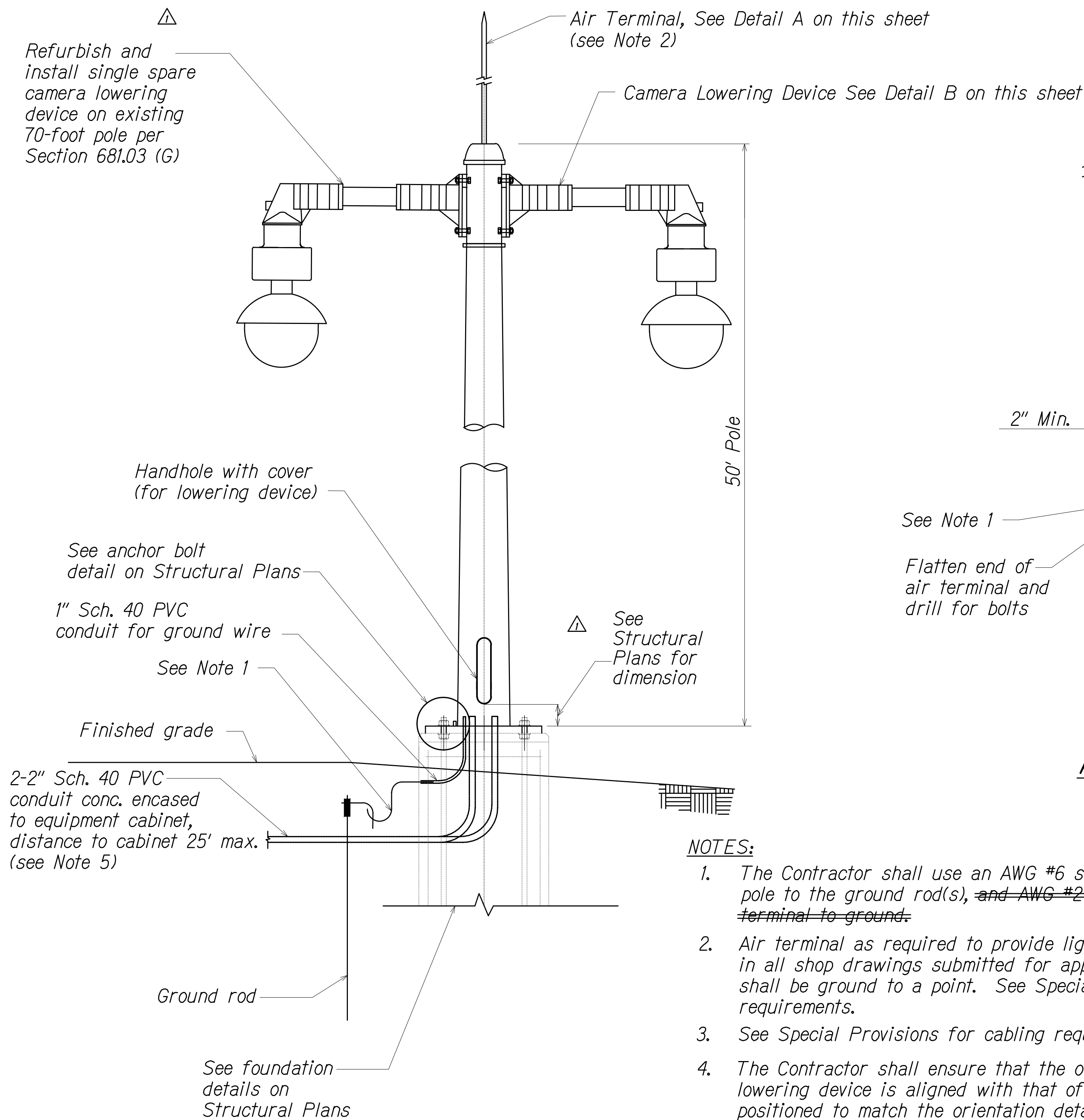
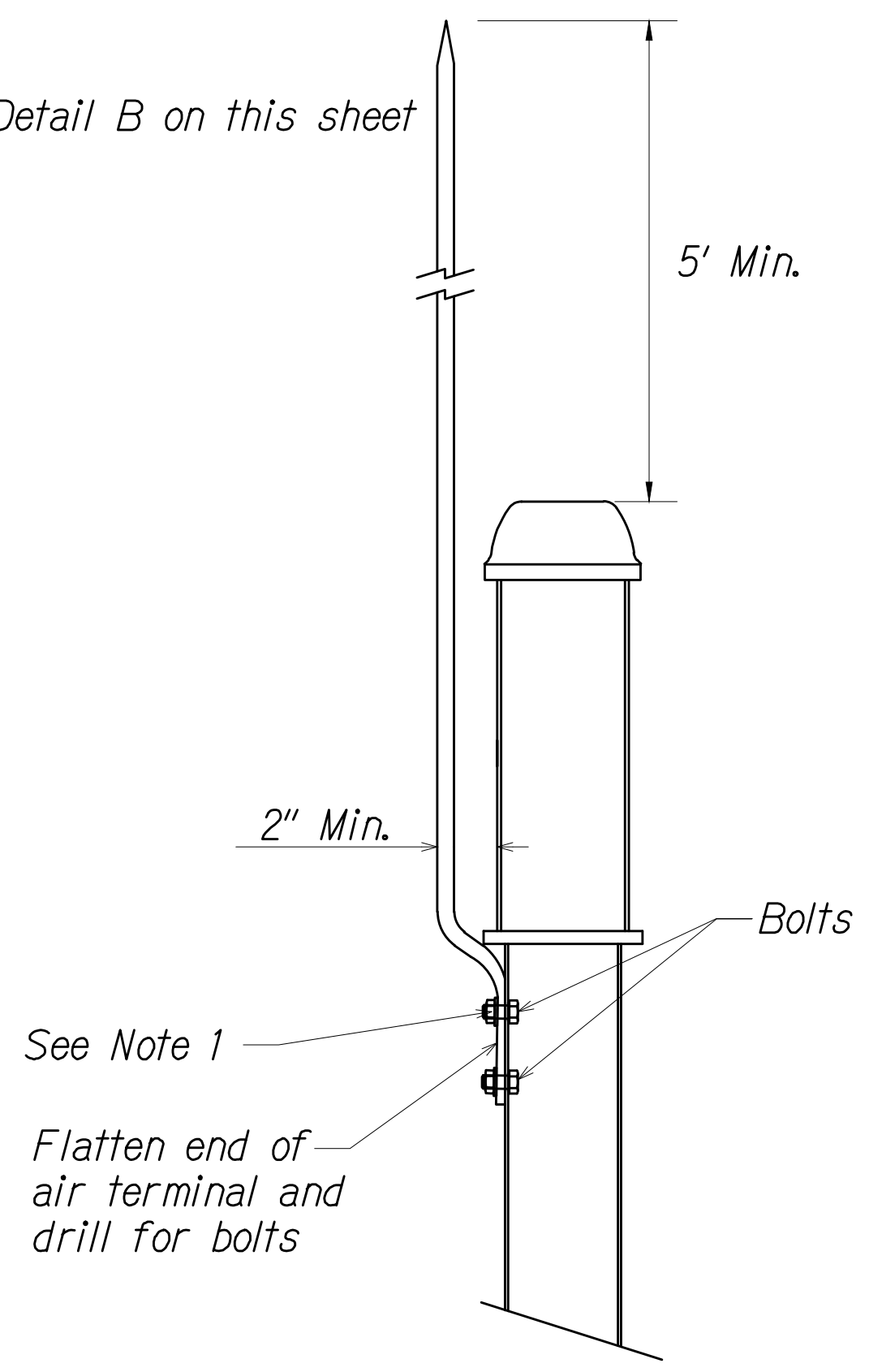


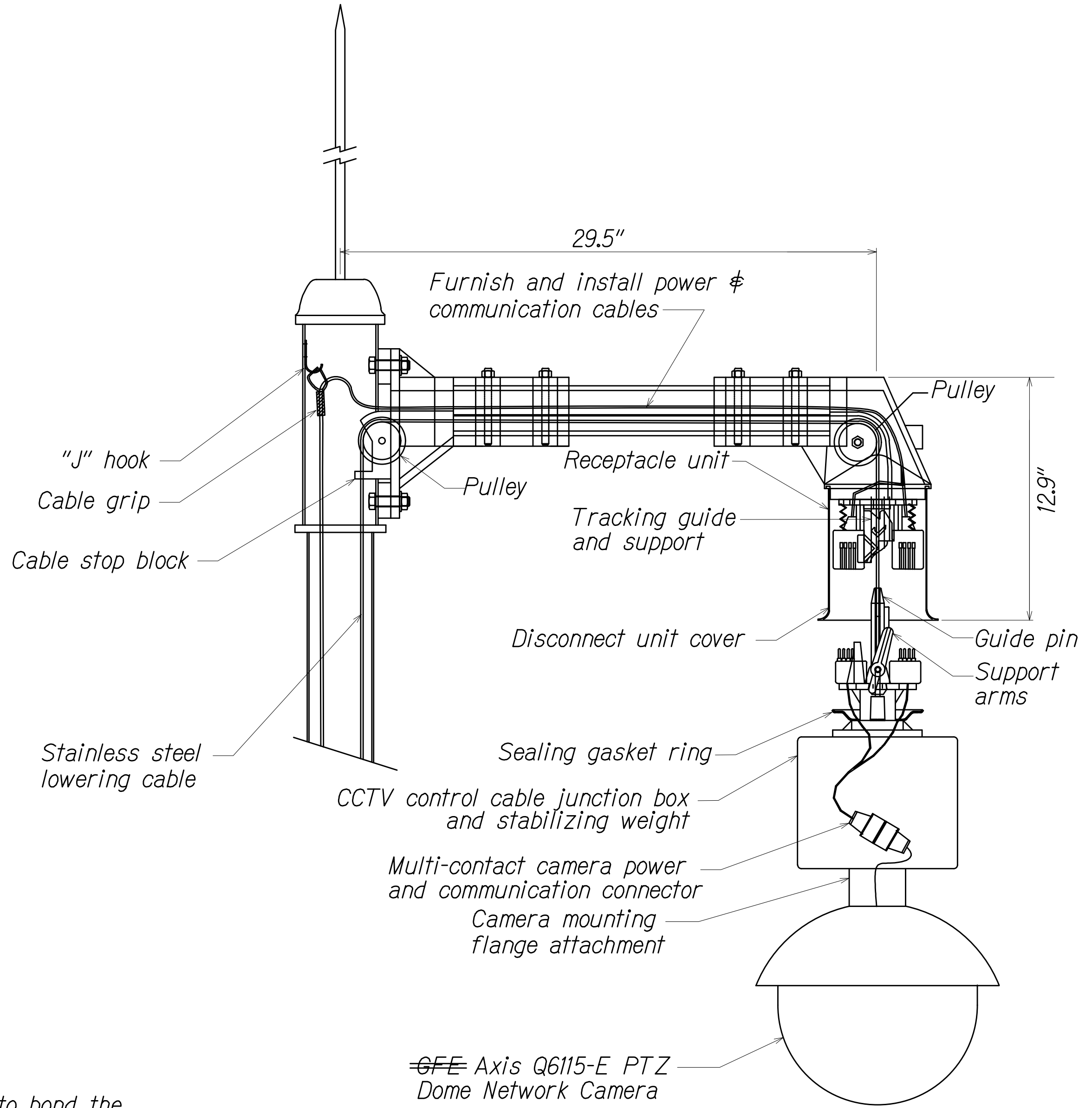
DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018 ADD. 26	186	



1 CCTV POLE DETAIL  
C3.1-C3.5 | C7.1 Not To Scale



DETAIL A  
AIR TERMINAL  
Not To Scale



DETAIL B  
CAMERA LOWERING DEVICE AND ~~GFE~~ CCTV CAMERA  
Not To Scale

- NOTES:
- The Contractor shall use an AWG #6 solid, bare copper wire to bond the pole to the ground rod(s), ~~and AWG #2 solid, bare copper wire from air terminal to ground.~~
  - Air terminal as required to provide lightning protection shall be included in all shop drawings submitted for approval. The tip of the air terminal shall be ground to a point. See Special Provisions for additional requirements.
  - See Special Provisions for cabling requirements.
  - The Contractor shall ensure that the orientation of the camera lowering device is aligned with that of the bolt circle pattern to be positioned to match the orientation detail on the site plans. This shall be approved by the Engineer prior to installation.
  - Refer to State of Hawaii, Department of Transportation, Highways Division, Standard Plans 2008, TE-36 for trench details.

