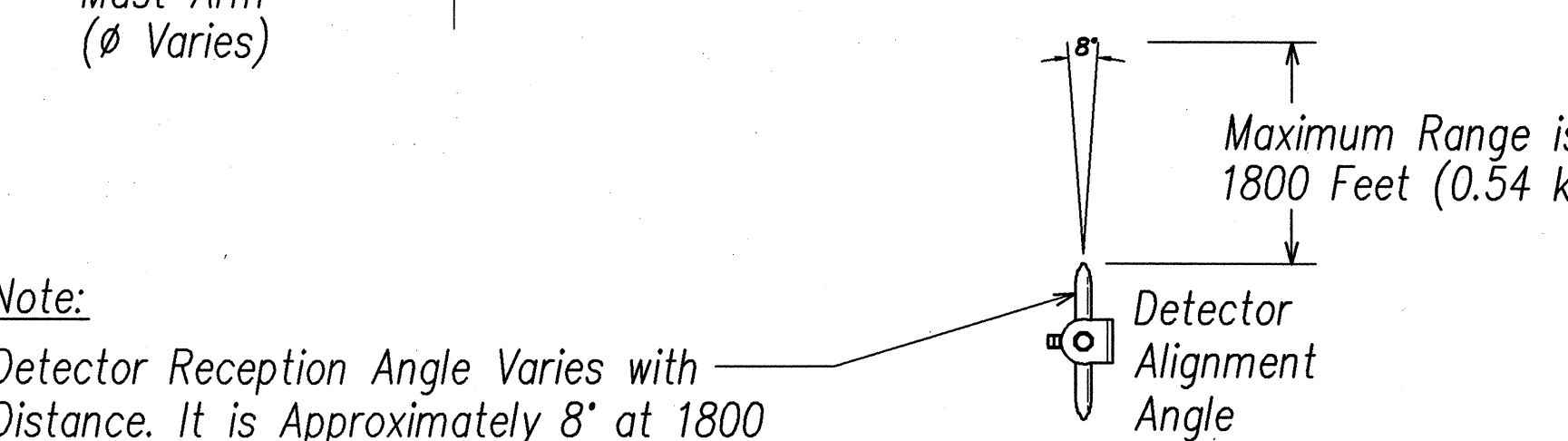
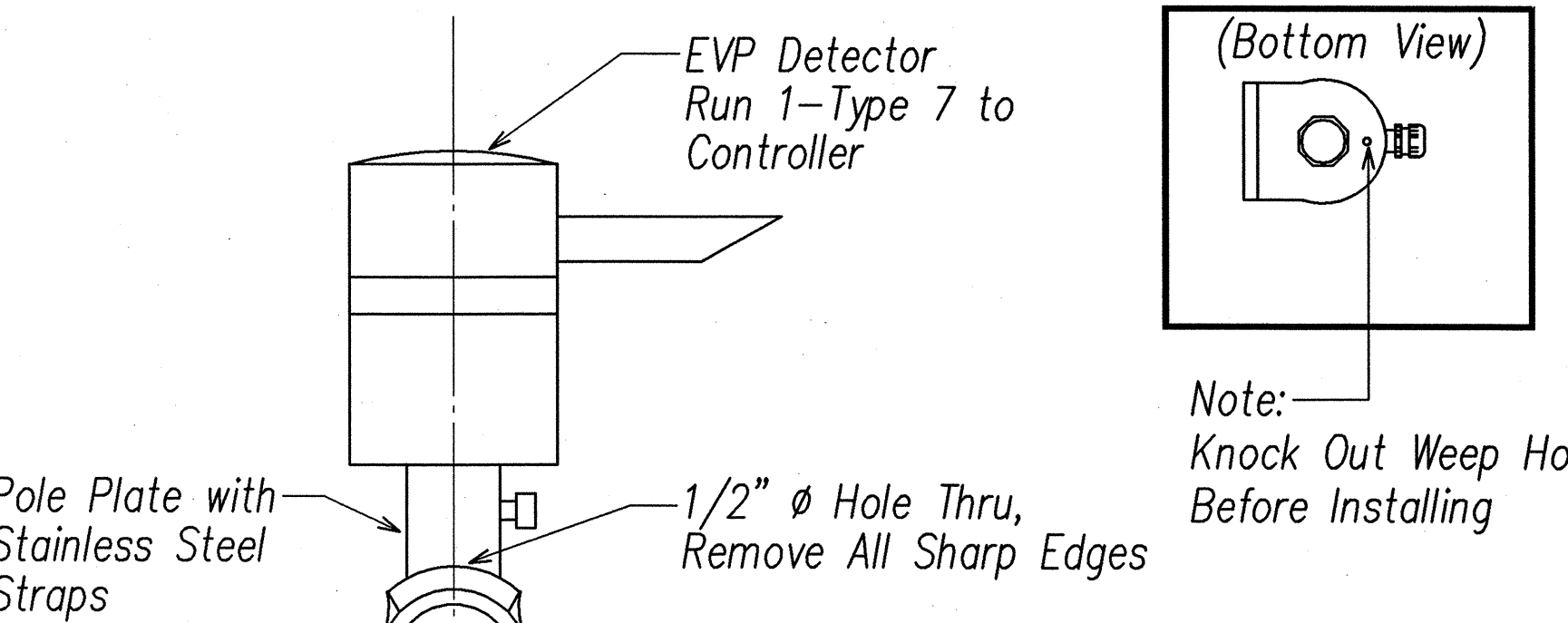
