

ELECTRICAL SYMBOLS

—○—	HIGHWAY LTG STANDARD, HIGH PRESSURE SODIUM LAMP LUMINAIRE, MULTIPLE CKT, 240V BALLAST
—○—	HIGHWAY LTG LUMINAIRE, HIGH PRESSURE SODIUM LAMP, MULTIPLE CKT, 240V BALLAST, REPLACING EXST MERCURY LAMP LUMINAIRE & BRACKET
—X—X—	EXST HIGHWAY LTG STANDARD & LUMINAIRE, SERIES CKT SYSTEM, TO BE REMOVED.
—X—X—	EXST HIGHWAY LTG STANDARD & LUMINAIRE, SERIES CKT SYSTEM, TO BE SALVAGED.
—○—	HIGHWAY LTG WOOD POLE, HIGH PRESSURE SODIUM LAMP LUMINAIRE & BRACKET ARM, MULTIPLE CKT 240V BALLAST.
—X—X—	EXST HIGHWAY LTG LUMINAIRE, BRACKET ARM & BALLAST, SERIES CKT SYSTEM, TO BE REMOVED
—SL—	HIGHWAY LTG CONDUIT 4 CONDUCTORS, 2" MIN.
—OSL—	OVERHEAD HIGHWAY LTG CONDUCTORS.
—SL—	EXST HIGHWAY LTG CONDUCTORS IN CONDUIT, TO BE REMOVED. CONDUIT TO BE ABANDONED IN PLACE.
—DSL—	EXST DIRECT BURIED HIGHWAY LTG CONDUCTORS TO BE ABANDONED IN PLACE.
—OSL—	EXST OVERHEAD HIGHWAY LTG CONDUCTORS TO BE REMOVED
—	HIGHWAY LTG PULLBOX, TYPE "A"
—	EXST HIGHWAY LTG PULLBOX
—	CAST METAL JUNCTION BOX, MTD ON CONCRETE BARRIER.
—	TRAFFIC SIGNAL STANDARD w/ HEADS
—	TRAFFIC SIGNAL STANDARD w/ "WALKING MAN/HAND" SIGNAL HEAD & PUSHBUTTON
—	EXST TRAFFIC SIGNAL HEADS
—TS—	TRAFFIC SIGNAL CONDUIT 4 CONDUCTORS, 2" MIN
—TS—	EXST TRAFFIC SIGNAL CONDUIT
—TS—	EXST TRAFFIC SIGNAL CONDUCTORS IN CONDUIT TO BE REMOVED, CONDUIT TO BE ABANDONED IN PLACE.
—E—	ELEC CONDUIT & WIRING, 2" MIN.
—	TRAFFIC SIGNAL PULLBOX, TYPE "A"
—	EXST TRAFFIC SIGNAL PULLBOX

CONSTRUCTION NOTES for GAS FACILITIES

1. THE GASCO, INC. GAS PIPELINES IN THE PROJECT AREA ARE PLASTIC COATED & CATHODICALLY PROTECTED. THE CONTRACTOR SHALL BE EXTREMELY CAREFUL WHEN WORKING NEAR THESE GAS PIPE LINES.

2. PRIOR WRITTEN CLEARANCE MUST BE OBTAINED FROM GASCO, INC. AT LEAST FIVE (5) WORKING DAYS BEFORE STARTING EXCAVATION NEAR GAS LINES.

SINCE GAS LINE LOCATIONS ON FIELD MAPS ARE APPROXIMATE, THE CONTRACTOR AFTER OBTAINING A WRITTEN CLEARANCE SHALL CALL GASCO, INC. A MINIMUM OF 48 HOURS BEFORE STARTING EXCAVATION TO ARRANGE FOR FIELD LOCATION OF EXISTING GAS LINES. THE TEL. NO. IS 547-3375 DURING BUSINESS HOURS & 526-0066 AFTER HOURS.

THE CONTRACTOR SHALL EXCAVATE & BACKFILL AROUND GAS PIPELINES IN THE PRESENCE OF A GASCO, INC. REPRESENTATIVE. ALL BACKFILL WITHIN SIX INCHES OF GAS PIPELINE SHALL BE SELECT CUSHION MATERIAL APPROVED BY GASCO, INC.

3. FOR RELOCATION OF ANY GAS PIPELINE, THE CONTRACTOR SHALL NOTIFY GASCO, INC. FIVE (5) WORKING DAYS BEFORE STARTING WORK. THE CONTRACTOR SHALL PROVIDE THE NECESSARY EXCAVATION & BACKFILL, ARRANGE FOR TRAFFIC PERMITS & RESTORE SIDEWALK PAVEMENT OR OTHER FACILITIES. ANY RELOCATION OF GAS FACILITIES SHALL BE DONE BY GASCO, INC. & PAID FOR BY CONTRACTOR.

4. THE CONTRACTOR SHALL NOTIFY GASCO, INC. IMMEDIATELY AFTER ANY DAMAGE HAS BEEN CAUSED TO EXISTING GAS PIPELINES, THEIR COATINGS OR THEIR CATHODIC PROTECTION DEVICES. REPAIR WORK ON THIS DAMAGE SHALL BE DONE BY GASCO, INC. & PAYMENT FOR THIS WORK TO BE BORNE BY THE CONTRACTOR.

5. MINIMUM VERTICAL OR HORIZONTAL CLEARANCE BETWEEN GAS PIPELINES & OTHER PIPELINES, CONDUITS, OR STRUCTURES SHALL BE 12 INCHES. ADEQUATE SUPPORT & PROTECTION FOR GAS PIPELINES EXPOSED IN THE TRENCH SHALL BE PROVIDED. SUCH SUPPORT & PROTECTION SHALL BE APPROVED BY GASCO, INC.

6. THE CONTRACTOR SHALL WORK IN AN EXPEDITIOUS MANNER IN ORDER TO KEEP UNCOVERED GAS PIPELINES EXPOSED FOR AS SHORT A PERIOD OF TIME AS POSSIBLE.

CONSTRUCTION NOTES

1. CONSTRUCTION WORK SHALL BE SCHEDULED IN SUCH A MANNER THAT STREET LIGHTING IS PROVIDED DURING ALL HOURS OF DARKNESS EITHER WITH NEW OR EXISTING LUMINAIRES, OR A COMBINATION THEREOF. TEMPORARY CONNECTIONS SHALL BE MADE TO ACCOMPLISH THIS END. THE CONTINUITY OF SERIES STREET LIGHTING CIRCUITS SHALL BE MAINTAINED UNTIL THE EXISTING SERIES STREET LIGHTING FIXTURES ARE READY FOR REMOVAL.

2. WHERE EXISTING SERIES CIRCUIT HIGHWAY LIGHTING LUMINAIRES ON METAL STANDARDS ARE INDICATED TO BE REMOVED, THE LUMINAIRE & POLE SHALL BE REMOVED & DISPOSED OF BY THE CONTRACTOR. THE FOUNDATION SHALL BE DEMOLISHED TO 6" BELOW GRADE & THE SURFACES AFFECTED SHALL BE RESTORED TO MATCH THE SURROUNDINGS.

3. NEW POLE LOCATIONS SHALL BE STAKED & APPROVAL OF LOCATIONS SHALL BE OBTAINED FROM THE ENGINEER BEFORE EXCAVATION IS STARTED. ADJUSTMENT OF POLE LOCATIONS IN THE FIELD WILL BE REQUIRED TO CLEAR UNDERGROUND & AERIAL UTILITY LINES.

4. CONTRACTOR SHALL AT HIS EXPENSE KEEP THE PROJECT & SURROUNDING AREA FREE FROM DUST, NUISANCE & SHALL BE RESPONSIBLE FOR CLEANING & REMOVAL OF ALL SILT & DEBRIS GENERATED BY THE EXCAVATION WORK & DEPOSITED & ACCUMULATED WITHIN DOWNSTREAM WATERWAYS, DITCHES, DRAIN PIPES & ON PUBLIC ROADWAYS.

5. THE CONTRACTOR SHALL LOCATE EXISTING BURIED UTILITY LINES IN THE VICINITY OF THE EXCAVATION WORK PRIOR TO COMMENCING EXCAVATION. AS A MINIMUM, AN ELECTRONIC MAGNETIC DEVICE FOR DETECTION OF BURIED LINES SHALL BE UTILIZED PRIOR TO EXCAVATION. TRENCHES SHALL BE EXCAVATED WITH CARE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING UTILITIES RESULTING FROM HIS NEGLIGENCE & SHALL BEAR COST OF REPAIRS TO THE UTILITIES. METHOD OF REPAIR SHALL BE DETERMINED BY THE STATE. CONTACT HECO. & HECO BEFORE STARTING EXCAVATION & HAVE EACH LOCATE BURIED UTILITY LINES AT THE PROJECT SITE.