LEGEND FOR AS-BUILT POSTINGS	
	Squiggly line for as-built deletion
	Double line for as-built deletion
Roadway	Text for as-built posting

0 1 2  
LINE IS 2 INCHES AT FULL SIZE  
(if not 2 inches scale accordingly)

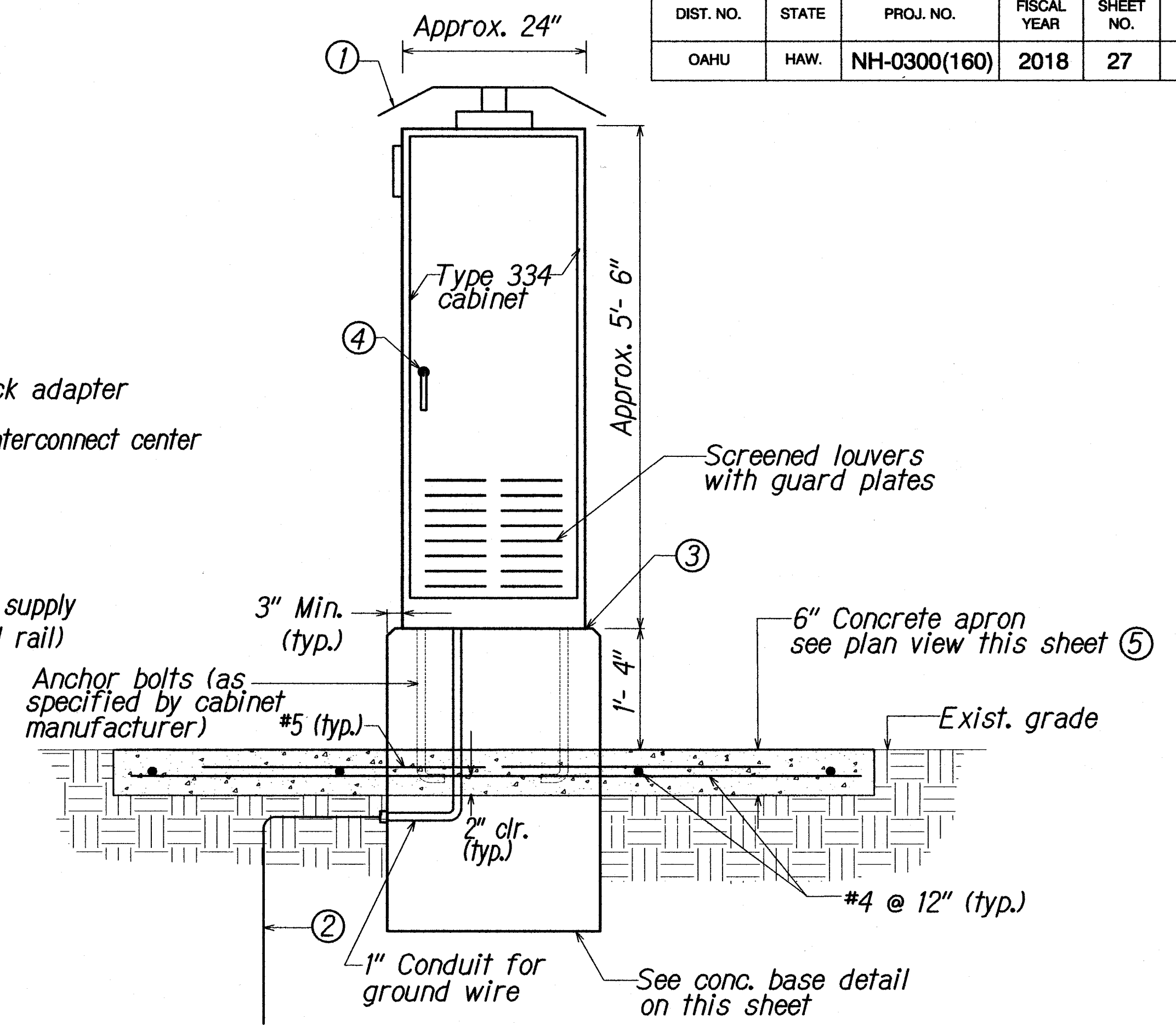
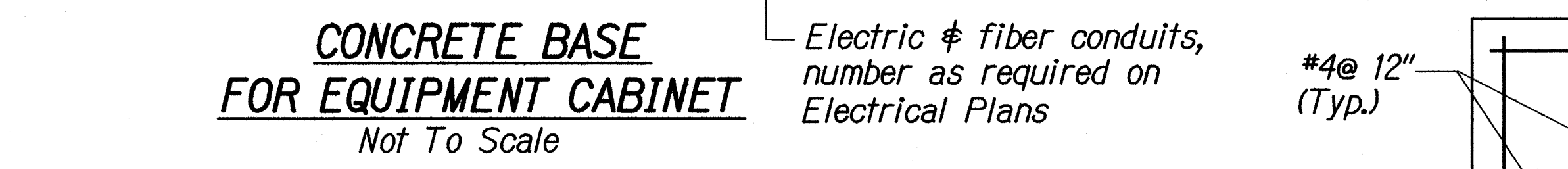
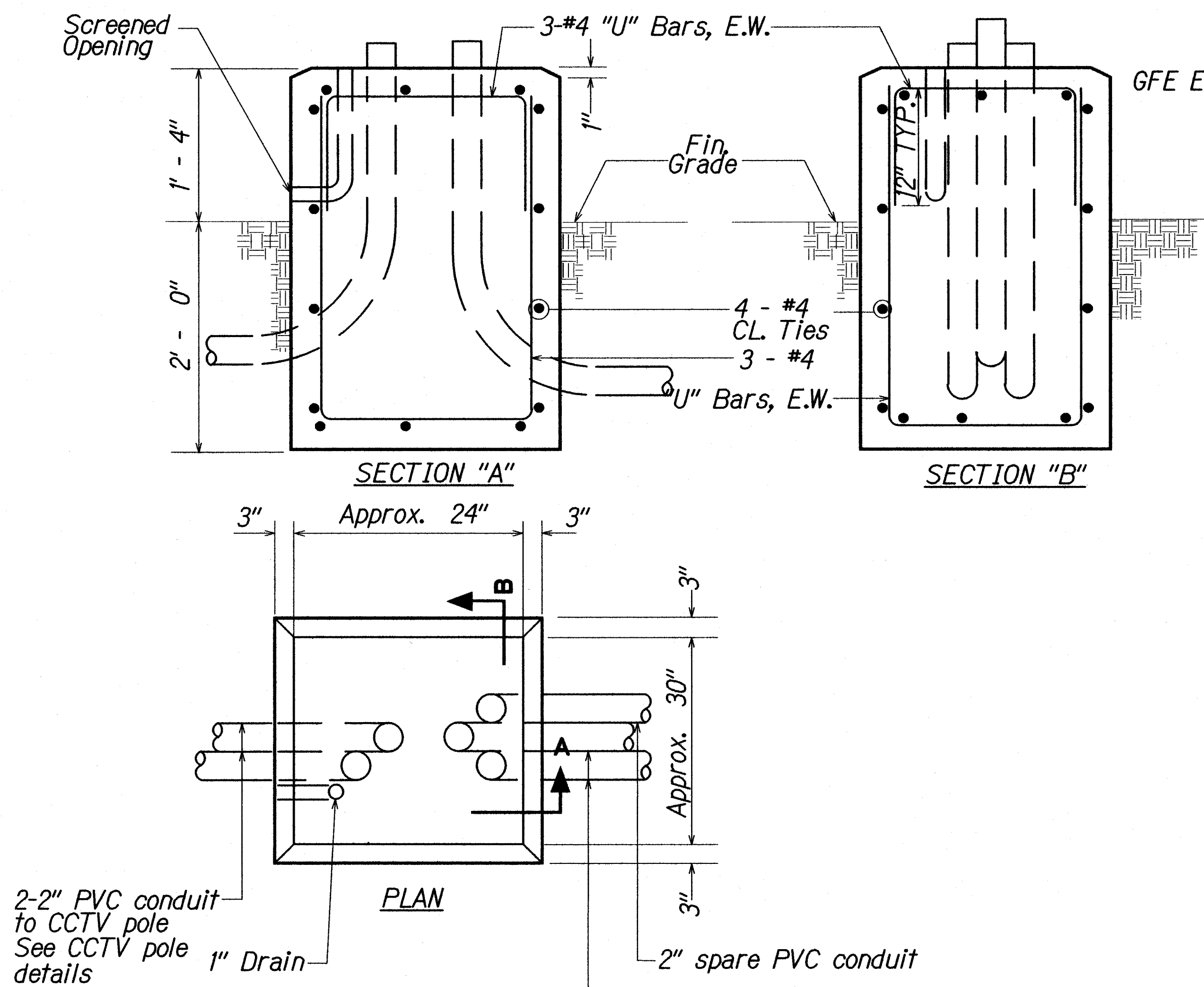
NEAL H. KASAMOTO  
LICENSED PROFESSIONAL ENGINEER  
No. 6931-C  
HAWAII, U.S.A.  
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION AS DEFINED IN HAWAII TITLE 16, CHAPTER 115, RULES OF THE BOARD OF PROFESSIONAL ENGINEERS, ARCHITECTS AND SURVEYORS, STATE OF HAWAII  
APRIL 30, 2020  
LIC. EXP. DATE

NO.	DATE	REVISION
	11/08/18	Removed dimension and refer to Structural Plans. Note added to lowering device.
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION <b>CCTV POLE DETAILS</b> Freeway Management System Phase 2 Federal Aid Project No. NH-0300(160) Scale: As Shown Date: June 29, 2018 SHEET NO. C7.1 OF 25 SHEETS		

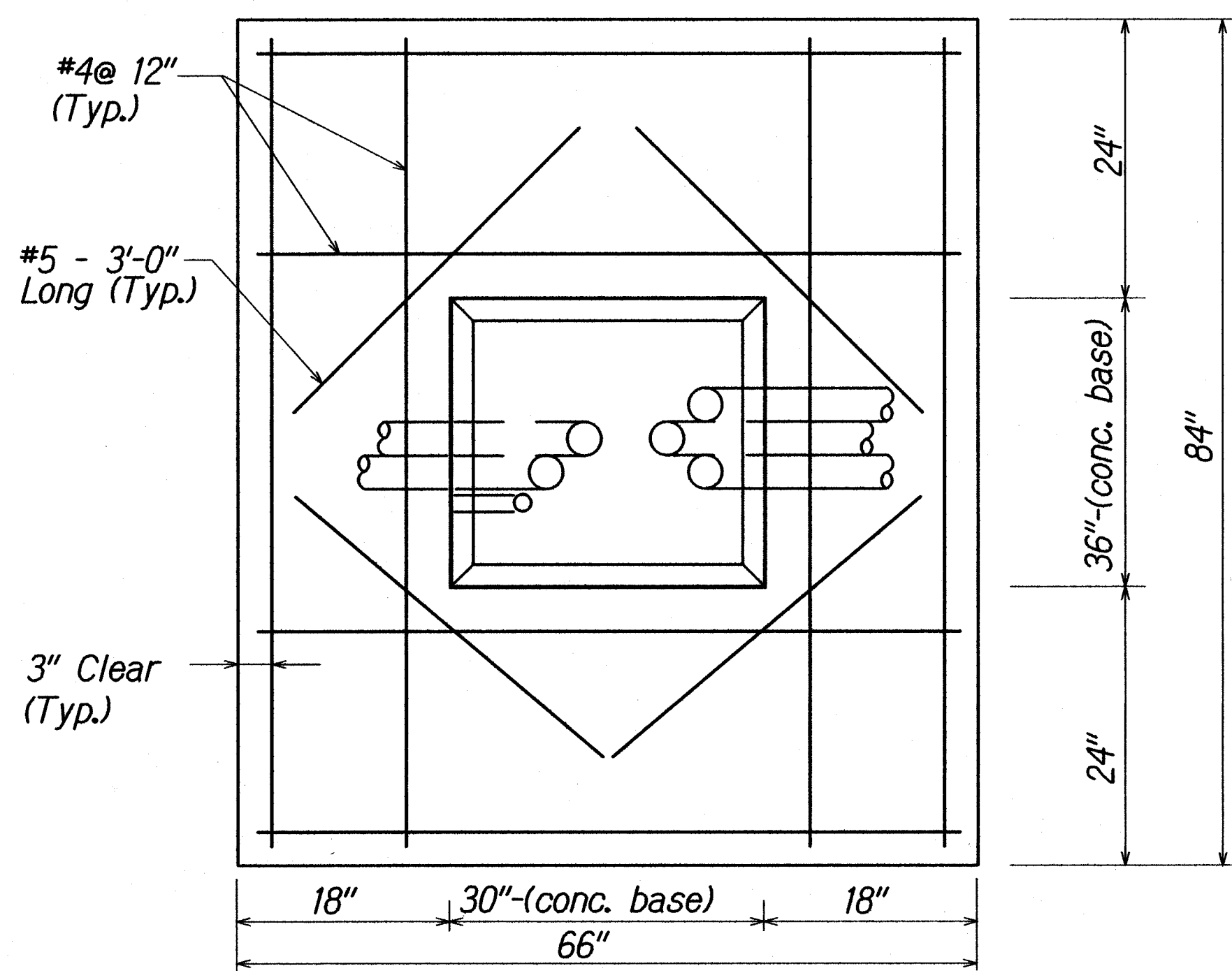
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DRAWN BY	"
DESIGNED BY	"
QUANTITIES BY	"
CHECKED BY	"
ORIGINAL PLAN	No.
NOTE BOOK	

PNV\2016\16-160\ENGINEERING\DWG\C7.1 POLE DETAILS.DWG Jun 16, 2022-1:13 PM

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018	27	186



- 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 have a Class 2, rubbed finish.



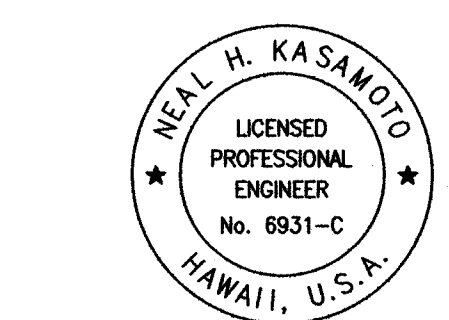
## 2 EQUIPMENT CABINET

C3.1-C3.5 C7.2 Not To Scale

- NOTES:**
- Sunshields on top and all sides of cabinet.
  - Ground rod, 3/4" dia. x 8' min. if subsurface conditions exist, which prohibit the placement of the ground rod in a vertical position, at the direction of the Engineer, the rod may be driven at an oblique angle not to exceed 45 degrees from vertical or buried in a trench at least 30" deep. connection to ground rod shall be cadwelded.
  - Silicone caulk between cabinet and base and apron and base
  - Door lock on each door
  - Conc. apron shall be Class "B"

