








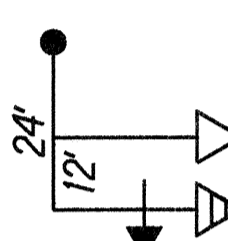








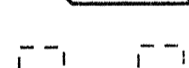


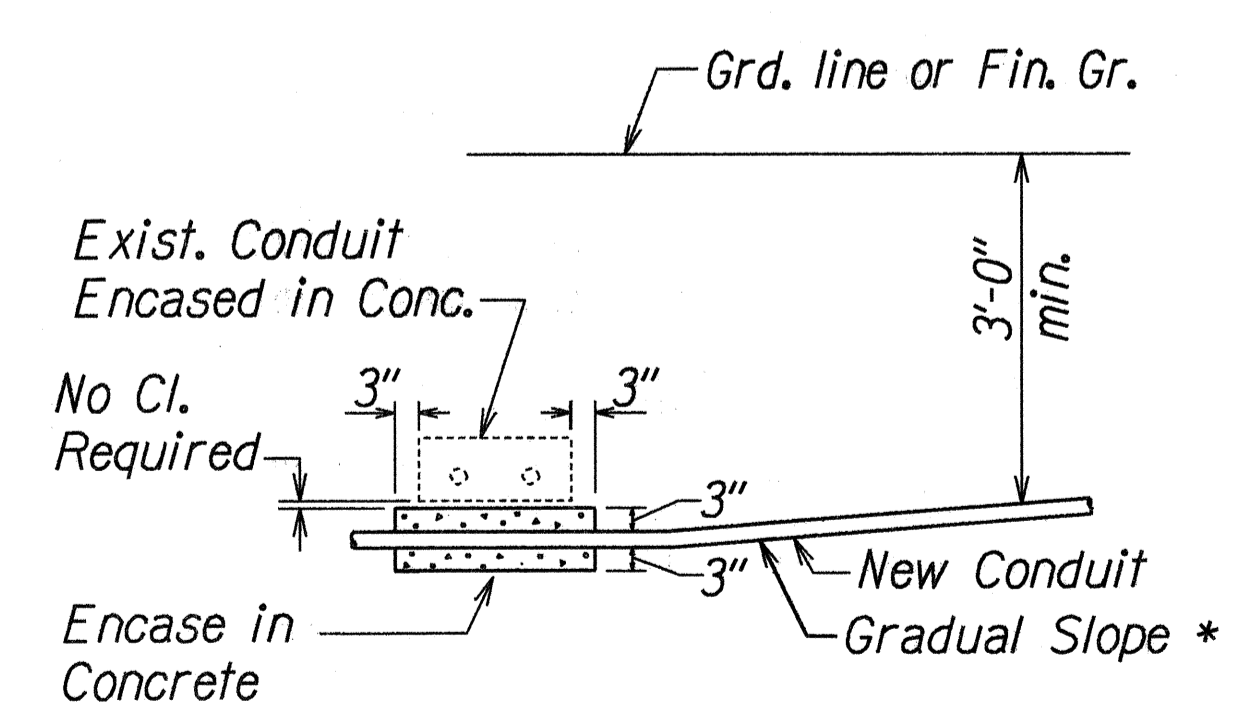


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-STP-099-1(12)	1996	40	64

TRAFFIC SIGNAL LEGEND

-  New Traffic Signal Controller
-  Existing Traffic Signal Controller
-  New Traffic Signal Conduits & Cables
-  Existing Traffic Signal Conduits & Cables
-  New 12" RYG Traffic Signal Head
-  New 12" RY^ Traffic Signal Head
-  New 12" RY< Traffic Signal Head
-  New 12" RYG ← Programmable Visibility 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 head specified on plan)
-  Existing Traffic Signal Standard
-  New Pedestrian Signal Head
-  New Type B Pullbox (Traffic Signal)
-  New Type B Pullbox w/Modified Cover (Traffic Signal)
-  New Type C Pullbox (For Details, See Sht. No. T11)
-  New Type D Pullbox (For Details, See Sht. No. T11)
-  Existing Traffic Signal Pullbox
-  New Loop Detectors
-  Existing Loop Detectors
-  Opticom Receiver
-  New Pipe Guard



