

STANDARD VEHICLE STANDARD HEADS (SIGNAL) WITH INDICATIONS AS SHOWN. MOUNTED ON TYPE I 10' STANDARD.

PEDESTRIAN SIGNAL HEADS, WALK - DON'T WALK. MOUNTED ON TRAFFIC SIGNAL STANDARD AS SHOWN.

STANDARD VEHICLE STANDARD HEADS (SIGNAL) WITH INDICATIONS AS SHOWN. MOUNTED ON TYPE II-B WITH MAST ARM TYPE. DIMENSIONS AS SHOWN.

TRAFFIC SIGNAL PULLBOX (TSB) TYPE "A"

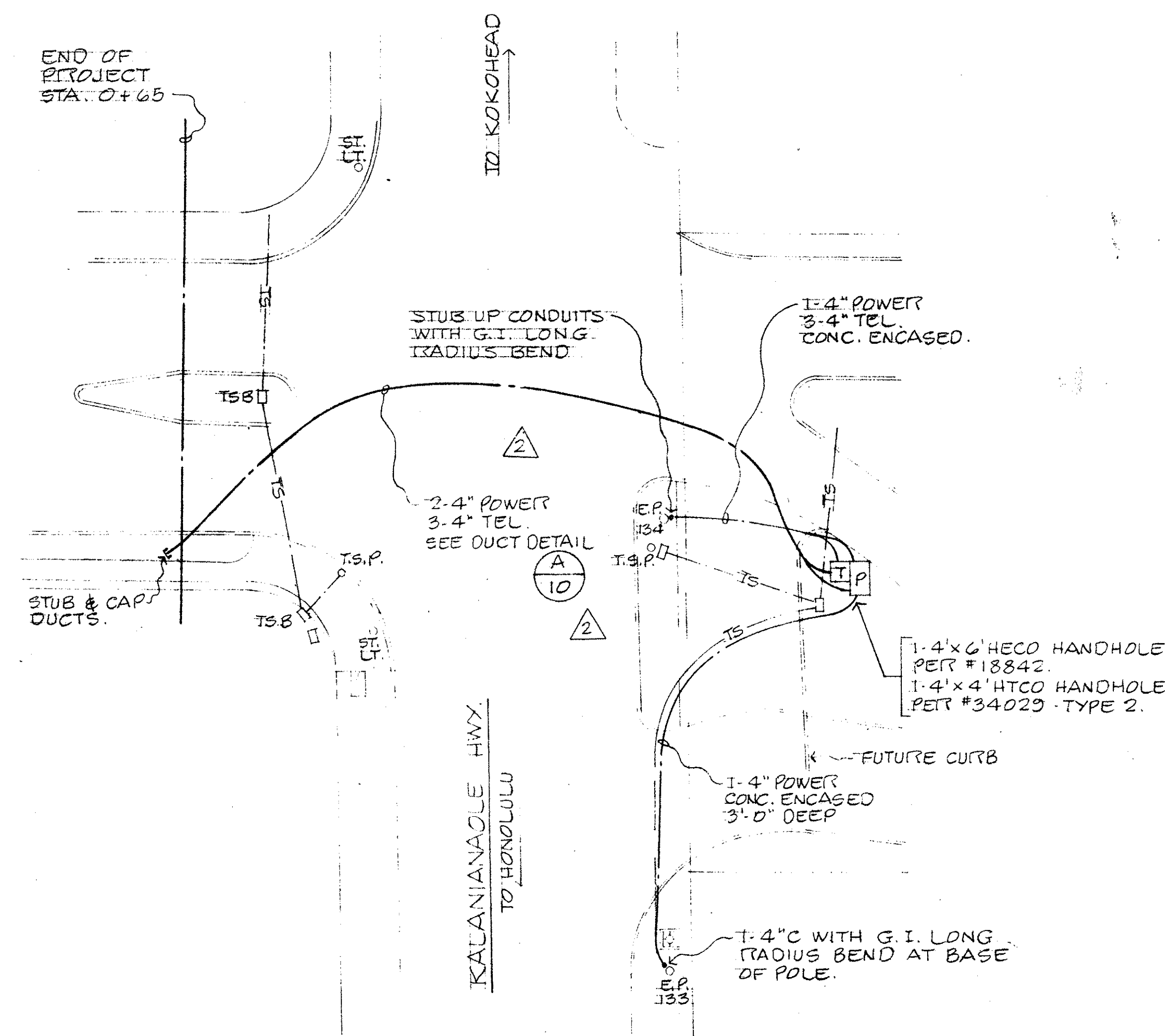
TRAFFIC SIGNAL CONTROLLER

TRAFFIC SIGNAL LOOPS (TYPE AS INDICATED)

UNDERGROUND TRAFFIC SIGNAL CONDUITS W/CABLES

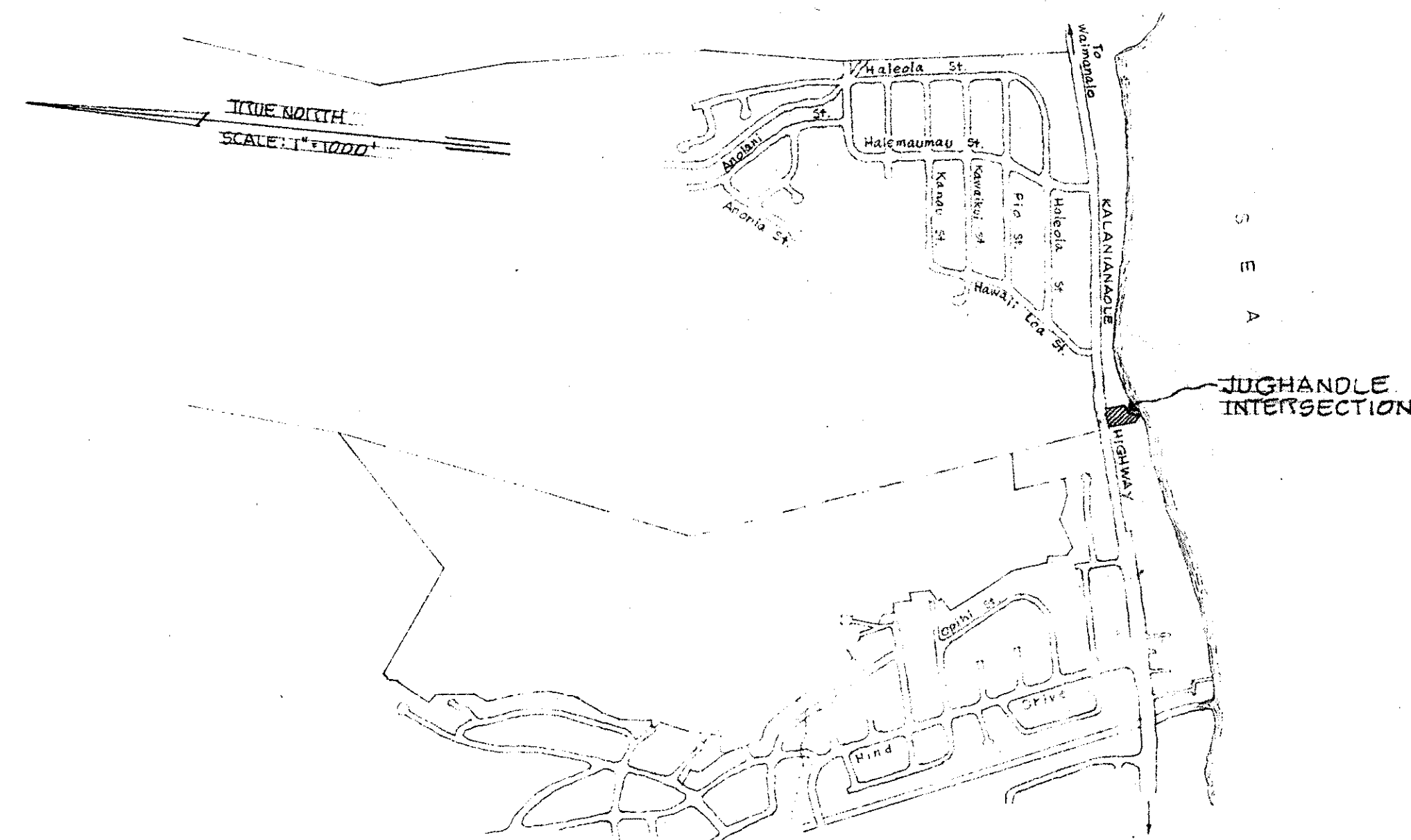
UNDERGROUND UTILITY LINES

1. ALL UNDERGROUND UTILITIES SHOWN ARE APPROXIMATE LOCATIONS ONLY. THE CONTRACTOR SHALL VERIFY LOCATION OF ALL UNDERGROUND UTILITIES WITH THE RESPECTIVE UTILITY COMPANIES. ANY DAMAGE TO THE EXISTING UTILITIES DURING CONSTRUCTION SHALL BE REPAIRED BY THE CONTRACTOR AT HIS OWN COST.
2. TRAFFIC SIGNAL PAVEMENT MARKINGS SHOWN ARE FOR DESIGN BASIS ONLY. ALL MARKINGS SHALL BE VERIFIED WITH THE APPROPRIATE GOVERNMENT AGENCIES PRIOR TO INSTALLATION OF THE TRAFFIC SIGNAL SYSTEMS.
3. ALL PULLBOXES, TRAFFIC SIGNAL STANDARDS, LOOP DETECTORS AND CONDUIT RUNS SHALL BE STAKED OUT IN THE FIELD FOR THE APPROVAL BY THE ENGINEER PRIOR TO CONSTRUCTION.
4. UNLESS OTHERWISE SPECIFIED, ALL WORK SHALL CONFORM TO THE STANDARD SPECIFICATIONS FOR ROAD & BRIDGE CONSTRUCTION 1969, OF THE STATE HIGHWAYS DIVISION.
5. ALL TRAFFIC SIGNAL WORK SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS & HIGHWAYS, FEDERAL HIGHWAY ADMINISTRATION, 1971.
6. CONSTRUCTION OF ALL TRAFFIC SIGNAL SYSTEMS SHALL BE INSPECTED BY THE DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU.
7. THE CONTRACTOR SHALL BOND AND GROUND THE TRAFFIC SIGNAL SYSTEM PER STATE OF HAWAII SPECIFICATIONS.
8. WORK DONE BY THE DEPARTMENT OF TRANSPORTATION SERVICES, CITY AND COUNTY OF HONOLULU, SHALL CONSIST OF:
 - A) ASSEMBLE AND CONNECT CONTROLLER AND AUXILIARY EQUIPMENT IN CONTROLLER CABINET.
 - B) MAKE ALL ELECTRICAL CONNECTIONS IN THE FIELD FOR TRAFFIC SIGNAL SYSTEMS, AFTER THE SYSTEMS HAVE BEEN INSTALLED IN PLACE BY THE CONTRACTOR.
 - C) FINAL ADJUSTMENT OF TRAFFIC SIGNAL CONTROL EQUIPMENT.

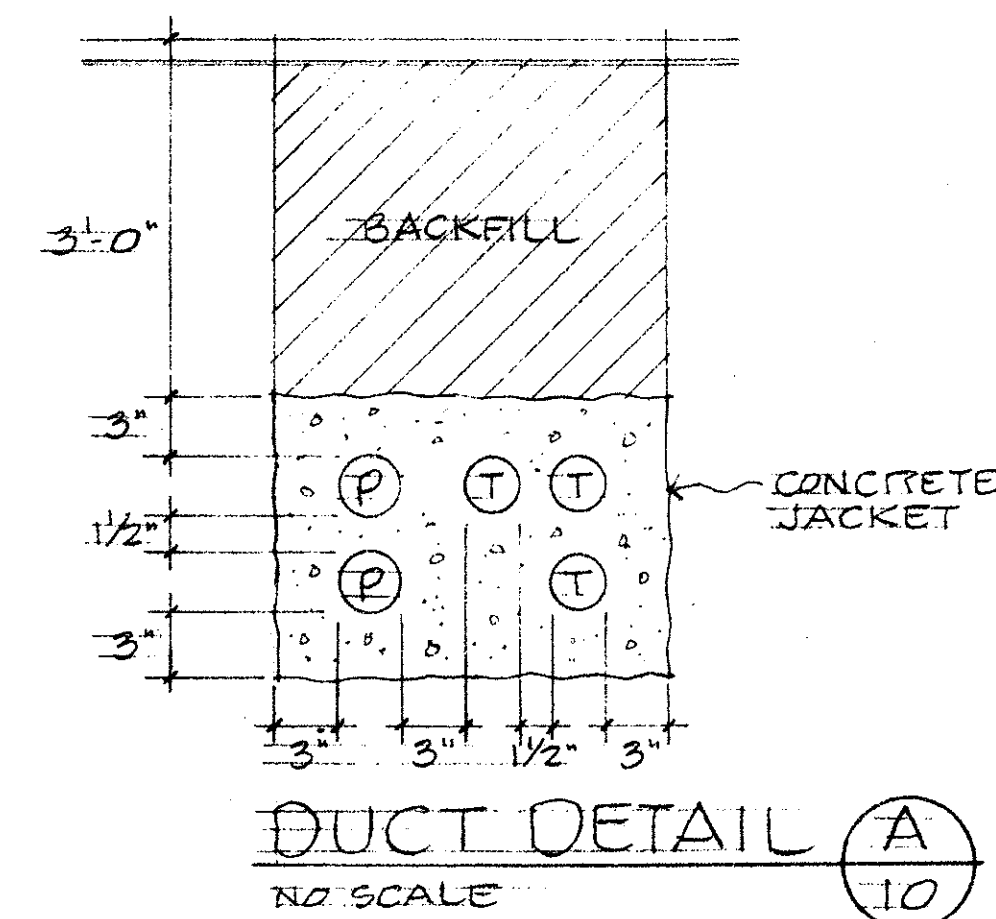




SCALE: 1" = 20'-0"

NOTE: TRAFFIC SIGNAL SHOWN FOR COORDINATION ONLY.



