





ELECTRICAL SYMBOLS


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	60	72


- 


EXISTING UTILITY POLE TO REMAIN
- 


EXISTING UTILITY POLE TO BE REMOVED
- 


NEW UTILITY POLE
- 


NEW FLASHING LIGHT
- 


NEW TRAFFIC SIGNAL POLE
- 


EXISTING TRANSFORMER TO REMAIN
- 


EXISTING TRANSFORMER TO BE REMOVED
- 


NEW TRANSFORMER
- 


EXISTING STREET LIGHT TO BE REMOVED
- 


EXISTING STREET LIGHT TO REMAIN
- 


NEW STREET LIGHT
- 


EXISTING GUY WIRE AND ANCHOR TO BE REMOVED
- 

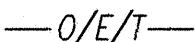
EXISTING GUY WIRE AND ANCHOR TO REMAIN
- 


NEW GUY WIRE AND ANCHOR
- 

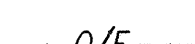
EXISTING PULLBOX TO REMAIN
- 


NEW PULLBOX
- 


NEW TRAFFIC SIGNAL CONTROLLER
- 


NEW 6' X 6' LOOP DETECTOR, CENTERED IN LANE
- 


EXISTING OVERHEAD ELECTRICAL & TELEPHONE LINES TO REMAIN
- 


EXISTING OVERHEAD TELEPHONE LINE TO REMAIN
- 


EXISTING OVERHEAD ELECTRICAL LINE TO REMAIN
- 


EXISTING OVERHEAD ELECTRICAL & TELEPHONE LINES TO BE REMOVED
- 

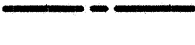
EXISTING OVERHEAD TELEPHONE LINE TO REMAIN
- 


EXISTING OVERHEAD ELECTRICAL LINE TO BE REMOVED
- 


NEW OVERHEAD ELECTRICAL & TELEPHONE LINES
- 


NEW OVERHEAD TELEPHONE LINE
- 


NEW OVERHEAD ELECTRICAL LINE
- 

NEW WIRING IN UNDERGROUND RACEWAY
- 

(L=35 FT), TYPE II FOOTING
- 

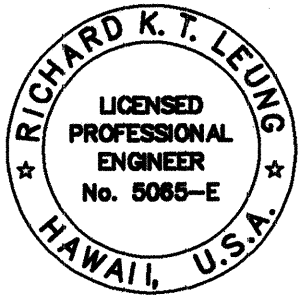
NEW TRAFFIC SIGNAL HEAD
- 

NEW SIGNAL STANDARD TYPE I
- 

NEW PEDESTRIAN SIGNAL WITH PEDESTRIAN
PUSH BUTTON ASSEMBLY AND SIGN R10-4B(R)
R10-4B(L) AS APPROPRIATE
- 

NEW TRAFFIC SIGNAL HEAD FOR TURN SIGNAL.

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
IN CHARGE	
NO.	



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Jason Yogi

LEUNG & PANG ASSOCIATES, INC.

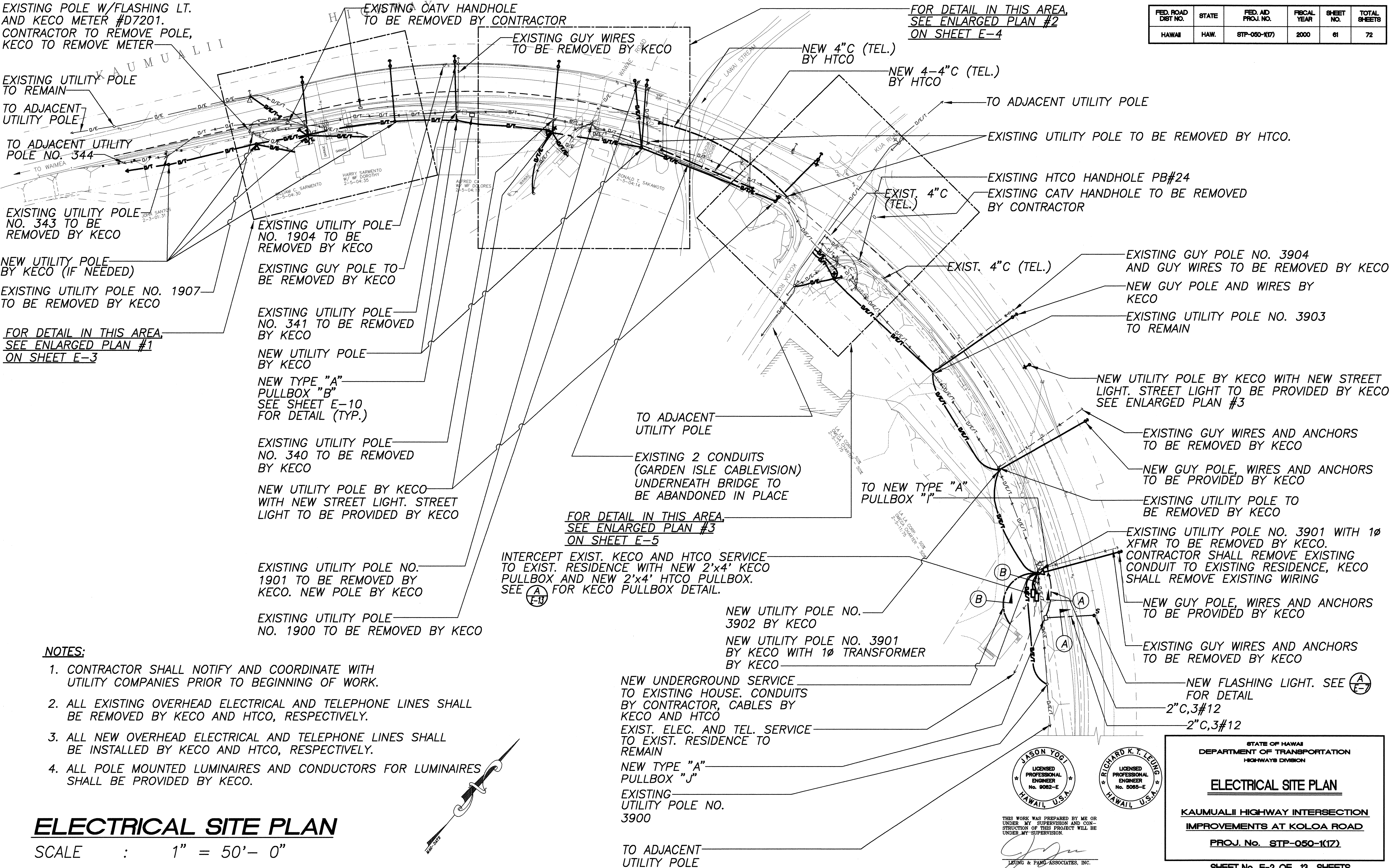
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SYMBOLS

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	61	72



NOTES:

1. CONTRACTOR SHALL NOTIFY AND COORDINATE WITH UTILITY COMPANIES PRIOR TO BEGINNING OF WORK.
2. ALL EXISTING OVERHEAD ELECTRICAL AND TELEPHONE LINES SHALL BE REMOVED BY KECO AND HTCO, RESPECTIVELY.
3. ALL NEW OVERHEAD ELECTRICAL AND TELEPHONE LINES SHALL BE INSTALLED BY KECO AND HTCO, RESPECTIVELY.
4. ALL POLE MOUNTED LUMINAIRES AND CONDUCTORS FOR LUMINAIRES SHALL BE PROVIDED BY KECO.

ELECTRICAL SITE PLAN

SCALE : 1" = 50'- 0"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SITE PLAN

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

SHEET No. E-2 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	62	72

EXISTING CATV HANDHOLE TO BE REMOVED BY CONTRACTOR

NEW FLASHING LIGHT. SEE (A) FOR DETAIL

EXISTING UTILITY POLE NO. 1906 TO BE REMOVED BY KECO
EXISTING UTILITY POLE NO. 1905 WITH 1Ø XFMR TO BE REMOVED BY KECO

EXISTING UTILITY POLE NO. 1907 TO BE REMOVED BY KECO

EXISTING UTILITY POLE TO BE REMOVED BY CONTRACTOR

REMOVE EXISTING FLASHING LIGHT WITH KECO METER #KED7201

NEW GUY POLE BY KECO

EXISTING UTILITY POLE NO. 1904 TO BE REMOVED BY KECO

NEW GUY POLE BY KECO

NEW TYPE "A" PULLBOX "A". SEE SHEET E-10 FOR DETAIL (TYP.)

TO NEW TYPE "A" PULLBOX "B"

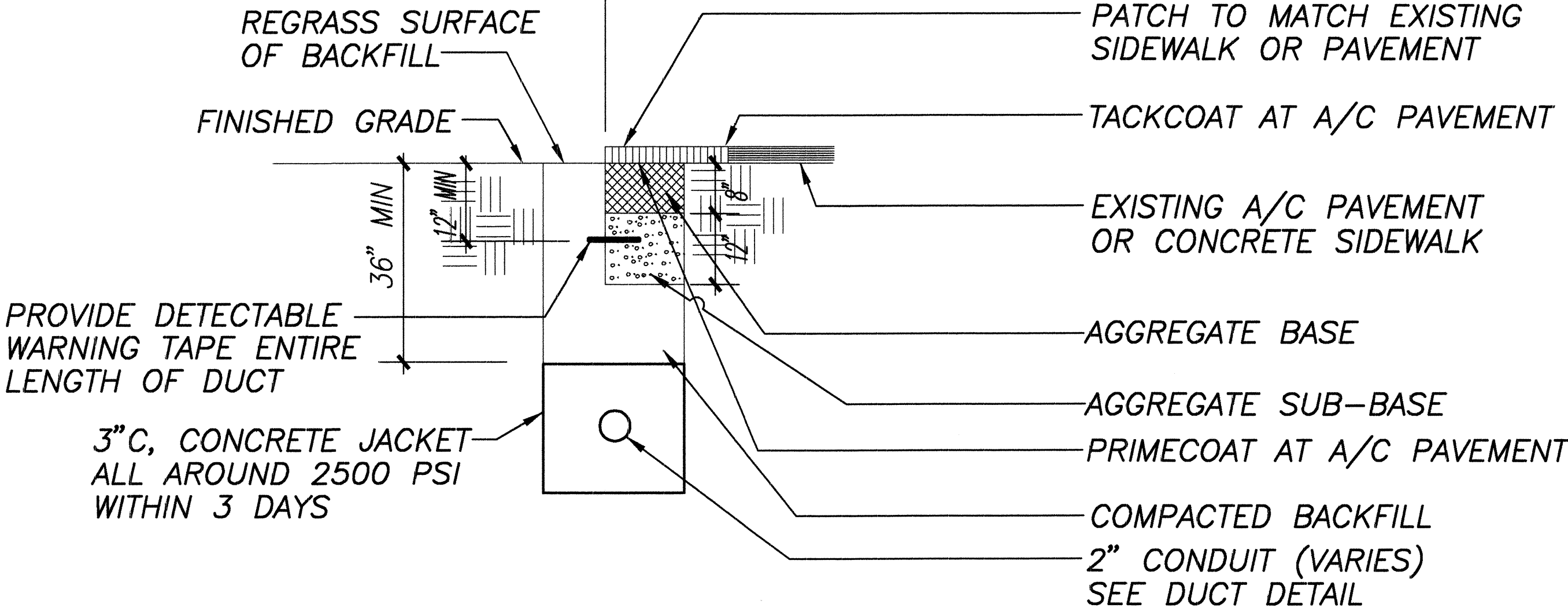
HARRY SARMENTO
W/ WF DOROTHY
2-5-04:35

NEW UTILITY POLE BY KECO
NEW UTILITY POLE WITH 1Ø TRANSFORMER BY KECO
WILLIAM C. SARMENTO
2-5-04:30

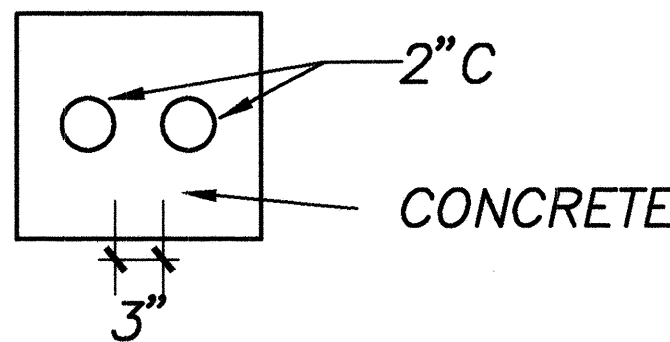
NOTE: CONTRACTOR SHALL COORDINATE AND VERIFY REQUIREMENTS WITH KAUAI ELECTRIC COMPANY, HAWAIIAN TELEPHONE COMPANY, AND GARDEN ISLE CABLEVISION PRIOR TO START OF ANY WORK.

