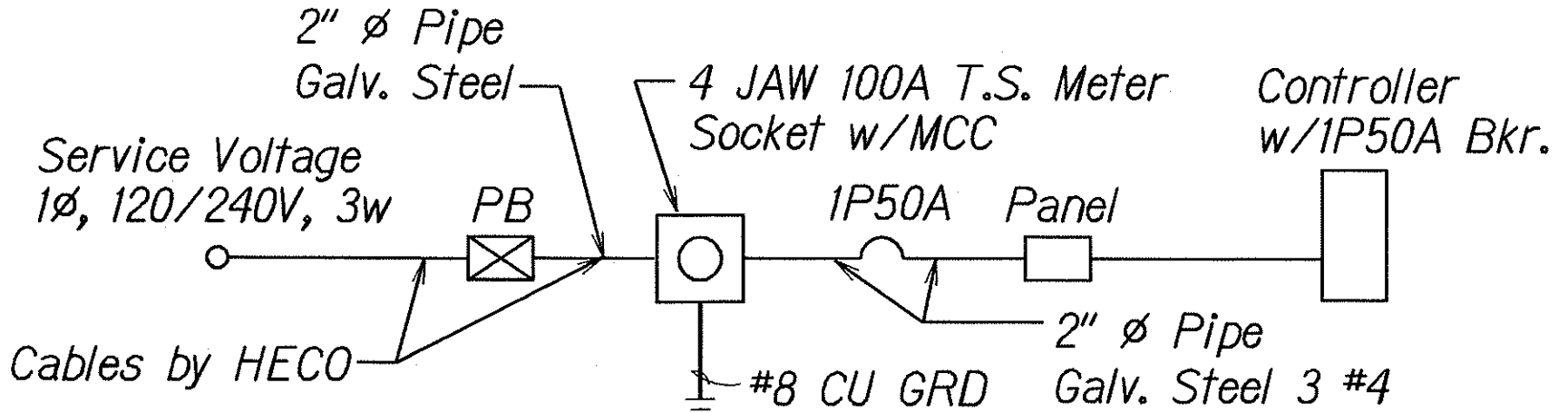
Scale: 1"=20' Date: April, 1999

SHEET No. 4 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	37	47



TRAFFIC SIGNAL HEAD SCHEDULE			
Traffic Signal Head Type and Description			
Pole Letter Signal Head Number	E - 1** E - 2**	A - 1 B - 2 D - 1	B - 1 C - 1*
* With Programmed Visibility ** Install on H-3 Overpass Structure See Plan Sheet No. 39 & 40 for Details			



LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

Scale: 1"=20' Date: April, 1999

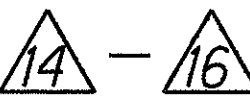
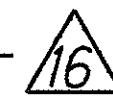
SHEET No. 5 OF 6 SHEETS

DATE	11/14/99
SURVEY PLOTTED BY	...
DRAWN BY	M. Takahashi
DESIGNED BY	C. G. G. G.
QUANTITIES BY	...
CHECKED BY	...
ORIGINAL PLAN	...
NOT BOOK	...
DATE	11/14/99

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	38	47

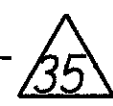
	CONDUIT (Conc. encased)	CABLE
	3"	2-26c #14 (Type 1)
	3"	3-2c #14 (Type 2)
	3"	Spare
	3"	Spare
	2"	2-4c #20 (Type 7)
	2"	1-12pr#19 (Type 3)
	2"	Spare
	2"	Spare

	CONDUIT (Conc. encased)	CABLE
	2"	1-26c #14 (Type 1)
	2"	1-2c #14 (Type 2)
	2"	Spare
	2"	Spare
	2"	Spare
	2"	Spare

 - 	CONDUIT (Conc. encased)	CABLE
	2"	1-2c #14 (Type 2)
	2"	1-12pr#19 (Type 3)
	2"	Spare
	2"	Spare
	2"	Spare

	CONDUIT (Conc. encased)	CABLE
	3"	2-26c #14 (Type 1)
	3"	3-2c #14 (Type 2)
	3"	Spare
	3"	Spare
	2"	2-4c #20 (Type 7)
	2"	Spare
	2"	Spare
	2"	Spare

	CONDUIT (Conc. encased)	CABLE
	3"	2-4c #14 (Type 5)

 - 	CONDUIT	CABLE
	EXIST 2"	1-12pr#19 (Type 3)

	CONDUIT (Conc. encased)	CABLE
	2"	1-26c #14 (Type 1)
	2"	1-4c #20 (Type 7)
	2"	Spare
	2"	Spare

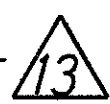
	*CONDUIT	CABLE
	2"	1-2c #14 (Type 2)

* 1-2" Galv. Steel Conduit
See Plan Sht. No. 39

	CONDUIT (Conc. encased)	CABLE
	2"	1-26c #14 (Type 1)
	2"	Spare
	2"	Spare

 - 	CONDUIT (Conc. encased)	CABLE
	2"	1-3c #4 (Type 6)

	CONDUIT (Conc. encased)	CABLE
	2"	1-26c #14 (Type 1)
	2"	1-2c #14 (Type 2)
	2"	Spare
	2"	Spare

 - 	CONDUIT (Conc. encased)	CABLE
	2"	HECO Power Cable

ORIGINAL PLAN	SURVEY PLOTTED BY _____		DATE
	DRAWN BY <u>M. Takahashi</u>		<u>1/22/99</u>
NOTE BOOK 142.may	TRACED BY _____		•
	DESIGNED BY <u>Richard Akana</u>		•
No. 2ms/rsp6	QUANTITIES BY _____		•
	CHECKED BY _____		•

