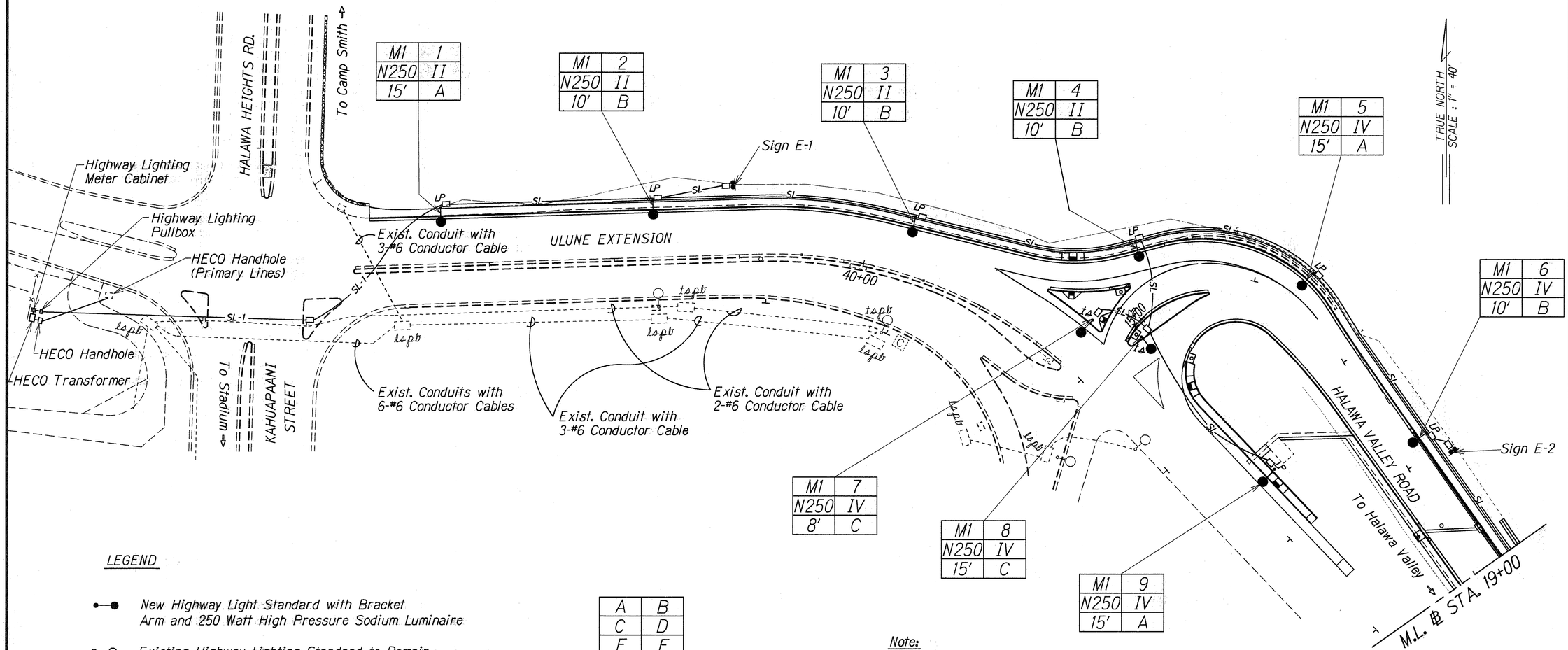
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	55	70



LEGEND

- New Highway Light Standard with Bracket Arm and 250 Watt High Pressure Sodium Luminaire
- Existing Highway Lighting Standard to Remain
- SL — New Highway Lighting Conduit & Cable (1-3" Conduit, Schedule 80 PVC with 2-1/0 RHW-USE & 1-#6 B. C. Ground Wire)
- SL-1 — New Highway Lighting Conduit & Cable (1-3" Conduit, Schedule 80 PVC with 2-1/0 RHW-USE, 1-#6 B.C. Ground Wire, & 2-#10 RHW-USE)
- New Type B Pullbox (Highway Lighting)
- lspb Existing Highway Lighting Pullbox to Remain
- tspb Existing Traffic Signal PUllbox

A	B
C	D
E	F

A - Meter Number
B - Light Pole Number
C - Lamp Data, N for HPS
D - Refractor Data
E - Bracket Arm Length (Feet)
F - Mounting Detail
(Type A - Anchor Base Mounting)
(Type B - Retaining Wall Mounting)
(Type C - Type III Traffic Signal Standard)

Note:

Signs E-1 & E-2 will have (2 Each) new 175-Watt Metal Halide sign luminaires. Power source for the luminaires shall be connected to the Highway Lighting System.

All ballasts and Photo Cells for Highway Lighting & Expressway Sign Lighting shall be 240 V.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 2/16/96
	DRAWN BY M. Takatuji	
NOTE BOOK 142 mag N'Hamilton	TRACED BY C. Abe	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

