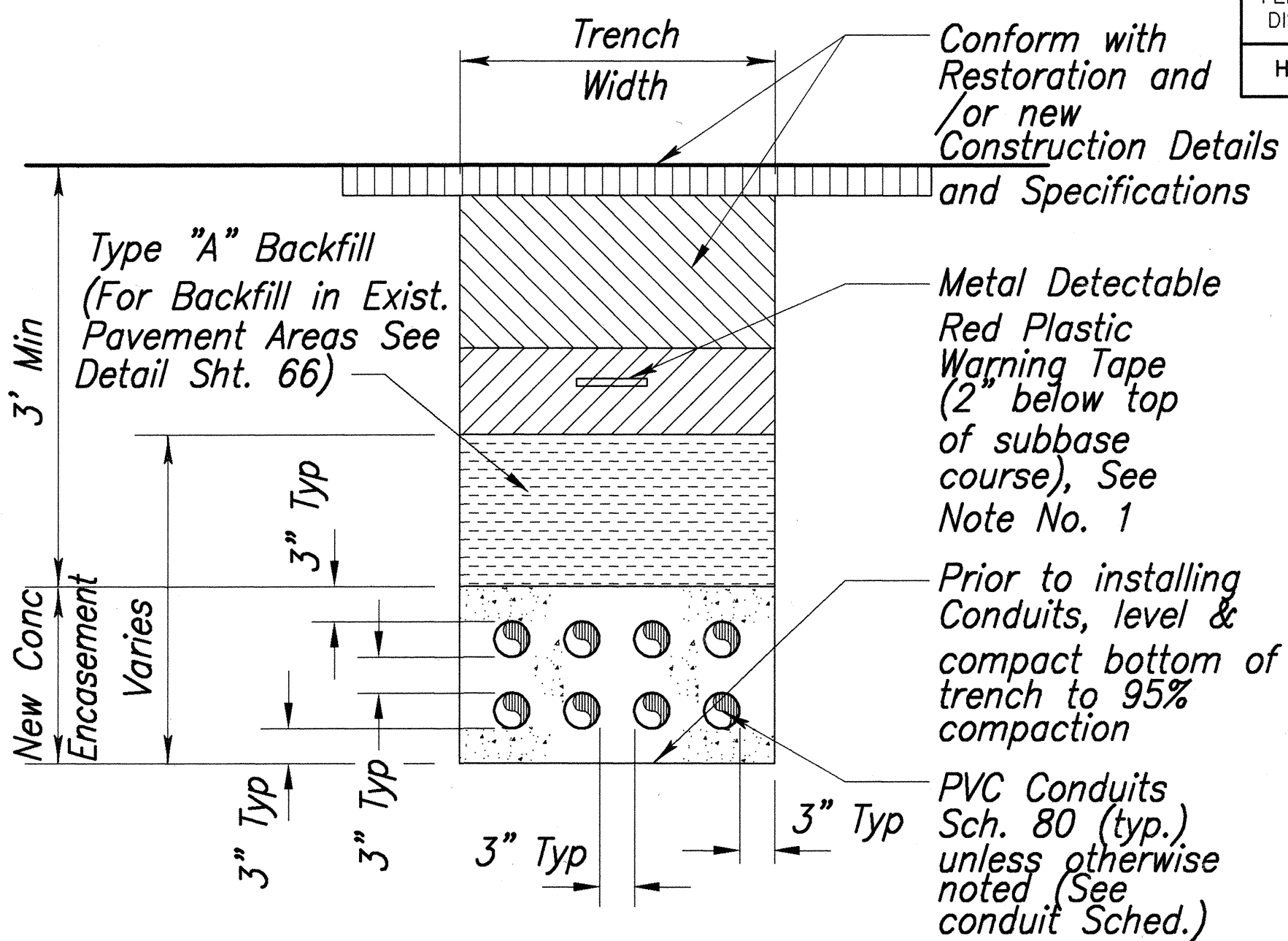
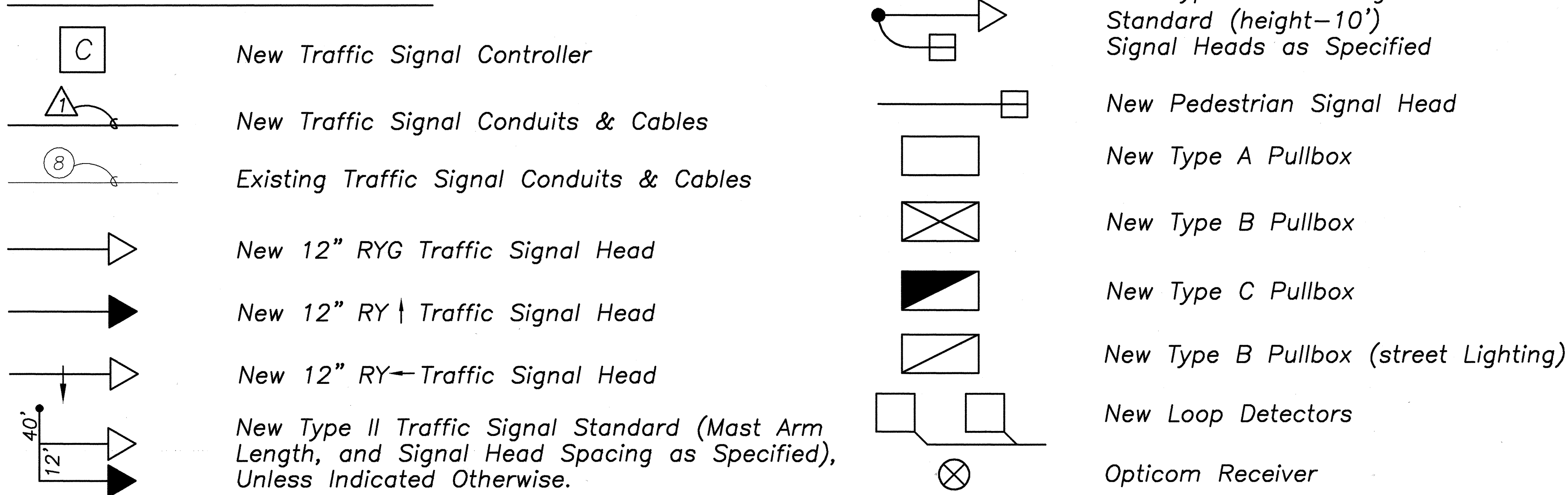


TRAFFIC SIGNAL NOTES

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 Control 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 Contractor Shall Install One Meter Socket and 50 Amp. Breaker as Shown On the Plans in Accordance With MECO Requirements. The Meter Shall Be Mounted On Concrete Pedestal. Between 5 Feet and 6 Feet Above Ground. For Details, See Electrical Drawings Meter Socket Shall Be 4-Prong, Complete With a Manual Circuit Closing Device.
7. 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.
8. 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.
9. 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.
10. 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.
11. Installation of the Opticum Receiver Shall Conform to the Standard Details and Standard Specifications of the State Department of Transportation.
12. All Work Relating to Hawaiian Telephone Shall Be Done in Accordance With HTCO's Underground Specifications, Dated May 1992.
13. Provide All New Non-programmable Signal Heads With LED Signal Assemblies. Retrofit Existing Non-programmable Traffic and Pedestrian Signal Heads to Remain or to Be Reused With LED Signal Assemblies.
14. Traffic Signals, Traffic Standards and Mast Arms Shall Conform with Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 2001, 4th Edition for 105 mph winds.

TRAFFIC SIGNAL LEGENDS



TRAFFIC SIGNAL SYSTEM
CONDUIT TRENCH SECTION
Not to Scale

NOTES:

1. 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 1 1/2" inches series "C" black lettering. The message will be repeated with a 4 1/2" spacing between top line of message and start of next repeat. Tape shall be considered incidental to ductline cost.
2. The Contractor may begin backfilling the conduit trench when the concrete reaches 2000 psi compressive strength after 3 days.
3. Maximum four (4) Conduits per row for multiple conduit duct section.
4. 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.

DANIEL S. MIYASATO

LICENSED PROFESSIONAL ENGINEER

No. 3443-C

HAWAII U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SATO & ASSOCIATES, INC.

STATE OF HAWAII

DEPARTMENT OF TRANSPORTATION

HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

MOKULELE HIGHWAY WIDENING

Vicinity of Cane Haul Road

To

Maui Humane Society

Federal - Aid Project No. NH-0311(5)

Scale: AS NOTED

Date: JUNE 2002

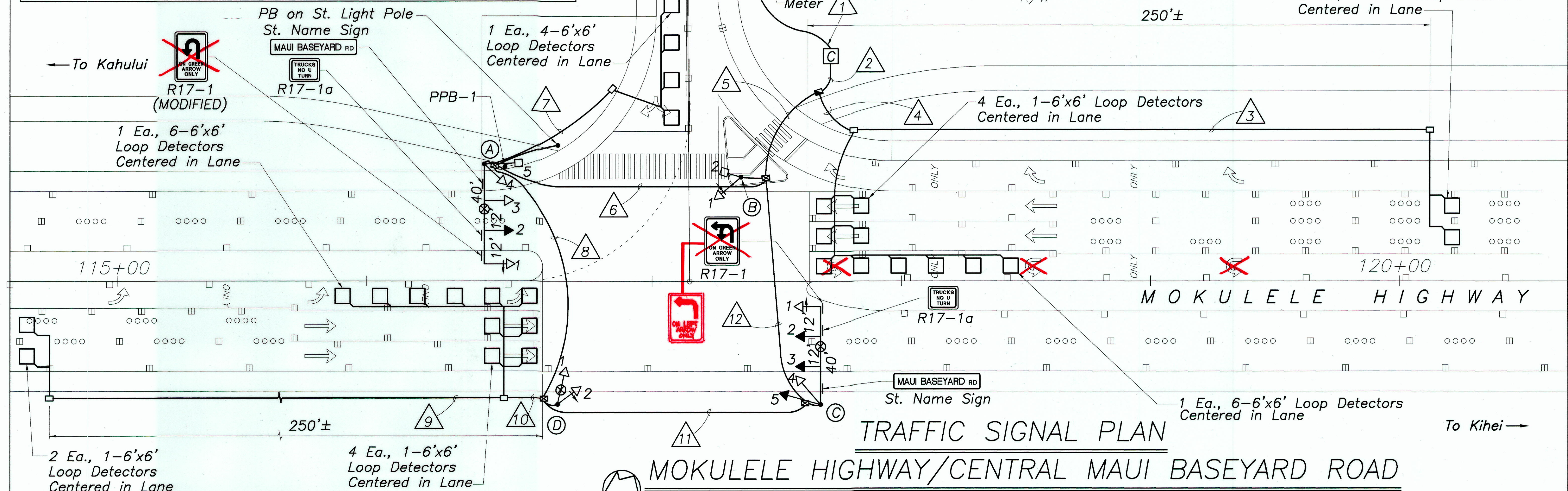
SHEET No. 1 OF 8 SHEETS

112

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	113	189

TRAFFIC SIGNAL HEAD SCHEDULE				
Traffic Signal Head Type and Description				
Pole Letter Signal Head Number	A-3 A-4 C-4 D-1	A-2 C-2 C-3 C-5	A-1* B-1 C-1* D-2	A-5 B-2

* Programmed Visibility Signals



TRAFFIC SIGNAL PLAN

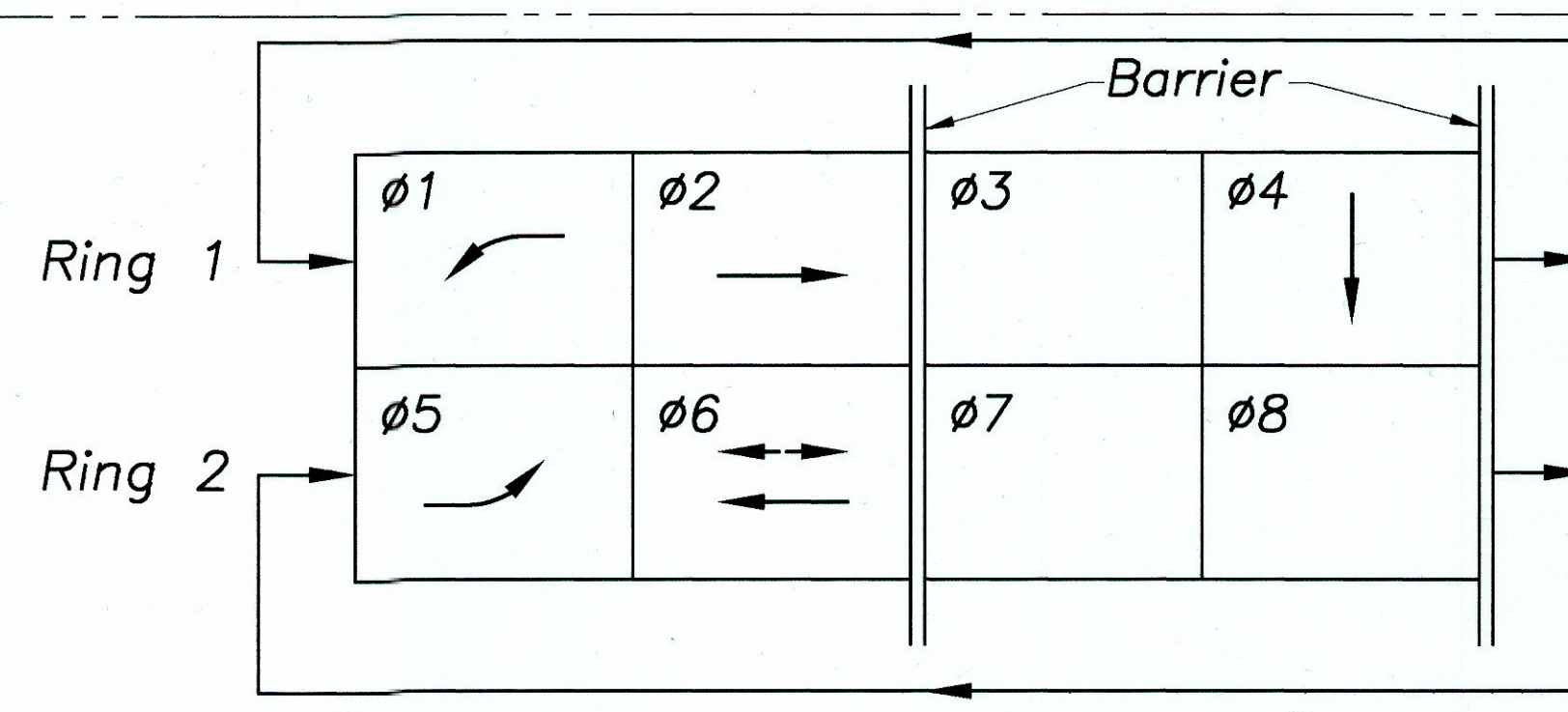
MOKULELE HIGHWAY/CENTRAL MAUI BASEYARD ROAD

SCALE: 1"=20'

TRAFFIC SIGNAL SYSTEM CONDUIT AND CABLE SCHEDULE

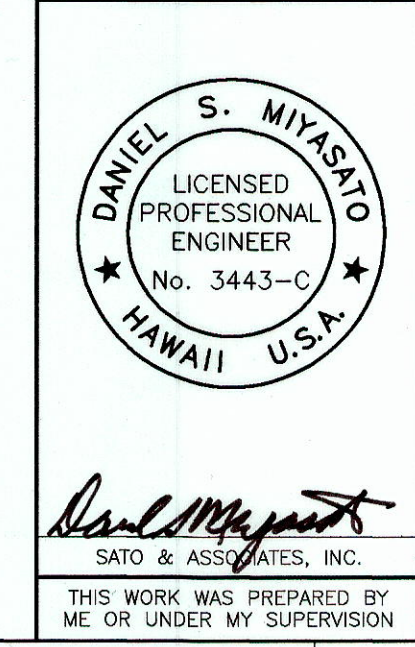
	Delta Item No. (Δ)											
	1	2	3	4	5	6	7	8	9	10	11	12
Quantity of 2" Conduit, See Note No. 1	1	8	1	1	8	4	1	3	1	1	4	5
Quantity of 3/C #6 Power Cable & #8 Ground	1											
Quantity of 26/C #14 Control Cable	4				4	2		2			2	2
Quantity of 2/C #14 Shielded Loop Detector and Pedestrian PB Cable	10	1	3	7	3	1		1	3	3	3	
Quantity of 3/C #20 Shielded Opticom Receiver Cable	3				3	1					1	2
Concrete Jacket	✓	✓			✓	✓	✓					✓

Note: 1. All Conduits Shall Be Schedule 80 PVC, Unless Otherwise Noted.



