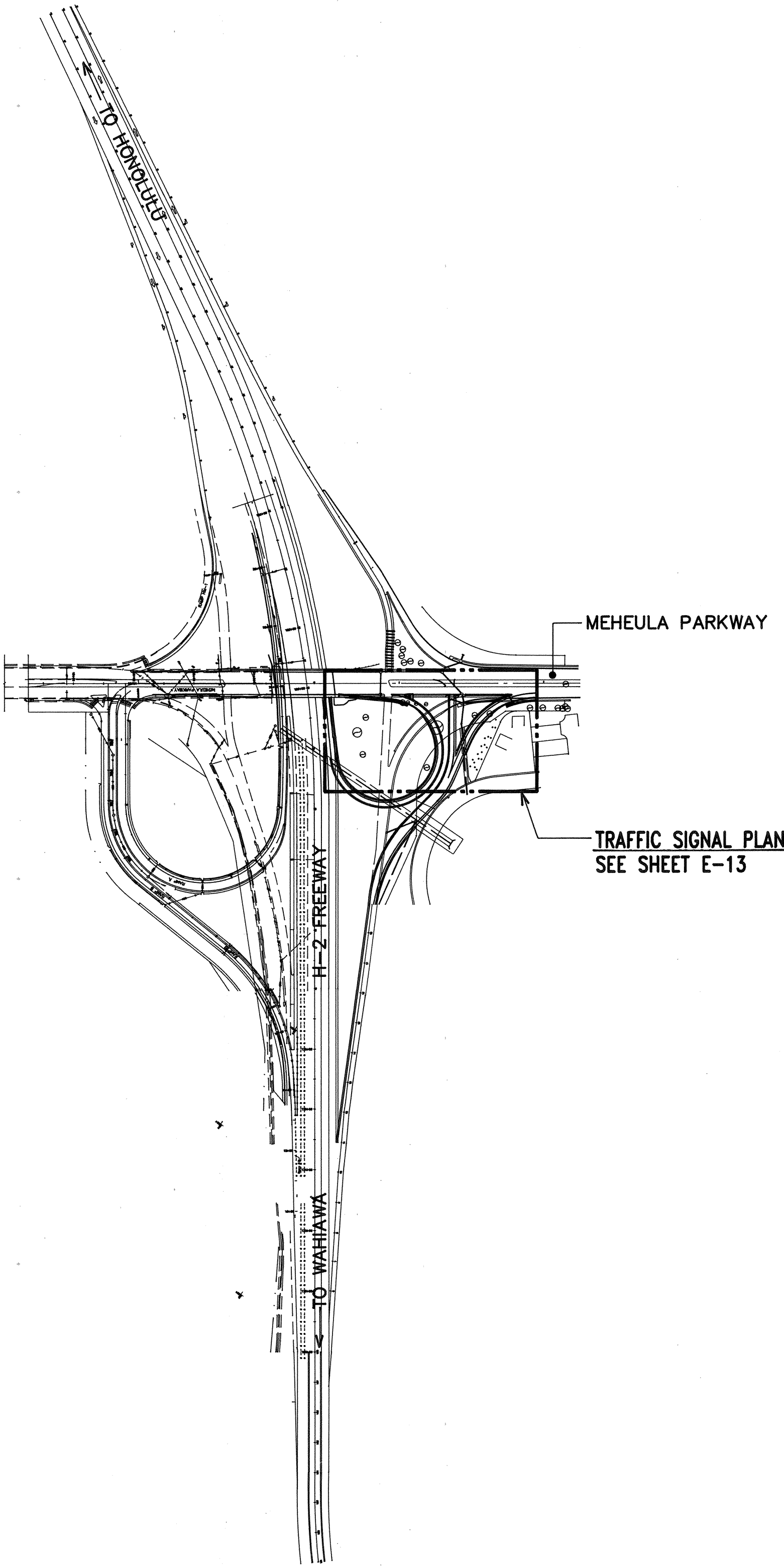


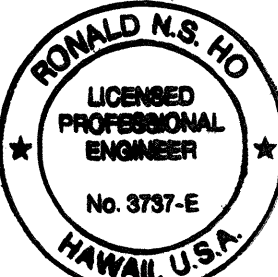
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	III	129

GENERAL NOTES - TRAFFIC SIGNAL SYSTEM:

- SEE HIGHWAY LIGHTING PLANS FOR ELECTRICAL SERVICE CONNECTIONS TO CONTROLLERS.
- ALL TRAFFIC SIGNAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", FEDERAL HIGHWAY ADMINISTRATION, LATEST EDITION, AND AMENDMENTS.
- THE LOCATIONS OF THE TRAFFIC SIGNAL STANDARDS, TRAFFIC SIGNAL STANDARDS WITH MAST-ARM, PEDESTRIAN PUSH BUTTONS, TRAFFIC CONTROLLER, PULLBOXES, CONDUITS, BARRIERS & LOOP DETECTORS SHALL BE STAKED OUT IN THE FIELD BY CONTRACTOR & APPROVAL OF THE LOCATIONS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION & INSTALLATION. LOCATIONS SHOWN ON THE PLANS SHALL BE ADJUSTED AS NECESSARY TO PREVENT CONFLICTS WITH EXISTING OR NEW FACILITIES.
- ALL NEW CONDUITS UNDER ROADWAY SHALL BE PVC SCHEDULE 80. CONTRACTOR SHALL HAVE THE OPTION OF USING PVC SCHEDULE 40 FOR NEW CONDUITS NOT UNDER ROADWAY, UNLESS OTHERWISE NOTED.
- IN ADDITION TO THE CONDUITS INDICATED IN THE "CONDUIT AND CABLE SCHEDULE". INSTALL ONE 3-INCH CONDUIT IN THE FOOTINGS OF ALL FINAL CONTROLLERS. CONDUIT SHALL BE STUBBED-OUT 12 INCHES FROM FOOTING AND SHALL BE CAPPED.
- A SOLID #8 BARE COPPER WIRE SHALL BE INSTALLED IN THE ENTIRE TRAFFIC SIGNAL CONDUIT SYSTEM FOR USE AS A SYSTEM GROUND.
- LOOP DETECTORS SHALL BE IN ACCORDANCE WITH STANDARD PLAN TE-40, EXCEPT FOR THE FOLLOWING:
  - LOOP SIZE SHALL BE 6' X 6'
  - LOOP SPACING SHALL BE 10'-0"
  - PROVIDE 4 CABLE TURNS IN A LOOP
- LEAD-IN WIRES IN PULLBOX NEAR LOOPS SHALL BE TAGGED WITH LOOP NUMBER(S).
- DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU WILL ASSIST THE ENGINEER IN CONSTRUCTION INSPECTION FOR THE TRAFFIC SIGNAL SYSTEM. WORK BY THE DEPARTMENT OF TRANSPORTATION SERVICES, C & C OF HONOLULU:
  - TEST CONTROLLER & AUXILIARY EQUIPMENT IN CABINET.
  - MAKE ALL ELECTRICAL EQUIPMENT CONNECTIONS IN THE FIELD FOR SIGNAL SYSTEM AFTER THE SYSTEM HAS BEEN INSTALLED IN PLACE BY THE CONTRACTOR.
  - FINAL ADJUSTMENT OF TRAFFIC SIGNAL CONTROL EQUIPMENT.
- 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.
- LOCATIONS OF TRAFFIC MARKINGS AND MARKERS (LANE LINES, STOP LINES, CROSS-WALK, ETC.) SHOWN ON THE PLANS SHALL BE VERIFIED WITH THE ENGINEER PRIOR TO THE INSTALLATION OF THE TRAFFIC SIGNAL SYSTEM.
- 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 -G- AND WILL REMAIN G OR -G- DURING THE NEXT PHASE, IT SHALL BE G OR -G- DURING THE CLEARANCE INTERVAL.
  - IF A SIGNAL IS G OR -G- AND WILL BECOME R OR EXTINGUISHED DURING THE NEXT PHASE, IT SHALL BE Y OR -Y- DURING THE CLEARANCE INTERVAL.
  - IF THE SIGNAL IS R AND WITH REMAIN R OR BECOMES G DURING THE NEXT PHASE, IT SHALL REMAIN R DURING THE CLEARANCE INTERVAL.
- THE FOLLOWING STATE STANDARD DETAILS SHALL BE USED:  
TE-38, TE-39, TE-40, TE-41, TE-42, TE-43
- SALVAGE AND DELIVER EXST TRAFFIC SIGNAL EQUIP (SIGNAL HEADS, PEDESTRIAN PUSHBUTTONS, CONTROLLER, ENCLOSURES ETC) TO THE DEPT OF TRANSPORTATION SERVICES TRAFFIC SIGNAL BASE YARD; 160 KOULA STREET (523-4831) AS DIRECTED BY THE ENGINEER.
- EXST TRAFFIC SIGNAL SYSTEM SHALL BE MAINTAINED AND KEPT OPERATIONAL UNTIL THE NEW TRAFFIC SIGNAL SYSTEM IS IN OPERATION. RECONNECT THE EXST TRAFFIC SIGNAL SYSTEM TO THE NEW TRAFFIC SIGNAL SYSTEM AS NECESSARY TO MAINTAIN OPERATION OF EXST RAMPS.



LOCATION MAP  
NOT TO SCALE TMK: 9-5-01



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.  
*[Signature]*  
4/1/97

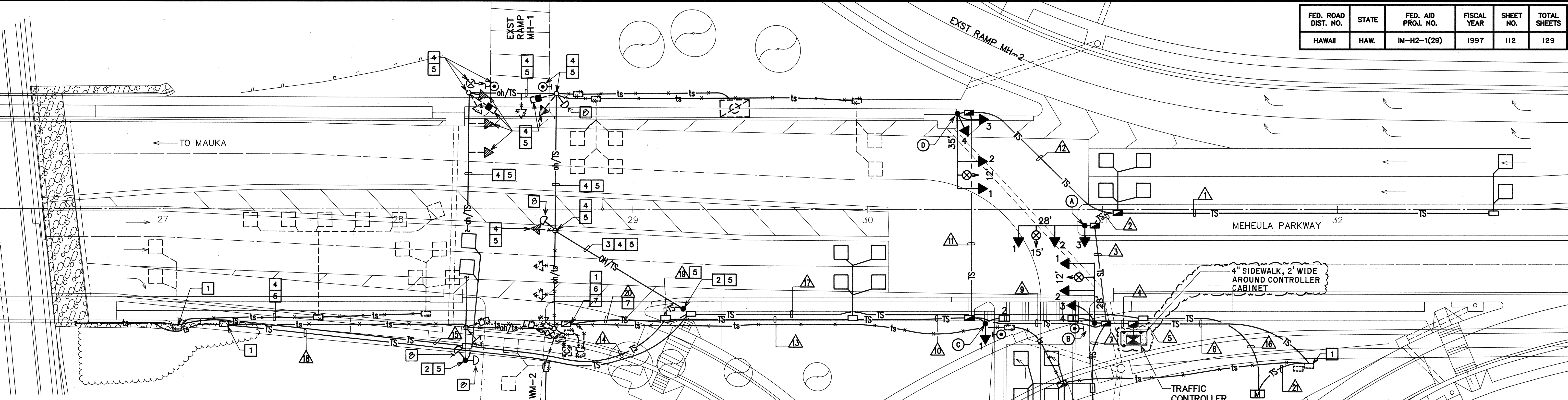
TRAFFIC SIGNAL SYMBOLS	
SYMBOL	DESCRIPTION
	TRAFFIC SIGNAL HEAD MOUNTED ON TYPE I SIGNAL STANDARD, SEE DETAIL
	TRAFFIC SIGNAL HEADS MOUNTED ON MAST ARM; SPREAD SHOWN IS 30' AND DISTANCE BETWEEN SIGNAL HEADS IS 12', TYPE II SIGNAL STANDARD, SEE DETAIL ON SHEETS E-14 AND E-15
	12" TRAFFIC SIGNAL HEAD, SEE TRAFFIC SIGNAL HEAD SCHEDULE FOR TYPE, SHEET E-13
	PEDESTRIAN SIGNAL HEAD, SEE DETAIL
	12" PROGRAMMED VISIBILITY TRAFFIC SIGNAL HEAD, SEE TRAFFIC SIGNAL HEAD SCHEDULE FOR TYPE
	MICROWAVE DETECTOR
	PEDESTRIAN PUSHBUTTON, ARROW INDICATES SIGN DIRECTION, SEE DETAIL
	OPTICAL EVP DETECTOR, ARROW INDICATES DIRECTION DETECTOR FACES, SEE DETAIL
	TYPE "B" PULLBOX (STATE), SEE DETAIL
	TYPE "B" PULLBOX WITH MODIFIED COVER, SEE DETAILS
	TYPE "D" PULLBOX 2' X 4', SEE DETAIL
	TRAFFIC CONTROLLER WITH CONCRETE FILLED 4" METAL PIPE GUARD AS INDICATED, SEE DETAILS
	LOOP DETECTORS, SERIES/PARALLEL CONNECTED, SEE SHEET DETAIL
	UNDERGROUND TRAFFIC SIGNAL DUCT AND WIRING. QUANTITY AS INDICATED. DUCT REQUIREMENTS AS INDICATED ON SHEET E-13 AND
	OVERHEAD TRAFFIC SIGNAL CABLES
	EXISTING UNDERGROUND DUCT
	EXST TRAFFIC SIGNAL DUCT AND WIRING
	EXST OVERHEAD TRAFFIC SIGNAL CABLES
	EXISTING PULLBOX
	EXST TRAFFIC SIGNAL ENCL
	EXST STEP DOWN TRANSFORMER WITHIN EXST EQUIP ENCL
	EXST LOOP DETECTORS
	EXISTING STREET LIGHT
	EXISTING PEDESTRIAN SIGNAL HEAD
	EXISTING TRAFFIC SIGNAL HEAD AND STANDARD
	EXISTING PEDESTRIAN PUSHBUTTON

NOTE:  
"X" THROUGH SYMBOL INDICATES TO BE REMOVED.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
  
TRAFFIC SIGNAL NOTES, SYMBOLS,  
LOCATION MAP  
  
INTERSTATE ROUTE H-2  
MILLANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMPS  
F.A.I. PROJECT NO. IM-H2-1(29)  
SCALE: AS NOTED DATE: MAR. 1997  
  
SHEET No. E-12 OF 19 SHEETS



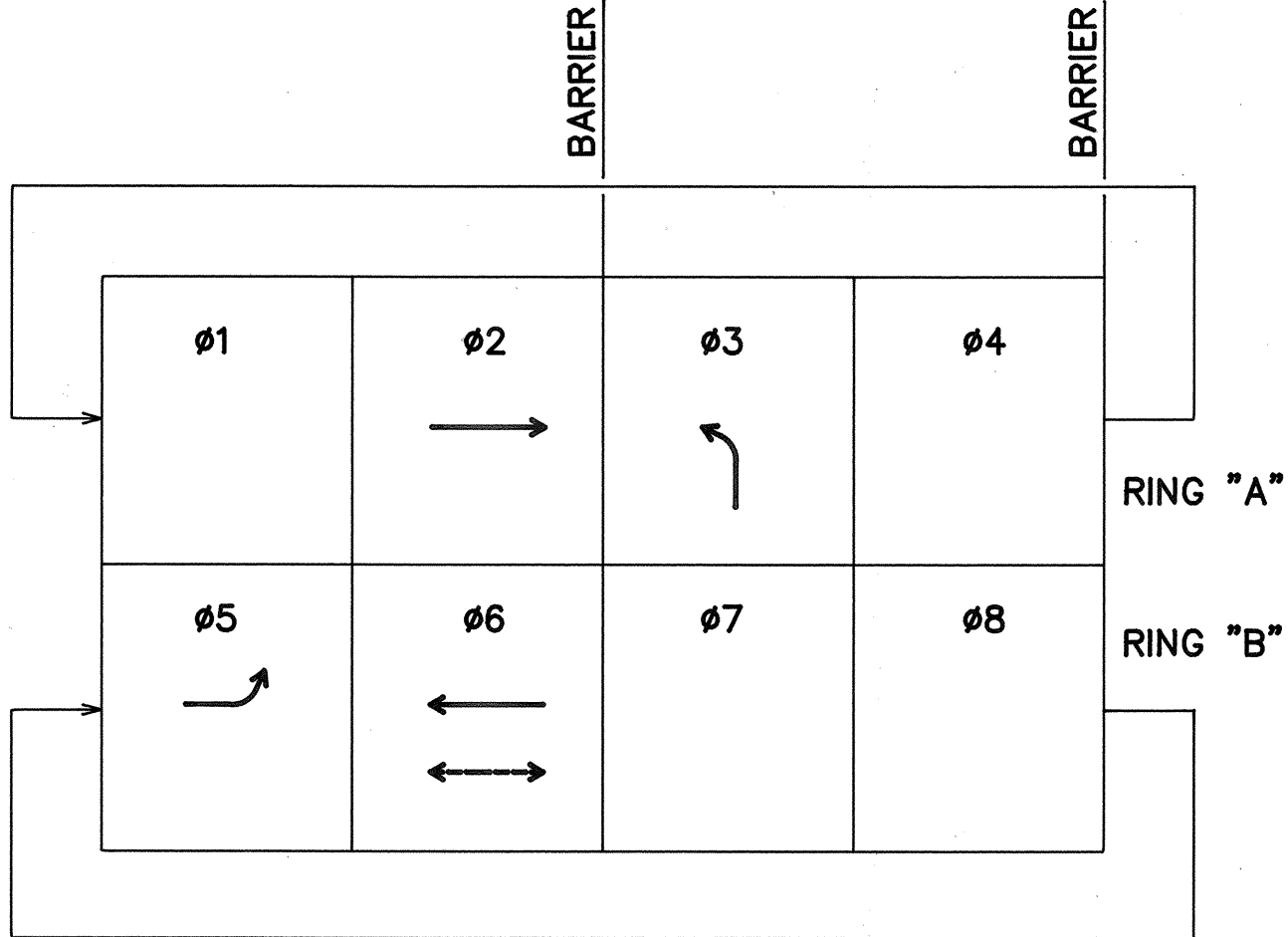
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	112	129



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	16	17	18	19	20	21		
QUANTITY OF 2"C, SEE NOTE NO. 1	1	3	3	6	6	2	1	1	3	3	2	2	3	1	1	2	2	1	1	1	2		
QUANTITY OF 26/C #14 CONTROL CABLE		1	1	2	2				2	1	1	1	1						1				
QUANTITY OF 2/C #14 SHIELDED LOOP DETECTOR AND PEDESTRIAN PB CABLE	1	2	2	9	9		2	1	5	4			3	2	1				1				
QUANTITY OF 3/C #20 SHIELDED OPTICOM CABLE			1	5	5				3	2	1		2						1				
QUANTITY OF 6PR #19 INTERCONNECT CABLE				1	1				1	1			1	1	1								
QUANTITY OF 3#8 & 1#8 GND					1	1															1		
QUANTITY OF 2PR #22 PHONE CABLE					1	1															1		
QUANTITY OF 2#2, #8 GND																1	1	1					
QUANTITY OF 2#6, #8 GND																1	1			1			
NOTES: 1. ALL CONDUITS SHALL BE PVC SCHEDULE 80, UNLESS OTHERWISE NOTED																							

NOTE(S): (CONT)

2. PROVIDE 2/C #14 SHIELDED PEDESTRIAN PB CABLE & 2#14 POWER CABLE (120V) FROM EACH MICROWAVE DETECTOR TO TRAFFIC SIGNAL CONTROLLER(S) AS NECESSARY. COORDINATE MOUNTING AND CONNECTION REQUIREMENTS WITH DEPT OF TRANSPORTATION SERVICES-TRAFFIC SECTION PRIOR TO INSTALLATION.



