

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

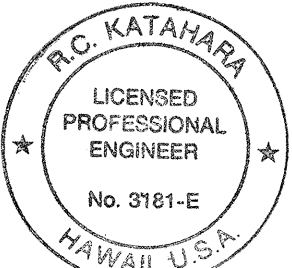
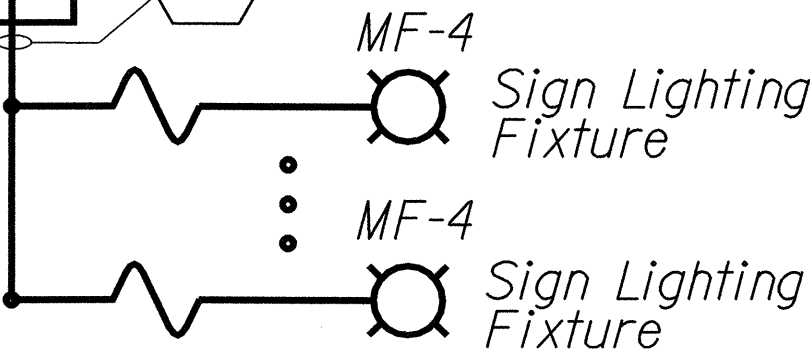
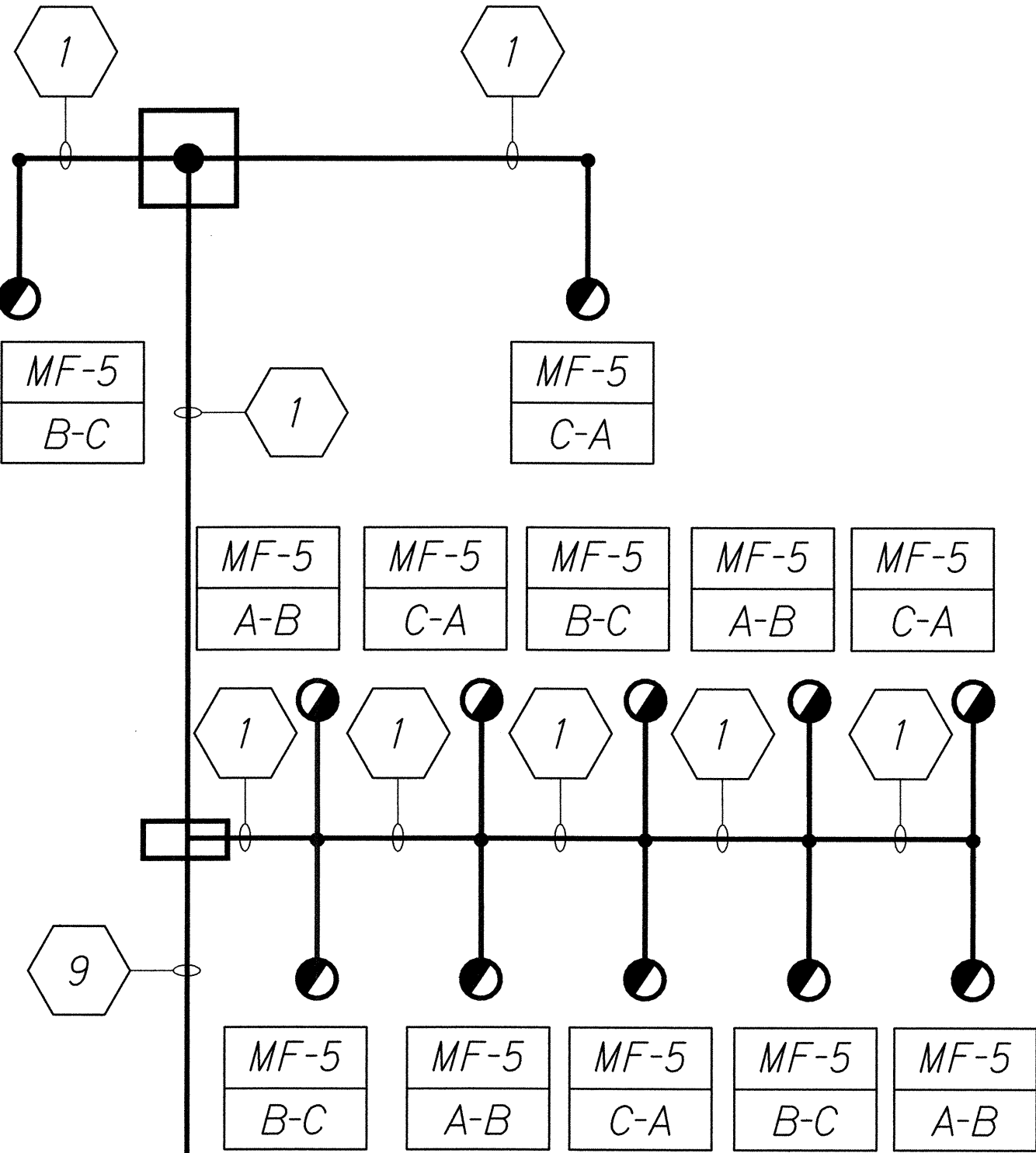
LEGEND

MF-1	←	CIRCUIT NUMBER
A-B	←	PHASE CONNECTION

NOTES:
1. See sheets E-20 and E-21 for additional wiring diagrams.

WIRING SCHEDULE

1	3#6,#6 Gnd
2	2#6,#6 Gnd
3	3#2,#2 Gnd (Ckt. MF-1)
4	3#2,#2 Gnd (Ckt. MF-2)
5	3#2,#2 Gnd (Ckt. MF-3)
6	Not Used
7	3#2,#2 Gnd (Ckt. MF-4)
8	Not Used
9	3#2,#2 Gnd (Ckt. MF-5)



This work was prepared by me
or under my supervision.
Robert S. 5/2/12
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04

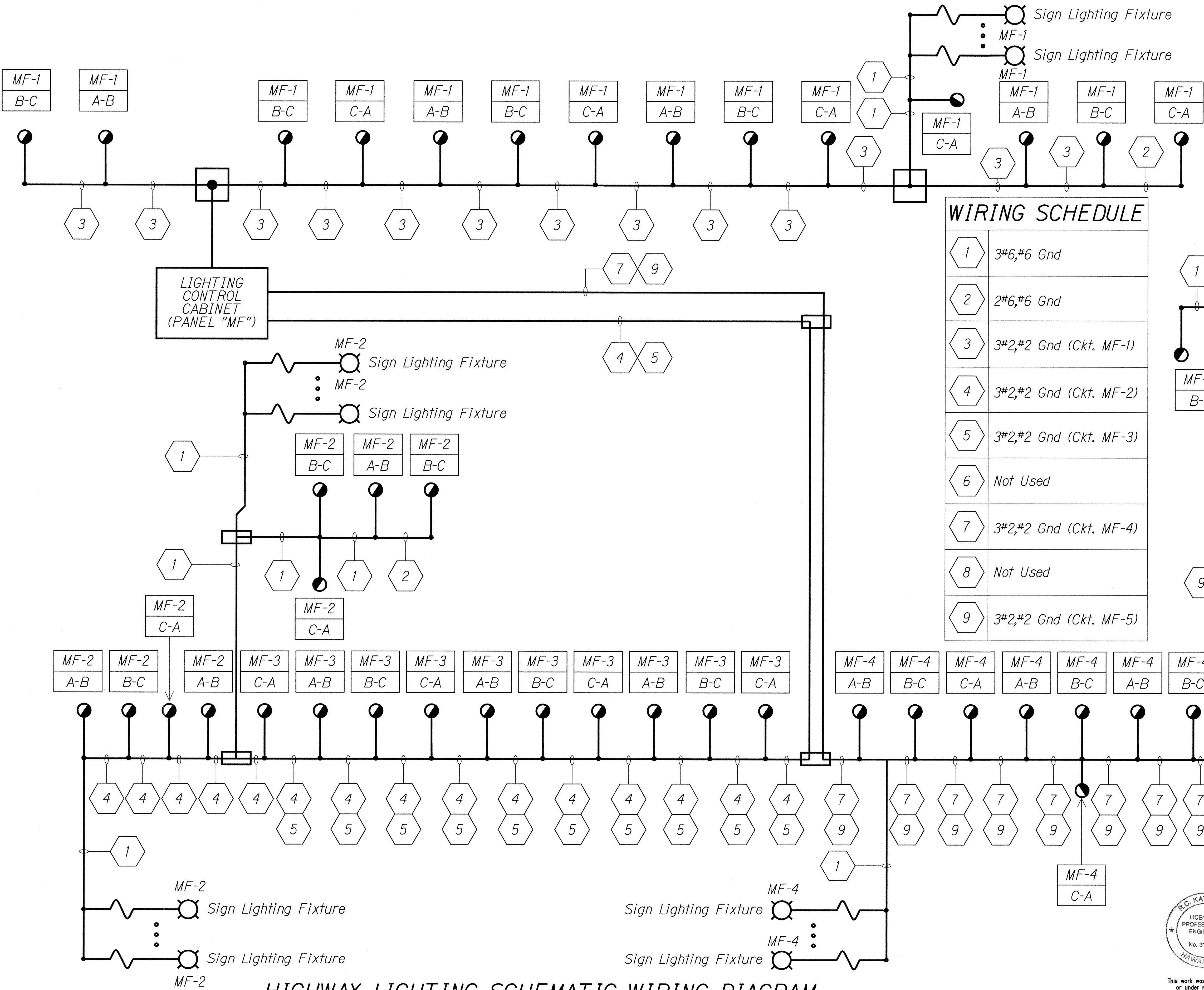
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SCHEMATIC
WIRING DIAGRAM

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

Scale: As Noted
Date: May 2002

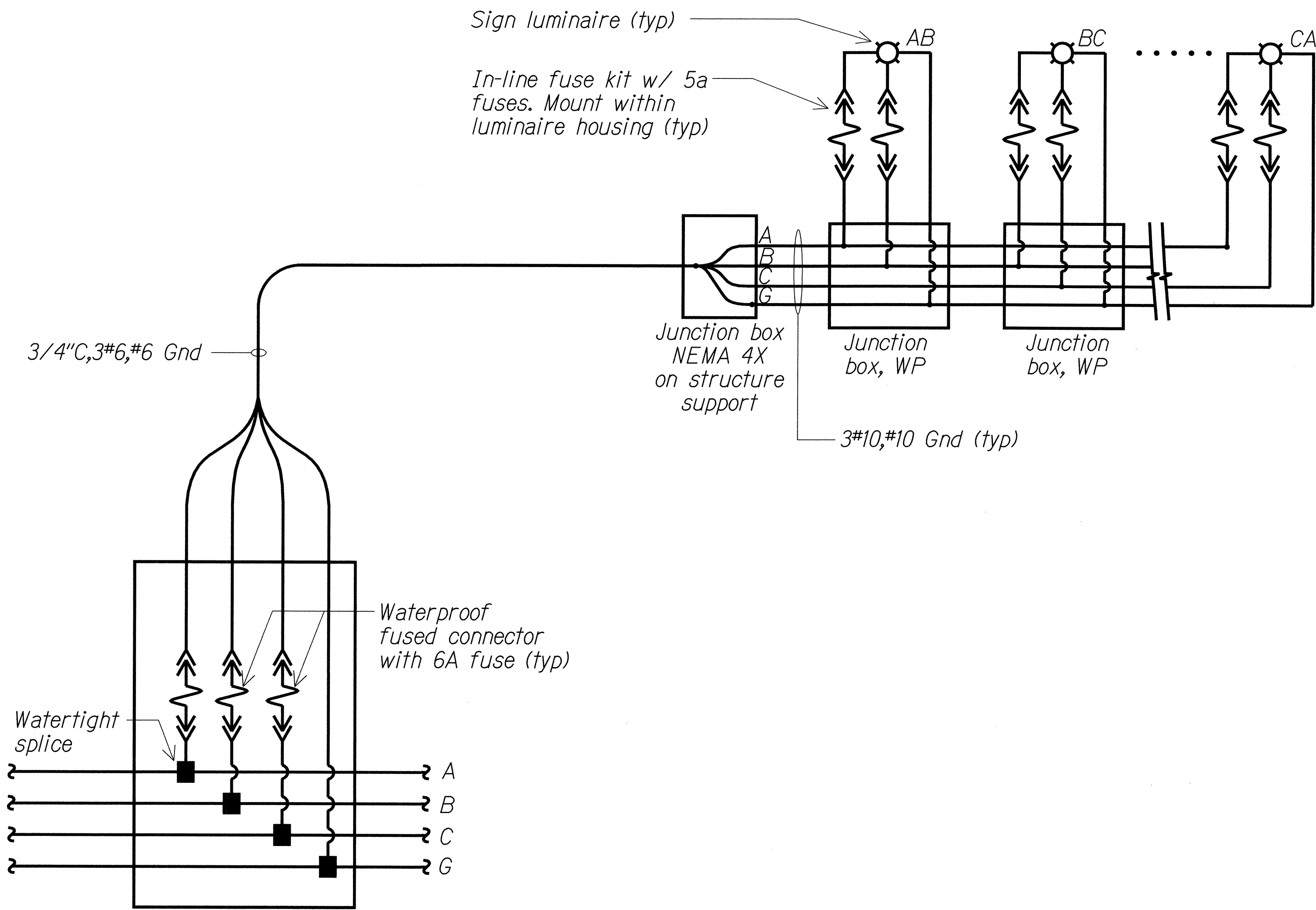
SHEET No. E-19 OF 92 SHEETS



HIGHWAY LIGHTING SCHEMATIC WIRING DIAGRAM
No scale
01402D11

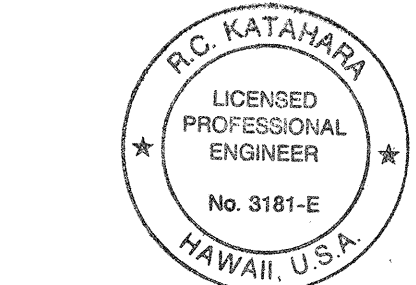
SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
DESIGNED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTE BOOK	
No.	

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



WIRING CONNECTION DIAGRAM - SIGN LIGHTING
 01402D12

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



This work was prepared by me
 or under my supervision.
R.C. KATAHARA 5/2/02
 MK ENGINEERS, LTD.
 LICENSE EXPIRATION DATE: 4/30/04

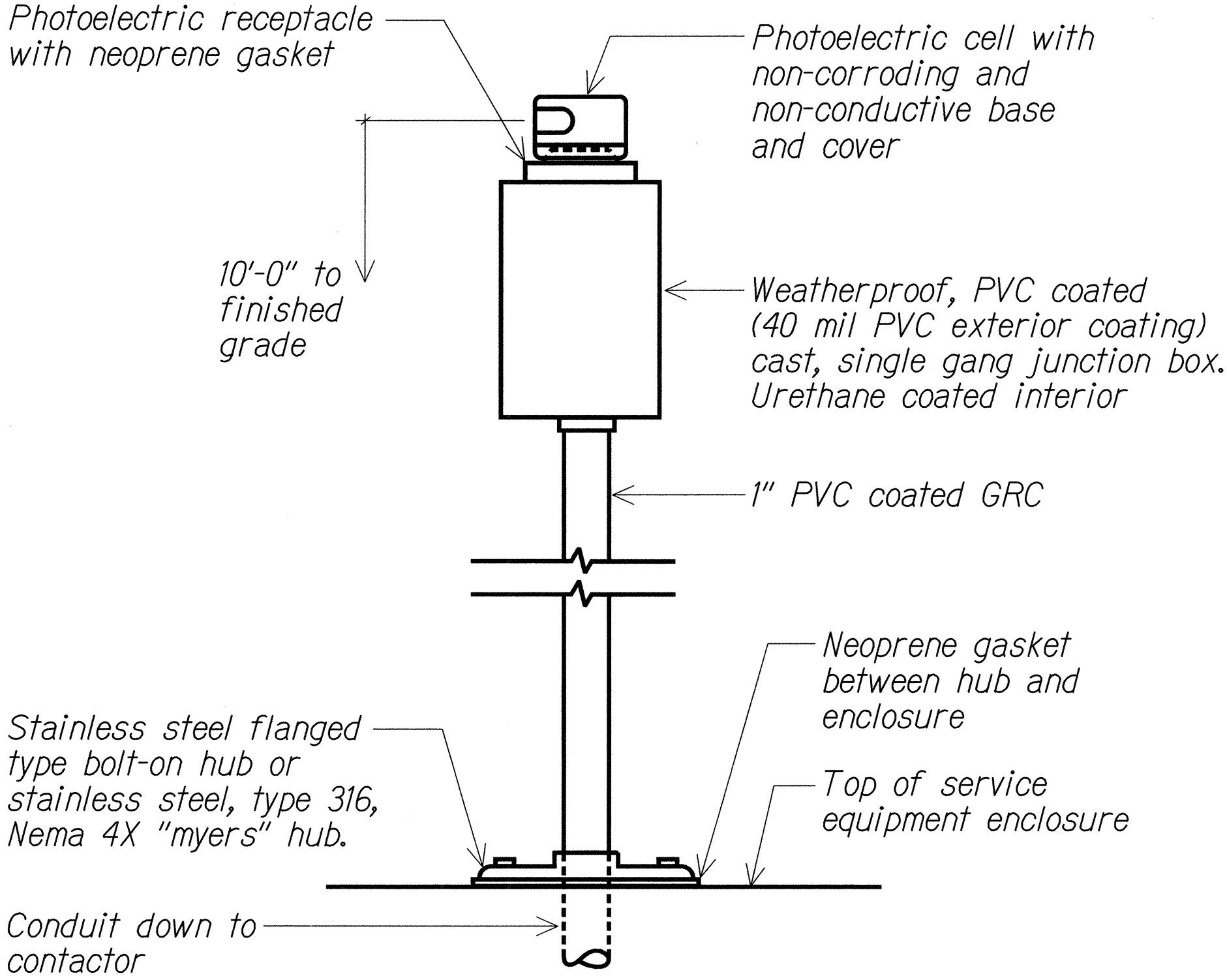
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

WIRING CONNECTION DIAGRAM -
 SIGN LIGHTING
 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-20 OF 92 SHEETS

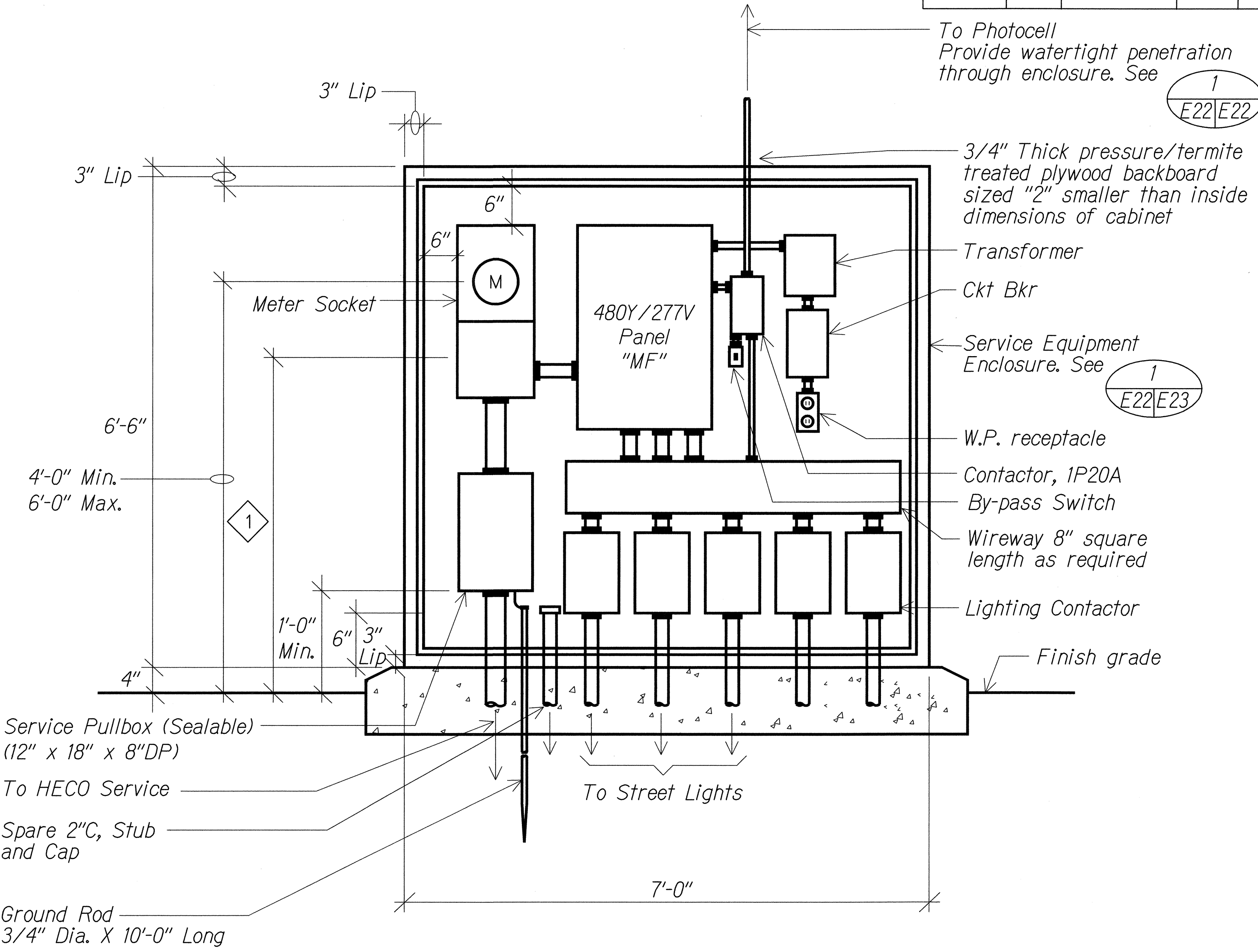
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002		92



1
E22 E22

PHOTOCELL MOUNTED ABOVE EQUIPMENT ENCLOSURE

01402D15



CONTROLLER "MF" EQUIPMENT ELEVATION

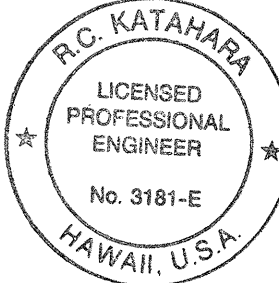
Not to scale

01402D10

NOTE:

1 3'-0" Minimum to center of Commercial By-pass Facility.

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



This work was prepared by me or under my supervision.

