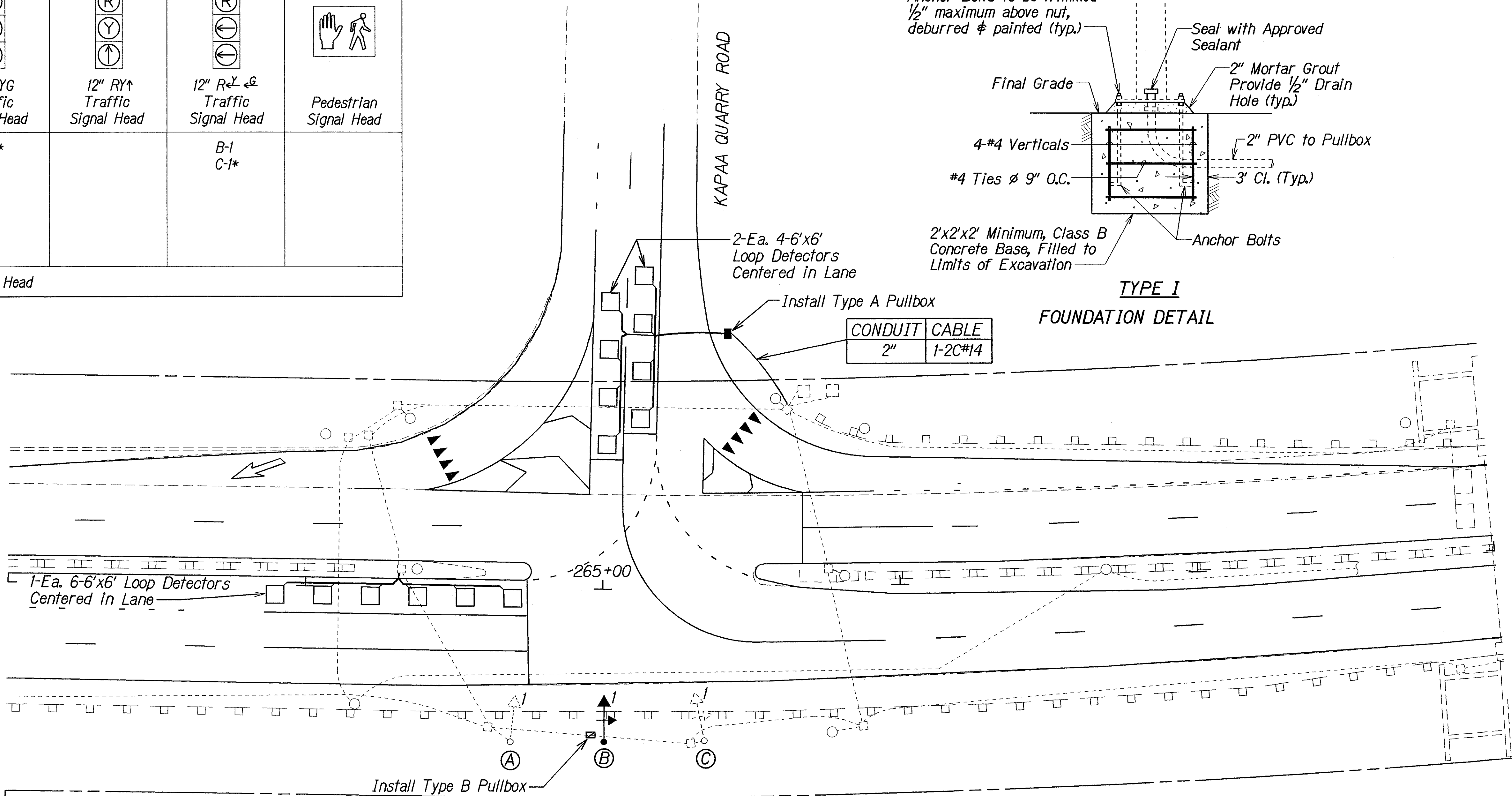
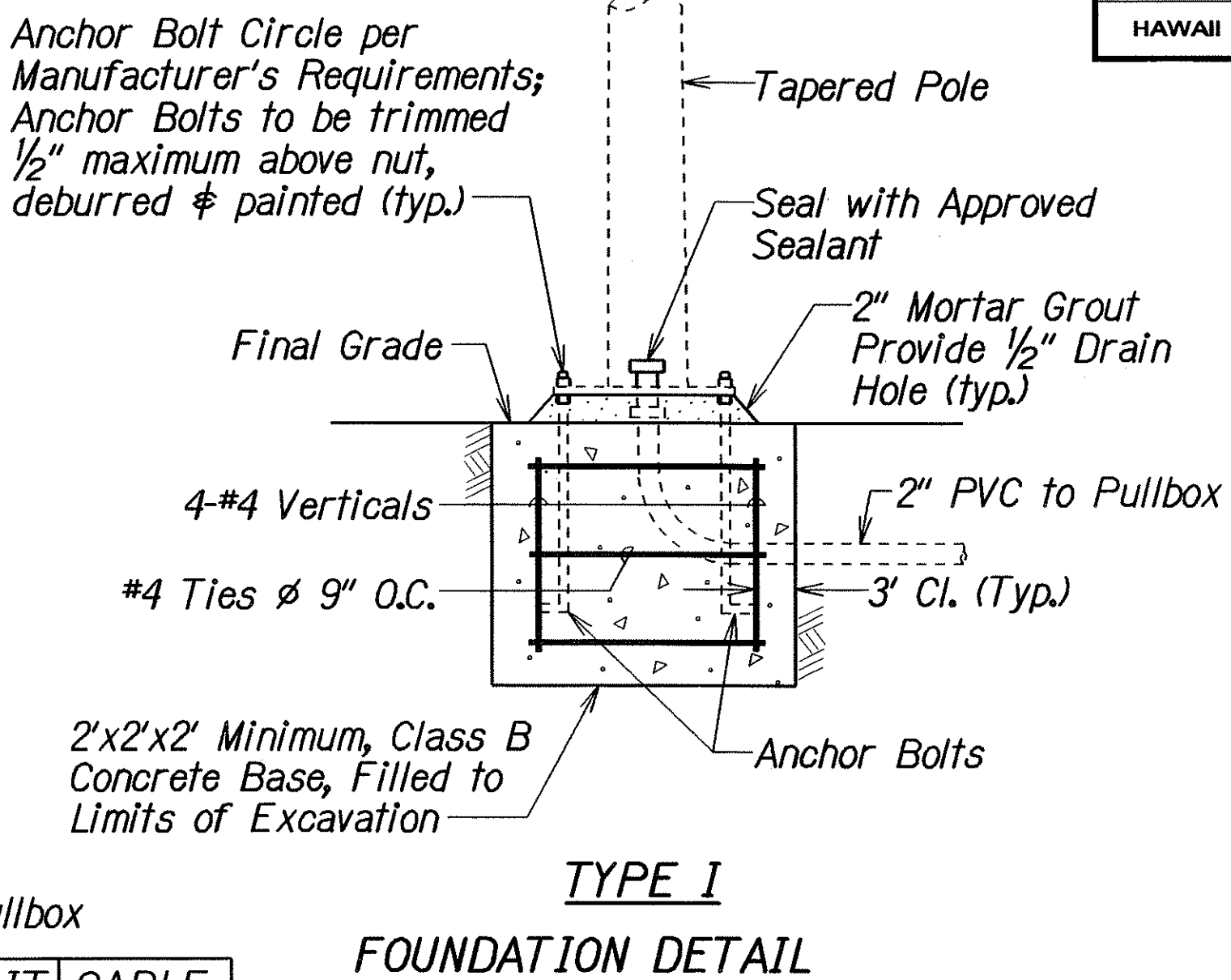


FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	61C-01-05M	2005	22	26

TRAFFIC SIGNAL HEAD SCHEDULE				
Traffic Signal Head Type and Description	Ⓡ Ⓨ Ⓒ 12" RYⒸ Traffic Signal Head	Ⓡ Ⓨ Ⓢ 12" RYⓈ Traffic Signal Head	Ⓡ Ⓢ Ⓢ 12" RⓈⓈ Traffic Signal Head	Ⓢ Ⓢ Ⓢ Pedestrian Signal Head
Pole Letter Signal Head Number	A-1*		B-1 C-1*	
* Existing Traffic Signal Head				



TRAFFIC SIGNAL POLE A
Remove exist. green arrow signal lens from exist. traffic signal head, and replace with green circular signal lens. This work shall not be paid for separately, but shall be considered incidental to the various traffic signal items.

TRAFFIC SIGNAL POLE B
Intercept exist. traffic signal conduit and salvage exist. cable. Install Type B pullbox and Type I traffic signal standard (H=10 ft.). Install exist. cable in new system and connect. Salvaging and reinstalling exist. cables shall not be paid for separately, but shall be considered incidental to the various traffic signal items.

TRAFFIC SIGNAL POLE C
Remove exist. yellow circular signal lens from exist. traffic signal head, and replace with yellow arrow signal lens. This work shall not be paid for separately, but shall be considered incidental to the various traffic signal items.

NOTE:
All conduits shall be Schedule 80, unless otherwise noted.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

KALANIANA'OLE HIGHWAY

PAVEMENT PREVENTIVE MAINTENANCE

Castle Junction to Castle Hospital

Project No. 61C-01-05M

Scale: 1"=20'