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

PRN\2018\18-149\ENGINEERING\DWG\C7.2 CABINET DETAILS.DWG Jun 25, 2018 - 2:06 PM



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*Neal Kasamoto*

APRIL 30, 2020  
LIC. EXP. DATE

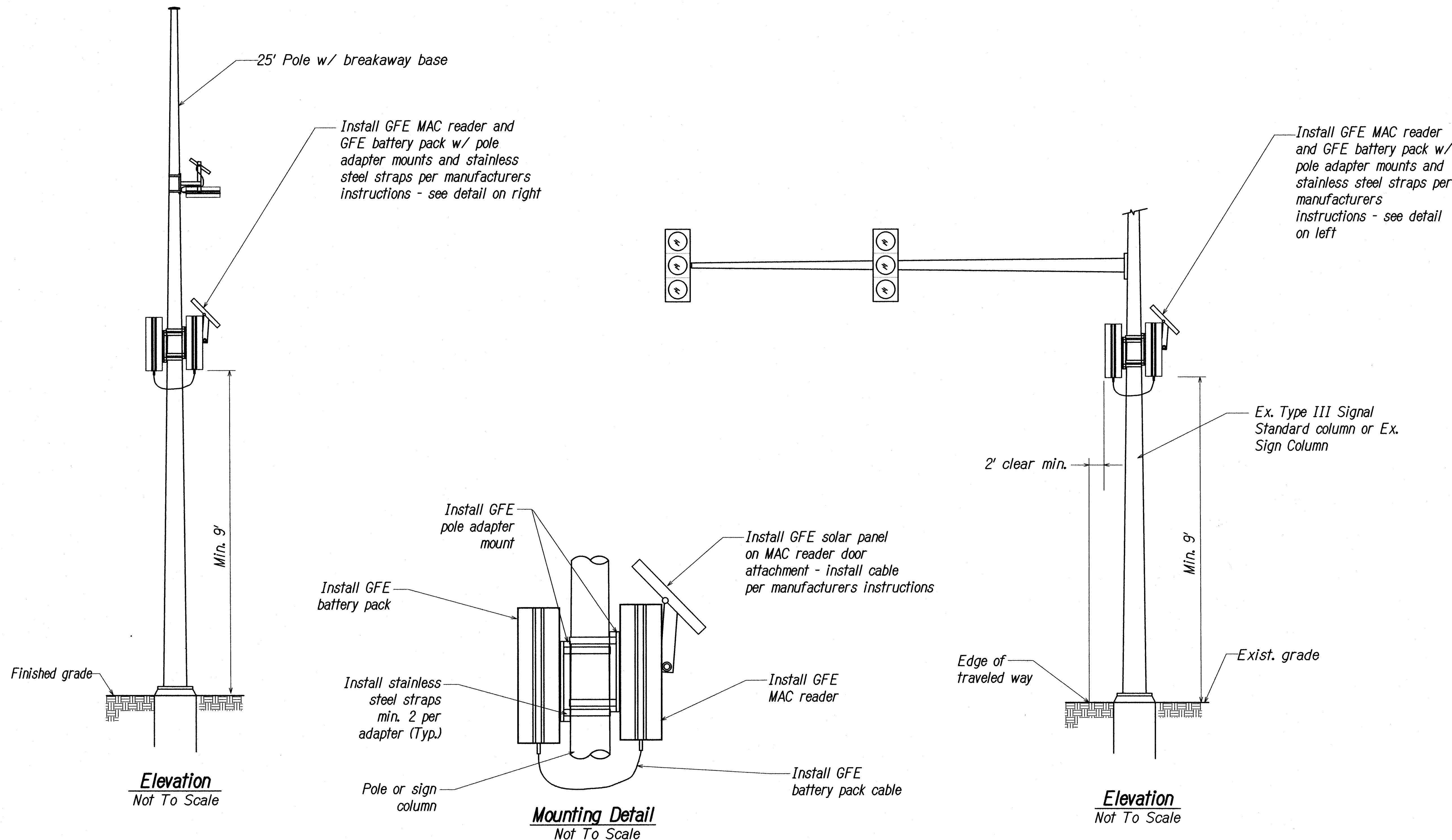
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**CCTV CABINET DETAILS**  
  
Freeway Management System  
Phase 2  
Federal Aid Project No. NH-0300(160)

Scale: As Shown
Date: June 29, 2018

SHEET No. C7.2 OF 25 SHEETS

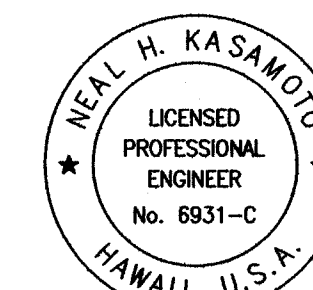
DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018	28	186



**Notes:**

1. GFE MAC Reader = BlueMac MAC Address Reader
2. Use separate pole adapter mounts to attach reader unit and battery pack, use minimum 2 straps per mount, do not combine mounts on same strap
3. Install at minimum 9' from the ground, setup and initialize per manufacturers instructions.
4. Position and tilt the solar panel to receive maximum sunlight.
5. Maintain 2' minimum clearance from curb face or edge of traveled way.

**GFE MAC READER DETAILS**  
Not To Scale



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Signature: *Neal H. Kasamoto*  
APRIL 30, 2020  
LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**MAC READER DETAILS**

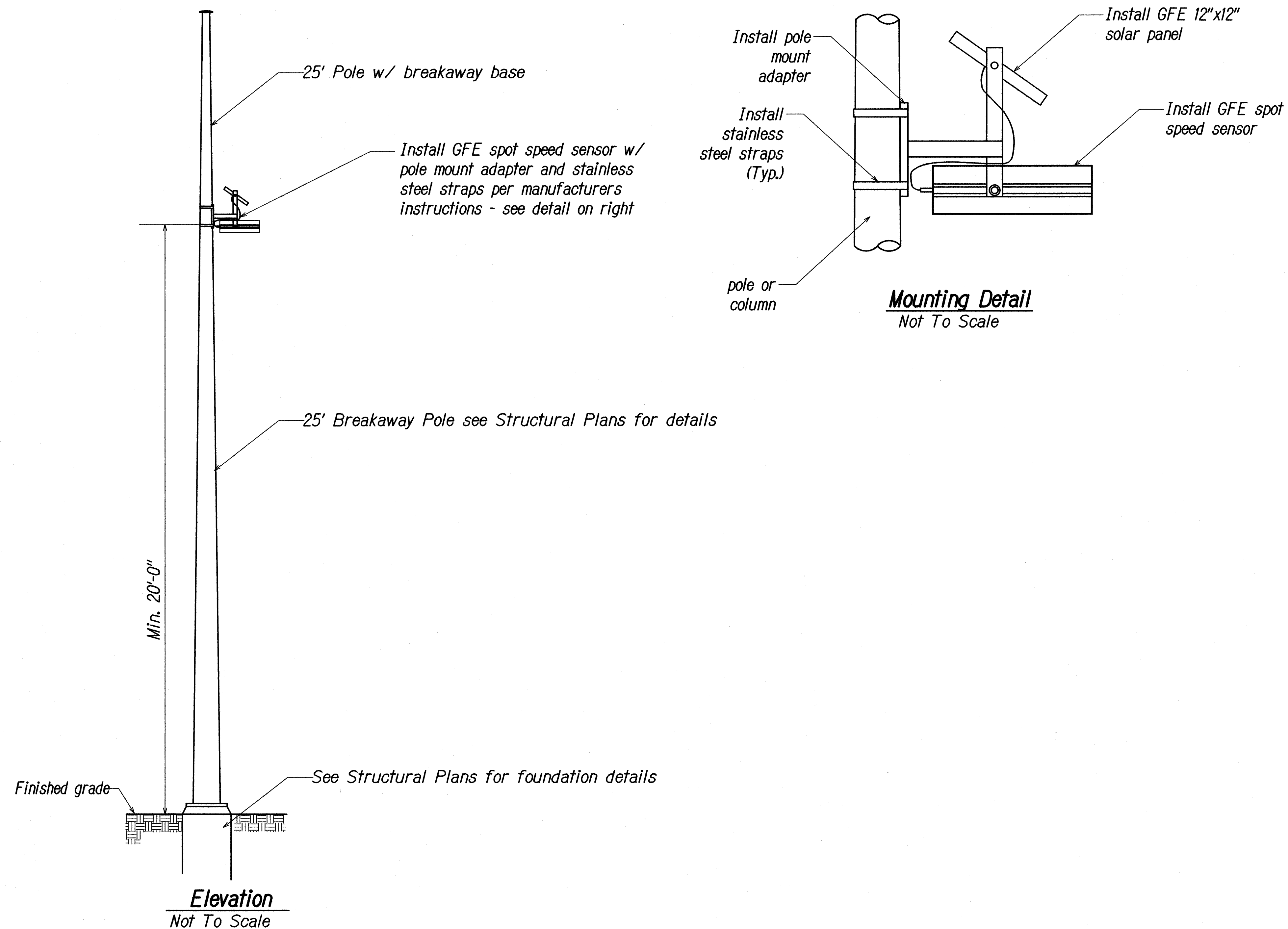
Freeway Management System  
Phase 2  
Federal Aid Project No. NH-0300(160)

Scale: As Shown Date: June 29, 2018

SHEET No. C7.3 OF 25 SHEETS



DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018	29	186

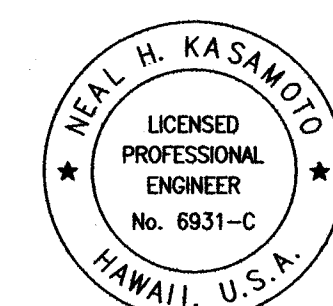


**Notes:**

1. GFE Speed Sensor = SpeedInfo ITMS-100 Infra-Red Traffic Detector
2. Install at minimum 20' from the ground, setup and initialize per manufacturers instructions.
3. Position and tilt the solar panel to receive maximum sunlight.

**GFE SPOT SPEED SENSOR DETAILS**  
Not To Scale

0 1 2  
LINE IS 2 INCHES AT FULL SIZE  
(if not 2 inches: scale accordingly)



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*Neal H. Kasamoto*  
APRIL 30, 2020  
LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**SPEED SENSOR DETAILS**

*Freeway Management System  
Phase 2  
Federal Aid Project No. NH-0300(160)*

Scale: As Shown Date: June 29, 2018

SHEET No. C7.4 OF 25 SHEETS

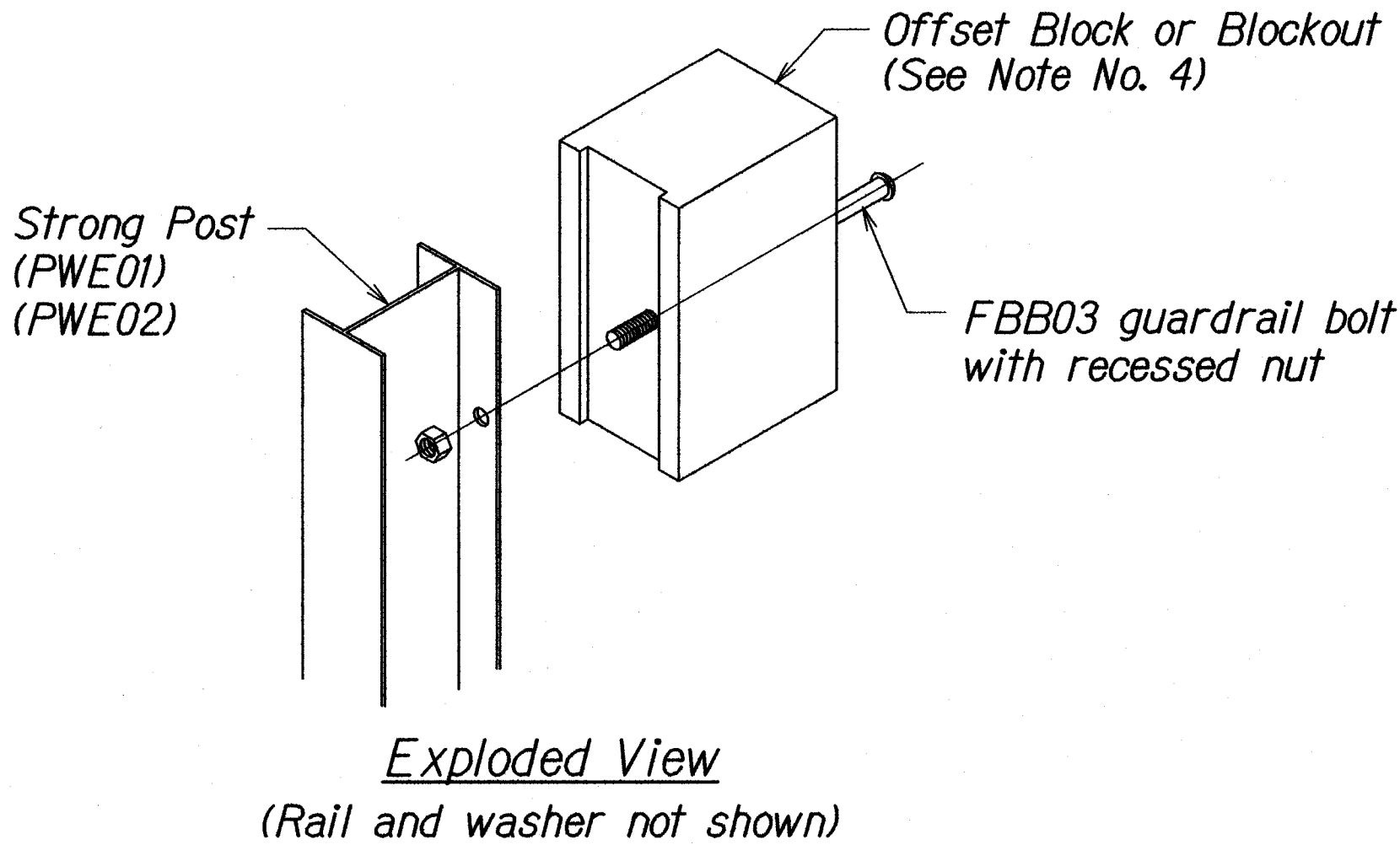
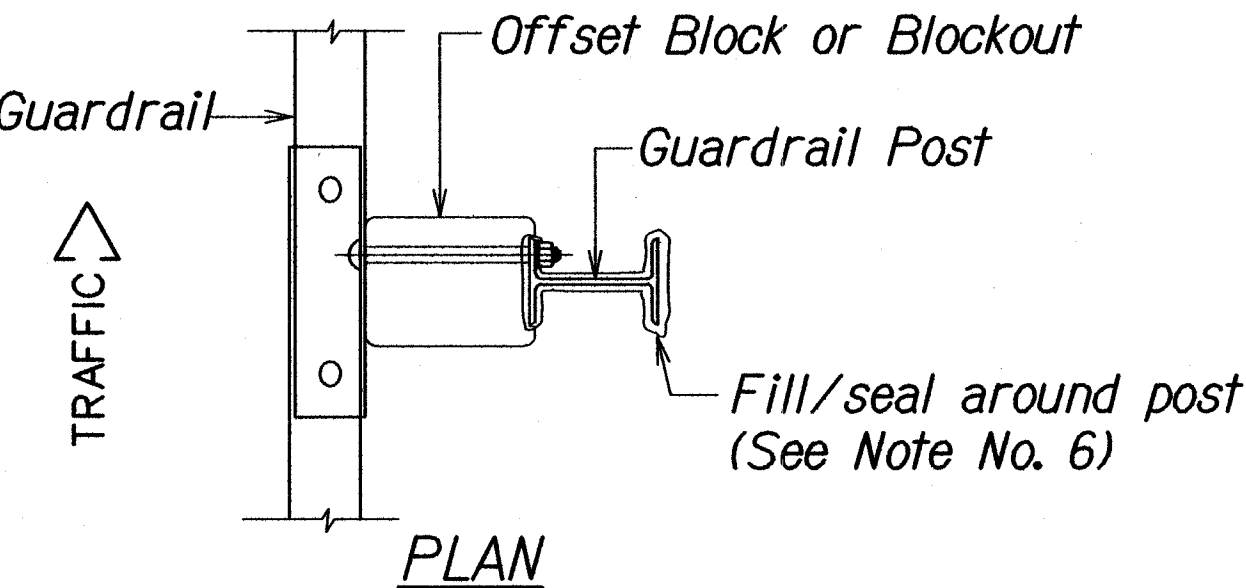
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DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