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

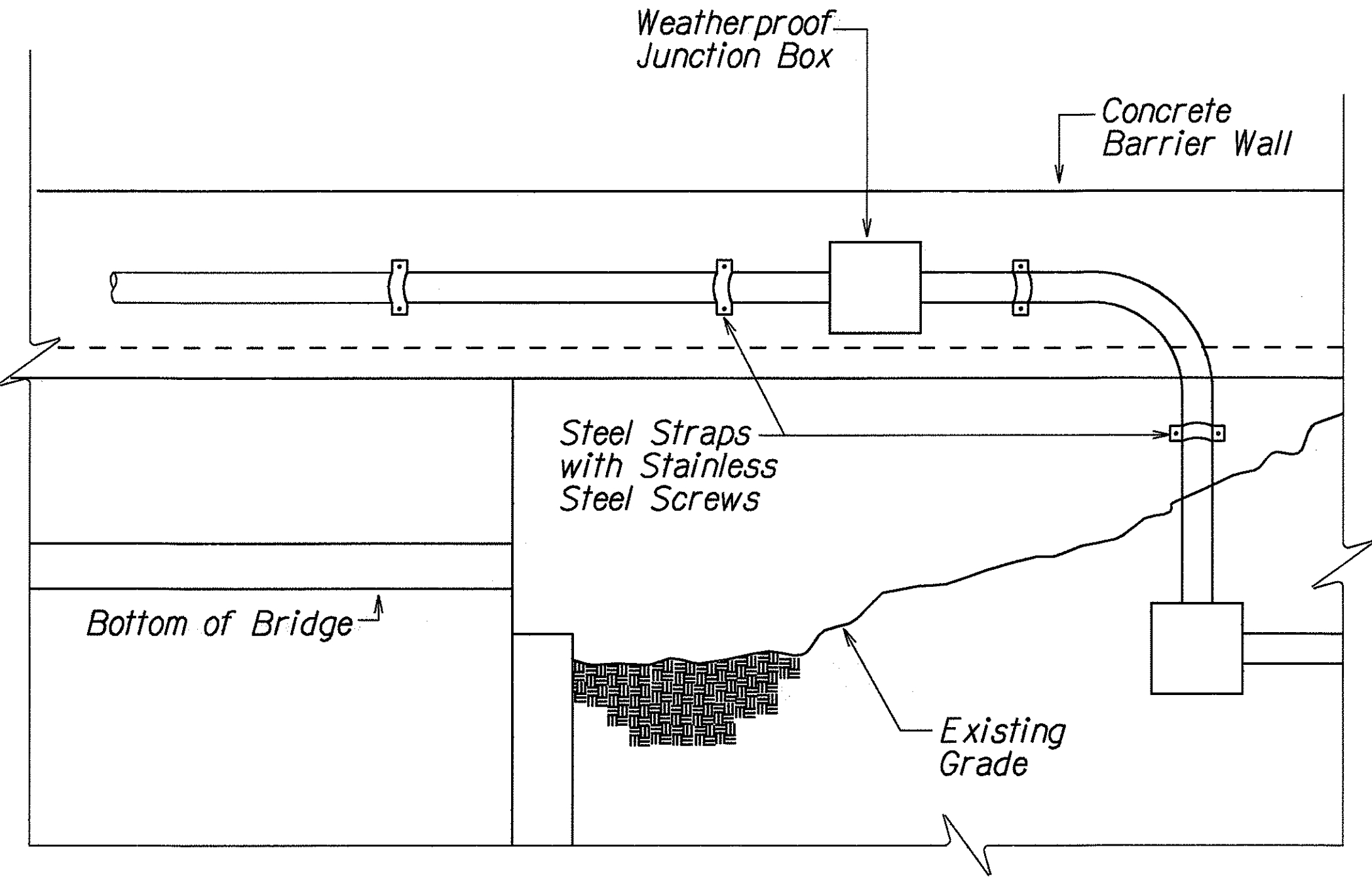
TRAFFIC SIGNAL PLAN

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

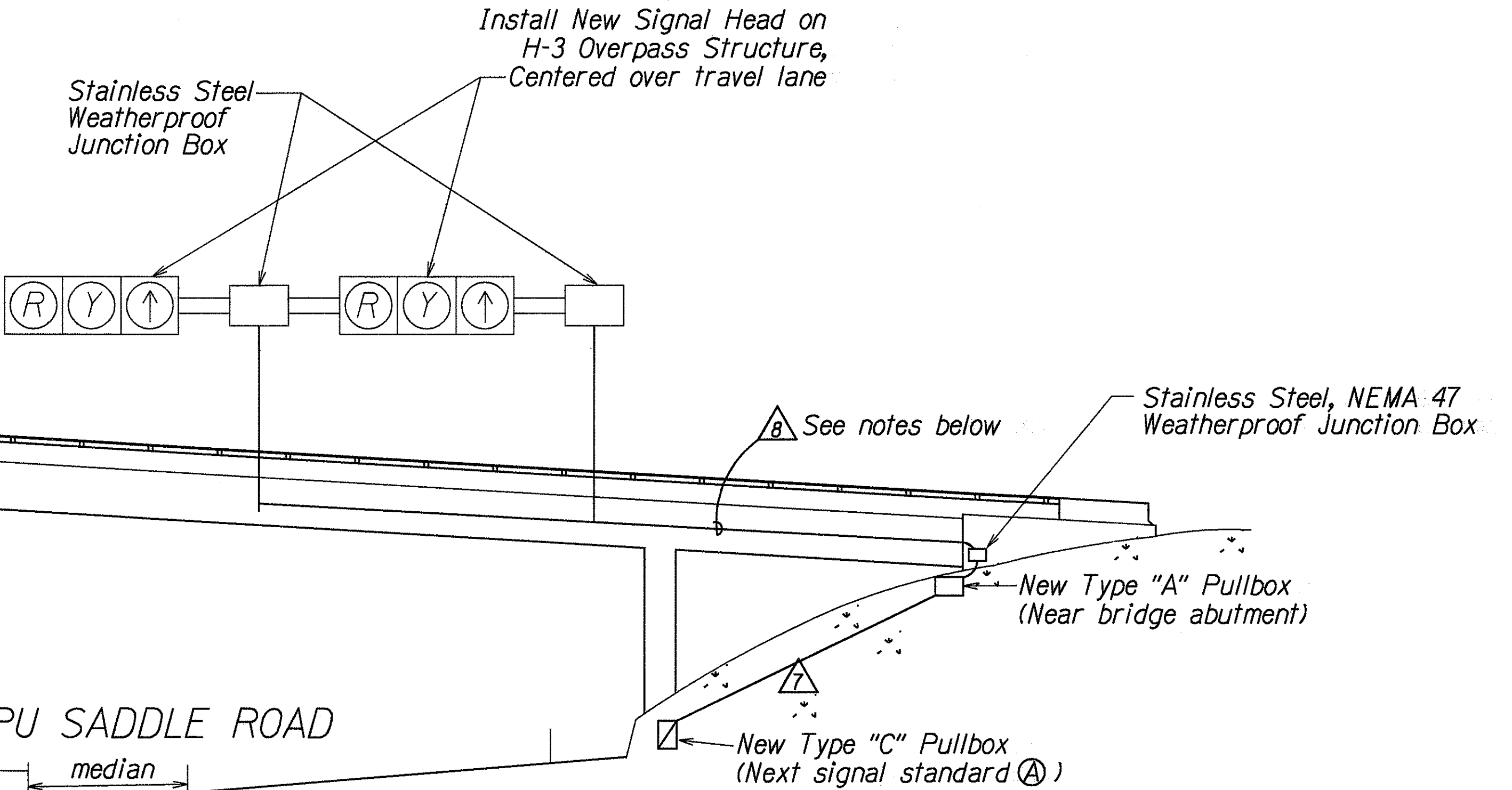
Scale: 1"=20' Date: April, 1999

SHEET No. 6 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	39	47



DETAIL
Not to Scale



NOTES

1. The traffic signal brackets, straps, couplings, elbows and other incidental materials not shown on the plans but is required to mount the signal heads and enclosures on the structure shall be stainless steel. The costs shall be incidental to the various traffic signal items.
2. The Contractor shall install the 2" galv. steel conduit w/stainless steel straps @ 3' o.c.

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
CHECKED BY	
NOTES BOOK	
NO. 2 (inserted)	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

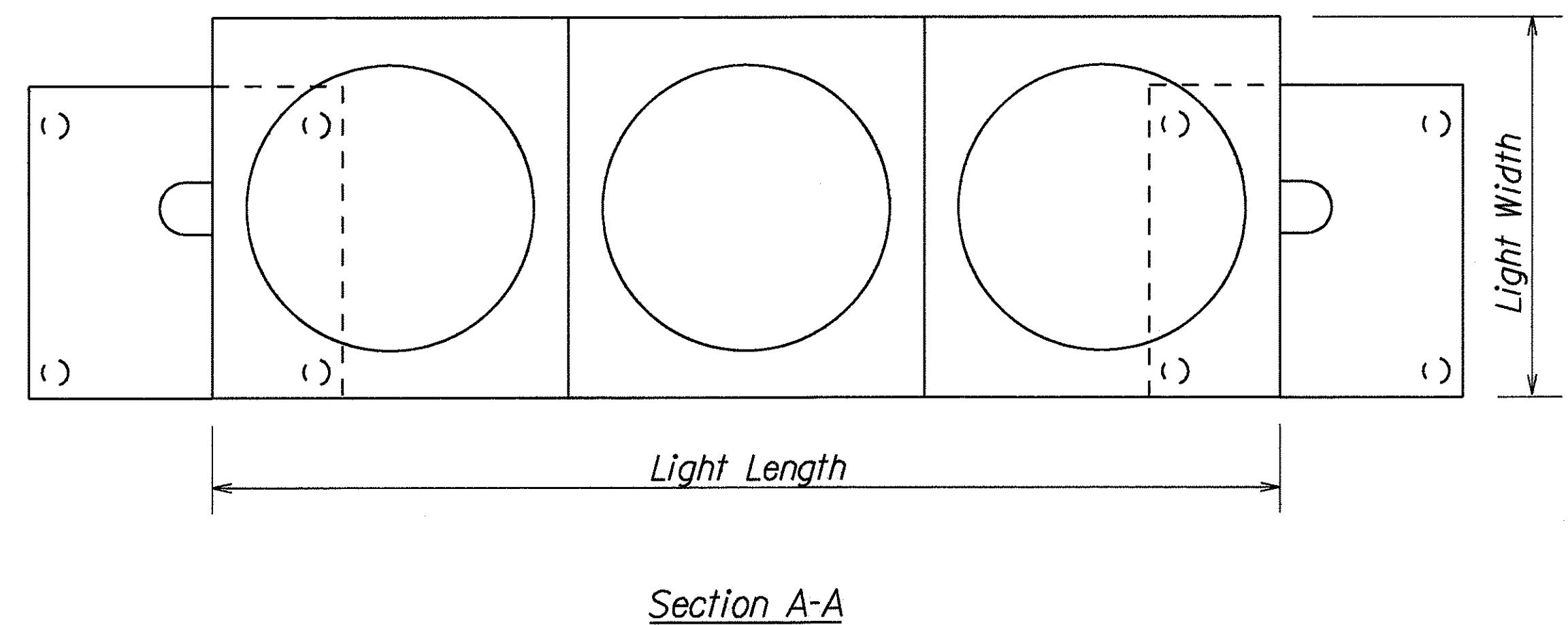
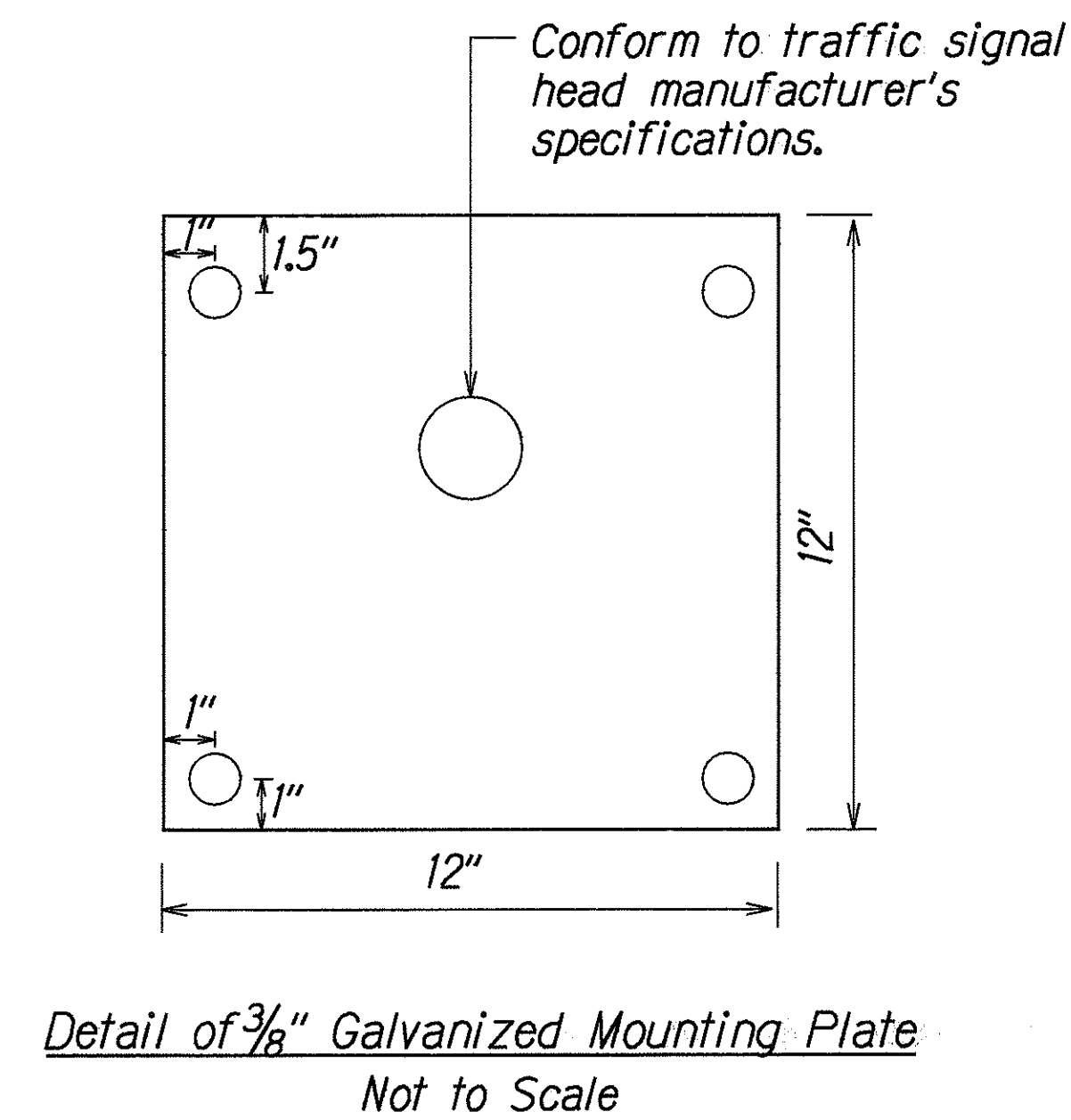
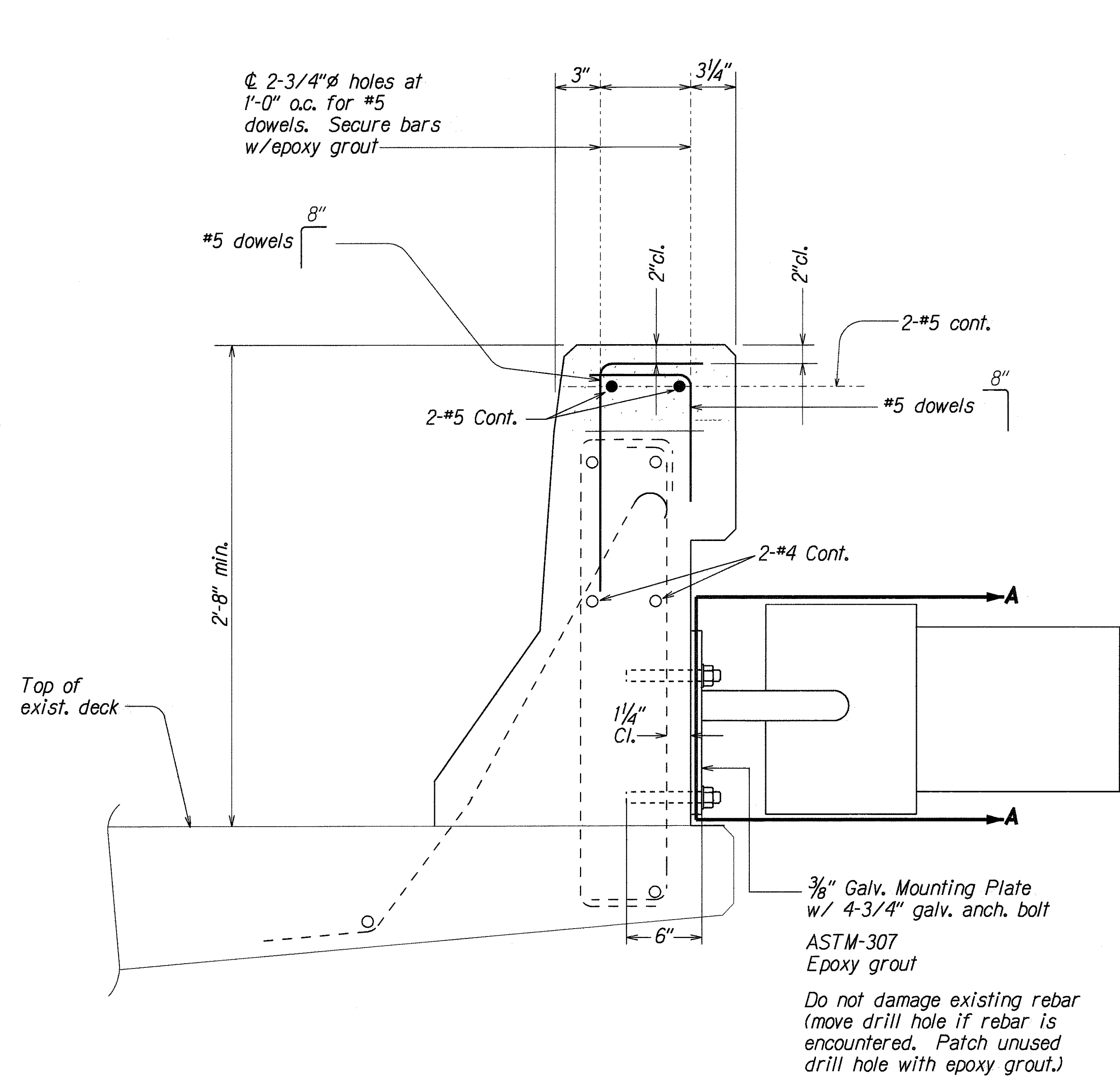
TRAFFIC SIGNAL DETAILS