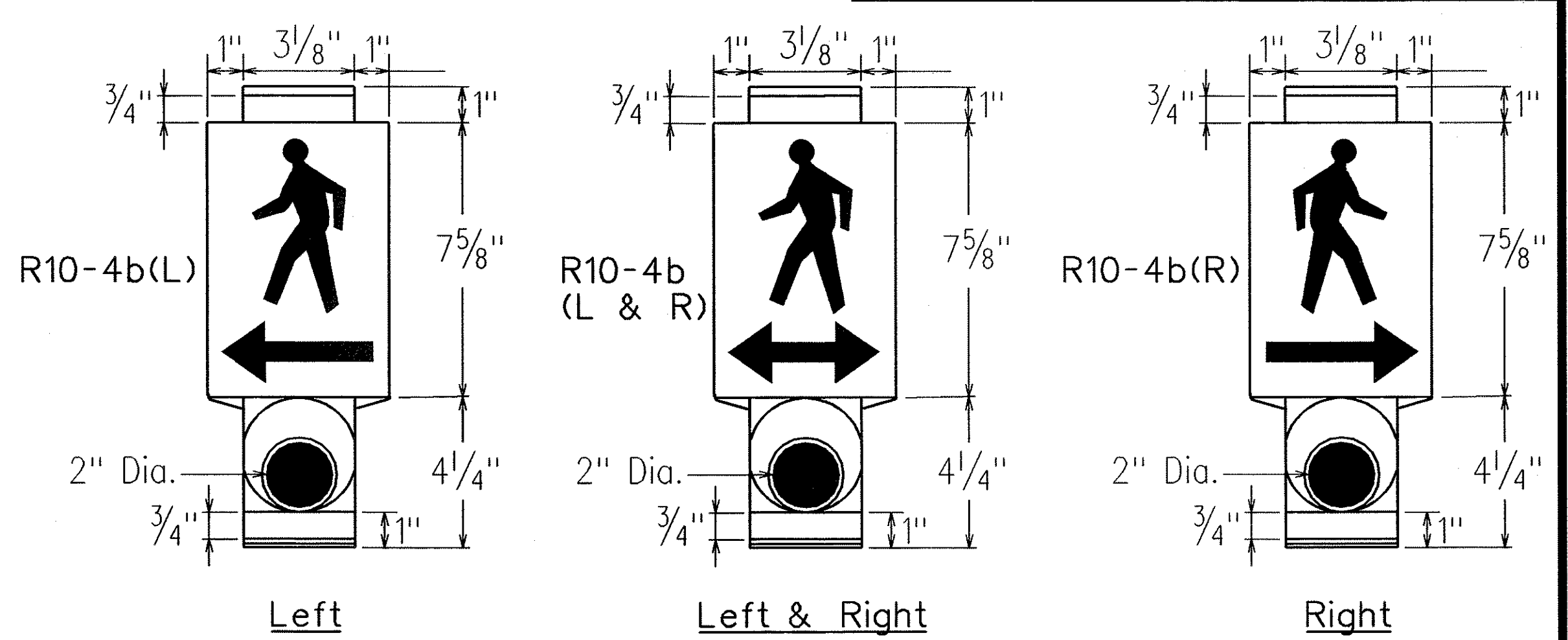
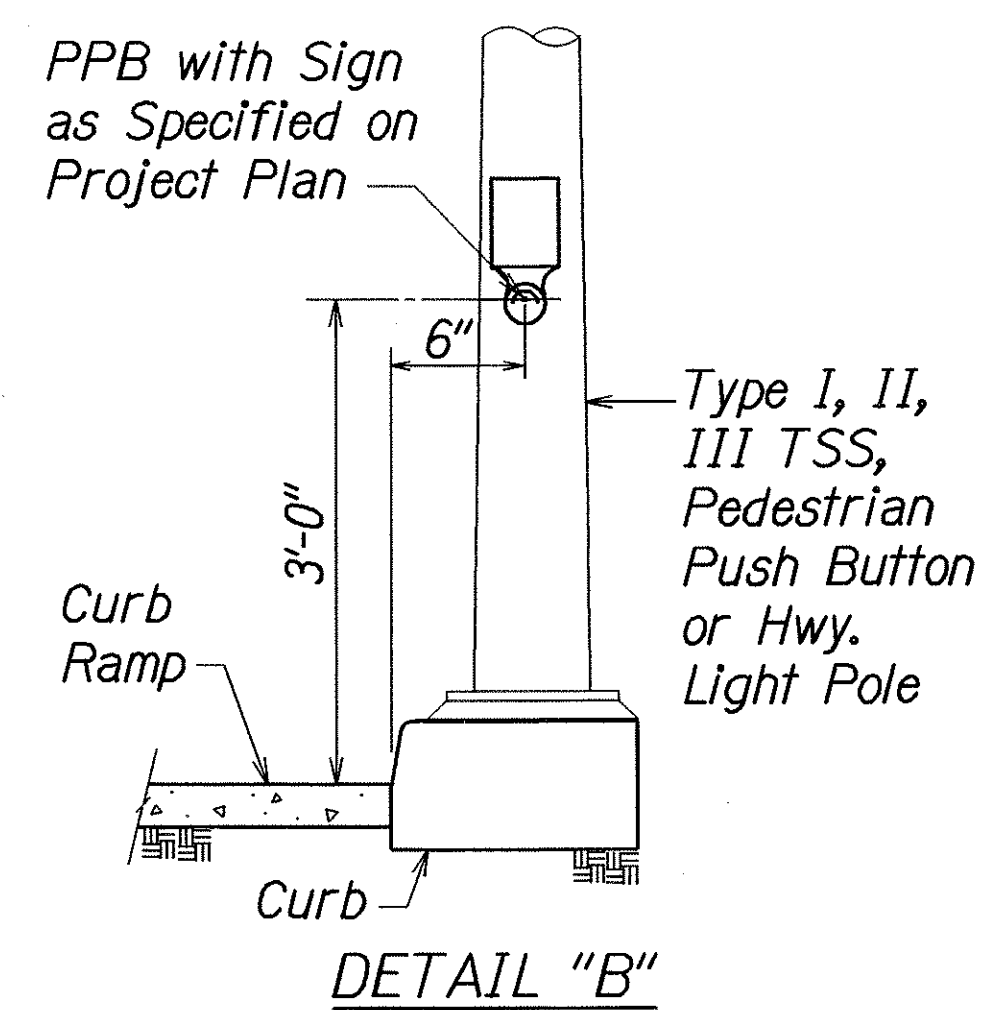
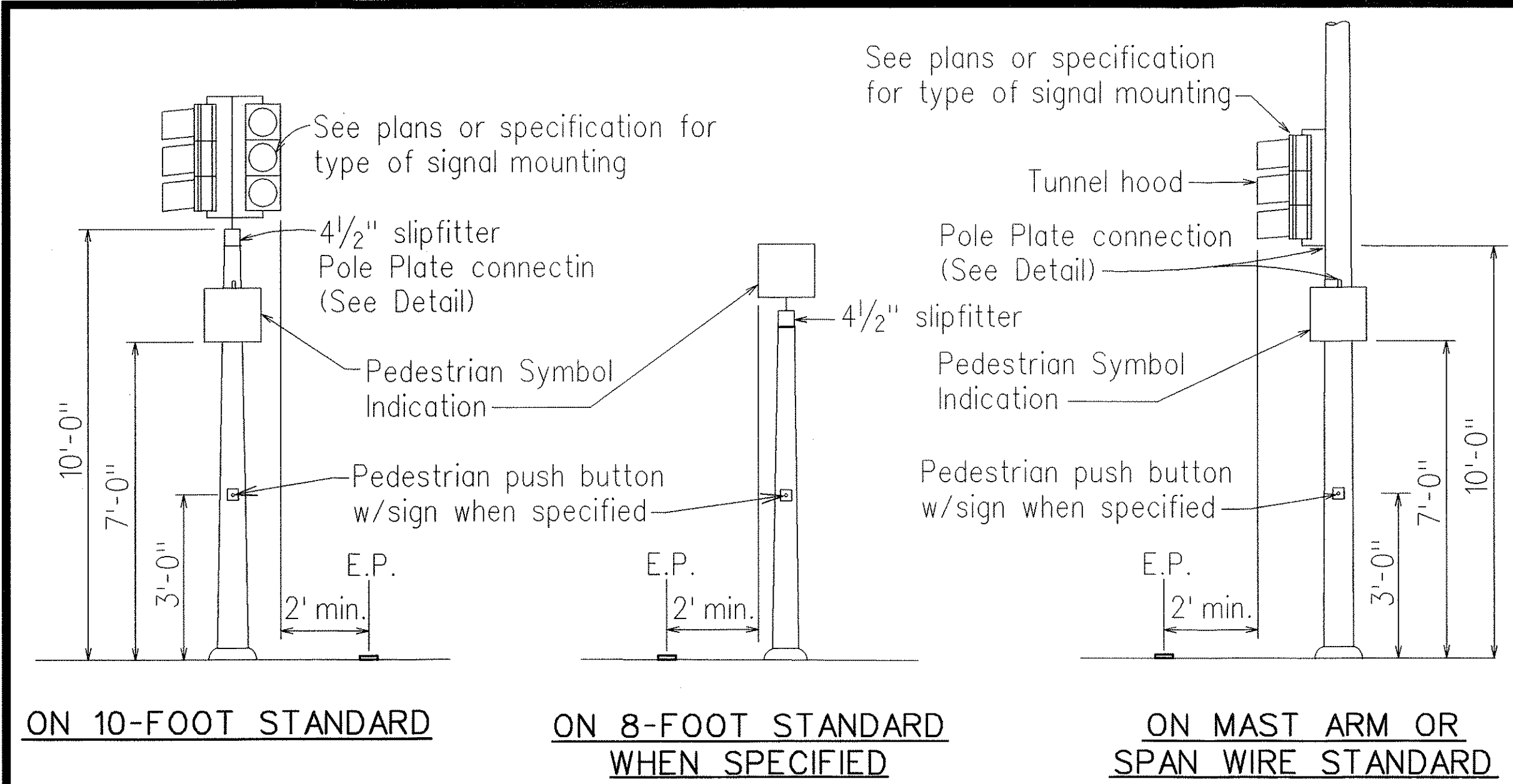
Date: Sept., 2004

