FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	99D-01-96	1996	8	11

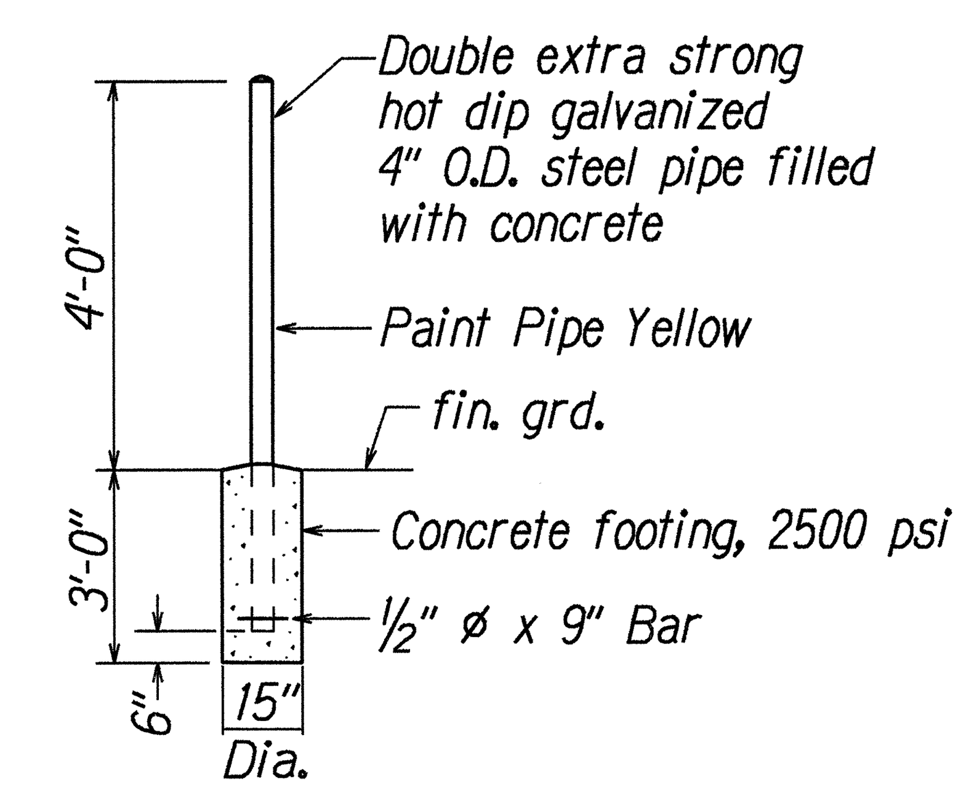
TRAFFIC SIGNAL NOTES

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 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.
10. The Contractor shall notify the Traffic Signal Branch, Department of Transportation Services, City & County of Honolulu, (phone no. 527-5007) 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 Electrical and Maintenence Services Division, Department of Transportation Services, three (3) working days prior to commencing work on the traffic signal system (phone no. 527-5007).
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.

ORIGINAL PLAN	
SURVEY PLOTTED BY	DATE
DRAWN BY R. Arii	3/11/96
TRACED BY	
DESIGNED BY G. Kakehi	
QUANTITIES BY	
CHECKED BY	
NOTE BOOK td2.may okamttsleg No.	

TRAFFIC SIGNAL LEGEND

- New Traffic Signal Controller
- New Traffic Signal Conduits & Cables
- New 12" RYG Traffic Signal Head
- New 12" RY↑ Traffic Signal Head
- New 12" RY→ Traffic Signal Head
- New 12" RY← Traffic Signal Head
- New Type I Traffic Signal Standard w/Traffic Signal Head as specified on plan
- 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) (24', 12')
- New Pedestrain Signal Head
- New Type C Pullbox (C&C Type)
- New Pipe Guard
- New Loop Detectors
- Exist. Traffic Signal Conduits & Cables
- Exist. Traffic Signal Standard & Signal Head
- Exist. Pedestrain Signal Head
- Existing Pullbox
- Existing Loop Detectors
- Existing Pipe Guard



TYP. ELEVATION

NOTE:
Cost of the conc. filled galvanized pipe controller barrier shall be incidental to other items of work