McKathum 5/2/02

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

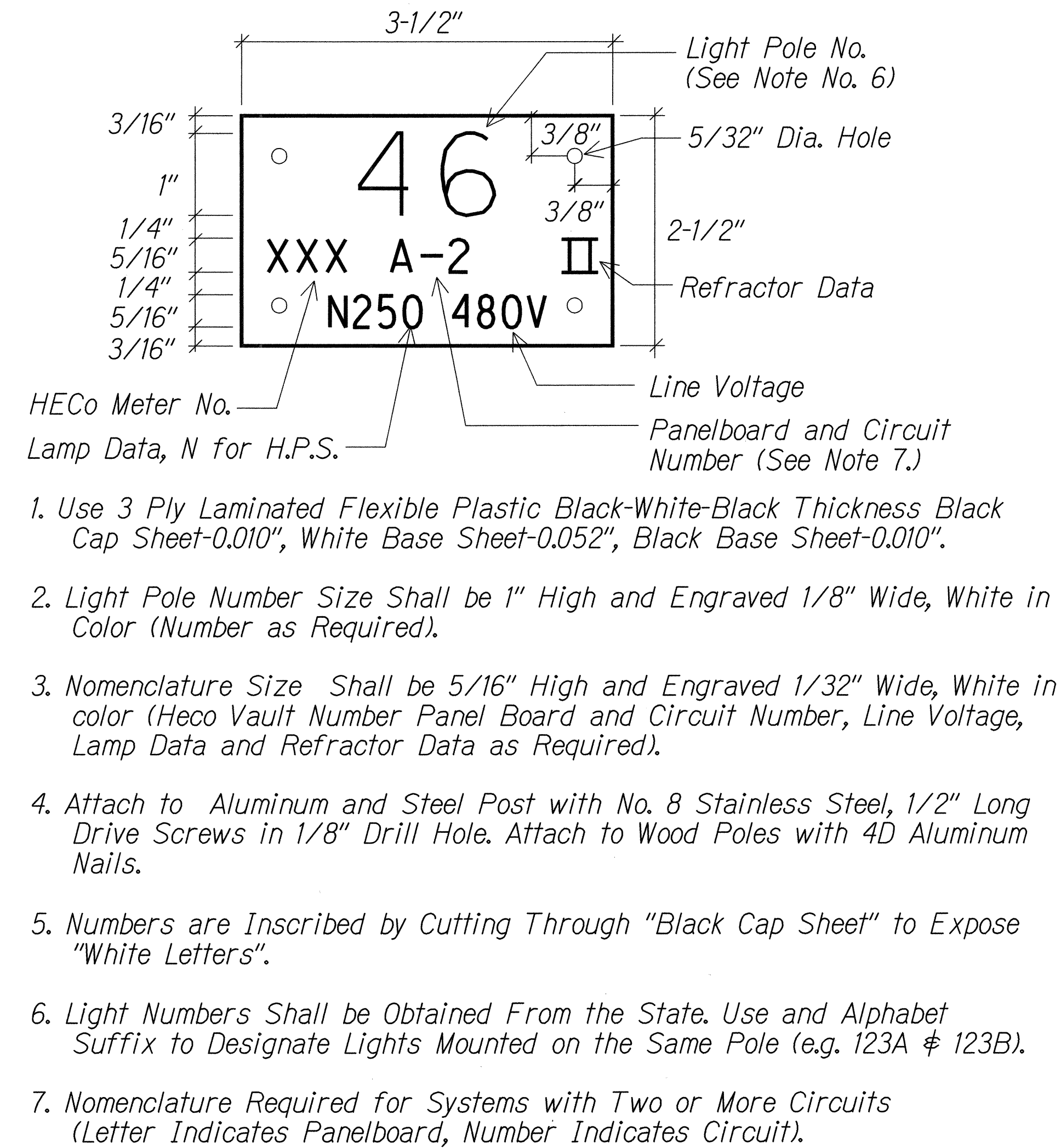
**HIGHWAY LIGHT POLE TAG DETAIL
METERED SYSTEM AND ELEVATION**

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

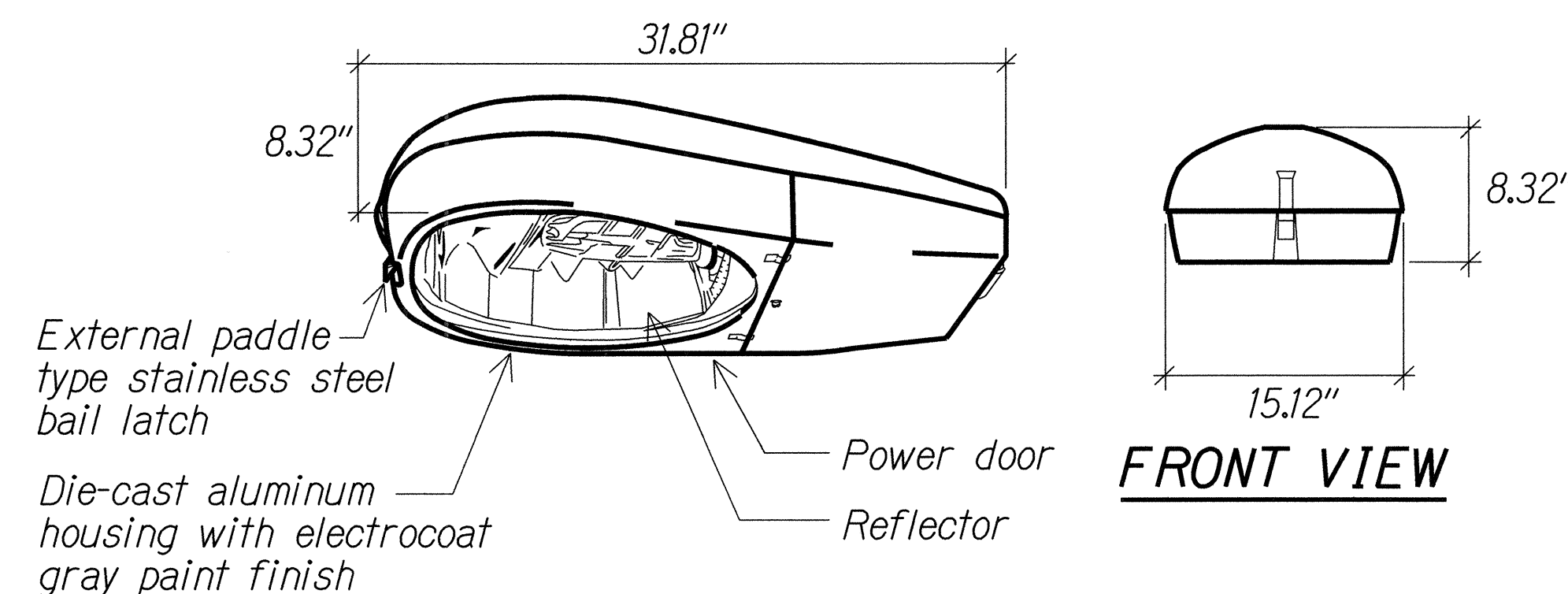
Scale: As Noted Date: May 2002

SHEET No. E-22 OF 92 SHEETS

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



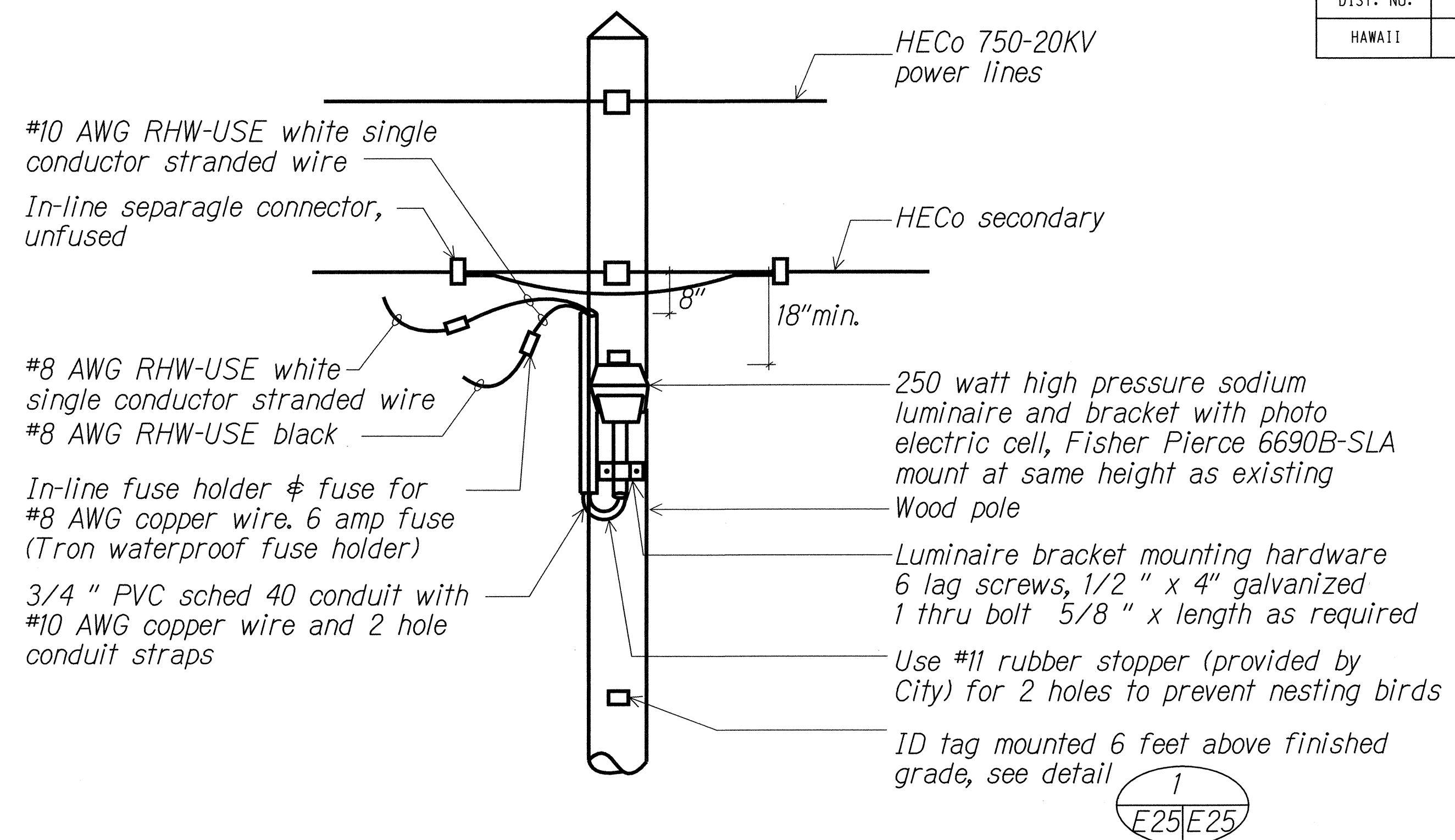
1 HIGHWAY LIGHT POLE TAG
DETAIL METERED SYSTEM
01402-D8



STREET LIGHT LUMINAIRE DETAIL
01402D17

NOTES:

- 250W HPS lamp.
- UL listed for wet locations.
- Provide with cutoff optics.
- Luminaire provided shall meet overall lighting level requirements for project area.

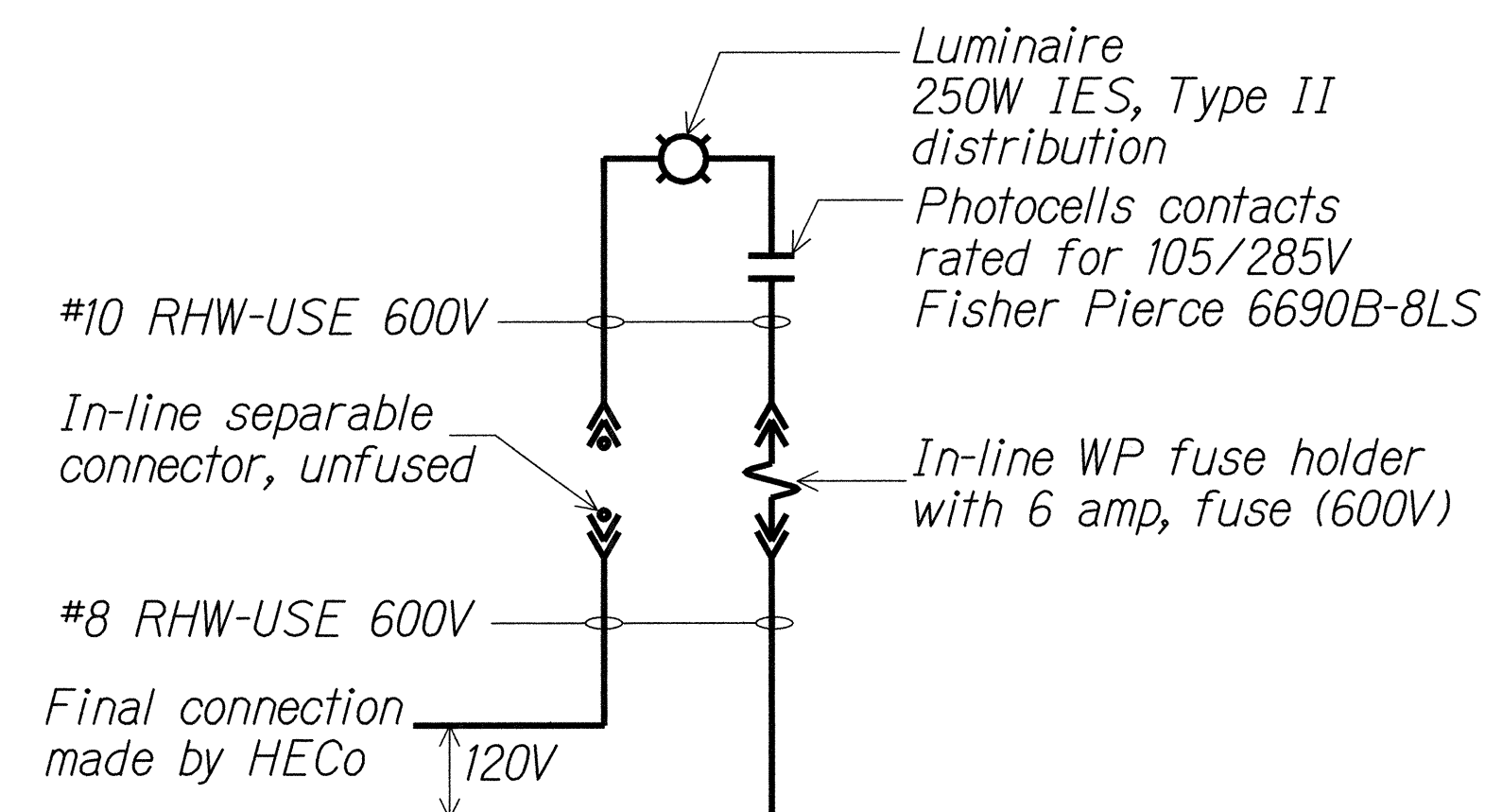


2 STREET LIGHT TANGENT INSTALLATION
NOT TO SCALE

NOTES:

- See 3 for wiring diagram.

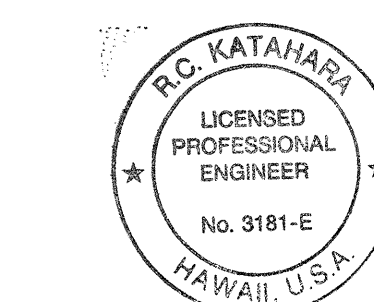
3
E25 E25



NOTE:

All neutral conductors must have white insulation. any other method of identification is unacceptable.

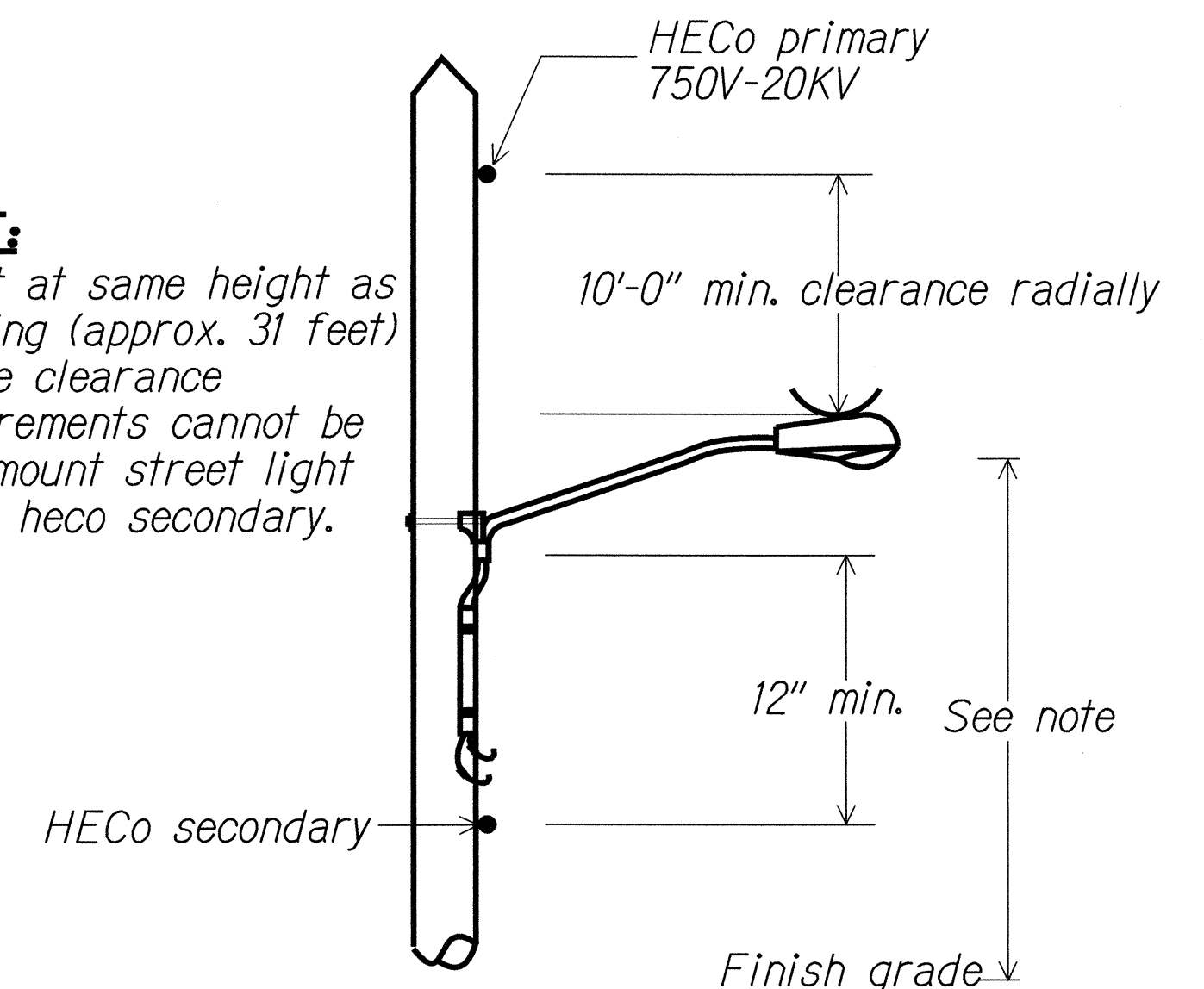
3 STREET LIGHT ONE-LINE DIAGRAM
NOT TO SCALE



This work was prepared by me or under my supervision.

PKK 5/2/02

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

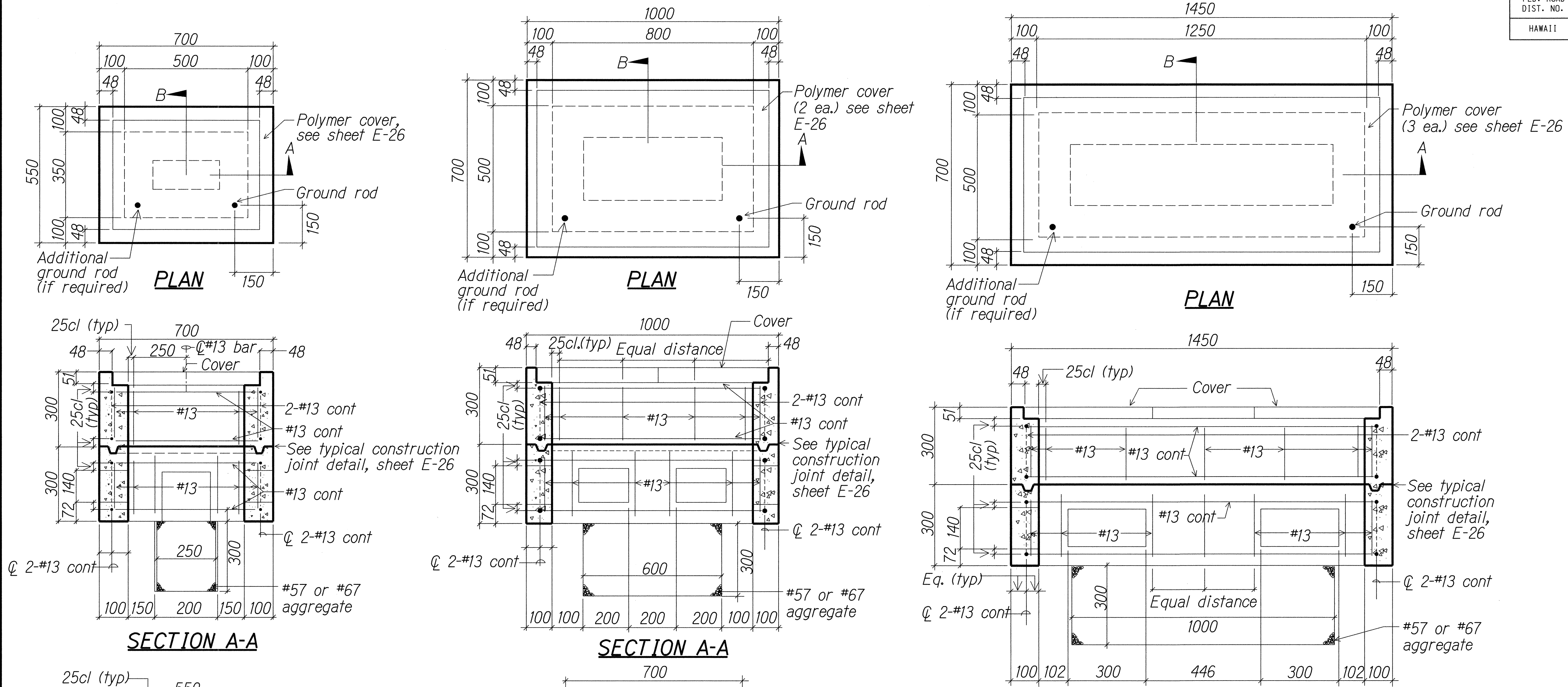


NOTE:

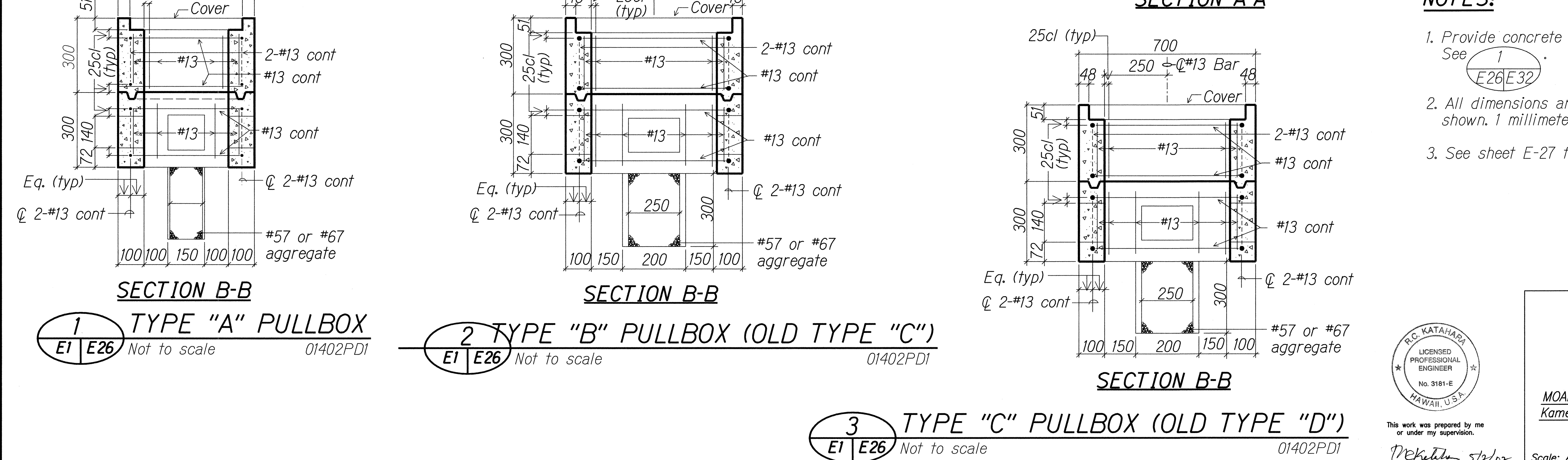
Mount at same height as existing (approx. 31 feet) If the clearance requirements cannot be met, mount street light below heco secondary.

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
HIGHWAY LIGHT POLE TAG DETAIL METERED SYSTEM AND ELEVATION	
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-25 OF 92 SHEETS	

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



- NOTES:**
1. Provide concrete collar around handhole. See E26E32.
 2. All dimensions are in millimeters unless otherwise shown. 1 millimeter = 0.039 inch.
 3. See sheet E-27 for additional information.