SHEET No. TS3 OF 7 SHEETS

22

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
12/2/04	
N. 12/2/04	

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	61C-01-05M	2005	23	26

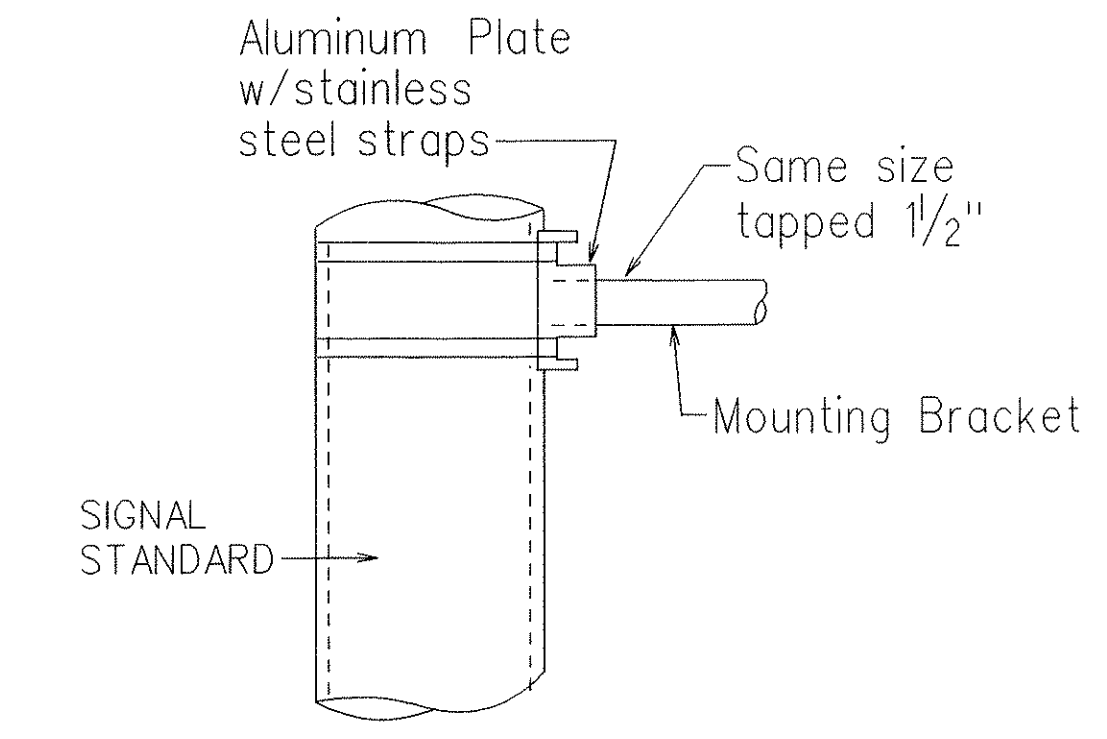


TYPICAL EQUIPMENT MOUNTINGS

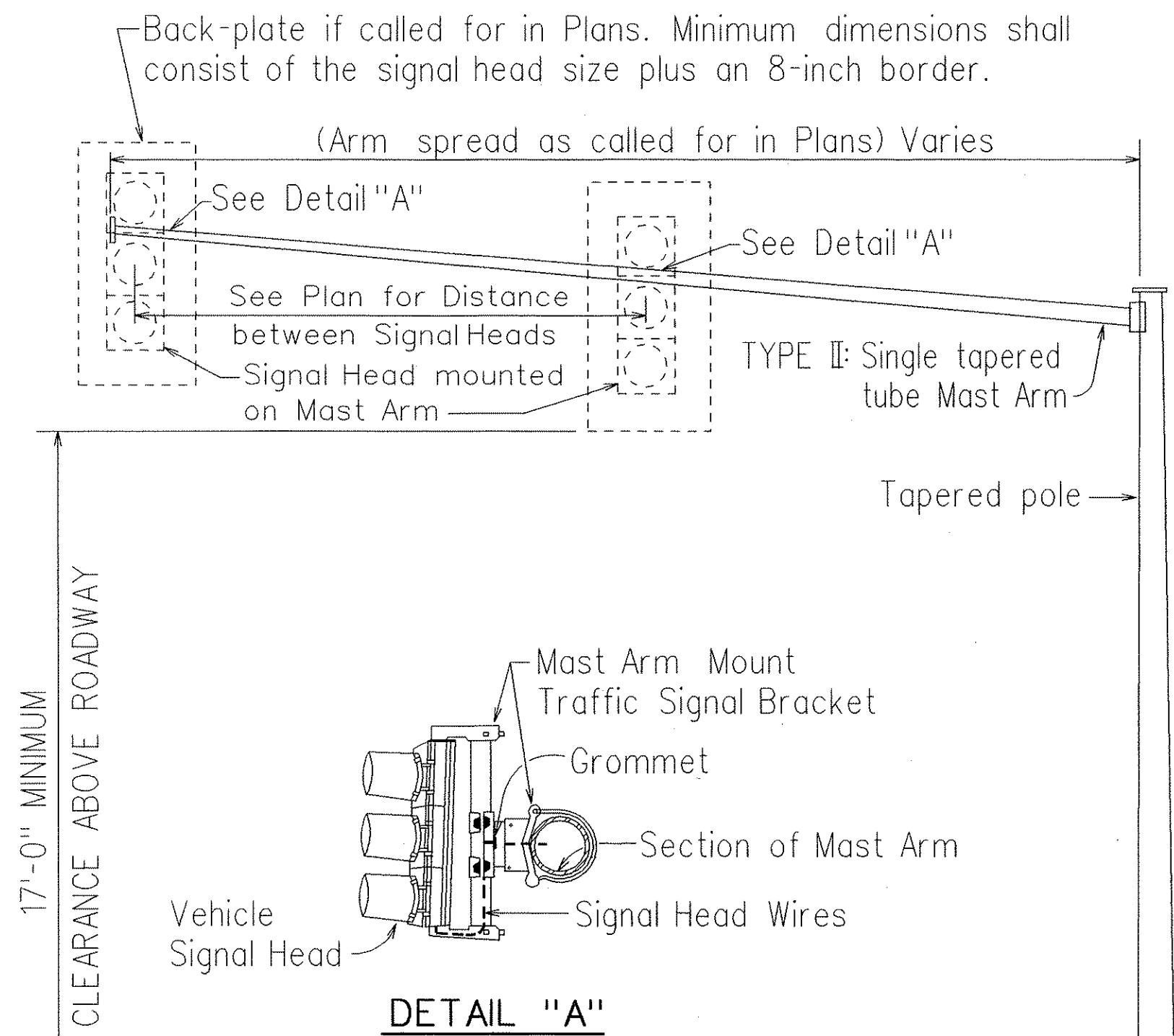
PEDESTRIAN PUSH BUTTON WITH SIGN

Man, Arrow & Push Button - White
Background - Black

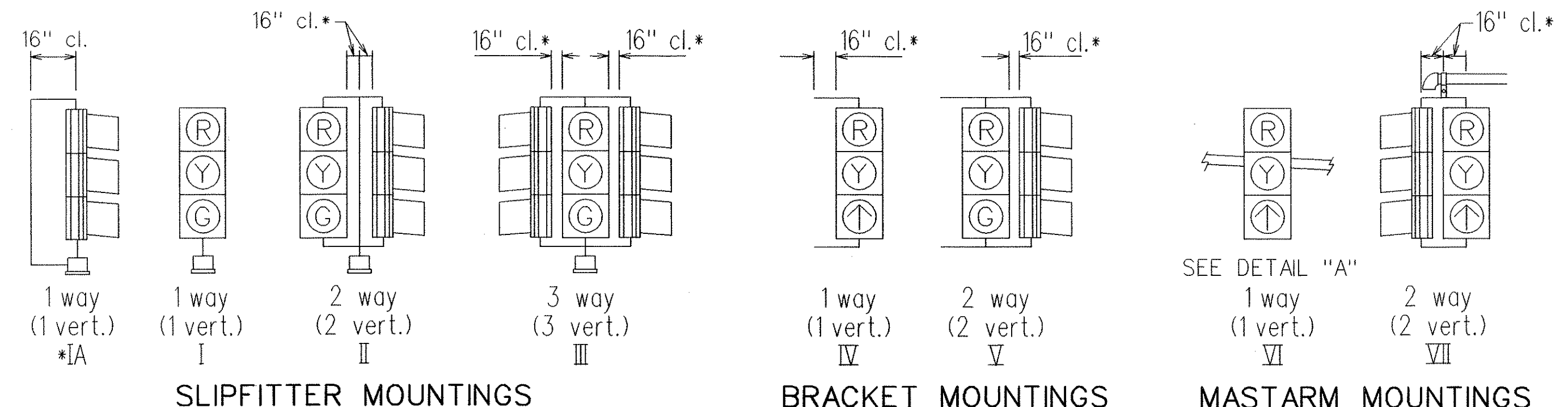
NOTE: The pedestrian push button shall meet operational and reach requirements of the American with Disabilities Act Accessibility Guidelines (ADAAG):
a) Forward Reach. The maximum height for forward reach shall be 48".
b) Side Reach. The maximum height for side reach shall be 54".
c) Operation. Controls 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



DETAIL "A"