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

Not to Scale Date: April, 1999

SHEET No. 1 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	40	47



TRAFFIC SIGNAL MOUNTING DETAILS
 Not to Scale

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTED BY	
DATE	

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

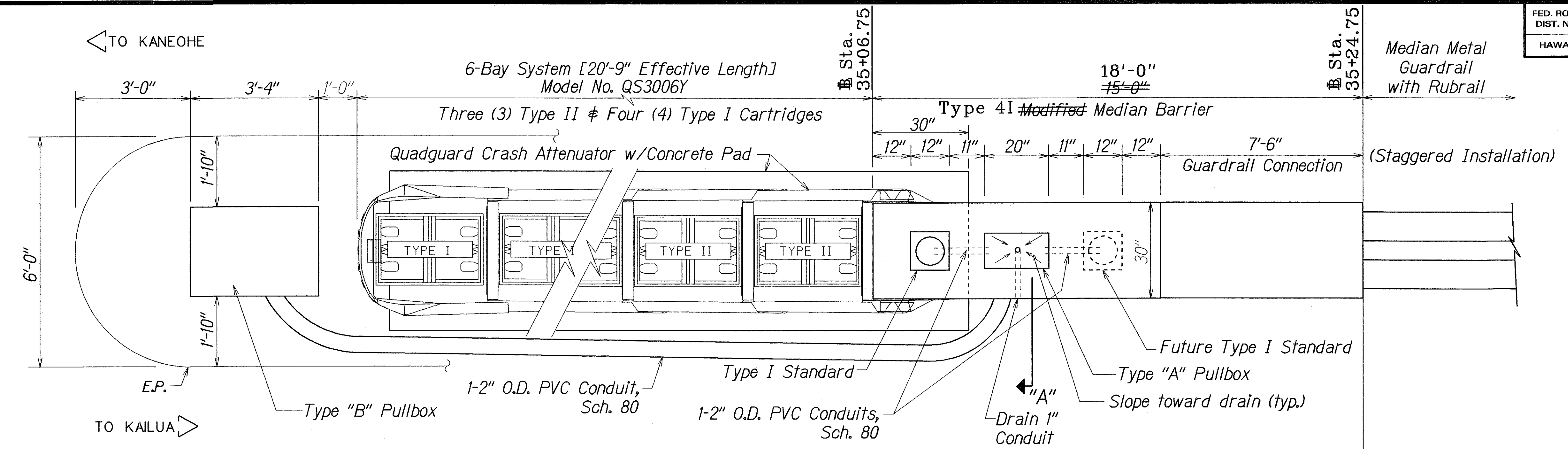
TRAFFIC SIGNAL DETAILS

 MOKAPU SADDLE ROAD
 Traffic Signals at H-3 On-Ramp
 Fed. Aid Project No. STP-065-1(6)

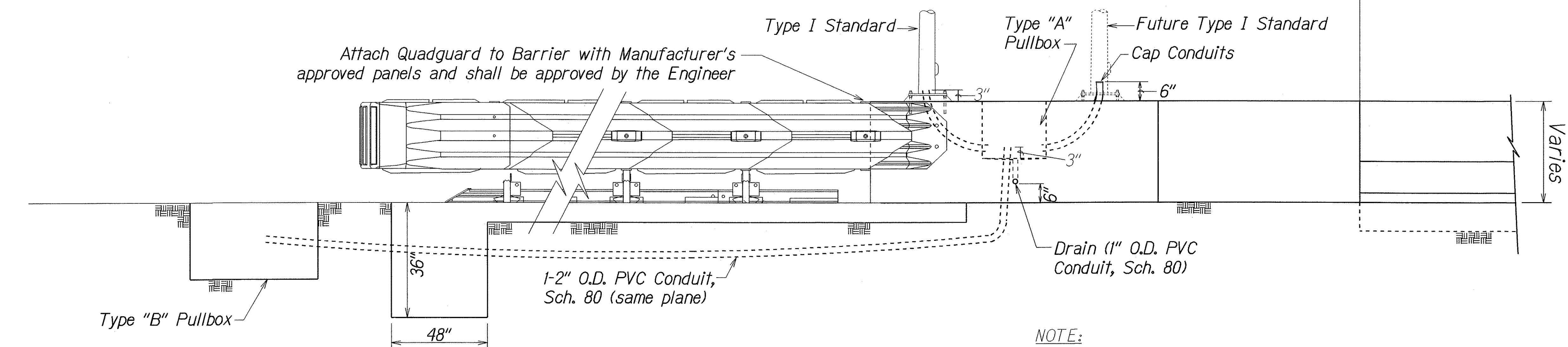
Not to Scale
 Date: April, 1999

SHEET No. 2 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	41	47



PLAN VIEW

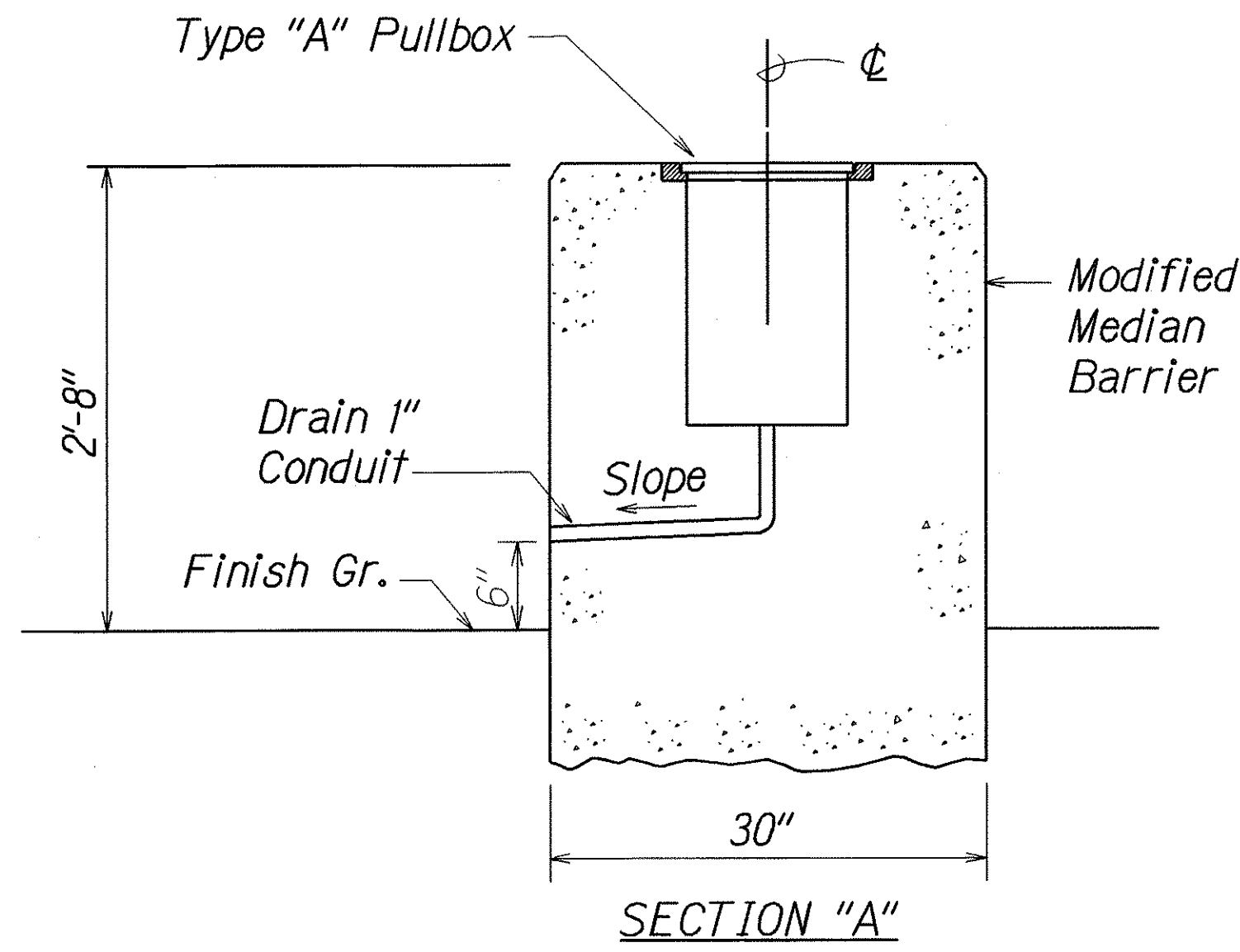


ELEVATION VIEW

NOTE:
The 2-2" PVC conduits between the Type "A" pullbox and the new and future Type I standard shall not be paid for separately but considered incidental to the various traffic signal items.

