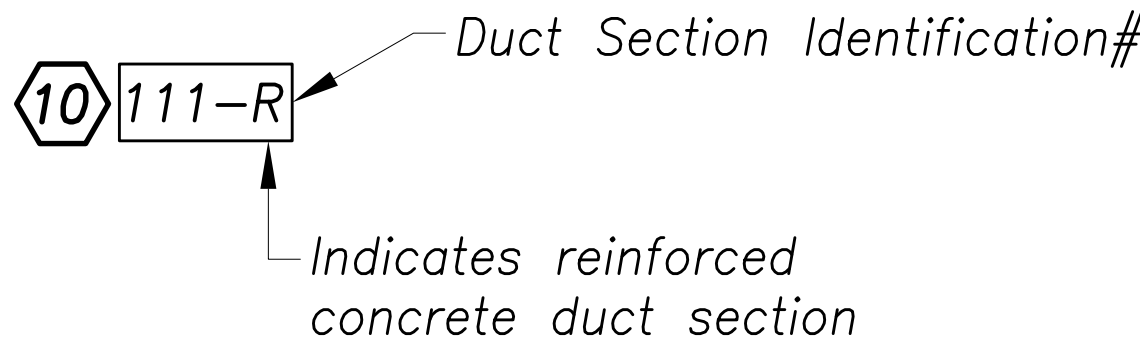
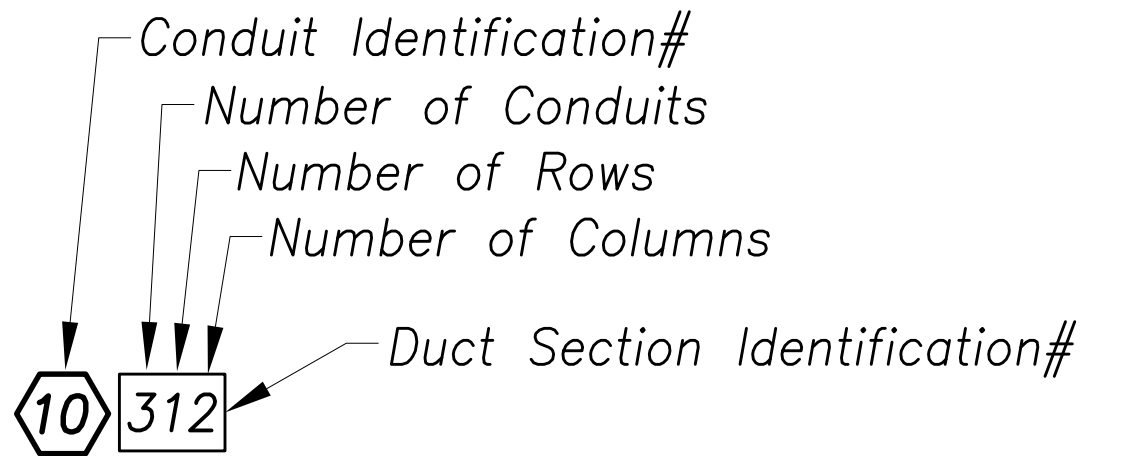


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)R	2020	209	291

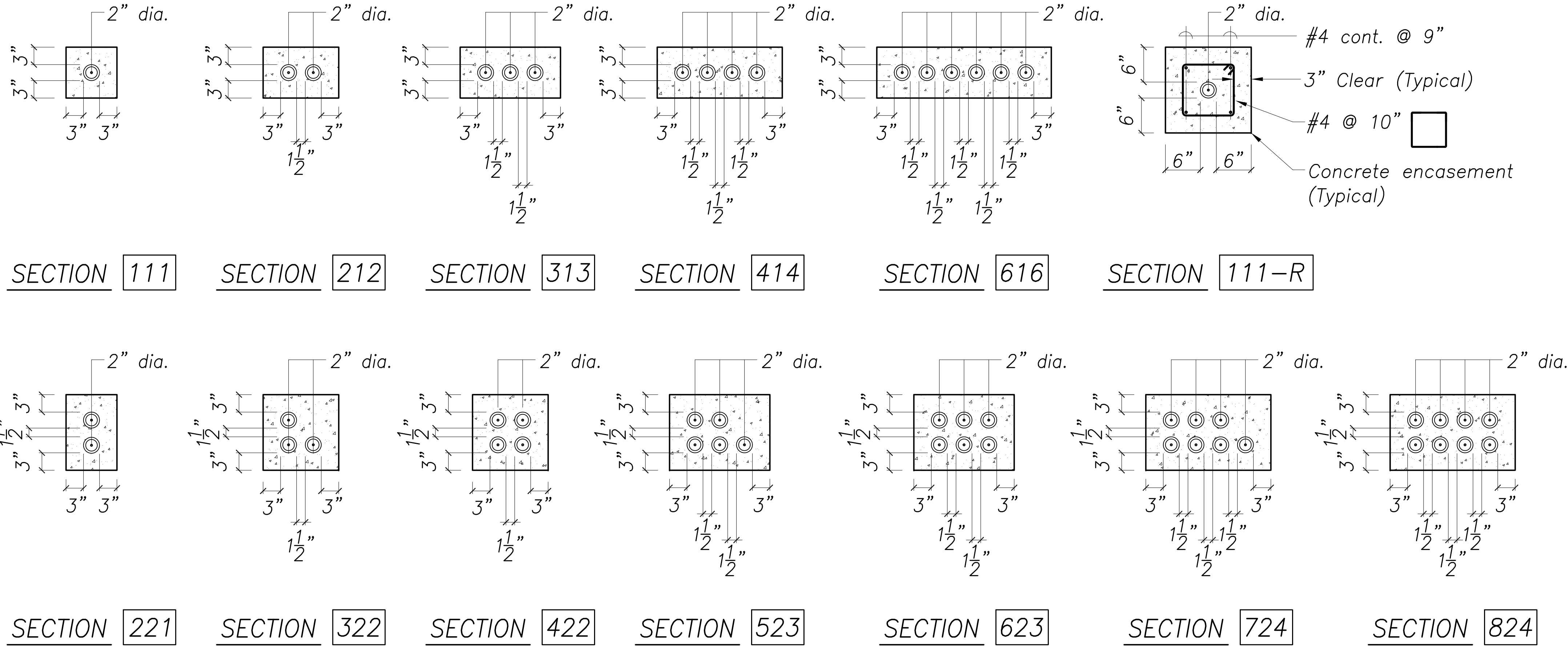
Legend:



Approved By:

Chief, Traffic Signals & Technology, DTS

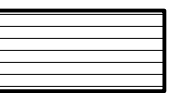
Date



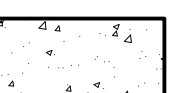
TRAFFIC SIGNAL DUCT SECTIONS

No Scale

Legend



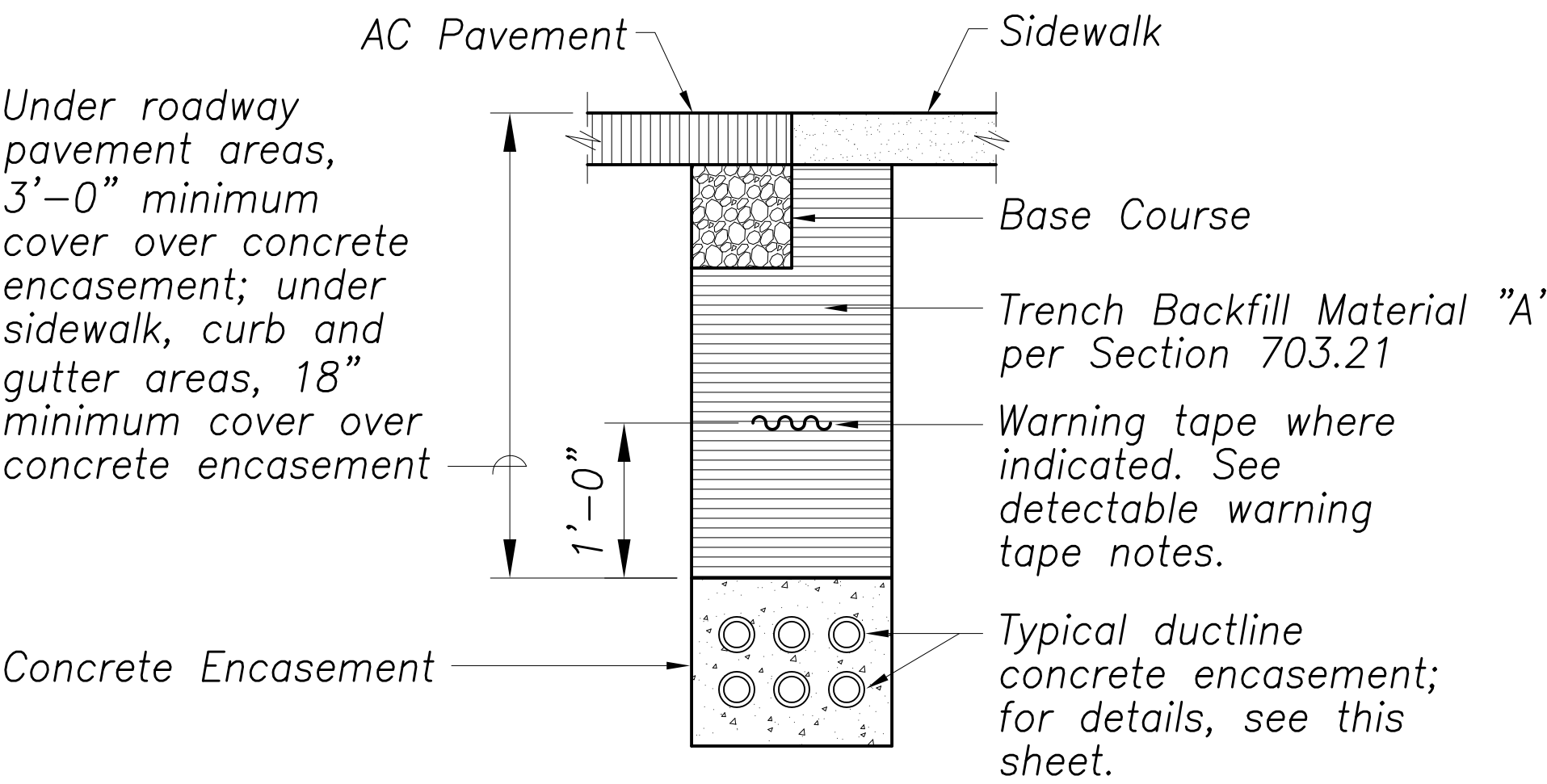
TRENCH BACKFILL MATERIAL "A"
When tested according to AASHTO T 176, the Sand Equivalent value shall be 20 or greater.



CONCRETE ENCASEMENT
3" encasement 3000 psi compressive strength at 28 Days.

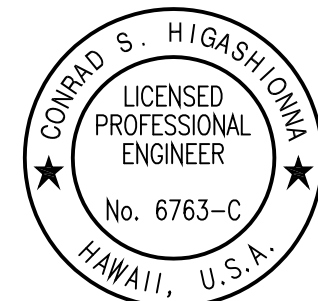
Trench Restoration Notes:

- If trench is located an unpaved area, the Contractor shall replace A.C. base course and A.C. pavement with Type "A" backfill material.
- The metal detectable red plastic warning tape shall be a minimum five (5) mils thick and 4 inches wide with a continuous metallic backing and corrosion resistant one (1) mil thick foil core. For the State DOT traffic signal and highway lighting ducts, the message on the tape shall read: "CAUTION – STATE TRAFFIC SIGNAL AND/OR HWY. LIGHTING BURIED BELOW." The warning tape message lettering shall be 1.5-inch tall Series "C" block lettering. The message shall be repeated with a 4.25-inch spacing between end of message and start of next repeat. The tape shall be incidental to the duct line cost.
- 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, except as indicated on plans.
- 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 foundation. 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 concrete encased conduits.
- For concrete sidewalk, curb & gutter, P.C.C. pavement, and asphalt pavement restoration over trench excavation, see details on sheets 78, 79, and 80.