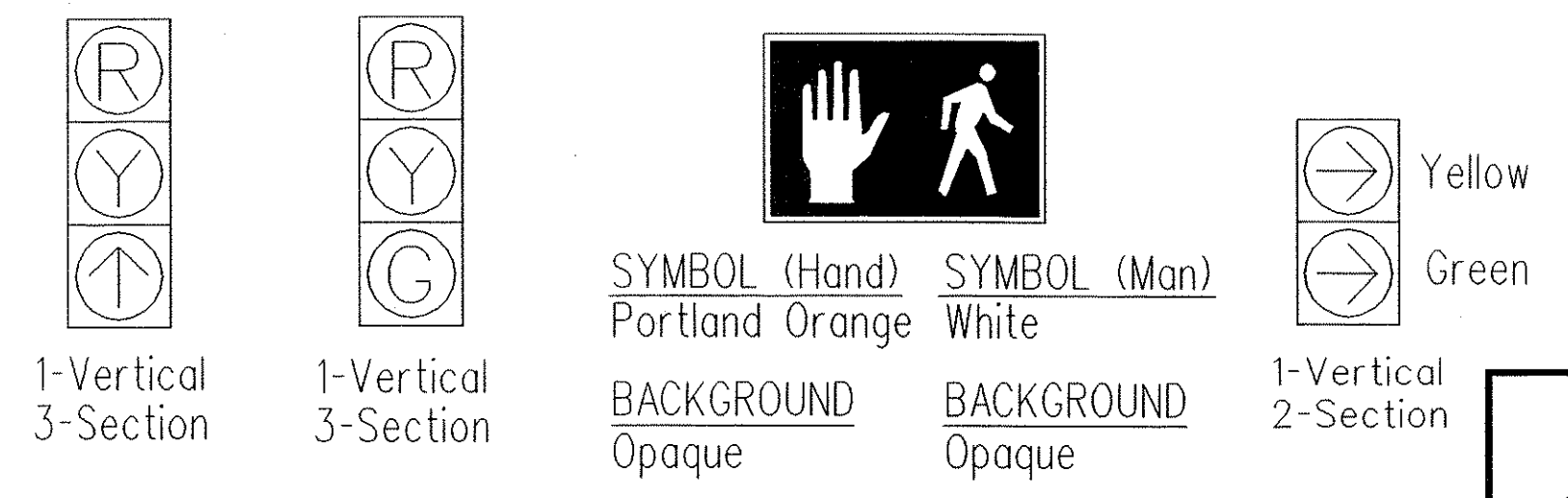


SLIPFITTER MOUNTINGS

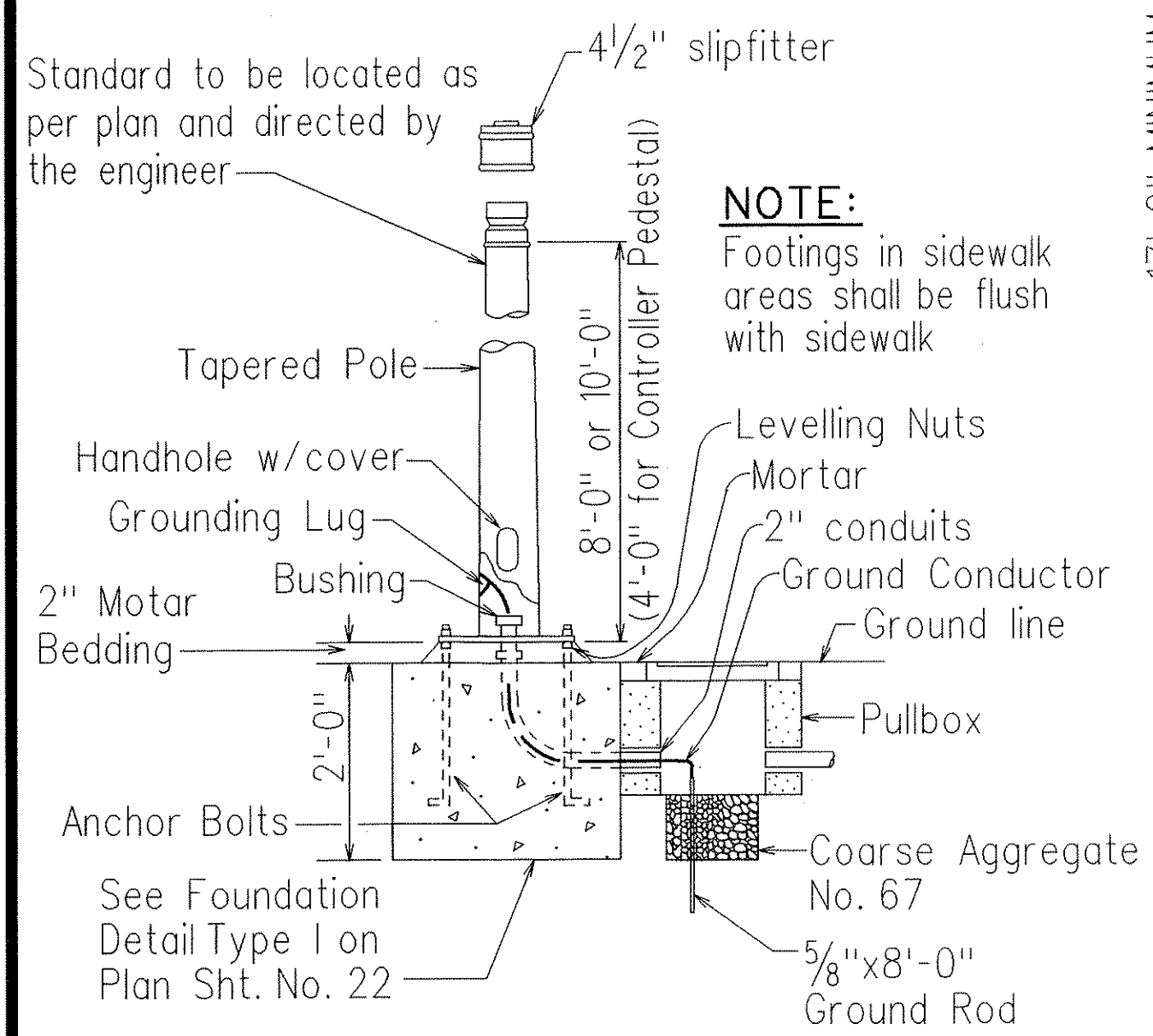
BRACKET MOUNTINGS

MASTARM MOUNTINGS

TYPICAL VEHICULAR AND PEDESTRIAN SIGNAL MOUNTINGS



TYPICAL SIGNAL ARRANGEMENTS



TYPE I SIGNAL STANDARD AND FOOTING

TYPE II MAST ARM AND STANDARD

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

KALANIANA'OLE HIGHWAY

PAVEMENT PREVENTIVE MAINTENANCE

Castle Junction to Castle Hospital

Project No. 61C-01-05M

Scale: As Shown

Date: Sept. 2004

SURVEY PLOTTED BY	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	

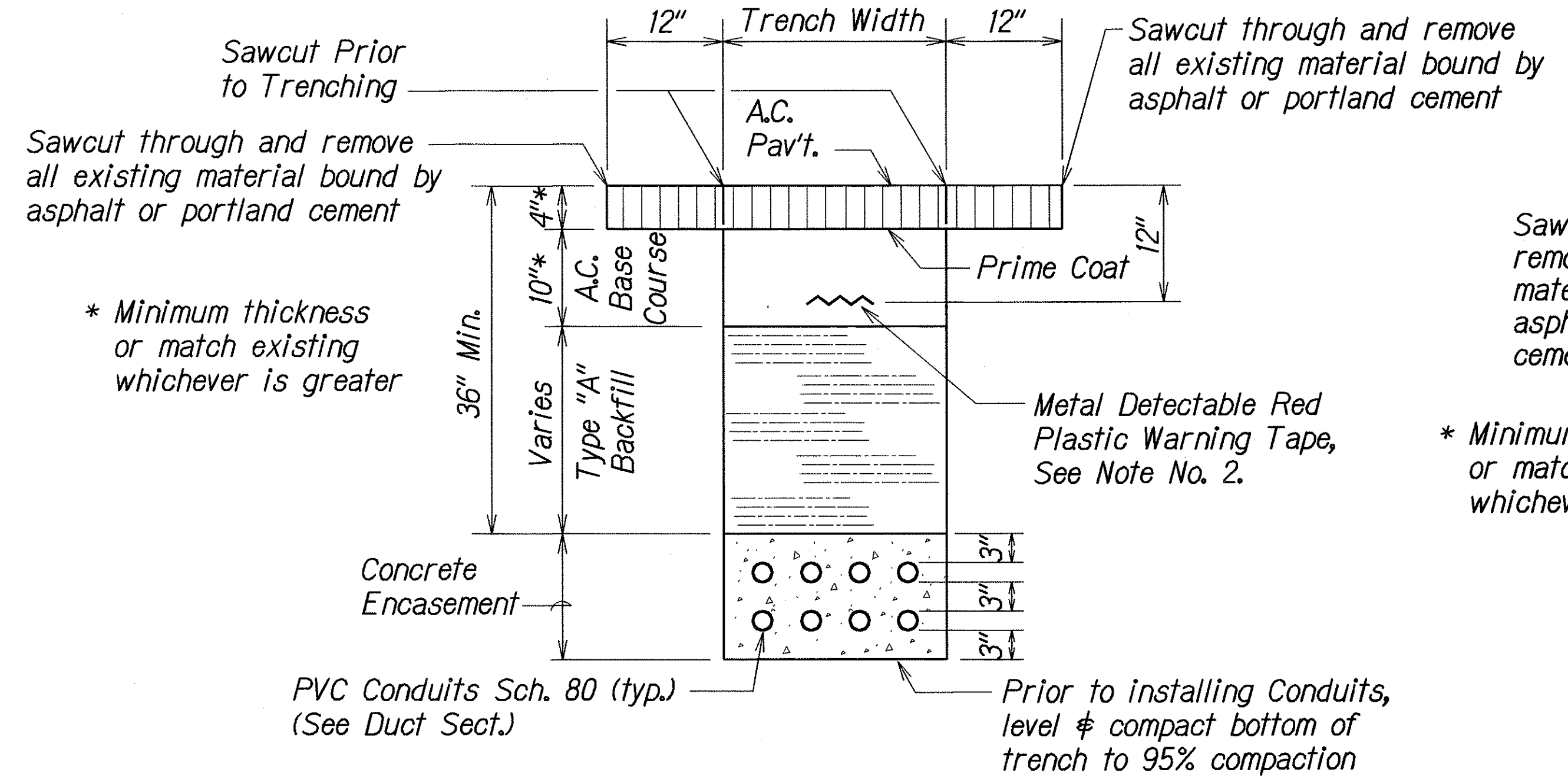
STATE RIGHT-OF-WAY BACKFILL NOTES

- 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.

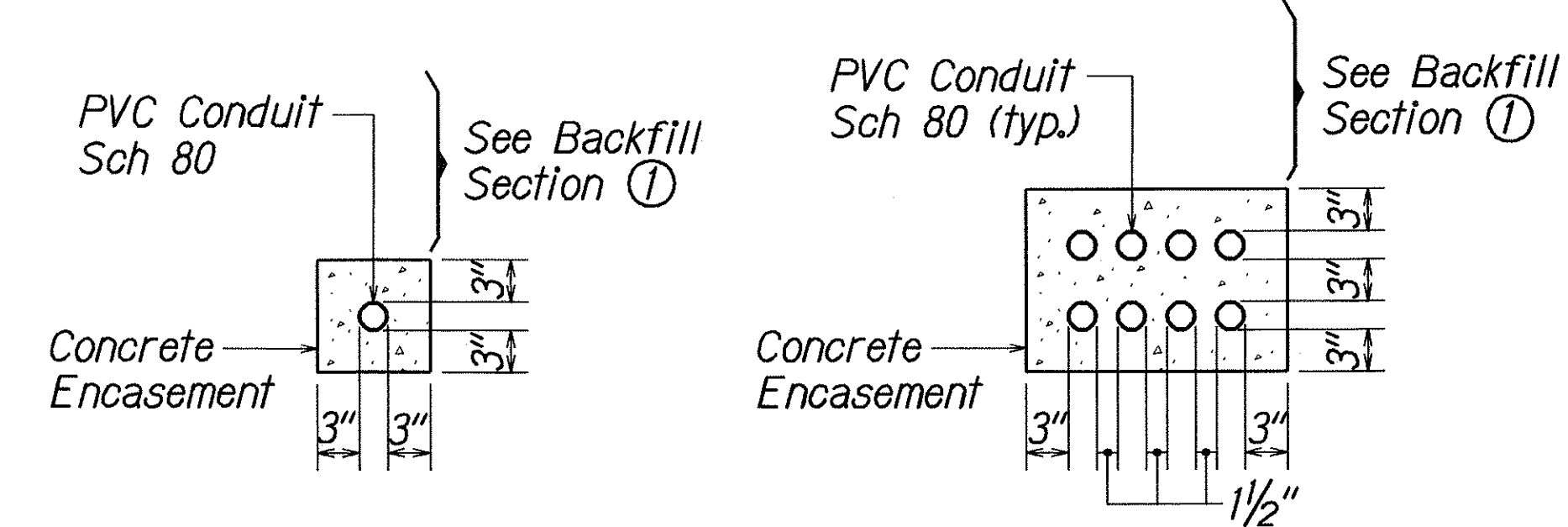
NOTE: Base Course & Sub-Base Course per 1994 State Standard Specifications for Highway Construction.

GENERAL NOTES

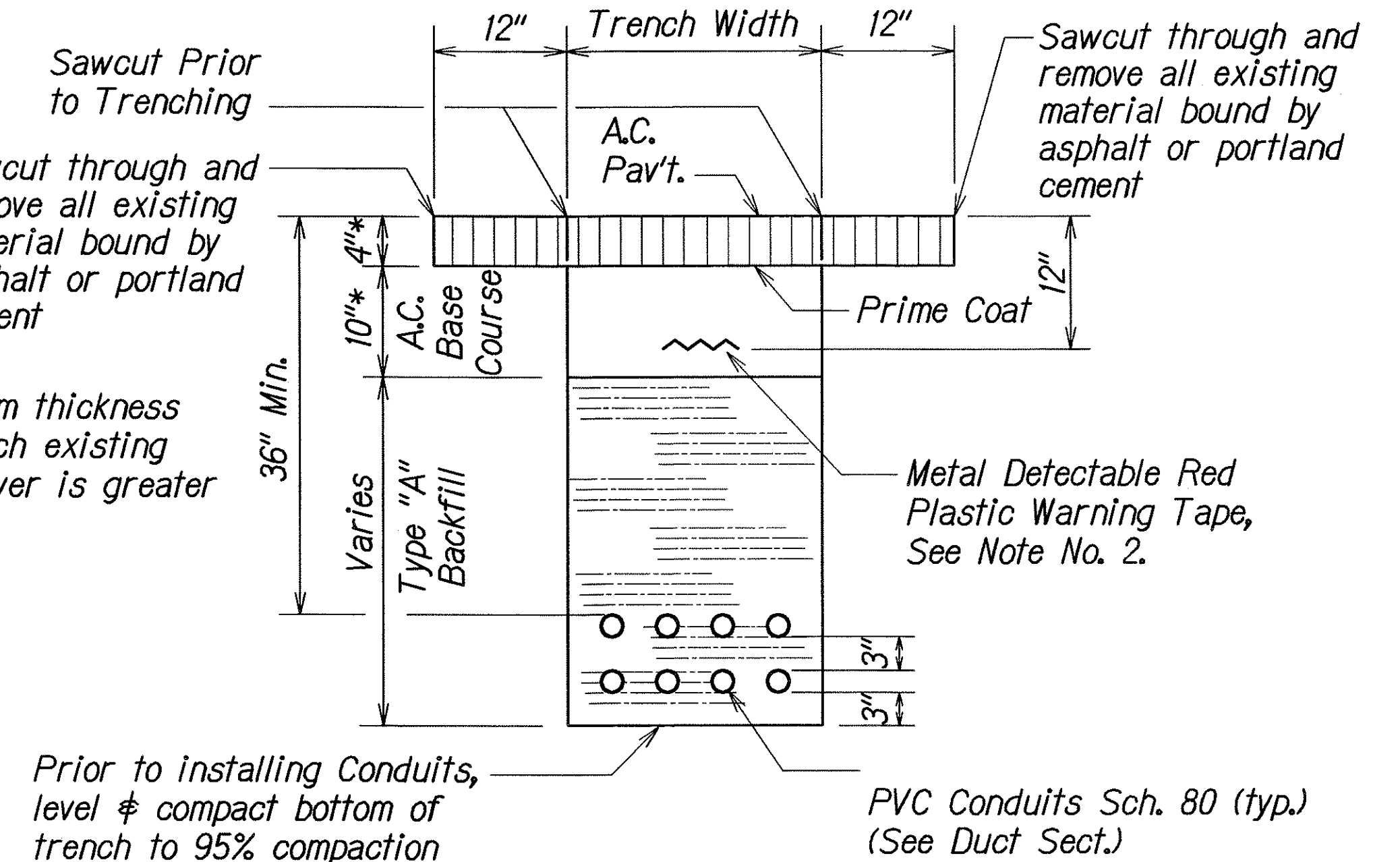
- If trench is located on unpaved area, the Contractor shall replace 10" A.C. Base Course and 4" A.C. Pavement with Type "A" backfill material.
- The Metal Detectable Red Plastic Warning Tape shall be a minimum 5 mils thick and 4" wide with a continuous metallic backing and corrosion resistant 1± mil 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.
- 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.