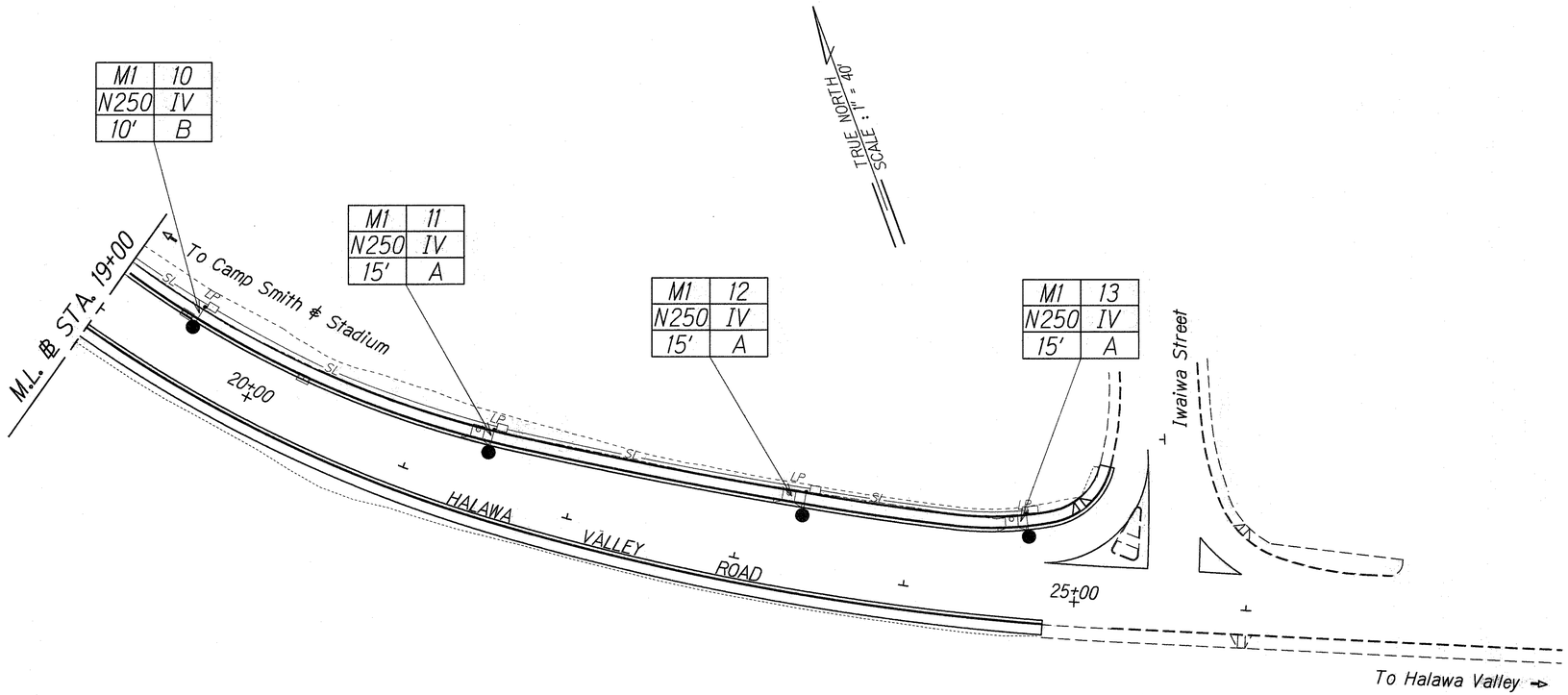
HIGHWAY LIGHTING PLAN

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

Scale: 1"=40' Date: Apr., 1996

SHEET No. T12 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	56	70



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Fukuji	"
NOTE BOOK	TRACED BY	"
H.Hwy	DESIGNED BY C. Abe	"
Identification	QUANTITIES BY	"
	CHECKED BY	"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. ℄
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

Scale: 1"=40' Date: Apr., 1996

SHEET No. T13 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	57	70

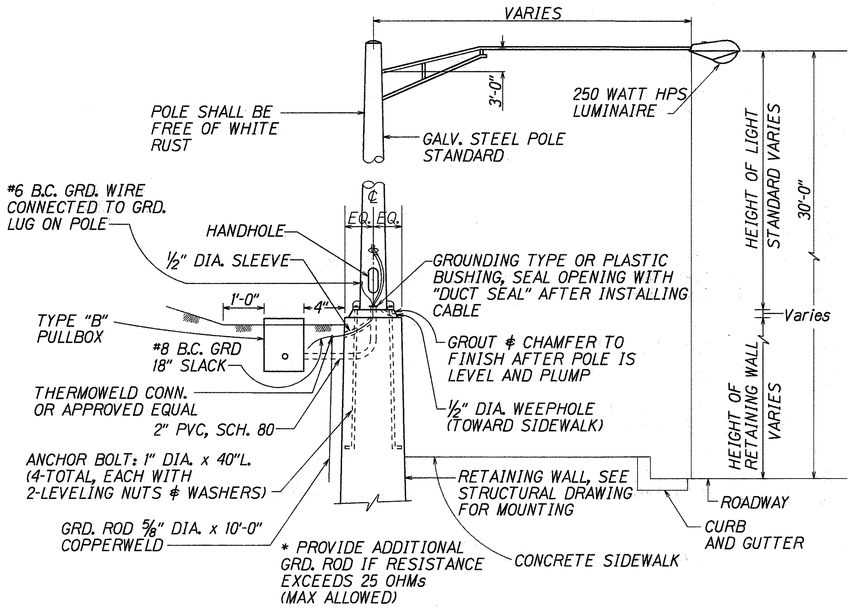
NOTES:

1. ALL CONDUIT SHALL BE "PVC" SCHED. 80 FOR DIRECT BURIED OR CONCRETE ENCASEMENT, U.O.N.
2. BACKFILL OVER CONCRETE DUCT SECTIONS SHALL BE TYPE "A"
3. BACKFILL OVER DIRECT BURIED CONDUITS SHALL BE TYPE "B"
4. IF THE NORMAL MATERIAL IN THE BOTTOM OF A TRENCH CONTAINING A DIRECT BURIAL CONDUIT IS NOT TYPE "B" AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL PROVIDED.
5. CONCRETE FOR DUCTS TO BE 2500 P.S.I. IN 28 DAYS.

BACKFILL TYPES ARE:

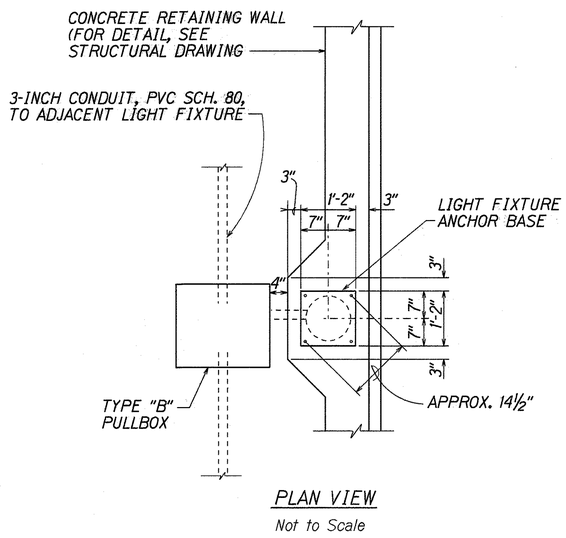
TYPE "A": BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH AND GRAVEL USED, THE MAXIMUM ROCK SIZE SHALL BE 1" AND THE MIXTURE SHALL CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES.

TYPE "B": BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH AND GRAVEL USED, MIXTURE MUST PASS A ½" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES.



ELEVATION

Not to Scale



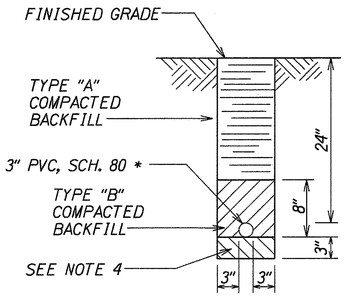
PLAN VIEW

Not to Scale

CONCRETE RETAINING WALL MOUNTING

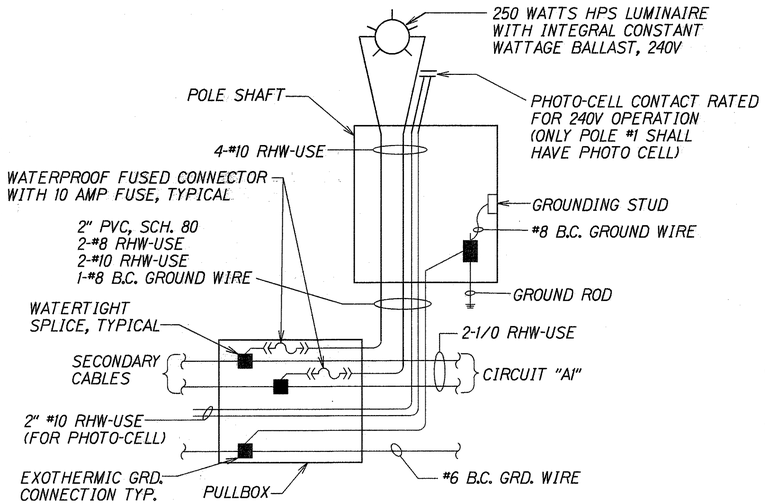
LIGHT STANDARD WITH CONCRETE RETAINING WALL MOUNTING

