

GENERAL TRAFFIC SIGNAL NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	11	23

1.

All Traffic Signal work shall conform to the requirements of the Manual on Uniform Traffic Control Devices for Streets and Highways, U.S. Department of Transportation, Federal Highway Administration, Latest Edition, and Amendments.

2.

The locations of the traffic signal standards, traffic signal standards with mast arm, pedestrian push buttons, traffic controller, transformer, pullboxes, conduits, & loop detectors shall be staked out in the field by the Contractor and locations accepted by the Engineer prior to construction and installation. Locations shown on plans shall be adjusted as necessary to prevent conflict with existing or new facilities.

3.

All conduits shall be PVC Schedule 80.

4.

Loop detectors shall be installed according to Loop Detector Details shown on the Plans.

5.

Lead-in wires in pullbox near loops shall be tagged with Loop Number(s).

6.

Existing pavement shall be restored according to Restoration of Existing Pavement due to Trench Excavation detail shown on the Plans.

7.

Department of Transportation Services, City & County of Honolulu will assist the Engineer in construction inspection for the Traffic Signal System. The following work is to be performed by the Department of Transportation Services, City & County of Honolulu.

A.

Test controller & auxiliary equipment in cabinet

B.

Make all electrical equipment connections in the field for signal system after the system has been installed in place by the Contractor.

C.

Final adjustment of traffic signal control equipment

8.

Steel plates for covering trenches shall have skid resistant surface.

9.

All structures, pavements, utilities, landscaping, and other topographical features shown on the Plans are existing and shall remain unless noted or indicated otherwise. All grassed areas damaged by construction activities shall be topsoiled and grassed.

10.

The traffic signal system shall be kept operational during construction. Any relocation required shall be approved by the Traffic Control Branch, Department of Transportation Services, and paid for by the Contractor.

11.

Existing signal standards, signal heads, and existing pullboxes, controller footings and the top 1'-6" of signal standard footings shall be removed and become the property of the Contractor.

12.

A solid #8 bare copper wire shall be pulled in all conduits with the traffic control cable for equipment ground. Cost shall be considered incidental to the installation of the signal control cable.

13.

All splicing shall be done in the pullboxes.

14.

All traffic signal controller equipment shall be completely wired in the cabinet and shall control the traffic signal as called for in the Plans.

15.

The loop amplifier units furnished for this project shall be capable of operating the loop detector configurations shown on the Plans.

16.

The Contractor shall be responsible for any damages to the existing traffic signal fiber optic cable system. Any and all damages to these facilities shall be repaired by the Contractor at his cost in accordance with the requirements of the City and County of Honolulu.

17.

The Contractor shall notify the Traffic Control Branch, Department of Transportation Services, three (3) working days prior to commencing work on the traffic signal system (phone: 523-4589).

18.

The Contractor shall be responsible for any damages to existing traffic signal facilities, including the traffic signal interconnect system. Any and all damages to these facilities shall be repaired by the Contractor according to the requirements of the City and County of Honolulu.

19.

A 30"x48" level area shall be provided along side pedestrian push button assemblies at a distance not to exceed 10'-0". An unobstructed 3'-0" min. wide route shall be provided along all sidewalks.

20.

The Contractor shall verify with the respective utility companies and government agencies, the locations of all electric, telephone, traffic signal, street light, cable television, fire alarm, gas, water, sewer, drain and other lines crossing the excavation path or in excavation areas.

21.

All work and materials for the traffic signal system shall conform to Section 623 - Traffic Signal System, of the current Standard Specifications for Road, Bridge, and Public Works Construction - 1994 of the Hawaii State Department of Transportation, except as otherwise provided on the Plans or in the Special Provisions.

22.

Provide ground rod in all pullboxes, pullboxes adjacent to signal standards, pedestals, controller cabinets, and other locations ordered by the Engineer. Ground rod connectors shall be copper welded and shall meet ground to earth resistance as specified by the National Electric Code or local inspecting agency. Furnishing and installing ground rods will not be measured or paid for separately, but shall be considered incidental to the various contract items.

23.

Lane closures allowed only during the hours from 8:30 am to 3:30 pm, Monday through Friday.

24.

Underground pipes, cables, or ductlines known to exist are indicated on the Plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the Plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.

25.

During working hours, the Contractor shall provide two lanes for through traffic. On streets too narrow to make this practicable, the Contractor may work in one half of the roadway keeping one lane open to traffic and alternating the flow of traffic. During non-working hours, all trenches shall be covered with a safe, non-skid, traffic-bearing bridging material and all lanes shall be open to traffic.

26.

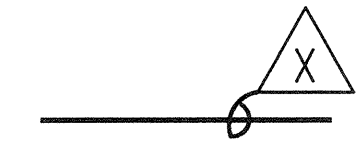





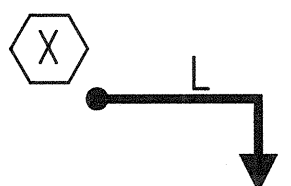

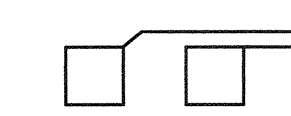
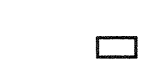
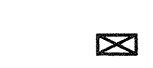
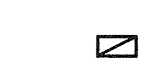


As required by the Hawaii Department of Transportation and/or Department of Transportation Services - City & County of Honolulu, the Contractor shall provide off-duty police officers to control the flow of traffic.

27.

Where pedestrian walkways exist, they shall be maintained in passable condition or other facilities for pedestrians shall be provided. Passage between walkways at intersections shall likewise be provided.

28.

Driveways shall be kept open unless the owners of the property using these rights-of-way are otherwise provided for satisfactorily.
29.

No material and/or equipment shall be stockpiled or otherwise stored within street rights-of-way except at locations designated in writing and approved by the Engineer.
- TRAFFIC SIGNAL LEGEND
- | | |
|---|--|
|  | Conduits and Cables, Conduit Run X |
|  | Temporary Signal System - Traffic Signal Head (Existing) |
|  | Traffic Signal Head |
|  | Programmed Visibility Traffic Signal Head |
|  | Pedestrian Signal Head with Pedestrian Push Button Assembly |
|  | Emergency Vehicle Preempt Receiver (Opticom Receiver) |
|  | Signal Standard with Mast Arm Type II, L=Length of Mastarm, Pole X, Footing Type C |
|  | Signal Standard Type I, Pole X, H=10', Footing Type A |
|  | Loop Detectors |
|  | Pullbox Type A |
|  | Pullbox Type B |
|  | Pullbox Type C |
|  | Traffic Controller Model 170E (Existing) and 332 Cabinet (Existing) with Type D Concrete Base for Controller Cabinet |
|  | Existing Pullbox |
-
- THIS WORK WAS PREPARED BY ME
OR UNDER MY SUPERVISION.
- Stanley T. Katsura*
- | | |
|--|--------------------|
| STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION | |
| TRAFFIC SIGNAL SYSTEM
NOTES & LEGEND | |
| VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98 | |
| SCALE: NONE | DATE: JANUARY 1999 |
| SHEET NO. TS1 OF 11 SHEETS | |
- 11

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	13	23

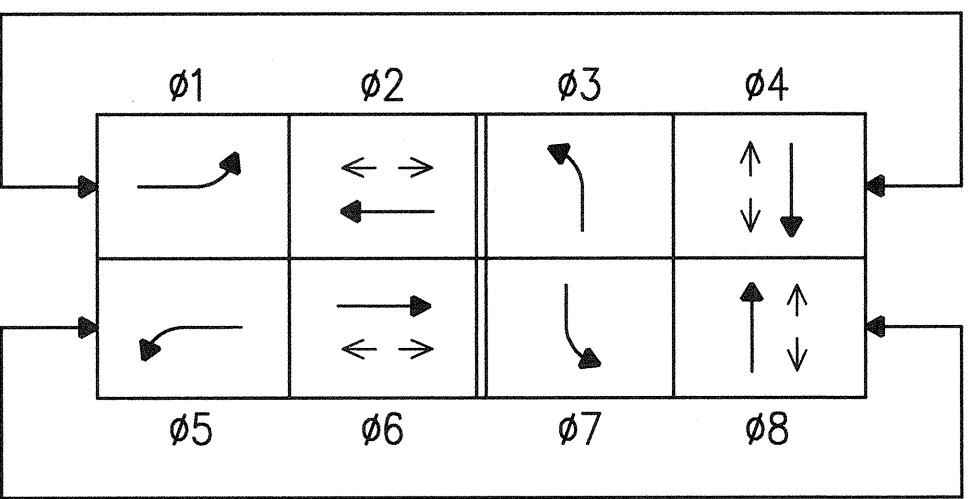
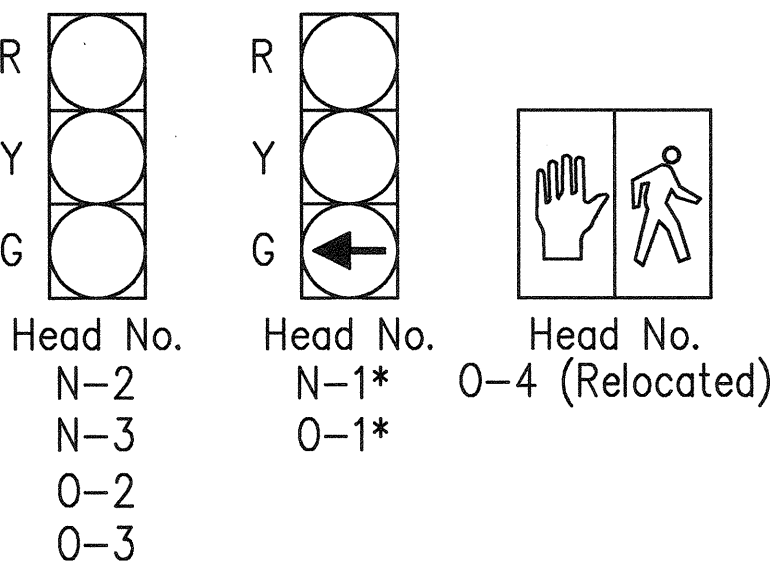
NOTES:

- Existing street name signs and street name plates shall be removed from existing signal mast arms and relocated on signal mast arms on poles N and O.
- Remove all existing signal standards, mast arms, signal heads and pullboxes associated with pole E, pole L and pole K not part of this signal system.

CONDUIT & CABLE SCHEDULE *						
# NO.	CONDUIT SIZE	26C#14 SIGNAL CONTROL	2C#14 PPB LOOPS	12PR#19 INTER-CONNECT	3C#20 OPTICOM	3C#6 POWER/SERVICE
1	2"	1				
	2"	1				
	2"	1				
	2"	1				
	2"	1	10			
	2"			2		
	2"				4	
2	2"	1				1
	2"	1				
	2"		6			
	2"				3	
	2"		SPARE			
3	2"	1				
	2"	1				
	2"		5			
	2"		SPARE		3	
	2"		SPARE			
4	2"	1				
	2"	1				
	2"		5			2
	2"		SPARE			
	2"		SPARE			
5	2"	1				
	2"	1				
	2"		3			2
	2"		SPARE			
	2"		SPARE			
6	2"	1				
	2"	1				
	2"		2			1
	2"		SPARE			
7	2"	1				
	2"	1				
	2"		1			1
	2"		SPARE			
8	2"	1				
	2"	1				
	2"		SPARE		1	
9	2"		2			
10	2"	1				
	2"	1				
	2"		1			
	2"		SPARE			
11	2"	1				
	2"	1				
	2"		4			
	2"		SPARE			
12	2"	1				
	2"	1				
	2"		5			1
	2"		SPARE			
13	2"	INSTALL CABLES TO POLES AND SIGNAL DEVICES AS NEEDED				
14	2"	1				
15	2"	1				
	2"		2			

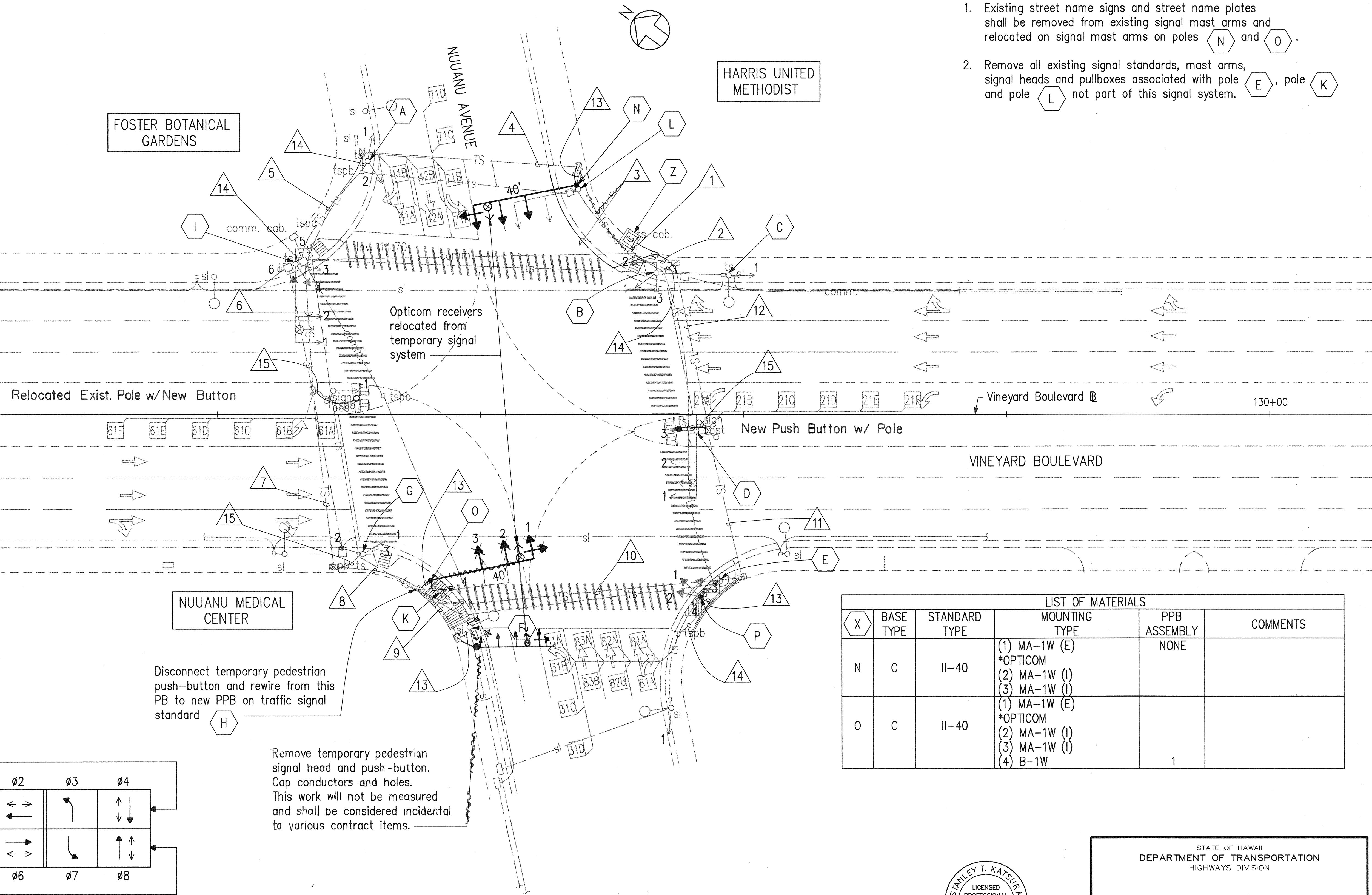
- NOTES:
- The No. 8 system ground installed in all traffic signal system conduits shall be bare solid copper wire.
 - Conduit run numbers labeled as "Exist." had conduits and cables installed during the construction of the temporary signal system phase.
 - Install cables to poles and signal devices for Ultimate Signal System not installed during the temporary signal system phase.

SIGNAL INDICATIONS

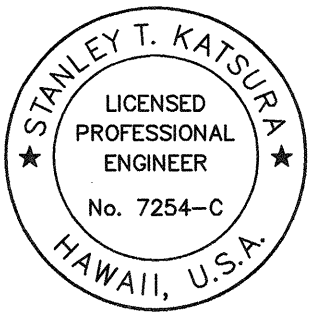


PHASE DIAGRAM
Model 170E Controller (Existing)
Model 332 Cabinet (Existing)

- Protected Vehicle Movement
↔ Pedestrian Movement



LIST OF MATERIALS					
X	BASE TYPE	STANDARD TYPE	MOUNTING TYPE	PPB ASSEMBLY	COMMENTS
N	C	II-40	(1) MA-1W (E) *OPTICOM (2) MA-1W (I) (3) MA-1W (I)	NONE	
O	C	II-40	(1) MA-1W (E) *OPTICOM (2) MA-1W (I) (3) MA-1W (I) (4) B-1W	1	



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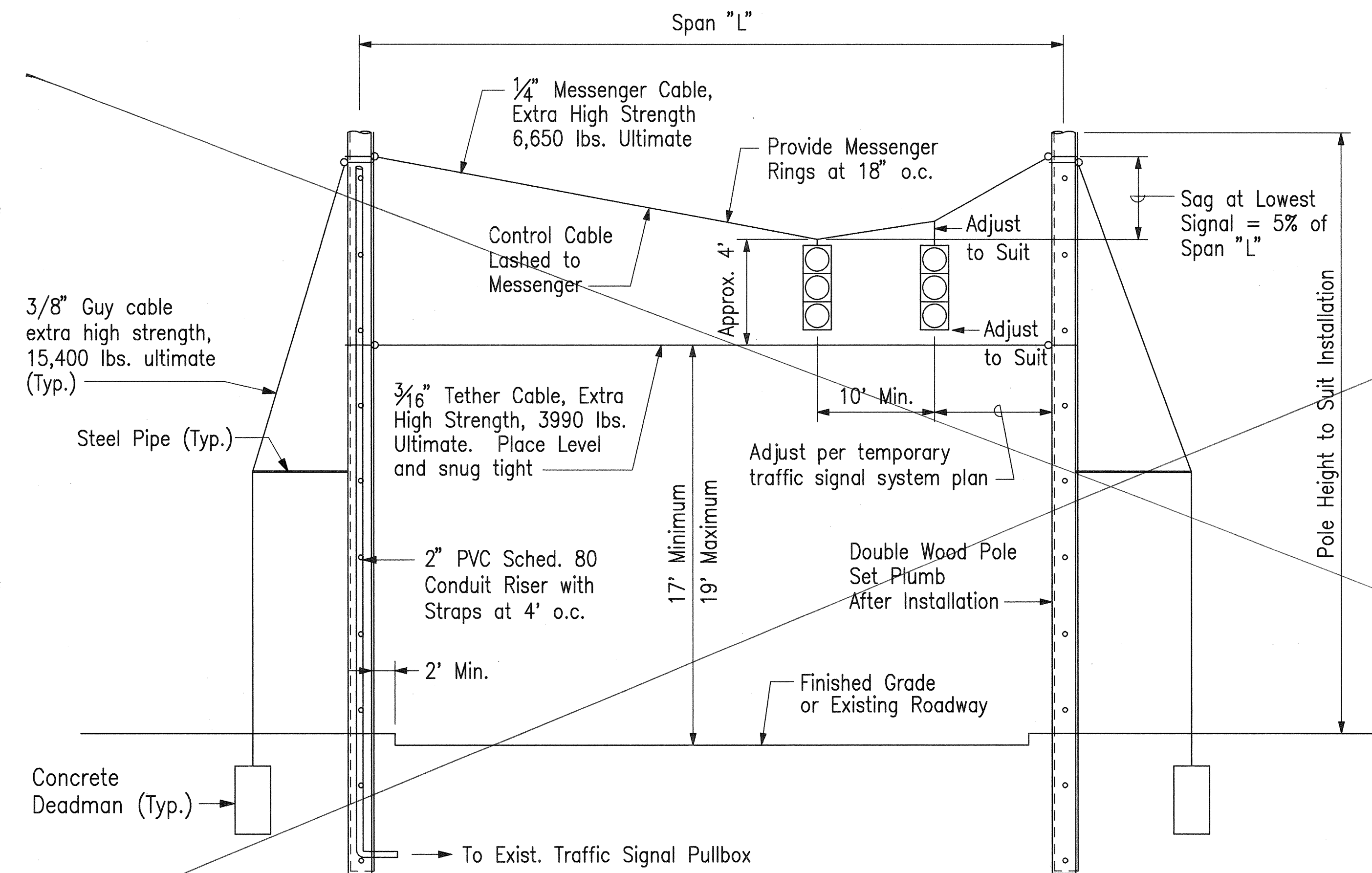
Stanley T. Katsura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL SYSTEM

VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: 1" = 20' DATE: JANUARY 1999
SHEET NO. TS3 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	14	23

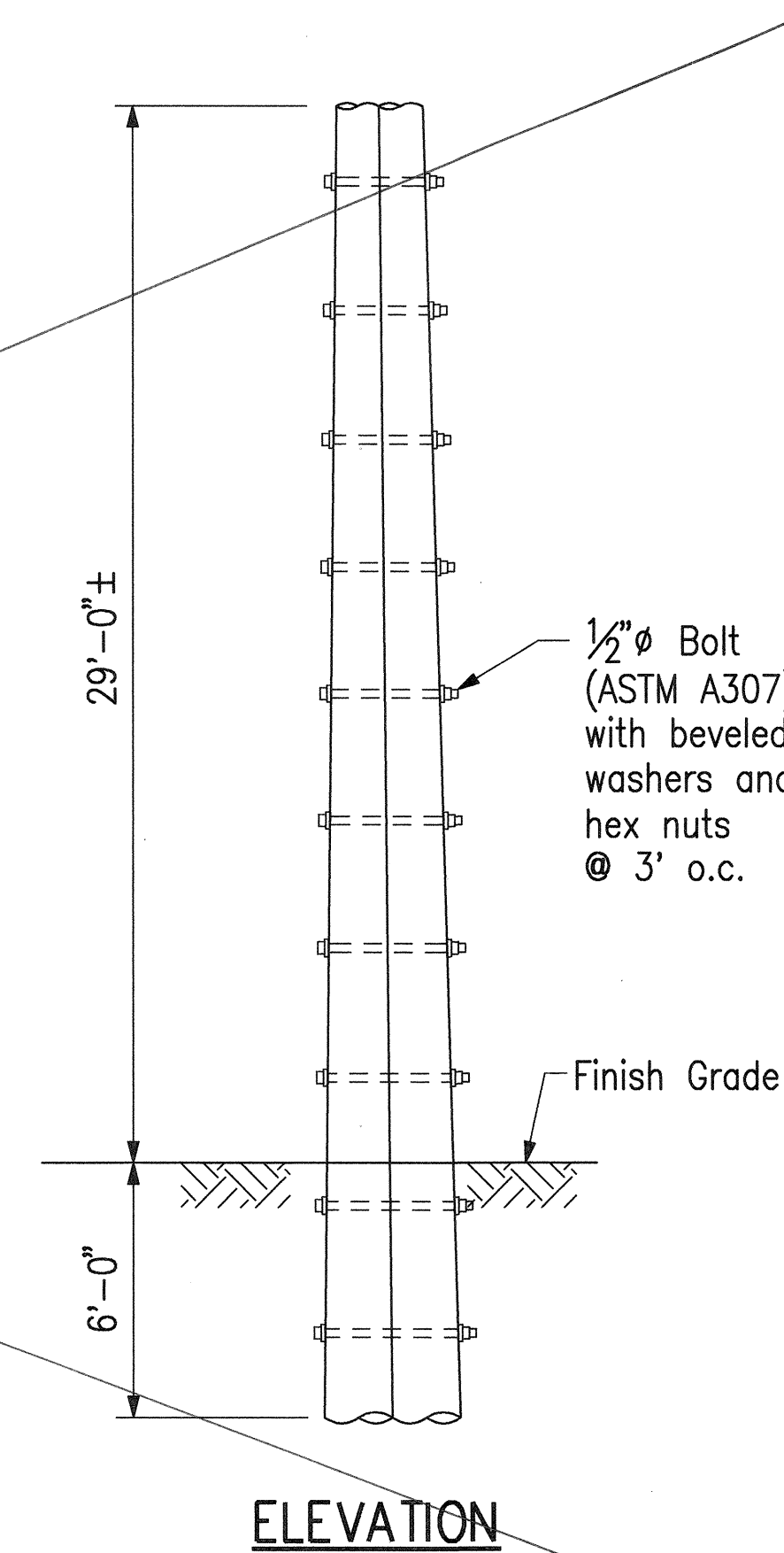


SPAN WIRE INSTALLATION (TEMPORARY)