① TYPICAL BACKFILL SECTION WITH CONCRETE ENCASED DUCTS



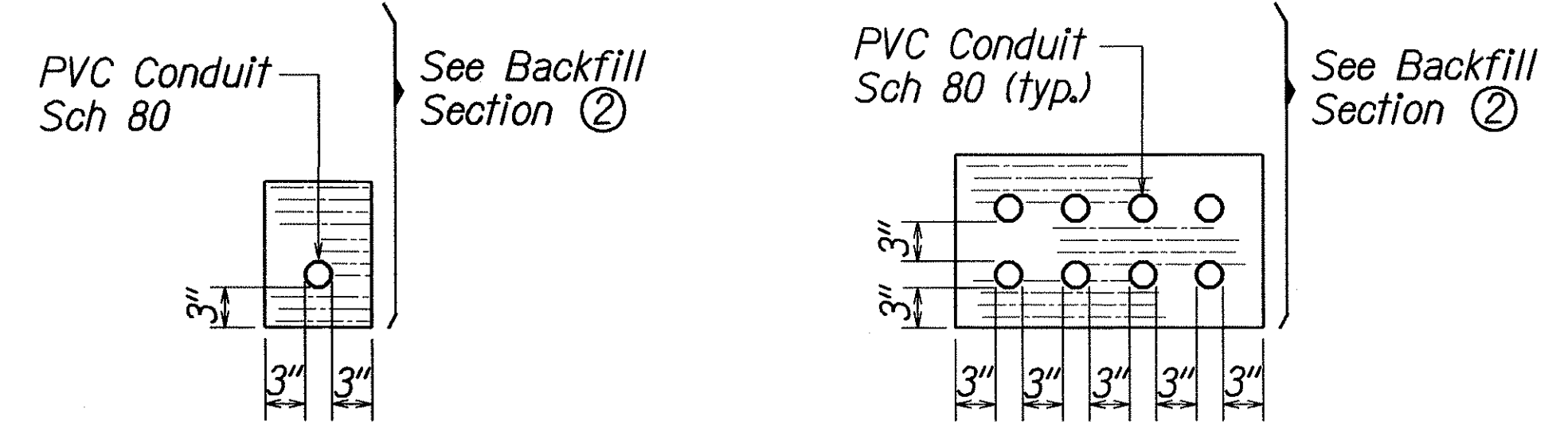
② TYPICAL BACKFILL SECTION DIRECT BURIED DUCTS



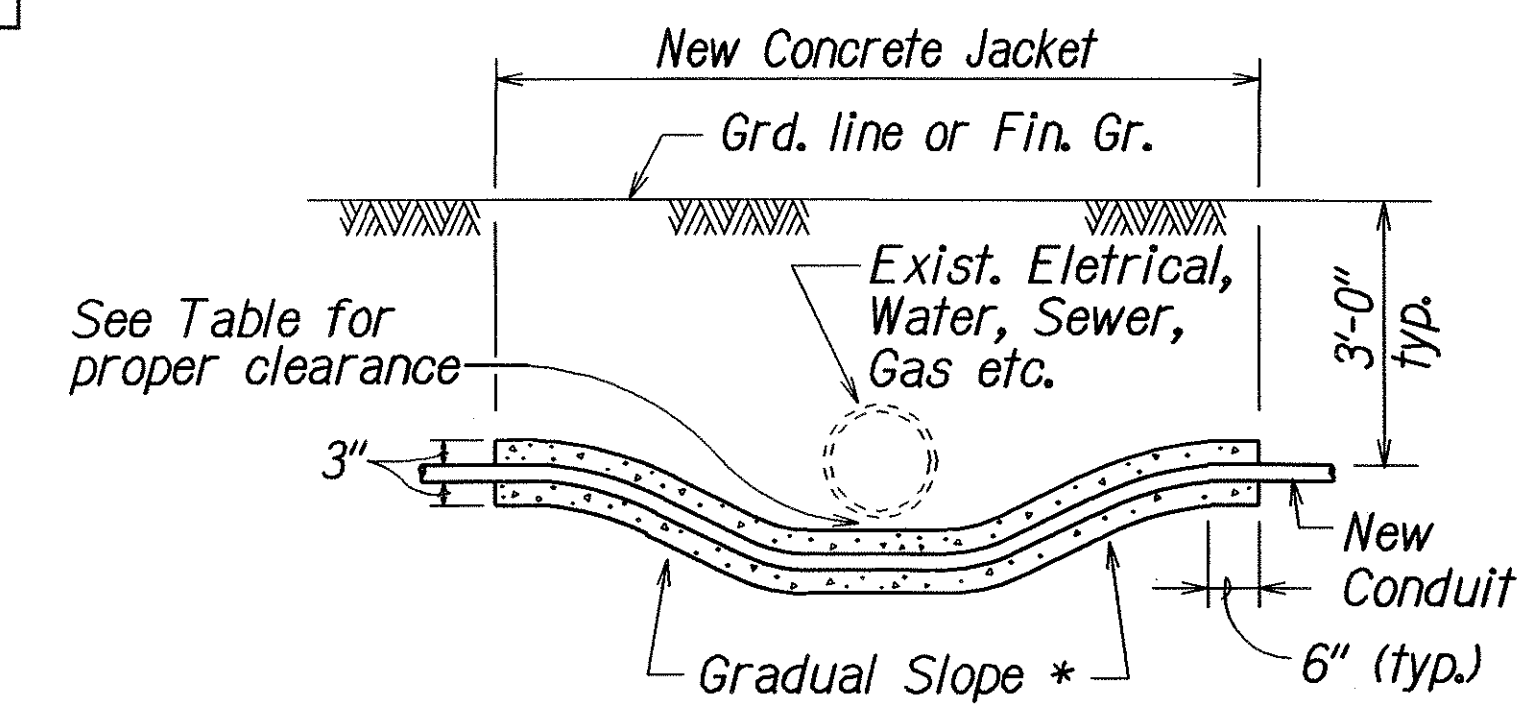
SINGLE CONDUIT DUCT SECTIONS - CONC. ENCASED

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.

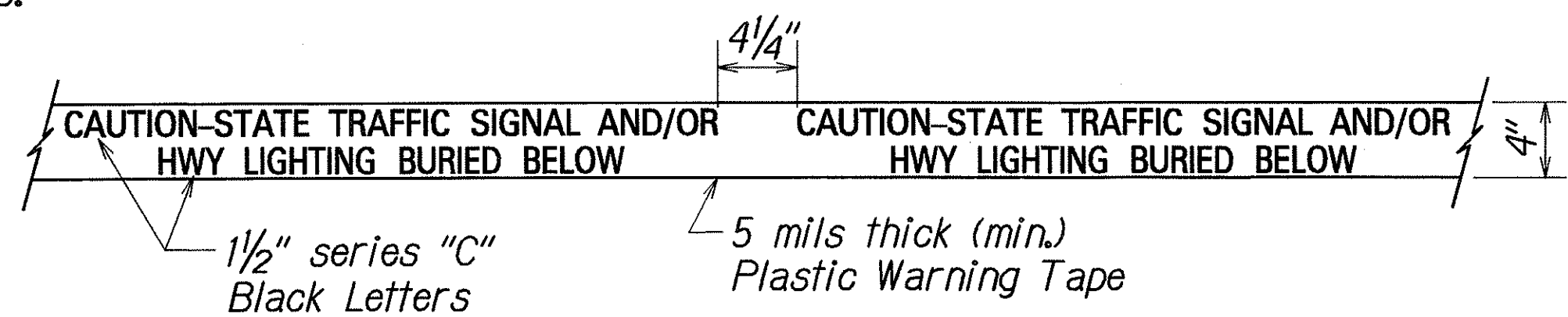
**At the electrical/signal ductline water crossing, install all electrical/signal ductline elevations to maintain 6" vertical clear separation from all waterlines (12" clear for all electrical/signal ductline structures larger than 16") at no cost to the Board of Water Supply.



SINGLE CONDUIT DUCT SECTIONS - DIRECT BURIED



* To be determined by County Electrical Inspector/Engineer
CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES
Not to Scale



For additional information see note no. 2.
METAL DETECTABLE RED PLASTIC WARNING TAPE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

KALANIANA'OLE HIGHWAY
PAVEMENT PREVENTIVE MAINTENANCE
Castle Junction to Castle Hospital
Project No. 61C-01-05M

Scale: As Shown Date: Sept. 2004

SHEET No. TS5 OF 7 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	61C-01-05M	2005	25	26

GENERAL NOTES

- Provide a minimum of one 16 ϕ 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.
- All pre-cast concrete pullboxes shall be manufactured in two pieces.
- The pullbox with cover shall be capable of supporting an MS 18 Loading.
- The maximum weight of the pullbox cover shall not exceed 27 kilograms.
- The openings for the conduits on all pullboxes shall be pre-cast concrete knockouts.
- 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.
- 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.
- All concrete shall be Class A (21 MPa (3,000 psi), min.)
- Rebars shall be Grade 300 and all lapped splices shall be 360mm minimum.
- The #57 or #67 size aggregate shall conform to latest version of AASHTO M43 (ASTM D 448).
- 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).

Clean concrete surface before application of first coat of primer coating and flashing compound

Const. Jt.

Flashing compound conforming to the requirements of ASTM D 4586

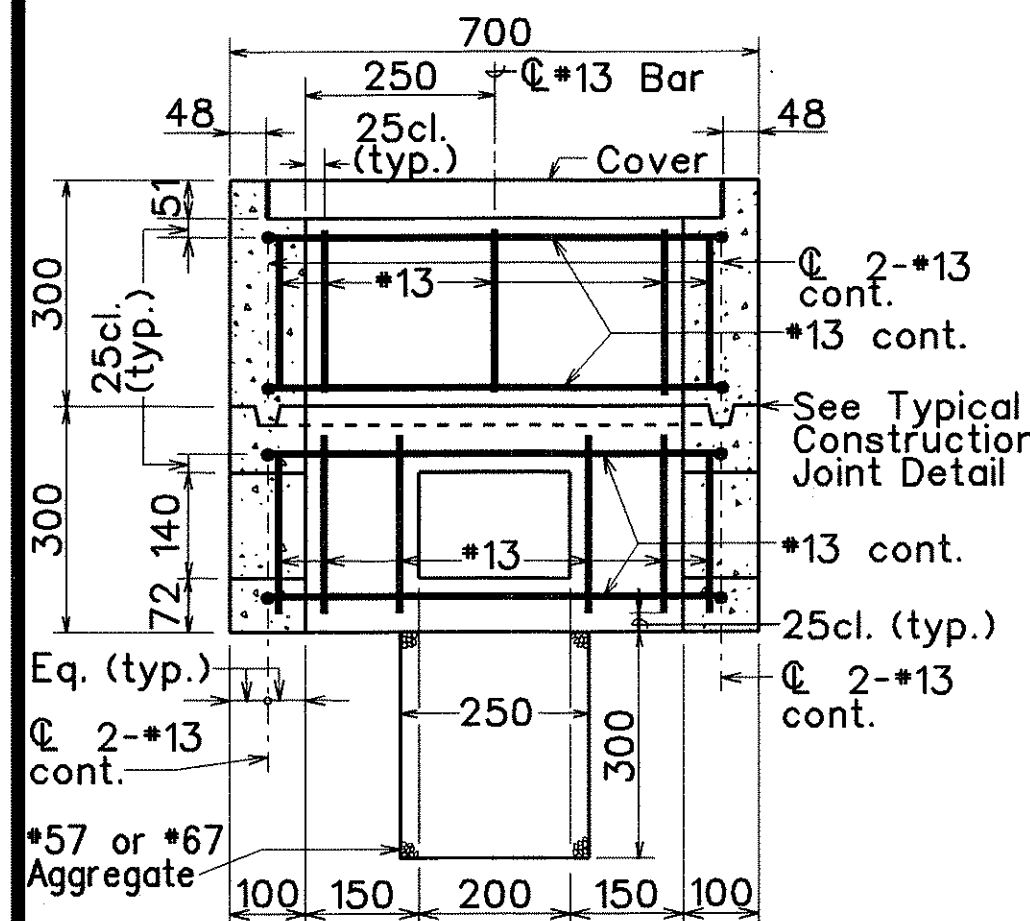
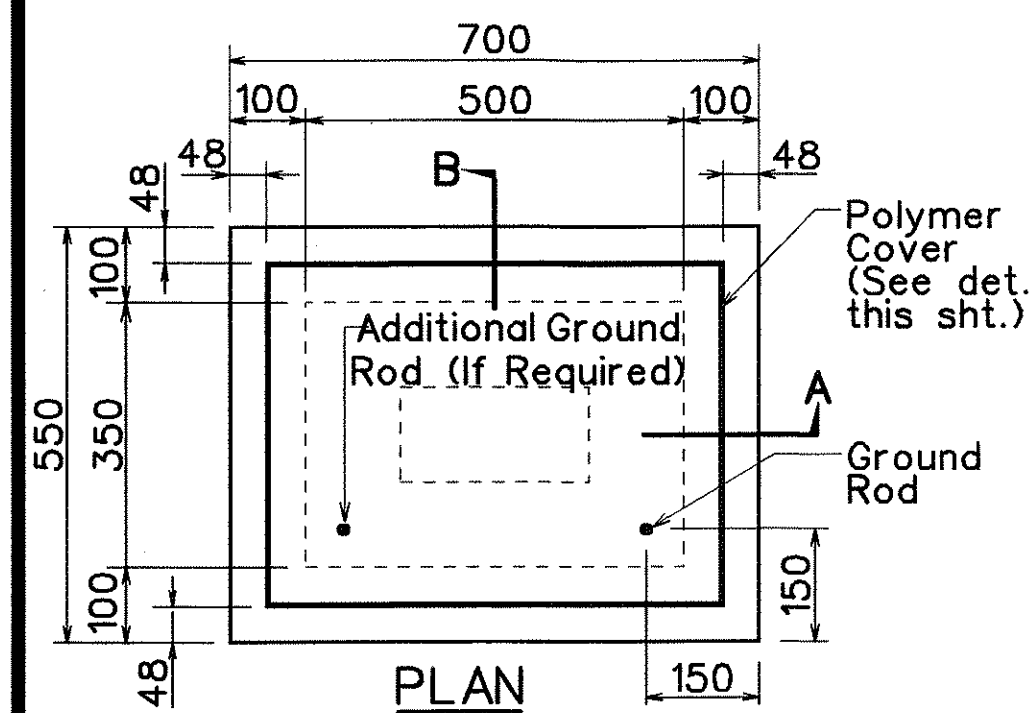
Primer coating conforming to the requirements of ASTM D 41