TYPICAL TRENCH RESTORATION DETAILS

No Scale



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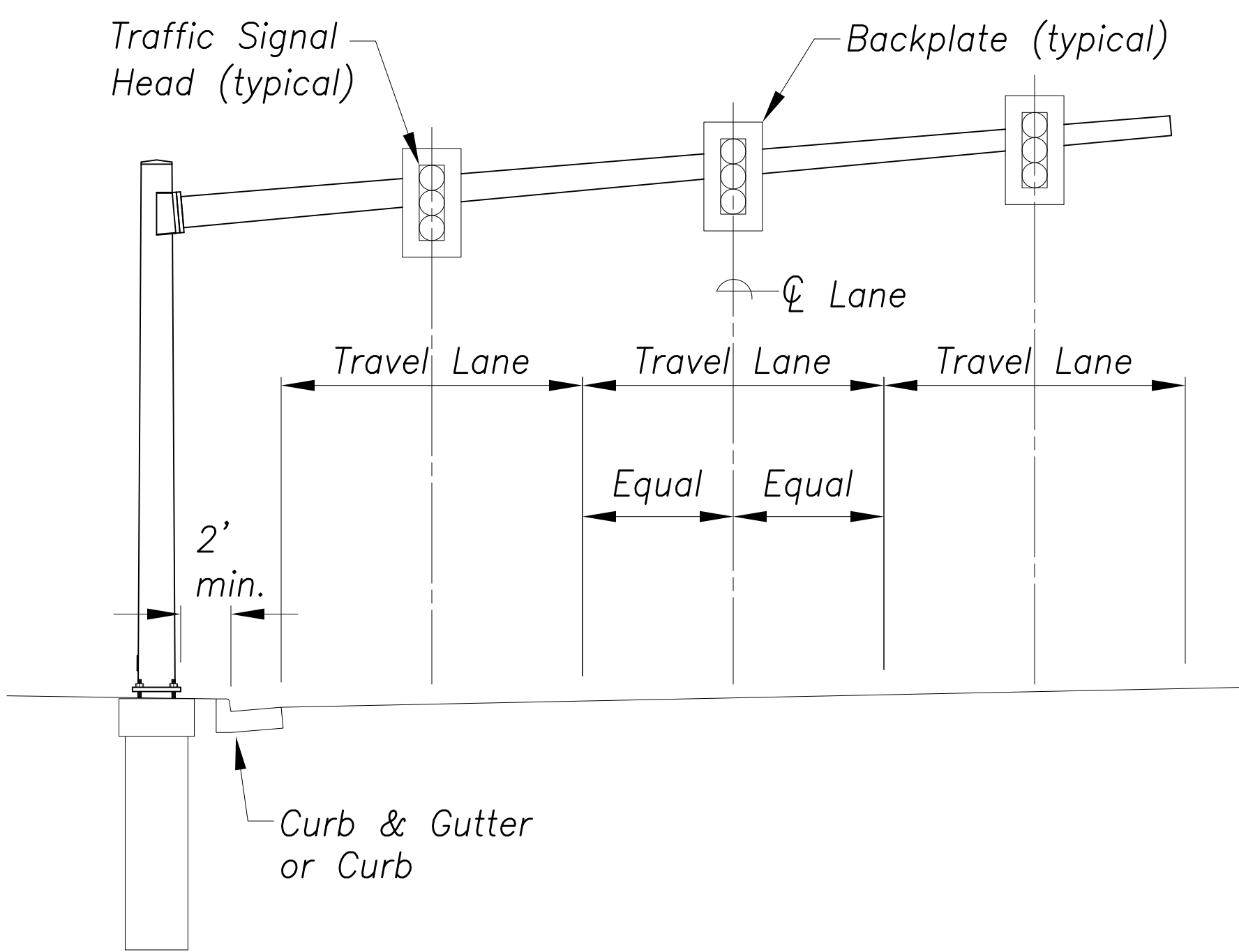
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MISCELLANEOUS DETAILS

Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)R
Scale: No Scale Date: Oct. 2020
SHEET No. TS-107 OF 113 SHEETS

DATE
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DESIGNED BY
CHECKED BY
NOTE BOOK
No.

New 18, 2020-12-24
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\209 Duct Line Details.dwg

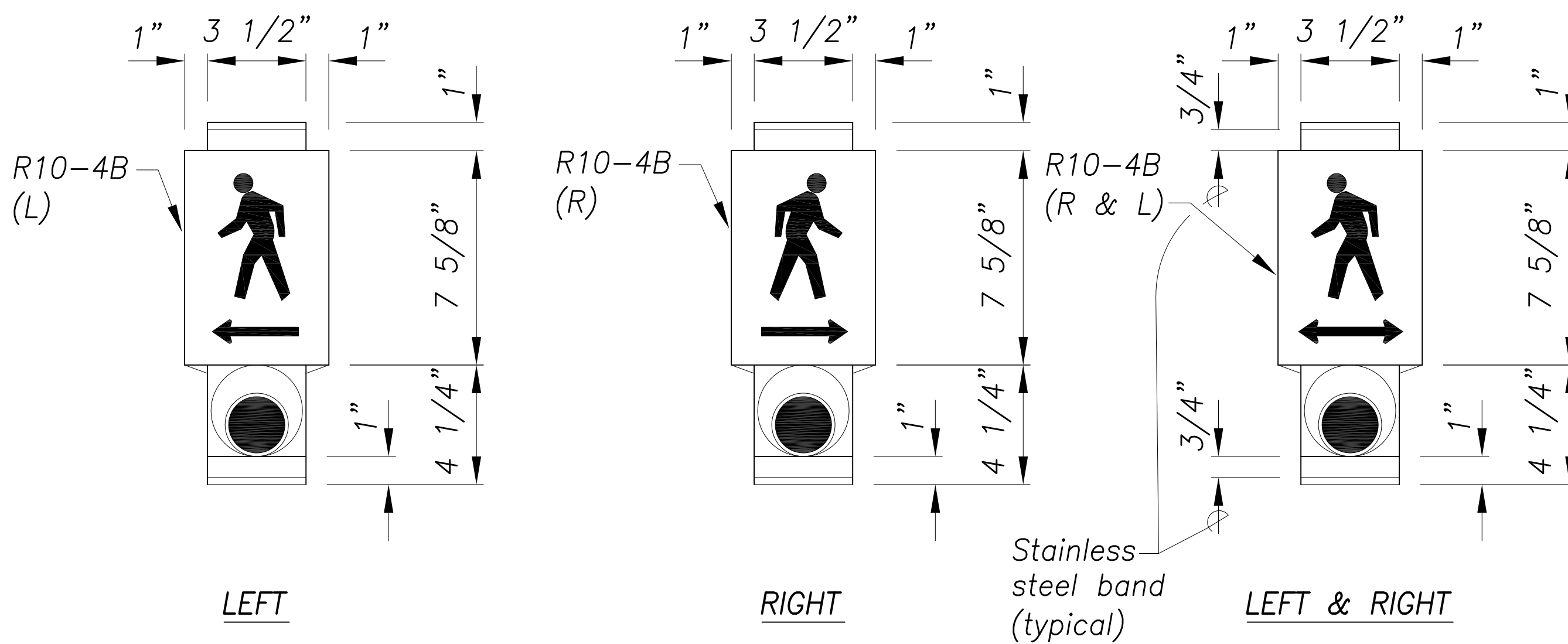


Notes:

1. The Contractor shall install traffic signal heads over center of travel lanes.
2. The Contractor shall submit shop drawings for Type I and II traffic signal standards for review and approval.

TYPE II TRAFFIC SIGNAL STANDARD

No Scale



Notes:

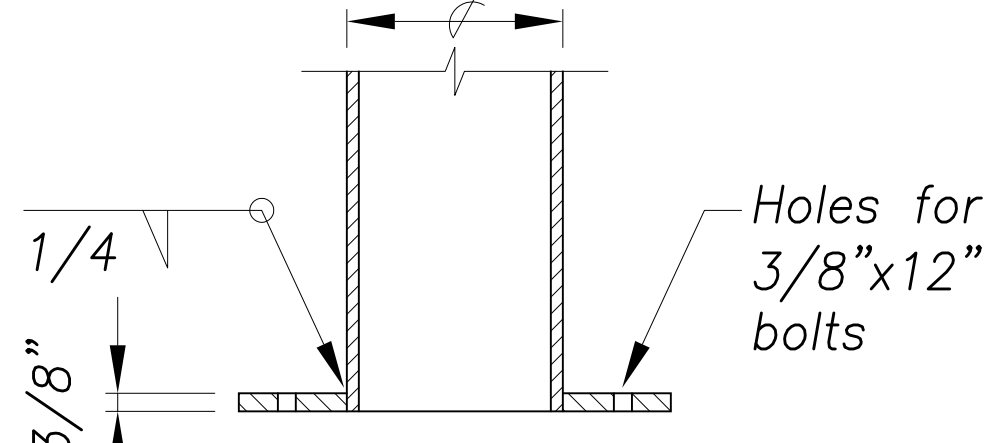
1. The pedestrian push button unit shall consist of a one piece assembly with raised walking man, arrow indication, and push button.
2. The push button activator shall be of the mushroom plunger type, ADA acceptable, 2-inches in diameter that requires less than 5 pounds of pressure to activate.
3. The raised man and arrows shall be directional and match the directional indication as shown on the plans.
4. The push button shall be tamper proof, weatherproof, and constructed so that electrical shocks are impossible.
5. The color scheme shall be:
White – Man, Arrow, and Push Button
Black – Background

PEDESTRIAN PUSH BUTTON DETAILS

Scale: 3"=1'-0"

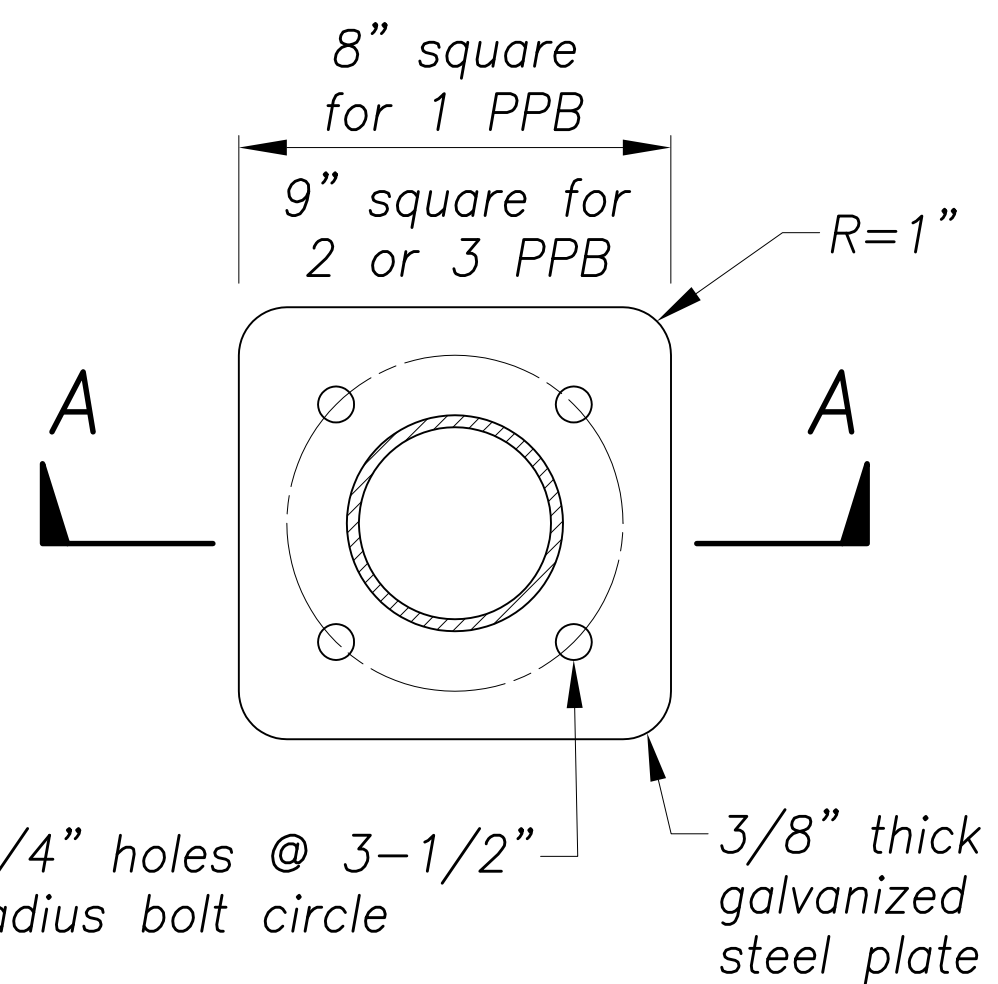
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)R	2020	210	291