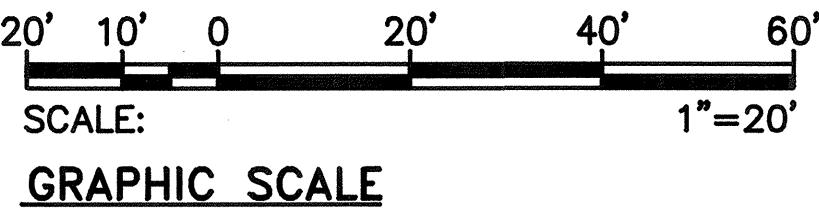
NOTE(S): PHASE 5 SHALL REMAIN OPERATIONAL UNTIL RAMP MH-1 IS CLOSED AND RAMP R-3 IS OPENED.

### PHASE ASSIGNMENT DIAGRAM

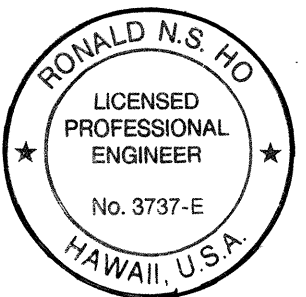


### TRAFFIC SIGNAL PLAN

SCALE: 1"=20'



- NOTE(S):
1. PENETRATE EXST. PULLBOX TO INSTALL CONDUIT. REPAIR TO MATCH EXST.
  2. PROVIDE TEMPORARY 30', CLASS 3 WOOD POLE AND EXTEND OVERHEAD TRAFFIC SIGNAL CABLES TO EXST TRAFFIC SIGNAL POLE AS REQUIRED.
  3. SLACKSPAN CABLE TO PROVIDE 20'-0" MIN CLEARANCE ABOVE ROADWAY.
  4. RECONNECT EXST TRAFFIC, PEDESTRIAN & EVP SIGNAL EQUIPMENT TO NEW TRAFFIC SIGNAL CONTROLLER. EXST TRAFFIC, PEDESTRIAN EVP SIGNAL EQUIPMENT SHALL REMAIN IN SERVICE UNTIL RAMP MH-1 IS CLOSED.
  5. REMOVE POLE, SIGNAL HEADS, WIRING AND ACCESSORIES AFTER RAMP MH-1 IS CLOSED AND RAMP R-3 IS OPERATIONAL.
  6. RECONNECT EXST TRAFFIC SIGNAL CONTROLLER POWER WIRES WITHIN PULLBOX. EXST CONTROLLER SHALL REMAIN IN OPERATION UNTIL EXST RAMP WM-2 IS CLOSED AND THE NEW CONTROLLER IS OPERATIONAL.
  7. TEMPORARY POWER FOR EXST TRAFFIC SIGNAL CONTROLLER. REMOVE CONDUCTORS AND PULLBOX AFTER NEW CONTROLLER IS OPERATIONAL.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

*Ronald N.S. Ho*  
2/6/98

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### TRAFFIC SIGNAL PLAN

INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

SCALE: AS NOTED      DATE: MAR. 1997

SHEET No. E-13 OF 19 SHEETS

DATE: \_\_\_\_\_

SURVEY PLOTTED BY: \_\_\_\_\_

DRAWN BY: \_\_\_\_\_

DESIGNED BY: \_\_\_\_\_

CHECKED BY: \_\_\_\_\_

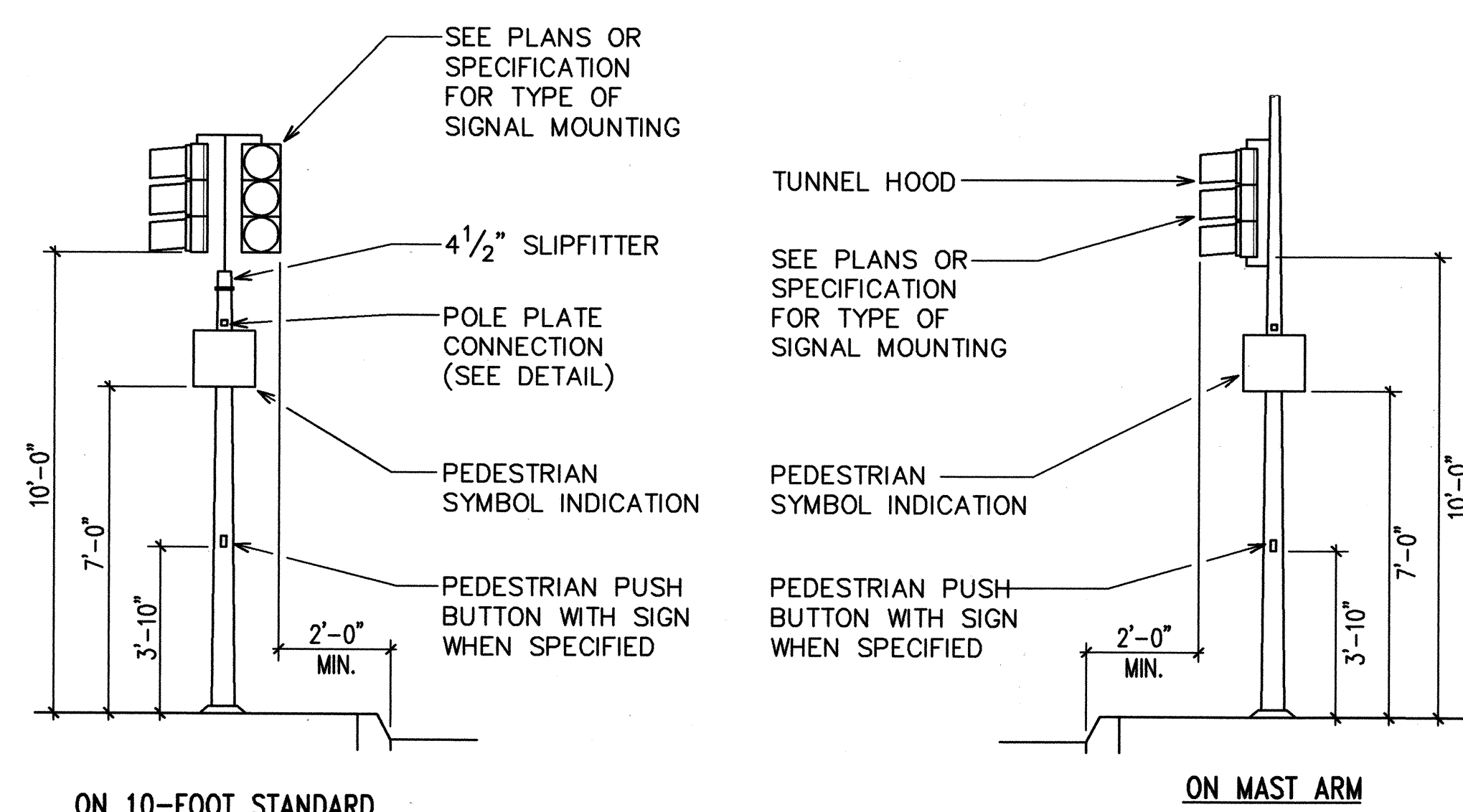
NO. \_\_\_\_\_

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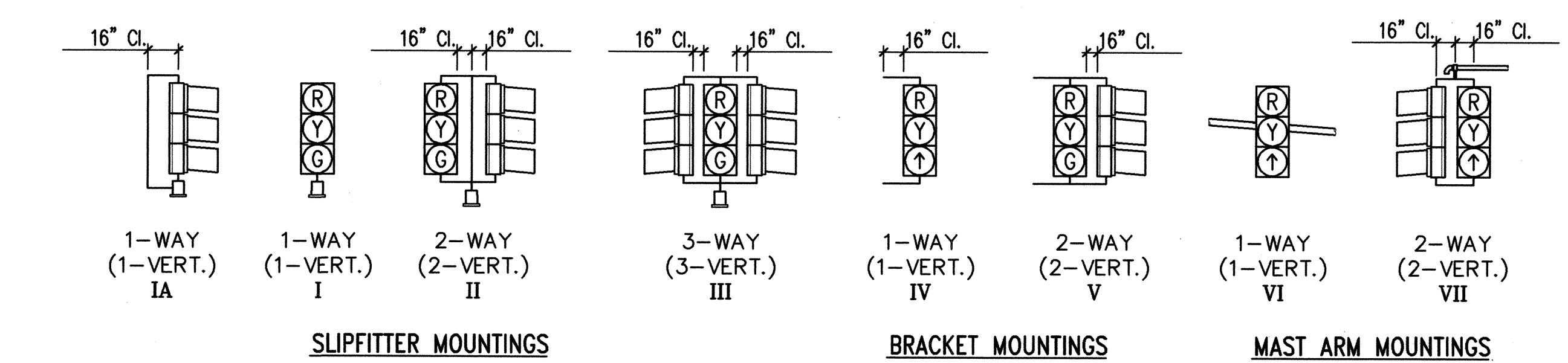
\* WITH PROGRAMMED VISIBILITY



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	113	129

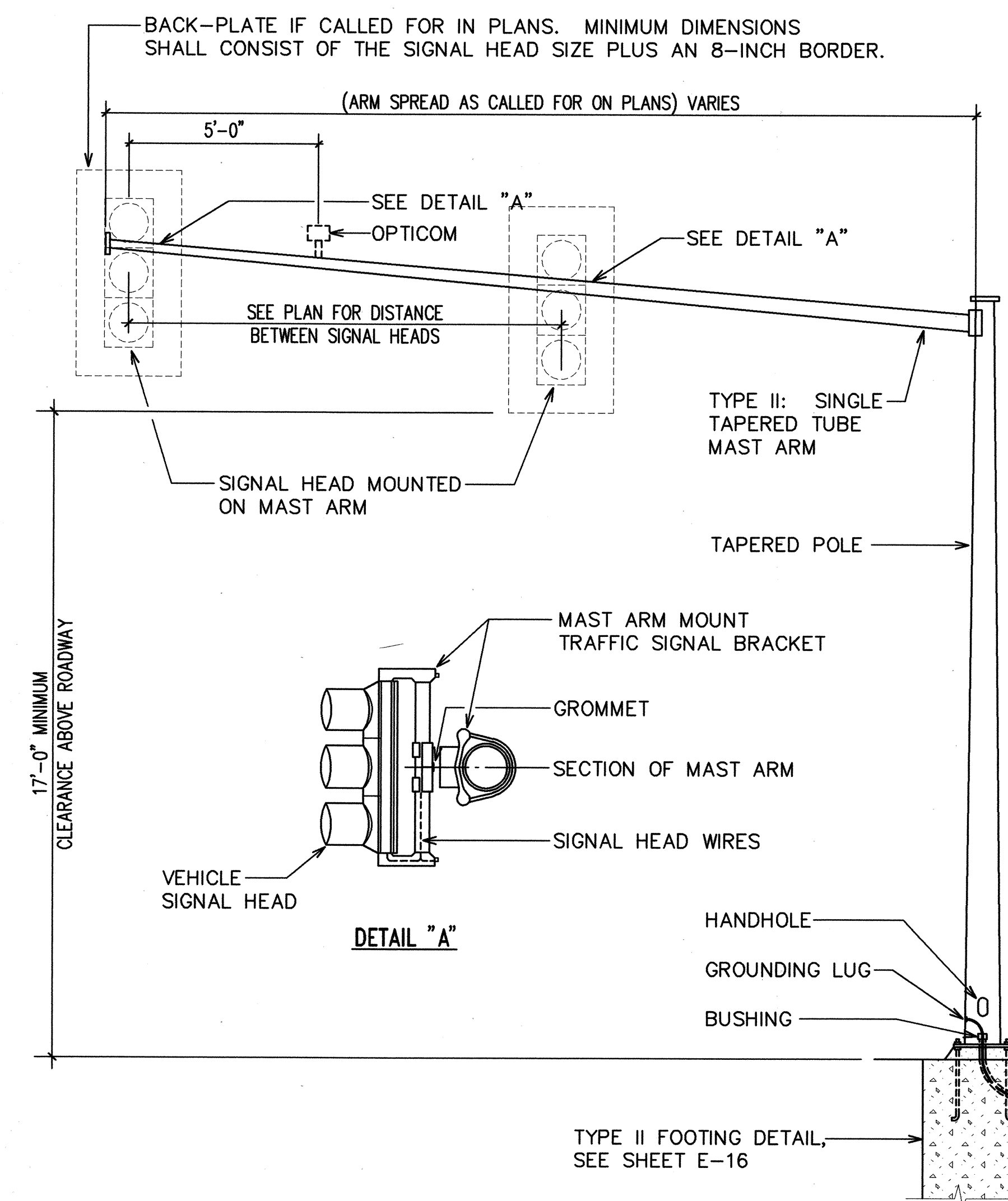


2 TYPICAL SIGNAL ARRANGEMENTS  
E-14E-14 NOT TO SCALE

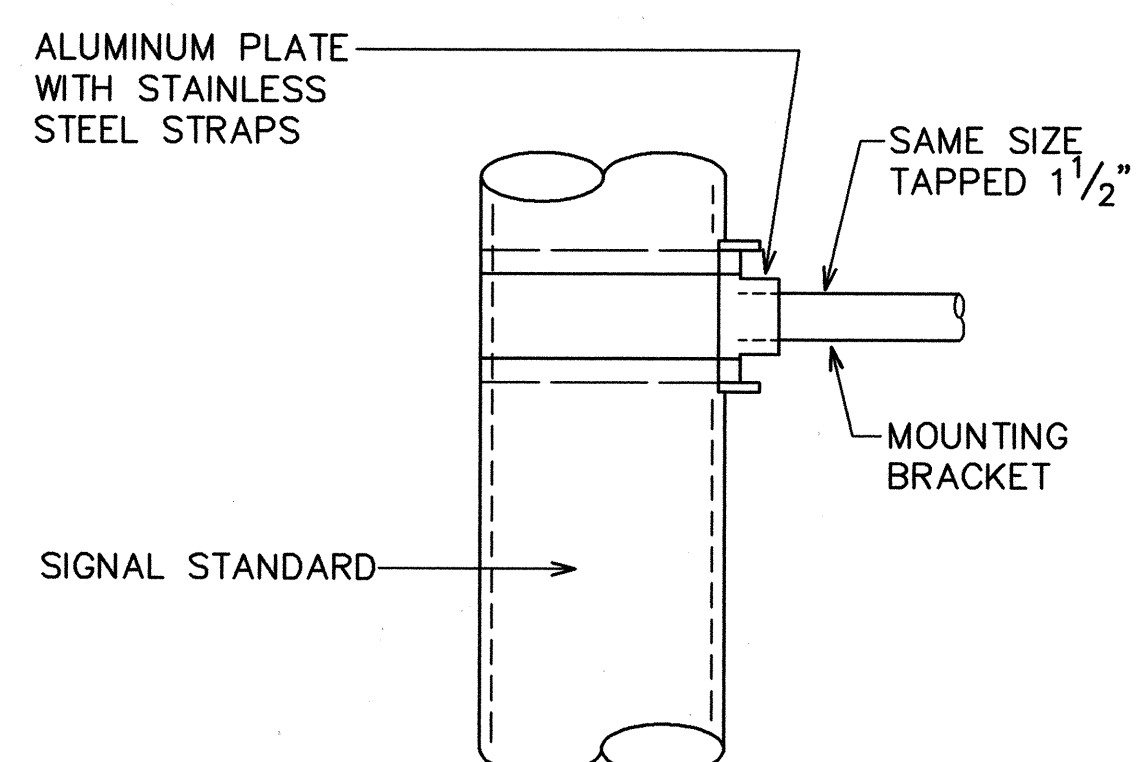


3 TYPICAL VEHICULAR AND PEDESTRIAN SIGNAL MOUNTINGS  
E-12E-14 NOT TO SCALE

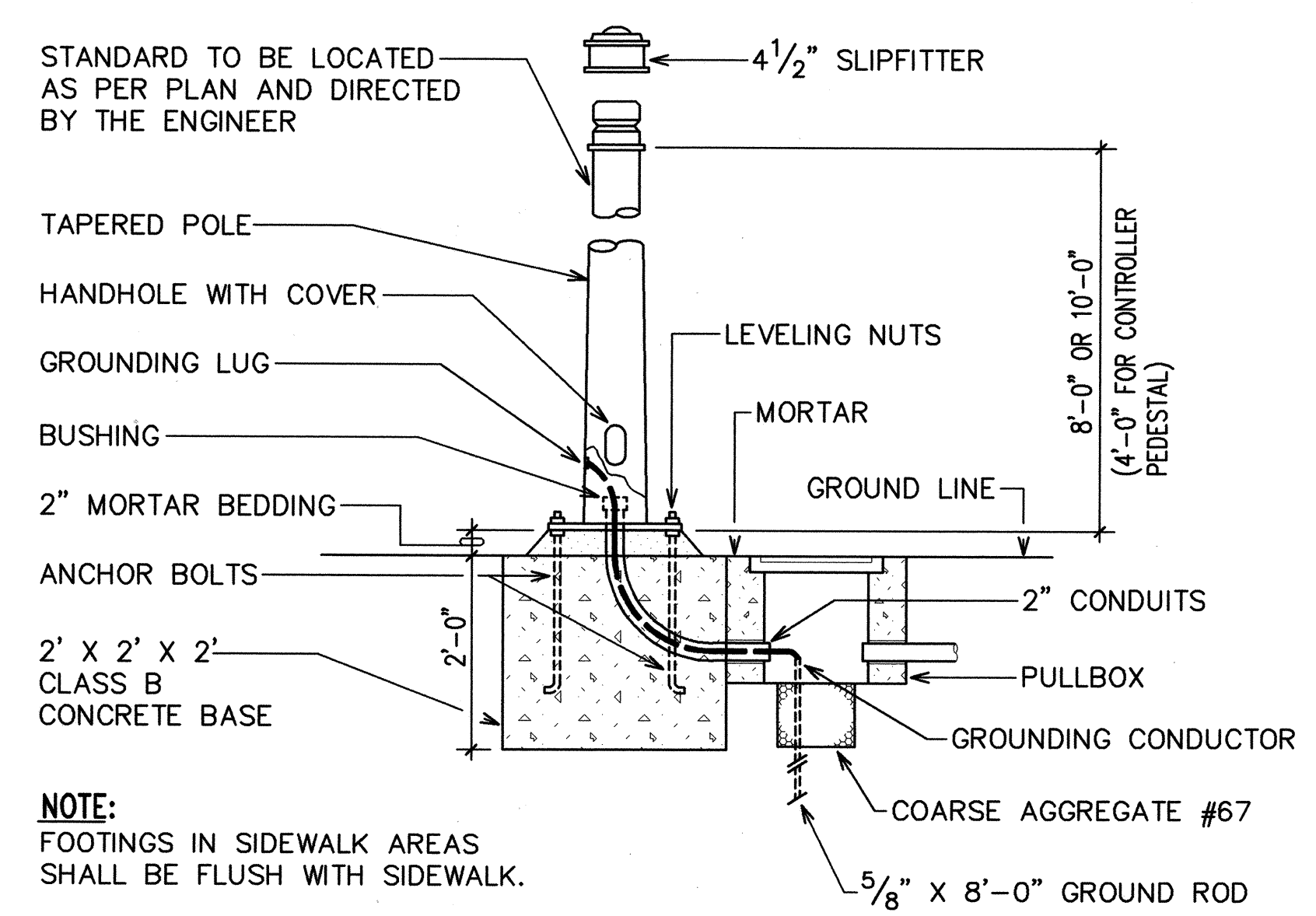
1 TYPICAL EQUIPMENT MOUNTINGS  
E-12E-14 NOT TO SCALE