TYPICAL TYPE I TRAFFIC SIGNAL STANDARD ON CONCRETE BARRIER

Sta. 34+86± Rt. to Sta. 35+22± Rt.
35+06.75 N.T.S. 35+24.75



LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

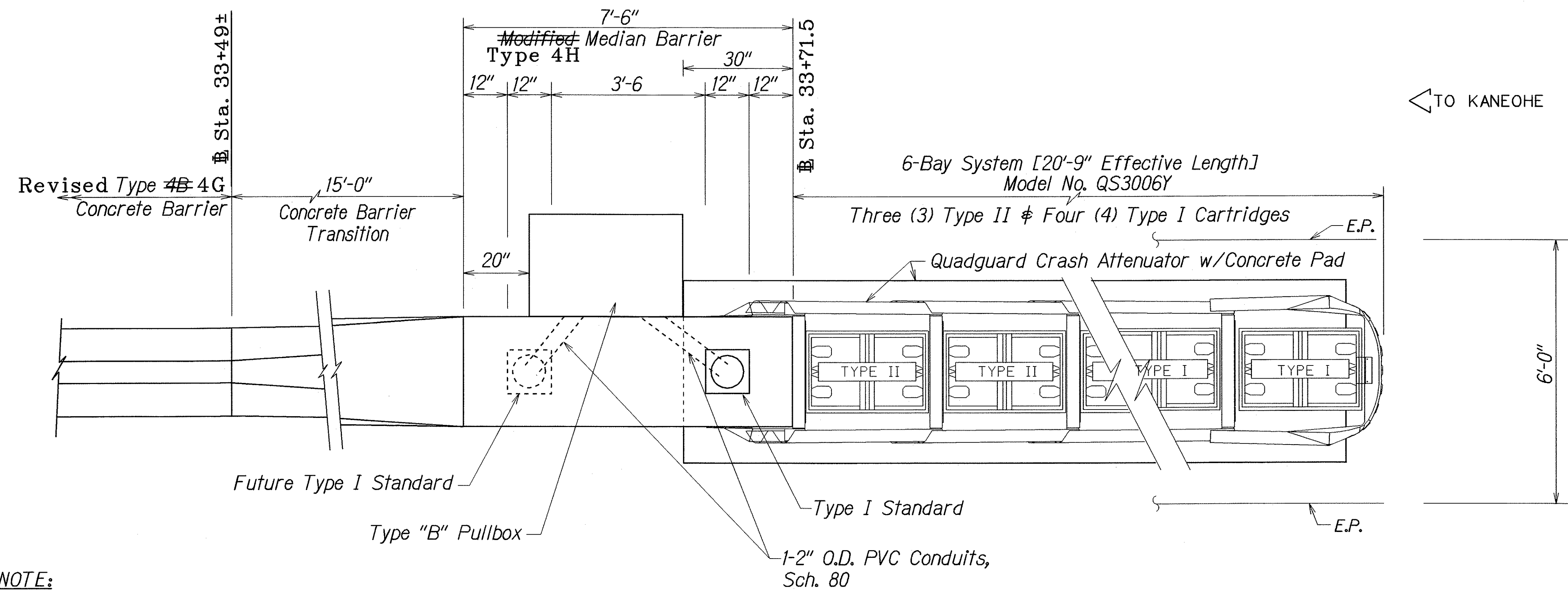
Not to Scale Date: April, 1999

SHEET No. 3 OF 6 SHEETS

ORIGINAL PLAN	DATE
DESIGNED BY	
TRACED BY	
NOTED BY	
CHECKED BY	
DATE	

"AS-BUILT"

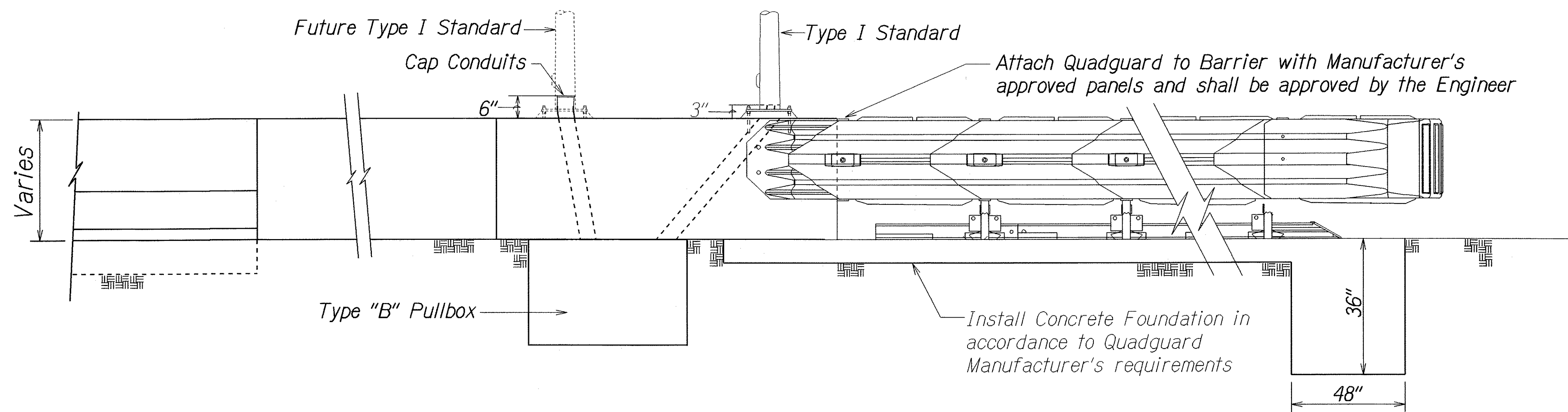
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	42	47



NOTE:

The 2" PVC conduits between the Type "B" Pullbox and the New and Future Type I Standard shall not be paid for separately but considered incidental to the various traffic signal items.