3-1/2" galvanized steel pipe for 1 PPB and 4-1/2" pipe for 2 or 3 PPB



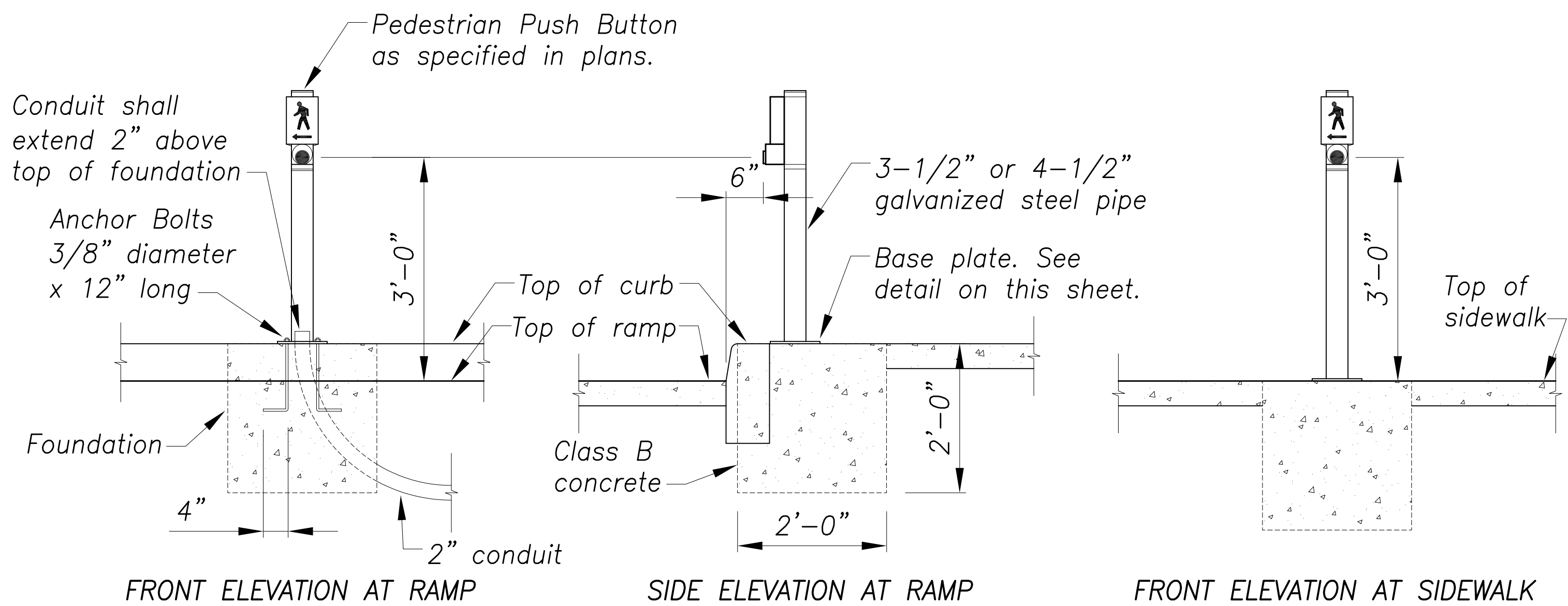
SECTION A-A

Scale: 3"=1'-0"



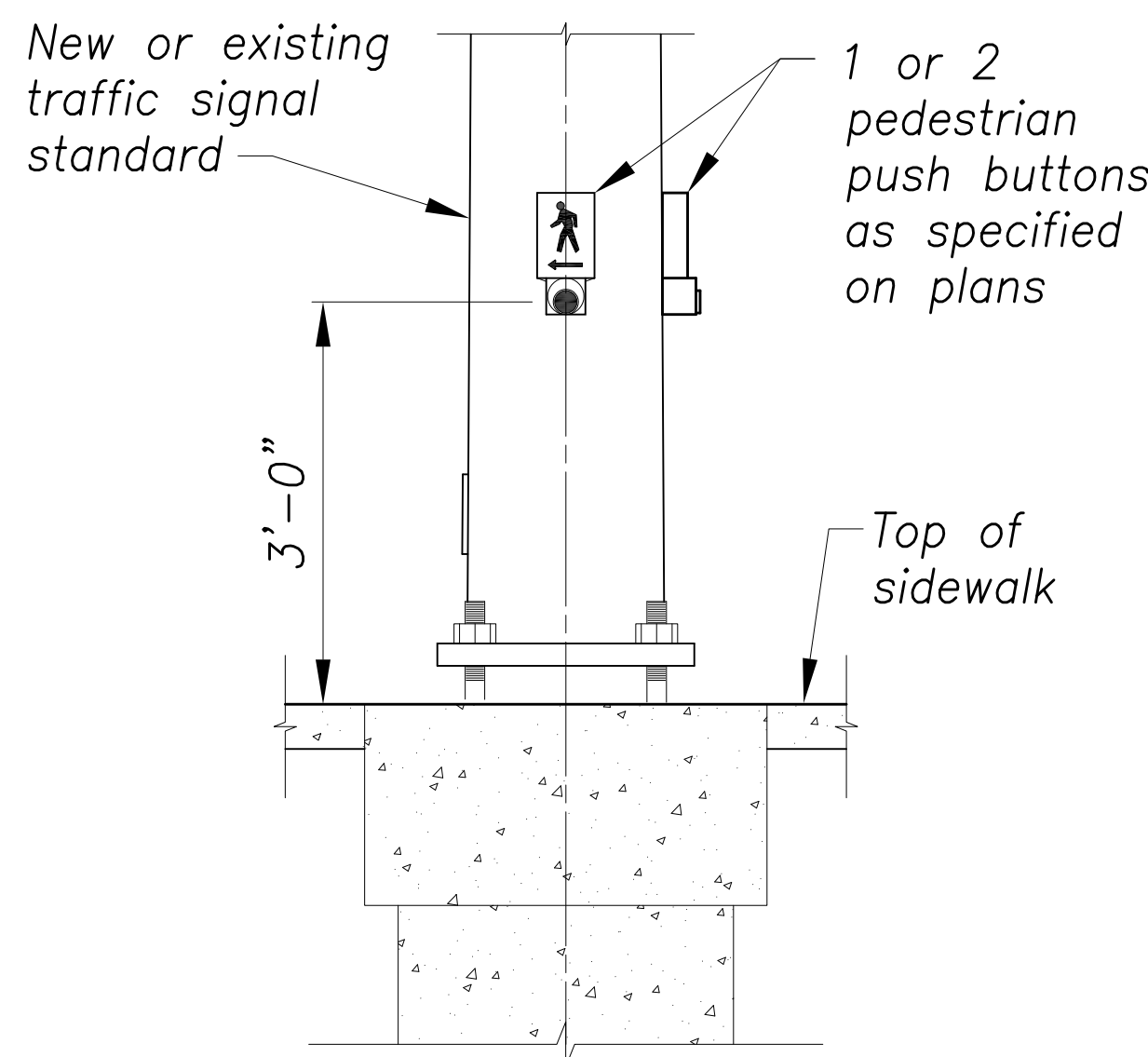
BASE PLATE DETAIL

Scale: 3"=1'-0"



PEDESTRIAN PUSH BUTTON ON PEDESTAL DETAILS

Scale: 3/4"=1'-0"

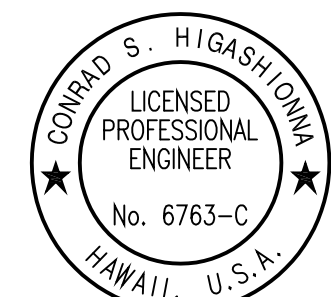


PEDESTRIAN PUSH BUTTON ON TRAFFIC SIGNAL STANDARD

Scale: 3/4"=1'-0"

Approved By: _____

Chief, Traffic Signals & Technology, DTS _____ Date _____



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HIGHWAYS DIVISION

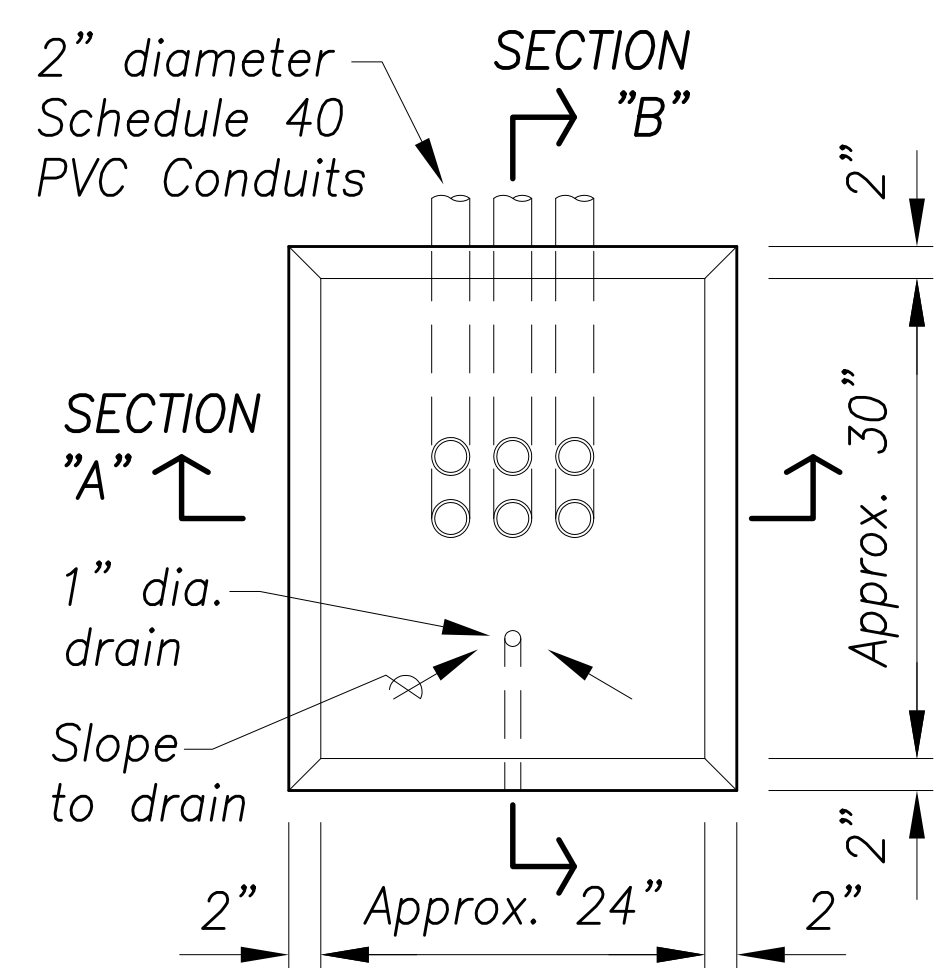
MISCELLANEOUS DETAILS

Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)R
Scale: As noted Date: Oct. 2020
SHEET No. TS-108 OF 113 SHEETS

DATE	_____
SURVEY PLOTTED BY	_____
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DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
NOTE BOOK	_____
No.	_____

New 18, 2020-5-24.m
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\210 Signal Standard and PPB Details.dwg