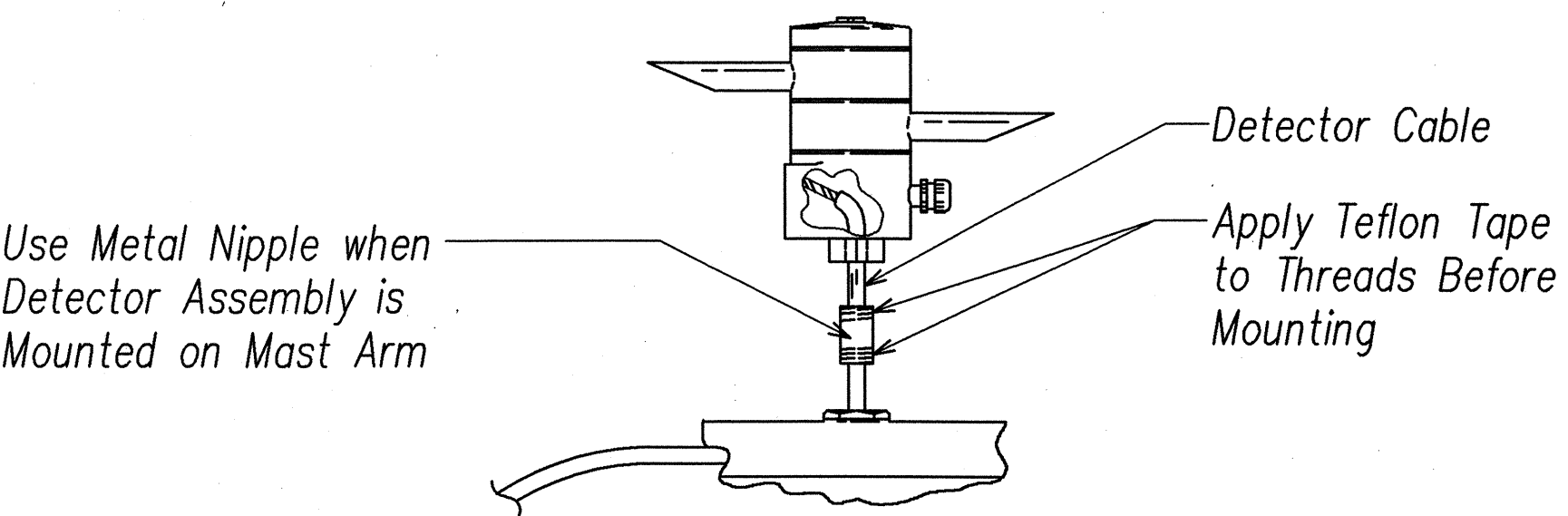