PLAN VIEW



ELEVATION VIEW

TYPICAL TYPE I TRAFFIC SIGNAL STANDARD ON CONCRETE BARRIER

Sta. 35+59 to Sta. 33+88±
33+49± N.T.S. 33+71.5

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

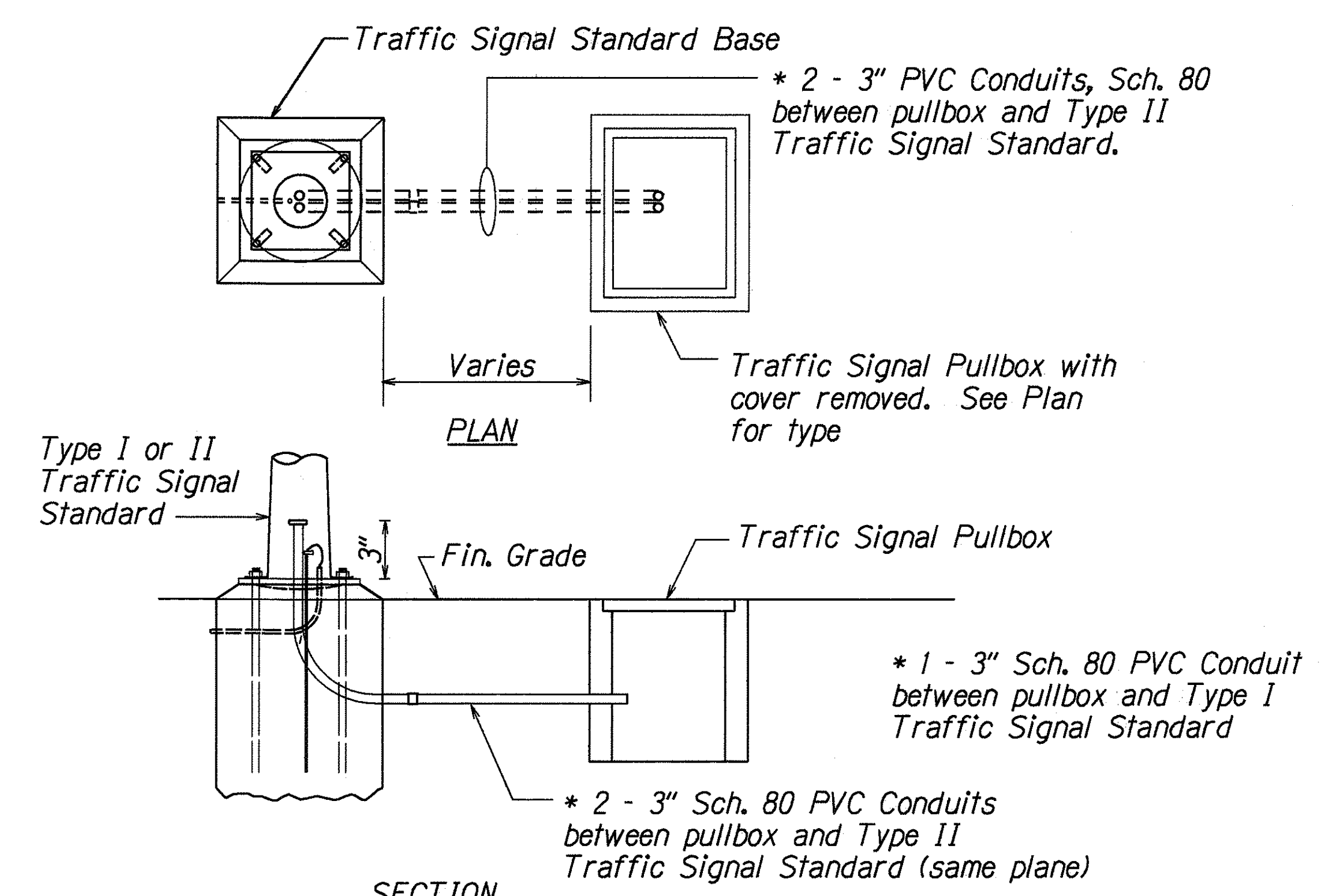
Not to Scale Date: Oct., 1997

SHEET No. 4 OF 6 SHEETS

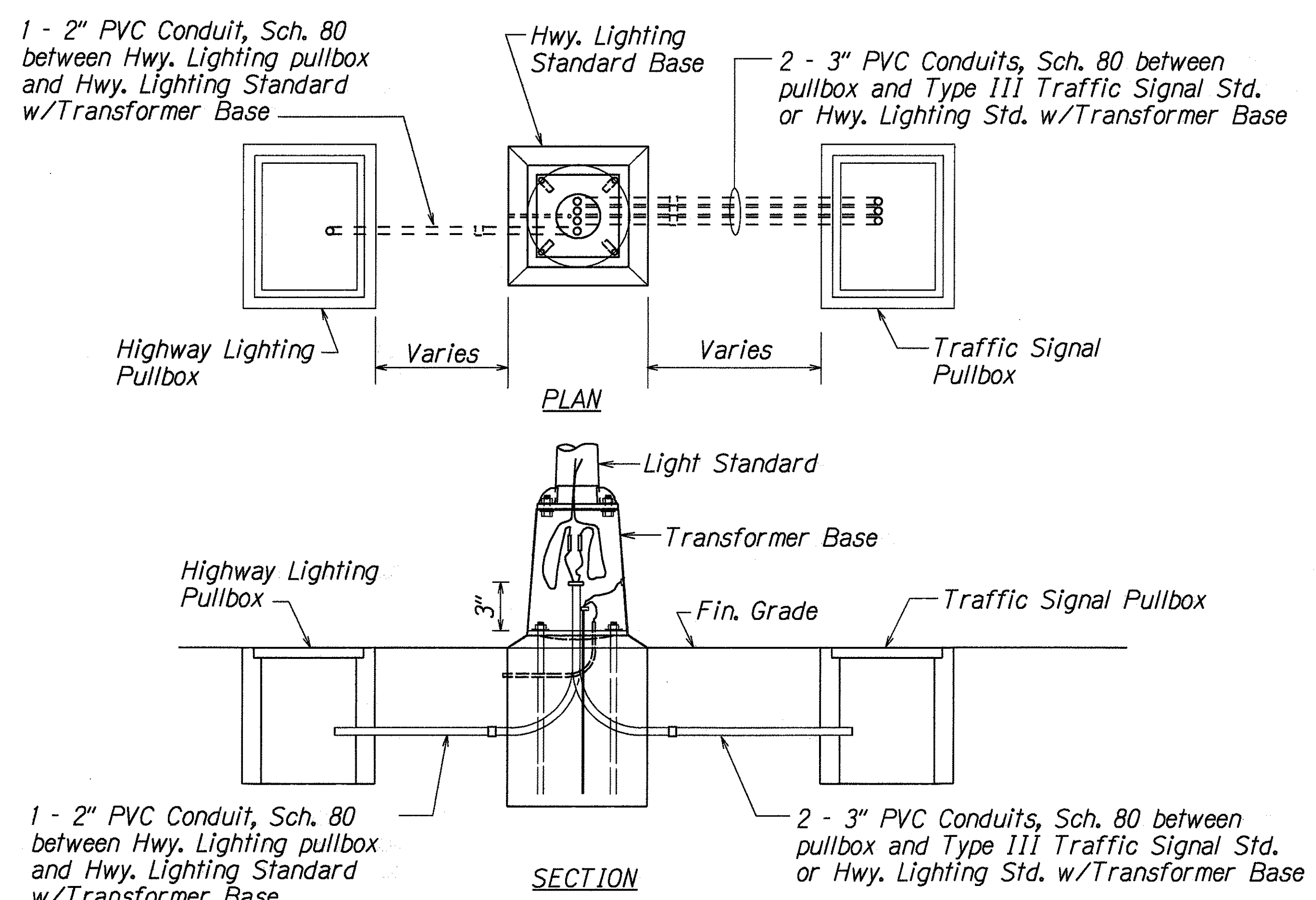
"AS-BUILT"

ORIGINAL PLAN	DATE
DESIGNED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	43	47



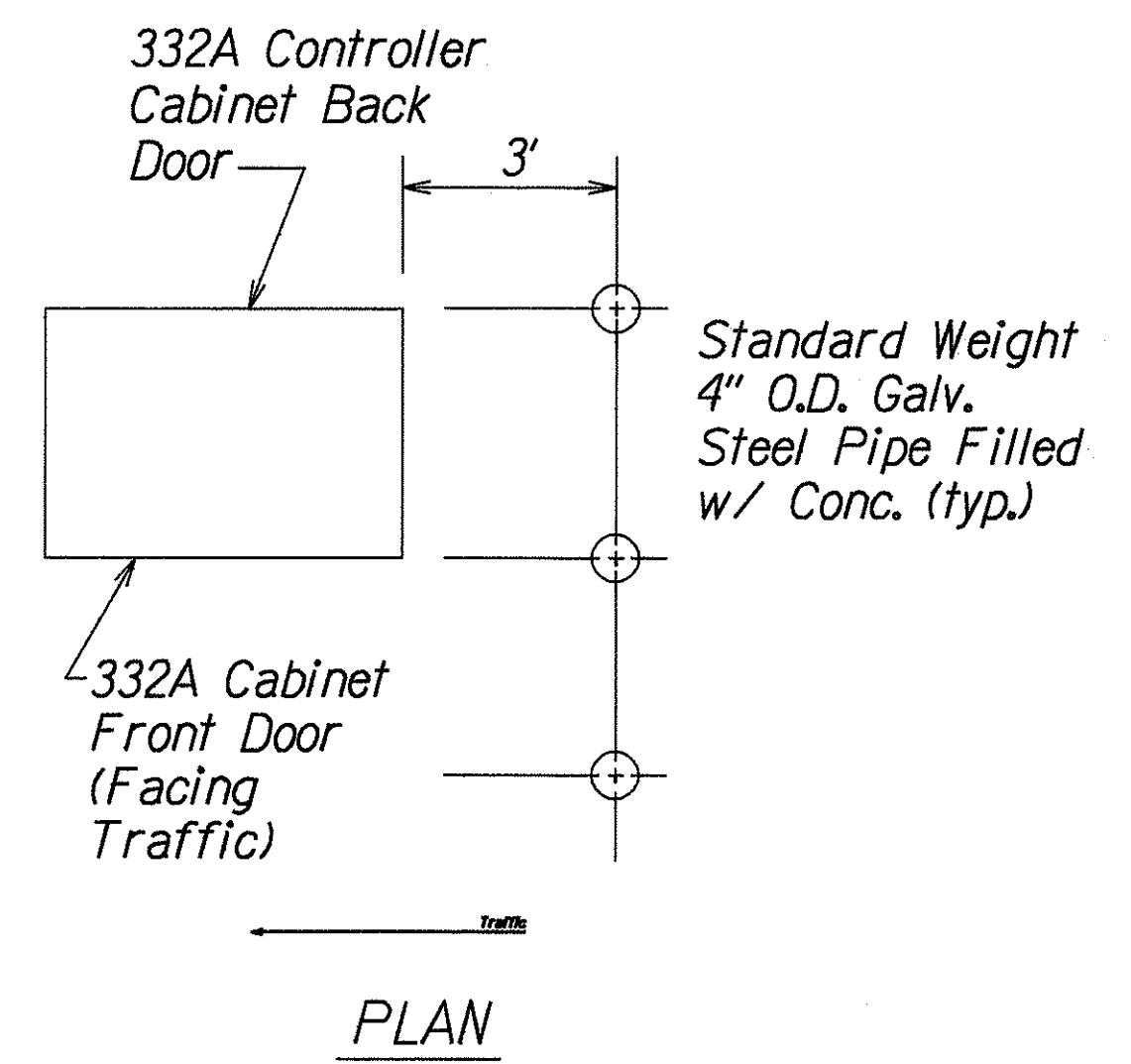
CONDUIT FOR TYPE I OR II TRAFFIC SIGNAL STD.



CONDUIT FOR TYPE III TRAFFIC SIGNAL STD. OR HWY. LT'G. STD.

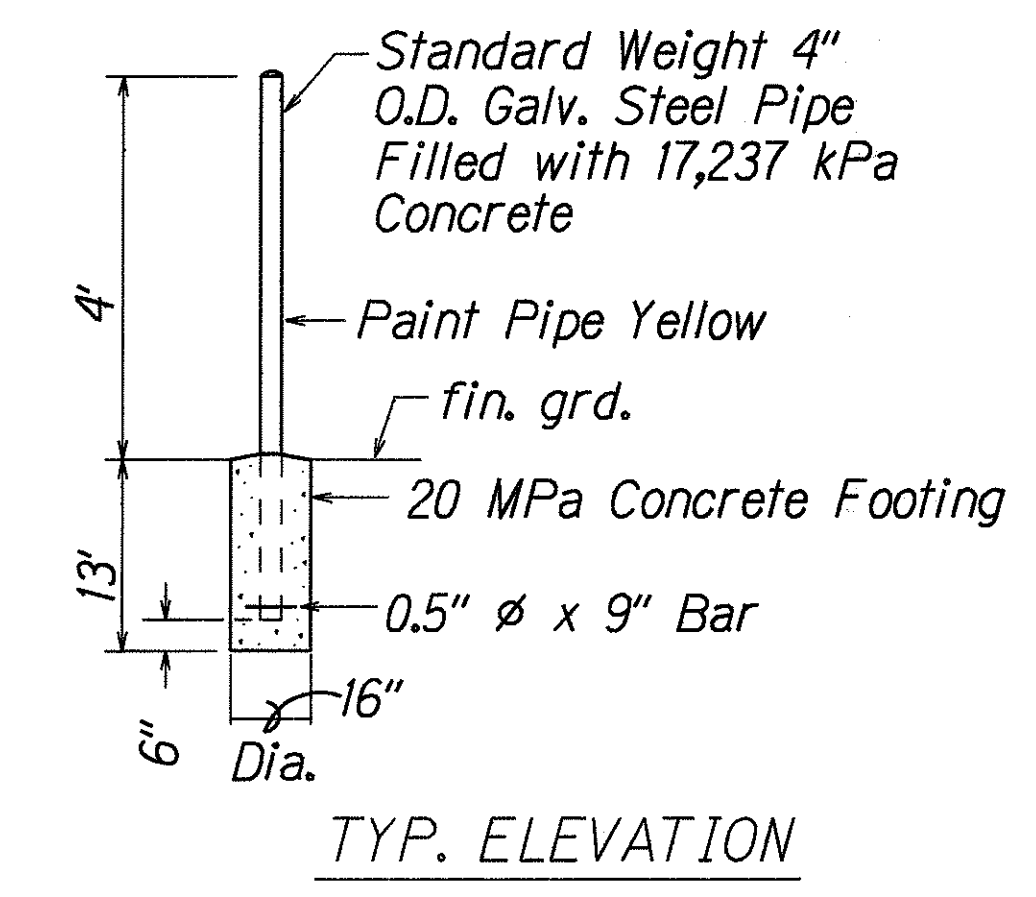
CONDUIT DETAILS FOR TRAFFIC SIGNAL/HWY. LIGHTING STANDARD

N.T.S.