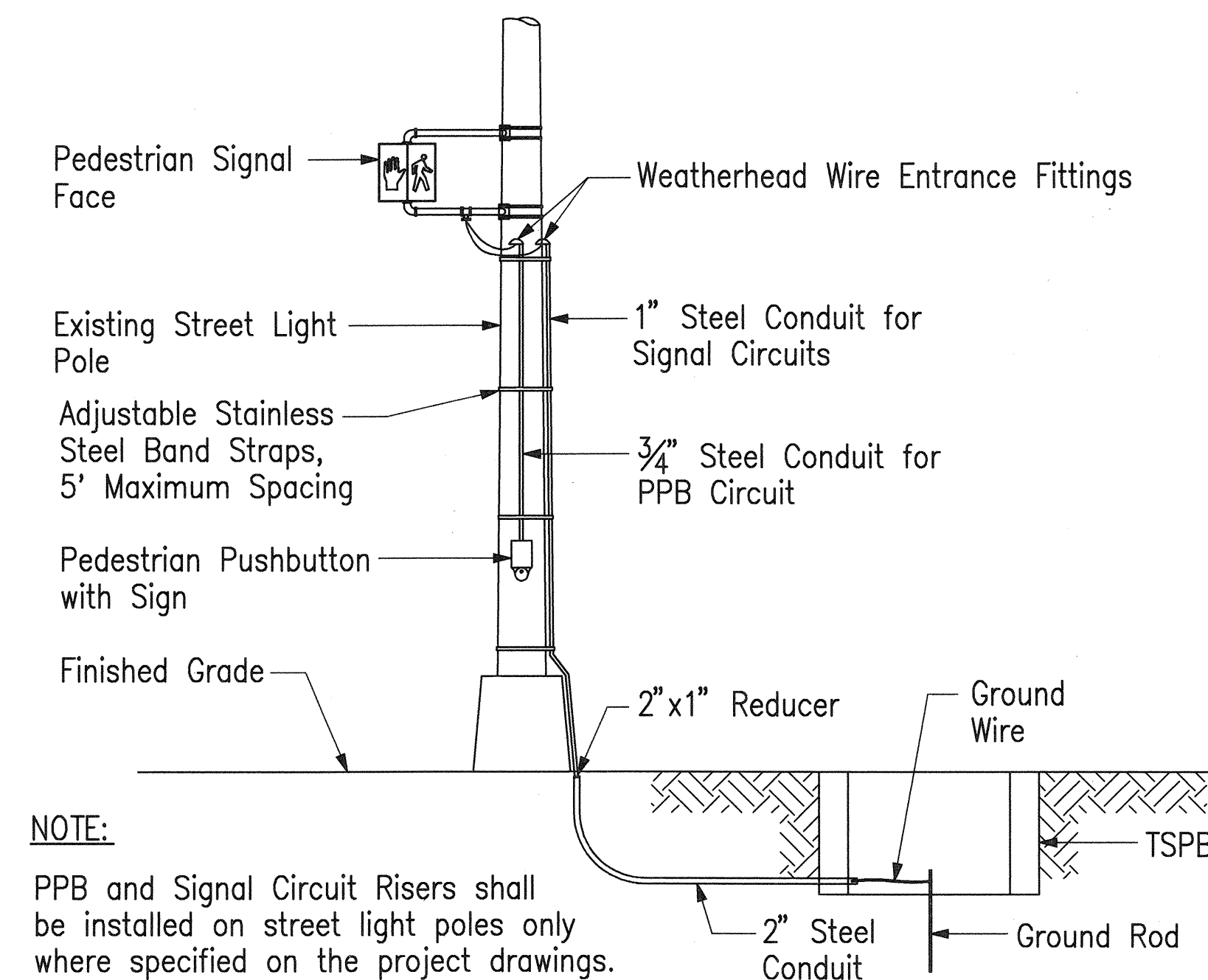
NOTES:

1. Place signal faces per temporary traffic signal plan sheet.
2. Messenger, guy and tether cables shall conform to ASTM A 475, extra high strength, class 'C' coating.
3. All cable fittings shall be galvanized.
4. Span length shall be verified in field.
5. Wood poles to be furnished to the Contractor by the State and shall remain the property of the State. Contractor shall be responsible for delivery of wood poles from/to State facility and project site.

HDOT's Pearl City Base Yard
837 Second Street
Pearl City, HI 96782
Ph. 456-3655



ELEVATION



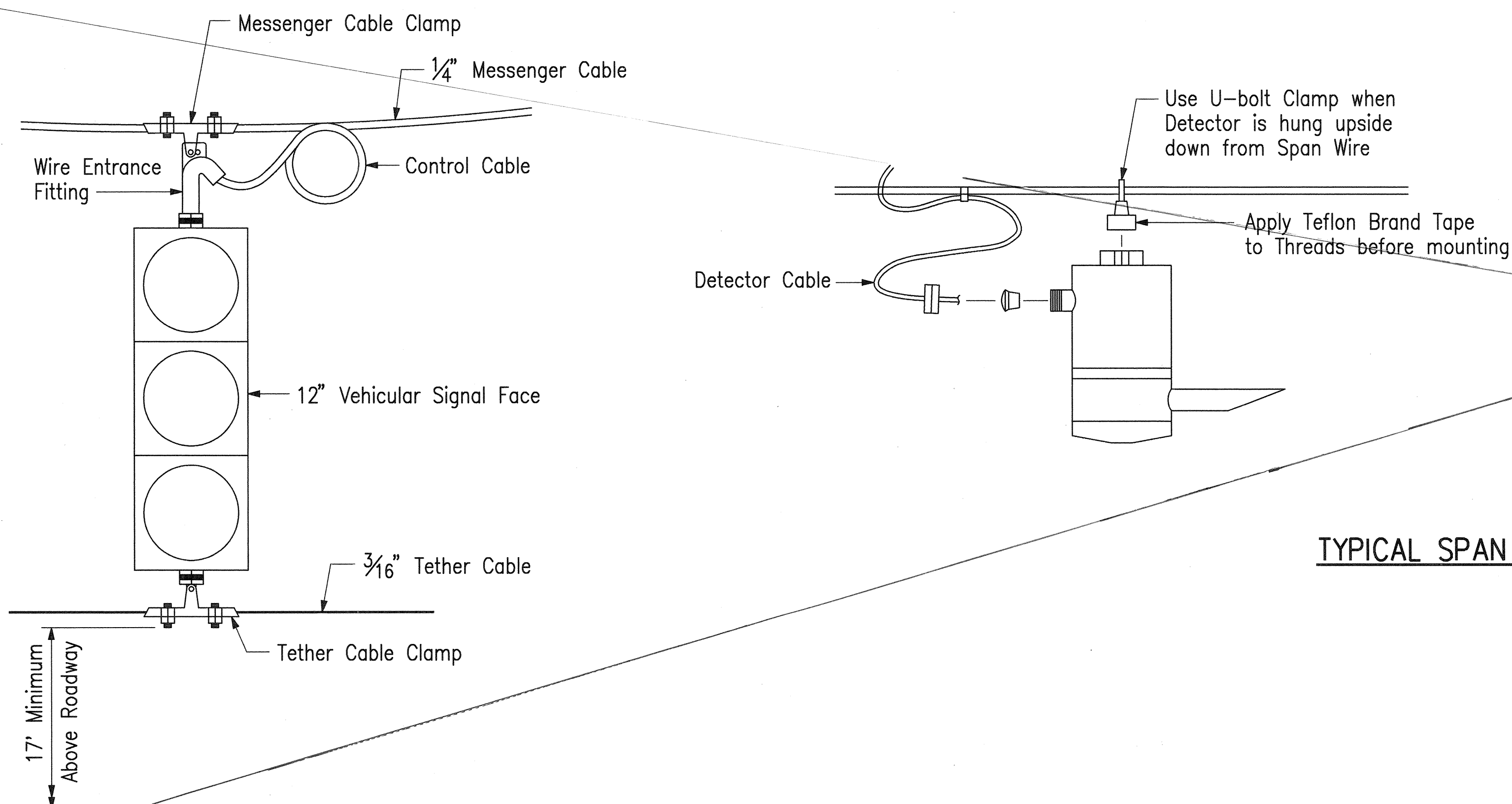
NOTE:

PPB and Signal Circuit Risers shall be installed on street light poles only where specified on the project drawings. This work will not be measured or paid for separately, but shall be considered incidental to the various contract items.

STREET LIGHT POLE RISER DETAIL

NOTES:

1. Detector Reception Angle varies with distance. It is approximately 8° at 1800 Feet. Due to reflection, reception angle is increased at close range. The Detector must be aligned within 8° of the farthest point where priority vehicles is to be sensed.
2. Detectors shall be reused on permanent Traffic Signal System. Relocation of detectors will not be measured and shall be considered incidental to the Emergency Vehicle Preempt Detector.



NOTE:

Knock out Weep Hole before installing

(INSIDE VIEW OF TOP COVER)

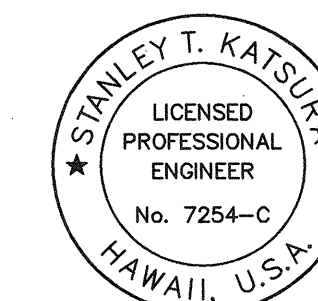
TYPICAL SPAN WIRE INSTALLATION OF EVP DETECTOR

SPAN WIRE MOUNTING

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

CAD by L. Fujimori, 55-52

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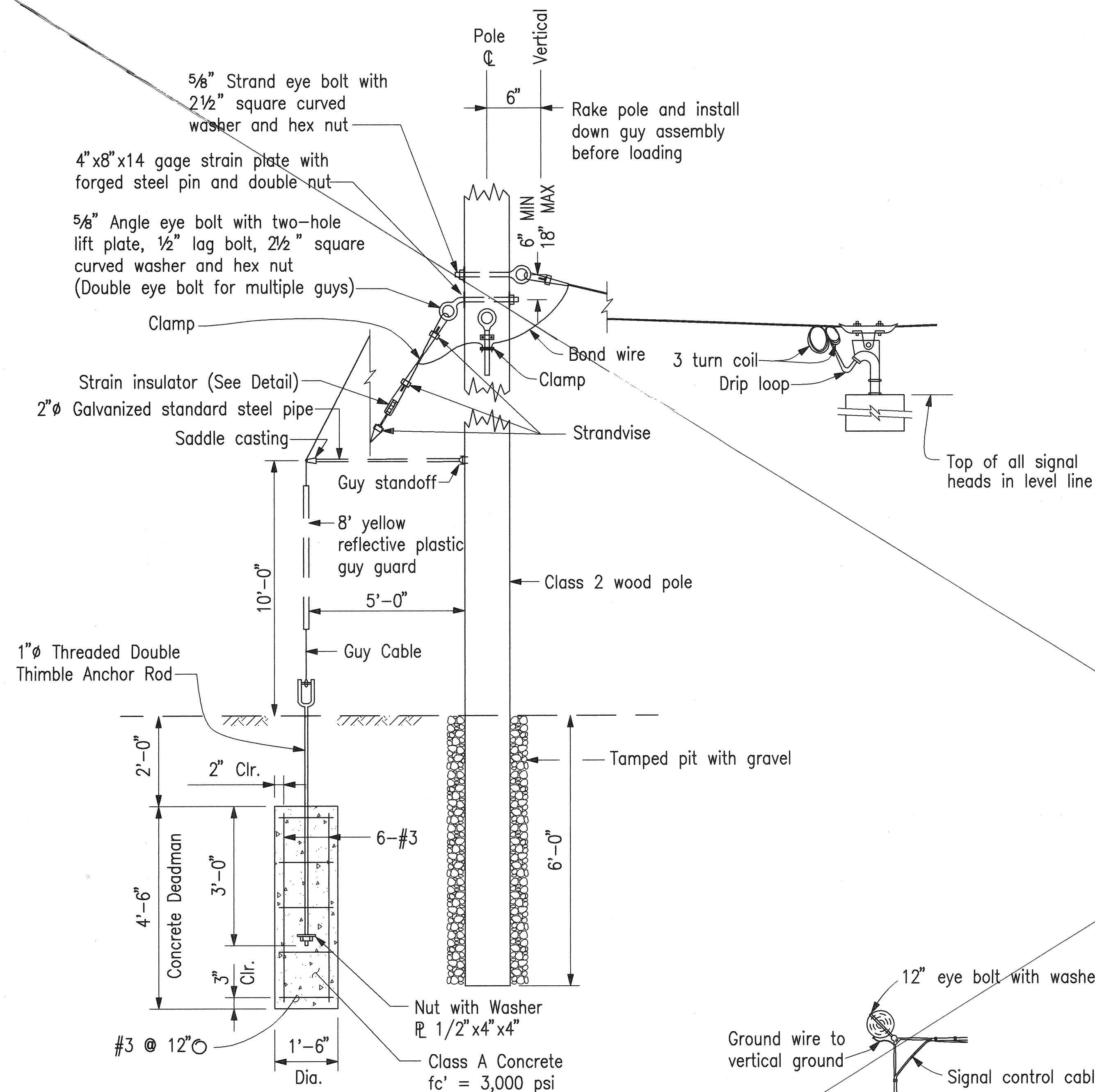
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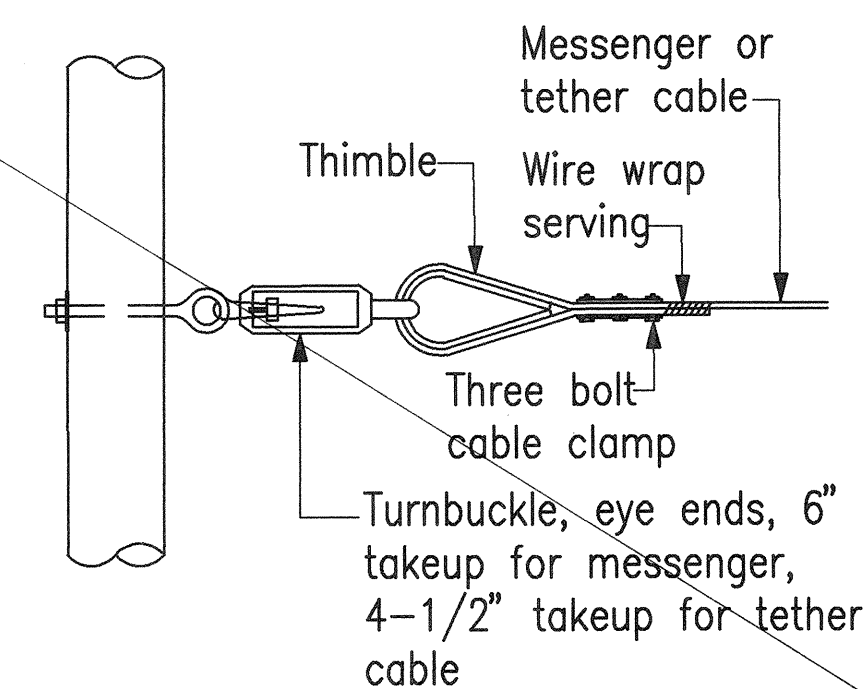
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TRAFFIC SIGNAL SYSTEM
SPAN WIRE DETAILS
STREET LIGHT POLE RISER DETAIL
VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: NONE
DATE: JANUARY 1999
SHEET NO. TS4 OF 11 SHEETS

14

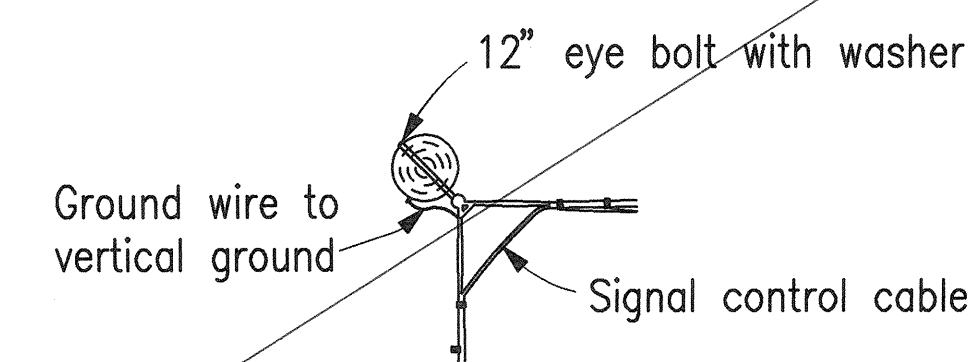
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HAWAII	HAW.	98A-01-98	1999	15	23



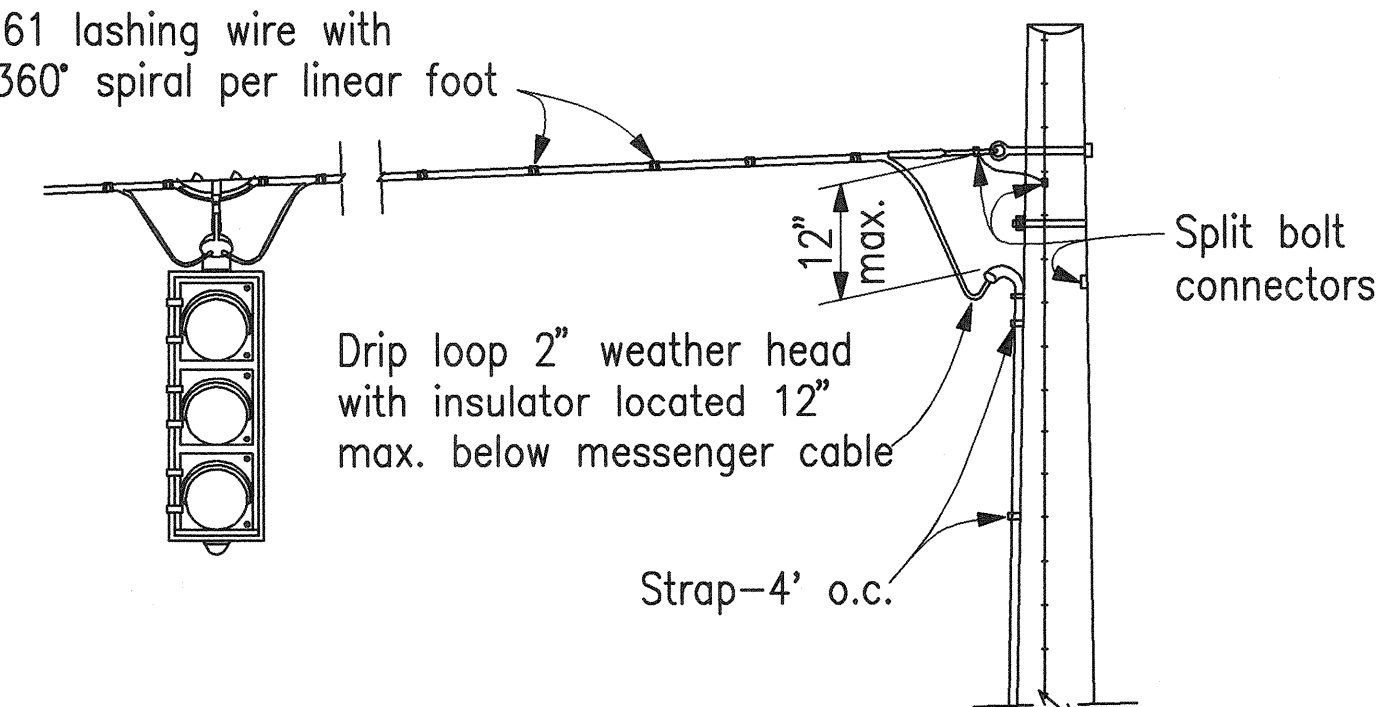
TYPICAL POLE AND ANCHOR DETAIL
Not To Scale



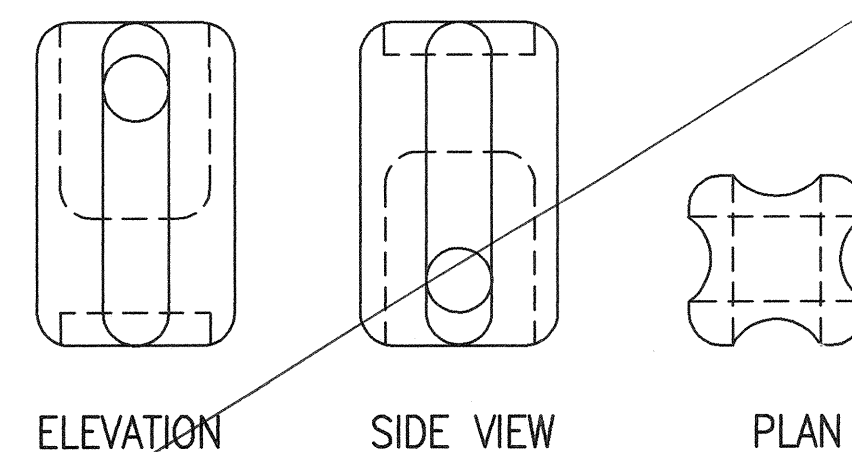
CABLE TO SPAN WIRE POLE
CONNECTION DETAIL
Not To Scale



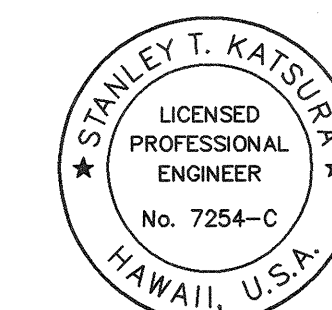
.05"x.30" aluminum
wrapping tape on 15"
centers min. four turns
Or .061 lashing wire with
one 360° spiral per linear foot