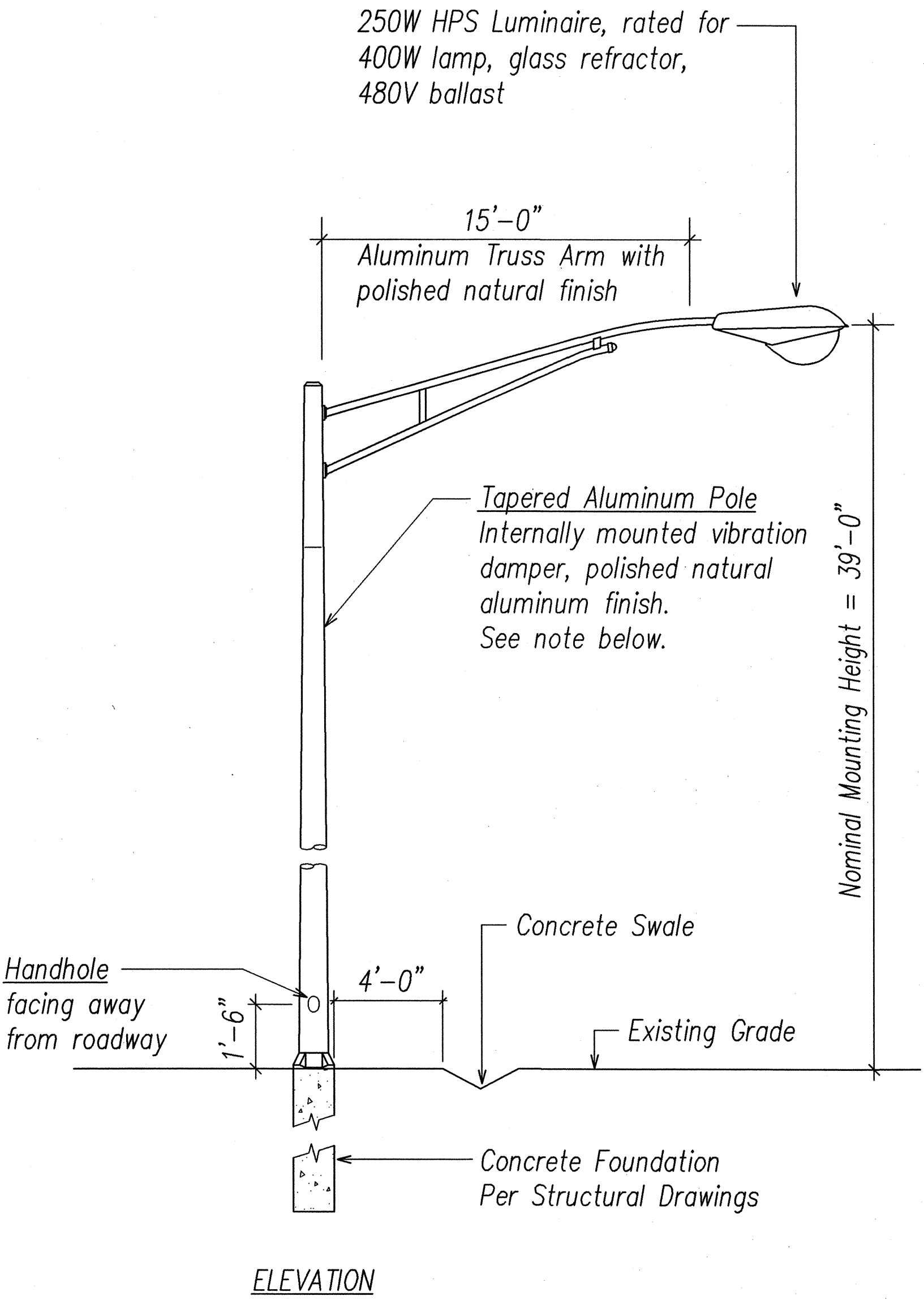
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(33)	2007	150	168