*To be determined by County Electrical Inspector/Engineer

CONDUIT BY-PASS DETAIL

Not to Scale

TRAFFIC SIGNAL NOTES

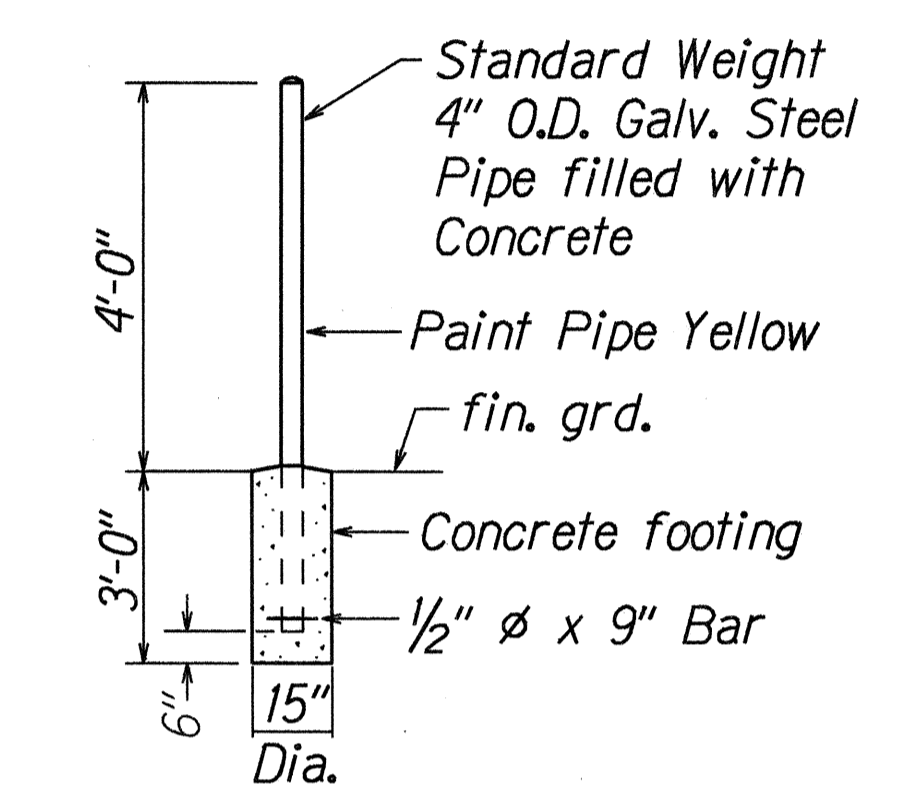
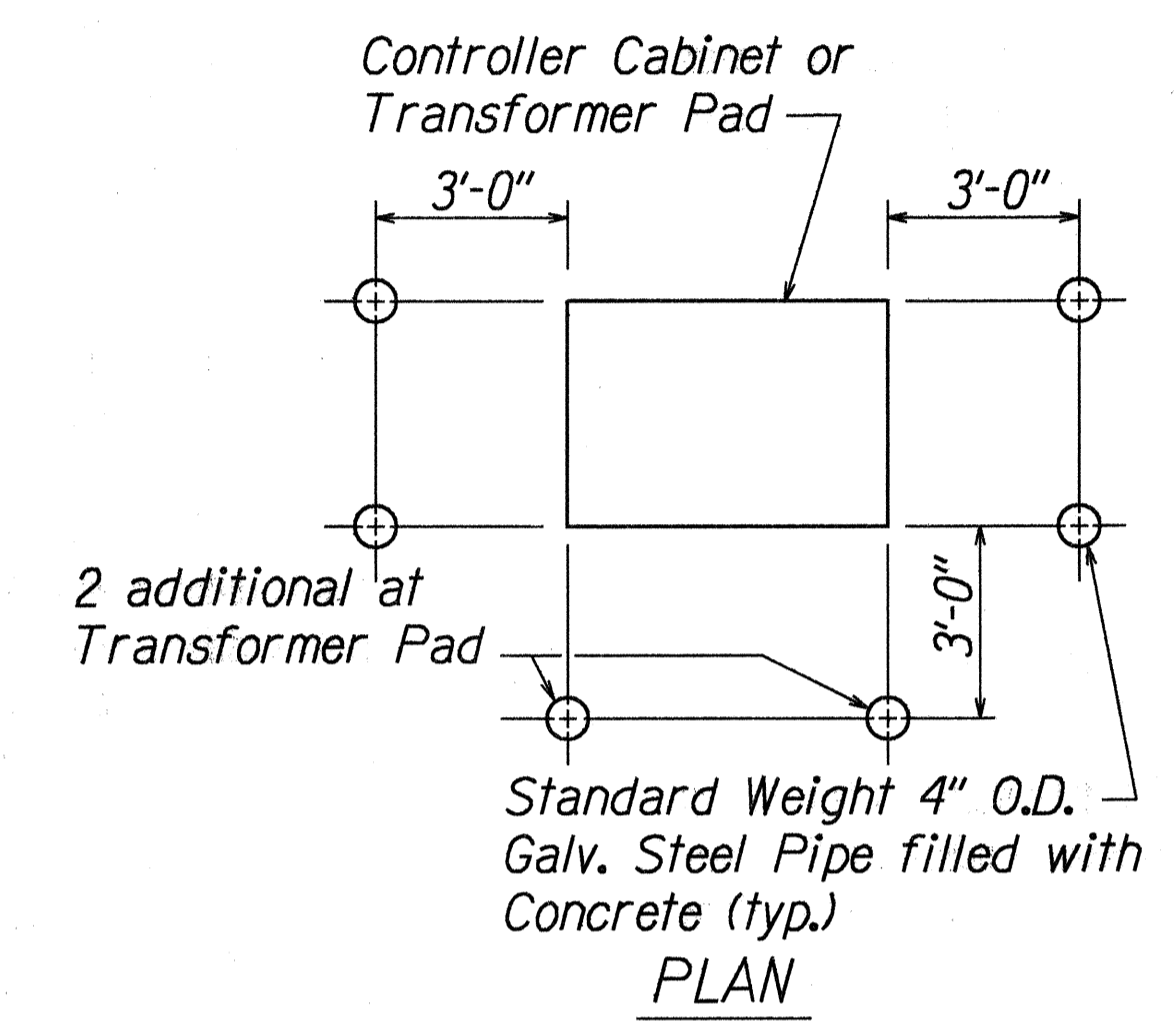
- The locations of the Traffic Signal Standards, Traffic Signal Standards w/Mast Arms, Pedestrian Push Buttons, Traffic Controller, Pullboxes, Conduits and Loop Detectors shall be staked out in the field by the Contractor and approval of the locations shall be obtained from the Engineer prior to construction 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 whatsoever 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.
- Existing traffic signal poles, mast arms, heads and controllers which are removed and not incorporated into the new Traffic Signal System shall be disposed of as directed by the Engineer. Cost shall be incidental to the various traffic signal items.
- 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.
- 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. 527-5007).
- Installation of the Opticom Receiver shall conform in accordance with the Standard Details of the Department of Transportation Services, City & County of Honolulu, Electrical and Maintenance Services Division, and all subsequent amendments and additions.
- The cost of the Pipe Guard (2 each) shall not be paid for separately but considered incidental to the various traffic signal items.
- All existing pullboxes, traffic signal poles and controller bases not incorporated into the New Traffic Signal System shall be removed to 6 inches below grade.
- Existing loop detectors and conduits not incorporated into the New Traffic Signal System shall be abandoned in place. Abandoned conduits shall be plugged with concrete. Remove existing cables.
- The traffic signals shall be kept operational during construction. Any relocation required shall be approved by the Electrical and Maintenance Services Division, Department of Transportation Services, City and County of Honolulu and paid for by the contractor.

TRAFFIC SIGNAL NOTES (Cont.)

- The contractor shall be responsible for any damages to existing Traffic Signal Facilities. Including the Traffic Signal Interconnect System, and any and all damages to these facilities shall be repaired by the Contractor at his cost in with the requirements of the City and County of Honolulu.