(TYPE B)

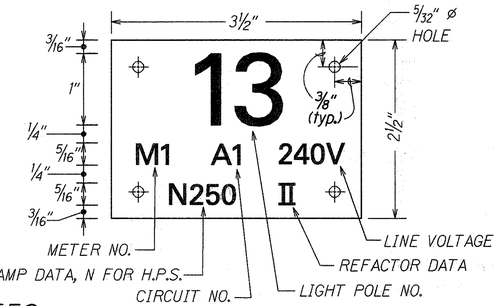


* FOR MULTIPLE CONDUIT, 3" SPACING BETWEEN CONDUITS

TYPICAL DUCT SECTION (DIRECT BURIED)



TYPICAL WIRING CONNECTION DIAGRAM FOR HIGHWAY LIGHTING



NOTES: (CONTINUED)

4. ATTACH TO ALUMINUM AND STEEL POLES WITH NO. 8 STAINLESS STEEL, ½" LONG DRIVE SCREWS IN ⅛" DRILL HOLE. ATTACH TO WOOD POLES WITH 4D ALIMINUM NAILS.
5. NUMBERS ARE INSCRIBED BY CUTTING THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE LETTERS".
6. ASSIGN CURCUIT NUMBER FOR SYSTEMS WITH TWO OR MORE CIRCUITS (LETTER INDICATES PANEL BOARD, NUMBER INDICATES CIRCUIT).

NOTES:

1. USE 3 PLY LAMINATED FLEXIBLE PLASTIC BLACK-WHITE-BLACK THICKNESS: BLACK CAP SHEET-0.010", WHITE BASE SHEET-0.052", BLACK BASE SHEET-0.010".
2. LIGHT POLE NUMBER SIZE SHALL BE 1" HIGH AND ENGRAVED ⅛" WIDE, WHITE IN COLOR (NUMBER AS REQUIRED).
3. NOMENCALTURE SIZE SHALL BE 5/16" HIGH AND EXGRAVED 1/32" WIDE, WHITE IN COLOR (METER NUMBER, CIRCUIT NUMBER, LINE VOLTAGE, LAMP DATA AND REFACTOR DATA AS REQUIRED).

HIGHWAY LIGHT I.D. TAG DETAIL METERED SYSTEM

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 2/15/96
	DRAWN BY M. Lindsey	
NOTE BOOK Ulune, Nov/Dec	TRACED BY	
	DESIGNED BY C. Abe	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