CONTROLLER BARRIER DETAIL

Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL LEGEND DETAIL AND NOTES

KAMEHAMEHA HIGHWAY INTERSECTION IMPROVEMENTS AT WAIMANO HOME ROAD

Project No. 99D-01-96

Scale: As shown Date: Mar., 1996

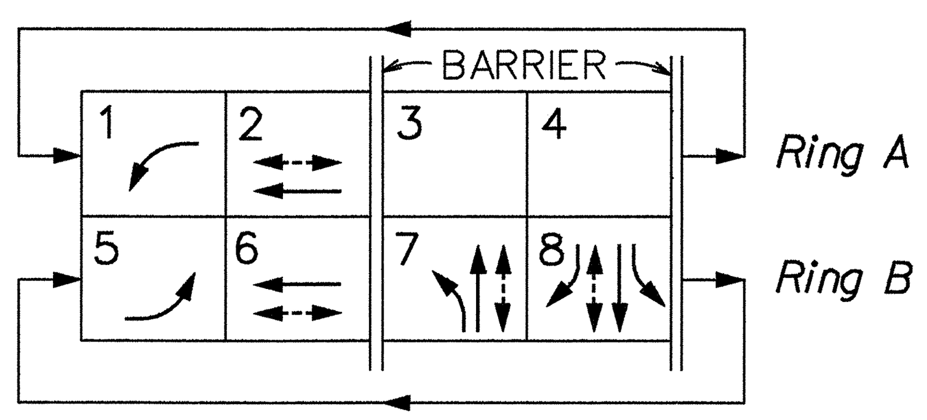
SHEET No. TS-1 OF 4 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	99D-01-96	1996	9	11

LIST OF MATERIALS

POLE LETTER	STANDARD TYPE	MOUNTING TYPE	SIGNAL FACES
A	I - 10	Slipfitter - Three Way Cantilever - Three way	R-Y-G←, R-Y-G, R-Y-G H-M, H-M, H-M
B	I - 10	Slipfitter - Two Way	R-Y-G← , R-Y-G←
C*	II - 40 (exist.)	Mast Arm - One Way (exist.) Mast Arm - One Way (exist.) Mast Arm - One Way (exist.)	R-Y-G← (exist.) R-Y-G↑ (exist.) R-Y-G (exist.)
D	II - 20	Mast Arm - One Way	R-Y-G←
E	I - 8	Slipfitter - One Way	H-M

* Relocate Ⓕ designated pole with mast arm, signal heads and st. name sign, to Ⓒ location. Relocation includes New Concrete Footing with Anchor Bolts. New Anchor Bolts to match existing.



PHASE DIAGRAM

R10-4b
(Sign Varies w/Direction)

Ⓐ (⇄) R10-4b(R), R10-4b(R&L)

Ⓔ (←) R10-4b(L)

PEDESTRIAN PUSH BUTTON W/SIGN (NEW)