T.M.K. : 3-7-01



	5/19/77	AS BUILT	SK
	5/19/76	REROUTED DUCT AT ROAD CROSSING	GMD <i>90</i>
REVISION	DATE	DESCRIPTION	BY APPROV

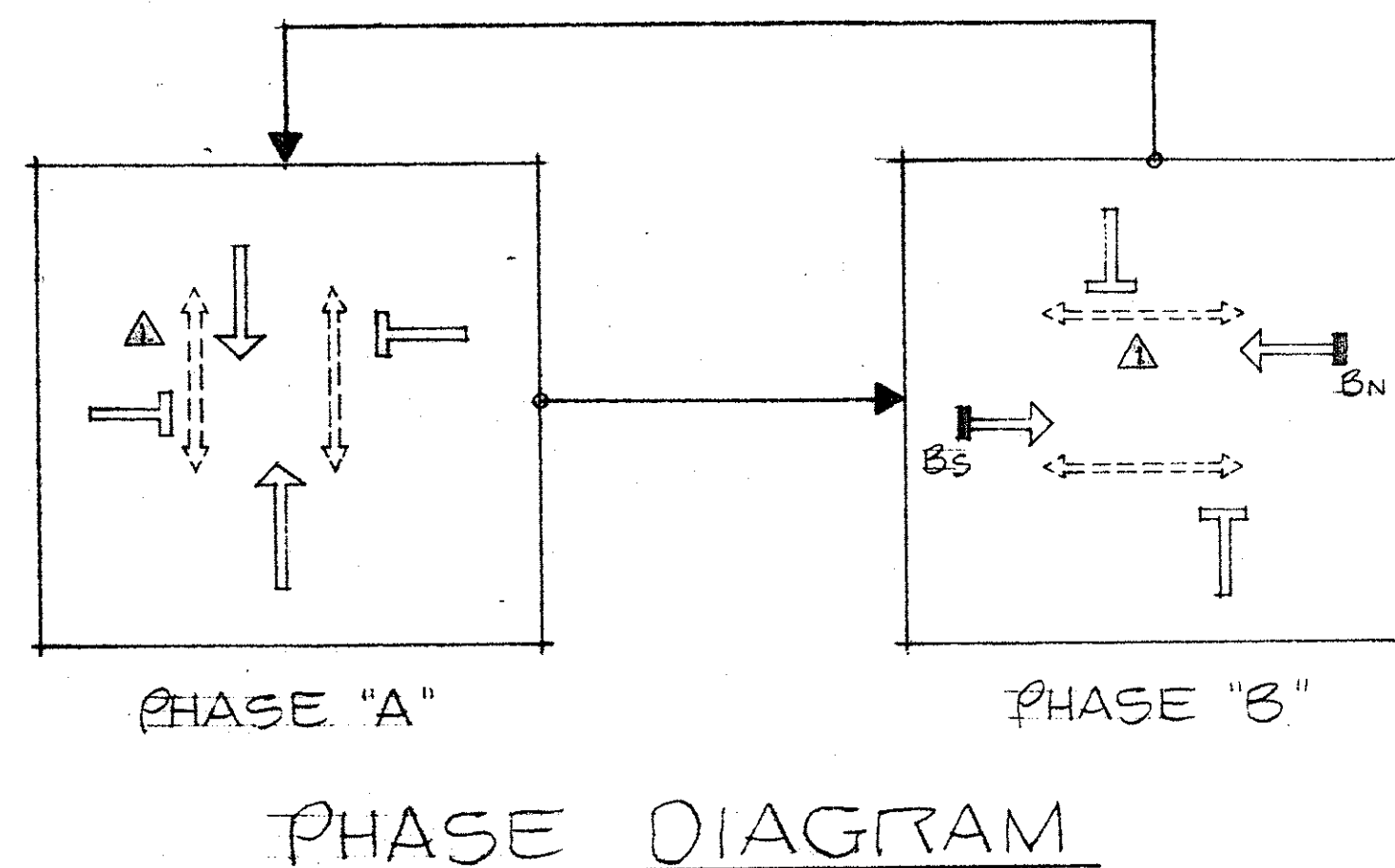
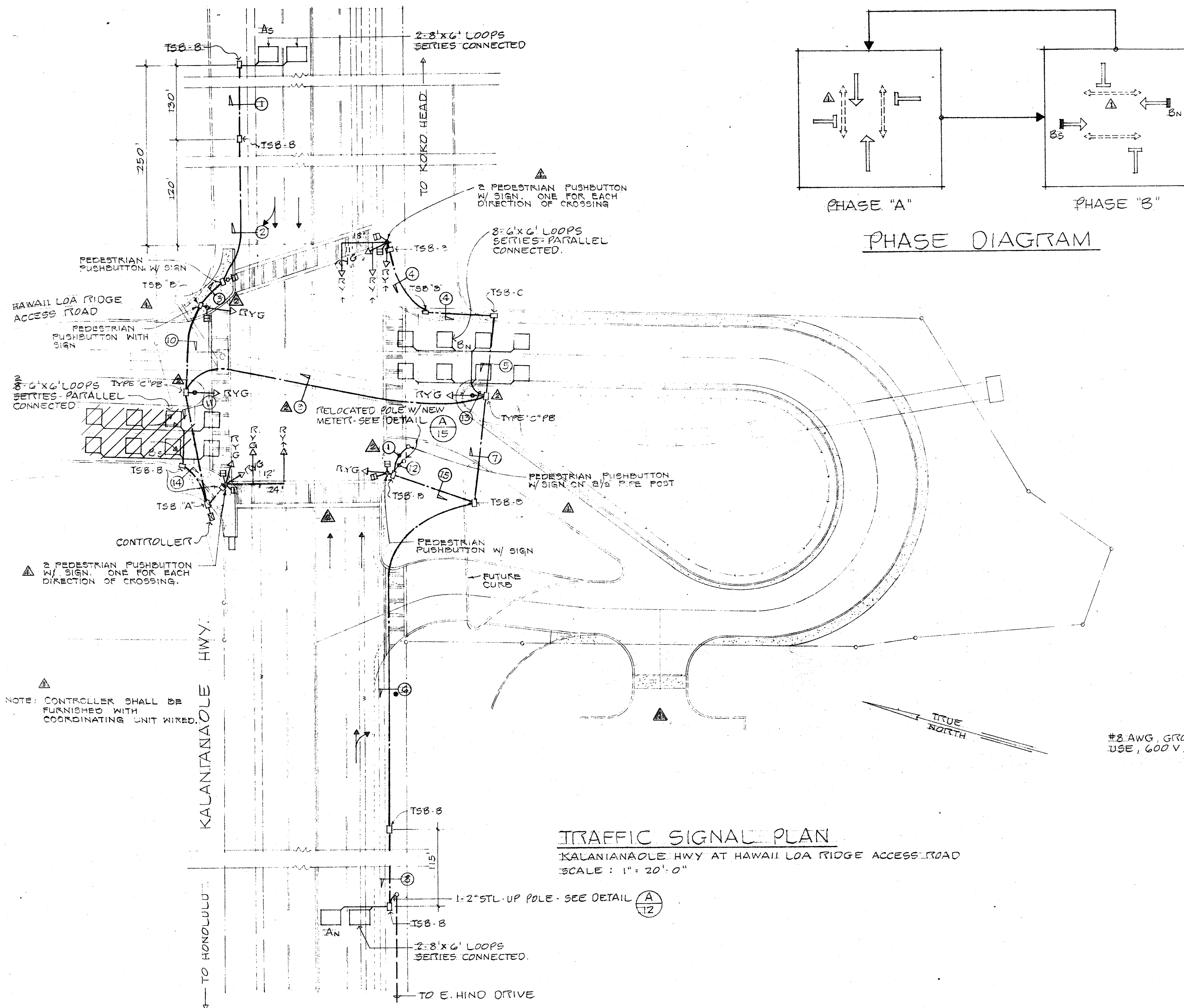
GRAY, RHEE & ASSOCIATES, INC.
CONSULTING ENGINEERS

116 S. KING ST. RM. 508

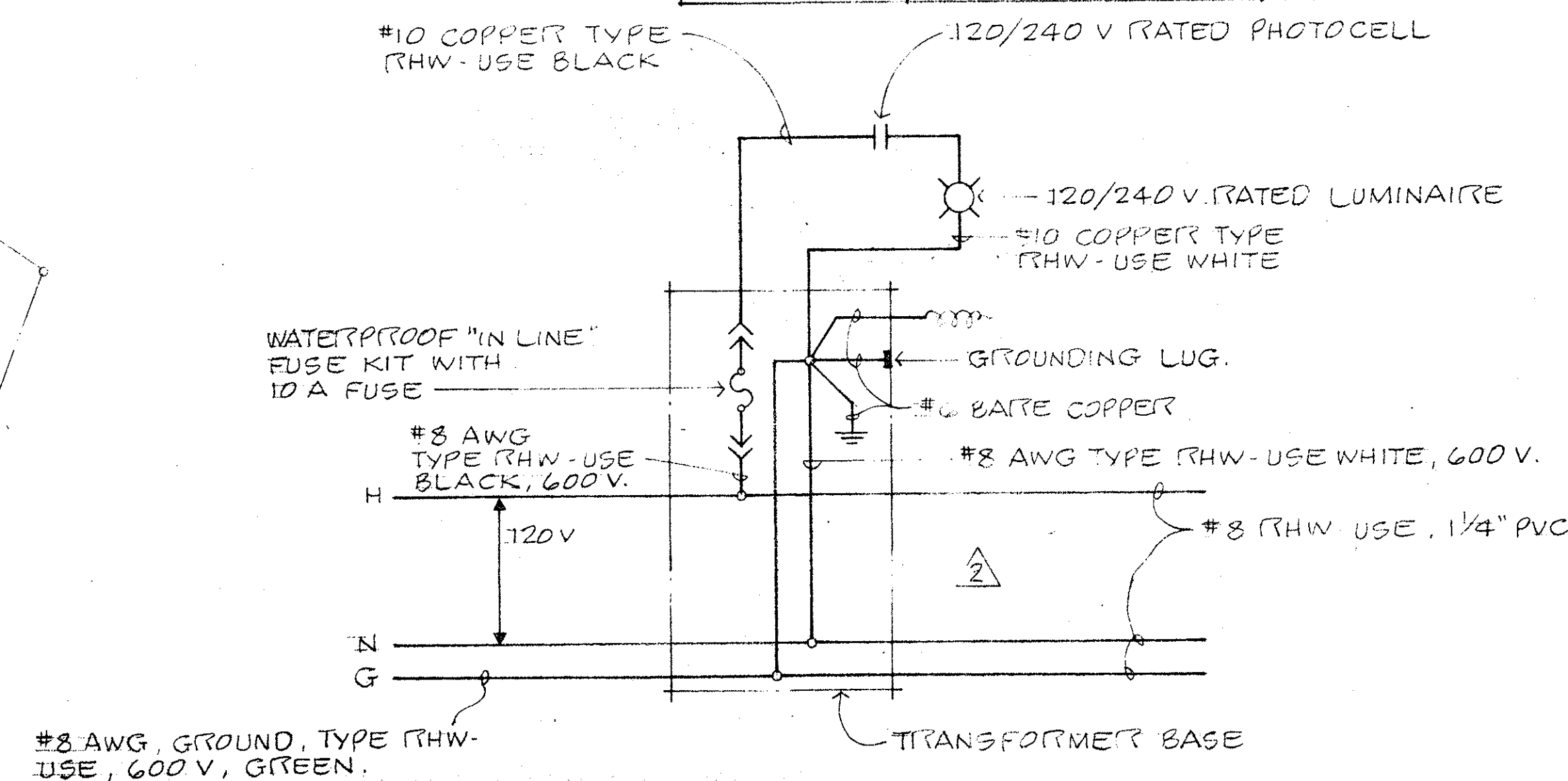
HAWAII LOA RIDGE
JUGHANDLE INTERSECTION
AND DRAIN OUTLET
WAILUPE AND NUI HONOLULU, OAHU HAWAII




