

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	ADD.3	15

WATER NOTES

- Unless otherwise specified, all materials and construction of water system facilities and appurtenances shall be in accordance with the HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE AND PUBLIC WORKS CONSTRUCTION, dated 1994, of the Hawaii Department of Transportation, Highways Division and the City and County of Honolulu Board of Water Supply's "WATER SYSTEM STANDARDS", Volume 1, dated 1985, the "APPROVED MATERIAL LIST AND STANDARD DETAILS FOR WATER SYSTEM CONSTRUCTION", Volume 2, dated 1985, the "WATER SYSTEM EXTERNAL CORROSION CONTROL STANDARDS", Volume 3, dated 1991, and all subsequent amendments and additions.
- All plans approved by the Board of Water Supply are based solely on the adequacy of the water supply. All other features of the water system, such as lines, grades, fittings, drainage, etc., and other features of improvements shall not be the responsibility of the Board of Water Supply.
- The existence and location of underground utilities and structures as shown on the plans are from the latest available data but is not guaranteed as to the accuracy or the encountering of other obstacles during the course of the work. The Contractor shall be responsible and pay for damages to existing utilities. The Contractor shall not assume that where no utilities are shown, that none exist.
- The Contractor shall be responsible for the protection of all water lines during construction. The Contractor shall be especially careful when excavating behind water lines, tees and bends wherever there is a possibility of water line movement due to the removal of the supporting earth beyond the existing reaction blocks. The Contractor shall take whatever measure necessary to protect the water lines, such as constructing special reaction blocks (with BWS approval) and/or modifying his construction method.
- Re-approval shall be required if this project is not under construction within a period of two years.
- At the electrical/signal ductline water crossings, adjust all electrical/signal ductline elevations to maintain 6" vertical clear separation from all waterlines (12" clear for all electrical/signal ductline structures larger than 16") at no cost to the Board of Water Supply.
- Maintain 3'-0" min. horizontal clear separation between all waterline systems and nearest electrical/signal ductlines paralleling the water system at no cost to the Board of Water Supply.
- The Contractor shall notify BWS Planning and Engineering Division, Construction Section, one week prior to commencing work on the water system.
- The Contractor shall verify all existing service lateral locations whether shown or not shown on plans prior to commencing with any of the work and shall not assume that where no services are shown, none exist.
- Prior to any excavating, the Contractor shall verify in the field the location of existing water mains and appurtenances.
- Maintain 3'-0" minimum cover for all existing waterlines (18" minimum for service laterals) and submit the probing data to BWS Construction Section. Any adjustments to the existing water system to meet the minimum cover and the requirements of the BWS standards, whether shown on the plans or not, shall be done by the Contractor at no cost to the Board of Water Supply.

NOTES

- Layout of pavement markings and striping shall be done by the Contractor and approved by the Engineer prior to any installation work.
- Existing pavement markings and striping not incorporated in the final traffic pattern shall be removed as directed by the Engineer. The removal of the existing pavement markings shall not be paid for separately but shall be considered incidental to the various pavement marking items.
- Raised pavement markers shall not be installed within crosswalks.
- Final locations of all signs shall be approved by the Engineer prior to any installation work.
- Existing signs not shown on these plans shall remain as posted unless otherwise directed by the Engineer. Removal and disposal of existing signs and/or posts as designated on these plans or directed by the Engineer shall not be paid for and shall be considered incidental to the various signing items.
- Final locations of all Stop Lines shall be approved by the Engineer prior to installation.
- All pavement striping shall be as noted on the legend or plans.
- All preformed pavement marking tapes over existing pavement shall be applied with an approved primer as recommended by the tape manufacturer and as approved by the Engineer. The primer shall be allowed to dry to the tacky stage prior to tape application.
- Stop signs indicated to be removed shall be removed after the traffic signal system is operational.
- Removal of existing delineators and posts as directed by the Engineer shall be considered incidental to the various signing items.
- Backing for all new regulatory and warning signs shall not be spliced.
- All sign panels shall conform to Section 621 of Special Provisions and the latest editions and amendments of the following FHWA publications:
 - "Manual on Uniform Traffic Control Devices for Street and Highways" (MUTCD)
 - "Standard Highway Signs"
 - "Standard Alphabets for Highway Signs"
- All new and relocated signs and markers installed on pipe post or light standard are to be mounted with band brackets and steel braces.
- The Contractor shall erect at the beginning of the project and at the end of the project advance construction warning signs as indicated on the plans or as directed by the Engineer for the duration of the highway project and shall be maintained by the Contractor. These signs shall be placed in addition to the required traffic control signs called for in Section 645-Traffic Control. The advance construction warning signs shall be new and become the property of the State. The Contractor shall remove, clean and deliver the signs and posts to the Oahu District Baseyard or as directed by the Engineer at the end of the project. The advance construction warning signs shall be paid under Item No. 621.7110, Construction Sign with two posts.

CONSTRUCTION NOTES

- The scope of work for this project consists of installing a new traffic signal system with appurtenances, pavement striping and markings and signing.
- The Contractor is reminded of the requirements of Subsection 108.01 - Subletting of Contract, which requires him to perform work amounting to not less than 50 percent of the total contract cost less deductible items. Non-compliance with this Subsection may be grounds for rejection of bid.
- The Contractor's attention is directed to the following Sections of the Special Provisions: Subsection 107.13 - Public Convenience and Safety. Subsection 107.21 - Contractor's Contractor's Responsibility for Utility Property and Services. Section 645 - Traffic Control.
- At the end of each day's work, the Contractor shall remove all equipment and other obstructions to permit free and safe passage of public traffic.
- Locations of existing underground structures and utilities such as pipelines, conduits, cables, etc., manholes, monuments and structures 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.
- Contractor shall provide for access to and from all existing side streets and driveways at all times.
- 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", Federal Highway Administration (1988) and as specified in the special provisions. The Contractor shall furnish and maintain adequate barricades, blinkers, construction signs, etc., for the safety of the safety of the motoring public.
- The Contractor shall notify the Oahu Transit Services Inc. (OTS), Ed Sniffen, at 848-4571 or Lowell Tom at 848-4578 two weeks prior to beginning any work, informing them of location, scope of work, proposed closure of any street or traffic lanes and the need to relocate any bus stop.
- Contractor shall provide 3' minimum horizontal clearance from all new signs with posts and traffic signal system facilities (signal standards, pipe guards, controller cabinets, pullboxes, etc.).

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

APPROVED: DATE
5/ Bernard P. Kea 6/10/96
Chief, Planning & Engineering, BWS



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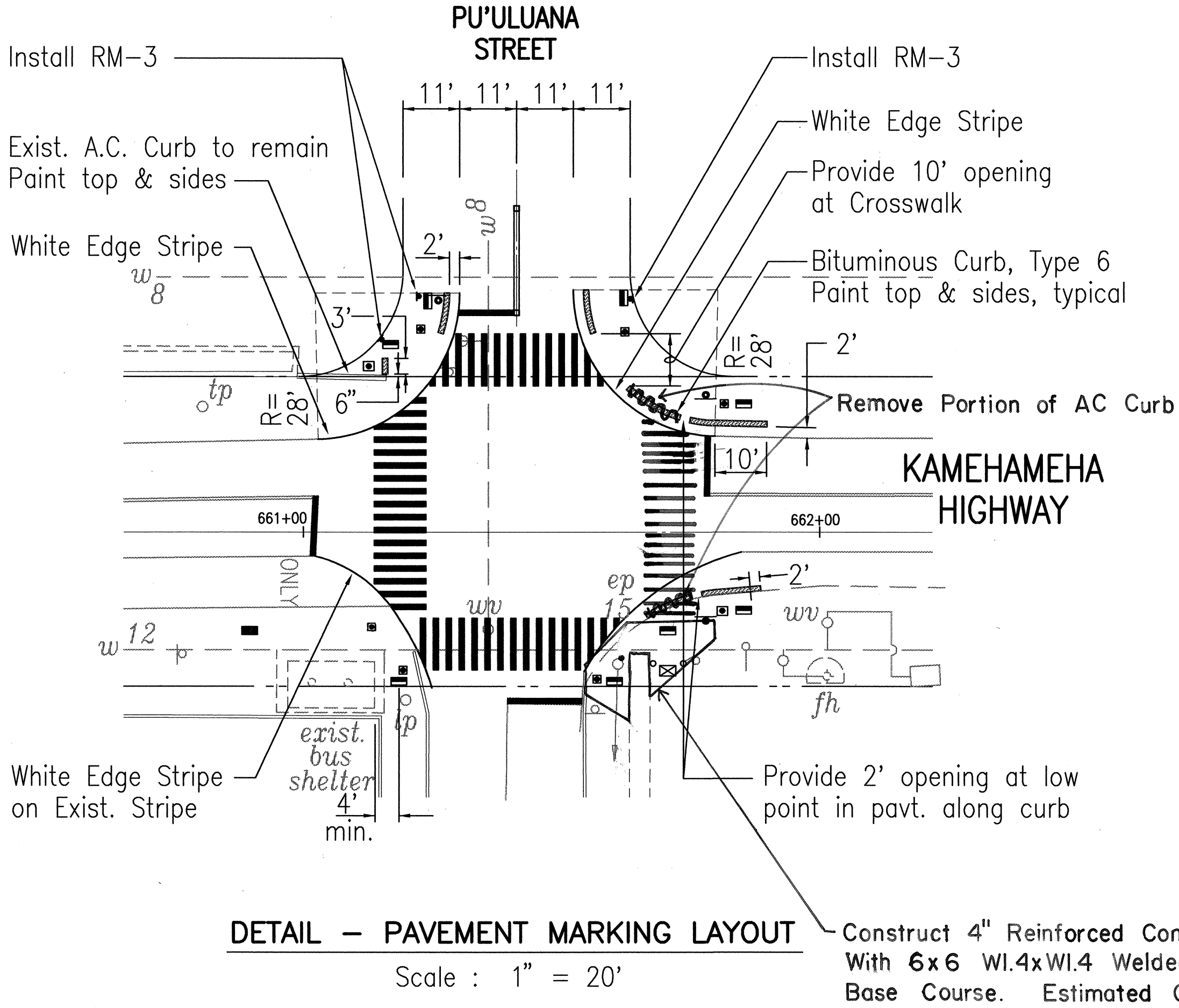
Bernard P. Kea

6/5/96	Added Water Notes Nos. 1 to 11 & BWS Signature Block
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION TRAFFIC NOTES KAMEHAMEHA HIGHWAY Inters. Improvements at Kahuku H.S. F.A. PROJECT NO. STP-083-1(36) Date : SHEET No. 1 OF 2 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	4	15

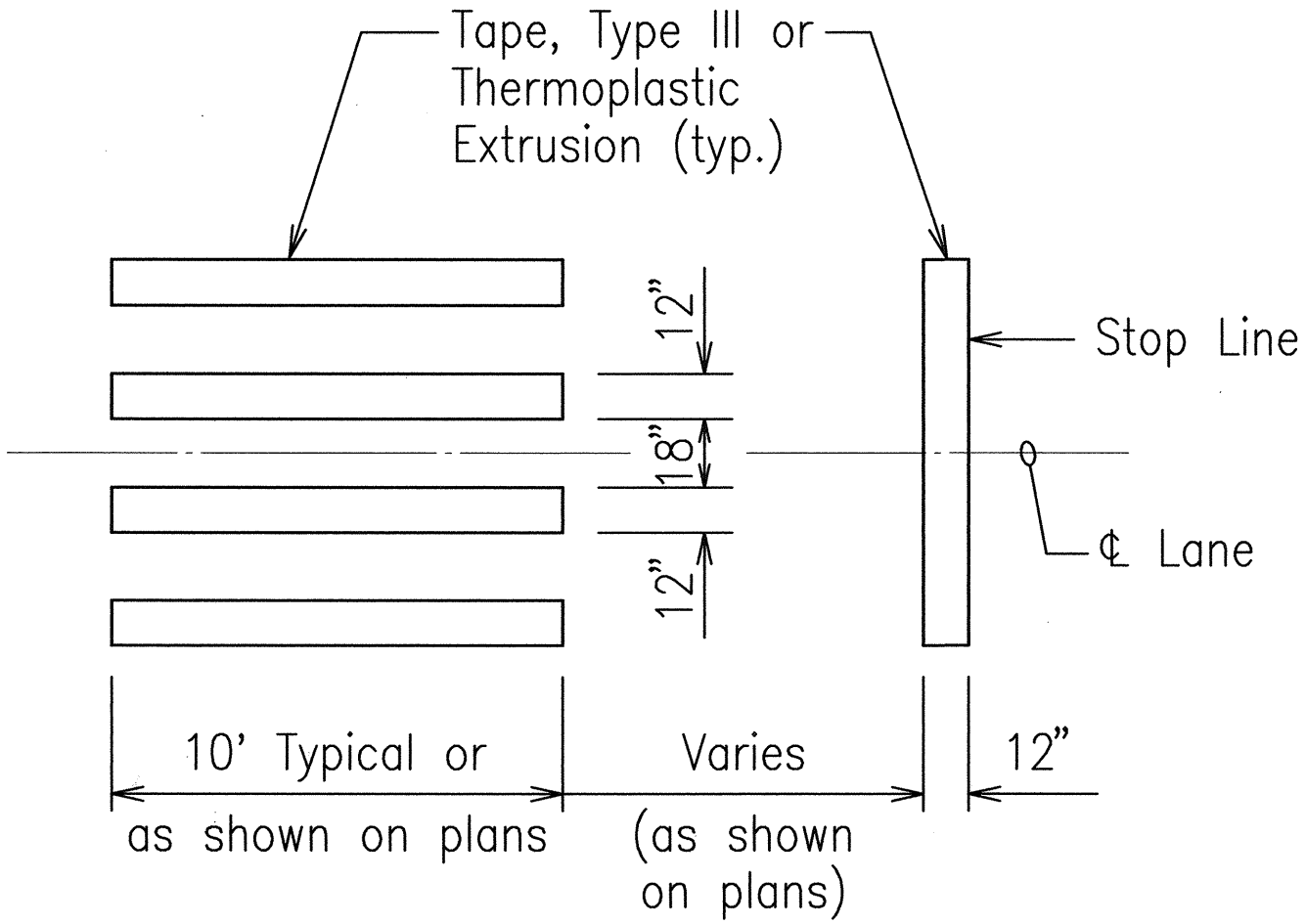
GENERAL NOTES FOR TRAFFIC CONTROL PLAN

- The permittee shall make minor adjustments at intersections, driveways, bridges, structures, etc., to fit field conditions.
- Cones or delineators shall be extended to a point where they are visible to approaching traffic.
- Traffic control devices shall be installed such that the sign or device farthest from the work area shall be placed first. The others shall then be placed progressively toward the work area.
- Regulatory and warning signs within the construction zone that are in conflict with the Traffic Control Plans shall be removed or covered. All signs shall be restored upon completion of the work.
- Flaggers and/or police officers shall be in sight of each other or in direct communication at all times.
- When required by the issuing office, the permittee shall install a flashing arrow signal as shown on the Traffic Control Plans.
- Sign spacings (L), taper lengths (T) and spacings of cones or delineators shall be as shown in Table 1, unless otherwise noted on the Traffic Control Plans.
- All traffic lanes shall be a minimum of 10 feet wide.
- All construction warning signs shall be promptly removed or covered whenever the message is not applicable or not in use.
- The backs of all signs used for traffic control shall be appropriately covered to preclude the display of inapplicable sign messages (i.e., when signs have messages on both faces).
- At the end of each day's work or as soon as the work is completed, the permittee shall remove all traffic control devices no longer needed to permit free and safe passage of public traffic. Removal shall be in the reverse order of installation.
- Replace permanent pavement markings and traffic signs upon completion of each phase of work.
- For sign location and requirements for additional traffic control devices, see Special Provisions Section 645 - Traffic Control, as amended, including "Table 1 For Traffic Control Plan" and "Figure 1A - Traffic Control Plan For Two Lane Highway-One Lane Closed".



LEGEND
(For Sheet Nos. 4 & 5)

- *wv* Exist. Water Valve Box
- ◻ *wm* Exist. Water Meter Box
- *s10* Exist. Sewer Line
- *w12* Exist. Water Line
- *ep, tp* Exist. Utility Pole
- Exist. Anchor Pole
- Exist. Anchor Wire



CROSSWALK STRIPING DETAIL
Not to Scale



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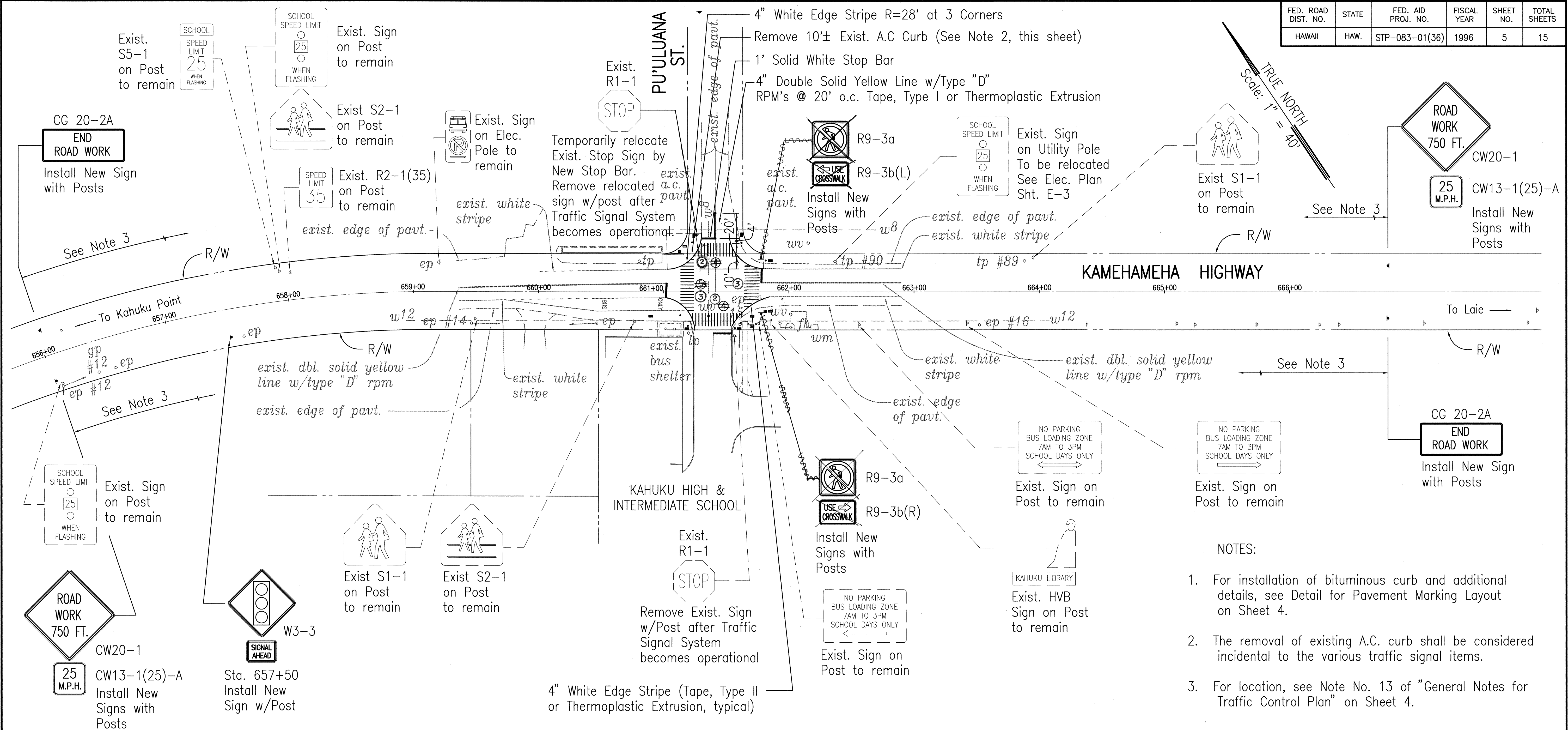
Bernard P. Kea

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
TRAFFIC NOTES AND
PAVEMENT MARKING DETAILS
KAMEHAMEHA HIGHWAY
Inters. Improvements at Kahuku H.S.
F.A. PROJECT NO. STP-083-1(36)
As Shown Date :
SHEET No. 2 OF 2 SHEETS

4

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
NOTE BOOK	
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-01(36)	1996	5	15

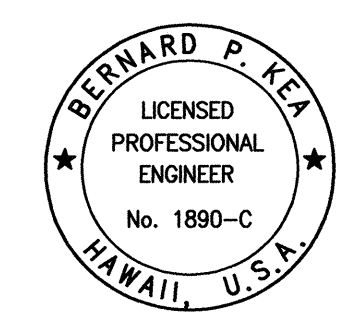


- NOTES:
- For installation of bituminous curb and additional details, see Detail for Pavement Marking Layout on Sheet 4.
 - The removal of existing A.C. curb shall be considered incidental to the various traffic signal items.
 - For location, see Note No. 13 of "General Notes for Traffic Control Plan" on Sheet 4.