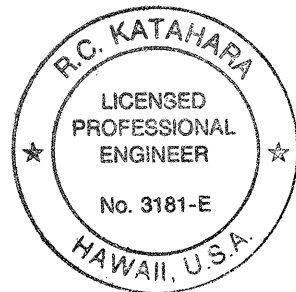


1 TYPE "A" PULLBOX
Not to scale 01402PD1

2 TYPE "B" PULLBOX (OLD TYPE "C")
Not to scale 01402PD1

3 TYPE "C" PULLBOX (OLD TYPE "D")
Not to scale 01402PD1

DATE	_____
DESIGNED BY	_____
CHECKED BY	_____
NOTED BY	_____
NO.	_____



This work was prepared by me or under my supervision.
 MK ENGINEERS, LTD.
 LICENCE EXPIRATION DATE 4/30/04

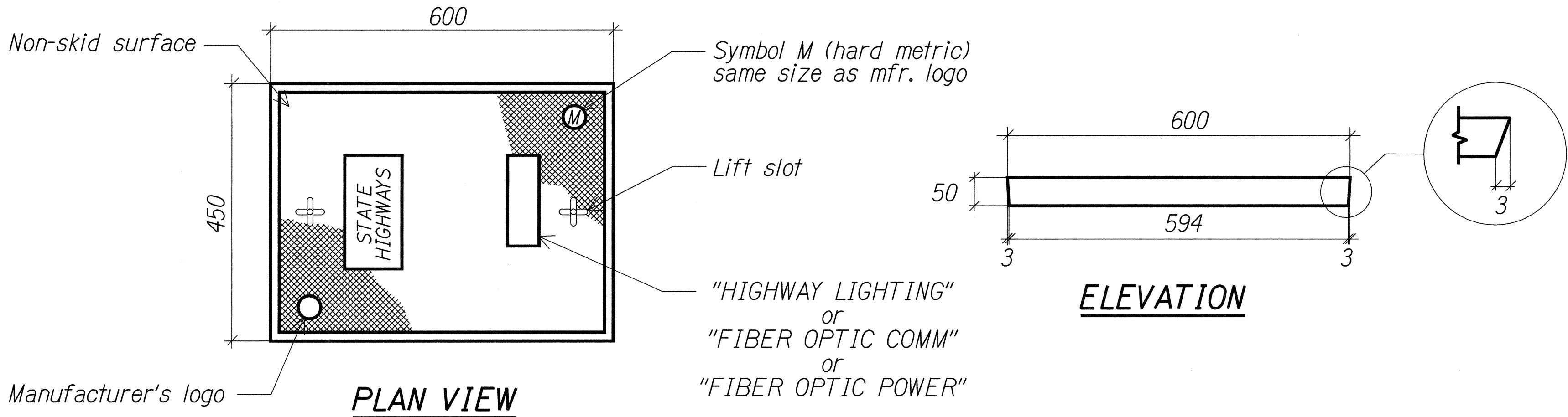
STATE OF HAWAII
 DEPARTMENT OF TRANSPORTATION
 HIGHWAYS DIVISION

PULLBOX DETAILS

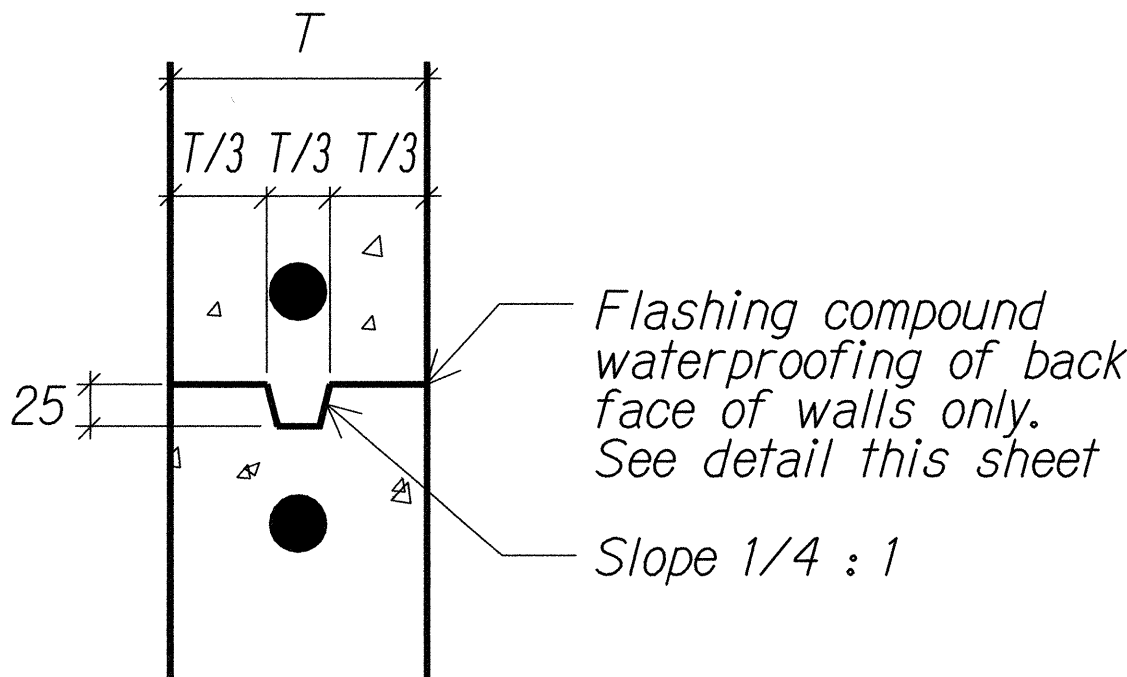
MOANALUA FREEWAY LIGHTING IMPROVEMENTS
 Kamehameha Highway to H1 Halawa Interchange
 Proj. No. 78A-01-02M
 Oahu, Hawaii

Scale: As Noted Date: May 2002
 SHEET No. E-26 OF 92 SHEETS

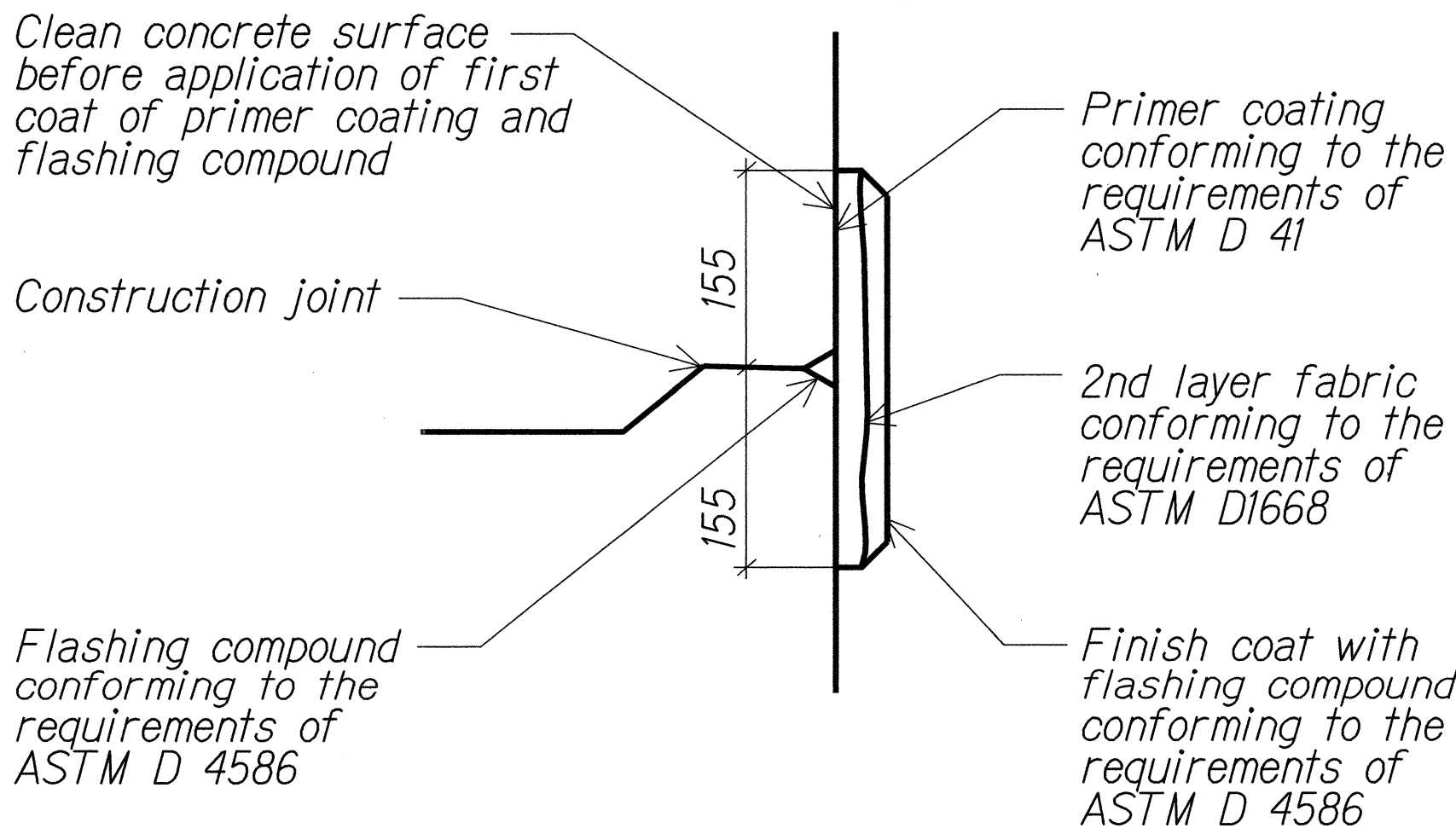
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002		92



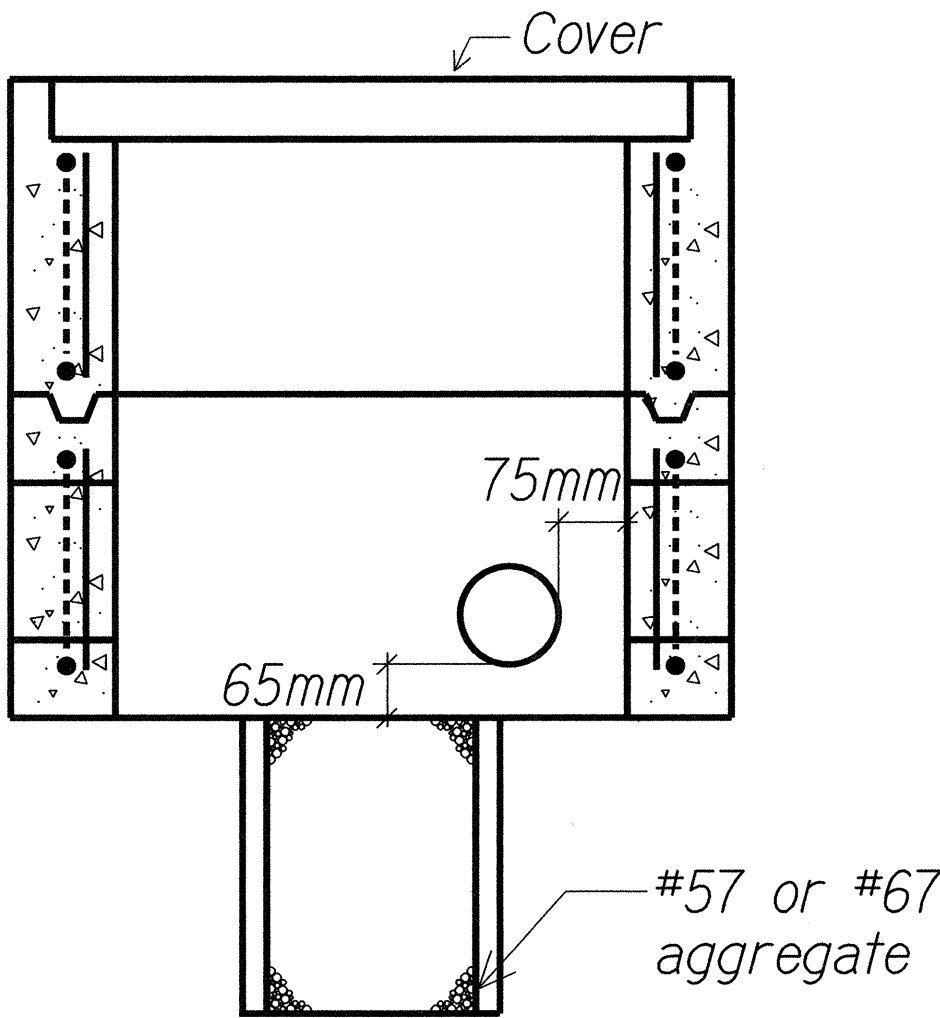
POLYMER CONCRETE COVER
Not to scale 01402-D6



TYPICAL CONSTRUCTION JOINT DETAIL
Not to scale 01402-D6



TYPICAL FLASHING COMPOUND WATERPROOFING DETAIL
Not to scale 01402-D6



FIBER OPTIC COMMUNICATIONS PULLBOX (TYPE 52) CONDUIT ENTRY DETAIL
Not to scale 01402D18

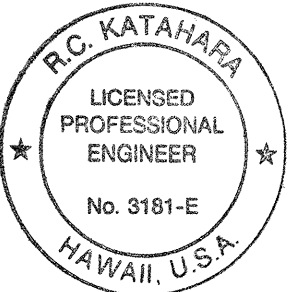
GENERAL PULLBOX NOTES:

1. Provide a minimum of one 190 X 3.0M copperclad ground rod in each pullbox. When directed by the traffic signal inspector/engineer. Install additional ground rods. Cost of ground rods shall be incidental to the pullboxes.
2. All pre-cast concrete pullboxes shall be manufactured in two pieces.
3. The pullbox with cover shall be capable of supporting an MS 18 loading.
4. The maximum weight of the pullbox cover shall not exceed 27 kilograms (60 pounds).
5. The openings for the conduits on all pullboxes shall be pre-cast concrete knockouts.
6. After installing the conduits in the openings of the pullboxes, the contractor shall fill the excess opening in the pre-cast knockouts with concrete mortar.
7. Prior to installing the pullboxes, the contractor shall level the bottom of the trench and achieve a minimum of 95% relative compaction of the bottom of trench.
8. All concrete shall be class A (25MPA (3625PSI), minimum).
9. Rebars shall be grade 300 and all lapped splices shall be 360mm minimum.
10. The #57 or #67 size aggregate shall conform to latest version of AASHTO M43 (ASTM D448).
11. Pullboxes shall be installed in a location protected from vehicular traffic (I.E. raised sidewalks, behind A.C. curbs, traffic signal standards or pipe guards).

NOTE:

1. All dimensions are in millimeters unless otherwise shown.
1 millimeter = 0.039 inch.

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

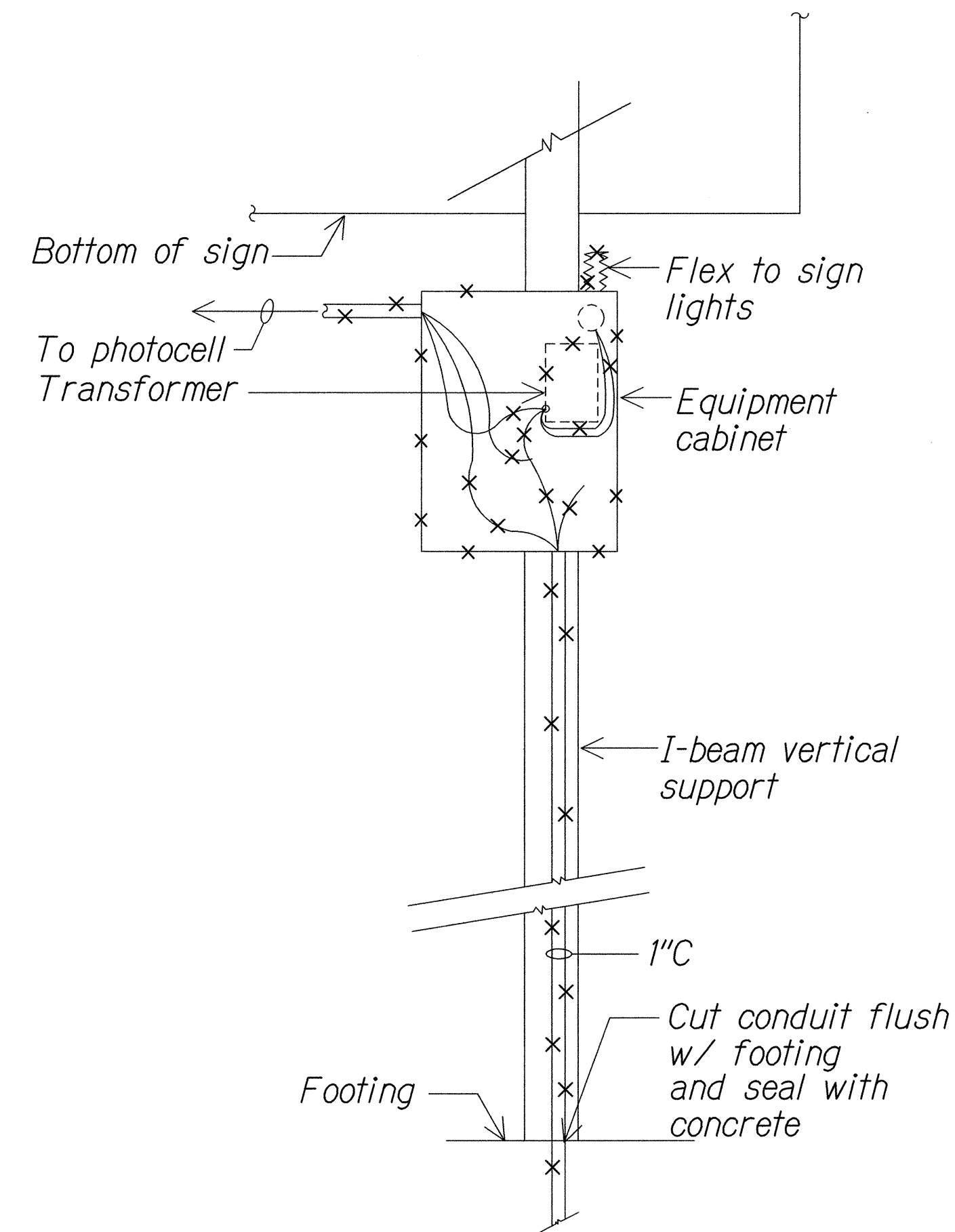


This work was prepared by me or under my supervision.

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

STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION	
GENERAL PULLBOX NOTES AND DETAILS	
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-27	OF 92 SHEETS

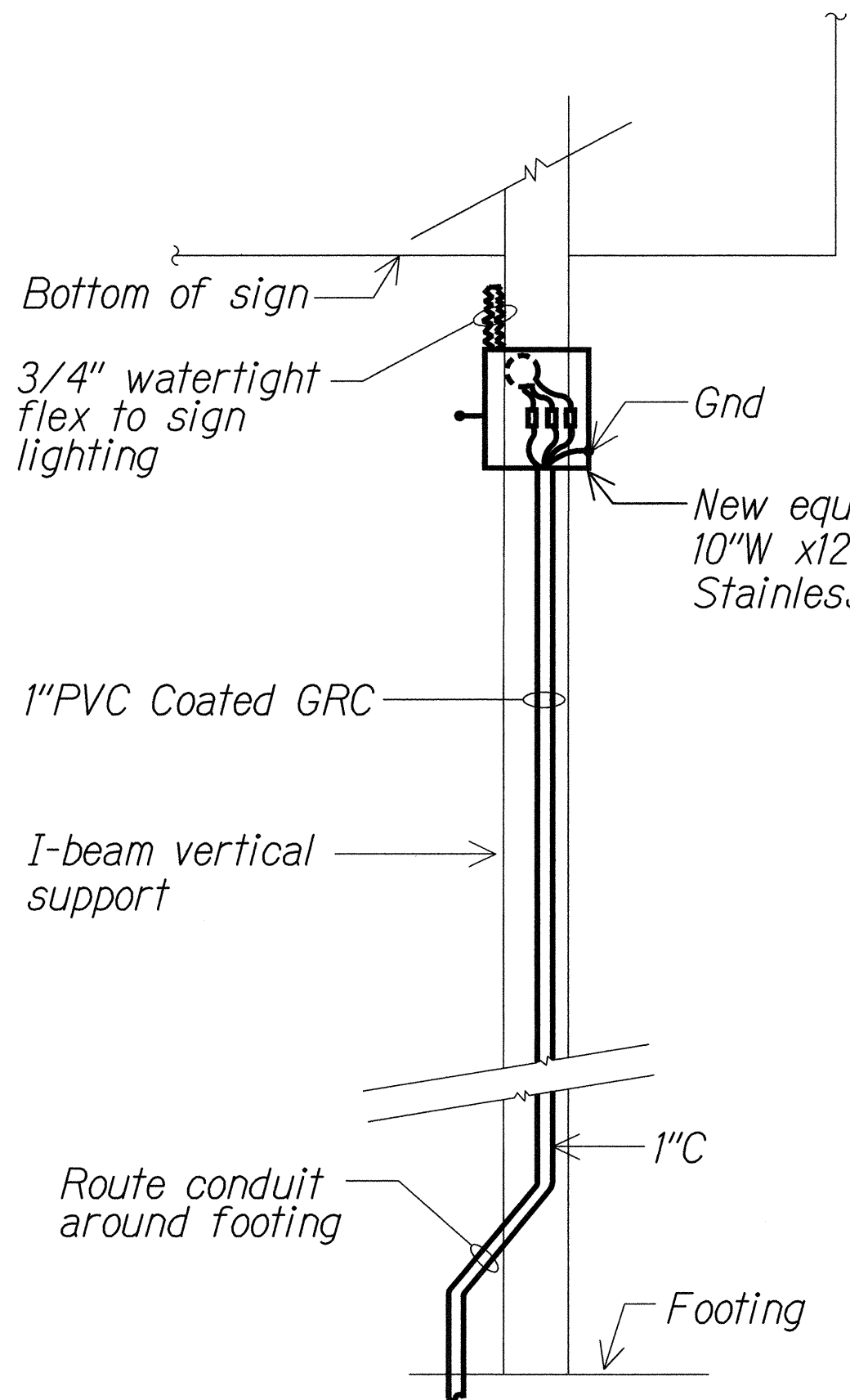
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002		92



1 SIGN "A" ELEVATION - EXISTING
E5 E28 NTS 01402D19

NOTES:

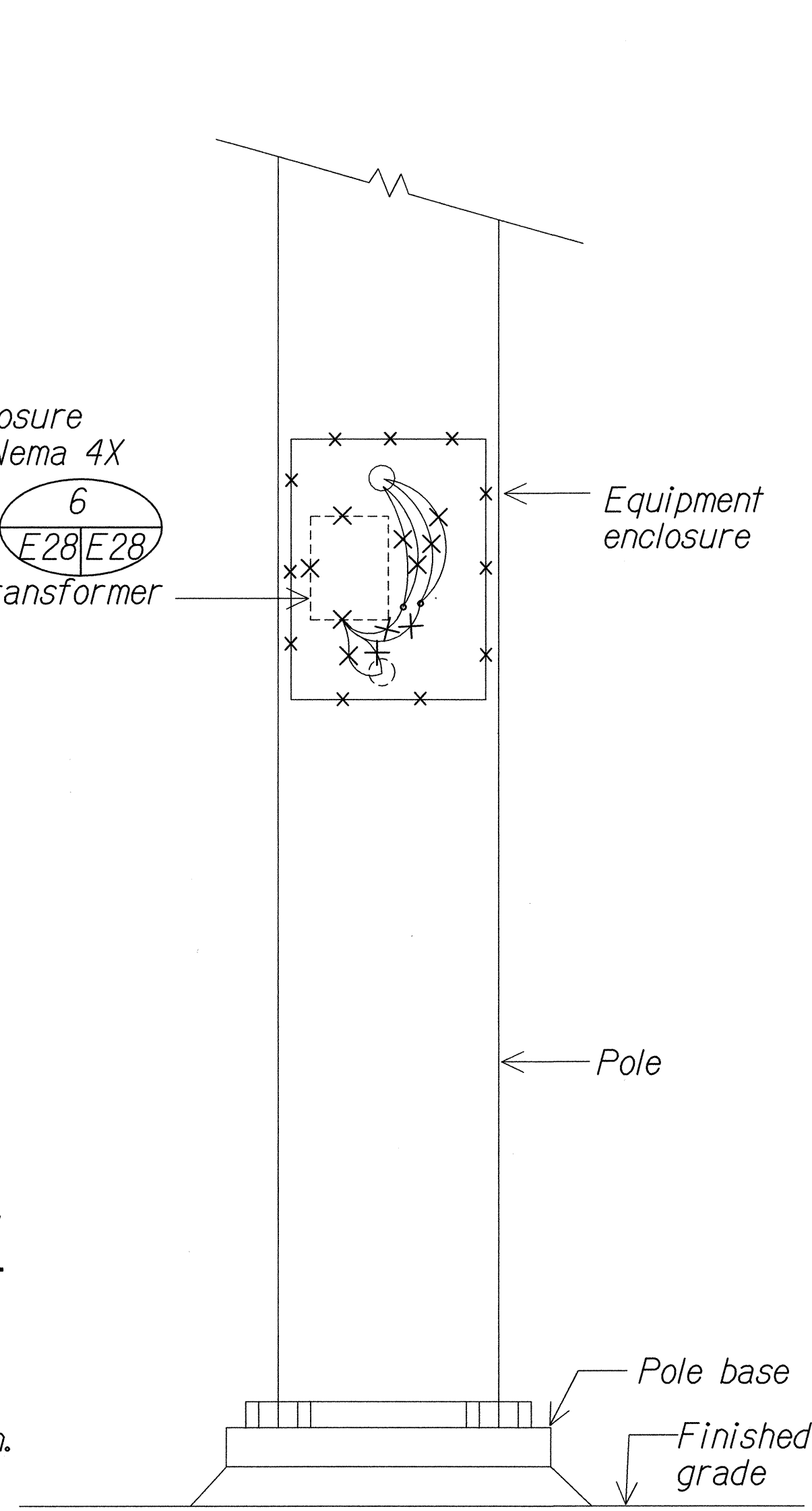
- Light lines denote existing condition. "x" items denote removal work.
- Restore surfaces exposed as a result of demolition work. Remove rust, prime & finish paint (2 coats) to match exst surface.



