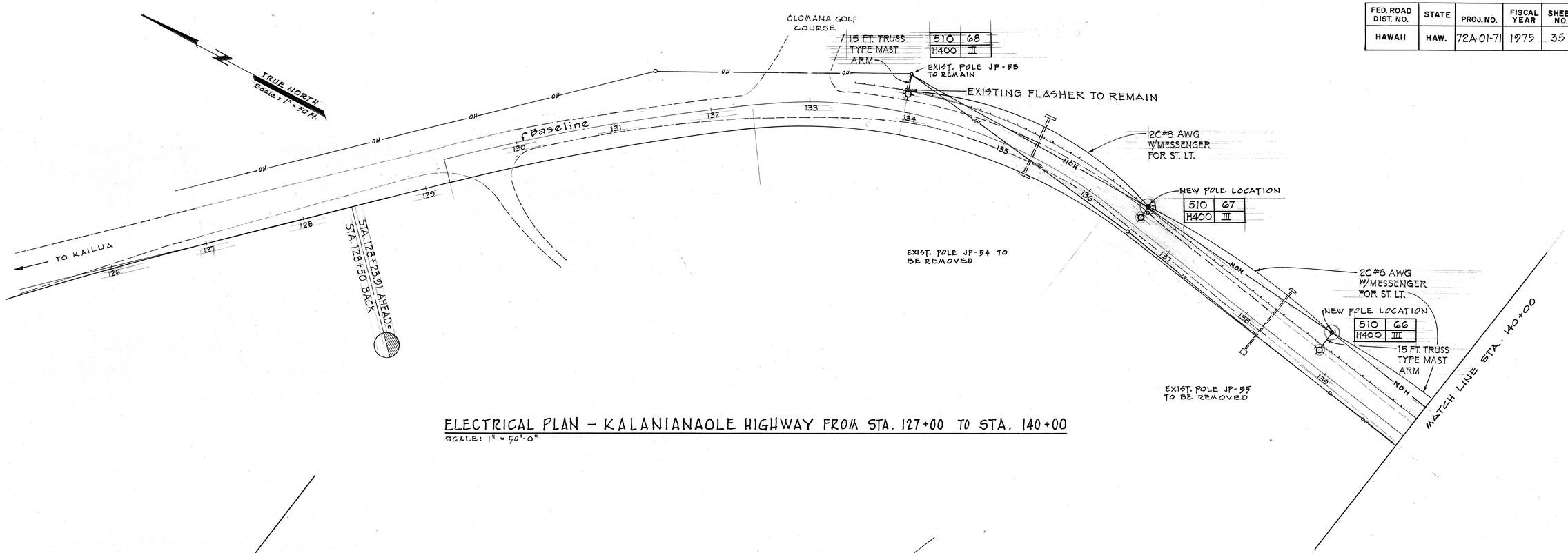
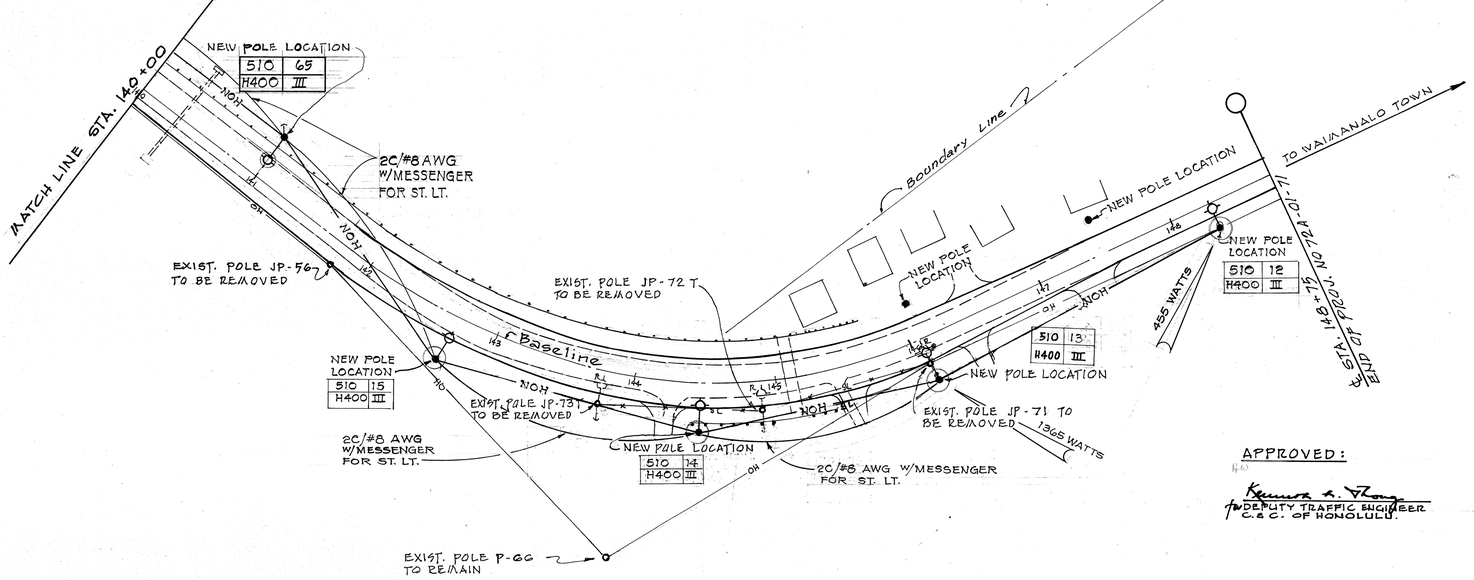
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	35	42