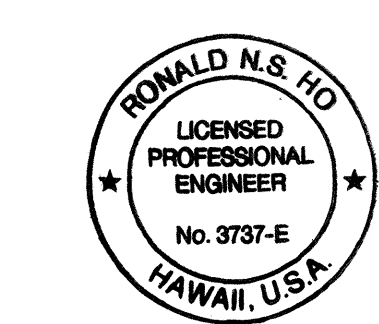
4 TYPE II MAST ARM AND STANDARD  
E-12E-14 NOT TO SCALE



5 DETAIL OF POLE PLATE CONNECTIONS  
E-15E-14 NOT TO SCALE



6 TYPE I SIGNAL STANDARD OR CONTROLLER PEDESTAL AND FOOTING  
E-12E-14 NOT TO SCALE



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*Ronald N.S. Ho*  
4/8/96

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS I

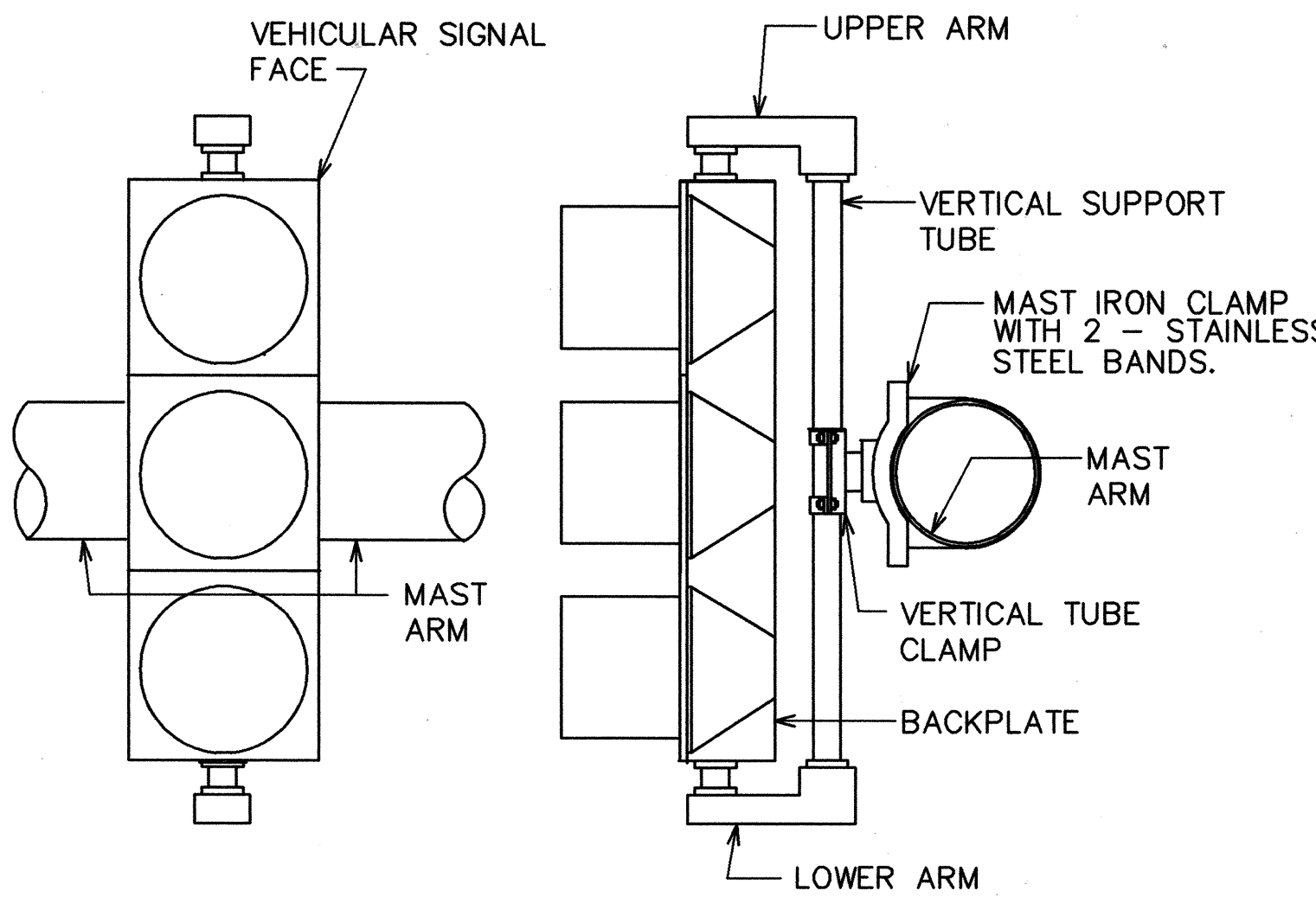
INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

SCALE: AS NOTED DATE: MAR. 1997

SHEET No. E-14 OF 19 SHEETS

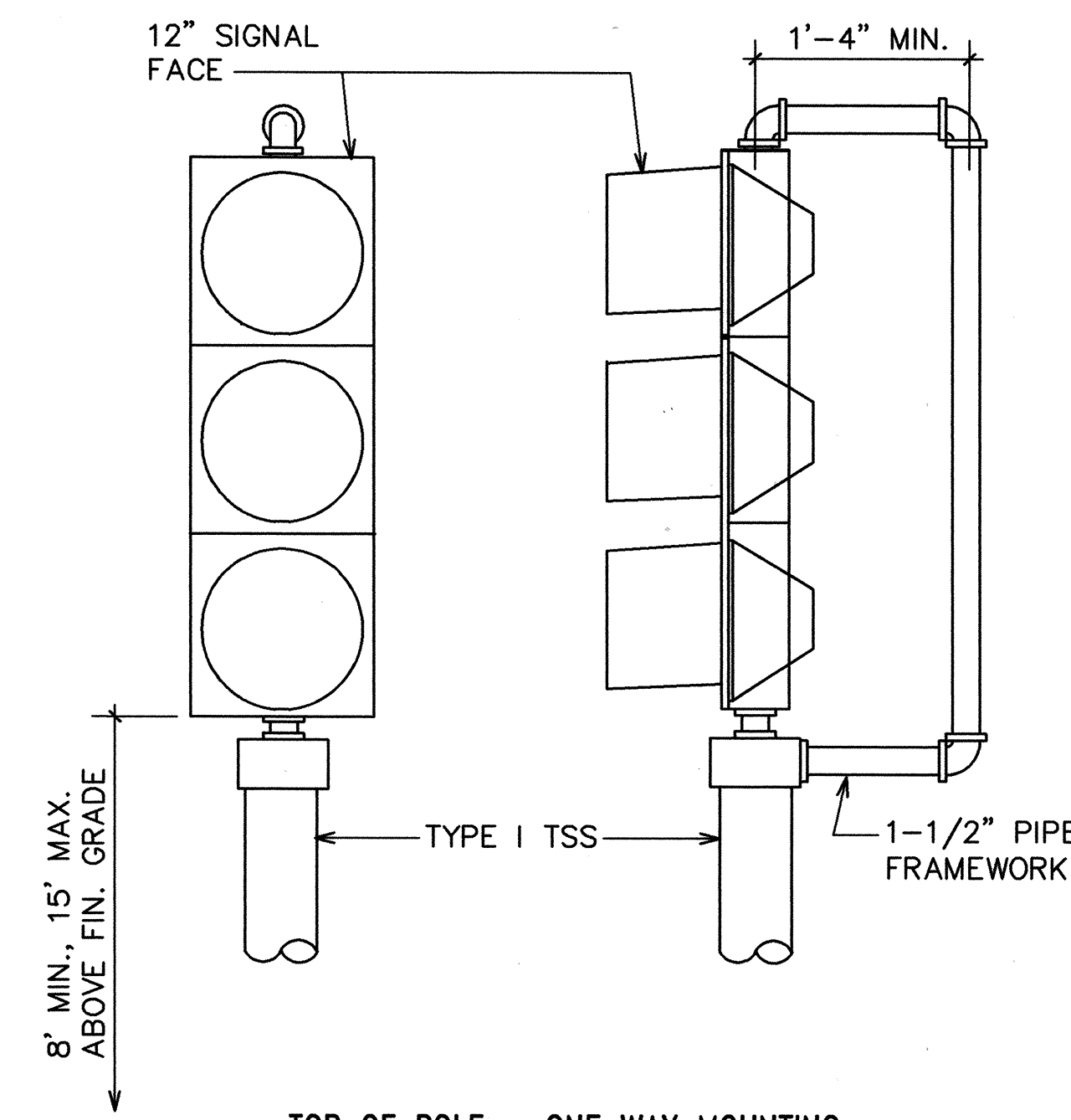
DATE: \_\_\_\_\_  
SURVEY PLOTTED BY: \_\_\_\_\_  
DRAWN BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
ORIGINAL PLAN: \_\_\_\_\_  
NOTE BOOK: \_\_\_\_\_  
QUANTITIES BY: \_\_\_\_\_  
CHECKED BY: \_\_\_\_\_  
No. \_\_\_\_\_  
Unit Price: 02/05/96 @ 16:32:18 by EA  
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	114	129

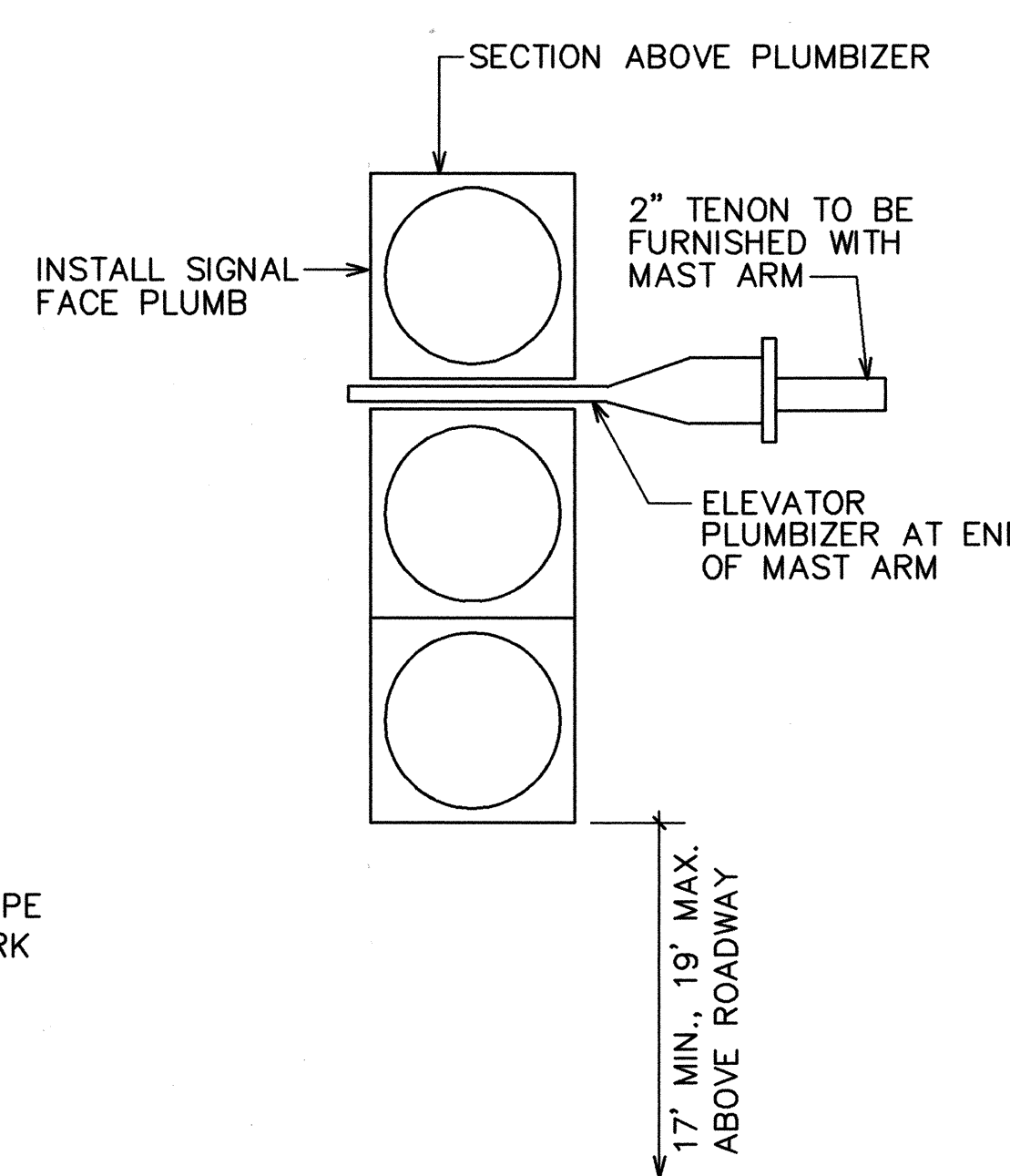


ADJUSTABLE MAST ARM ONE WAY MOUNTING AT INTERMEDIATE POINT

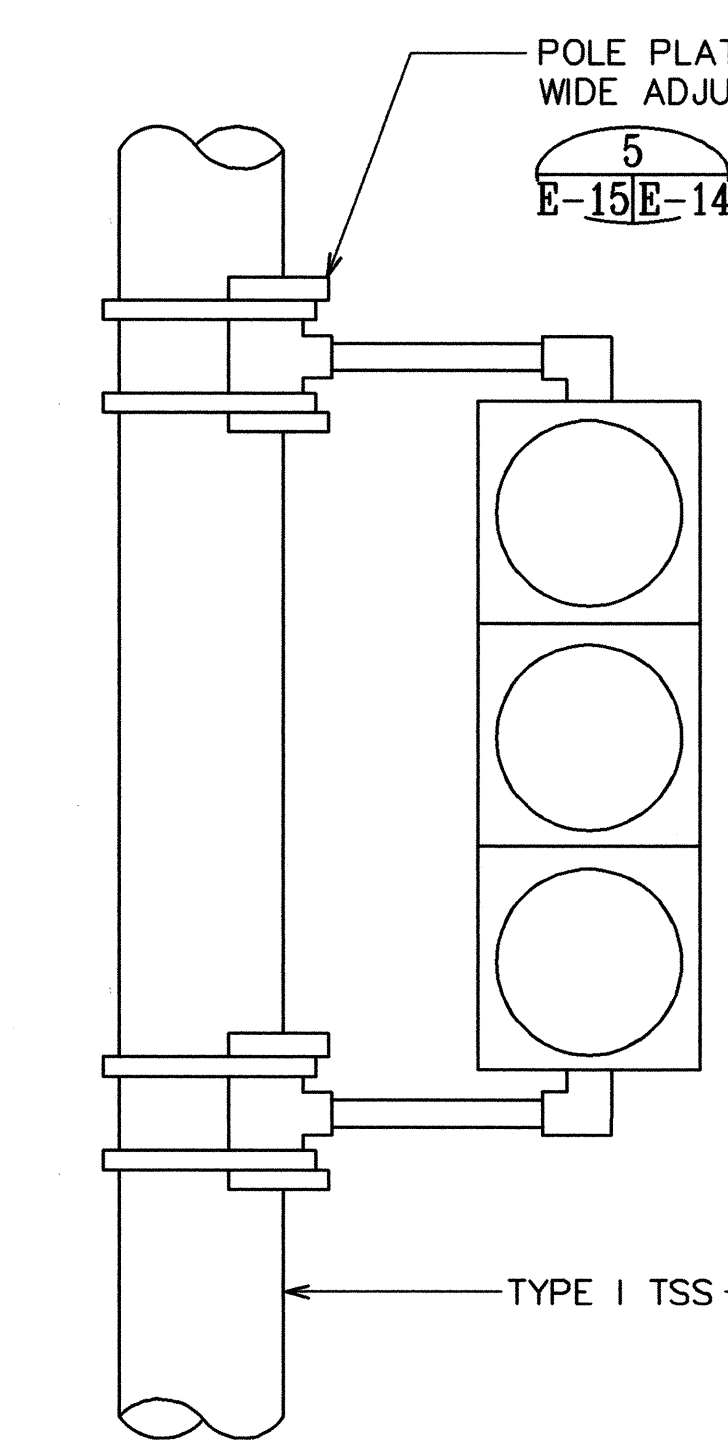
- NOTES:
1. STAINLESS STEEL BANDS SHALL BE 1/2" WIDE X .050" THICK, MINIMUM. TENSILE STRENGTH SHALL BE 100,000 PSI MINIMUM.
  2. UPPER ARM, LOWER ARM AND VERTICAL SUPPORT TUBE SHALL BE OF 356 CAST ALUMINUM.
  3. ALL WIRING SHALL BE CONCEALED.
  4. VERTICAL TUBE CLAMP SHALL BE OF MALLEABLE IRON, GRADE 32510.
  5. ALL ALUMINUM PARTS SHALL HAVE AN ALODINE 1200 FINISH.
  6. SIGNAL AS NOTED ON PLANS.
  7. MAINTAIN 16" MIN. CLEARANCE AT REAR OF ALL PROGRAMMED FACES.
  8. PROVIDE BACKPLATES FOR SIGNAL HEADS MOUNTED TO MAST ARMS.