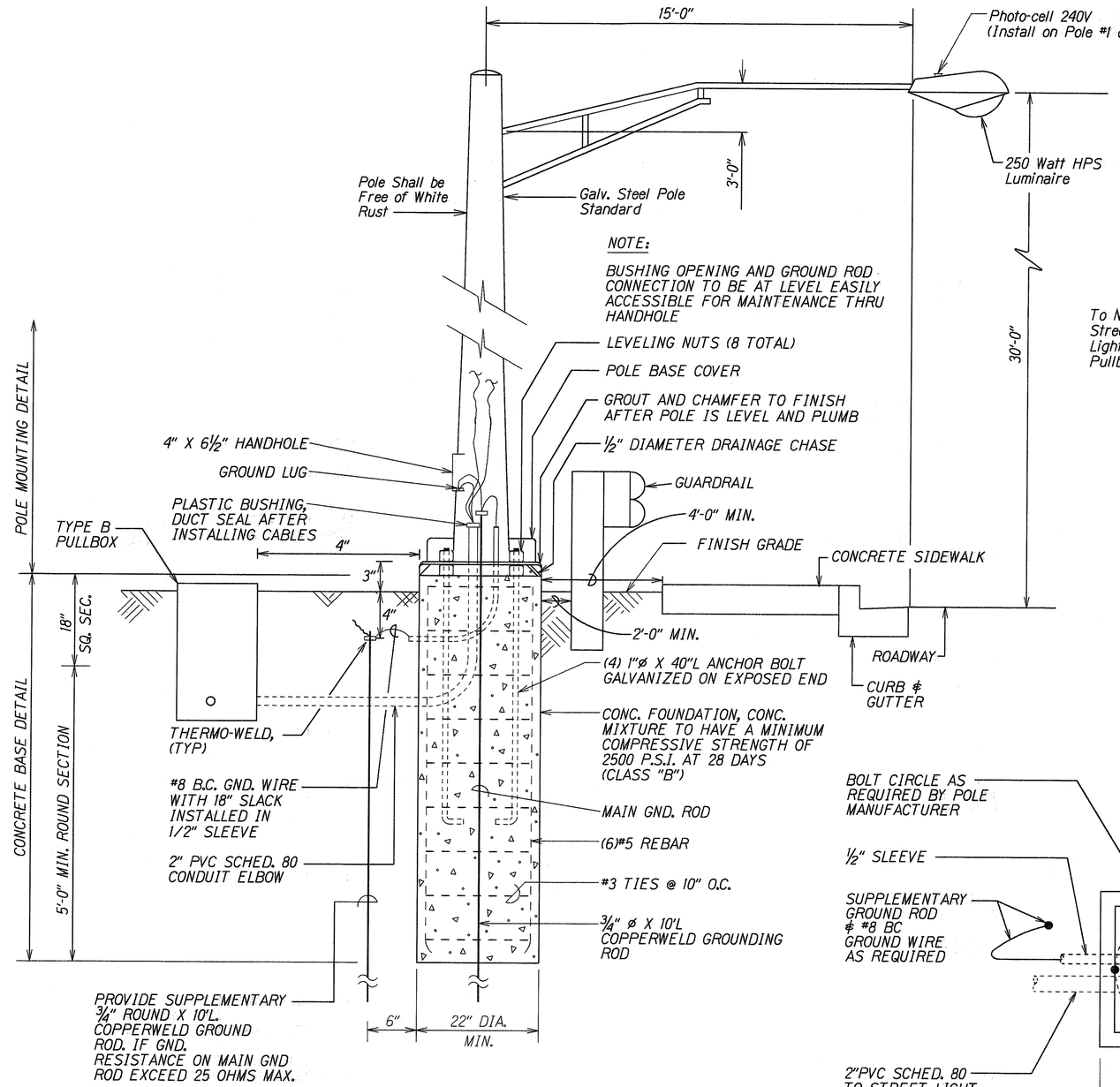
HIGHWAY LIGHTING DETAILS

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

Not to Scale Date: Apr., 1996

SHEET No. T14 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	58	70

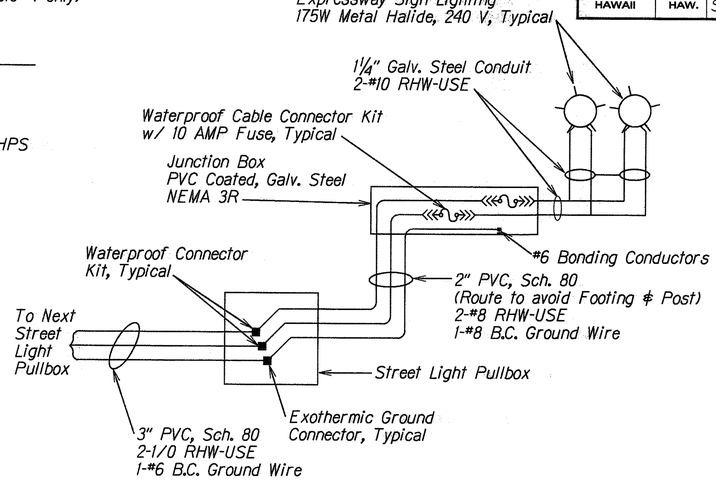


ELEVATION

Not to Scale

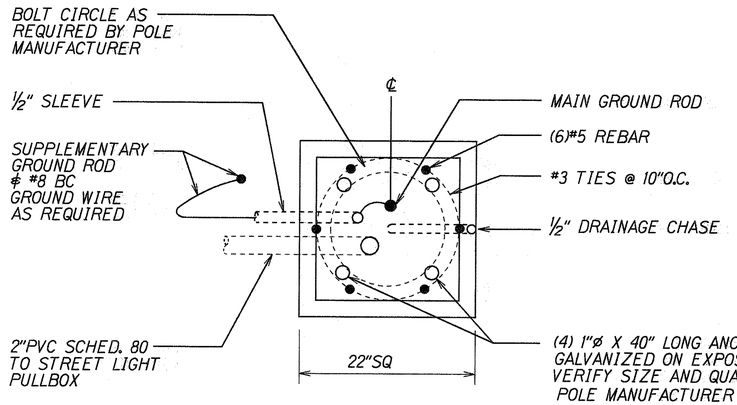
LIGHT STANDARD WITH ANCHOR BASE MOUNTING

(TYPE A)



TYPICAL WIRING CONNECTION DIAGRAM

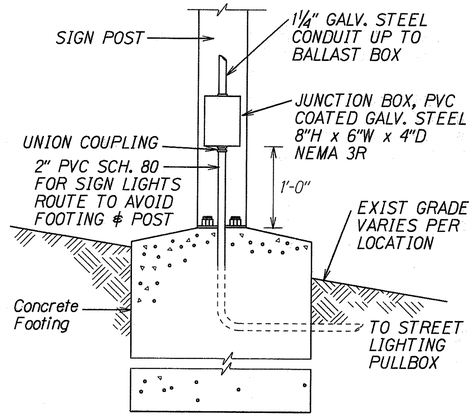
FOR EXPRESSWAY SIGN LIGHTING



PLAN VIEW

Not to Scale

ANCHOR BASE MOUNTING



REAR ELEVATION

JUNCTION BOX MOUNTING

AT EXPRESSWAY SIGN POST

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE 2/16/96
	DRAWN BY M. Takahuji	
NOTE BOOK rd2.may Nov'11to2.dgn	TRACED BY C. Abe	
	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING DETAILS

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

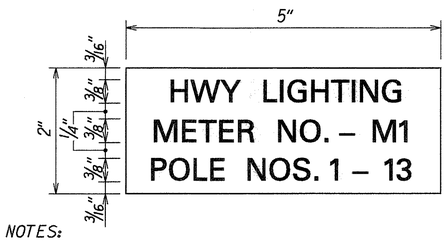
Not to Scale Date: Apr., 1996

SHEET No. T15 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	59	70

NOTES:

1. CABINET TO BE PRIMED WITH ONE COAT SHOP PRIMER.
2. PLYWOOD TO BE ¾" THICK (MIN.) TREATED (WOLMANIZED) PLYWOOD. (EXTERIOR GRADE)
3. MADE FROM 10 GA. GALV. SHEET STEEL.
4. PROVIDE ACRYLIC ENAMEL FINISH, COLOR TO MATCH TRANSFORMER. (2 COATS)
5. ENCLOSURE SHALL BE NEMA 3R WITH NEOPRENE GASKETING.
6. PADLOCKS:
   2 - CONTRACTOR FURNISHED, BRASS CORBIN SESAMEE COMBINATION (CONTRACTOR TO PROVIDE 2 SETS OF KEYS PER PADLOCK:
   1 SET TO HECO
   1 SET TO STATE HIGHWAYS ENGINEER
7. WASH CHANNEL WITH SOLUTION OF CHEMICAL PHOSPHORIC METAL ETCH AND ALLOW TO DRY. APPLY 2 COATS OF GALVANIZED METAL PRIMER AND 2 COATS OF ENAMEL TO MATCH CABINET.
8. SHOP FABRICATION DRAWINGS SHALL BE SUBMITTED FOR APPROVAL.
9. LOCATION OF OPENING FOR METER READER TO CORRESPOND WITH LOCATION OF METER.

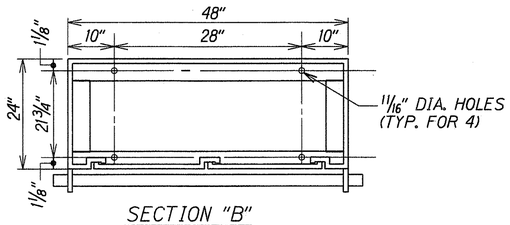


NOTES:

1. USE 3-PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK THICKNESS: BLACK CAP SHEET - 0.010", WHITE BASE SHEET - 0.052", BLACK BASE SHEET - 0.010".
2. ATTACH TO METER SOCKET USING SCOTCH 3M BRAND VERY HIGH BOND (VHB) DOUBLE COATED ACRYLIC FOAM TAPE OR EQUIVALENT.
3. LETTERS/NUMBERS SHALL BE ⅜" HIGH, 1/16" STROKE (WHITE IN COLOR).
4. LETTERS/NUMBERS AREA INSCRIBED BY CUTTING THROUGH "BLACK CAP SHEET" TO EXPOSE WHITE LETTERS/NUMBERS.