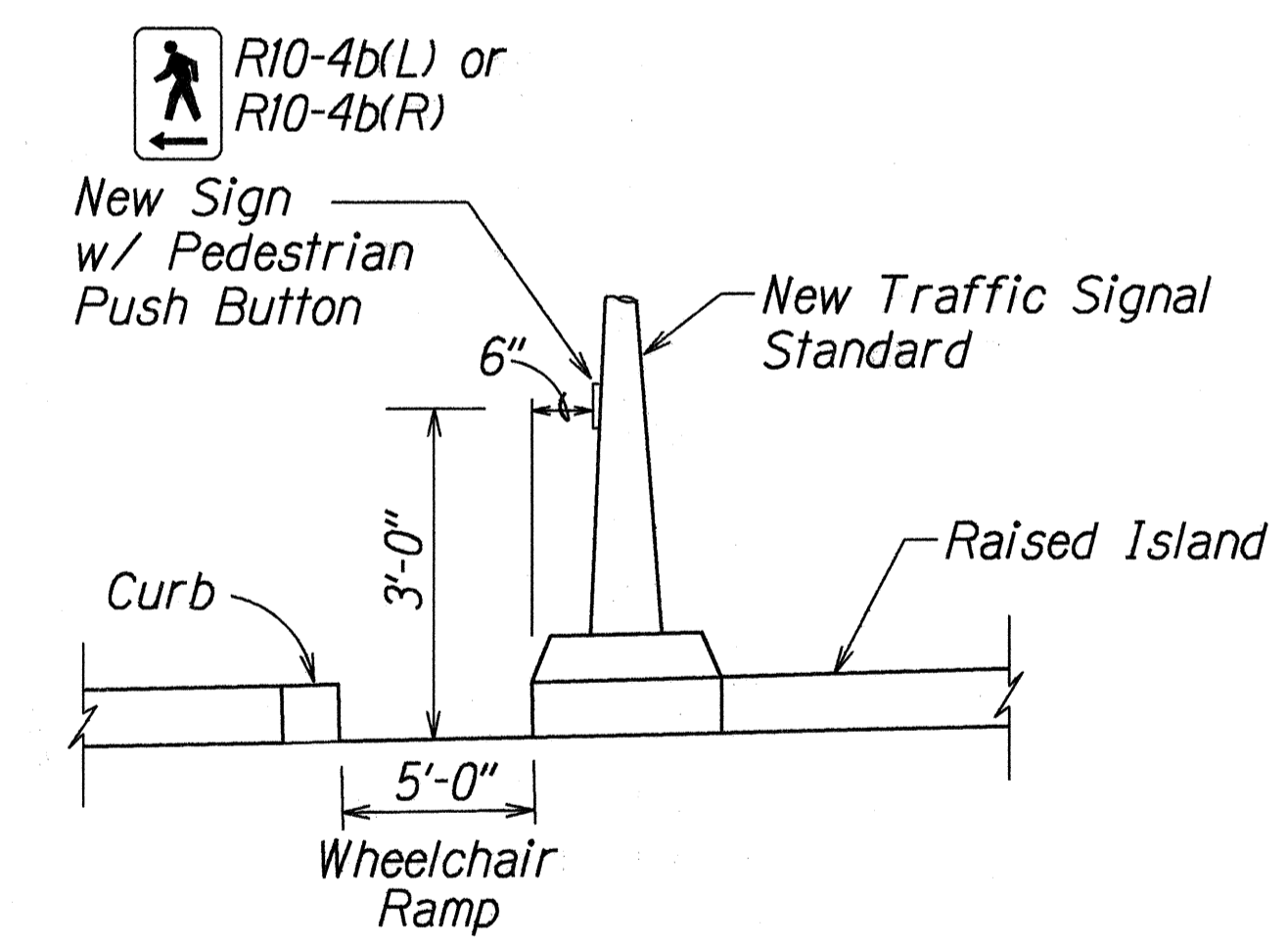
NOTE:

Cost of the conc. filled galvanized pipe guard shall be incidental to other items of work.