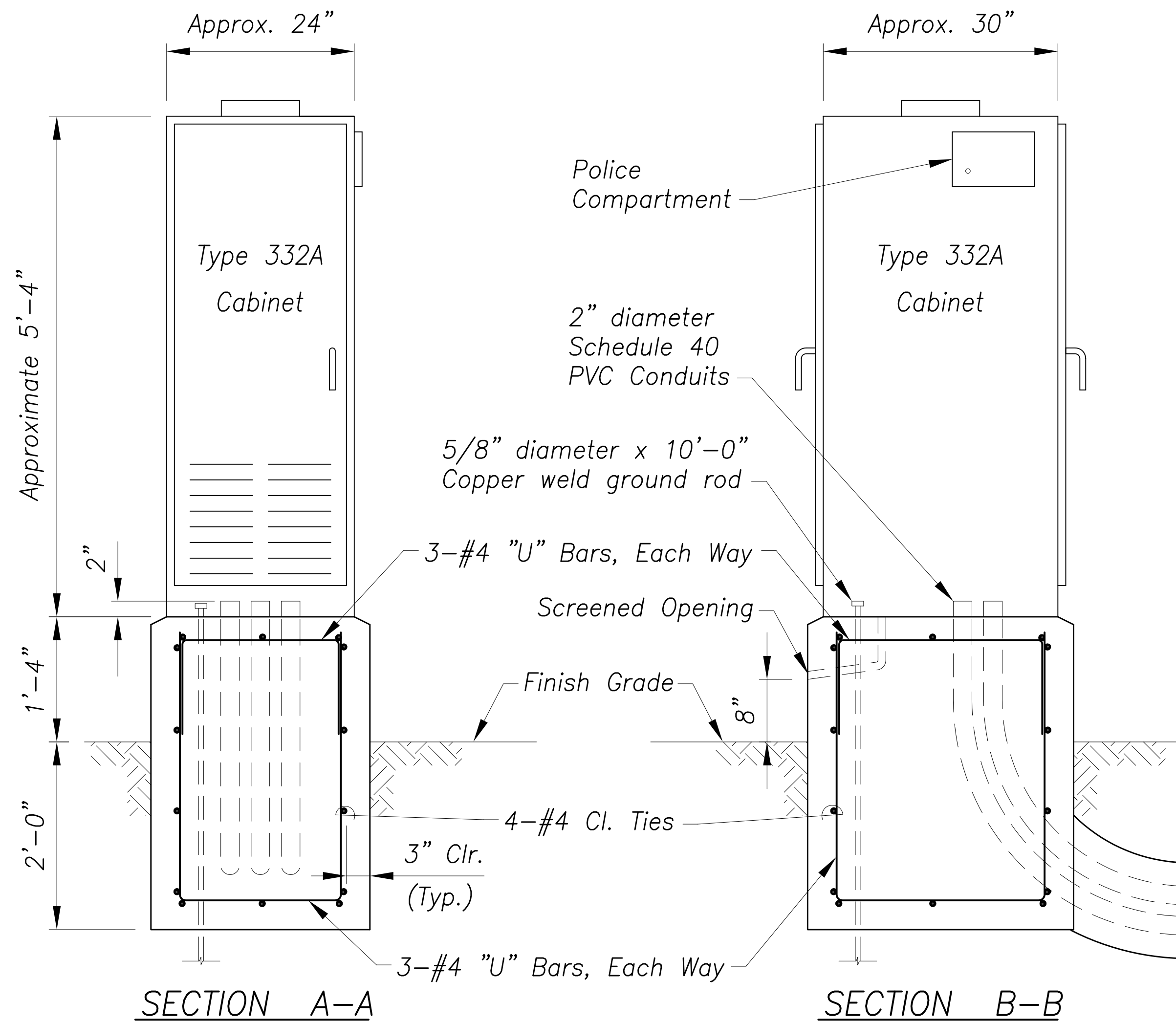
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)R	2020	211	291



PLAN

Notes:

- Concrete shall be Class "B".
- Dimensions shall be altered to suit controller cabinet actually furnished.
- Conduits, bends, and drain are incidental to concrete base.
- Refer to cabinet manufacturer's specifications for details of anchor bolts and base settings.
- All exposed surfaces of concrete base shall be given a Class 2, rubbed finish.
- All conduits shall be PVC.
- The Contractor shall provide a switch/jack and 15-foot switch cord assembly for each Police Compartment. The cost shall not be paid for separately, but shall be considered incidental to the controller.



SECTION A-A

SECTION B-B

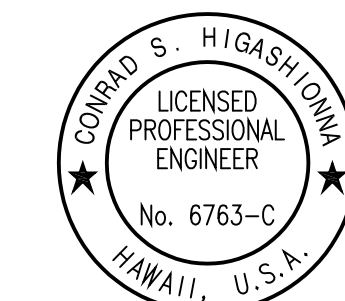
CONTROLLER CABINET & FOUNDATION DETAIL

No Scale

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

New 18, 2020-12-24
N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\211 Controller Detail.dwg

Approved By: _____
Chief, Traffic Signals & Technology, DTS
Date _____



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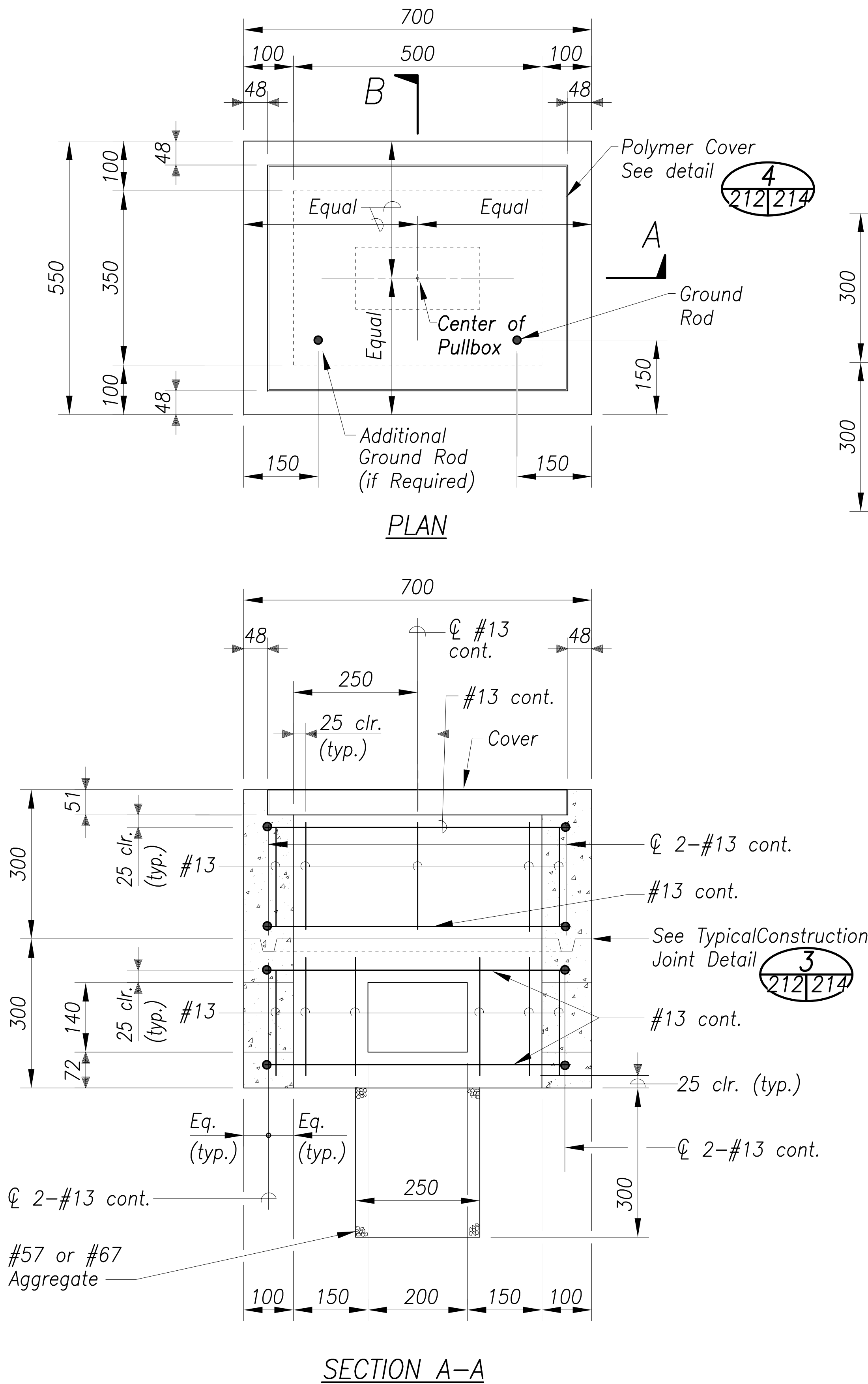
MISCELLANEOUS DETAILS

Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)R
Scale: No Scale Date: Oct. 2020
SHEET No. TS-109 OF 113 SHEETS

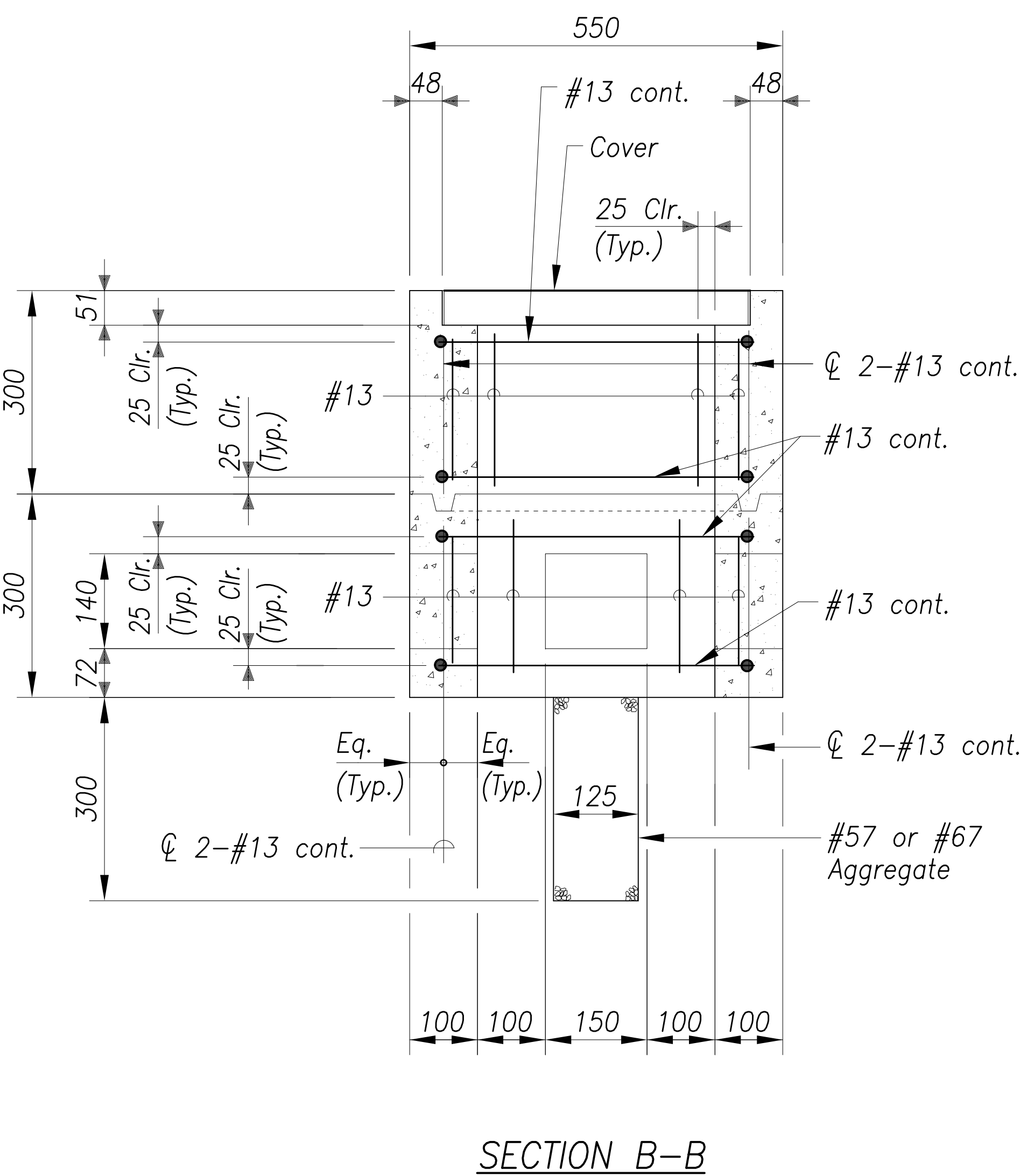
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)R	2020	212	291

NOTES FOR PULLBOX DETAILS (Type "A", "B", and "C"):

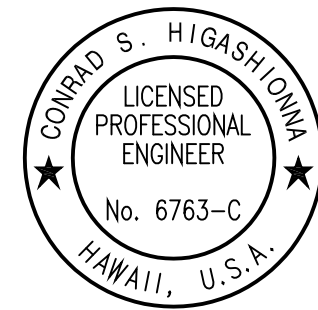
- Provide a minimum of one 16Ø x 2.5m copperweld ground rod in each pullbox. When directed by the traffic signal inspector/engineer, install additional ground rods. Cost of ground rods shall be incidental to the pullboxes.
- All pre-cast concrete pullboxes shall be manufactured in two pieces.
- The pullbox 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 95% relative compaction of the bottom of the trench.
- All concrete shall be Class A (25MPa, minimum).
- Rebars shall be Grade 300 and all lapped splices shall be 360 mm minimum.
- The #57 or #67 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),
- Ties (pull box location) is to center of pull box.
- Precast pull boxes shall be set on six (6) inches of level, 95% compacted crushed rock fill, 3/4 inch to one (1) inch size, extending twelve (12) inches beyond the pull box on each side. Granular fill shall be compacted by a minimum of four passes with a plate type vibrator.