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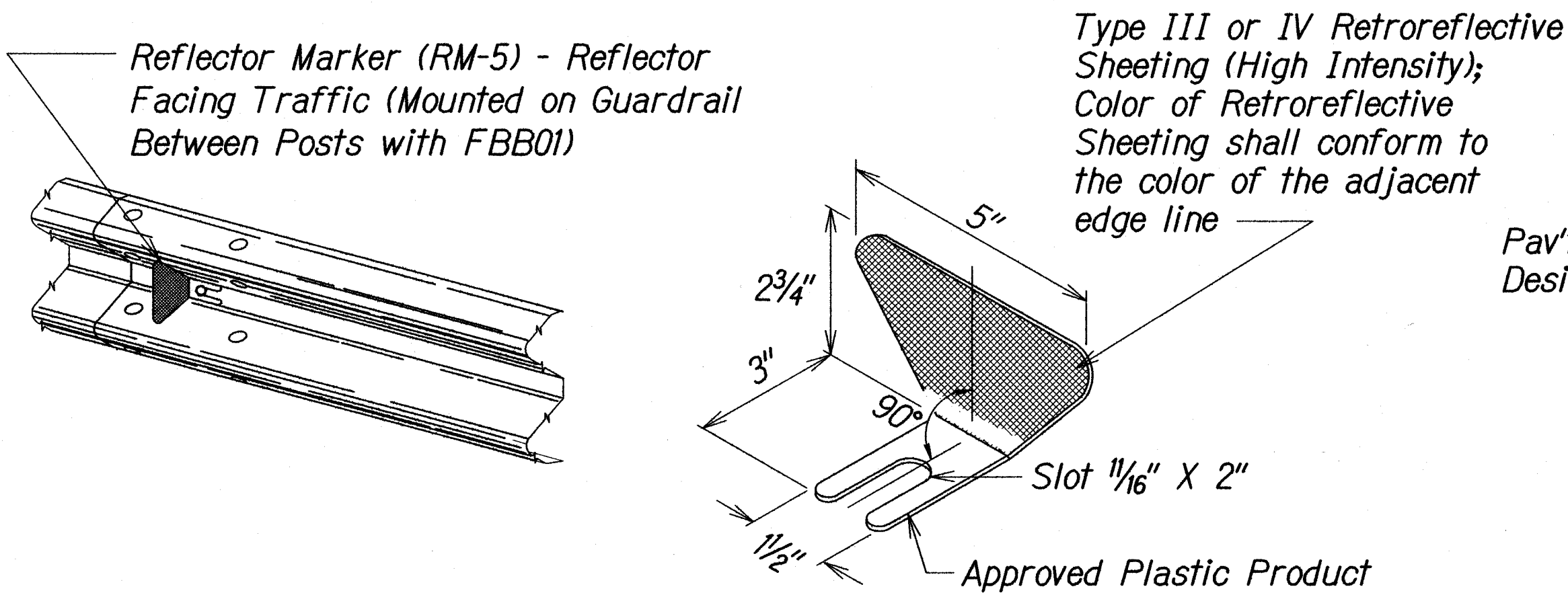
GENERAL NOTES

1. All hardware, posts and fasteners shall be hot-dip zinc coated galvanized after fabrication. No punching, drilling or cutting will be permitted after galvanizing.
2. Where conditions require, special post lengths in increments of 6 inches may be specified by the Engineer.
3. All fasteners, posts, and rail elements (i.e. FBB03, PWE01, RWM04b, etc.) shall conform to the latest edition and amendments of "A Guide to Standardized Highway Barrier Rail Hardware", a report prepared and approved by the AASHTO-AGC-ARTBA Joint Cooperative Committee, Subcommittee On New Highway Materials, Task Force 13 Report. Dimensions of fastners, posts and rail elements have been converted from metric units into their present form.
4. The Blockout or Offset Block shall be approved by the State.
5. All new guardrail systems (system consists of total length of guardrail including both end treatments) shall include the Additional Paved Area.
6. After the guardrail posts are installed in the paved area, the Contractor shall fill/seal around each guardrail post and all cracks in the paved area caused during the guardrail post installation. If required by the inspector/engineer, the Contractor shall tamper the paved area around the guardrail post prior to filling/sealing. All costs associated with this work shall not be paid for separately, but shall be considered incidental to the various guardrail items.
7. When standards for the fill slope area cannot be met, a site specific, engineer approved design may be used.
8. Minimum working width (clear distance) between back of MGS post to any fixed object is 4'-1" (49").
9. New Hot Mix Asphalt (HMA) pavement at guardrails shall extend 6 feet longitudinally beyond terminal ends.
10. Reflector Markers (RM-5) mounted on guardrails shall be spaced every 25 feet. RM-5's shall not be installed on Terminal Sections. Furnishing and installing of each RM-5 shall be considered incidental to the guardrail system.

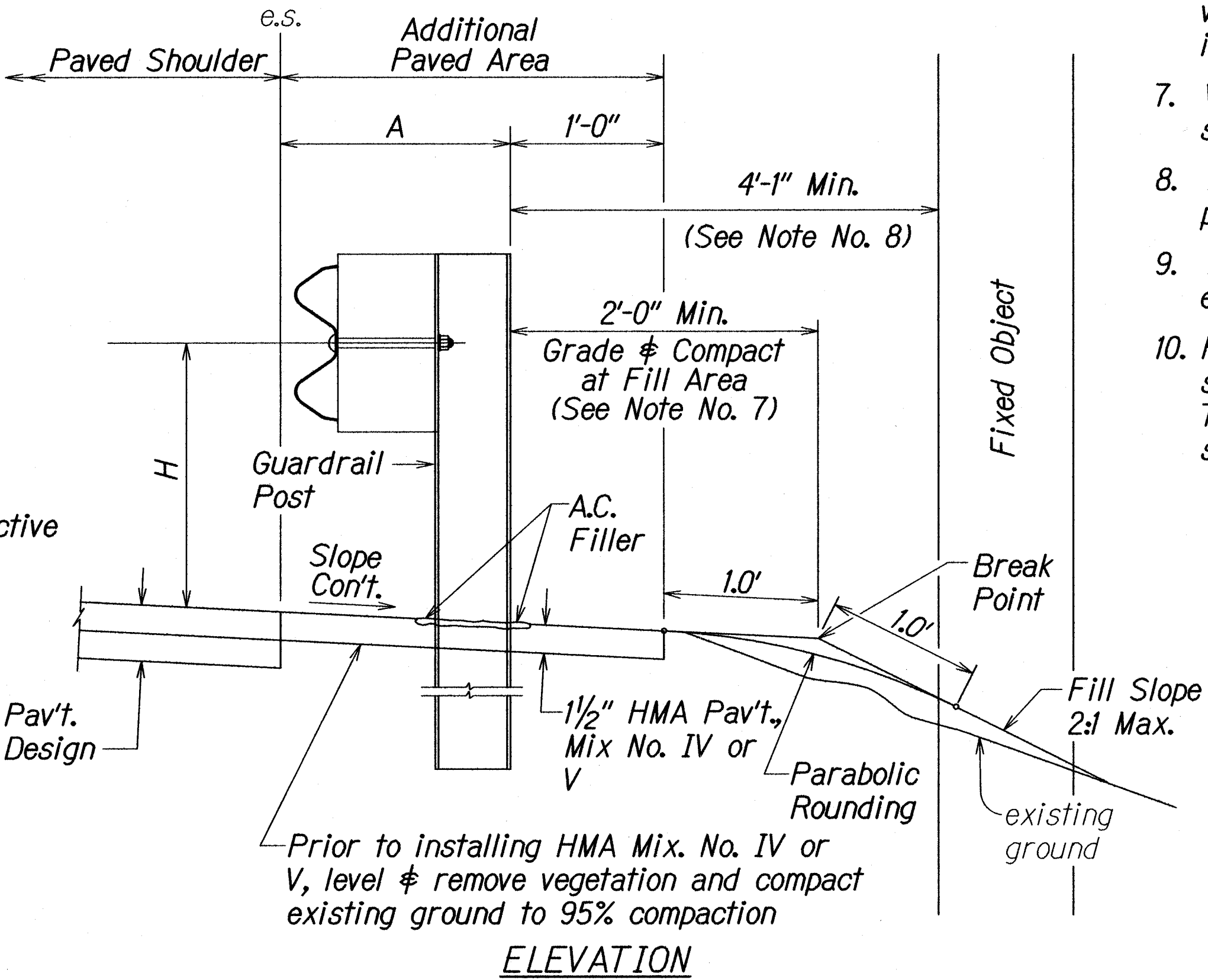
GUARDRAIL TYPE	DIMENSION	
	H	A
MGS w/ Standard 8" Offset Block	2'-1"	1'-6"
MGS w/ No Blockout	2'-7/8"	9/4"



STEEL POST AND BLOCK DETAIL



REFLECTOR MARKER (RM-5) DETAIL AND TYPICAL INSTALLATION



TYPICAL GUARDRAIL INSTALLATION

LINE IS 2 INCHES AT FULL SIZE  
(if not 2 inches: scale accordingly)

NEAL H. KASAMOTO  
LICENSED PROFESSIONAL ENGINEER  
No. 6931-C  
HAWAII, U.S.A.

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*Val Kanta*  
APRIL 30, 2020  
LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**GUARDRAIL DETAILS & NOTES**

*Freeway Management System*  
*Phase 2*  
*Federal Aid Project No. NH-0300(160)*

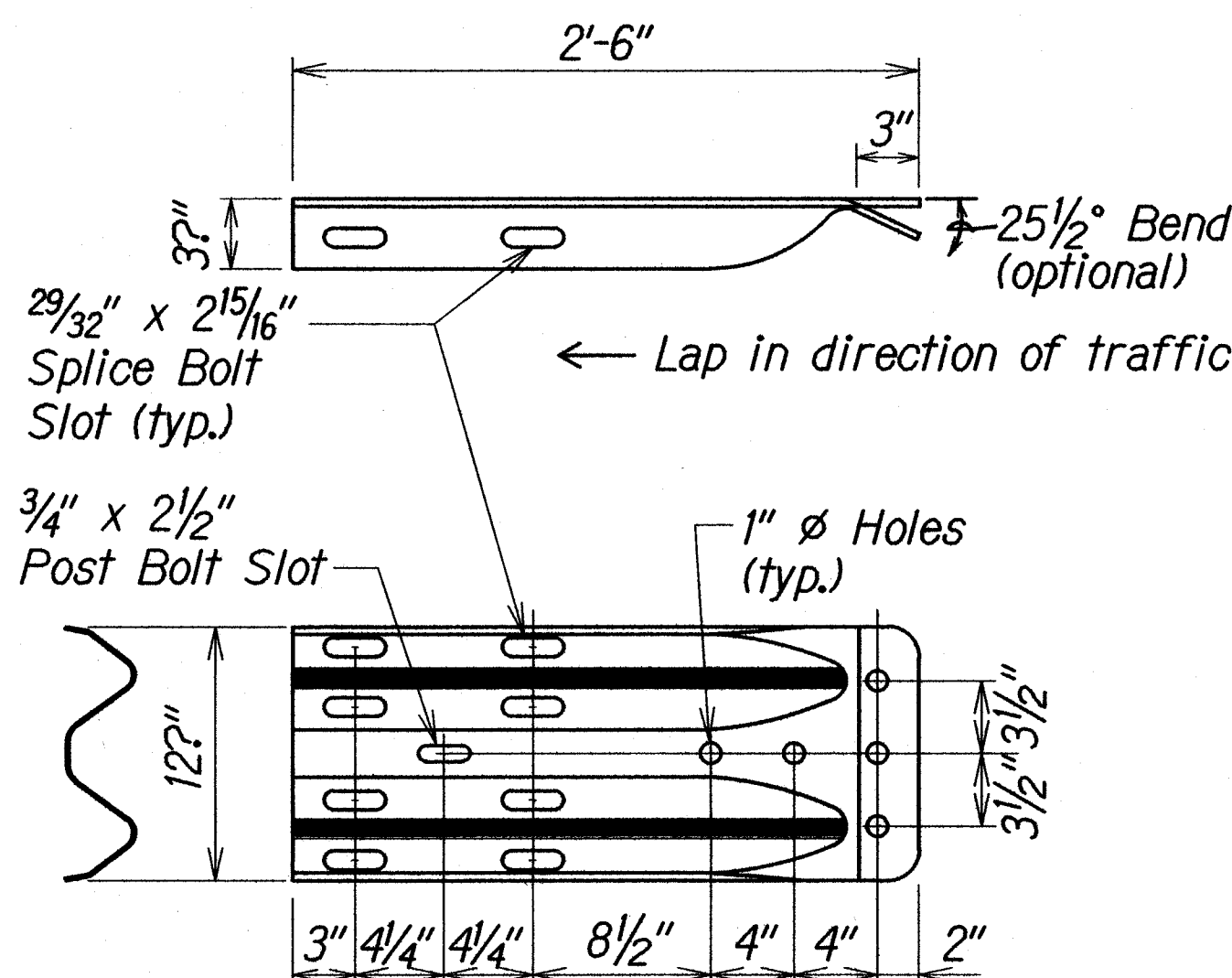
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SHEET No. C7.5 OF 25 SHEETS