TRAFFIC SIGNAL NOTES

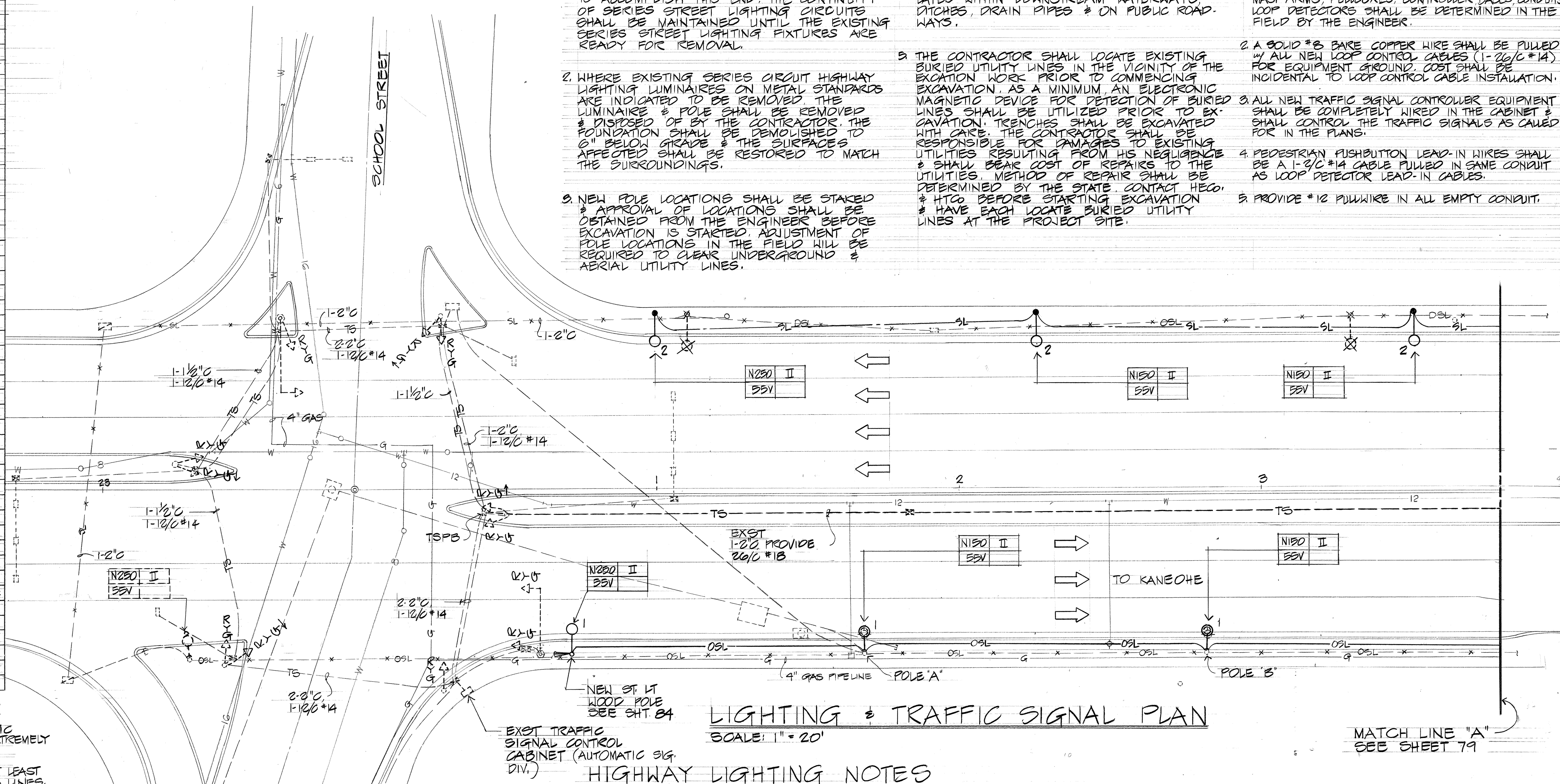
1. THE EXACT LOCATION OF TRAFFIC SIGNAL STANDARD MAST ARMS, PULLBOXES, CONTROLLER BASES, CONDUITS, LOOP DETECTORS SHALL BE DETERMINED IN THE FIELD BY THE ENGINEER.

2. A SOLID #8 BARE COPPER WIRE SHALL BE PULLED w/ ALL NEW LOOP CONTROL CABLES (1-26/C #14) FOR EQUIPMENT GROUND. COST SHALL BE INCIDENTAL TO LOOP CONTROL CABLE INSTALLATION.

3. ALL NEW TRAFFIC SIGNAL CONTROLLER EQUIPMENT SHALL BE COMPLETELY WIRED IN THE CABINET & SHALL CONTROL THE TRAFFIC SIGNALS AS CALLED FOR IN THE PLANS.

4. PEDESTRIAN PUSHBUTTON LEAD-IN WIRES SHALL BE A 1-2/C #14 CABLE PULLED IN SAME CONDUIT AS LOOP DETECTOR LEAD-IN CABLES.

5. PROVIDE #12 PULLWIRE IN ALL EMPTY CONDUIT.



LIGHTING & TRAFFIC SIGNAL PLAN

SCALE: 1" = 20'

MATCH LINE "A"
SEE SHEET 79

HIGHWAY LIGHTING NOTES

1. CONTRACTOR SHALL NOTIFY ELECTRICAL MAINTENANCE SECTION, DEPT. OF TRANSPORTATION, STATE HIGHWAY DIVISION 72 HOURS IN ADVANCE BEFORE COMMENCING INSTALLATION OF HIGHWAY LIGHTING SYSTEM. PHONE: 548-4077

2. ALL LUMINAIRES SHALL BE HIGH PRESSURE SODIUM TYPE WITH WATTAGE & I.E.S. TYPE LIGHT DISTRIBUTION AS SHOWN ON THE PLANS.

3. CONTRACTOR SHALL HAVE ONE SET OF APPROVED PLANS AT JOB SITE AT ALL TIMES DURING THE CONSTRUCTION WORK & RECORD ALL CHANGES OCCUR ON CONSTRUCTION OF HIGHWAY LIGHTING SYSTEM.

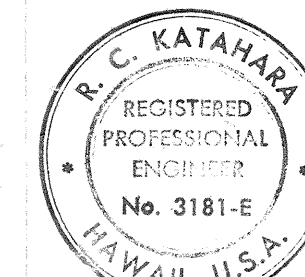
4. CONTRACTOR TO STENCIL DATE OF INSTALLATION AT THE BOTTOM OF PHOTOCELL. ONE PHOTOCELL ONLY IS REQUIRED AS INDICATED ON PLAN.

5. FINAL ACCEPTANCE & INSPECTION WILL BE UNDERTAKEN ONLY AFTER ALL WORK HAS BEEN COMPLETED.

6. CONTRACTOR SHALL MEASURE & RECORD GROUND RESISTANCE AT EACH STANDARD & SUBMIT RECORDED GROUND RESISTANCES TO TRAFFIC SECTION, DEPT. OF TRANSPORTATION, STATE HIGHWAY.

7. CONTRACTOR SHALL PROVIDE EIGHT (8) LIGHT GLARE SHIELDS & DELIVER TO THE STATE HIGHWAY DIVISION ELECTRICAL MAINTENANCE SECTION, OAHU DISTRICT, AT 727 KAKOI STREET FOR STORAGE.

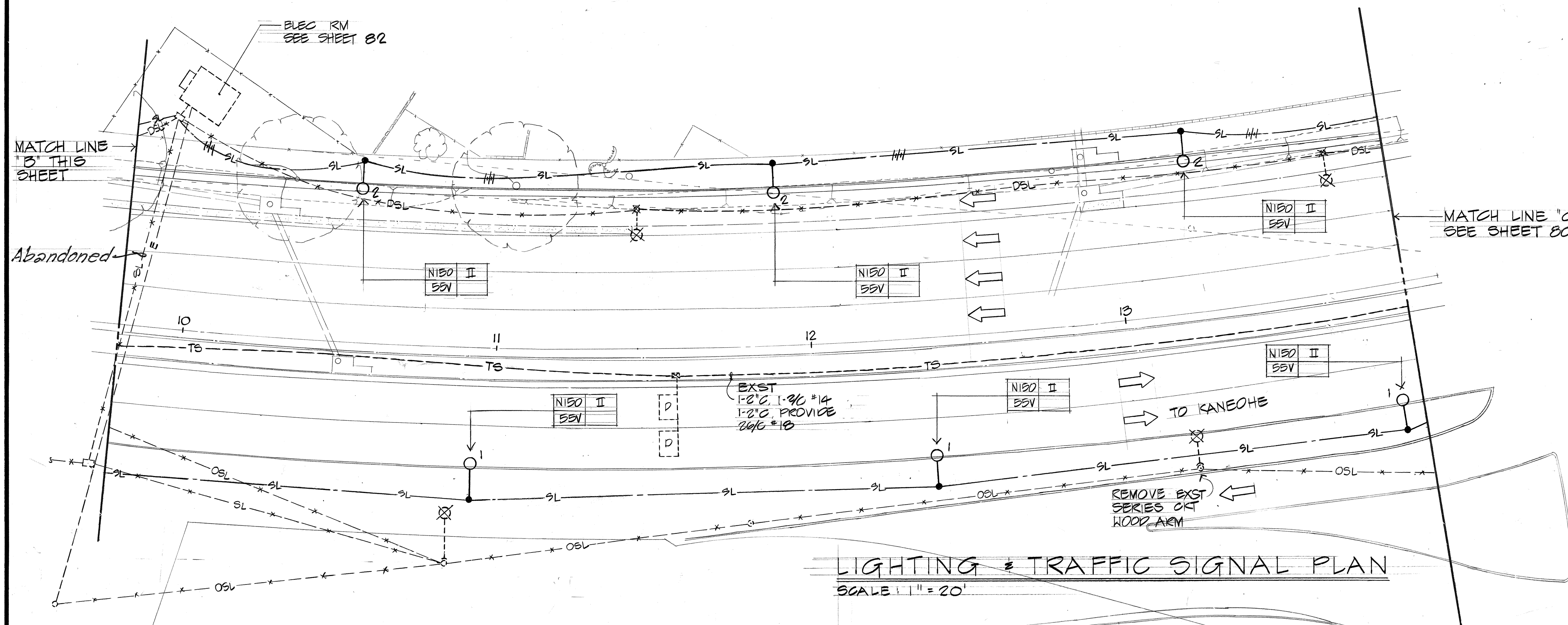
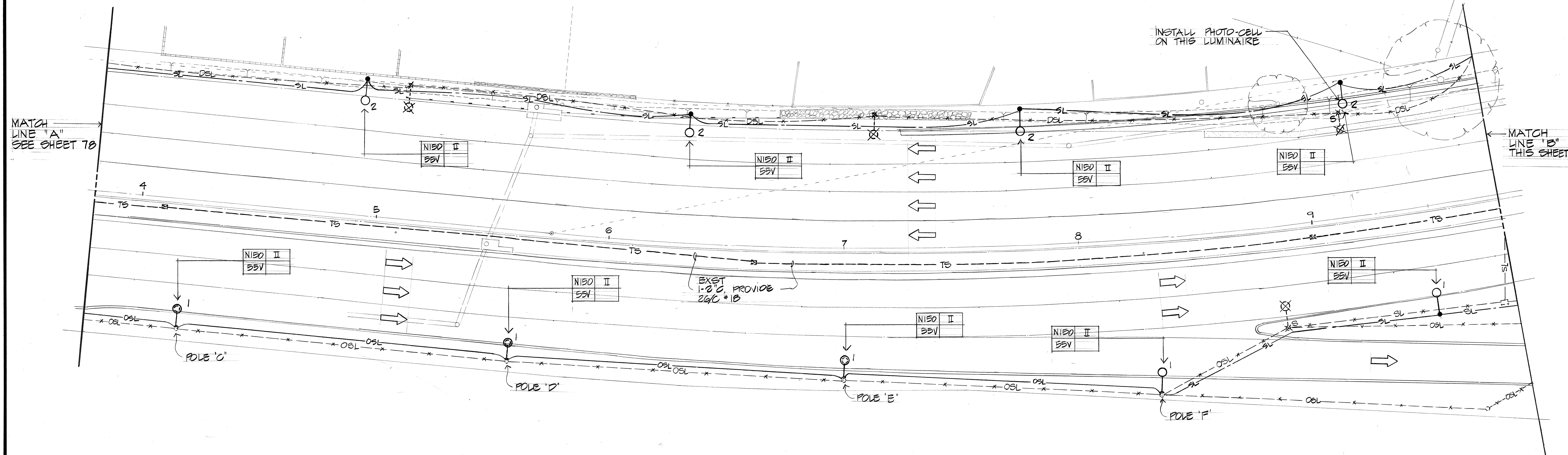
8. TRIM TREE BRANCHES TO CLEAR STREET LIGHT STANDARD.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
R. C. KATHANA
8/17/84STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISIONLIGHTING & TRAFFIC SIGNAL
PLAN & ELECTRICAL SYMBOLSLIKELIKE HIGHWAY IMPROVEMENTS
(KAMUY ROAD TO VICINITY OF KALIHU STREET)