TYPICAL MAST ARM INSTALLATION OF EVP DETECTOR
NOT TO SCALE

SEAN K. SUGAL
LICENSED PROFESSIONAL ENGINEER
No. 9023-E
HAWAII, U.S.A.
SIGNATURE: [Signature]
APRIL 30, 2008
EXPIRATION DATE OF LICENSE
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

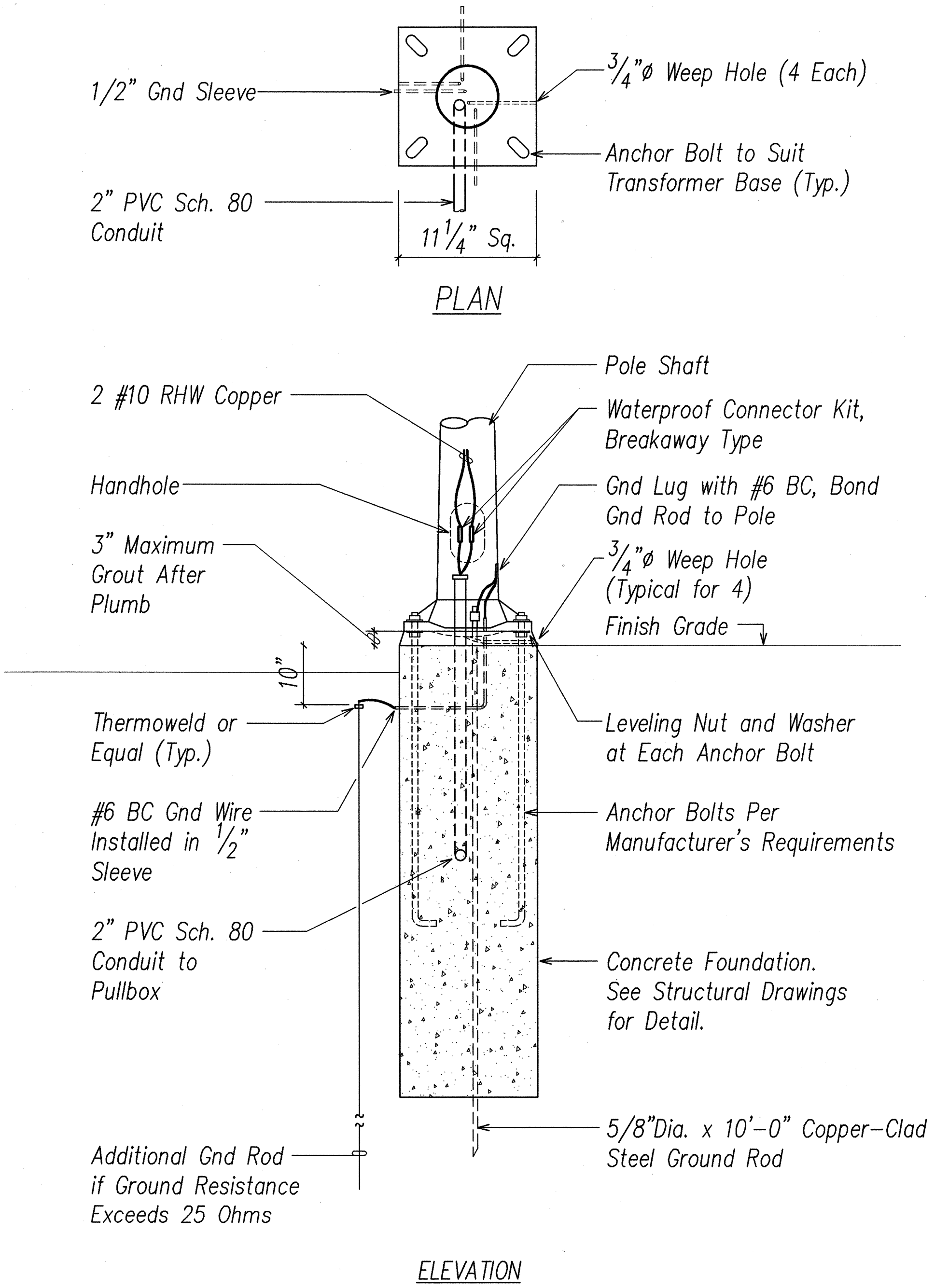
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROADWAY LIGHT & EVP DETECTOR DETAILS
WAIPIO INTERCHANGE, RAMP WG-3
INTERSTATE ROUTE H-2 REHABILITATION
Waipio Interchange and Mililani Interchange
On/Off Ramps, Ka Uka Boulevard and
Meheula Parkway Overpasses & Kipapa Stream Bridge
Federal Aid Project No. IM-H2-1(33)
DATE: November 2006