ENLARGED PLAN #1
SCALE : 1" = 20'- 0"

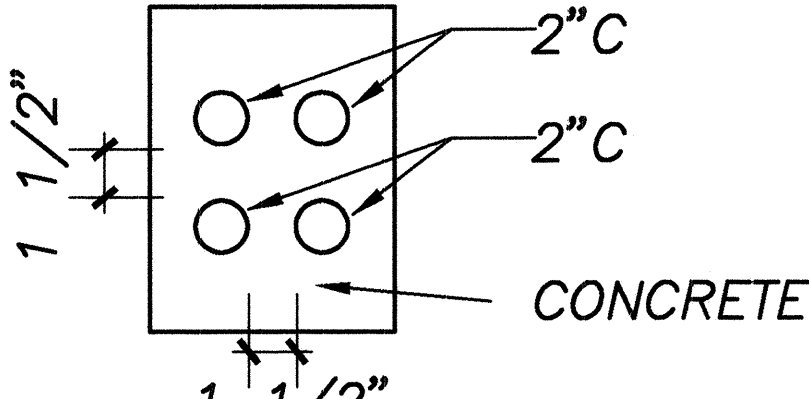
CONDITION AT FINISHED GRADE CONDITION AT PAVEMENT OR SIDEWALK AREA



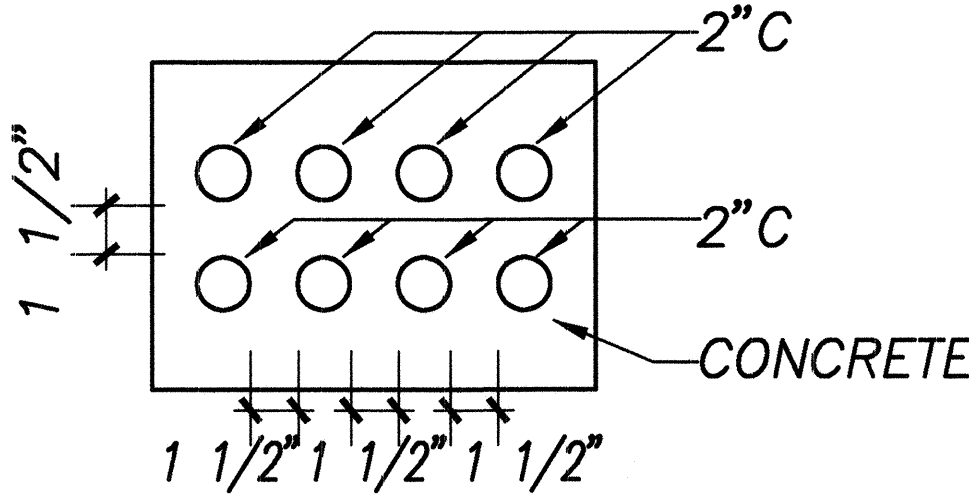
TYPICAL TRENCH & BACKFILL DETAIL "A"
NOT TO SCALE



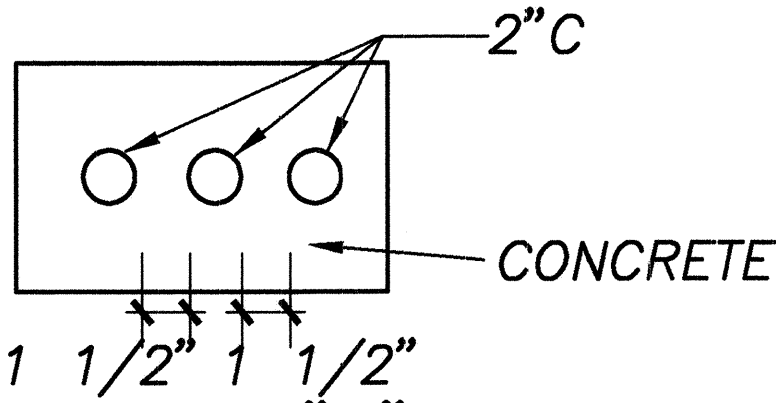
DETAIL "B"
NOT TO SCALE



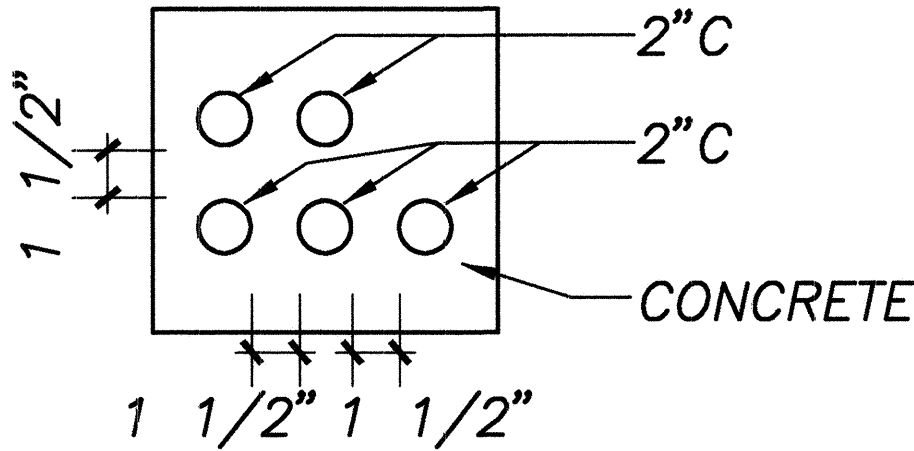
DETAIL "C"
NOT TO SCALE



DETAIL "D"
NOT TO SCALE



DETAIL "E"
NOT TO SCALE



DETAIL "F"
NOT TO SCALE



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LEUNG & PANG ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ENLARGED PLAN #1

**KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD**

PROJ. No. STP-050-1(17)

SHEET No. E-3 OF 13 SHEETS

FED. ROAD DIST NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	63	72

EXISTING UTILITY POLE NO. 1901 TO BE REMOVED BY KECO. NEW POLE BY KECO

EXISTING UTILITY POLE NO. 340 TO BE REMOVED BY KECO

NEW UTILITY POLE BY HTCO WITH NEW STREET LIGHT. STREET LIGHT TO BE PROVIDED BY KECO

NEW UTILITY POLE BY KECO

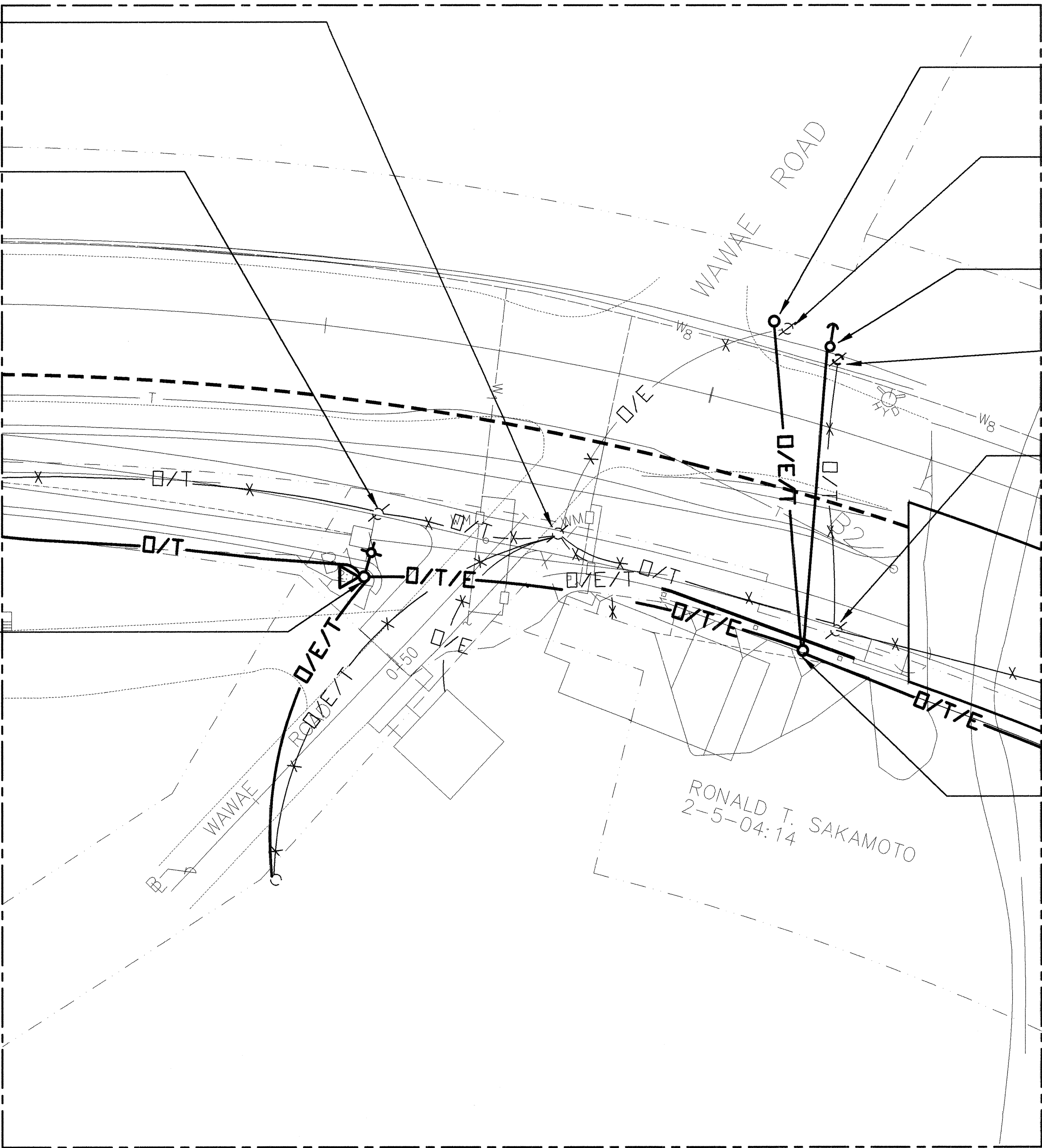
EXISTING UTILITY POLE NO. 1900 TO BE REMOVED BY KECO

NEW GUY POLE BY KECO

EXISTING UTILITY POLE TO BE REMOVED BY KECO

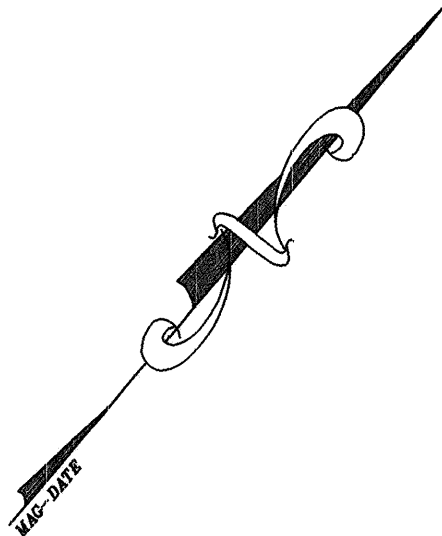
EXISTING UTILITY POLE TO BE REMOVED BY KECO

NEW UTILITY POLE BY KECO

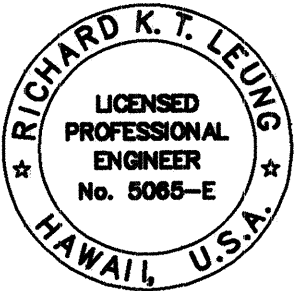


NOTE:
CONTRACTOR SHALL COORDINATE AND VERIFY REQUIREMENTS WITH KAUAI ELECTRIC COMPANY, HAWAIIAN TELEPHONE COMPANY, AND GARDEN ISLE CABLEVISION PRIOR TO START OF ANY WORK.

ENLARGED PLAN #2
SCALE : 1" = 20'- 0"



DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
IN CHARGE	
NO.	



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Jason Yogi
LEUNG & FANG ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

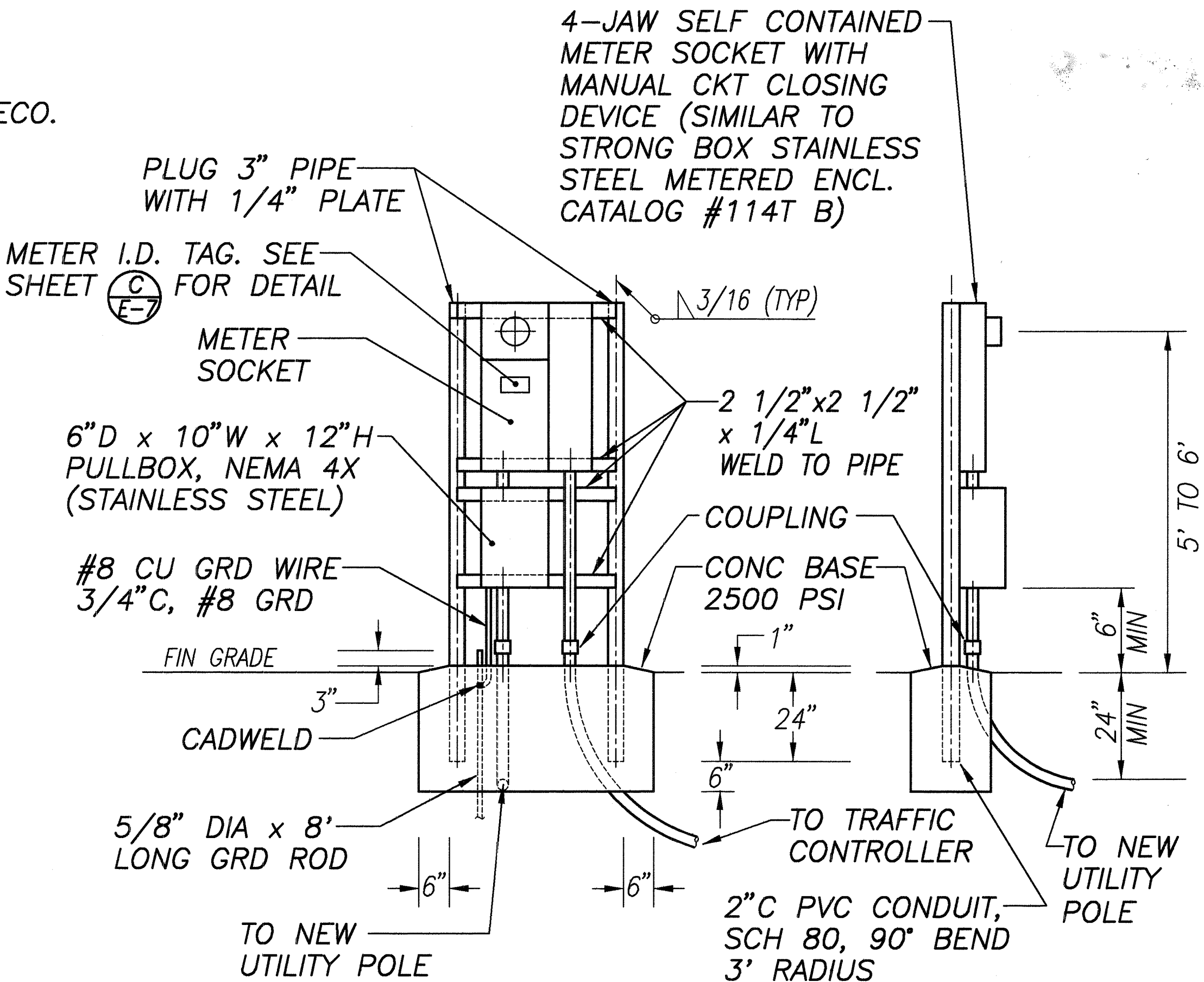
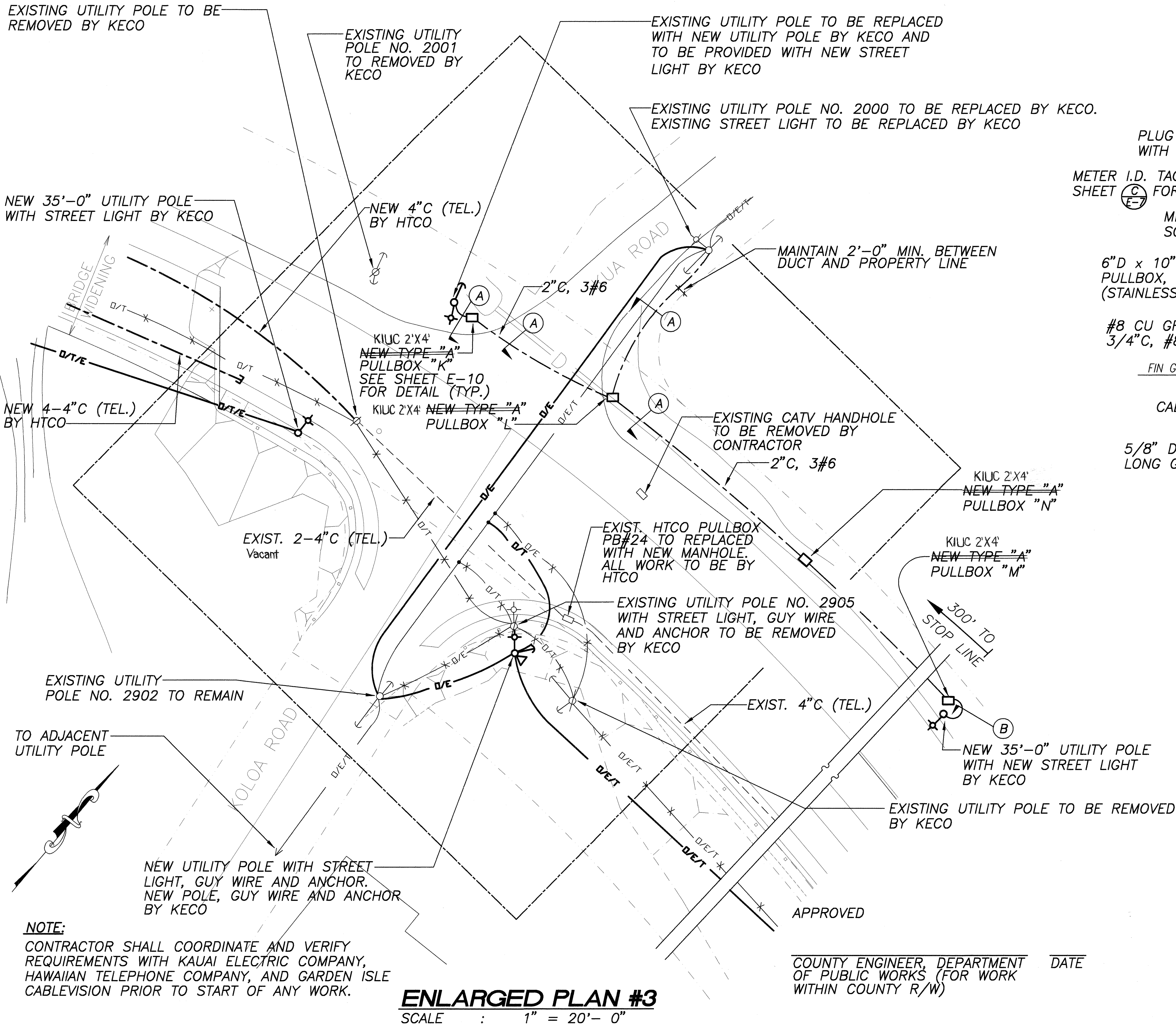
ENLARGED PLAN #2

**KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD**

PROJ. No. STP-050-1(17)

SHEET No. E-4 OF 13 SHEETS

FED. ROAD DIST NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	64	72

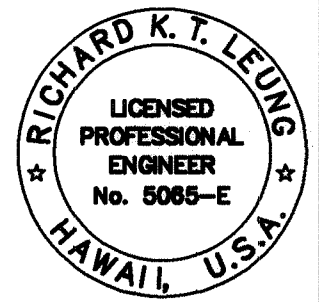
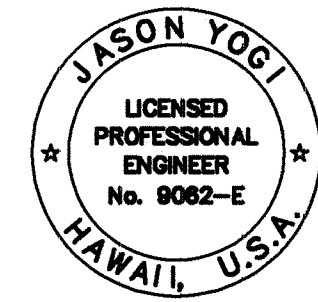


FRONT ELEVATION SIDE ELEVATION

- NOTES:
1. PEDESTAL SHALL HOT-DIPPED GALVANIZED AFTER FABRICATION.
 2. ALL FASTENING BOLTS, NUTS AND WASHER SHALL BE STAINLESS STEEL.
 3. PROVIDE 4 FT CLEARANCE IN FRONT OF METER.
 4. SEALABLE STAINLESS STEEL ENCLOSURE 6"D x 10"W x 12"H.

A PEDESTAL MOUNTING DETAIL E-5 NOT TO SCALE

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	



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LEUNG & PANG ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

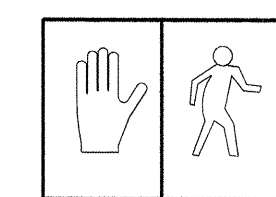
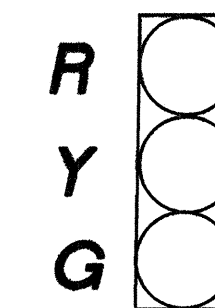
ENLARGED PLAN #3

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	65	72

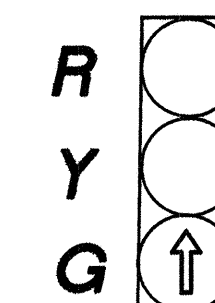
SIGNAL INDICATORS



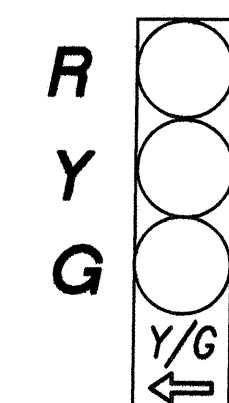
Head No.

A-1
A-2, A-3
B-2
C-3, C-4
D-2

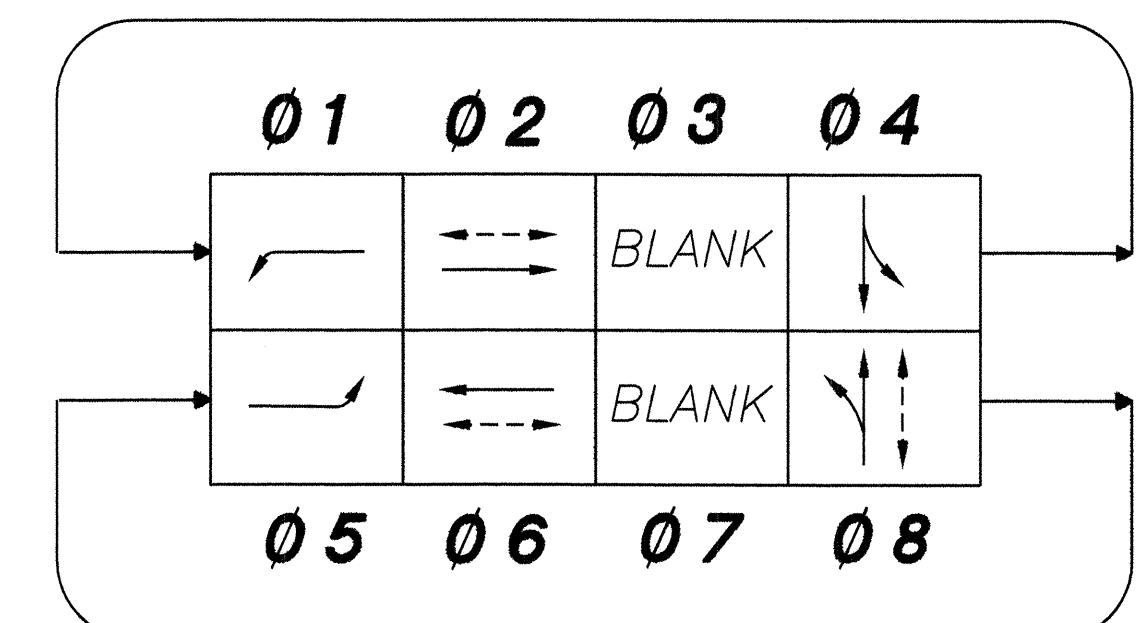
B-3, B-4
C-5, C-6
D-1



Head No.
A-4
C-2



Head No.
A-5
B-1
C-1
D-3



PHASING DIAGRAM

PROTECTED VEHICLE MOVEMENT

PEDESTRIAN MOVEMENT

7-2-03	REVISED TRAFFIC SIGNAL STANDARDS, REVISED SIGNAL INDICATOR DIAGRAM, ADDED NOTES
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

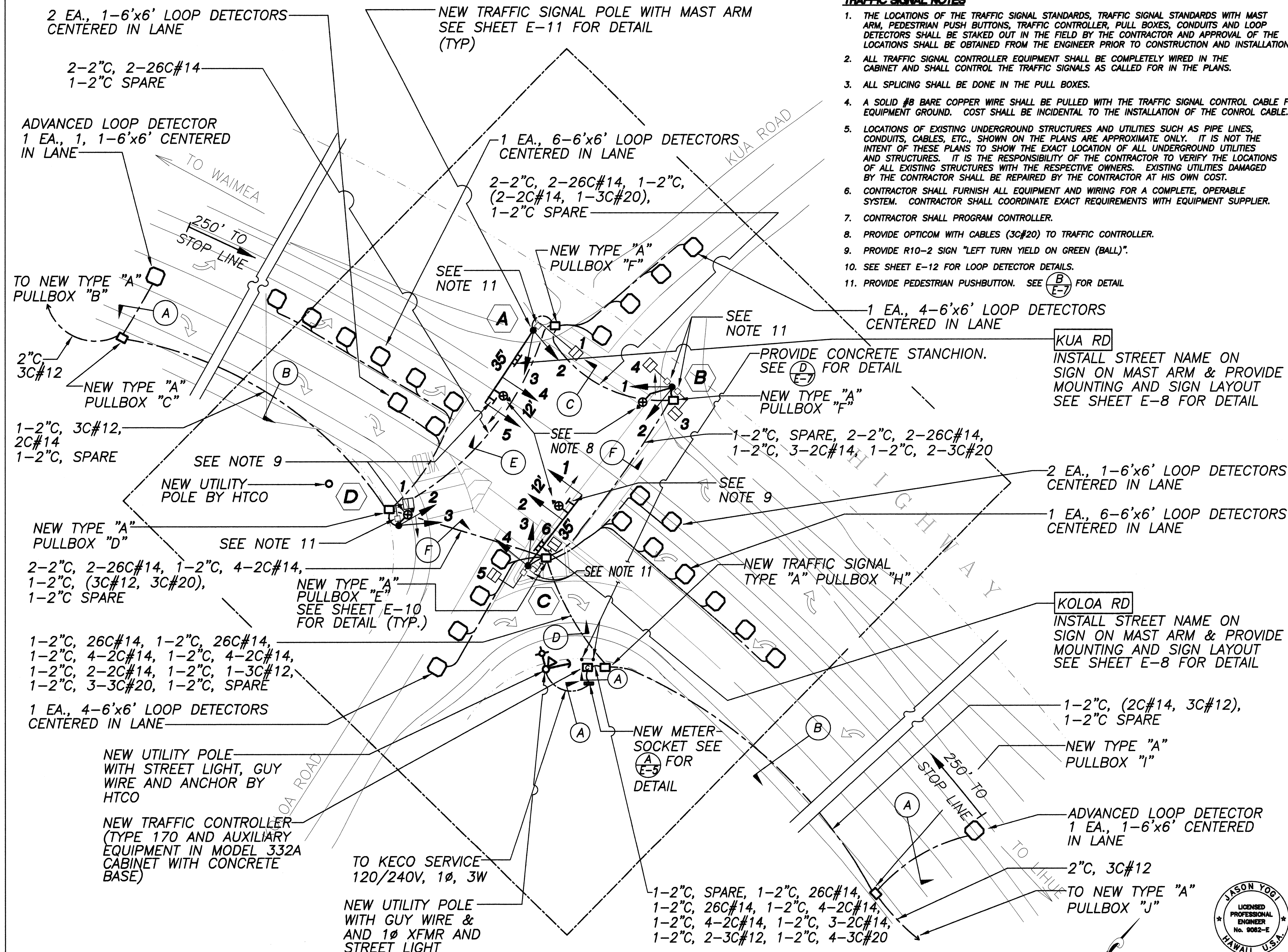
SHEET No. E-6 OF 13 SHEETS

C. O. 65

TRAFFIC SIGNAL NOTES

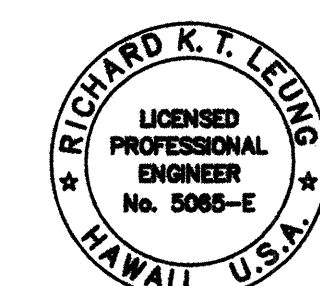
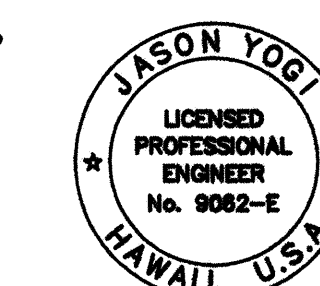
- THE LOCATIONS OF THE TRAFFIC SIGNAL STANDARDS, TRAFFIC SIGNAL STANDARDS WITH MAST ARM, PEDESTRIAN PUSH BUTTONS, TRAFFIC CONTROLLER, PULL BOXES, CONDUITS AND LOOP DETECTORS SHALL BE STAKED OUT IN THE FIELD BY THE CONTRACTOR AND APPROVAL OF THE LOCATIONS SHALL BE OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION AND INSTALLATION.
- ALL TRAFFIC SIGNAL CONTROLLER EQUIPMENT SHALL BE COMPLETELY WIRED IN THE CABINET AND SHALL CONTROL THE TRAFFIC SIGNALS AS CALLED FOR IN THE PLANS.
- ALL SPlicing SHALL BE DONE IN THE PULL BOXES.
- A SOLID #8 BARE COPPER WIRE SHALL BE PULLED WITH THE TRAFFIC SIGNAL CONTROL CABLE FOR EQUIPMENT GROUND. COST SHALL BE INCIDENTAL TO THE INSTALLATION OF THE CONTROL CABLE.
- LOCATIONS OF EXISTING UNDERGROUND STRUCTURES AND UTILITIES SUCH AS PIPE LINES, CONDUITS, CABLES, ETC., SHOWN ON THE 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 STRUCTURES WITH THE RESPECTIVE OWNERS. EXISTING UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN COST.
- CONTRACTOR SHALL FURNISH ALL EQUIPMENT AND WIRING FOR A COMPLETE, OPERABLE SYSTEM. CONTRACTOR SHALL COORDINATE EXACT REQUIREMENTS WITH EQUIPMENT SUPPLIER.
- CONTRACTOR SHALL PROGRAM CONTROLLER.
- PROVIDE OPTICOM WITH CABLES (3C#20) TO TRAFFIC CONTROLLER.
- PROVIDE R10-2 SIGN "LEFT TURN YIELD ON GREEN (BALL)".
- SEE SHEET E-12 FOR LOOP DETECTOR DETAILS.
- PROVIDE PEDESTRIAN PUSHBUTTON. SEE (B/F) FOR DETAIL.