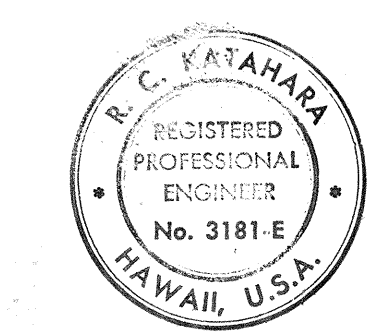
PROJECT NO. F-063-1 (17)

SHEET No. 1 OF 3 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(17)	84	79	136



LIGHTING & TRAFFIC SIGNAL PLAN SCALE 1" = 20'



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R. C. Kahana

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

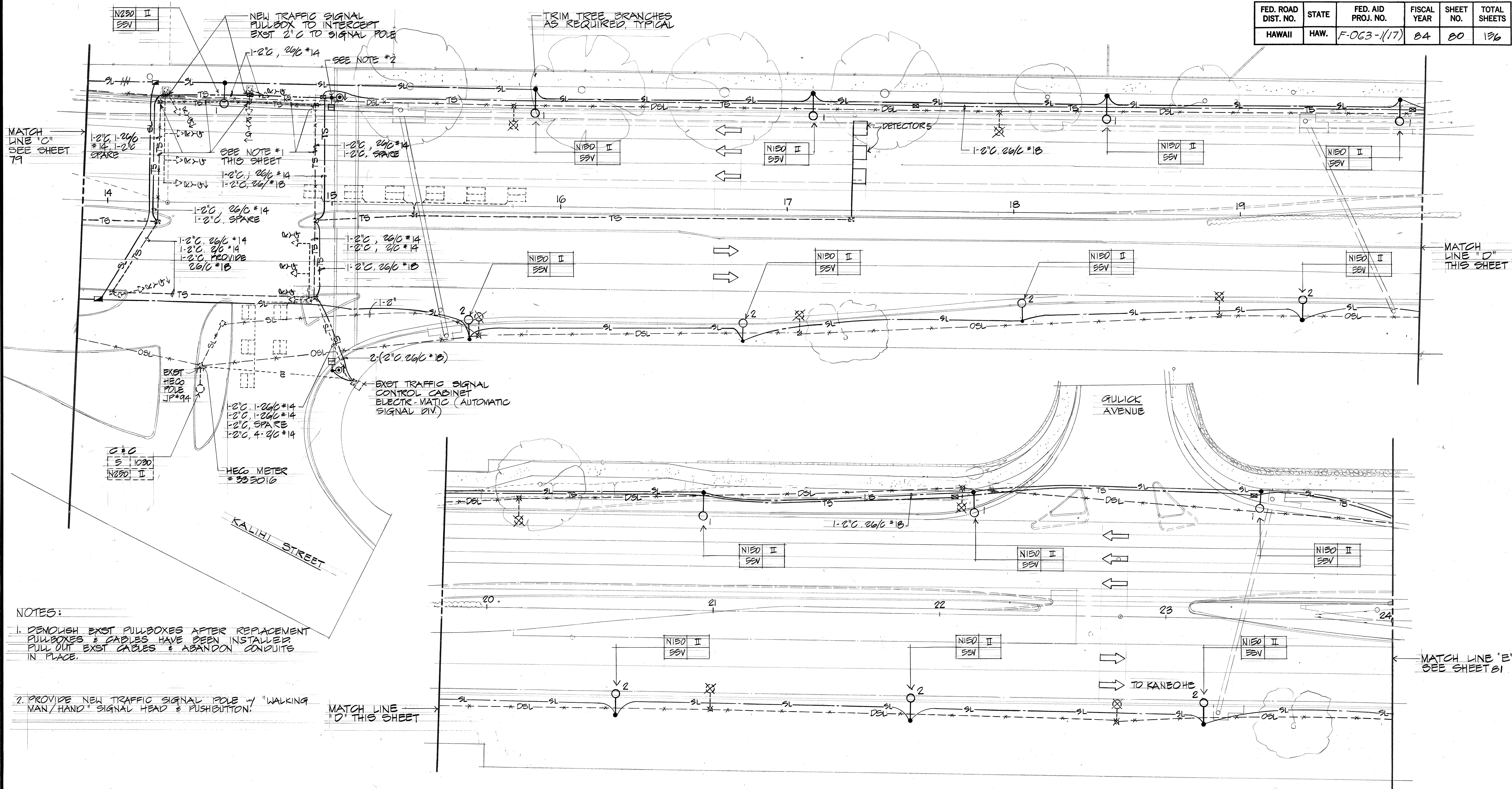
LIGHTING & TRAFFIC SIGNAL PLAN

LIKELIKE HIGHWAY IMPROVEMENTS
(KAM IV ROAD TO VICINITY OF KALIHI STREET)

PROJECT NO. F-063-1 (17)

SHEET NO. 2 OF 3 SHEETS

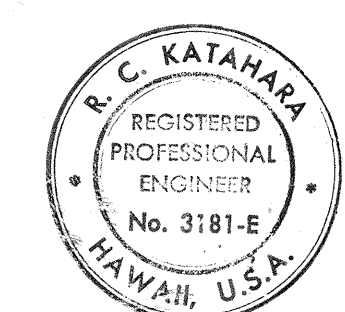
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(17)	84	80	136



- NOTES:
1. DEMOLISH EXST PULLBOXES AFTER REPLACEMENT PULLBOXES & CABLES HAVE BEEN INSTALLED. PULL OUT EXST CABLES & ABANDON CONDUITS IN PLACE.
 2. PROVIDE NEW TRAFFIC SIGNAL POLE w/ "WALKING MAN/HAND" SIGNAL HEAD & PUSHBUTTON.

DATE	_____
SURVEYED BY	_____
DRAWN BY	_____
DESIGNED BY	_____
QUANTITIES BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
No.	_____

LIGHTING & TRAFFIC SIGNAL PLAN SCALE: 1" = 20'



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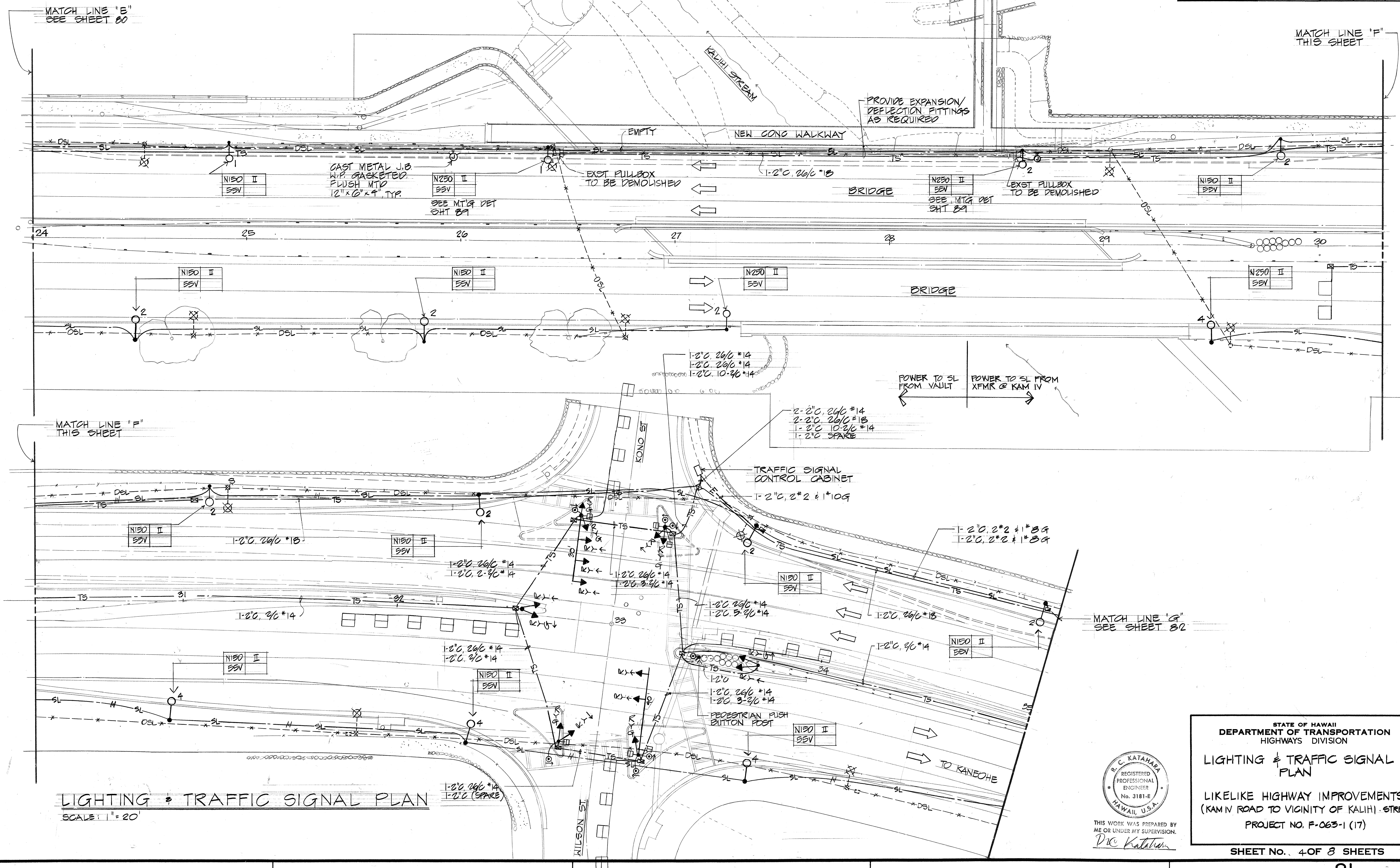
R. C. KATAHARA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

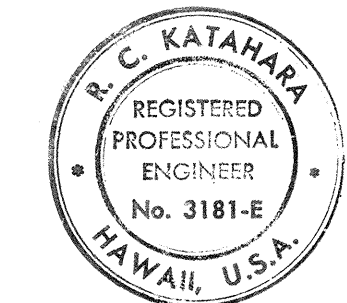
LIGHTING & TRAFFIC SIGNAL
PLAN

LIKELIKE HIGHWAY IMPROVEMENTS
(KAM IV ROAD TO VICINITY OF KALUHI STREET)
PROJECT NO. F-063-1 (17)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(17)	84	81	130



DATE	BY
DESIGNED BY	DATE
DRAWN BY	BY
CHECKED BY	DATE
NOTED BY	BY
QUANTITIES BY	DATE
NO.	