2 SIGN "A" ELEVATION - NEW
E11 E28 NTS 01402D20

NOTES:

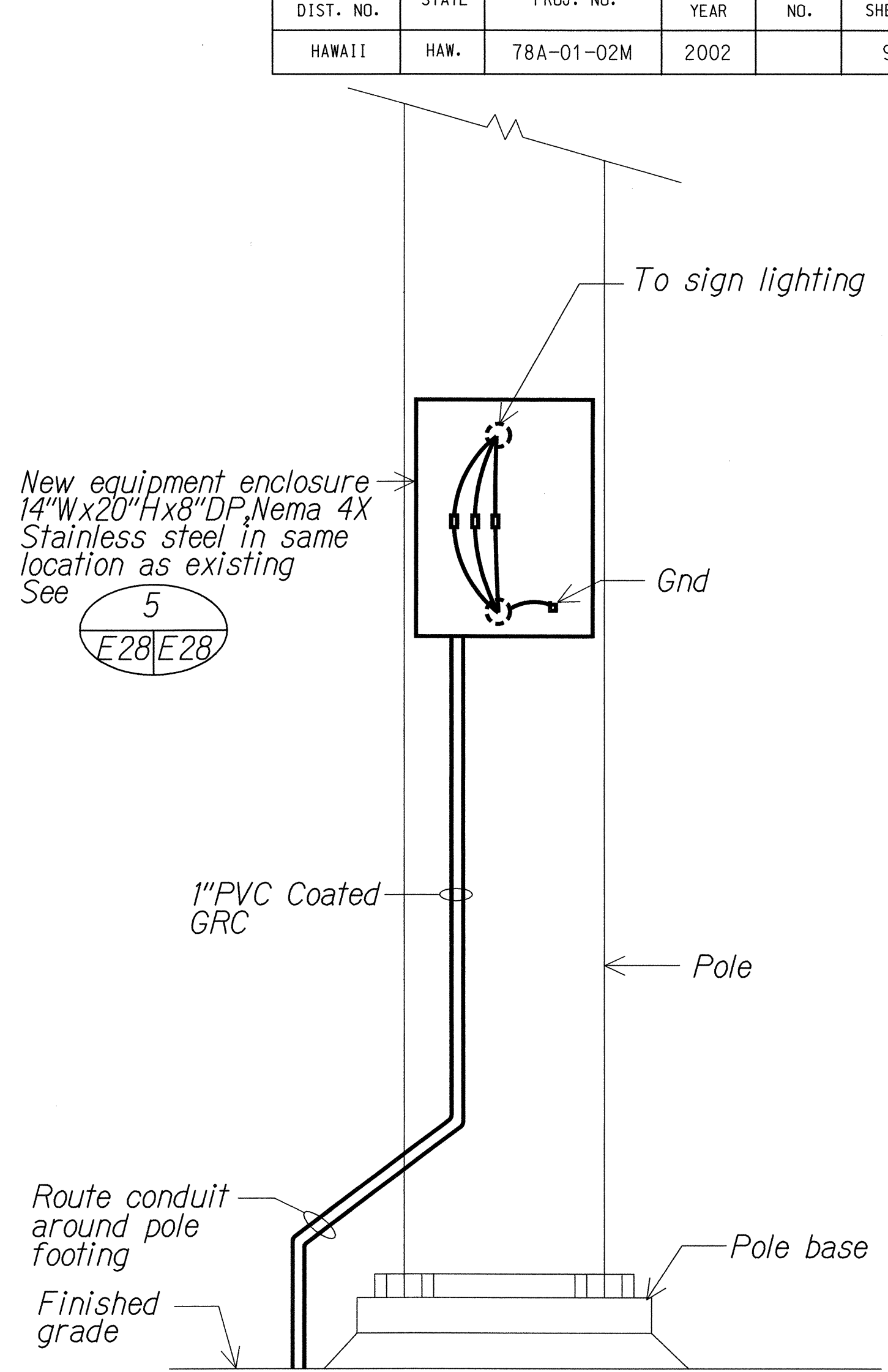
- Light lines denote existing condition. Bold lines denote new work.
- Transition from PVC coated GRC to PVC for conduit installed underground. See 2
- Restore surfaces exposed as a result of demolition work. Remove rust, prime & finish paint (2 coats) to match exst surface.



3 SIGN "B" ELEVATION - EXISTING
E5 E28 NTS 01402D21

NOTES:

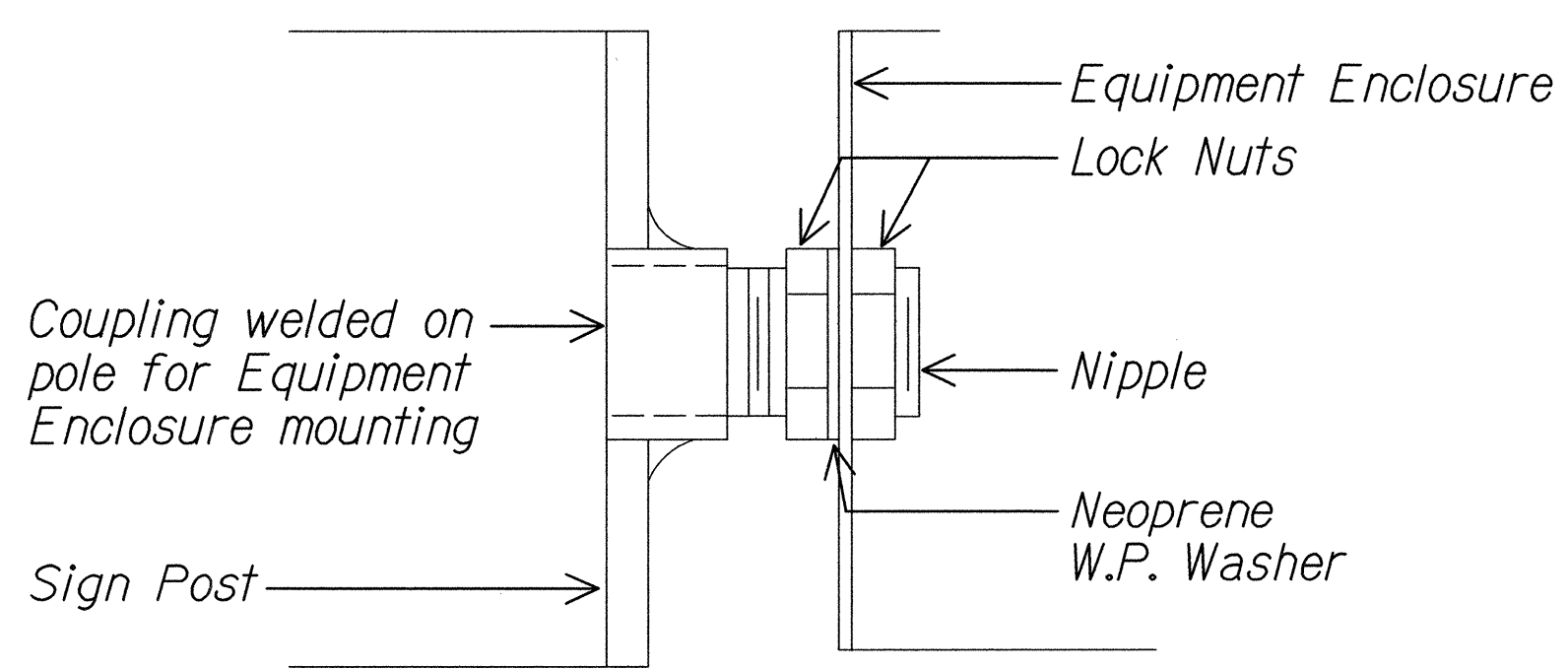
- Light lines denote existing condition. "x" items denote removal work.



4 SIGN "B" ELEVATION - NEW
E11 E28 NTS 01402D22

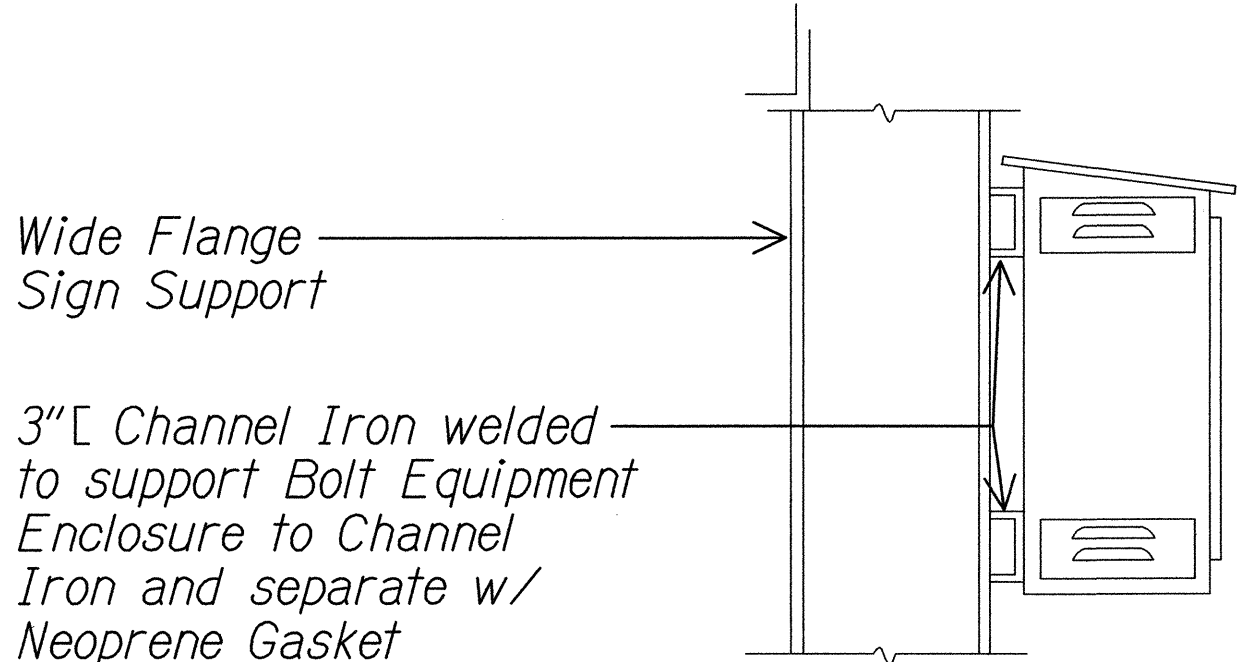
NOTES:

- Light lines denote existing condition. Bold lines denote new work.
- Transition from PVC coated GRC to PVC for conduit installed underground. See 2
- Restore surfaces exposed as a result of demolition work. Remove rust, prime & finish paint (2 coats) to match exst surface.



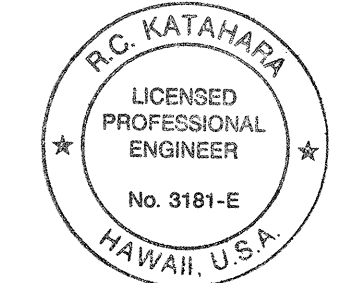
WIRING HUB DETAIL

5 EQUIPMENT ENCLOSURE MOUNTING DETAIL "A"
E28 E28 NTS 01402D36



6 EQUIPMENT ENCLOSURE MOUNTING DETAIL "B"
E28 E28 NTS 01402D37

DATE	_____
SUPPLY PLOTTED BY	_____
DESIGNED BY	_____
TRACED BY	_____
NOTE BOOK	_____
CHECKED BY	_____
No.	_____



This work was prepared by me or under my supervision.
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

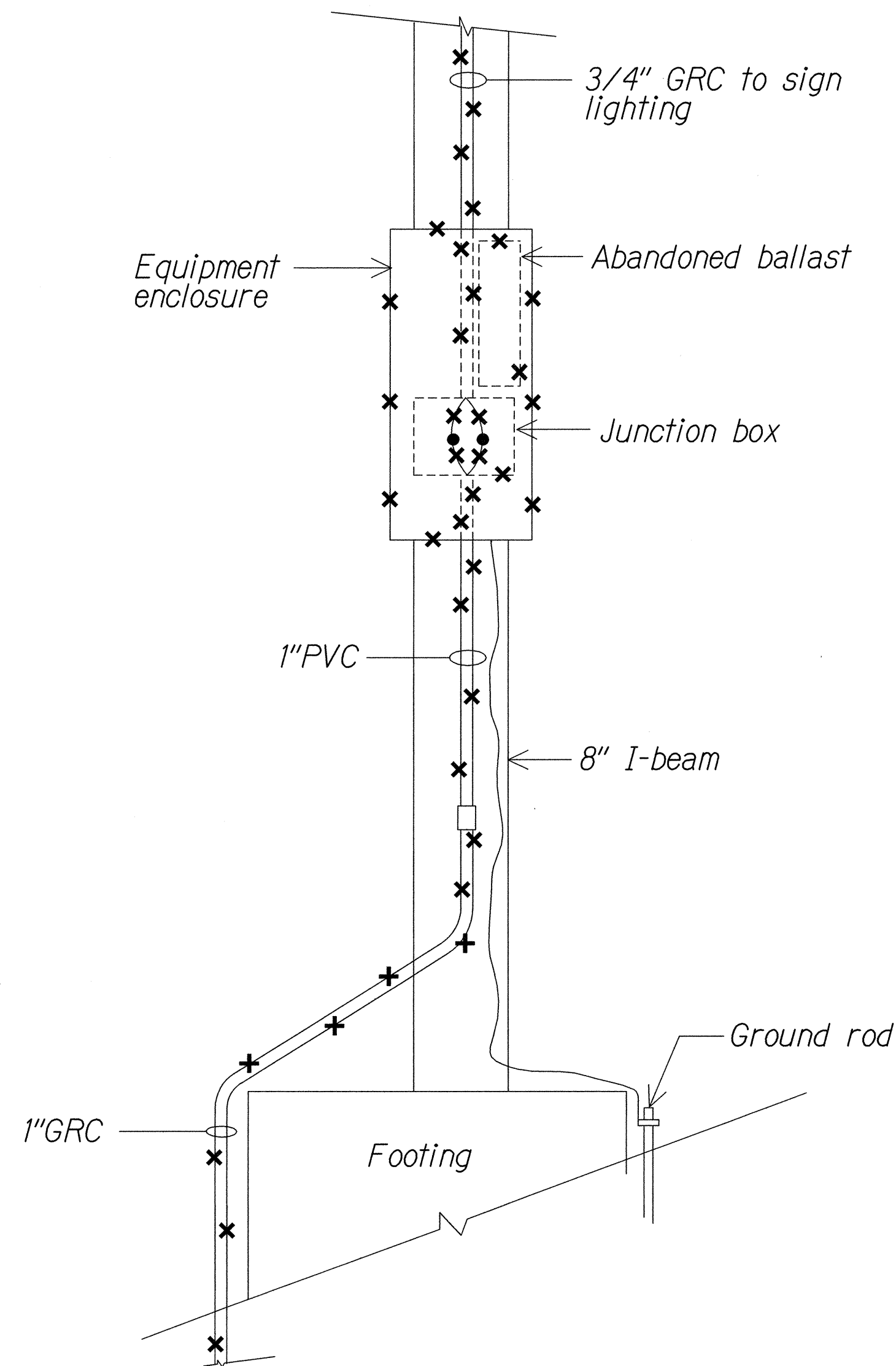
SIGN ELEVATIONS

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-28 OF 92 SHEETS

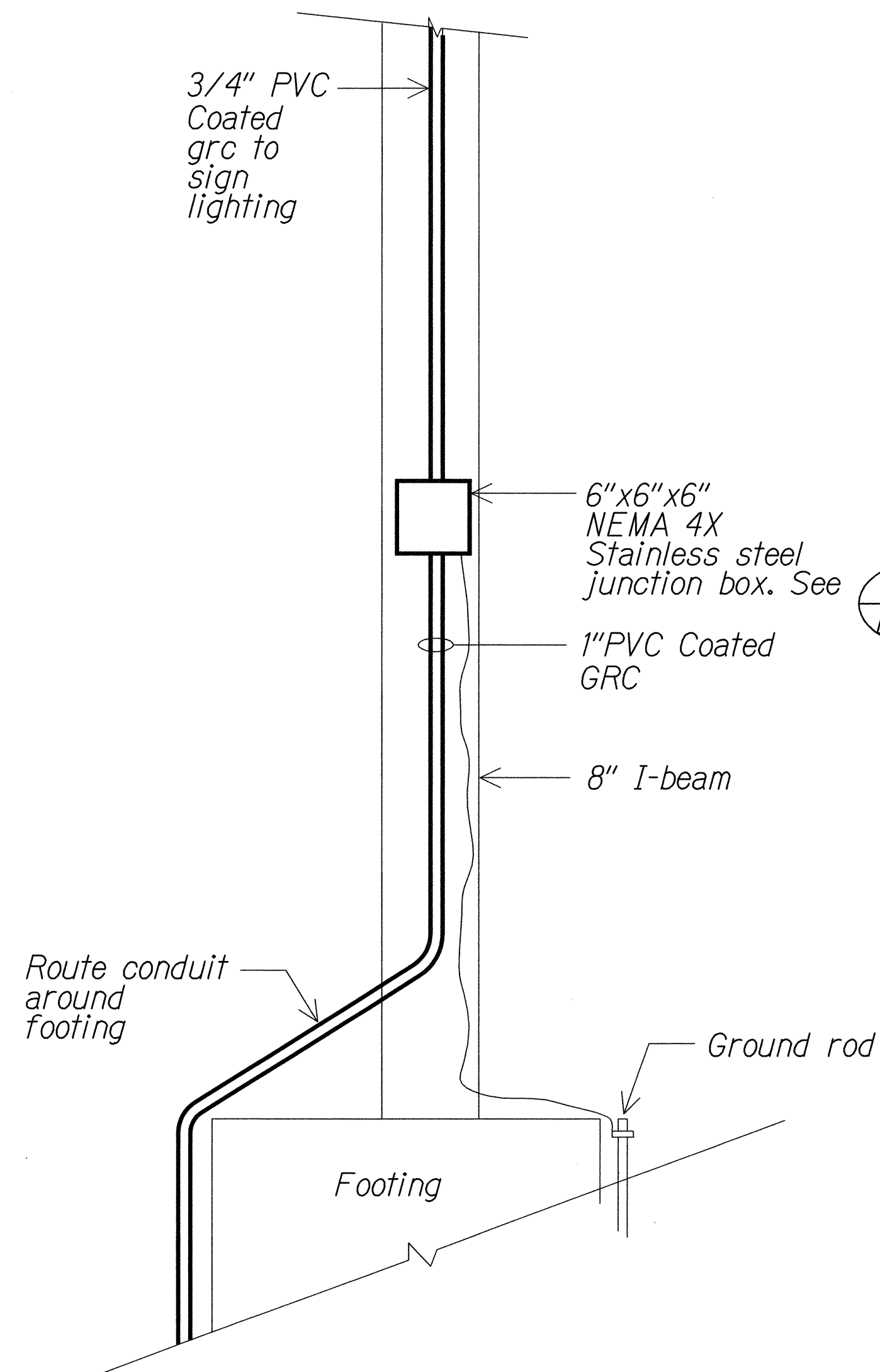
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002		92



1 SIGN "C" ELEVATION - EXISTING
E7 E29 NTS 01402D23

NOTES:

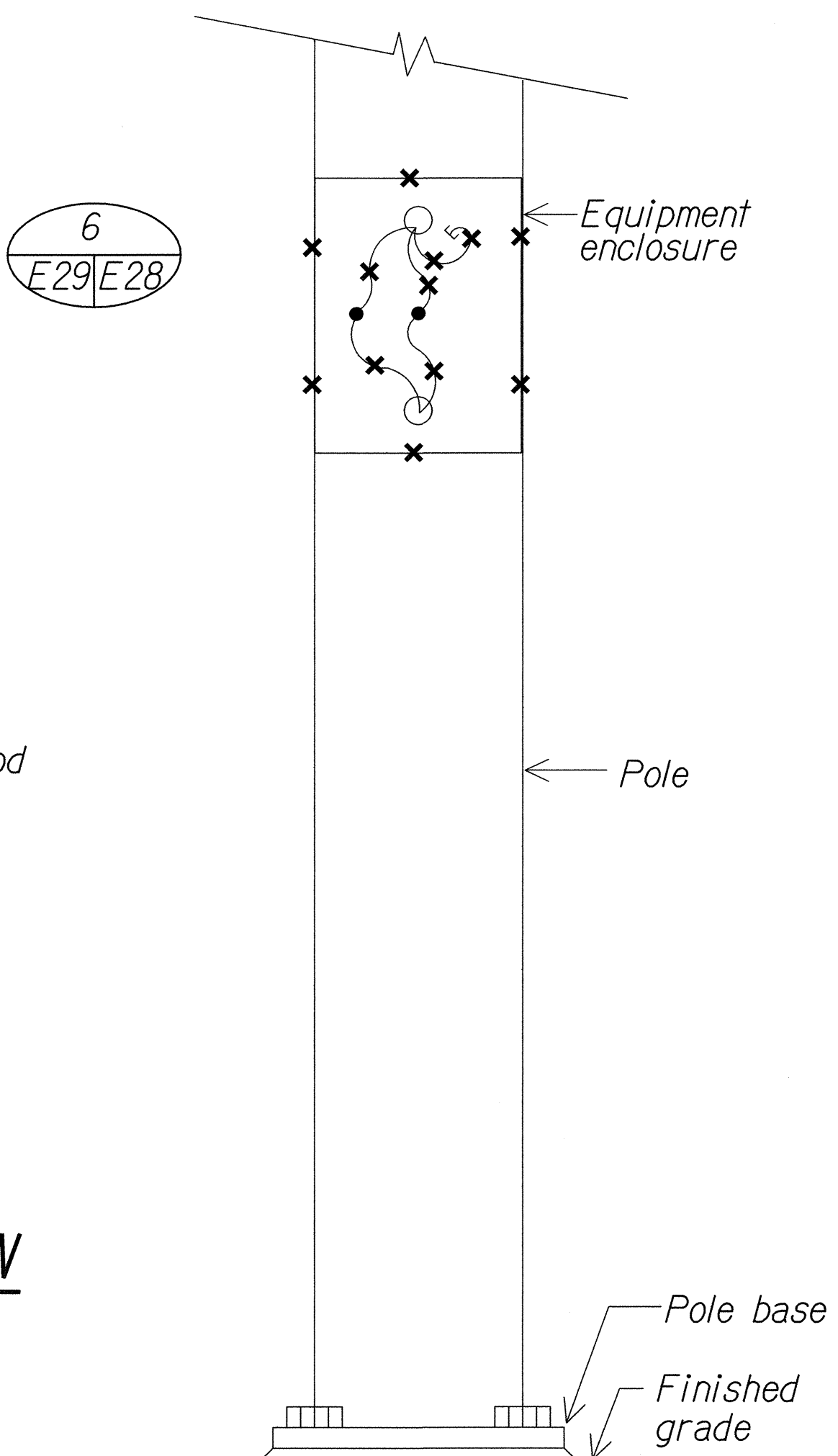
- Light lines denote existing condition.
"x" items denote removal work.