PIPE GUARD DETAIL

Not to Scale



TYPICAL SIGN W/PEDESTRIAN

PUSH BUTTON @ RAISED ISLAND

Not to Scale

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TRAFFIC SIGNAL

LEGEND, DETAIL AND NOTES

KAMEHAMEHA HIGHWAY WIDENING

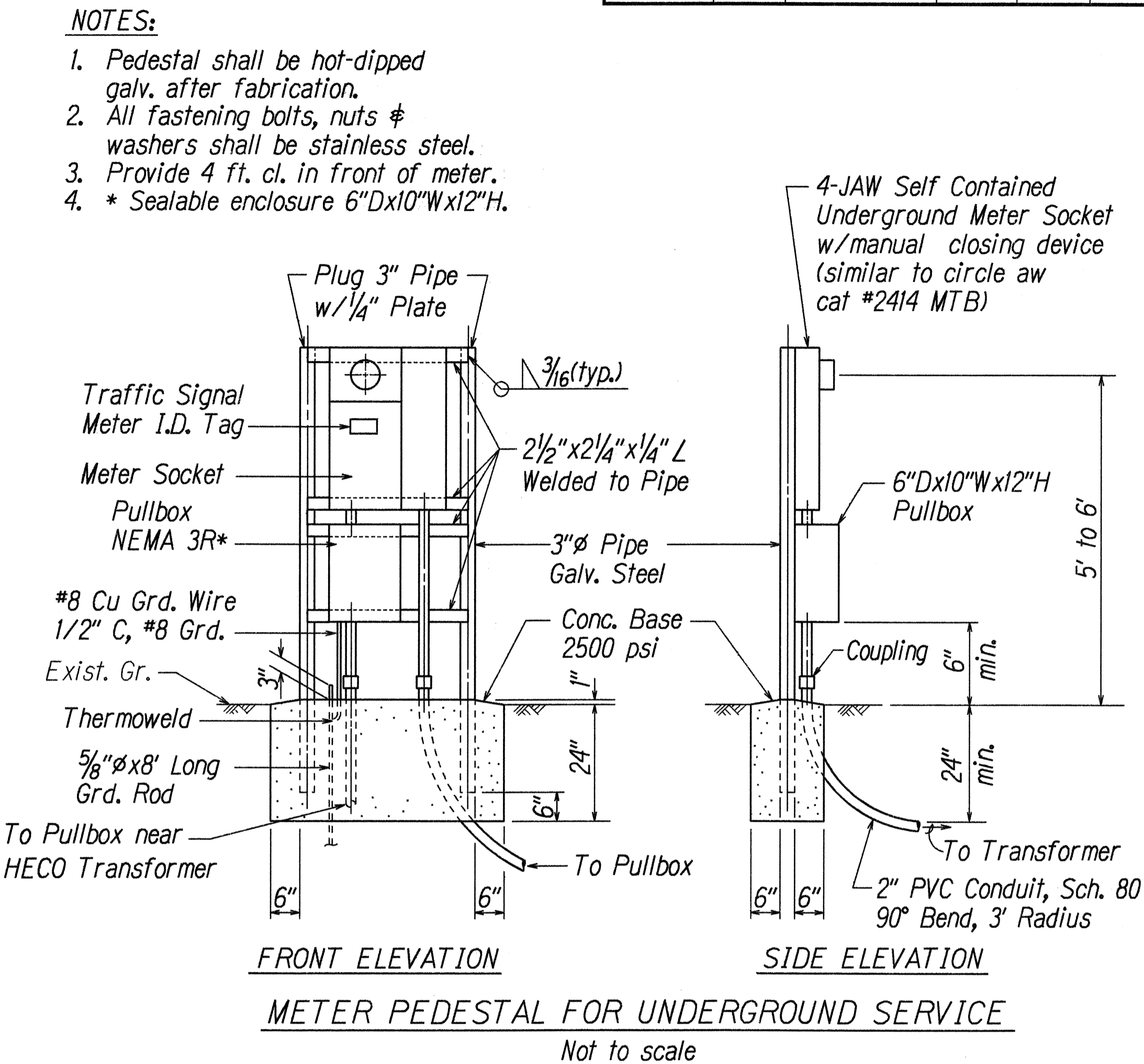
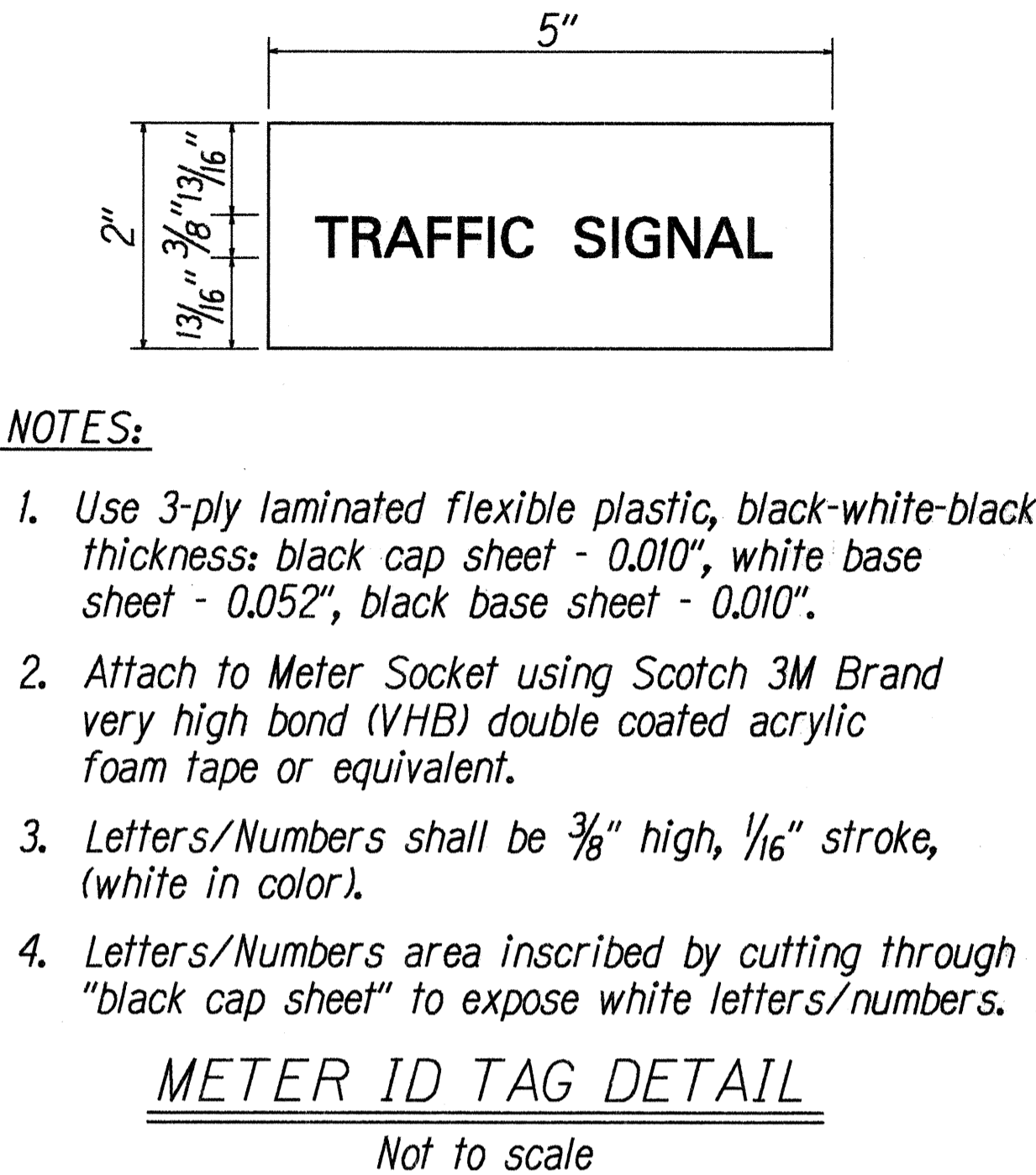
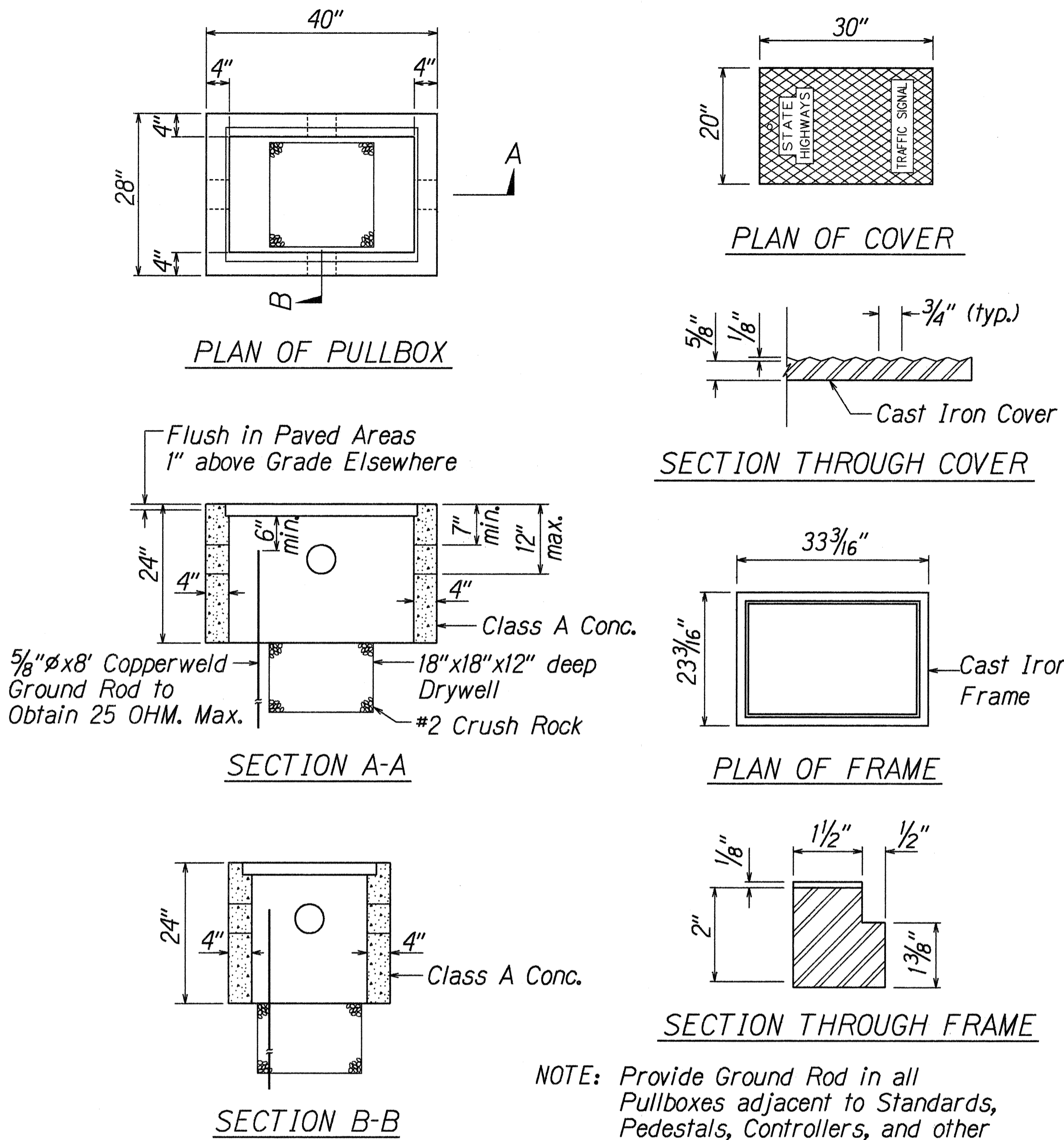
Waipio Uka Street to Ka Uka Boulevard