PAVEMENT MARKING SUMMARY	
DESCRIPTION	QUANTITY
Pavement Markers Type D	2 ea.
Tape - Type I or Thermoplastic Extrusion Double 4-inch Pavement Stripe (Yellow)	20 lf.
Tape - Type II or Thermoplastic Extrusion 4-inch Pavement Stripe (White)	162 lf.
Tape - Type III or Thermoplastic Extrusion 12-inch Pavement Stripe (White) Crosswalk Markings	50 lf. 13 Lanes

TRAFFIC SIGN SUMMARY					
SIGN NO.	MESSAGE	QUANTITY			
		10 SQ FT OR LESS		GREATER THAN 10 SQ FT	
		W/POST	W/O POST	W/POST	W/O POST
W3-3		1			
R9-3a		2			
R9-3b(L)		1			
R9-3b(R)		1			
RM-3		3			
TOTAL		8	0	0	0

CONSTRUCTION SIGN SUMMARY			
SIGN NO.	MESSAGE	W/POST	W/O POST
CG20-2A	END ROAD WORK	2	
CW20-1 CW13-1(25)-A	ROAD WORK 750 FT. 25 M.P.H.	2	
TOTAL		4	0

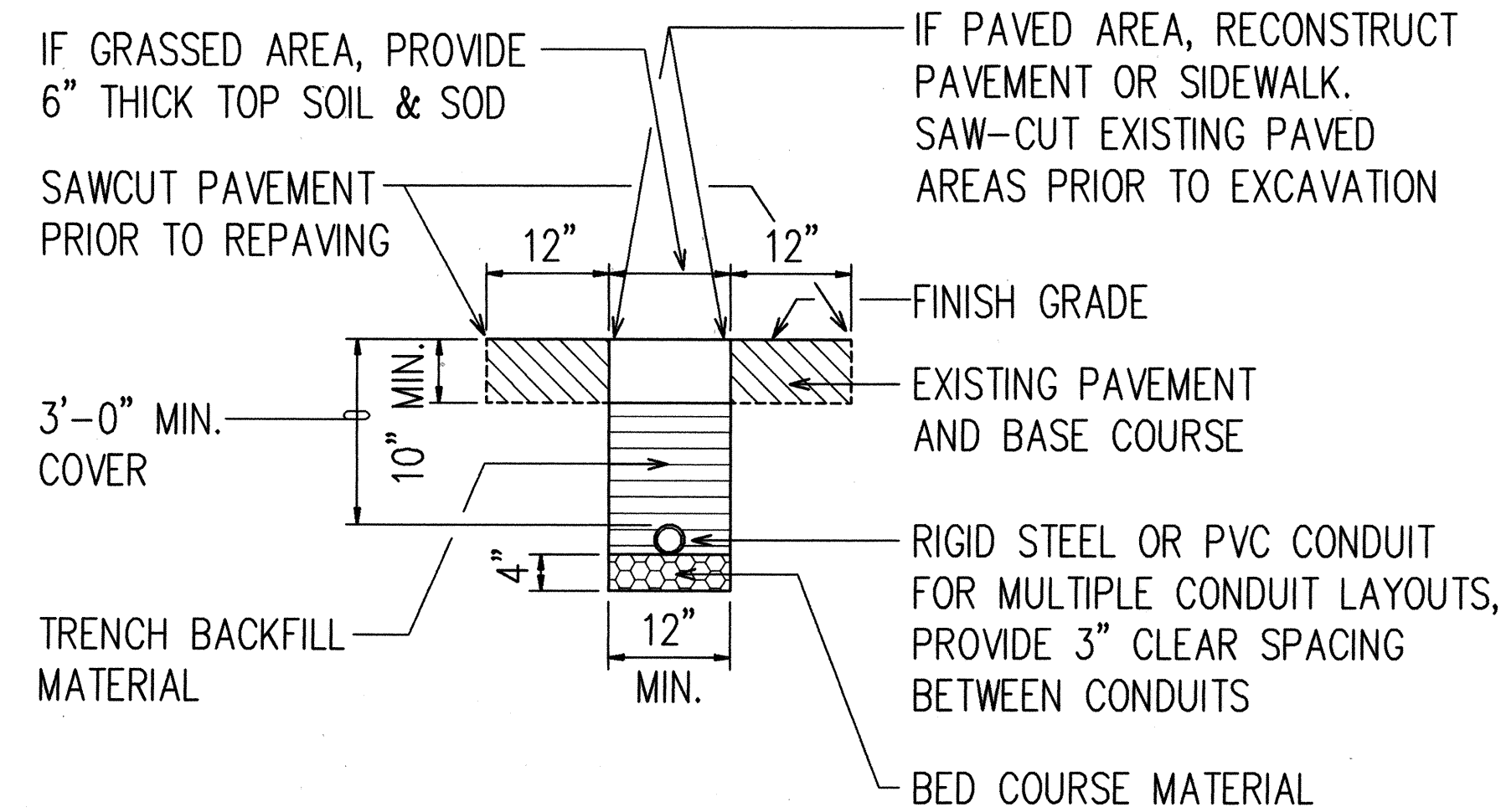


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Bernard P. Kea

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**PAVEMENT MARKING
& SIGNING PLAN**
KAMEHAMEHA HIGHWAY
Inters. Improvements at Kahuku H.S.
F.A. PROJECT NO. STP-083-1(36)
Scale: 1" = 40' Date: _____
SHEET No. 1 OF 1 SHEETS

ELECTRICAL SYMBOLS

ITEM	DESCRIPTION
	STANDARD TRAFFIC AND PEDESTRIAN SIGNAL HEADS MOUNTED ON TYPE I SIGNAL STANDARD, HEIGHT = 10'-0".
	STANDARD TRAFFIC SIGNAL HEADS MOUNTED TYPE II SIGNAL STANDARD, ARM SPREAD SHOWN IS 30'-0".
	PEDESTRIAN SIGNAL HEAD
	PEDESTRIAN PUSHBUTTON ASSEMBLY & SIGN R10-4a(L) OR R10-4a(R), AS INDICATED BY ARROW DIRECTION.
	TRAFFIC SIGNAL HEAD, RYG.
	TRAFFIC SIGNAL HEAD, RYG-STRAIGHT AHEAD ARROW.
	OPTICAL DETECTOR. ARROW INDICATES DIRECTION DETECTOR FACES.
	EXISTING ELECTRICAL/TELEPHONE OVERHEAD CONDUCTORS.
	ELECTRICAL/TELEPHONE DUCTLINE & WIRING AS NOTED.
	UNDERGROUND TRAFFIC SIGNAL SYSTEM RACEWAY, SEE TRENCH SECTION ON THIS SHEET.
	LOOP DETECTOR, SEE DETAILS ON SHEET E-5.
	TRAFFIC SIGNAL SYSTEM TYPE "Z" PULLBOX, SEE DETAIL ON SHEET E-9.
	TRAFFIC SIGNAL SYSTEM TYPE "C1" PULLBOX, SEE DETAIL ON SHEET E-9.
	TRAFFIC SIGNAL SYSTEM TYPE "A1" PULLBOX, SEE DETAIL ON SHEET E-9.
	TRAFFIC SIGNAL CONTROLLER, MODEL 170 WITH 332 CABINET, SEE DETAIL ON SHEET E-6.



NOTE:

1. ALL CONDUITS UNDER ROADWAYS SHALL BE STEEL OR PVC SCHEDULE 80. ALL OTHERS SHALL BE PVC SCHEDULE 40.

TYPICAL TRENCH SECTION FOR CONDUIT

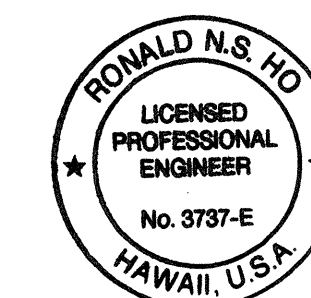
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	6	15

DEMOLITION NOTES:

1. PLANS DO NOT INDICATE COMPLETE EXISTING ELECTRICAL CONDITIONS. CONTRACTOR SHALL VISIT JOBSITE TO BECOME FAMILIAR WITH ALL EXISTING CONDITIONS AND EXTENT OF DEMOLITION AND NEW WORK PRIOR TO THE START OF WORK.
2. PRIOR TO THE START OF WORK, CONTRACTOR SHALL VISIT JOBSITE AND REPORT ANY DISCREPANCIES AND/OR DIFFERENCE IN DRAWINGS, IN RESPECT TO EXISTING CONDITION, TO ENGINEER OR HIS REPRESENTATIVE.
3. CONTRACTOR SHALL RESOLVE ALL DISCREPANCIES AND QUESTIONS PRIOR TO THE START OF WORK. NO EXTRA PAYMENT SHALL BE ALLOWED ON ACCOUNT OF WORK MADE NECESSARY BY CONTRACTOR'S FAILURE TO VISIT THE SITE AND/OR FAILURE TO RESOLVE DISCREPANCIES AND QUESTIONS.
4. AREAS TO BE CONSTRUCTED SHALL BE DONE IN PHASES. VERIFY WITH ENGINEER OR HIS REPRESENTATIVE FOR PHASING SEQUENCE. PROVIDE ALL WIRING AND CONNECTIONS, PER NEC REQUIREMENTS, TO ENSURE CONTINUITY OF ELECTRICAL AND TELEPHONE EQUIPMENT TO REMAIN IN USE AT NO ADDITIONAL COST TO THE OWNER.
5. BEFORE ANY ELECTRICAL WIRING IS CUT, CONTRACTOR SHALL VERIFY USAGE OF WIRING TO ENSURE THAT REQUIRED SERVICES ARE NOT DISCONTINUED.
6. REMOVE ALL EXISTING EXPOSED CONDUIT AND WIRES NOT TO REMAIN IN SERVICE; CONCEALED RACEWAYS NO LONGER REQUIRED SHALL BE CAPPED AND ABANDONED IN PLACE WITH ALL WIRES REMOVED.
7. RETURN ALL SALVABLE APPARATUS, AS DETERMINED BY THE STATE, TO A SITE DESIGNATED BY THE STATE, AT NO ADDITIONAL COST TO THE STATE. DISPOSE OF ALL UNWANTED MATERIALS.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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PROJECT: 083-1(36) SHEET: 6



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Ronald N.S. Ho
5/3/96

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
ELECTRICAL SYMBOLS, TYPICAL TRENCH SECTION, DEMOLITION NOTES	
KAMEHAMEHA HIGHWAY Inters. Improvements at Kahuku H. S.	
F.A. PROJECT NO. STP-083-1(36)	
SCALE: AS NOTED	DATE:
SHEET No. E-1 OF E-9 SHEETS	

GENERAL NOTES – TRAFFIC SIGNAL SYSTEM

1. 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.
2. 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.
3. ALL NEW CONDUITS UNDER ROADWAY SHALL BE PVC SCHEDULE 80.
4. IN ADDITION TO THE CONDUITS INDICATED IN THE "CONDUIT AND CABLE SCHEDULE". INSTALL ONE 3-INCH CONDUIT IN THE FOOTINGS OF ALL CONTROLLERS. CONDUIT SHALL BE STUBBED OUT 12 INCHES FROM FOOTING AND SHALL BE CAPPED.
5. A SOLID #8 BARE COPPER WIRE SHALL BE INSTALLED IN THE ENTIRE TRAFFIC SIGNAL CONDUIT SYSTEM FOR USE AS A SYSTEM GROUND.
6. LEAD-IN WIRES IN PULLBOX NEAR LOOPS SHALL BE TAGGED WITH LOOP NUMBER(S).
7. 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:
- (a) MAKE ALL ELECTRICAL EQUIPMENT CONNECTIONS IN THE FIELD FOR SIGNAL SYSTEM AFTER THE SYSTEM HAS BEEN INSTALLED IN PLACE BY THE CONTRACTOR.
- (b) FINAL ADJUSTMENT OF TRAFFIC SIGNAL CONTROL EQUIPMENT.
8. 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.
9. 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.
10. ALL TRAFFIC SIGNAL CONTROLLER EQUIPMENT SHALL BE COMPLETELY WIRED IN THE CABINET AND SHALL CONTROL THE TRAFFIC SIGNALS AS CALLED FOR IN THE PLANS.
11. SIGNAL INDICATIONS DURING CLEARANCE INTERVAL:
- A. 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.
- B. 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.
- C. IF THE SIGNAL IS R AND WILL REMAIN R OR BECOMES G DURING THE NEXT PHASE, IT SHALL REMAIN R DURING THE CLEARANCE INTERVAL.

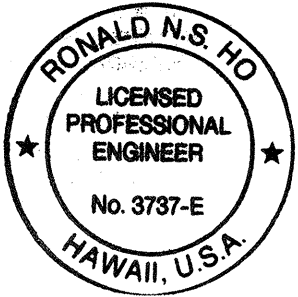
DEPARTMENT OF TRANSPORTATION SERVICES--
ELECTRICAL & MAINTENANCE SERVICES DIVISION NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER, 1986, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, EXCEPT AS MODIFIED HEREIN OR IN THE SPECIAL PROVISIONS.
2. THE CONTRACTOR SHALL VERIFY WITH THE RESPECTIVE UTILITY COMPANIES AND GOVERNMENT AGENCIES, THE LOCATIONS OF ALL ELECTRIC, TELEPHONE, TRAFFIC SIGNAL, STREET LIGHT, FIRE ALARM, GAS, WATER, SEWER, DRAIN, AND OTHER LINES CROSSING THE EXCAVATION PATH OR IN EXCAVATION AREAS.
3. THE LOCATIONS OF ALL NEW TRAFFIC SIGNAL STANDARDS AND CONTROLLERS ON THE DRAWINGS ARE APPROXIMATE. EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER. CONFLICTS BETWEEN STANDARDS AND CROSSWALK LOCATIONS SHALL BE AVOIDED WHEREVER POSSIBLE. THE LOCATIONS OF TRAFFIC SIGNAL STANDARDS, CONTROLLERS, PULLBOXES, AND CONDUITS SHALL BE STAKED OUT BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO ANY EXCAVATION.
4. ALL STRUCTURES, PAVEMENTS, UTILITIES, LANDSCAPING, AND OTHER TOPOGRAPHICAL FEATURES SHOWN ON THE INTERSECTION DRAWINGS ARE EXISTING AND ARE TO REMAIN UNLESS NOTED OR INDICATED OTHERWISE.
5. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES AND GOVERNMENT AGENCIES OF THEIR INTENT TO BEGIN CONSTRUCTION ON ANY INTERSECTION OR STREET AT LEAST TWO (2) WEEKS PRIOR TO THE START OF SUCH CONSTRUCTION.
6. THE CONTRACTOR MAY CLOSE ONLY ONE LANE OF TRAFFIC AT A TIME FOR ANY REASON. DURING THE PEAK TRAFFIC PERIODS FROM 5:30 TO 9:00 A.M. AND FROM 3:00 TO 6:00 P.M., MONDAY THROUGH FRIDAY, ALL LANES SHALL BE KEPT OPEN AND MAINTAINED AT ALL TIMES.
7. ALL CABLES EXCEPT TYPE 4 SENSOR LOOP CABLES SHALL BE INSTALLED IN CONDUITS IN GROUPS OF ONE OR MORE CABLES BETWEEN PULLBOXES AS SPECIFIED ON THE PROJECT PLANS. TYPE 4 CABLES SHALL BE INSTALLED IN SAWCUTS AND CONDUITS IN THE GROUPS SHOWN ON THE DETAILS FOR SENSOR LOOPS.
8. TYPE "A" BACKFILL – EARTH AND GRAVEL, ROCK SIZE TO BE 1" AND THE MIXTURE TO CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.
9. TYPE "B" BACKFILL – EARTH AND GRAVEL, MIXTURE MUST PASS A 1/2" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES. 95% COMPACTION.
10. IF NORMAL MATERIAL AT BOTTOM OF TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL PROVIDED.
11. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE 523-4589).

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	7	15

DATE	____
SURVEY PLOTTED BY	____
ORIGINAL PLAN	____
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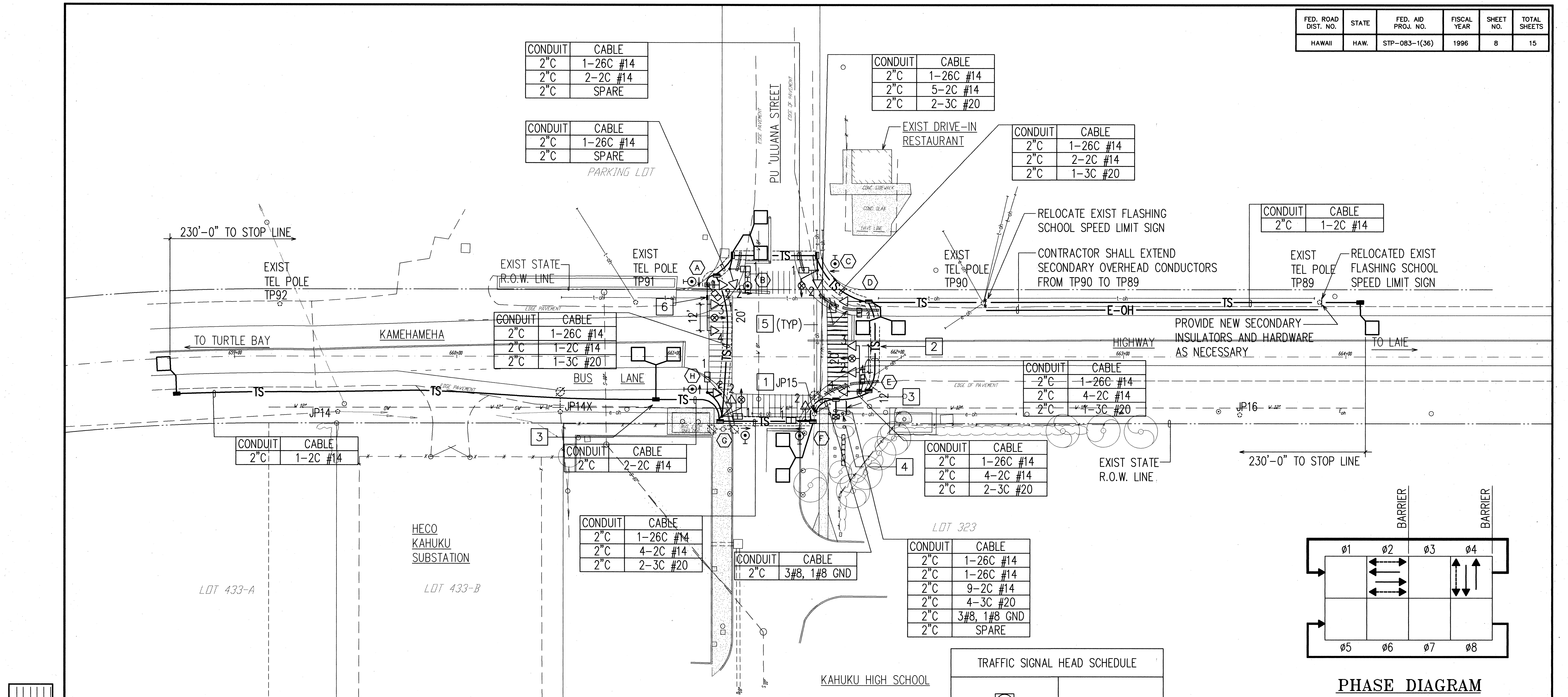
ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER, 1986, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, EXCEPT AS MODIFIED HEREIN OR IN THE SPECIAL PROVISIONS.