2nd layer fabric conforming to the requirements of ASTM D 1668

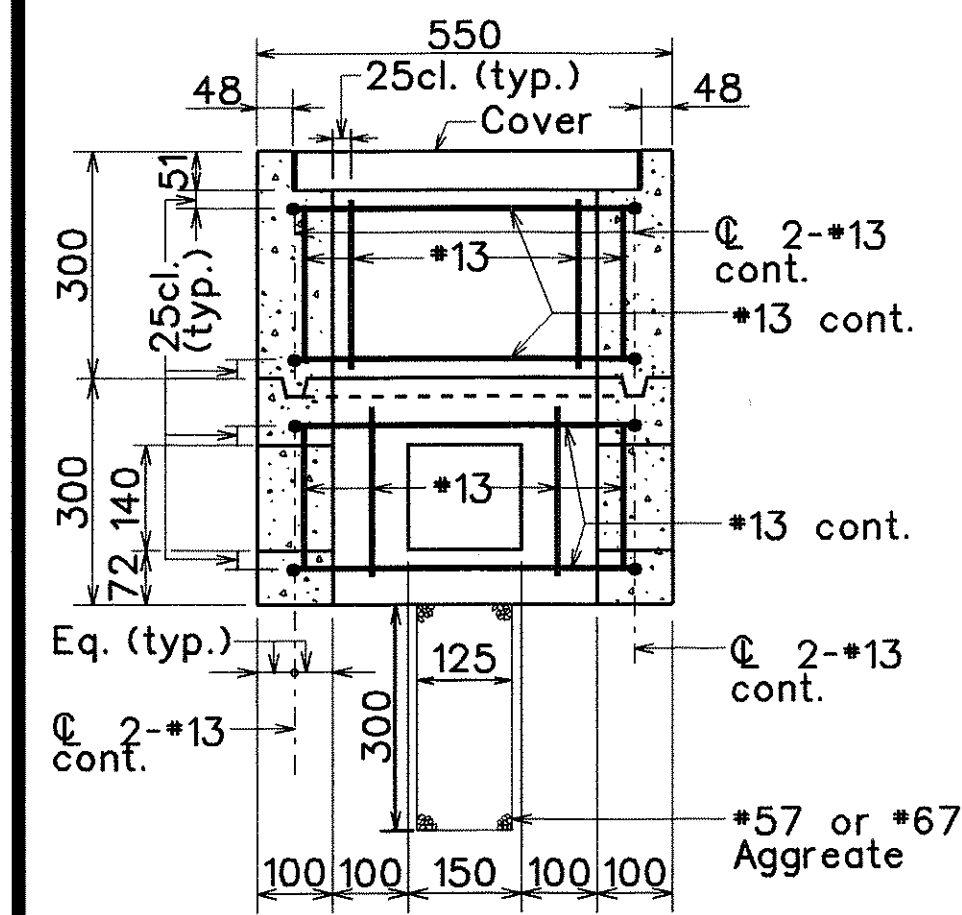
Finish coat with flashing compound conforming to the requirements of ASTM D 4586

TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS

ALL DIMENSIONS ARE IN MILLIMETERS
UNLESS OTHERWISE SHOWN

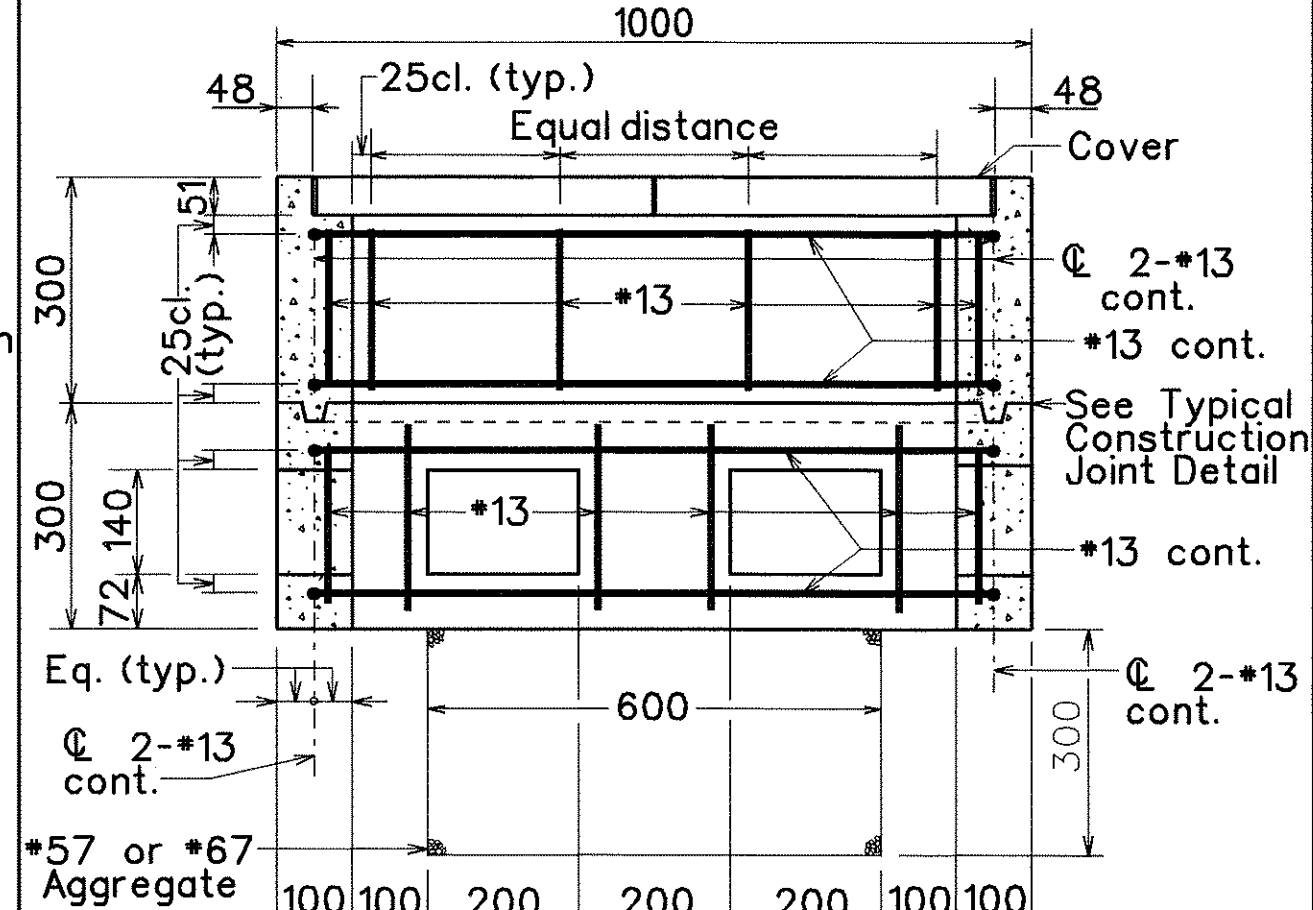
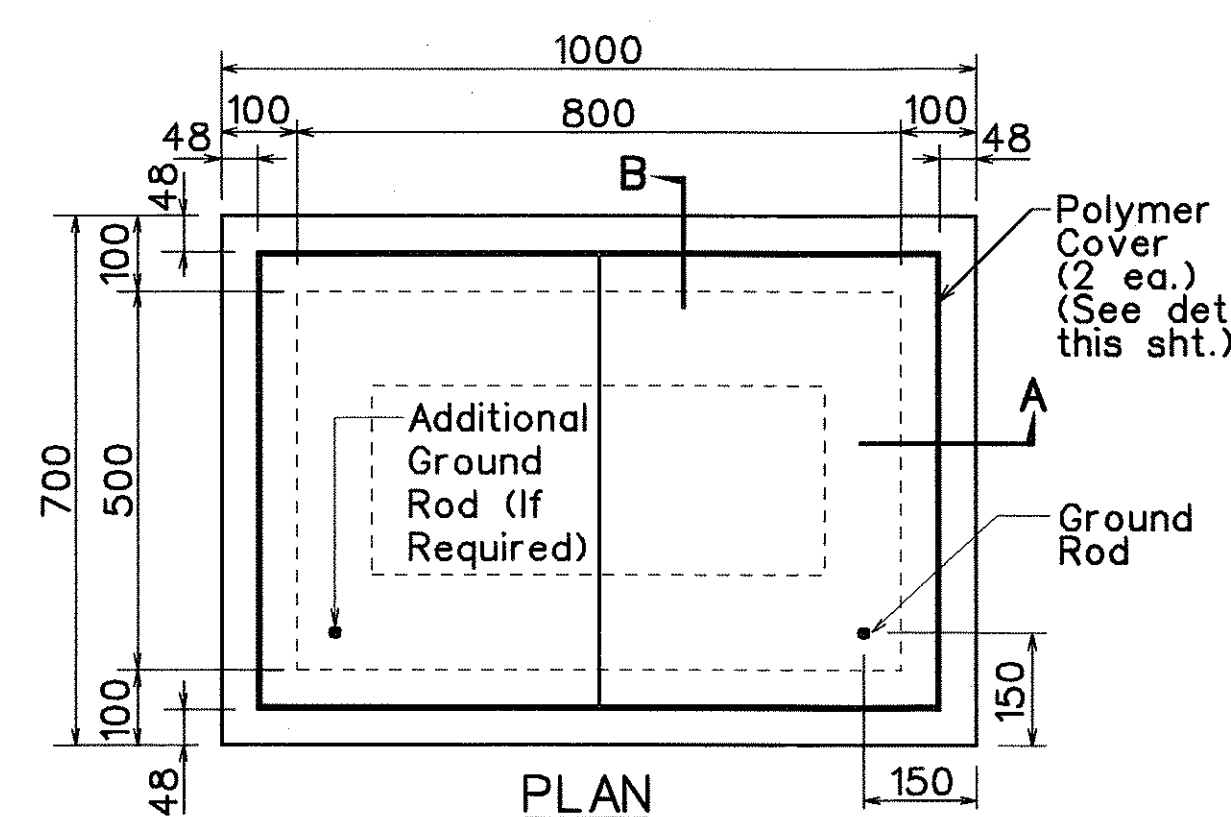