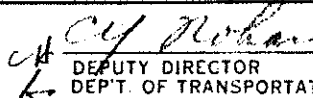
TRAFFIC SIGNAL LEGEND & NOTES

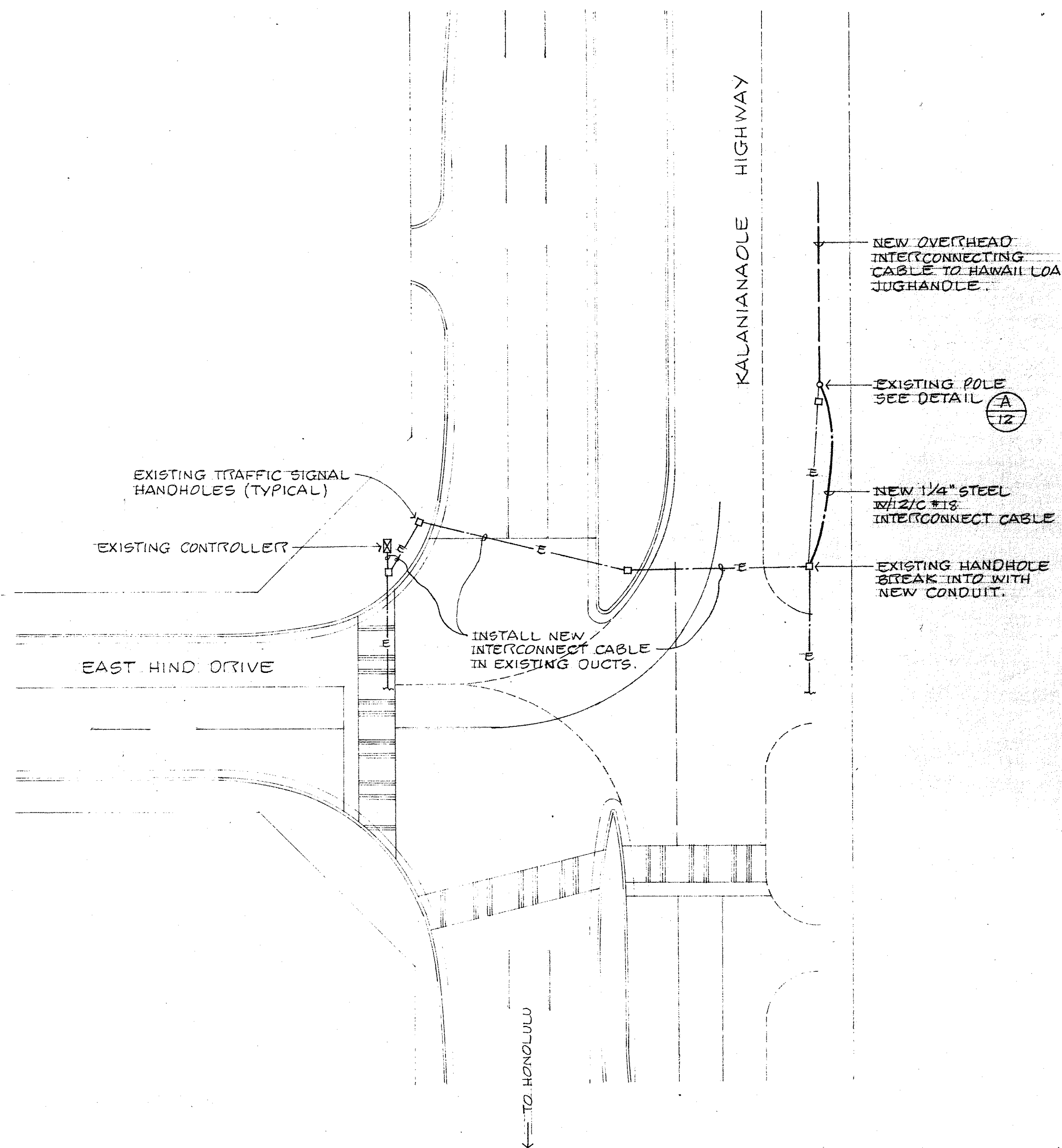
ENGINEER <u>GTK</u>	DRAWN BY <u>KMI</u>	CHECKED BY <u>GMD</u>
APPROVED BY:	<i>Ch. Rhee</i> DEPUTY DIRECTOR DEPT. OF TRANSPORTATION SERVICES	
	DATE <u>5/27/77</u>	



2 DUCT SCHEDULE		
NO.	CONDUIT	CABLES
1, 2	1-2" STL	1-2/C #14
5	2-2" PVC	2-19/C #14 2-1/C #10
7	4-2" PVC 1-1/4" PVC	2-19/C #14 1-3/C #8 2-1/C #10 1-12/C #18 1-2/C #14
6, 8	2-2" STL	1-2/C #14 1-12/C #18
9 11 SIMILAR	4-2" PVC 1-1/4" PVC	2-19/C #14 1-2/C #8 2-1/C #10 1-12/C #18 *3-2/C #14 (4-3/C #14 FOR 11)*
4	2-2" STL	2-19/C #14 2-1/C #10
13, 14	1-2" STL	2-2/C #14
BETWEEN CONTROLLER & CONTROLLER PULL BOX	1-1/4" STL 4-2" STL	1-2/C #8 2-19/C #14 2-1/C #10 1-12/C #18 5-2/C #14
10	3-2" PVC	2-19/C #14 2-1/C #10 1-2/C #14
12	1-1/4" STL	1-2/C #8
15	2-2" STL 1-1/4" STL	2-9/C #14 2-1/C #10 1-2/C #8
3	1-2" STL 1-1/4" STL	1-3/C #14 1-2/C #14

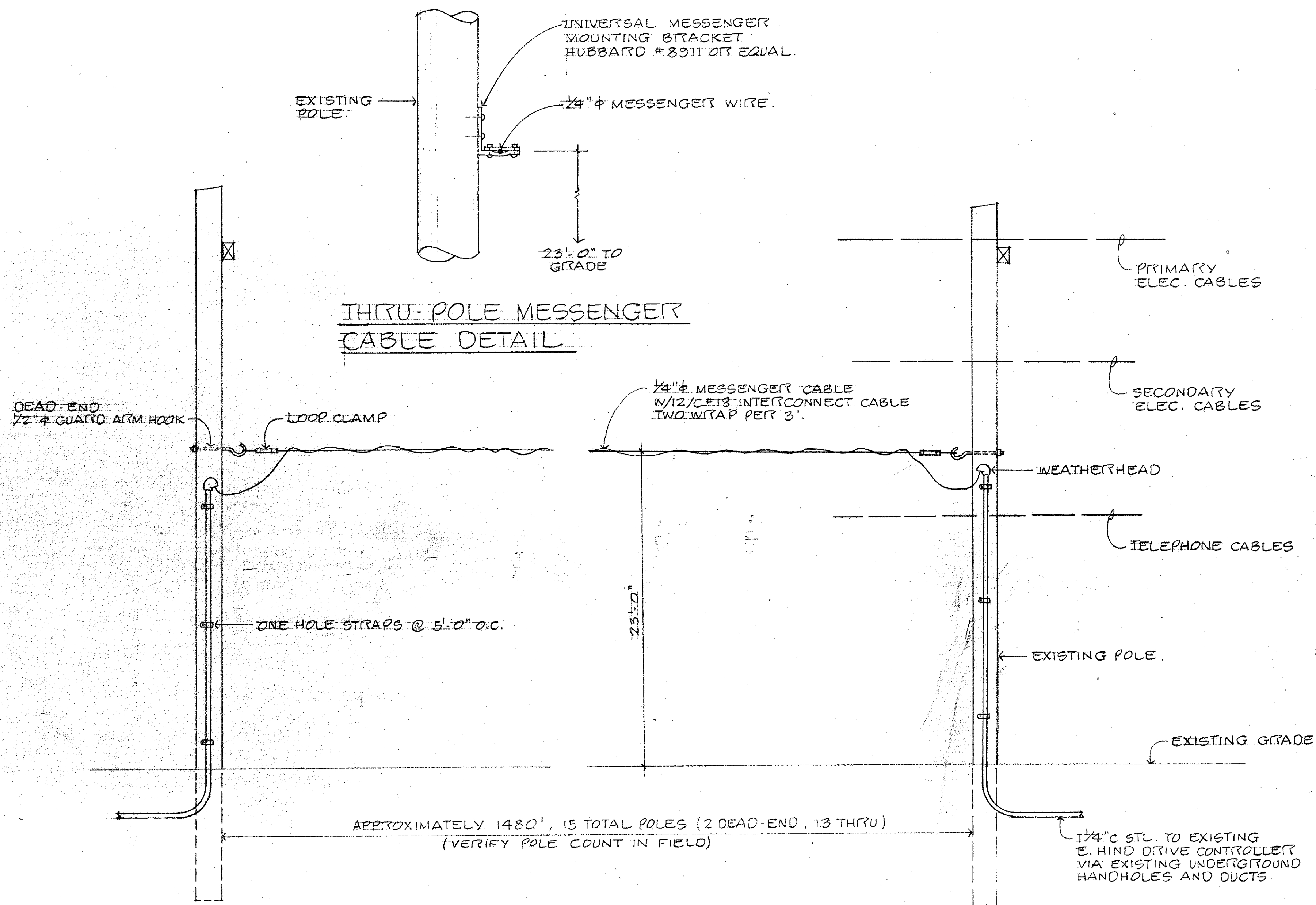


	5/19/77	AS BUILT	GK		
	9/2/76	REROUTED DUCT 3 & 9	GMD		
	10-10-75	ADDED PEDESTRIAN PUSHBUTTON W/ SIGN & NOTE MODIFIED PHASE EIA	12/25/75		
REVISION	DATE	DESCRIPTION	BY	APPR'D	
GRAY, RHEE & ASSOCIATES, INC. CONSULTING ENGINEERS 116 S. KING ST. RM. 508					
HAWAII LOA RIDGE JUGHANOLE INTERSECTION AND DRAIN OUTLET WAILUPE AND NIU HONOLULU, OAHU, HAWAII					
TRAFFIC SIGNAL PLAN					
ENGINEER	GK	DRAWN BY	KMI	CHECKED BY	GMD
APPROVED BY:  DEPUTY DIRECTOR DEPT. OF TRANSPORTATION SERVICES				DATE 4/23/76	



TRAFFIC SIGNAL PLAN

AT EAST HIND DRIVE & KALANIANAʻOLE HIGHWAY
SCALE : 1" = 20'-0"