2 SIGN "C" ELEVATION - NEW
E13 E29 NTS 01402D24

NOTES:

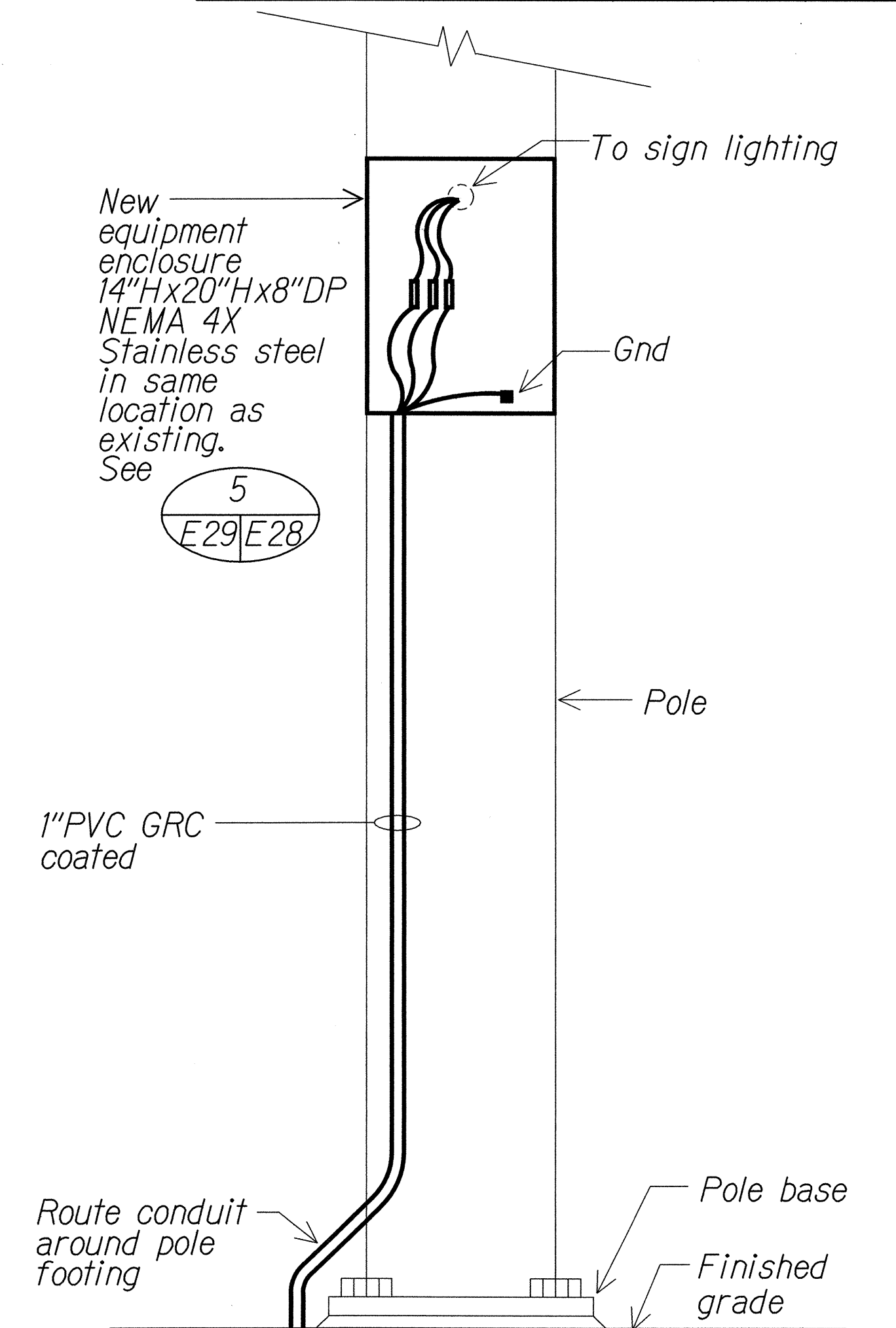
- Light lines denote existing condition.
Bold lines denote new work.
- Transition from PVC coated GRC to PVC for conduit installed underground.
See 2 E29/E30
- Restore surfaces exposed as a result of demolition work. Remove rust, prime & finish paint (2 coats) to match exst surface.



3 SIGN "D" ELEVATION - EXISTING
E8 E29 NTS 01402D25

NOTES:

- Light lines denote existing condition.
"x" items denote removal work.

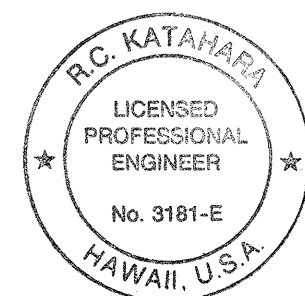


4 SIGN "D" ELEVATION - NEW
E14 E29 NTS 01402D26

NOTES:

- Light lines denote existing condition.
Bold lines denote new work.
- Transition from PVC coated GRC to PVC for conduit installed underground.
See 2 E29/E30
- Restore surfaces exposed as a result of demolition work. Remove rust, prime & finish paint (2 coats) to match exst surface.

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



This work was prepared by me or under my supervision.

Peterson 5/2/02

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

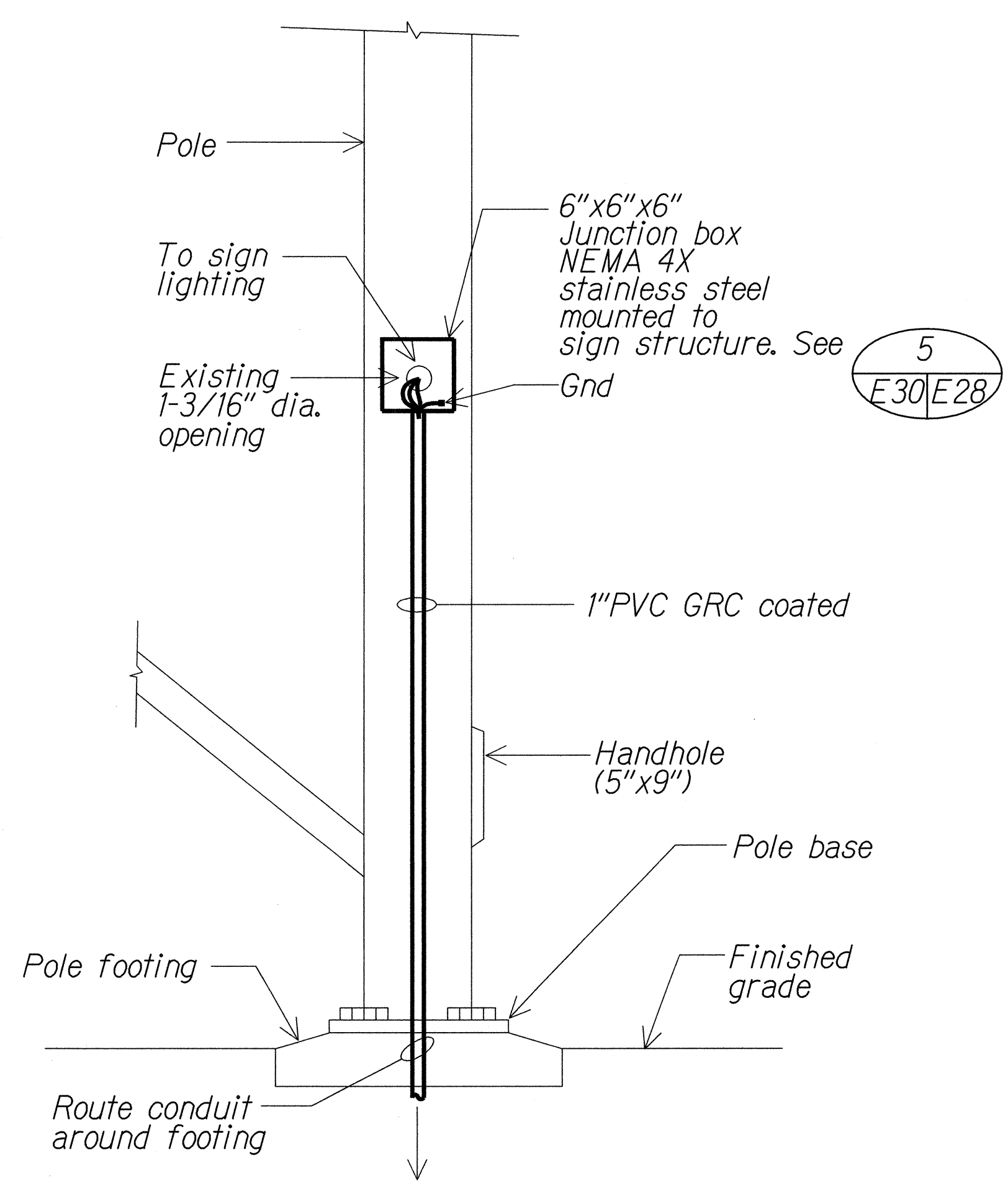
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN ELEVATIONS

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

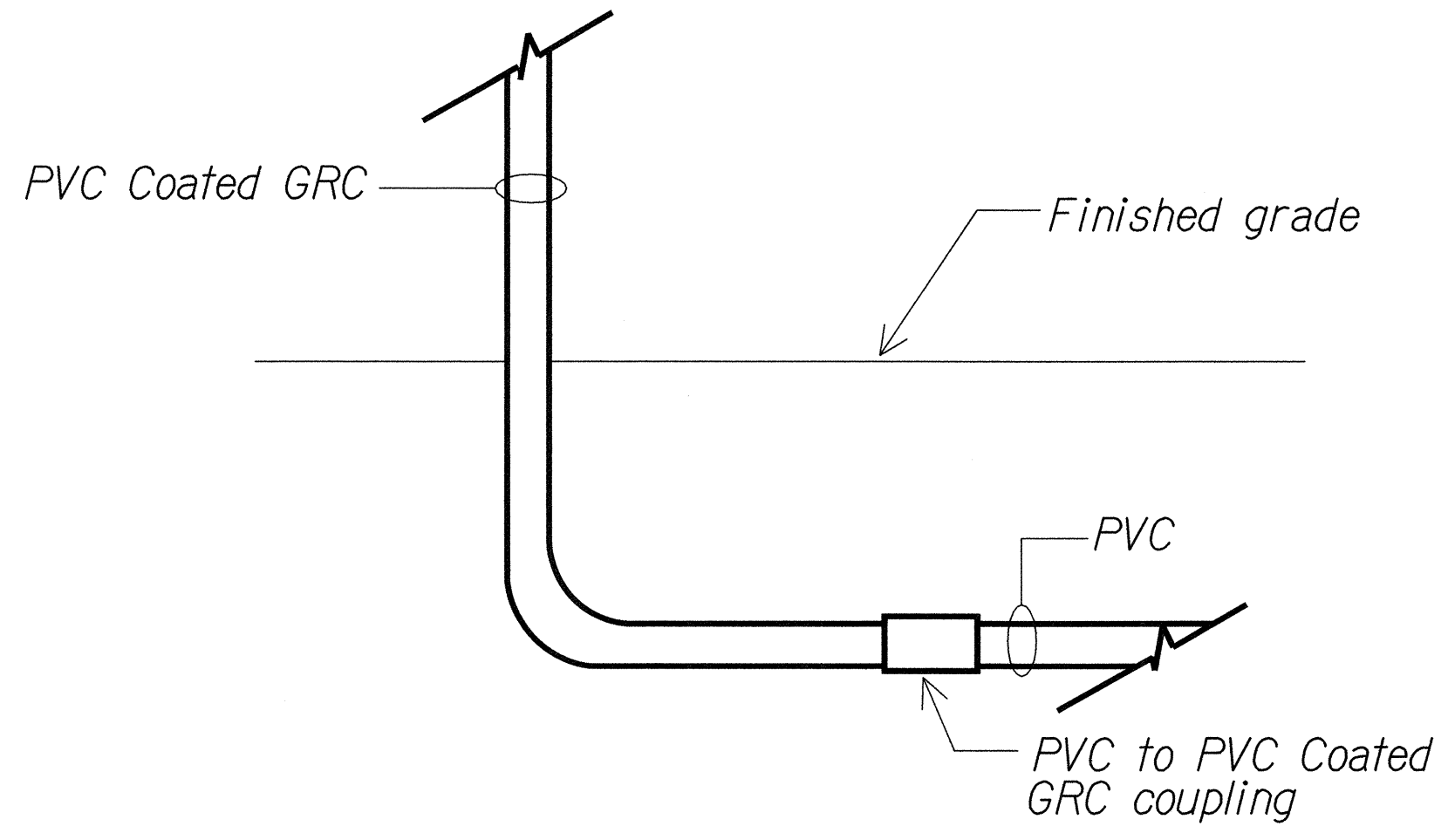
Scale: As Noted Date: May 2002
SHEET No. E-29 OF 92 SHEETS

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

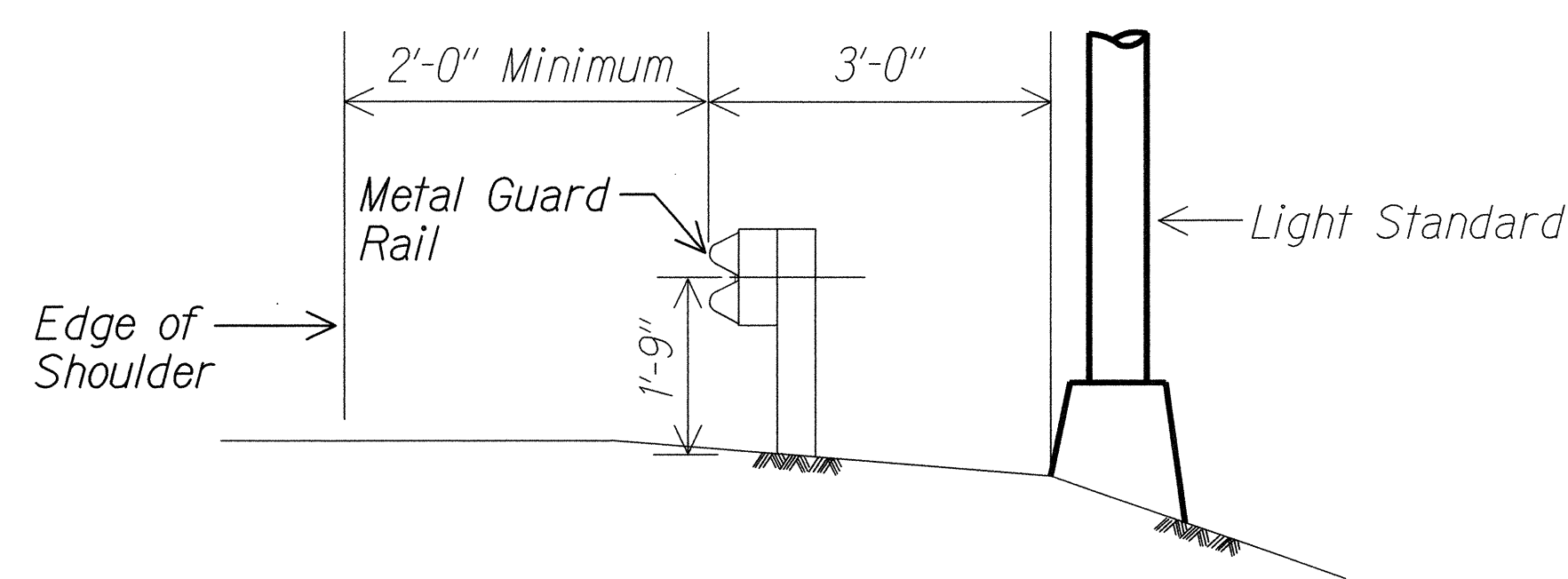


1 SIGN "E" ELEVATION - NEW
E14 E30 NTS 01402D27

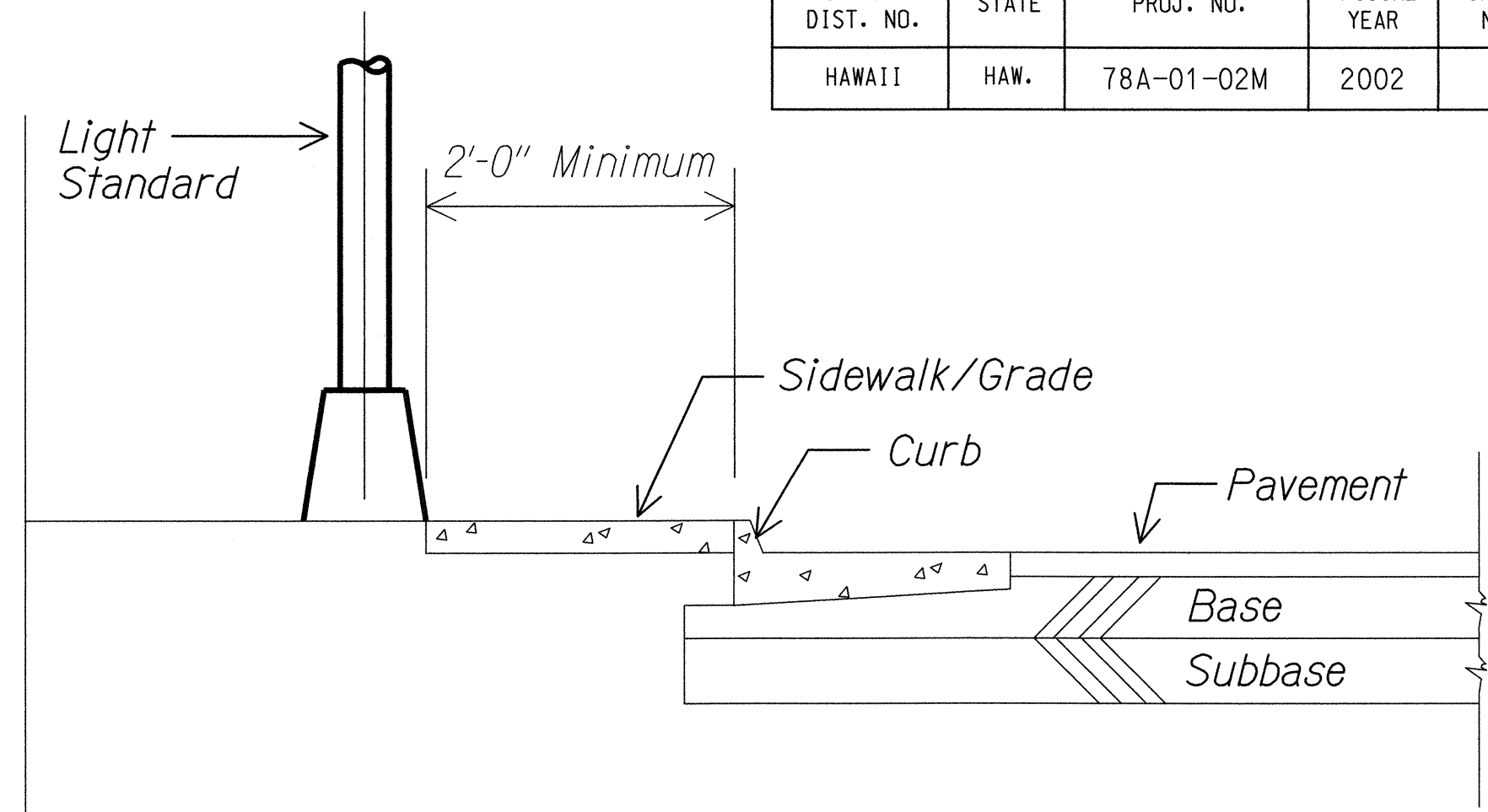
- NOTES:**
- Light lines denote existing condition.
Bold lines denote new work.
 - Transition from PVC coated GRC to PVC for conduit installed underground.
See **2**



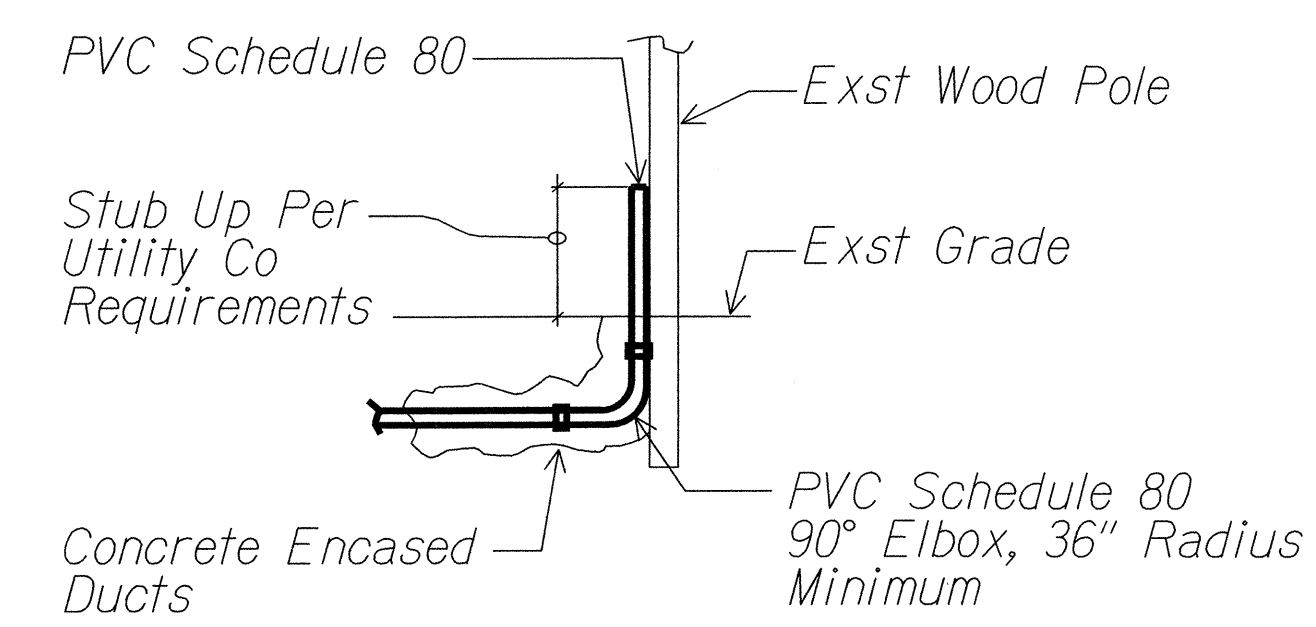
2 PVC COATED GRC TO PVC TRANSITION DETAIL
E28 E30 NTS 01402D28