ELECTRICAL PLAN – KALANIANAOLE HIGHWAY FROM STA. 127+00 TO STA. 140+00

SCALE: 1" = 50'-0"



ELECTRICAL PLAN - KALANIANAOLE HIGHWAY FROM STA. 140+00 TO STA. 148+75

SCALE: 1" = 50'-0"

APPROVED:

Kenneth A. Kong
for DEPUTY TRAFFIC ENGINEER
C. & C. OF HONOLULU.

DATE.

10-27-76

ROBERT WAKEFIELD WARD
REGISTERED PROFESSIONAL ENGINEER
No. 1607-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

Signature

DATE	REVISION
4-29-76	Extend Highway Lighting Sta. 134+00 to 142+75

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL PLAN

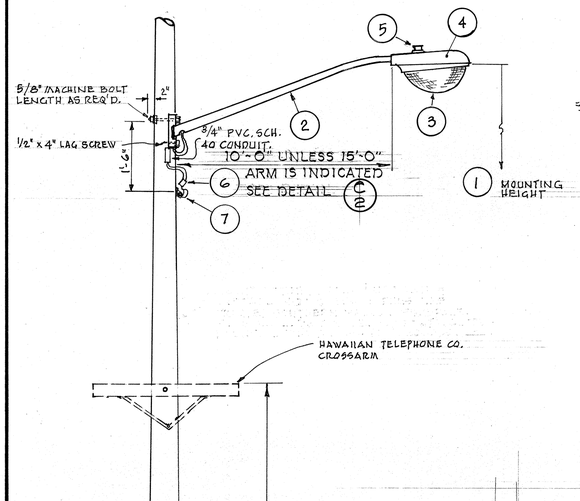
KALANIANAOLE HIGHWAY
PROJECT NO. 72 A-01-71