TRAFFIC SIGNAL HEAD SCHEDULE

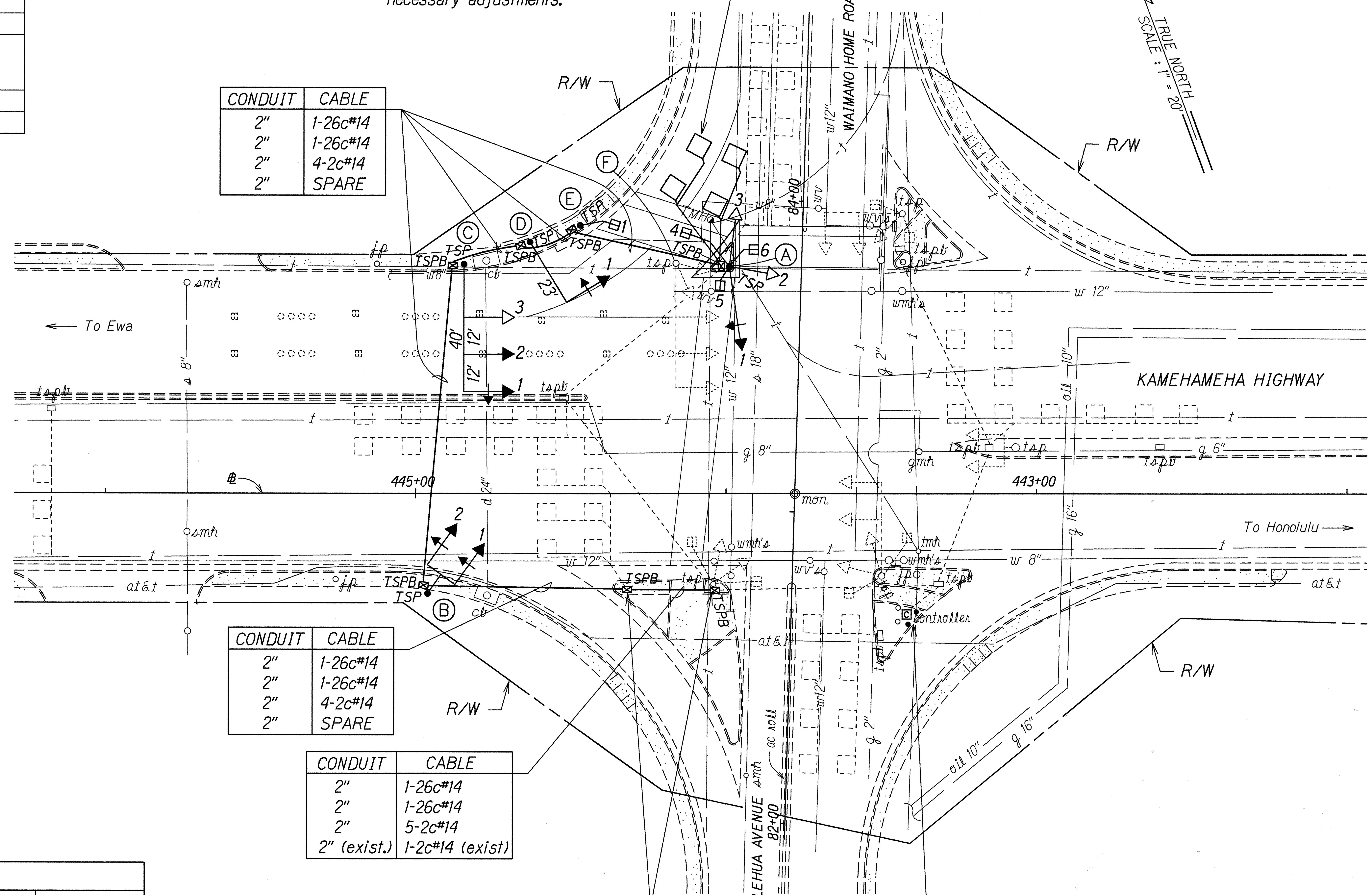
Traffic Signal Head Type and Description	12" RYG Traffic Signal Head	12" RY↑ Traffic Signal Head	12" RY← Traffic Signal Head	12" RY→ Traffic Signal Head	Pedestrian Signal Head
Pole Letter Signal Head Number	A-2 A-3 C-3 (Exist.)	C-2 (Exist.)	A-1 C-1 (Exist.)	B-1 B-2 D-1	A-4 A-5 A-6 E-1

NOTE: All Red Signal Indications shall be LED Lamp

℄ STA. 445+98± O/S 72'± LT.
Remove Exist. Traffic Signal Pullbox and Install New Type "C" (C&C Type) to new finished grade. Tie into exist. and/or new system and make all necessary adjustments.

4 Ea. 1-6'x6' Loop Detectors Centered in Lanes

CONDUIT	CABLE
2"	1-26c#14
2"	1-26c#14
2"	4-2c#14
2"	SPARE



CONDUIT	CABLE
2"	1-26c#14
2"	1-26c#14
2"	4-2c#14
2"	SPARE

CONDUIT	CABLE
2"	1-26c#14
2"	1-26c#14
2"	5-2c#14
2" (exist.)	1-2c#14 (exist)

Remove Exist. Traffic Signal Pullbox and Install New Type "C" (C&C Type) to new finished grade. Tie into exist. and/or new system and make all necessary adjustments.