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
APPROVED BY	
NOTED BY	
DATE	



TRAFFIC SIGNAL PLAN

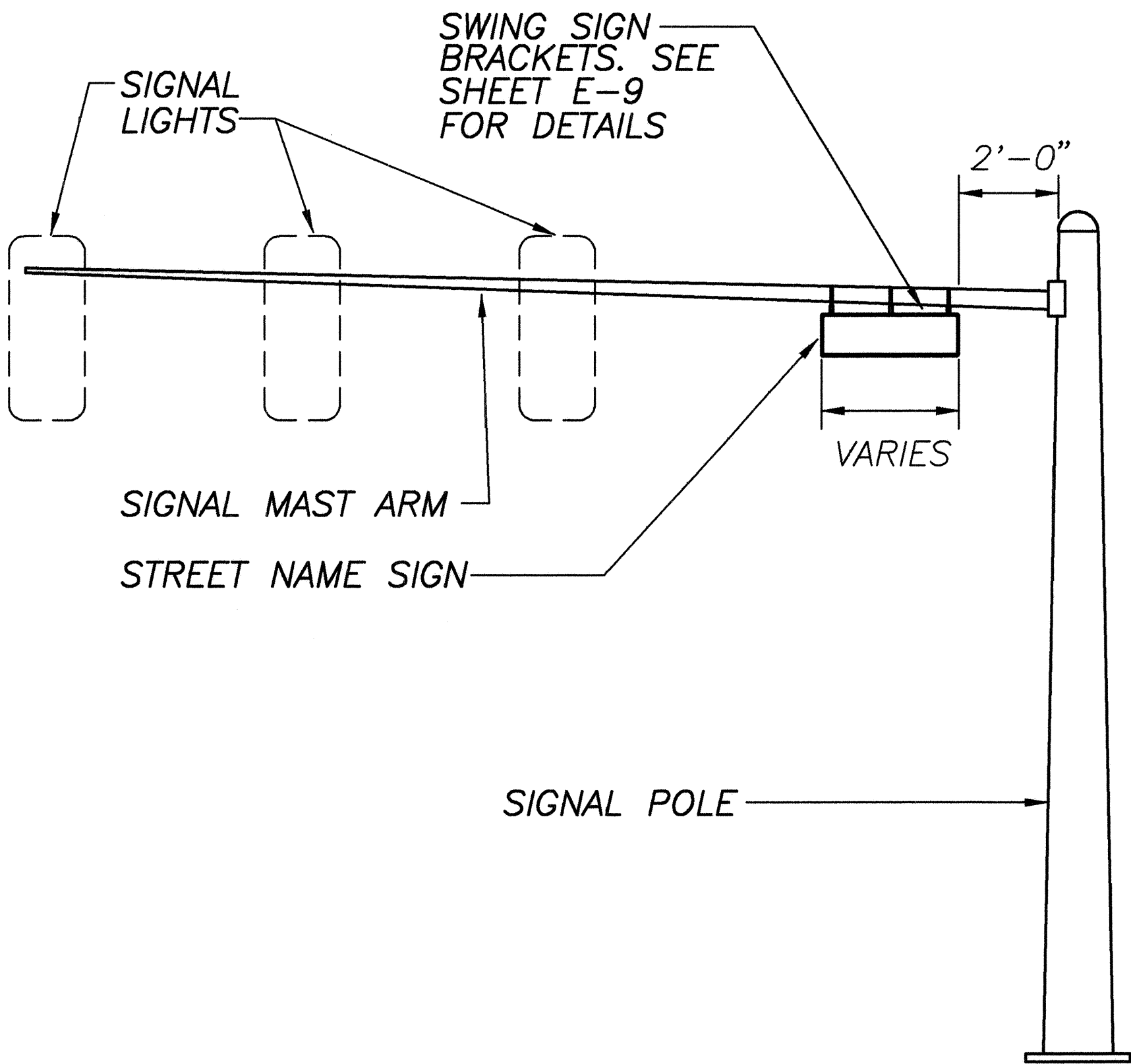
SCALE : 1" = 20'- 0"



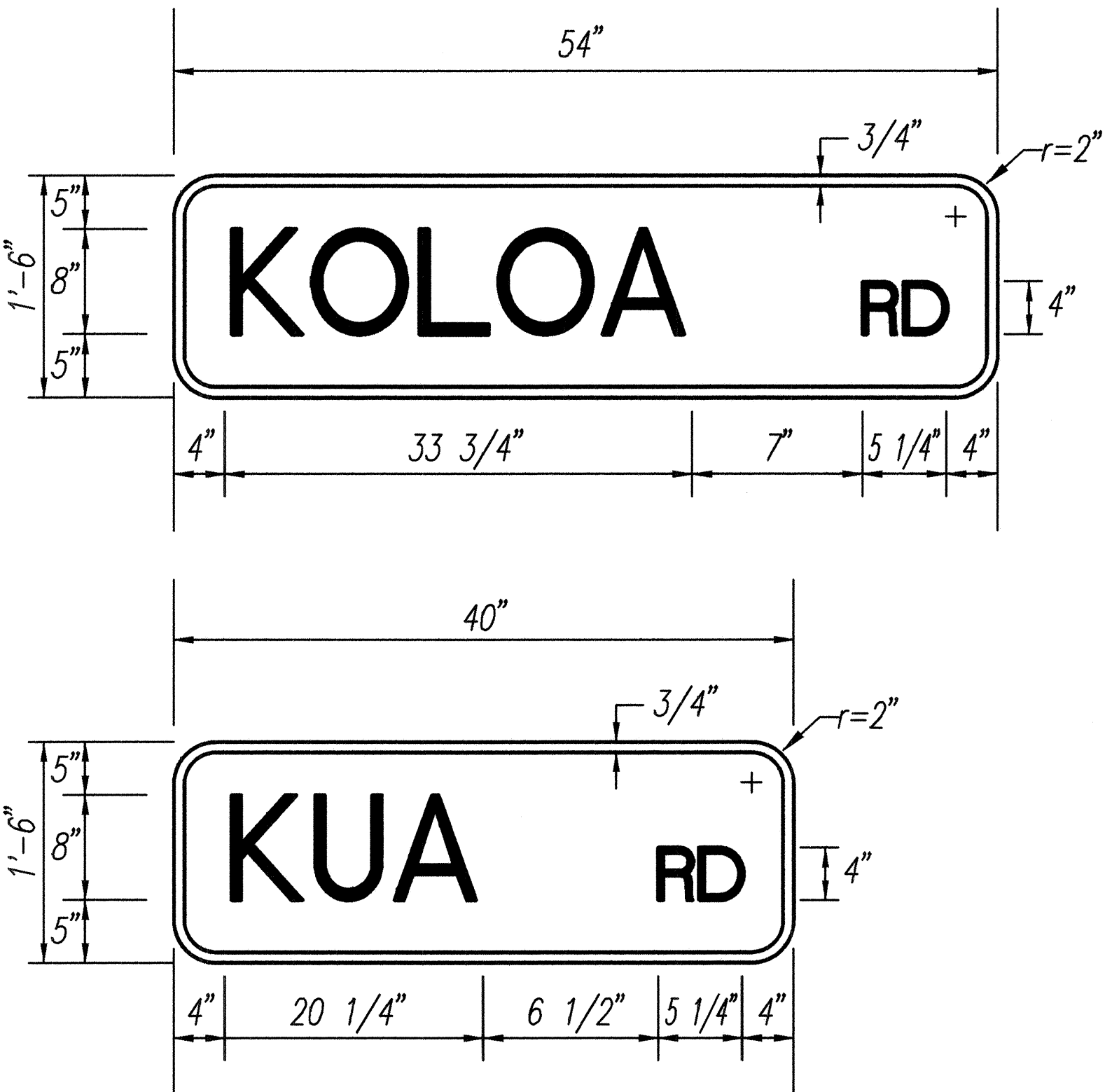
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LEUNG & PANG ASSOCIATES, INC.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	67	72



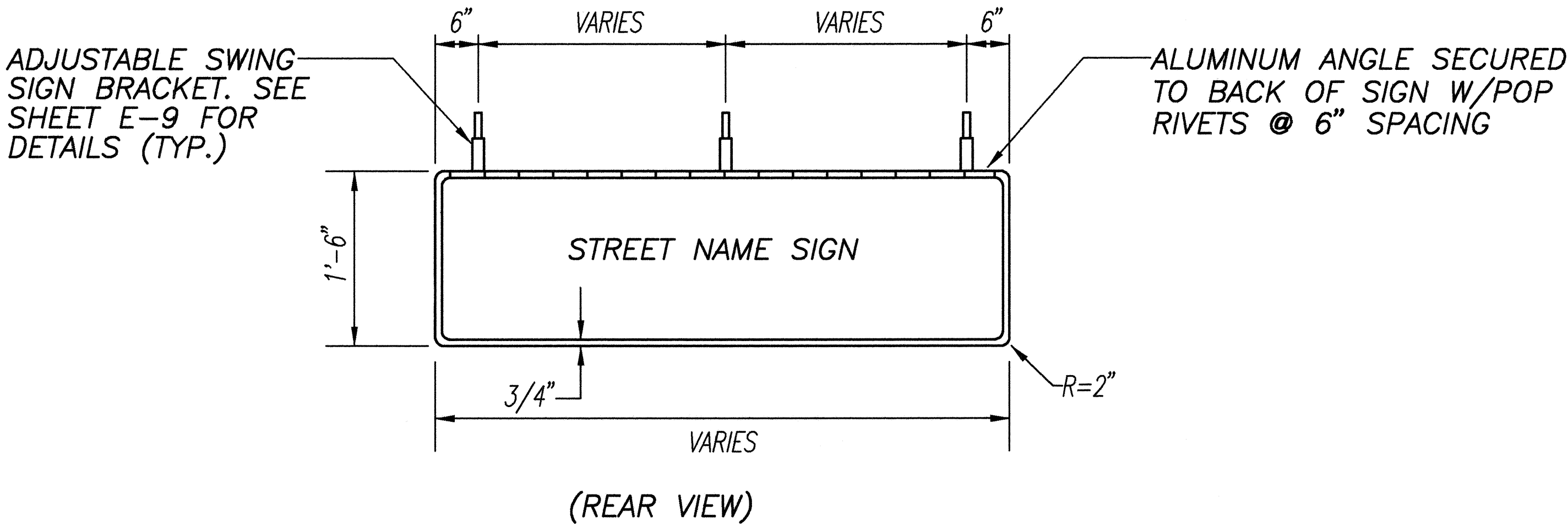
STREET NAME SIGN MOUNTING
ON MAST ARM
NOT TO SCALE



COLORS:
LEGEND - WHITE (REFL.)
BACKGROUND - GREEN (REFL.)

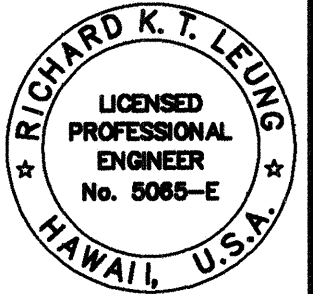
NOTE:
PROVIDE THE SAME MESSAGE ON THE FRONT
AND BACK SIDE OF THE SIGN.

TYPICAL PANEL LAYOUT FOR
FOR STREET NAME SIGN ON
TRAFFIC SIGNAL MAST ARM
NOT TO SCALE



PANEL AND SWING BRACKET LAYOUT
FOR STREET NAME SIGN
NOT TO SCALE

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
APPROVED BY	
REVISION	
NO.	



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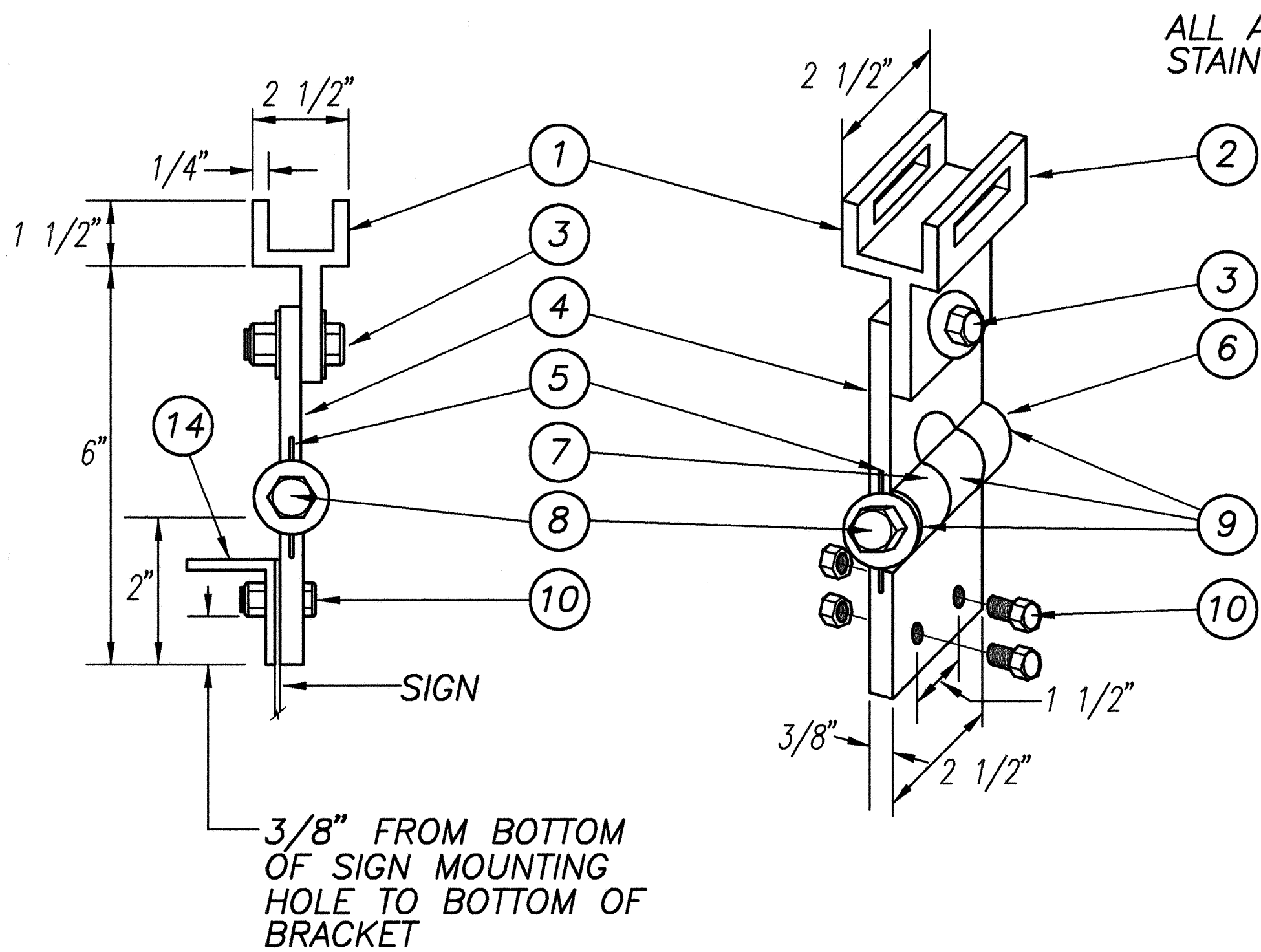
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN MOUNTING DETAILS