PHASE DIAGRAM

"AS-BUILT"



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

MOKULELE HIGHWAY WIDENING
Vicinity of Cane Haul Road

To
Maui Humane Society

Federal - Aid Project No. NH-0311(5)
Scale: 1"=20' Date: JUNE 2002

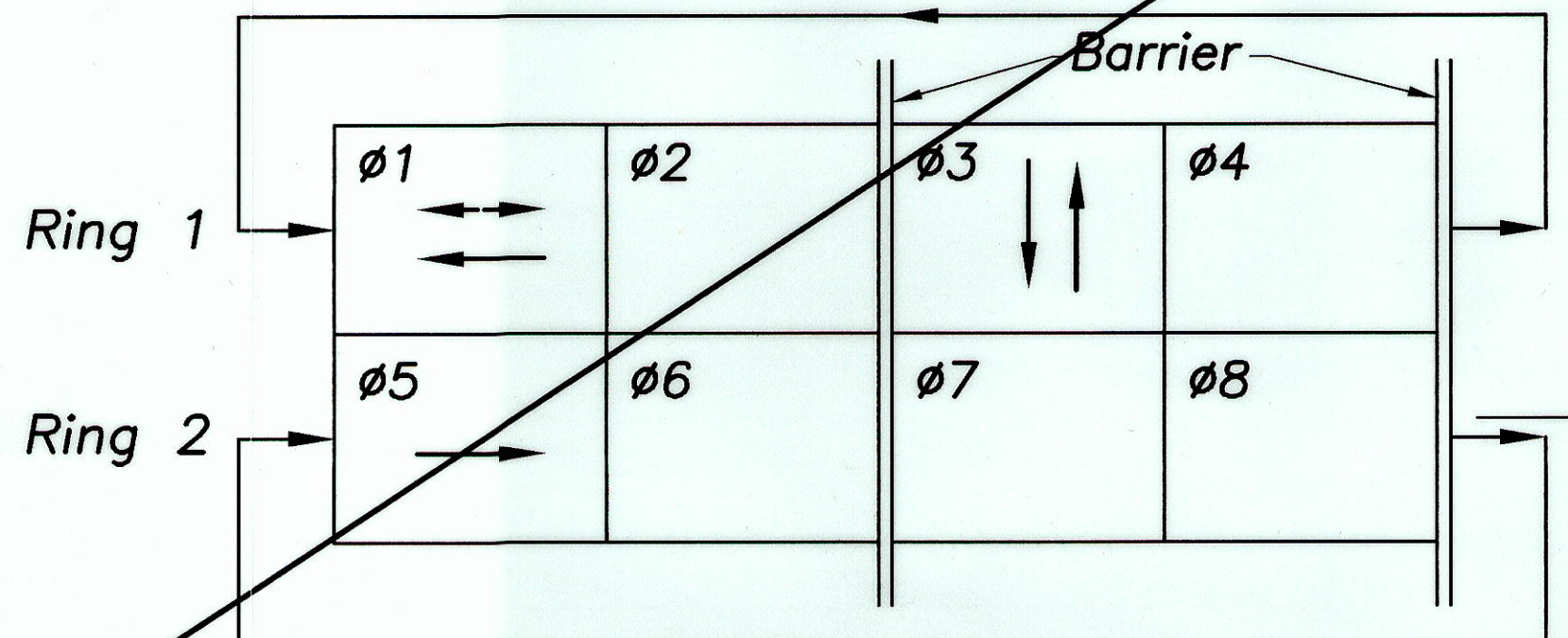
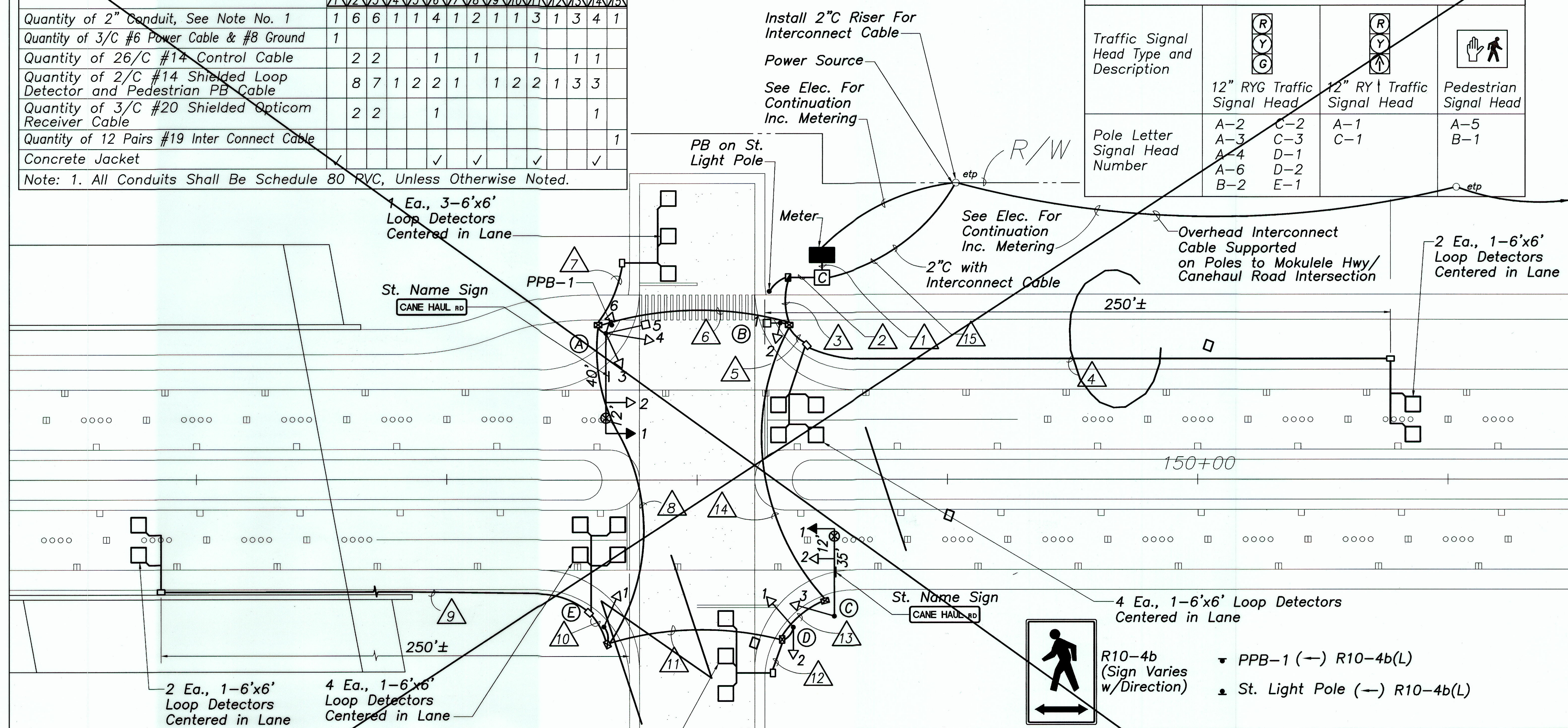
SHEET No. 2 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	114	189

TRAFFIC SIGNAL SYSTEM CONDUIT AND CABLE SCHEDULE	Delta Item No. (Δ)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Quantity of 2" Conduit, See Note No. 1	1	6	6	1	1	4	1	2	1	1	3	1	3	4	1
Quantity of 3/C #6 Power Cable & #8 Ground	1														
Quantity of 26/C #14 Control Cable	2	2				1		1			1		1	1	
Quantity of 2/C #14 Shielded Loop Detector and Pedestrian PB Cable	8	7	1	2	2	1			1	2	2	1	3	3	
Quantity of 3/C #20 Shielded Opticom Receiver Cable	2	2				1								1	
Quantity of 12 Pairs #19 Inter Connect Cable															1
Concrete Jacket							✓	✓			✓			✓	

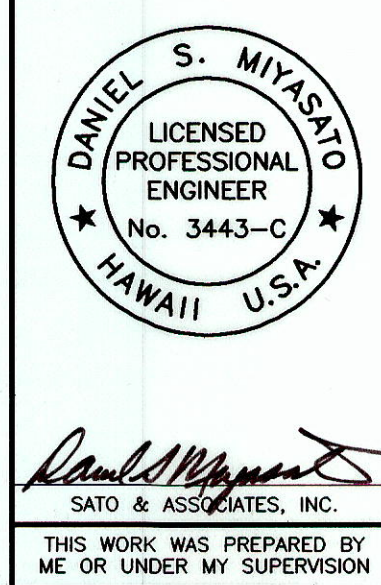
Note: 1. All Conduits Shall Be Schedule 80 PVC, Unless Otherwise Noted.

TRAFFIC SIGNAL HEAD SCHEDULE			
Traffic Signal Head Type and Description			
	12" RYG Traffic Signal Head	12" RY ↑ Traffic Signal Head	Pedestrian Signal Head
Pole Letter	A-2	A-1	A-5
Signal Head Number	A-3 A-4 A-6 B-2	C-3 D-1 C-1 D-2 E-1	B-1



TRAFFIC SIGNAL PLAN MOKULELE HIGHWAY/CANE HAUL CROSSING

SCALE: 1"=20'



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN
MOKULELE HIGHWAY WIDENING
Vicinity of Cane Haul Road
To
Maui Humane Society
Federal - Aid Project No. NH-0311(5)
Scale: 1"=20' Date: JUNE 2002

SHEET No. 3 OF 8 SHEETS

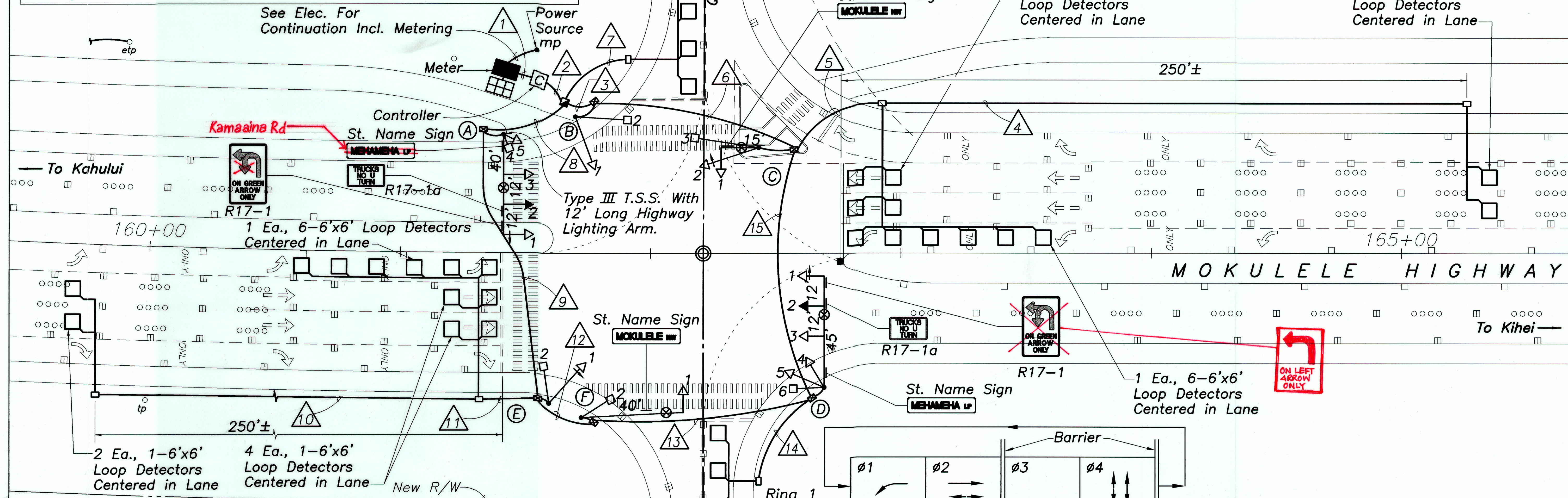
SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	

PROJ. NO.: M9901.00
2/26/02
R:\moku_ph2b\traffig\CANEHAUL.dwg

TRAFFIC SIGNAL HEAD SCHEDULE				
Traffic Signal Head Type and Description				
	12" RYG Traffic Signal Head	12" RYG Traffic Signal Head	12" RYG Traffic Signal Head	Pedestrian Signal Head
Pole Letter Signal Head Number	A-3 D-3 A-5 D-4 B-1 D-5 C-1 F-1	A-2 D-2	A-1* C-2 D-1* E-1	A-4 B-2 C-3 D-6 E-2 F-2

* Programmed Visibility Signals

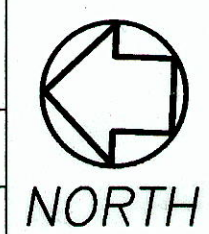
See Elec. For Continuation Incl. Metering



TRAFFIC SIGNAL SYSTEM CONDUIT AND CABLE SCHEDULE															
	Delta Item No. (Δ)														
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
Quantity of 2" Conduit, See Note No. 1	1	8	5	1	1	5	1	5	5	1	1	4	3	1	4
Quantity of 3/C #6 Power Cable & #8 Gnd.	1														
Quantity of 26/C #14 Control Cable		4	2			2		2	2			2	2		2
Quantity of 2/C #14 Shielded Loop Detector and Pedestrian PB Cable		15	7	1	3	6	1	7	5	1	3	1		1	2
Quantity of 12 Pairs #19 Interconnect Cable															
Quantity of 3/C #20 Shielded Opticom Receiver Cable		4	2			2		2	1			1			1
Concrete Jacket	✓					✓	✓		✓			✓		✓	✓

Note: 1. All Conduits Shall Be Schedule 80 PVC, Unless Otherwise Noted.

PHASE DIAGRAM



TRAFFIC SIGNAL PLAN MOKULELE HIGHWAY/MEHAMEHA LOOP

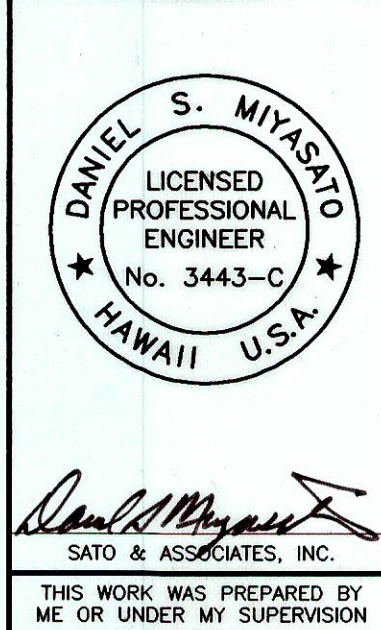
SCALE: 1"=20'

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	115	189

- Ⓐ (→) R10-4b(L)
- Ⓑ (→) R10-4b(R)
- Ⓒ (→) R10-4b(R)
- Ⓓ (→) R10-4b(L)
- Ⓔ (→) R10-4b(L)
- Ⓕ (→) R10-4b(L)

Ⓖ (→) R10-4b(L)