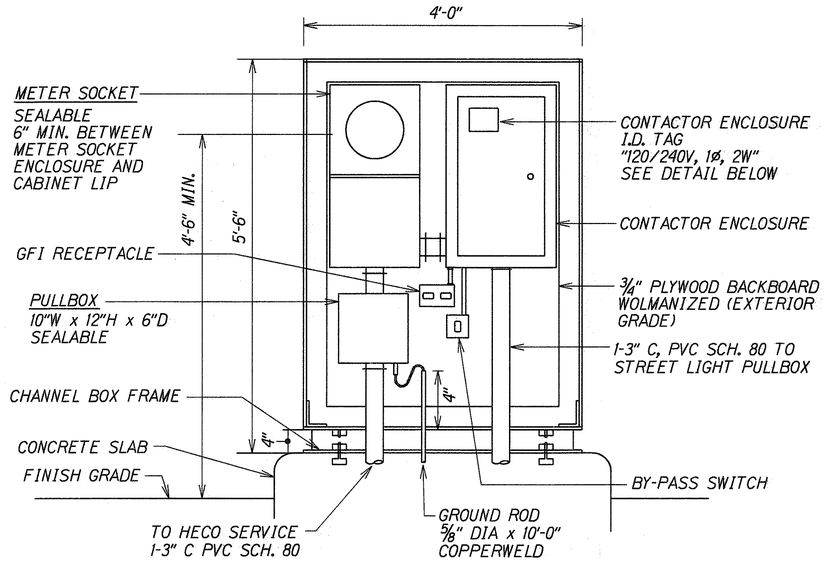
METER ID TAG DETAIL

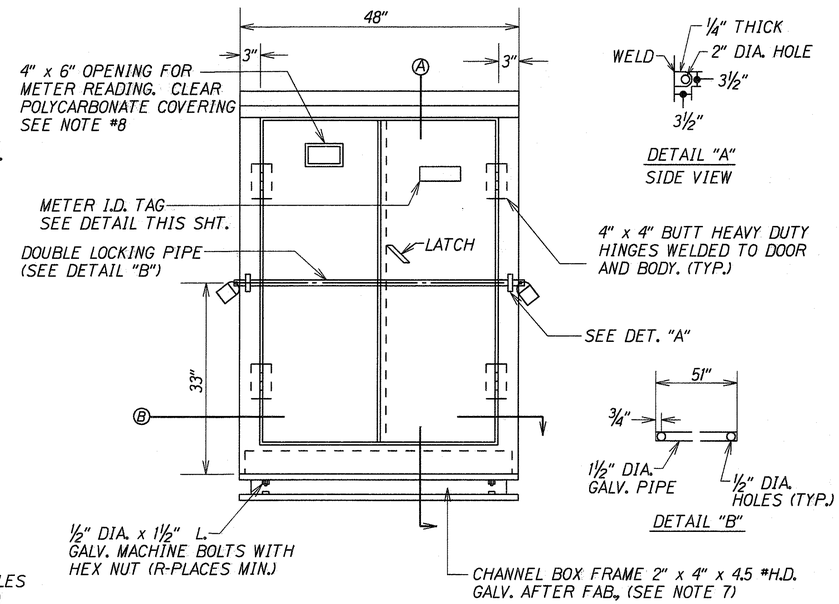
Not to scale



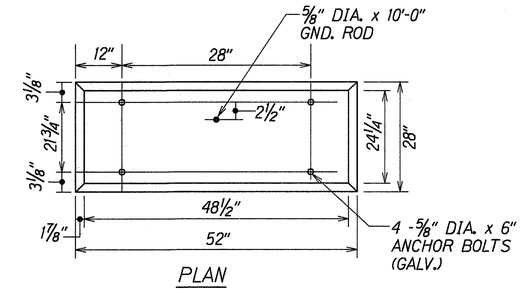
SECTION "B"

(GALV. ANGLE FRAME)

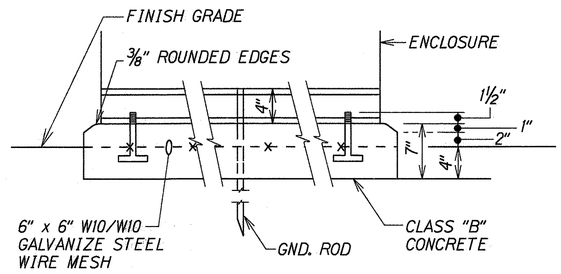




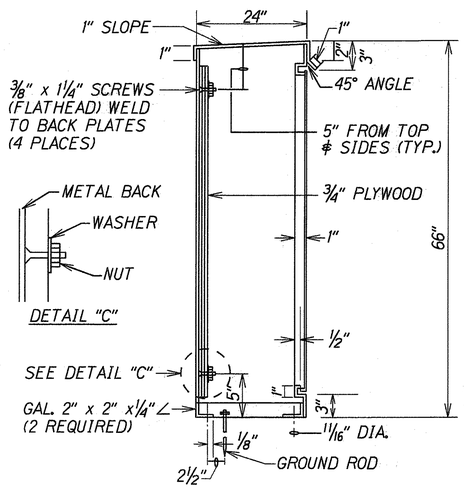
HIGHWAY LIGHTING METER CABINET



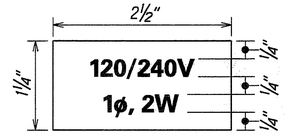
PLAN



FRONT



SECTION "A"



NOTES:

1. USE 2 PLY PLASTIC - BLACK, WHITE.
2. LETTER SIZE SHALL BE ¼" HIGH AND ENGRAVED 1/32" WIDE, WHITE IN COLOR.
3. ATTACH TO PANEL USING SCOTCH 3M BRAND VERY HIGH BOND (VHB) DOUBLE COATED ACRYLIC FOAM TAPE OR EQUIVALENT.

CONTACTOR ENCLOSURE
I.D. TAG DETAIL

ORIGINAL PLAN	SURVEY PLOTTED BY: M. Lindsey	DRAWN BY: M. Lindsey	TRACED BY:	DESIGNED BY: G. Abe	QUANTITIES BY:	CHECKED BY:
	NOTE BOOK DATE:					