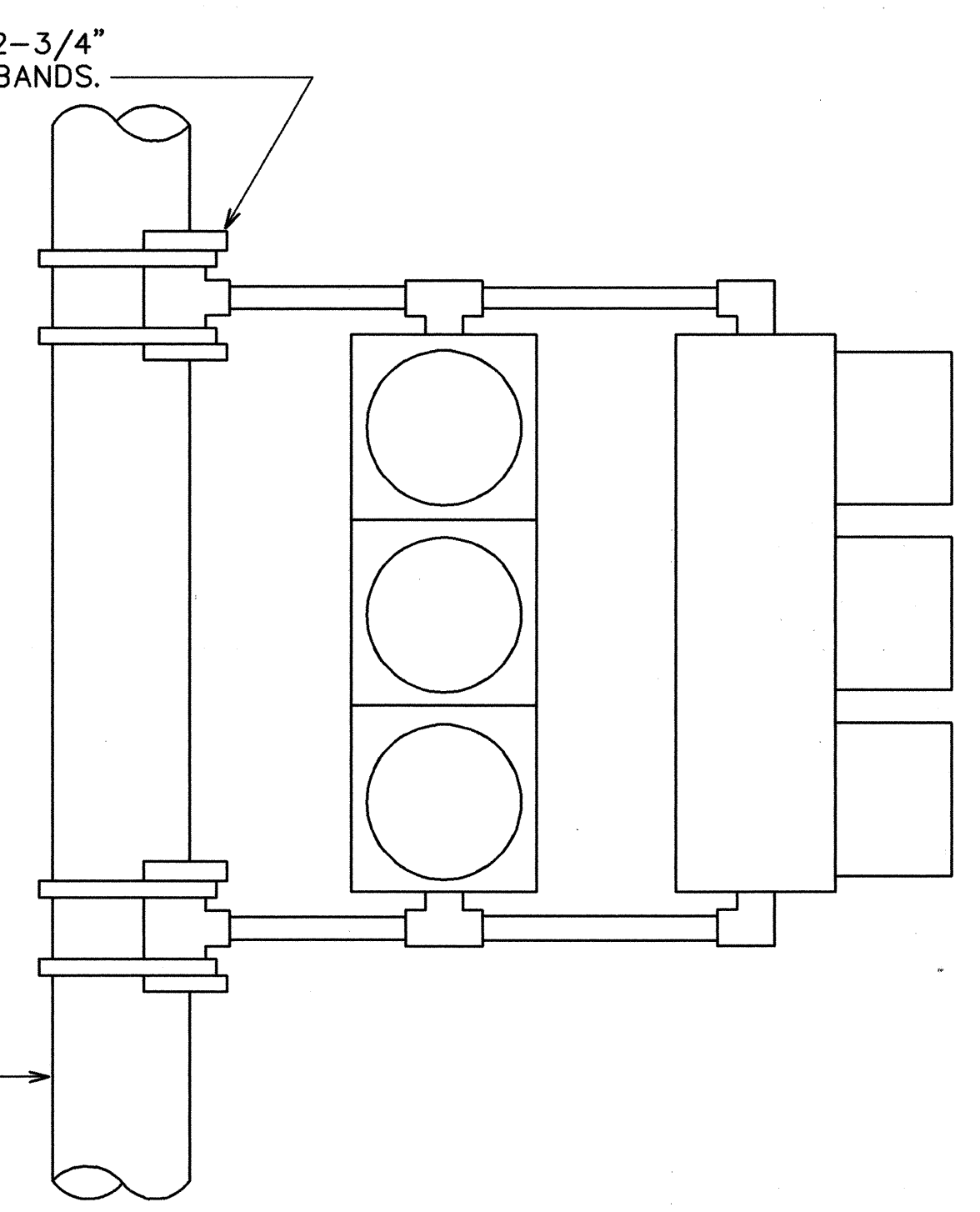
TOP OF POLE - ONE WAY MOUNTING



MAST ARM - ONE WAY MOUNTING AT ENDS

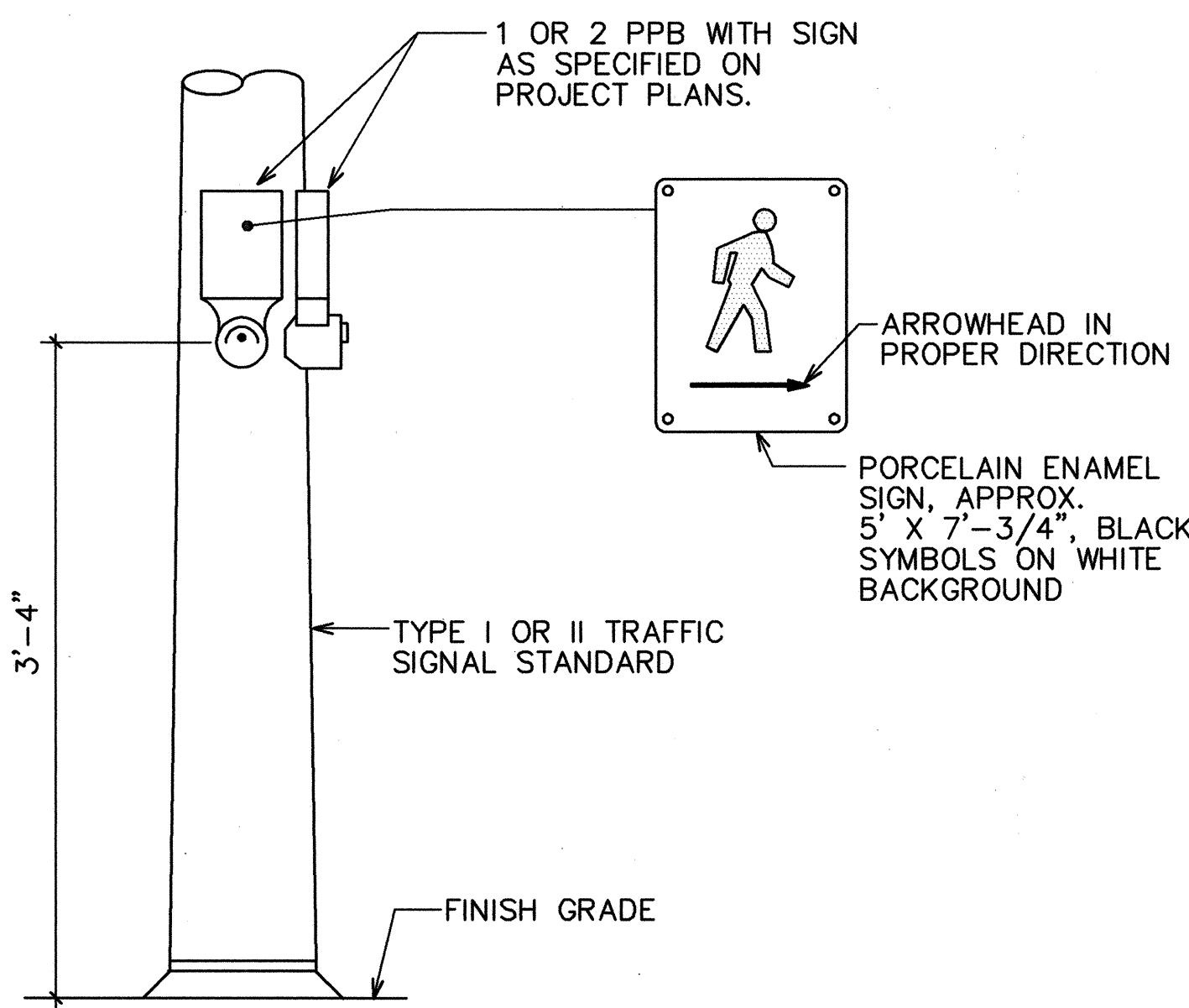


BRACKET MOUNT - ONE WAY

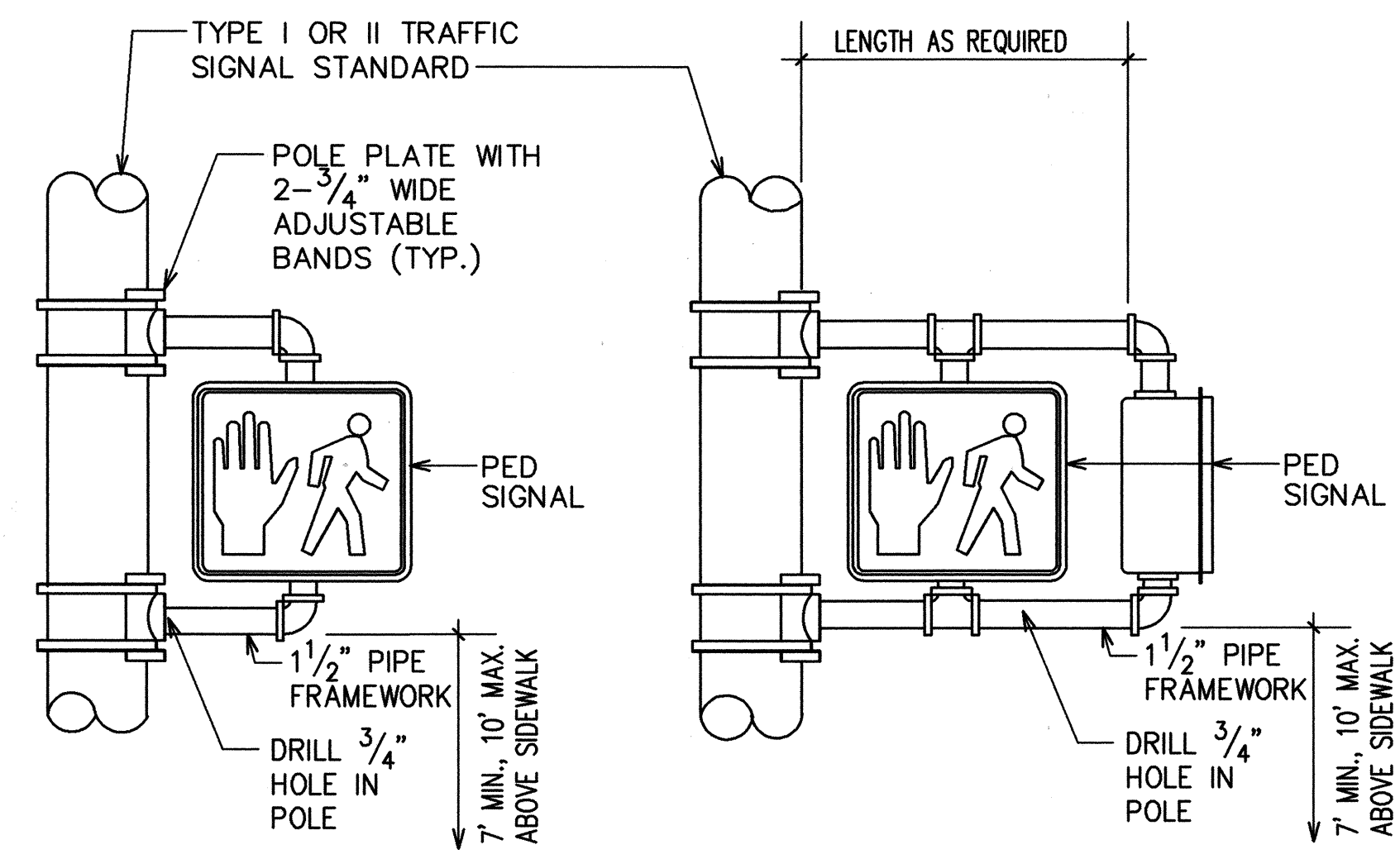


BRACKET MOUNT - TWO WAY

# 1 VEHICULAR SIGNAL MOUNTING DETAILS E-12E-15 NOT TO SCALE



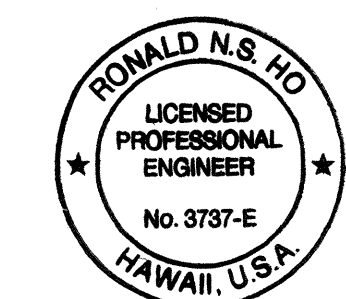
## 2 PEDESTRIAN PUSHBUTTON DETAILS E-12E-15 NOT TO SCALE



BRACKET MOUNT - ONE WAY

BRACKET MOUNT - TWO WAY

## 3 PEDESTRIAN SIGNAL MOUNTING DETAILS E-12E-15 NOT TO SCALE



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*Ronald N.S. Ho*  
2/8/96

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS II

INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

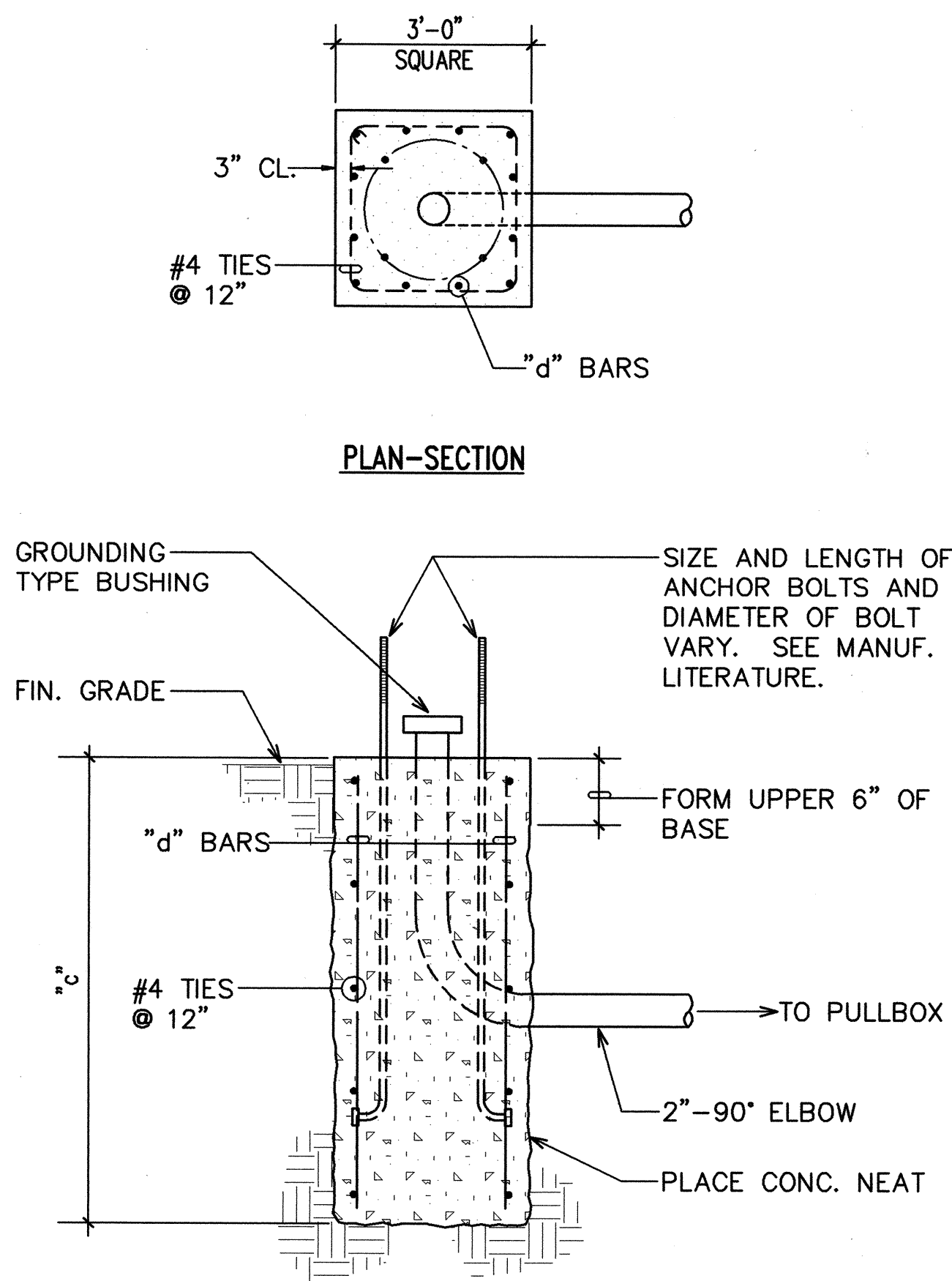
SCALE: AS NOTED DATE: MAR. 1997

SHEET No. E-15 OF 19 SHEETS

ORIGINAL PLAN  
DATE  
DRAWN BY  
CHECKED BY  
NOTED BY  
DATE  
E-12E-15



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	115	129

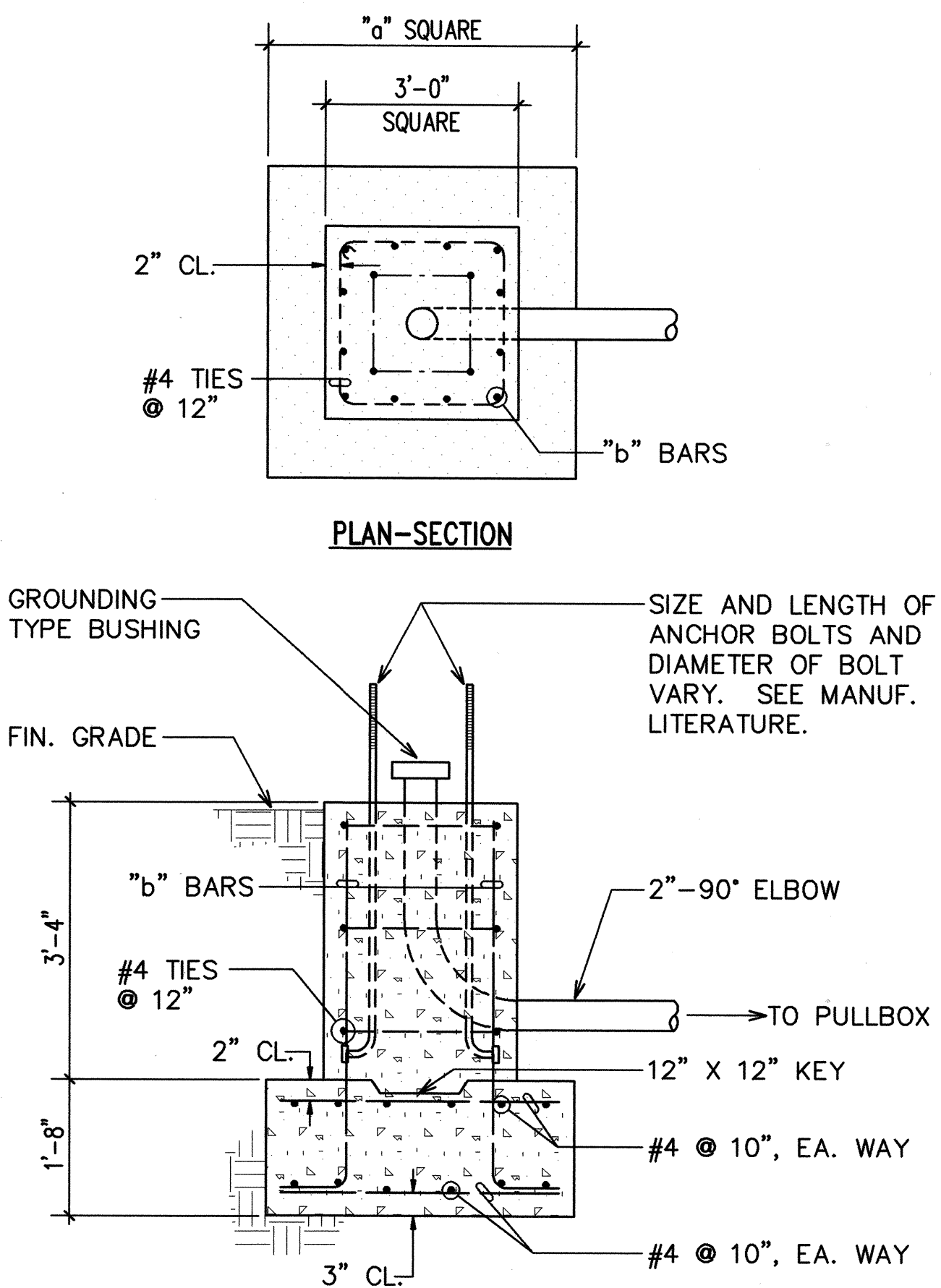


NOTE(S): CONCRETE SHALL BE CLASS B.