SECTION A-A

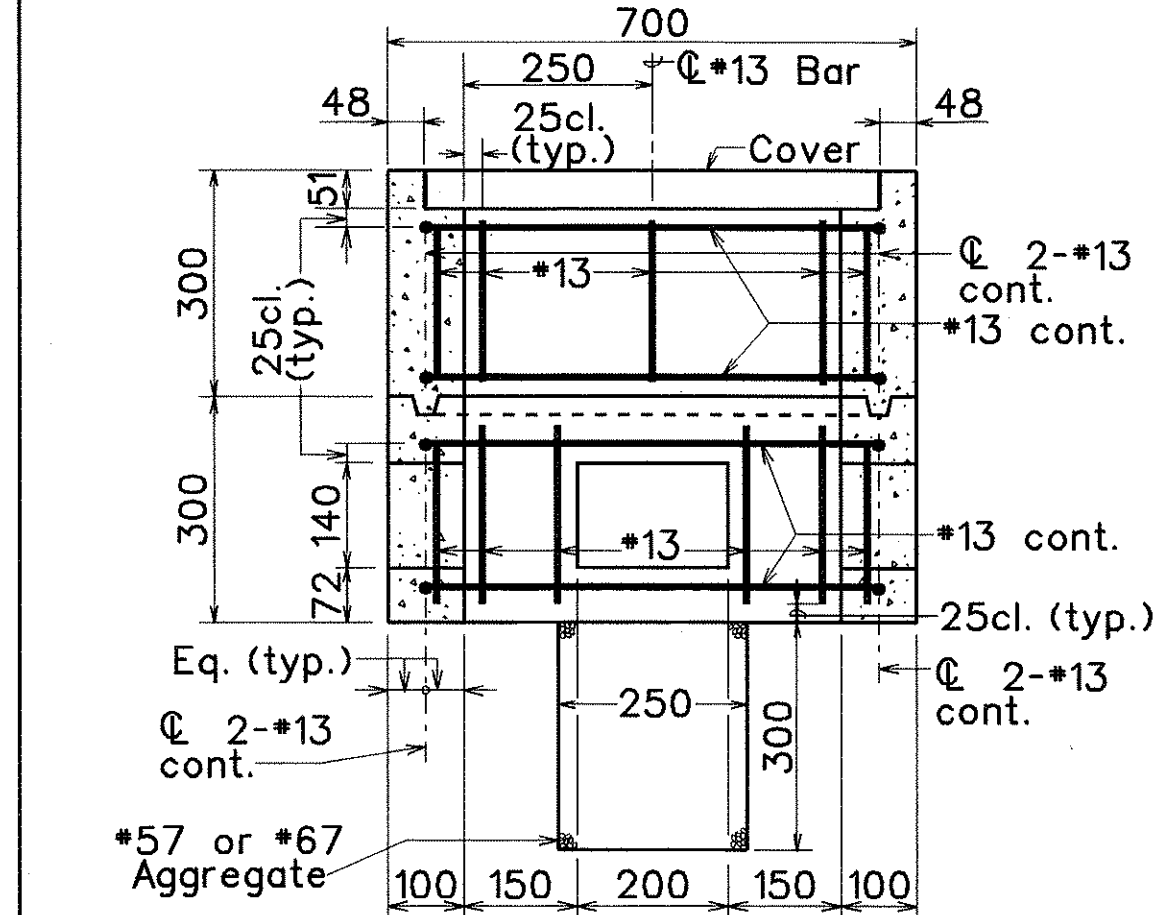


SECTION B-B

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

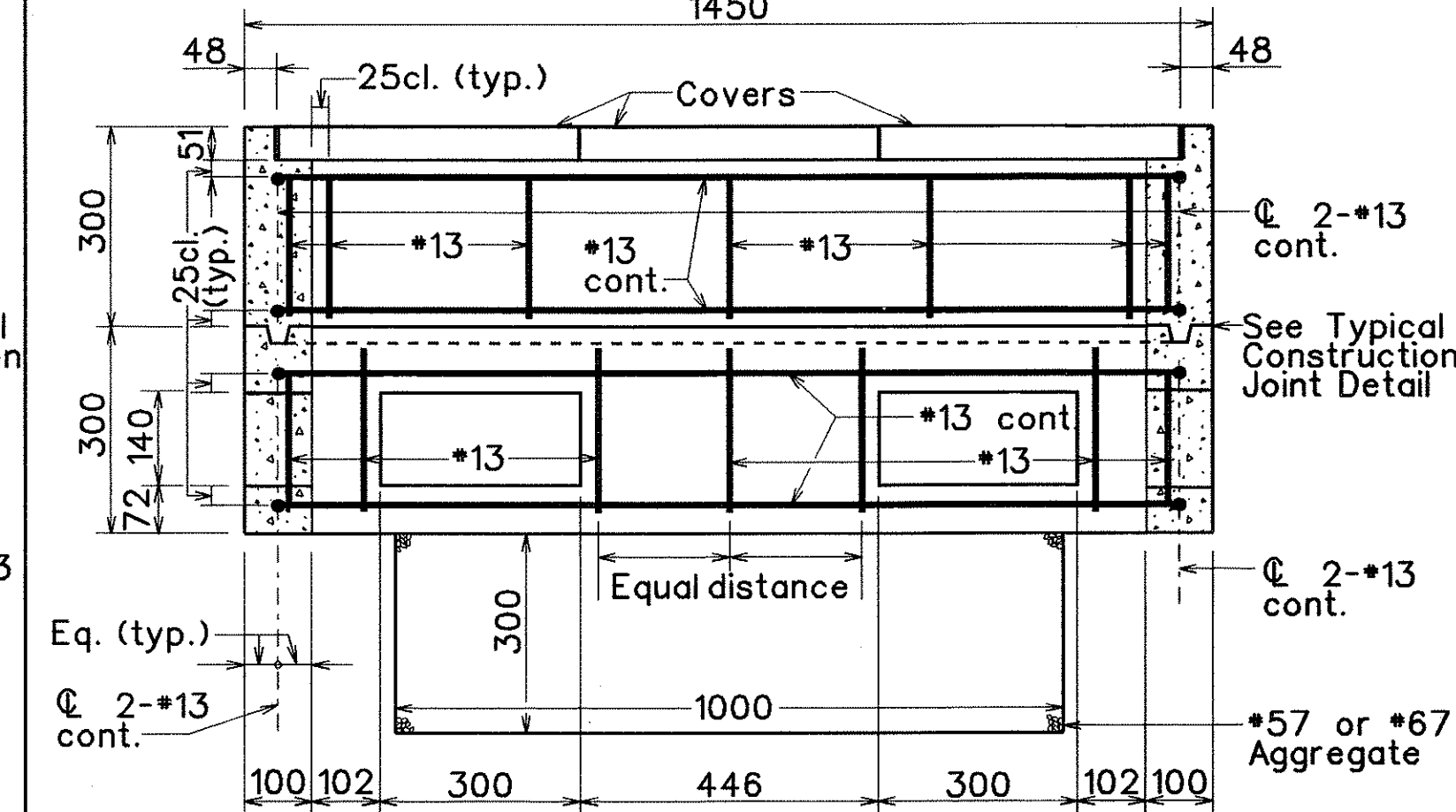
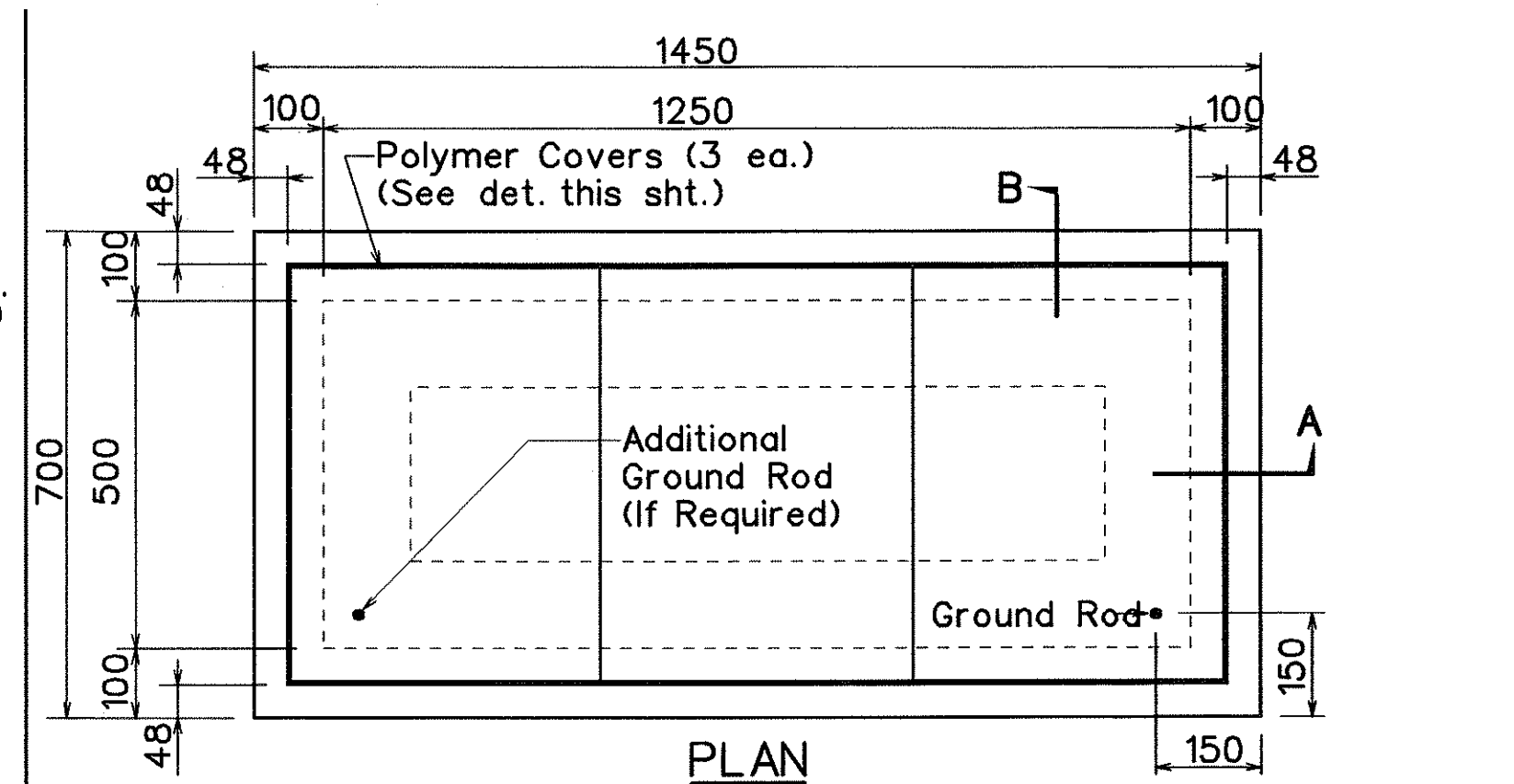


