

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0380(10)	2013	ADD.162	166

**LEGEND**

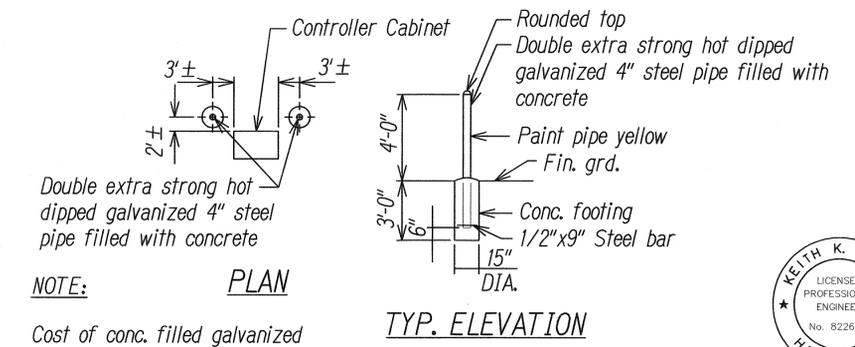
NEW		EXISTING
	Standard traffic and pedestrian count down signal heads mounted on Type I Signal Standard, height=10'	
	Pedestrian count down signal head mounted on Type I Signal Standard, height=8'	
	12" R Y arrow Traffic signal head	
	12" R Y G Traffic signal head	
	Pedestrian head with count down signal head	
	12" left arrow Traffic signal head	
	12" left arrow Traffic signal head	
	12" R Y G left arrow 4-Section Traffic signal head	
	Traffic signal heads mounted on Type II Signal Standard 40' M.A. : 12' between heads	
	EVP Detector	
	Type "A" pullbox	
	Type "B" pullbox	
	Type "C" pullbox	
	Existing pullbox	
	Replace existing pullbox with new Type "B" pullbox	
	Replace existing pullbox with new Type "C" pullbox	
	Exist. Model 170 controller	
	New Model 170 controller on new base	
	Pipe guards	
	Loop detectors	
	Sign	
	New traffic signal standard	
	Traffic signal conduits (underground)	

**TRAFFIC SIGNAL NOTES**

- All traffic signal controller equipment shall be completely wired in the cabinet and shall control the traffic signals as called for in the plans.
- Signal indications during clearance interval:
  - If a signal is G or left arrow and will remain G or left arrow during the next phase, it shall be G or left arrow during the clearance interval.
  - If a signal is G or left arrow and will become R or extinguished during the next phase, it shall be Y or left arrow during the clearance interval.
  - If a signal is R and will remain R or becomes G during the next phase, it shall remain R during the clearance interval.
- 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.
- A solid #8 bare copper wire shall be pulled with the traffic control cable for equipment ground. Cost shall be incidental to the installation of the control cable.
- Conduits and pullbox locations as shown on the plans are schematic. They may be modified by the contractor with the approval of the engineer.
- The contractor shall install the controller and cabinet in the indicated location.
- All work for the installation or modification of the traffic signal system shall conform to the latest revisions of the "Hawaii Standard Specifications for Road and Bridge Construction", 2005 and the "Standard Plans" of the Department of Transportation, Highways Division and as shown on these drawings.
- All splicing shall be done in the pullboxes.
- 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 contract items.
- The concrete jacket for the conduit by-pass detail shown on Sheet TE-36 shall not be paid for separately but considered incidental to the various various
- All cable and elements for grounding shall be new.
- Cables between signal faces, pedestrian heads, and EVP detectors and the nearest pullbox are not called out on the plan, but shall be furnished and installed in sufficient numbers and lengths as required. Cost shall be incidental to various traffic signal contract items.
- Conduits between the traffic signal standard and the pullbox shall be in sufficient number as required. Cost shall be incidental to the installation of the traffic signal standard foundation.
- Unless otherwise specified, all conduits shall be concrete encased PVC schedule 40.
- The contractor shall notify the State of Hawaii Department of Transportation Highways Division, Maui District Office three (3) working days prior to commencing work on the traffic signal system (Phone: 873-3535).
- While modifying the existing traffic signal systems, the contract shall keep the existing system operational until the new traffic signal system can be put into service.
- The contractor shall salvage all existing heads, standards, and cables not used in the new system. Cost shall be incidental to the various contract items put into service.
- All traffic signal hardware removed from the intersection shall be stockpiled and delivered to a location determined by the Engineer.
- Back Plates with a 5-inch border containing a 2-inch wide retro-reflective tape shall be installed on all mast arm mounted traffic signal heads as indicated on the plan sheets.