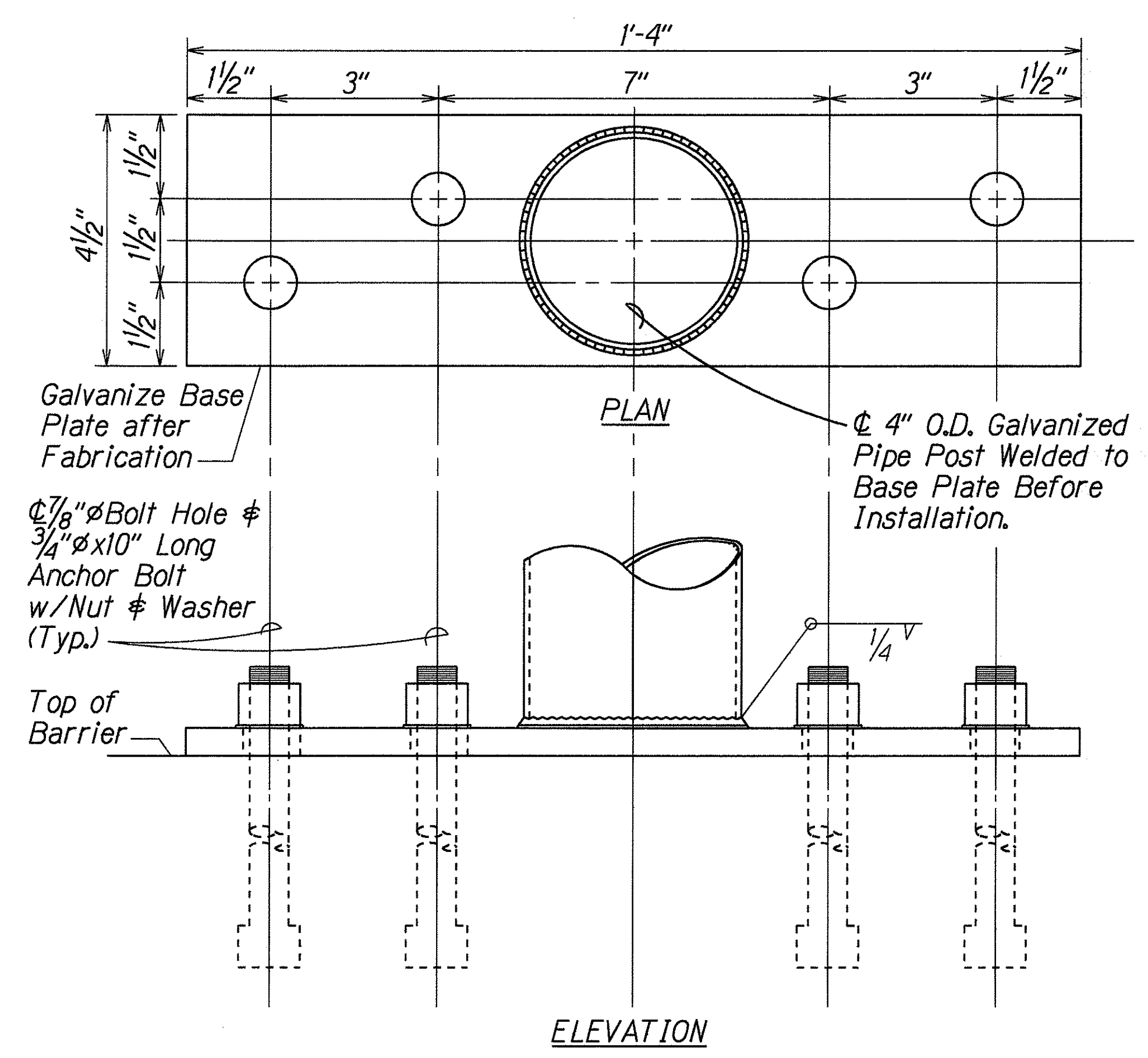


PIPE GUARD DETAIL

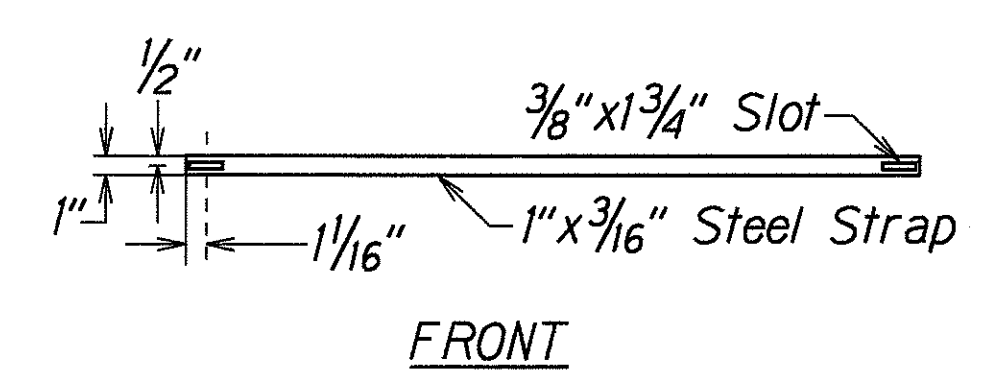
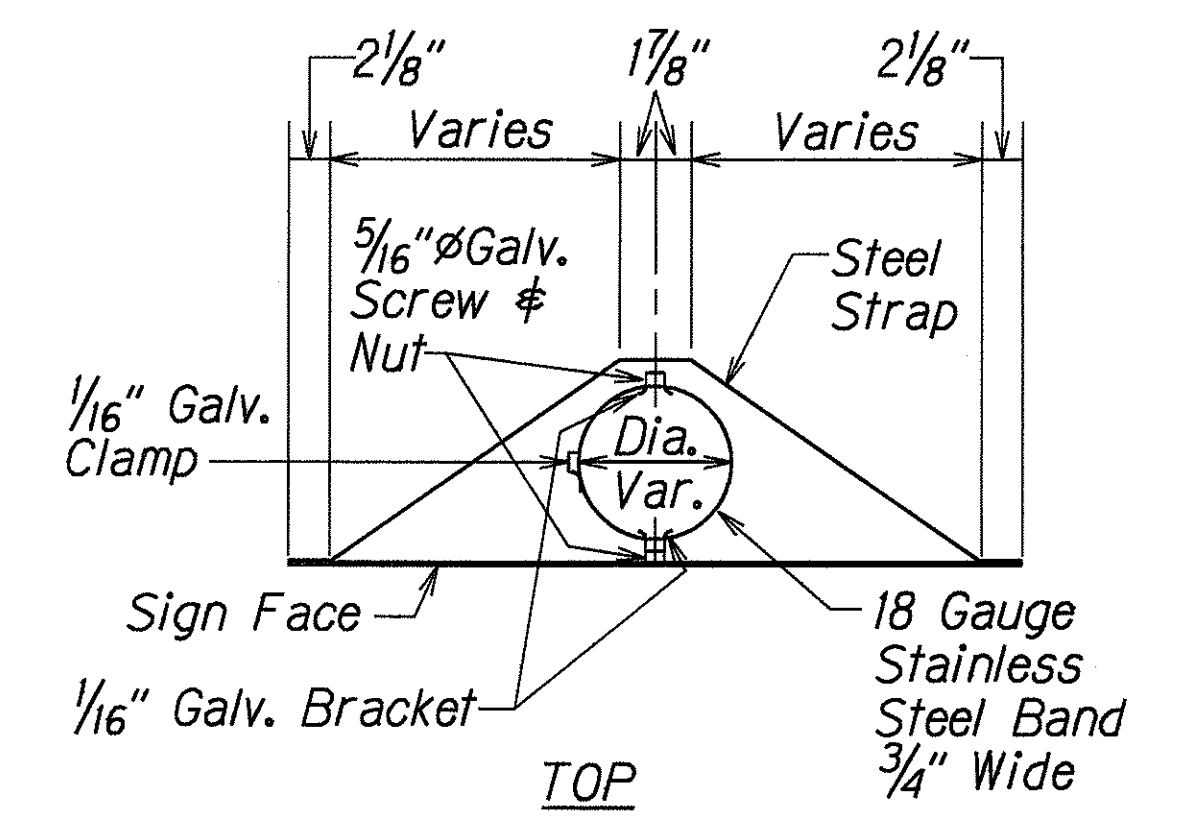
Not to Scale



NOTE:
Cost of concrete filled galvanized pipe guard shall be incidental to other items of work.