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R.C. KATAHARA

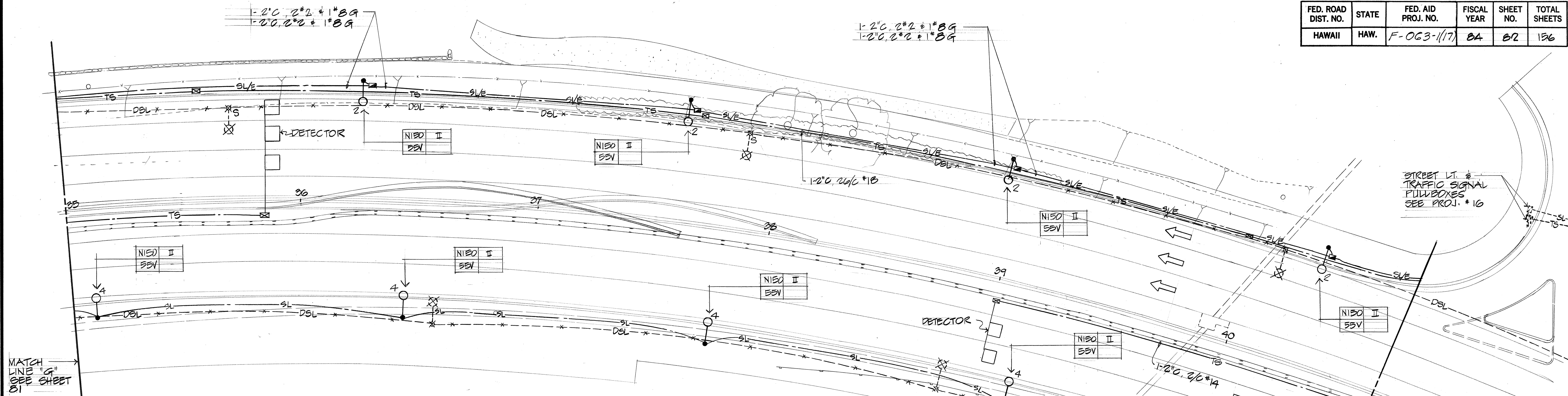
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LIGHTING & TRAFFIC SIGNAL PLAN

LIKELIKE HIGHWAY IMPROVEMENTS
(KAM IV ROAD TO VICINITY OF KALIHI STREET)
PROJECT NO. F-063-1 (17)

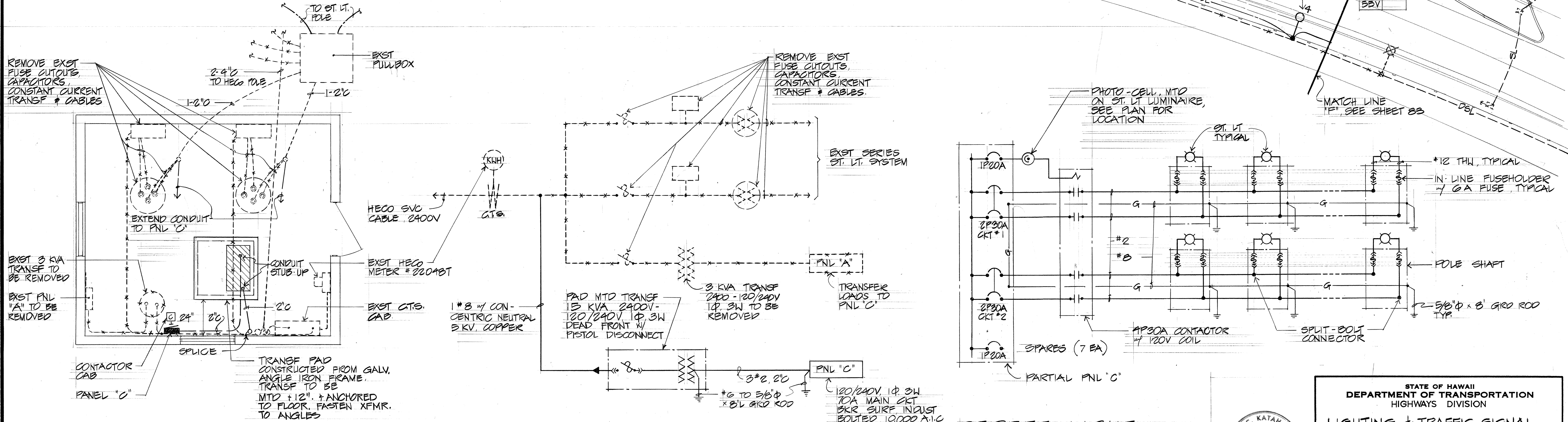
SHEET No. 4 OF 8 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(17)	84	82	156



LIGHTING & TRAFFIC SIGNAL PLAN

SCALE: 1" = 20'



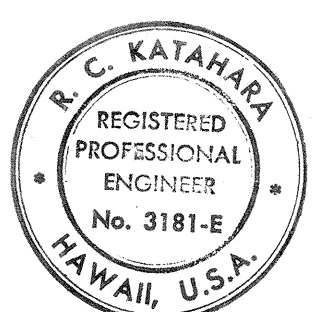
A EXST ELECTRICAL ROOM

SCALE: 3/8" = 1'-0"

ONE-LINE DIAGRAM

DASHED LINES DENOTE EXISTING.
SOLID LINES DENOTE NEW WORK.

STREET LIGHT CONTROL DIAGRAM



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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

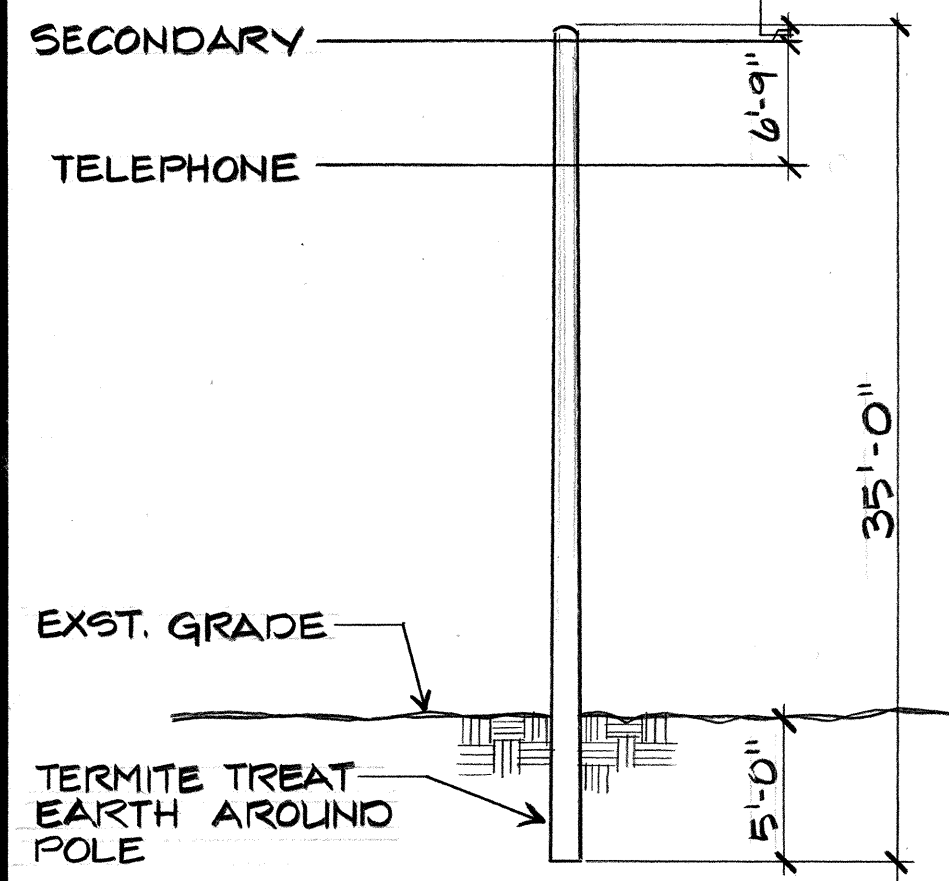
LIGHTING & TRAFFIC SIGNAL
PLAN & DIAGRAM

LIKELIKE HIGHWAY IMPROVEMENTS
(KAMIV ROAD TO VICINITY OF KALIHI STREET)
PROJECT NO. F-063-1 (17)

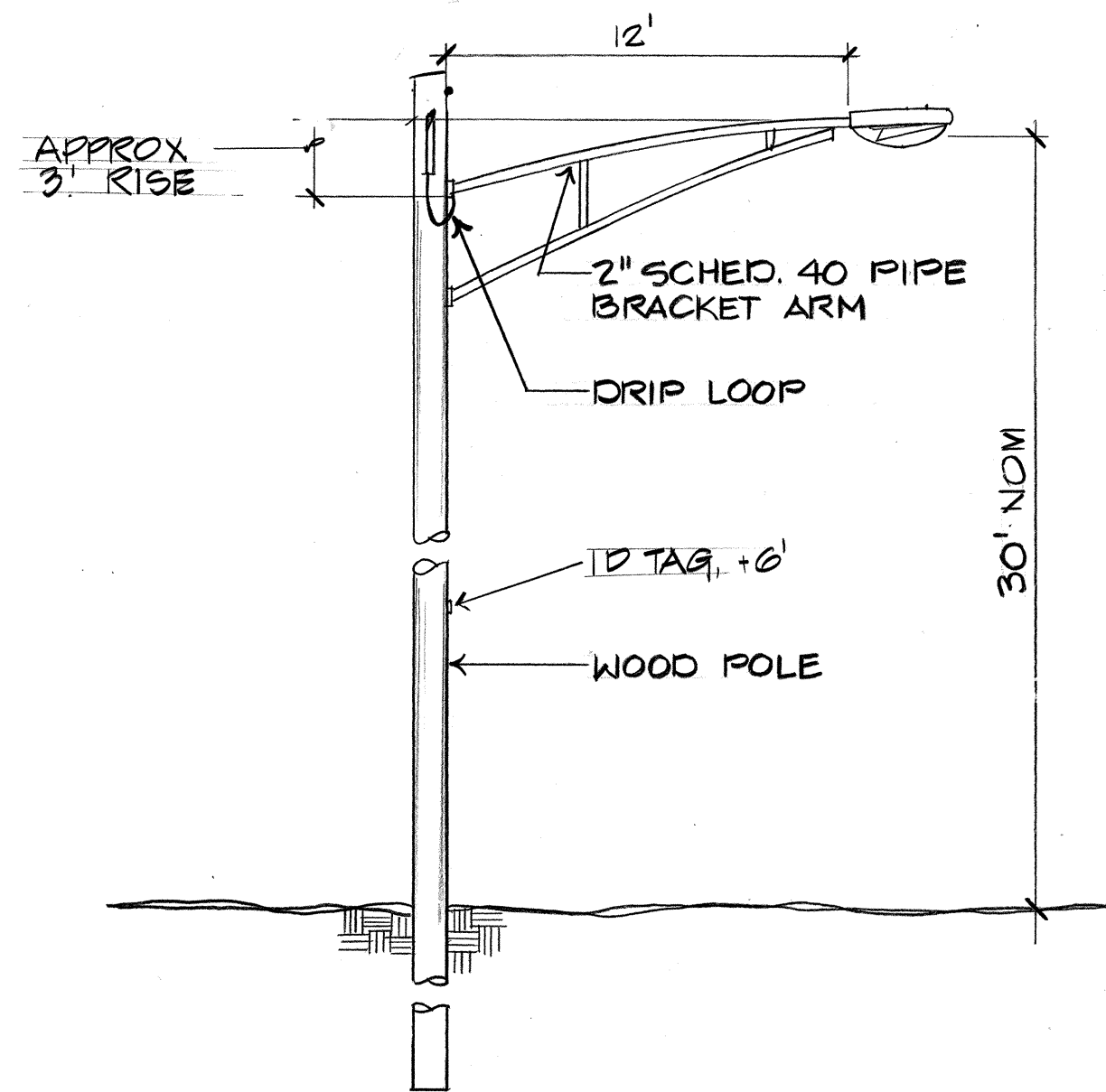
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(17)	84	84	136