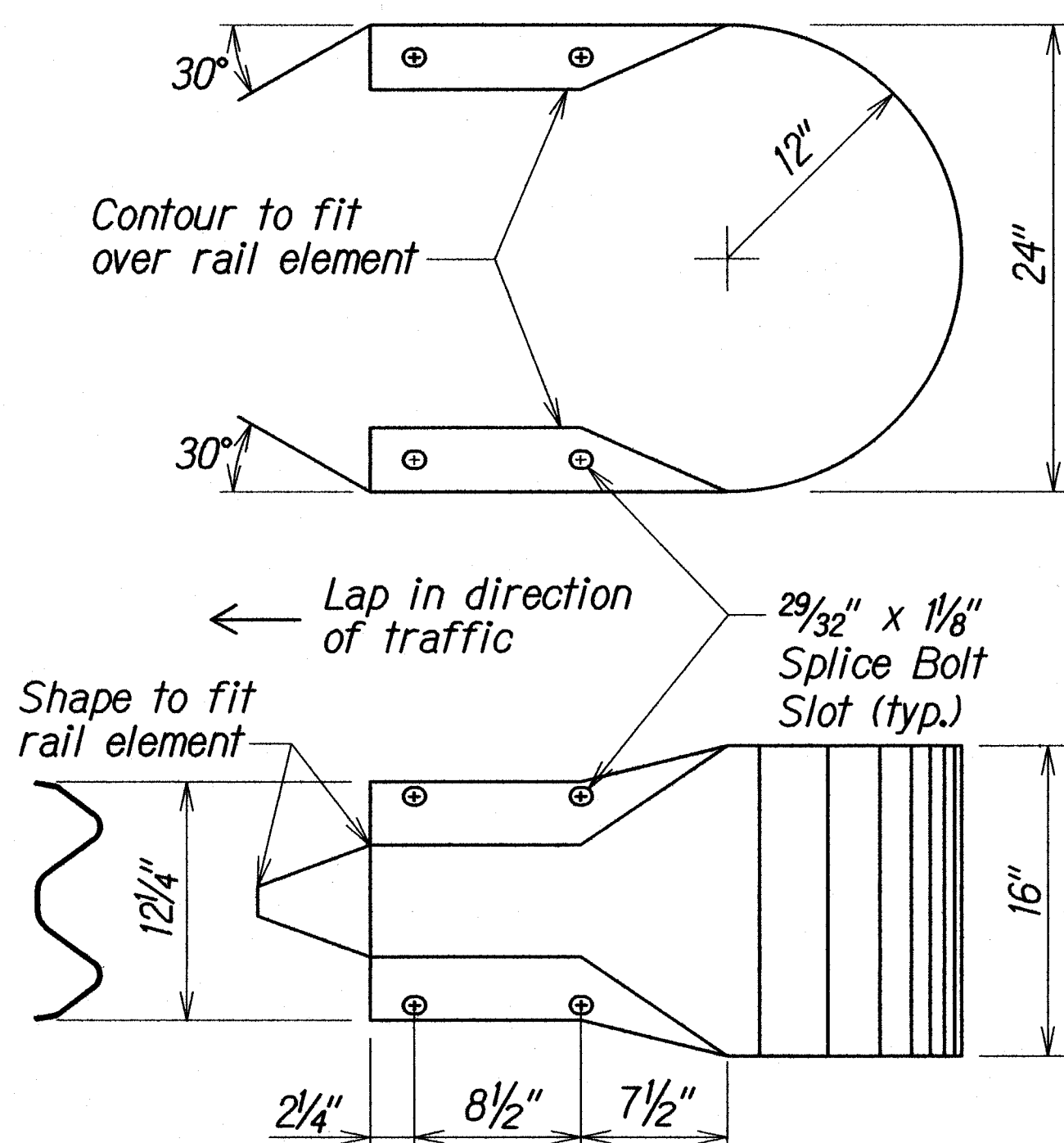
DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018	32	186



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

DESIGNATOR	BASE METAL THICKNESS
RWE02b	10 Gauge

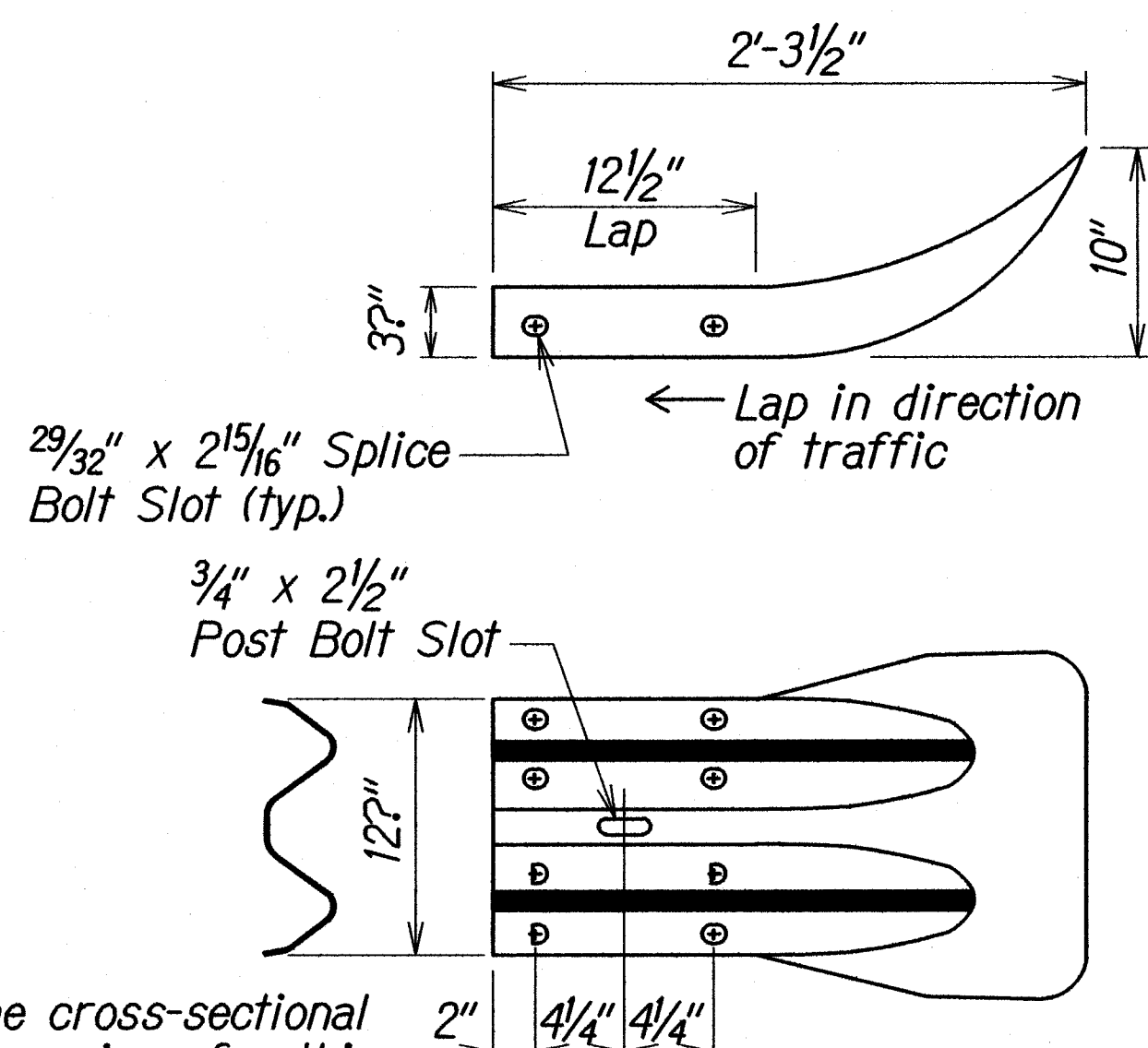
W-BEAM TERMINAL CONNECTOR (RWE02b)



The cross-sectional dimensions for this part are to fit over part RWM02a

DESIGNATOR	BASE METAL THICKNESS
RWE06a	12 Gauge

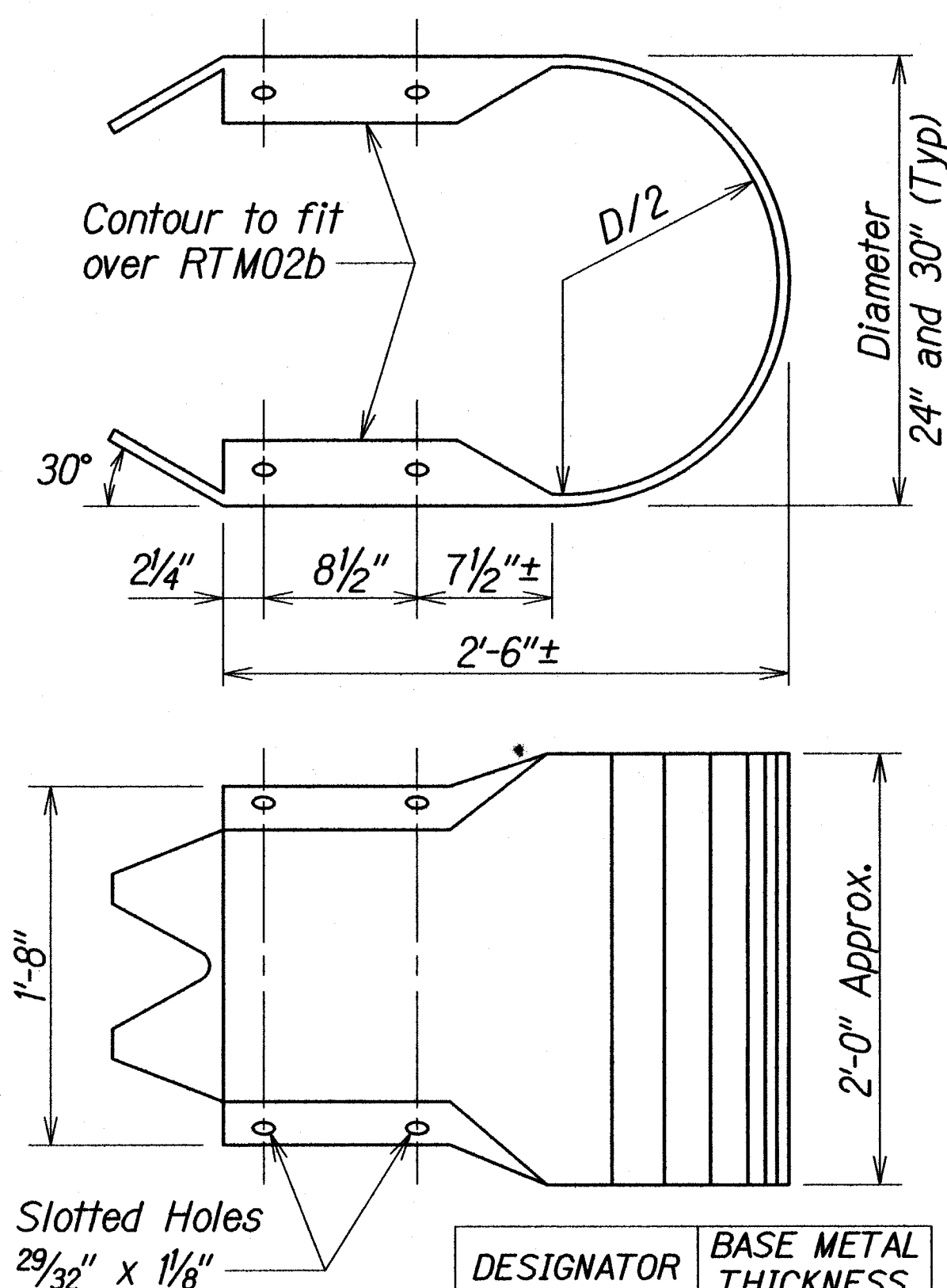
W-BEAM END SECTION (BUFFER RWE06a)



The cross-sectional dimensions for this part are to fit over part RWM02a on the approach end and under part RWM02a on the trailing end.

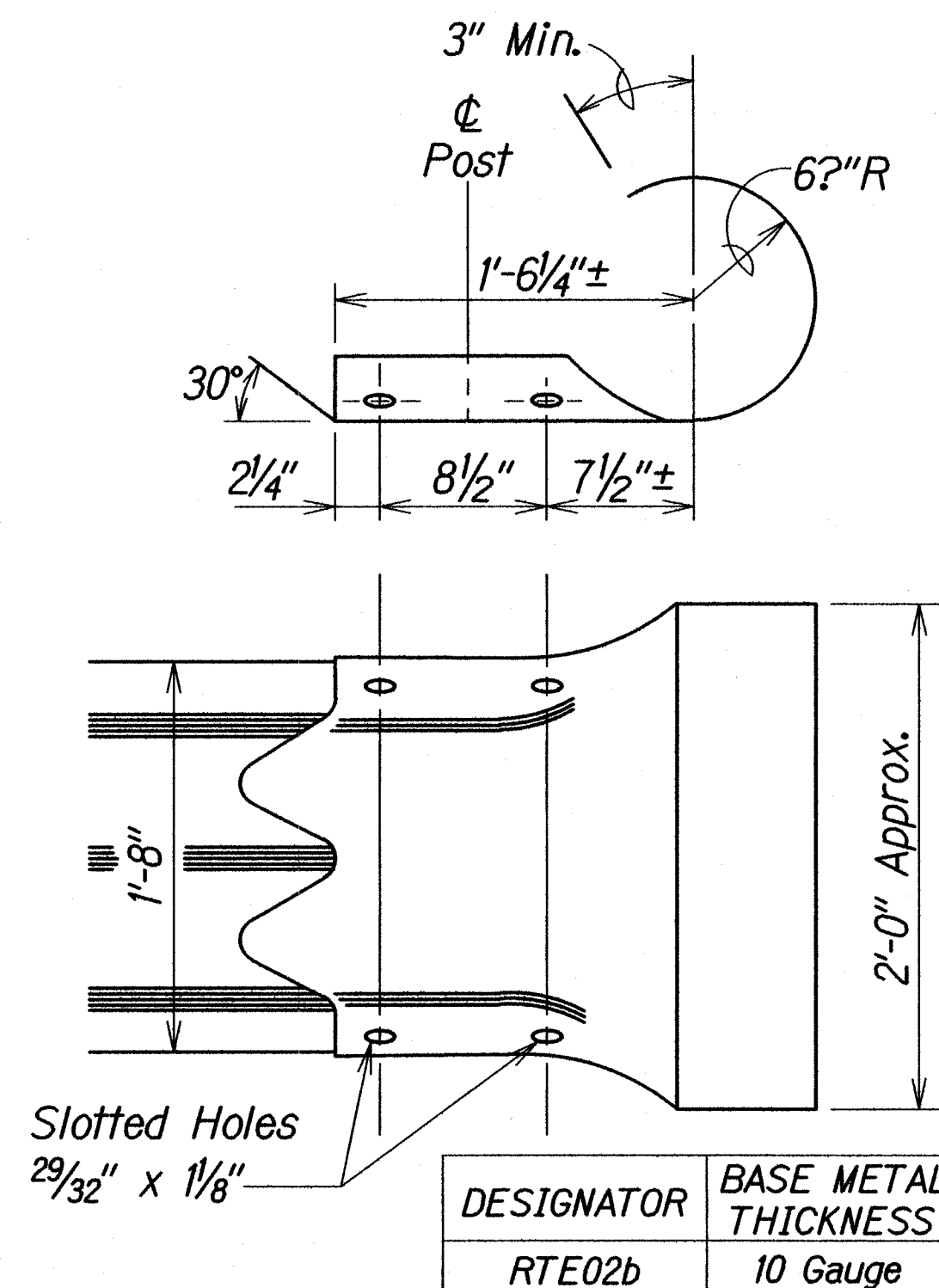
DESIGNATOR	BASE METAL THICKNESS
RWE01a	12 Gauge