F.A. Project No. NH-STP-099-1(12)

Scale: As Noted

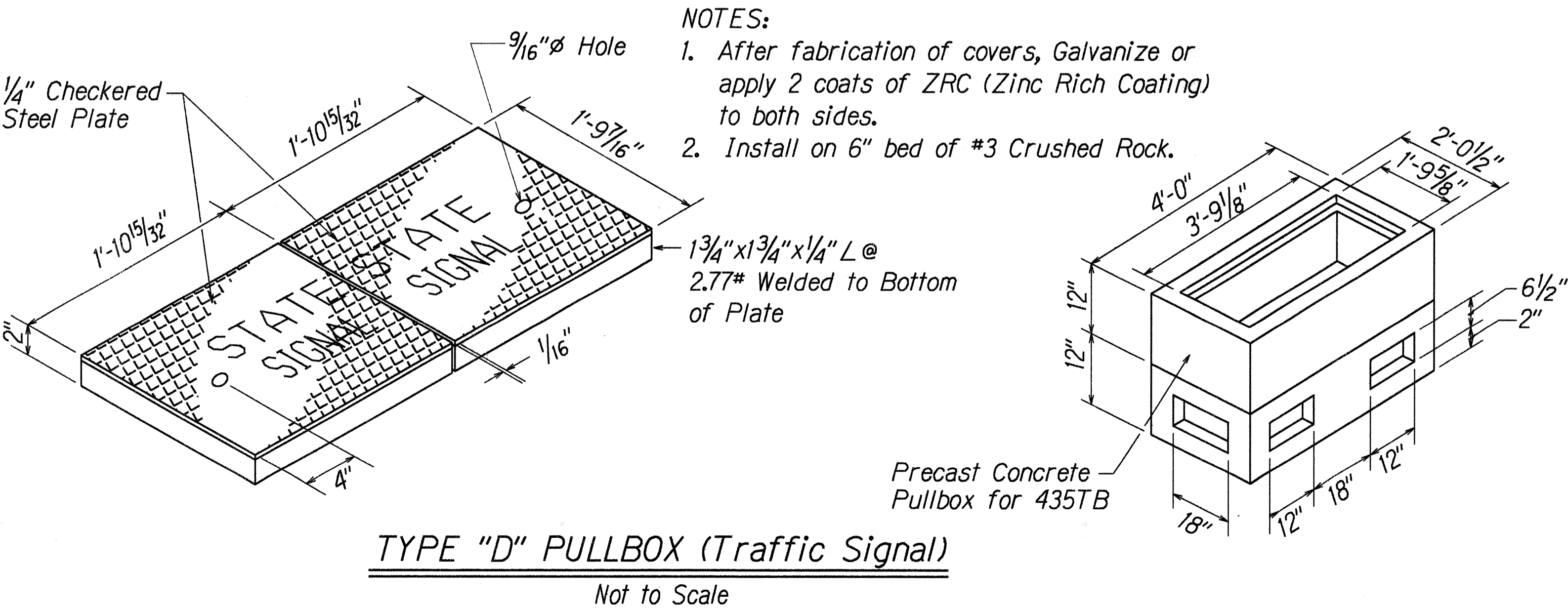
Date: Dec., 1995

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-STP-099-1(12)	1996	42	64



- NOTES:
1. Contractor shall make all electrical connections to controller, provide 2-IP50A breaker, ground and concrete-encased 2" conduit.
 2. All conduits to contain a polyolefin pull line (Jet Line cat. #232 or equivalent).
 3. The installation of the meter pedestal for underground service will not be paid for separately but considered incidental to the Meter Socket and Breaker (50 amps).