Remove Exist. Controller and Install New Model 170 Master Traffic Signal Controller Unit, Model 332 Cabinet, Ground Mounted, and Auxiliary Equipment on existing foundation. Tie into existing system and make all necessary connections and adjustments for an operating system. Remove one (1) damaged controller barrier and install two (2) new barriers.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

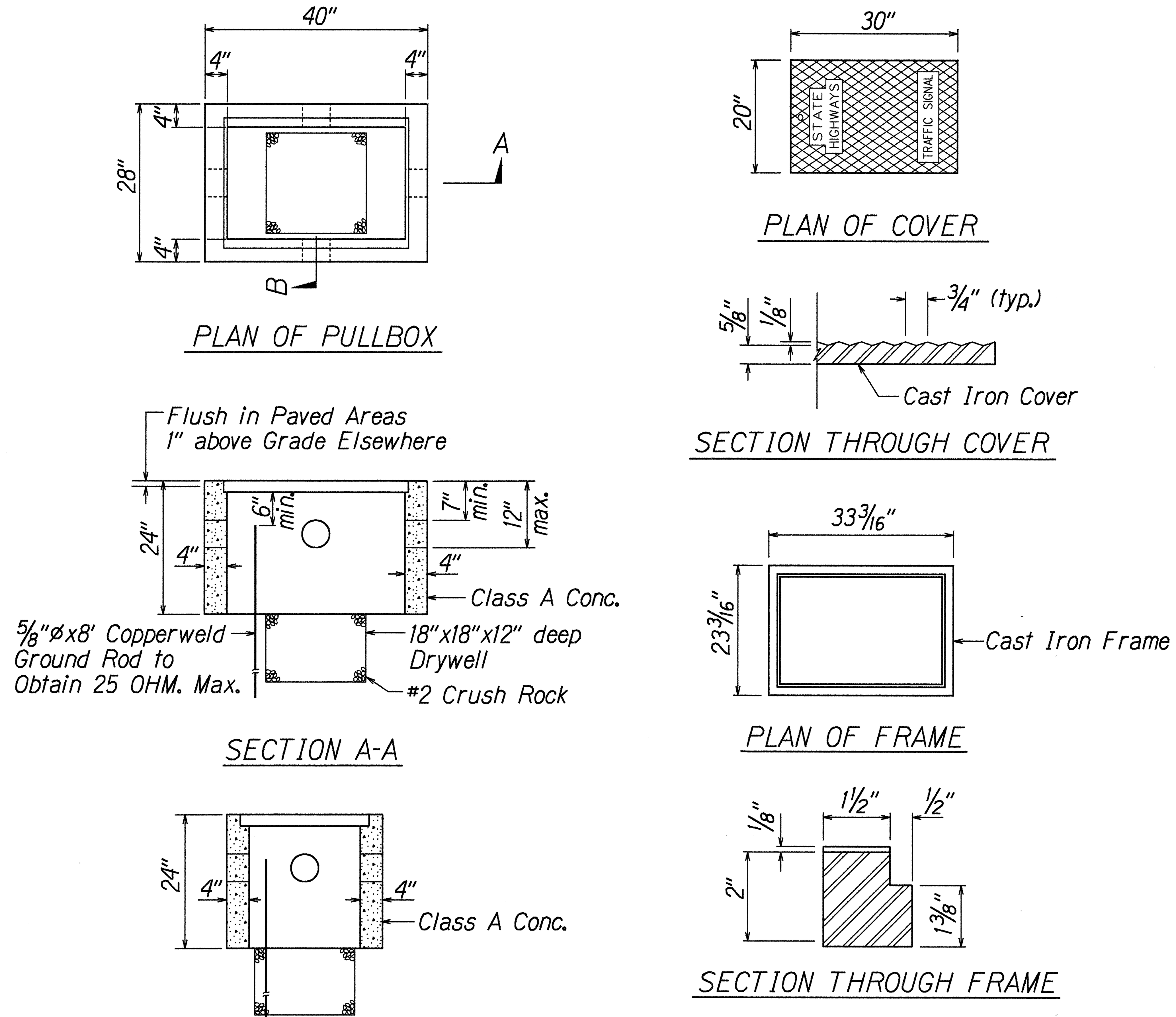
KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT WAIMANO HOME ROAD
Project No. 99D-01-96

Scale: 1" = 20' Date: Mar., 1996

SHEET No. TS-2 OF 4 SHEETS

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY R. Arii | TRACED BY | DESIGNED BY G. Kakehi | QUANTITIES BY | CHECKED BY | NOTE BOOK 1d2.may dkam1s | DATE