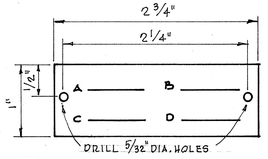
SHEET NO. 1 OF 2 SHEETS

C. 6 - 8

C. 0. 35

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	72A-01-71	1975	36	42





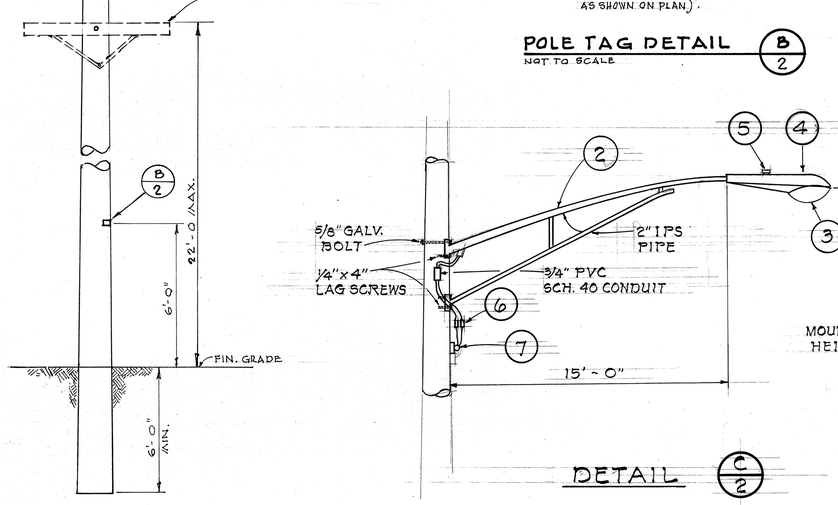
POLE TAG

1. MAKE FROM 3-PLY LAMINATED PLASTIC, BLACK-WHITE-BLACK 1/8" HIGH COMMERCIAL GOTHIC LETTERS ENGRAVED OR STENCILLED.
2. ATTACH TO WOOD POLE WITH 4D ALUMINUM NAIL
3. ATTACH 6'-0" ABOVE CURB OR FINISH GRADE

ENGRAVING SCHEDULE

A CONTRACT NUMBER (AS SHOWN ON PLAN)
B LIGHT NUMBER (AS SHOWN ON PLAN)
C LAMP DATA (AS SHOWN ON PLAN)
D REFRACTOR NUMBER (IES ROMAN NUMBER AS SHOWN ON PLAN).

POLE TAG DETAIL (B/2)
NOT TO SCALE



LUMINAIRE MOUNTING DETAIL ON WOOD POLE (A/2)
NOT TO SCALE

DETAIL (C/2)

ELECTRICAL SPECIFICATION

1. MOUNTING HEIGHT.

A. ALL MOUNTING HEIGHTS ARE NOMINAL AND INDICATE DISTANCE FROM TOP OF CURB TO CENTER OF LUMINAIRE SUPPORT AT POINT OF LUMINAIRE ATTACHMENT.

B. FOR 175 WATTS AND 250 WATTS LUMINAIRE 27'-8"

C. FOR 400 WATTS LUMINAIRES 30'.

2. BRACKET ARM

A. BRACKET ARM ASSEMBLY CONSISTS OF 2" I.P.S. STEEL PIPE.

B. POLE END SHALL HAVE STEEL FITTING WELDED TO IT, WHICH WILL PERMIT POSITIONING OF ARM ON PLATE, HELD ONLY BY GRAVITY WHILE ARM IS SECURED TO POLE WITH CAP SCREWS, PROVIDING WEATHER-RESISTANT CONNECTION AND SMOOTH WIRING RACEWAY.

C. FACE PLATE SHALL BE DESIGNED FOR WOOD POLE MOUNTING AND CONNECTING BOLTS MUST BE CAPABLE OF RESISTING THE SAME MOMENT AT YIELD STRENGTH AS ARM MEMBER.

D. FIFTEEN FEET MAST ARM TO BE TRUSS TYPE.

3. LUMINAIRE

A. ANSI. TYPE "H" HORIZONTAL BURNING MERCURY VAPOR LAMPS HEAT RESISTANT GLASS PRISMATIC REFLECTOR. DISTRIBUTION ACCORDING TO ASA-IES TYPE AS SHOWN ON DRAWINGS. WEATHER-PROOF CAST ALUMINUM HOUSING AND REFLECTOR HOLDER WITH STAINLESS STEEL HARDWARE, ALZAK ALUMINUM REFRACTOR POLISHED AND PROCESSED TO MIRROR FINISH, HAVING 80 TO 85 PERCENT REFLECTING SURFACE, REFRACTOR HOLDER ASSEMBLY HINGED TO HOUSING AT BUILDING SIDE AND FASTENED AT STREET SIDE BY AUTOMATIC TYPE LATCH AND OPTICALLY SEALED. SEALED AGAINST MOISTURE AND FOREIGN MATERIALS. COMBINATION 1 1/4" AND 2" END MOUNTING SLIP FITTER. HEAVY PORCELAIN MOGUL SOCKET ON BUILDING SIDE OF REFLECTOR FOR OPERATION ON 120 V. OR 240 V. MULTIPLE CIRCUIT.