SECTION

MAST ARM LENGTH	"c"	"d" BARS
16'-18'	5'-0"	12-#6
20'	5'-6"	12-#6
25'	6'-0"	12-#6
30'	6'-6"	12-#6
35'	7'-0"	12-#8
40'	8'-0"	12-#8

TYPE II



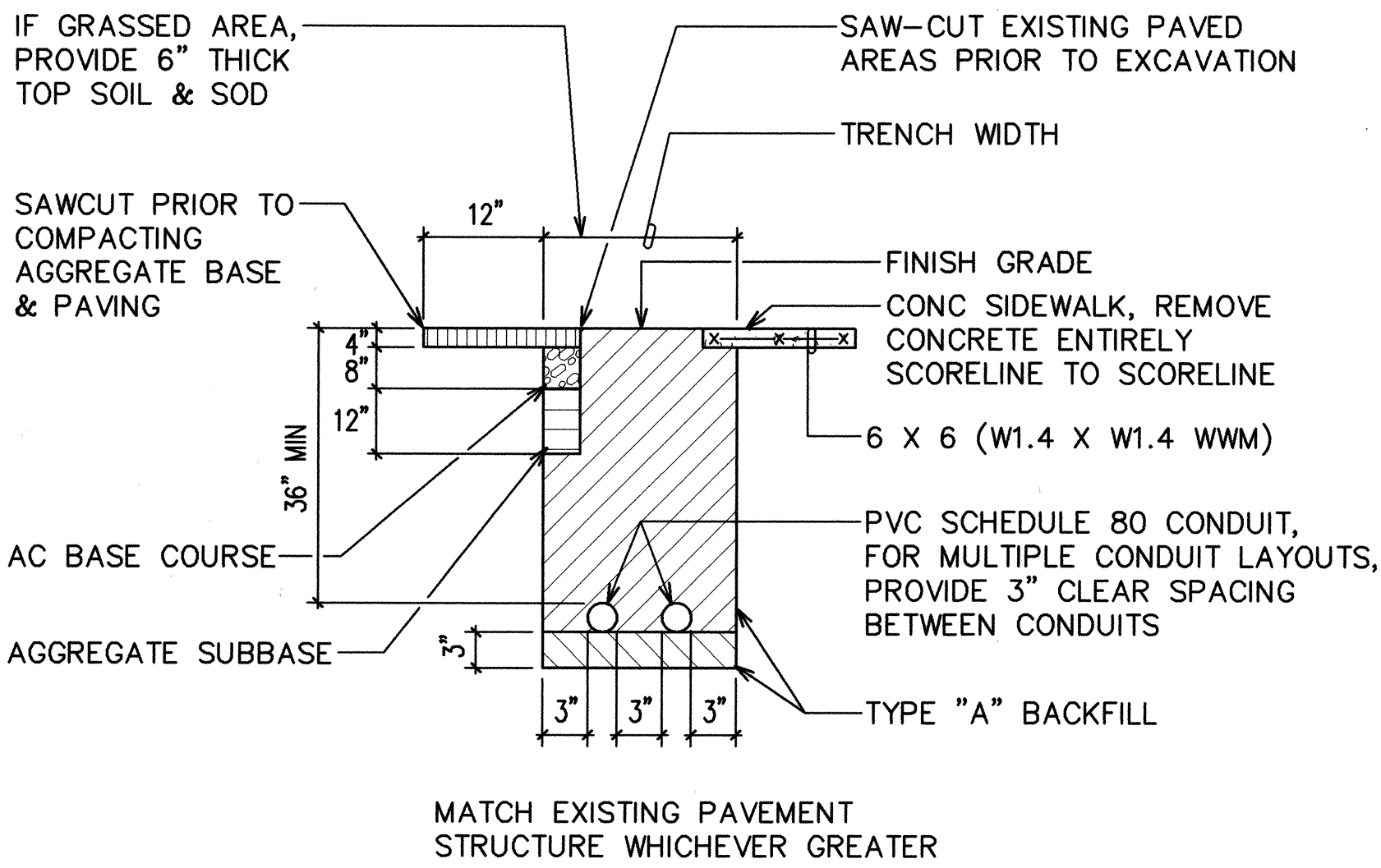
NOTE(S): CONCRETE SHALL BE CLASS B.

SECTION

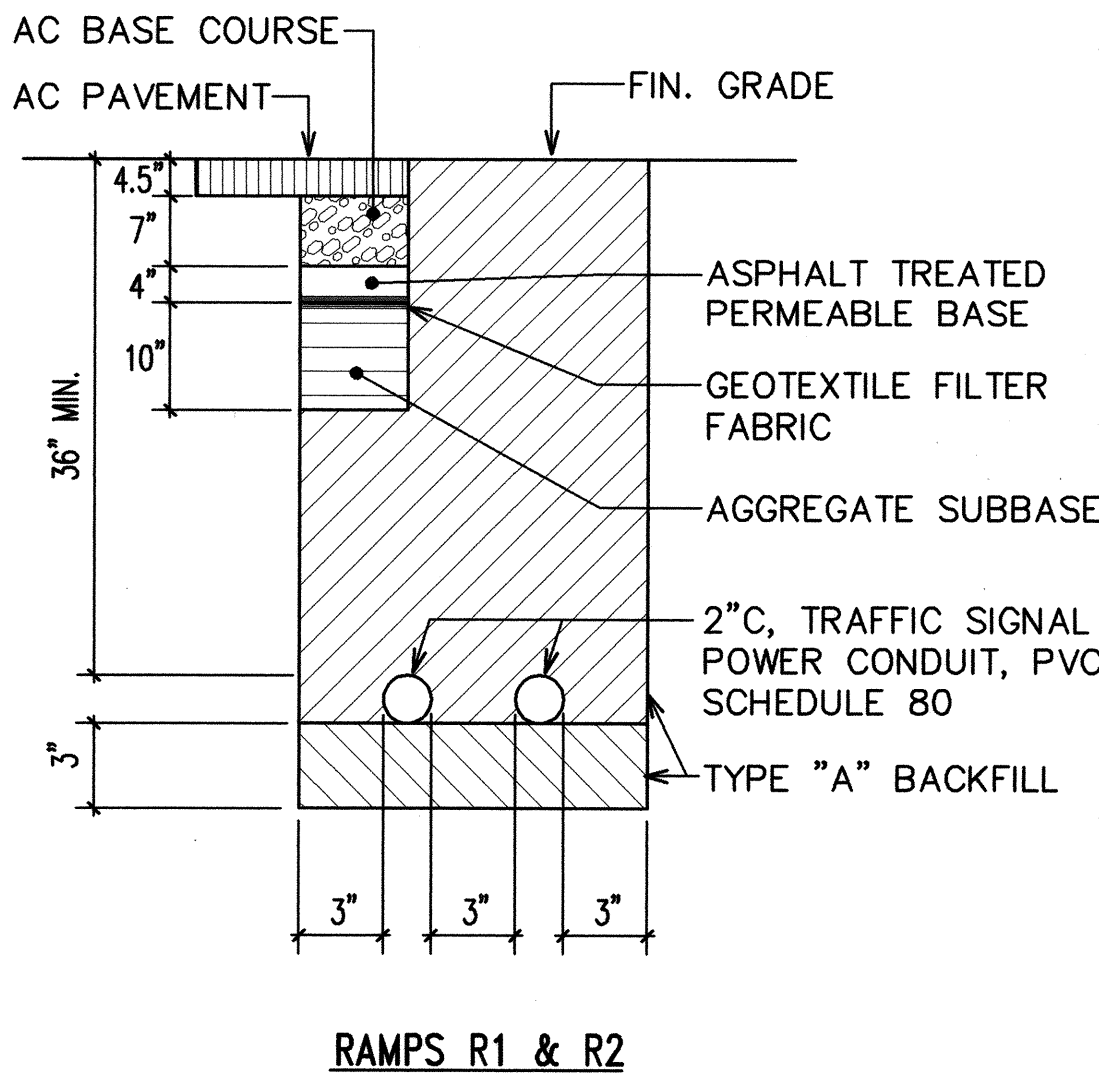
MAST ARM LENGTH	"a"	"b" BARS
16'-18'	5'-0"	12-#6
20'	5'-6"	12-#6
25'	6'-0"	12-#6
30'	6'-6"	12-#8
35'	6'-6"	12-#8
40'	7'-0"	12-#8

TYPE IIA

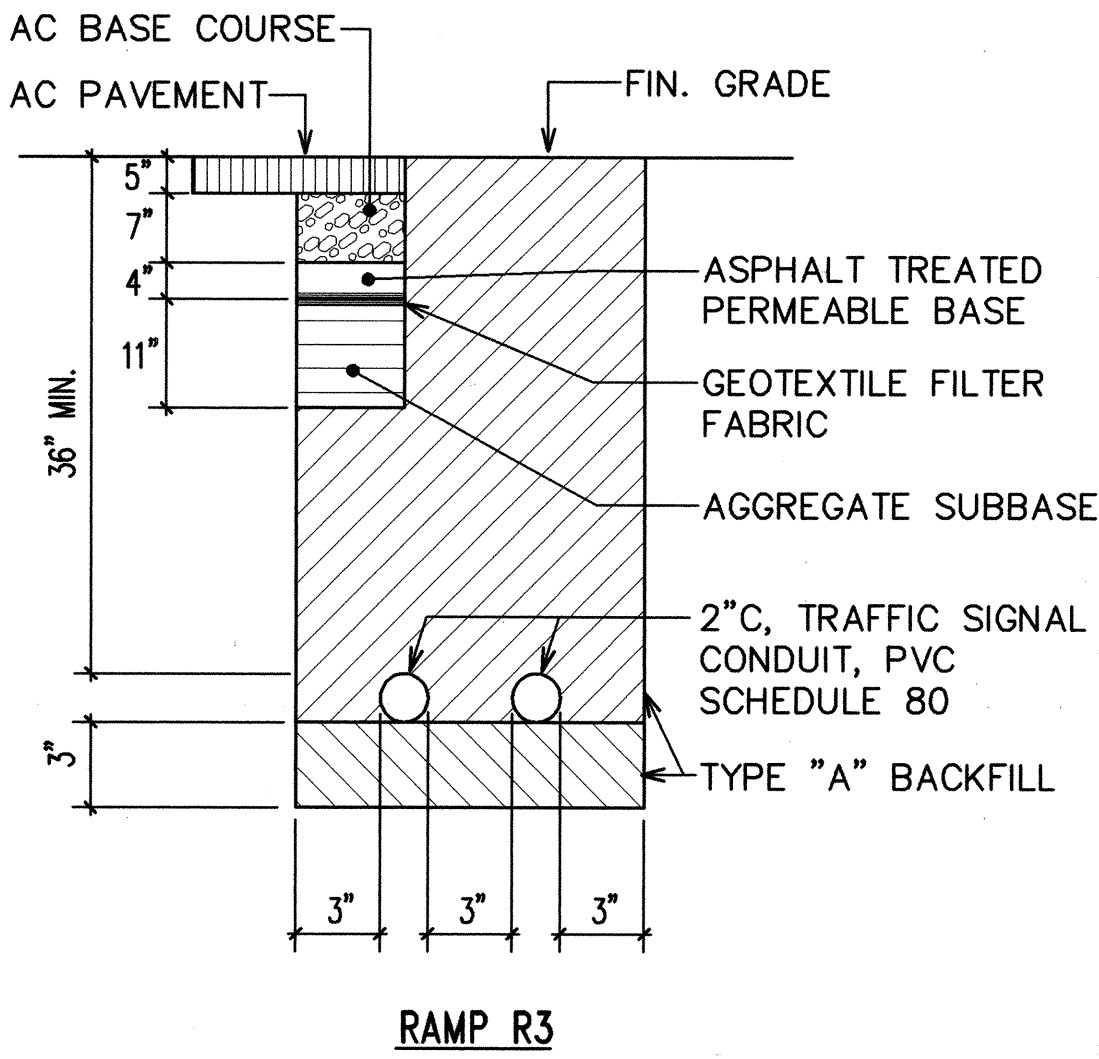
1 FOOTING FOR MAST ARM STANDARD  
E-14E-16 NOT TO SCALE



MEHEULA PARKWAY



RAMPS R1 & R2



RAMP R3

2 TYPICAL TRENCH SECTION FOR CONDUIT  
E-12E-16 NOT TO SCALE



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.  
*Ronald N.S. Ho*  
2/8/96

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### TRAFFIC SIGNAL DETAILS III

INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

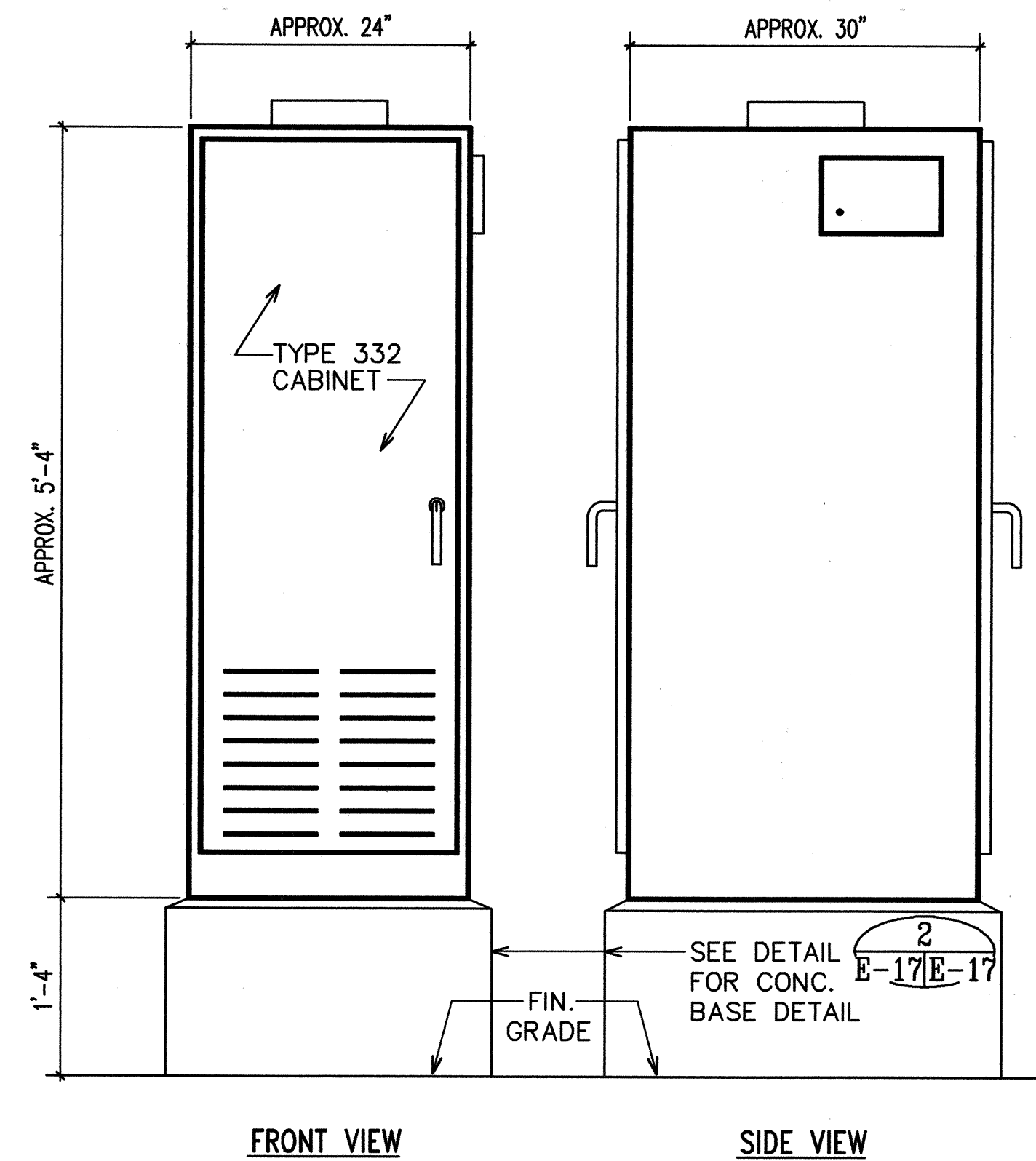
SCALE: AS NOTED DATE: MAR. 1997

SHEET No. E-16 OF 19 SHEETS

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

Let date 02/02/96 by 07:52:37 by EA

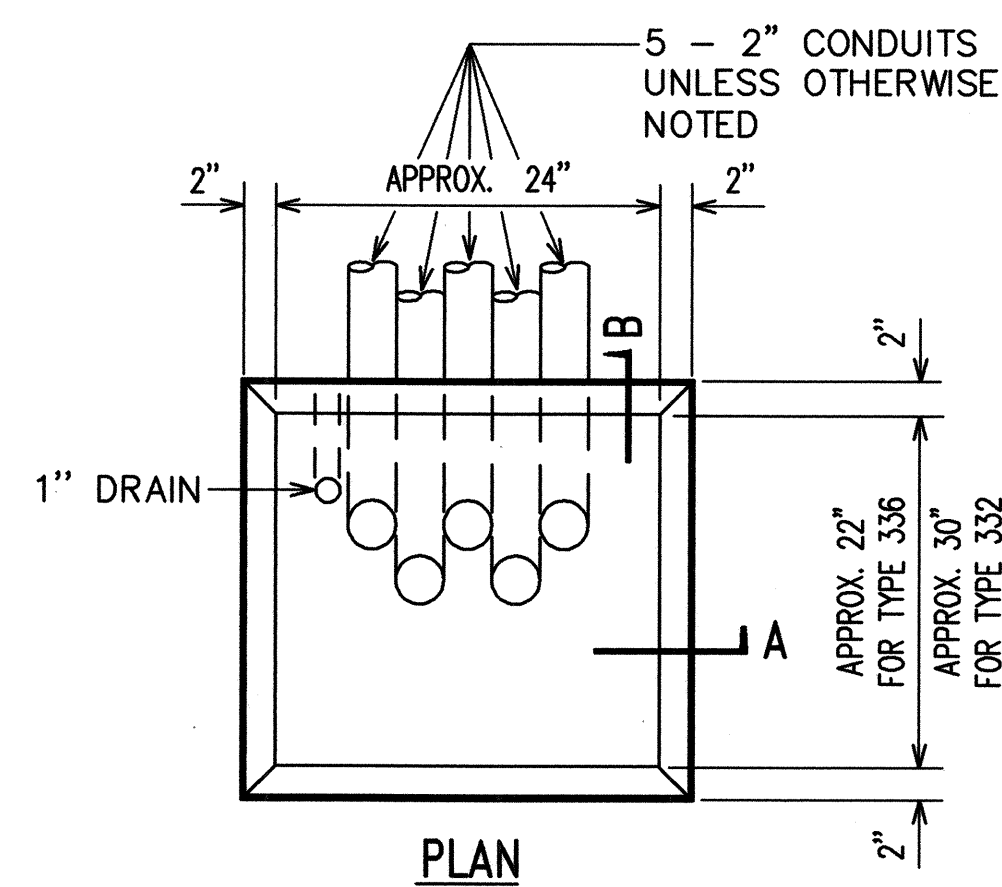
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	116	129