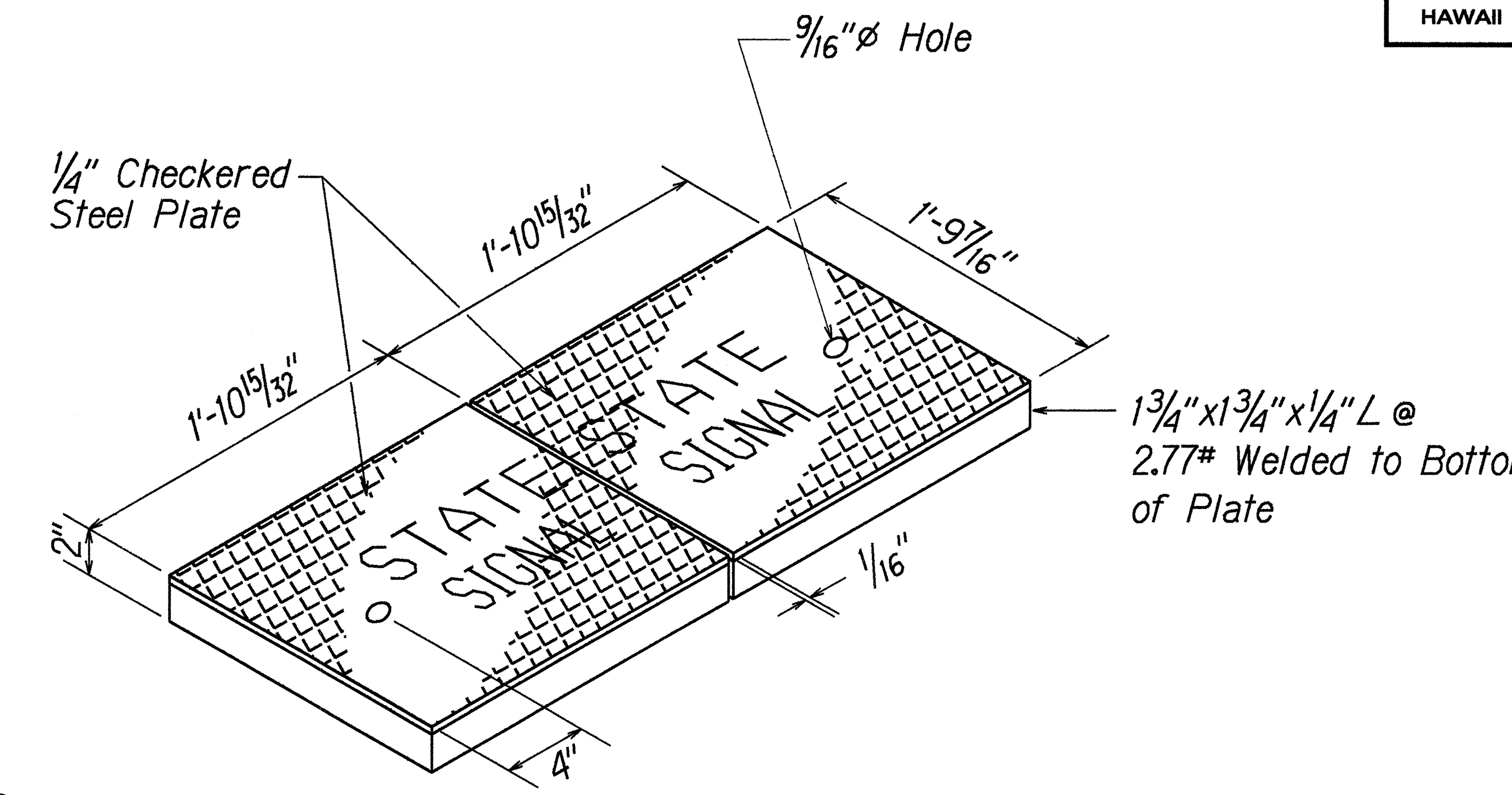
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	99D-01-96	1996	10	11