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Unafonso
5/2/96

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
CONSTRUCTION NOTES	
KAMEHAMEHA HIGHWAY Inters. Improvements at Kohuku H. S.	
F.A. PROJECT NO. STP-083-1(36)	
SCALE: AS NOTED	DATE:
SHEET No. E-2 OF E-9 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	8	15



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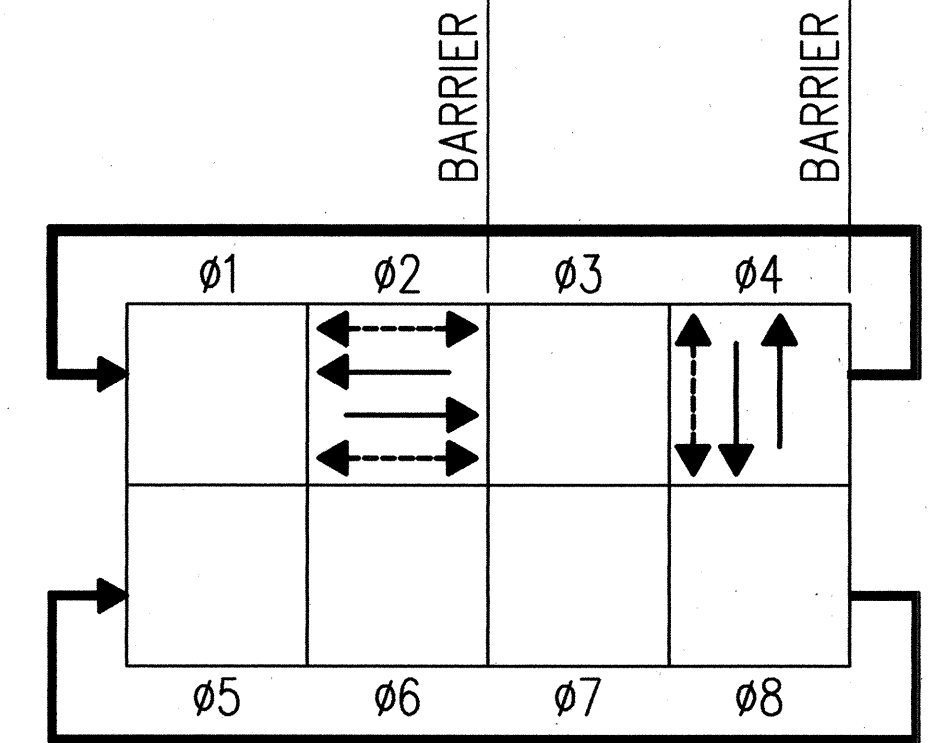
- NOTES:
- 1 REMOVE EXIST METER, CONDUIT RISERS & WEATHERHEADS AND REPLACE WITH NEW. SEE SERVICE EQUIPMENT ELEVATION ON SHT E-4 FOR DETAILS.
 - 2 SAWCUT EXIST AC PAVEMENT/SIDEWALK PRIOR TO TRENCHING. REPAIR TO MATCH EXISTING.
 - 3 PROVIDE 3'-0" MINIMUM CLEARANCE BETWEEN EXIST BWS 12" WATER MAIN AND NEW TRAFFIC SIGNAL EQUIPMENT.
 - 4 PROVIDE STANCHION, SEE DETAIL ON SHT E-4.
 - 5 NEW AC BERMS, SEE SHT NO 4 FOR EXACT LOCATION AND DETAILS.
 - 6 INSTALL STREET NAME SIGN. FOR DETAILS, SEE SHT NO 15.



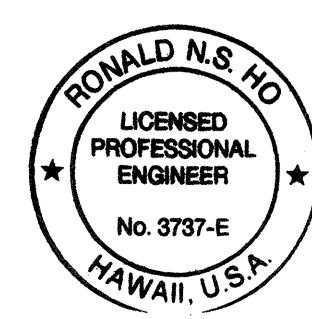
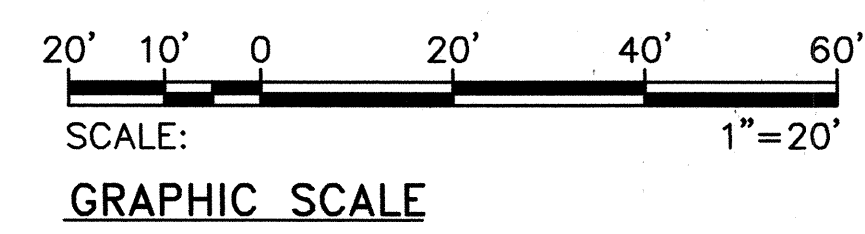
TRAFFIC SIGNAL PLAN
 SCALE: 1"=20'

TRAFFIC SIGNAL HEAD SCHEDULE					
12" RYG TRAFFIC SIGNAL HEAD			PEDESTRIAN SIGNAL HEAD		
A-2	C-2	E-3	A-1	G-1	
A-3	D-1	F-2	B-1	H-1	
A-4	E-1	G-2	C-1	D-2	
B-2	E-2	H-2	F-1	E-4	

TRAFFIC SIGNAL HEAD DESIGNATION: A-2
 POLE LETTER _____
 SIGNAL NUMBER _____



PHASE DIAGRAM



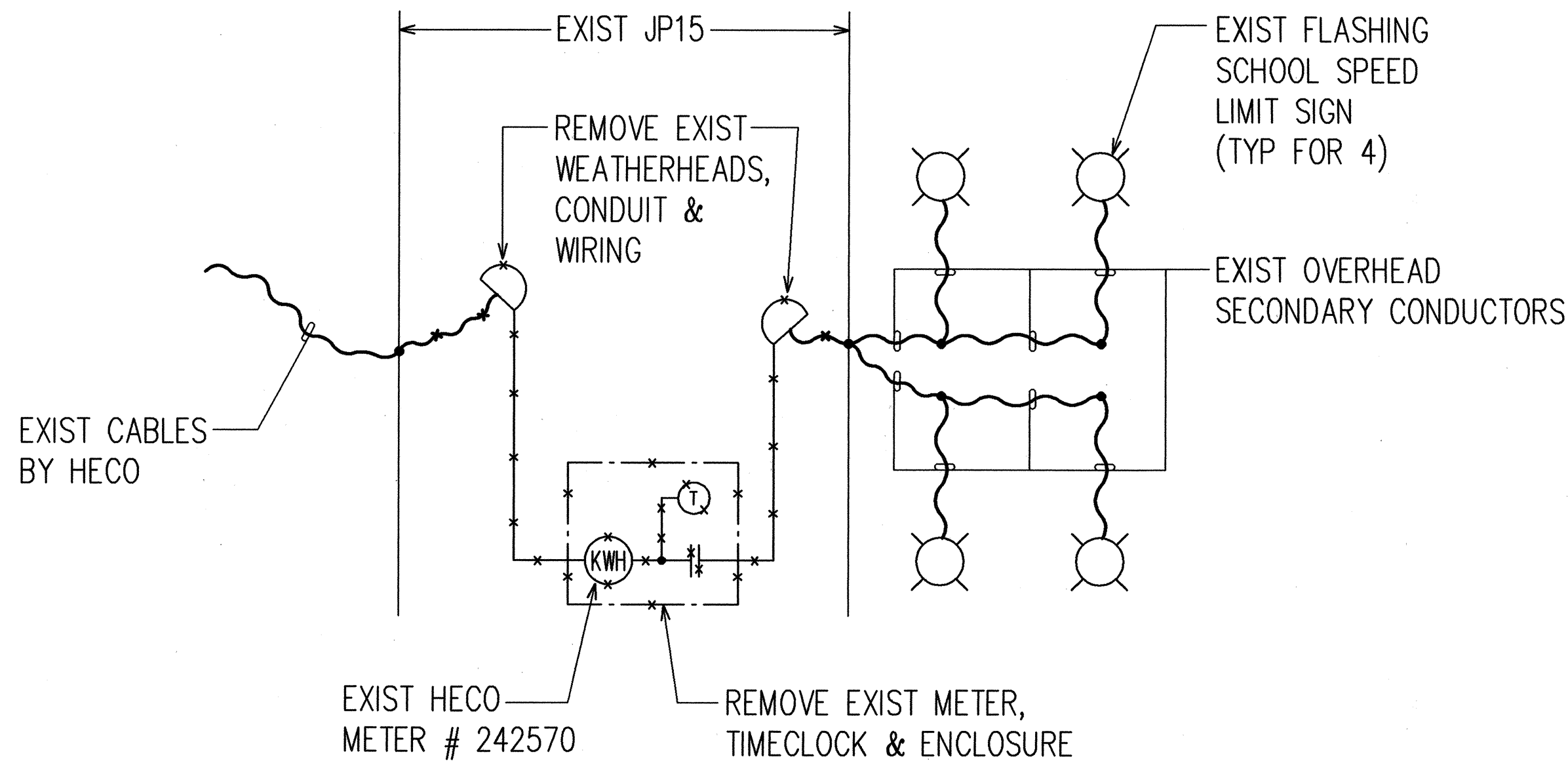
THIS WORK WAS PREPARED BY ME
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Ronald N.S. Ho
 5/2/96

STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

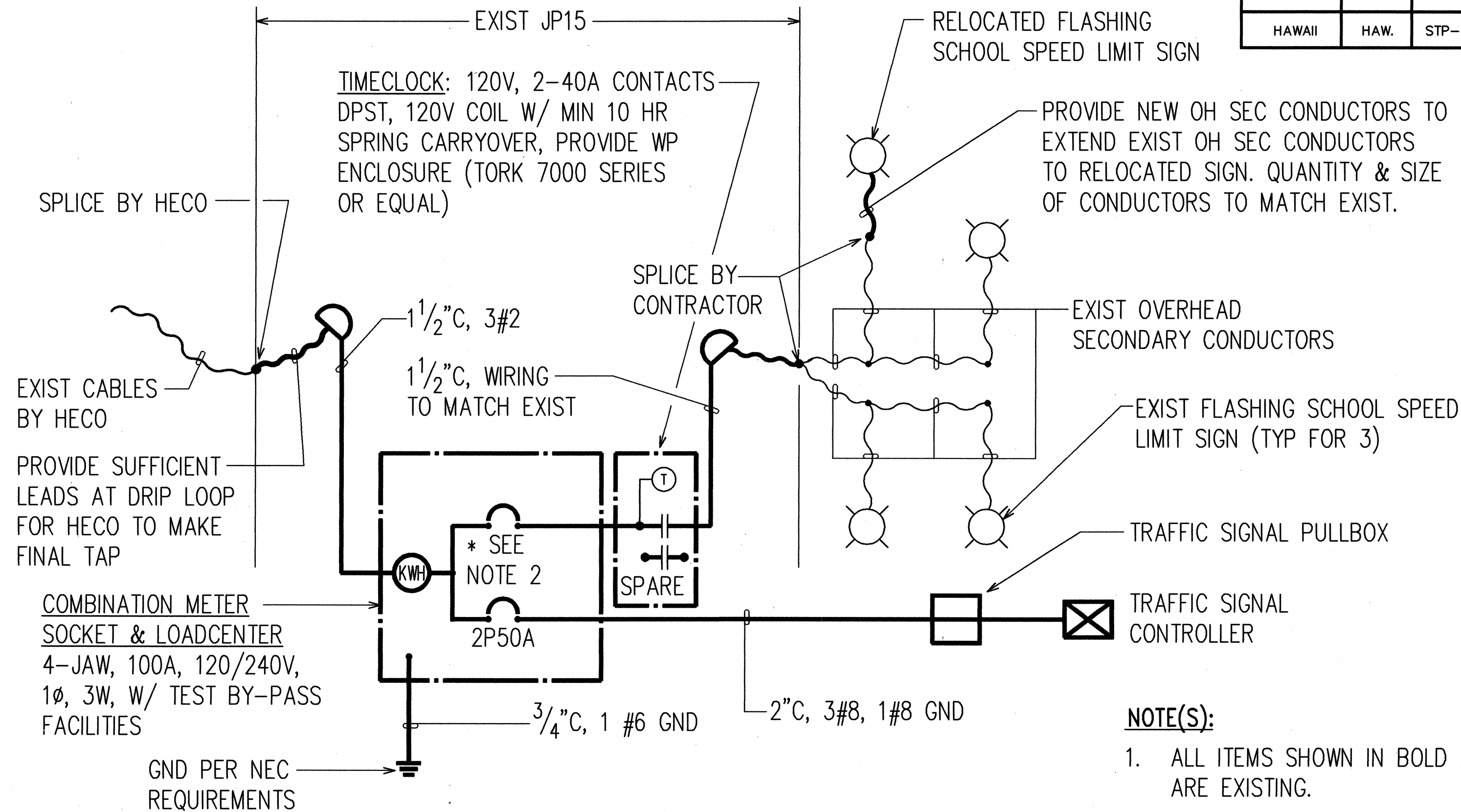
TRAFFIC SIGNAL PLAN

 KAMEHAMEHA HIGHWAY
 Inters. Improvements at Kahuku H. S.
 F.A. PROJECT NO. STP-083-1(36)
 SCALE: AS NOTED
 DATE: _____
 SHEET No. E-3 OF E-9 SHEETS

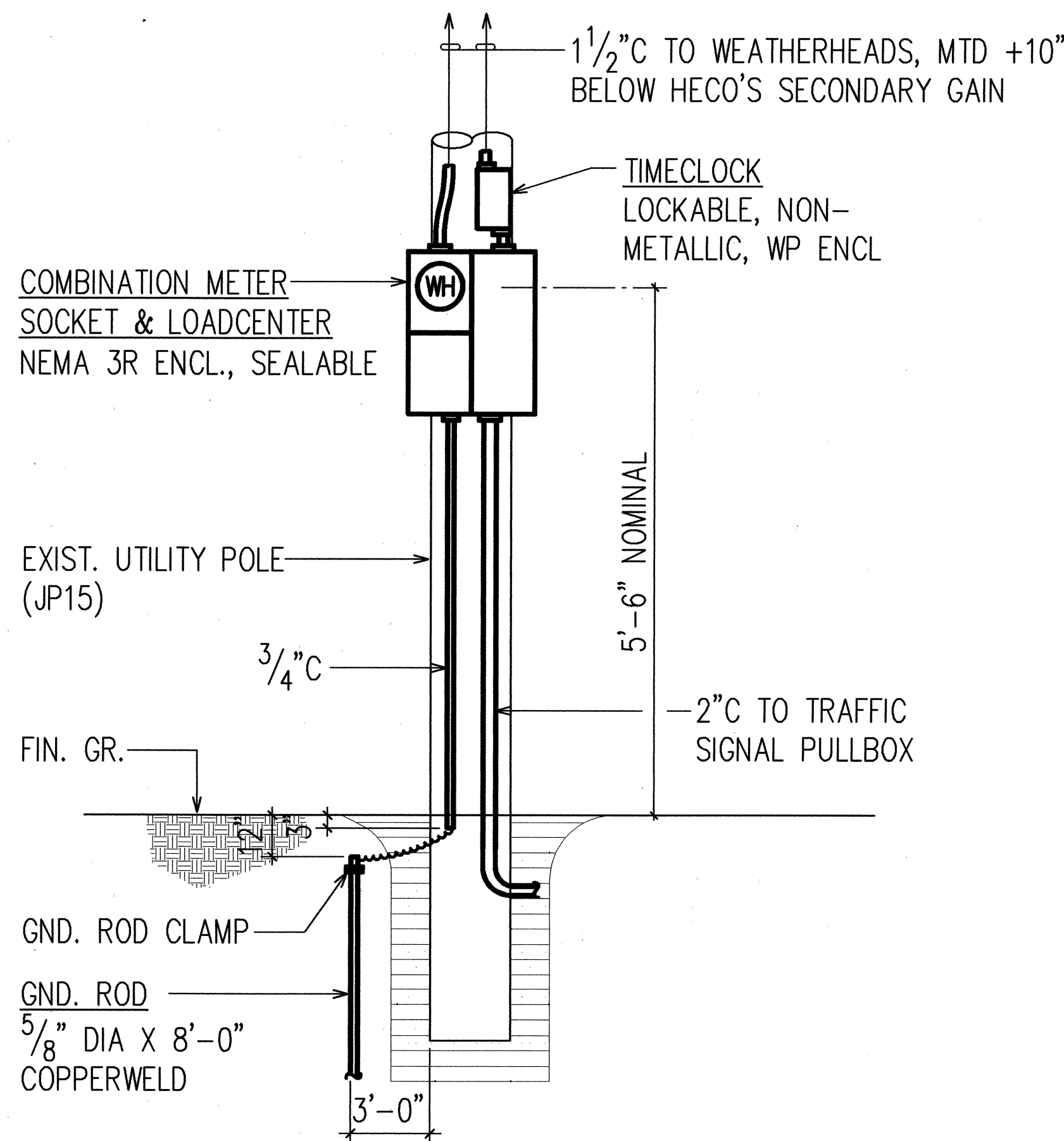
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	9	15