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	68	72

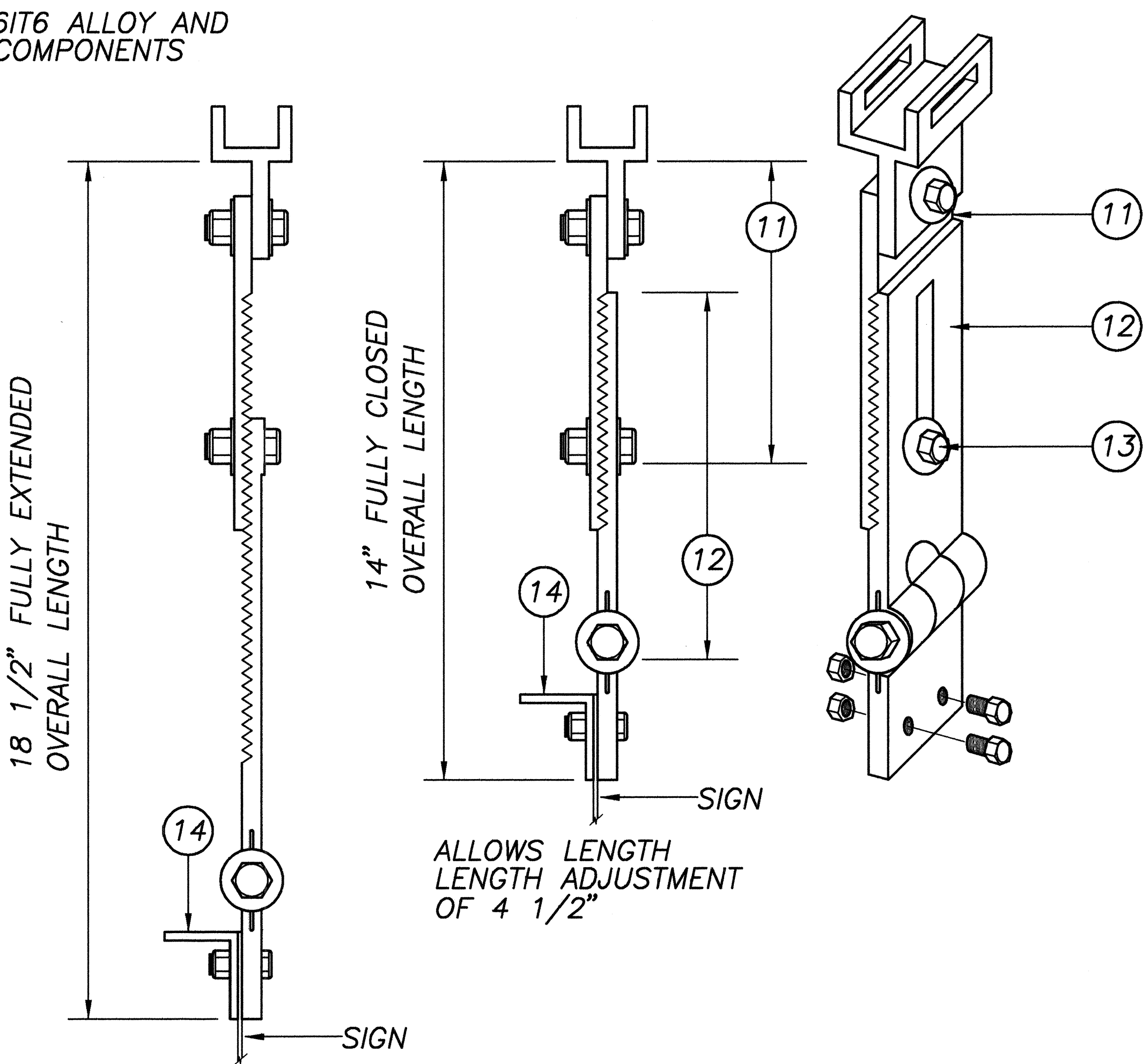


FIXED LENGTH NON-ADJUSTABLE SWING SIGN BRACKET

NOT TO SCALE

- 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 OILTITE BUSHING
- ⑩ SIGN MOUNTING SETS, CONSISTING OF TWO EACH 5/16" - 18 x 1" STAINLESS STEEL HEX HEAD BOLT WITH STAINLESS STEEL HEX LOCK NUT. TWO HOLES ON 1 1/2" CENTERS PROVIDE POSITIVE LOCK SIGN MOUNTING TO BRACKET.

ALL ALUMINUM 6061T6 ALLOY AND
STAINLESS STEEL COMPONENTS

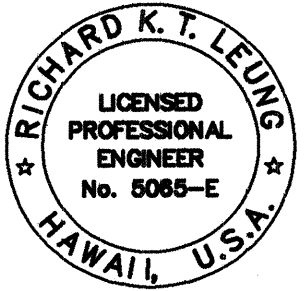


ADJUSTABLE LENGTH SWING SIGN BRACKET

NOT TO SCALE

- 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

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
INCHES	
NO.	



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Jason Yogi
LEUNG & PANG ASSOCIATES, INC.

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HIGHWAYS DIVISION

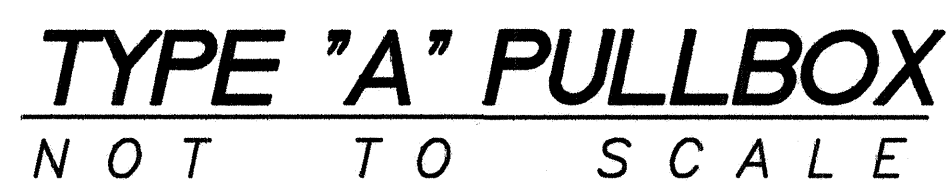
SIGN MOUNTING DETAILS

**KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD**

PROJ. No. STP-050-1(17)

SHEET No. E-9 OF 13 SHEETS

FED. ROAD DIST NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	69	72



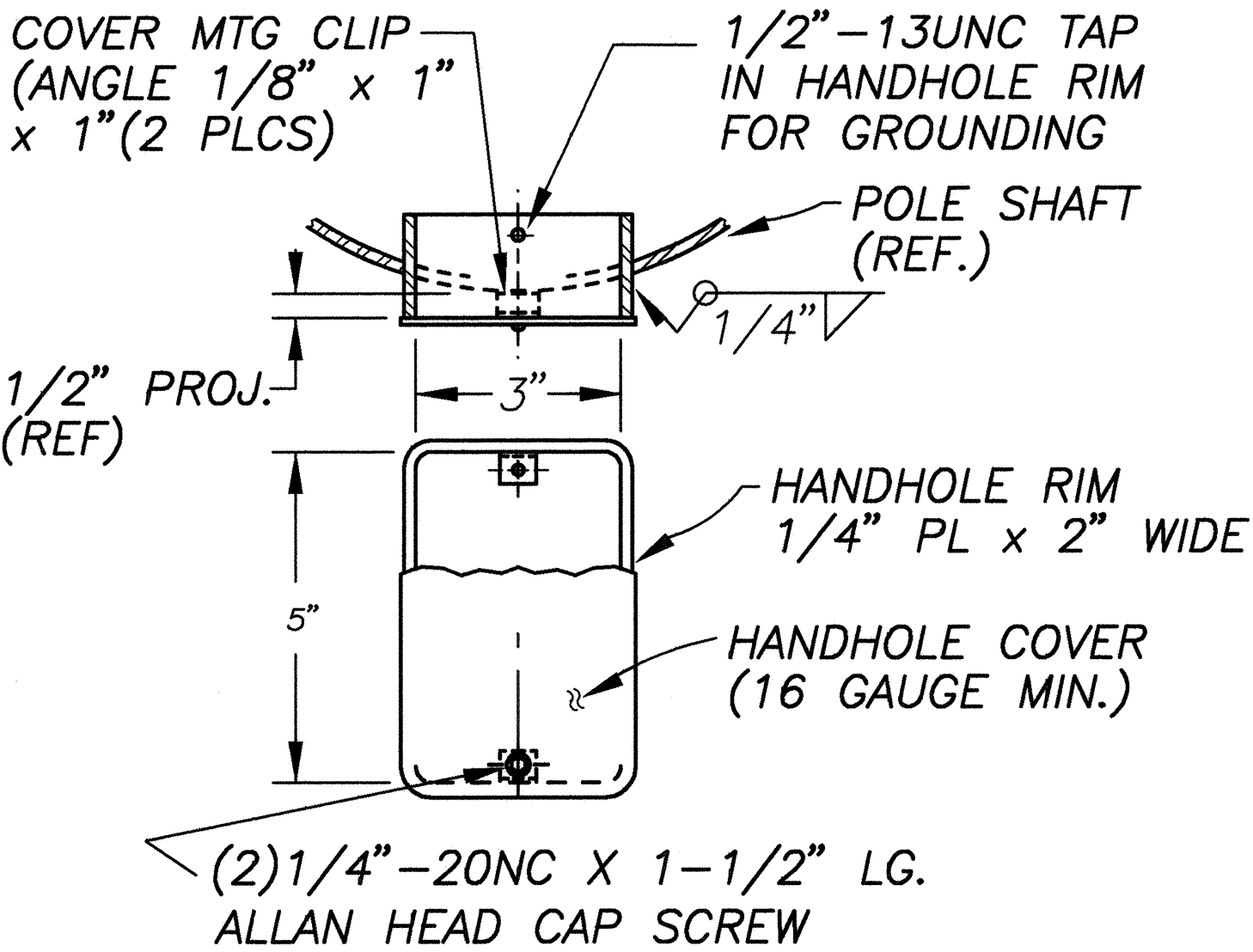
- TYPICAL FLASHING COMPOUND**
WATERPROOFING DETAILS
NOT TO SCALE



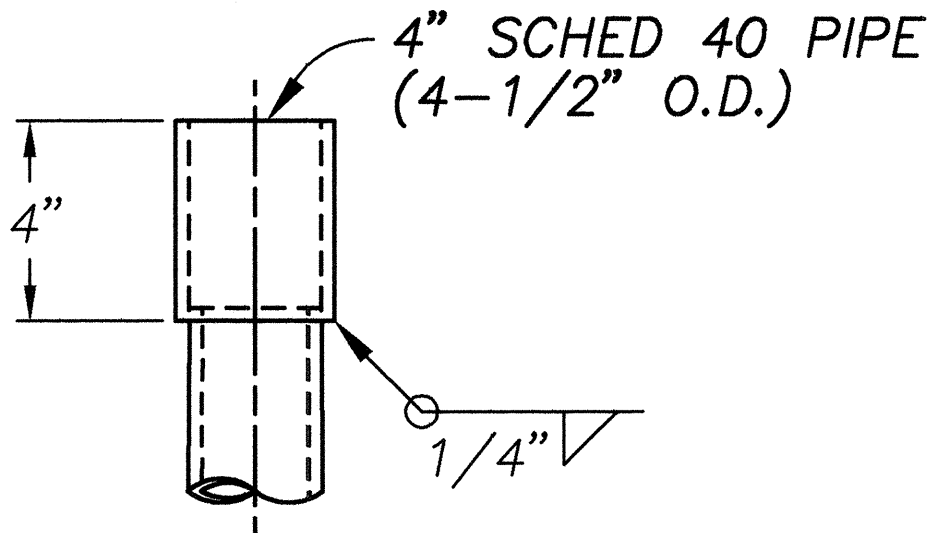
FED. ROAD DIST NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	70	72

TYPE	LENGTH "A"	P O L E D A T A							ANCHOR BOLT SIZE	
		TOP O.D. X BASE O.D.	MAT'L BREAKDOWN				BASE SQ. "F"	BASE B.C.		BASE THK. "T"
			.120" THK	.179" THK	.239" THK	.313" THK				
TYPE1-3-966	3'-7"	4-3/4" X 5-1/4"	3'7"				9"	8-1/2"	1/2"	3/4"ØX18"x3"
TYPE1-7-966	7'-0"	4-5/16" X 5-1/4"	7'0"				9"	8-1/2"	1/2"	3/4"ØX18"x3"
TYPE1-8-966	8'-0"	4-1/8" X 5-1/4"	8'0"				9"	8-1/2"	1/2"	3/4"ØX18"x3"
TYPE1-10-966	10'-0"	3-7/8" X 5-1/4"	10'0"				9"	8-1/2"	1/2"	3/4"ØX18"x3"
TYPE1-13-966	13'-0"	3-7/16" X 5-1/4"	13'0"				9"	8-1/2"	1/2"	3/4"ØX18"x3"
TYPE1-16-966	16'-0"	3-7/8" X 6-1/16"	16'0"				11-1/2"	9-1/2"	3/4"	1"ØX36"x4"