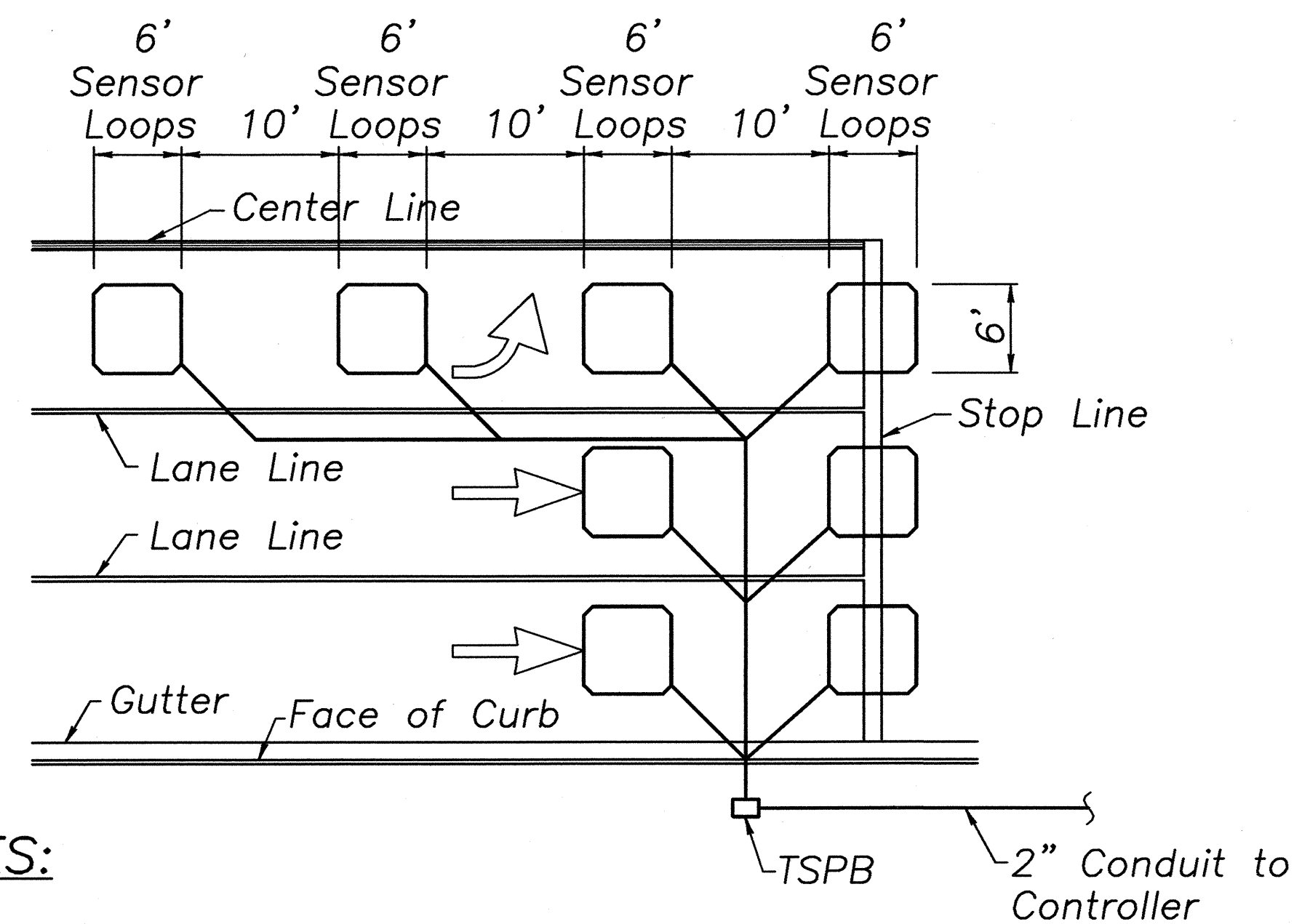


STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN
MOKULELE HIGHWAY WIDENING
Vicinity of Cane Haul Road
To Maui Humane Society
Federal - Aid Project No. NH-0311(5)
Scale: 1"=20' Date: JUNE 2002

SHEET No. 4 OF 8 SHEETS

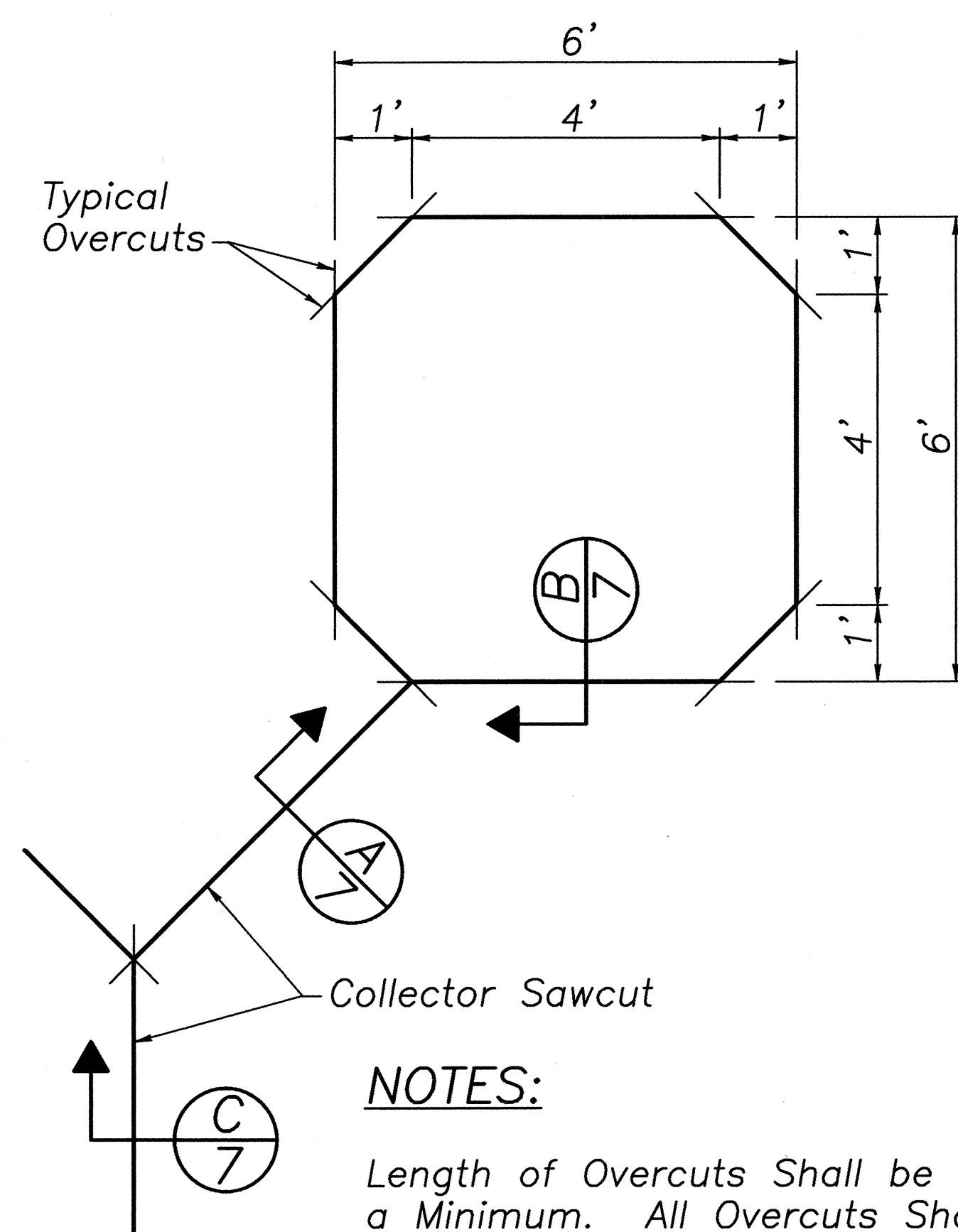
FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	116	189



NOTES:

- Center Sensor Loops in Lanes.
- Collector Cables Shall Be Twisted 2 Turns Per Foot.
- Number and Loops and Locations Vary. See Project Plans.
- Number and Locations of Collector Sawcuts May Be Varied in the Field to Suit.

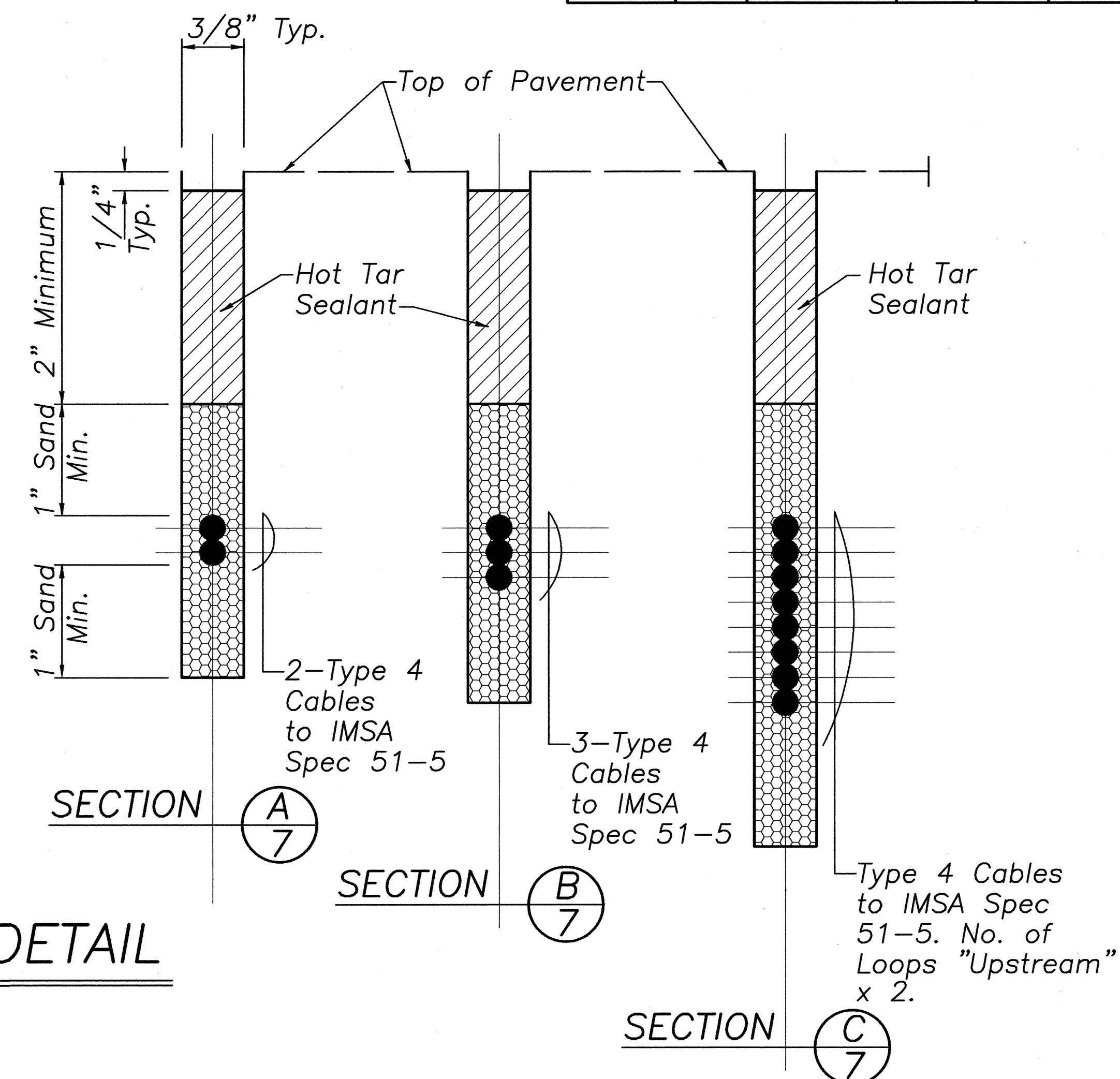
TYPICAL SENSOR LOOP LAYOUT



NOTES:

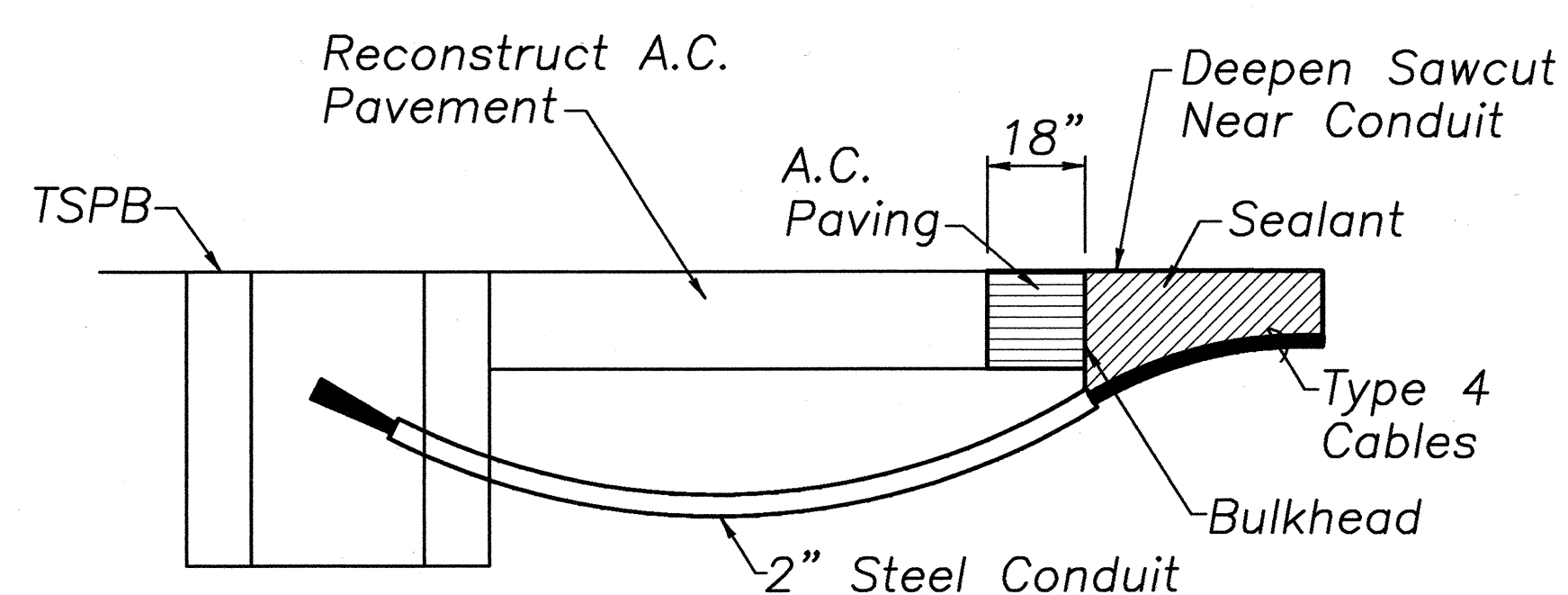
Length of Overcuts Shall be Kept to a Minimum. All Overcuts Shall be Back Filled With Hot Tar.

TYPICAL SENSOR LOOP SAWCUT DETAIL



TYPES OF CABLE

- | | |
|--------|---|
| 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. 19, 12 Pairs |
| Type 4 | Loop Sensor Cable: Stranded No. 12, Single Conductor to IMSA Spec 51-5 |
| Type 5 | Cable From Signal Loop to Signal Head: Stranded, No. 14, 4 Conductor |
| Type 6 | Service Cable: Solid, Size as Shown, 3 Conductors |