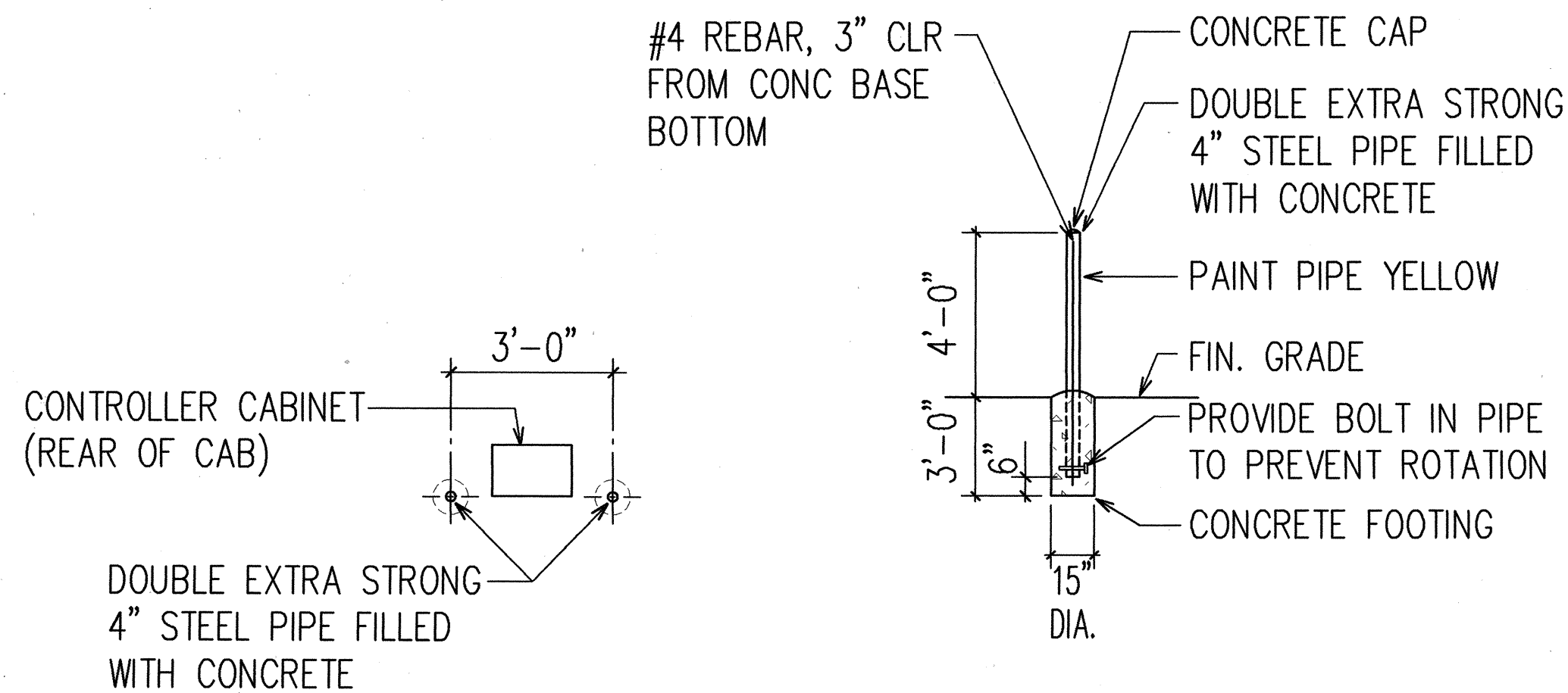
ONE-LINE DIAGRAM - DEMOLITION



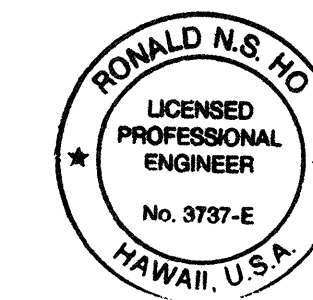
ONE-LINE DIAGRAM - NEW



SERVICE EQUIPMENT ELEVATION
NOT TO SCALE



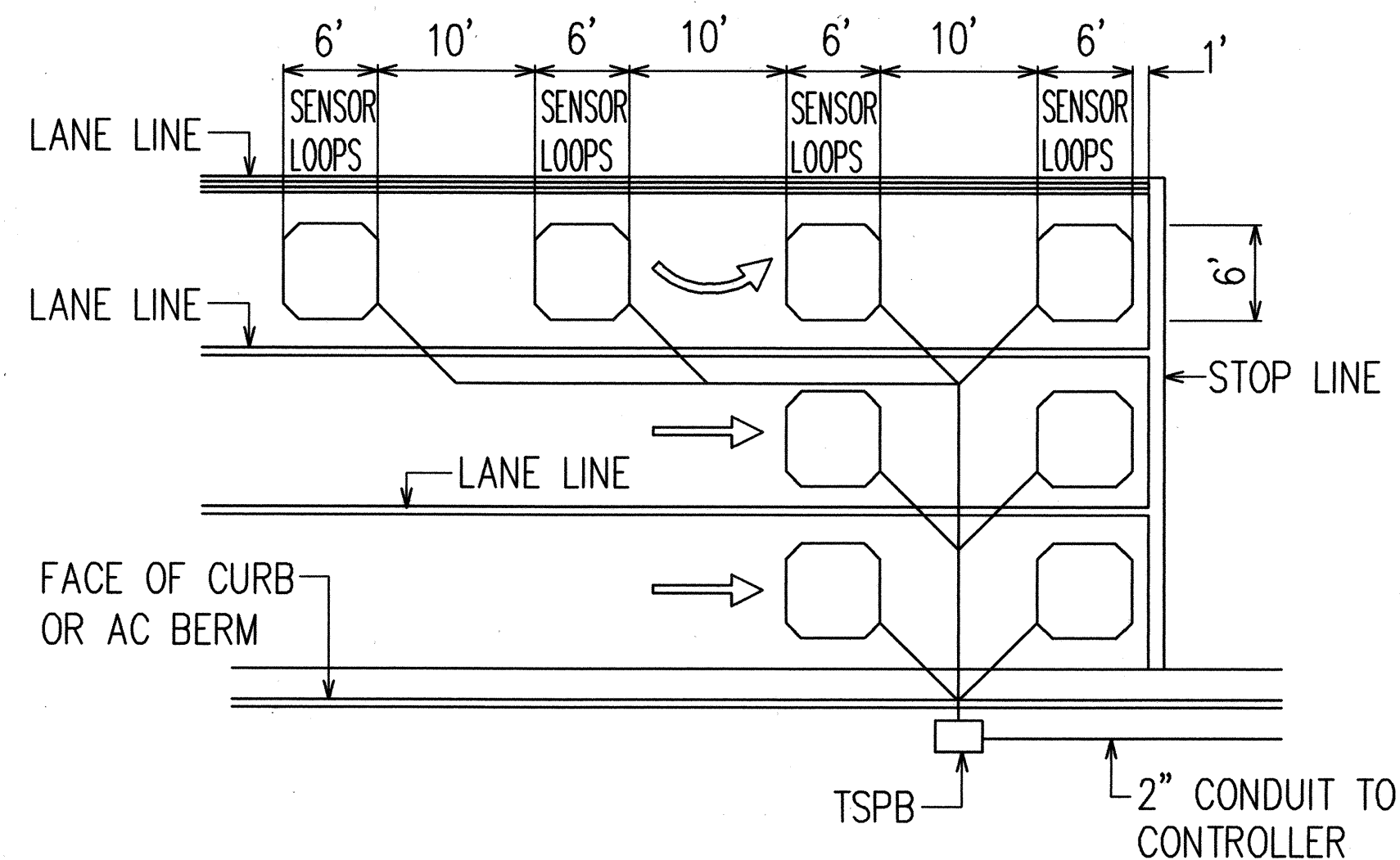
PIPE GUARD DETAIL
NOT TO SCALE



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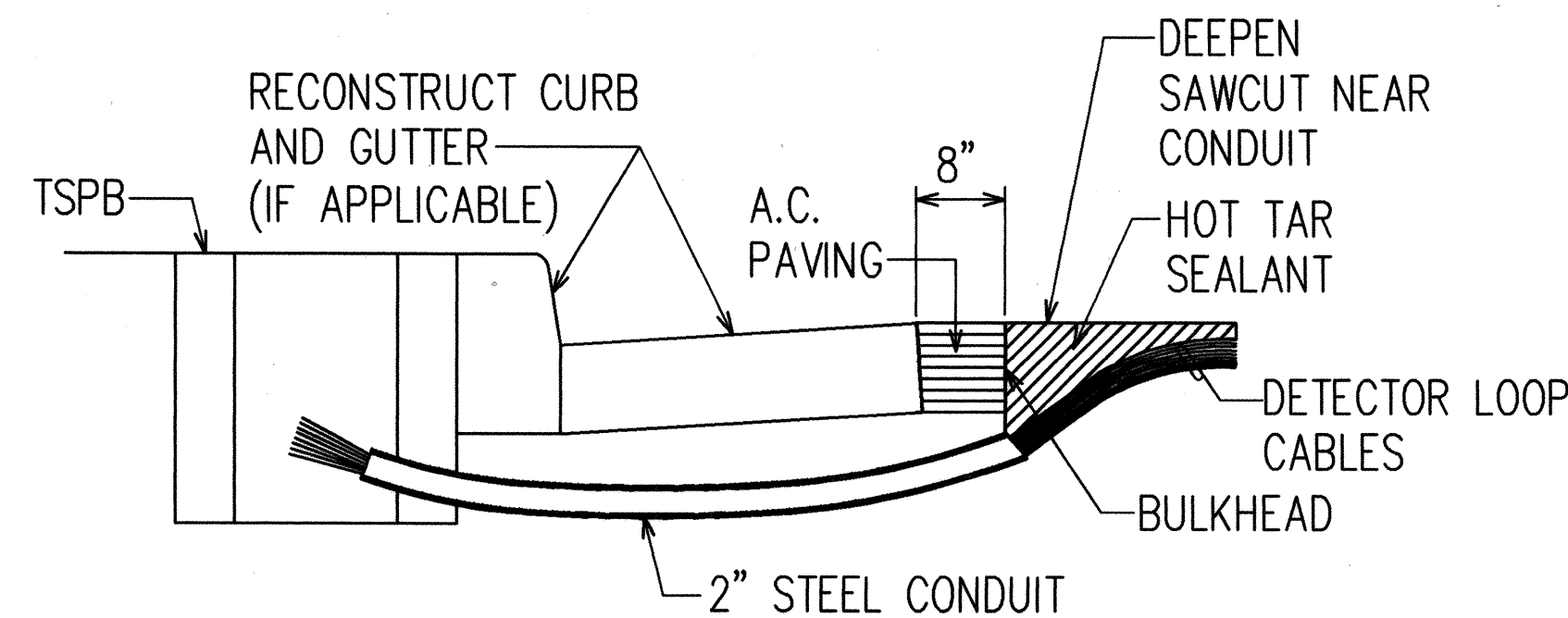
6/13/96	General Revisions Per HECO Comments
DATE	REVISION
STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION ONE-LINE DIAGRAMS, MISC DETAILS KAMEHAMEHA HIGHWAY Inters. Improvements at Kahuku H. S. F.A. PROJECT NO. STP-083-1(36) SCALE: AS NOTED DATE: SHEET No. E-4 OF E-9 SHEETS	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	10	15



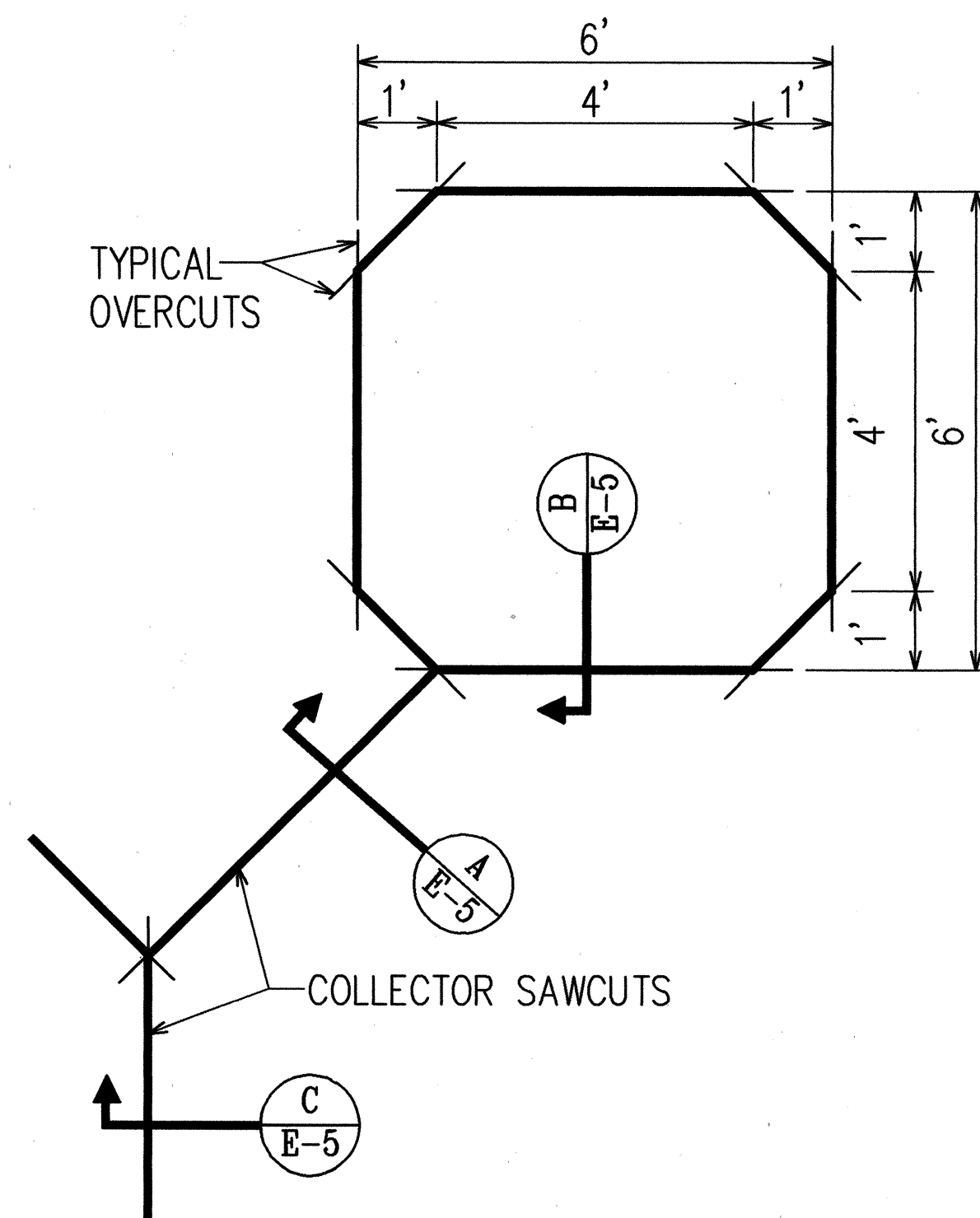
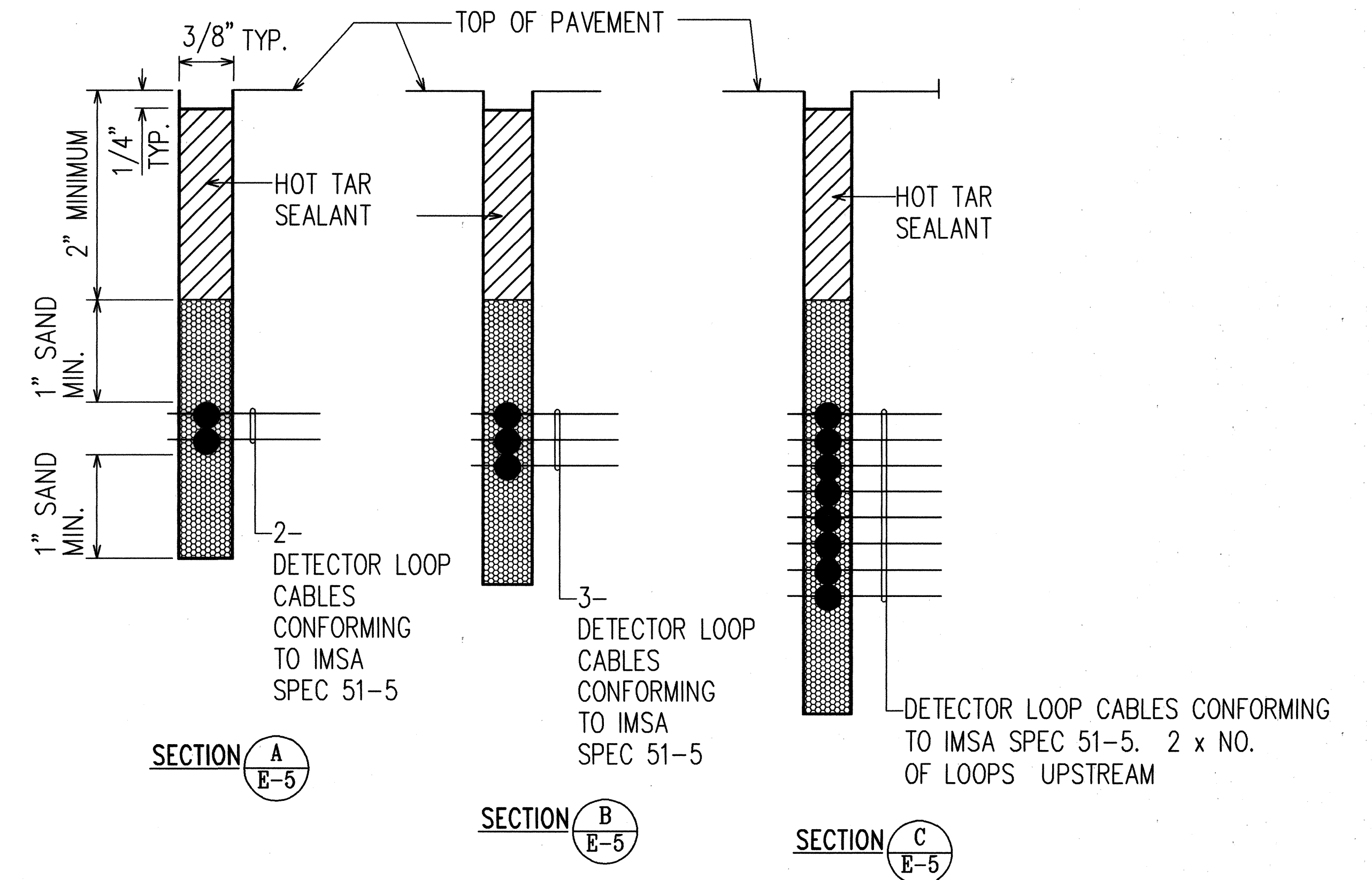
- NOTES:
1. CENTER SENSOR LOOPS IN LANES.
 2. COLLECTOR CABLES SHALL BE TWISTED 2 TURNS PER FOOT.
 3. NUMBER OF LOOPS AND LOCATIONS VARY. SEE PROJECT PLANS.
 4. NUMBER AND LOCATIONS OF COLLECTOR SAWCUTS MAY BE VARIED IN THE FIELD TO SUIT.

TYPICAL SENSOR LOOP LAYOUT



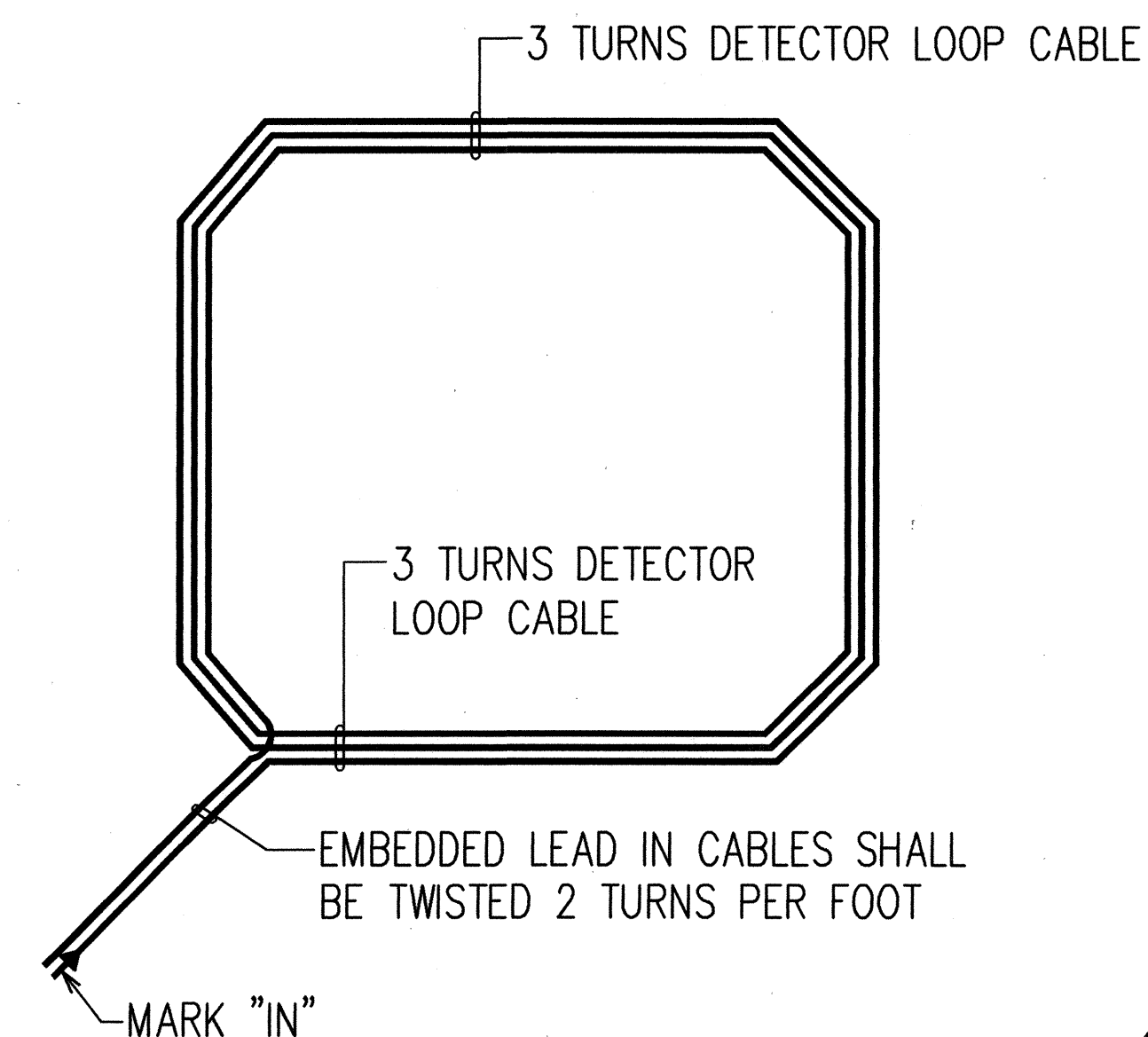
- NOTES ON CONSTRUCTION AT END OF SAWCUT
1. SEAL ROADWAY END OF CONDUIT AFTER INSTALLATION OF CONDUCTORS
 2. INSTALL BULKHEAD ACROSS CONDUIT TRENCH.
 3. PLACE HOT TAR IN SAWCUT.
 4. BACKFILL OVER CONDUIT WITH NEW A.C.
 5. RECONSTRUCT CURB AND GUTTER AS REQUIRED.

DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF ROADWAY

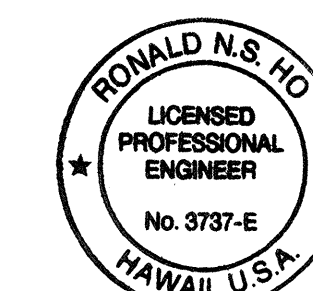


NOTE: LENGTH OF OVERCUTS SHALL BE KEPT TO A MINIMUM.
ALL OVERCUTS SHALL BE BACKFILLED WITH HOT TAR.