SECTION A-A

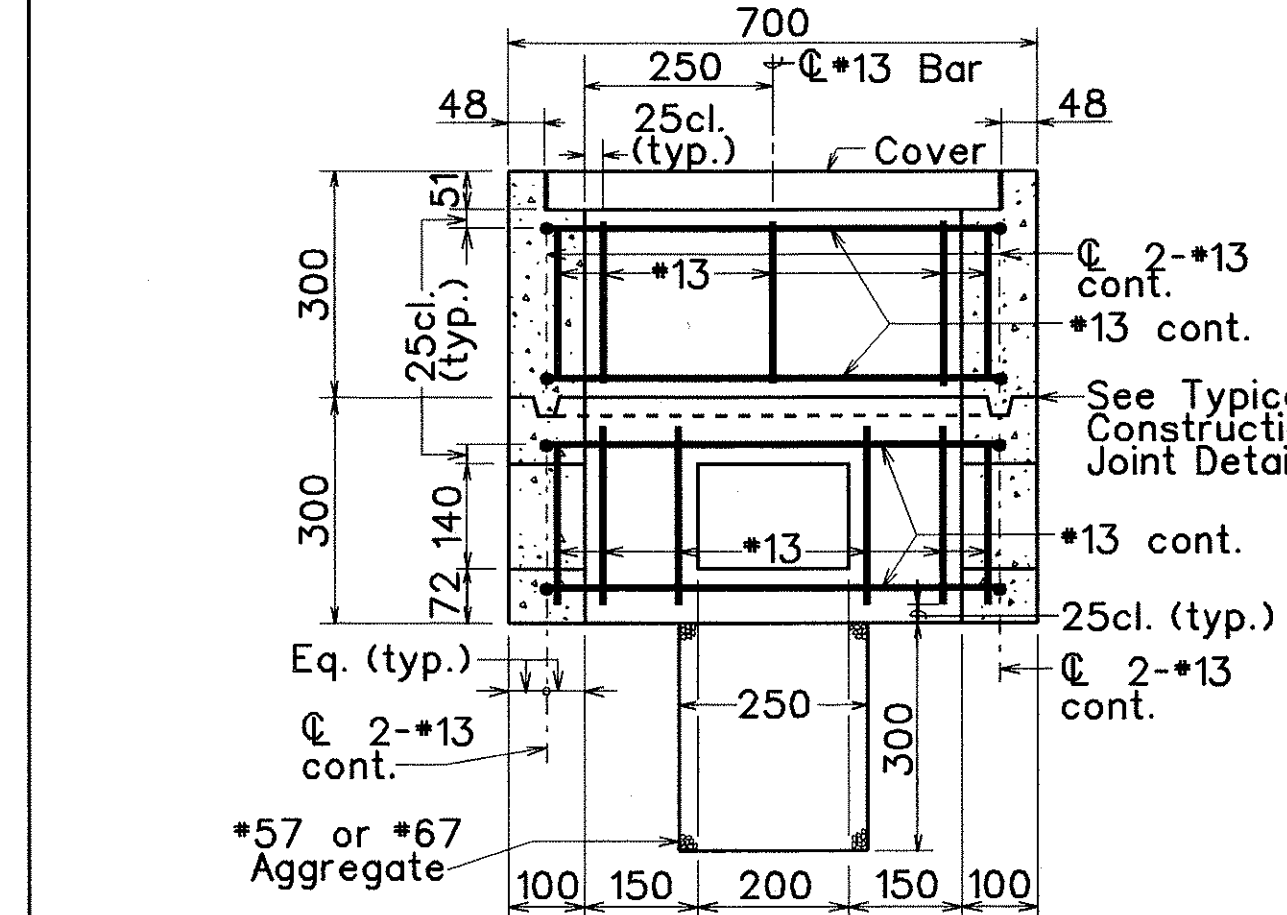


SECTION B-B

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

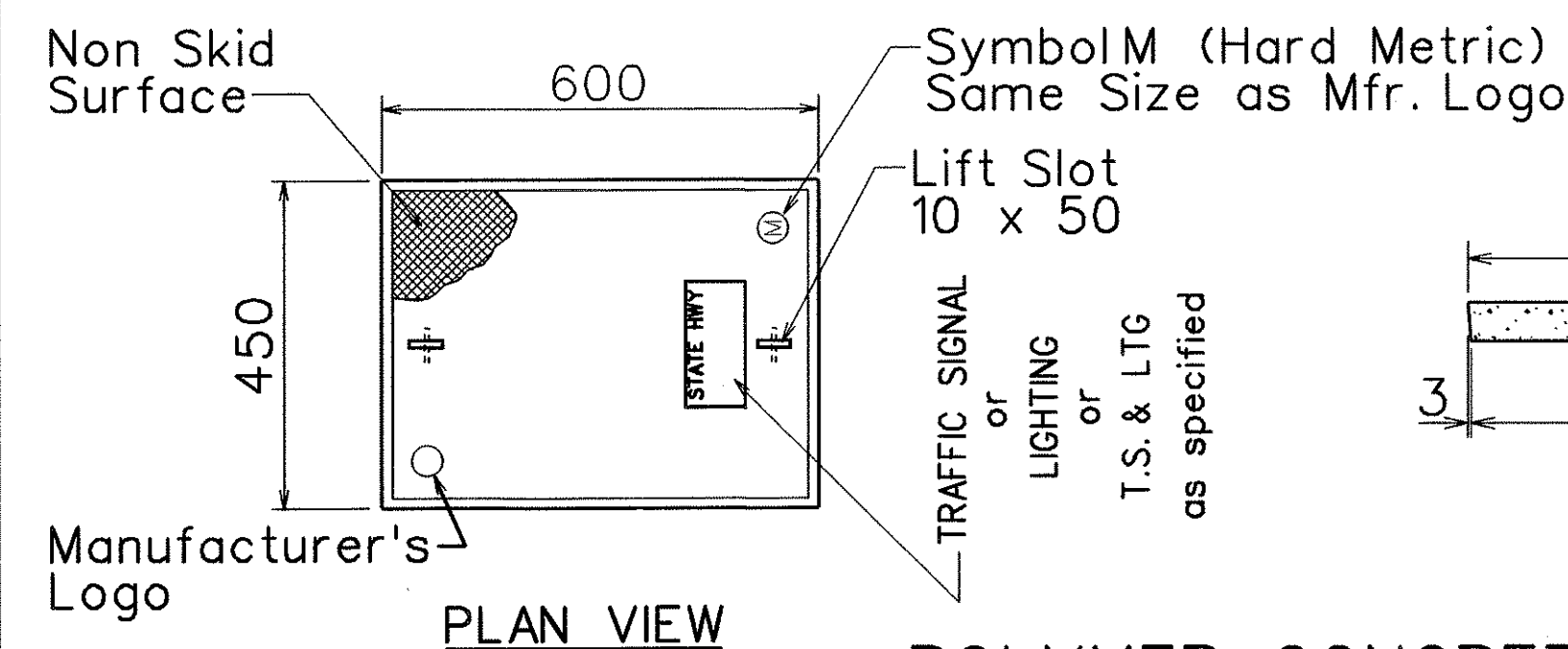


SECTION A-A

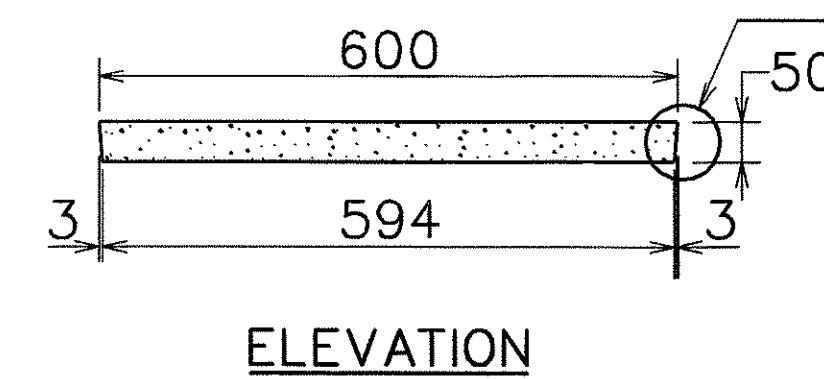


SECTION B-B

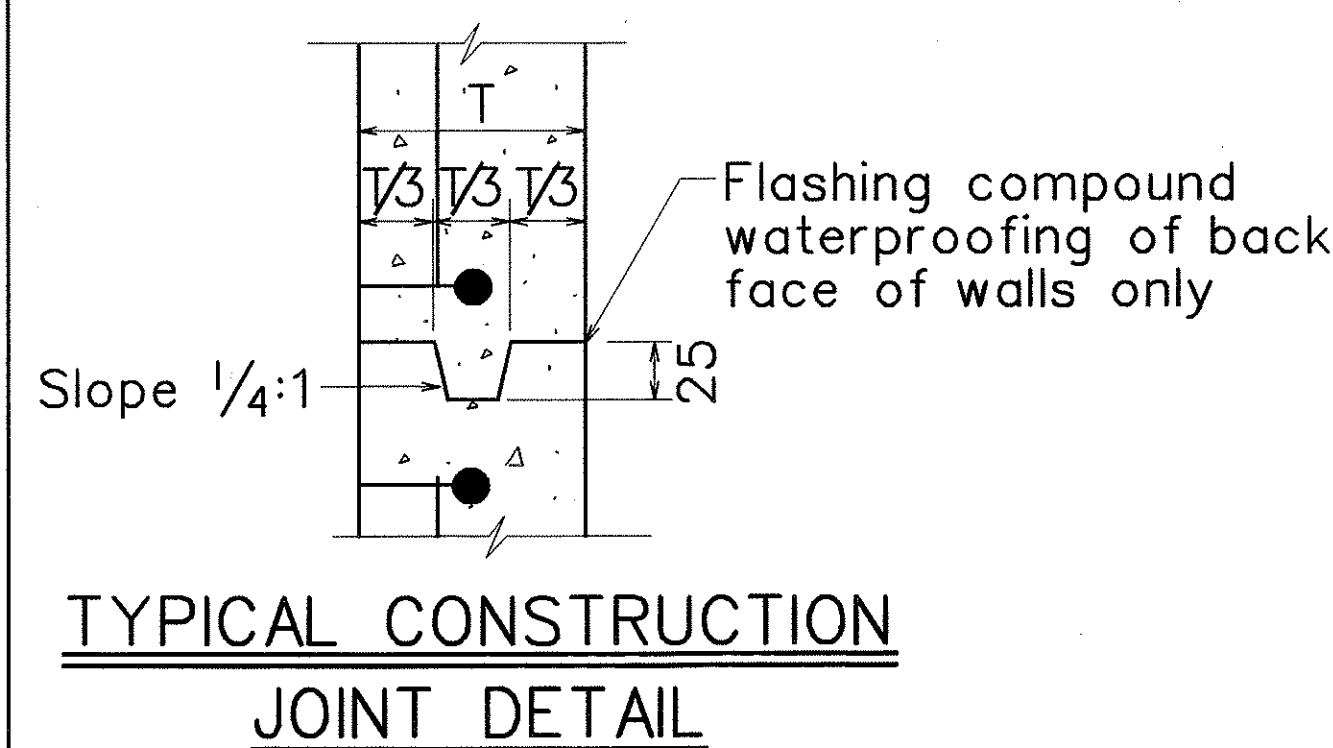
TYPE "C" PULLBOX (Old Type "D")



POLYMER CONCRETE COVER



ELEVATION



TYPICAL CONSTRUCTION
JOINT DETAIL

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

PULLBOX & COVER DETAILS

KALANIANA'OLE HIGHWAY

PAVEMENT PREVENTIVE MAINTENANCE

Castle Junction to Castle Hospital

Project No. 61C-01-05M

Scale: As Shown

Date: Sept. 2004

SHEET No. TS6 OF 7 SHEETS