SIGN POST BASE PLATE DETAIL



SIGN BRACKET DETAIL

Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

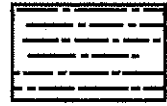
MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

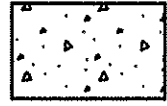
Not to Scale Date: April, 1999

SHEET No. 5 OF 6 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-065-1(6)	2000	44	47

STATE RIGHT-OF-WAY BACKFILL NOTES

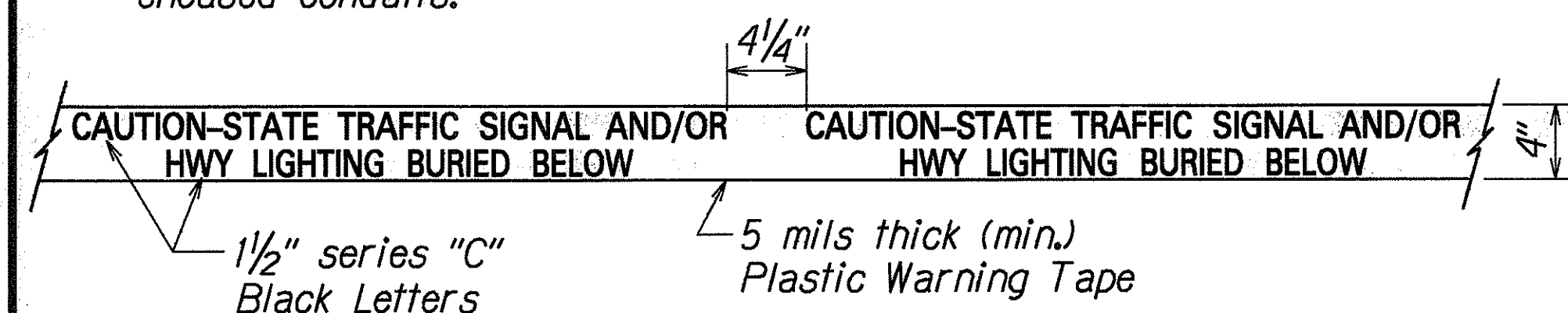
 Trench Backfill Material "A"
Beach Sand, Earth, or Earth and Gravel. If Earth and Gravel used, the maximum shall contain not more than 50% by volume of rock particles. Maximum 8" loose fill per lift. Obtain 95% compaction for each lift.

 Concrete
3000 psi compressive strength @ 3 days.

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

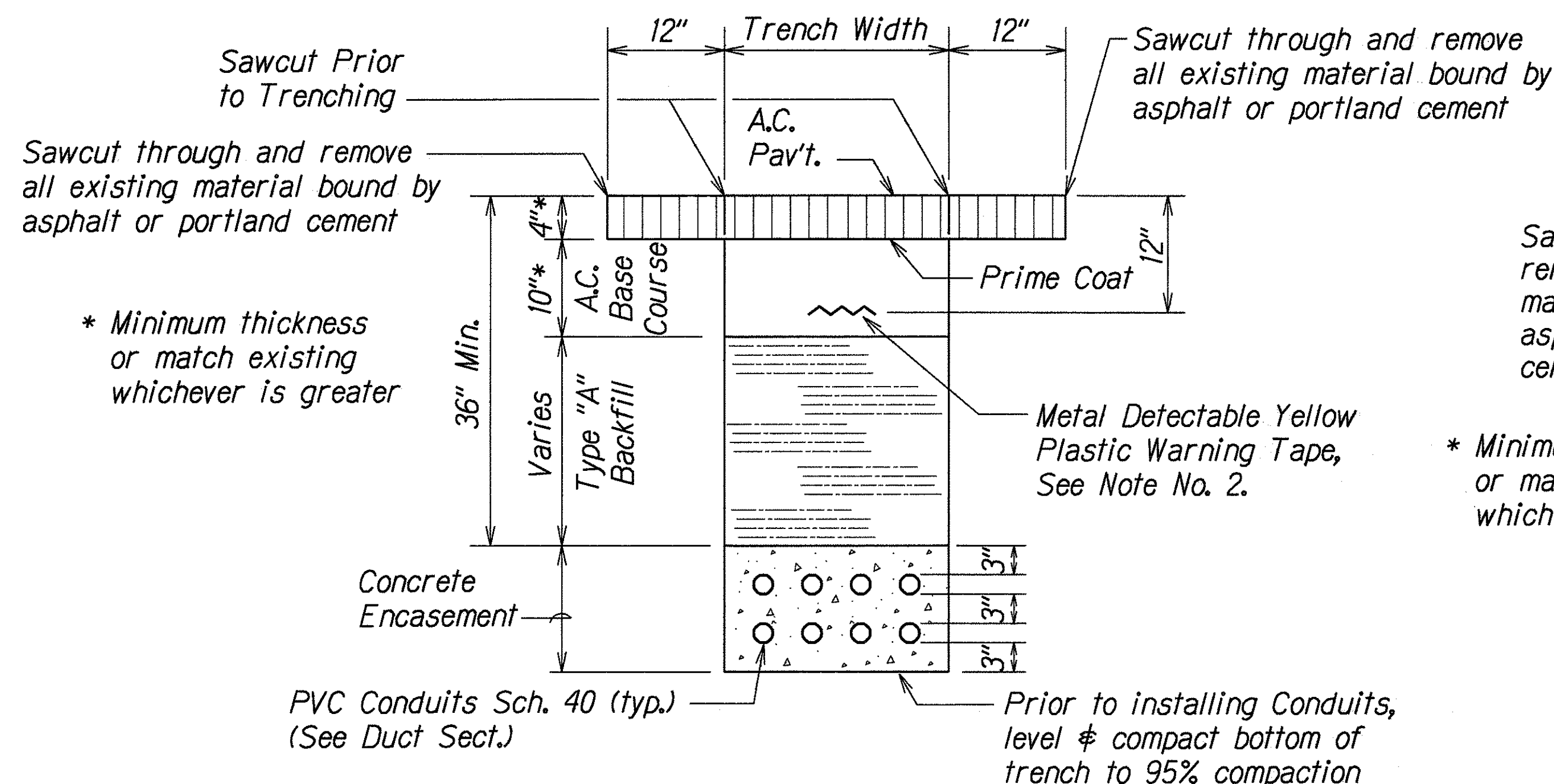
GENERAL NOTES

- 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.
- The Metal Detectable Yellow 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.
- The Contractor may begin backfilling the conduit trench when the concrete reaches 3000 psi compressive strength after 3 days.
- Maximum four (4) Conduits per row for multiple conduit duct section.
- 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.
- 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.

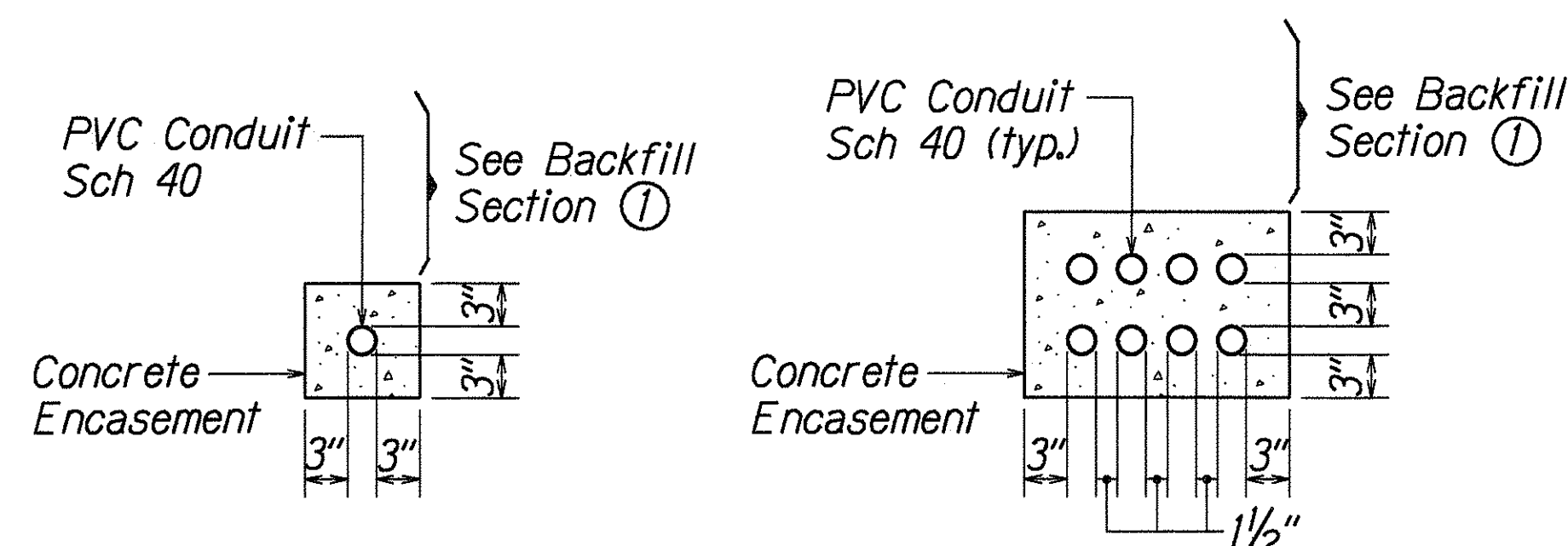


For additional information see note no. 2.

METAL DETECTABLE YELLOW PLASTIC WARNING TAPE



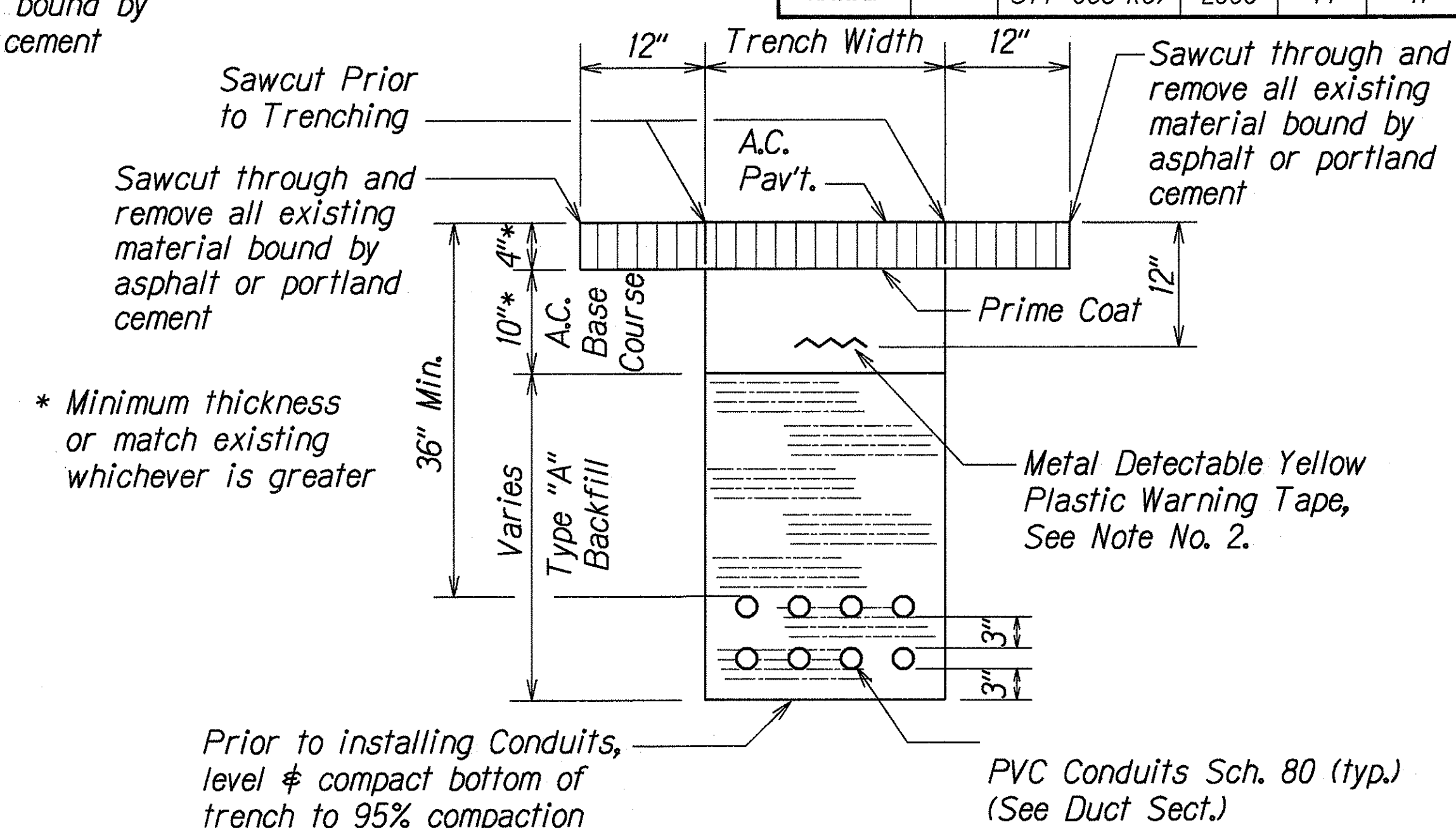
① TYPICAL BACKFILL SECTION
WITH CONCRETE ENCASED DUCTS