TYPICAL SENSOR LOOP SAWCUT DETAIL



TYPICAL SENSOR LOOP WIRING DIAGRAM



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Ronald N.S. Ho
5/2/96

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

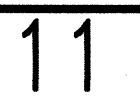
KAMEHAMEHA HIGHWAY
Inters. Improvements at Kahuku H. S.
F.A. PROJECT NO. STP-083-1(36)
SCALE: AS NOTED
DATE:

SHEET No. E-5 OF E-9 SHEETS

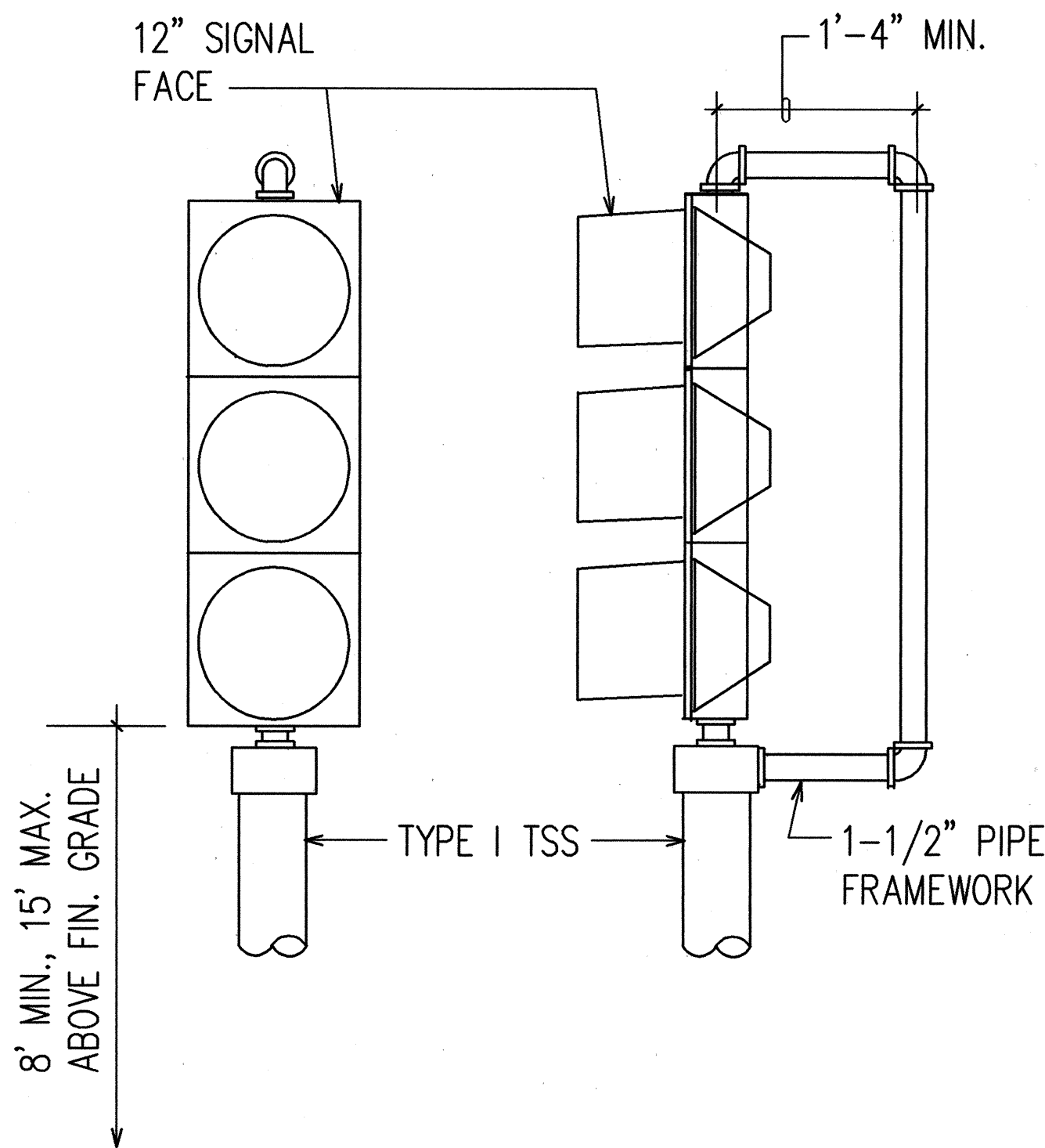
ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

TYPICAL LAYOUT AT SHOULDER AREAS

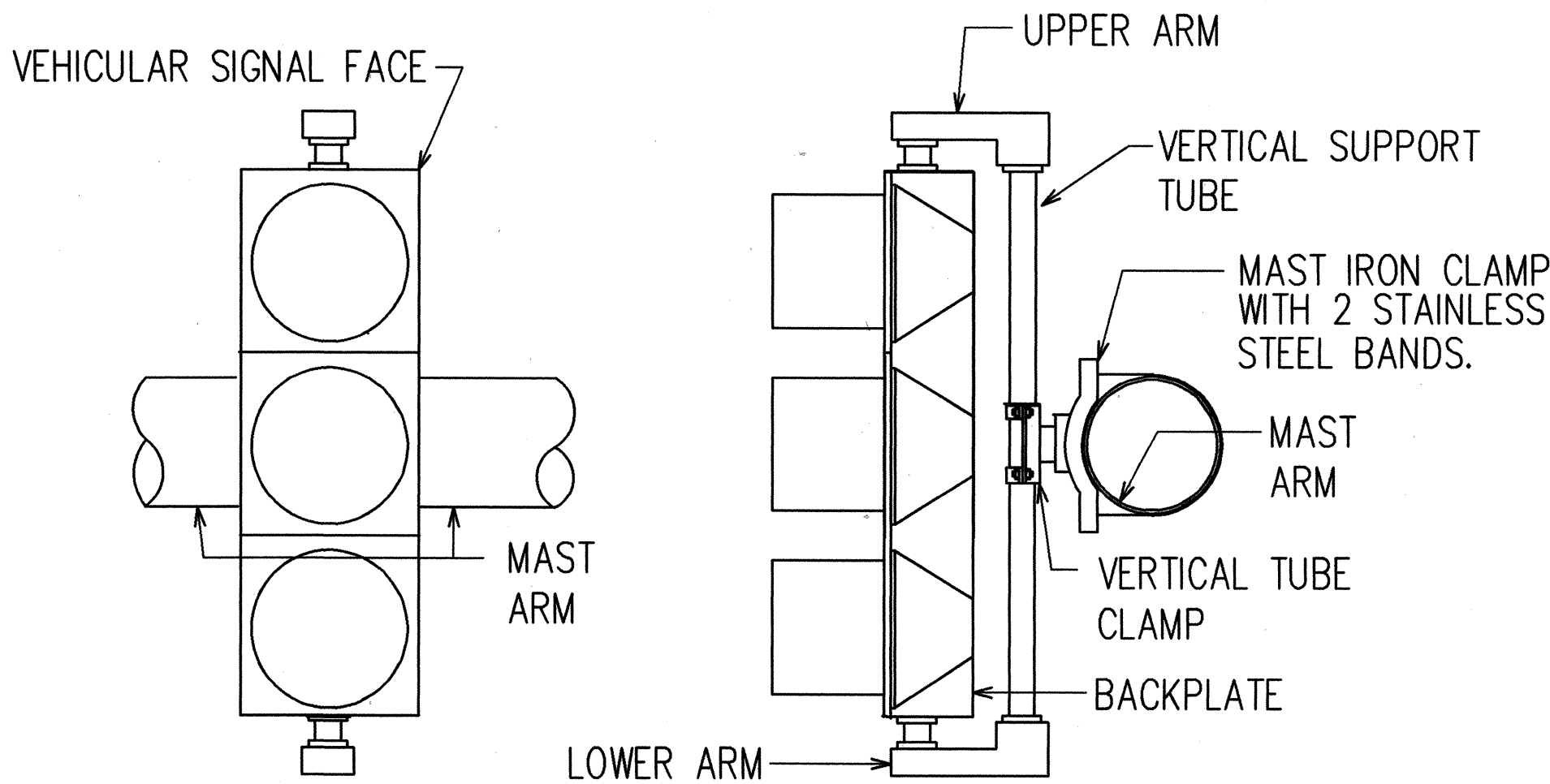
ORIGINAL PLAN	SURVEY PLOTTED BY _____	DATE _____
NOTE BOOK	DRAWN BY _____	" _____
	TRACED BY _____	" _____
	DESIGNED BY _____	" _____
	QUANTITIES BY _____	" _____
No. _____	CHECKED BY _____	" _____



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	12	15

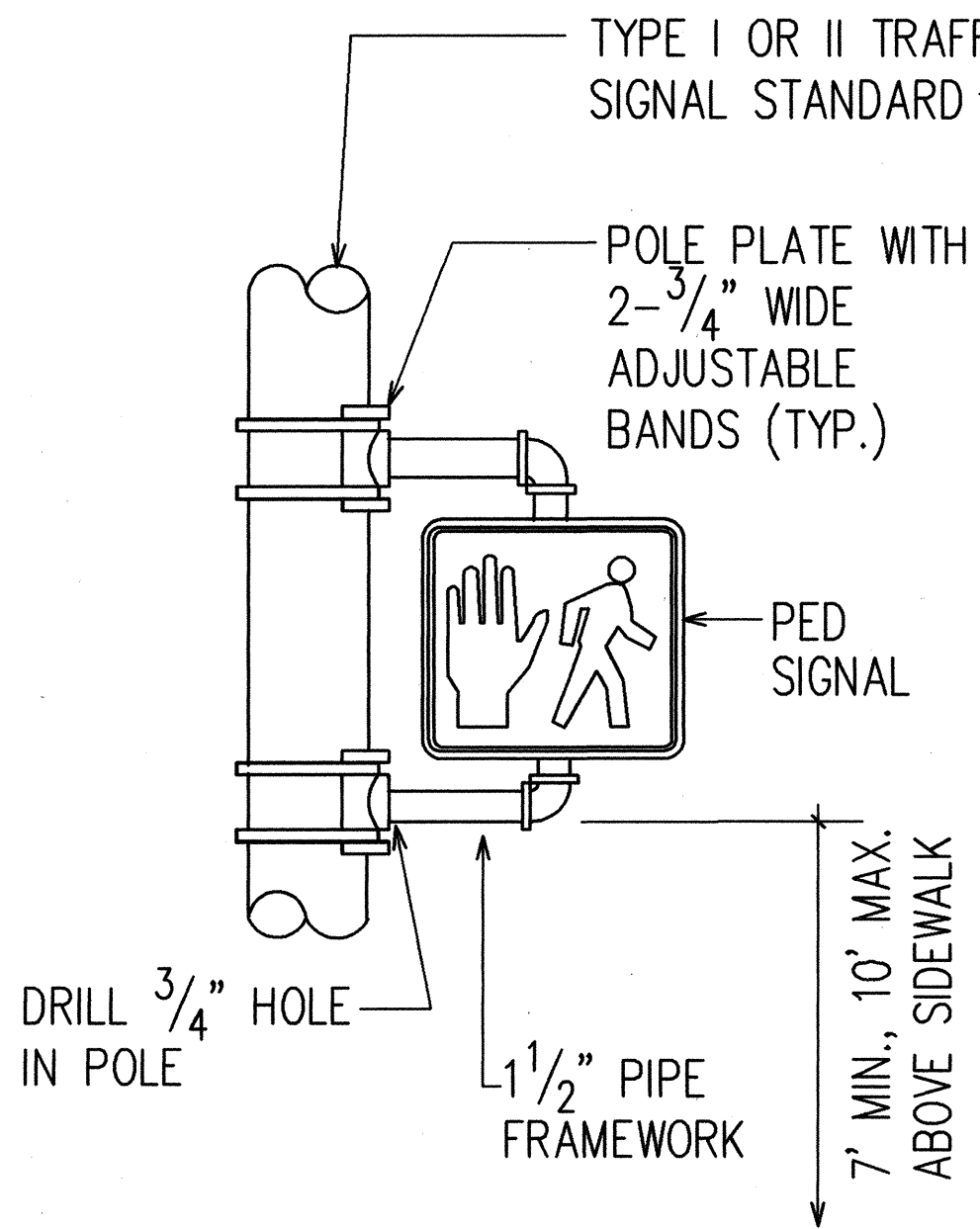


TOP OF POLE - ONE WAY MOUNTING

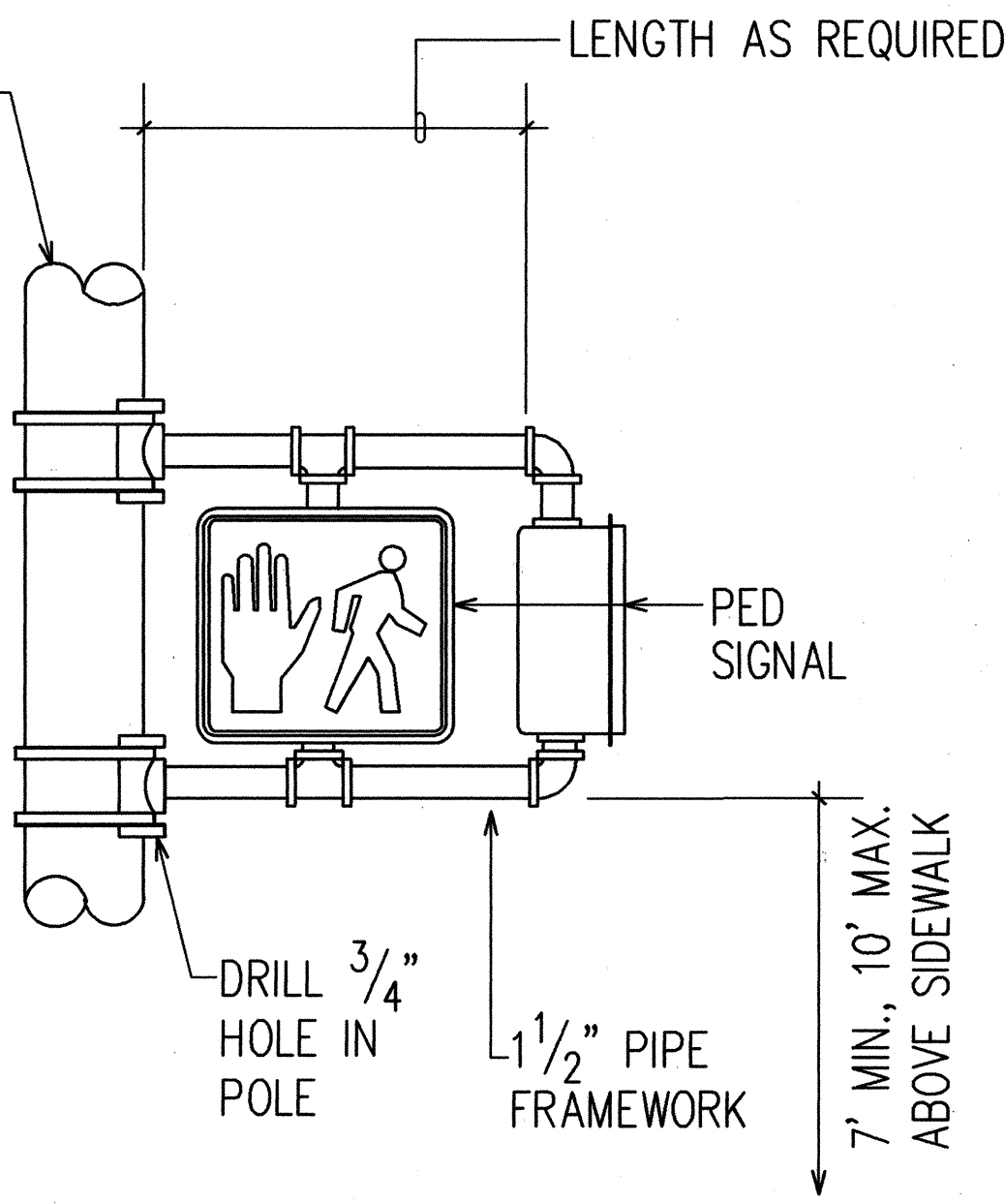


ADJUSTABLE MAST ARM ONE WAY MOUNTING AT INTERMEDIATE POINT

- 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.



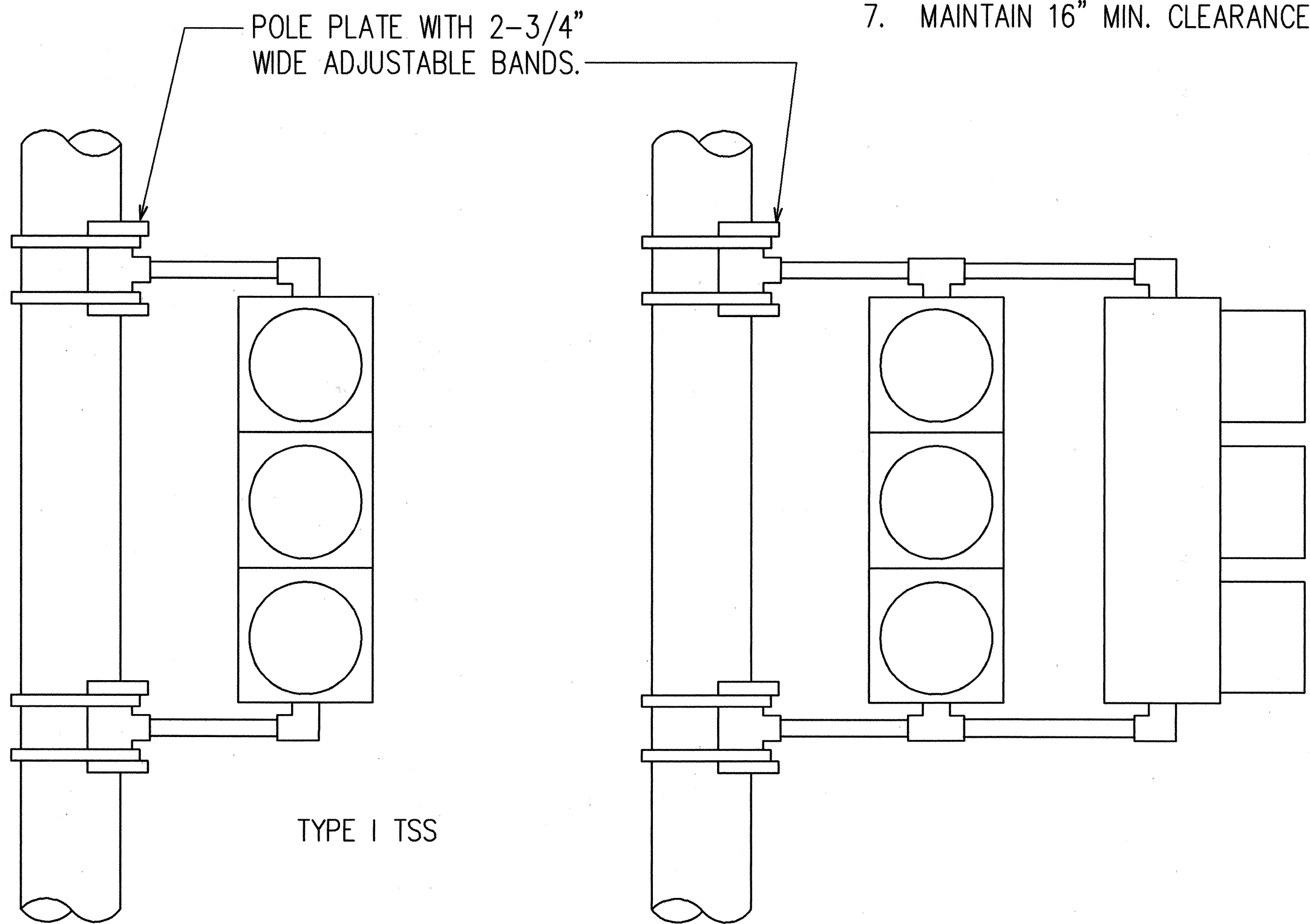
BRACKET MOUNT - ONE WAY



BRACKET MOUNT - TWO WAY

PEDESTRIAN SIGNAL MOUNTING DETAILS

NOT TO SCALE



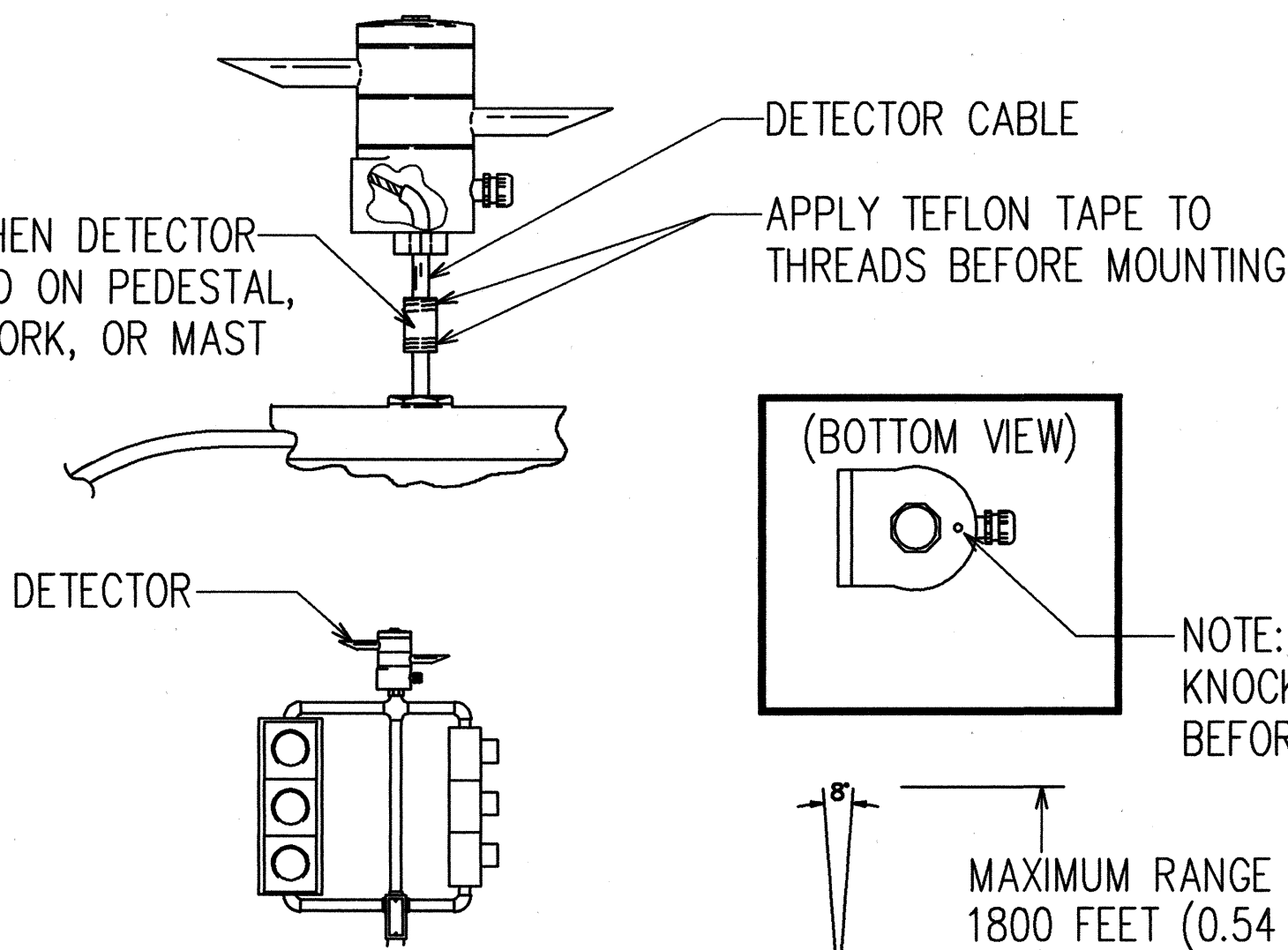
BRACKET MOUNT - ONE WAY

BRACKET MOUNT - TWO WAY

VEHICULAR SIGNAL MOUNTING DETAILS

NOT TO SCALE

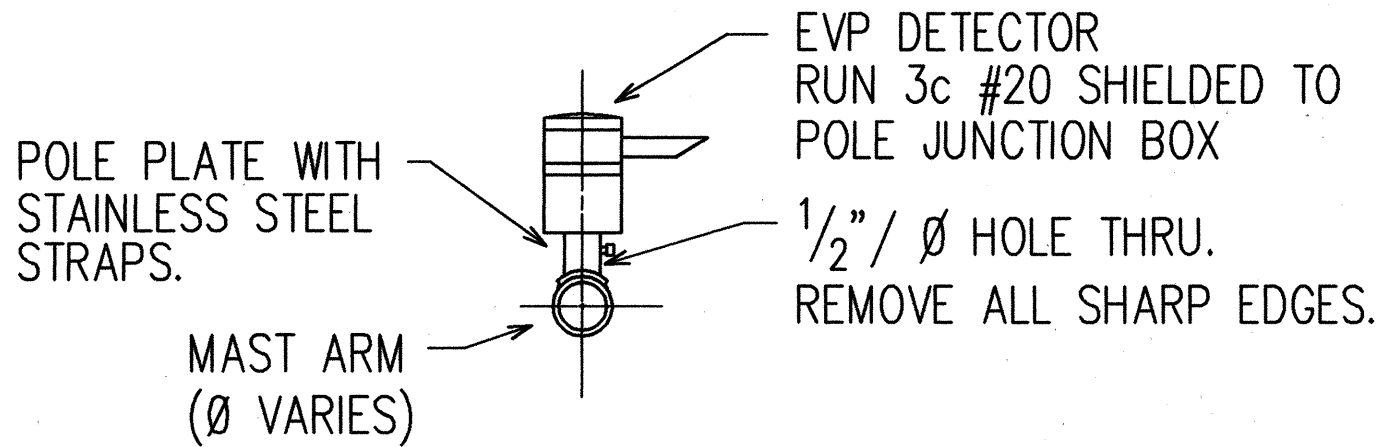
USE METAL NIPPLE WHEN DETECTOR ASSEMBLY IS MOUNTED ON PEDESTAL, SIGNAL HEAD FRAMEWORK, OR MAST ARM



NOTE:
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.