POLE NOTE:

All Components of the Light Standard shall be Designed in Accordance with AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", Dated 2001, 4th Edition, including interims.

ROADWAY LIGHT STANDARD
NOT TO SCALE



TYPICAL CONCRETE FOUNDATION AND BASE DETAIL
NOT TO SCALE

DATE	_____
SURVEY PLOTTED BY	_____
PLAN	_____
DRAWN BY	_____
DESIGNED BY	_____
NOTED BY	_____
CHECKED BY	_____
NO.	_____

LAST SAVE: 09/17/2008 10:00 AM
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STRUCTURAL GENERAL NOTES

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(33)	2007	152	168

1. General Specifications: Hawaii Department of Transportation, Standard Specifications for Road and Bridge Construction, 1994, together with Special Provisions prepared for this contract.

2. Design Specifications:

- (A) AASHTO 2004 LRFD Bridge Design Specifications (Third Edition) and its subsequent interim specifications with interim supplements and modifications by the Highways Division, Department of Transportation, State of Hawaii.
- (B) AASHTO 2001 Standard specifications for structural supports for Highway Signs, Luminaries and Traffic Signals (Fourth Edition) and its subsequent interim specifications with interim supplements and modifications by the Highways Division, Department of Transportation, State of Hawaii.

3. Loads:

- (A) Wind Load: 105 mph. Value is a 3 second gust speed at 32.8 ft above ground for Exposure C category and is associated with an annual probability of 0.02 (50 year mean recurrence interval).
- (B) Recurrence Interval of 50 Years for the Traffic Signal Structures. Recurrence Interval of 25 Years for the Luminaire Support Structures.
- (C) Fatigue importance factor, IF, Shall be based on fatigue Category I for traffic signal structures.
- (D) Vortex shedding induced loads shall be considered for cantilevered mast arms and pole shafts that do not have tapers or have tapers of less than 0.14 in/ft.
- (E) Traffic signal support structures shall be designed for a truck induced gust based on a truck speed of 20 MPH over the posted speed.
- (F) Galloping and natural wind gust shall be considered for cantilever traffic signal structures.

4. Materials:

(A) All concrete strengths shall be as noted below:

Item No.	Structural Parts	Classes of Concrete	Specified Compressive Strength, f_c (28 Days)
(1)	Drilled shafts	-	4500 PSI
(2)	Except as noted otherwise, all others	A	3000 PSI

All concrete with a 28 days compressive strenght of 4000 psi or greater shall have a maximum W/C Ratio of 0.45. The W/C Ratio for other class of concrete shall follow the Standard Specifications.

- (B) All reinforcing steel shall be ASTM A615 Grade 60 unless otherwise noted.
- (C) All structural steel shall be hot dip galvanized after fabrication, unless otherwise noted.
- (D) All anchor bolts, washers and nuts shall be hot dip galvanized after fabrication, unless otherwise specified.

5. Reinforcement:

- (A) The minimum covering measured from the surface of the concrete to the face of any reinforcing bars shall be as follows, except as otherwise shown:
- (1) Concrete cast against and permanently exposed to earth = 3"
- (2) All others unless otherwise noted = 2".
- (B) Reinforcing bars shall be detailed in accordance with the latest edition of the design specification in note 2 unless otherwise noted.
- (C) Minimum clear spacing between parallel bars shall be 1 1/2 times the diameter of bars (for non bundled bars). In no case shall the clear distance between the bars be less than 1 1/2 times the maximum size of the coarse aggregate or 1 1/2".
- (D) All dimensions relating to reinforcing bars are to centers of bars unless otherwise noted.
- (E) Reinforcing bars shall be securely tied at all intersections and lap splices except where the spacing of intersections is less than one foot in each direction, in which case alternate intersections shall be tied.