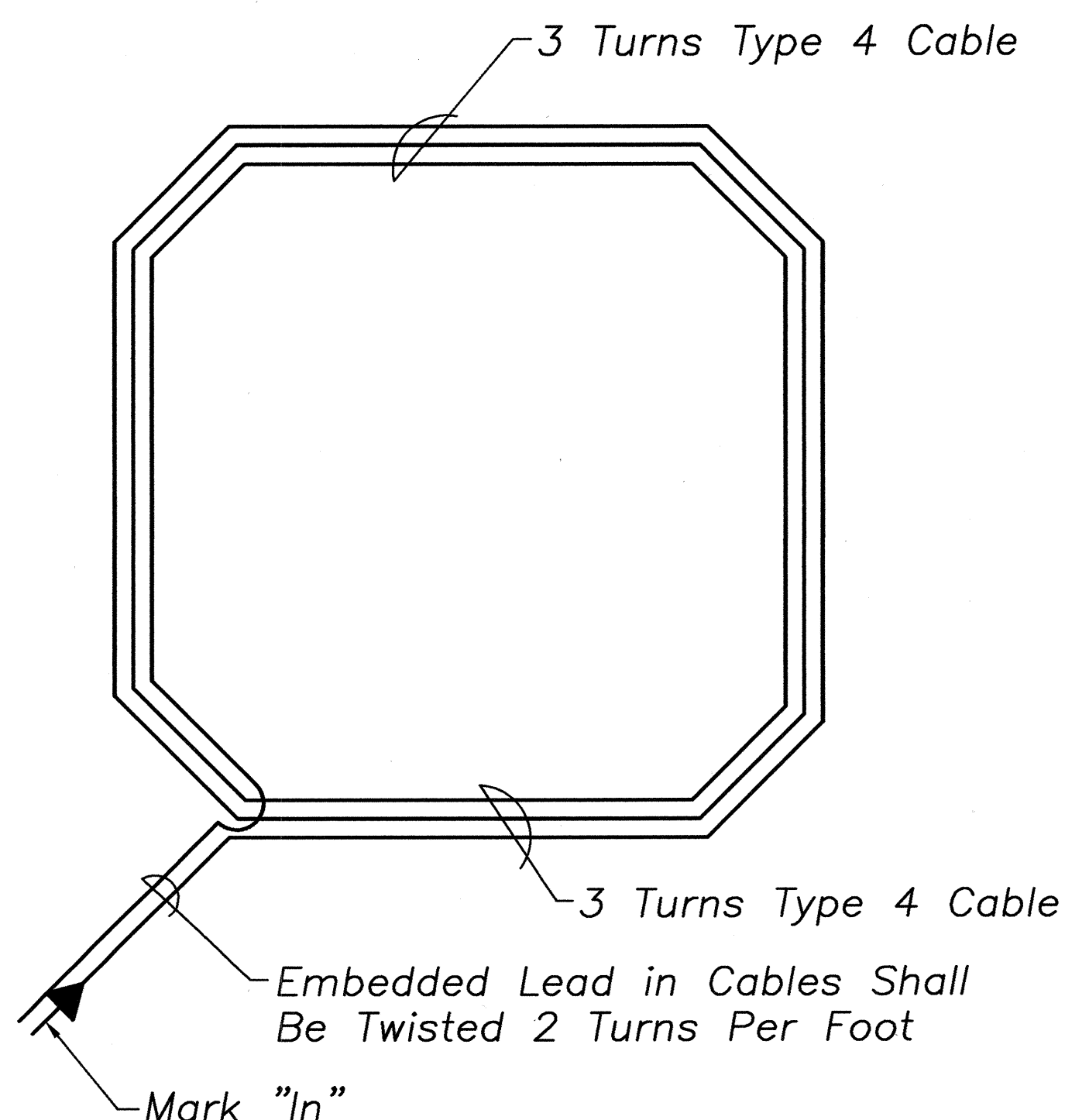


NOTES ON CONSTRUCTION AT END OF SAWCUT

- 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



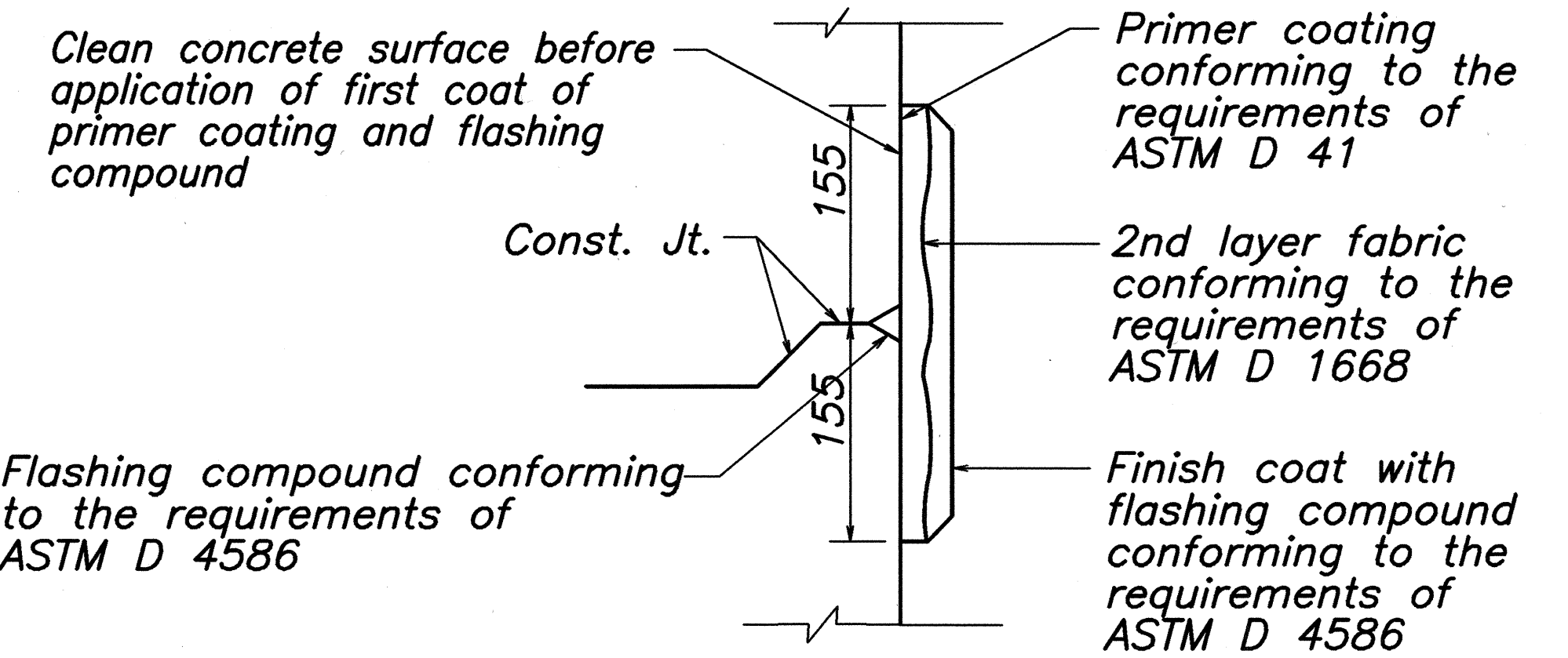
TYPICAL SENSOR LOOP WIRING DIAGRAM

	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TRAFFIC SIGNAL PLAN MOKULELE HIGHWAY WIDENING Vicinity of Cane Haul Road To Maui Humane Society Federal - Aid Project No. NH-0311(5) Scale: AS NOTED Date: JUNE 2002
	SHEET No. 5 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	117	189

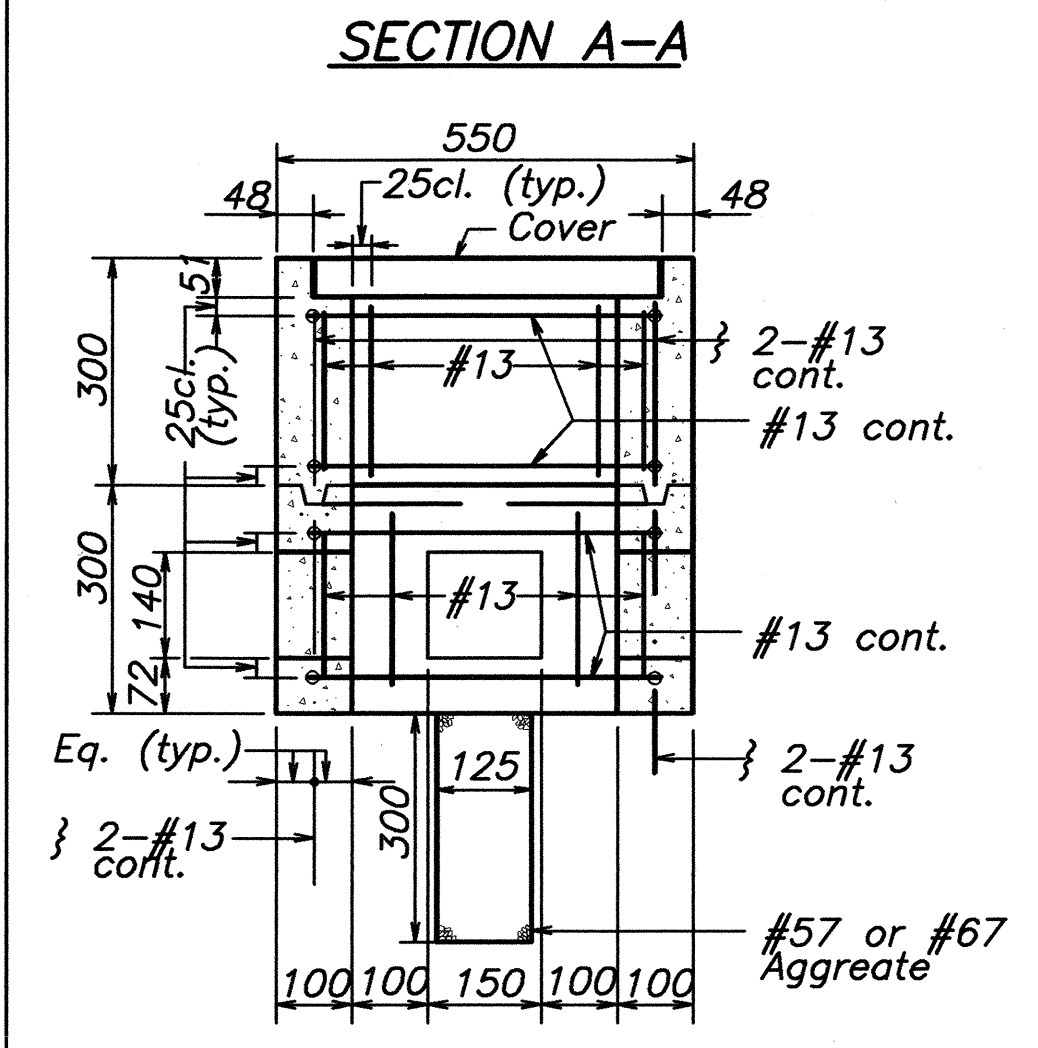
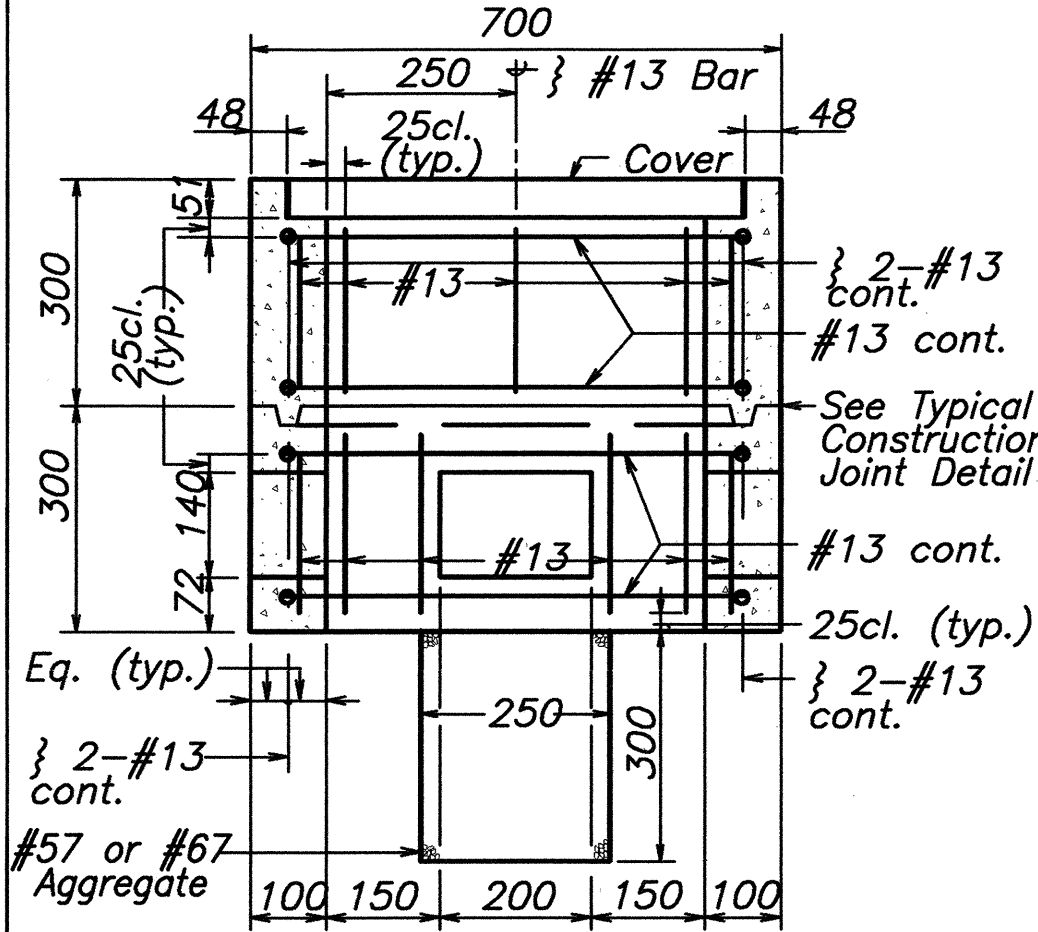
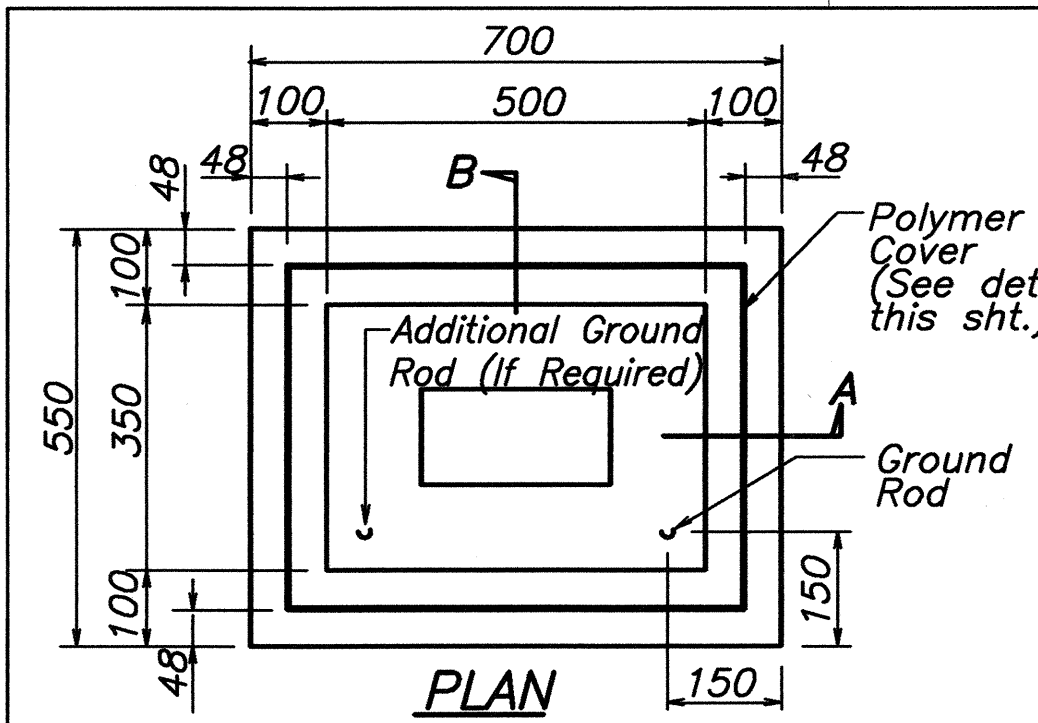
GENERAL NOTES

- Provide a minimum of one 16mm 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).