**CONSTRUCTION NOTES**

- Locations of existing underground structures and utilities such as pipe-lines, conduits, cables, etc., shown on plans are approximate only. It is not the intent of these plans to show the exact location of all underground utilities and structures. It is the responsibility of the contractor to verify the locations of all existing utilities with the respective owners. Existing utilities damaged by the contractor shall be repaired by the contractor at his own cost.
- The contractor shall verify and check all dimensions and details shown on the drawings prior to the start of construction. Any discrepancy shall be immediately brought to the attention of the engineer for clarification.
- The contractor shall notify all agencies to verify, tone and locate their existing utilities within the project area prior to excavating. The contractor shall coordinate all work.
- The locations of the new traffic signal standards, traffic signal standards with mast-arm, 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.
- All traffic signal work shall conform to the requirements of the "Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition", Federal Highway Administration (2009) as amended.
- Maintenance of traffic through the construction area shall be in accordance with Part VI of the "Manual on Uniform Traffic Control Devices for Streets and Highways, 2009 Edition", Federal Highway Administration as amended and as specified in the special provisions. The contractor shall furnish and maintain adequate barricades, blinkers, construction signs, etc., for the safety of the motoring public.
- At the end of each day's work, the contractor shall remove all equipment and other obstruction to permit free and safe passage of public traffic.



NOTE: Cost of conc. filled galvanized posts shall be incidental to other items of work.

**PIPE GUARD DETAIL**  
NOT TO SCALE



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APR 30, 2014  
AUSTIN, TSUTSUMI & ASSOC. INC. LIC. EXP. DATE

DATE	BY
DESIGNED BY	DESIGNED BY
CHECKED BY	CHECKED BY
NO.	NO.

DRAWING NAME: \\FILES\PROJECTS\2008\08-068\DWG\TS-1 NOTES AND LEGEND ADD. 2.DWG PLOT TIME: 04-05-13, 2:13 PM

DATE	REVISION
4/5/13	Added 4-Section Head Symbol, Revised Traffic Signal Note #15