POLE LINE MATERIAL LIST

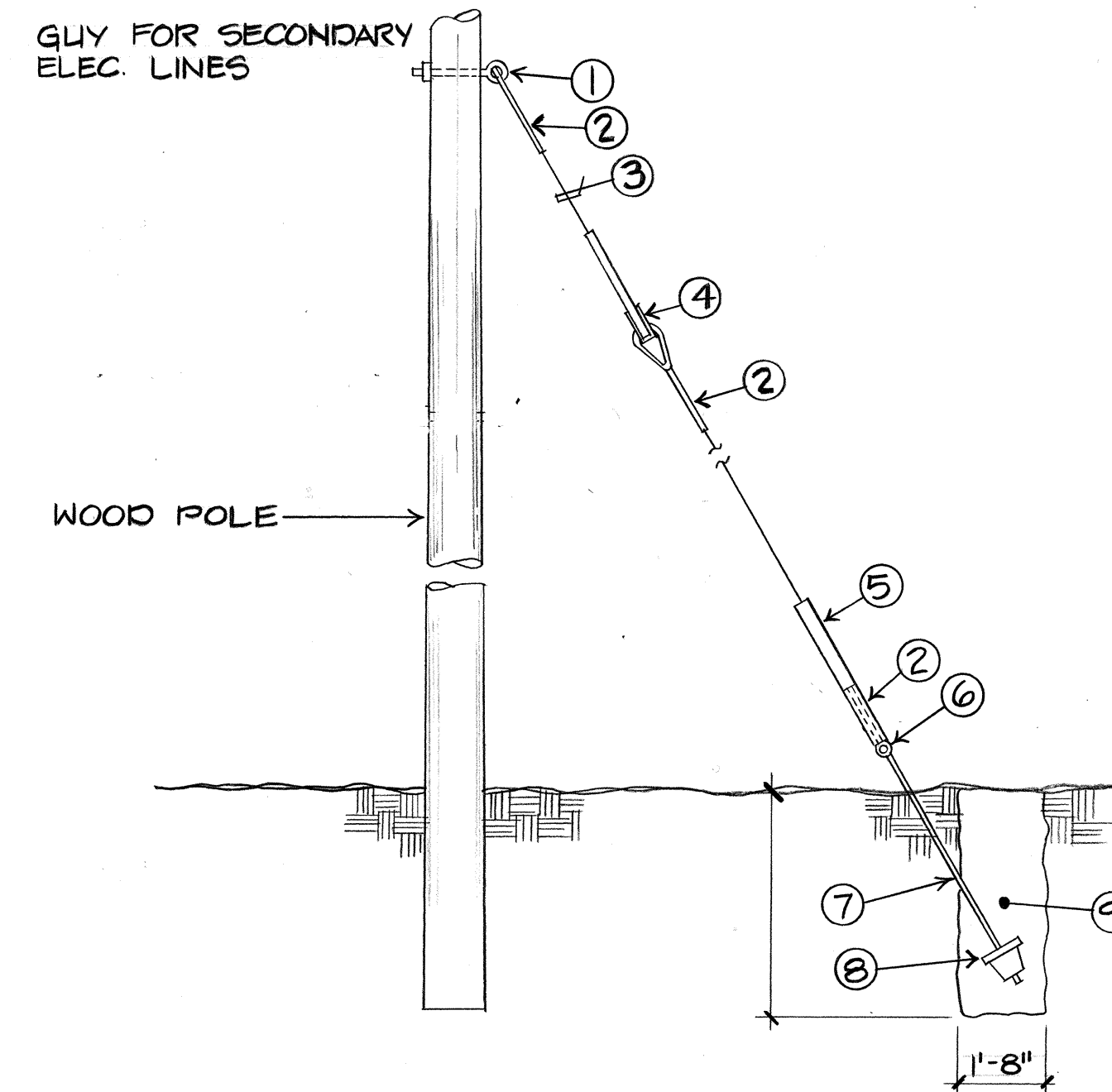
- 7/16" D. GUY EYEBOLT
- PREFORMED STRAND GRIP
- 7/16" D. GUY STRAND
- STRAND INSULATOR - 20,000 LBS.
- YELLOW PVC GUY GUARD, 8'-0"
- EYE FOR TWO GUYS
- 3/4" D. ANCHOR ROD
- 18" DIA. CONC. DEADMAN
- BACKFILL W/EXCAVATED EARTH & AVAILABLE ROCK-TAMP SOLID
- TAP CONNECTOR
- INSULATED SEPARABLE CONNECTOR, FUSED & NON-FUSED
- SECONDARY COND. & BARE MESSENGER, #2 COPPER
- GROUND ROD 3/4" D. X 8'-0" LONG
- BARE MESSENGER
- ANCHOR ROD, 1" X 8'-0" SINGLE EYE W/WASHER & NUT
- WOOD MOULDING & GROUND WIRE (#8 B&C)
- GUY STRAND CLAMPS, SIDEWALK TYPE
- INSULATED CLEVIS W/PREFORMED TIE
- 3/4" PVC 80