6. Construction Notes:

- (A) See Standard Specifications and Special Provisions.
- (B) Except as otherwise noted, all vertical dimensions are measured plumb.
- (C) The Contractor shall verify all site conditions and not rely upon these plans for stream location, etc. Conditions may differ from those shown.
- (D) The Contractor shall tone and verify the location of all utility lines and notify the respective owners before commencing with excavation, and any temporary piling or sheeting.
- (E) For concrete finish see Standard Specifications and Special Provisions.
- (F) Construction joints may be relocated or additional ones added subject to the approval of the Engineer.
- (G) Unless otherwise noted, all exposed concrete edges shall be chamfered 3/4"x3/4".

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

MILES Y. SHIMOKAWA
LICENSED PROFESSIONAL ENGINEER
NO. 3906-S
HAWAII, U.S.A.

SIGNATURE
APRIL 30, 2008
EXPIRATION DATE OF LICENSE
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

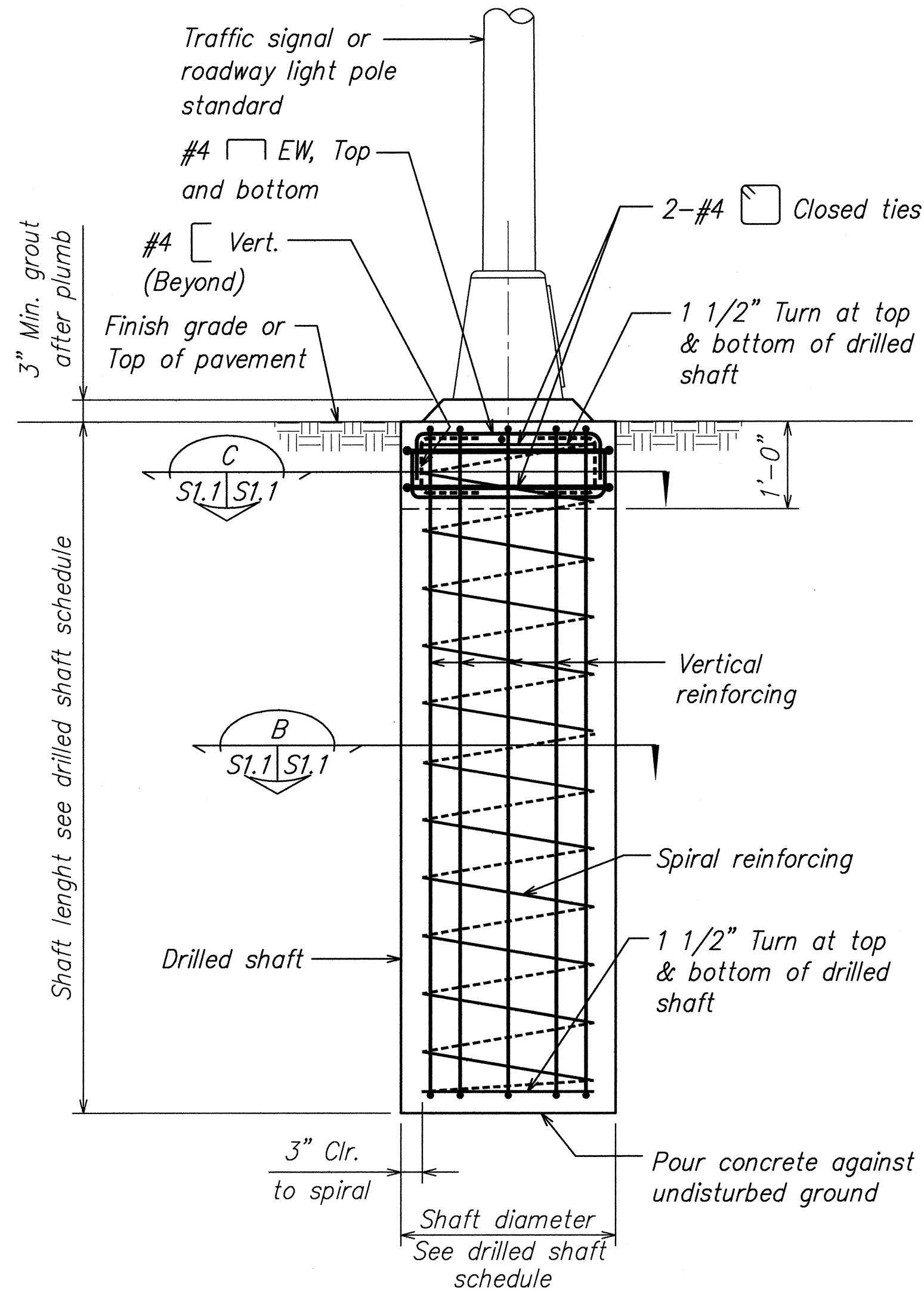
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STRUCTURAL GENERAL NOTES
WAIPIO INTERCHANGE, RAMP WG-3
INTERSTATE ROUTE H-2 REHABILITATION
Waipio Interchange and Mililani Interchange
On/Off Ramps, Ka Uka Boulevard and
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Federal Aid Project No. IM-H2-1(33)