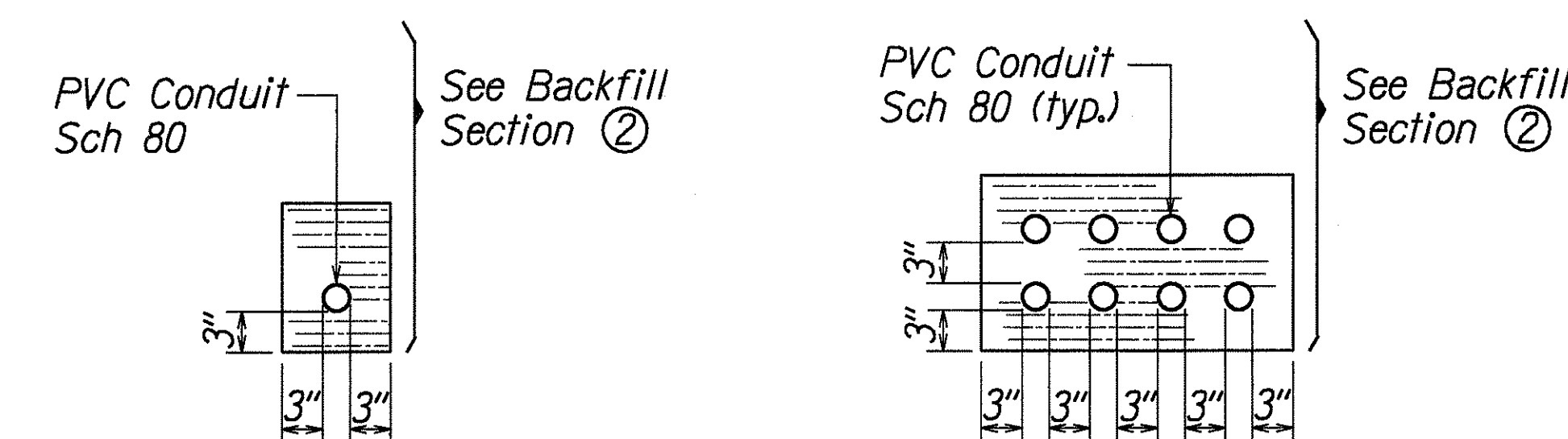
SINGLE CONDUIT

MULTIPLE CONDUIT

DUCT SECTIONS - CONC. ENCASED



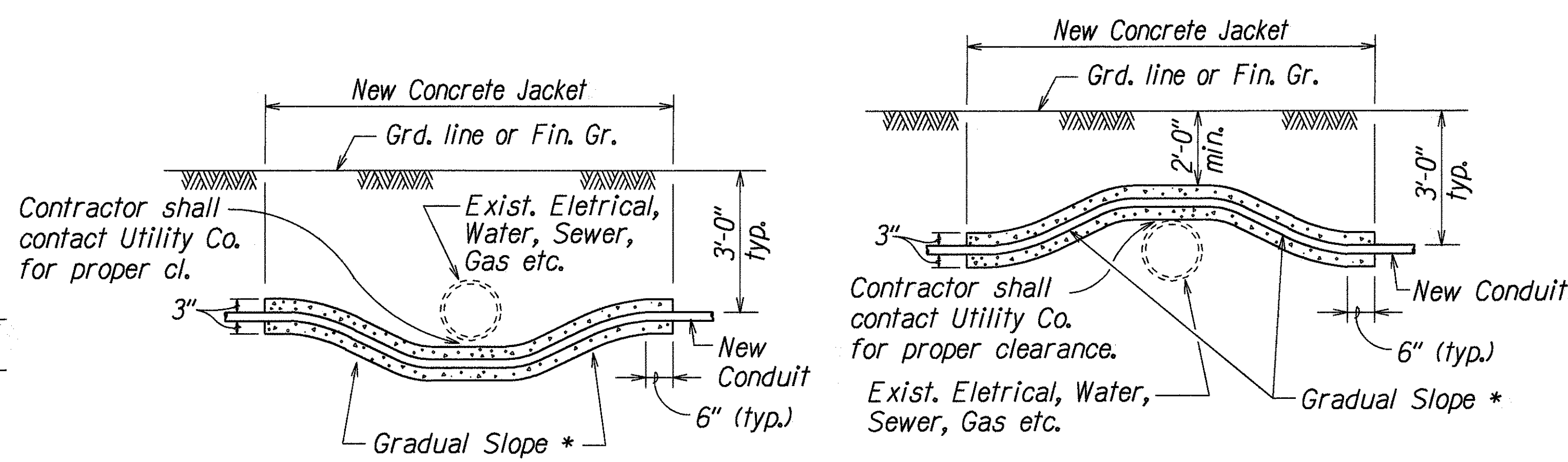
② TYPICAL BACKFILL SECTION
DIRECT BURIED DUCTS



SINGLE CONDUIT

MULTIPLE CONDUIT

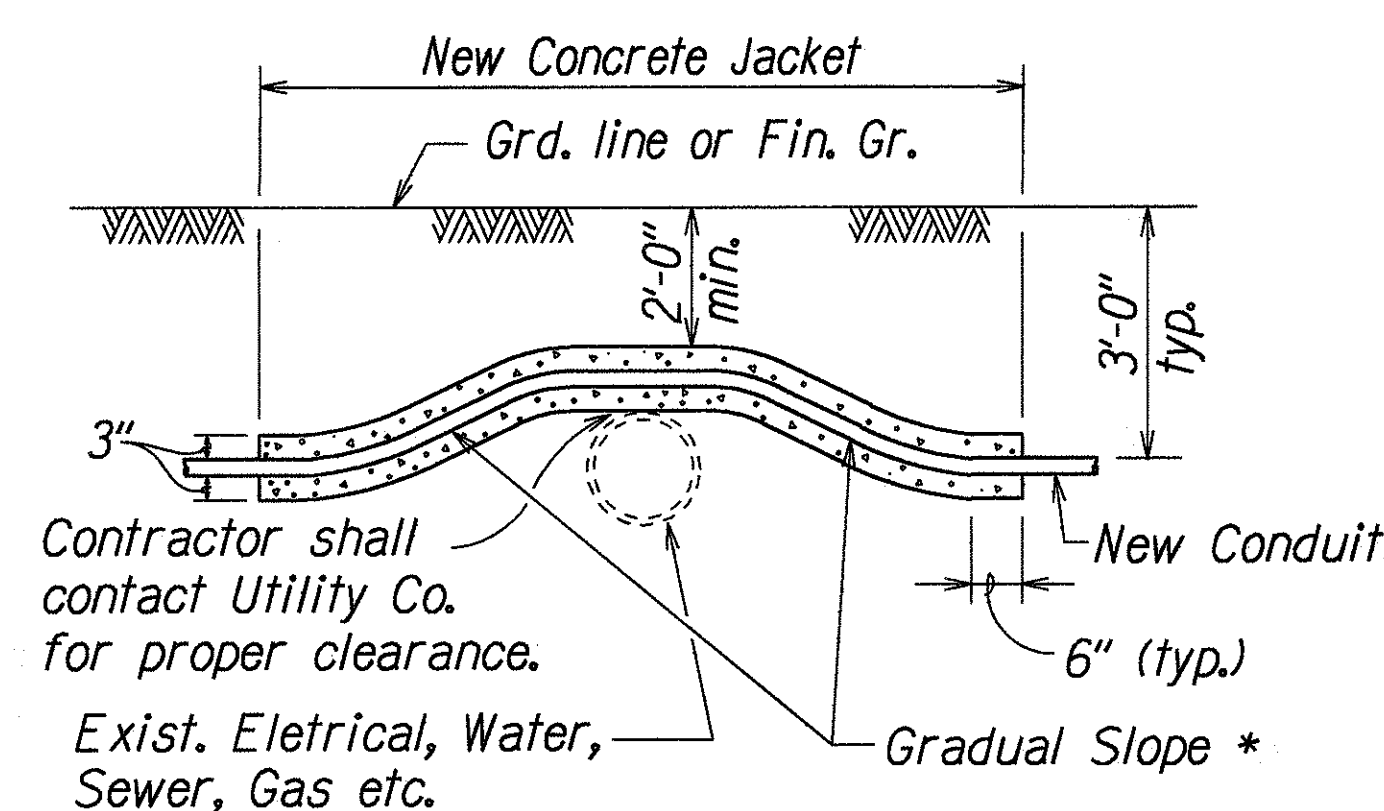
DUCT SECTIONS - DIRECT BURIED



* To be determined by County Electrical Inspector/Engineer

CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES

Not to Scale



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

MOKAPU SADDLE ROAD
Traffic Signals at H-3 On-Ramp
Fed. Aid Project No. STP-065-1(6)

Not to Scale Date: April, 1999

SHEET No. 6 OF 6 SHEETS