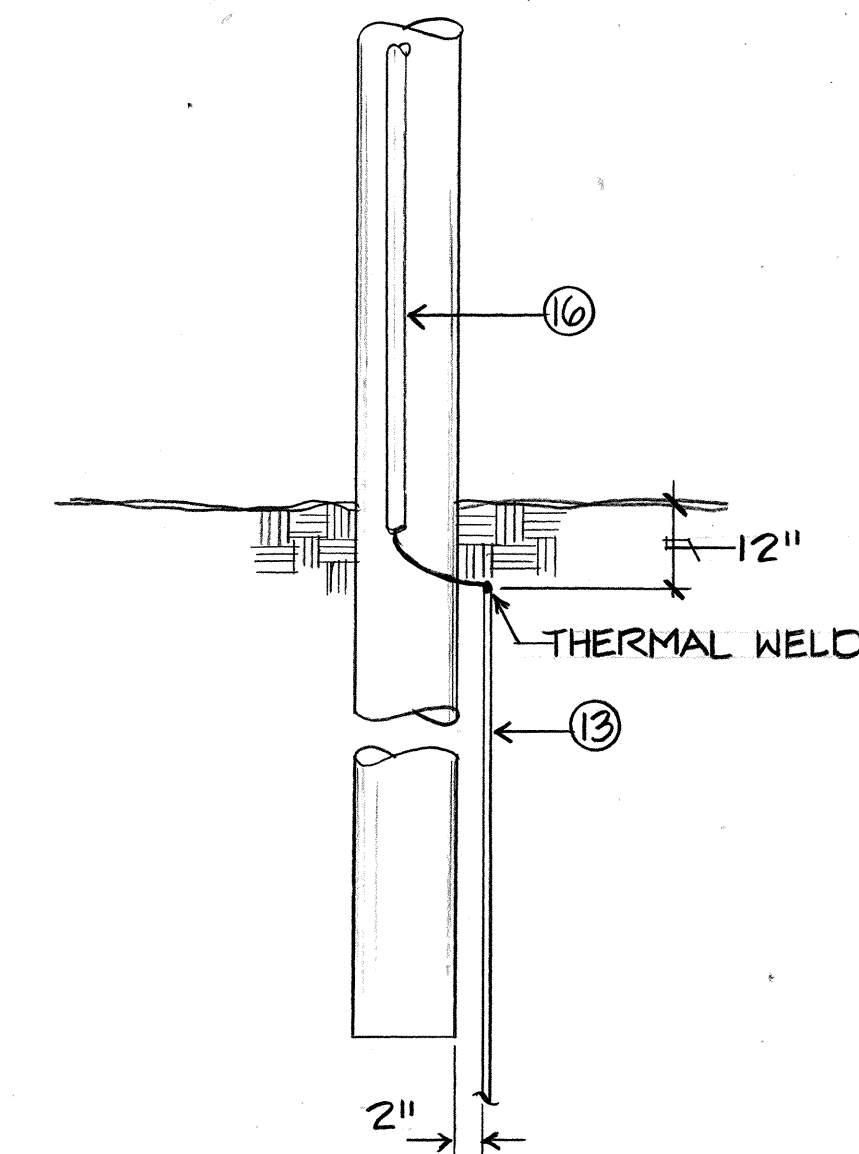
A POLE FRAMING DETAIL
84 NOT TO SCALE



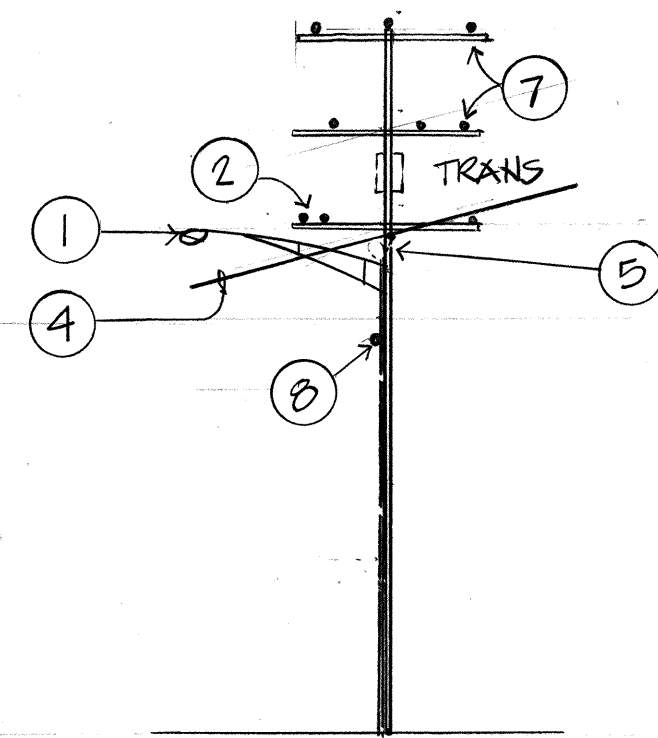
B LIGHT POLE STANDARD
84 NOT TO SCALE



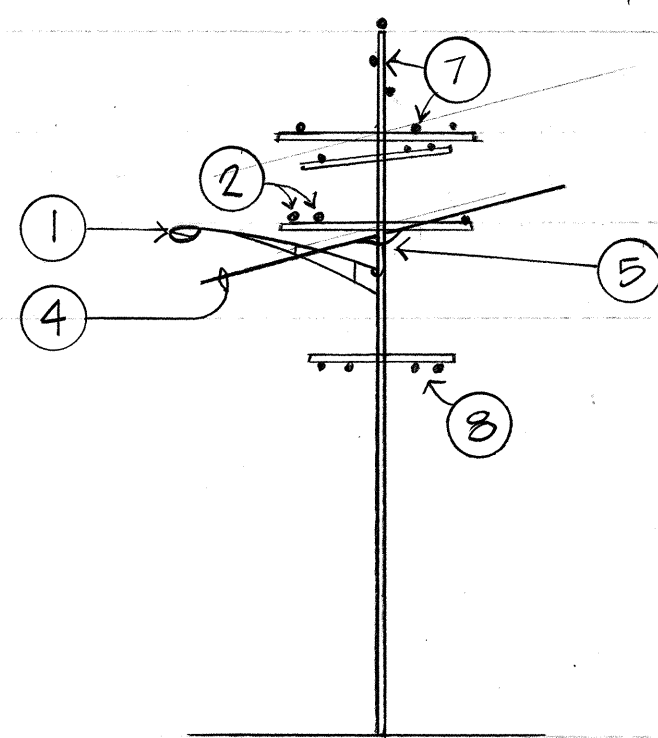
C GUY ANCHOR DETAIL
84 NOT TO SCALE



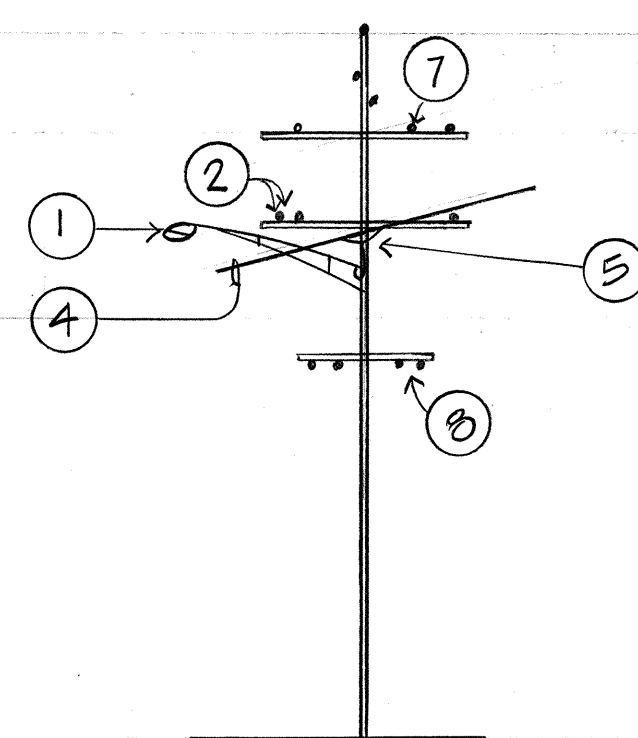
D GROUNDING DETAIL
84 NOT TO SCALE



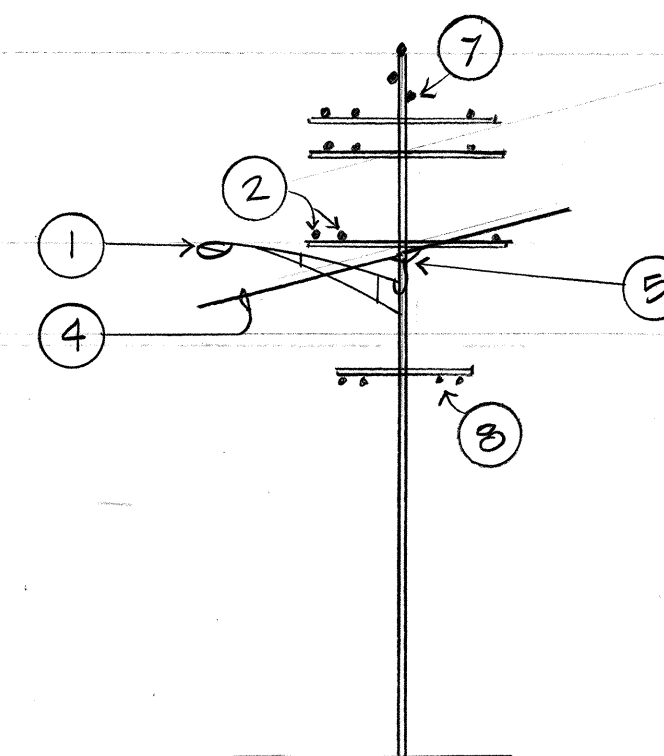
POLE # A



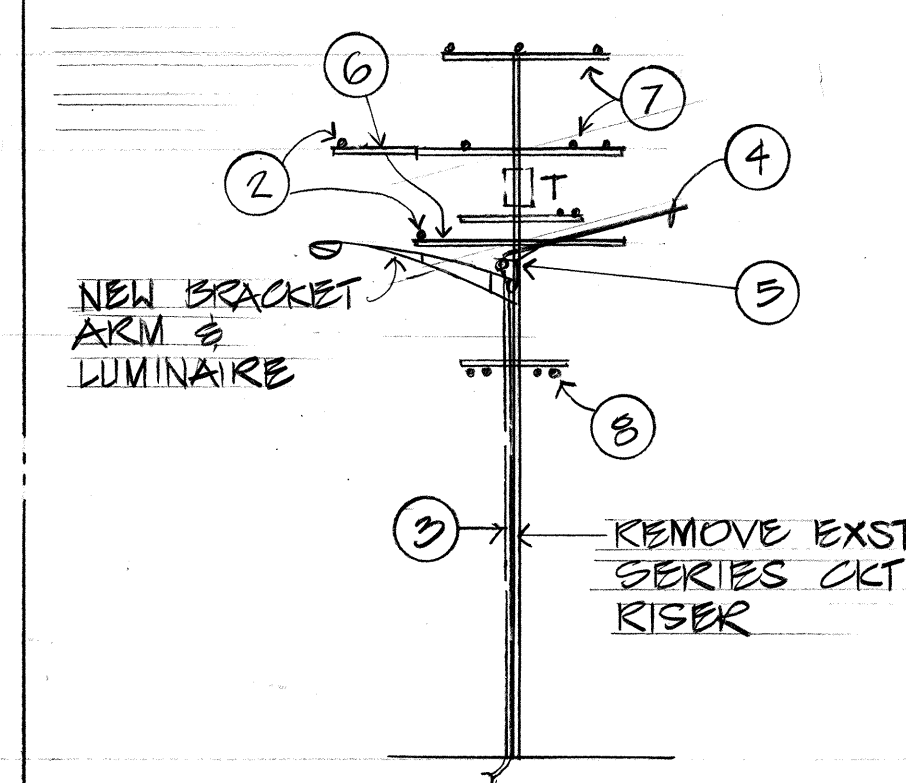
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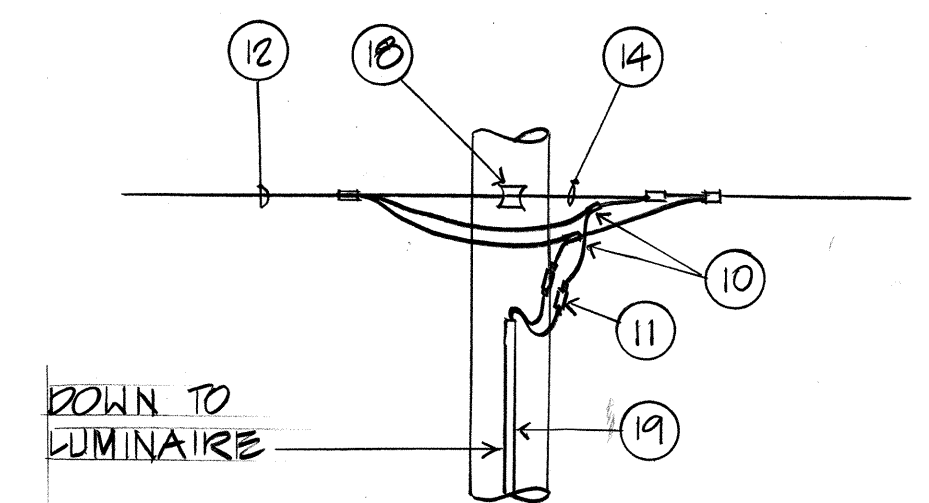
POLE # C



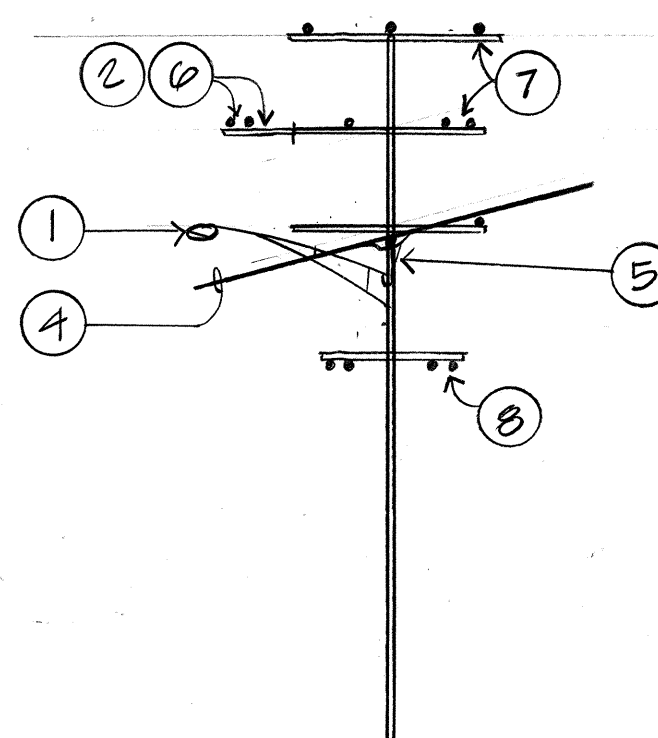
POLE # D



POLE # F



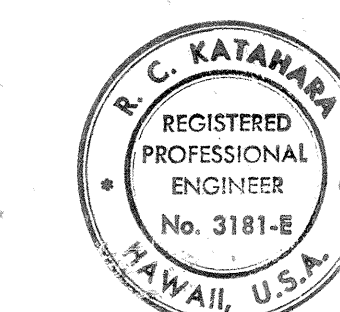
E LUMINAIRE CONNECTION DET.
84 NOT TO SCALE