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

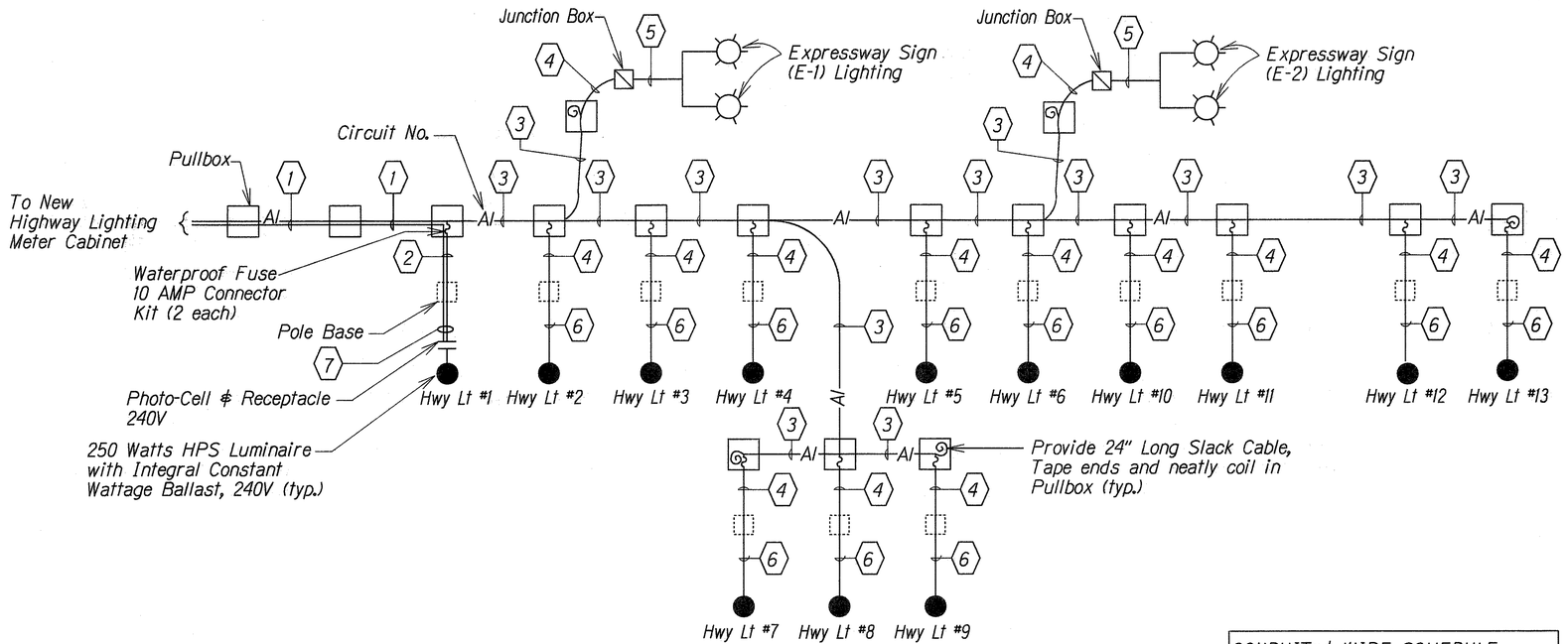
HIGHWAY LIGHTING DETAILS

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

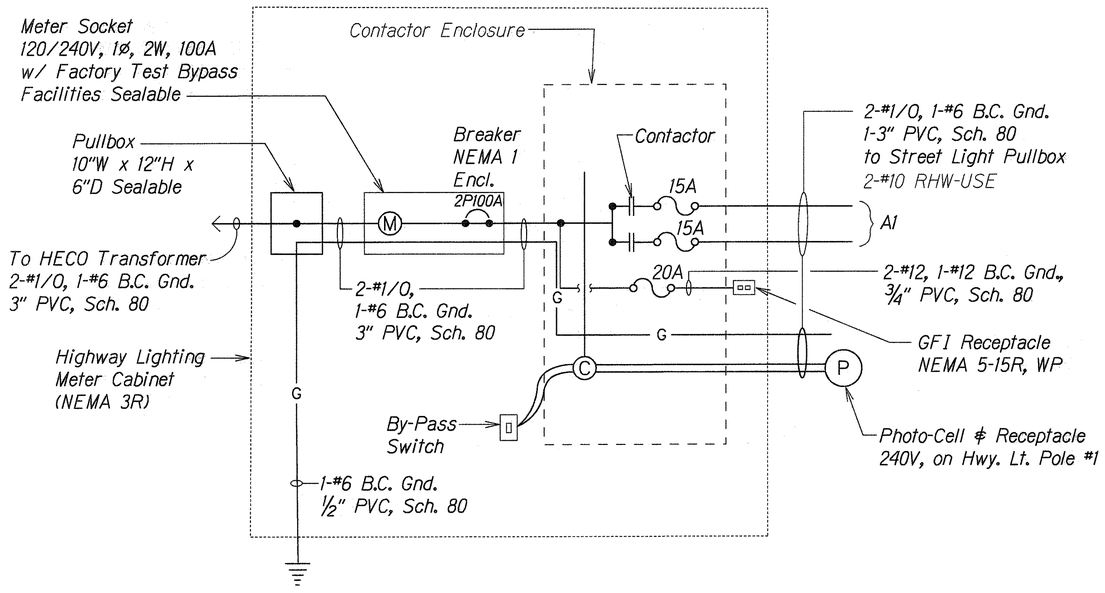
Not to Scale Date: Apr., 1996

SHEET No. T16 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	60	70



HIGHWAY LIGHTING CONNECTION DIAGRAM



HIGHWAY LIGHTING SERVICE ONE-LINE DIAGRAM

Not to Scale

CONDUIT & WIRE SCHEDULE	
ITEM	DESCRIPTION
1	1-3" PVC, Schedule 80 2-1/0 RHW-USE 1-#6 B.C. Ground Wire 2-#10 RHW-USE
2	1-2" PVC, Schedule 80 2-#8 RHW-USE 2-#10 RHW-USE 1-#6 B.C. Ground Wire
3	1-3" PVC, Schedule 80 2-1/0 RHW-USE 1-#6 B.C. Ground Wire
4	1-2" PVC, Schedule 80 2-#8 RHW-USE 1-#8 B.C. Ground Wire
5	1-1¼" Galv. Steel Conduit 2-#10 RHW-USE
6	LIGHT POLE SHAFT/ARM 2-#10 RHW-USE
7	LIGHT POLE SHAFT/ARM 2-#10 RHW-USE (Luminaire) 2-#10 RHW-USE (Photo-Cell)

ORIGINAL PLAN

SURVEY PLOTTED BY
DRAWN BY M. Takafuji
TRACED BY
DESIGNED BY C. Abe
QUANTITIES BY
CHECKED BY
DATE

NOTE BOOK 142 may 1st Hilo

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING DETAILS

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

Not to Scale Date: Apr., 1996

SHEET No. 117 OF 19 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	61	70

HECO NOTES

1. The Contractor is to furnish materials and construct the facilities for the padmounted transformer including the concrete pad, primary and secondary ducts, anchor bolts, and also a concrete curb and rock fill around the pad, when required. (See Note 10).

2. The location of HECo's overhead and underground facilities shown on the plans are from existing records with varying degrees of accuracy and are not guaranteed as shown. The Contractor shall exercise extreme caution whenever construction crosses or is in close proximity of underground lines and shall maintain adequate clearance when operating equipment within or under any overhead lines.

3. Primary Ducts: The bends into the primary compartment of the padmount transformer shall be PVC with a 3'-0" radius.

4. Secondary Ducts: The Contractor is to supply and install the secondary ducts and cables. The secondary cables are to be minimum of 12'-0" long from the end of the duct.

5. The Contractor shall comply with the State of Hawaii's Occupational Safety and Health Law (DOSH).

6. The Contractor shall obtain an excavation permit from HECo's Mapping and Records Division located at 820 Ward Avenue, 4th floor, two weeks prior to starting construction.

7. For verification of underground lines or for assistance in supporting and protecting these lines, the Contractor shall call HECo's Underground Division at 543-7345 a minimum of 72 hours in advance.

8. When trench excavation is adjacent to or beneath our existing structures or facilities, the Contractor is responsible for:
   a. Sheeting and bracing the excavation to prevent slides, caveins, and settlements.
   b. Protecting existing structures or facilities with beams, struts, or under-pinnings.

9. For pole bracing instructions, the Contractor shall call the HECo District Superintendent at (Koolau/261-6085, Waiau/543-4223, Ward/543-7745) a minimum of 72 hours in advance.

10. Any work required to relocate HECo facilities shall be done by HECo and the Contractor shall be responsible for all coordination, and for possible costs it applicable.

11. Should it become necessary to temporarily relocate any of HECo facilities to enable the Contractor to perform his work in a safe and expeditious manner in fulfulling his contract obligations, these temporary relocations will be done by HECo, or by the Contractor under HECo's supervision, with all costs borne by the Contractor.