B. LAMP SHALL BE FOR USE WITH MERCURY VAPOR BALLAST IN 120V. MULTIPLE STREET LIGHTING DISTRIBUTION SYSTEM.

C. COMPLETE WITH INTEGRAL BALLAST AND PHOTO-ELECTRIC CONTROL UNIT.

4 BALLAST

RATED FOR 120/240V INPUT OF MULTIPLE CIRCUIT, 60 CYCLE DISTRIBUTION SYSTEM. UNIT SHALL CONSIST OF A CORE AND COIL ASSEMBLY IMPREGNATED WITH GLASS 'F' VARNISH. BALLAST SHALL BE FOR SINGLE MERCURY LAMPS, WATTAGE AS SHOWN ON DRAWING, REGULATED OUTPUT TYPE, HIGH POWER FACTOR, CAPABLE OF MAINTAINING RATED OUTPUT WITH 13% VARIATION OF INPUT VOLTAGE, AND CONFORMING TO APPLICABLE NEMA SPECIFICATIONS.

5. PHOTO-ELECTRIC CELL

A. PHOTO-ELECTRIC CELL SHALL BE FOR PLUG CONNECTION ON LUMINAIRE WITH WEATHERPROOF TWIST-LOCK RECEPTACLE AND CONTROL OF NORMALLY CLOSED CONTACT. INDIVIDUAL UNIT, TUBELESS TYPE, 105-285 VOLTAGE RANGE 50/60 CYCLES A.C. CONTACTS FOR 1000 WATTS INCANDESCENT LAMP MAXIMUM DIRECT LAMP LOAD OR 1300 VOLT AMPERE MERCURY VAPOR AND FLUORESCENT LAMP LOAD. 120 AMPERE INRUSH CURRENT RATING. TURN ON RANGE 0.5 TO 2.5 FOOTCANDLES, TURN OFF RANGE AT 6 FOOTCANDLES MAXIMUM, MINIMUM 200 MILLI-SECONDS TIME DELAY, EXPULSION TYPE LIGHTNING ARRESTER, FULL WAVE RECTIFIER AND COMBINATION RESISTOR CAPACITOR.

B. IN THE EVENT OF ELECTRONIC CIRCUIT FAILURE LOAD SHALL REMAIN ON.

C. CADMIUM SULFIDE PHOTO CELL SHALL BE OF AVERAGE SENSITIVITY, HERMETICALLY SEALED AND TESTED TO 100 %

D. RELAY SHALL HAVE DOUBLE POLE, SINGLE THROW, DOUBLE CONTACTS, WITH CONTACTS NORMALLY CLOSED.

E. INDIVIDUAL COMPONENTS MOUNTED ON BAKELITE CHASSIS WITH THREE LOCKING BLADES AND REMOVABLE NEOPRENE SEALING GASKET ON BOTTOM SIDE, SO DESIGNED THAT THE UNIT MAY BE MOUNTED DIRECTLY ON LUMINAIRE HEADS AND ADAPTERS THAT MEET EEI-NEMA STANDARD. BAKELITE CHASSIS PROTECTED BY WEATHERPROOF ACRYLIC PLASTIC HOUSING, WITH APERTURE FOR LIMITED FIELD OF SEEING BY PHOTOCELL AND ADJUSTABLE SHUTTER TO CONTROL ON-OFF PERIOD.

F. CONTROL UNIT SHALL BE DESIGNED FOR MINIMUM OF 5000 ON-OFF OPERATIONS FULL RATED LOAD CONDITIONS.

6. FUSED CONNECTOR

A. FUSED CONNECTOR SHALL BE RUBBER BODY, WATERTIGHT, TWO SECTION (LINE SIDE RECEPTACLE — LOAD SIDE PLUG), METALLIC FUSE HOLDER WITH WIRE TERMINAL AND LEAD-IN WIRES.

B. LEAD-IN WIRES SOLDERED TO TERMINALS, LINE SIDE LEAD-IN WIRE SHALL BE TWO FEET OF NO 8 RUN AND LOAD SIDE LEAD-IN WIRE SHALL BE TWO FEET OF NO 10 RUW-USE. LEAD-IN WIRES SHALL BE CONNECTED TO LINE AND LOAD WIRES BY SOLDERLESS CONNECTORS. ALL WIRES SHALL BE RATED FOR 600 VOLT MINIMUM.

C. FUSE SHALL BE MIDGET TYPE 10 AMPERE CARTRIDGE FUSE NEMA STYLE G4 OR APPROVED EQUAL.

7. STREET LIGHTING AERIAL CABLE.

A. CABLE FOR AERIAL DISTRIBUTION SHALL BE TWO CONDUCTOR CROSS LINK POLYETHYLENE INSULATED CABLE WITH 3/8" EHS COPPER-CLAD STEEL MESSENGER.