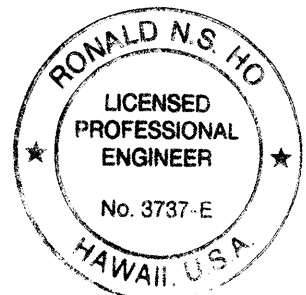
TYPICAL PEDESTAL/MAST ARM INSTALLATION OF EVP DETECTOR

NOT TO SCALE



EVP DETECTOR HORIZONTAL MOUNTING DETAIL

NOT TO SCALE



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Ronald N.S. Ho
5/5/96

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

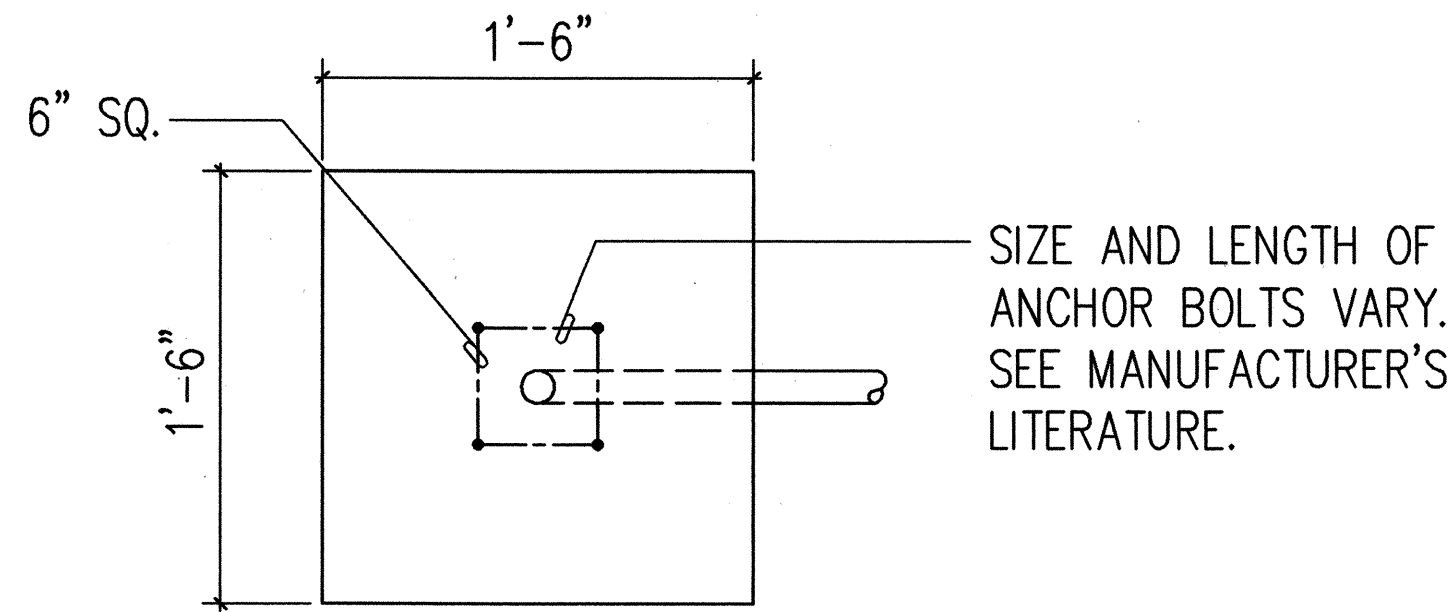
KAMEHAMEHA HIGHWAY
Inters. Improvements at Kahuku H. S.
F.A. PROJECT NO. STP-083-1(36)

SCALE: AS NOTED DATE: SHEET No. E-7 OF E-9 SHEETS

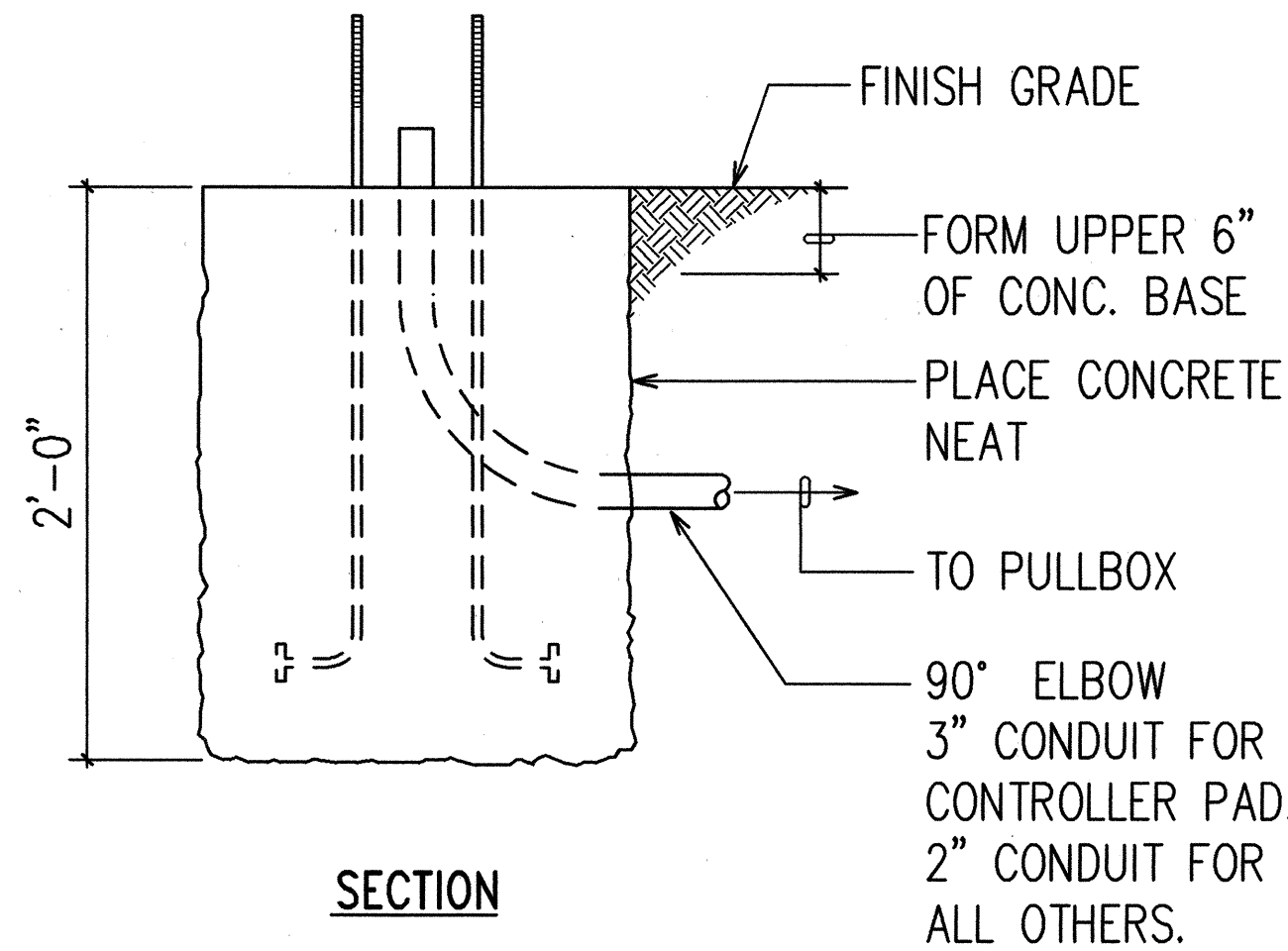
ORIGINAL PLAN	DATE
DESIGNED BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
NO.	

cat. 05/07/96 14:30:02 by cv

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	13	15



PLAN



SECTION

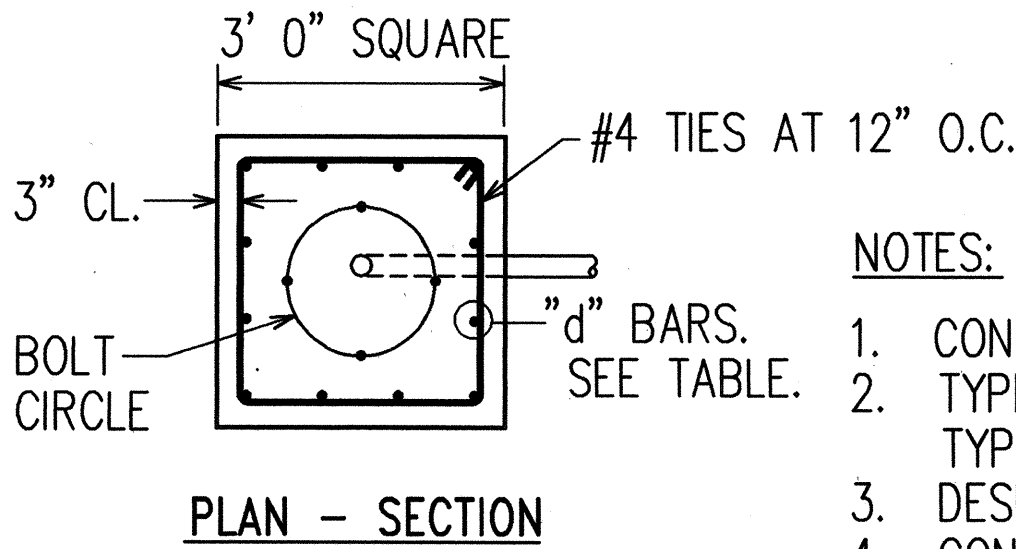
NOTES:

1. CONCRETE SHALL BE CLASS "B".
2. TYPE "A" CONCRETE BASE SHALL BE USED FOR TYPE I-10, I-7 AND I-3 STANDARDS.
3. CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE CONSTRUCTION.

TYPE "A" CONCRETE BASE
N.T.S.

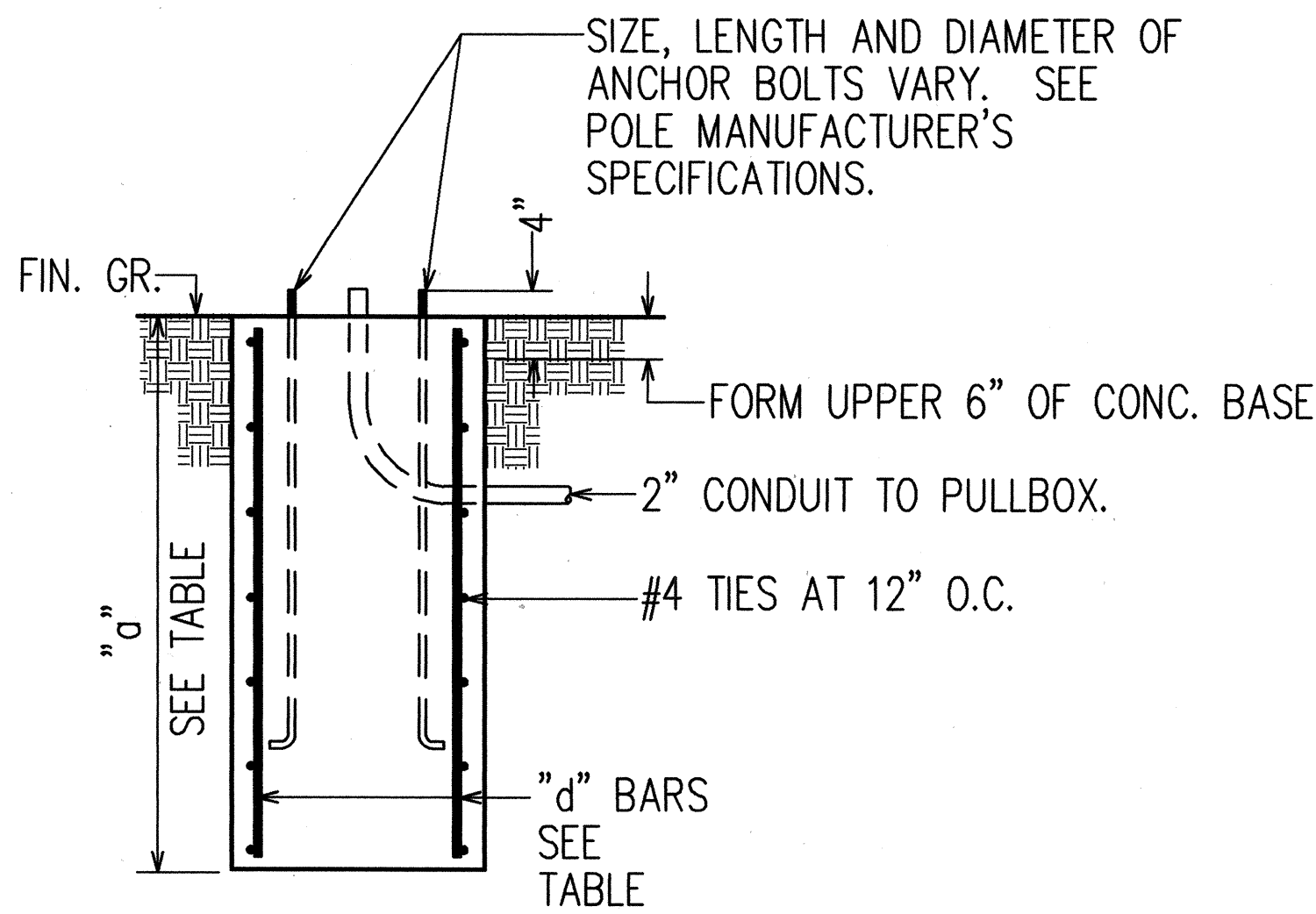
TYPE "C" CONCRETE BASE		
TYPE OF STANDARD	"d"	"b" BARS
II - 18	5' - 0"	12 - #6
II - 20	5' - 6"	12 - #6
II - 25	6' - 0"	12 - #6
II - 30	6' - 6"	12 - #8
II - 35	7' - 0"	12 - #8
II - 40	8' - 0"	12 - #8
III - 18	5' - 6"	12 - #6
III - 20	6' - 0"	12 - #6
III - 25	6' - 6"	12 - #8
III - 30	6' - 6"	12 - #8
III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

TYPICAL STANDARD DESIGNATION: TYPE - MAST ARM LENGTH



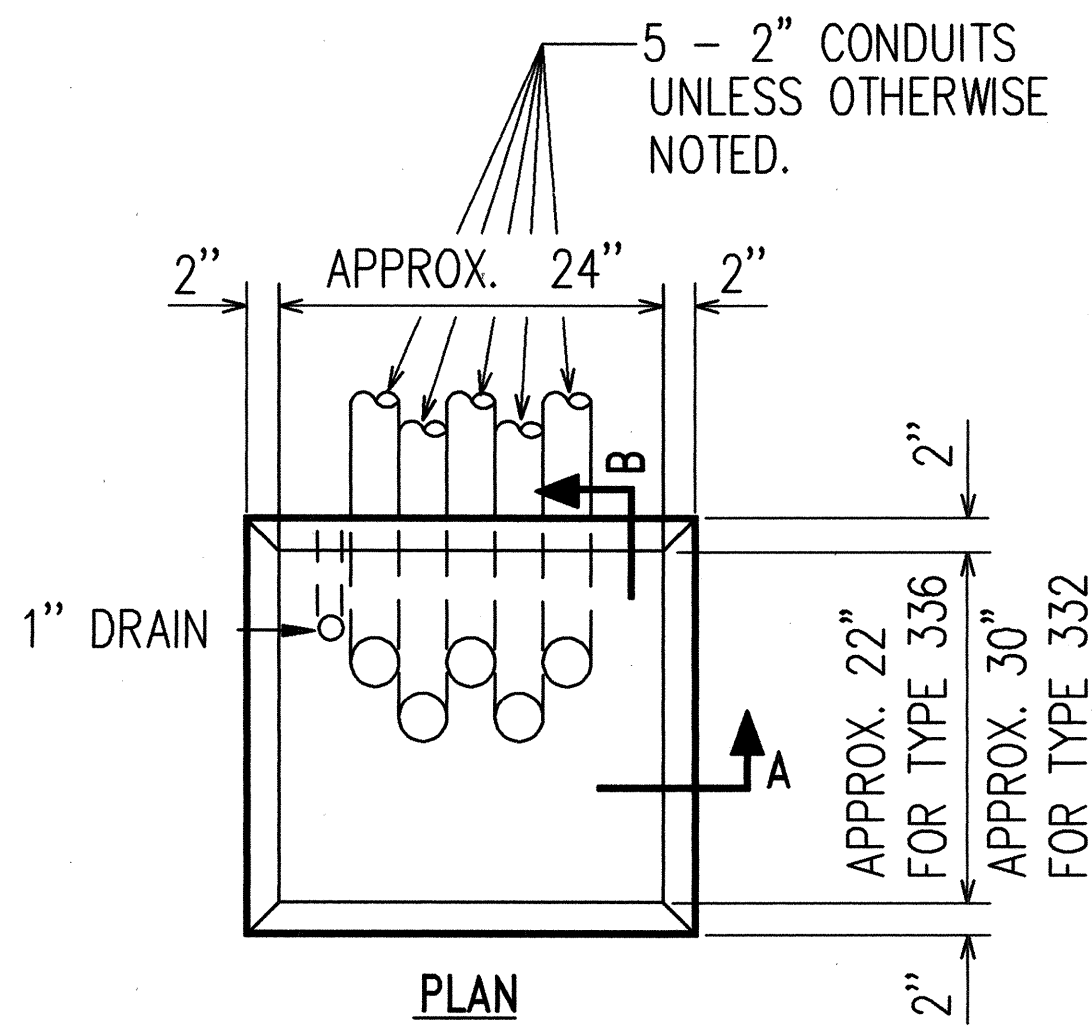
NOTES:

1. CONCRETE SHALL BE CLASS "B".
2. TYPE "C" CONCRETE BASE SHALL BE USED FOR TYPES II AND III TRAFFIC SIGNAL STANDARDS.
3. DESIGN LATERAL PRESSURE: 1,500 PSF.
4. CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE.