POLE TO SPAN WIRE CONNECTION DETAIL
Not To Scale



STRAIN INSULATOR DETAIL
Not To Scale



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

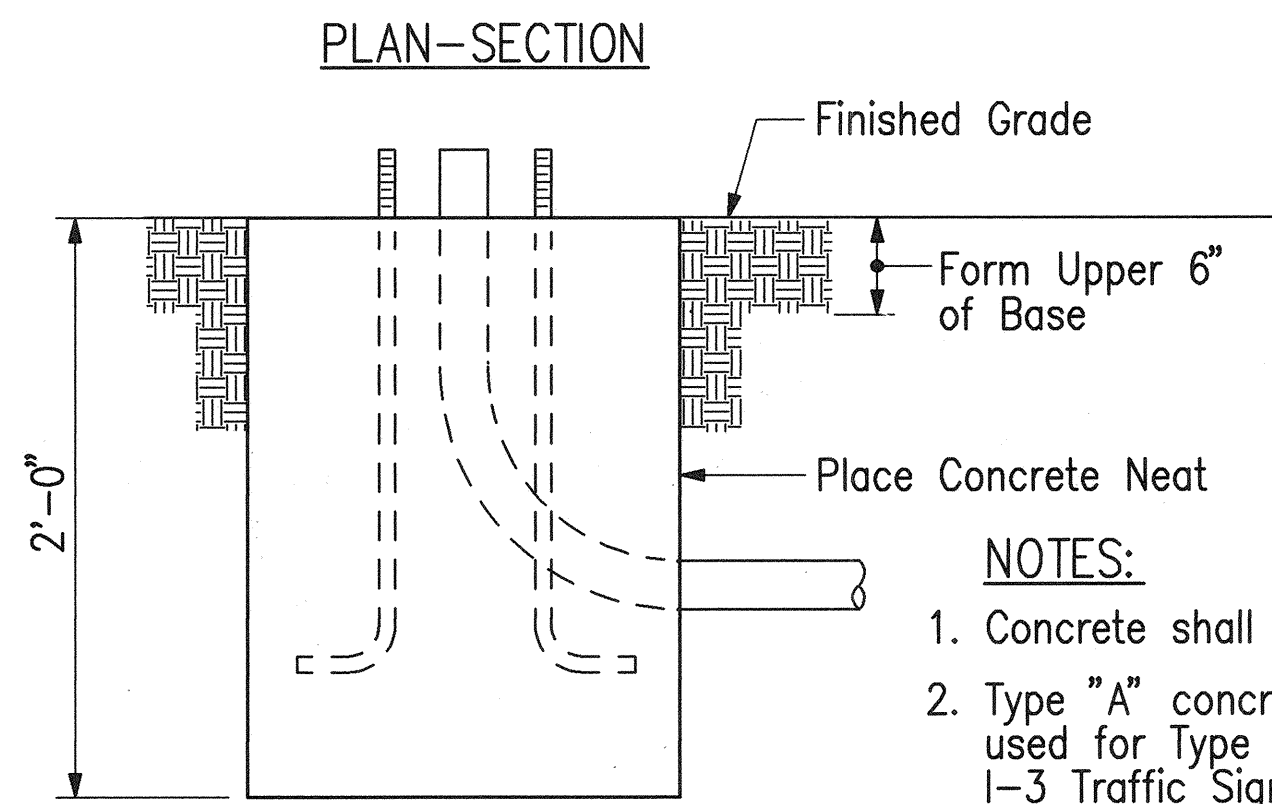
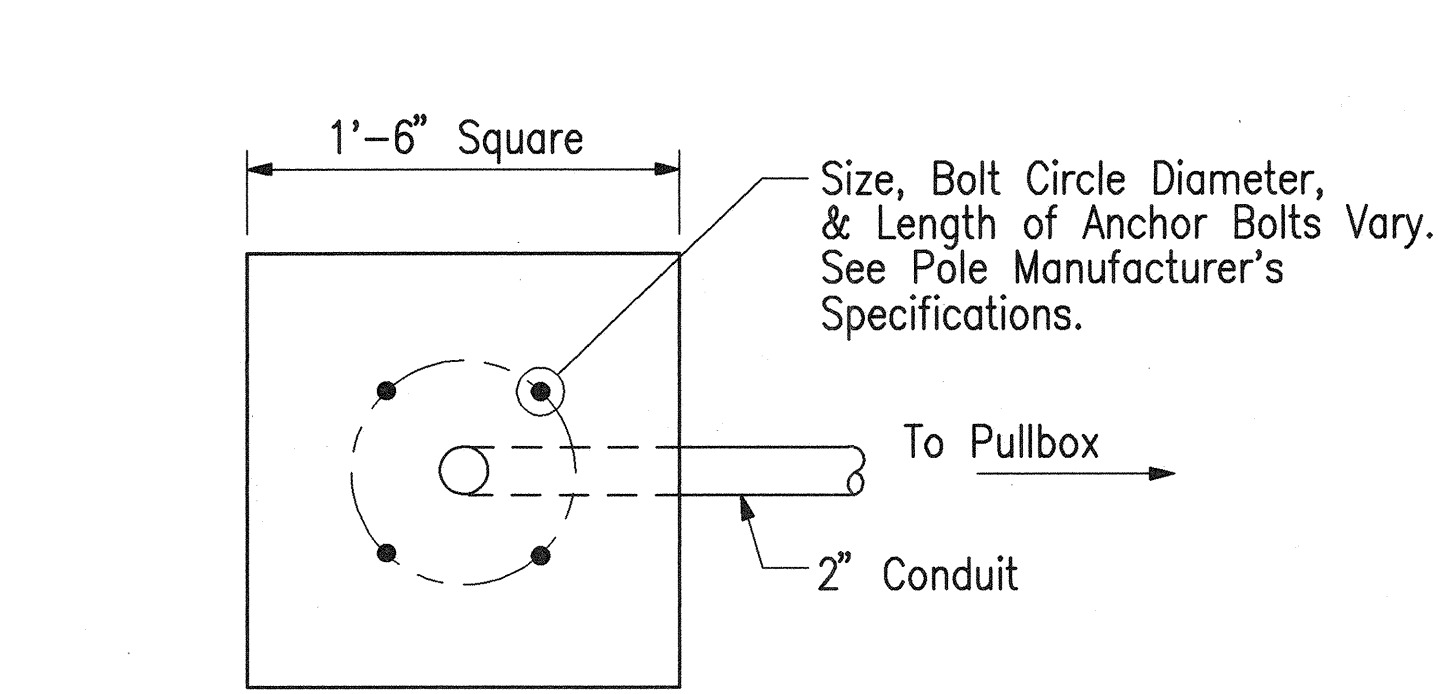
TRAFFIC SIGNAL SYSTEM
SPAN WIRE DETAILS

VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98

SCALE: NONE DATE: JANUARY 1999

SHEET NO. TS5 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	16	23



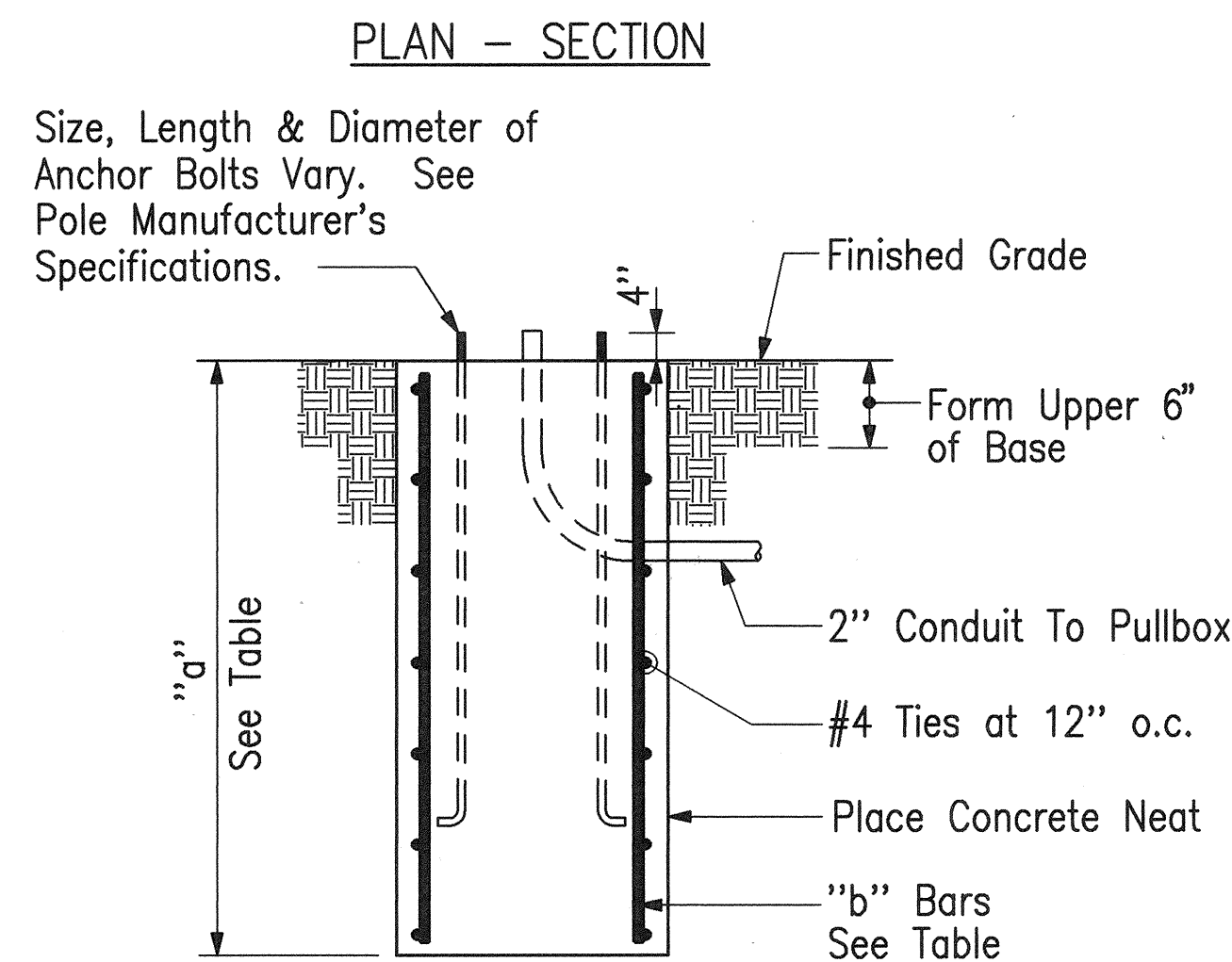
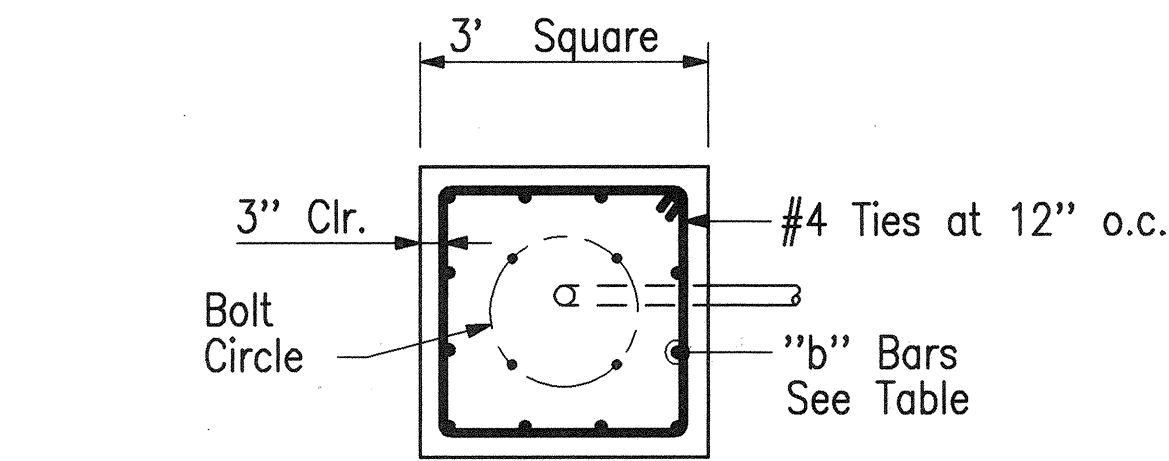
VERTICAL SECTION

TYPE "A" CONCRETE BASE

Scale: $1\frac{1}{2}" = 1'-0"$

NOTES:

- Concrete shall be Class "B".
- Type "A" concrete base shall be used for Type I-10, I-7, and I-3 Traffic Signal Standards.
- Conduit bend is incidental to concrete base.



VERTICAL SECTION

TYPE "C" CONCRETE BASE

Scale: $\frac{1}{2}" = 1'-0"$

TYPE "C" CONCRETE BASE		
TYPE OF STANDARD	"a" Bars	"b" Bars
II - 18	5'-0"	12-#6
II - 20	5'-6"	12-#6
II - 25	6'-0"	12-#6
II - 30	6'-6"	12-#8
II - 35	6'-6"	12-#8
II - 40	7'-0"	12-#8
III - 18	5'-0"	12-#6
III - 20	5'-6"	12-#6
III - 25	6'-0"	12-#6
III - 30	6'-6"	12-#8
III - 35	6'-6"	12-#8
III - 40	7'-0"	12-#8

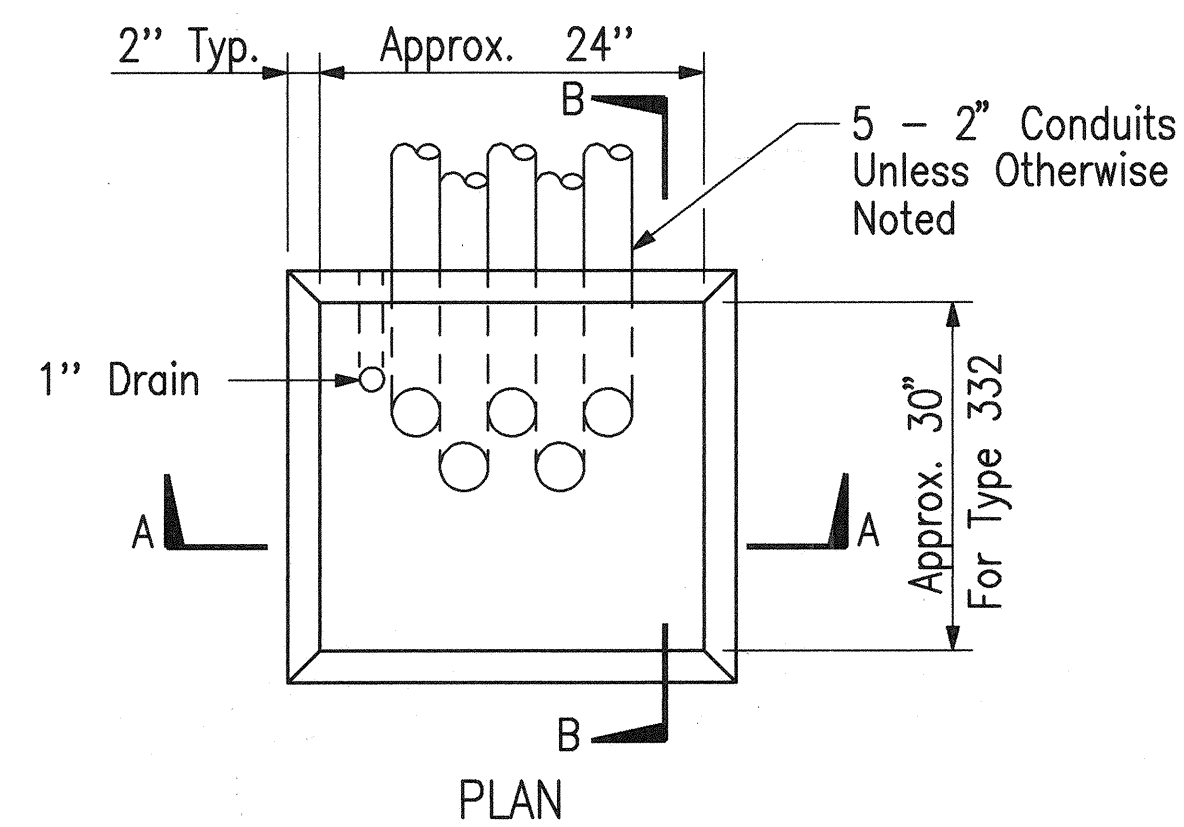
Typical Standard Designation: II - 25

Type

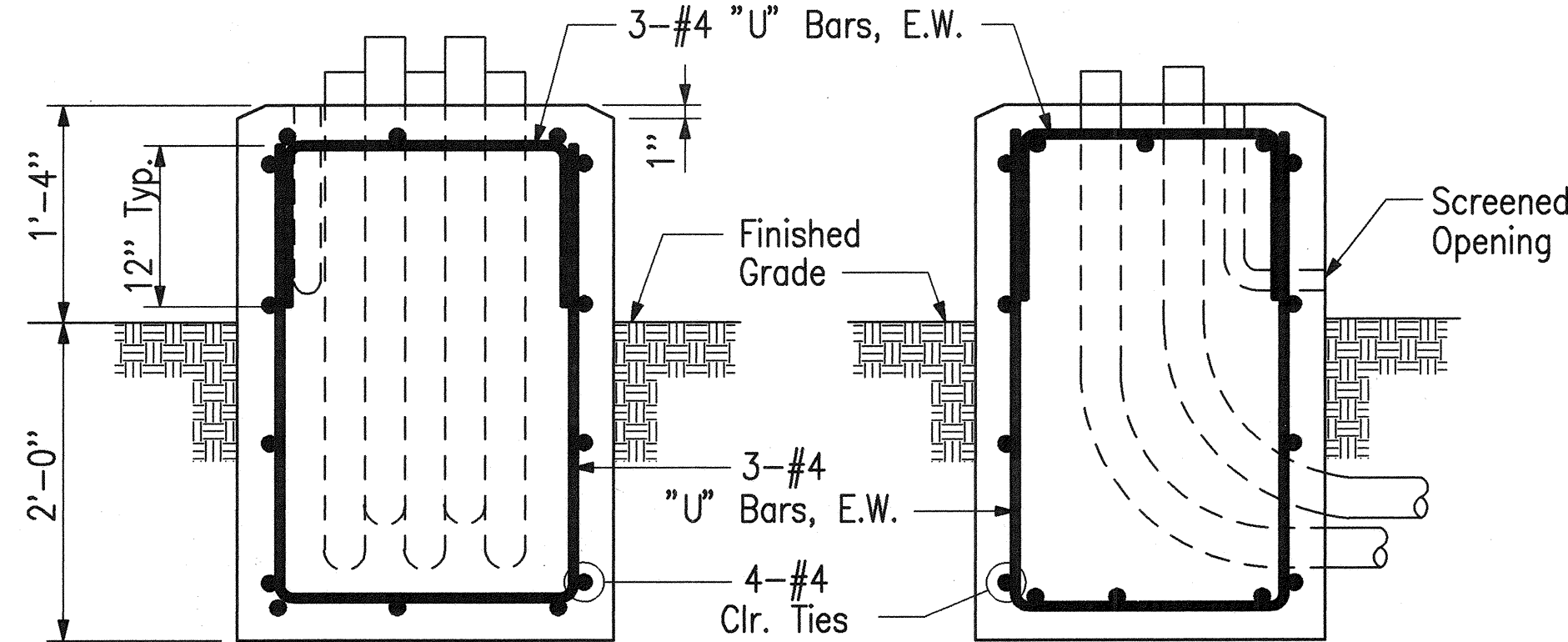
Mast Arm Length

NOTES:

- Concrete shall be Class "B".
- Type "C" concrete base shall be used for Types II and III Traffic Signal Standards.
- Design Lateral Pressure: 1,500 PSF.
- Conduit bend is incidental to concrete base.



PLAN



SECTION "A"

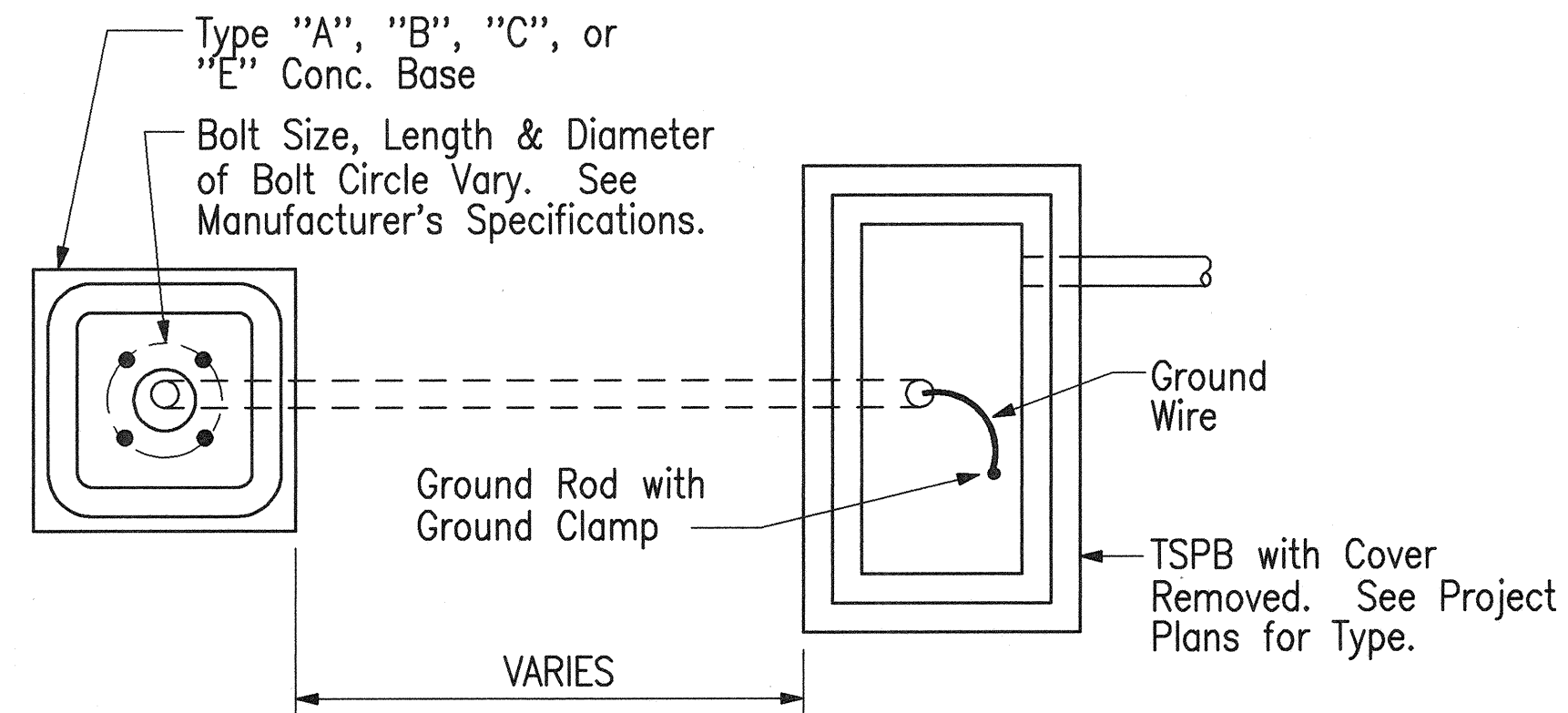
SECTION "B"

TYPE "D" CONC. BASE FOR CONTROLLER CABINETS

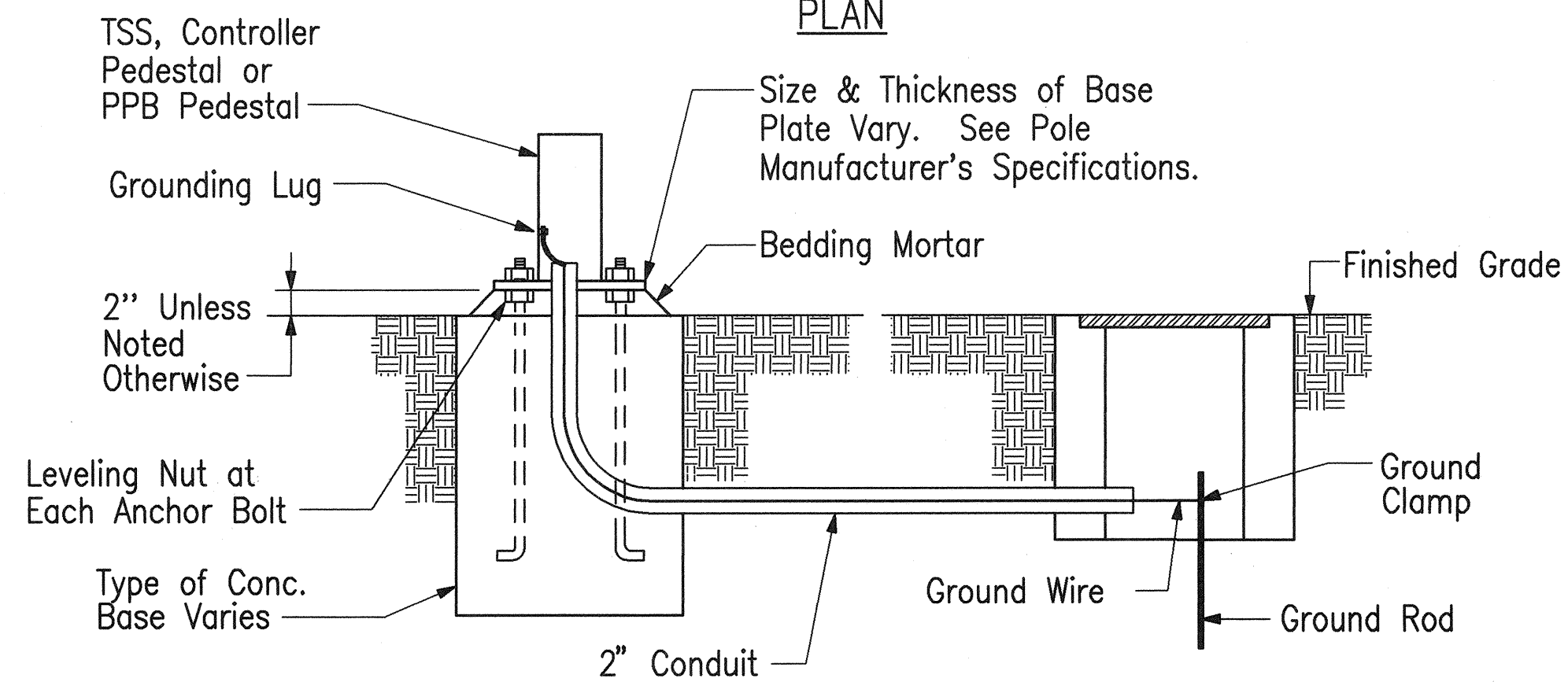
Scale: $1" = 1'-0"$

NOTES:

- Concrete shall be Class "B".
- Dimensions shall be altered to suit controller cabinet actually furnished.
- Conduit bends and drain are incidental to concrete base.
- Refer to cabinet manufacturer's specifications for details of anchor bolts and base setting.
- All exposed surfaces of concrete base shall be given a Class 2, Rubbed Finish.