TYPE "A" PULLBOX (OLD TYPE "B")
No Scale



All dimensions on this sheets are in millimeters unless otherwise noted.



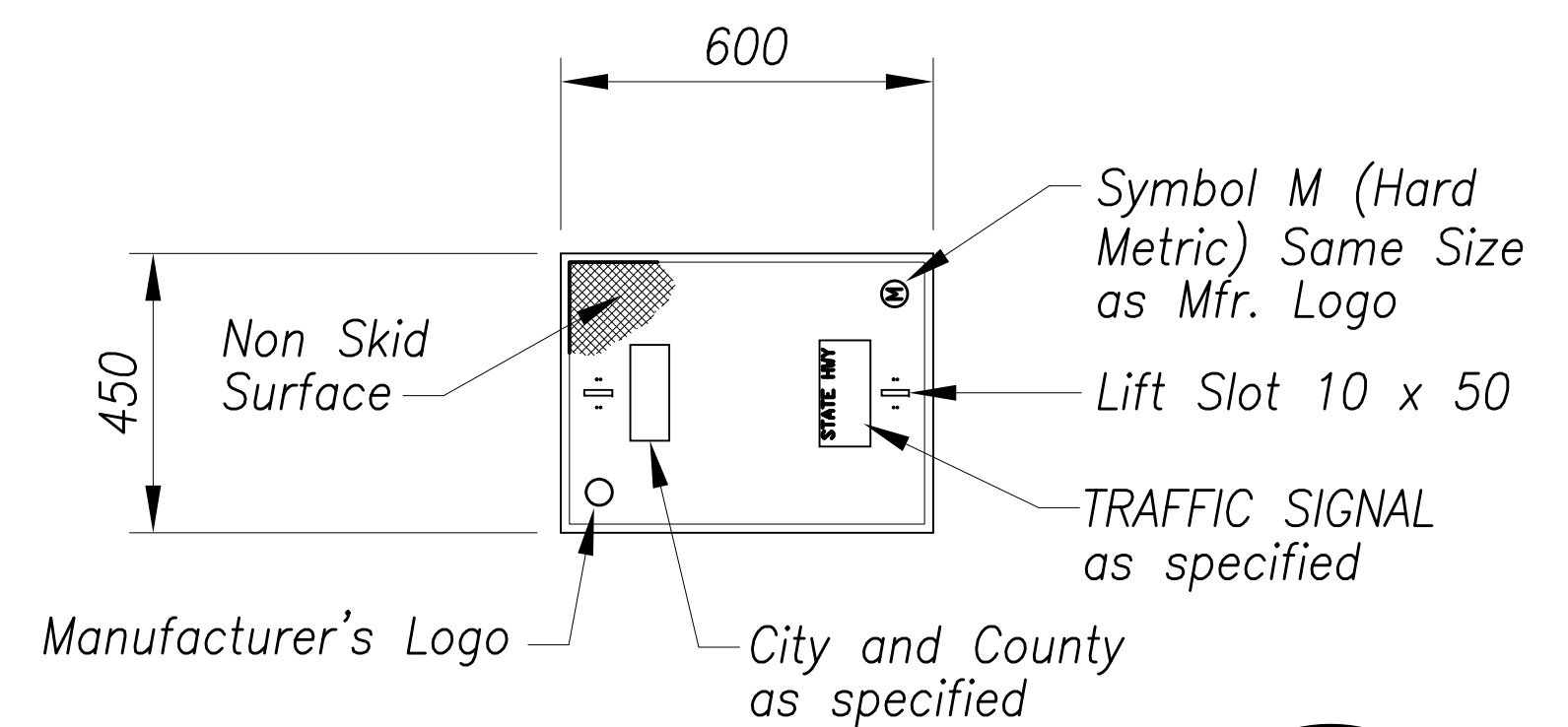
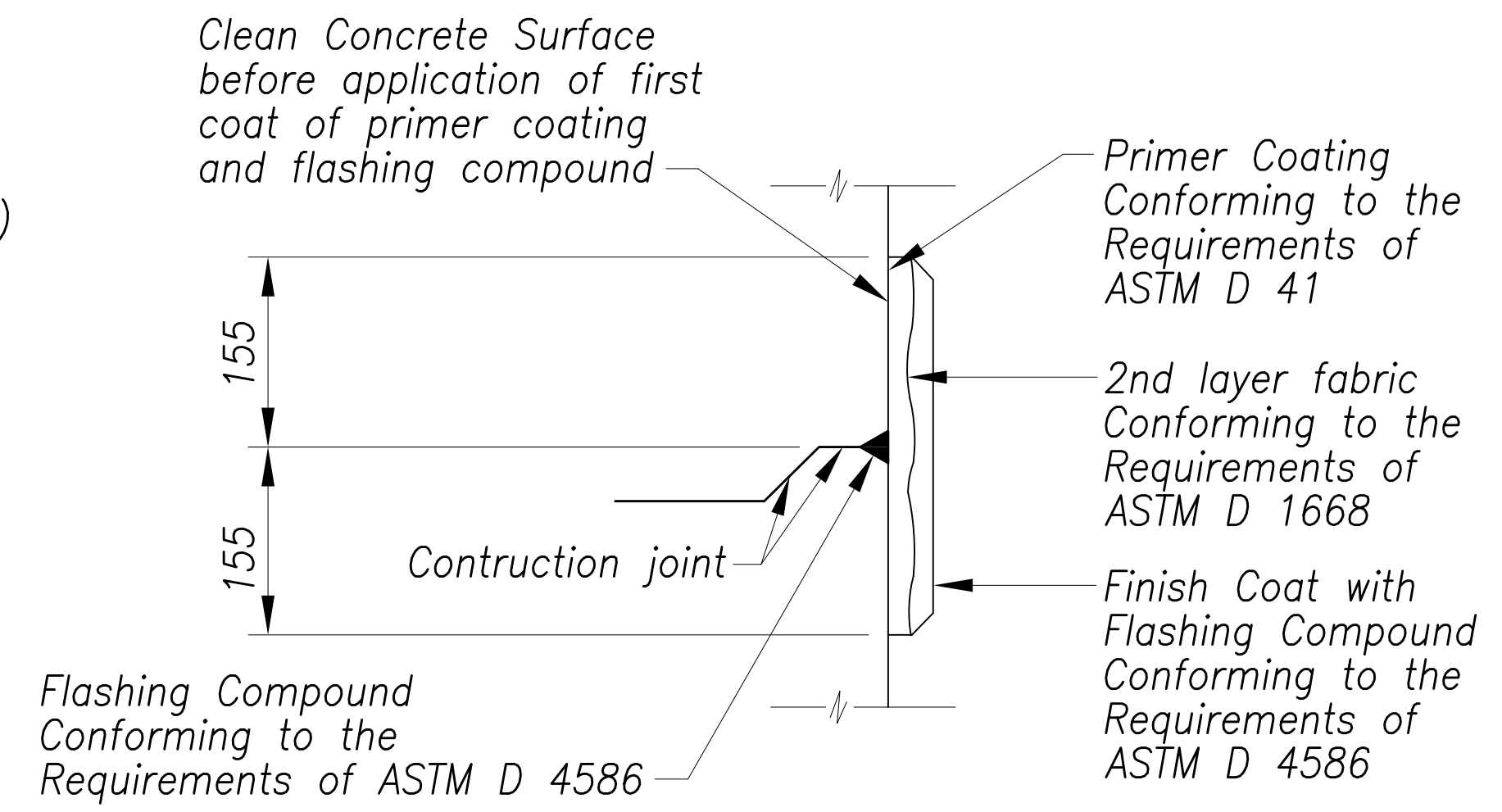
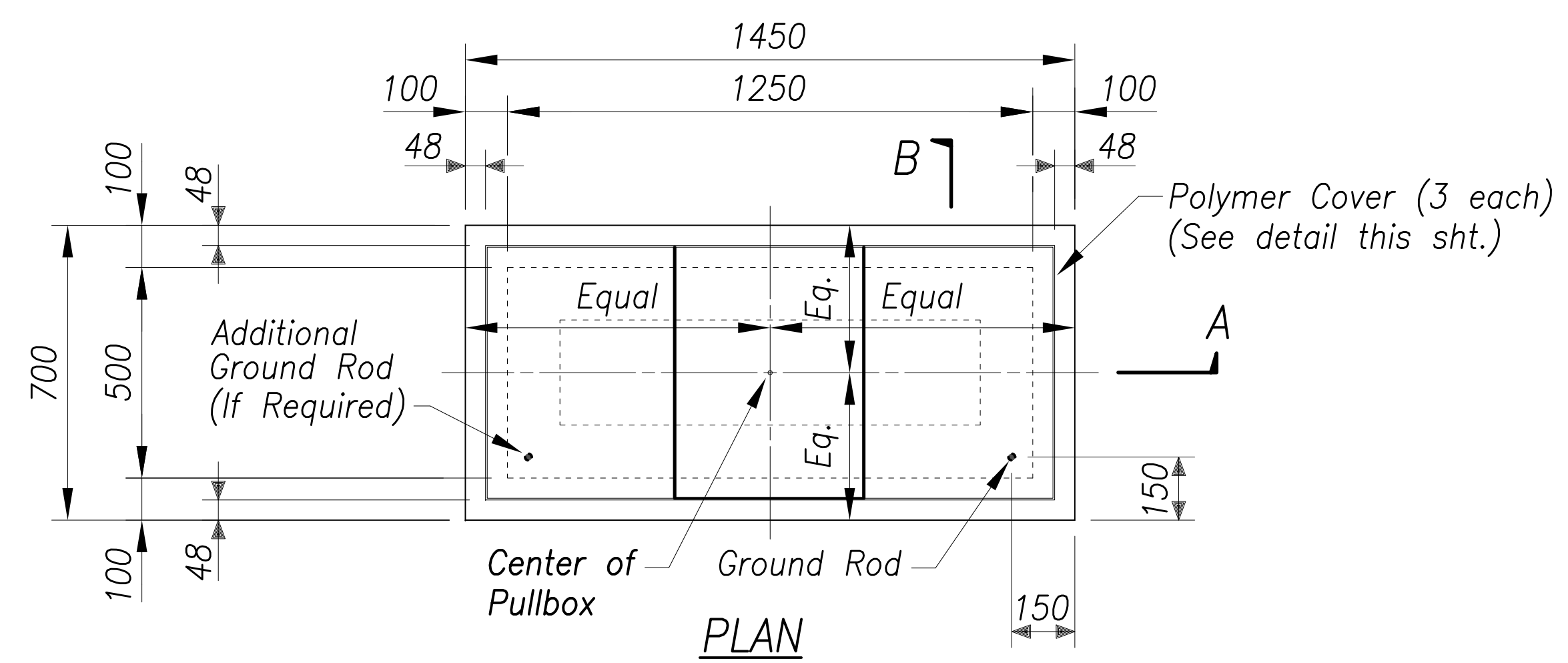
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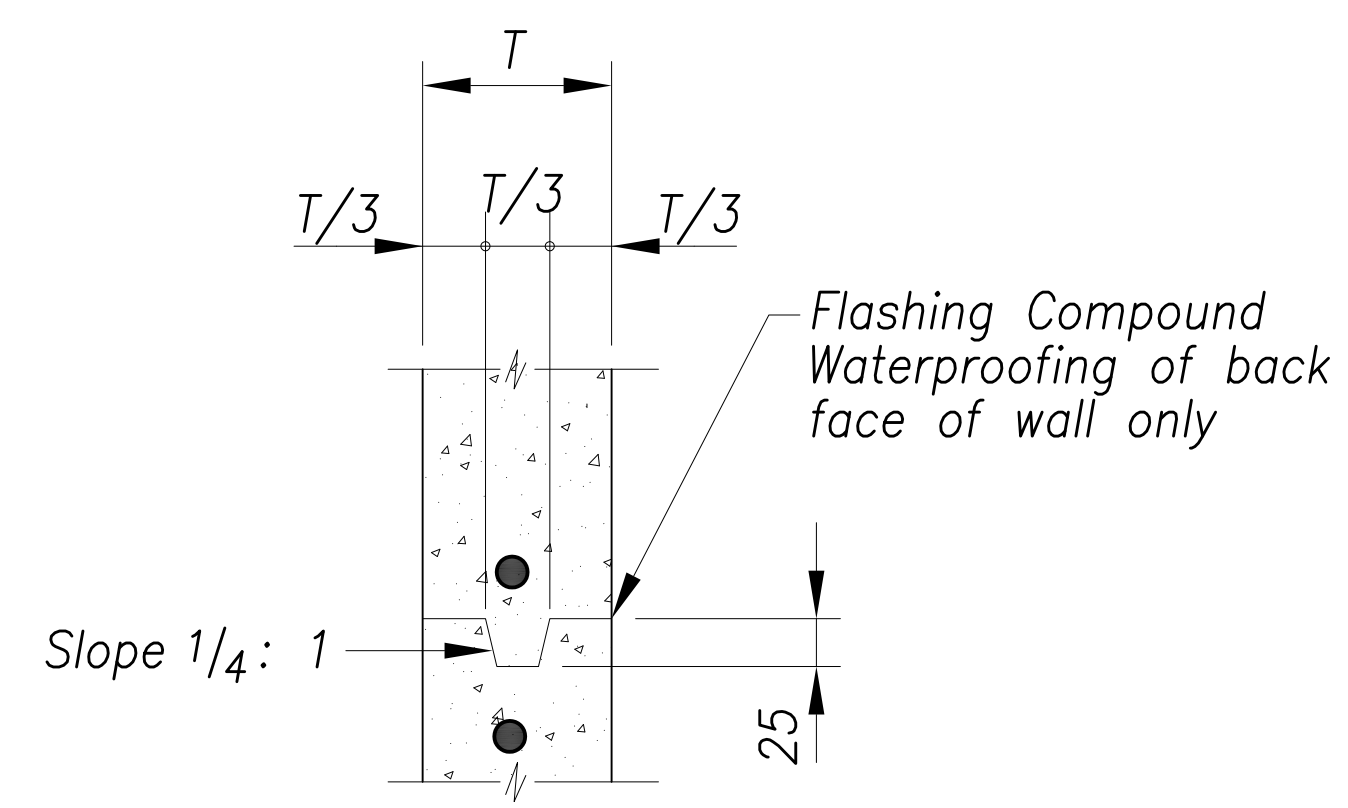
MISCELLANEOUS DETAILS

Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)R
Scale: No Scale Date: Oct. 2020
SHEET No. TS-110 OF 113 SHEETS

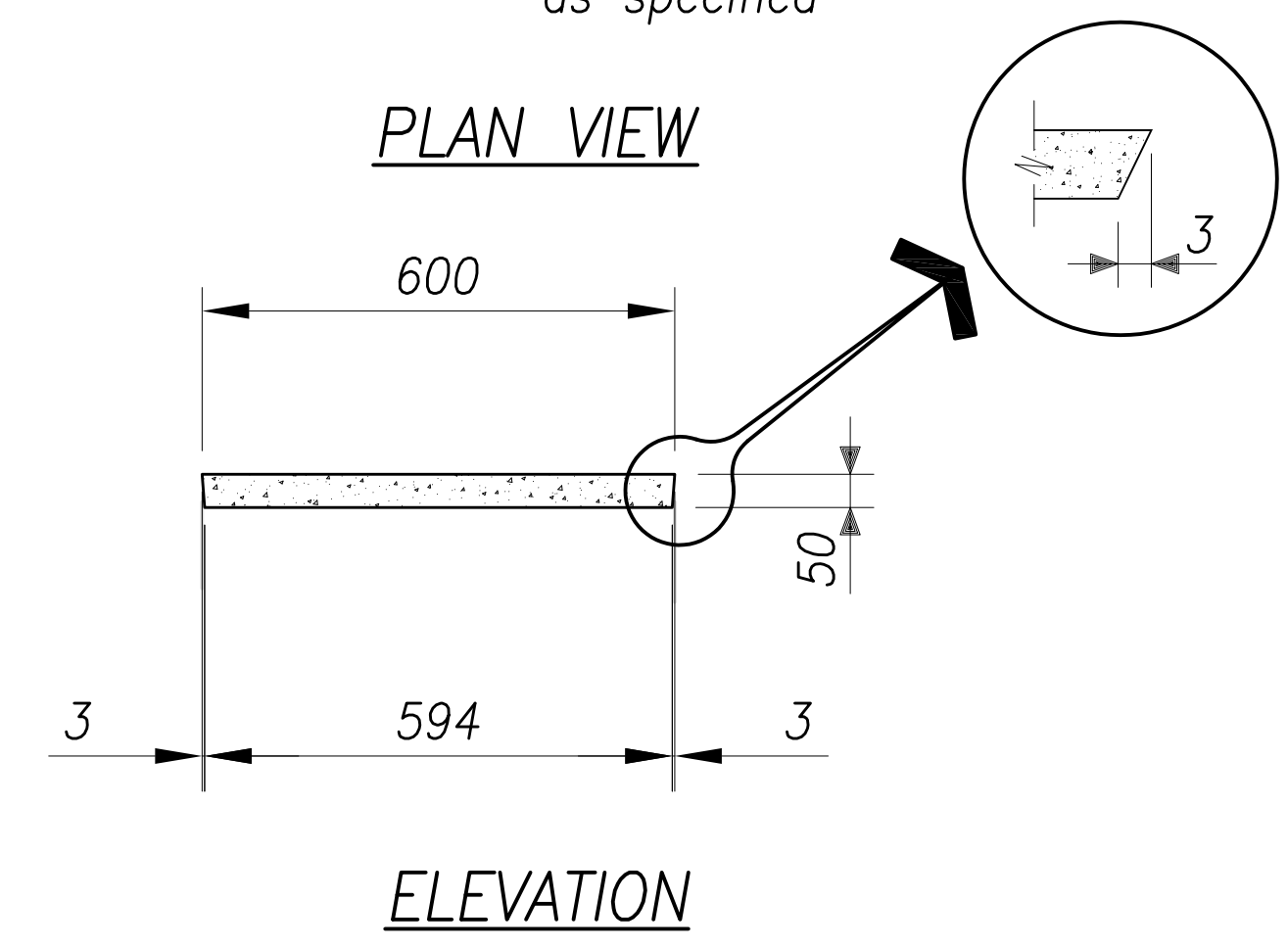
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)R	2020	214	291



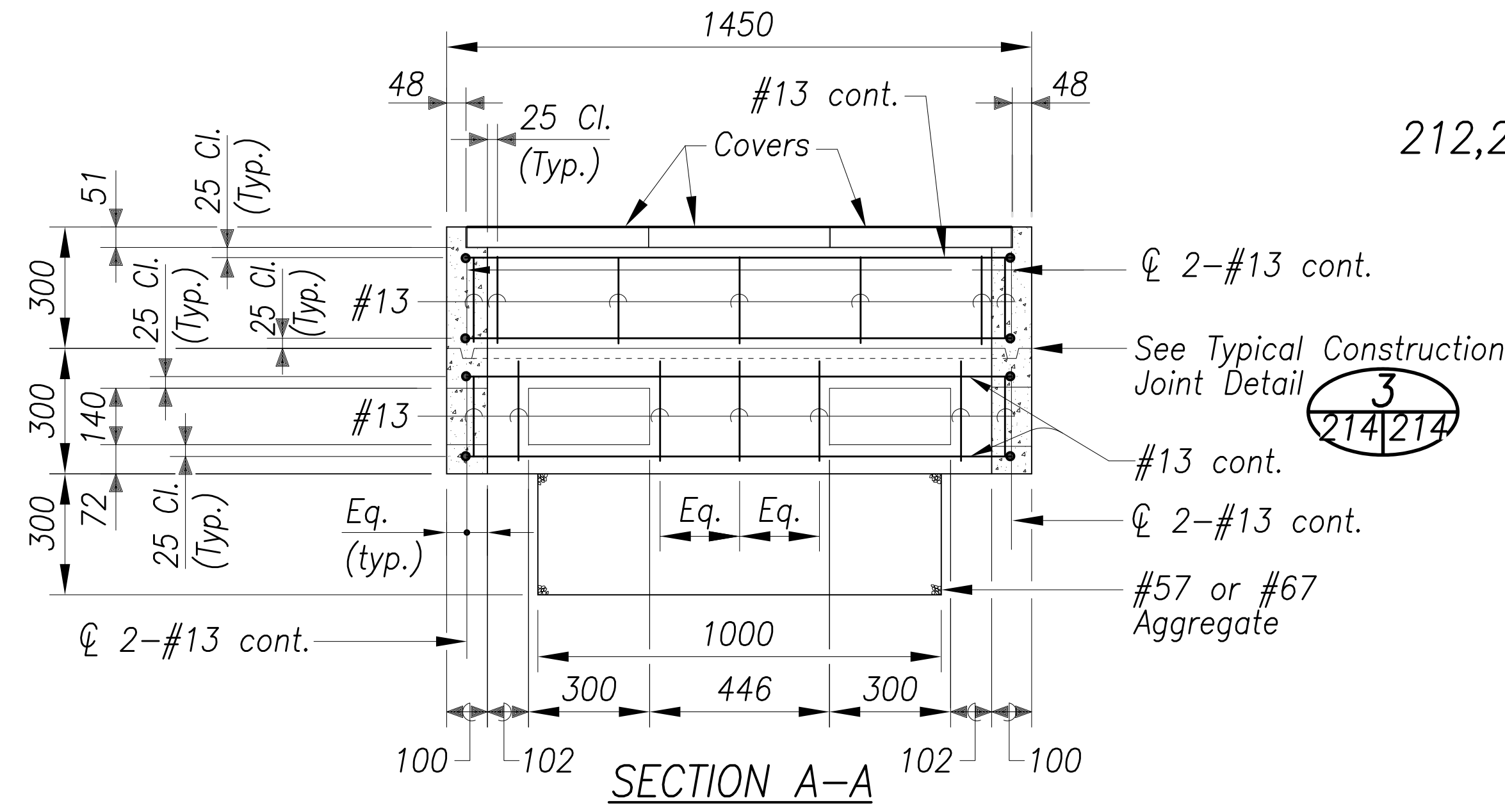
2 TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS
212,213,214|214|
No Scale