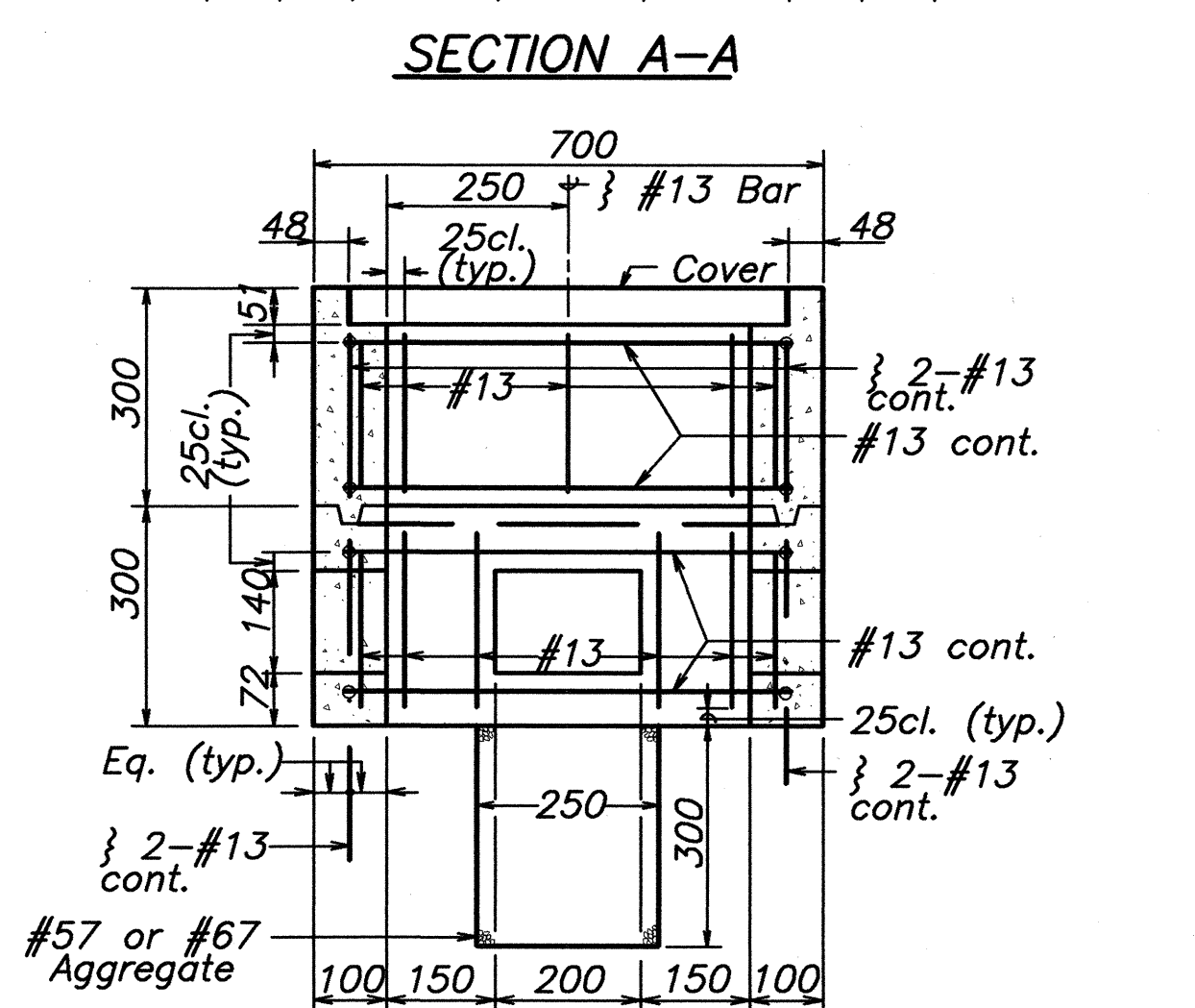
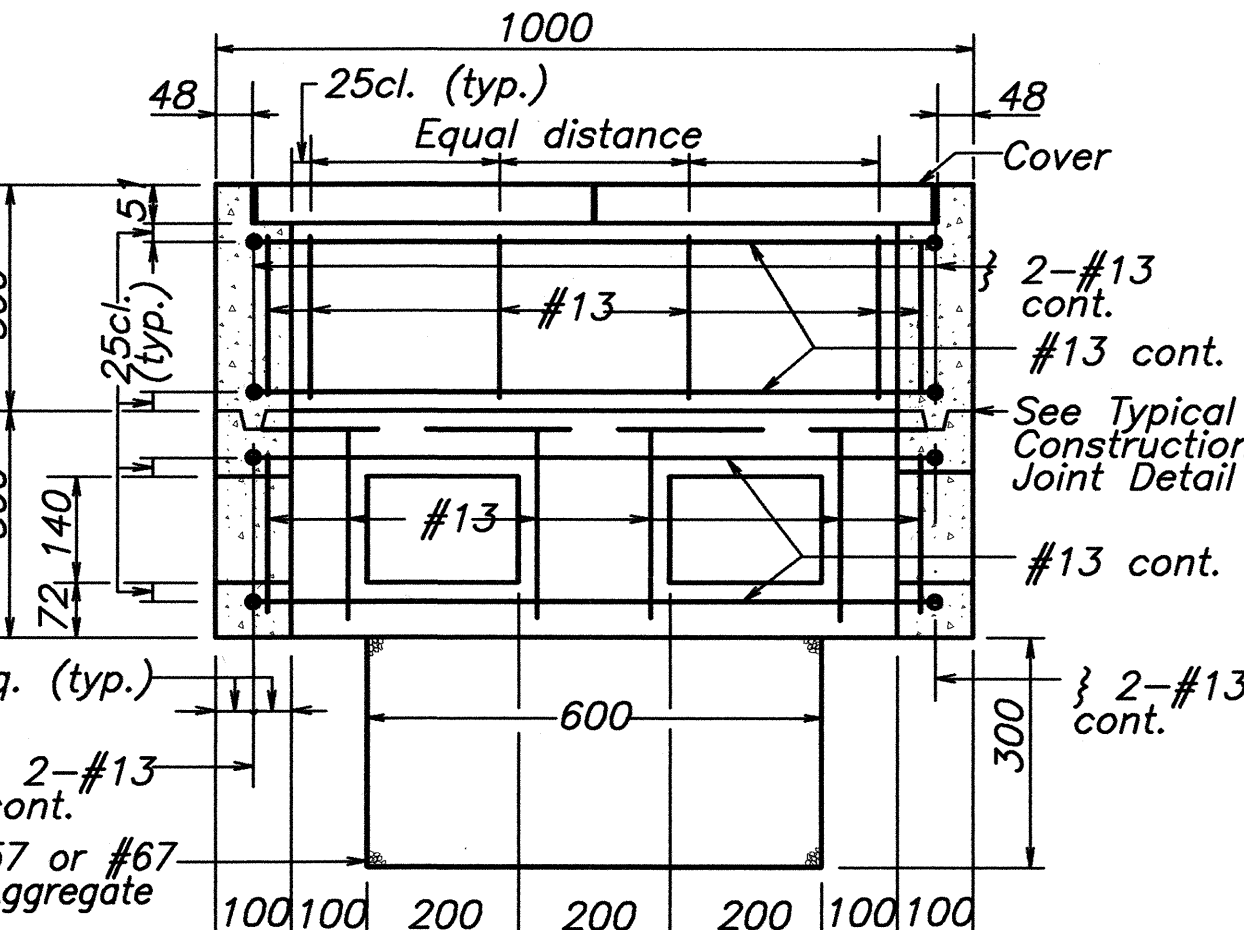
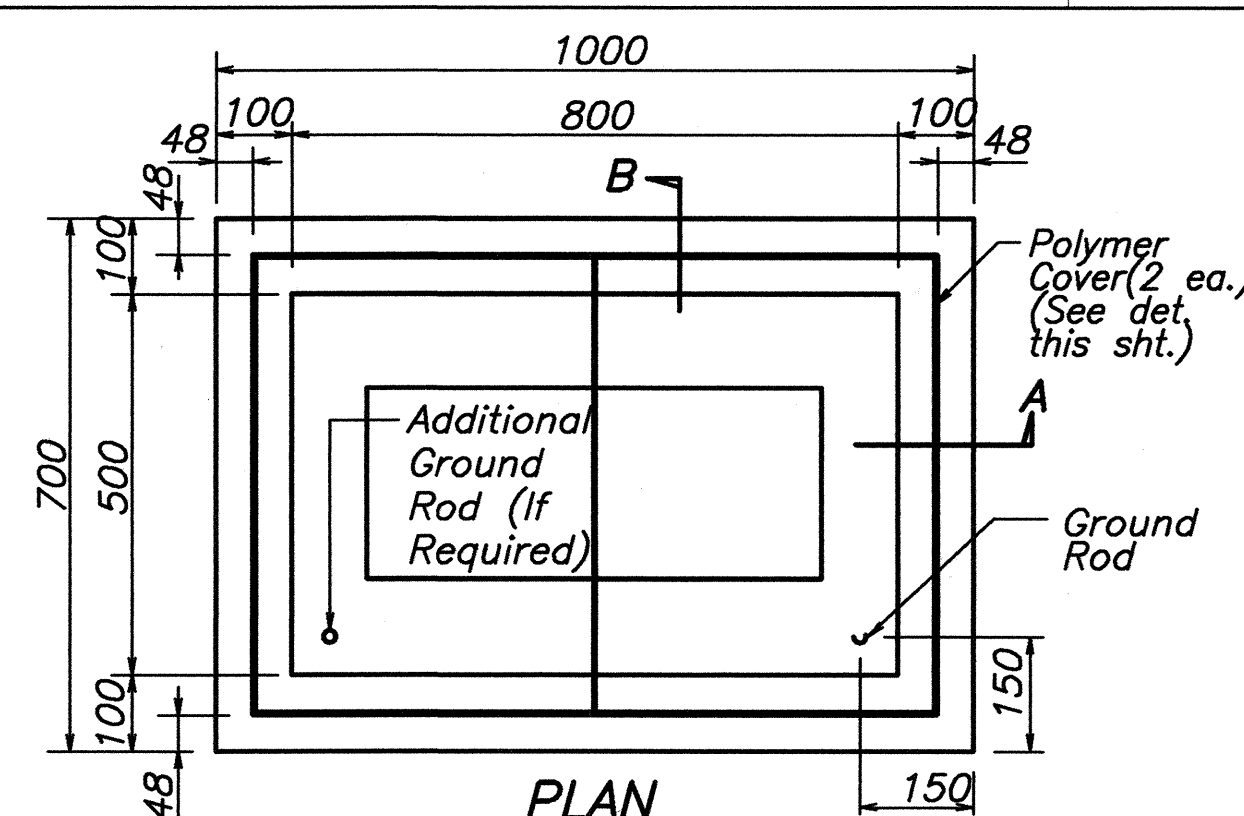


TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS
Not to Scale

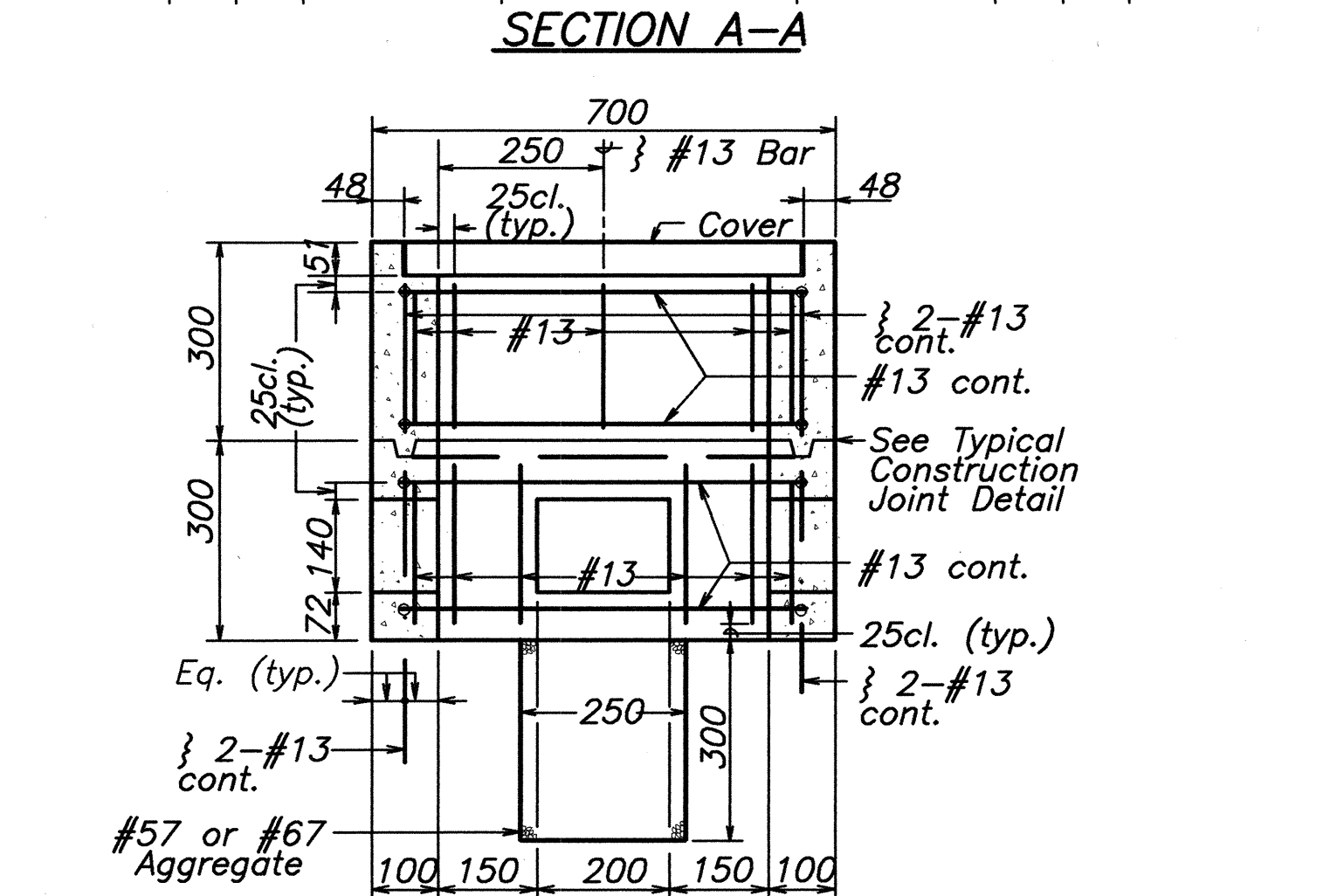
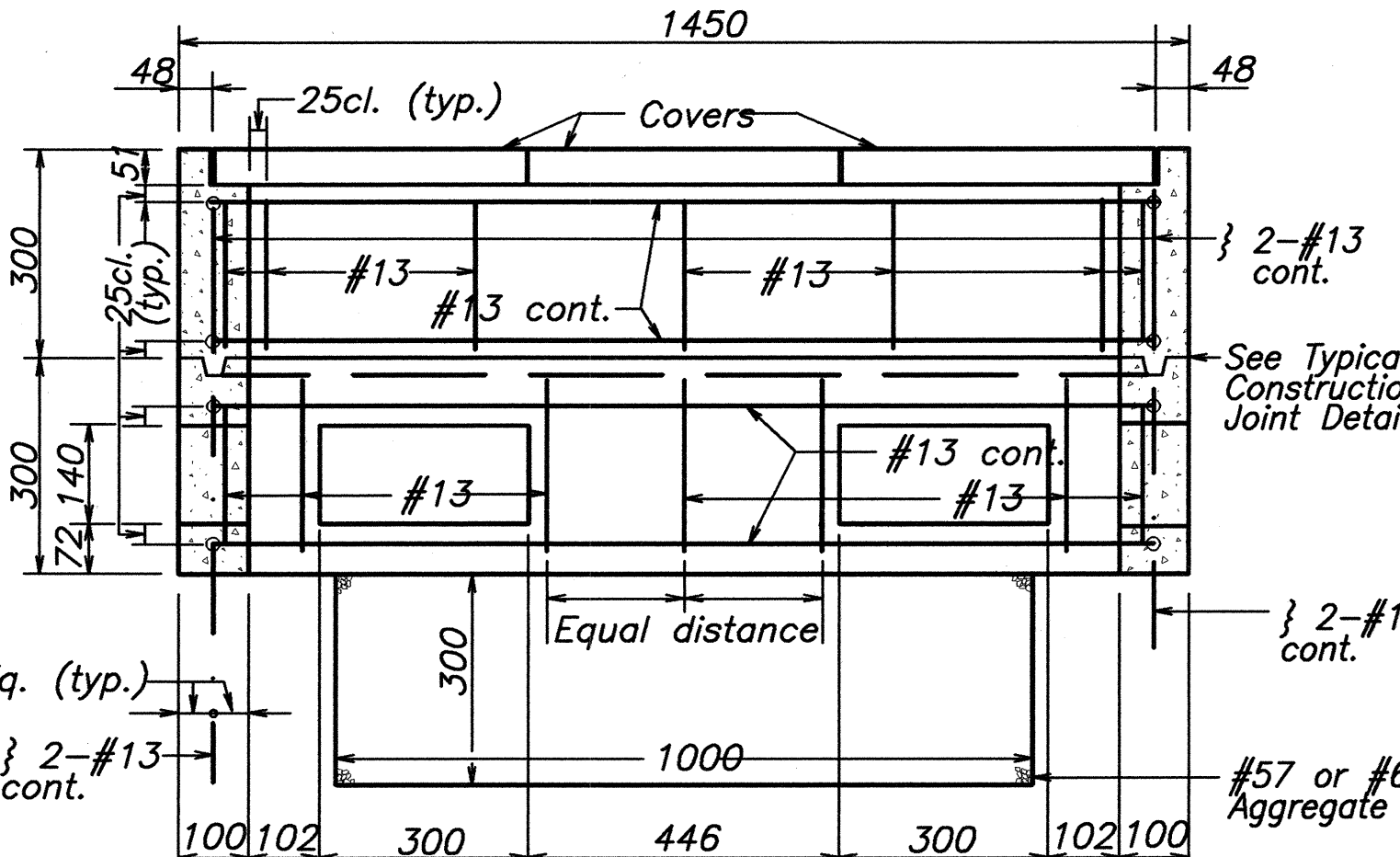
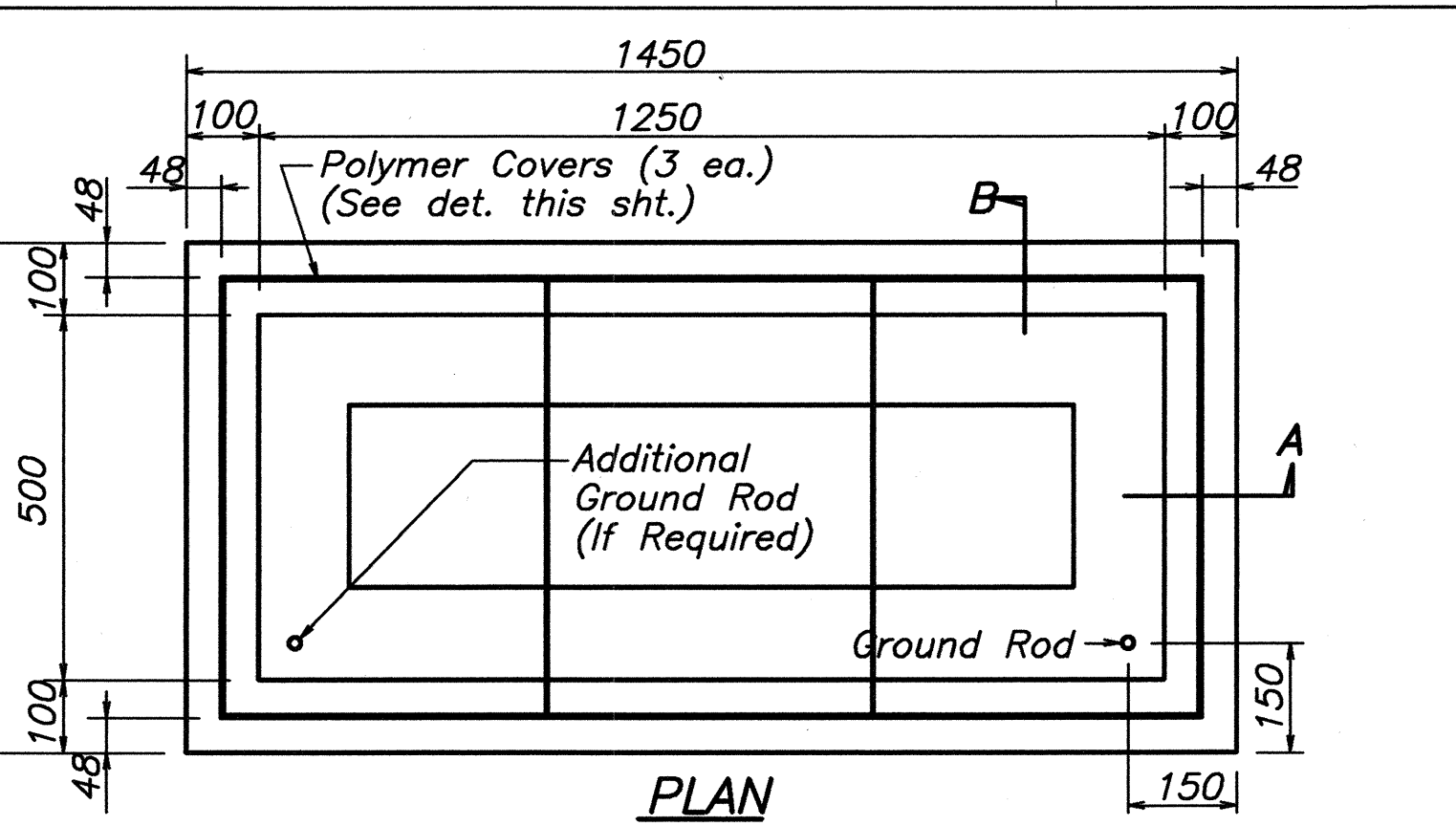
NOTE: All dimensions and rebar sizes are in metric.