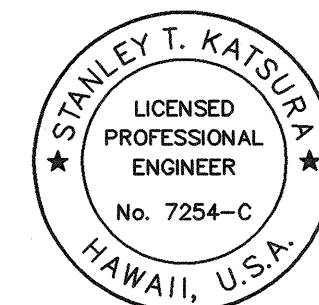
PLAN



SECTION

TYPICAL STANDARD AND PEDESTAL INSTALLATION

Scale: $\frac{1}{2}" = 1'-0"$



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TRAFFIC SIGNAL SYSTEM
CONTROLLER CABINET AND
CONCRETE BASE DETAILS**
VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: AS SHOWN
DATE: JANUARY 1999
SHEET NO. TS6 OF 11 SHEETS

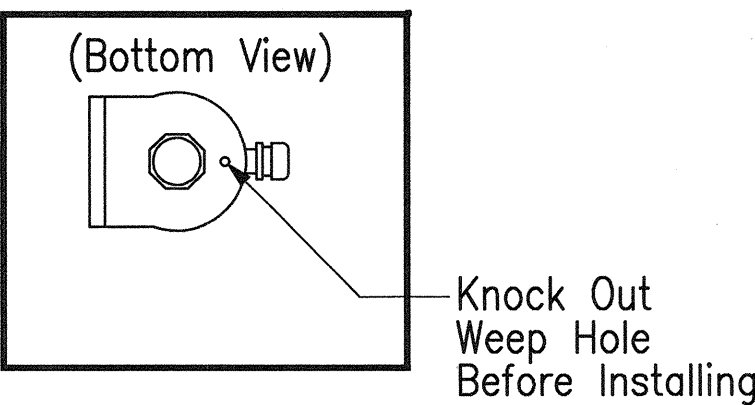
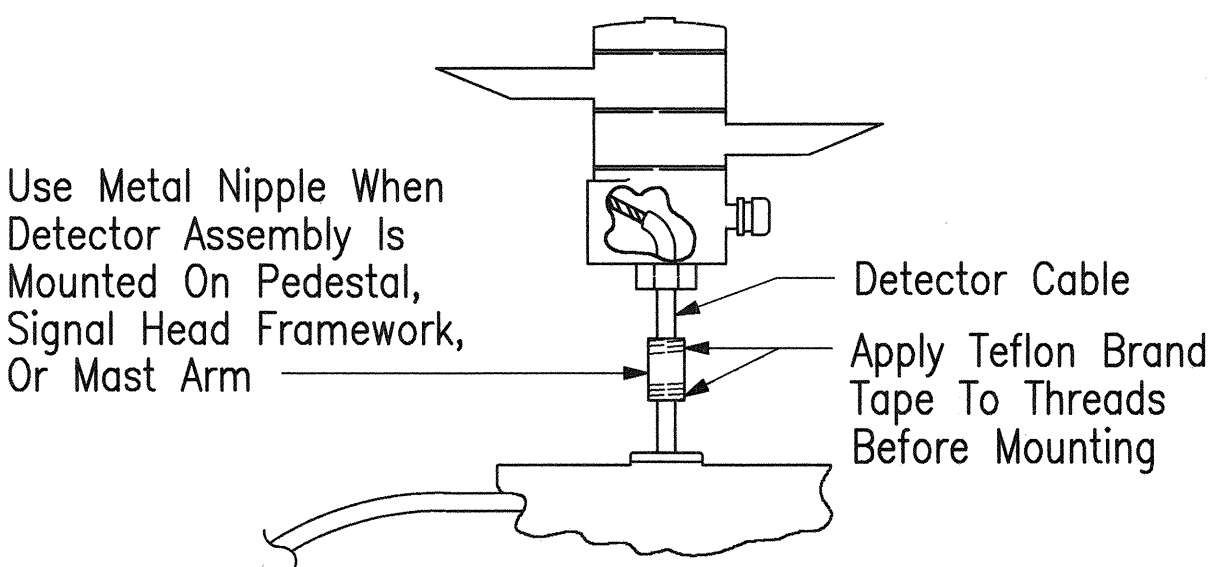
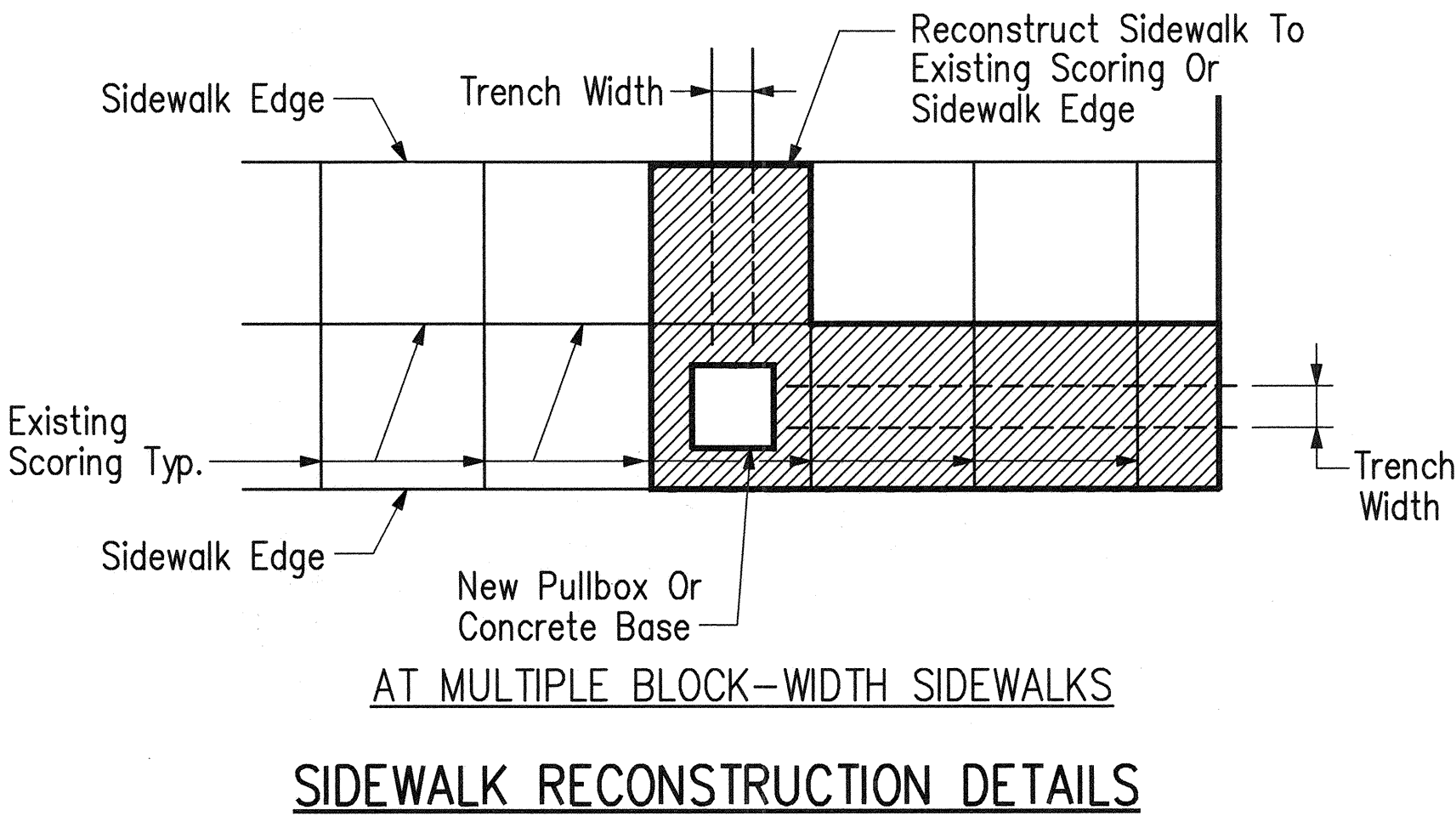
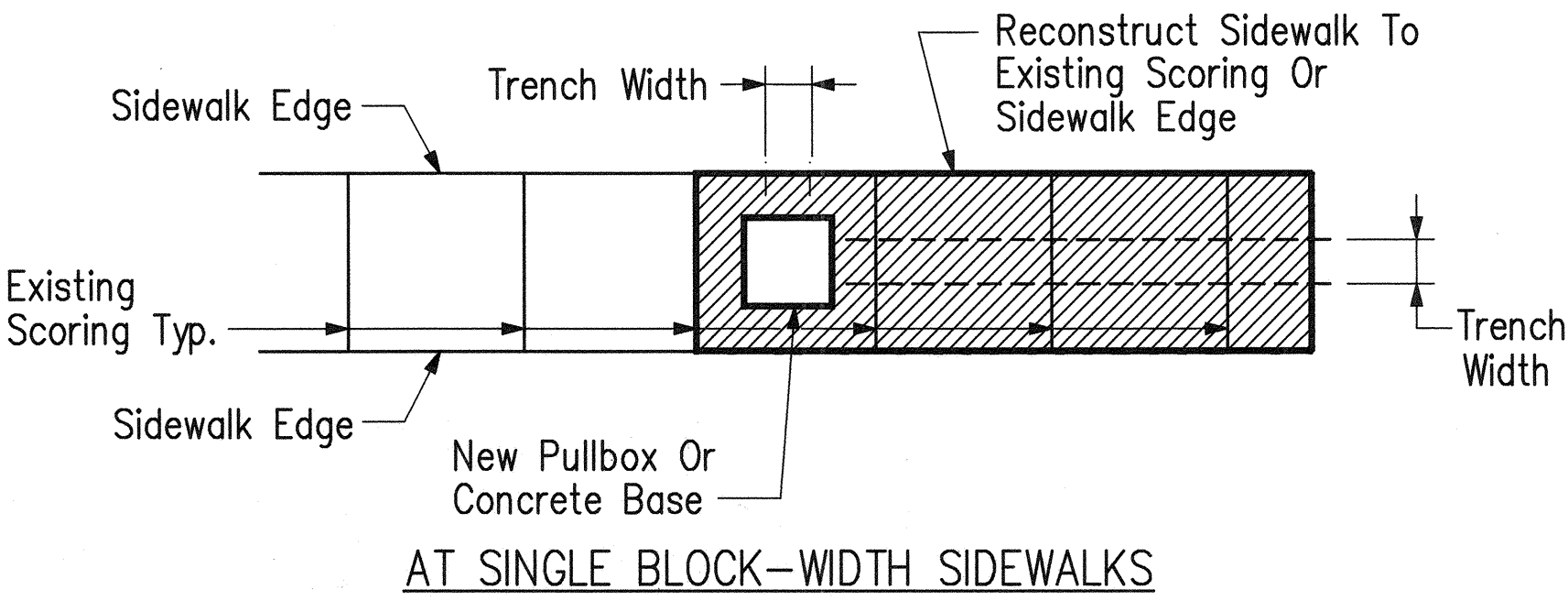
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SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
DESIGNED BY	
CHECKED BY	
NO.	

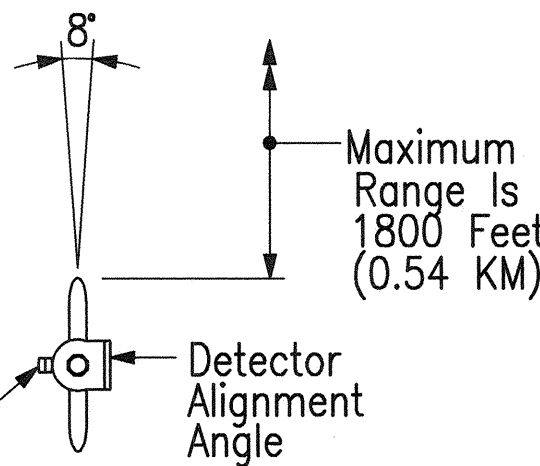
CAD By J. Minura, 55-52

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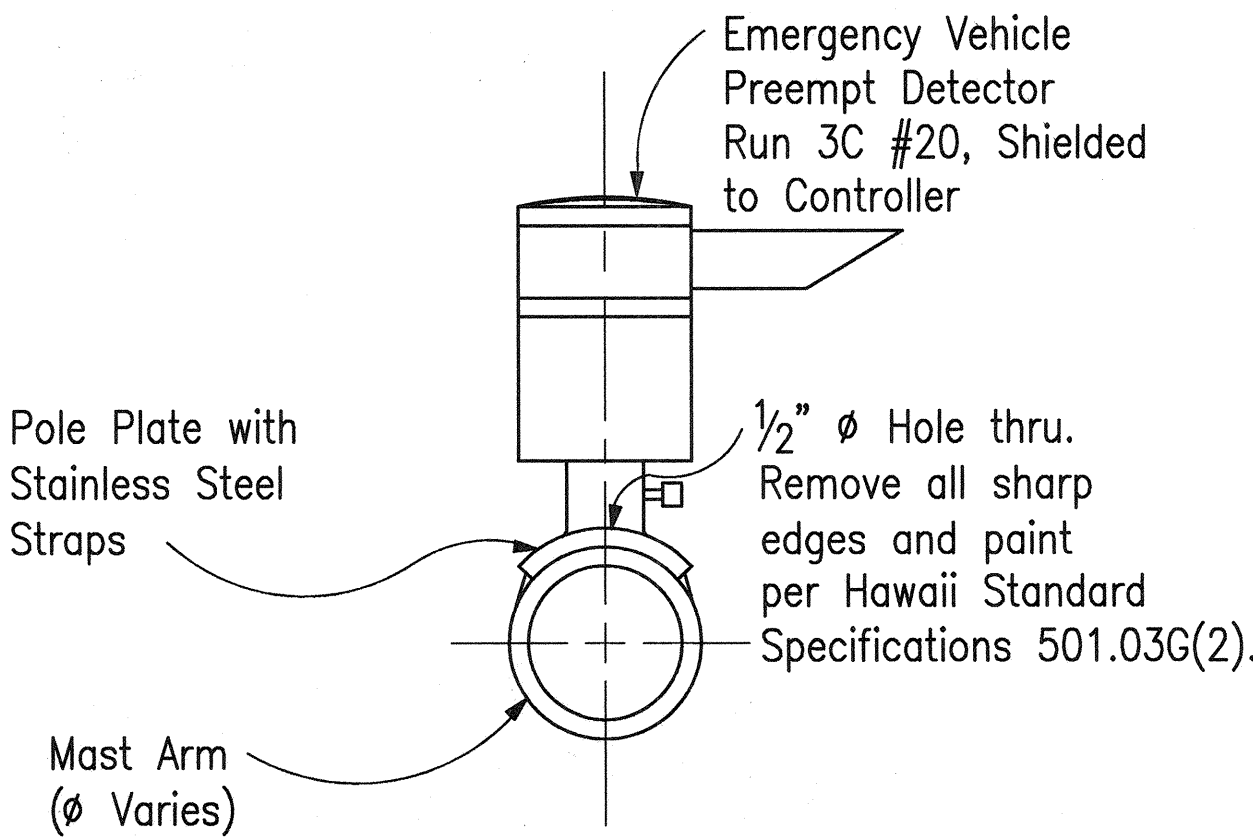
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	17	23



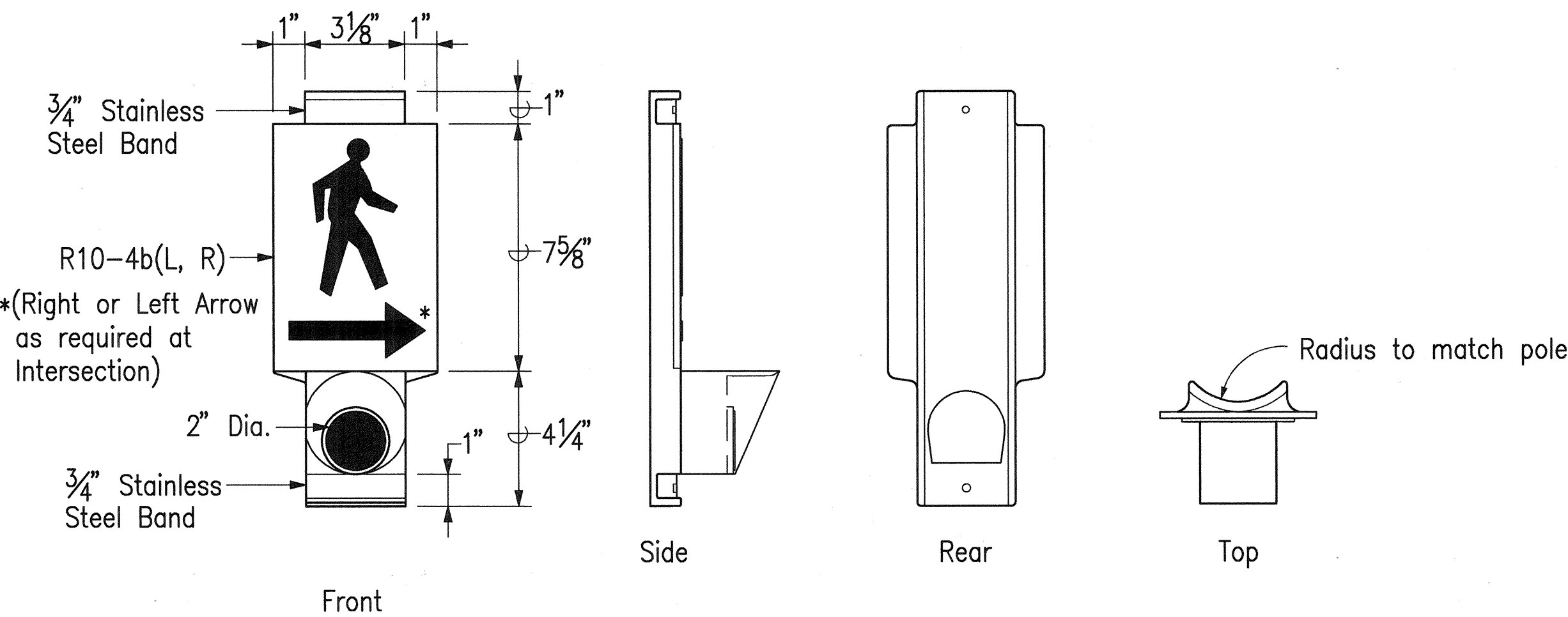
Detector Reception Angle varies with distance. It is approximately 8° at 1800 feet (0.54km). Due to reflection, reception angle is increased at close range. The detector must be aligned within 8° of the farthest point where priority vehicle is to be sensed.



TYPICAL MAST ARM INSTALLATION OF EVP DETECTOR



TYPICAL HORIZONTAL MOUNT OF EMERGENCY VEHICLE PREEMPT DETECTOR

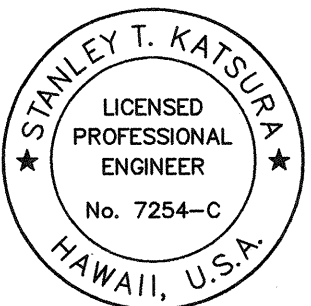


PEDESTRIAN PUSH BUTTON ASSEMBLY

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
No.	