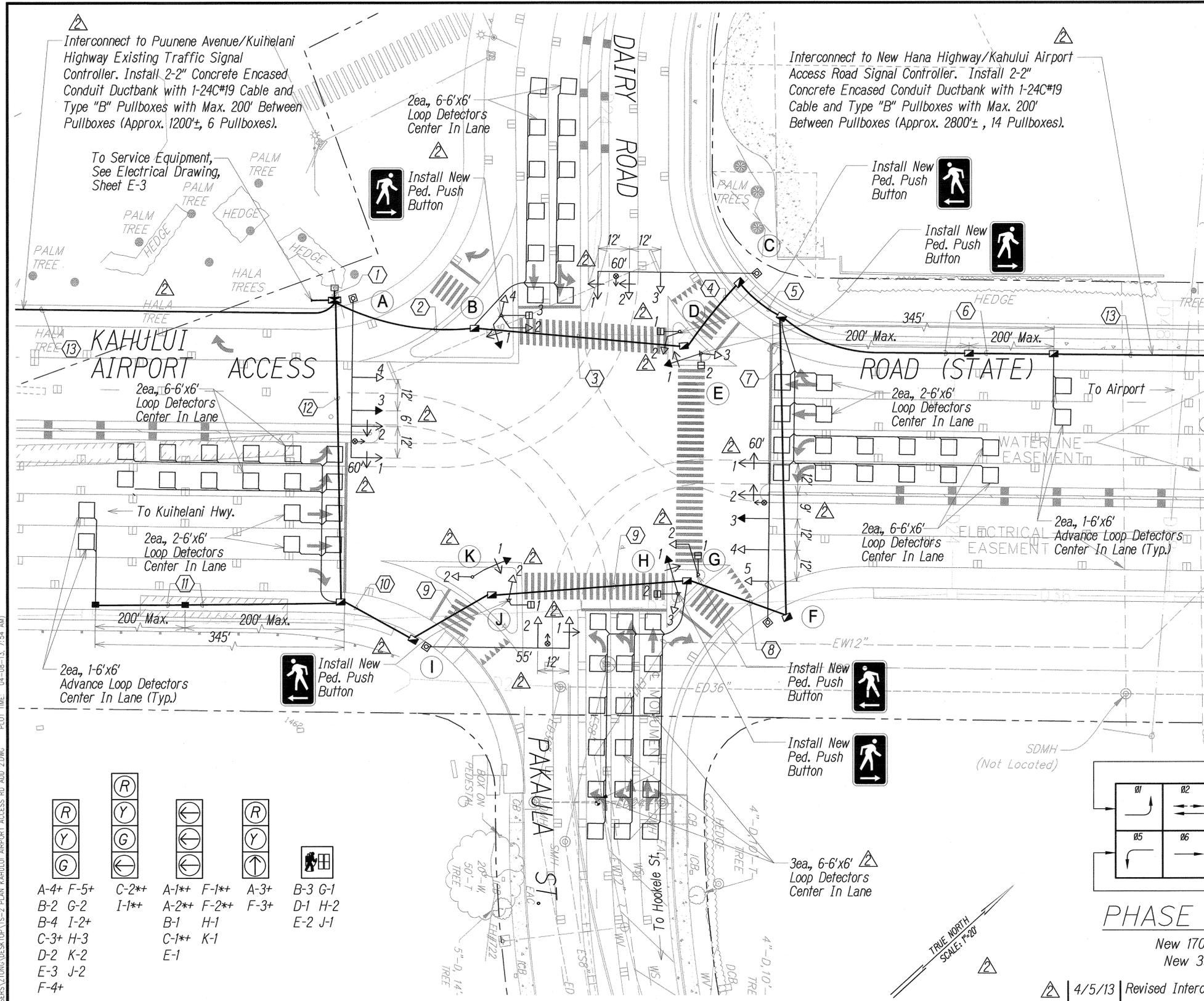
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL  
NOTES AND LEGEND**

KAHULUI AIRPORT  
ACCESS ROAD, PHASE I  
Federal Aid Project No. NH-0380(10)  
Scale: None Date: February 2013

SHEET No. TS-1 OF 5 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0380(10)	2013	ADD.163	166



### CONDUIT AND CABLE SCHEDULE

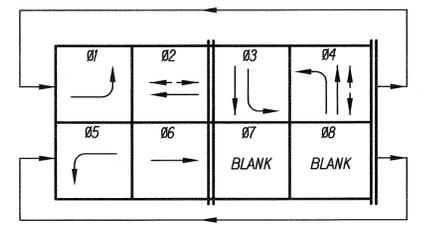
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①	3" Conc.	2-26C#14	⑥	2" Conc.	1-2C#14	
	3" Conc.	11-2C#14		2" Conc.	1-24C#19	
	2" Conc.	2-24C#19	⑦	2" Conc.	1-26C#14	
	2" Conc.	1-3C#6		2" Conc.	1-26C#14	
2" Conc.	4-evp	2" Conc.		1-2C#14		
②	2" Conc.	2" Conc.	2" Conc.	2" Conc.	2" Conc.	
	1-26C#14	1-26C#14	1-26C#14	1-26C#14	1-26C#14	
	6-2C#14	1-24C#19	2" Conc.	2" Conc.	1-2C#14	
	2" Conc.	2-evp	2" Conc.	2" Conc.	1-2C#14	
	2" Conc.	Spare	2" Conc.	2" Conc.	Spare	
③	2" Conc.	1-26C#14	⑨	2" Conc.	1-26C#14	
	2" Conc.	1-26C#14		2" Conc.	1-26C#14	
	2" Conc.	5-2C#14	2" Conc.	2-2C#14		
	2" Conc.	1-24C#19	2" Conc.	Spare		
	2" Conc.	2-evp	⑩	2" Conc.	1-26C#14	
④	2" Conc.	1-26C#14	2" Conc.	1-26C#14	2" Conc.	2-2C#14
	2" Conc.	1-26C#14	2" Conc.	1-26C#14	2" Conc.	1-evp
	2" Conc.	4-2C#14	2" Conc.	1-24C#19	2" Conc.	Spare
	2" Conc.	2-evp	⑪	2" Conc.	1-2C#14	
	2" Conc.	Spare	⑫	2" Conc.	1-26C#14	
2" Conc.	1-26C#14	2" Conc.		1-26C#14		
2" Conc.	5-2C#14	2" Conc.		1-evp		
⑤	2" Conc.	1-24C#19	2" Conc.	1-24C#19	2" Conc.	Spare
	2" Conc.	1-evp	⑬	2" Conc.	1-24C#19	
	2" Conc.	Spare		2" Conc.	Spare	