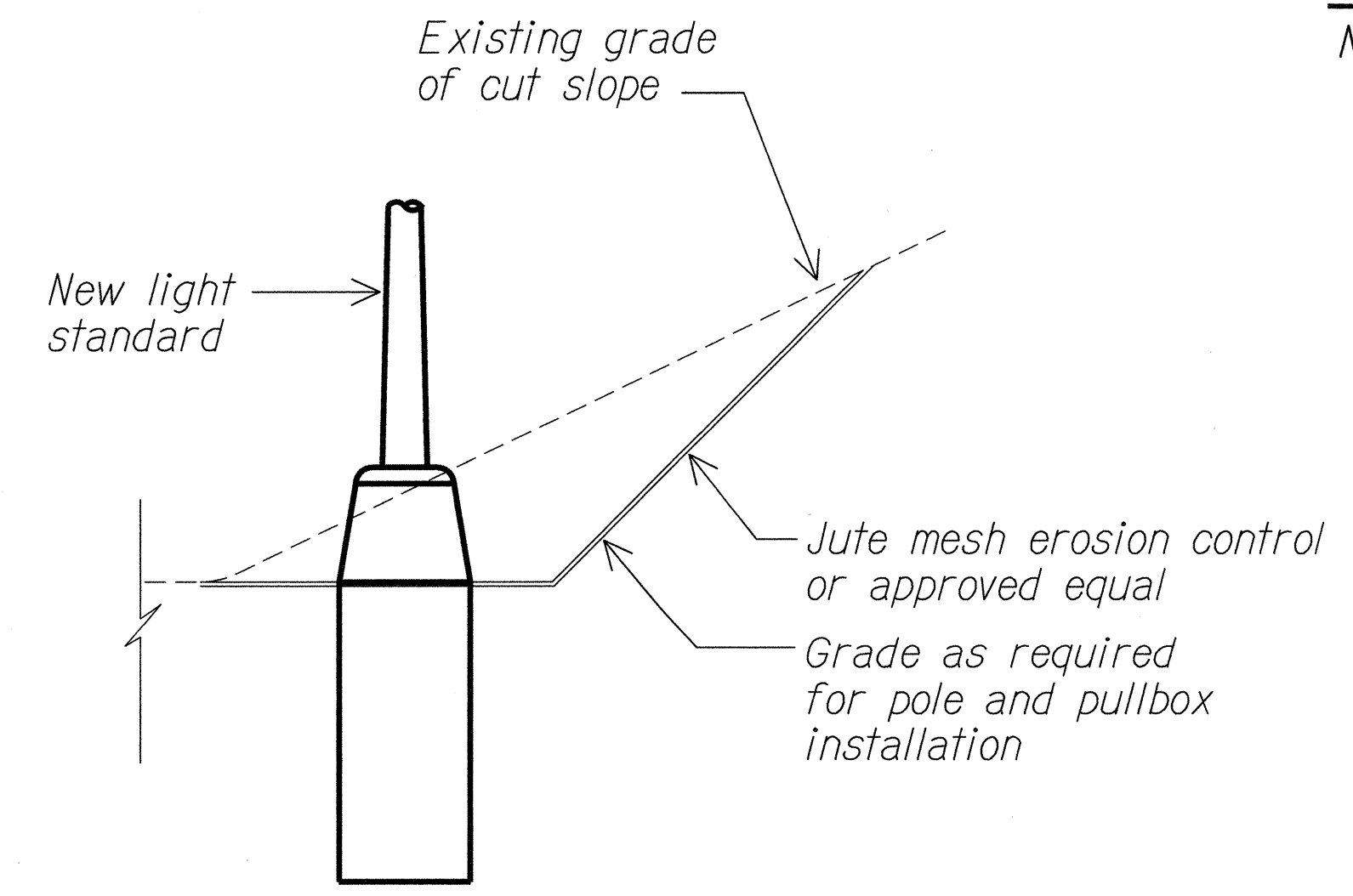
4 LIGHT STANDARD INSTALLATION DETAIL - GUARDRAIL CONDITION
E-24 E-30 NTS 01402D42



3 LIGHT STANDARD INSTALLATION DETAIL - CURBED CONDITION
E-24 E-30 NTS 01402D34

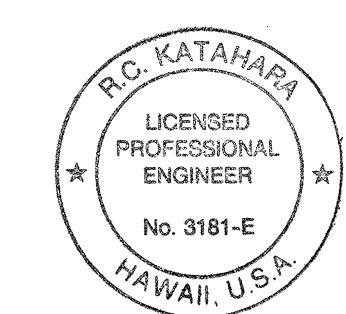


5 LIGHT STANDARD INSTALLATION DETAIL - GUARDRAIL CONDITION
E-12 E-30 NTS 01402D40



TYPICAL LIGHT STANDARD INSTALLATION ALONG CUT SLOPE
NTS 01402D43

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

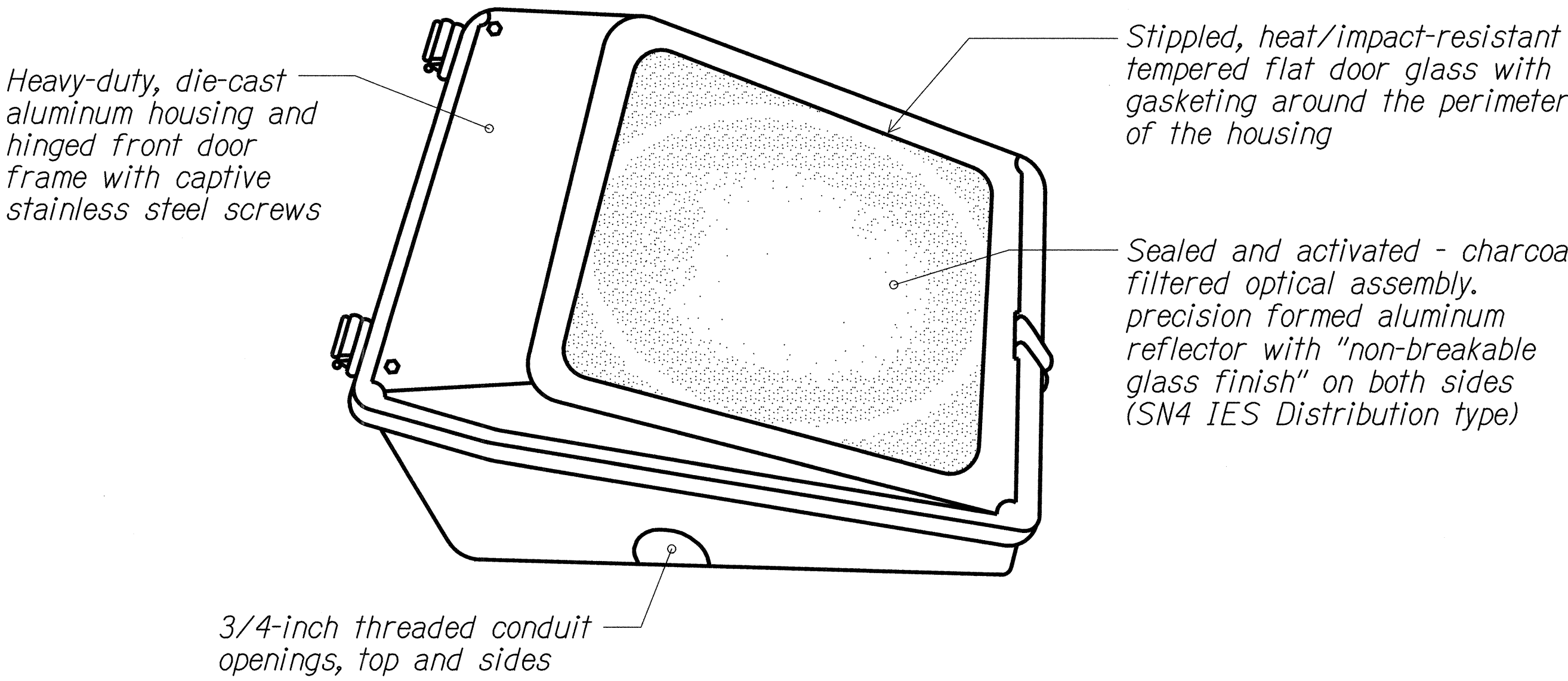


This work was prepared by me or under my supervision.
Robert S. Sforzo
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04

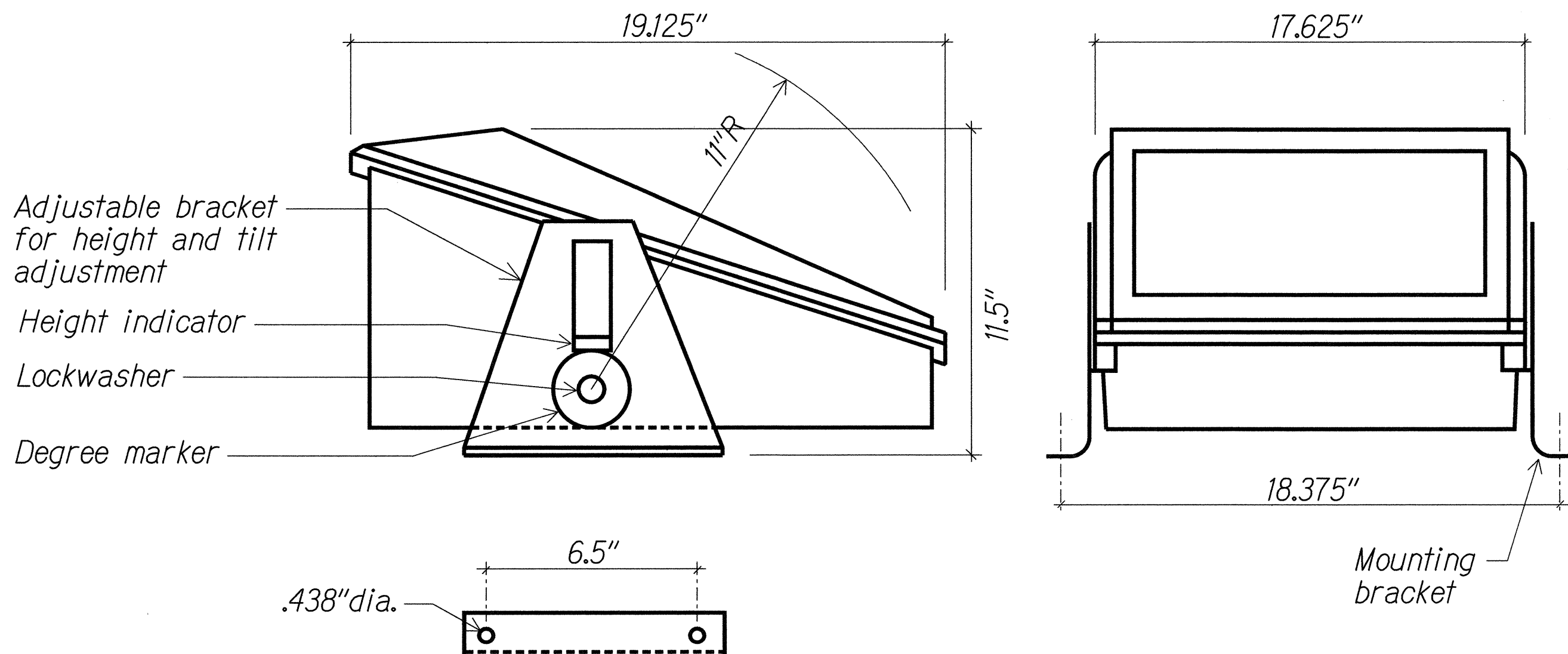
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN ELEVATION AND DETAIL
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-30 OF 92 SHEETS

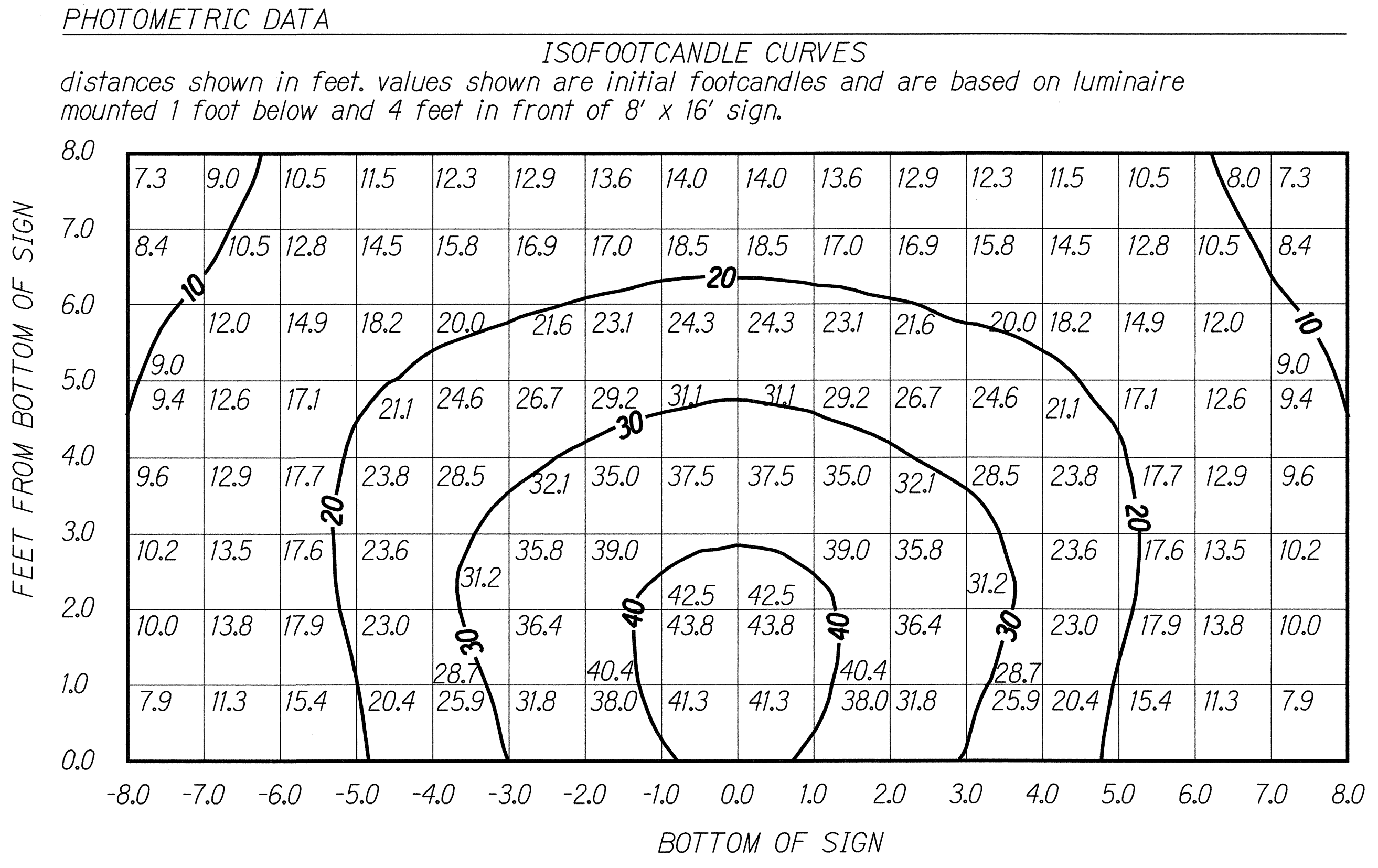
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002		92



Lamp: 175w metal halide
Ballast: 480v auto regulator type (integral with unit)
Finish: gray



SIGN LUMINAIRE DETAIL
Not to Scale



SHORT NON-CUTOFF TYPE IV

- NOTES:
1. Aim light fixtures to provide even illumination of signs.

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

Professional Engineer Seal for R.C. KATAHARA, No. 3181-E, HAWAII, U.S.A.

This work was prepared by me or under my supervision.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN LUMINAIRE DETAIL

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-31 OF 92 SHEETS

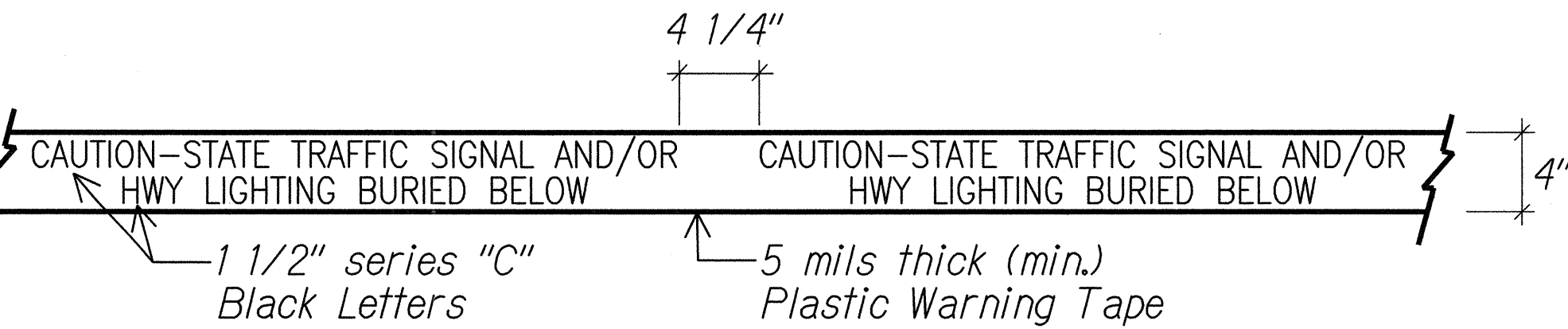
STATE RIGHT-OF-WAY BACKFILL NOTES

- Trench Backfill Material "A"
Beach Sand, Earth or Earth
and Gravel. If Earth and Gravel
used, the maximum shall contain
not more than 50% by volume of
rock particles. Maximum 8" loose
fill per lift. Obtain 95% compaction
for each lift.
- Concrete
3000 psi compressive strength @ 3 days.

NOTE: Base Course & Sub-Base Course per
1994 State Standard Specifications
for Highway Construction.

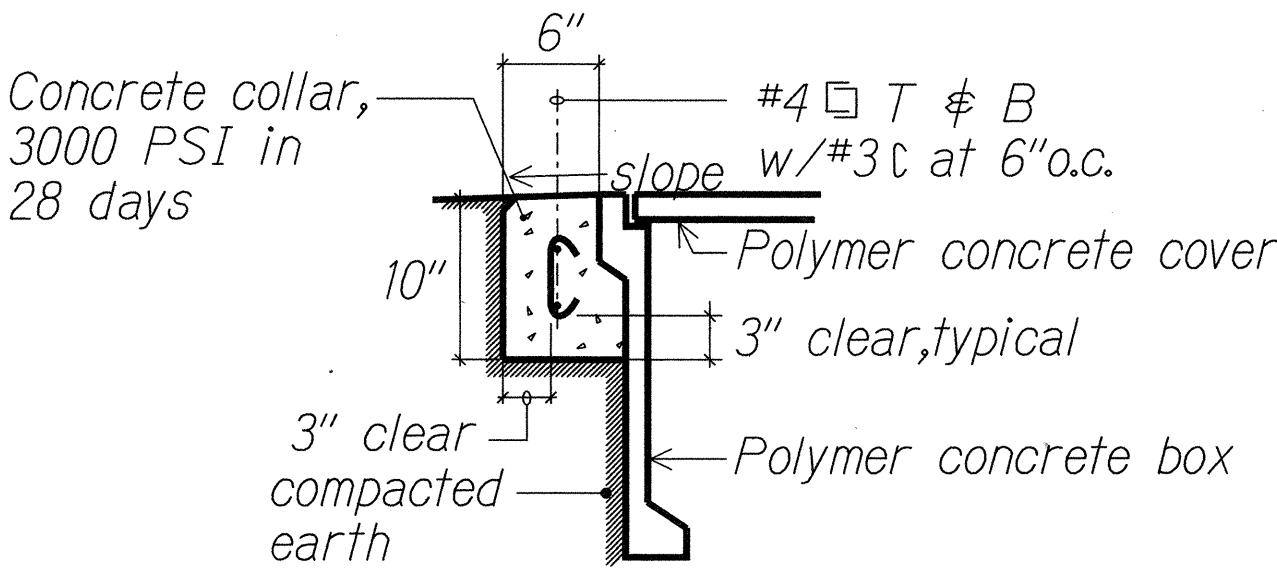
GENERAL NOTES

- If trench is located on unpaved area, the Contractor shall replace 10" A.C. Base Course and 4" A.C. Pavement with Type "A" backfill material.
- The Metal Detectable Red Plastic Warning Tape shall be a minimum 5 mils thick and 4" wide with a continuous metallic backing and corrosion resistant 1 ± mil thick foil core. The message on the tape shall read, "CAUTION - STATE TRAFFIC SIGNAL AND/OR HWY LIGHTING BURIED BELOW," utilizing 1 1/2 " inches series "C" black lettering. The message will be repeated with a 4 1/4 " spacing between top line of message and start of next repeat.
- The Contractor may begin backfilling the conduit trench when the concrete reaches 3000 psi compressive strength after 3 days.
- Maximum four (4) Conduits per row for multiple conduit duct section.
- For direct buried duct sections, the concrete jacket required at the conduit by-pass for various utilities, shall not be paid for separately but considered incidental to the direct buried conduits.
- After installing all the traffic signal cables, the Contractor shall duct seal all conduits in the pullboxes, traffic signal standards and traffic signal controller cabinet concrete base. The duct seal material shall be approved by the Traffic Signal Inspector/Engineer and shall not be paid for separately but considered incidental to the direct buried and/or concrete encased conduits.



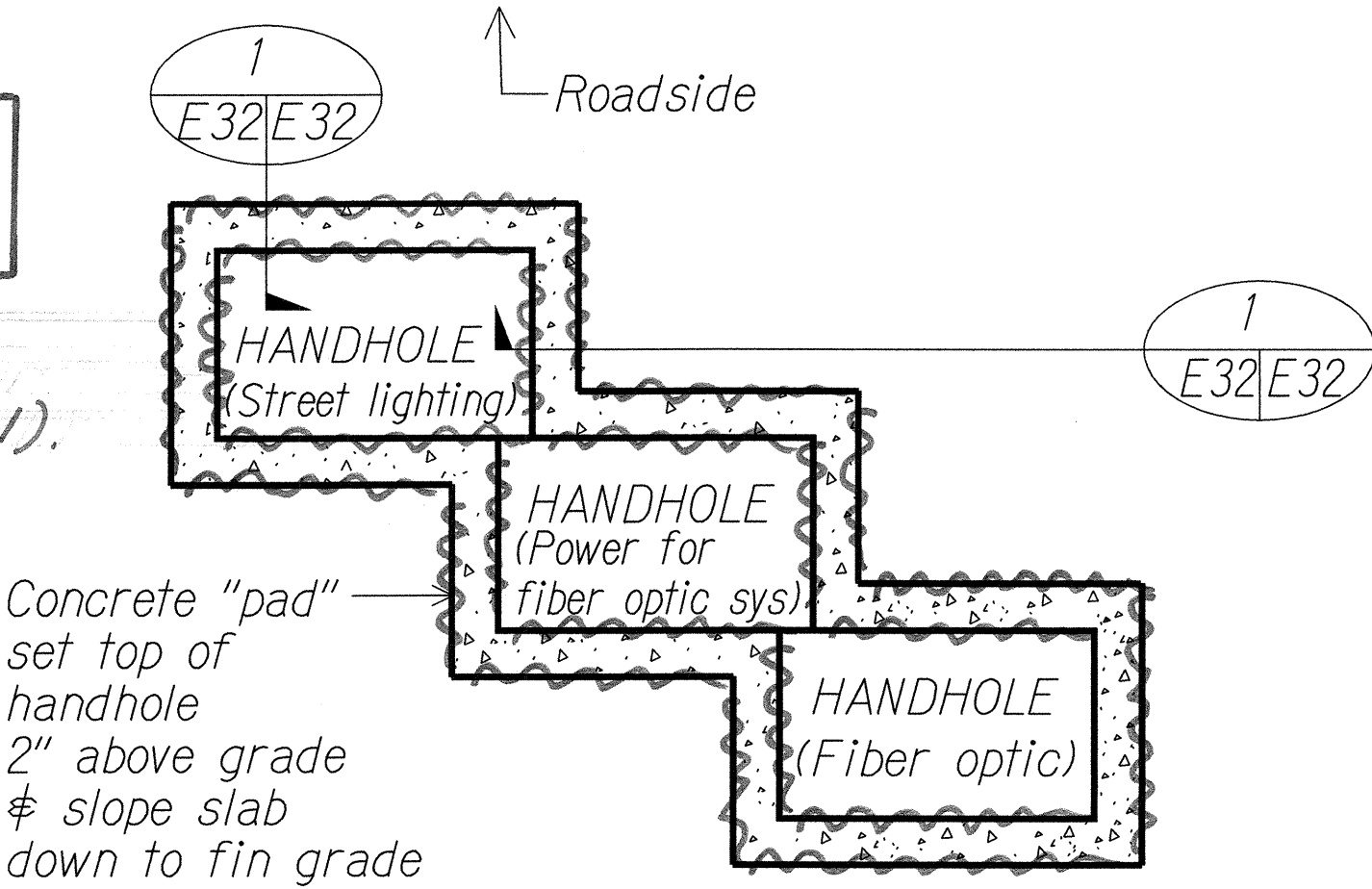
For additional information see note no. 2