GD by J. Winters, 55-52

Last Saved: J:\VINEYARD\TRAFFIC\Detmisc2.dwg 03/05/99 at 09:29



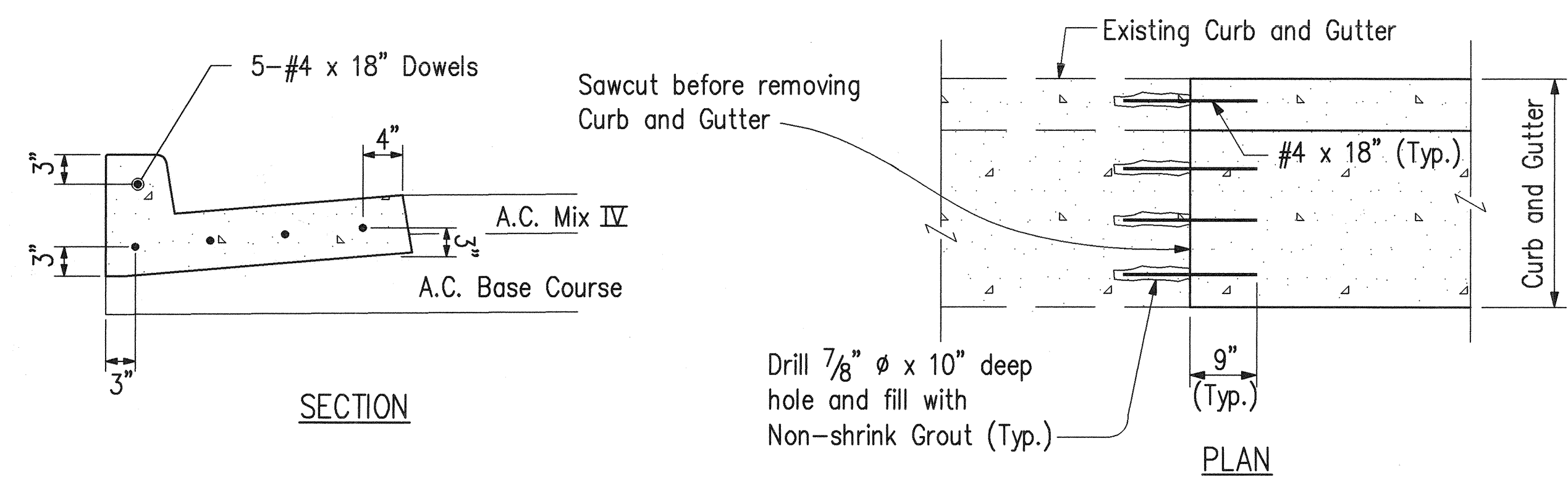
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Stanley T. Katsura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

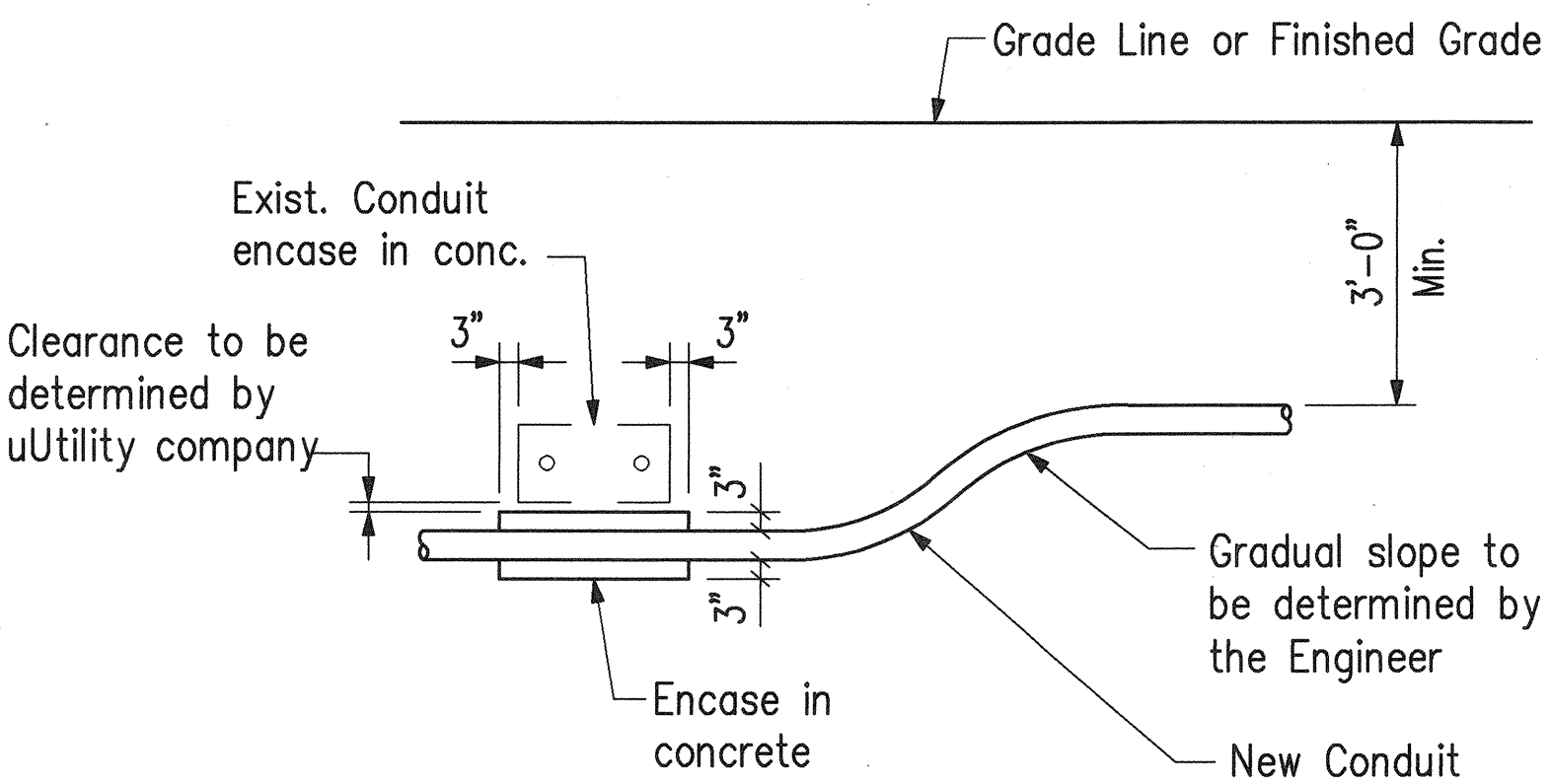
**TRAFFIC SIGNAL SYSTEM
MISCELLANEOUS DETAILS**

VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: NONE DATE: JANUARY 1999
SHEET NO. TS7 OF 11 SHEETS

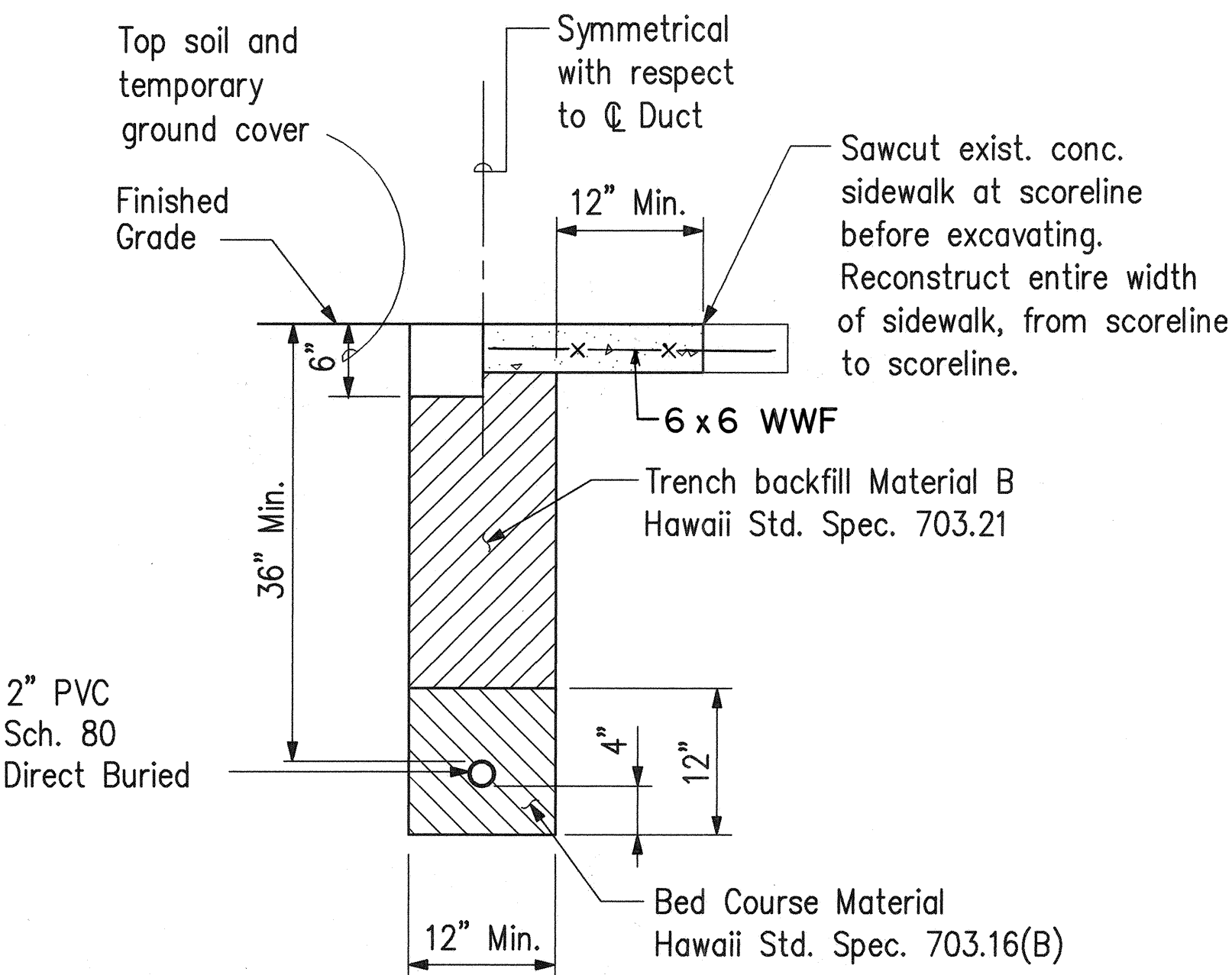
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	18	23



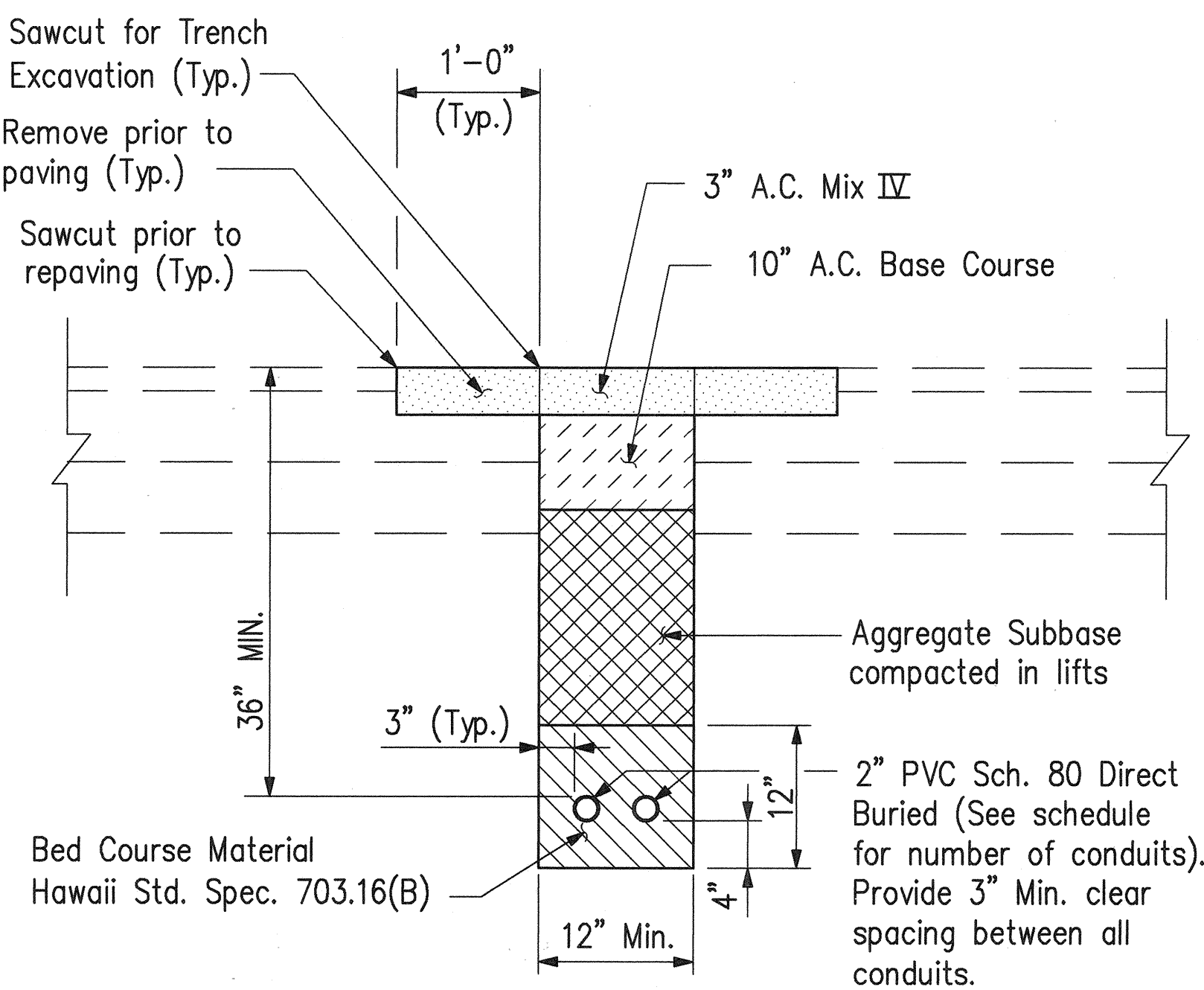
RESTORATION OF CURB AND GUTTER
DUE TO TRENCH EXCAVATION



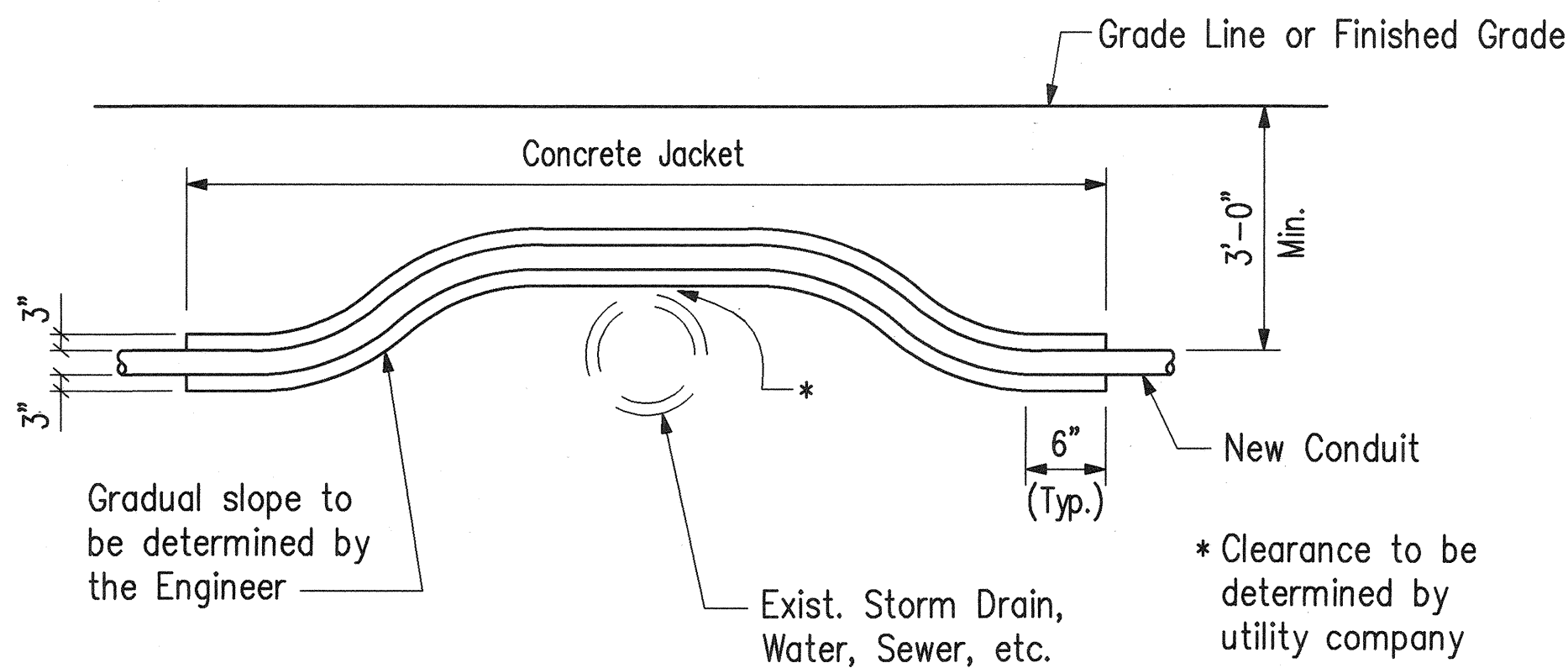
CONDUIT BY-PASS DETAIL



RESTORATION OF EXISTING GROUND
DUE TO TRENCH EXCAVATION



RESTORATION OF EXISTING PAVEMENT
DUE TO TRENCH EXCAVATION

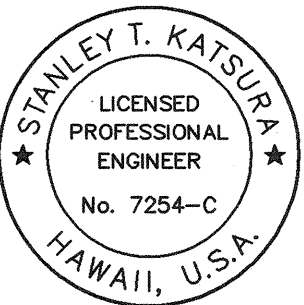


CONDUIT BY-PASS DETAIL
AT VARIOUS UTILITIES

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DESIGNED BY	
QUANTITIES BY	CHECKED BY	
NO.		

CAD by J. Minura, 55-52

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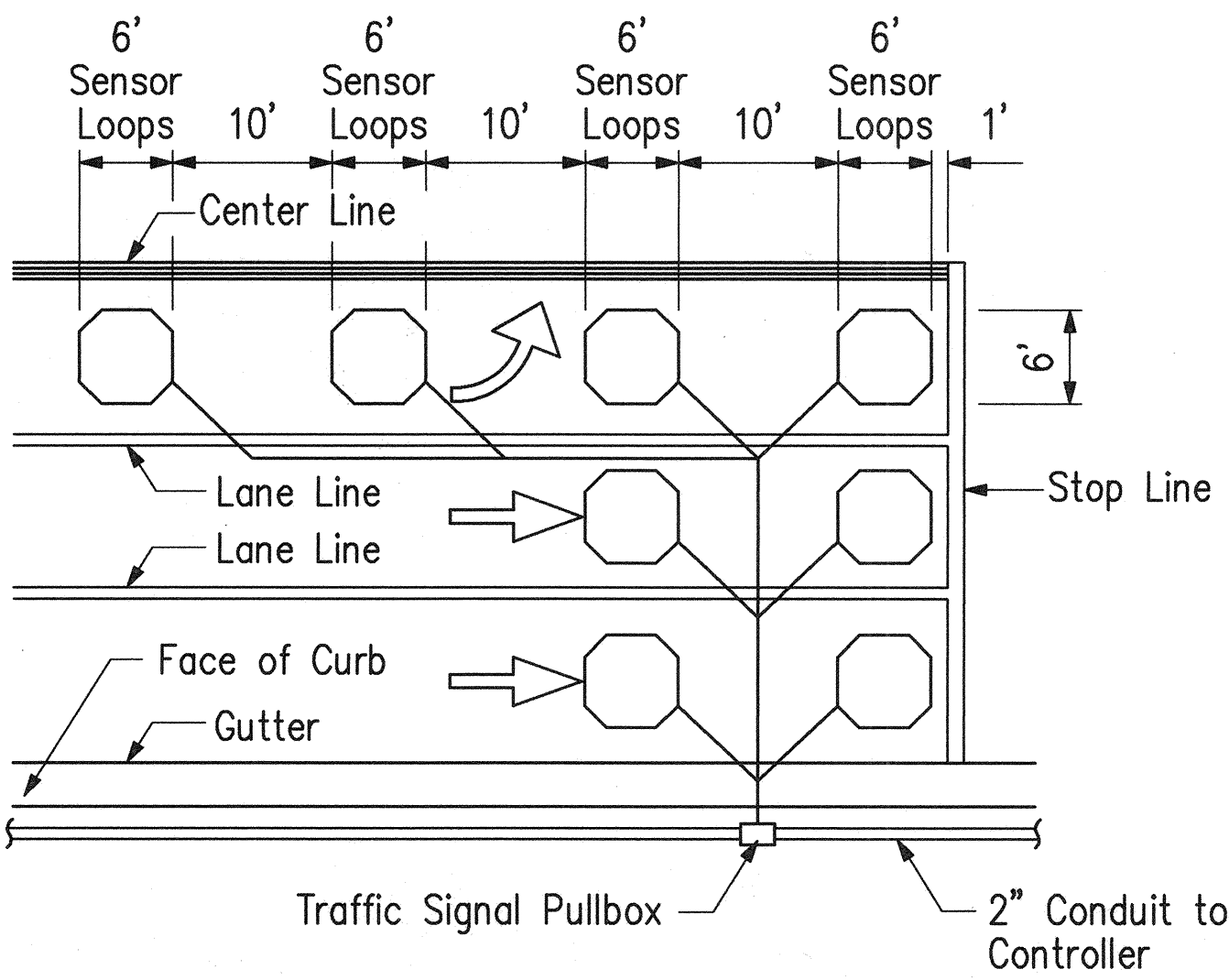
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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TRAFFIC SIGNAL SYSTEM
TRENCHING DETAILS**

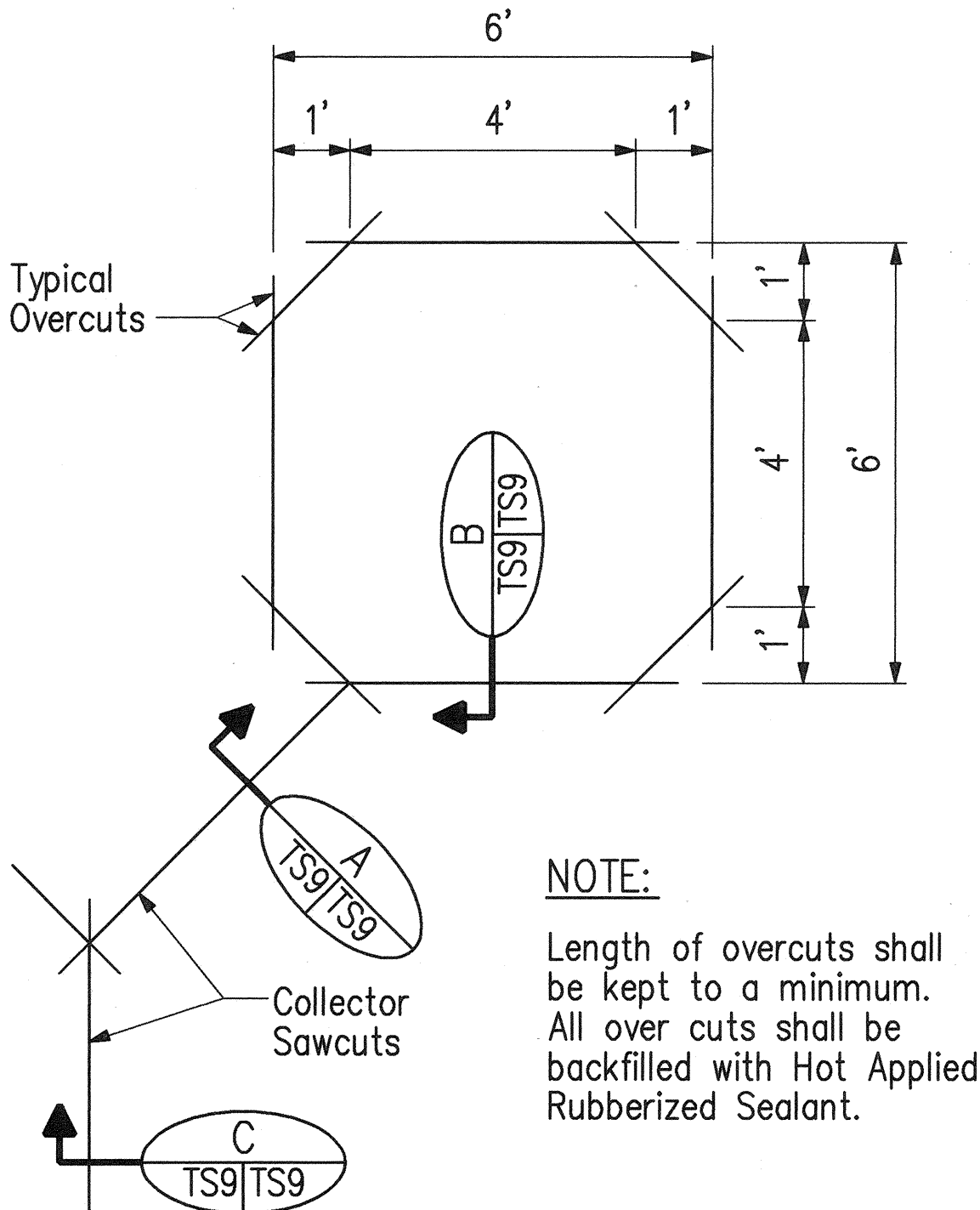
VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: NONE
DATE: JANUARY 1999
SHEET NO. TS8 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	19	23