OVERHEAD INTERCONNECT CABLE DETAIL A/12

NO SCALE

REVISION	DATE	DESCRIPTION	BY	APPR'D.
	5/19/77	AS BUILT	GK	

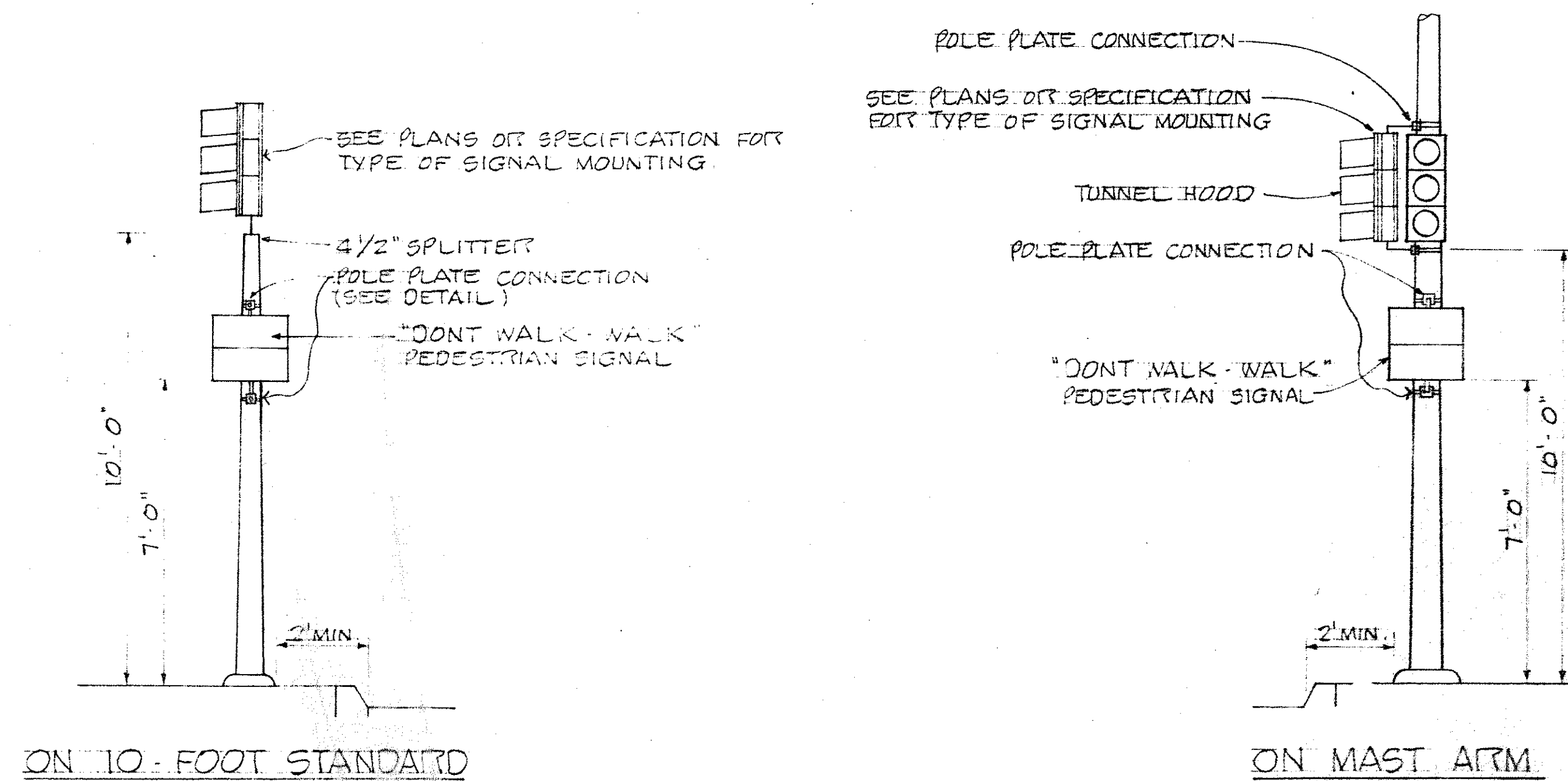
GRAY, RHEE & ASSOCIATES, INC.
CONSULTING ENGINEERS
116 S. KING ST. RM. 508

HAWAII LOA RIDGE
JUGHANOLE INTERSECTION AND DRAIN OUTLET
WAILUPE AND NIO, HONOLULU, OAHU, HAWAII

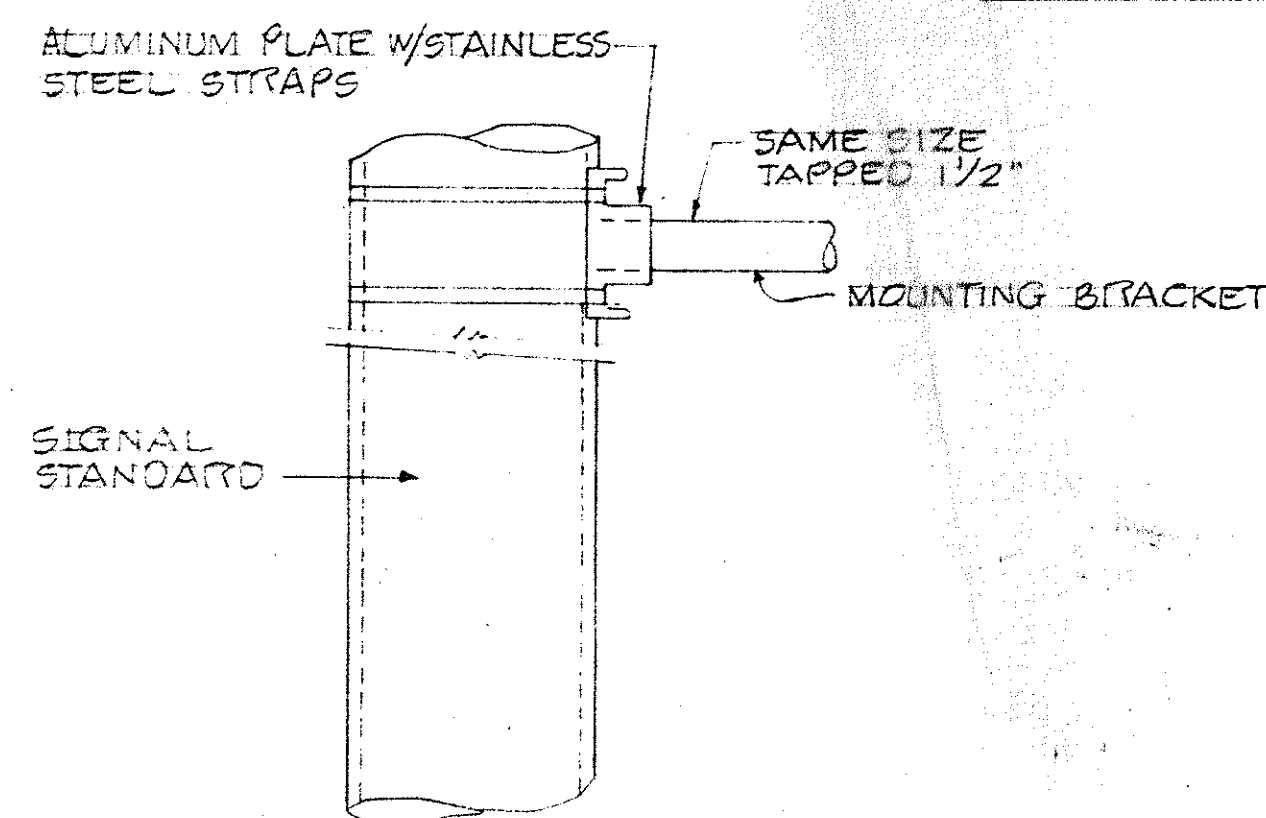
TRAFFIC SIGNAL PLAN @ E. HIND DR. AND KALANIANAʻOLE HIGHWAY

ENGINEER: GK
DRAWN BY: KMI
CHECKED BY: GMD

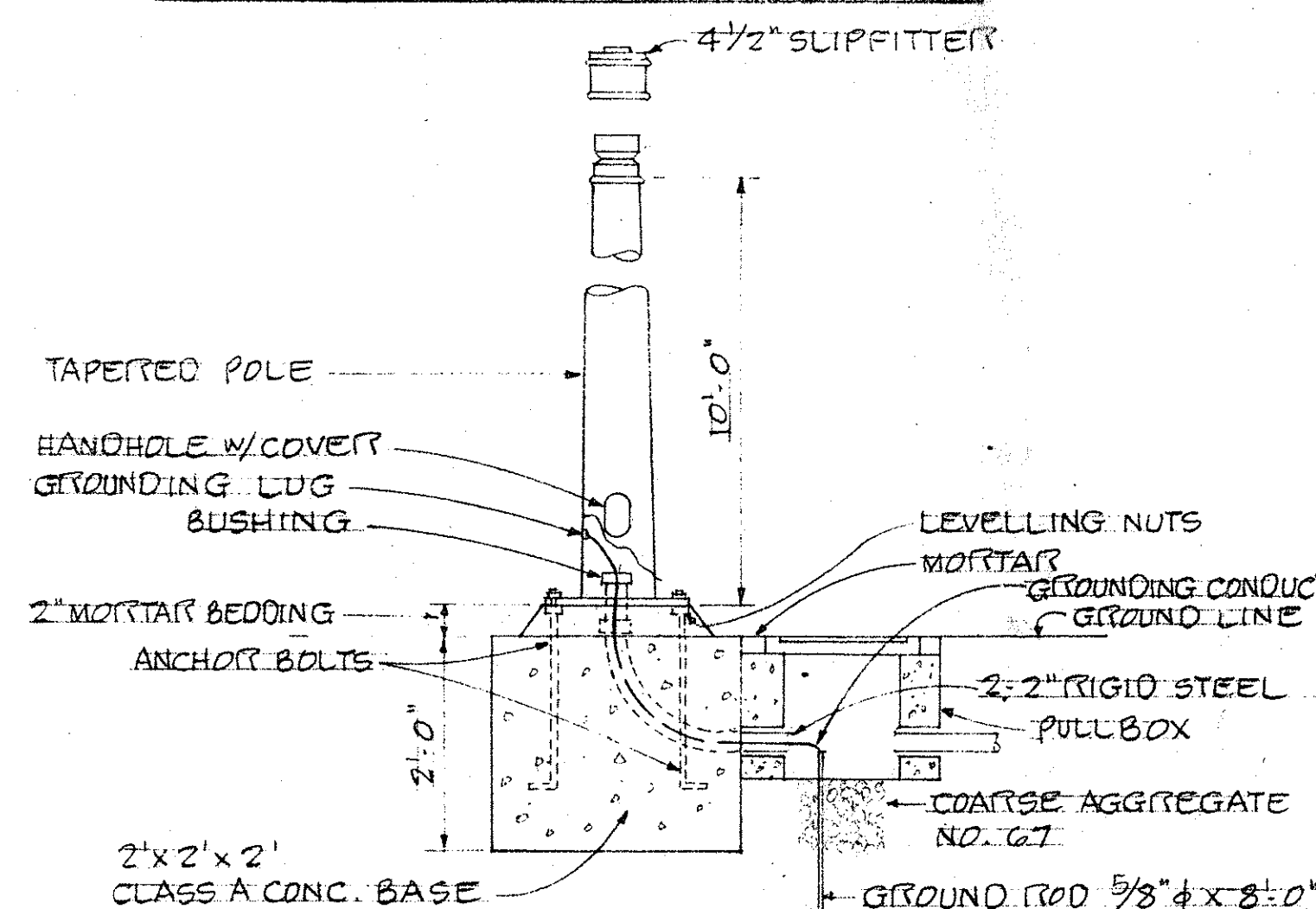
APPROVED BY: *C. J. Nolan*
DEPT. OF TRANSPORTATION SERVICES