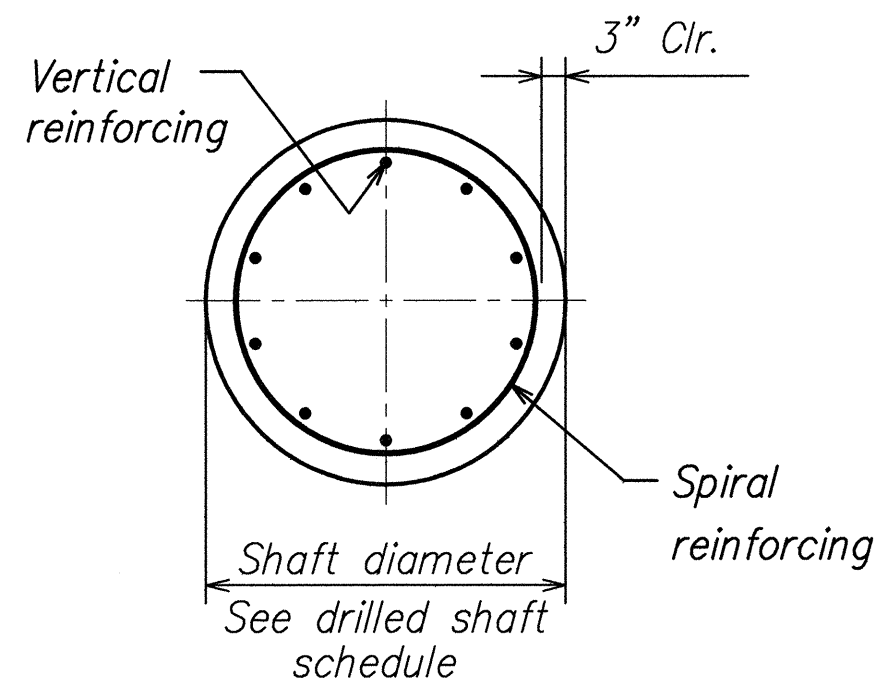
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SHEET No. SO.1 OF 1 SHEETS