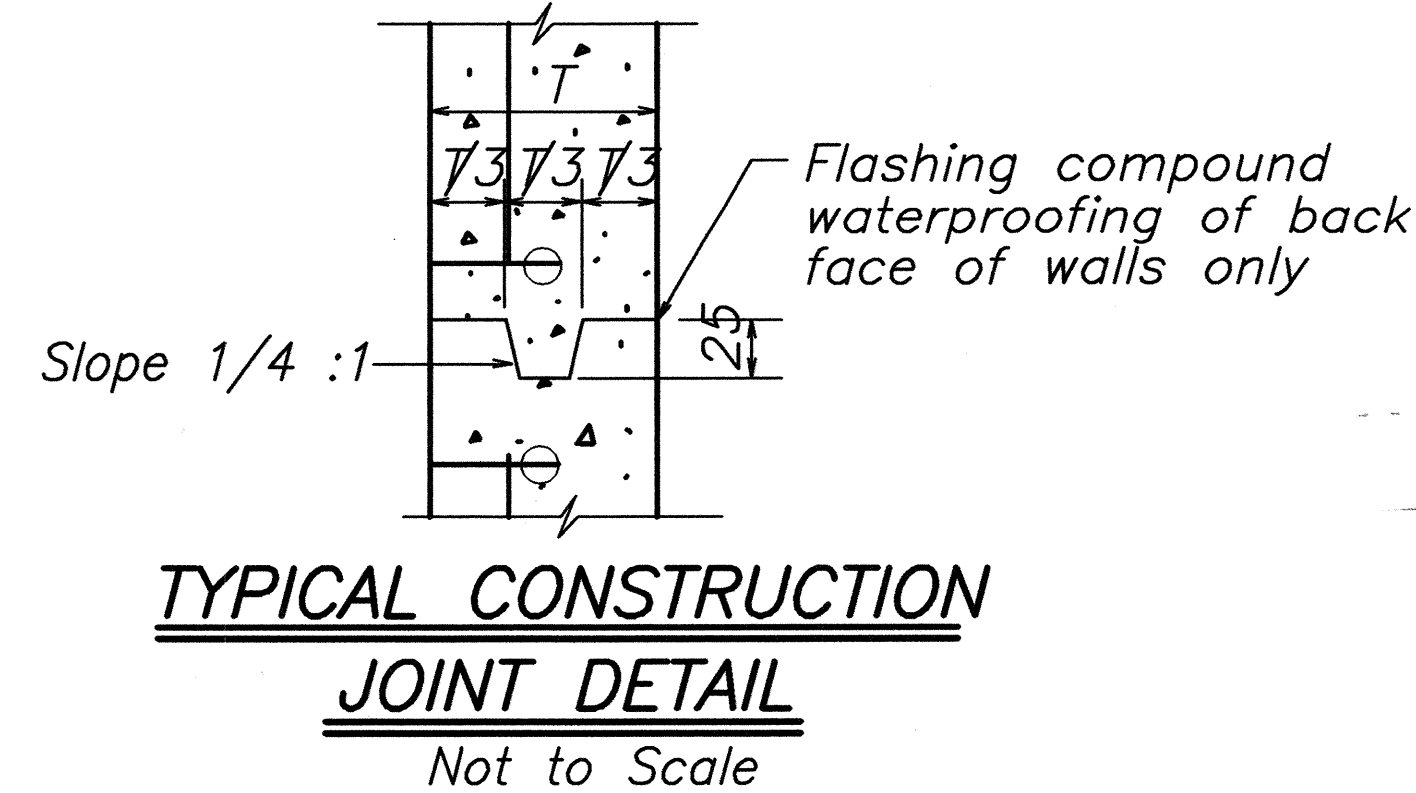
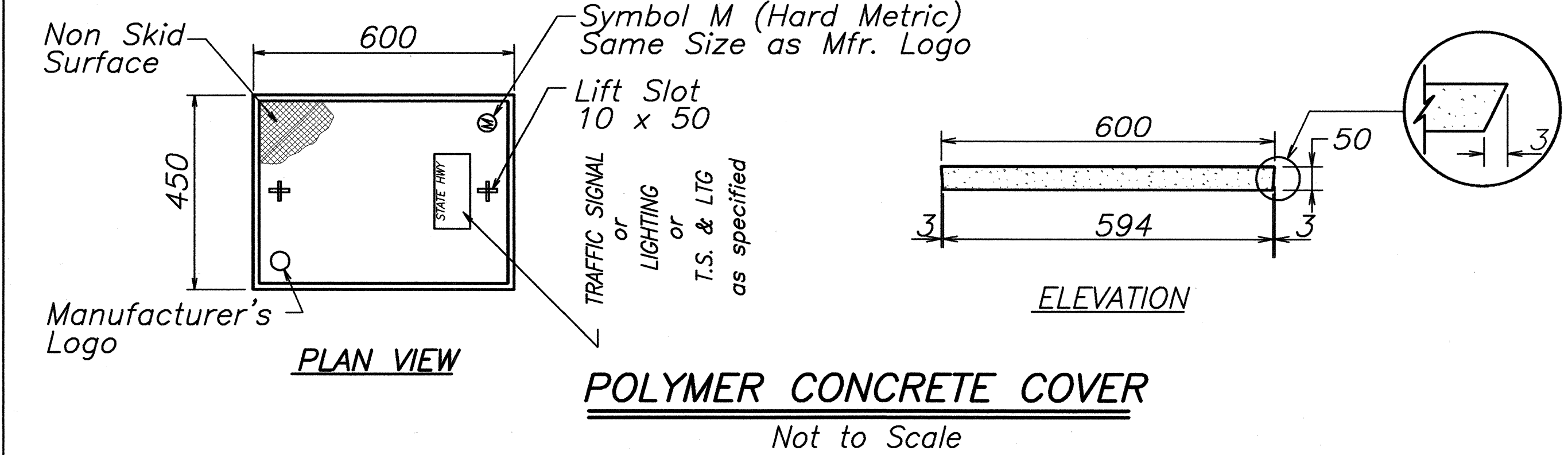
TYPE "A" PULLBOX
(Old Type "B")
Scale: 1:10



TYPE "B" PULLBOX (Old Type "C")
Scale: 1:10



TYPE "C" PULLBOX (Old Type "D")
Scale: 1:10



DANIEL S. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 3443-C
HAWAII U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX & COVER DETAILS

MOKULELE HIGHWAY WIDENING

Vicinity of Cane Haul Road

To
Maui Humane Society

Federal - Aid Project No. NH-0311(5)

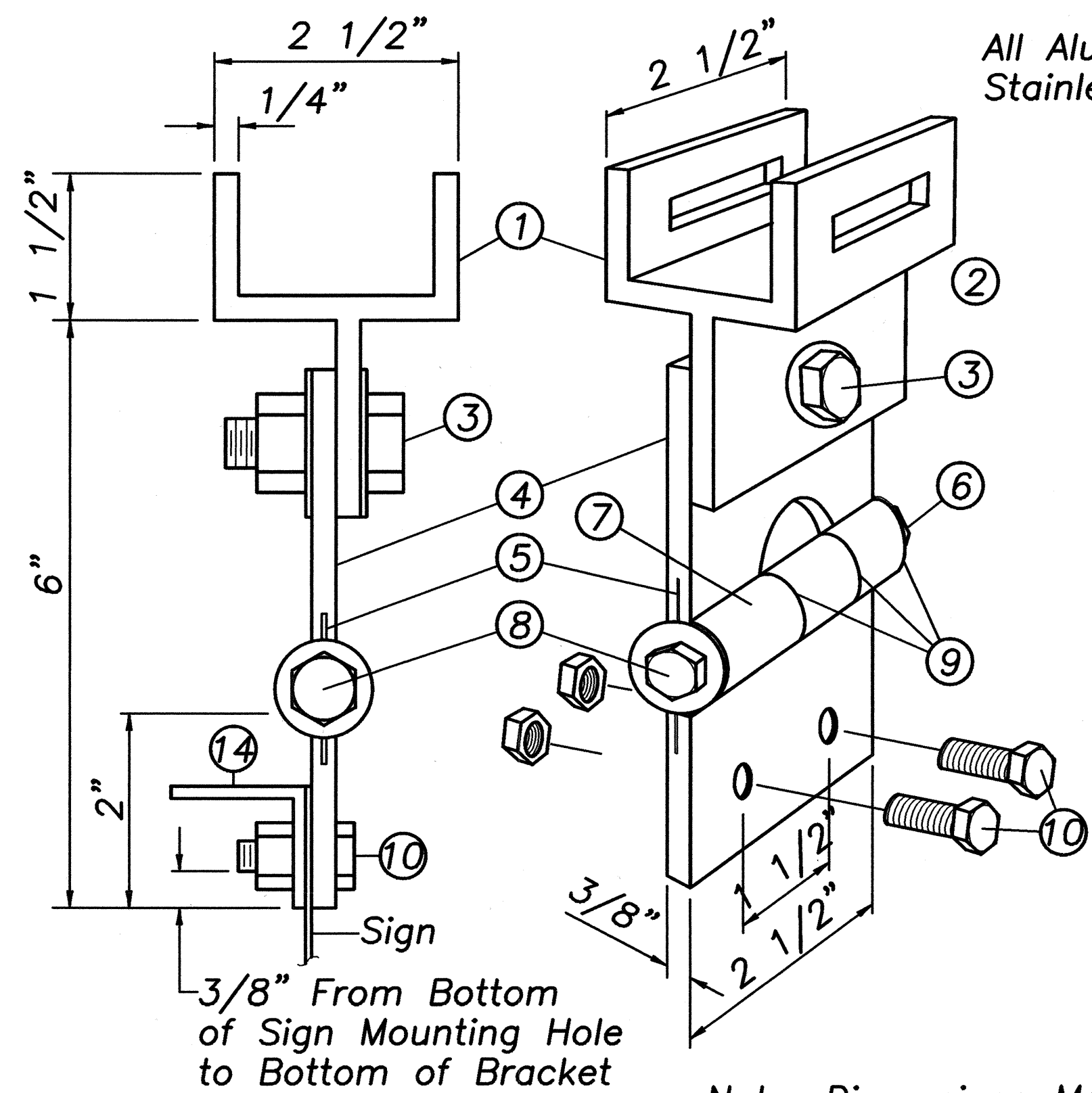
Scale: AS NOTED Date: JUNE 2002

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

SHEET No. 6 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	118	189

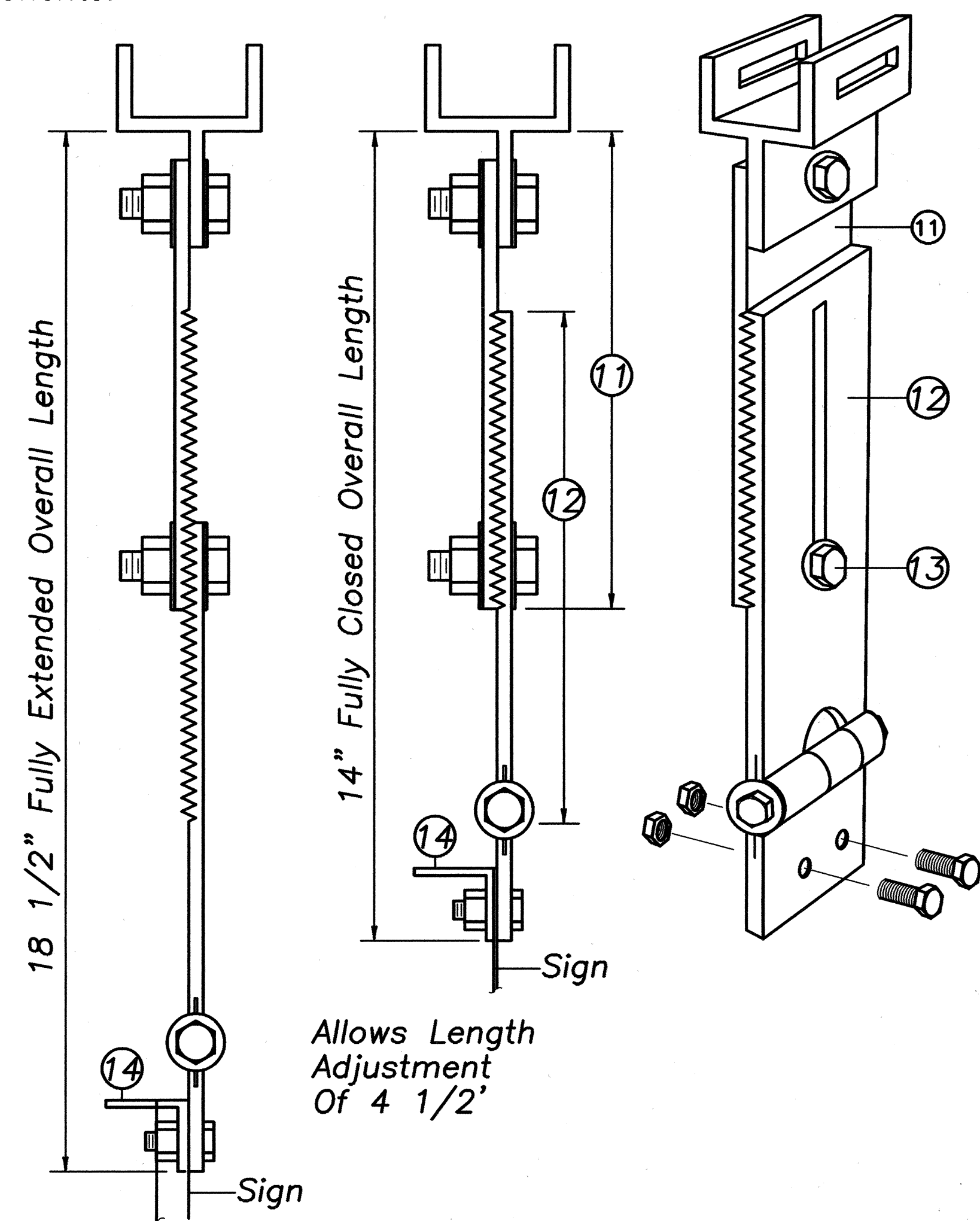
- ① Pivotal Upper Bracket
- ② 1 5/8"x 1/4" Slot For Double Strapping to Electrolier Mast Arm. (M2G-34S(HD) 0.030"x 3/4" Heavy Duty Stainless Steel Strap With M22G-34B(HD) Buckle Recommended.
- ③ 1/2"- 13 x 1 1/2" Stainless Steel Hex Head Bolt With Stainless Steel Hex Lock Nut and 1/16" Stainless Steel Washer (Both Sides). Allow Upper Bracket to Pivot and Align With Electrolier Mast Arm.
- ④ 6" Overall Drop With Fixed Length Sign Bracket.
- ⑤ Stainless Steel Dampener Spring (removable).
- ⑥ Stainless Steel Hex Lock Nut With 1/16" Stainless Steel Washer.
- ⑦ 1" O.D. Axle Housing.
- ⑧ 1/2"- 13 x 4" Stainless Steel Hex Head Bolt With 1/16" Stainless Steel Washer.
- ⑨ Oilite Bushing.
- ⑩ Sign Mounting Sets, Consisting of Two Each 5/16"- 18 x 1" Stainless Steel Hex Head Bolt With Stainless Steel Hex Lock Nut. Two Holes On 1 1/2" Centers Provide Positive Lock Sign Mounting to Bracket.
- ⑪ 8 1/4" Overall Length Upper Adjustable Sign Bracket Section.
- ⑫ 9" Overall Length Lower Adjustable Sign Bracket Section, Including Axle Housing (8" Overall Length to Top of Housing).
- ⑬ 1/2"- 13 x 1 1/2" Stainless Steel Hex Bolt With Stainless Steel Hex Lock Nut and 1/16" Stainless Steel Washers (Both sides). Loosen Lock Nut, Adjust Bracket Teeth to Level sign.
- ⑭ 1 1/4" x 1 1/4" x 1/8" Aluminum Angle.