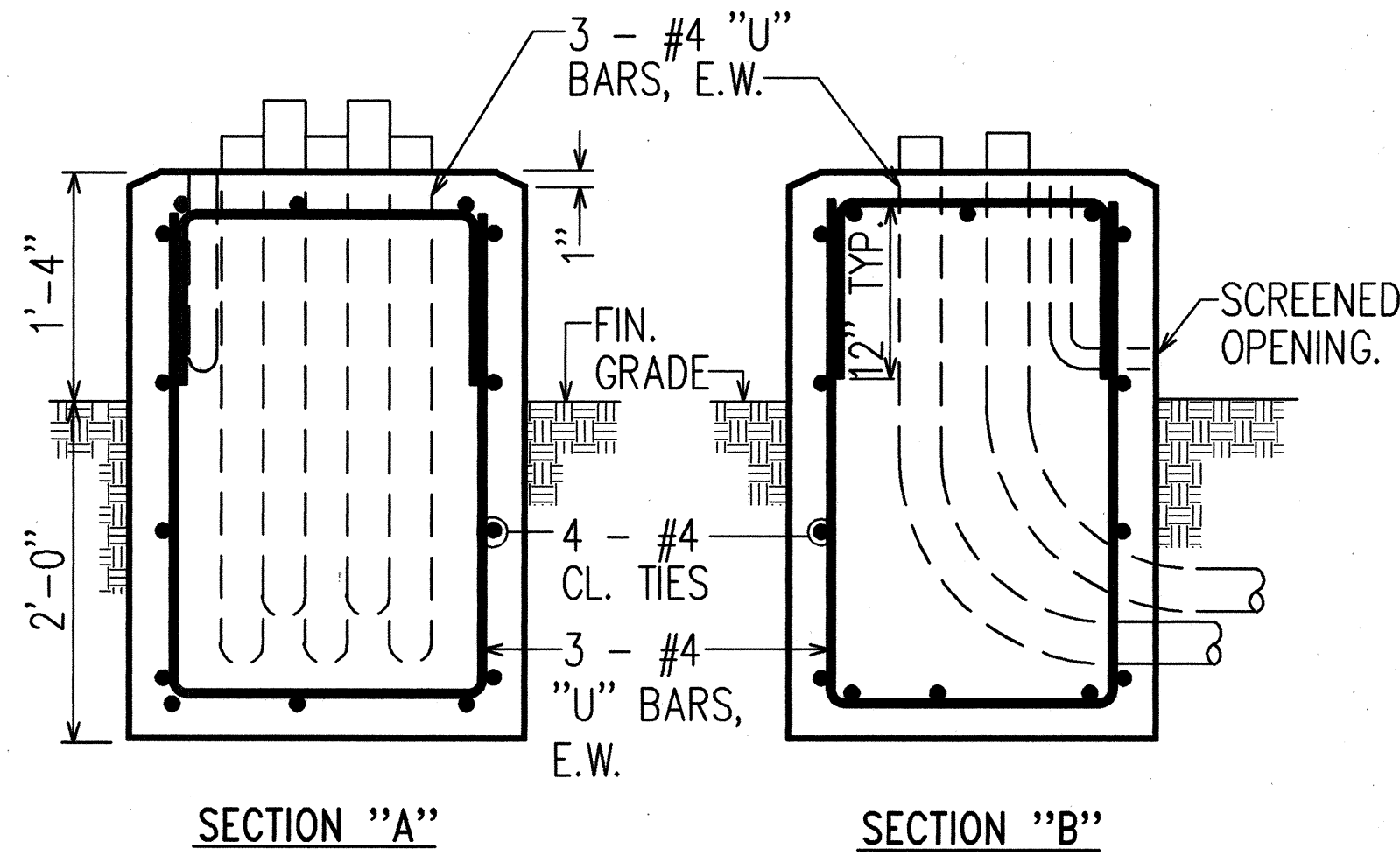
VERTICAL SECTION

TYPE "C" CONCRETE BASE
N.T.S.



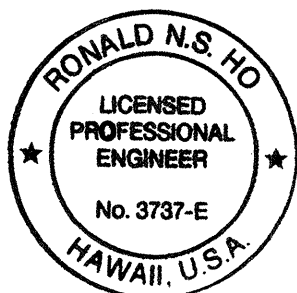
NOTES:

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.



TYPE "D" CONC. BASE CONTROLLER CABINETS
N.T.S.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

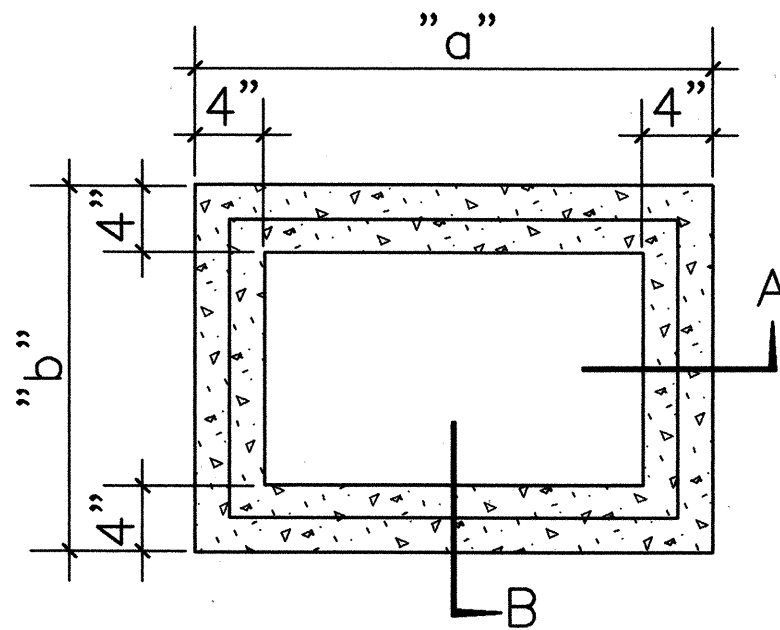
TRAFFIC SIGNAL DETAILS

KAMEHAMEHA HIGHWAY
Inters. Improvements at Kahuku H. S.
F.A. PROJECT NO. STP-083-1(36)

SCALE: AS NOTED
SHEET No. E-8 OF E-9 SHEETS

DATE:

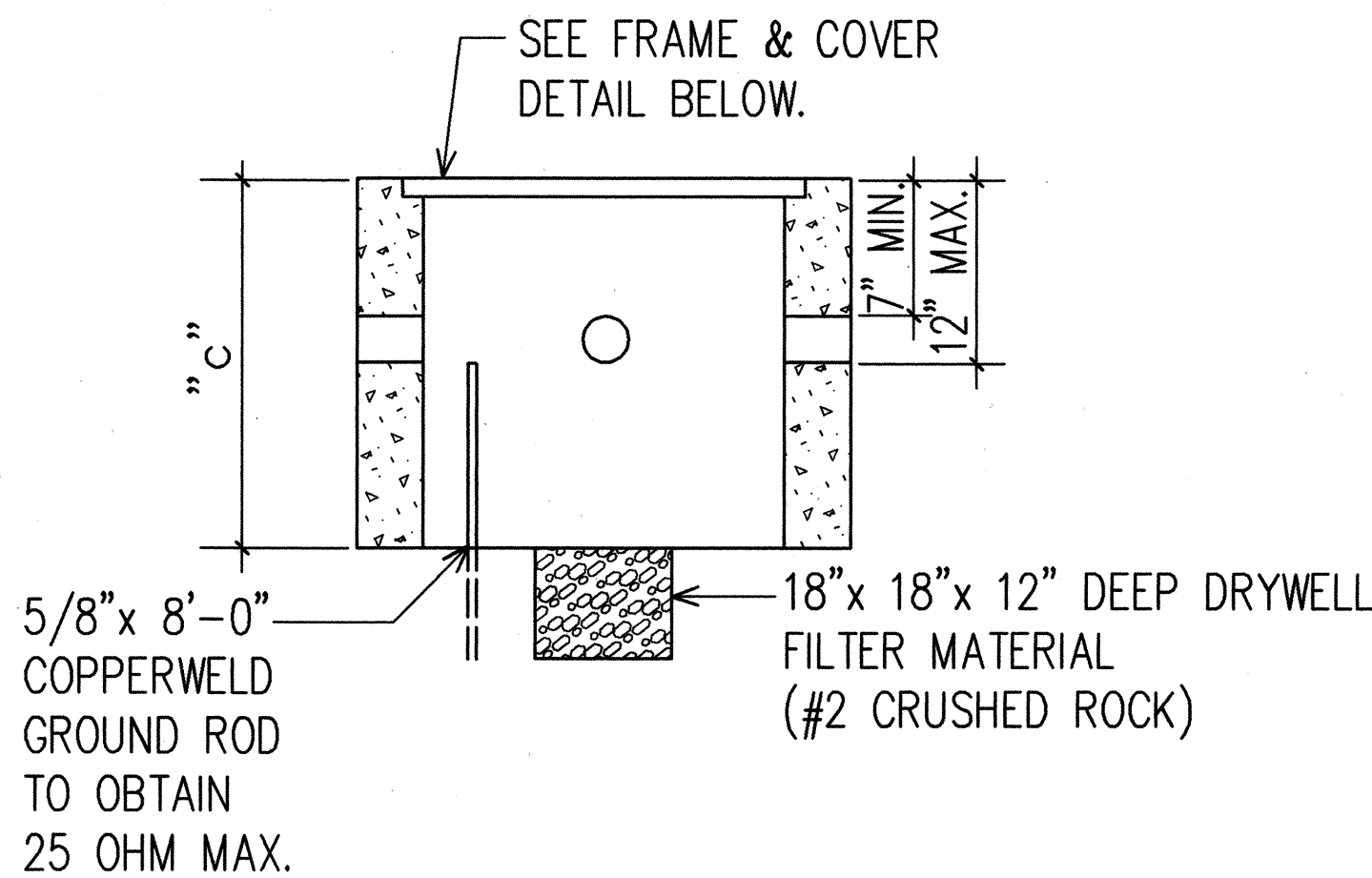
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	14	15



PLAN OF PULLBOX

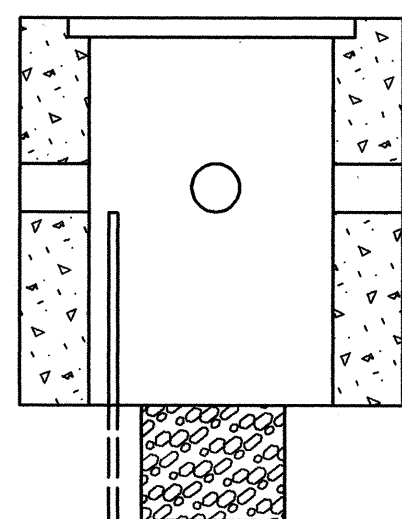
NOTES:

1. CONCRETE BRICKS MAY BE USED IN LIEU OF CONCRETE UNLESS OTHERWISE SPECIFIED.
2. ALL DIMENSIONS ARE IN INCHES.
3. ALL CONCRETE SHALL BE 3000 PSI COMPRESSIVE STRENGTH IN 28 DAYS.
4. PROVIDE GROUND ROD IN ALL PULLBOXES ADJACENT TO STANDARDS, PEDESTALS, CONTROLLERS AND OTHER SPECIFIED LOCATIONS.



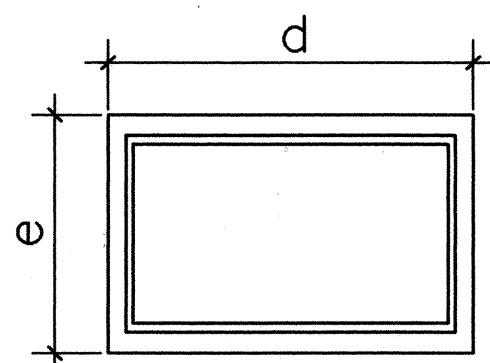
SECTION "A-A"

	TYPE "A1"	TYPE "C1"
"a"	28	40
"b"	19	28
"c"	18	24

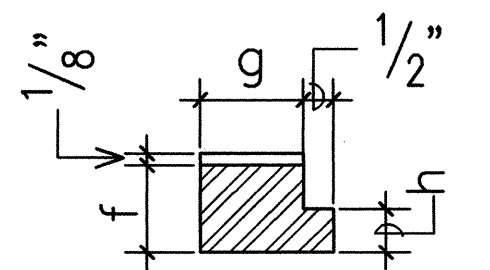


SECTION "B-B"

	TYPE "A1"	TYPE "C1"
a	19 3/4	30
b	12	20
c	1/2	5/8
d	22 1/2	33 3/16
e	14 3/4	23 3/16
f	1	2
g	1 1/4	1 1/2
h	1/2	3/8

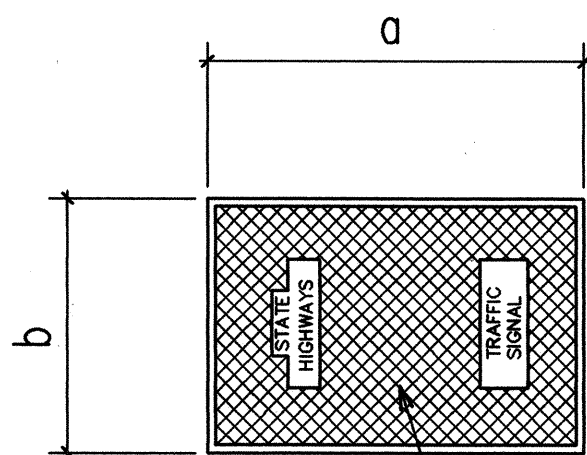


PLAN OF FRAME

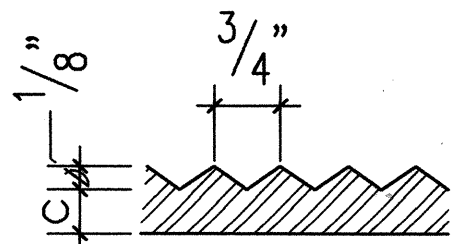


SECTION THROUGH FRAME

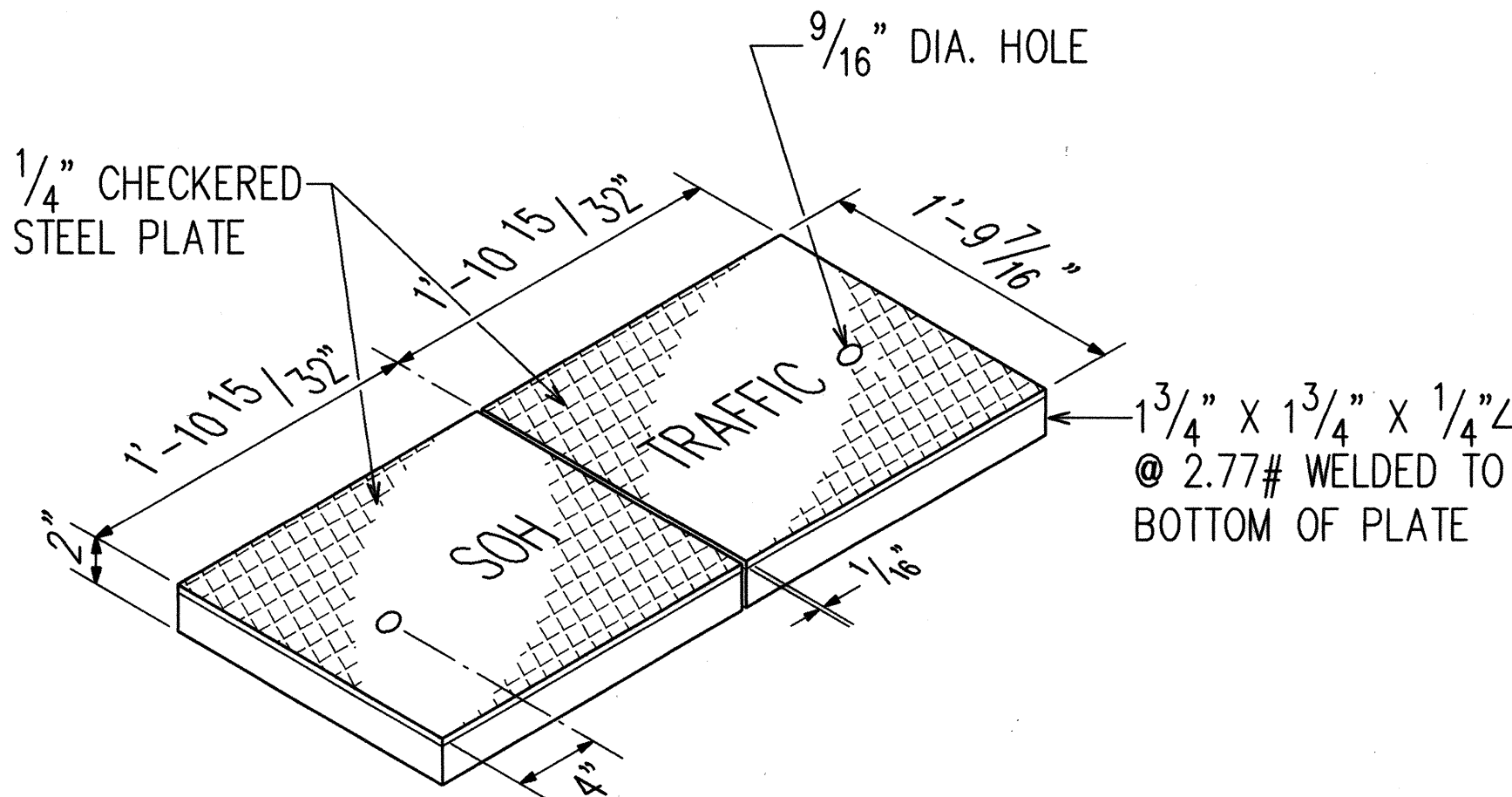
NOTE: STEEL RIM SHALL BE WELDED TO BOTTOM OF STEEL COVER IF NECESSARY SO THAT TOP OF COVER AND FRAME ARE FLUSH.



PLAN OF COVER

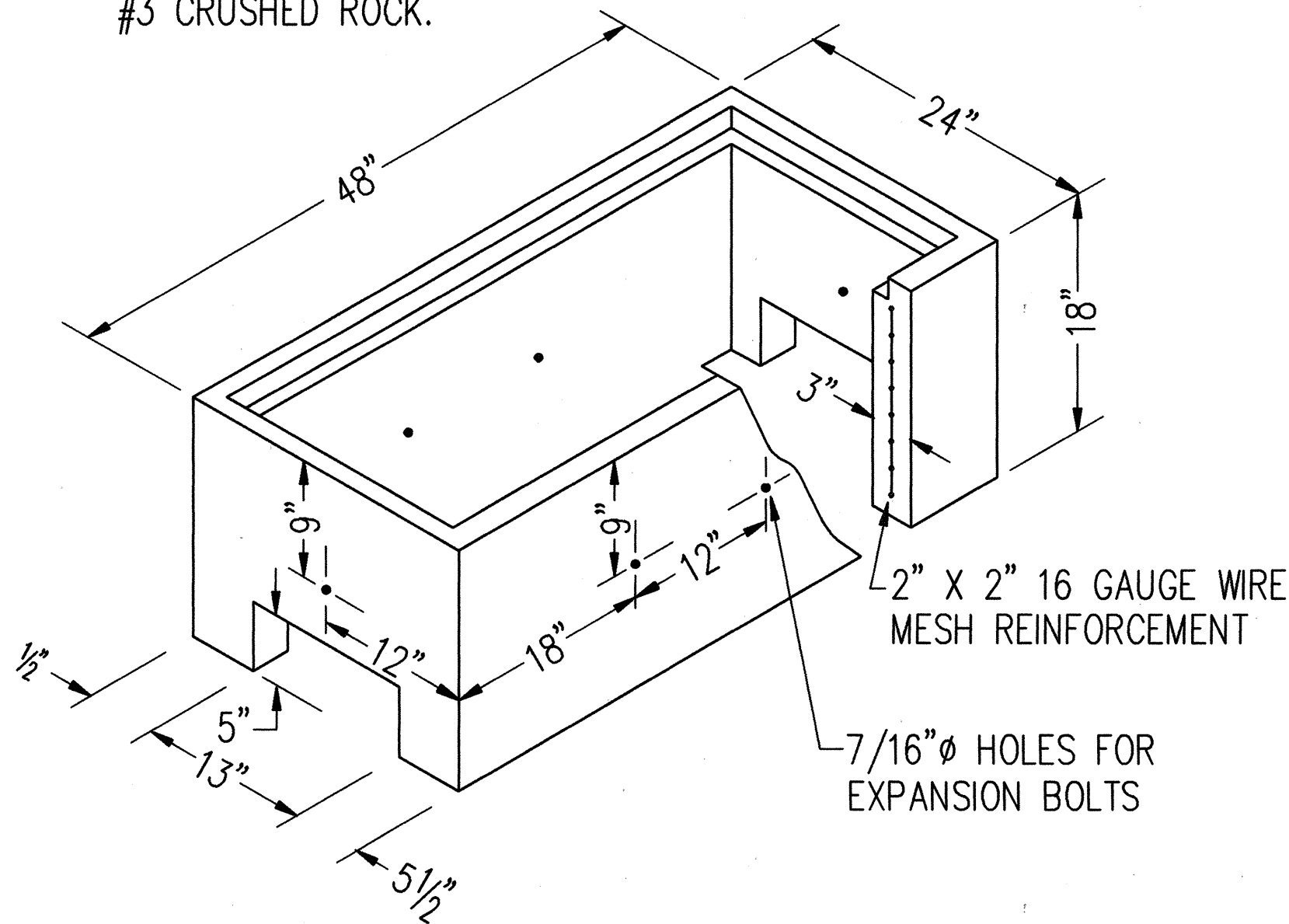


SECTION THRU COVER



NOTES:

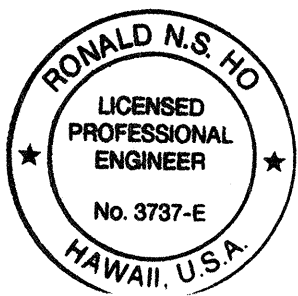
1. AFTER FABRICATION OF COVERS, GALVANIZE OR BOTH SIDES.
2. INSTALL ON 6" BED OF #3 CRUSHED ROCK.