B. SIZE SHALL BE 2/C-NO 8 AWG COPPER. CONTRACOR TO FURNISH & INSTALL CABLE FROM POLE JP 71 TO LIGHT # 14 TO #18 AND #65 TO #68.

8. GALVANIZED FINISH.

BRACKET ARM AND ALL ACCESSORIES AND HARDWARE SUCH AS NUTS, WASHERS, BOLTS & SHIMS SHALL BE HOT DIPPED GALVINIZED.

STREET LIGHTING NOTES:

1. STREET LIGHT SYSTEM FOR THE WIDENING OF KALANIANAOLE HIGHWAY PROJECT NO 72A-01-71 SHALL BE UNDER HAWAIIAN ELECTRIC CO. INC. CONTRACT NO 510
2. STREET LIGHT NUMBERS FOR THIS PROJECT SHALL BE NUMBER 12 TO NUMBER 15. INCLUSIVE.
3. THE SECONDARY OVERHEAD CIRCUIT FOR THE STREET LIGHTS SHALL BE PROVIDED BY THE ELECTRICAL CONTRACTOR. CONNECTION TO THE H.E.CO. SECONDARY SHALL BE MADE BY H.E.CO. AND PAID FOR BY THE ELECTRICAL CONTRACTOR. PROVIDE ADEQUATE SLACK FOR H.E. CO. CONNECTION.
4. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING & INFORMING H.E.CO. OF STREETLIGHT SERVICE LOCATIONS ON THE POLE, PRIOR TO THE INSTALLATION OF THEIR CABLES & EQUIPMENT ON POLES.
5. EXISTING FLASHER TO BE REMOVED AND RE-INSTALLED IN NEW LOCATION AS SHOWN ON PLAN. INSTALL NEW CONDUIT AND WIRES FROM EXISTING SERVICE ON POLE JP-53 WITH SAME SIZE CONDUIT & WIRES AS EXISTING.
6. ALL LUMINAIRES SHALL BE MERCURY VAPOR TYPE WITH WATTAGE & IES TYPE LIGHT DISTRIBUTION AS SHOWN ON THE PLANS.
7. FOR TYPICAL CONSTRUCTION DETAILS, SEE THIS SHEET.
8. CONTRACTOR SHALL STENCIL DATE OF INSTALLATION ON BOTTOM OF THE PHOTO-CELL.
10. LUMINAIRE COUNT:

    400 W LUMINAIRES: 8
11. CONTRACTOR TO ARRANGE WITH H.E.CO. TO ENERGIZE STREET LIGHTS A MINIMUM OF 6 HOURS FOR FINAL INSPECTION AND ACCEPTANCE. CONTRACTOR TO ASSUME THE COST.
12. CONTRACTOR SHALL HAVE ONE SET OF APPROVED PLANS ON JOB SITE AT ALL TIMES DURING THE CONSTRUCTION WORK.
14. ALL STREET LIGHTING EQUIPMENT REMOVED FROM THIS PROJECT SHALL BE DELIVERED TO THE C.&C. OF HONOLULU YARD AT 160 KOULA STREET.
15. COORDINATE WORK ON THIS PROJECT WITH JOINT POLE APPLICATION FROM H.E.CO. FOR POLE LINE RELOCATION.

SYMBOL LIST

- 400W MERCURY VAPOR STREET LIGHTING FIXTURE ON WOODPOLE
- EXIST MERCURY VAPOR STREET LIGHTING FIXT. TO BE REMOVED
- EXISTING POLE
- NEW POLE
- —OH— EXISTING OVERHEAD DISTRIBUTION
- —NOH— NEW LOCATION OF OVERHEAD DISTRIBUTION
- 455 WATTS SERVICE CONNECTION

APPROVED: DATE

Kenneth R. Young — 10-27-72
for DEPUTY TRAFFIC ENGINEER
C.&C. OF HONOLULU.

DATE	REVISION
4-29-76	Extend Highway Lighting and Fifteen Ft. Mast Arm Details

ROBERT WAKEFIELD WARD — REGISTERED PROFESSIONAL ENGINEER — No. 1607-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Robert Ward
Signature

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STREET LIGHT DETAILS AND SPECIFICATION

KALANIANAOLE HIGHWAY PROJECT NO. 72 A-01-71

SHEET NO. 2 OF 2 SHEETS

2192-2154

G.D. 33 6