ELECTRICAL SERVICE DETAIL



STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

KAMEHAMEHA HIGHWAY WIDENING

Waipio Uka Street to Ka Uka Boulevard

F.A. Project No. NH-STP-099-1(12)

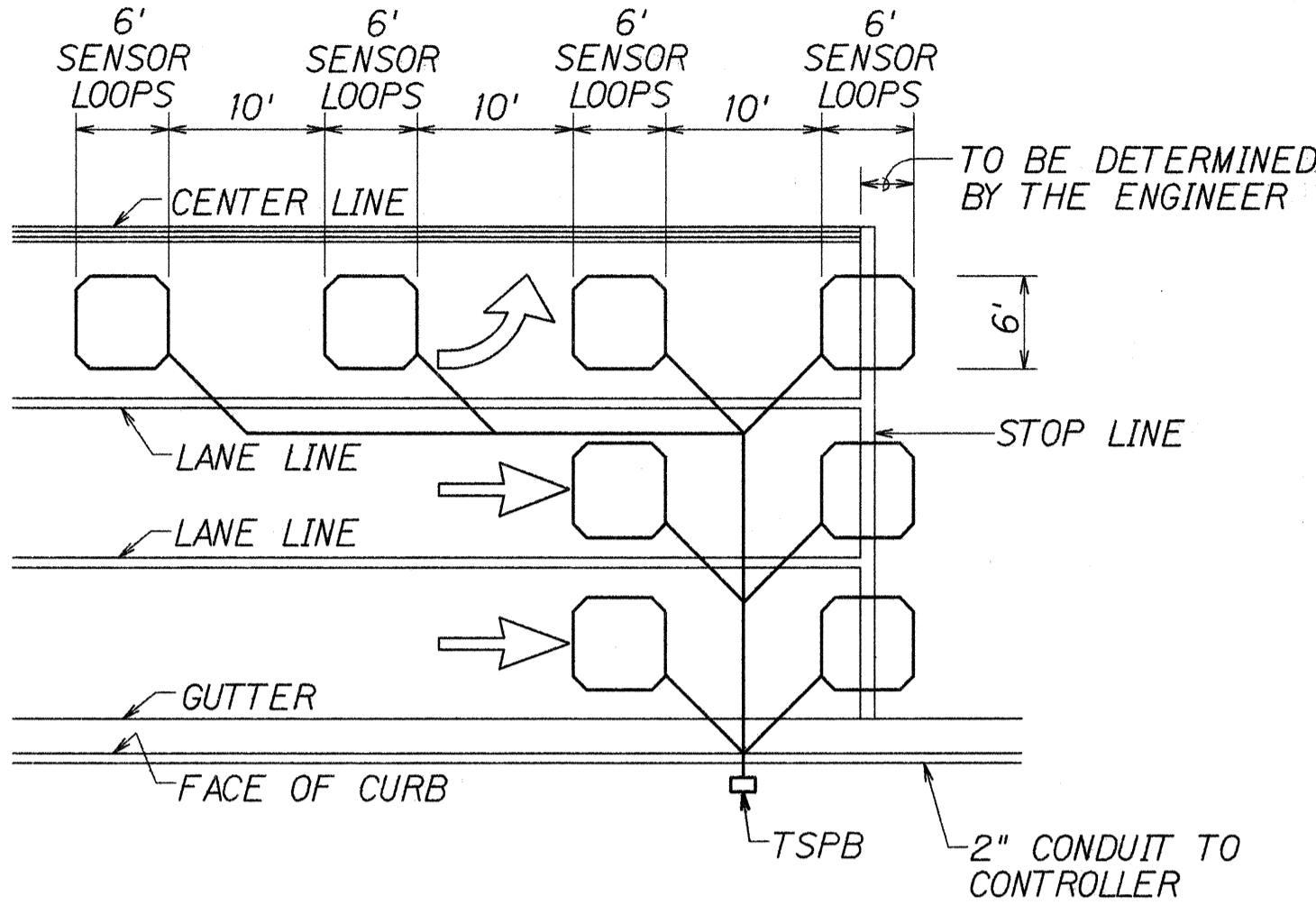
Scale: As Noted

Date: Dec., 1995

SHEET No. 711 OF 23 SHEETS

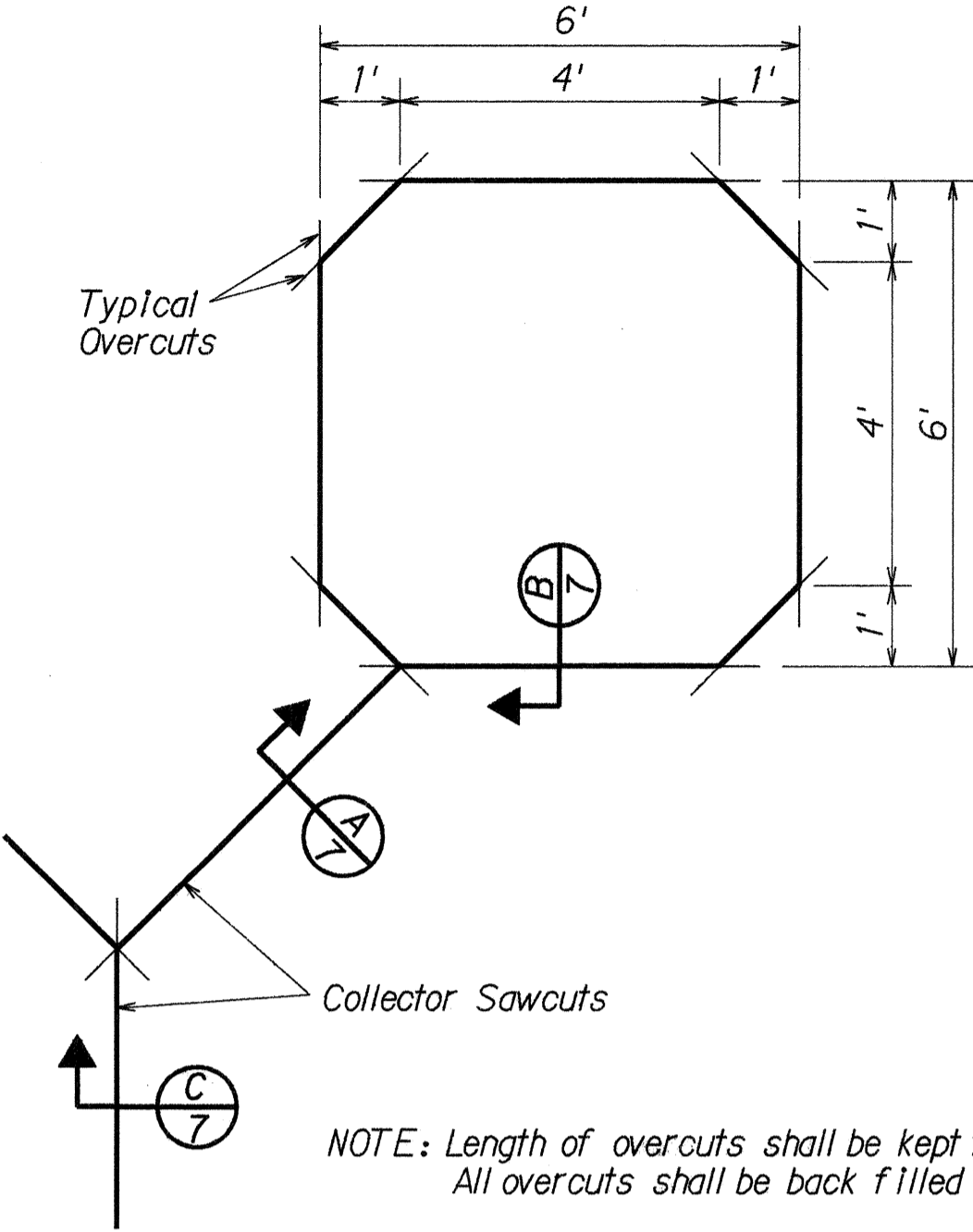
ORIGINAL PLAN	DATE	3/18/95
SURVEY PLOTTED BY		
DRAWN BY		
NOTE BOOK		
DESIGNED BY		
QUANTITIES BY		
CHECKED BY		
N. Oramine		