CONCRETE PULLBOX

TYPE "Z" PULLBOX
NOT TO SCALE

TRAFFIC SIGNAL PULLBOX DETAILS
N.T.S.



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Ronald N.S. Ho
5/5/96

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

KAMEHAMEHA HIGHWAY
Inters. Improvements at Kahuku H. S.
F.A. PROJECT NO. STP-083-1(36)

SCALE: AS NOTED

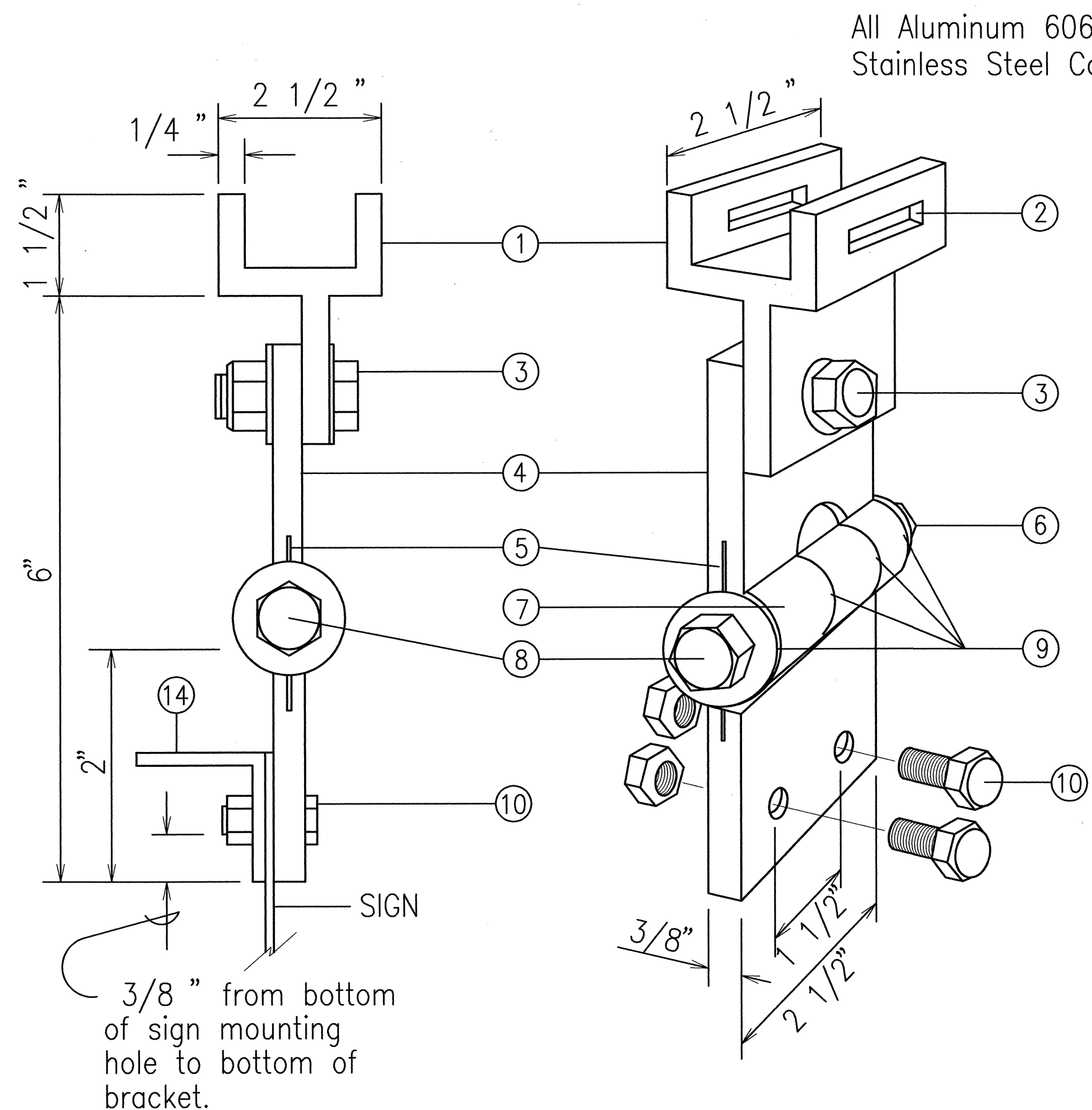
DATE:

SHEET No. E-9 OF E-9 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	"
TRACED BY	"
DESIGNED BY	"
QUANTITIES BY	"
CHECKED BY	"

NO. 1000-10-01-01-01-01-01
KAWAIA PROJECTS, 1000-10-01-01-01-01-01

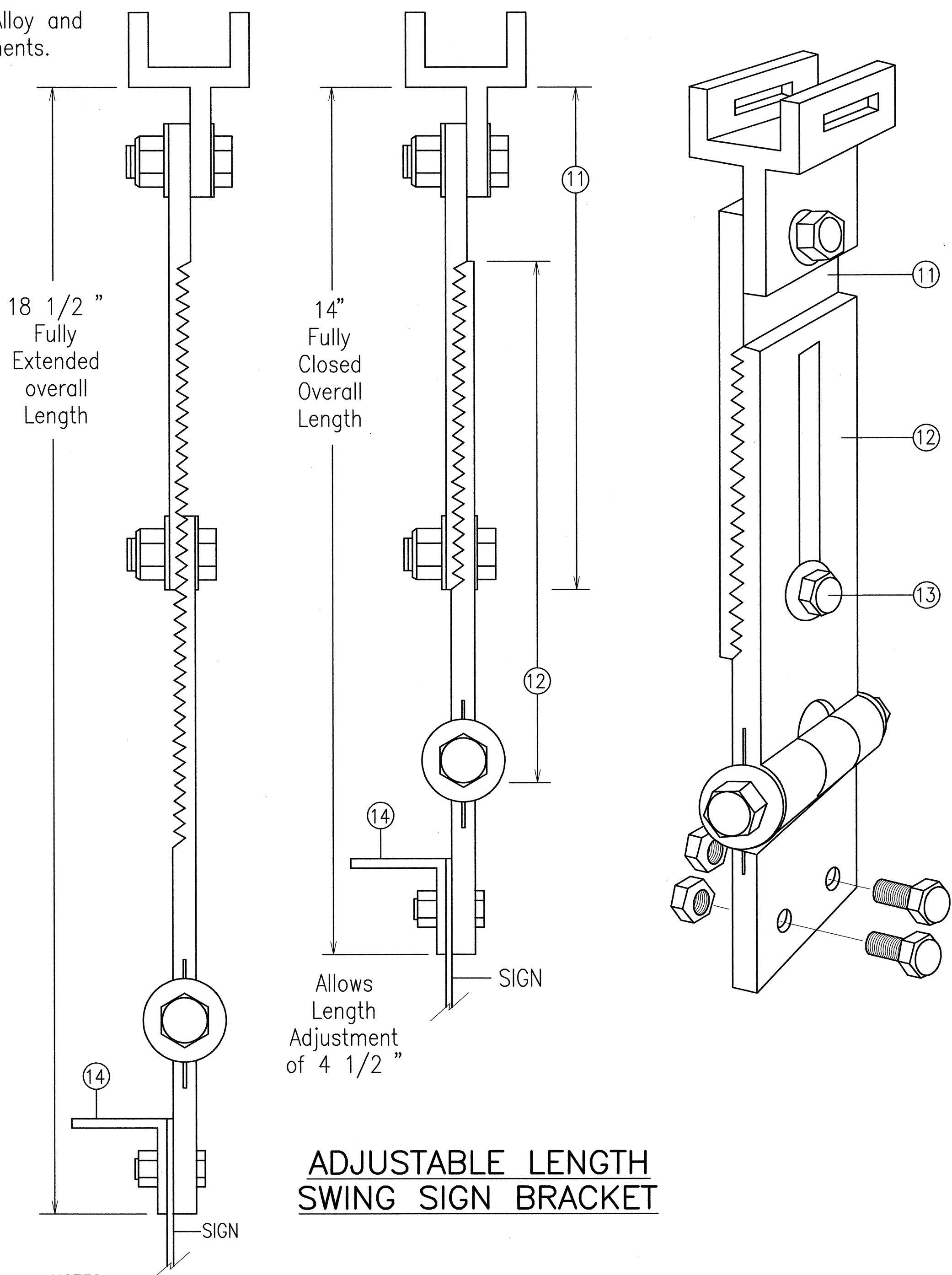
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-083-1(36)	1996	15	15



FIXED LENGTH NON-ADJUSTABLE SWING SIGN BRACKET

- ① Pivotal Upper Bracket
- ② 1 5/8 " x 1/4 " Slot for double strapping to electrolier mast arm. (M2G-34S(HD) .030" x 3/4 " Heavy Duty Stainless Steel Strap with M2G-34B(HD) Buckle recommended.)
- ③ 1/2 " - 13 x 1 1/2 " Stainless Steel Hex Head Bolt with Stainless Steel Hex Lock Nut and 1/16 " Stainless Steel Washer (both sides). Allows upper bracket to pivot and align with electrolier mast arm.
- ④ 6" Overall drop with Fixed Length Sign Bracket
- ⑤ Stainless Steel Dampener Spring (Removable)
- ⑥ Stainless Steel Hex Lock Nut with 1/16 " Stainless Steel Washer
- ⑦ 1" O.D. Axle Housing
- ⑧ 1/2 " - 13 x 4" Stainless Steel Hex Head Bolt with 1/16 " Stainless Steel Washer
- ⑨ Oilite Bushing
- ⑩ Sign Mounting Sets, consisting of two each 5/16 " - 18 x 1" Stainless Steel Hex Head Bolt with Stainless Steel Hex Head Bolt with Lock Nut. Two holes on 1 1/2 " centers provide positive lock sign mounting to bracket.
- ⑪ 8 1/4 " overall length Upper Adjustable Sign Bracket Section.
- ⑫ 9" overall length Lower Adjustable Sign Bracket section, including Axle Housing (8" overall length to top of Axle Housing).
- ⑬ 1/2 " - 13 x 1 1/2 " Stainless Steel Hex Bolt with Stainless Steel Hex Lock Nut and 1/16 " Stainless Steel Washers (both sides). Loosen lock nut, adjust bracket teeth to level sign.
- ⑭ 1 1/4 " x 1 1/4 " x 1/8 " Aluminum Angle

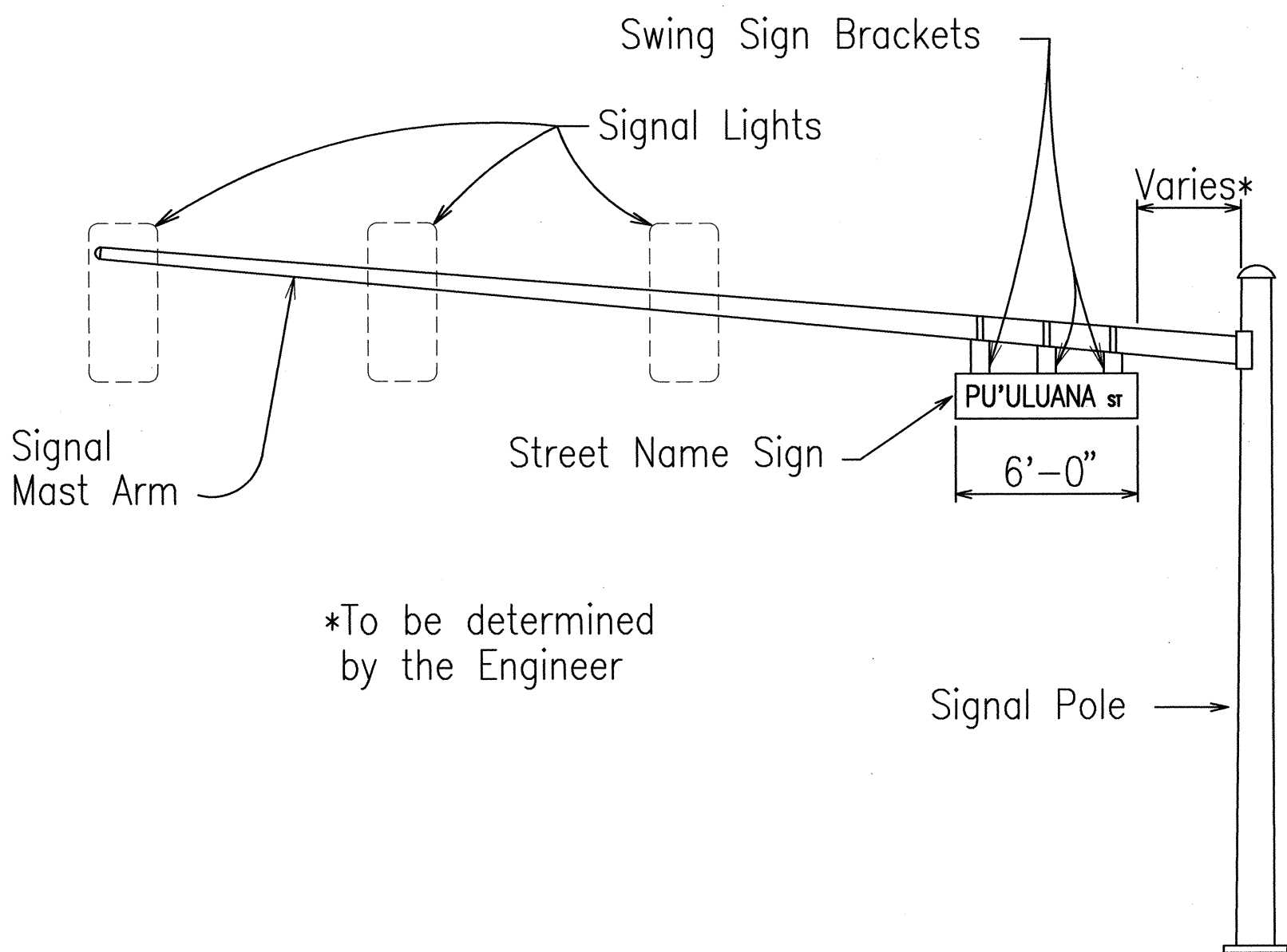
Note: Dimensions may vary slightly.



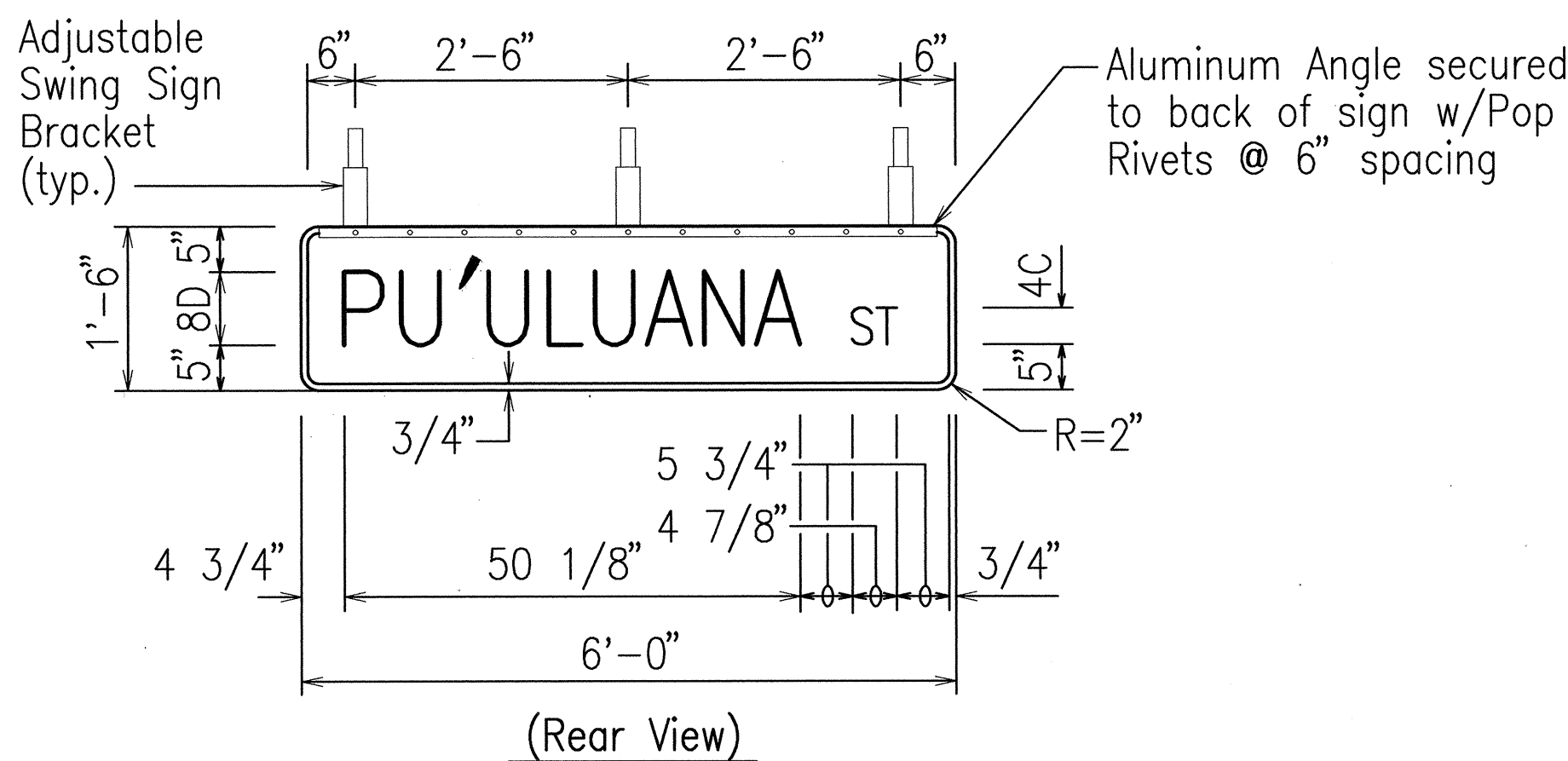
ADJUSTABLE LENGTH SWING SIGN BRACKET

NOTES

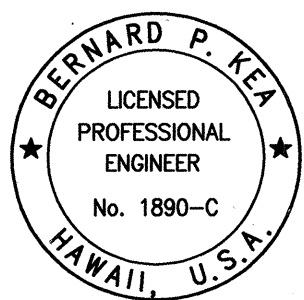
1. Sign shall be new Street Name Sign. The Contractor shall provide the same message on the front and back side of the sign. Payment will not be made separately but shall be considered as one unit.
2. Colors:
Legend - White (Reflectorized)
Background - Green (Reflectorized)
3. All panels shall be reflectorized with Type reflective sheeting in accordance with Section 712.20 of the Standard Specifications.
4. Borders and messages shall conform to details as shown on the plans and as specified in the MUTCD.
5. Sign mounting prackets, aluminum angle, fixtures, fasteners and all necessary hardware and equipment, tools, labor, materials and other incidentals for installation, will not be paid for separately but shall be considered incidental to street name sign installation.
6. All signs shall conform to Section 621 of the Standard Specifications and the latest editions and amendments of the following FHWA publications:
 - a. "Manual on Uniform Traffic Control Devices for Streets and Highways" (MUTCD)
 - b. "Standard Highway Signs"
 - c. "Standard Alphabets for Highway Signs"



STREET NAME SIGN MOUNTING ON MAST ARM



PANEL & SWING BRACKET LAYOUT FOR STREET NAME SIGN



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Bernard P. Kea

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
SIGN MOUNTING DETAIL	
KAMEHAMEHA HIGHWAY	
Inters. Improvements at Kahuku H.S.	
F.A. PROJECT NO. STP-083-1(36)	
Not to Scale	Date :
SHEET No. 1 OF 1 SHEETS	

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