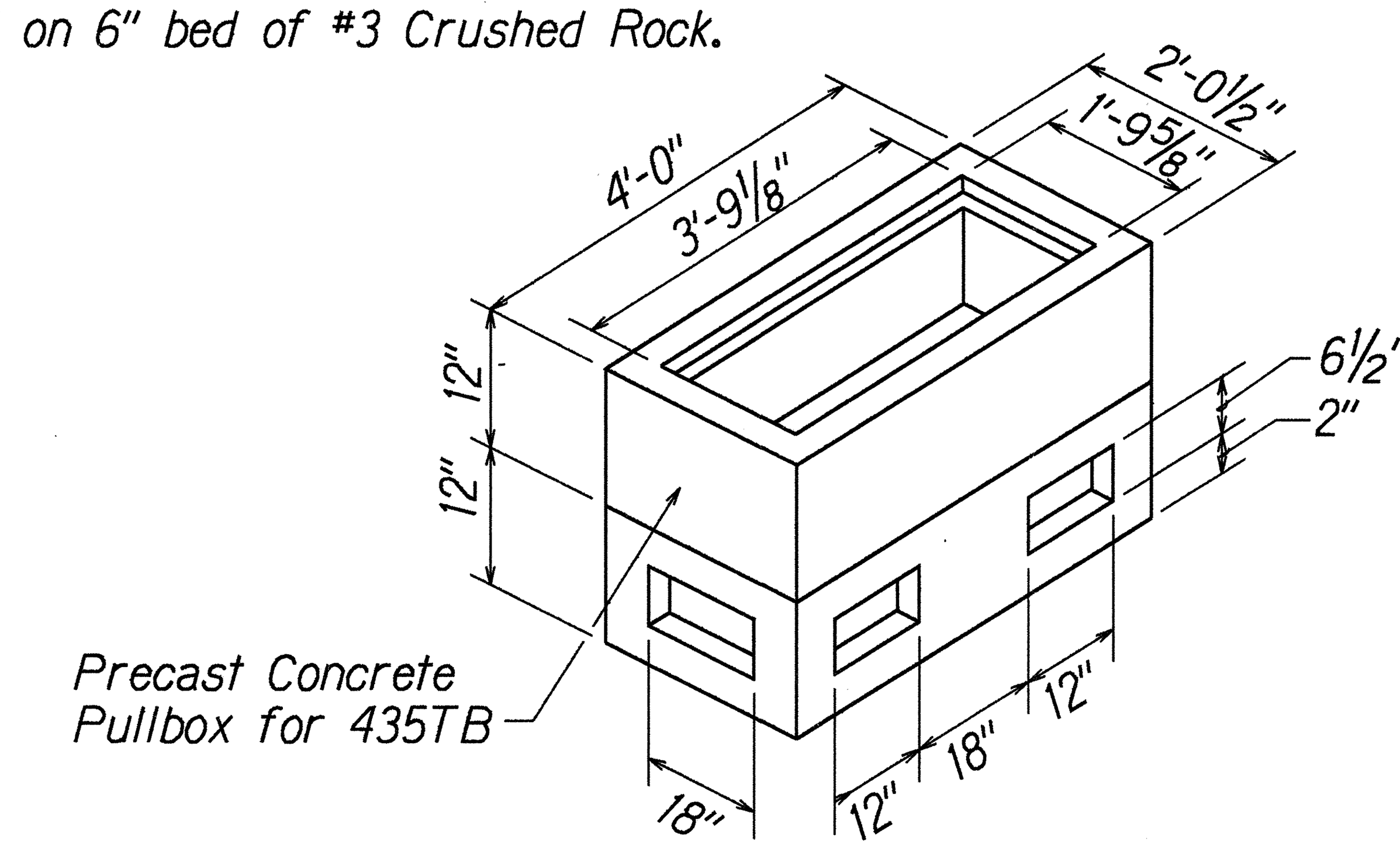
Note: Provide Ground Rod in all Pullboxes adjacent to Standards, Pedestals, Controllers, and other locations specified by the Engineer.

TYPE "C" PULLBOX (C & C Type)