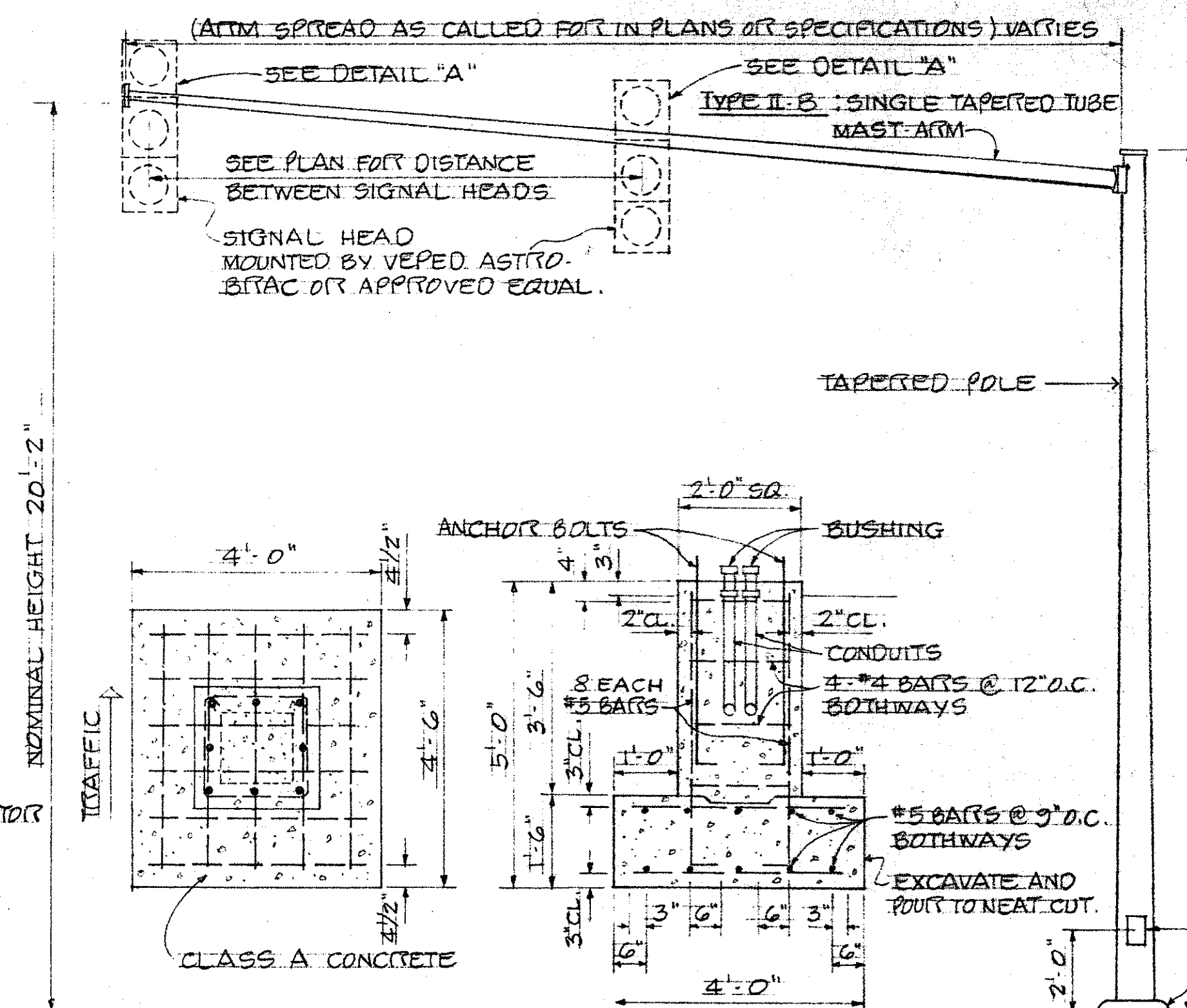
TYPICAL EQUIPMENT MOUNTINGS



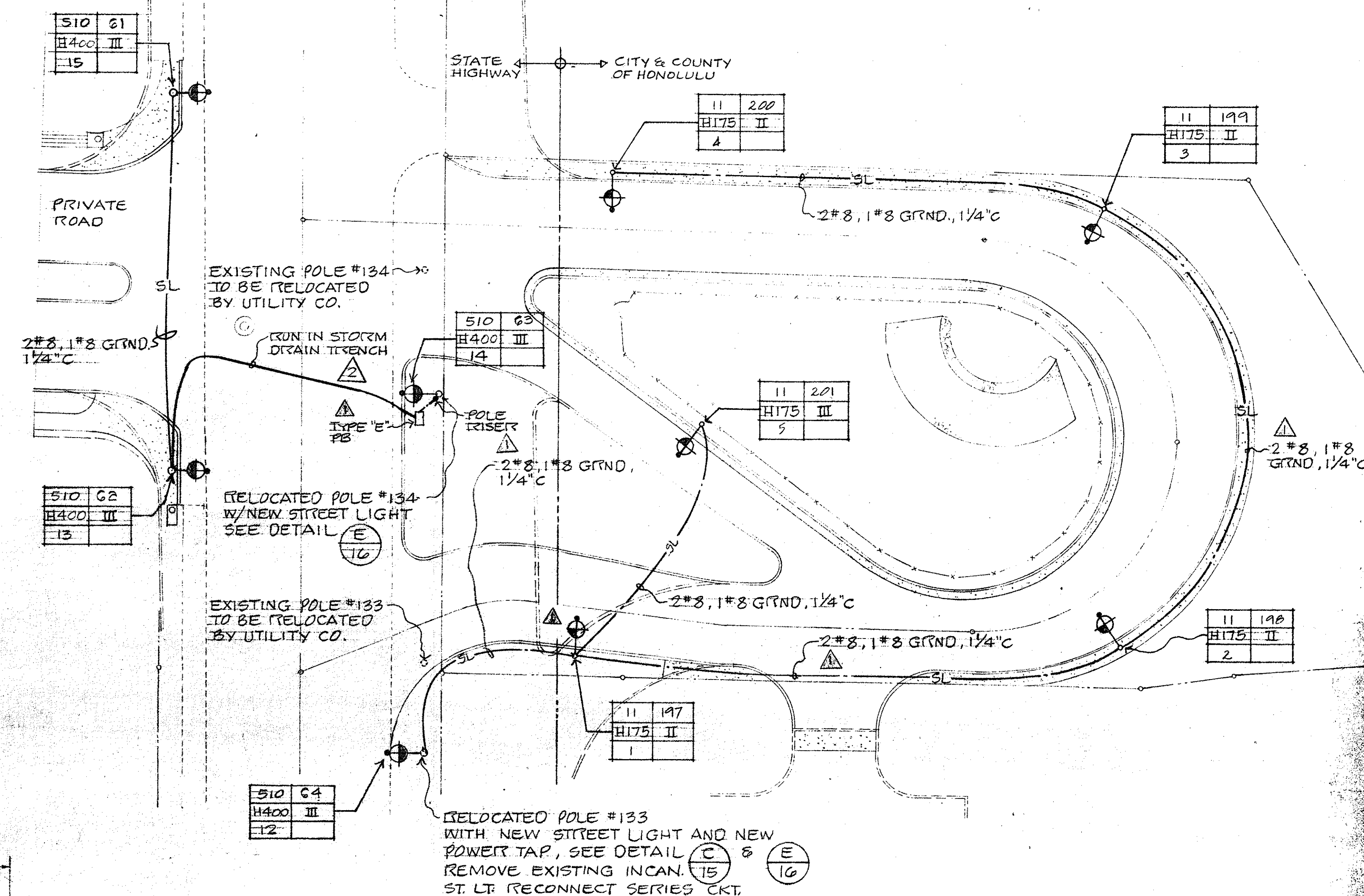
DETAIL OF
POLE PLATE CONNECTIONS



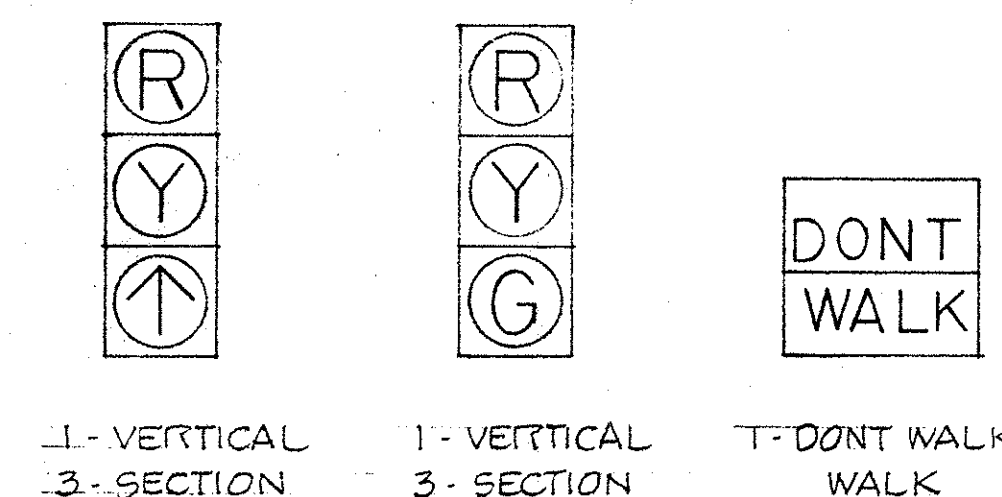
FOOTING FOR TYPE I SIGNAL STANDARD



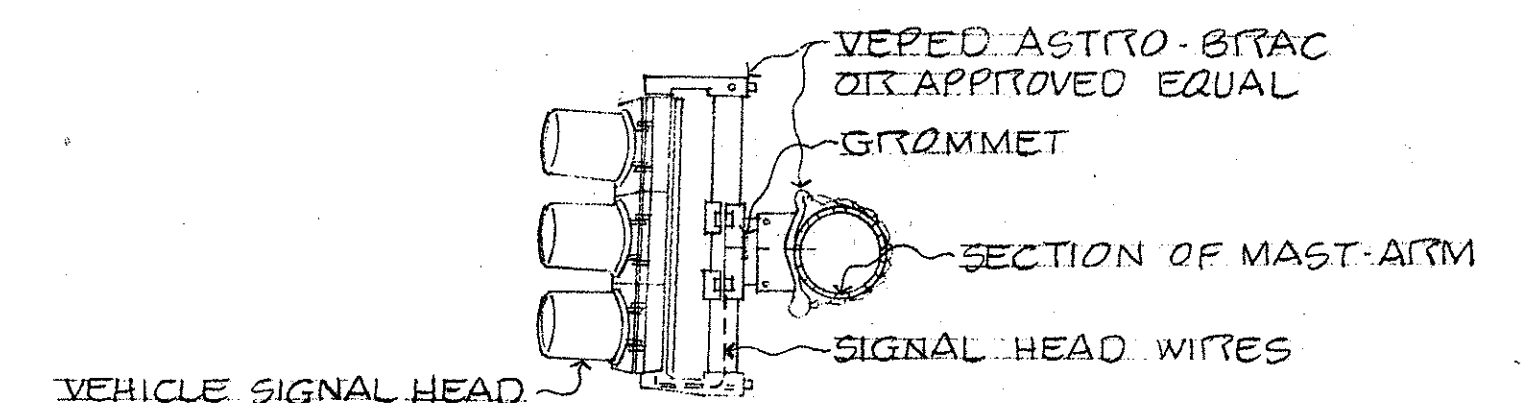
TYPE II MAST ARM STANDARD
AND FOOTING



STREET LIGHTING PLAN
SCALE: 1" = 20'-0"



TYPICAL SIGNAL ARRANGEMENTS



DETAIL "A"
NO SCALE

REVISION	DATE	DESCRIPTION	BY	APPR'D.
1	5/19/77	AS BUILT	GTK	
2	9-9-76	ADDED NOTE	GTK	
3	7-30-76	SEPARATED SL SERVICE GMD	K	

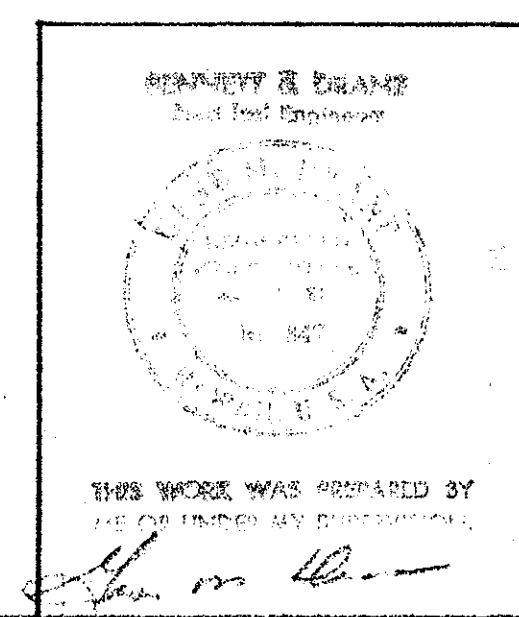
GRAY, RHEE & ASSOCIATES, INC.
CONSULTING ENGINEERS
116 S. KING ST. RM. 508

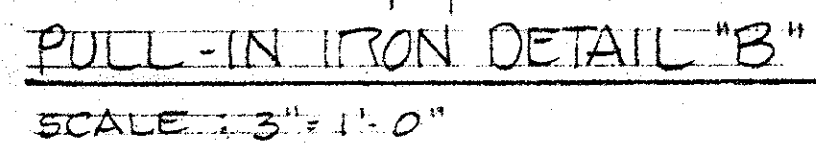
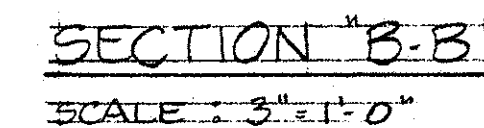
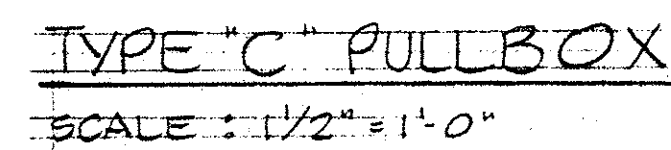
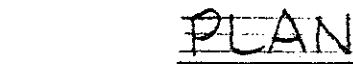
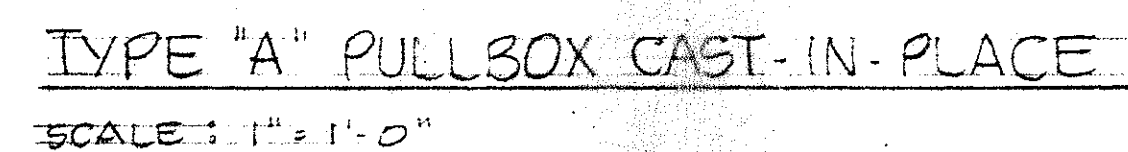
HAWAII LOA RIDGE
JUGHANDLE INTERSECTION
AND DRAIN OUTLET
WAILUPE AND NIU, HONOLULU, OAHU, HAWAII

TRAFFIC SIGNAL DETAILS &
STREET LIGHTING PLAN

ENGINEER: GTK DRAWN BY: FMI CHECKED BY: GMD

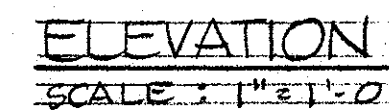
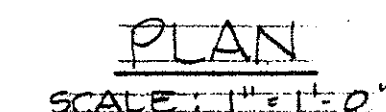
APPROVED BY: [Signature] DEPUTY DIRECTOR DEPT. OF TRANSPORTATION SERVICES





1. 3/8" ROLLED STEEL PLATE COVER WITH NON-SLIP ABRASIVE SURFACING MEDIUM GRADE, NATURAL COLOR SHALL BE USED ON ALL PULLBOXES LOCATED ON SIDEWALK AREAS WHERE PEDESTRIANS ARE WALKING.
2. 3/8" CHECKERED PLATE COVER SHALL BE USED ON ALL PULLBOXES LOCATED IN MEDIAN AREAS AND OTHER LOCATIONS WHERE THERE ARE NO PEDESTRIANS WALKING.
3. PULLITONS SHALL BE PLACED OPPOSITE EACH CONDUIT SLOT.
4. COVERS ON ALL PULLBOXES LOCATED IN SIDEWALK AREAS SHALL BE SET FLUSH WITH THE CONC. SIDEWALK.
5. EACH PULLBOX SHALL HAVE A PAIR OF PULLITONS OPPOSITE EACH OTHER FOR LIFTING PURPOSES.

- B. DETAILS OF CONDUITS, ANCHOR BOLTS, ETC. ARE APPROXIMATE ONLY. EXACT DETAILS SHALL BE SECURED BY THE CONTRACTOR FROM MANUFACTURER.



CONCRETE BASE FOR CONTROLLED CABINET

SECURITY IS DRAFTED
 Registered Engineers

UNIVERSITY OF TORONTO
 LIBRARY
 130 St. George Street
 Toronto, Ontario
 M5S 1A5
 1982-83

THIS WORK WAS PREPARED
 BY ENGINEER W. STEPHENS

W. Stephens

120-1#2W SERVICE FROM
HECO. SECONDARY
WEATHER HEAD TO BE 18"
BELOW SEC. ARM. PROVIDE
3' CABLE SLACK

4 JAW METERS SOCKET
W/ MANUAL CLOSING
DEVICE AT +7'-0"

30A-1P IN
NEMA 3R ENCLOSURE
PROVIDE PAD-LOCK

NOTE:

CONTRACTOR SHALL GIVE HECO. ONE WEEK ADVANCE
NOTICE FOR HECO. SERVICE CONNECTION.

1/4" STEEL CONDUIT WITH
2/C #8 CABLE TO CONTROLLER.

WOOD MOULDING

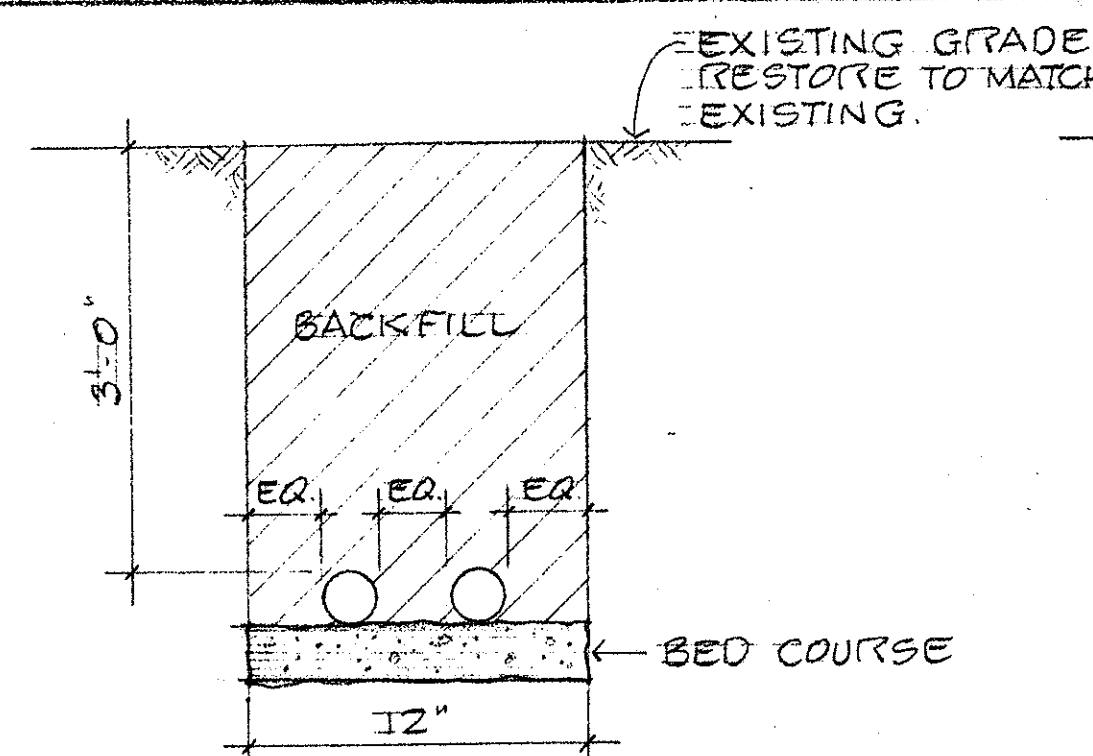
#6 BARE COPPER

5/8" x 8"
COPPER WELD
GROUND ROD.