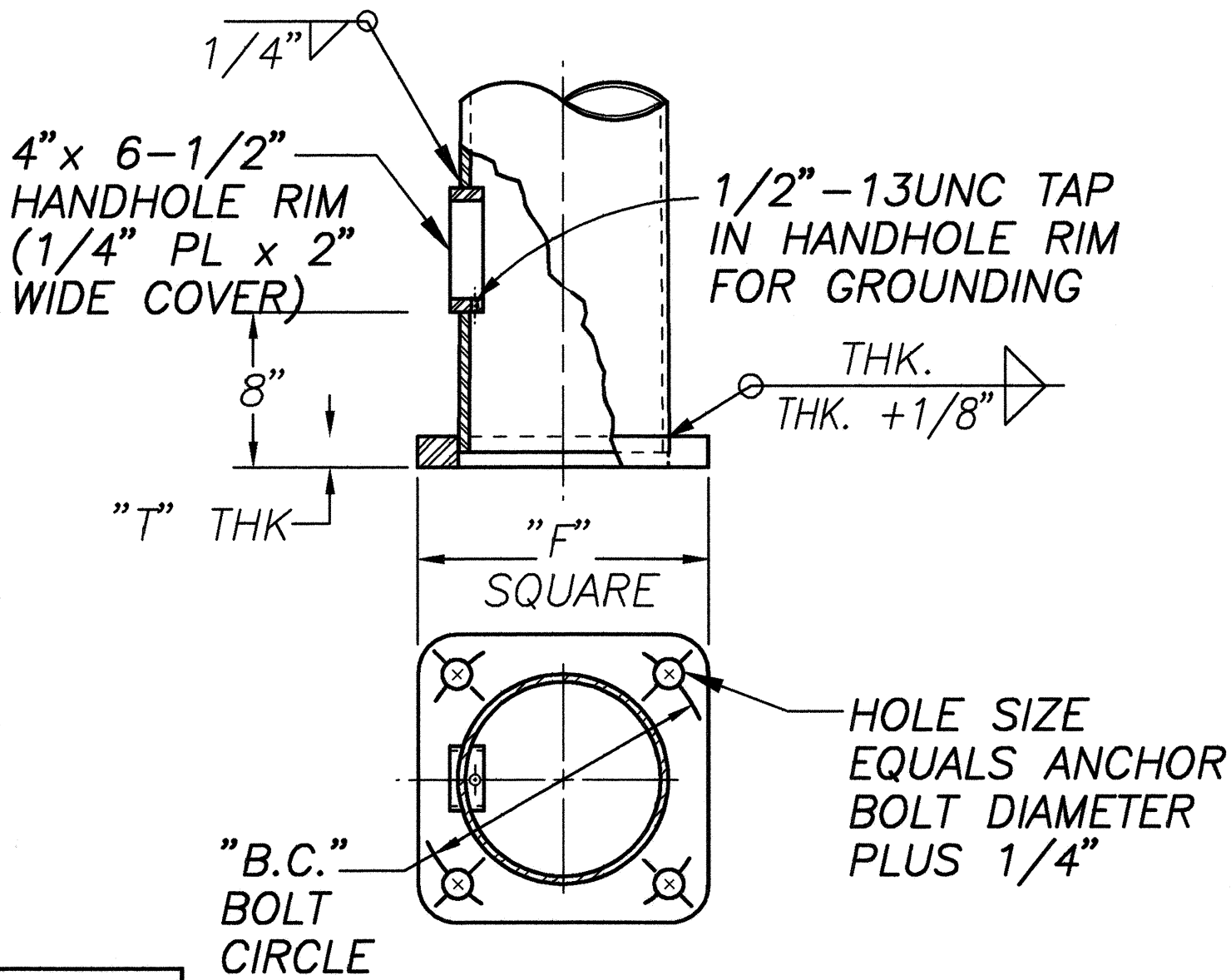
-- GENERAL NOTES --	
MATERIAL SPECIFICATIONS	
SHAFT	STEEL OF 48,000 P.S.I. MINIMUM YIELD AFTER FABRICATION
BASEPLATES AND FLANGES	ASTM A-36
PIPE	ASTM A-53-GR.B
ANCHOR BOLTS	ASTM A-307
MANUFACTURING PROCESSES	
BUTT WELDS	GROUND FLUSH WITH BASE METAL
LONGITUDINAL WELDS	BUTT WELDED BY THE ELECTRICAL RESISTANCE WELD PROCESS
CIRCUMFERENTIAL WELDS	BUTT WELD WITH PERMANENT BACK-UP RING
FINISH COATING	
STRUCTURE	HOT DIP GALVANIZE PER ASTM A-123, OR PRIME PAINTED
HARDWARE	HOT DIP GALVANIZE PER ASTM A-153
DESIGN CRITERIA	
STRUCTURE AND HARDWARE	IN ACCORDANCE WITH THE "SPECIFICATIONS FOR STRUCTURAL SUPPORTS OF HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, AASHTO 1985
WELDING	IN ACCORDANCE WITH SECTION 1.4.2 OF THE SPECIFICATIONS FOR STRUCTURAL SUPPORTS OF HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS, AASHTO 1985