POLE # E

NOTES (FOR POLES A THRU F)

- REPLACE EXST SERIES LTG FIXT & BRACKET ARM WITH NEW 12' BRACKET ARM & 150 W HIGH PRESSURE SODIUM LUMINAIRE, SEE DET B/E-7.
- REMOVE SERIES CKT CONDUCTORS & BALLAST
- 2" O. G.R.S. w/ WEATHERHEAD w/ 2" x 1" BG
- #2 TRIPLEX CONDUCTORS
- LUMINAIRE CONNECTION SEE DET B/E-7
- REMOVE SERIES CKT SYSTEM WOOD ARM
- HECO PRIMARY CABLES
- HTG & CATV CABLES



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

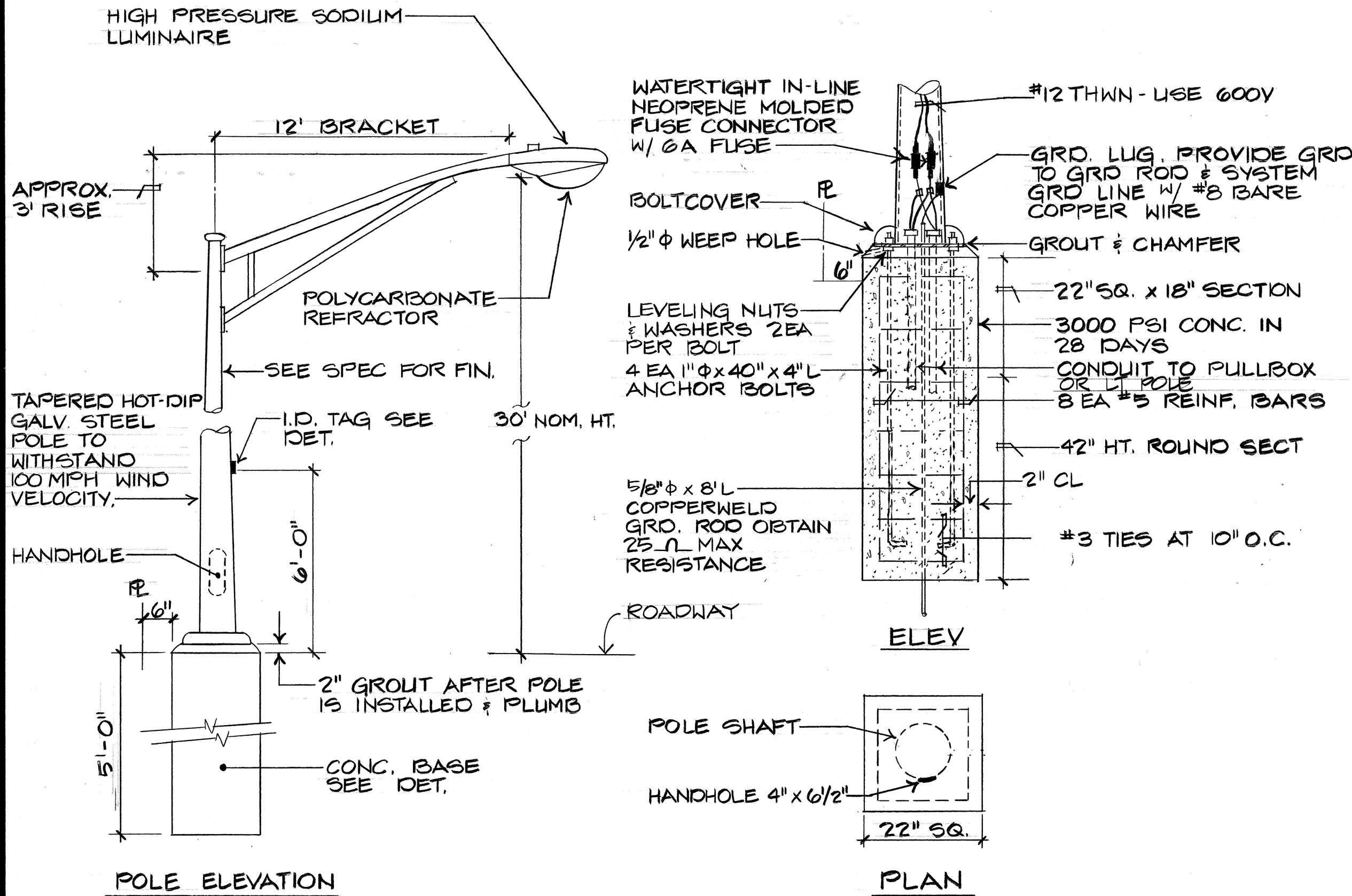
POLE DETAILS

LIKELIKE HIGHWAY IMPROVEMENTS
(KAM IV ROAD TO VICINITY OF KALIHI STREET)
PROJECT NO. F-063-1 (17)

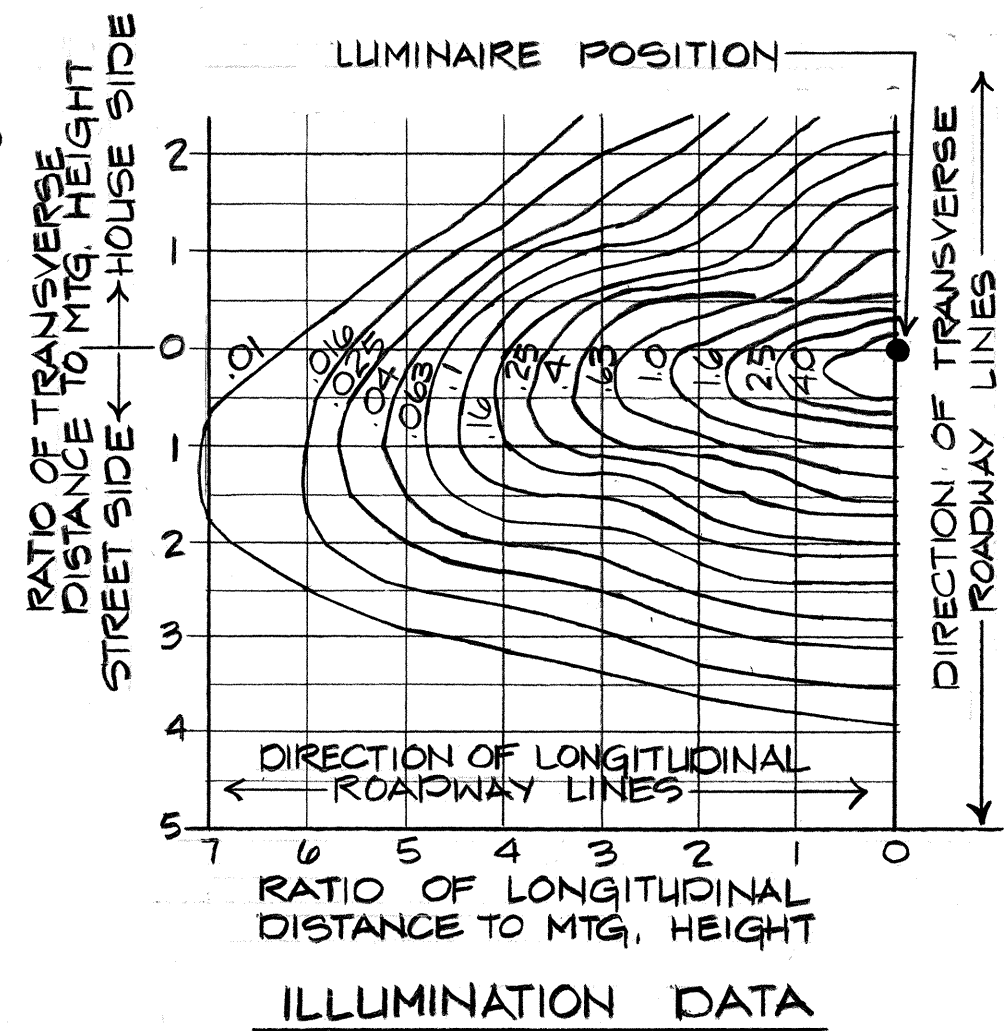
SHEET No. 7 OF 8 SHEETS

DATE	_____
SURVEY PLOTTED BY	_____
DESIGNED BY	_____
NOTED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
QUANTITIES BY	_____
CHECKED BY	_____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	F-063-1(17)	84	85	186