Note: Dimensions May Vary Slightly.

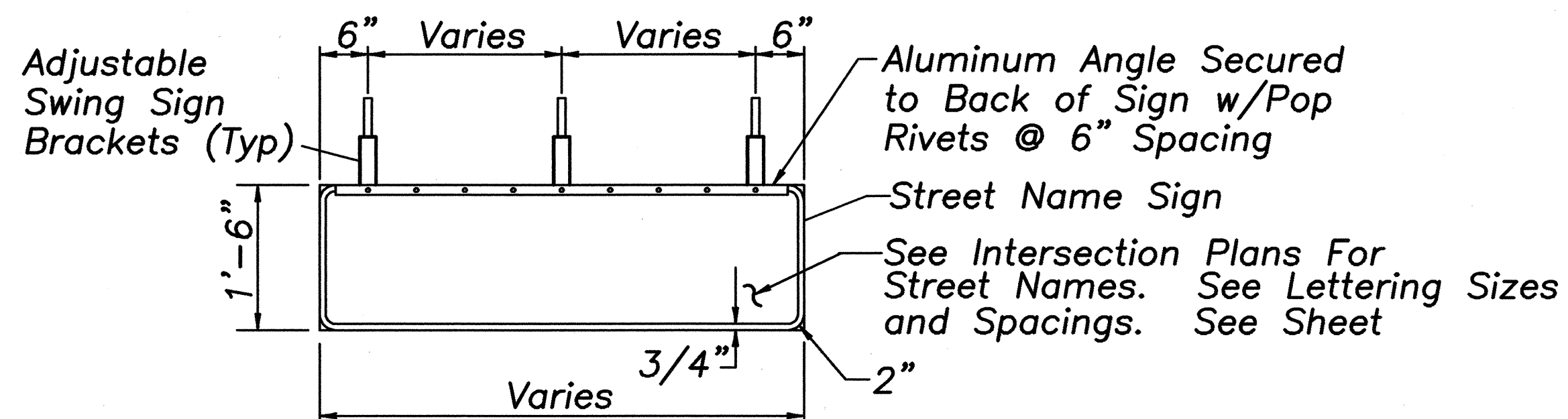
FIXED LENGTH NON-ADJUSTABLE SWING SIGN BRACKET

Not to Scale



ADJUSTABLE LENGTH SWING SIGN BRACKET

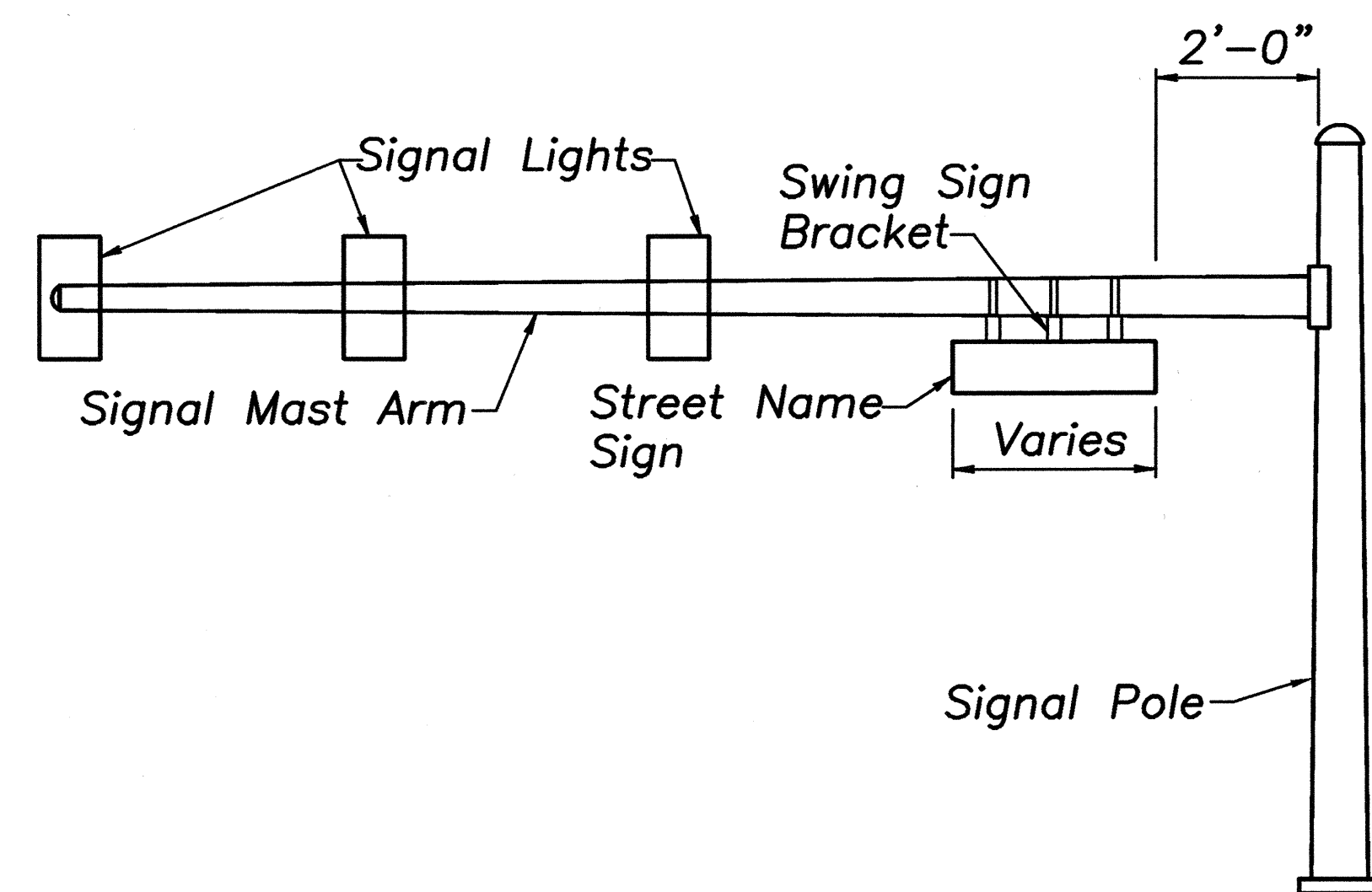
Not to Scale



(REAR VIEW)

PANEL & SWING BRACKET LAYOUT FOR STREET NAME SIGN

Not to Scale

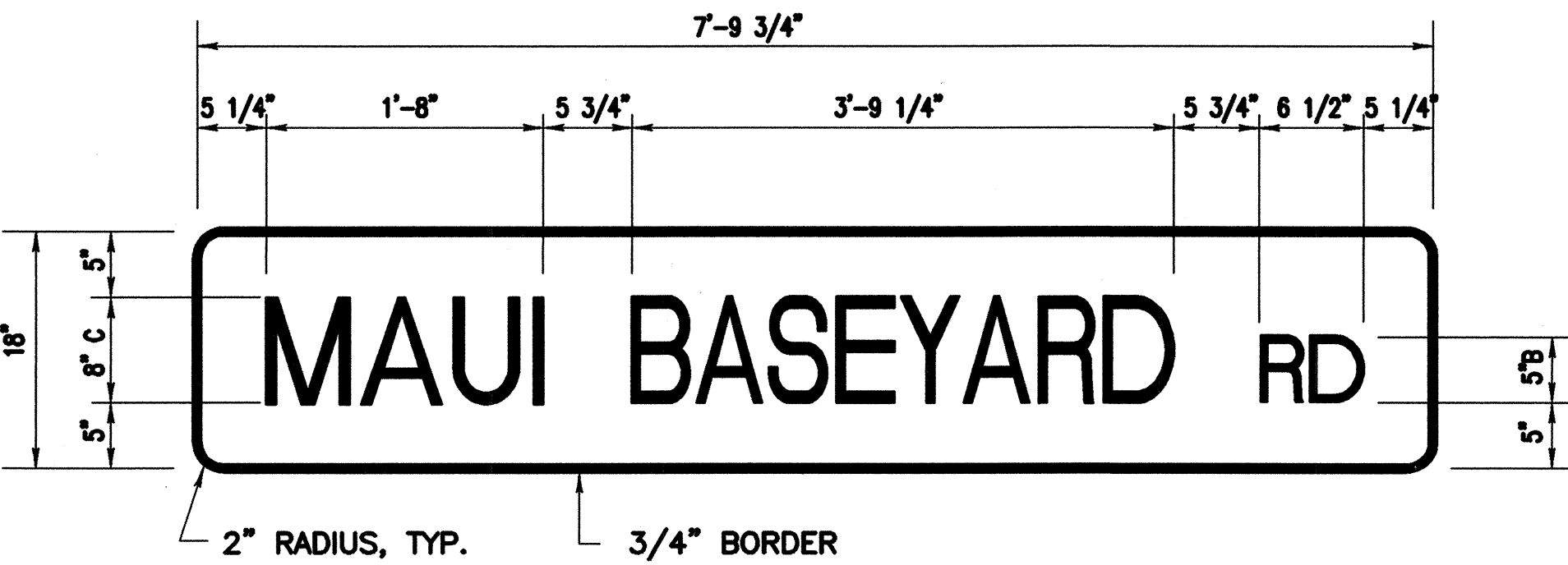
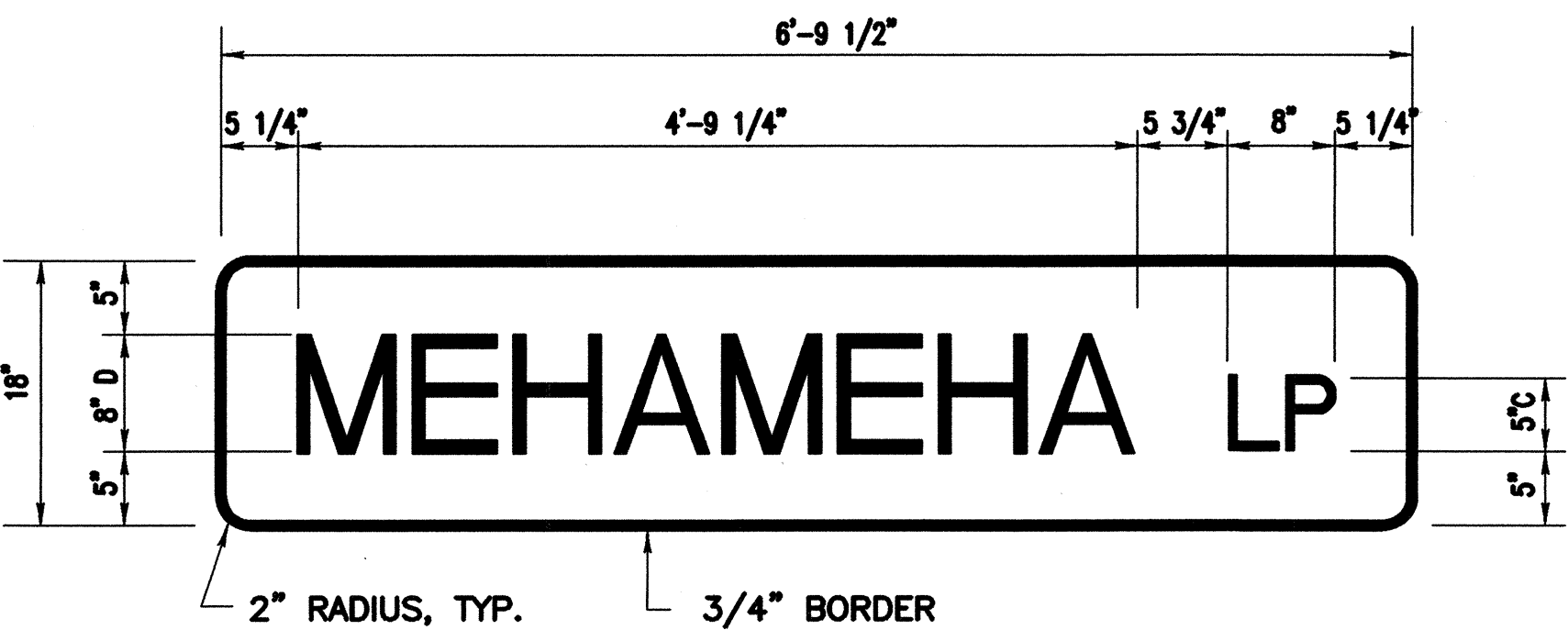
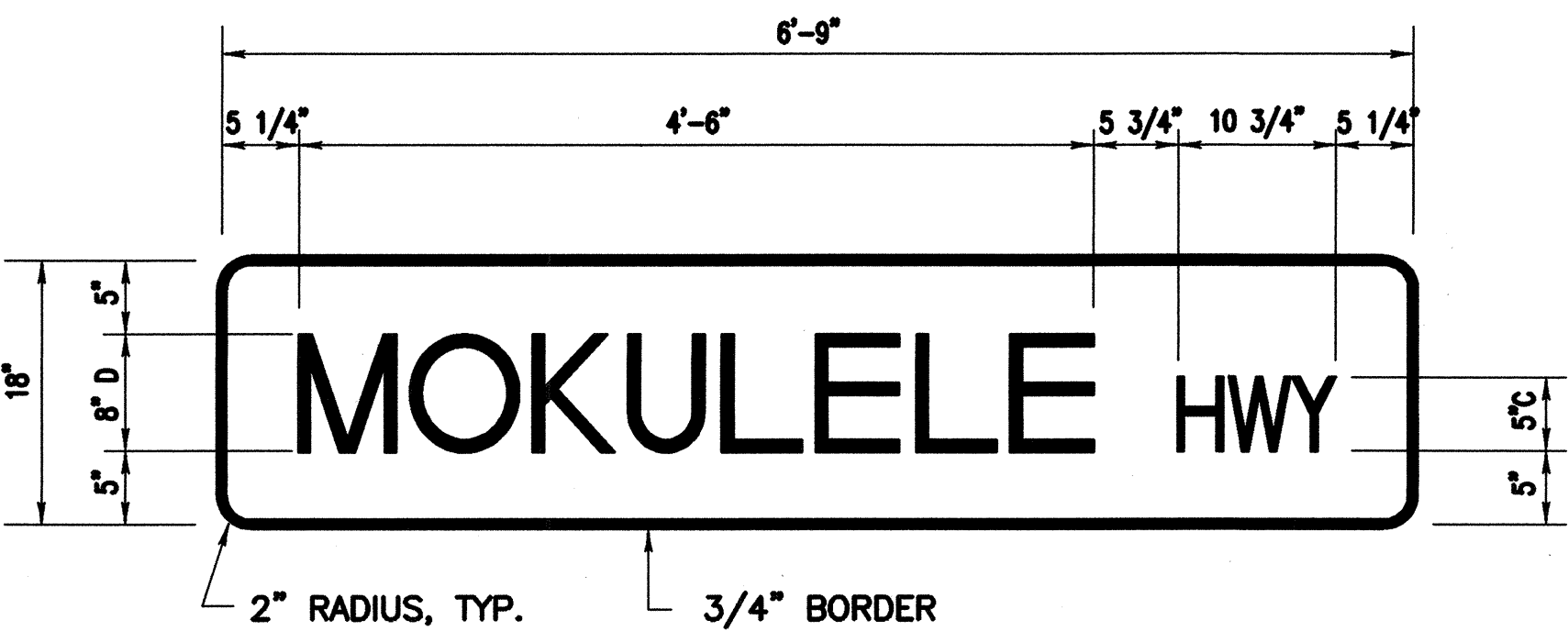