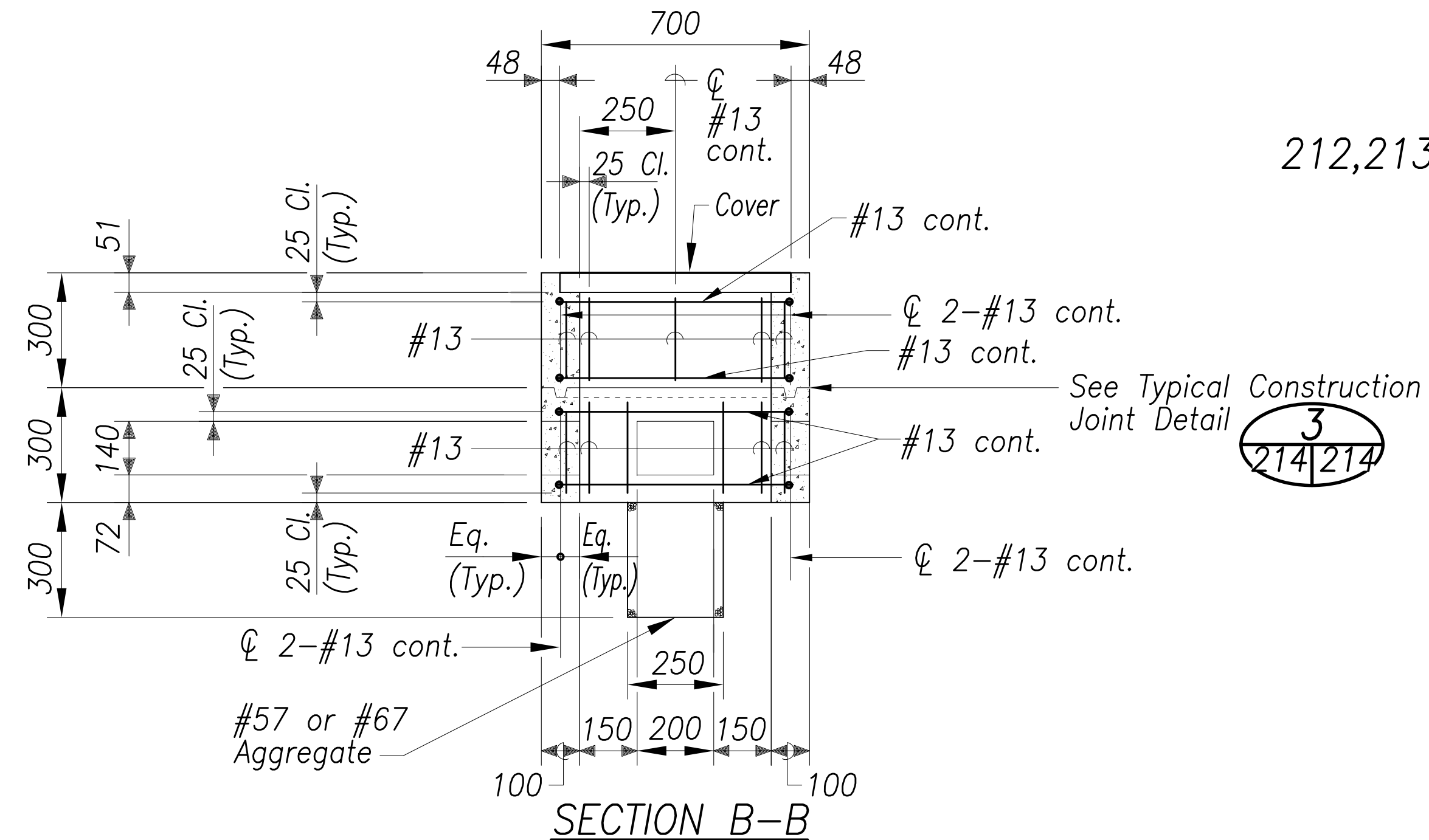
4 POLYMER CONCRETE COVER
212,213,214|214|
No Scale



3 TYPICAL CONSTRUCTION DETAIL
212,213,214|214|
No Scale

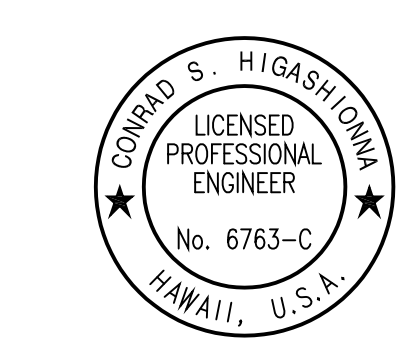


1 TYPE "C" PULLBOX (OLD TYPE "D")
214|214|
No Scale



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N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\214 Pullbox Details 3.dwg

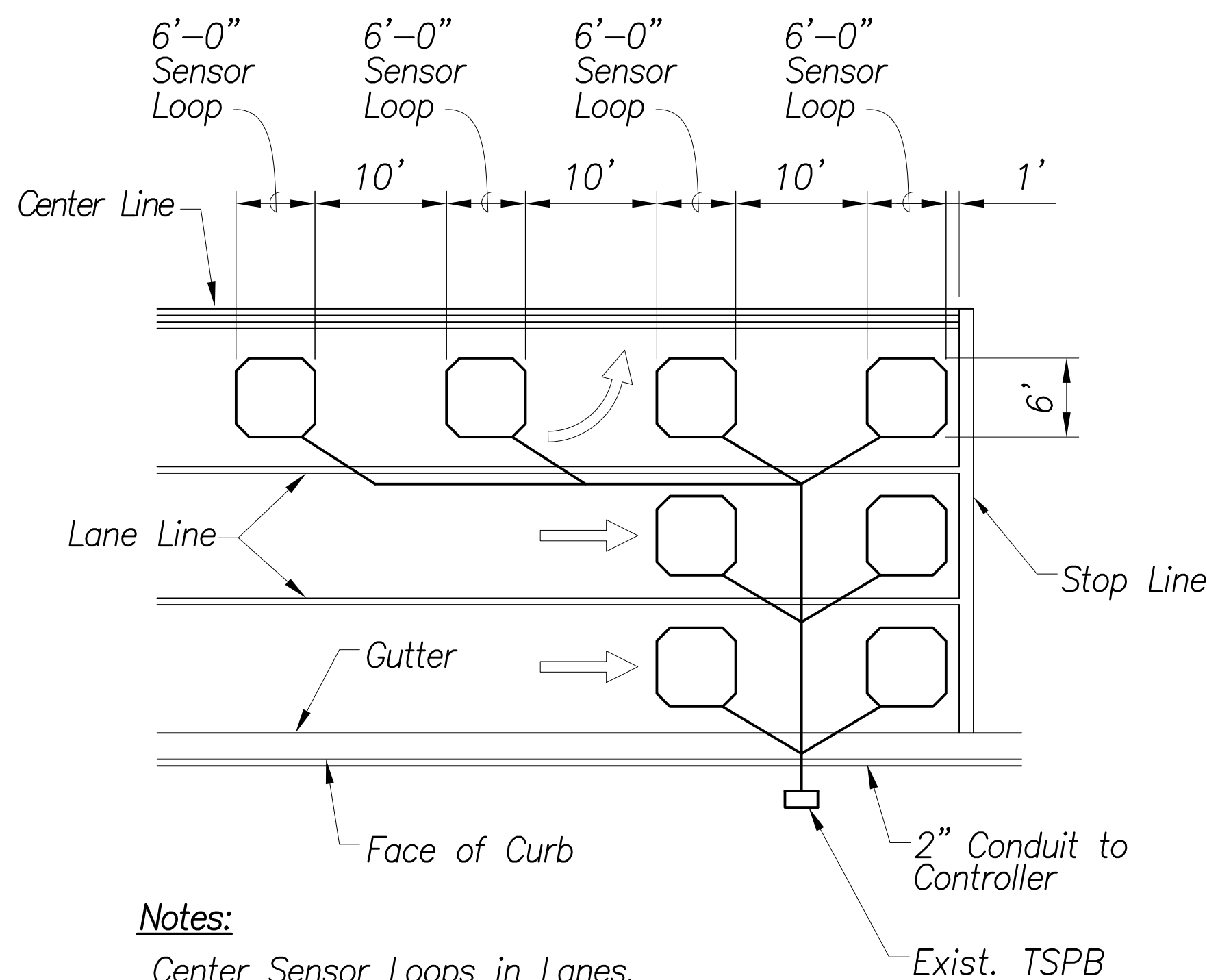


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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
MISCELLANEOUS DETAILS
Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)R
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SHEET No. TS-112 OF 113 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(163)R	2020	215	291



Notes:

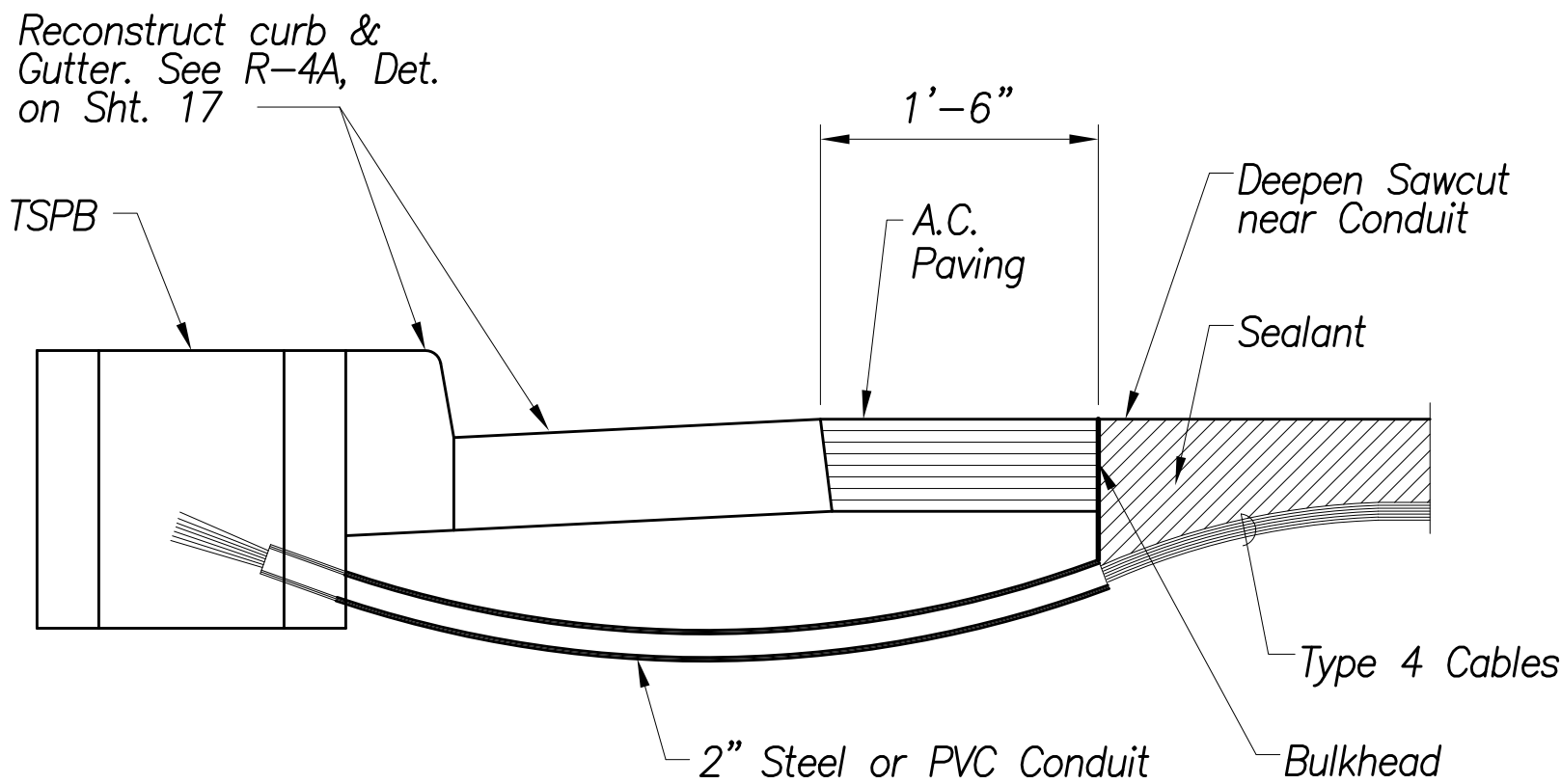
Center Sensor Loops in Lanes.

Collector Cables shall be Twisted 2 Turns Per Foot.

Number of Loops and Location Vary. See Project Plans.

Number and Locations of Collector Sawcuts may be Varied in the Field to Suit.

TYPICAL SENSOR LOOP LAYOUT
No Scale



Notes on Construction at End of Sawcut

Seal Roadway end of Conduit after installaton of Conductors.