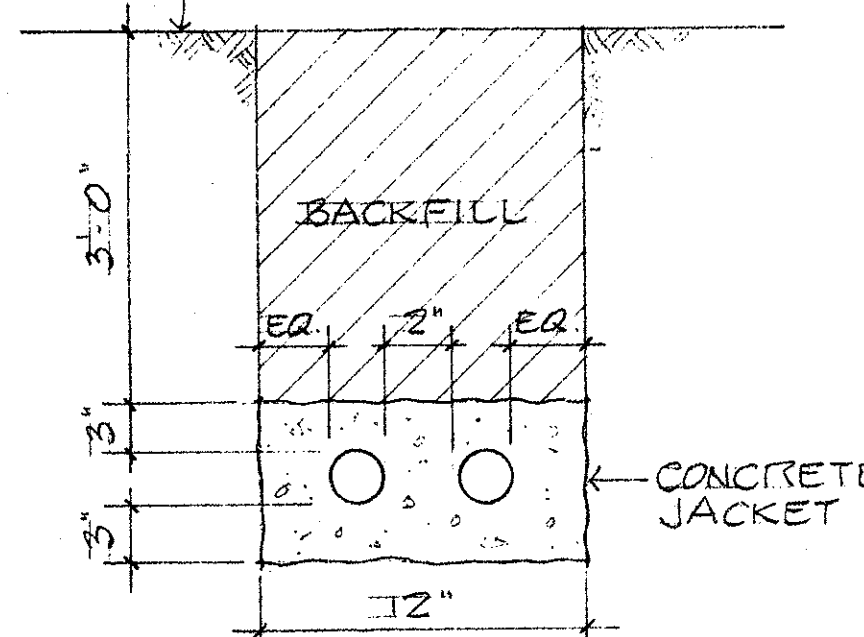
EXISTING GRADE

TO CONTROLLER

SERVICE POLE ELEVATION DET. (A)
NO SCALE

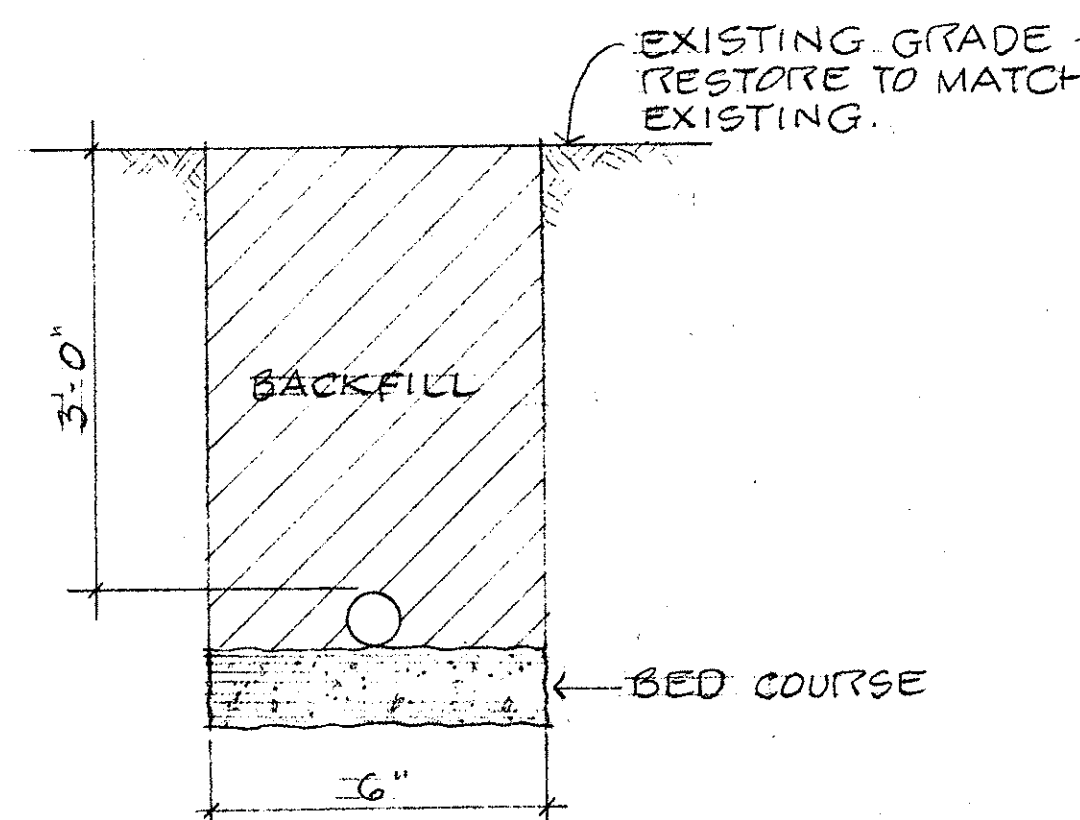


MULTIPLE CONDUITS

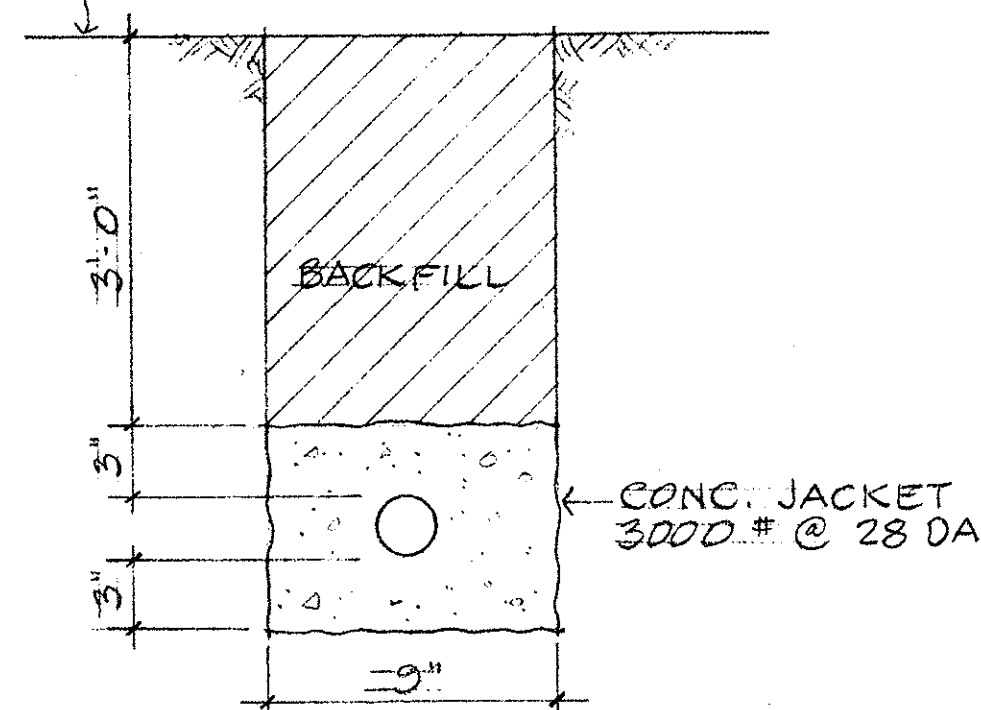


MULTIPLE CONDUITS

NOTE: MAINTAIN 2" SPACE BETWEEN
ALL DUCTS & 3" BETWEEN DUCT & EDGE OF
CONC. 16" TRENCH REQD. FOR 3 DUCTS.