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-STP-099-1(12)	1996	43	64

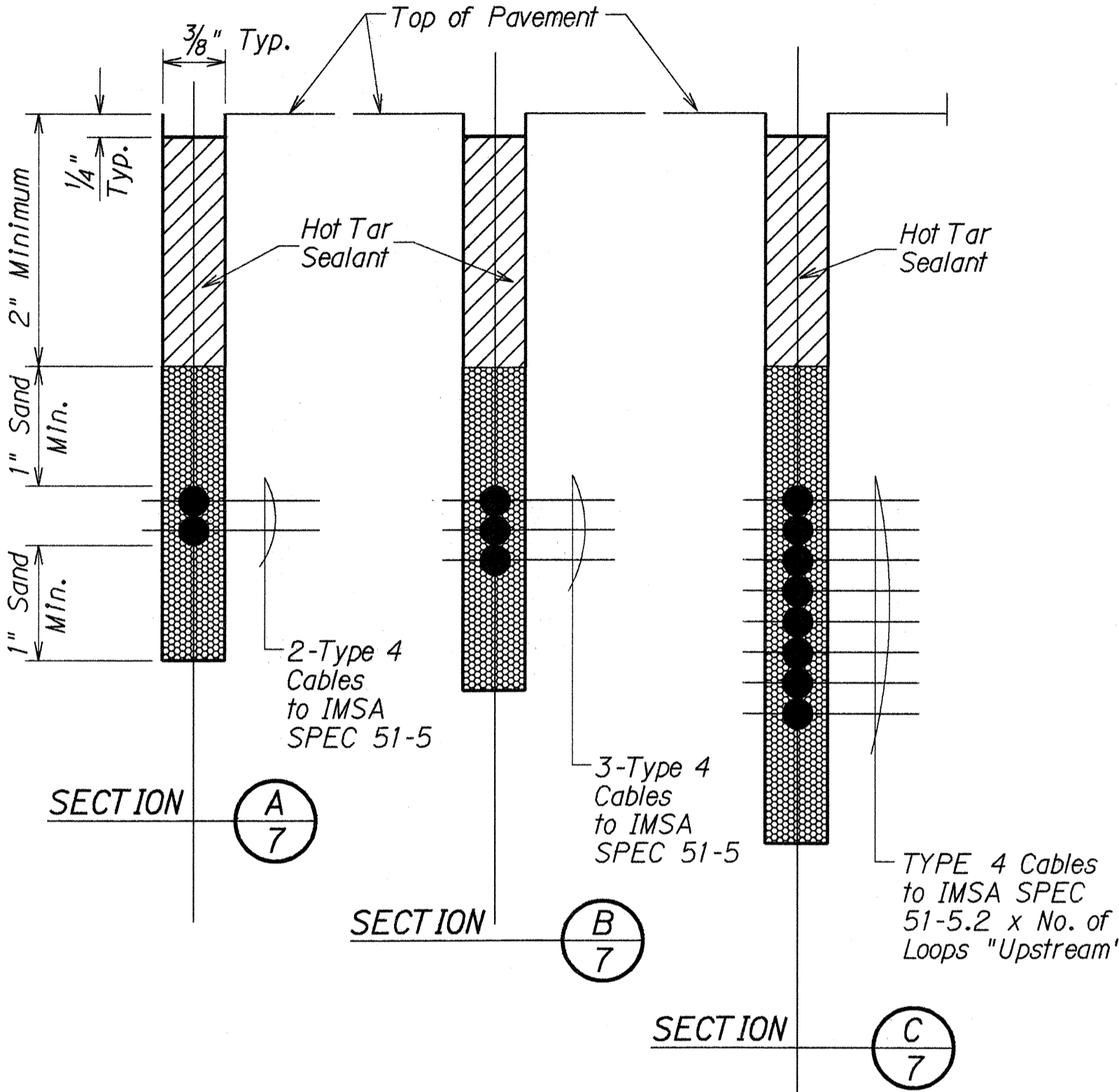


- NOTES:
- Center sensor loops in lanes.
 - Collector cables shall be twisted 2 turns per foot.
 - Number of loops and locations vary. See project plans.
 - Number and locations of collector sawcuts may be varied in the field to suit.