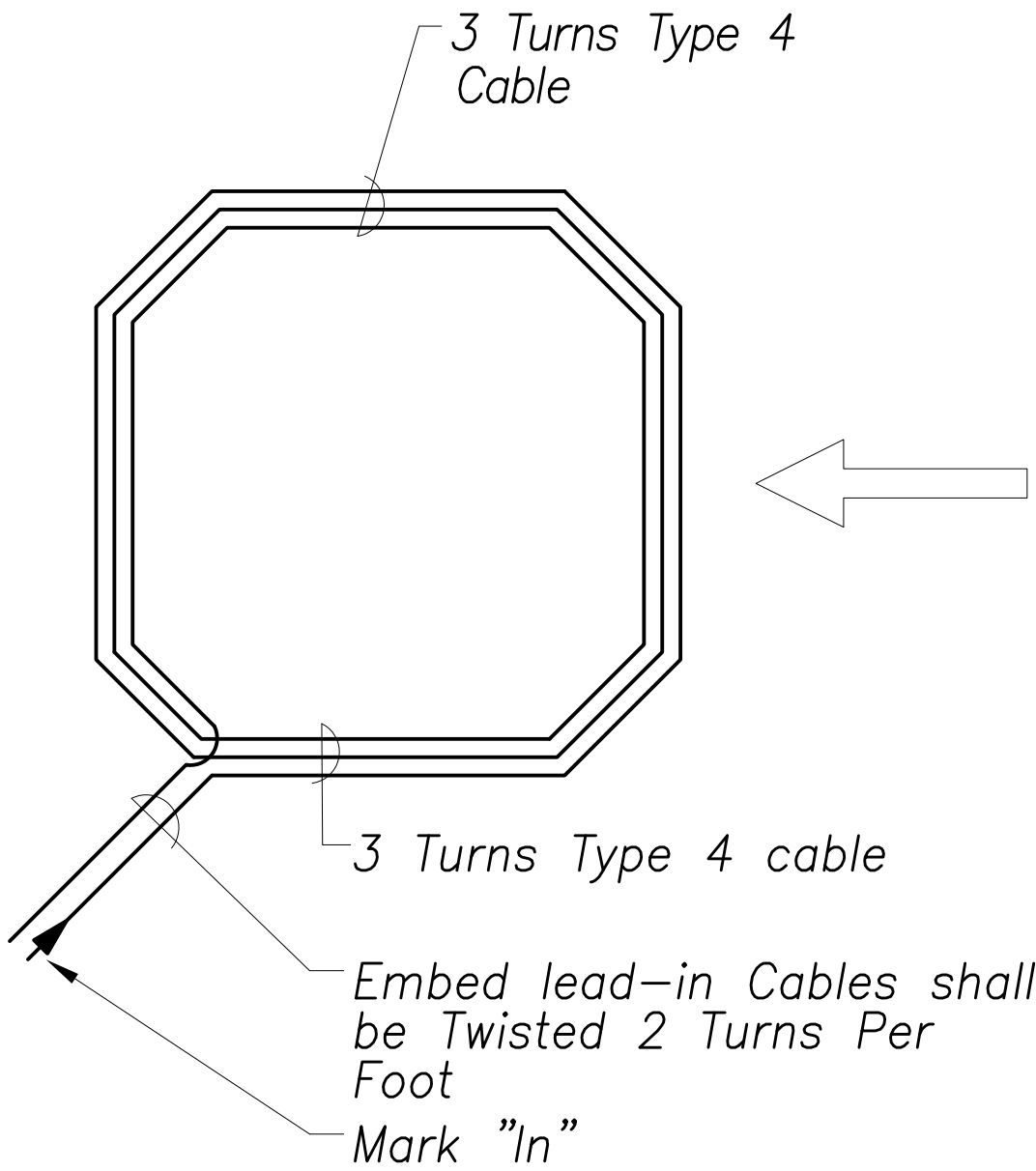
Install Bulkhead Across Conduit Trench.

Place Hot Tar or Approved Sealant in Sawcut.

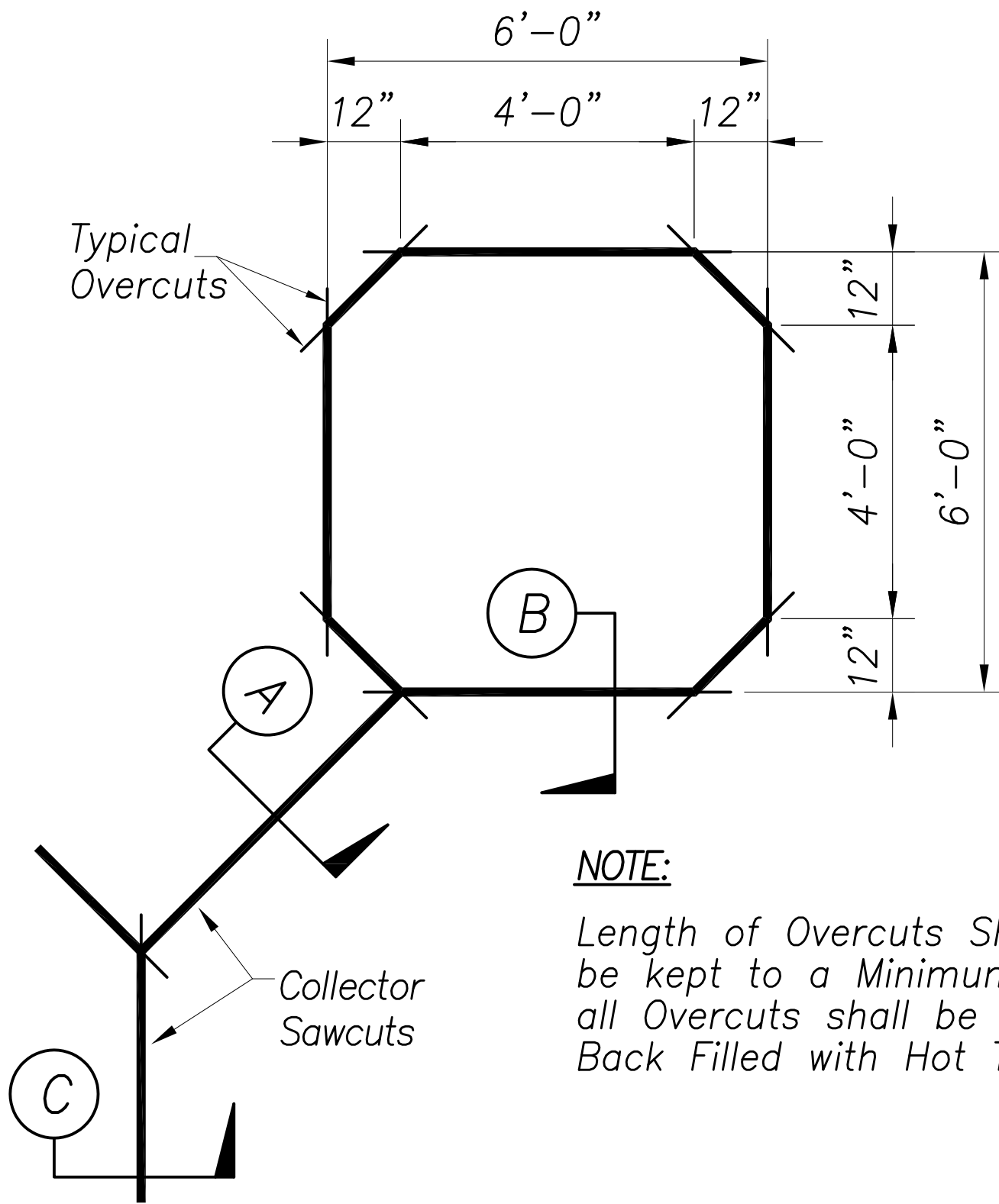
Backfill over Conduit with New A.C.

Reconstruct Curb and Gutter as Required. See R-4A Detail on Sht. 17.

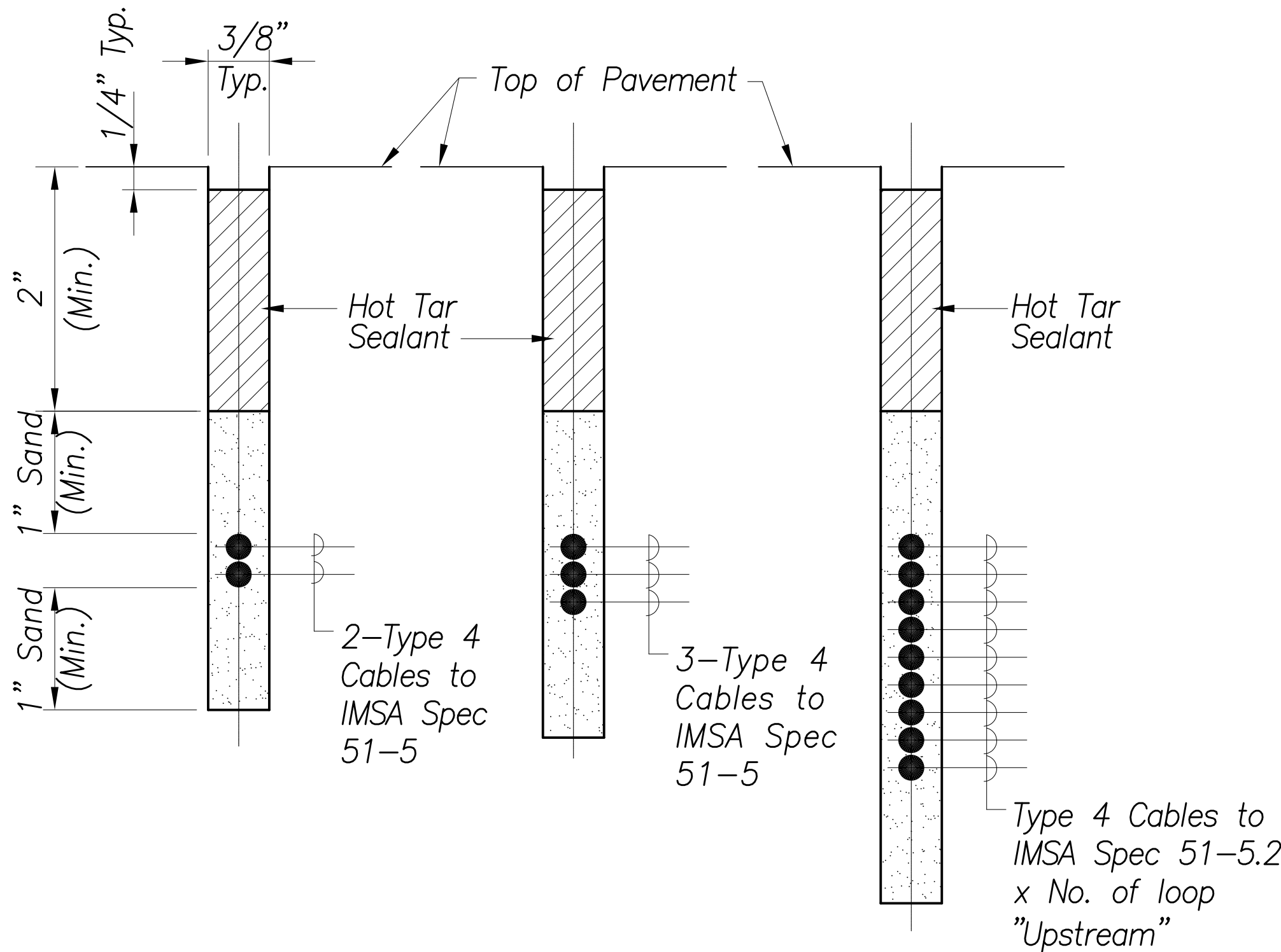
DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF ROADWAY
No Scale



TYPICAL SENSOR LOOP WIRING DIAGRAM
No Scale



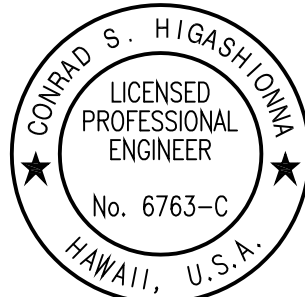
TYPICAL SENSOR LOOP SAWCUT DETAIL
No Scale



Section A Section B Section C

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N:\CAO\DWG\2015\1512-Traffic Signal Modernization @ Various Locations P&E\FINAL\215 Loop Detector Details.dwg



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MISCELLANEOUS DETAILS

Traffic Signal Modernization, Oahu, Phase 1
Federal-Aid Project No. STP-0300(163)R
Scale: No Scale Date: Oct. 2020
SHEET No. TS-113 OF 113 SHEETS