Not to Scale

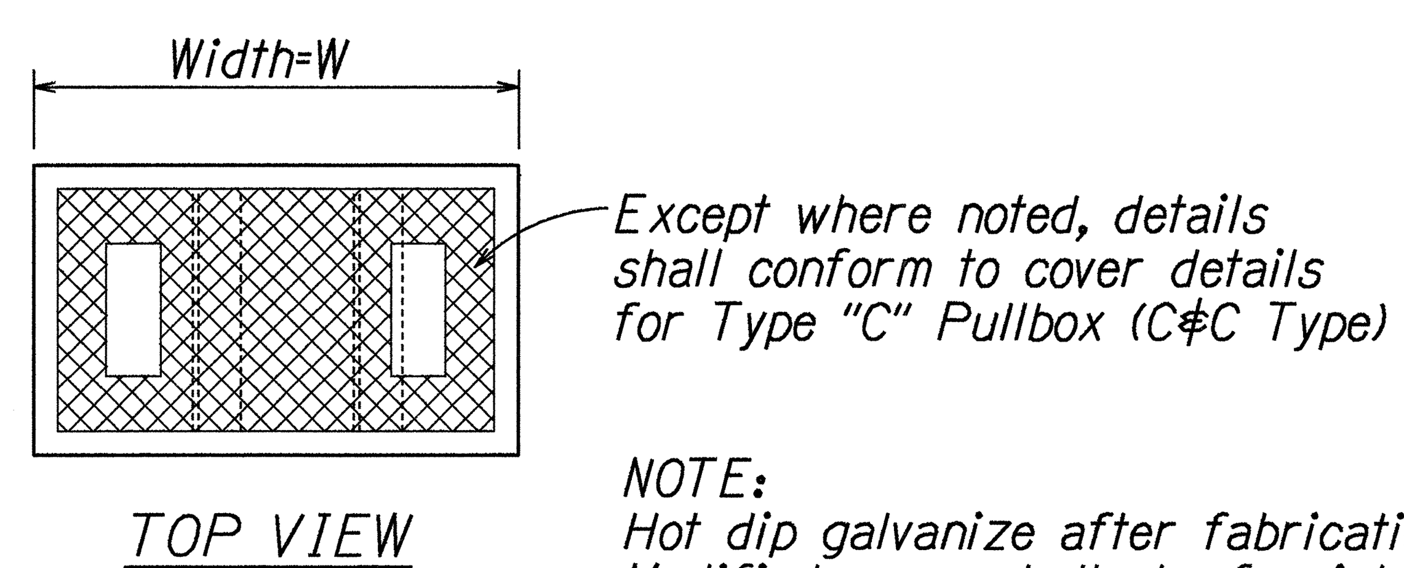


NOTES:
1. After fabrication of covers, Galvanize or apply 2 coats of ZRC (Zinc Rich Coating) to both sides.
2. Install on 6" bed of #3 Crushed Rock.

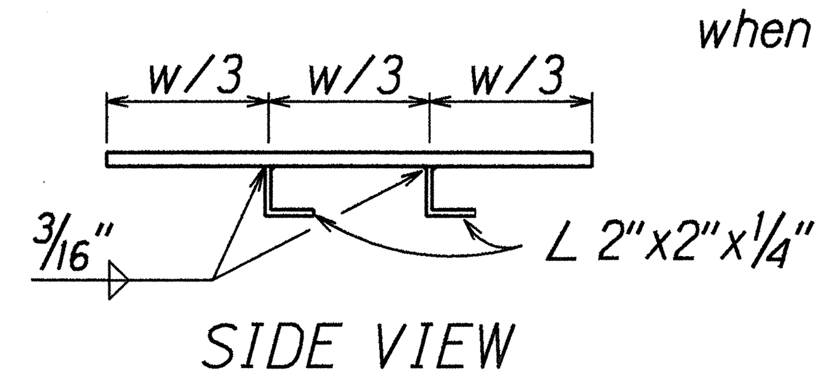


TYPE "D" PULLBOX (C & C Type)

Not to Scale



NOTE:
Hot dip galvanize after fabrication. Modified cover shall be furnished when called for on plans.



MODIFIED COVER DETAIL

Not to Scale

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT WAIMANO HOME ROAD

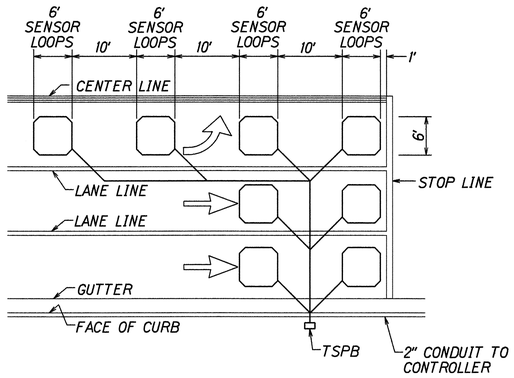
Project No. 99D-01-96

Not to Scale Date: Mar., 1996

SHEET No. TS-3 OF 4 SHEETS

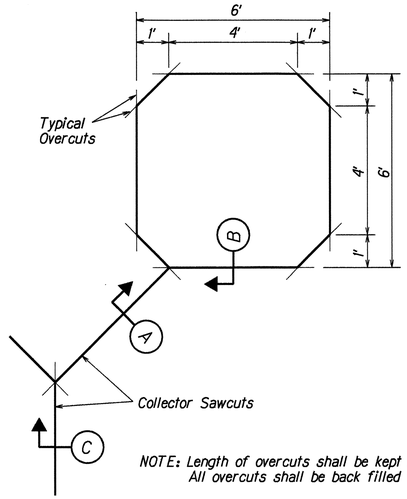
ORIGINAL PLAN | NOTE BOOK td2.msy | SURVEY PLOTTED BY | DRAWN BY B. Arii | TRACED BY G. Kakehi | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE 3/11/96