FRONT VIEW

SIDE VIEW

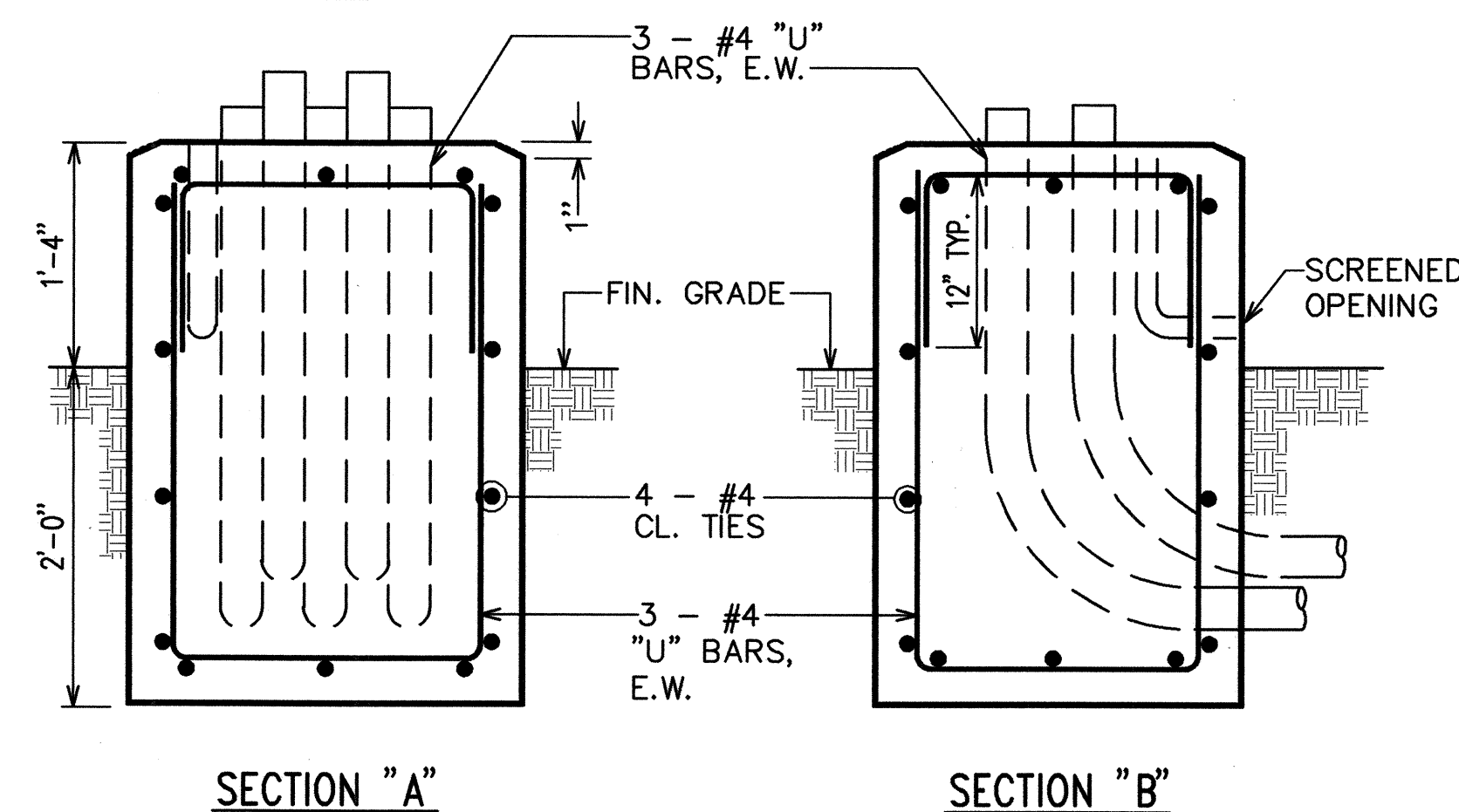
1 **TRAFFIC CONTROLLER CABINET DETAIL**  
E-12E-17 NOT TO SCALE  
E-13



PLAN

**NOTE(S):**

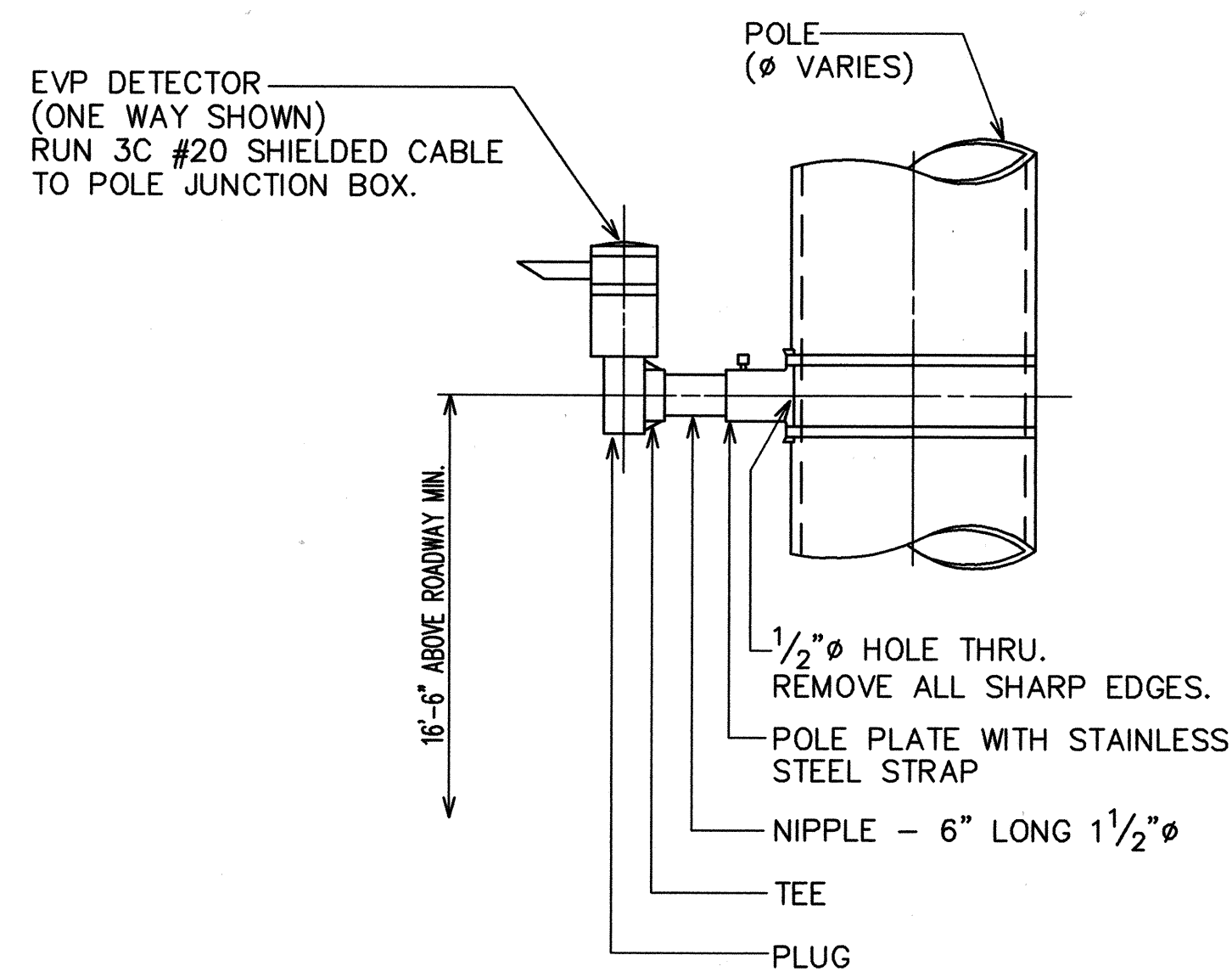
1. CONCRETE SHALL BE CLASS "B".
2. DIMENSIONS SHALL BE ALTERED TO SUIT CONTROLLER CABINET ACTUALLY FURNISHED.
3. CONDUIT BENDS AND DRAIN ARE INCIDENTAL TO CONCRETE BASE.
4. REFER TO CABINET MANUFACTURER'S SPECIFICATIONS FOR DETAILS OF ANCHOR BOLTS AND BASE SETTING.
5. ALL EXPOSED SURFACES OF CONCRETE BASE SHALL BE GIVEN A CLASS 2, RUBBED FINISH.



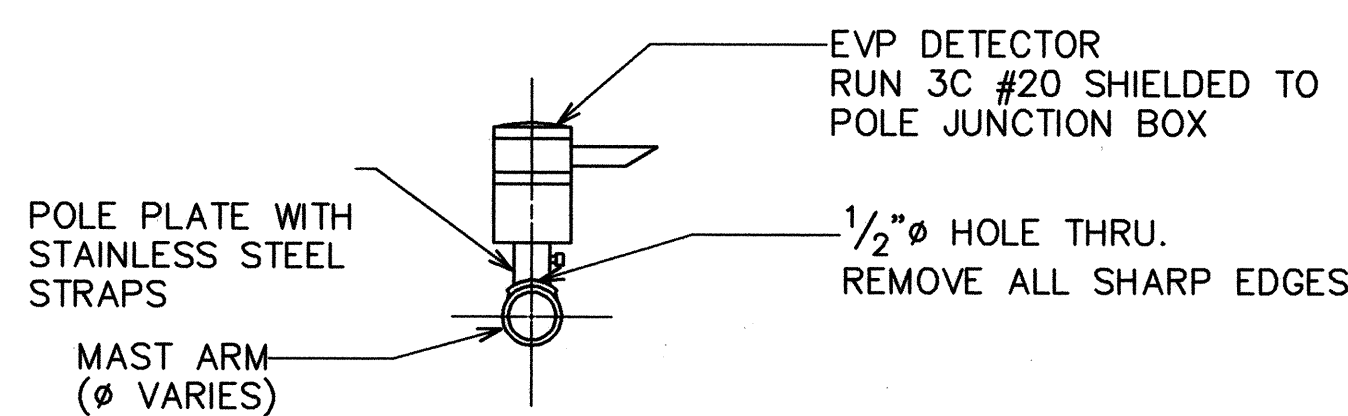
SECTION "A"

SECTION "B"

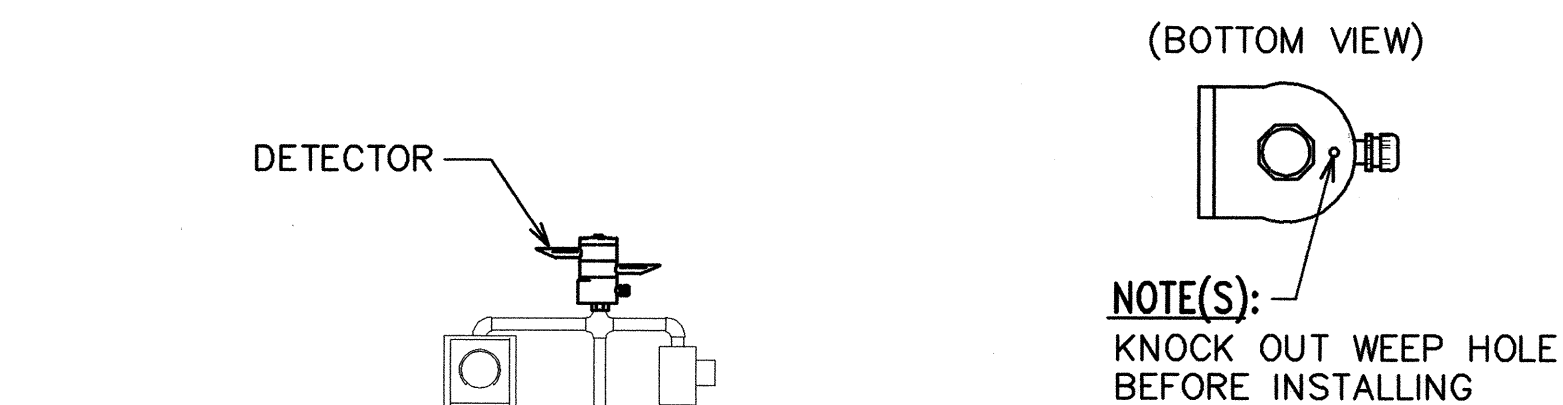
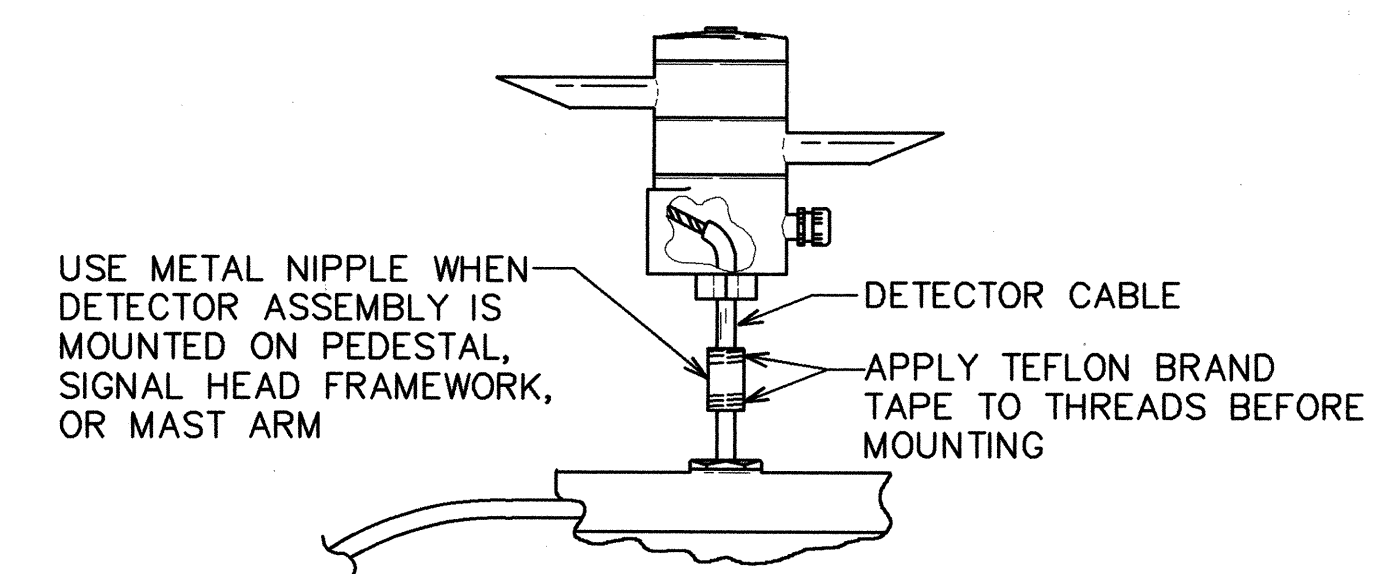
2 **TYPE "D" CONC. BASE CONTROLLER CABINET**  
E-17E-17 NOT TO SCALE



TYPICAL VERTICAL MOUNT OF EVP DETECTOR DETAIL



TYPICAL HORIZONTAL MOUNT OF EVP DETECTOR DETAIL

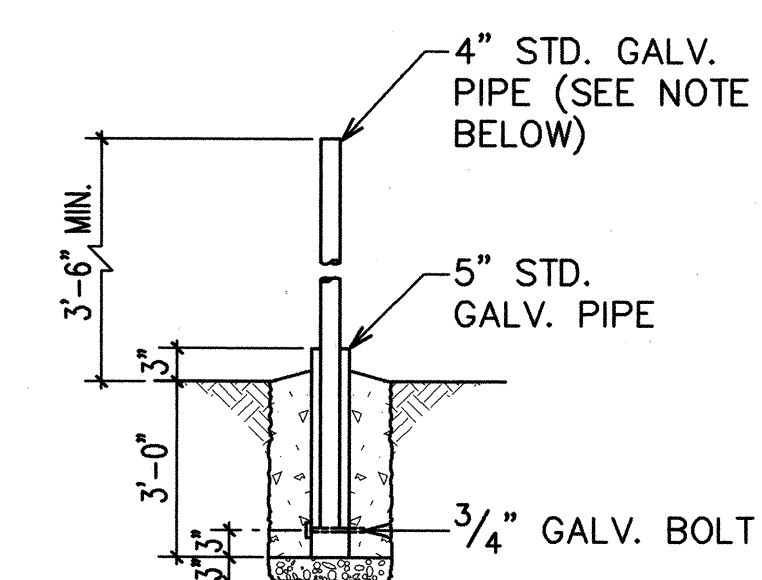


**NOTE(S):**

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 FURTHEST POINT WHERE PRIORITY VEHICLE IS TO BE SENSED.

TYPICAL PEDESTAL/MAST ARM INSTALLATION OF EVP DETECTOR

3 **TYPICAL EVP MOUNTING DETAILS**  
E-12E-17 NOT TO SCALE



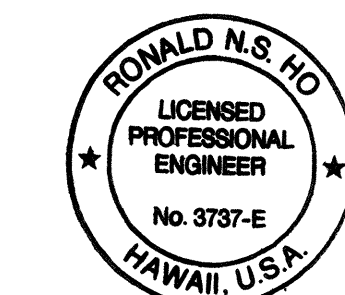
THE 4" STANDARD GALV. PIPE TO BE FILLED WITH CONCRETE TO WEIGH APPROXIMATELY 150 LBS.

SECTION

**NOTE(S):**

BARRIER POSTS ARE TO BE PAINTED YELLOW AS PER ANSI SPEC. Z53.1 TO COMPLY WITH THE OSHA STANDARDS FOR COLOR CODING.