W-BEAM END SECTION (FLARED RWE01a)

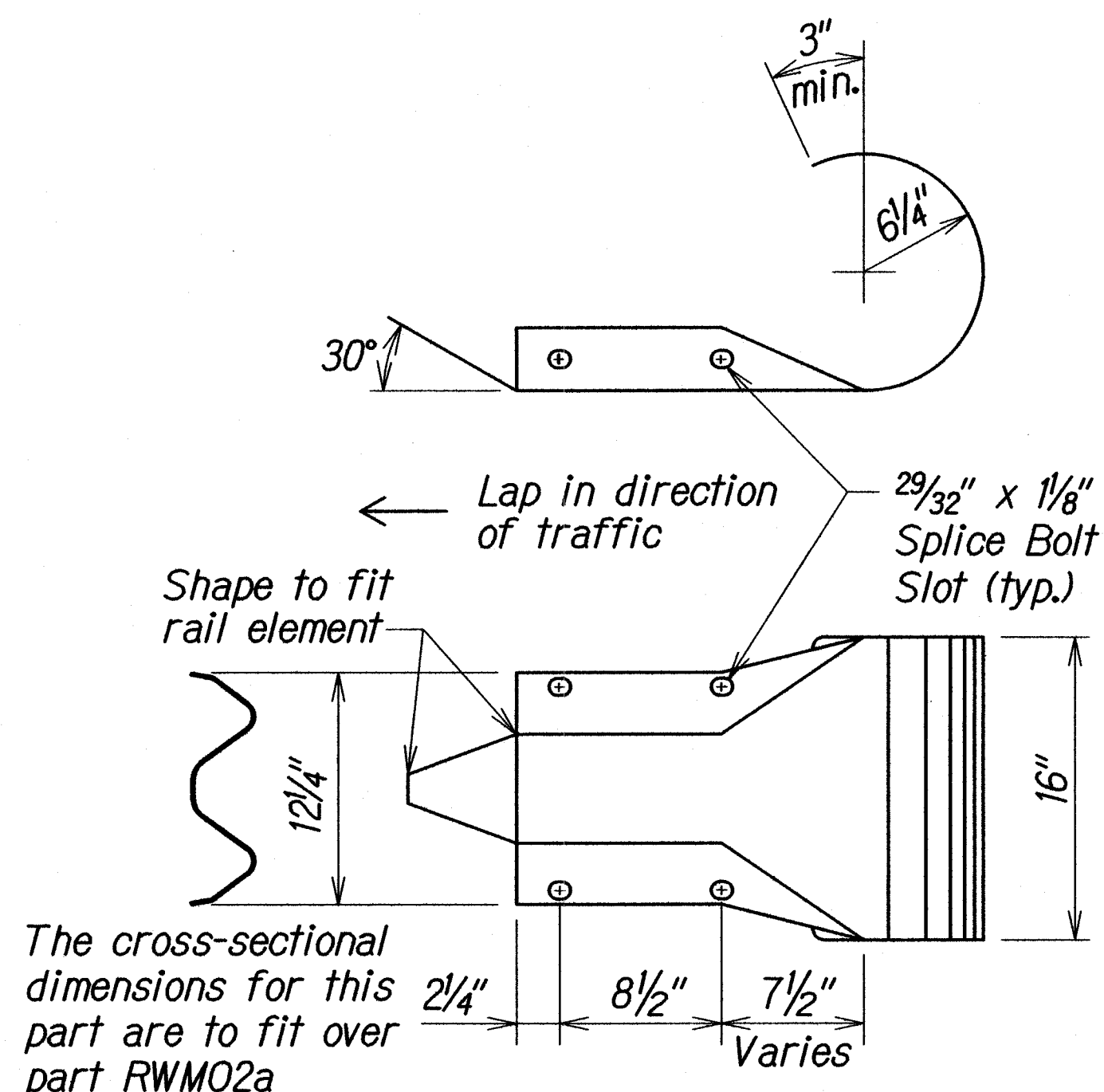


DESIGNATOR	BASE METAL THICKNESS
RTE03b & RTE04b	10 Gauge

THRIE-BEAM END SECTION (BUFFER RTE03b or RTE04b)

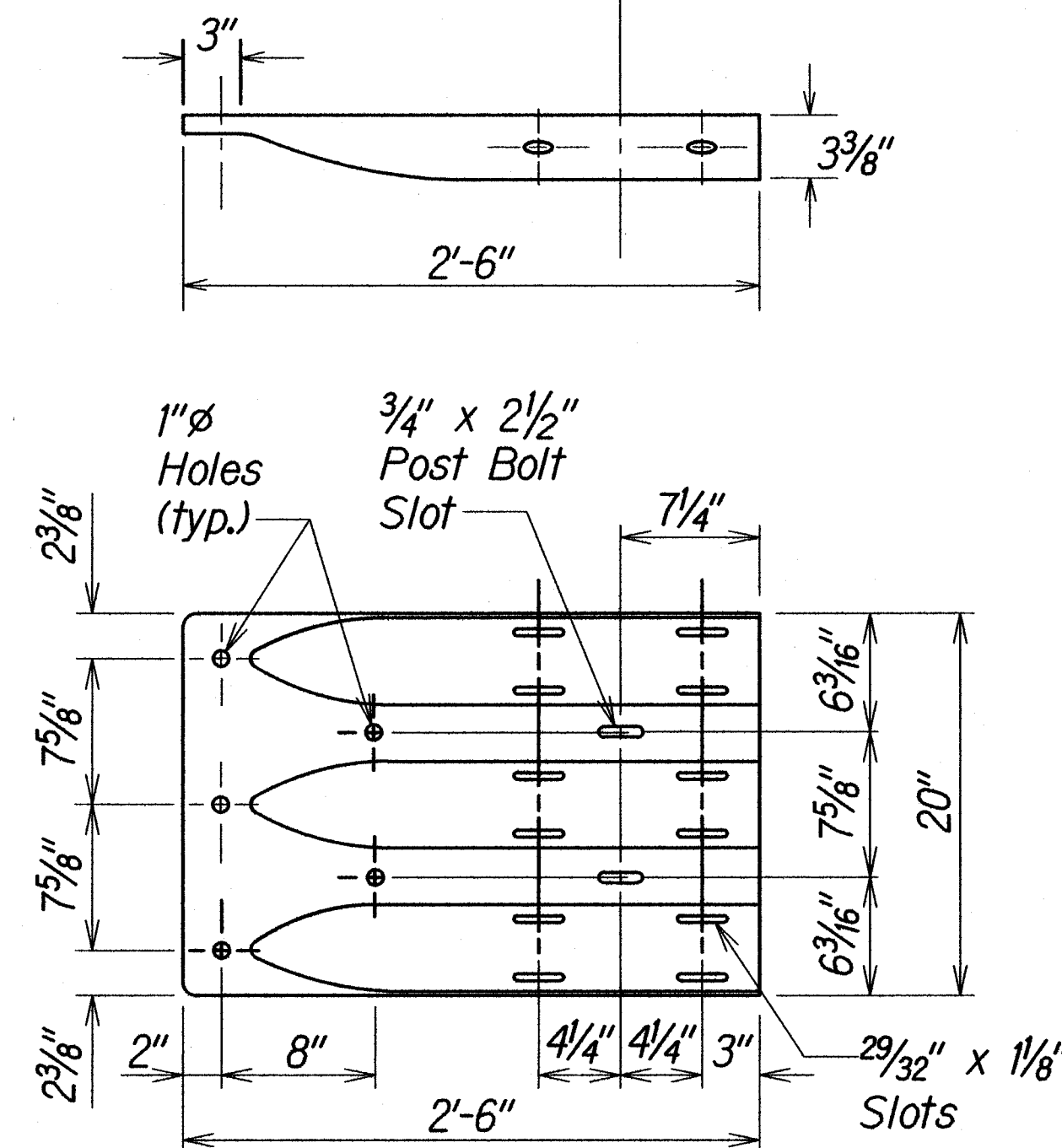


THRIE-BEAM SECTION (ROUNDED) (RTE02b)



DESIGNATOR	BASE METAL THICKNESS
RWE03a	12 Gauge

W-BEAM END SECTION (ROUNDED RWE03a)

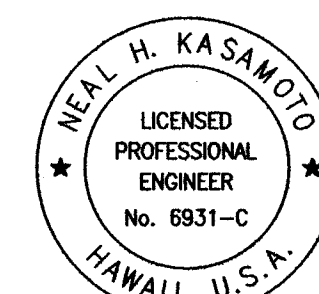


DESIGNATOR	BASE METAL THICKNESS
RTE01b	10 Gauge

THRIE-BEAM TERMINAL CONNECTOR (RTE01b)

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
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PNV-2018-16-048-ENGINEERING.DWG C7.7 GUARDRAIL DETAILS 3.DWG Jun 25, 2018-2:06 PM



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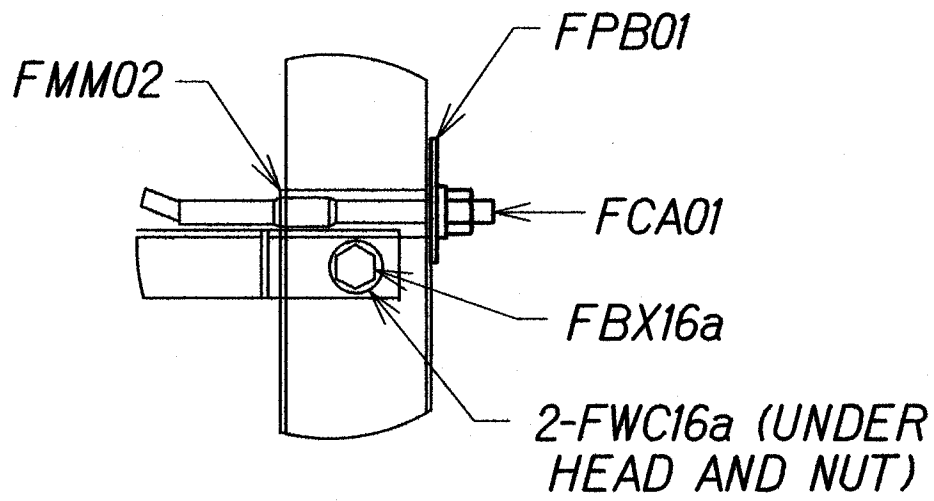
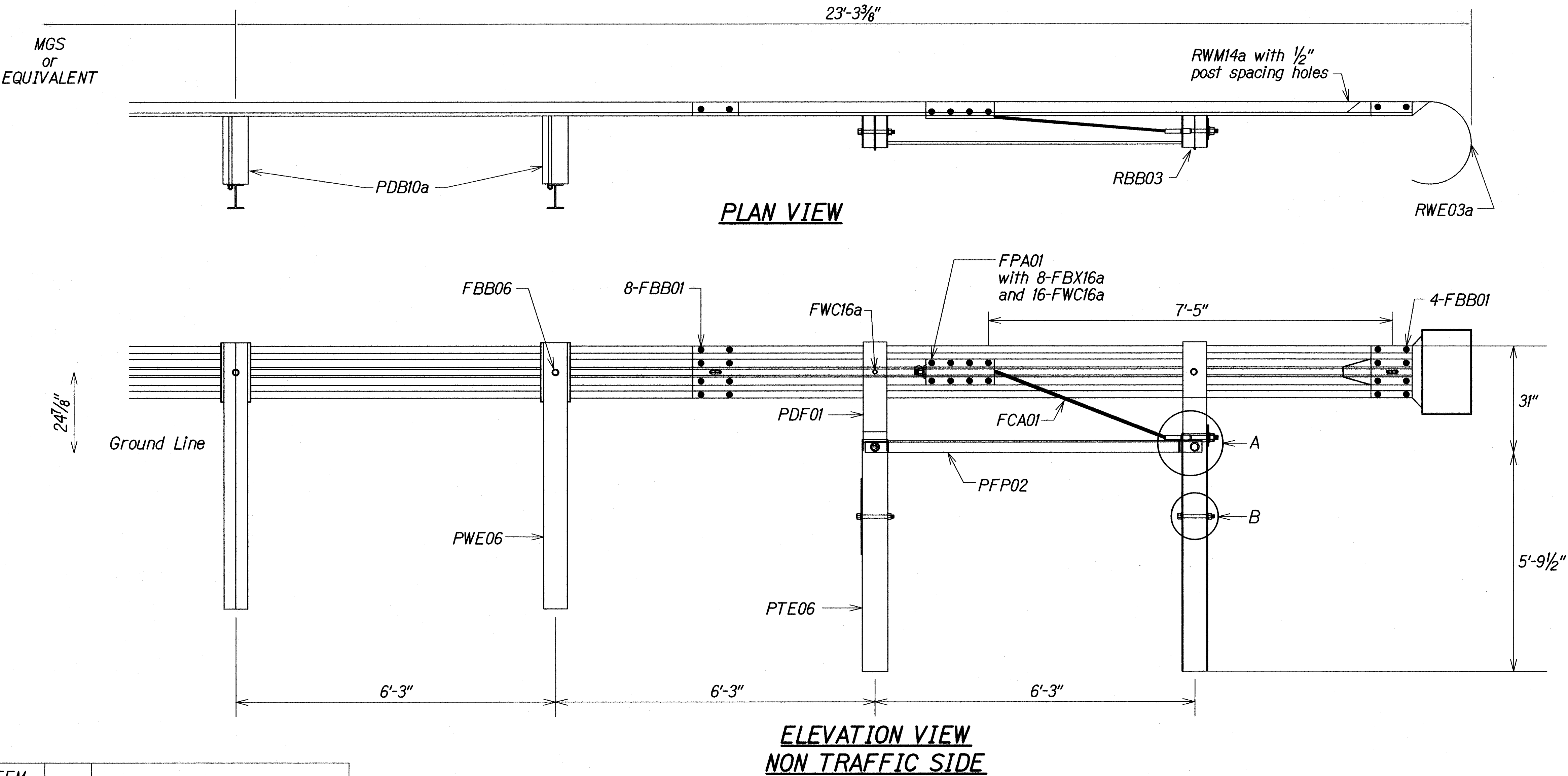
Neal H. Kasamoto  
APRIL 30, 2020  
LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**GUARDRAIL TERMINAL CONNECTORS AND END SECTIONS**  
Freeway Management System  
Phase 2  
Federal Aid Project No. NH-0300(160)