### SIGNAL INDICATIONS

(R)	(Y)	(G)	(R)	(Y)	(G)	(R)	(Y)	(G)	(R)	(Y)	(G)	(R)	(Y)	(G)	(R)	(Y)	(G)
A-4+	F-5+	C-2**	A-1**	F-1**	A-3+	B-3	G-1										
B-2	G-2	I-1**	A-2**	F-2**	F-3+	D-1	H-2										
B-4	I-2+		B-1	H-1	E-2	J-1											
C-3+	H-3		C-1**	K-1													
D-2	K-2		E-1														
E-3	J-2																
F-4+																	

## TRAFFIC SIGNAL PLAN

Scale: 1"=20'



4/5/13	Revised Interconnect, Phase Diagram, Mast Arm Lengths, Conduits, Cables, Loop Detectors, Various Signal Heads, EVP, and Pullboxes.
DATE	REVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### KAHULUI AIRPORT ACCESS RD. / DAIRY RD. / PAKAULA ST. TRAFFIC SIGNAL PLAN

KAHULUI AIRPORT  
ACCESS ROAD, PHASE I  
Federal Aid Project No. NH-0380(10)  
Scale: As Shown Date: February 2013

SHEET No. 7S-2 OF 5 SHEETS

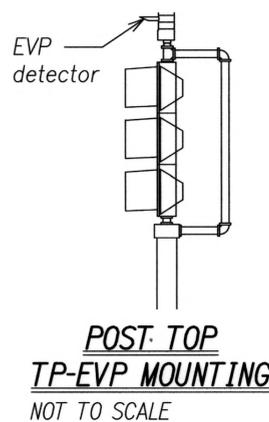
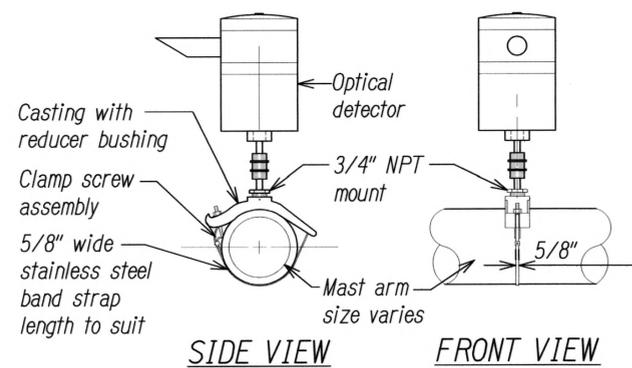
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 NOTE BOOK No. \_\_\_\_\_  
 QUANTITIES BY: \_\_\_\_\_  
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APRIL 30, 2014  
AUSTIN, TSUTSUMI & ASSOC. INC. LIC. EXP. DATE

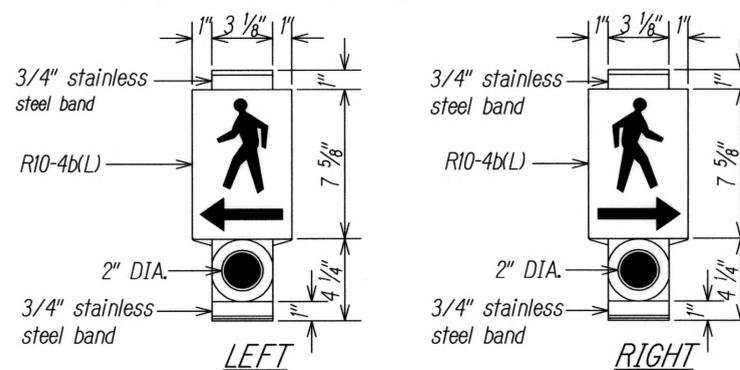


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0380(10)	2013	165	166



The color scheme shall be:  
 White - Man, arrow and push button  
 Black - Background