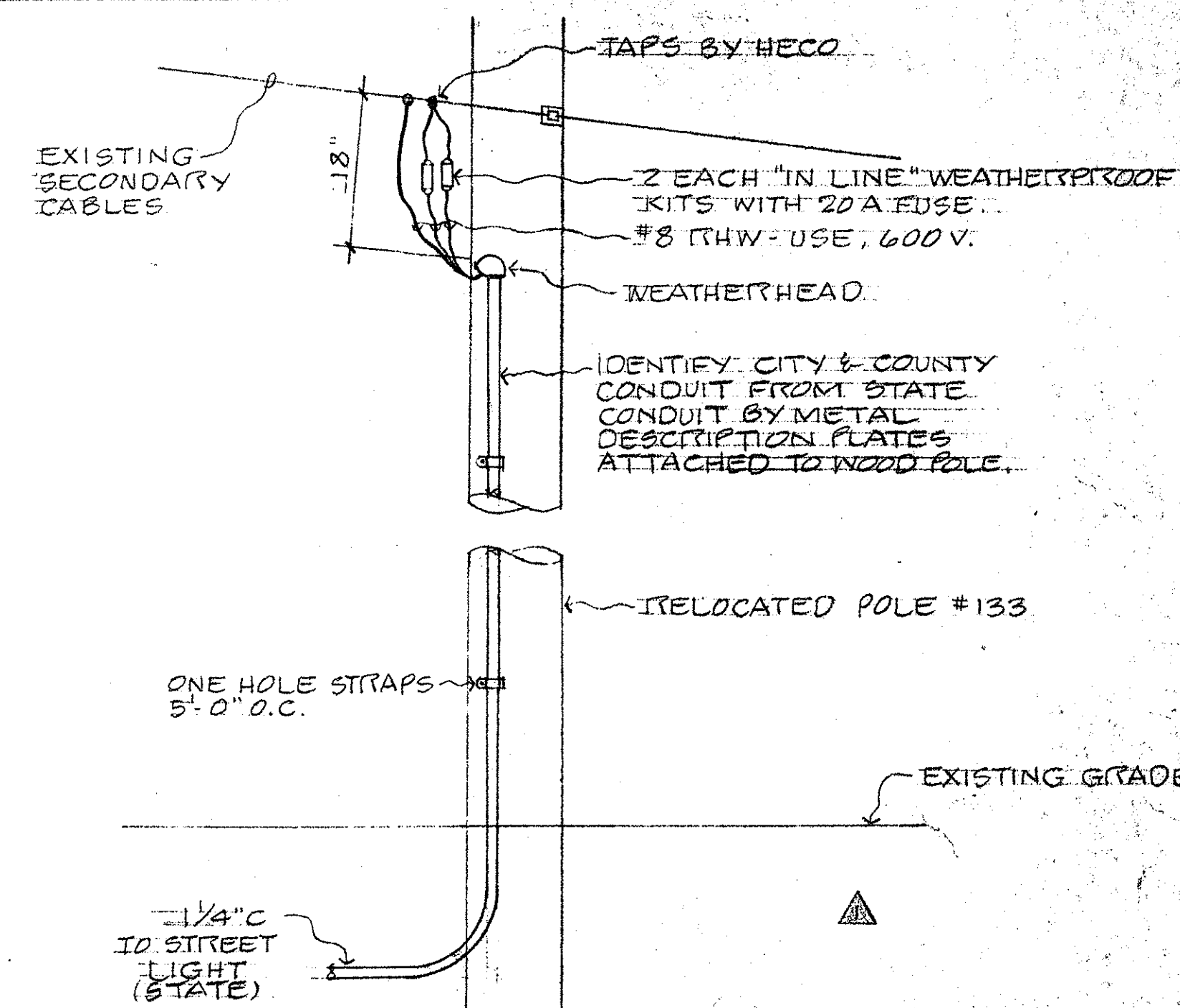


SINGLE CONDUIT
RIGID STEEL



SINGLE CONDUIT
PVC SCH. 40

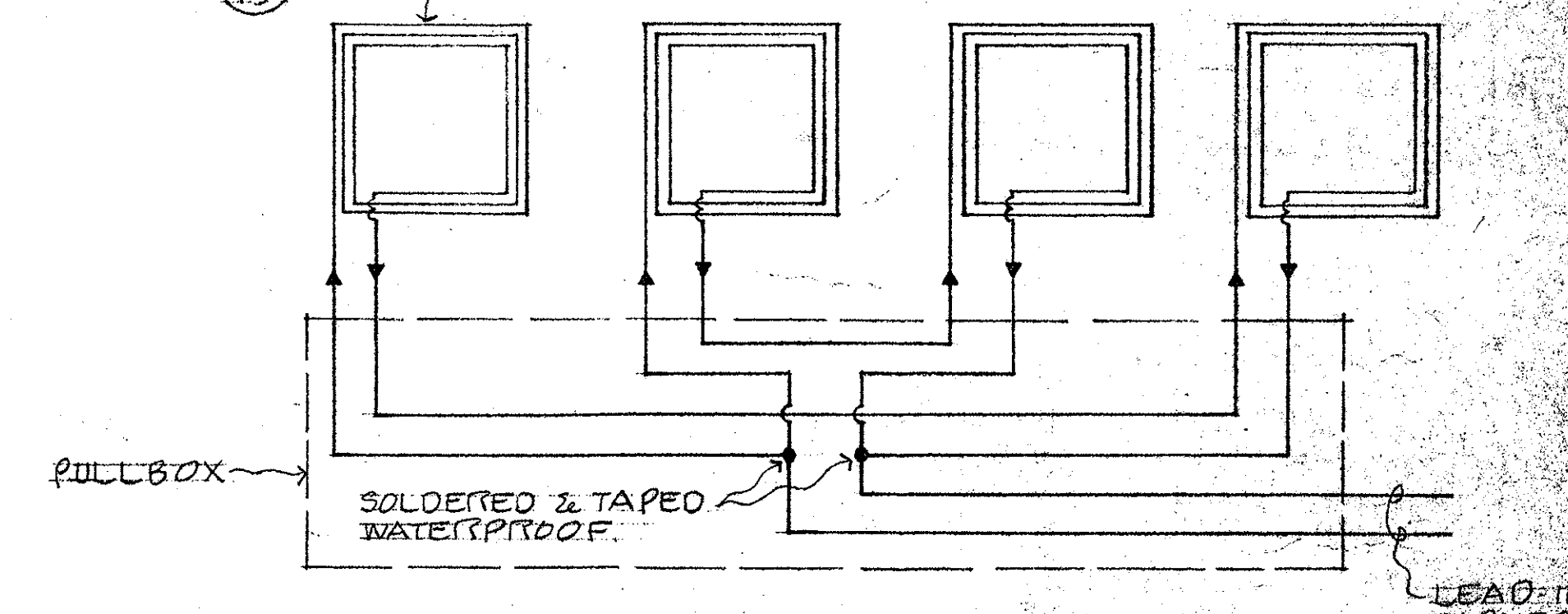
DUCT SECTIONS
NO SCALE



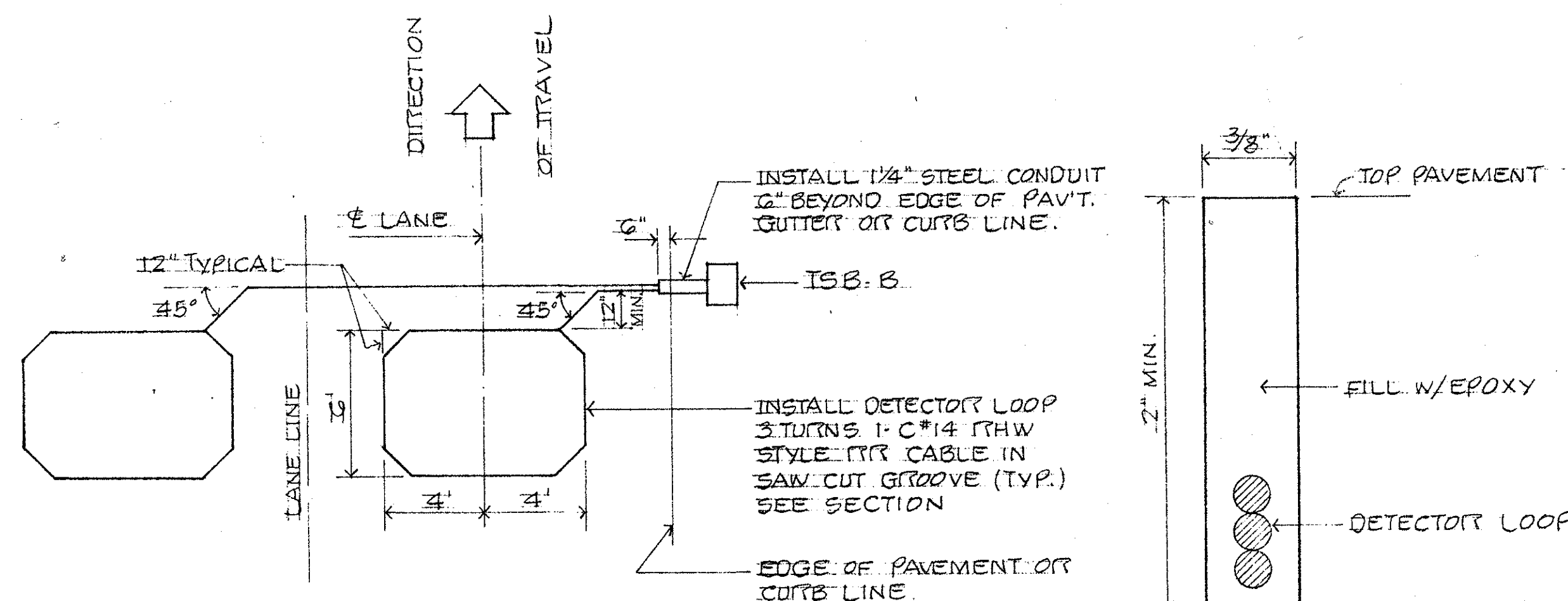
POLE #133 SERVICE DETAIL (C)
NO SCALE

6' x 6' SAW-CUT
GROOVES - SEE
DETAIL (B)
15

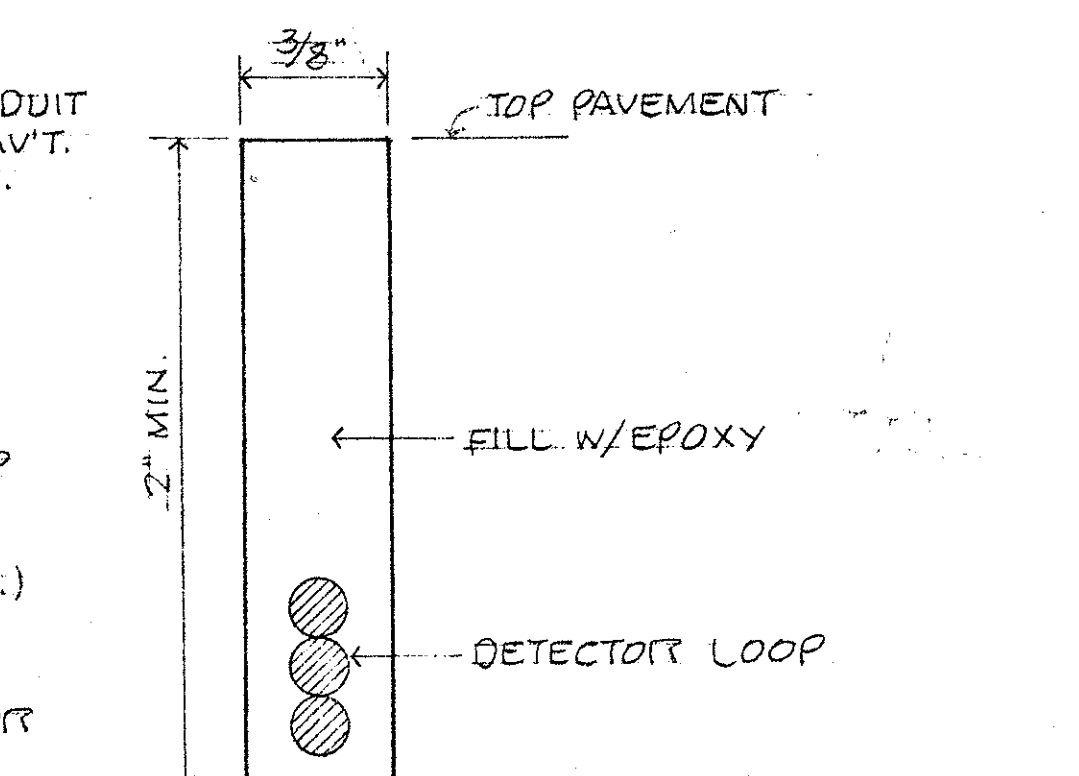
DIRECTION OF TRAVEL



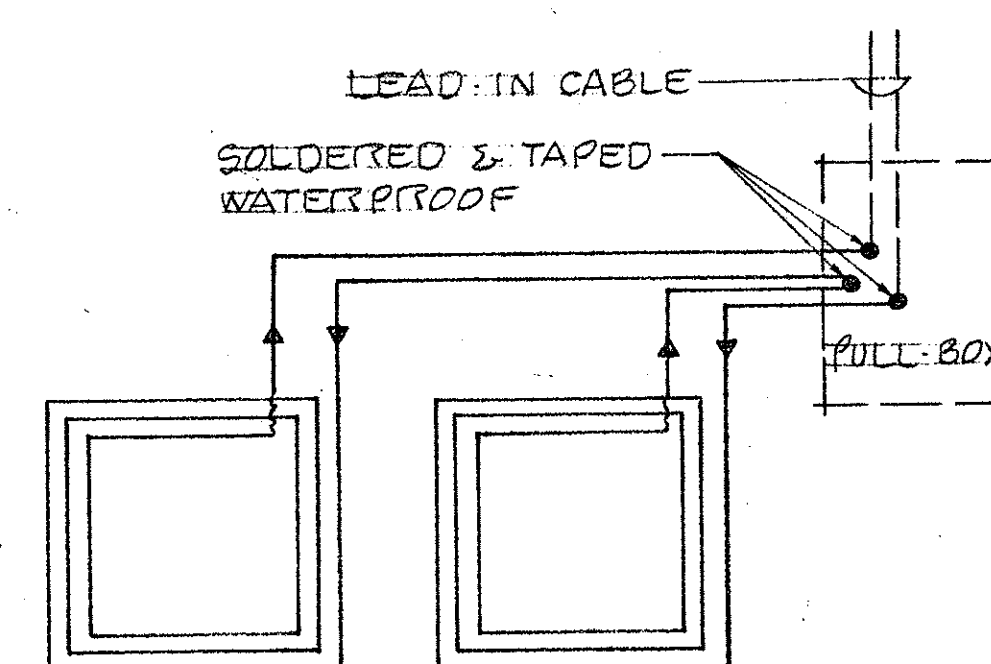
SERIES-PARALLEL LOOP DIAGRAM
SECOND PARALLEL LOOP SIMILAR



MULTIPLE LOOP LAYOUT PLAN
NO SCALE



SAW-CUT GROOVE SECTION
NO SCALE



LOOP CONNECTION DIAGRAM
SERIES LOOP

DETECTION LOOP DETAILS (B)
15

REVISION	DATE	DESCRIPTION	BY	APPR'D.
1	5/19/77	AS BUILT	GK	
2	7-30-76	ADDED C&C ST LT CONDUIT	GMD	K

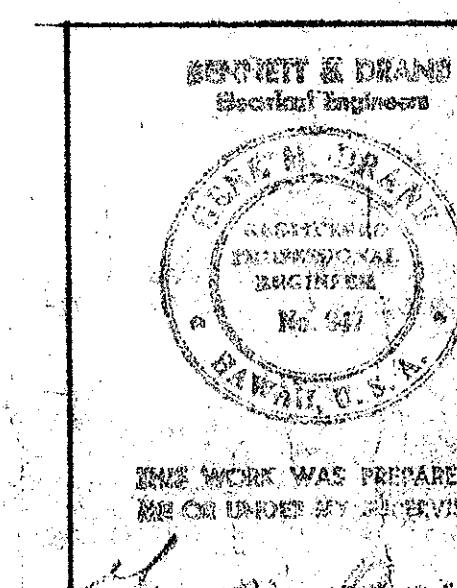
GRAY, RHEE & ASSOCIATES, INC.
CONSULTING ENGINEERS
116 S. KING ST. RM. 508