METAL DETECTABLE RED PLASTIC WARNING TAPE



1 CONCRETE COLLAR AT HANDHOLE
E26 E32 Not to scale
01402-D2

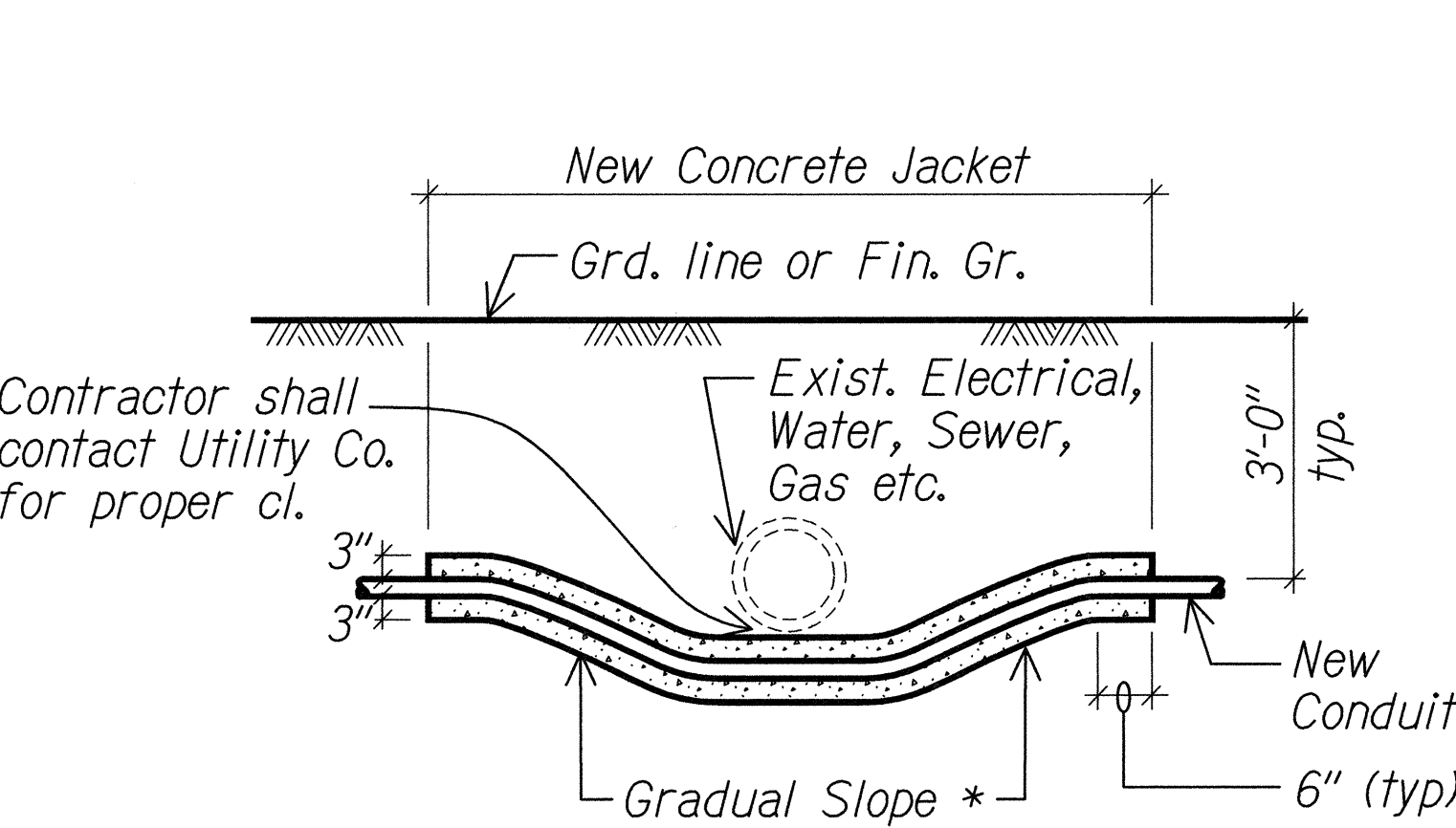
Handhole Arrangement
Reconfigured to fit within
Available Space. (See Note 1).



2 TYPICAL HANDHOLE GROUP PLAN
E32 E32 Not to scale
01402-D2

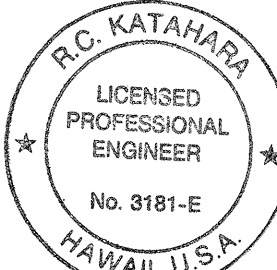
NOTES:

- Adjust spacing as required based on field conditions.
- Restore surrounding conditions damaged by installation of handholes and associated ductlines to the original condition at no cost to the State.



* To be determined by State Electrical Inspector/Engineer

CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES



This work was prepared by me
or under my supervision.
Date: 5/2/02
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

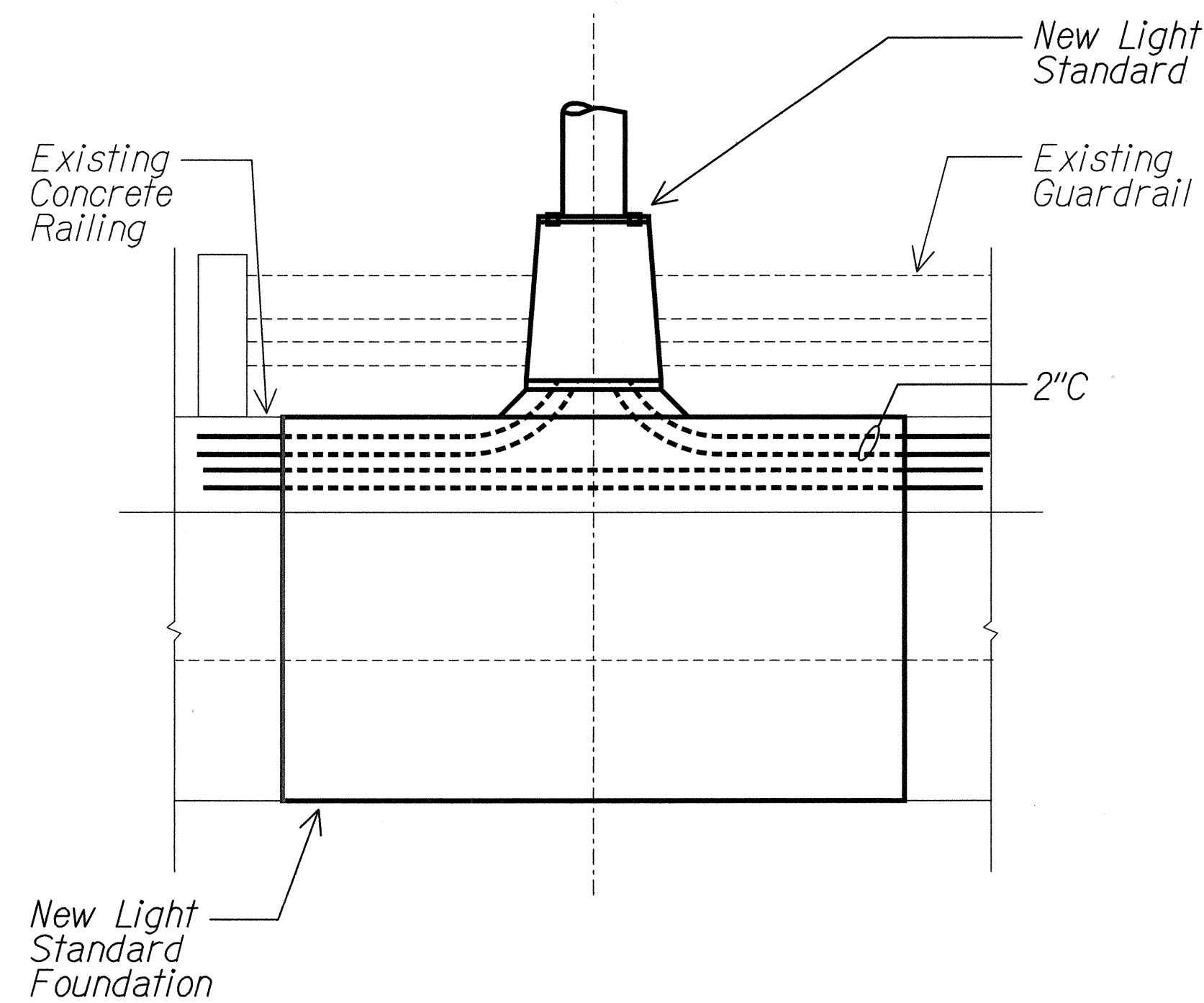
MISCELLANEOUS DETAILS

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-32 OF 92 SHEETS

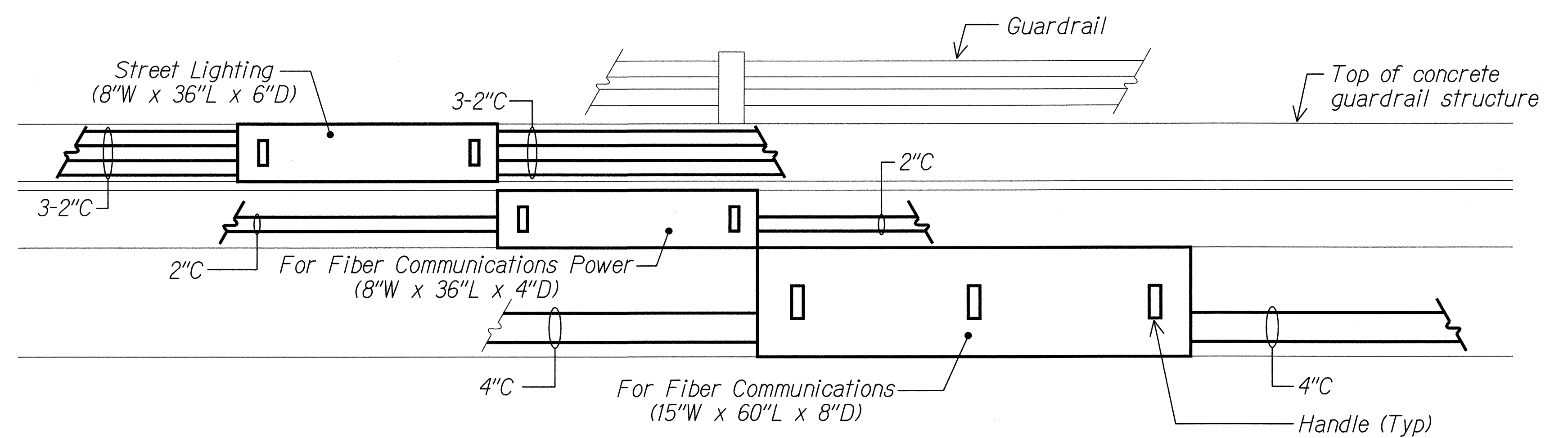
"AS-BUILT"

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



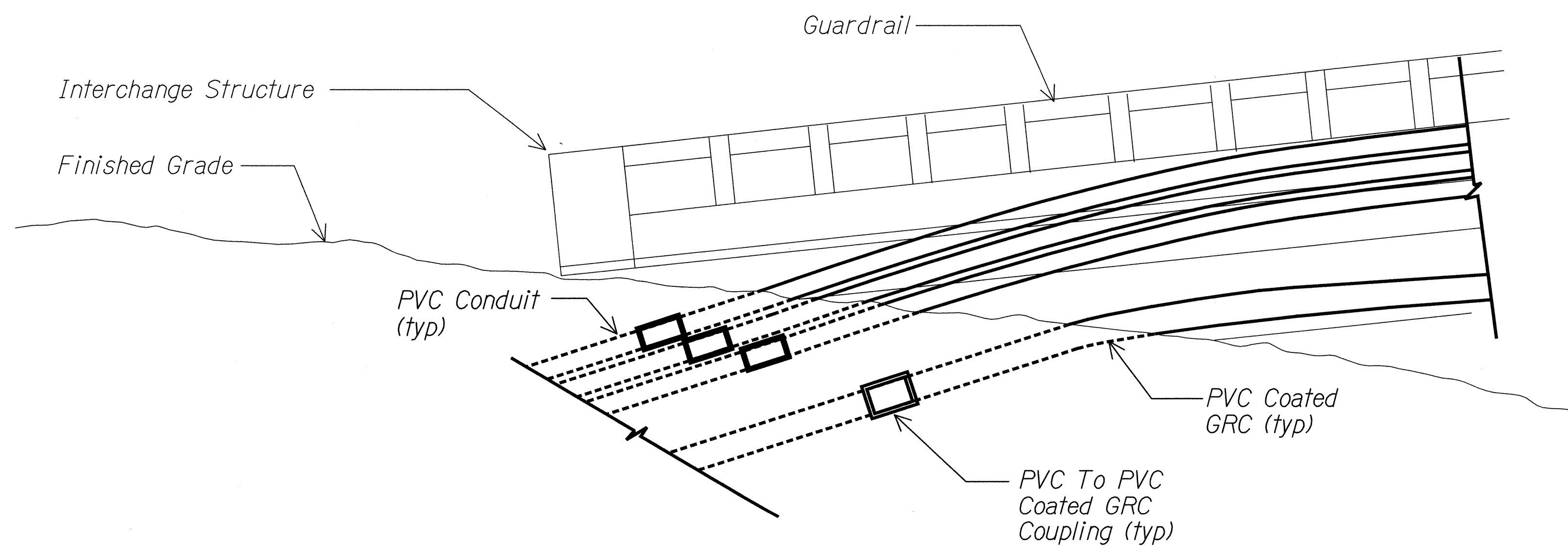
2 LIGHT STANDARD MOUNTING DETAIL -
AIEA INTERCHANGE STRUCTURE No. 2
NTS 01402D39

- NOTES:
1. See structural drawings for additional information on foundation.



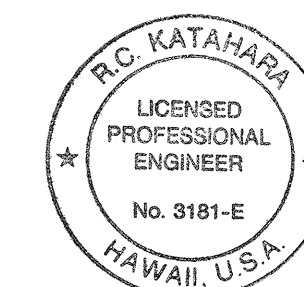
PULLBOX MOUNTING DETAIL
NTS 01402D33

- NOTES:
1. Conduits shall be PVC coated galvanized conduit. Inside of conduit shall also be coated.
 2. See structural drawings for detail on mounting pullbox to existing structure.
 3. All pullboxes shall be NEMA 4X stainless steel.



1 PVC TO PVC COATED GRC TRANSITION DETAIL
NTS 01402D41

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



This work was prepared by me or under my supervision.

Dekehan 5/2/02
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04

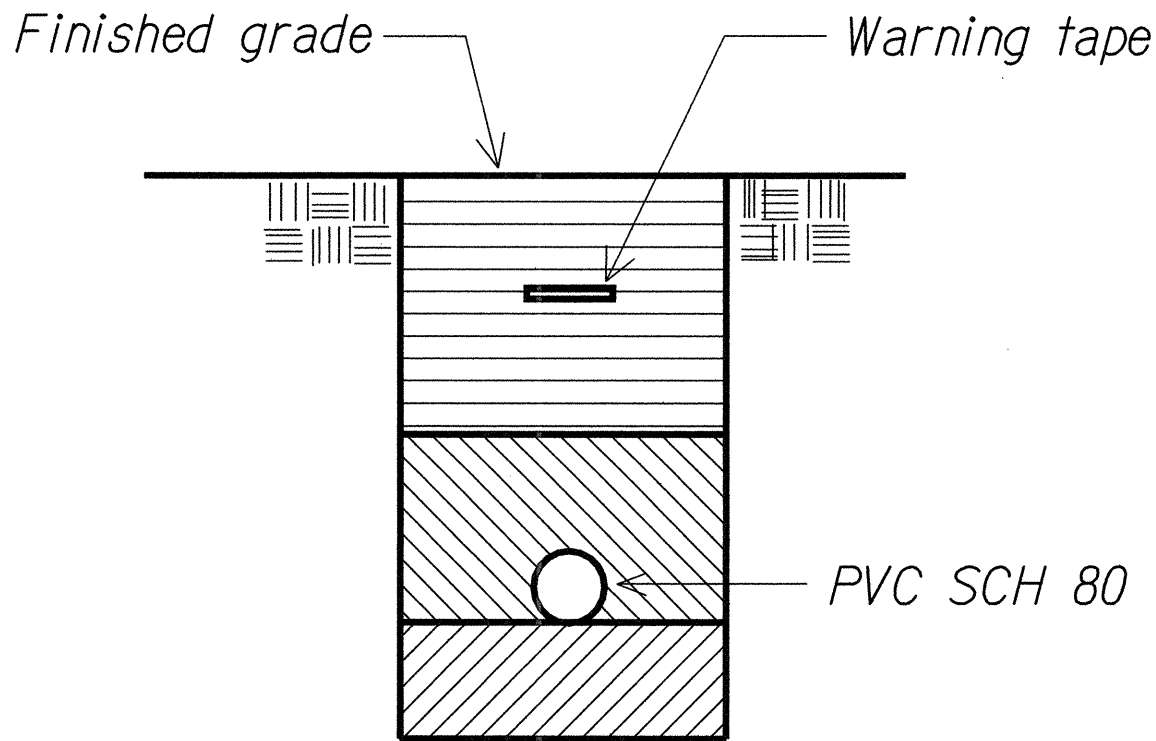
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MISCELLANEOUS DETAILS

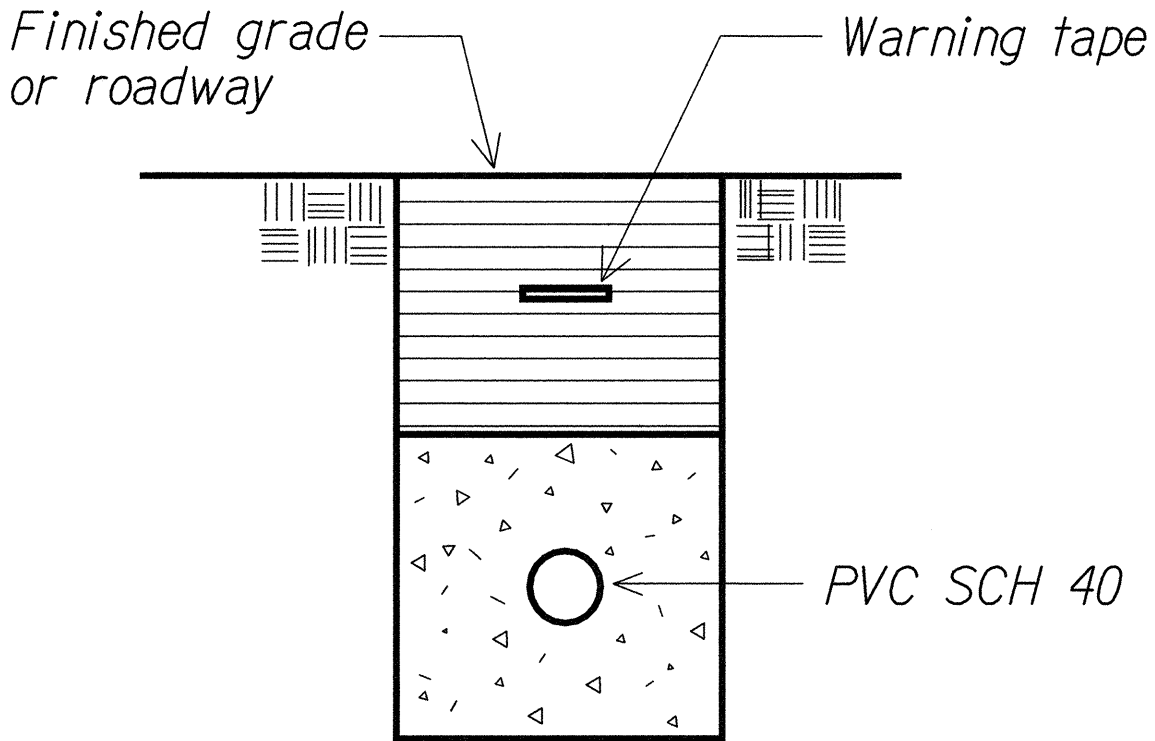
MOANALUA FREEWAY LIGHTING IMPROVEMENTS
Kamehameha Highway to H1 Halawa Interchange
Proj. No. 78A-01-02M
Oahu, Hawaii

Scale: As Noted Date: May 2002
SHEET No. E-33 OF 92 SHEETS

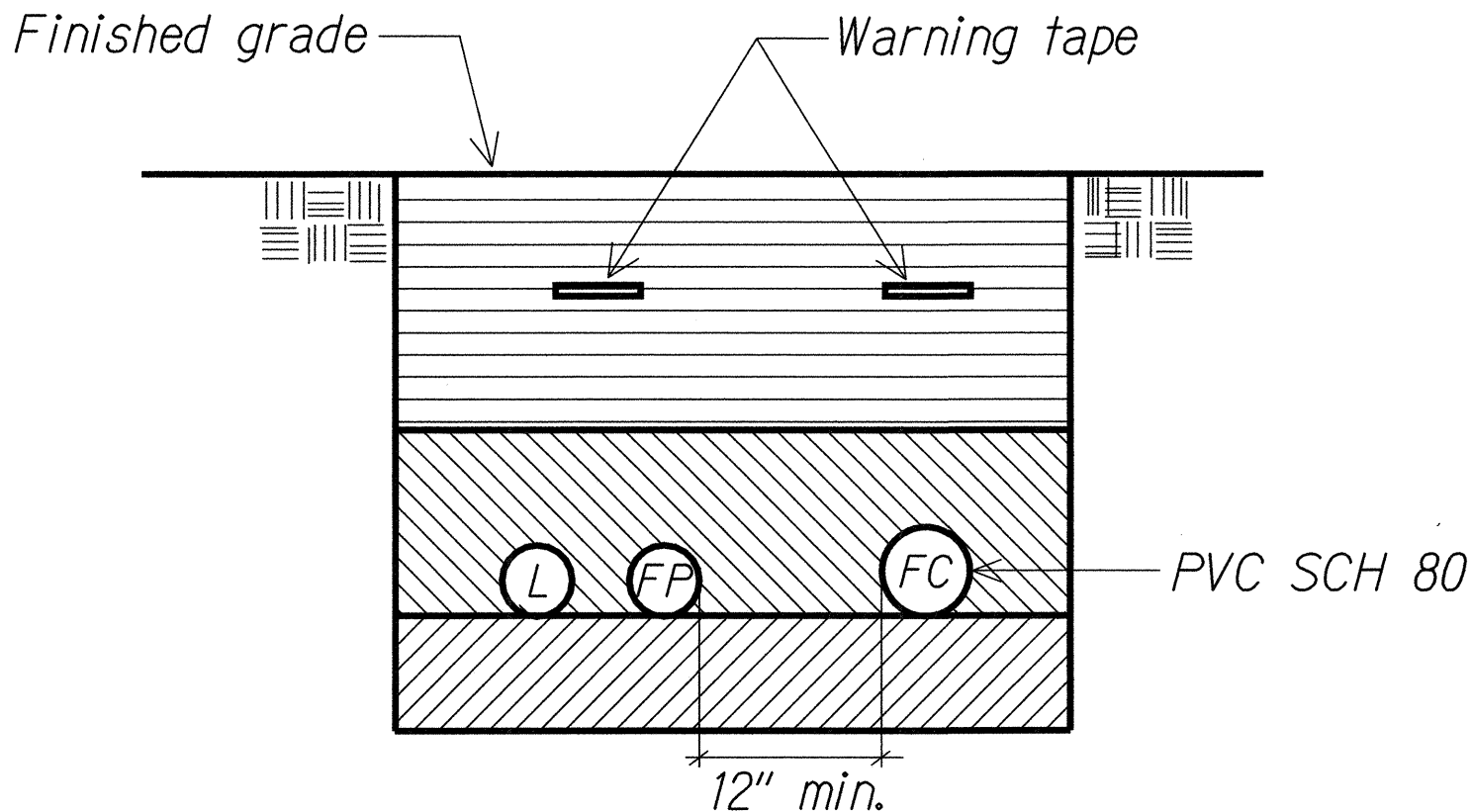
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	78A-01-02M	2002		92