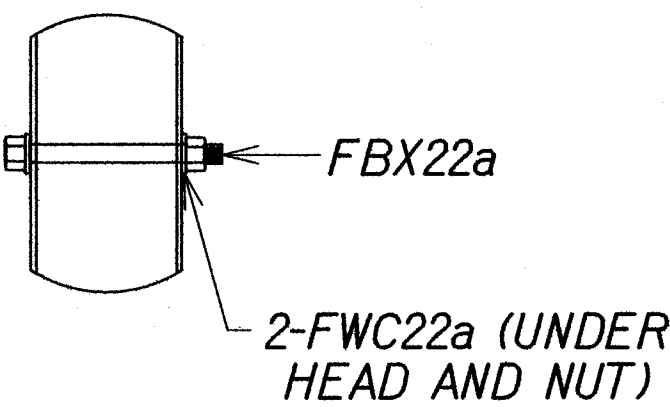
Scale: As Shown  
Date: June 29, 2018  
SHEET No. C7.7 OF 25 SHEETS

0 1 2  
LINE IS 2 INCHES AT FULL SIZE  
(if not 2 inches scale accordingly)

DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018	33	186

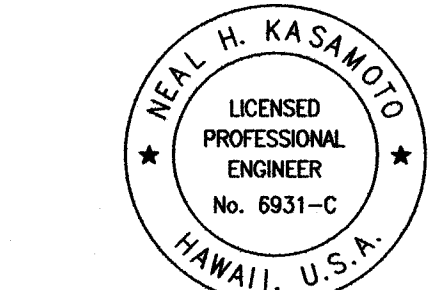
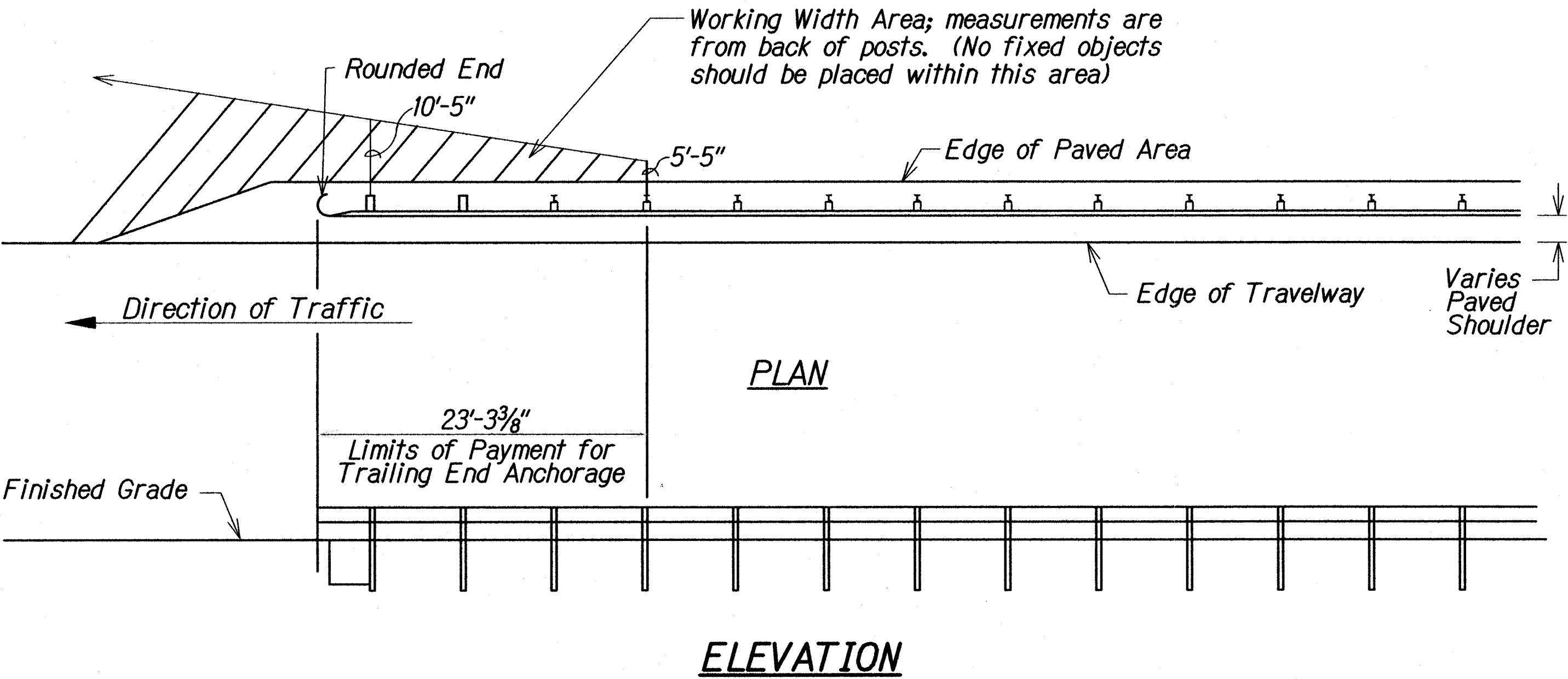


DETAIL A



DETAIL B

ITEM NO.	QTY	COMPONENTS
FBB01	12	Guardrail Bolt and Nut
FBB03	2	Guardrail Bolt and Nut
FBB06	1	Guardrail Bolt and Nut
FBX16a	2	Hex Head Bolt (10") and Nut
FBX16a	8	Hex Head Bolt (1 1/2") and Nut
FBX22a	2	Hex Head Bolt (7 1/2") and Nut
FCA01	1	BCT Anchor Cable Assembly
PDB10a	2	MGS Timber Blockout
PFP02	1	Strut and Yoke Assembly
PWE06	1	Wide-Flange Guardrail Post
FMM02	1	BCT Post Sleeve
FPA01	1	Anchor Bracket Assembly
FPB01	1	BCT Bearing Plate
FWC16a	22	Circular Washer
FWC22a	4	Circular Washer
PDF01	2	BCT Timber Post
PTE06	2	Foundation Tube
RWE03a	1	W-Beam Rounded End Section
RWM14a	1	W-Beam MGS End Section



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*Neal Kasamoto*  
APR 30, 2020  
LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
**TRAILING-END ANCHORAGE SYSTEM**  
Freeway Management System  
Phase 2  
Federal Aid Project No. NH-0300(160)

Scale: As Shown  
Date: June 29, 2018  
SHEET No. C7.8 OF 25 SHEETS

ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
REVISIONS	

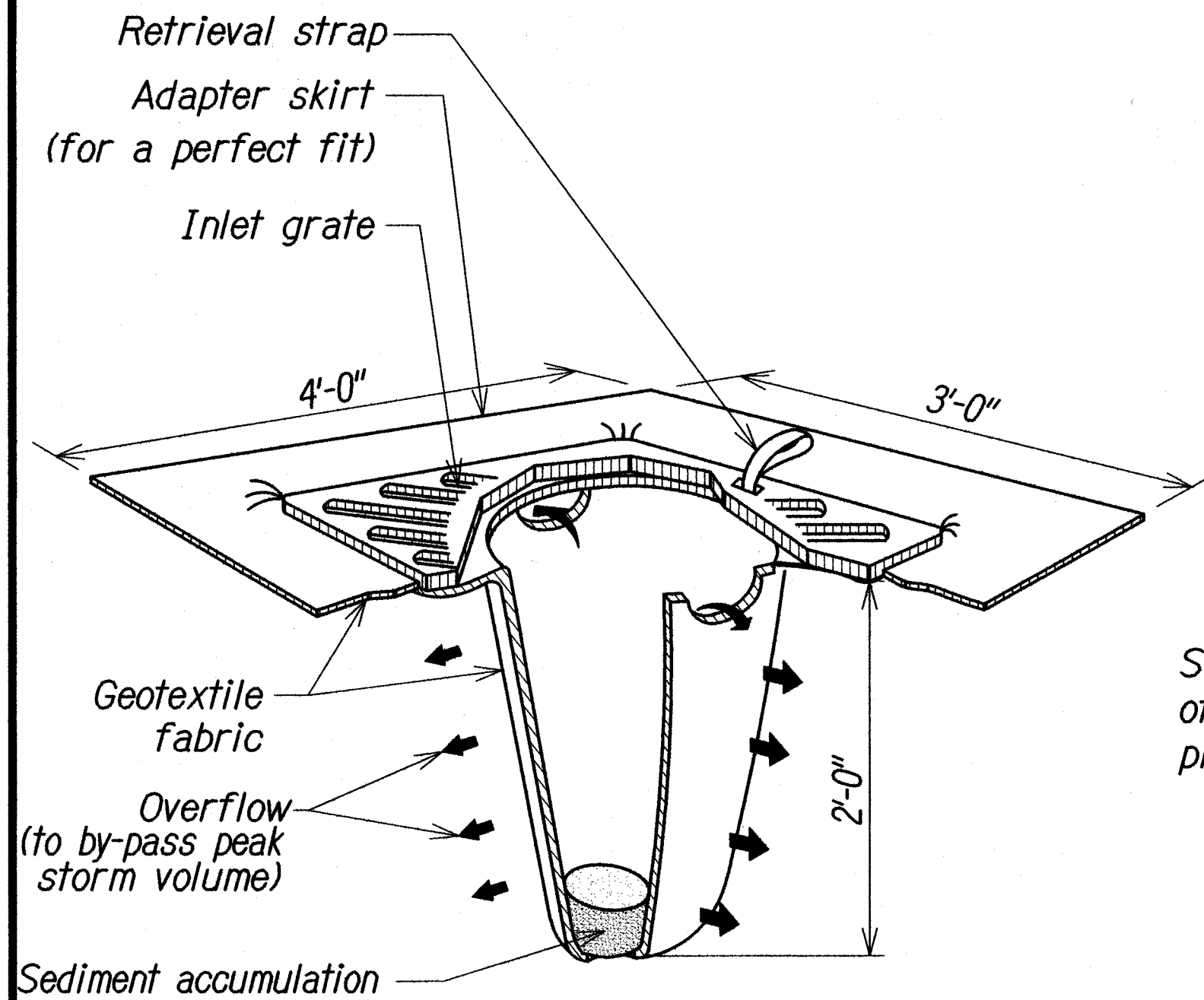
PKY:\2018\16-049\ENGINEERING\DWG\7.8 GUARDRAIL DETAILS 4.DWG Jun 23, 2018-2:05 PM



DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
OAHU	HAW.	NH-0300(160)	2018	34	186

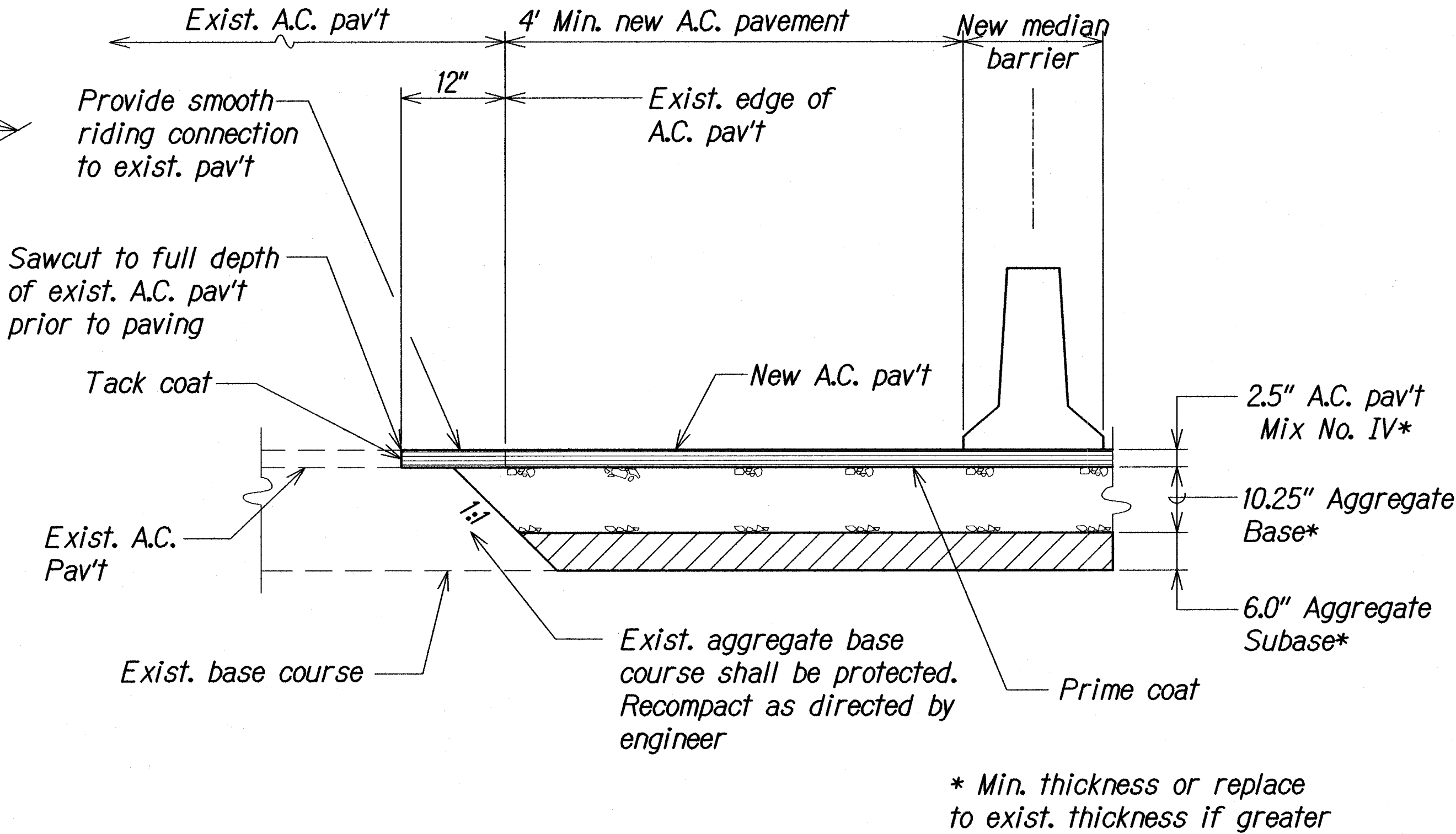
EROSION CONTROL/BEST MANAGEMENT PRACTICES NOTES:

- Erosion control measures to be installed prior to start of work, and be maintained until completion of project.
- All construction BMPs shall be inspected weekly, and within 24 hours of any rainfall event of 0.25 inches or greater in a 24 hour period. The Contractor shall submit a copy of the SWPPP Inspection and Maintenance Report Form to the Engineer within 24 hours of the inspection.
- Remove filter at times of above normal rainfall events and replace them when the event has passed.
- The final lift of each day's work shall be compacted to prevent erosion of fill material.
- Good housekeeping shall be utilized to ensure protection of roadways from mud, dirt, and debris.
- The Contractor shall ensure that all tires of construction vehicles are sufficiently cleaned off so that dirt or debris is not tracked off the construction site. Washing off tires with water will not be acceptable unless the runoff is contained and does not enter the storm drain system.
- Any dirt or grassed area disturbed shall be restored by seeded hydromulch.
- At the end of construction operations and at the completion of the project, Contractor shall inspect all catch basin, drain inlet and drain manhole surrounding the project site. Any accumulated sediment and debris found in storm drain structures shall be removed. Please note that flushing into the drain structures is prohibited.
- Contractor shall submit proposed storm drain and sediment barrier for acceptance prior to installation.

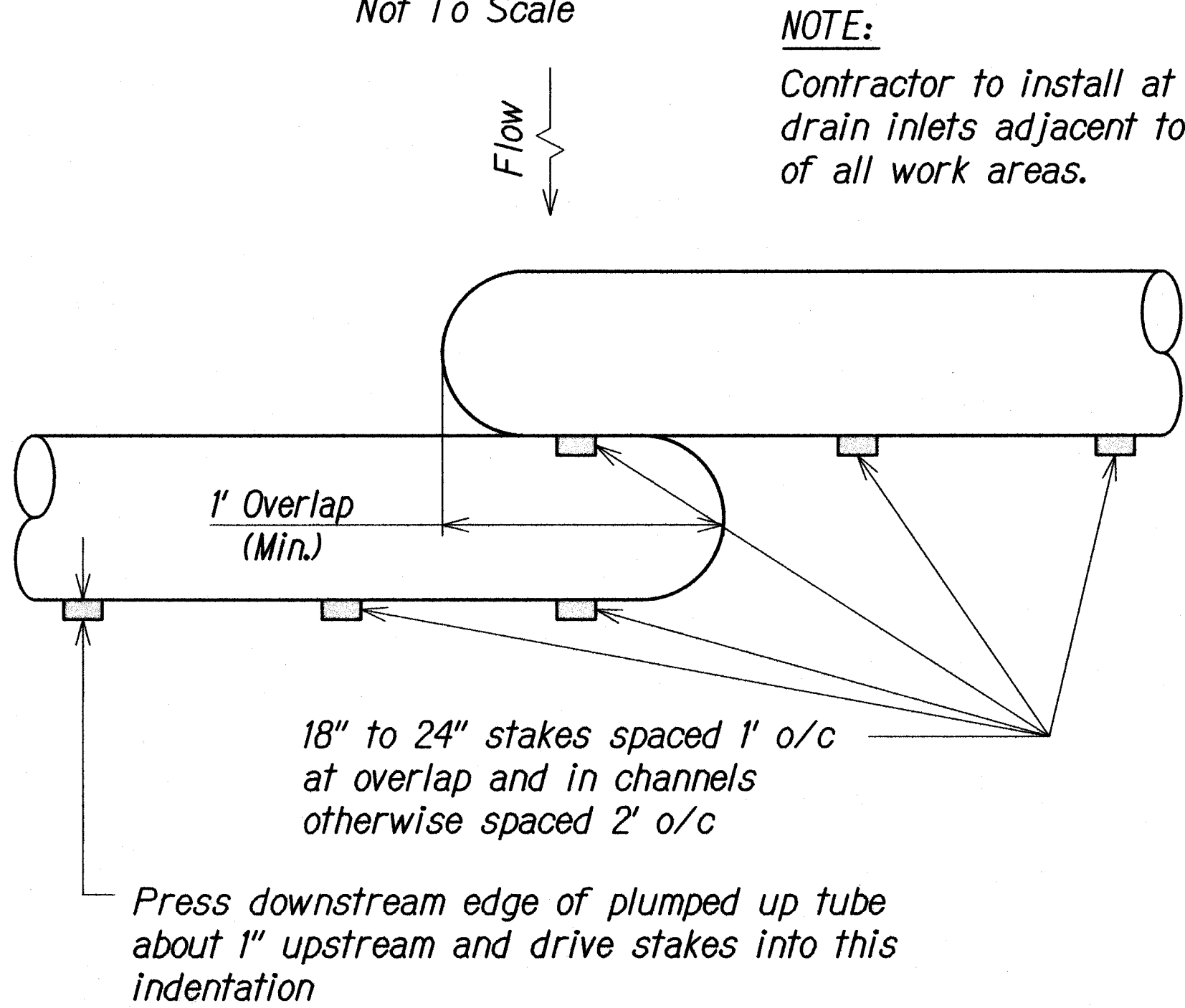


- NOTES:
- All inlet protection on road shoulders shall be protected from damage by vehicular traffic with Type II barricades with amber flashers.
  - Contractor shall check the condition of the filter at the beginning and ending of each work day and repair/clean as necessary.

TEMPORARY SEDIMENT BARRIER  
AT DRAIN INLET  
Not To Scale

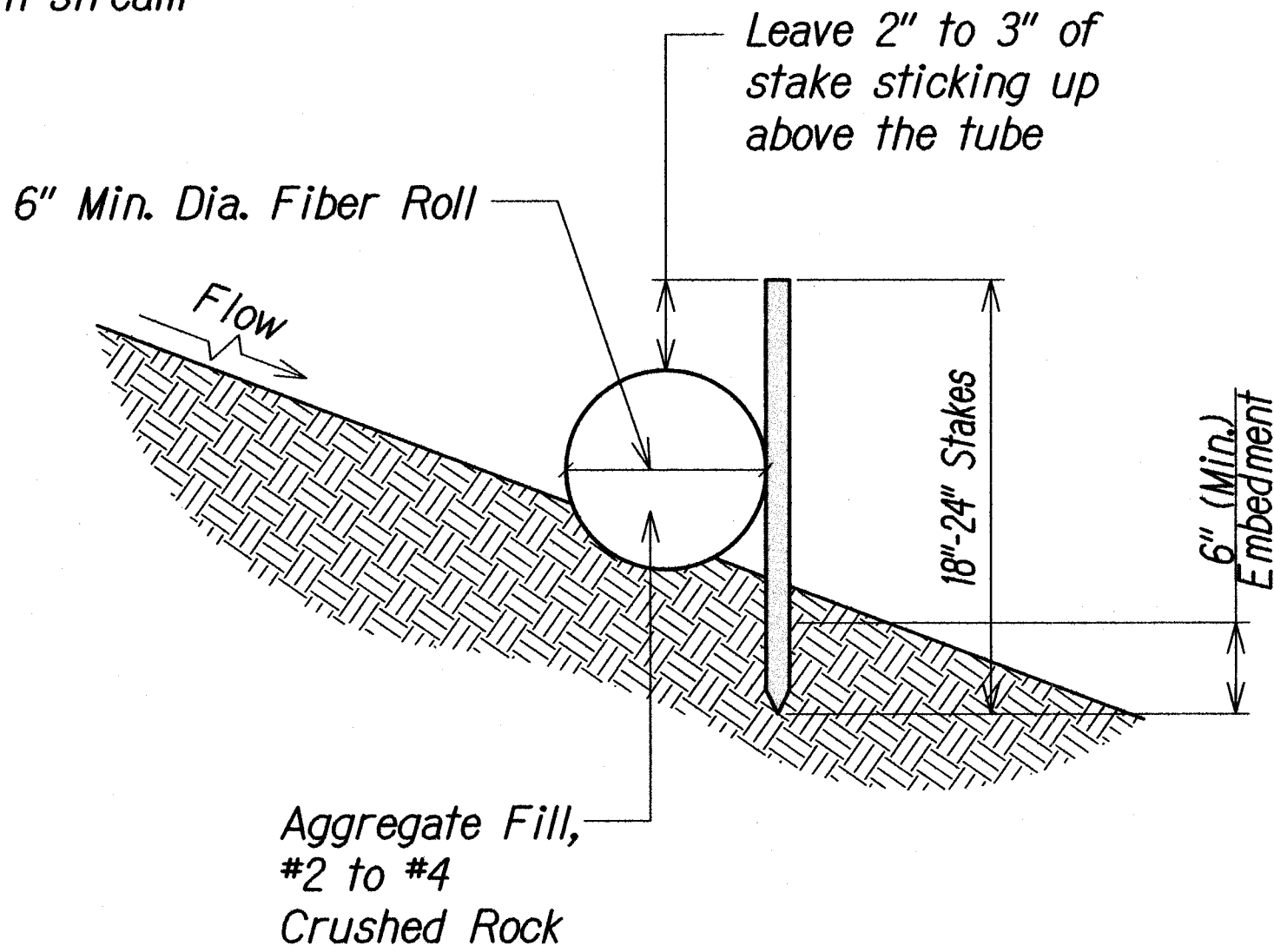


A.C. PAVEMENT RESTORATION DETAIL AT MEDIAN BARRIER  
Not To Scale

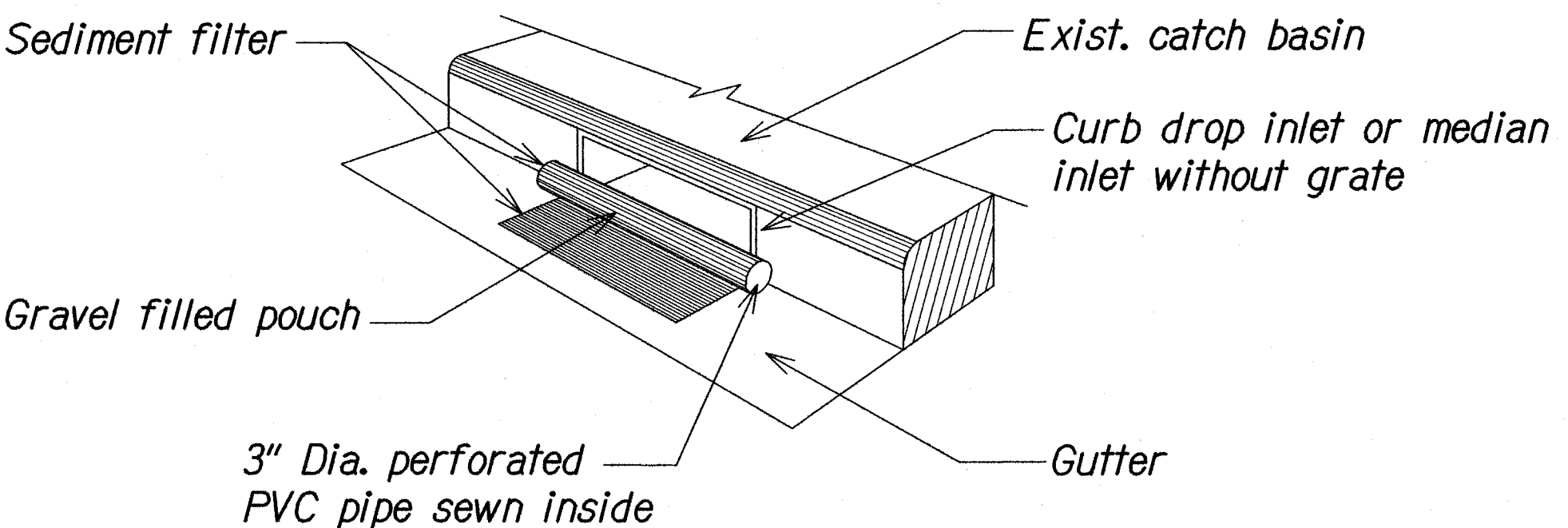


PLAN

TEMPORARY FIBER ROLL DETAIL  
Not To Scale



SECTION



TEMPORARY STORM DRAIN PROTECTION  
Not To Scale



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APRIL 30, 2020  
LIC. EXP. DATE

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**EROSION CONTROL DETAILS**

Freeway Management System  
Phase 2  
Federal Aid Project No. NH-0300(160)

Scale: As Shown Date: June 29, 2018

SHEET No. C7.9 OF 25 SHEETS