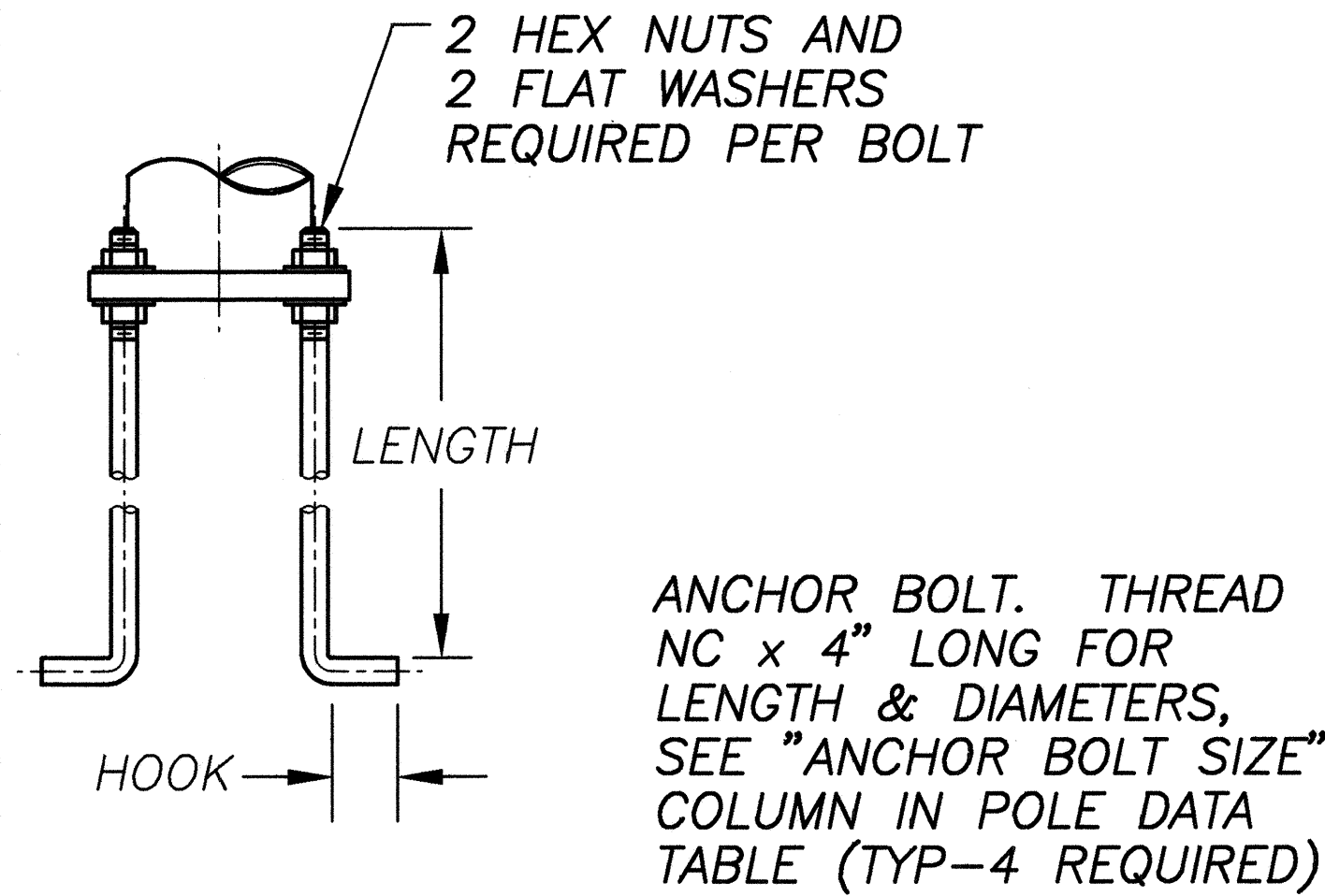
DETAIL "C" HANDHOLE DETAIL



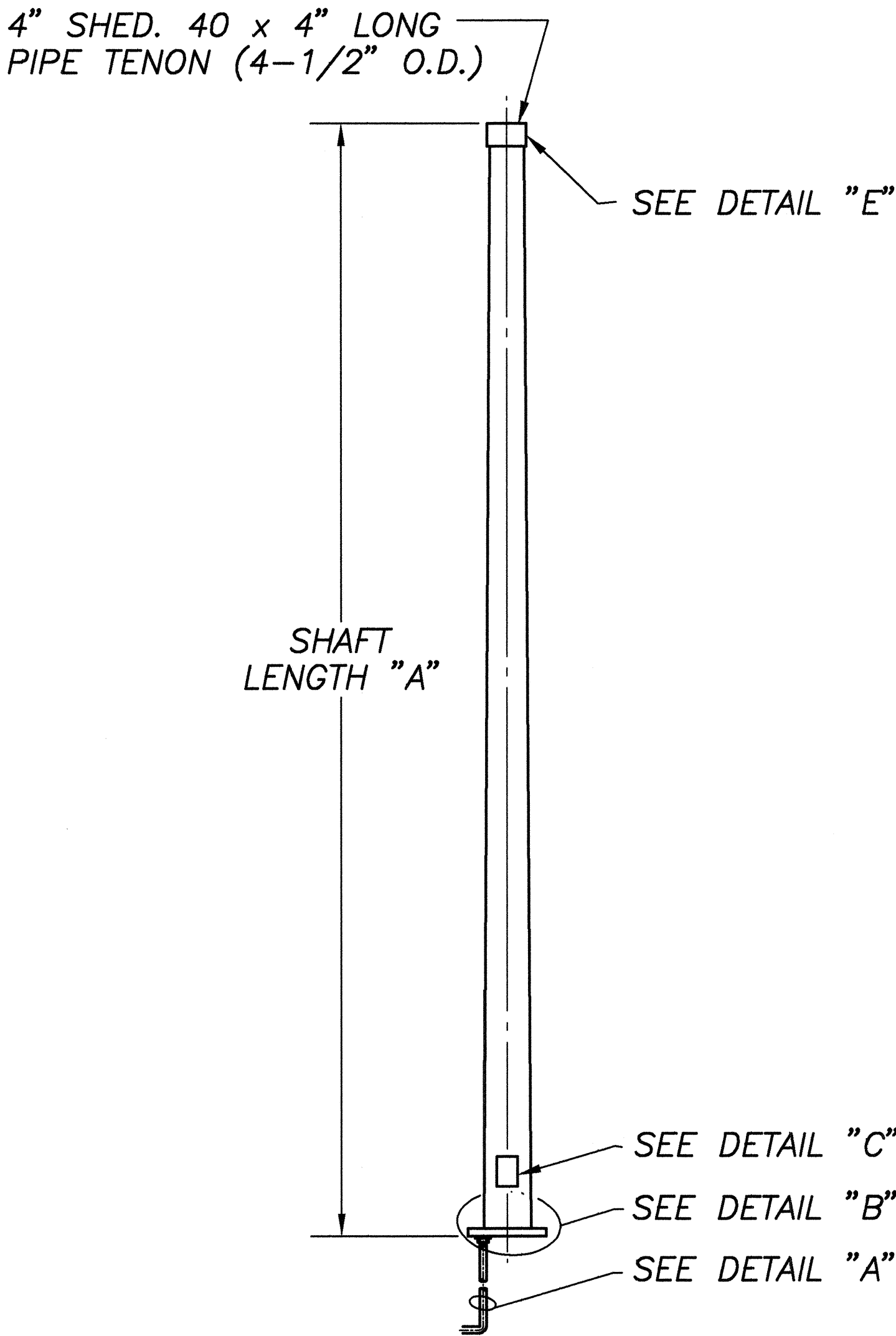
TENON DETAIL



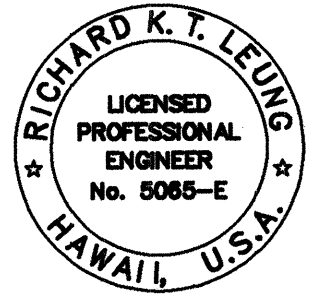
DETAIL "B" BASEPLATE DETAIL



DETAIL "A" ANCHOR BOLT DETAIL



SIGNAL POLE DETAIL
NOT TO SCALE



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

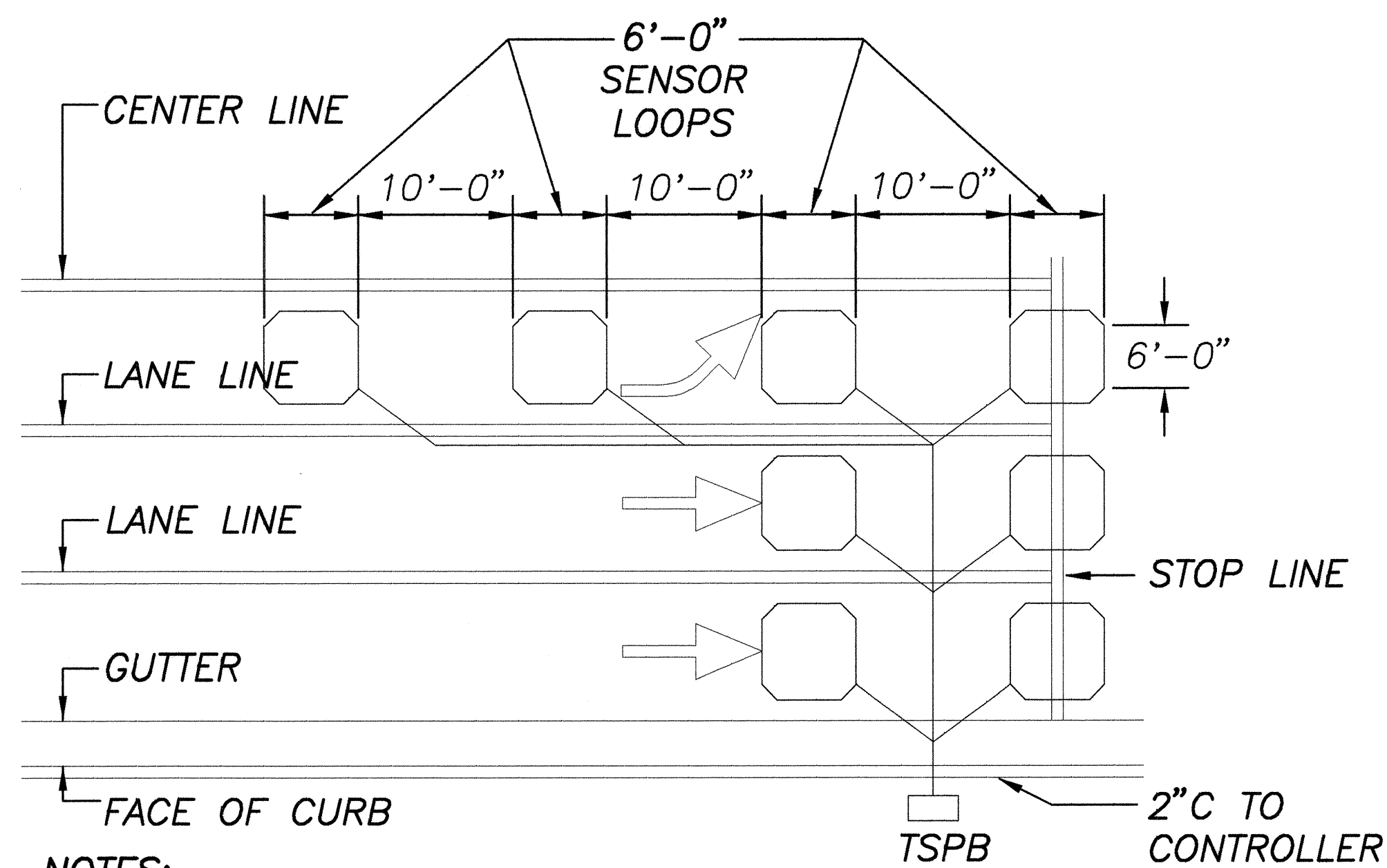
SIGNAL POLE DETAILS

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

SHEET No. E-11 OF 13 SHEETS

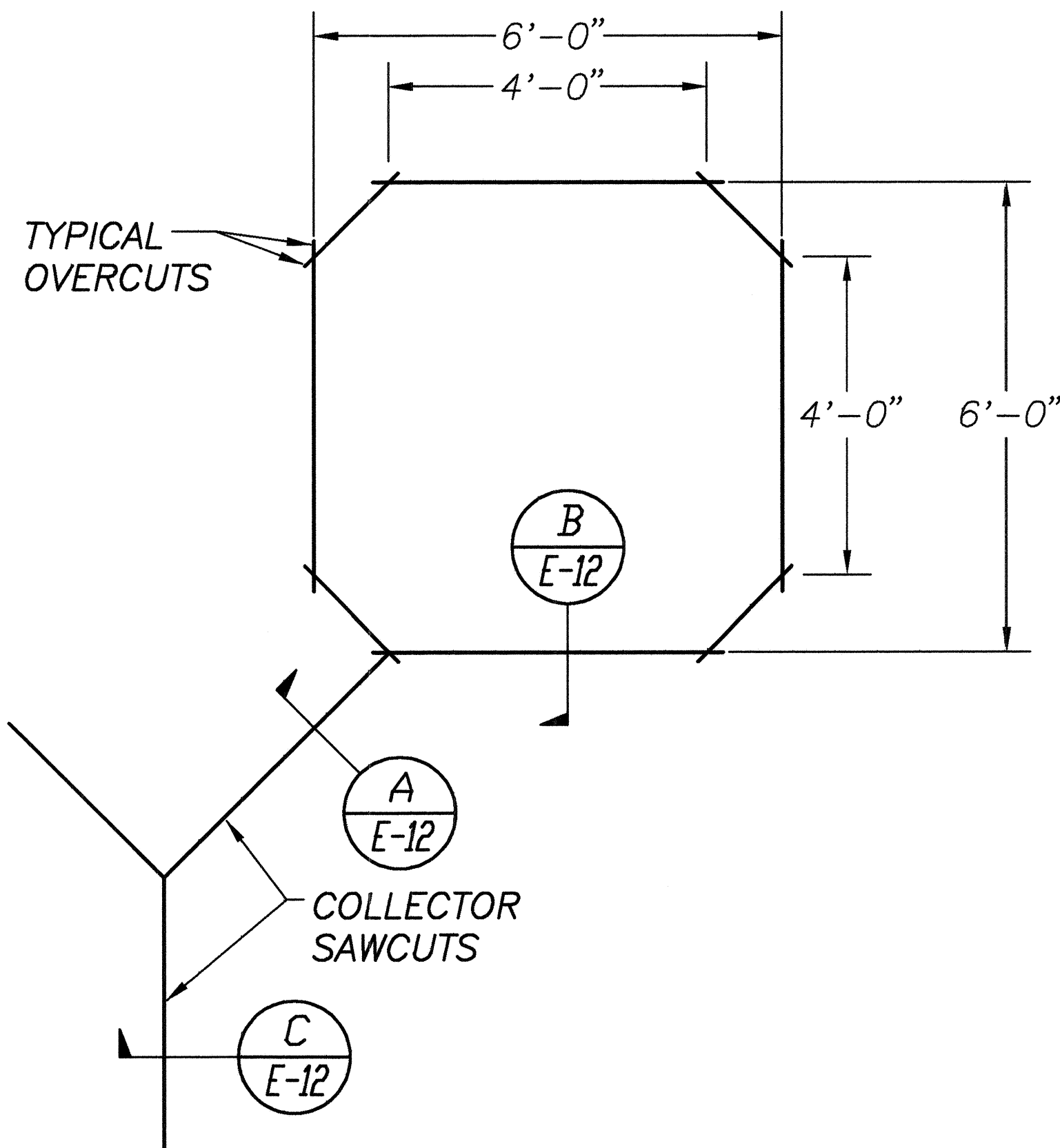
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-1(17)	2000	71	72



NOTES:

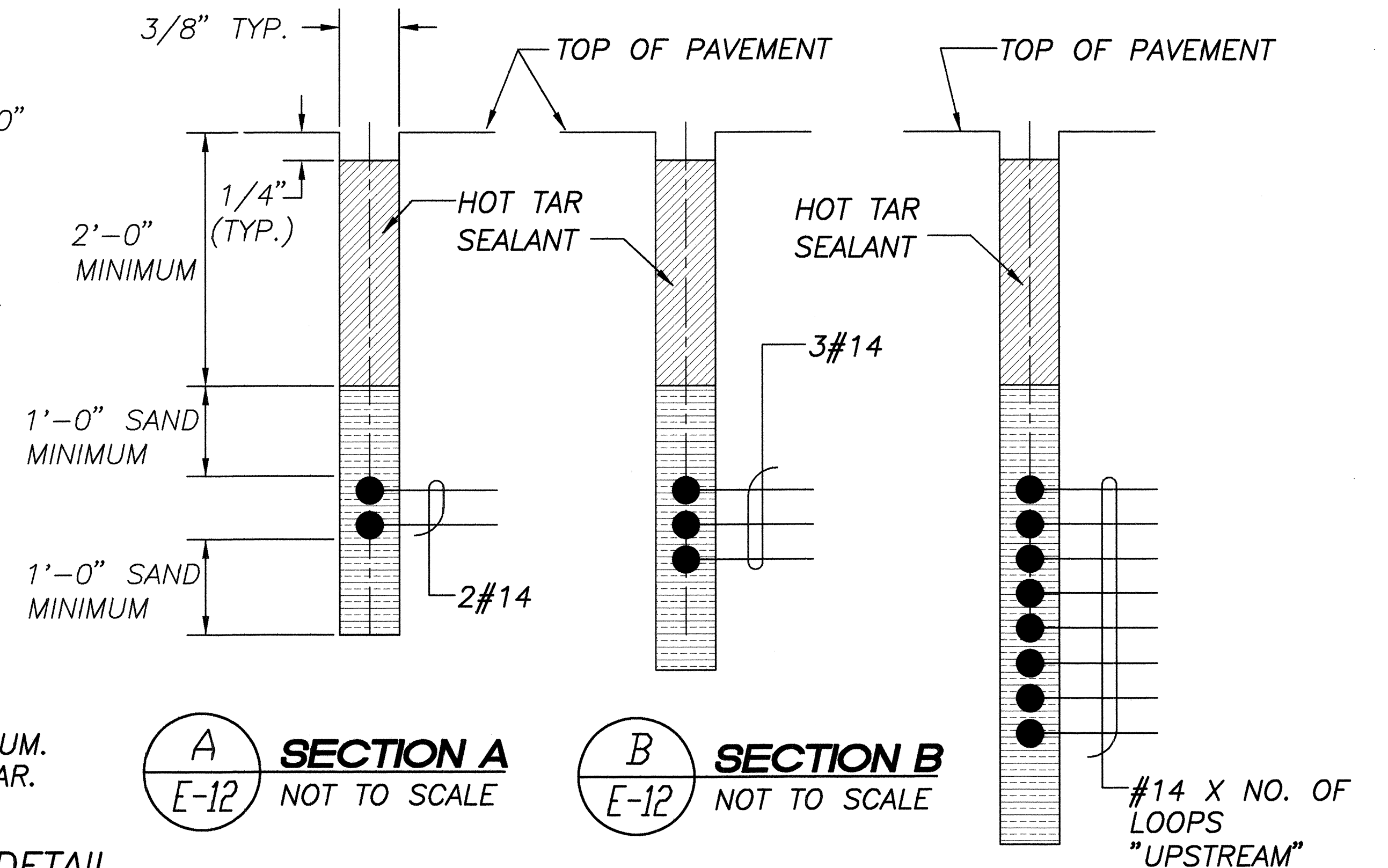
1. CENTER SENSOR LOOPS IN LANES.
2. COLLECTOR CABLES SHALL BE TWISTED 2 TURNS PER FOOT.
3. NUMBER OF LOOPS AND LOCATIONS VARY. SEE PLANS.
4. NUMBER AND LOCATIONS OF COLLECTOR SAWCUTS MAY BE VARIED IN THE FIELD TO SUIT.

TYPICAL SENSOR LOOP SAWCUT DETAIL



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

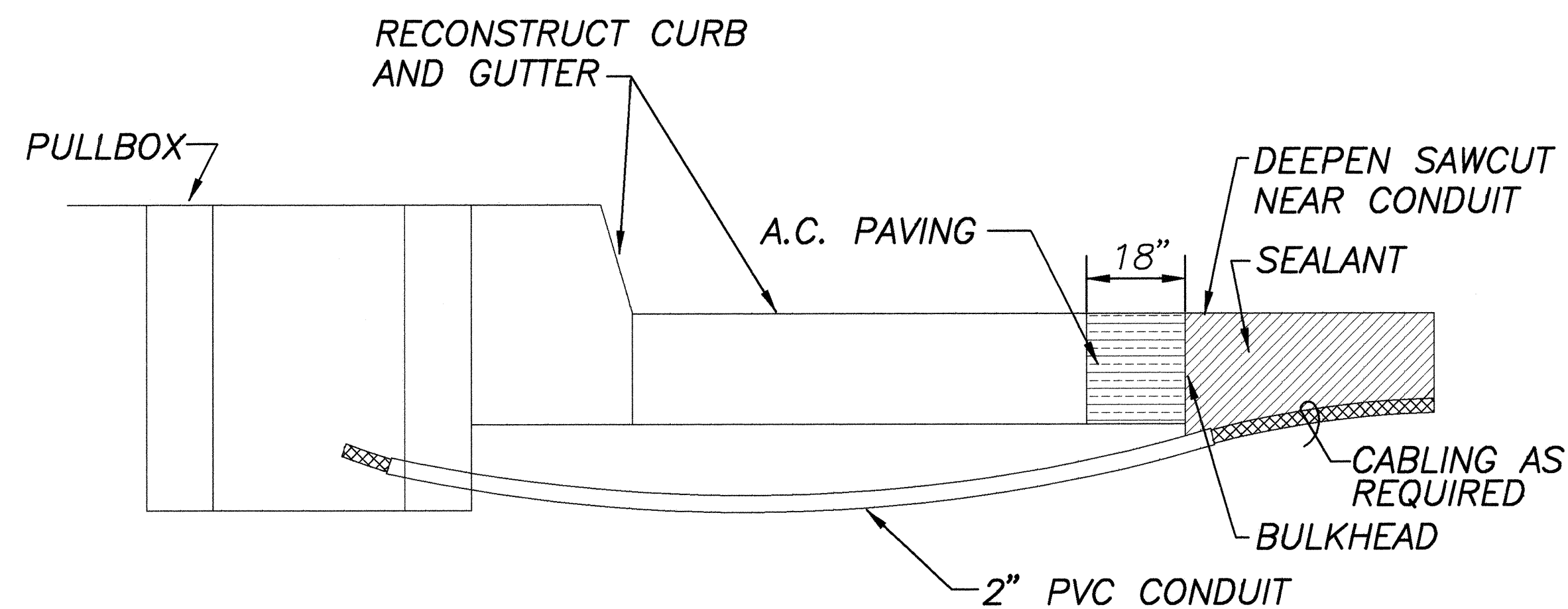
TYPICAL SENSOR LOOP SAWCUT DETAIL



SECTION A
NOT TO SCALE

SECTION B
NOT TO SCALE

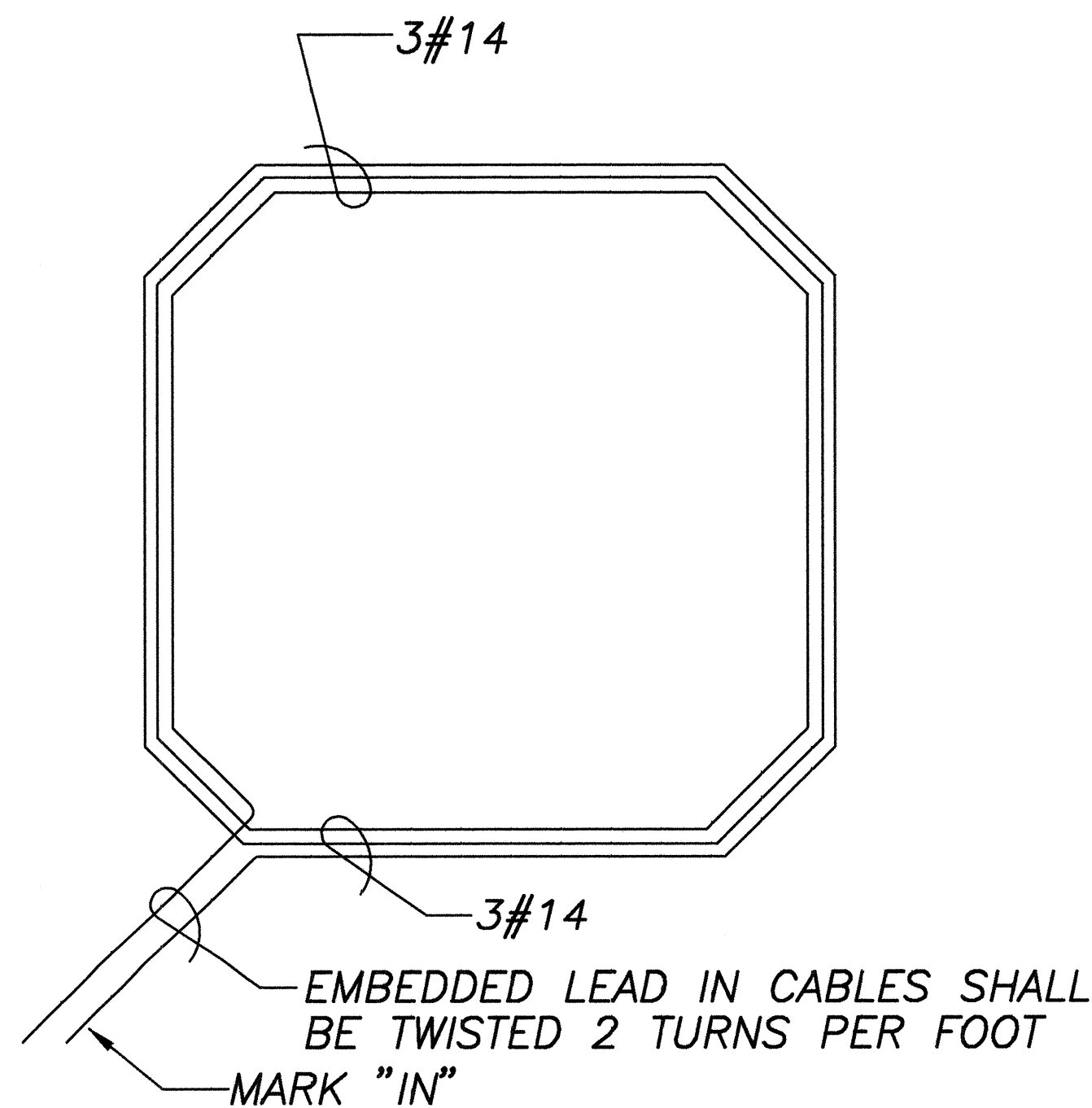
SECTION C
NOT TO SCALE



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.

DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF ROADWAY



TYPICAL SENSOR LOOP WIRING DIAGRAM



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LOOP DETECTOR DETAILS

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-1(17)

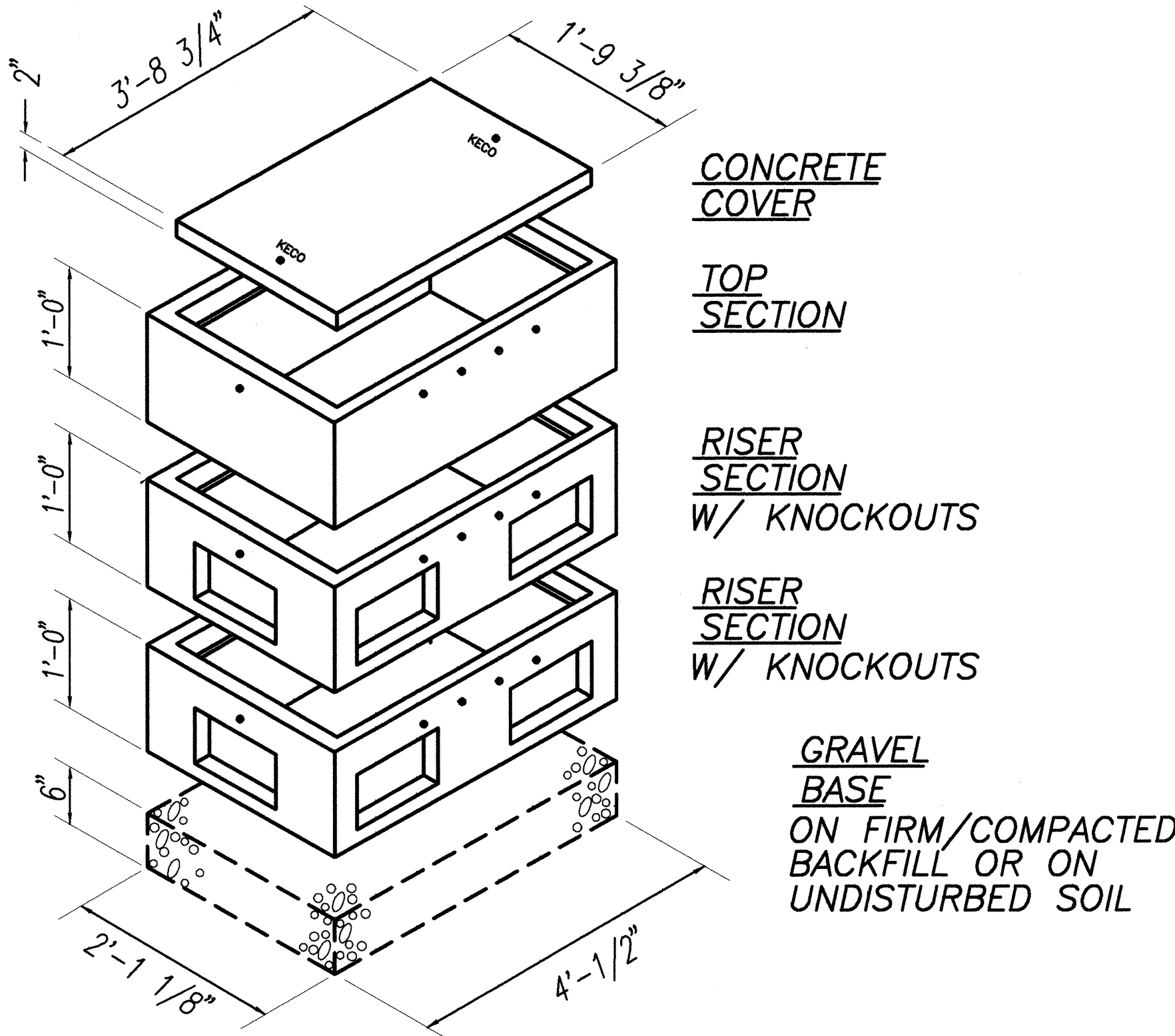
SHEET No. E-12 OF 13 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-050-K(17)	2000	72	72

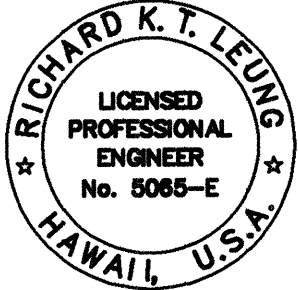
KAUAI ELECTRIC "UNDERGROUND CONSTRUCTION NOTES AND REQUIREMENTS"

1. CONTRACTOR SHALL CONTACT KAUAI ELECTRIC'S ("KE") QUALITY ASSURANCE COORDINATOR PRIOR TO START OF WORK ON KE FACILITIES AND FOR SCHEDULING SITE INSPECTIONS. [WESTSIDE: DAVE TAYLOR @ 335-6223/PAGER 644-1818; EASTSIDE: BERNARD NAEA @ 822-9204]
2. CONTRACTOR SHALL CONTACT KE'S ENGINEERING DEPARTMENT 246-4340 FOR DESIGN APPROVALS, STANDARD DETAILED DRAWINGS, AND ANY ITEMS NOT ADDRESSED IN THESE NOTES OR DRAWINGS.
3. ALL CONTRACTORS ENTERING KE FACILITIES MUST BE APPROVED BY KE AND MUST HAVE PROPER LICENSING AND INSURANCE COVERAGE. CONTACT KE RISK MANAGEMENT @ 246-4369 FOR DETAILS.
4. ALL WORK ON ELECTRICAL FACILITIES SHALL BE IN STRICT ACCORDANCE WITH SPECIFICATIONS AND REQUIREMENTS OF KE. THE CONTRACTOR SHALL CLOSELY COORDINATE ALL WORK WITH KE'S ENGINEERING DEPARTMENT.
5. ALL TRENCHES AND PULLBOXES MUST BE INSPECTED BY KE'S INSPECTOR PRIOR TO BACKFILLING AND CONCRETE-ENCASING OPERATIONS.
6. THE CONTRACTOR SHALL PROVIDE A POLY-LINE 200 LB. TEST LINE OR EQUIVALENT AS A PULLING WIRE IN ALL CONDUITS.
7. ALL CONDUITS, PULLBOXES, HANDHOLES AND MANHOLES SHALL BE CLEANED AND FREE FROM OBJECTIONABLE MATERIALS. CONDUIT ENDS SHALL BE ADEQUATELY COVERED UNTIL THE CONDUCTOR IS INSTALLED BY THE ELECTRIC COMPANY. (COVER'S SHALL BE CARLON PLUG WITH PULL TAB SERIES P258, EQUIVALENT OR BETTER)
8. CONDUIT TYPE EB WILL NOT BE ACCEPTED.
9. FOR ALL CONDUIT OTHER THAN SERVICES, REFER TO CONDUIT SCHEDULE ON DRAWINGS.
10. FOR ALL SERVICES WHERE THE CONDUCTOR SHALL BE 3/0 OR LESS, AND THE DISTANCE FROM KE HANDHOLE AND CUSTOMER'S METER IS LESS THAN 125 FEET, THE CONDUIT SHALL BE 2 INCH SCHEDULE 40 PVC. ANY DEVIATIONS MUST BE APPROVED BY KE ENGINEERING DEPARTMENT.
11. FOR SERVICES WITH CONDUIT UNDER DRIVEWAYS, ROADWAYS, AND PAVED AREAS THE CONDUIT SHALL BE CONCRETE ENCASED (AS NOTED IN ITEM 12) SCHEDULE 40 PVC (EQUIVALENT OR BETTER). SCHEDULE 80 PVC CONDUIT MAY BE SUBSTITUTED FOR THE CONCRETE ENCASED SCHEDULE 40 PVC UNDER CONCRETE DRIVEWAYS.
12. ALL PRIMARY AND SECONDARY ROADWAY CROSSINGS SHALL BE ENCASED IN A MINIMUM 3 INCH CONCRETE JACKET, WHICH SHALL EXTEND A MINIMUM OF 12 INCHES OUTSIDE OF EDGE OF PAVEMENT.
13. SUPPLY CONDUITS, WHEN INSTALLED NEAR COMMUNICATION CABLES, SHALL BE SEPARATED FROM COMMUNICATION DUCT SYSTEMS AND BURIED COMMUNICATION CABLES OR CONDUCTORS BY NOT LESS THAN 3 INCHES OF CONCRETE OR 12 INCHES OF EARTH WHEN PARALLELING OR CROSSING.
14. CHAIRS (DUCT SEATS) SHALL BE INSTALLED AND SPACED AT A MAXIMUM OF 5 FEET SEPARATION WHEN CONCRETE ENCASING CONDUITS.
15. BACKFILL MATERIAL AROUND ALL DUCTS SHALL BE SELECT MATERIAL. (REFER TO PAGE 21 OF KE SERVICE INSTALLATION MANUAL)
16. ALL CONDUITS SHALL ENTER BOXES AT 90 DEGREES ANGLE PERPENDICULAR AND FLUSH TO THE WALL WITH BELL ENDS TO PREVENT CABLE DAMAGE.
17. 90 DEGREE CONDUIT BENDS SHALL BE FACTORY MADE WITH A MINIMUM RADIUS OF 3 FEET IN TRENCH RUNS.
18. CONDUIT BENDS LESS THAN 90 DEGREES WILL NOT BE ACCEPTED.
19. A 36 INCH MINIMUM CLEARANCE SHALL BE MAINTAINED WHEN RUNNING KE CONDUITS PARALLELING, AND BY AT LEAST 6 INCHES WHEN CROSSING WATER & SEWER LINES. IF CLEARANCES ARE REDUCED BELOW 36 INCHES, THE KE CONDUIT SHALL BE CONCRETE ENCASED.

20. NO FOREIGN PULLBOXES, HANDHOLES, MANHOLES, CONCRETE SLABS/BOXES, STRUCTURES, ETC. ARE TO BE INSTALLED OVER KE FACILITIES WITH THE EXCEPTION OF HTGO, CATV OR WATERLINE CONDUIT CROSSINGS. SUCH CROSSING MUST BE APPROVED BY KE'S ENGINEERING DEPARTMENT AND KE CONDUIT TO BE CONCRETE ENCASED. CONCRETE ENCASEMENT MUST BE MINIMUM OF 3 INCH ENCASEMENT AND EXTEND A MINIMUM OF 1 FOOT BEYOND CROSSING CONDUIT OR PIPE.
21. YELLOW MARKER TAPE TO BE PLACED 1 FOOT ABOVE ELECTRICAL CONDUITS IN THE TRENCH DURING BACKFILLING. (E-Z CODE WBT 6 INCH WIDE 4 MILL POLYETHYLENE PROTECT-A-LINE WARNING TAPE NA-0708 "ELECTRIC LINE" IN YELLOW, EQUIVALENT OR BETTER)
22. UNLESS OTHERWISE NOTED, THE TOP OF ALL CONDUITS SHALL BE AT A MINIMUM DEPTH OF 24 INCHES BELOW FINISHED GRADE.
23. ALL HANDHOLES, PULLBOXES, AND MANHOLES SHALL MEET KAUAI ELECTRIC'S SPECIFICATIONS AND MANUFACTURED BY A KE APPROVED SUPPLIER.
24. TYPICALLY, THE TOP OF ALL ELECTRICAL UTILITY BOXES SHALL BE 1 INCH ABOVE FINISHED GRADE UNLESS OTHERWISE NOTED. SINGLE PHASE TRANSFORMER PADS SHALL 2 INCHES ABOVE, AND THREE PHASE TRANSFORMER PADS SHALL BE 4 INCHES ABOVE FINISHED GRADE. (SPECIAL CONDITIONS MAY APPLY TO SIDEWALKS, ROADWAYS, ETC. SEE SPECIFIC LOCATION NOTATION)
25. AT NO TIME SHALL CEMENT MORTAR, WOOD OR ANY OTHER MATERIAL BE USED BETWEEN PRE-CAST SECTIONS OF KE PULLBOXES, HANDHOLES, OR MANHOLES. THE PERMANENT INSTALLATION OF WOODEN WEDGES TO LEVEL OR RAISE THE PRE-CAST SECTIONS SHALL NOT BE PERMITTED.
26. A MINIMUM OF 6 INCHES OF #3 CRUSHED ROCK BACKFILL SHALL BE PLACED LOOSELY BENEATH THE BOTTOM SECTION OF HANDHOLES AND PULLBOXES. CRUSHED ROCK OR OTHER FOREIGN MATERIALS ARE NOT TO BE PLACED INSIDE HANDHOLES AND PULLBOXES.



A KECO 2'x4' HANDHOLE DETAIL
E-13 NOT TO SCALE



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LEUNG & PANG ASSOCIATES, INC.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

KAUAI ELECTRIC NOTES
AND KECO HANHOLE DETAIL

KAUMUALII HIGHWAY INTERSECTION
IMPROVEMENTS AT KOLOA ROAD

PROJ. No. STP-050-K(17)

SHEET No. E-13 OF 13 SHEETS