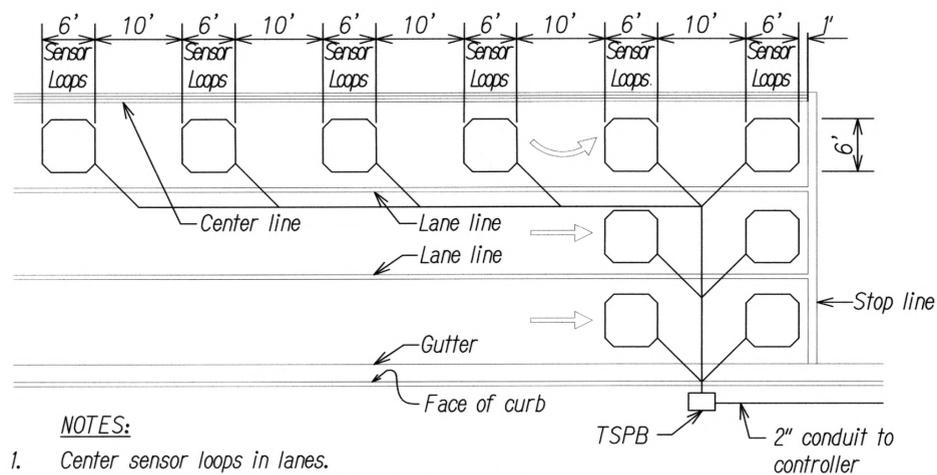
NOTE: On plan sheet, use applicable detail.  
 see state STD. DET. for PPB pedestal.



**PEDESTRIAN PUSH BUTTON DETAILS**  
 NOT TO SCALE

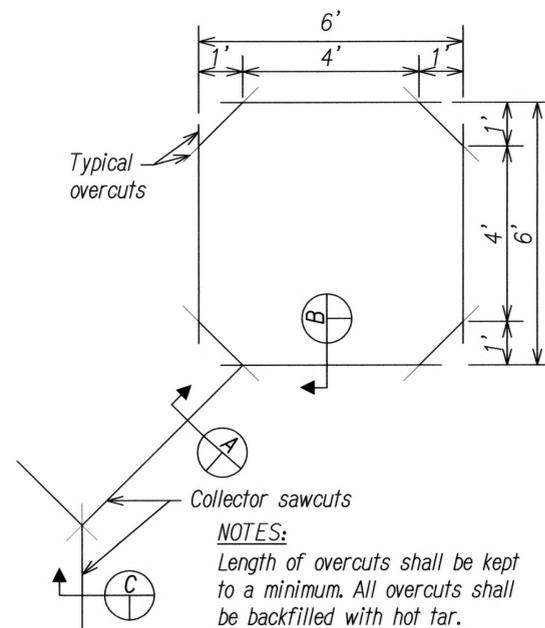
- NOTES:**
- Optical detector shall be "Model 711 preemption detector", or approved equal, unless noted otherwise in the special provisions.
  - Support saddle assembly shall be "ASTRO MINI-BRAC, AB-0132-29", or approved equal, unless noted otherwise in the special provisions.

**OPTICAL DETECTOR FOR MAST ARM MOUNTING**  
 NOT TO SCALE

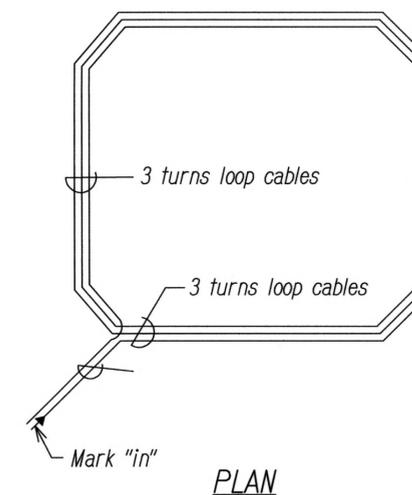


- NOTES:**
- Center sensor loops in lanes.
  - Collector cables shall be twisted 2 turns per foot.
  - Number of loops and locations vary. See project plans.
  - Number and locations of collector sawcuts may be varied in the field to suit.