4 **PIPE GUARD DETAILS**  
E-12E-17 NOT TO SCALE



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2/18/96

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DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL DETAILS IV**

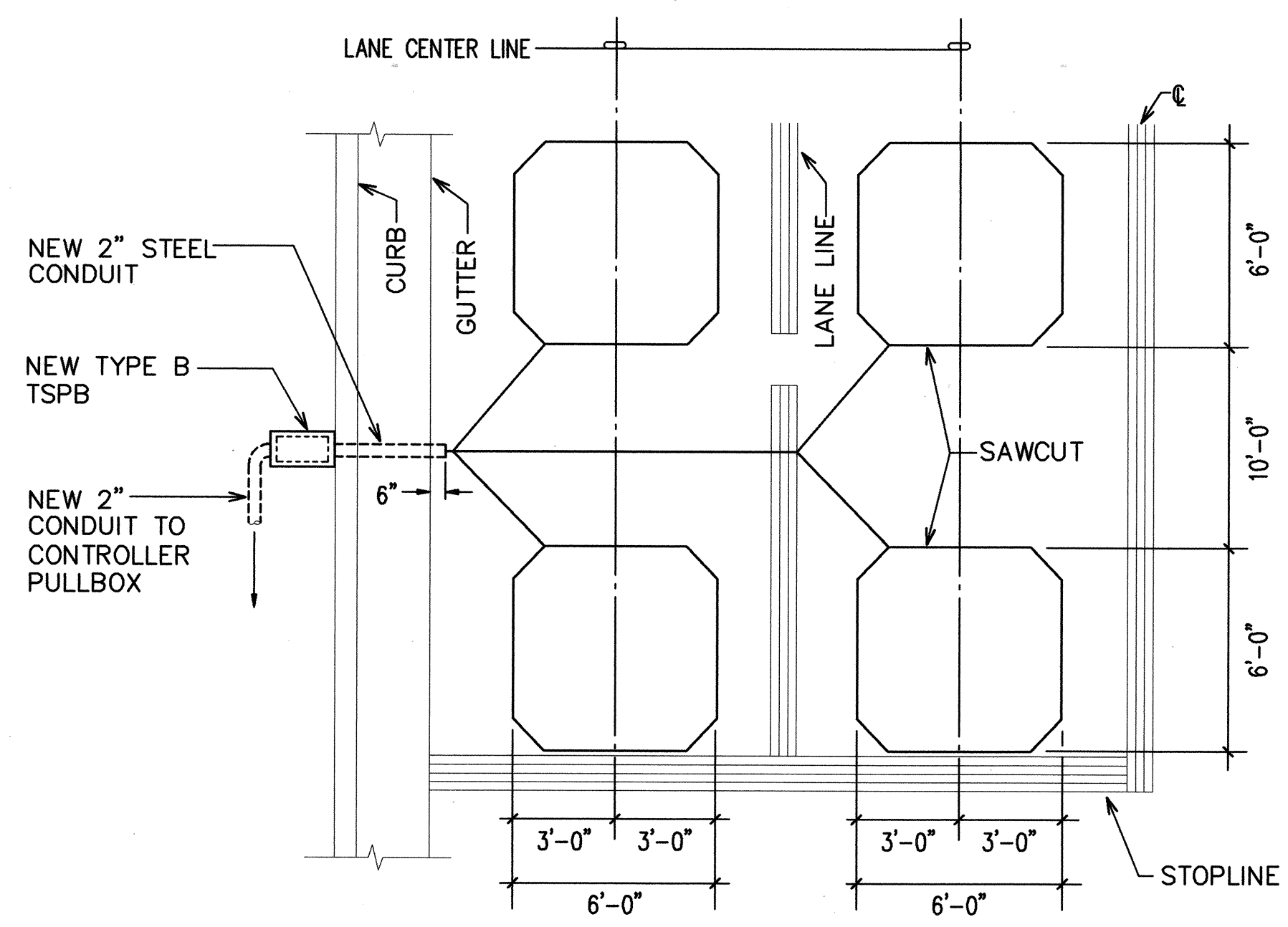
INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

SCALE: AS NOTED DATE: MAR. 1997

SHEET No. E-17 OF 19 SHEETS

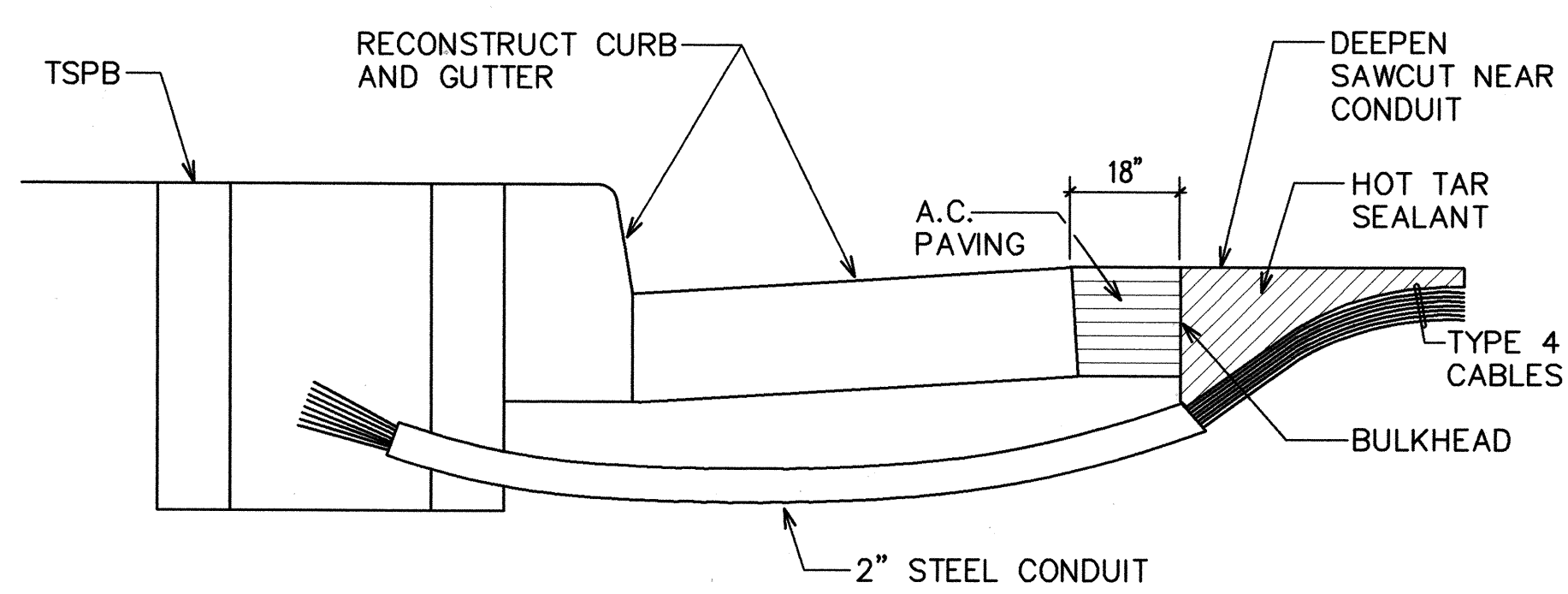


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	117	129



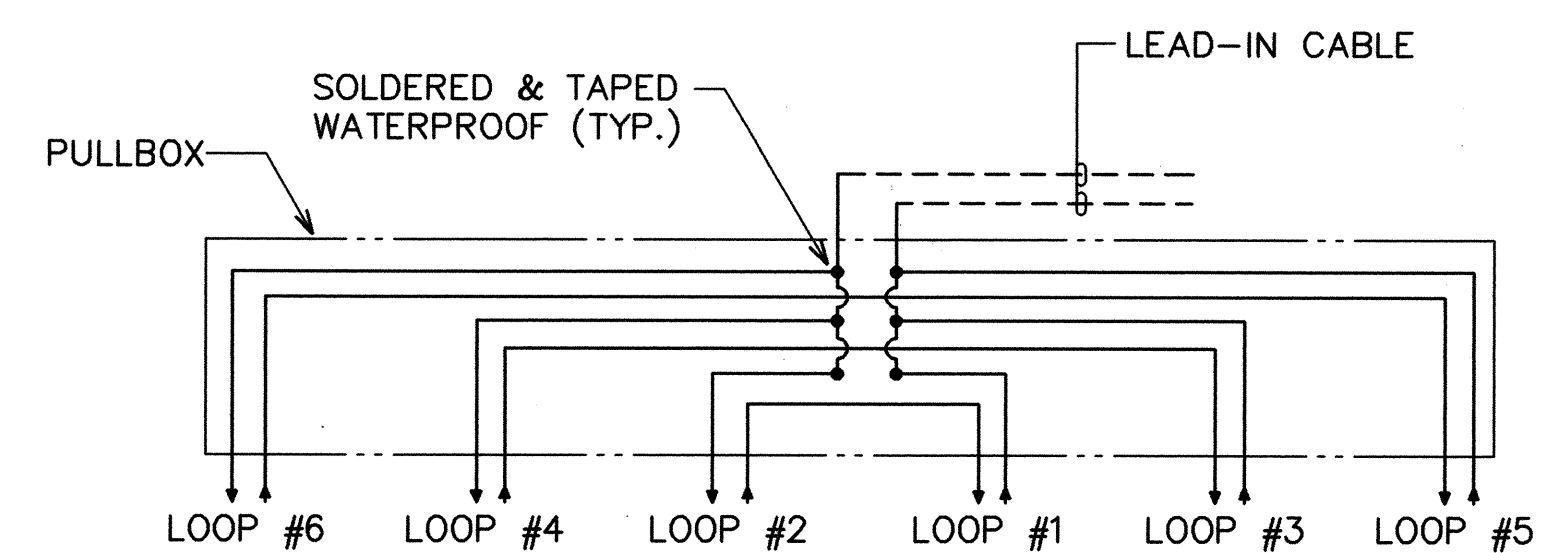
NOTE: ADD ONE PAIR OF LOOPS FOR EACH ADDITIONAL LANE.

1  
E-12/E-18  
TYPICAL LAYOUT AT STOPLINES  
NOT TO SCALE

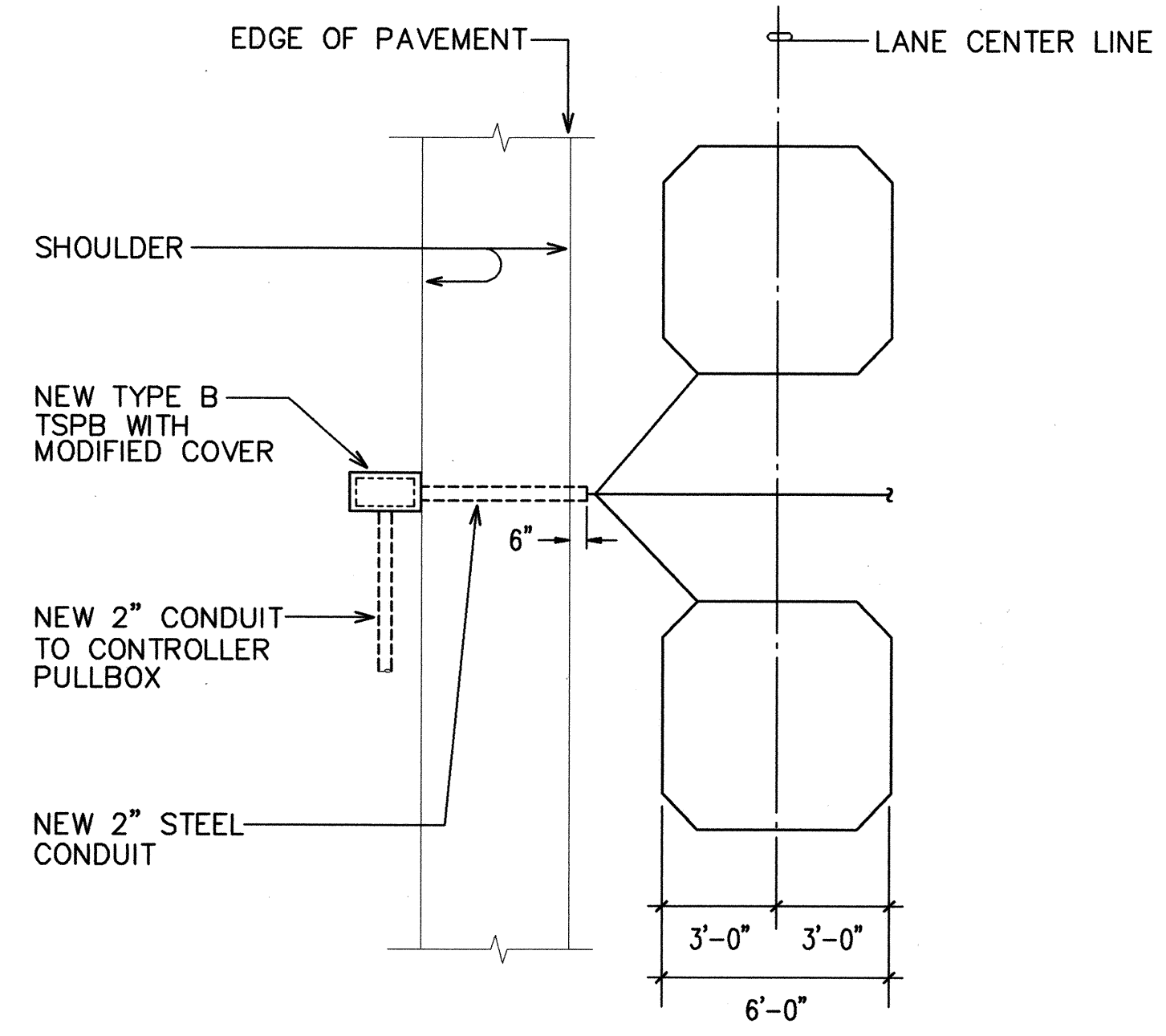


- NOTES ON CONSTRUCTION AT END OF SAWCUT:
1. SEAL ROADWAY END OF CONDUIT AFTER INSTALLATION OF CONDUCTORS.
  2. INSTALL BULKHEAD ACROSS CONDUIT TRENCH.
  3. PLACE HOT TAR IN SAWCUT.
  4. BACKFILL OVER CONDUIT WITH NEW A.C.
  5. RECONSTRUCT CURB AND GUTTER AS REQUIRED.

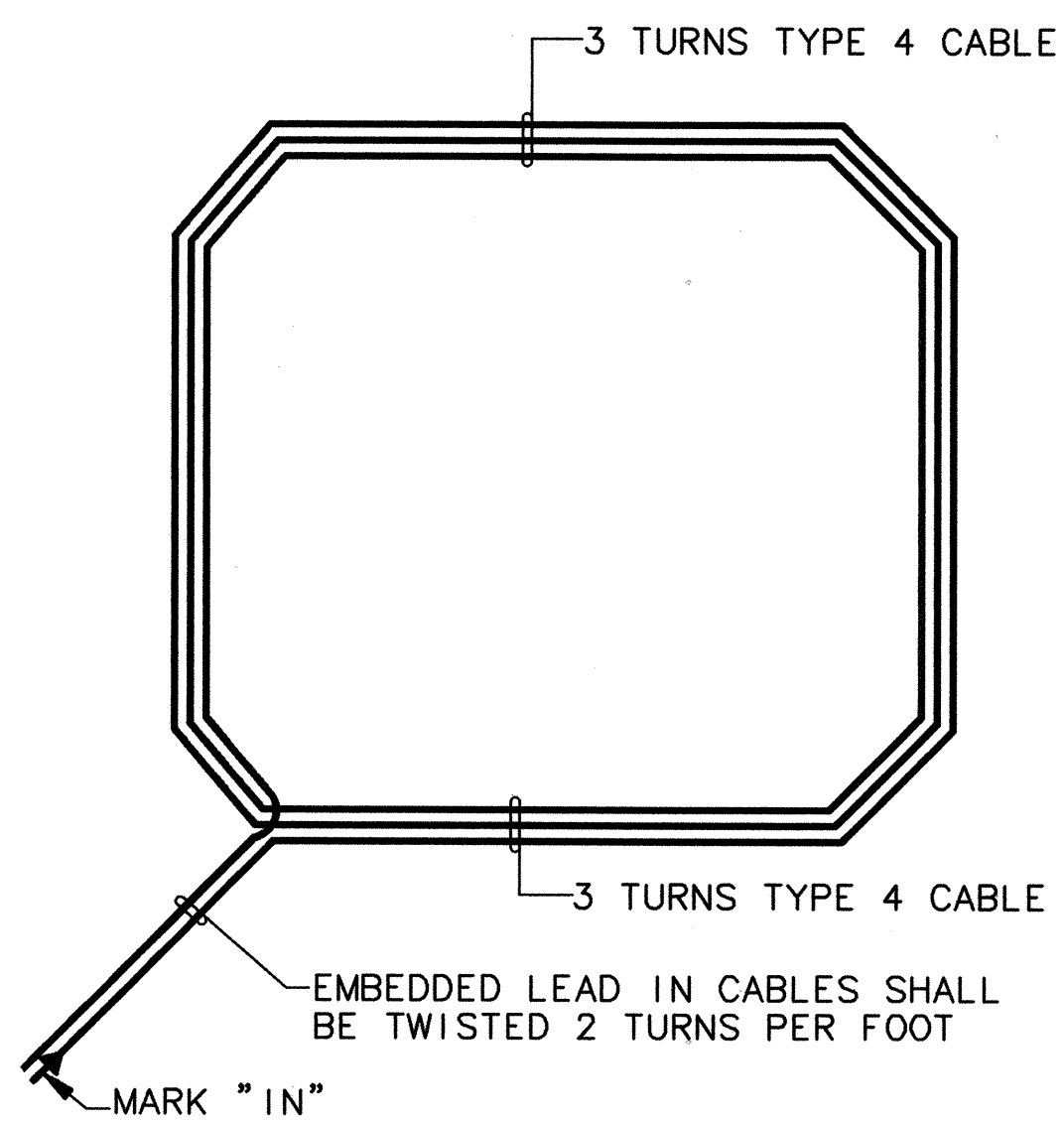
3  
E-18/E-18  
SENSOR LOOP INSTALLATION AT  
EDGE OF ROADWAY DETAIL  
NOT TO SCALE



