FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002	47R	92

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	Pullbox, see schedule on this sheet
	Existing pullbox for lighting standards mounted on concrete structure
T	Transformer
	New highway lighting standard with 250W HPS luminaire & break away transformer base foundation. 10 foot bracket arm unless noted otherwise. IES type II distribution.
	Existing utility pole with new 10 foot bracket arm unless noted otherwise and 250W HPS luminaire. Coordinate connection with Hawaiian Electric Co. IES type II distribution. See detail (2 / E1 | E25),
	Existing highway lighting standard with 250W HPS luminaire
(JP)	Existing joint pole with 250W HPS luminaire
(WP)	Existing 250W HPS luminaire on wood pole
	Existing highway lighting standard with 150W HPS luminaire
(WP)	Existing 150W HPS luminaire on wood pole
	New highway lighting standard with 250W HPS luminaire and transformer base foundation. 10 foot bracket arm unless noted otherwise. IES type II distribution
III	New highway lighting standard with 250W HPS luminaire and transformer base foundation. 10 foot bracket arm unless noted otherwise. IES type III distribution
	New double arm, highway lighting standard & transformer base foundation with (2) new bracket arms & (2) new 250W HPS luminaires. 10 foot bracket arm unless noted otherwise. IES type II distribution.
E	Equipment connection (i.e. Sign connection)
	Existing utility lines to be removed
	Existing underground highway lighting ductline to remain
R	Existing underground highway lighting ductline. Remove existing conductors. Draw a brush/mandrel through to clean, provide new lighting conductors in existing duct to be reused
DB	Existing direct buried underground highway lighting cable
	New underground highway lighting ductline.
150W-A1 / 20+50' O/S 6' RT | A-B	Lighting standard indicator symbol. "A1" denotes feeder circuit "A1", "A-B" denotes phases A & B, & 20+50' O/S 6' RT denotes station location
1 / E1 | E2	Detail indicator. "1" indicates detail number. "E1" indicates sheet on which the detail is referenced. "E2" indicates sheet on which detail appears
1	Plan note indicator. See note "1" on plan.
(WP)	Existing Wood Light Pole
(JP)	Existing Wood Joint Utility Pole
(GP)	Existing Galvanized Pole
(AL)	Existing Aluminum Pole

OVERHEAD SYMBOLS

- Aerial Secondary
- Span Guy
- OH/ET/E/e/T/V — Overhead Utility Lines
  - Cable Television
  - Telephone
  - Secondary Electrical
  - Primary Electrical
  - Electrical Transmission Lines

DUCT DESIGNATION

2 E 4 (A)

- A — Duct Section "A" See Duct Section Details, Sheet E-34, E-35, E-36
- 4 — Conduit Size
- E — System "S" Secondary Electrical
  - "L" Lighting, Street or Area
  - "FP" Fiber Optic System Power
  - "FC" Fiber Optic Communications
- 2 — Number of Ducts

PULLBOX, HANDHOLE, MANHOLE SCHEDULE

(51) State Highways Type "A" Pullbox. See (1 / E1 | E26), (Power for Fiber Optic Communications)

(52) State Highways Type "B" Pullbox. See (2 / E1 | E26), (Fiber Optic Communication)

(53) State Highways Type "C" Pullbox. See (3 / E1 | E26), (Highway Lighting)

GENERAL NOTES

1. Obtain all standards and drawings related to this project from the utility companies. Verify that the HECo project drawings are the same as the contract drawings. Notify the Engineer of any differences between them. If differences exist, obtain a resolution prior to proceeding with the work which is affected.
2. Prior to starting work, notify the utility companies in writing when work will start, and provide them with a construction schedule.
3. Existing lighting shall remain operational until new lighting system is operational, and accepted.
4. The following minimum clearances shall be provided when installing new electrical ductlines and handholes:

   Horizontal clearances to ≈ 3' other utilities.
   Vertical clearances to ≈ 6" other utilities (when crossing).
5. Exercise caution when trenching near existing utilities. See notes on sheet E-3.
6. See sheet E-32 for requirements when crossing existing utilities.
7. Where existing landscaped areas are impacted by project, contractor shall remove and replace existing landscaping to match original condition at no cost to the state.
8. Trim trees as required to install new lighting standards.
9. Where installation of light standards or conduits is in area with a slope greater than 1:4, provide erosion control. See detail on sheet E-30.

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

R.C. KATAHARA — LICENSED PROFESSIONAL ENGINEER — No. 3181-E — HAWAII, U.S.A.

This work was prepared by me or under my supervision.

MK Katahara 7/10/02

MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04

DATE	REVISION
6-05-02	Revise "Existing underground highway lighting ductline to be demolished. Remove existing conductors and conduit" to "Existing utility lines to be removed"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SYMBOLS, LEGEND AND GENERAL NOTES

MOANALUA FREEWAY LIGHTING IMPROVEMENTS
Kamehameha Highway to H1 Halawa Interchange
Proj. No. 78A-01-02M
Oahu, Hawaii

Scale: As Noted — Date: May 2002

SHEET No. E-1 OF 92 SHEETS