**TYPICAL SENSOR LOOP LAYOUT**  
 NOT TO SCALE



**TYPICAL SENSOR LOOP SAWCUT DETAIL**  
 NOT TO SCALE



**TYPICAL SENSOR LOOP WIRING DIAGRAM**  
 NOT TO SCALE

ORIGINAL PLAN	DATE
NO. _____	_____
DESIGNED BY	DATE
_____	_____
CHECKED BY	DATE
_____	_____

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 Keith K. Niya, APRIL 30, 2014  
 AUSTIN, TSUTSUMI & ASSOC. INC. LIC. EXP. DATE

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION  
**TRAFFIC SIGNAL DETAILS**  
 KAHULUI AIRPORT  
 ACCESS ROAD, PHASE I  
 Federal Aid Project No. NH-0380(10)  
 Scale: None Date: February 2013  
 SHEET No. TS-4 OF 5 SHEETS

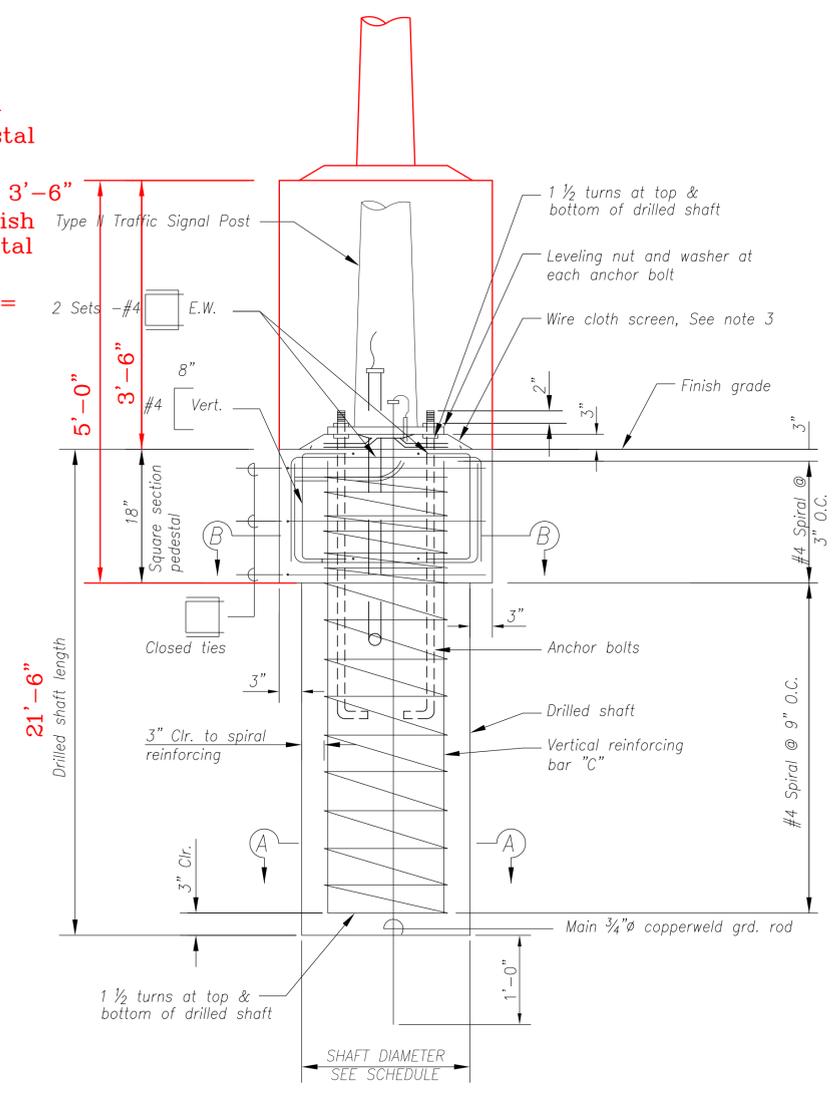
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-0380(10)	2013	ADD.166	166

Level Group Condition - Above Groundwater						
Soil Type	Mast Arm Length	Shaft Diameter	Shaft Length	Pedestal Width	Bars "C"	Bolt Pattern
Clay & Silt Clay	41'	42"	14'-0"	48"	32-#6	6-Bolt Circle
Clay & Silt Clay	45' - 50'	42"	15'-0"	48"	32-#6	6-Bolt Circle
Clay & Silt Clay	53'	42"	17'-0"	48"	32-#6	6-Bolt Circle
Clay & Silt Clay	55' - 60'	42"	18'-0"	48"	32-#6	6-Bolt Circle