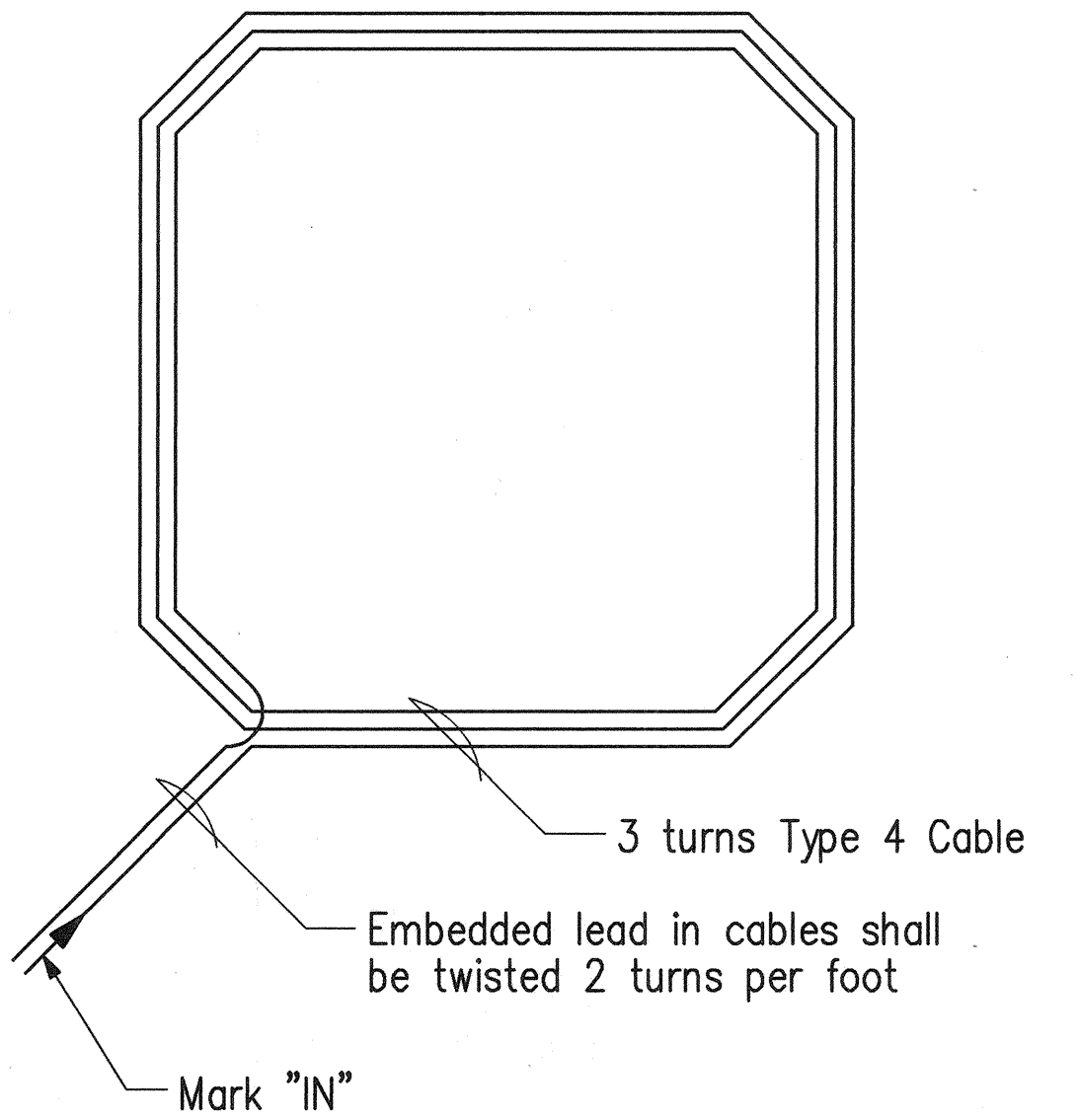


- NOTES:**
- Center sensor loops in lanes.
 - Collector Cables shall be twisted 2 turns per foot.
 - Number of loops and locations vary. See Project Plans.
 - Number and locations of Collector Sawcuts may be varied in the field.

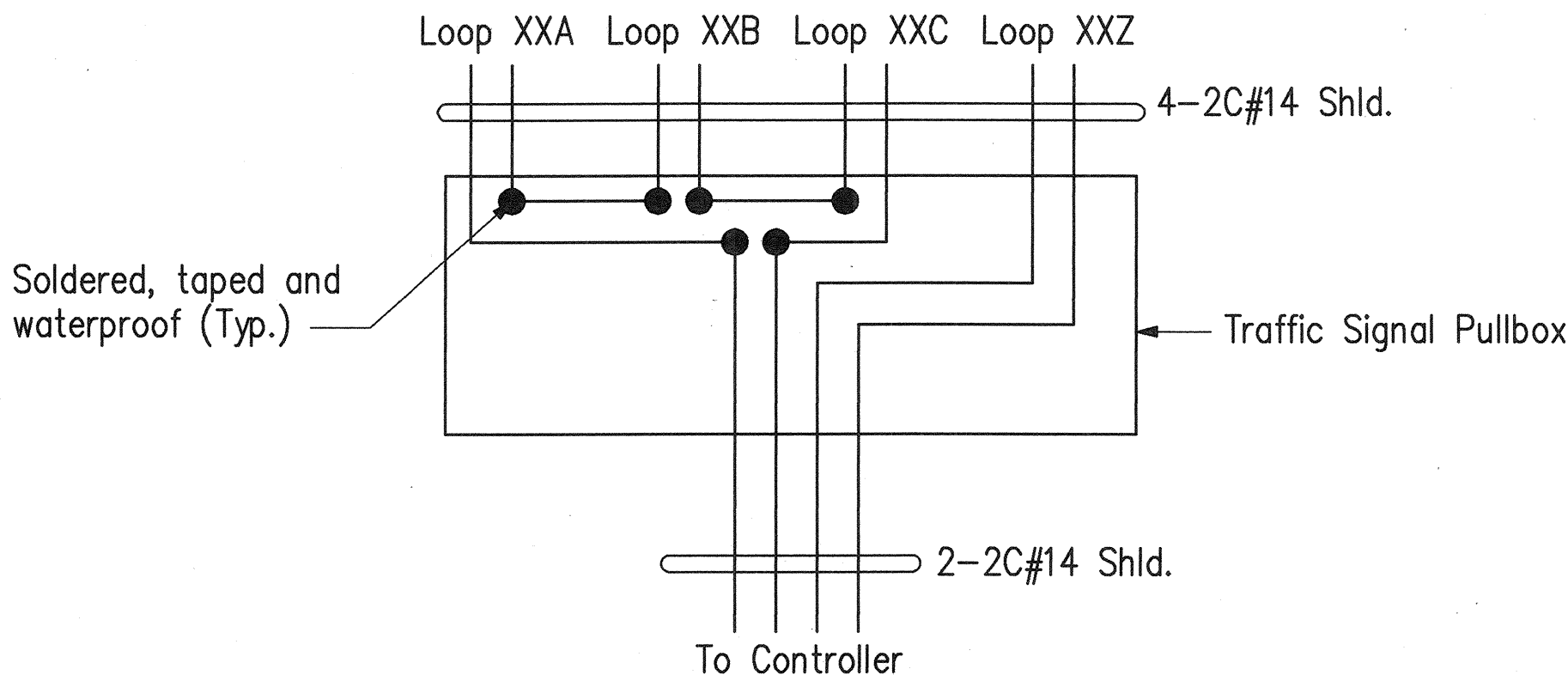
TYPICAL SENSOR LOOP LAYOUT



TYPICAL SENSOR LOOP SAWCUT DETAIL



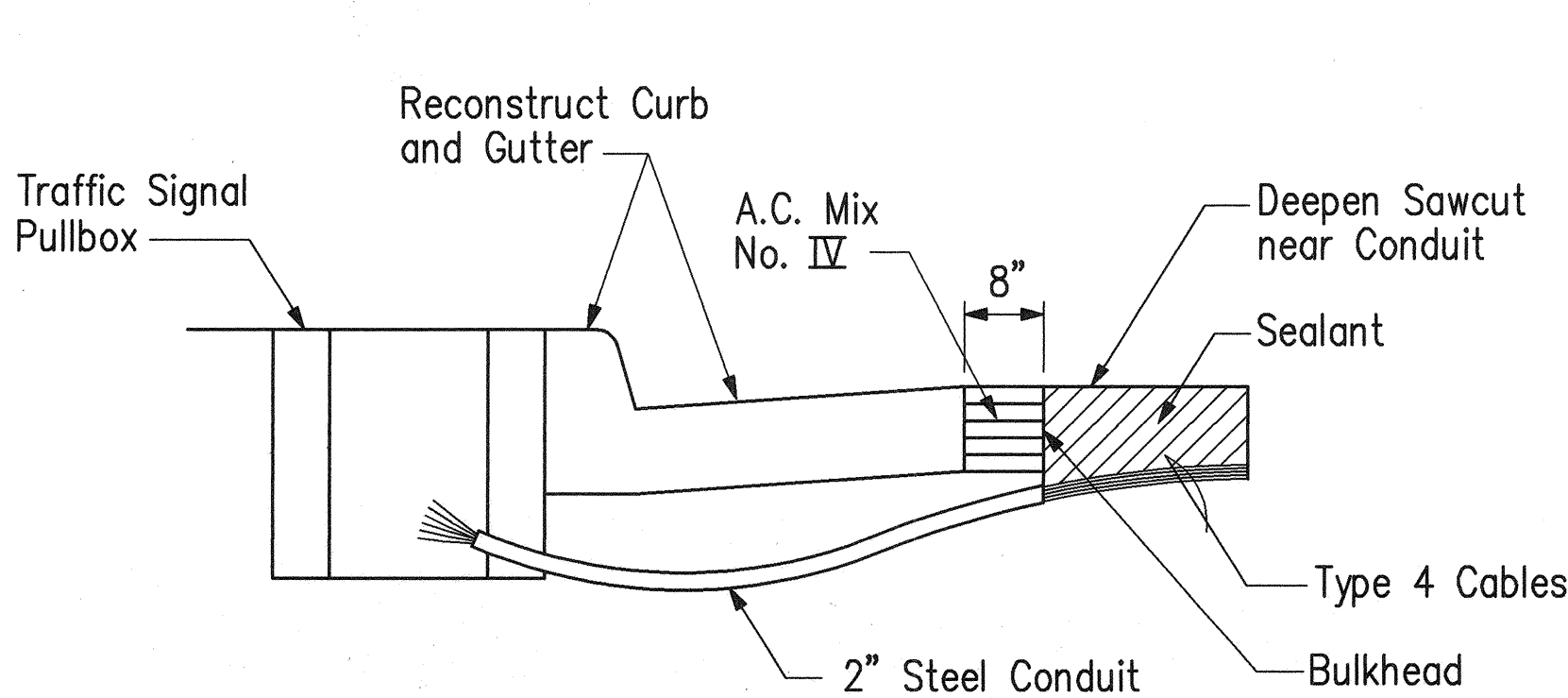
TYPICAL SENSOR LOOP WIRING DIAGRAM



LOOP DETECTOR CONNECTION DETAIL

TYPES OF CABLES

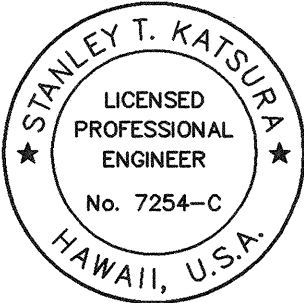
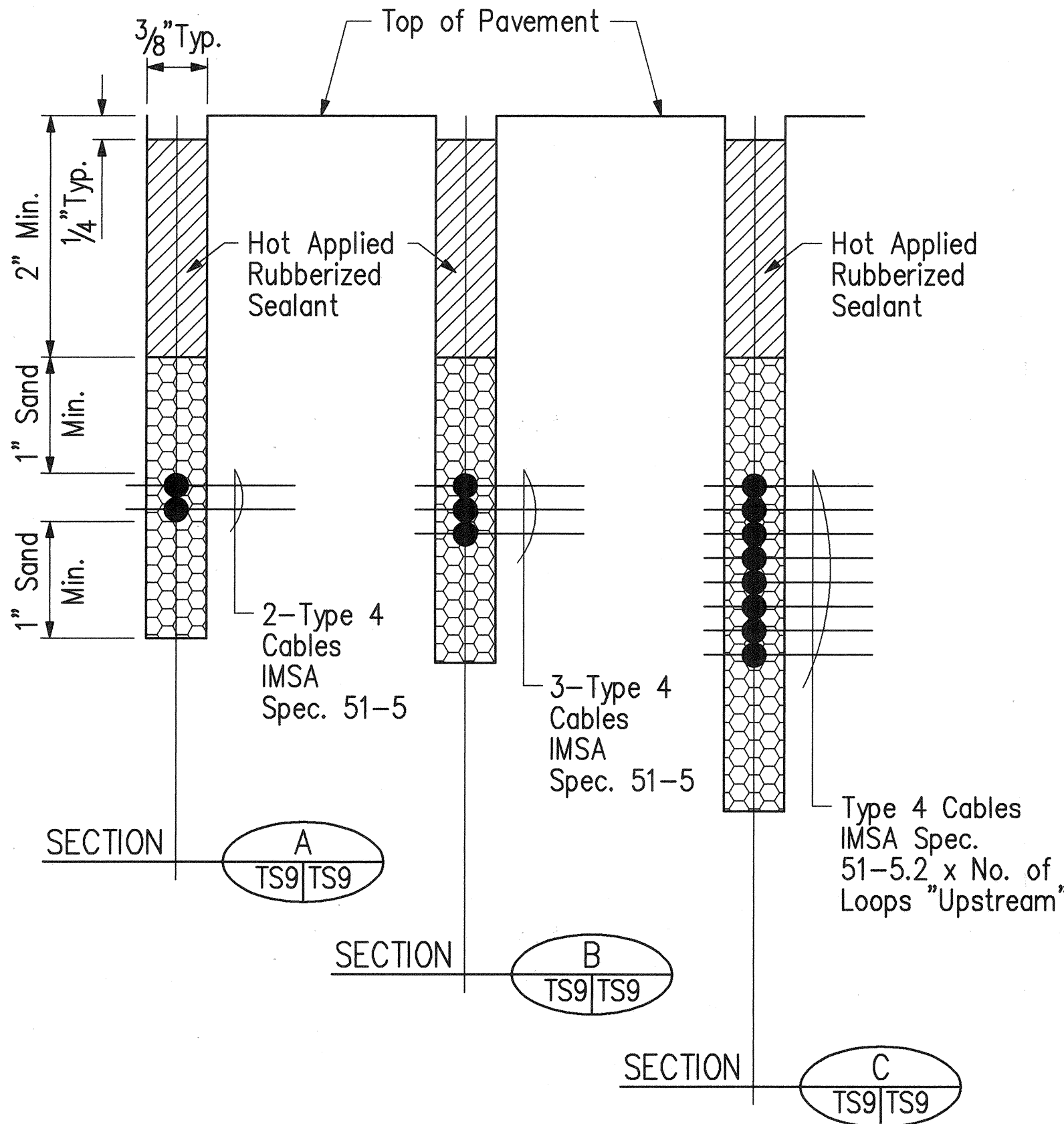
- Type 1 Signal Loop Cable: Stranded No. 14, 26 conductors
- Type 2 Detector lead in cable and pedestrian push button circuit cable: Stranded, No. 14, two conductors
- Type 3 Interconnect Cable: Solid No. 19, 12 pairs
- Type 4 Loop Sensor Cable: Solid No. 12, single conductor to IMSA spec. 51-5
- Type 5 Cable from signal loop to signal head: Stranded, No. 14, four conductors
- Type 6 Service Cable: Solid, No. 6, three conductors
- Type 7 Optical Detector Cable: Berktek Type B, Stranded, No. 20, three conductors
- Type 8 Drop Cable: Solid, No. 14, four 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 PAVEMENT



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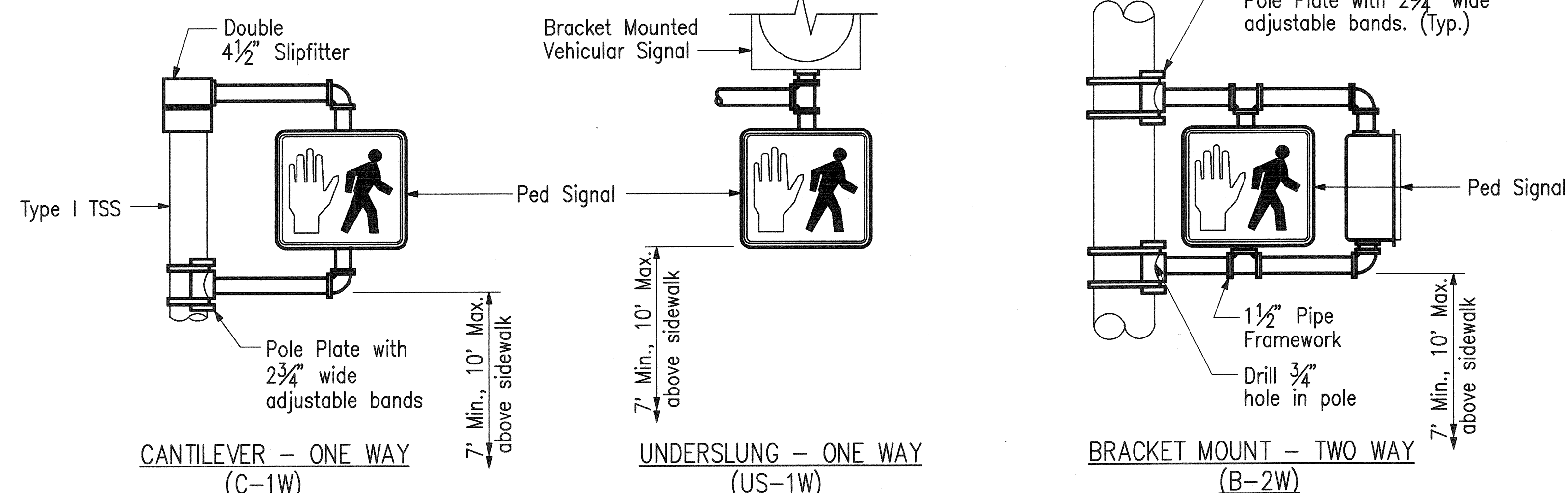
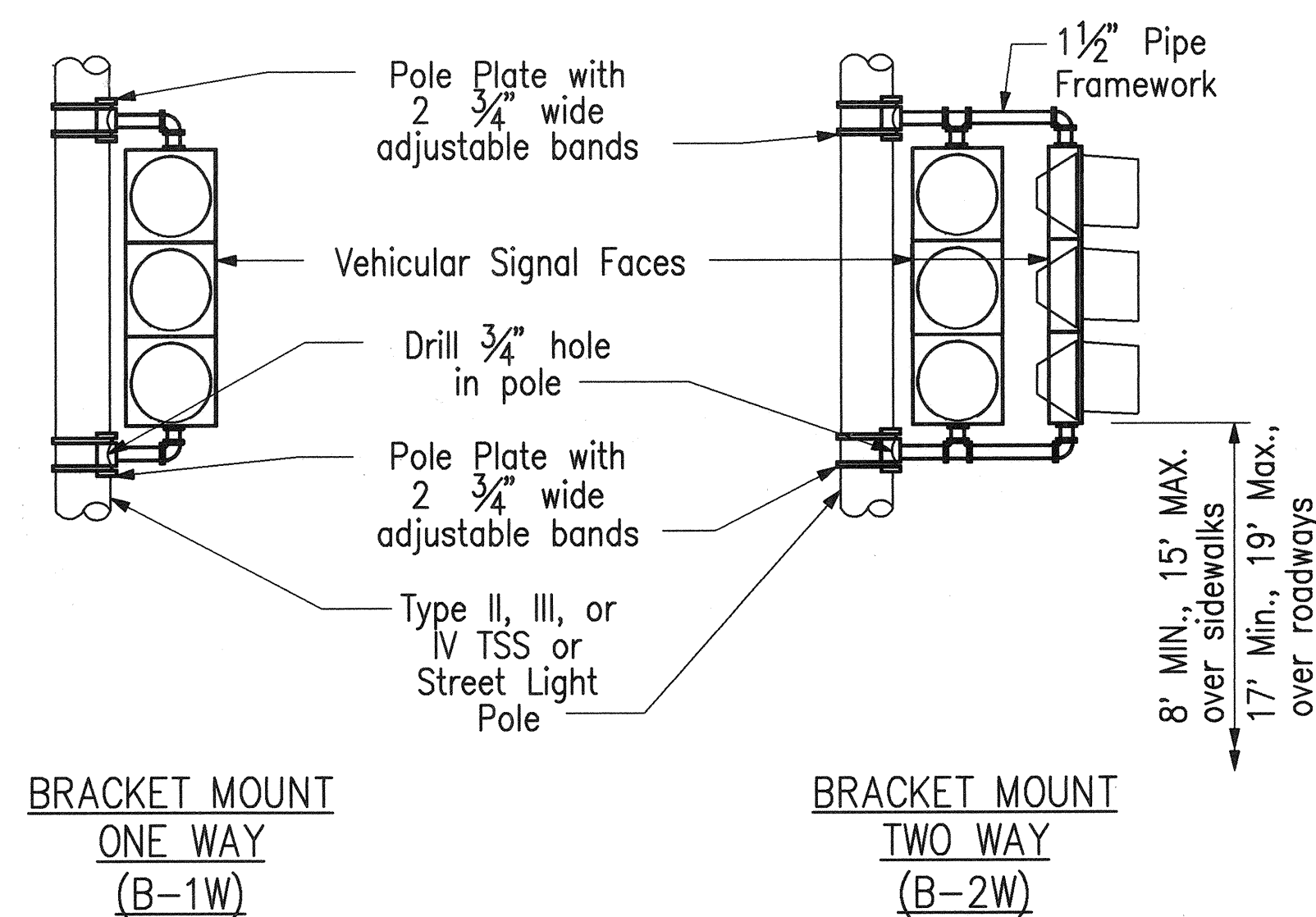
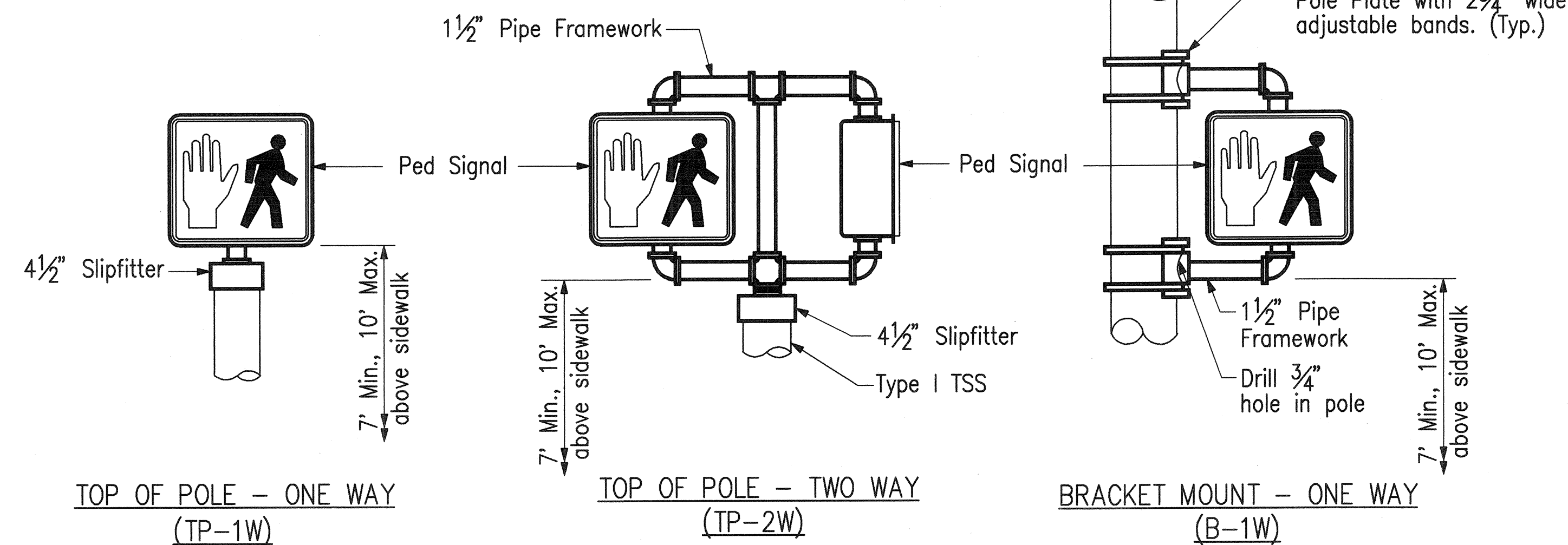
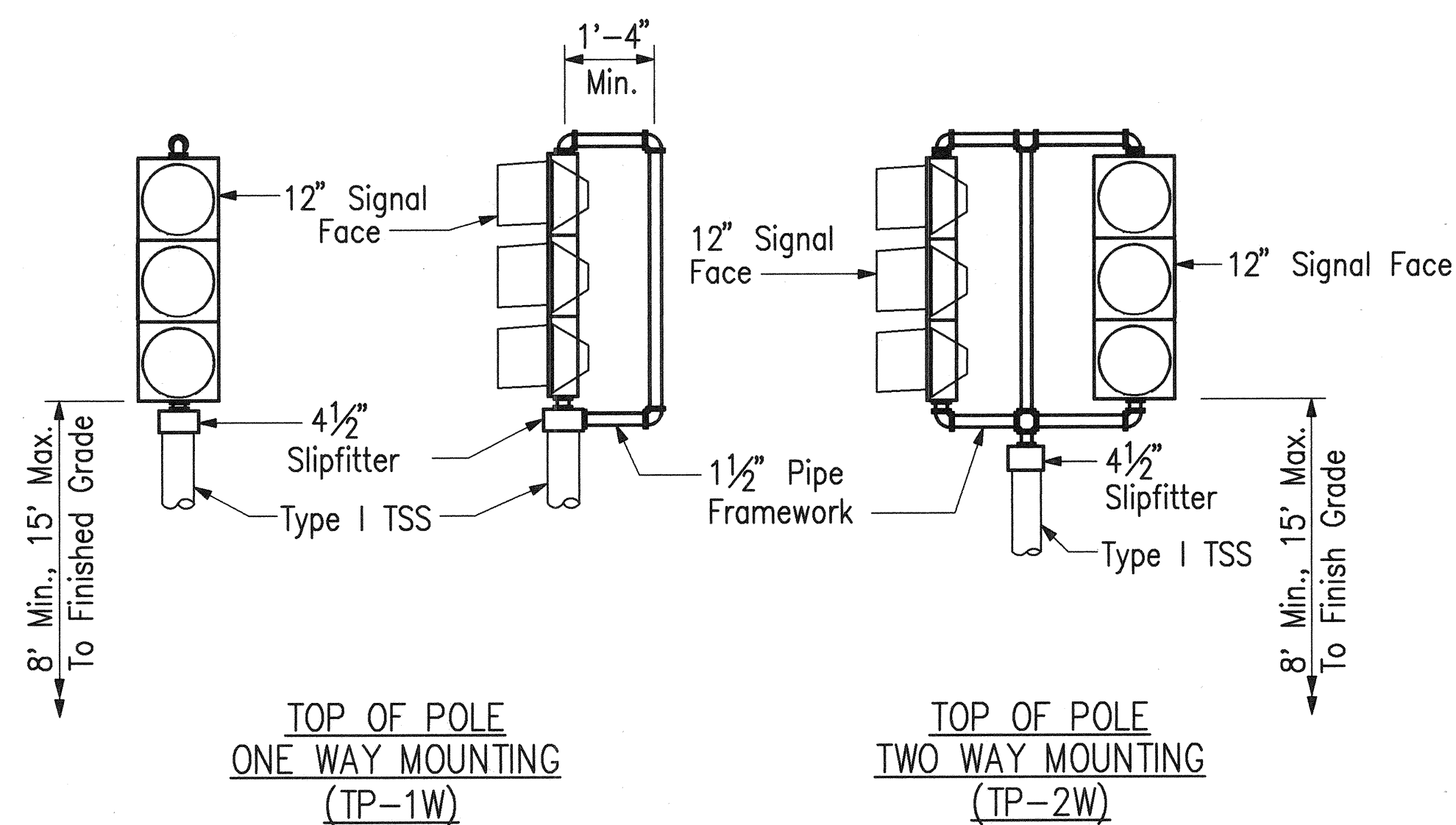
Stanley T. Katsura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TRAFFIC SIGNAL SYSTEM
LOOP DETECTOR DETAILS**

VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: NONE DATE: JANUARY 1999
SHEET NO. TS9 OF 11 SHEETS

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

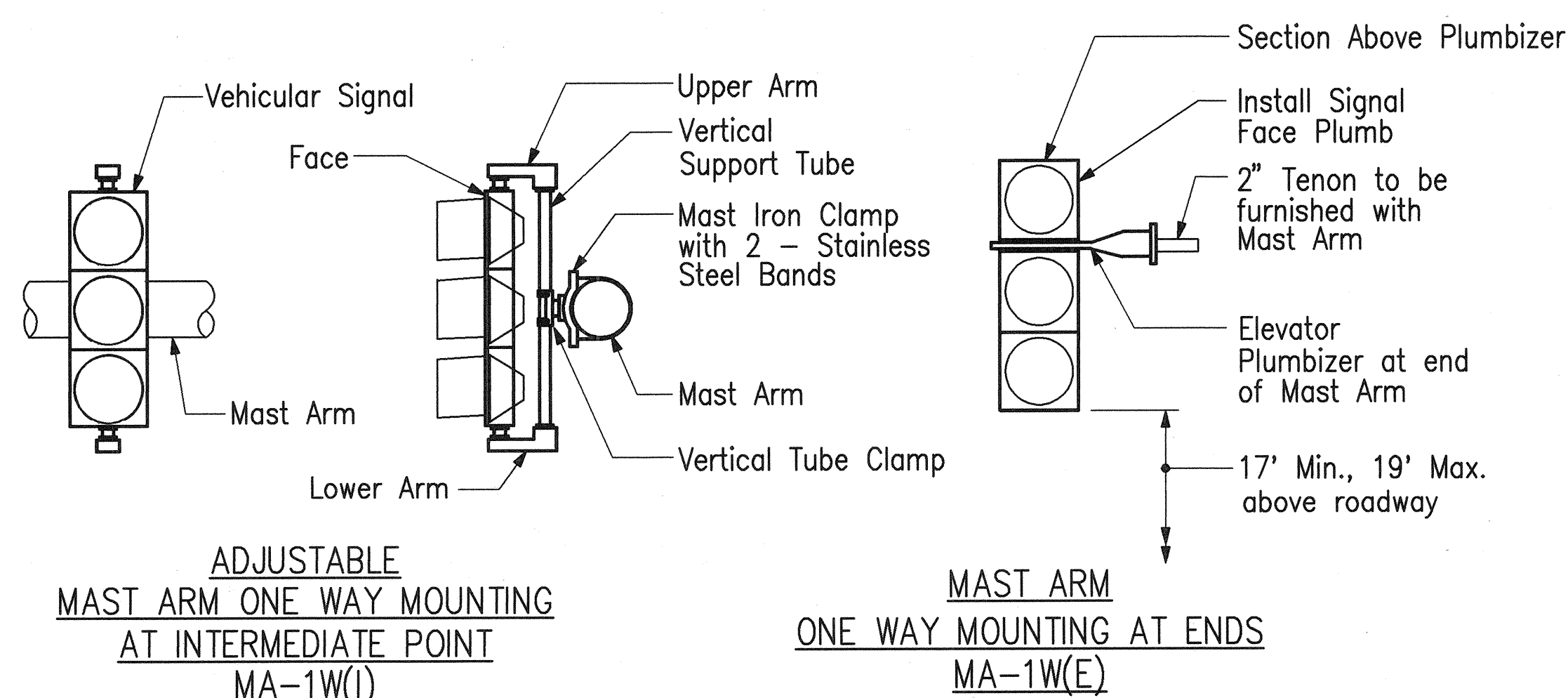
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	20	23



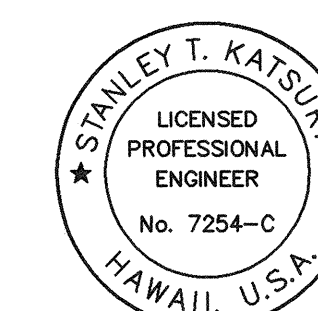
NOTES:

1. Stainless Steel Bands shall be 1/2" wide X .050" thick, minimum. Tensile Strength shall be 100,000 PSI minimum.
2. Upper Arm, Lower Arm and Vertical Support Tube shall be of 356 Cast Aluminum.
3. All wiring shall be concealed.
4. Vertical Tube Clamp shall be of Malleable Iron, Grade 32510.
5. All aluminum parts shall have an Alodine 1200 finish.

PEDESTRIAN SIGNAL MOUNTINGS



VEHICULAR SIGNAL MOUNTINGS



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STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TRAFFIC SIGNAL SYSTEM MOUNTING BRACKET DETAILS

VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98

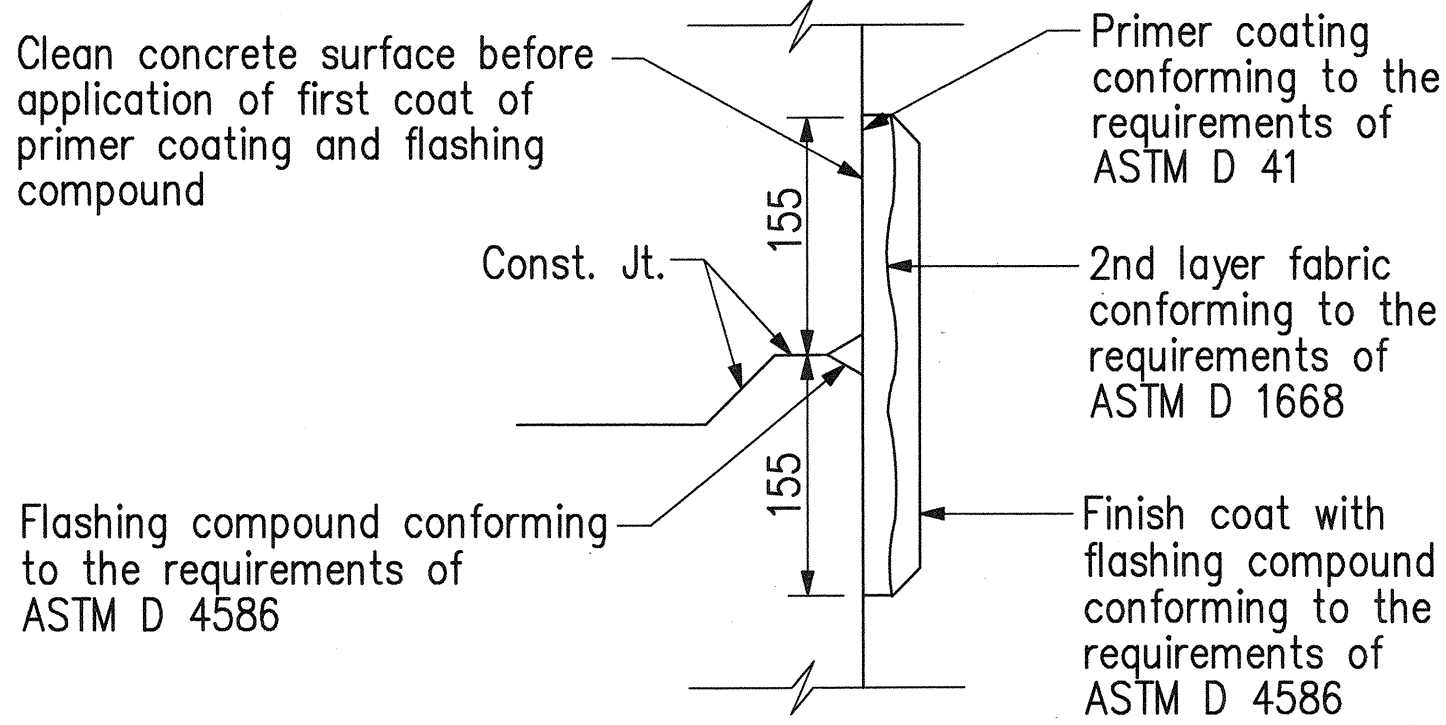
SCALE: NONE DATE: JANUARY 1999

SHEET NO. TS10 OF 11 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	98A-01-98	1999	21	23

GENERAL NOTES:

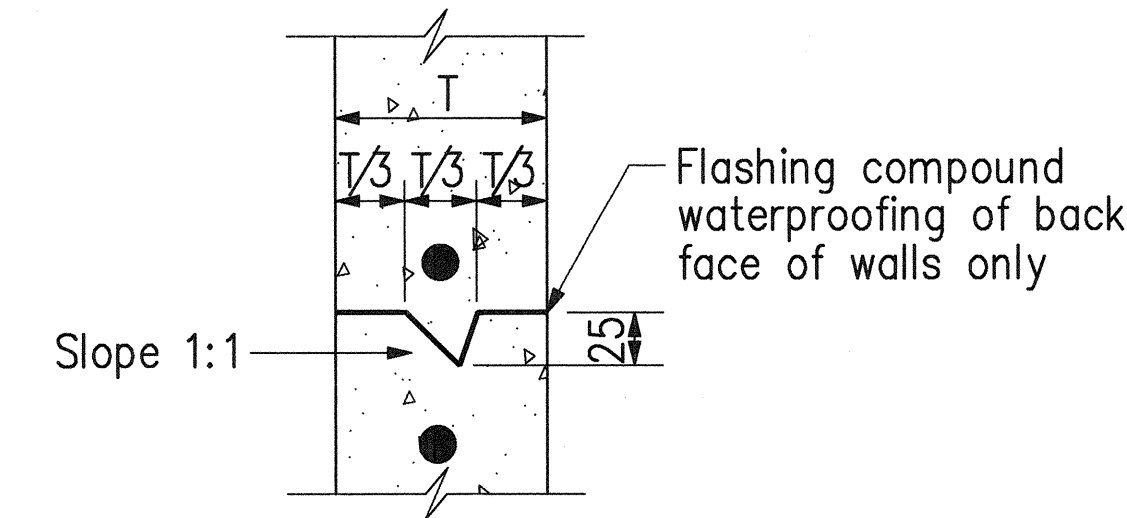
1. Provide a minimum of one 16 ϕ x 2.5m Copperweld Ground Rod in each pullbox. When directed by the Traffic Signal Inspector/Engineer, install additional Ground Rods. Cost of Ground Rods shall be incidental to the pullboxes.
2. All pre-cast concrete pullboxes shall be manufactured in two pieces.
3. The pullbox with cover shall be capable of supporting an MS 18 Loading.
4. The maximum weight of the pullbox cover shall not exceed 27 kilograms.
5. The openings for the conduits on all pullboxes shall be pre-cast concrete knockouts.
6. 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.
7. 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.
8. All concrete shall be Class A (25MPa, min.)
9. Rebars shall be Grade 300 and all lapped splices shall be 360mm minimum.
10. The #57 or #67 size aggregate shall conform to latest version of AASHTO M43 (ASTM D 448).
11. 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

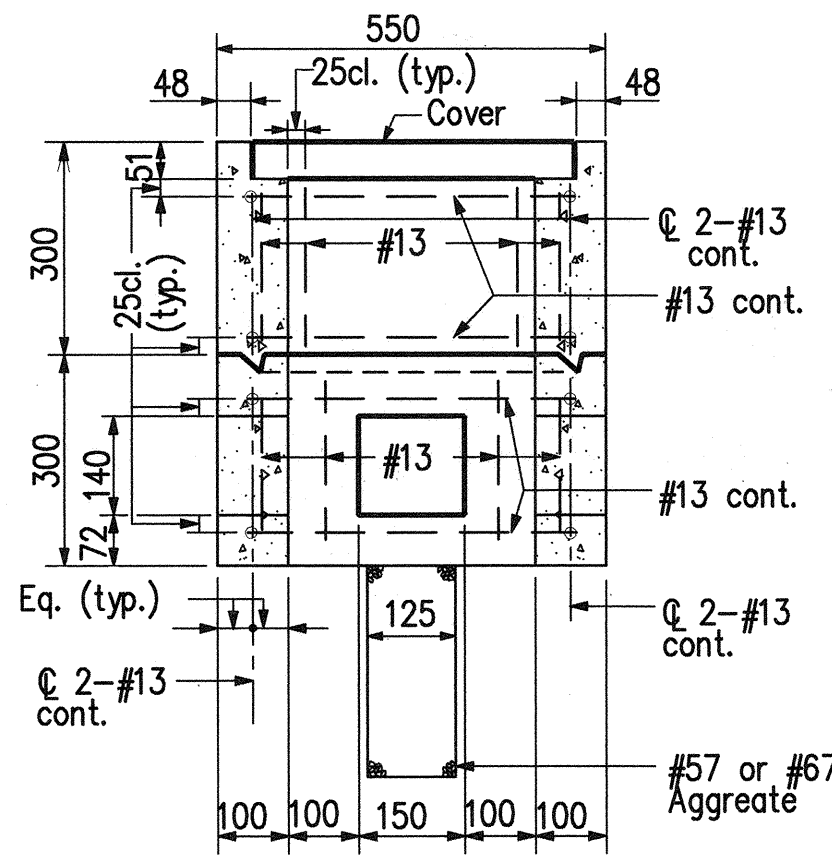
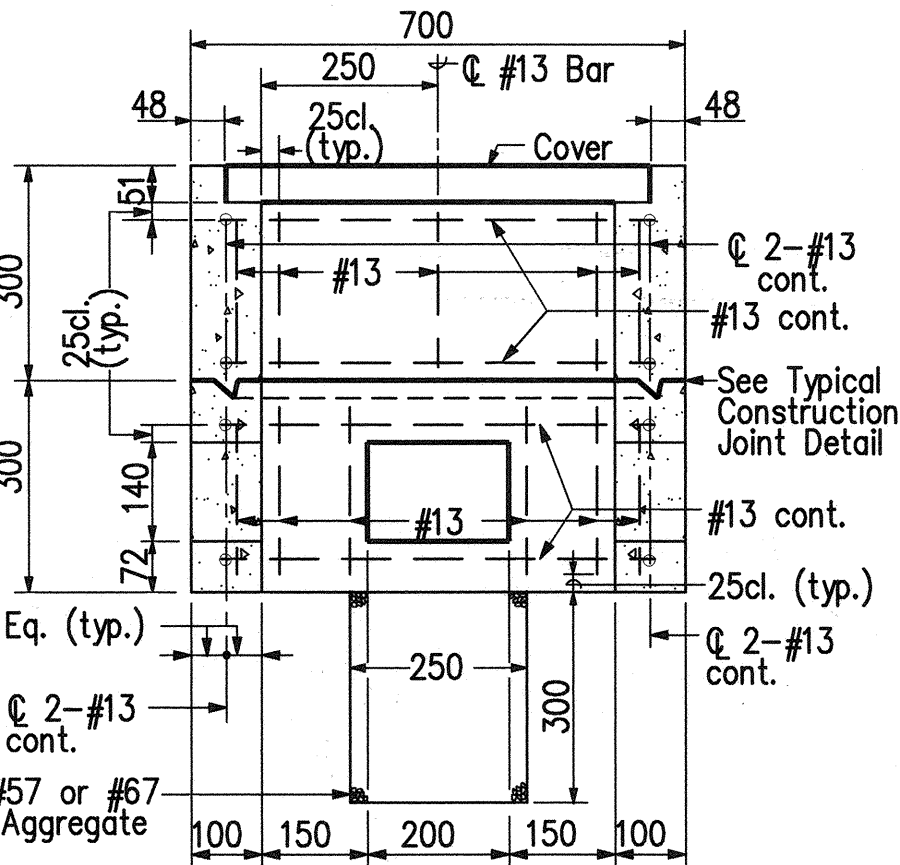
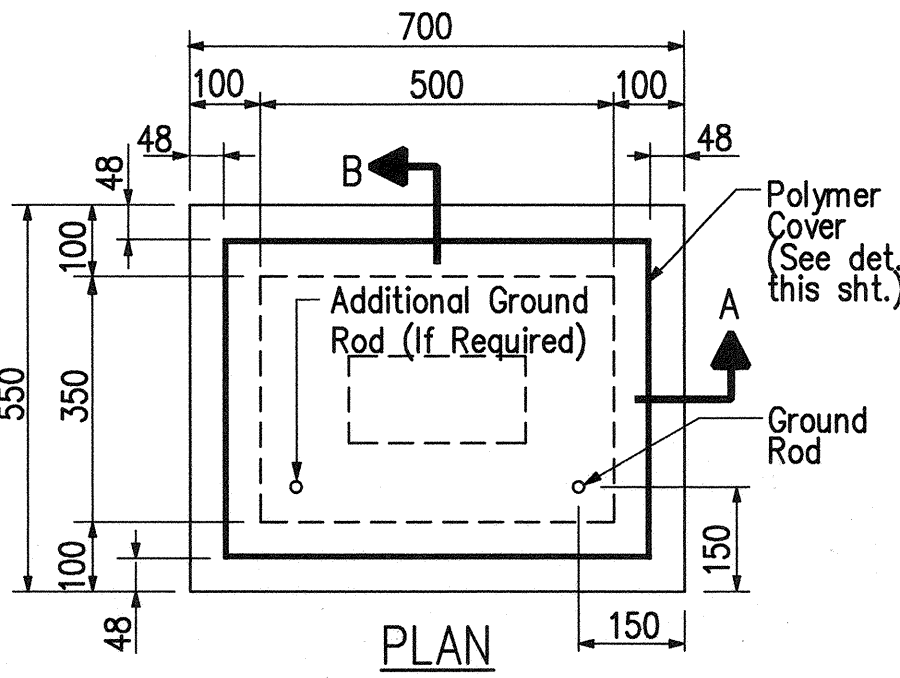