STREET NAME SIGN MOUNTING ON MAST ARM

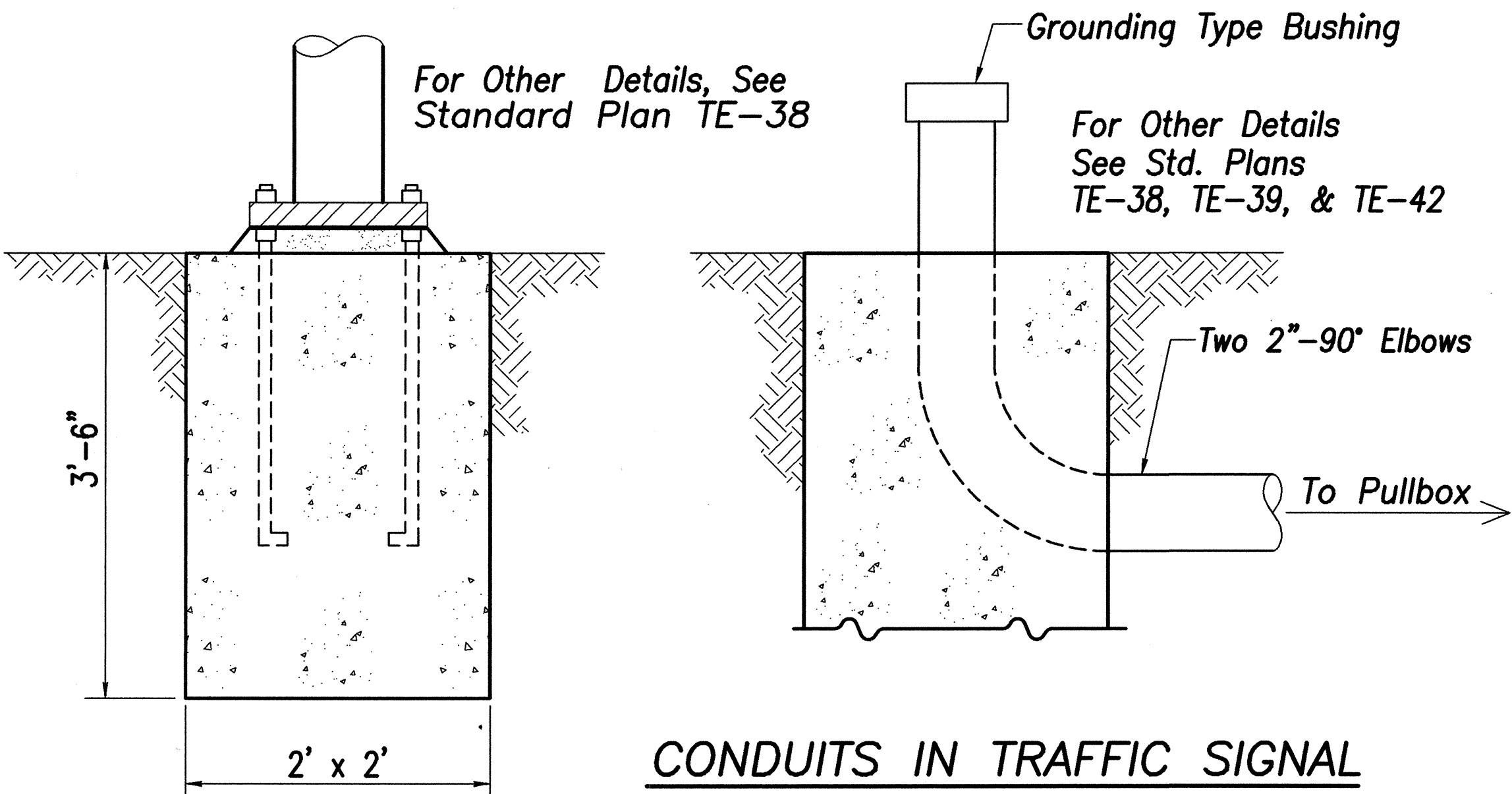
Not to Scale

	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TRAFFIC SIGNAL PLAN MOKULELE HIGHWAY WIDENING Vicinity of Kane Haul Road To Maui Humane Society Federal - Aid Project No. NH-0311(5) Scale: AS NOTED Date: JUNE 2002
	SHEET No. 7 OF 8 SHEETS

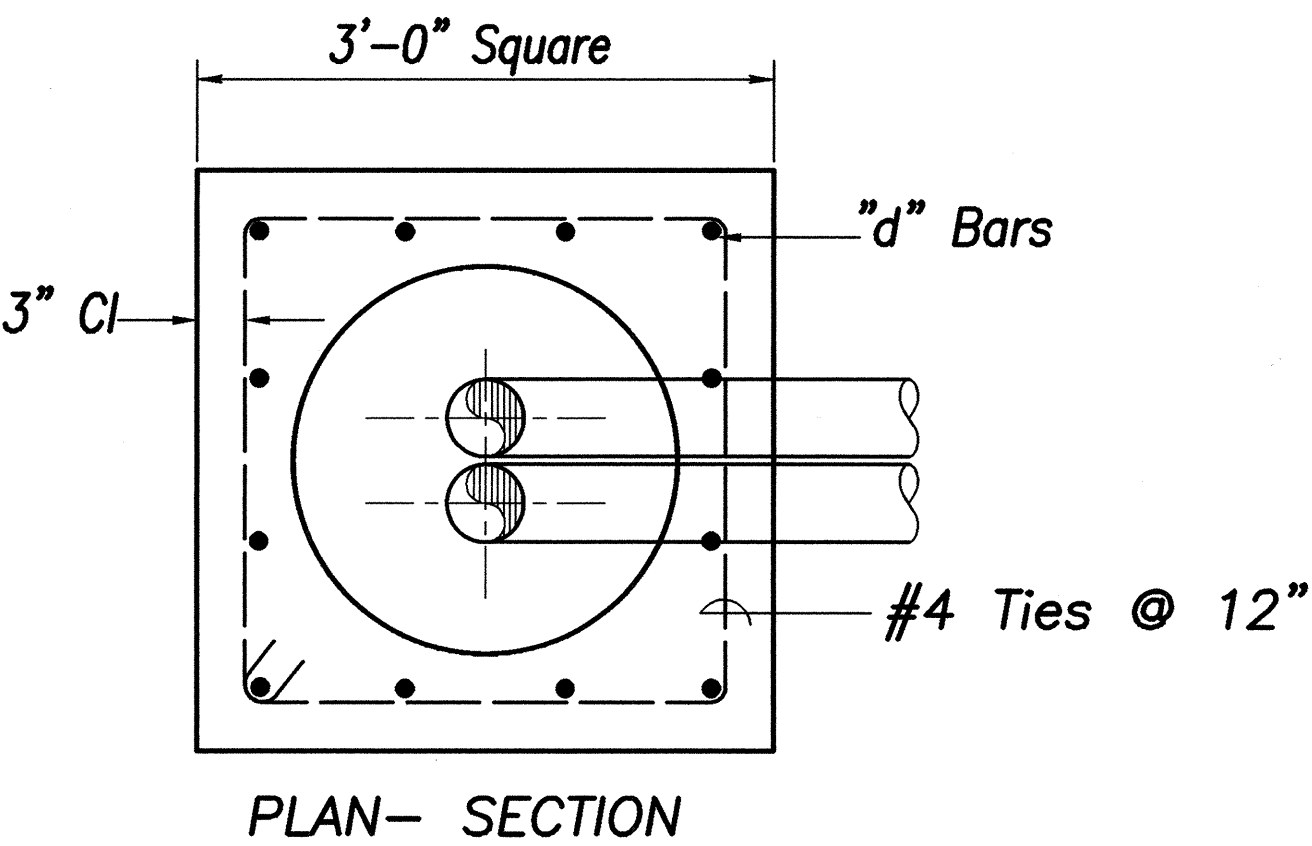
FED. ROAD DIST. NO.	STATE	FEDERAL - AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0311(5)	2003	119	189



STREET NAME SIGN DETAILS
Not to Scale



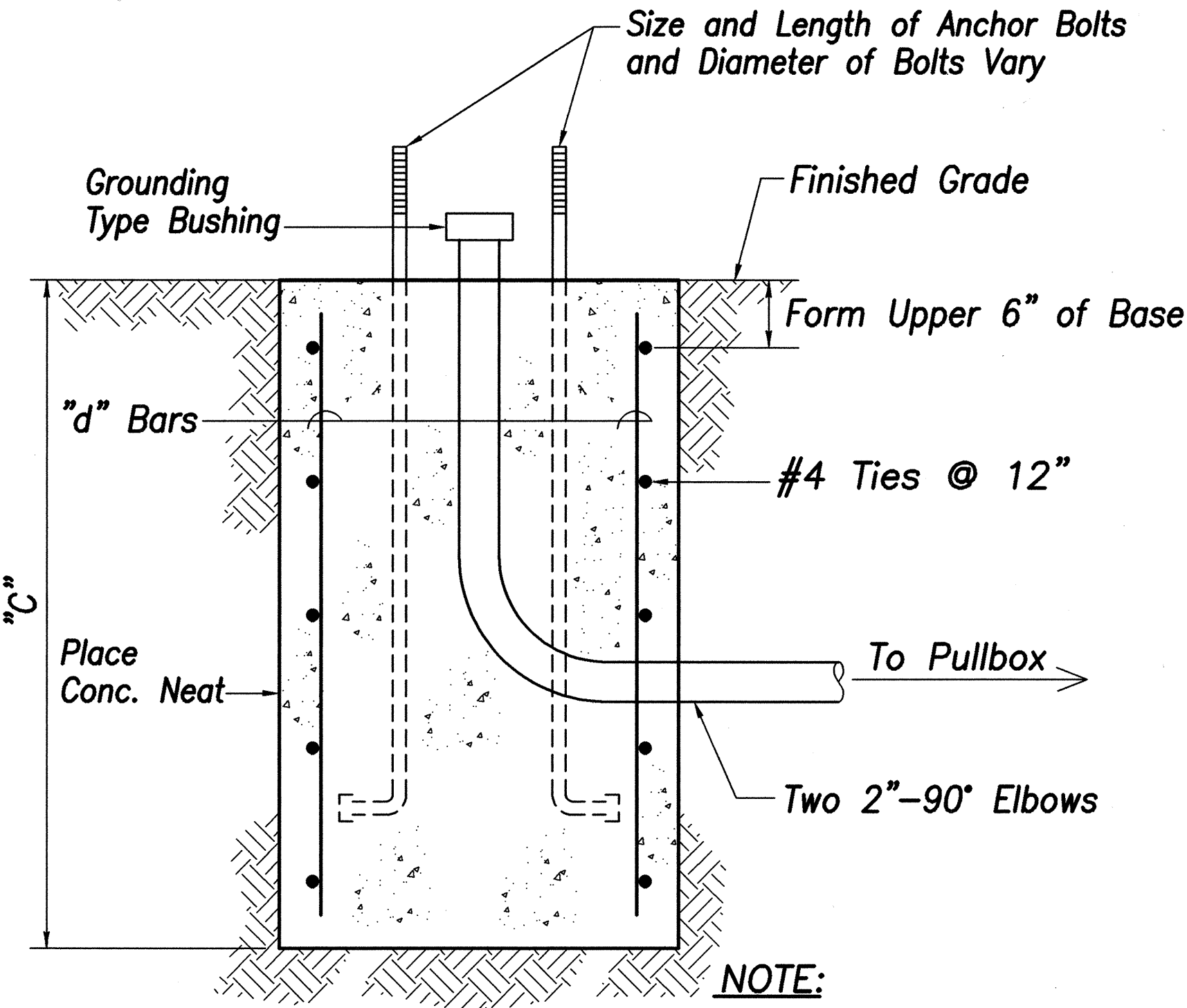
CONDUITS IN TRAFFIC SIGNAL
STANDARD FOOTINGS
Not to Scale



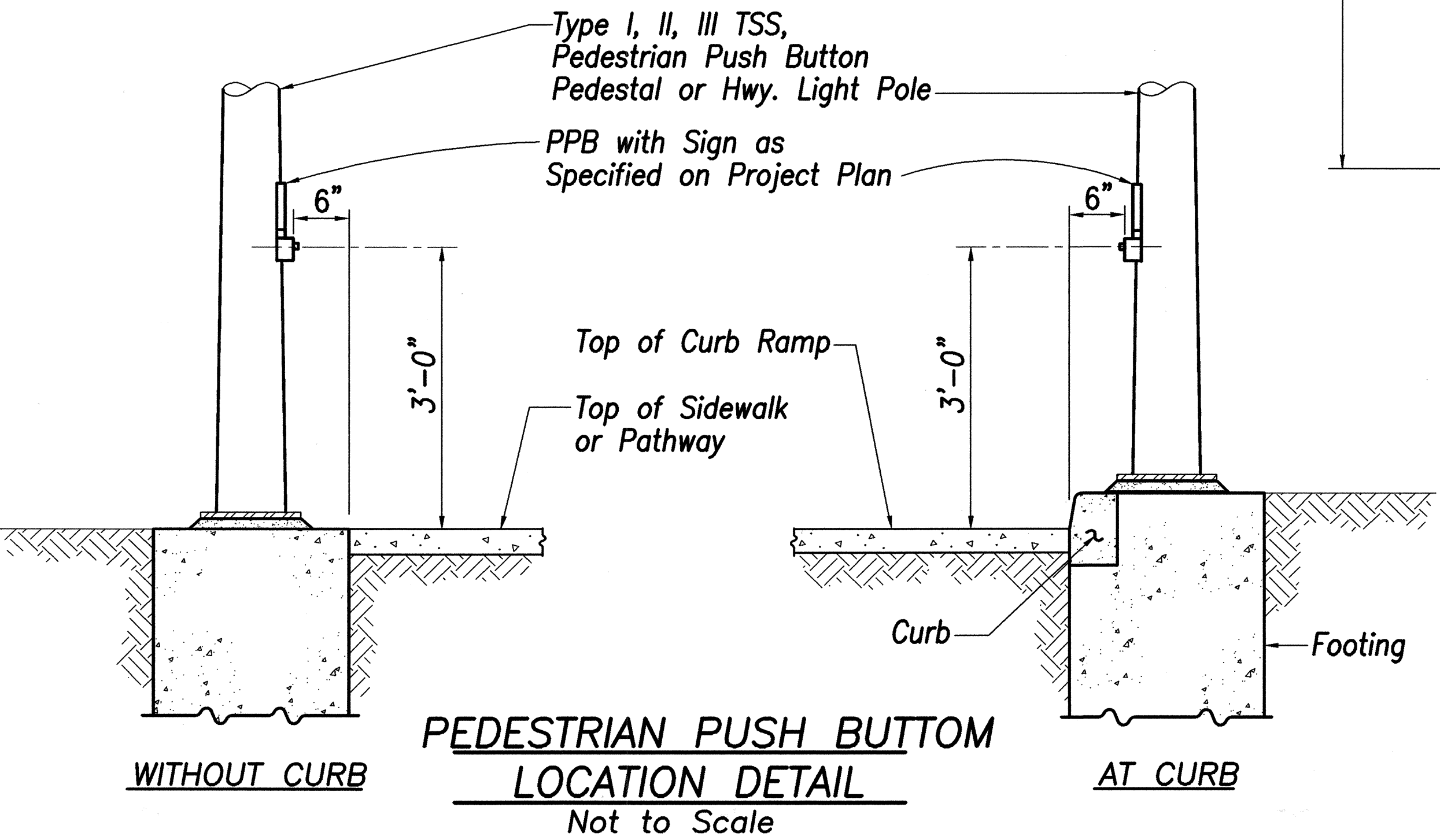
FOOTING FOR
TYPE I SIGNAL STANDARD
Not to Scale

TSS TYPE	MAST ARM LENGTH	"c"	"d" BARS
II	15'-20'	7'-0"	12-#6
II	25'-30'	7'-6"	12-#6
II	35'	8'-0"	12-#6
II	40'-45'	8'-6"	12-#6
III	40'	8'-9"	12-#6

TYPE II FOOTINGS



FOOTING FOR
MAST ARM STANDARD
Not to Scale



PEDESTRIAN PUSH BUTTON
LOCATION DETAIL
Not to Scale

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

MOKULELE HIGHWAY WIDENING
Vicinity of Cane Haul Road

To
Maui Humane Society

Federal - Aid Project No. NH-0311(5)

Scale: AS NOTED Date: JUNE 2002

SHEET No. 8 OF 8 SHEETS

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