RFI #32  
9/24/14

Note: All As-Built markup revisions shown are for Mast Arm "C" on TS-2 (Sheet 163)

Mast arm "C" Pedestal on TS-2 extended 3'-6" above finish grade. Total height of pedestal = 5'-0"



Notes:

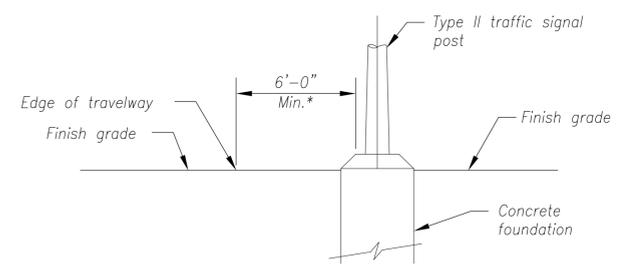
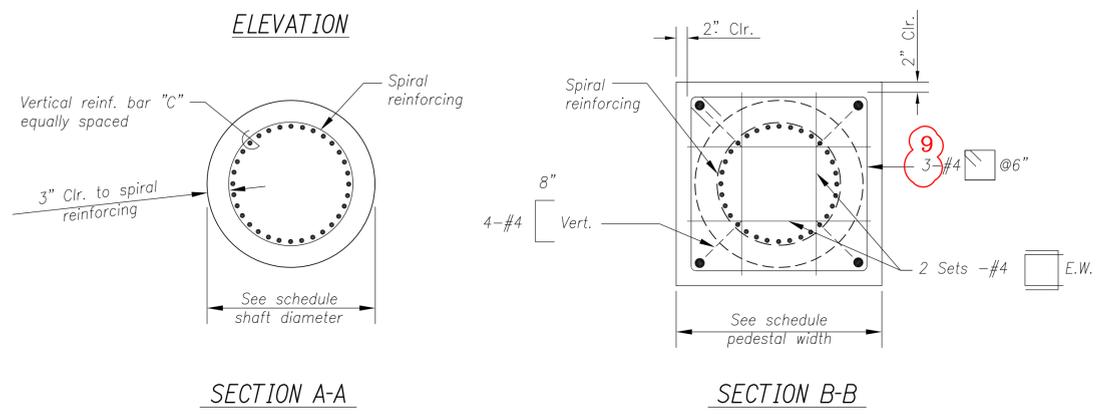
1. Traffic signal poles manufacturer's recommendations shall be followed
2. See schedules this sheet for additional details.
3. Mast arm standards have been designed and shall conform to 4.0 Modifications to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals as noted in HDOT "Design criteria for Bridges and Structures", April 15, 2008.

**LEGEND FOR AS-BUILT POSTINGS**

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Roadway Text for as-built posting



\* If 6'-0" min. cannot be maintained due to conflict with other utilities, coordinate field adjustments with Engineer.

HIGHWAY LIGHTING DETAIL  
NOT TO SCALE

DRILLED SHAFT FOUNDATION FOR TYPE II MAST ARM STANDARD  
NOT TO SCALE  
(FOR MAST ARM GREATER THAN 40' IN LENGTH)

|                   |       |
|-------------------|-------|
| DATE              | _____ |
| SURVEY PLOTTED BY | _____ |
| DRAWN BY          | _____ |
| TRACED BY         | _____ |
| DESIGNED BY       | _____ |
| QUANTITIES BY     | _____ |
| CHECKED BY        | _____ |
| NO.               | _____ |

DRAWING NAME: C:\PROJECTS\KAHULUI-2011\AS-BUILT OCTOBER 2013\TRAFFIC\TS-5.DWG PLOT TIME: 10-18-13 3:57 PM

4/5/13 Revised Table, Mast Arm Type

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL  
DETAILS**

KAHULUI AIRPORT  
ACCESS ROAD, PHASE I  
Federal Aid Project No. NH-0380(10)  
Scale: None Date: February 2013

SHEET No. TS-5 OF 5 SHEETS

"AS-BUILT"

ADD. 166

AS-BUILT DRAWINGS