HAWAII LOA RIDGE
JUGHANDLE INTERSECTION
AND DRAIN OUTLET
WAILUPE AND NIU, HONOLULU, OAHU, HAWAII

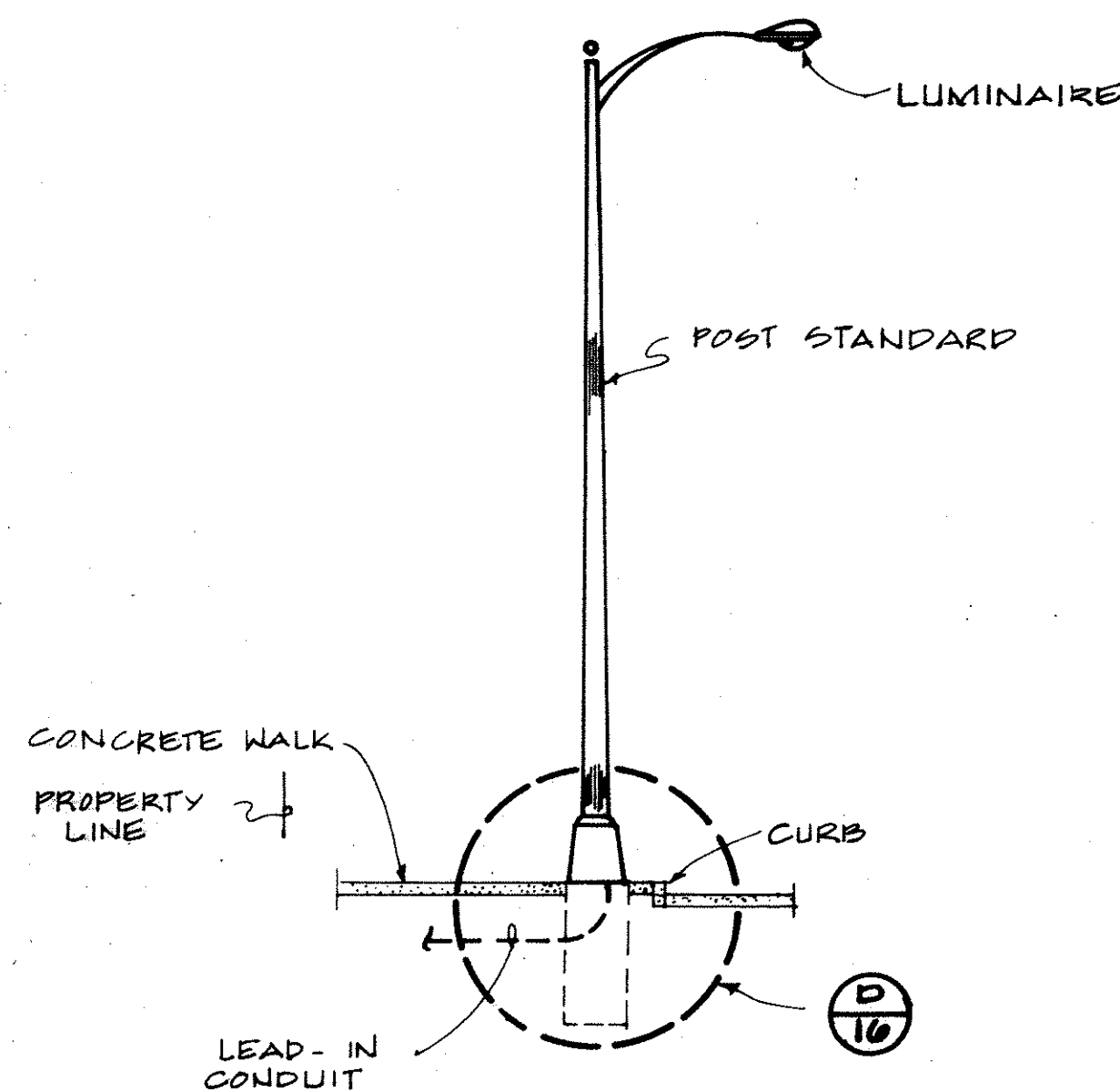
TRAFFIC SIGNAL DETAILS

ENGINEER: GK DRAWN BY: KMI CHECKED BY: GMD

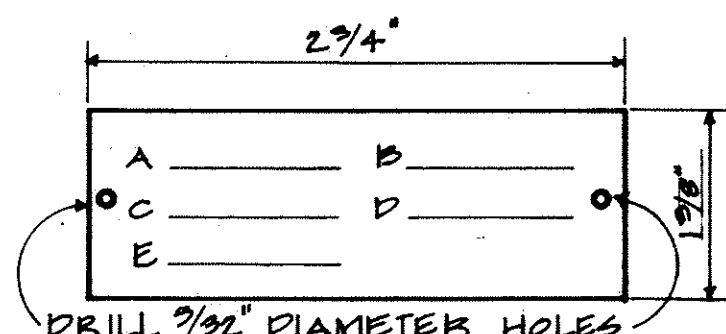
APPROVED BY: DATE: 5/19/77



THIS WORK WAS PREPARED BY
ME OR UNDER MY SUPERVISION



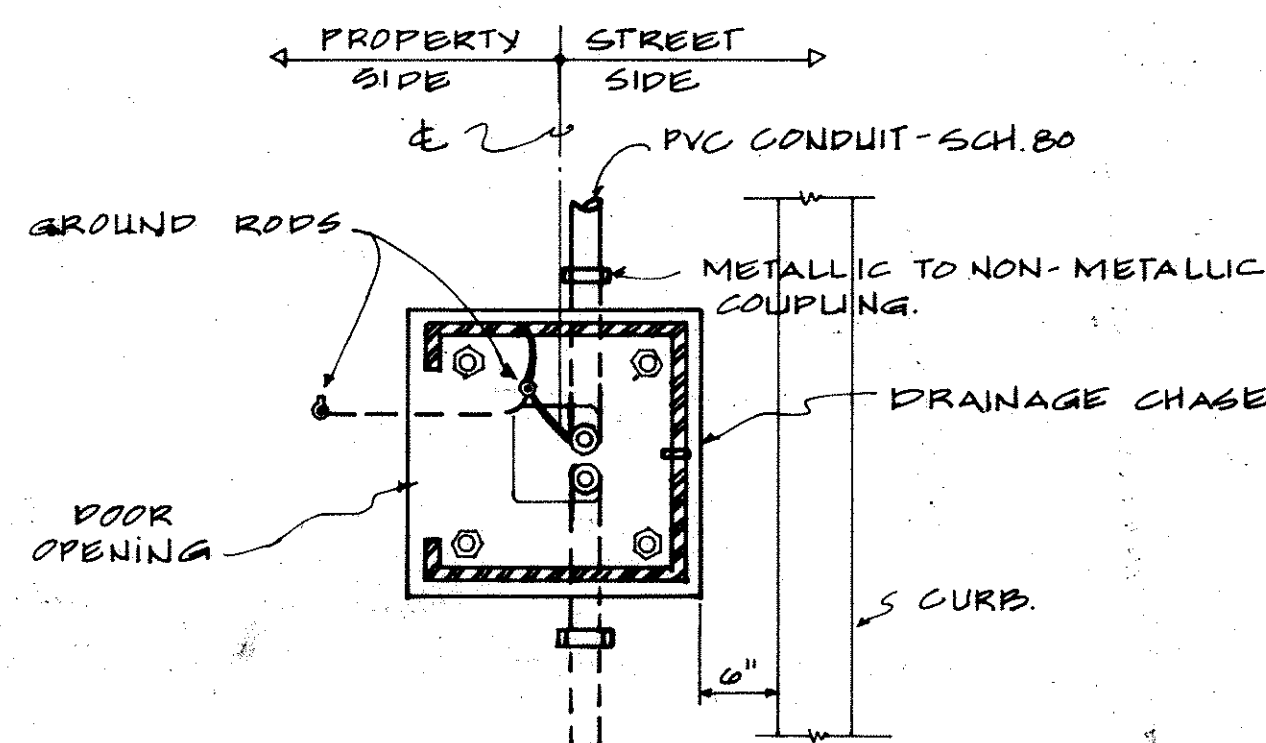
ELEVATION
(A) LUMINAIRE POST STANDARD
NOT TO SCALE



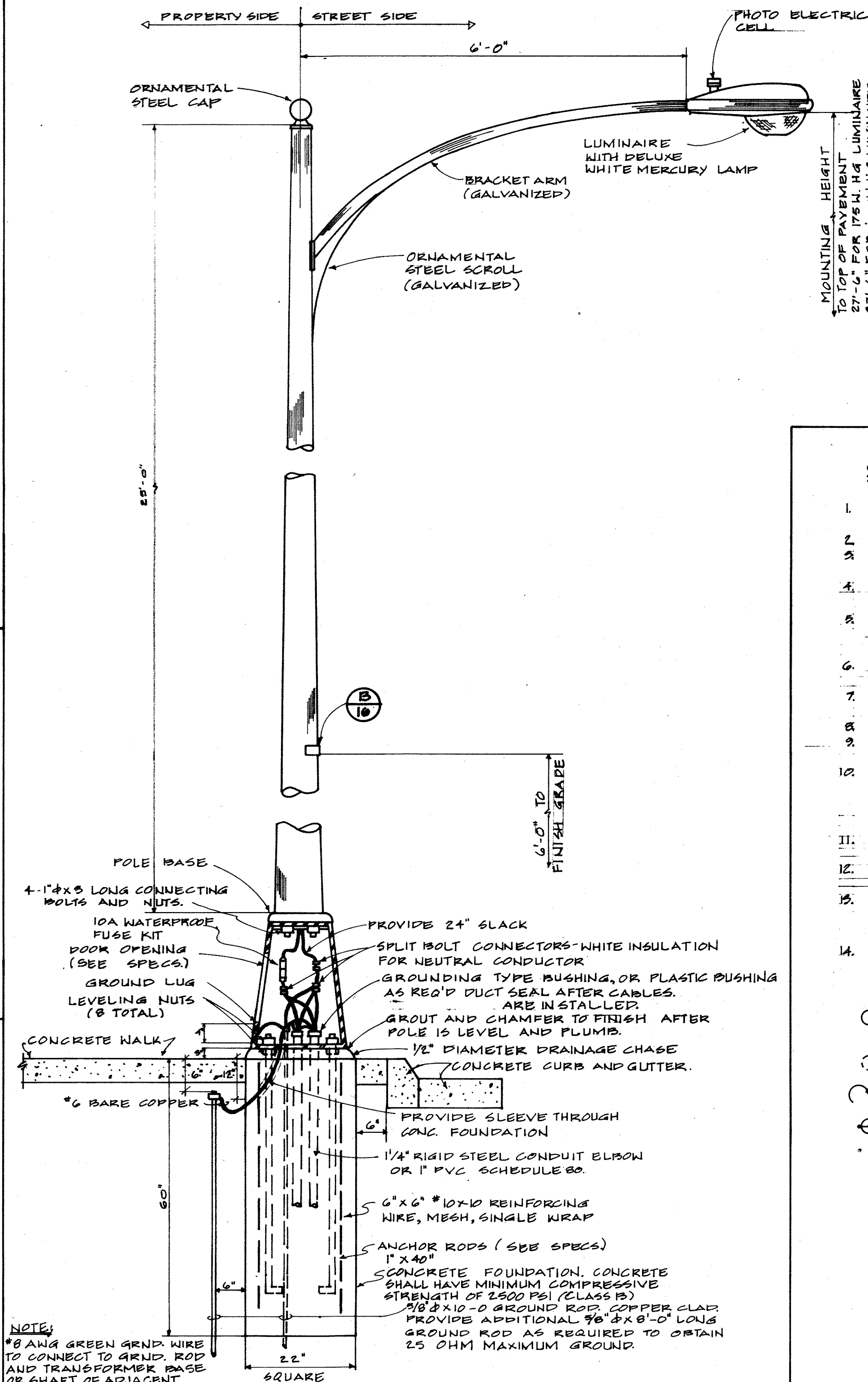
POLE TAG
1. MAKE FROM BLACK-WHITE BLACK LAMINATED PLASTIC W/1/4" HIGH COMMERCIAL GOTHIC LETTERS ENGRAVED OR STENCILED.
2. ATTACH TO POLE WITH NO. 6 CADMIUM PLATED SCREWS.

ENGRAVING SCHEDULE
A. CONTRACT NUMBER (AS SHOWN ON PLAN)
B. LIGHT NUMBER.
C. LAMP DATA.
D. REFRACTOR NUMBER (IES ROMAN NUMERAL AS SHOWN ON PLAN.)
E. POST NUMBER (AS SHOWN ON PLAN.)

(B) IDENTIFICATION TAG FOR MULTIPLE STREET LIGHTING
NOT TO SCALE



PLAN
(C) PLAN SECTION OF POST STANDARD
NOT TO SCALE



NOTE:
*8 AWG GREEN GRND. WIRE TO CONNECT TO GRND. ROD AND TRANSFORMER BASE OR SHAFT OF ADJACENT STREET LIGHT IF PVC CONDUIT IS USED.

ELEVATION
(D) LUMINAIRE POST STANDARD DETAIL
NOT TO SCALE

STREET LIGHTING NOTES

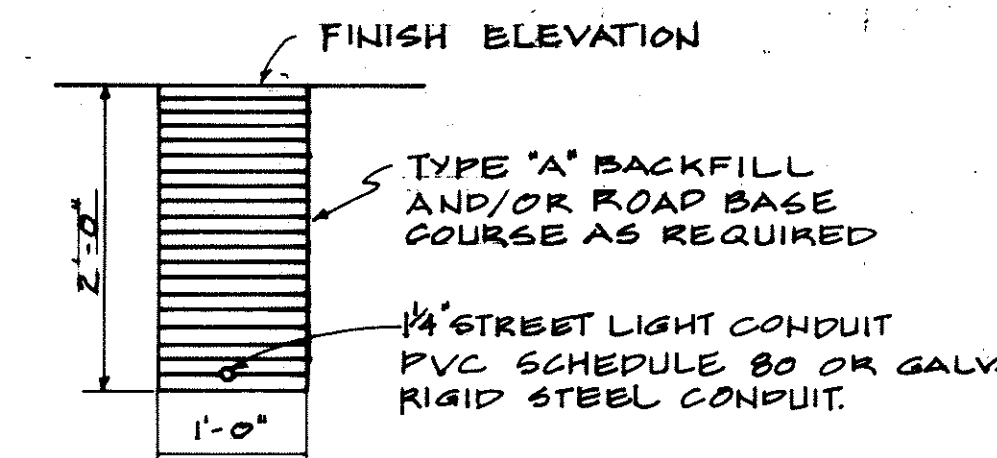
- STREET LIGHT SYSTEM FOR THIS INCREMENT OF THE SUBDIVISION SHALL BE UNDER HAWAIIAN ELECTRIC COMPANY, INC. CONTRACT NO. 11.
- STREET LIGHT NUMBERS FOR THIS INCREMENT OF SUBDIVISION SHALL BE NO. 197 TO 201, INCLUSIVE.
- ALL SECONDARY CIRCUIT EXTENSION ON HECO SECONDARY CABLES SHALL BE PROVIDED BY THE CONTRACTOR. CONNECTIONS SHALL BE BY HECO AND PAID BY THE CONTRACTOR.
- CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING AND INFORMING HECO OF STREET LIGHT LOCATIONS ON SITE PRIOR TO INSTALLATION OF THEIR SECONDARY CABLES.
- CONTRACTOR SHALL NOTIFY ELECTRICAL & MAINTENANCE SERVICES DIV., DEPT. OF TRANSPORTATION SVCS., CITY AND COUNTY OF HONOLULU, 72 HOURS IN ADVANCE OF COMMENCING INSTALLATION OF STREET LIGHT SYSTEM. P.H. NO. 516-2805.
- ALL LUMINAIRES SHALL BE MERCURY VAPOR TYPE WITH WATTAGE AND IES TYPE LIGHT DISTRIBUTION AS SHOWN ON PLAN.
- FOR TYPICAL CONSTRUCTION DETAILS SEE SHEET. ALSO REFER TO APPLICABLE STANDARD DETAILS OF THE ELECTRICAL & MAINTENANCE SVCS., DIV., DEPT. OF TRANSPORTATION SVCS., CITY AND COUNTY OF HONOLULU.
- CONTRACTOR SHALL STENCIL DATE OF INSTALLATION ON BOTTOM OF PHOTOCELL.
- CONTRACTOR SHALL OBTAIN WRITTEN ACCEPTANCE OF STREET LIGHT SYSTEM FROM ELECTRICAL & MAINTENANCE SVCS., DIV., DEPT. OF TRANSPORTATION SVCS., CITY AND COUNTY OF HONOLULU.
- LUMINAIRE AND POLE COUNT.

POLES:
175 WATTS 5 LUMINAIRE (CITY & COUNTY)
WATTS 4 LUMINAIRE (STATE)

- CONTRACTOR TO ARRANGE WITH HECO TO ENERGIZE STREET LIGHTS A MINIMUM OF 6 HOURS FOR FINAL INSPECTION AND ACCEPTANCE, CONTRACTOR TO ASSUME COSTS.
- CONTRACTOR SHALL HAVE ONE SET OF APPROVED PLANS ON JOB SITE AT ALL TIMES DURING THE CONSTRUCTION WORK.
- FINAL ACCEPTANCE INSPECTION WILL BE UNDERTAKEN ONLY AFTER ALL WORK HAS BEEN COMPLETED AND THE "AS-BUILT" CLOTH TRACING IN INK HAS BEEN GIVEN TO THE ELECTRICAL & MAINTENANCE SVCS., DIV., DEPT. OF TRANSPORTATION SVCS., CITY AND COUNTY OF HONOLULU.
- CONTRACTOR TO MEASURE GROUND RESISTANCE AT EACH STANDARD RECORD SAME AND SUBMIT TO ELECTRICAL & MAINTENANCE SVCS., DIV., DEPT. OF TRANSPORTATION SVCS.

SYMBOL LIST

- STREET LIGHTING STANDARD. ANNOTATION IS STREET LIGHTING STANDARD ADDRESS. CONSTRUCT IN ACCORDANCE WITH DETAILS ON SHEET.
- EXISTING OR FUTURE STREET LIGHTING STANDARD AS NOTED ON PLAN.
- STREET LIGHTING RACEWAY. CONSTRUCT IN ACCORDANCE WITH DETAILS ON SHEET.
- 175 W. MERCURY, MULTIPLE.
- 4" W. MERCURY, MULTIPLE.



NOTE:
MAINTAIN 1'-0" SEPARATION BETWEEN STREET LIGHTING AND ELECTRIC OR COMMUNICATIONS.

(F) TYP. STREET LIGHTING RACEWAY SECTION
NOT TO SCALE

(E) NEW STREET LIGHT AT RELOCATED POLE #134
NOT TO SCALE

REVISION	DATE	DESCRIPTION	BY	APPROVED
1	5/19/77	AS BUILT	CK	
GRAY, KHEE & ASSOCIATES, INC. CONSULTING ENGINEERS 116 S. KING ST. RM. 508				
HAWAII LOA RIDGE JUNCTION INTERSECTION RAIN OUTLET W. SIDE OF HONOLULU, HAWAII				
STREET LIGHTING DETAILS				
ENGINEER	DESIGNED BY	CHECKED BY		
APPROVED BY:	DATE	DEPT. OF TRANSPORTATION SVCS.		