12. Any unforseen conflict that would result in the redesign or relocation (either temporary or permenent) of HECo's electrical facilities may be cause for lengthy delays. To avoid such delays, the Contractor must notify HECo of the conflict a minimum of 30 days prior to the start of construction.

13. Any damage to HECo's facilities will be reported immediately to HECo's Trouble Dispatcher at 543-7874.

14. All HECo overhead and underground facilities shall be protected at all times by the Contractor during construction. Costs for damages to HECo facilities shall be borne by the Contractor. This repair work shall be done by HECo, or by the Contractor under HECO's supervision.

15. The Contractor shall indemnify, defend and hold harmless HECo from and against all losses, damages, claims and actions, all expenses incidental to such losses, damages, claims or action, based upon or arising out of damage to property or injuries to persons, or other tortious acts caused or contributed to by Contractor or anyone acting under its direction or control or on its behalf; provided Contractor's indemnity shall not be applicable to any liability upon the sole negligence of HECo.

16. The Utility Company shall have 24-hour access to the transformer without going through locked areas.

17. The Utility Company shall have a minimum 10' wide vehicular access to the transformer.

18. Bends due to changes of grade are to have a minimum radius of 20'-0". The ducts are to be as shown in the duct encasement details and are to run in a straight line from pad to pole or handhole. The Contractor is to install the ducts from the pad to the property line with the end left so that the Utility Company can readily connect to it. The Utility Company will extend the ducts from the property line to the pole or handhole.

19. One copperclad ground rod 5/8" dia x 8'-0" long is to be provided by the Utility Company and installed by the Contractor. The Contractor is to pick up the rods at the Utility Company. The rod is to extend 6" above the finished pad. Tie the rod to a water pipe with #1/0 copper wire. This tie may be eliminated where the water pipe is more than 25' away.

20. No permanent or temporary structure or object shall be erected or placed within the indicated clear space.

21. The transformer pads are to be located by the Contractor so that the transformer sound levels do not exceed the limits specified in the Department of Health Regulation "Community Noise Control for Oahu". The Utility Company shall provide the Contractor with the transformer sound level for each project and only standard NEMA sound level transformers shall be installed. It will be the responsibility of the Contractor to meet the allowable sound level limits at the property lines and also consider the proximity of the transformer to building windows, walls, etc. on this project to limit any objectionable noise to occupants in that property.

22. When the concrete pad is located in the vicinity of existing or future combustible material, combustible buildings or parts of buildings, the Contractor shall provide safeguards as outlined in Article 450 of the National Electrical Code (latest revision), subject to the approval of the County Inspector. If fire resistant concrete curbs are required, the Contractor shall erect a 5" wide x 14" deep concrete curb around the transformer pad, 2 ft. from the edges. The curb shall protrude 2" above the pad finished grade, and the space between the pad and the curb shall be filled with 7" of grade "A" crushed lava rock.

23. The front side of the concrete pad shall always be located to face the vehicular access (see Notes #4 and #5) and shall be free and clear of any construction at all times.

24. When parts of buildings or structures are located directly over the concrete pad, a minimum vertical clearance of 9'-0" from the pad grade is required. In addition, 4'-0" clearance from any permanent or temporary object or structure shall be required from either sides of the pad to facilitate transformer removal or changeout. The customer shall provide adequate safeguards as outlined in Article 450 of the National Electrical Code (latest revision), and subject to approval of the County Building Inspector.

25. All duct lines shall contain a polyolefin pull line (Jet Line Cat. #232 or equivalent.

26. After the conduits are installed, the Contractor shall pass a smooth bullet-shaped woodent test mandrel through the entire length of each conduit to test for freedom of burrs and obstructions.

27. Select Backfill: As specified in the Utility Company's Service Installation Manual.

28. The Utility Company's metering facilities shall be installed in readily accessible, preferably unlocked, areas. However, when the Utility Company's metering facilities or any other equipment accessible to the Utility Company is located in enclosed areas which are locked, those areas shall be provided with doors or covers which are padlockable or fitted with a cylinder type Best Universal Lock. The Utility Company will provide the padlock or cylinder.

29. Two primary ducts are required to facilitate maintenance of service in the future. Horizontal bends are to have a minimum radius of 30'-0".

30. All construction must be inspected and approved by the Utility Company's Inspection Division prior to the installation of any Utility Company's facility or the energizing of the Utility Company's electrical system.

31. HECO H.G. Division is responsible for any duct entry into existing handholes or manholes that contain energized cables. 10 days advance notice is required. Contractor shall coordinate with HECO Division, Ph. 543-7345 to schedule the handhole or manhole penetration.

32. The Contractor is to call Kent Okamoto, HECO Planner at 543-5624 five working days in advance prior to encasing the primary ducts in concrete, terminating the primary ducts in the transformer pad and backfilling of the trench prior to calling HECO's Contracting and Inspection Division.

ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY M. Tadaki
TRACED BY
NOTE BOOK
DESIGNED BY S. Abe
QUANTITIES BY
CHECKED BY
DATE 4

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

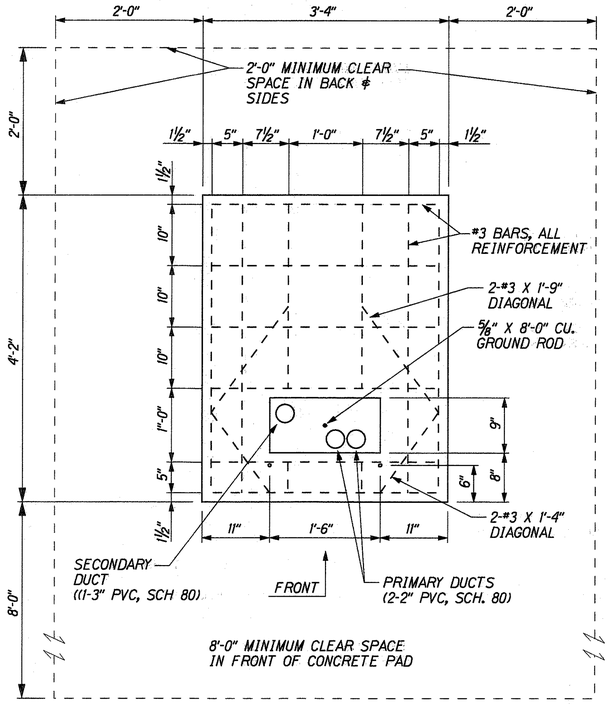
HECO NOTES

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

Date: Apr., 1996

SHEET No. T18 OF 19 SHEETS

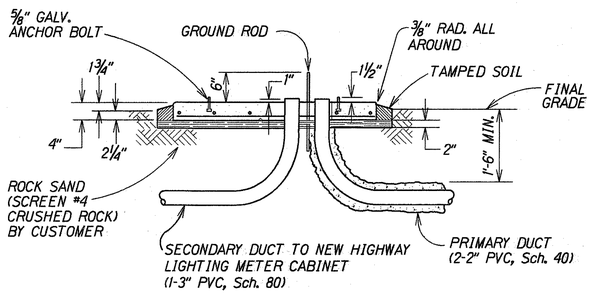
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0300(39)	1996	62	70