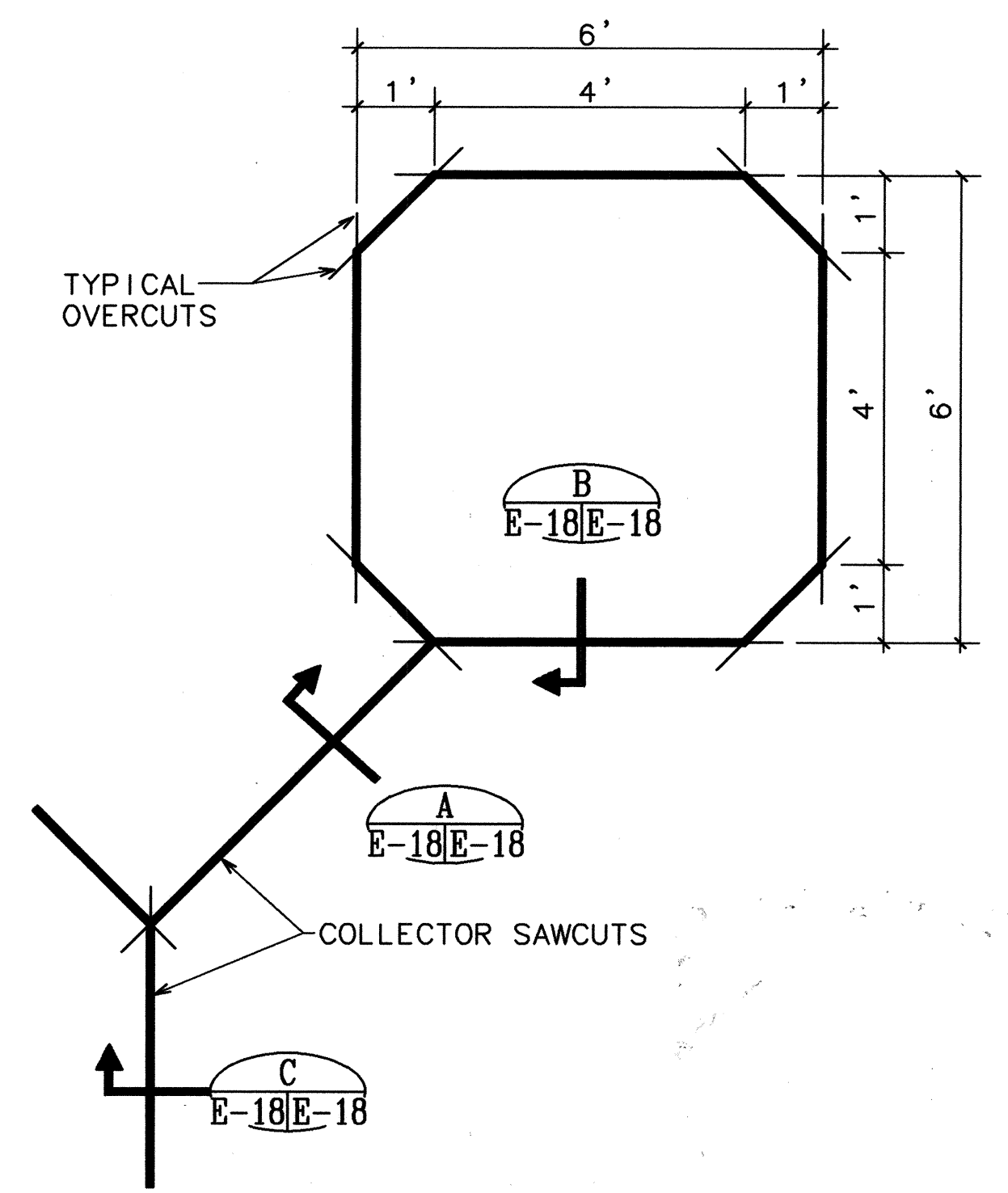
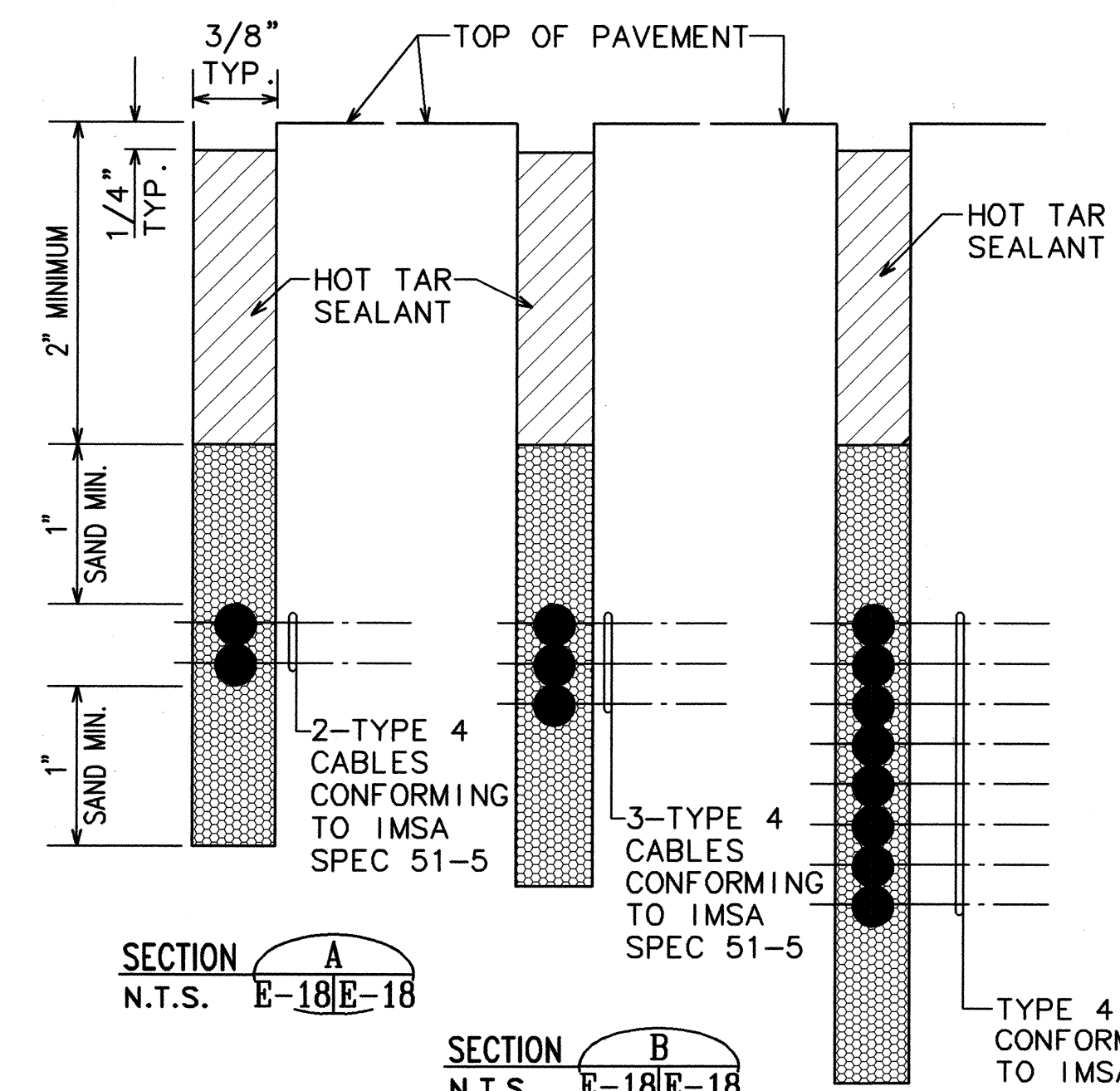
5  
E-18/E-18  
TYPICAL SERIES-PARALLEL LOOP CONNECTION  
DETAIL "A"



2  
E-12/E-18  
TYPICAL LAYOUT AT SHOULDER AREAS  
NOT TO SCALE

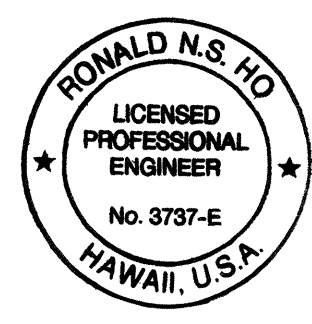


4  
E-12/E-18  
TYPICAL SENSOR LOOP  
WIRING DIAGRAM



NOTE: LENGTH OF OVERCUTS SHALL BE KEPT TO A MINIMUM. ALL OVERCUTS SHALL BE BACKFILLED WITH HOT TAR.

6  
E-18/E-18  
TYPICAL SENSOR LOOP SAWCUT DETAIL  
NOT TO SCALE



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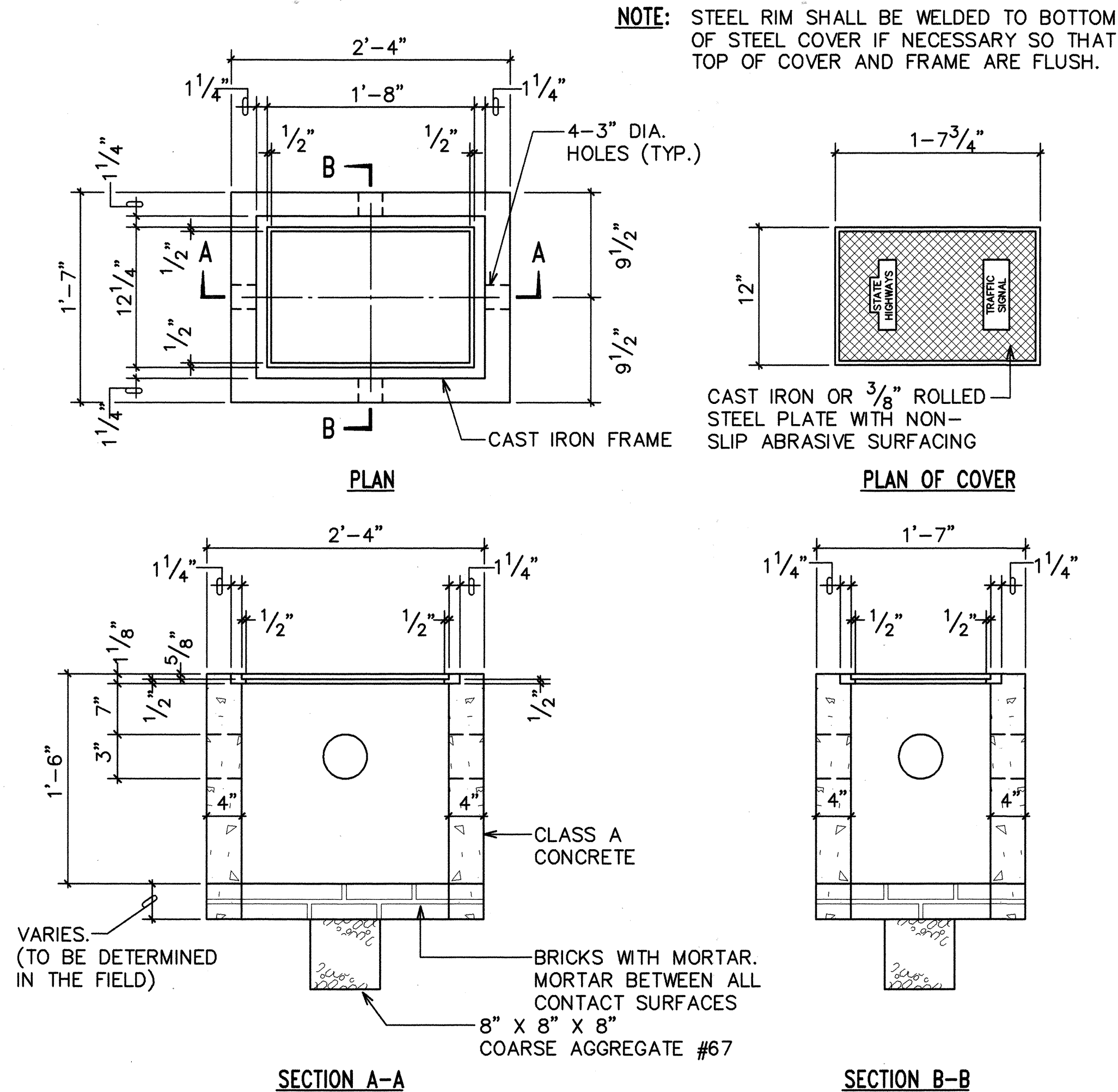
LOOP DETECTOR DETAILS

INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

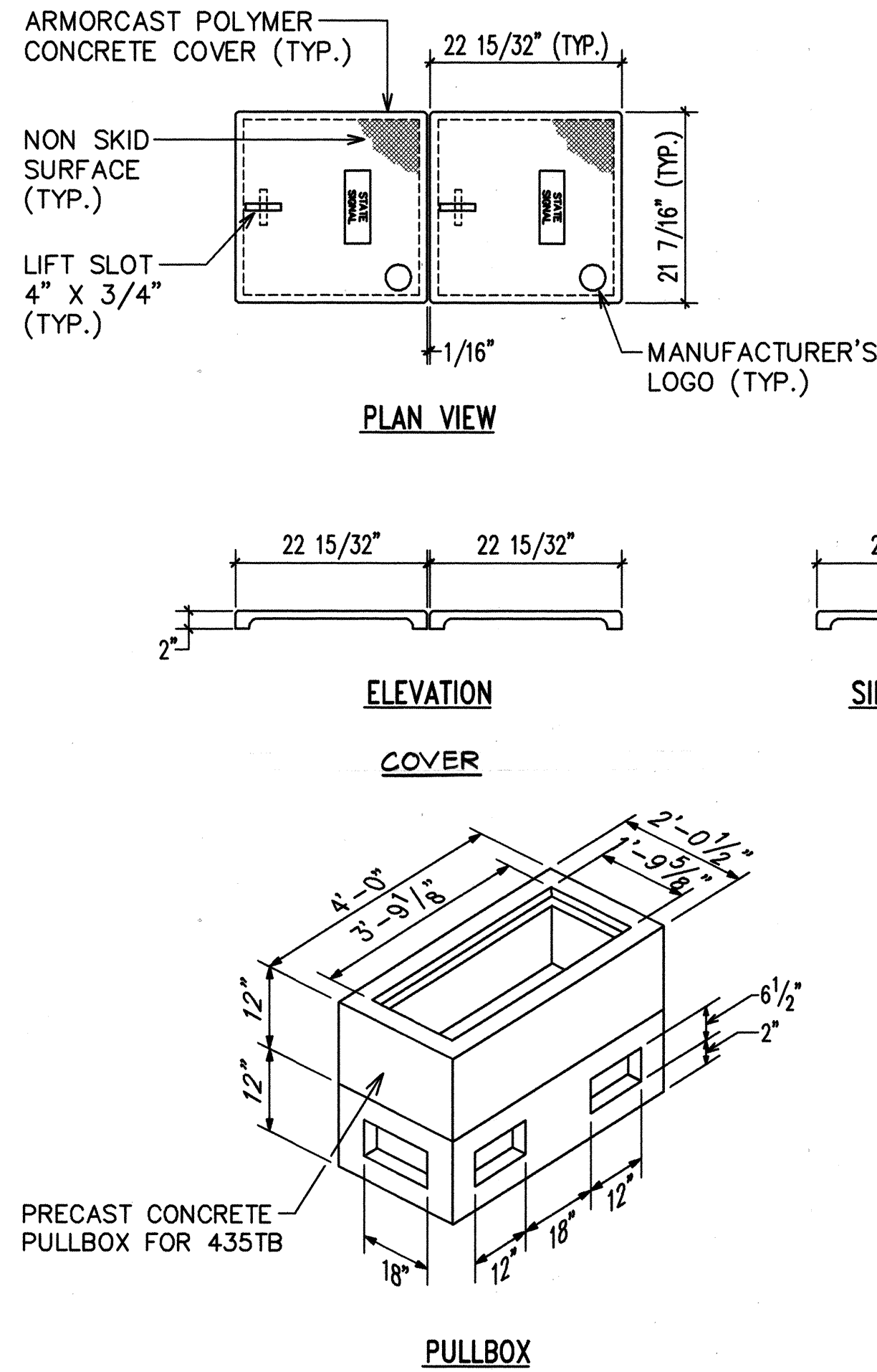
SCALE: AS NOTED  
DATE: MAR. 1997

SHEET No. E-18 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H2-1(29)	1997	118	129



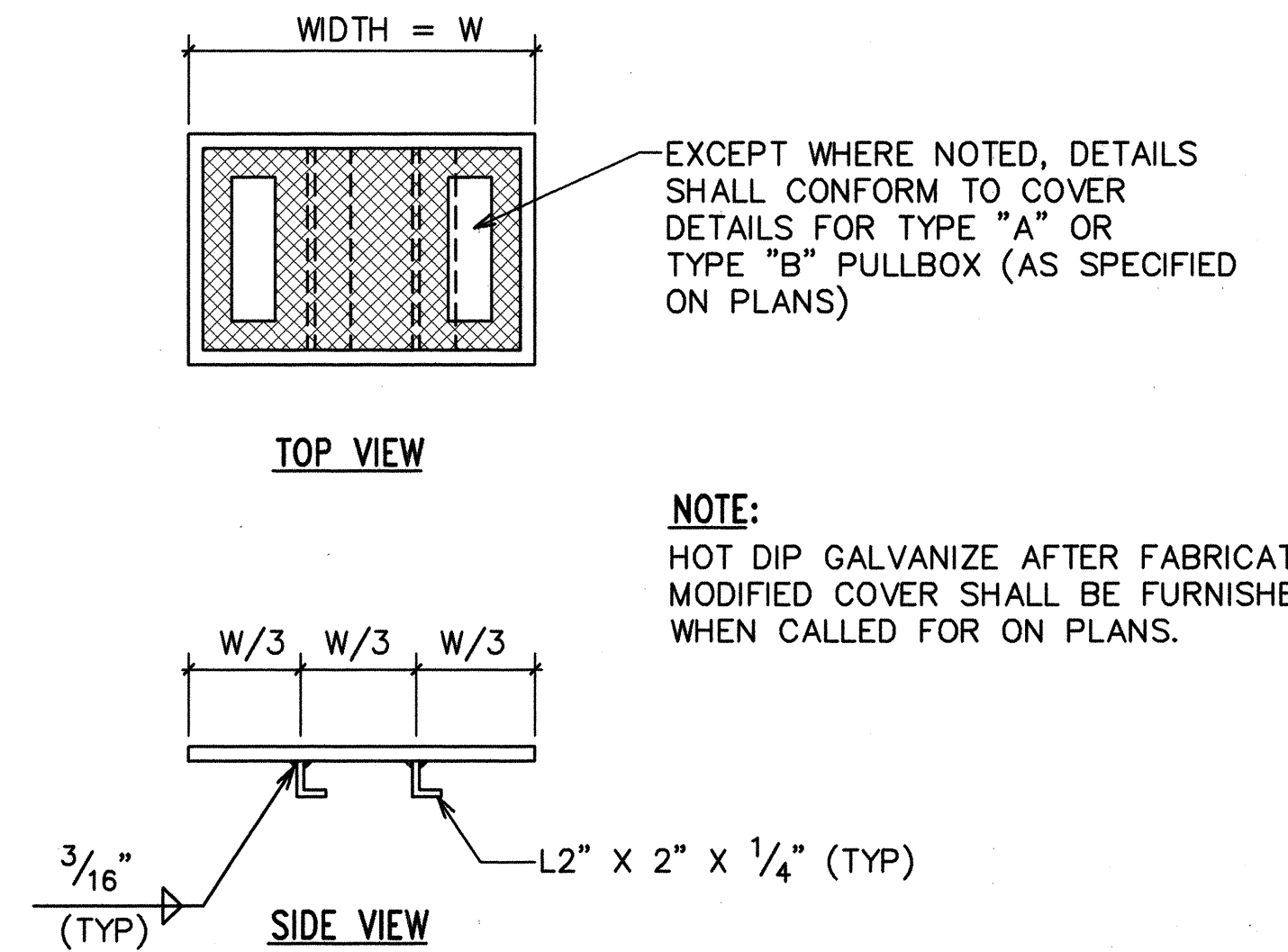
1 TYPE "B" PULLBOX  
E-12E-19 NOT TO SCALE



**NOTES:**

1. PROVIDE ARMORCAST POLYMER CONCRETE COVER.
2. INSTALL ON 6" BED OF #3 CRUSHED ROCK.
3. PROVIDE SUFFICIENT AMOUNT OF 5/8"  $\phi$  X 8' COPPERWELD GROUND RODS AS DIRECTED BY THE TRAFFIC SIGNAL INSPECTOR/ENGINEER. COST SHALL BE INCIDENTAL TO THE VARIOUS TRAFFIC SIGNAL ITEMS.

2 TYPE "D" PULLBOX  
E-12E-19 NOT TO SCALE

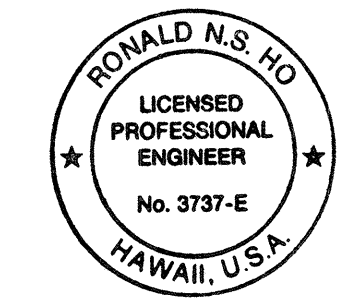


**NOTE:**

HOT DIP GALVANIZE AFTER FABRICATION. MODIFIED COVER SHALL BE FURNISHED WHEN CALLED FOR ON PLANS.

3 MODIFIED COVER DETAIL  
E-12E-19 NOT TO SCALE

DATE	_____
DESIGNED BY	_____
DRAWN BY	_____
CHECKED BY	_____
IN CHARGE	_____
DATE	_____



THIS WORK WAS PREPARED BY ME  
OR UNDER MY SUPERVISION.  
*Ronald N.S. Ho*  
2/26/97

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**PULLBOX DETAILS**

INTERSTATE ROUTE H-2  
MILILANI INTERCHANGE  
SOUTHBOUND ON-AND-OFF RAMP  
F.A.I. PROJECT NO. IM-H2-1(29)

SCALE: AS NOTED DATE: MAR. 1997

SHEET No. E-19 OF 19 SHEETS