TYPICAL CONSTRUCTION

JOINT DETAIL

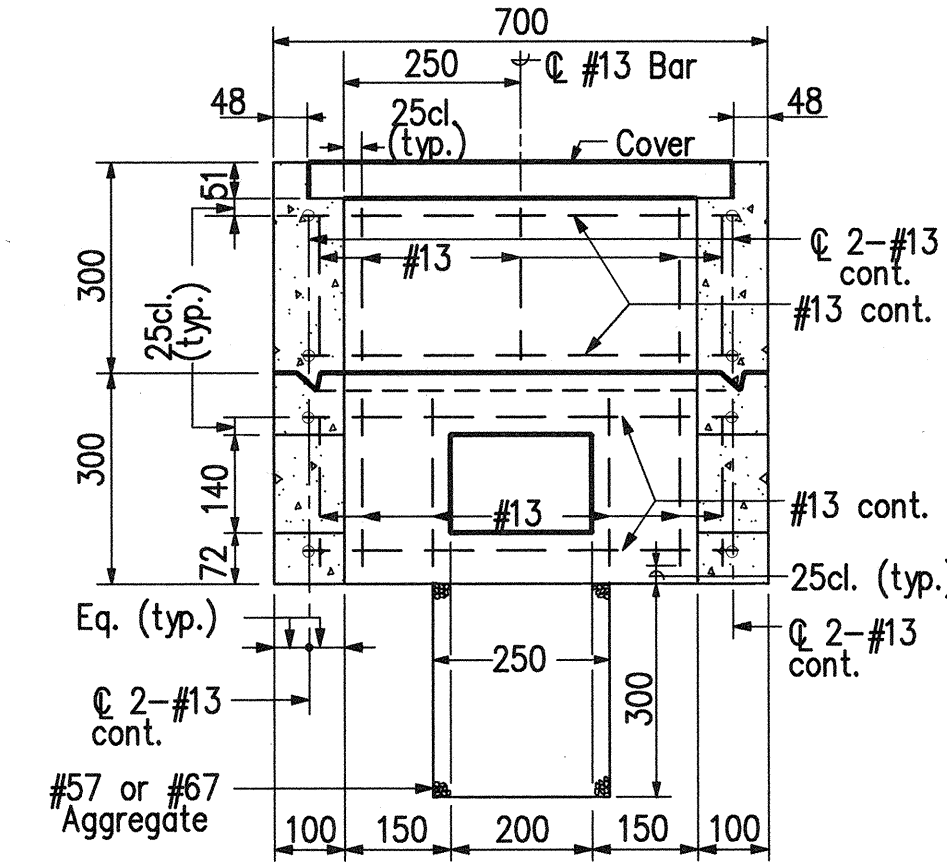
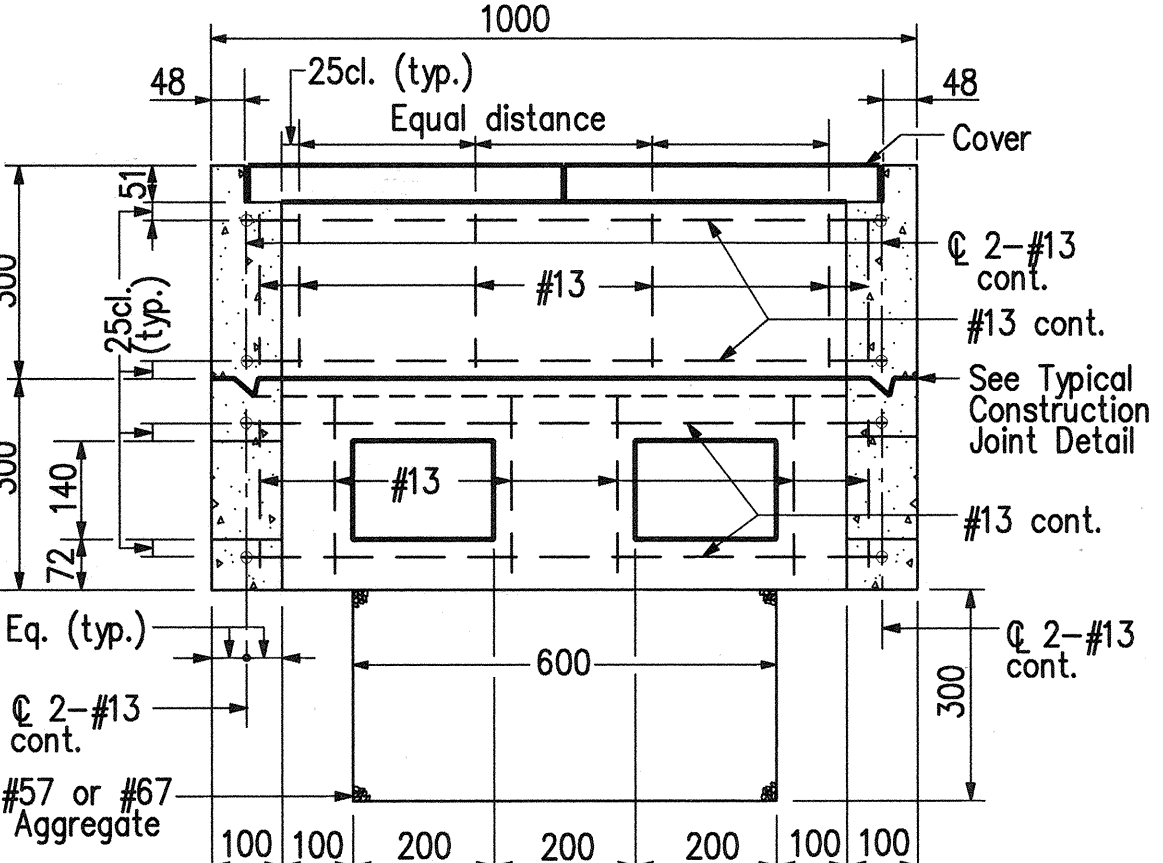
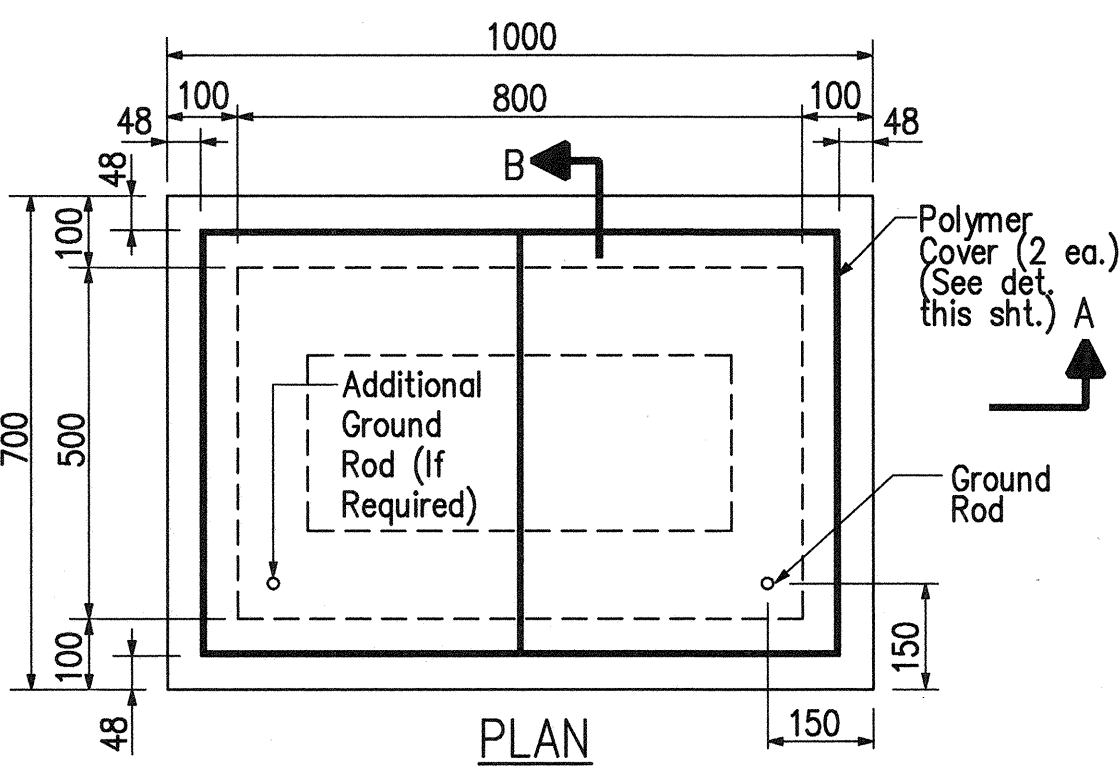
Not to Scale

ALL DIMENSIONS ARE IN MILLIMETERS
UNLESS OTHERWISE SHOWN



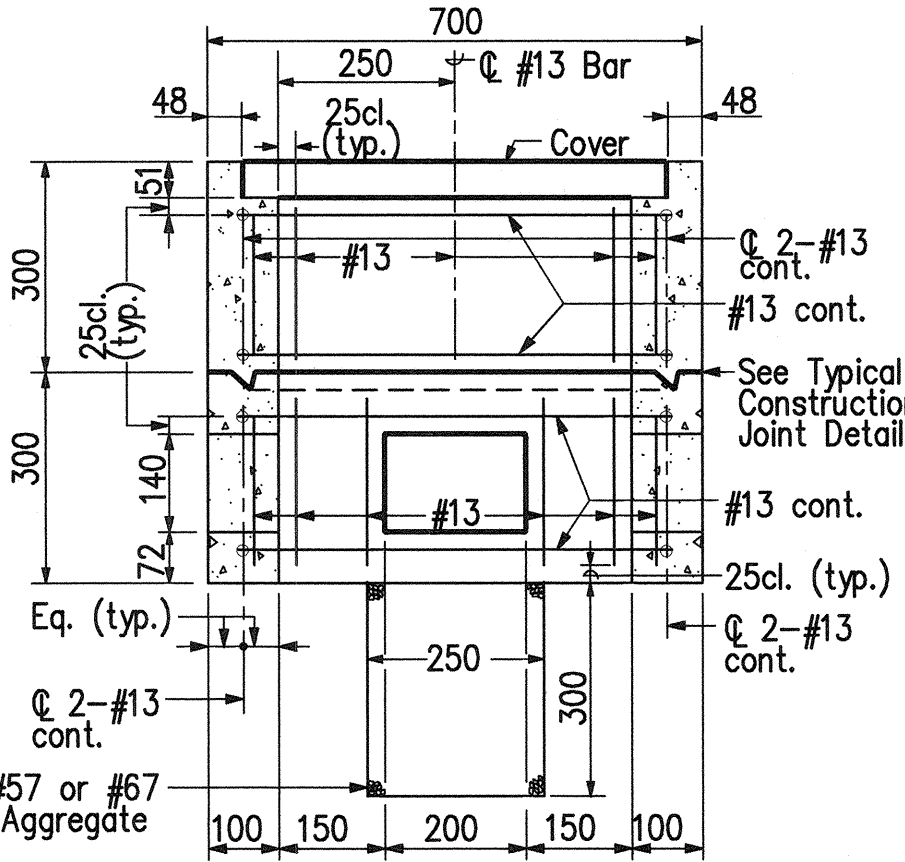
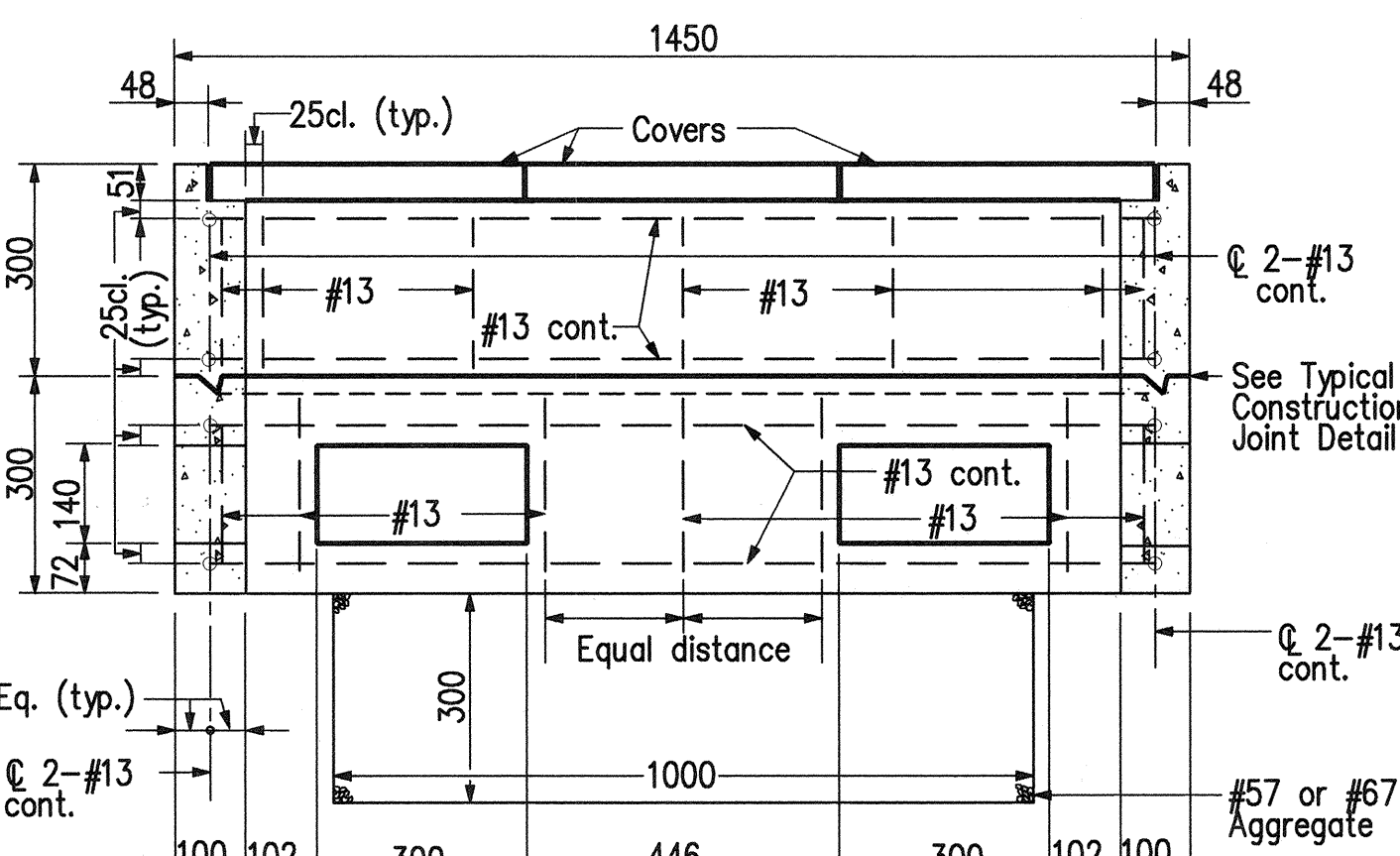
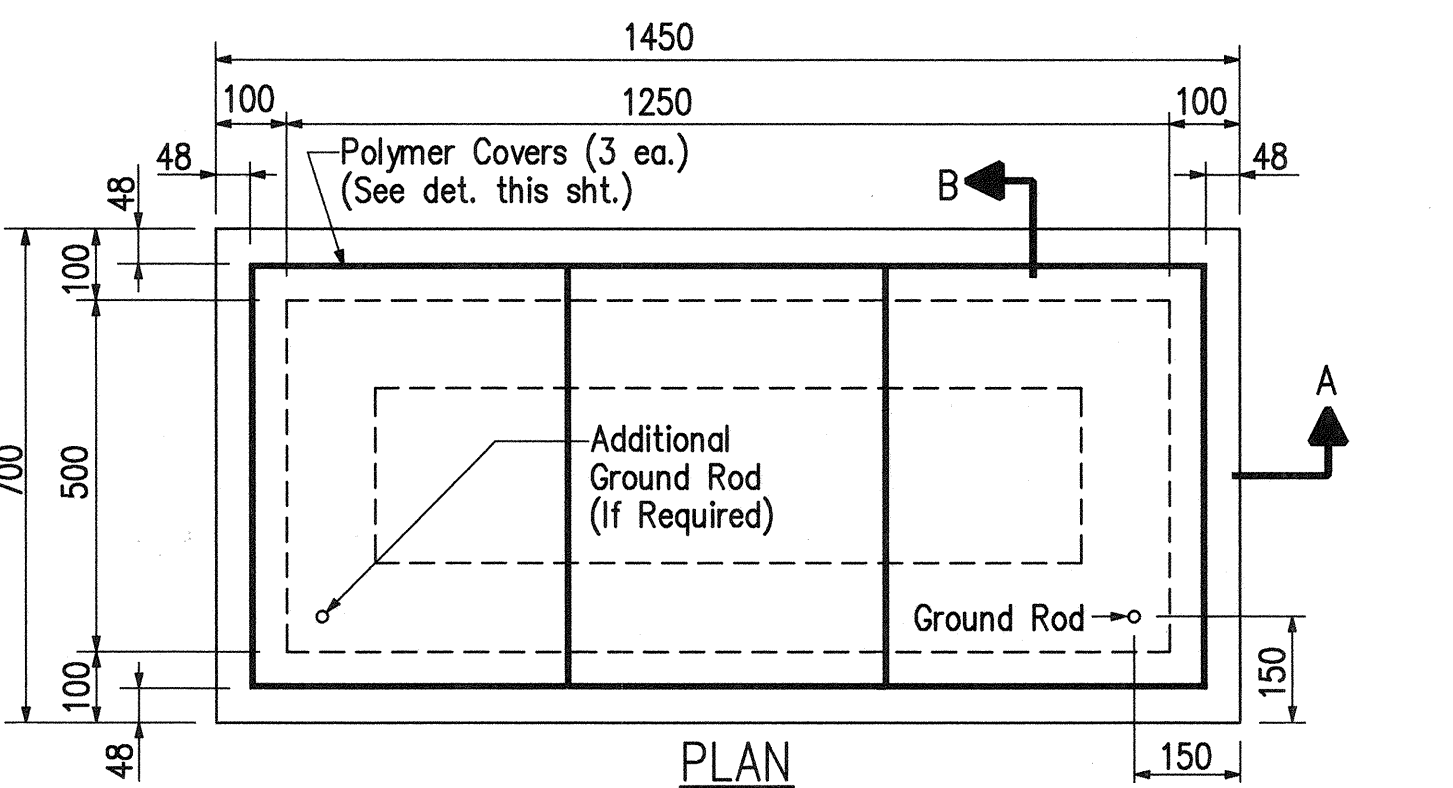
TYPE "A" PULLBOX
(Old Type "B")

Scale: 1 : 100



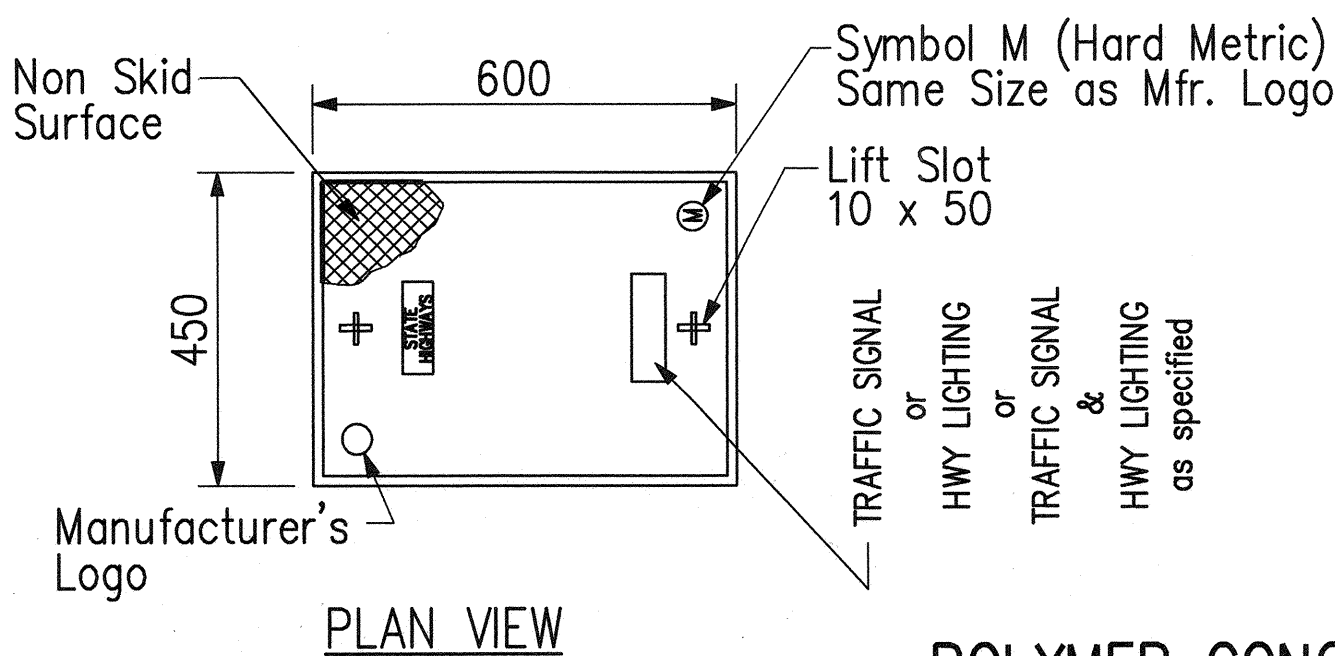
TYPE "B" PULLBOX (Old Type "C")

Scale: 1 : 100



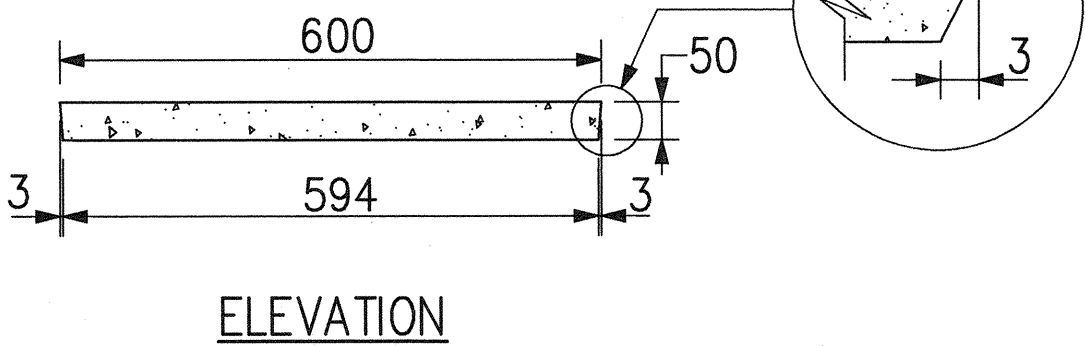
TYPE "C" PULLBOX (Old Type "D")

Scale: 1 : 100



POLYMER CONCRETE COVER

Not to Scale



ORIGINAL
PLAN
DATE
DRAWN BY
CHECKED BY
NOTED BY
QUANTITIES BY
No.

CAD by J. Minura, 55-52

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**TRAFFIC SIGNAL SYSTEM
PULLBOX & COVER DETAILS**
VINEYARD BOULEVARD
TRAFFIC SIGNAL UPGRADE AT NUUANU AVENUE
PROJECT NO. 98A-01-98
SCALE: AS SHOWN DATE: JANUARY 1999
SHEET NO. TS11 OF 11 SHEETS