CONCRETE PAD FOR 1 ø PADMOUNT TRANSFORMER

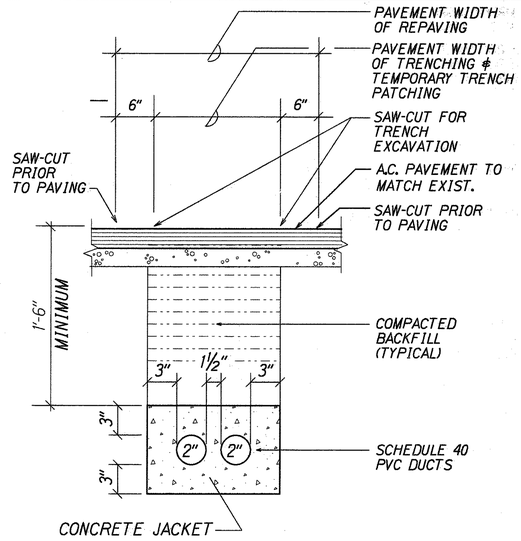
NOTES:

1. COMPRESSIVE STRENGTH OF CONCRETE SHALL BE 3,000 P.S.I. AT 28 DAYS.
2. TOP OF PAD SHALL BE SMOOTH, TRUE, LEVEL AND OTHER EXPOSED SURFACES SHALL BE SMOOTH AND FREE FROM DEFECTS.
3. CONCRETE SHALL BE CURED BY APPROVED METHOD (ASTM A15).
4. REINFORCING BARS SHALL BE CLEAN DEFORMED BARS.
5. ALL ITEMS SHALL BE FURNISHED IN PLACE COMPLETE BY CUSTOMER.



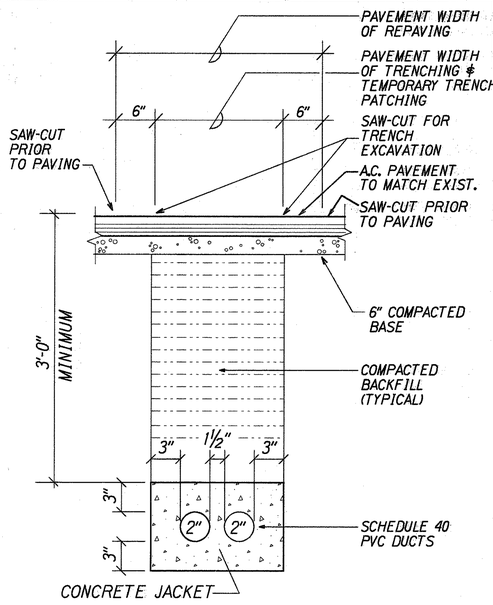
ELEVATION

N.T.S.



TRENCH DETAIL "A"

(WITHIN CITY & COUNTY RIGHT-OF-WAY)



DETAIL "B"

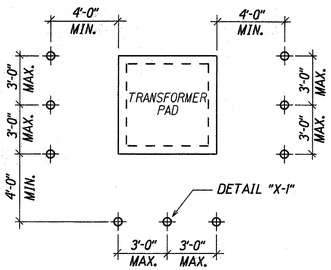
(WITHIN STATE RIGHT-OF-WAY)

NOTES:

1. MAINTAIN 6" VERTICAL CLEAR SEPARATION FROM WATER LINES 16" OR LESS AT WATER CROSSINGS.
2. MAINTAIN 12" VERTICAL CLEAR SEPARATION FROM WATER LINES LARGER THAN 16" AT WATER CROSSINGS.
3. MAINTAIN 3'-0" MINIMUM HORIZONTAL CLEAR SEPARATION BETWEEN ALL WATER LINES SYSTEMS WHEN PARALLELING THE WATER SYSTEM.

DUCT ENCASEMENT DETAIL

NOT TO SCALE



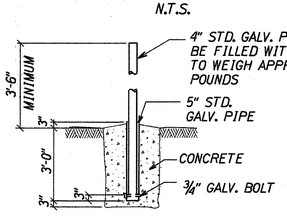
POST LOCATION DETAIL

N.T.S.

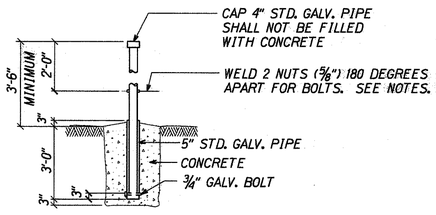
NOTE: BARRIER POSTS ARE TO BE PAINTED YELLOW AS PER ANSI SPEC 253J TO COMPLY WITH OSHA STANDARDS FOR COLORING CODE.

THE PIPE THAT IS TO BE PLACED DIRECTLY IN FRONT OF THE DOORS SHALL NOT BE FILLED WITH CONCRETE. THE PIPE SHALL BE CAPPED AND THE WELDED NUTS ARE FOR SCREWING IN BOLTS TO ACT AS "HANDLES" FOR LIFTING. THE BOLTS ARE TO BE REMOVE AFTER INSTALLATION.

BEFORE PROCEEDING WORK, CONTACT HECO FOR THE LOCATION OF UNDERGROUND ELECTRICAL LINES.



DETAIL "X"



DETAIL "X-1"

POST TYPE BARRIER

N.T.S.

DUCT NOTES

1. ALL CONDUITS TO BE PVC SCHEDULE 40.
2. ALL CONDUITS TO CONTAIN A POLYOLEFIN PULL LINE (JET LINE CAT. #232 OF EQUIVALENT).
3. AFTER THE CONDUITS ARE INSTALLED, THE CUSTOMER SHALL PASS A SMOOTH BULLET-SHAPED WOODEN TEST MANDREL THROUGH THE ENTIRE LENGTH OF EACH CONDUIT TO TEST FOR FREEDOM OF BURRS AND OBSTRUCTIONS.
4. BACKFILL LEGEND:

TYPE "A" BACKFILL:

BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH GRAVEL, THE MAXIMUN ROCK SIZE SHALL BE 1" AND THE MIXTURE SHALL CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES.

TYPE "B" BACKFILL:

BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH GRAVEL, THE MIXTURE MUST PASS A ½" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

NOTE:

IF NORMAL MATERIAL IN THE BOTTOM OF THE TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL SHALL BE PROVIDED.

CONCRETE ENCASEMENT STRENGTH: 2500 PSI IN 28 DAYS
MAXIMUM AGGREGATE: ¾"

ORIGINAL PLANS	SURVEY PLOTTED BY	DATE
	DRAWN BY M. Hirata	
NOTE BOOK HG Book Norton3.dgn	TRACED BY	
	DESIGNED BY Lc Abe	
	QUANTITIES BY	
	CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO ELECTRICAL SERVICE PLAN

ULUNE STREET IMPROVEMENTS
Halawa Hts. Rd. to Halawa Valley Rd. &
HALAWA VALLEY RD. IMPROVEMENTS
Ulune Street to Iwaiwa Street
F.A. Project No. STP-0300(39)

Scale: As Shown Date: Apr., 1996

SHEET No. T19 OF 19 SHEETS