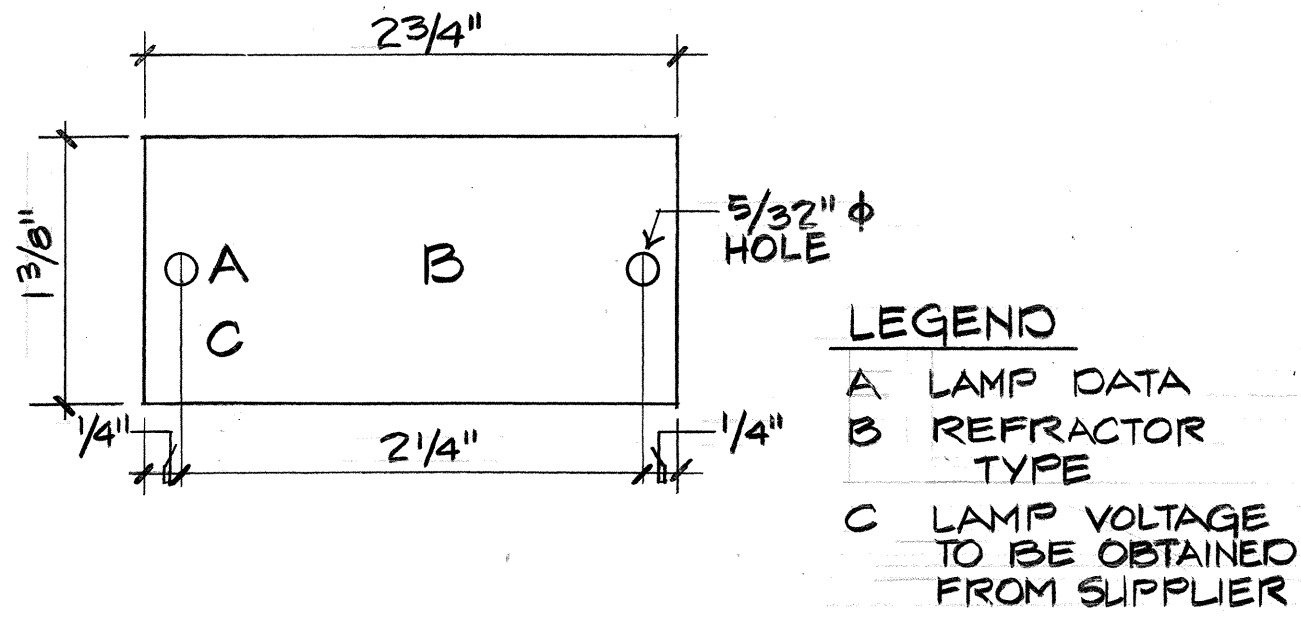
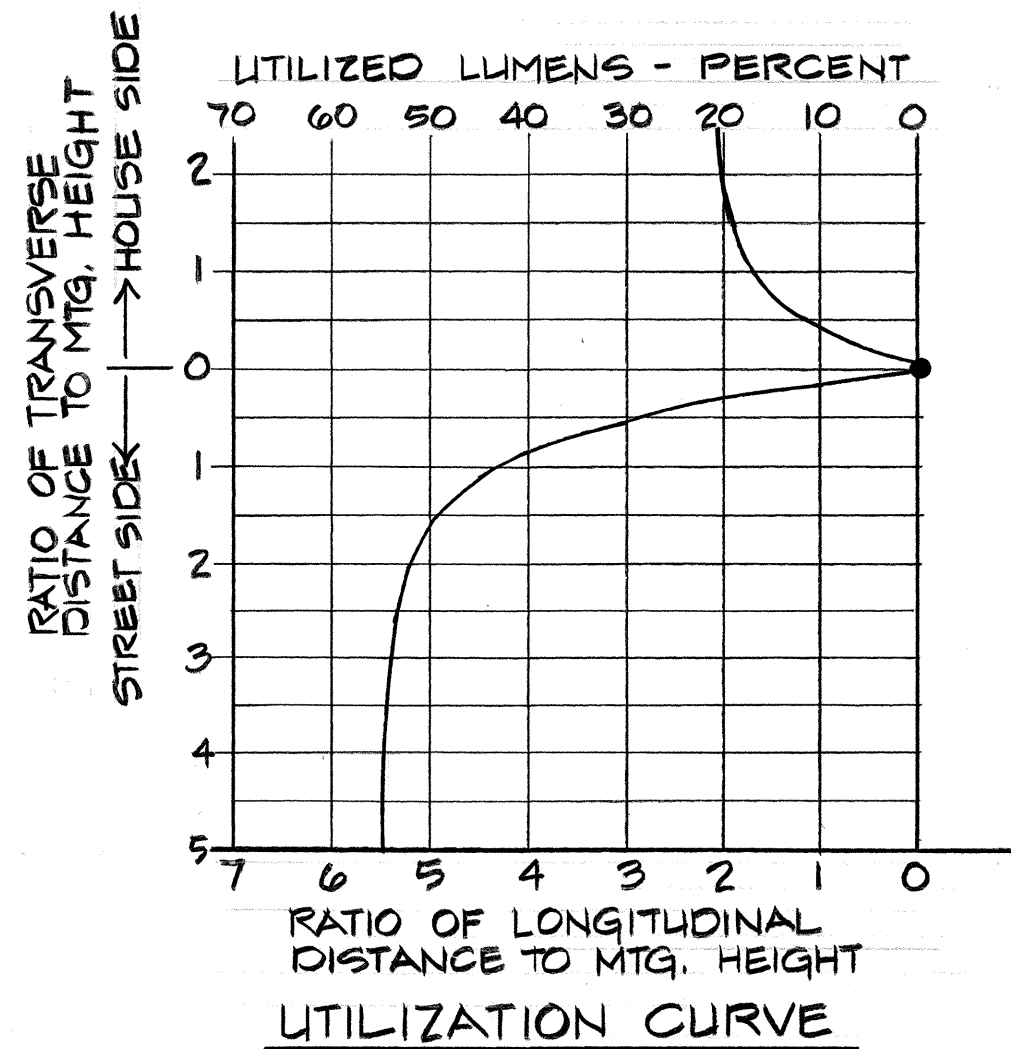


A HIGHWAY LIGHT POLE STANDARD DETAIL
85 NOT TO SCALE



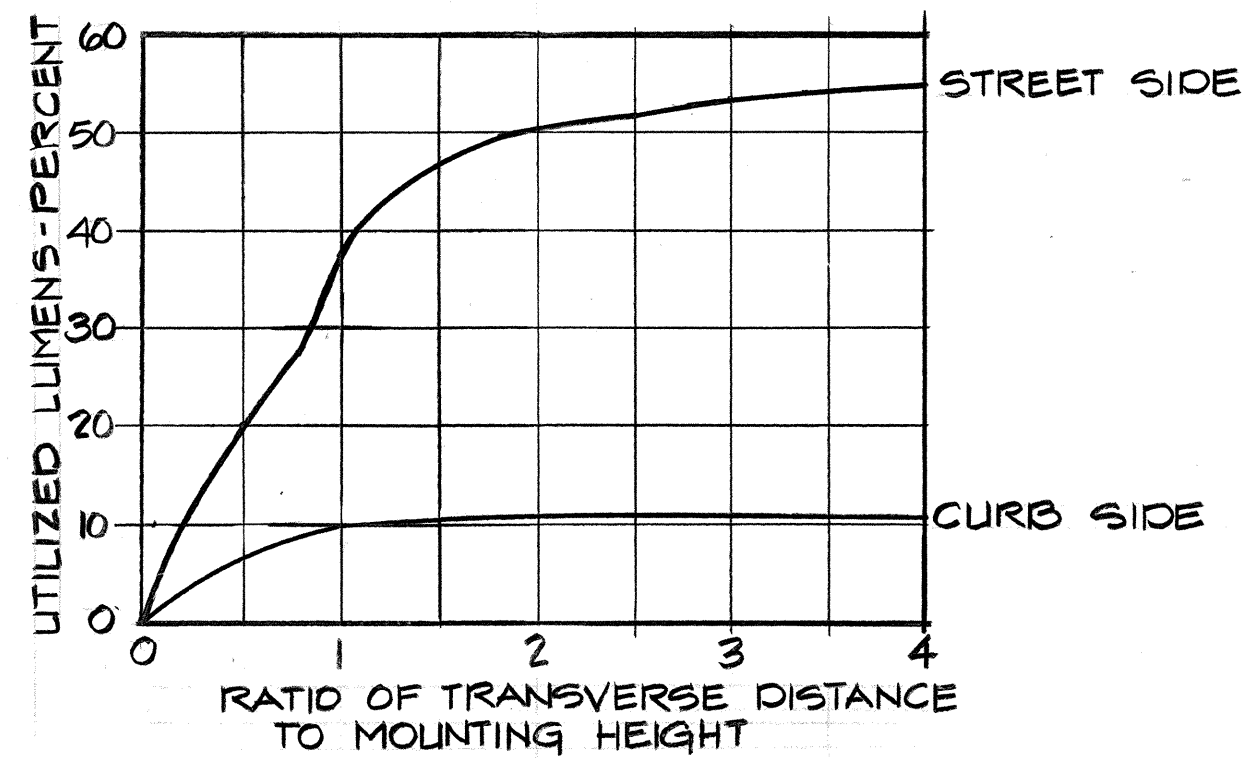
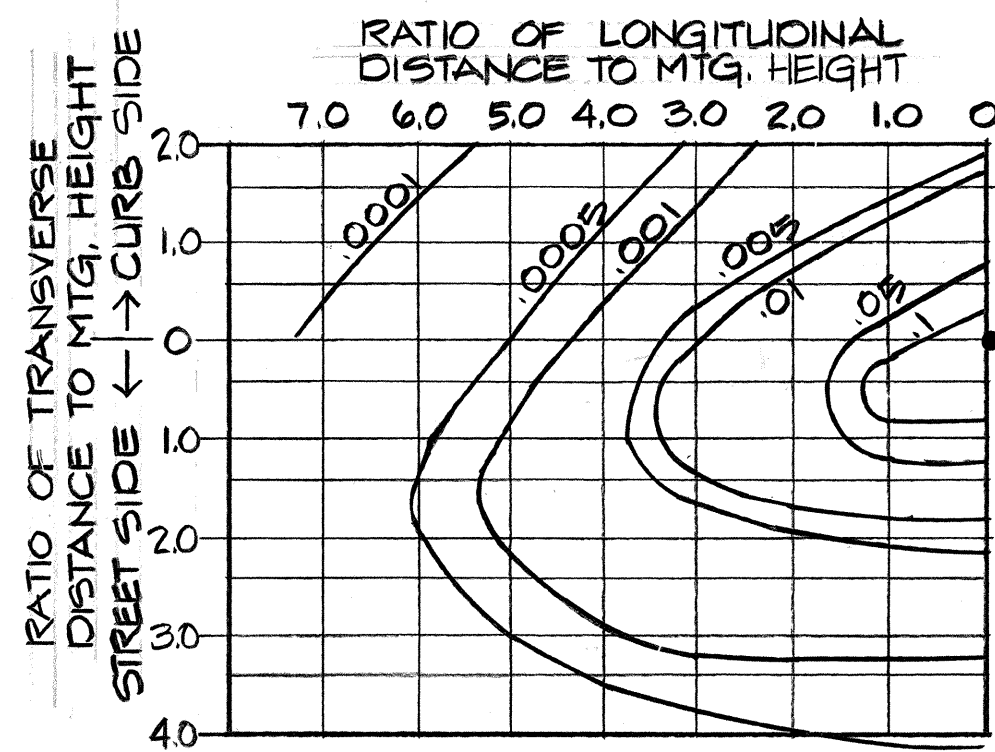
IES TYPE MEDIUM/CUTOFF TYPE II

250W HIGH PRESSURE SODIUM



- NOTES:**
1. TAG MADE FROM 3-PLY LAMINATED PLASTIC BLACK-WHITE-BLACK.
 2. ATTACH TO STEEL POLE W/ NO. 8 5/8" L DRIVE SCREW IN 1/8" DRILL HOLE. ATTACH TO WOOD POLE 7/4" ALUM NAILS.
 3. LETTERS NO. 5 REDUCTION, 1/5" ENLARGED.
 4. ATTACH 6'-0" ABOVE CURB OR FINISHED GRADE. TAG SHALL BE ON STREET SIDE OF POLE.

TYPICAL IDENTIFICATION TAG DETAIL
NOT TO SCALE



150W HIGH PRESSURE SODIUM

ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	
NO.	



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R.C. Katakara

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

LIGHT STANDARD DETAIL

LIKELIKE HIGHWAY IMPROVEMENTS
(KAM IV ROAD TO VICINITY OF KALIHI STREET)
PROJECT NO. F-063-1(17)

SHEET No. 8 OF 8 SHEETS