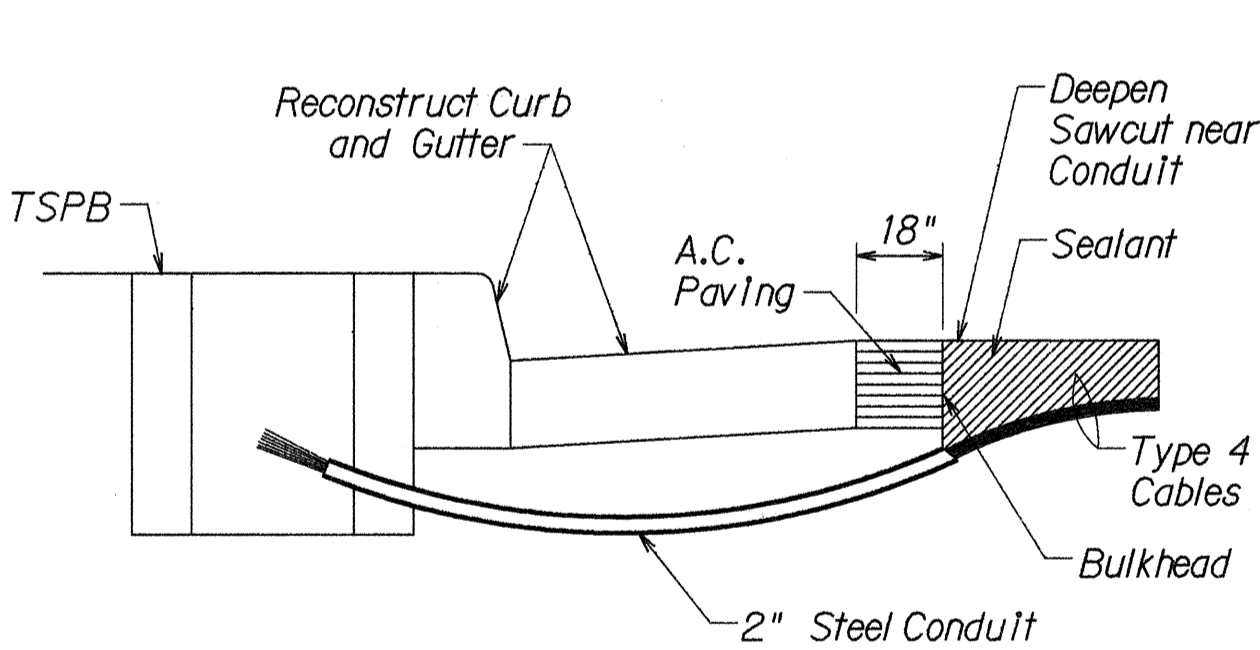
TYPICAL SENSOR LOOP LAYOUT



TYPICAL SENSOR LOOP SAWCUT DETAIL

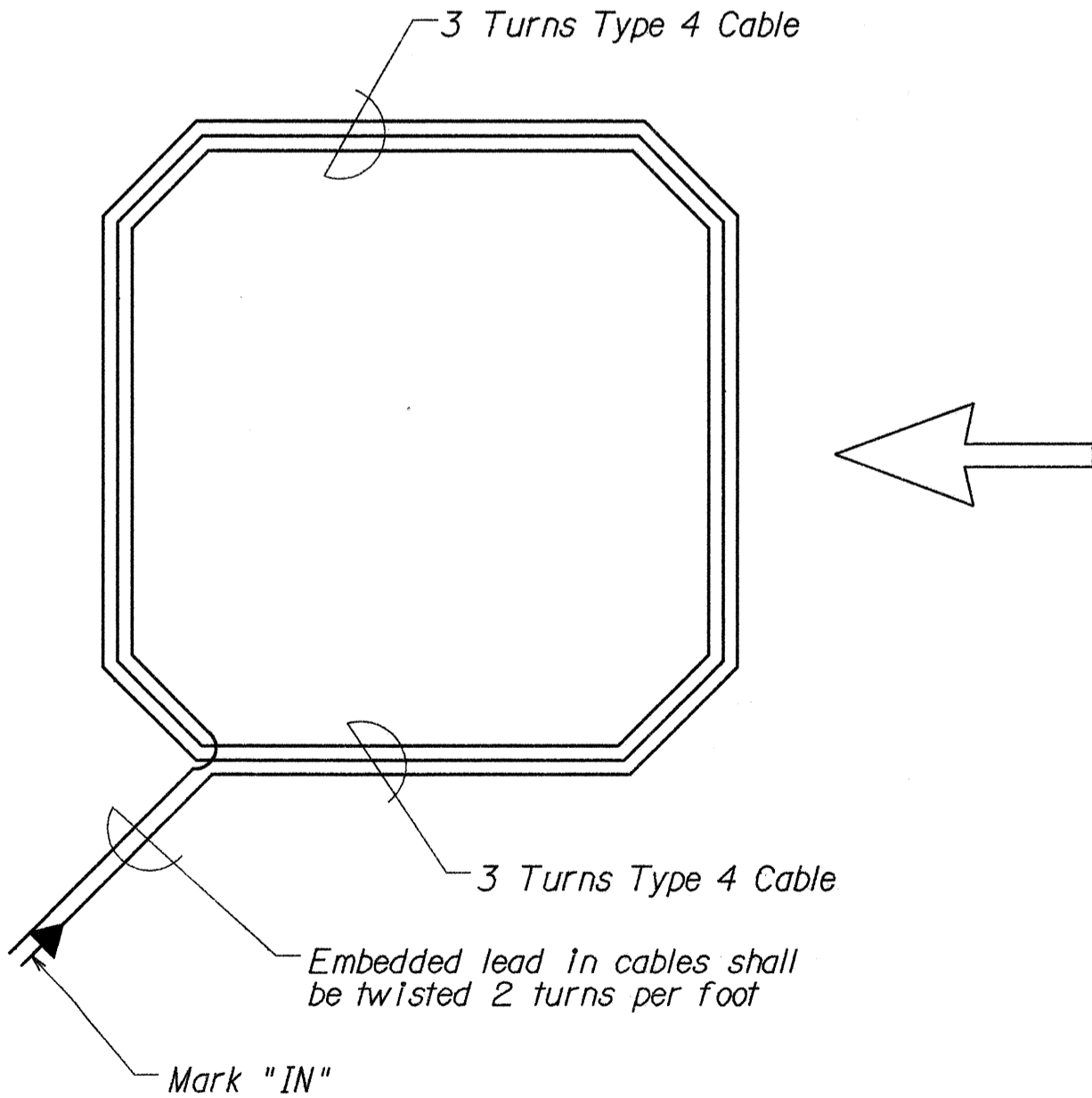


NOTE:
REFER TO TE-40 OF THE STATE HIGHWAYS STANDARD PLANS FOR
TYPICAL TRENCH SECTION FOR CONDUIT DETAIL.



- NOTES ON CONSTRUCTION AT END OF SAWCUT
- Seal roadway end of conduit after installation of conductors.
 - Install bulkhead across conduit trench.
 - Place hot tar in sawcut.
 - Backfill over conduit with new A.C.
 - 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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

KAMEHAMEHA HIGHWAY WIDENING
Waipio Uka Street to Ka Uka Boulevard
F.A. Project No. NH-STP-099-1(12)
Not to Scale

Date: Dec., 1995
SHEET No. 112 OF 23 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	2/24/95
10/1/95	TRACED BY	
10/1/95	CHECKED BY	
10/1/95	QUANTITIES BY	
10/1/95	CHECKED BY	