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	99D-01-96	1996	11	11



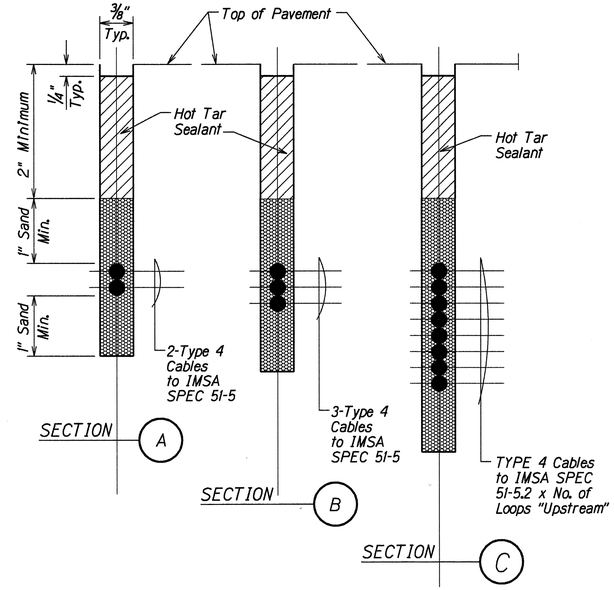
NOTES:
1. Center sensor loops in lanes.
2. Collector cables shall be twisted 2 turns per foot.
3. Number of loops and locations vary. See project plans.
4. Number and locations of collector sawcuts may be varied in the field to suit.

TYPICAL SENSOR LOOP LAYOUT

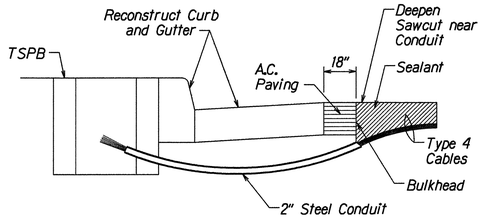


NOTE: Length of overcuts shall be kept to a minimum. All overcuts shall be back filled with hot tar.

TYPICAL SENSOR LOOP SAWCUT DETAIL



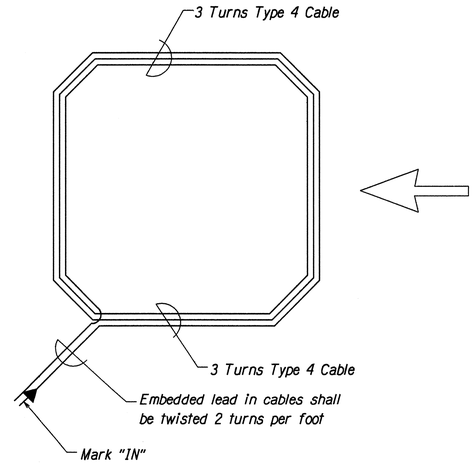
TYPICAL SECTION THROUGH SENSOR LOOP



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

TYPES OF CABLES

TYPE 1	Signal Loop Cable: Stranded No. 14, 26 conductors
TYPE 2	Detector Lead-In Cable and Pedestrian Push Button Circuit Cable: Stranded, No. 14, 2 Conductors
TYPE 3	Interconnect Cable: Solid No. 20, 12 Pairs
TYPE 4	Loop Sensor Cable: Solid No. 12, Single Conductor to IMSA SPEC 51-5
TYPE 5	Cable from Signal Loop to Signal Head: Stranded, No. 14, Single Conductor
TYPE 6	Service Cable: Solid, No. 6, 3 Conductors

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

KAMEHAMEHA HIGHWAY
INTERSECTION IMPROVEMENTS
AT WAIMANO HOME ROAD
Project No. 99D-01-96

Not to Scale Date: Mar., 1996

SHEET No. TS-4 OF 4 SHEETS