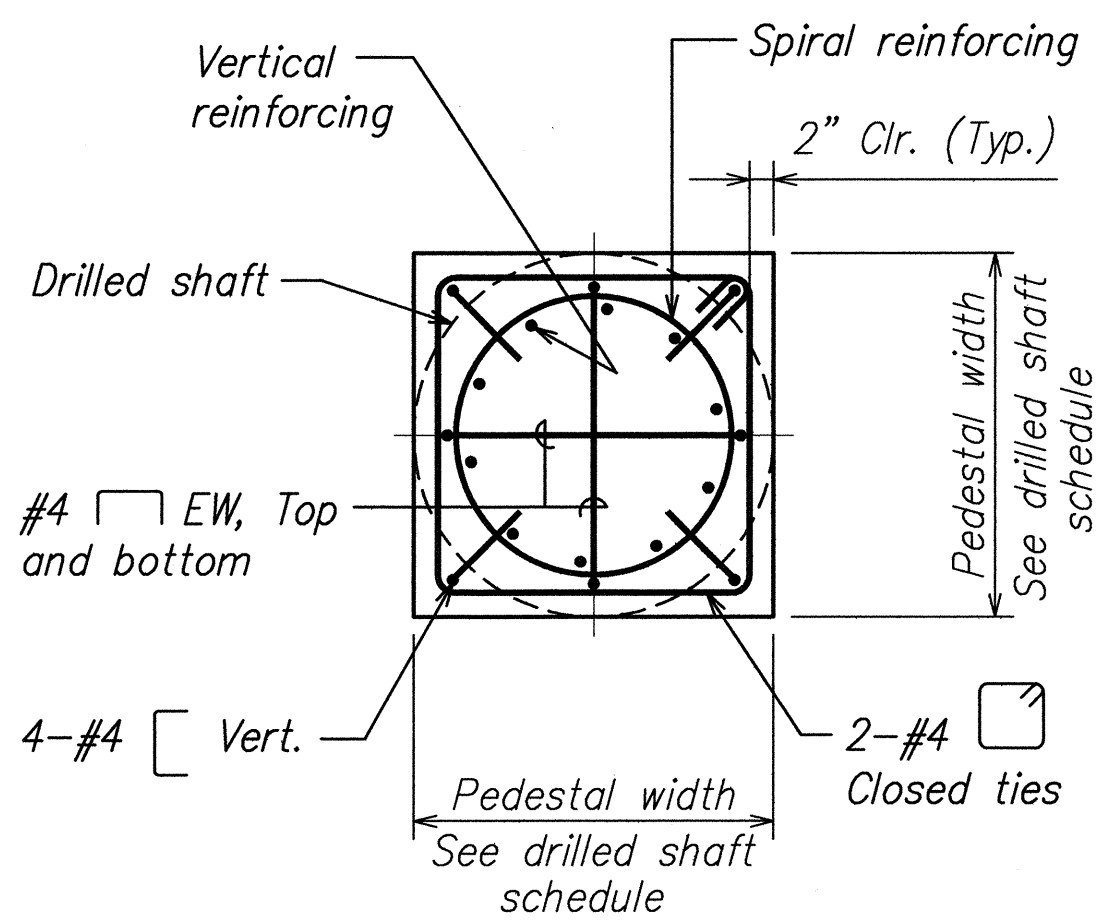
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1M-H2-1(33)	2007	153	168



TYPICAL POLE FOUNDATION
SCALE: 3/4" = 1'-0"
SECTION A
S1.1 | S1.1



SECTION B
SCALE: 3/4" = 1'-0"
S1.1 | S1.1



SECTION C
SCALE: 3/4" = 1'-0"
S1.1 | S1.1

- Notes:**
1. See electrical drawings for additional details.
 2. Traffic signal and roadway light standard pole manufacturer's recommendations shall be followed.

Drilled Shaft Schedule

	Shaft diameter inch	Shaft Length feet	Pedestal Width inch	Vertical reinforcing	Spiral reinforcing
Roadway Light Standard	24	6	24	10-#6	#4 @ 8"
Type I Traffic Signal Standard	24	5	24	10-#6	#4 @ 8"
Type II Traffic Signal Standard	30	8	30	10-#8	#5 @ 8"

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TYPICAL SIGNAL LIGHT POLE FOUNDATION
WAIPIO INTERCHANGE, RAMP WG-3
INTERSTATE ROUTE H-2 REHABILITATION
Waipio Interchange and Mililani Interchange
On/Off Ramps, Ka Uka Boulevard and
Meheula Parkway Overpasses, & Kipapa Stream Bridge
Federal Aid Project No. 1M-H2-1(33)
SCALE: As Noted
DATE: November 2006
SHEET No. S1.1 OF 1 SHEETS