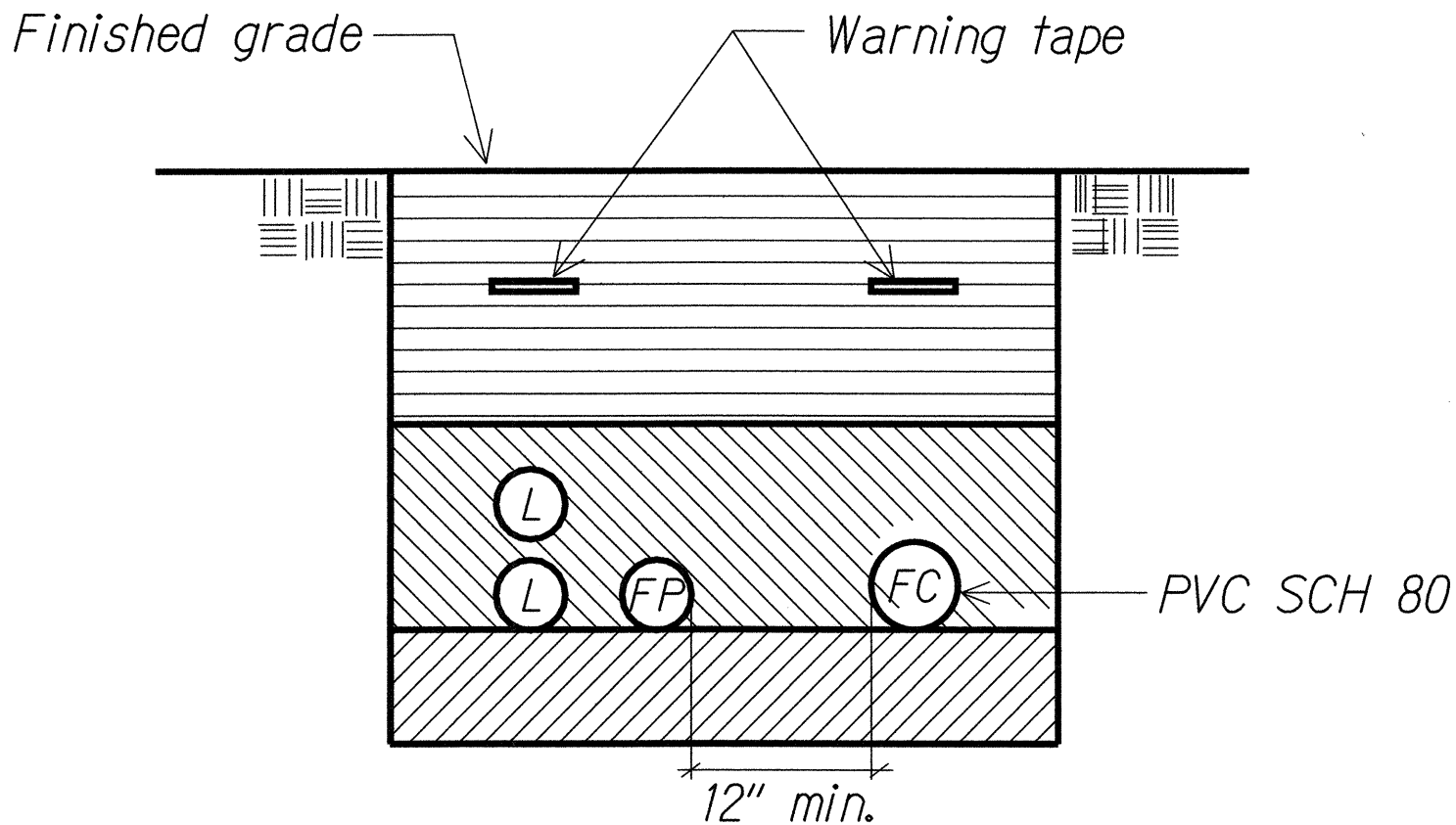
DUCT SECTION (A)



DUCT SECTION (B)

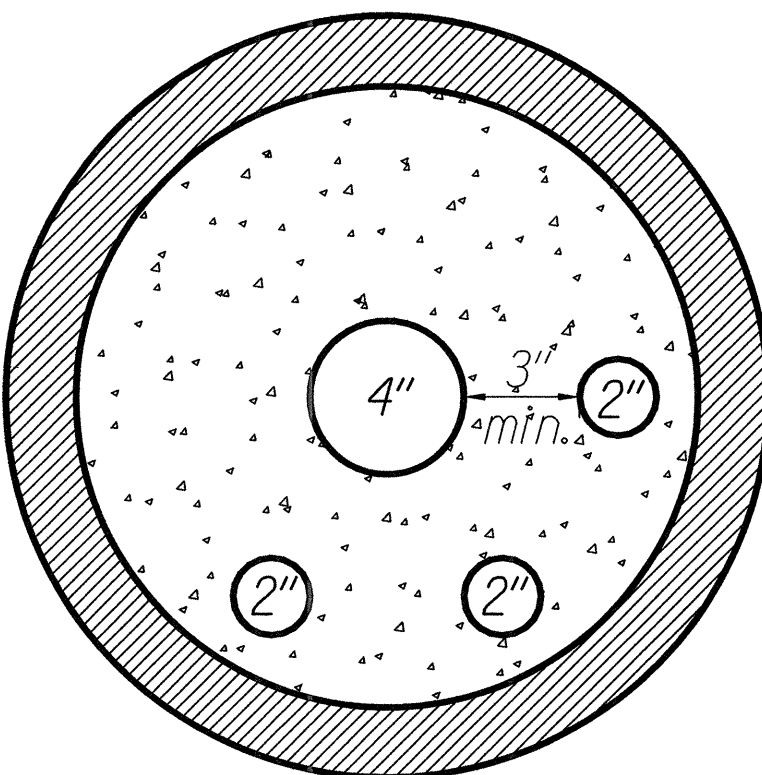


DUCT SECTION (C)

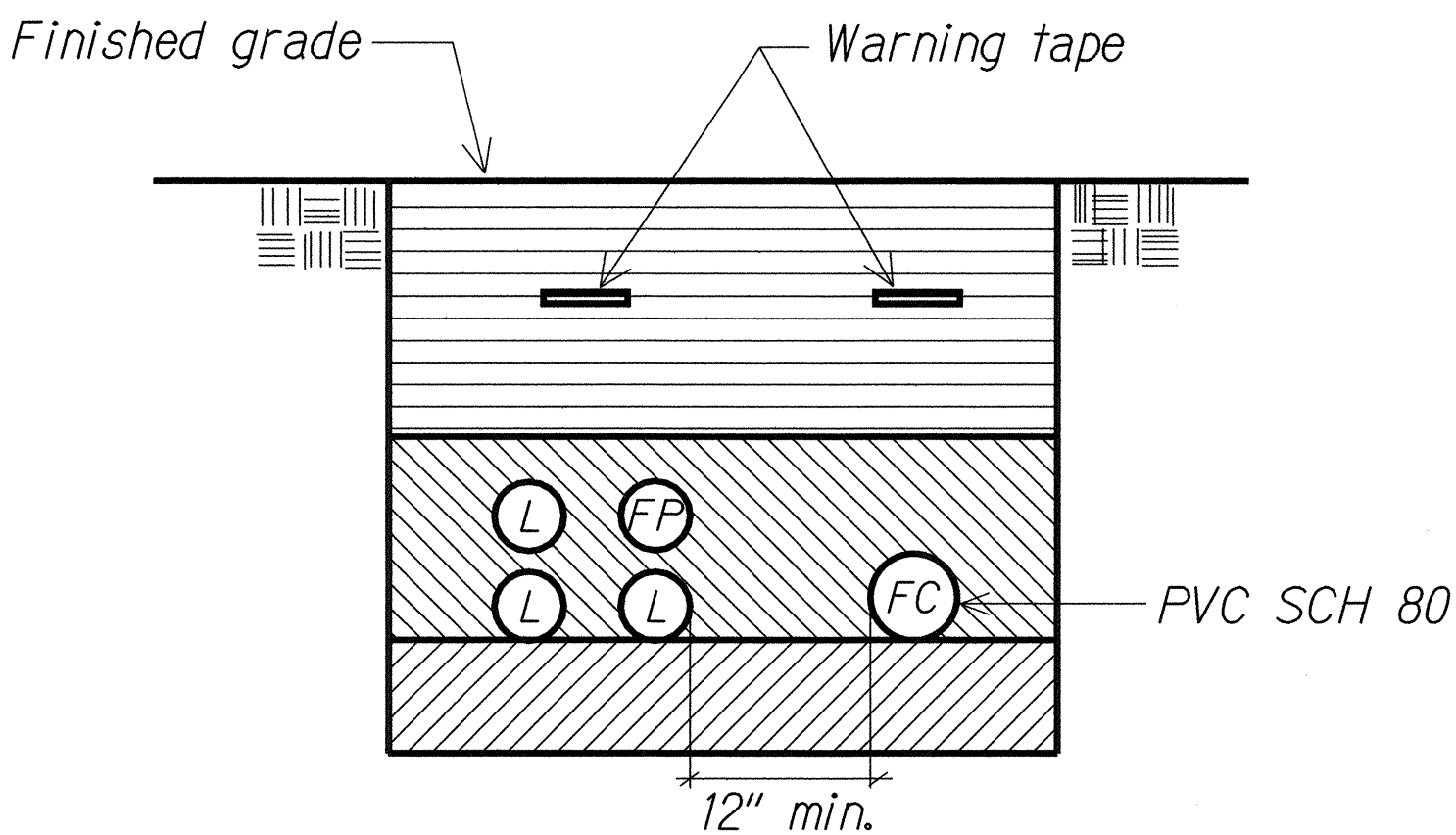


DUCT SECTION (D)

4 - 2" Conduits
1 - 4" Conduit
HDPE DR 11 Pipe 20" Nominal
20.00 O.D.
16.146 I.D.

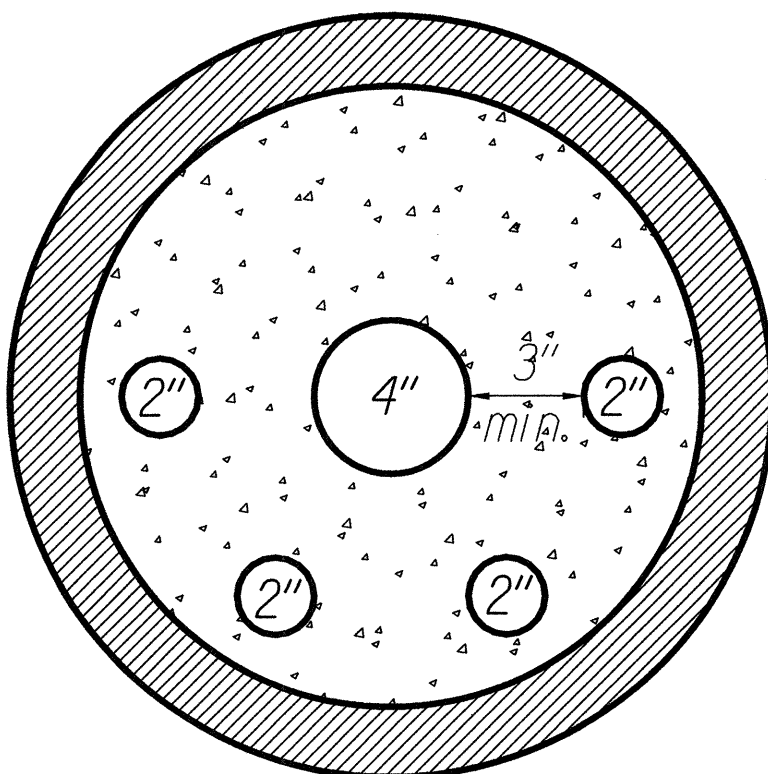


DUCT SECTION (E)



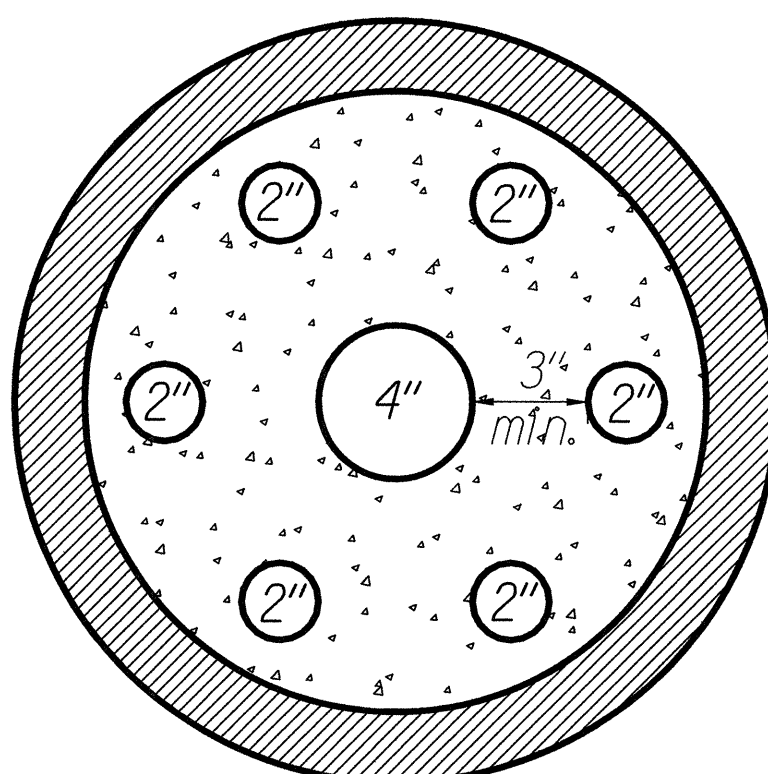
DUCT SECTION (F)

4 - 2" Conduits
1 - 4" Conduit
HDPE DR 11 Pipe 20" Nominal
20.00 O.D.
16.146 I.D.



DUCT SECTION (G)

6 - 2" CONDUITS
1 - 4" CONDUIT
HDPE DR 11 PIPE 20" NOMINAL
20.00 O.D.
16.146 I.D.



DUCT SECTION (H)

DUCT SECTION DETAILS

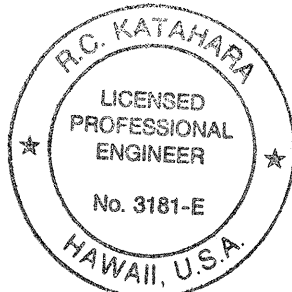
Not to Scale

01402D16

NOTES:

1. Refer to sheet E-34 for additional details.

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



This work was prepared by me or under my supervision.

R.C. KATAHARA 5/1/02

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

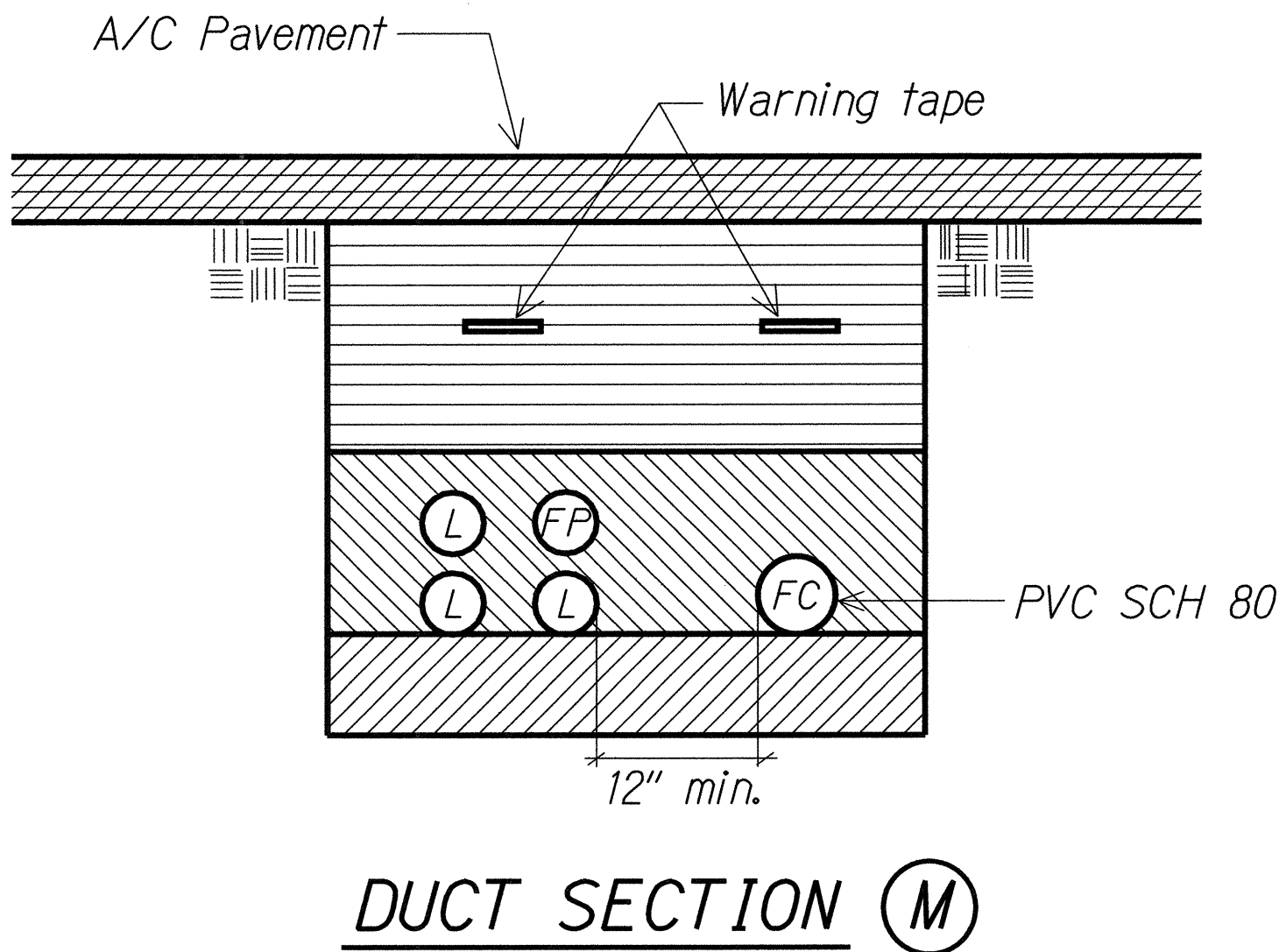
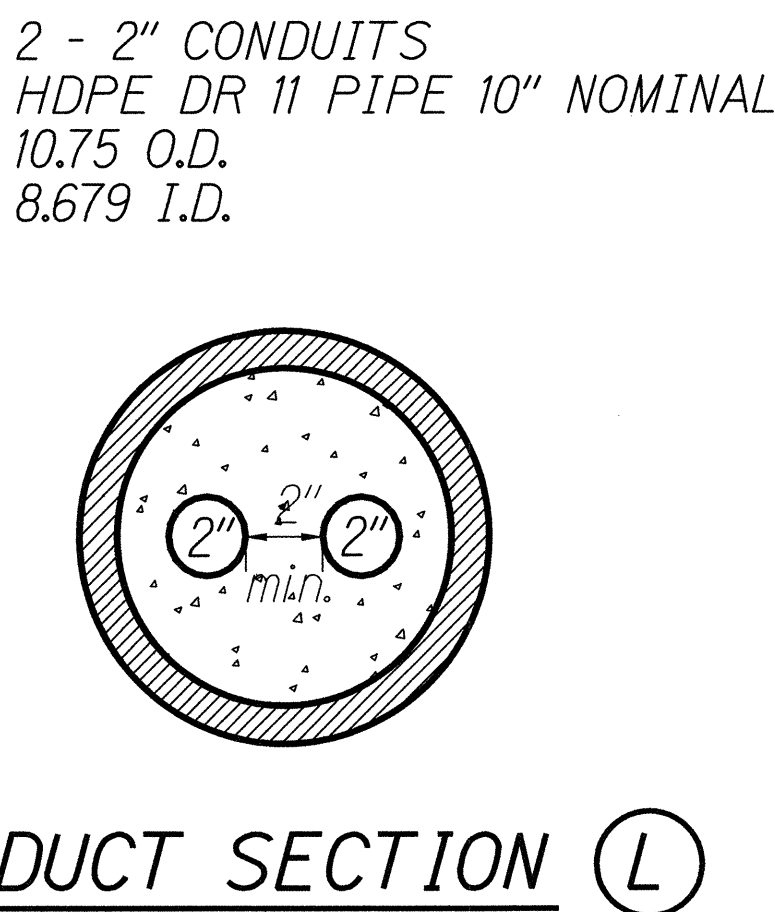
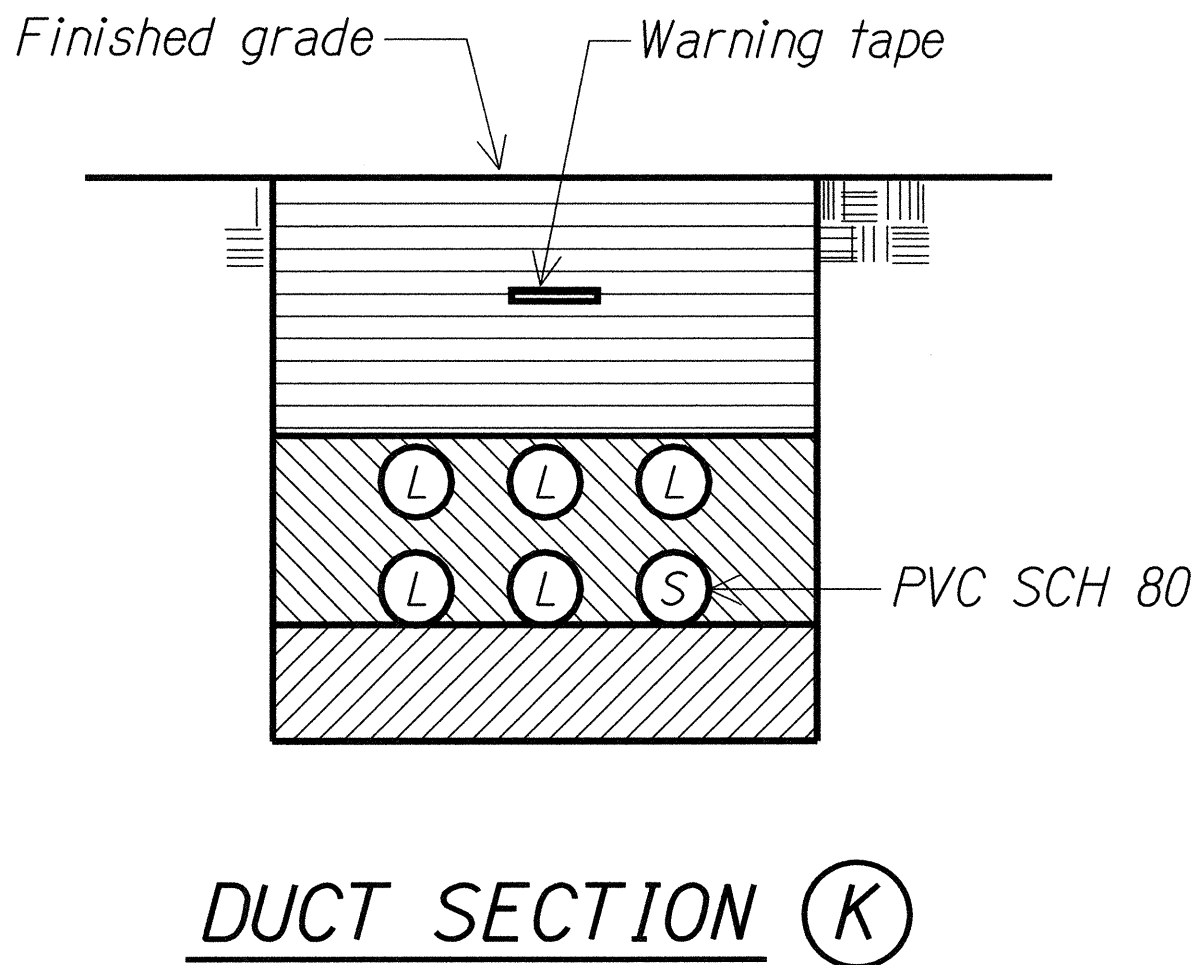
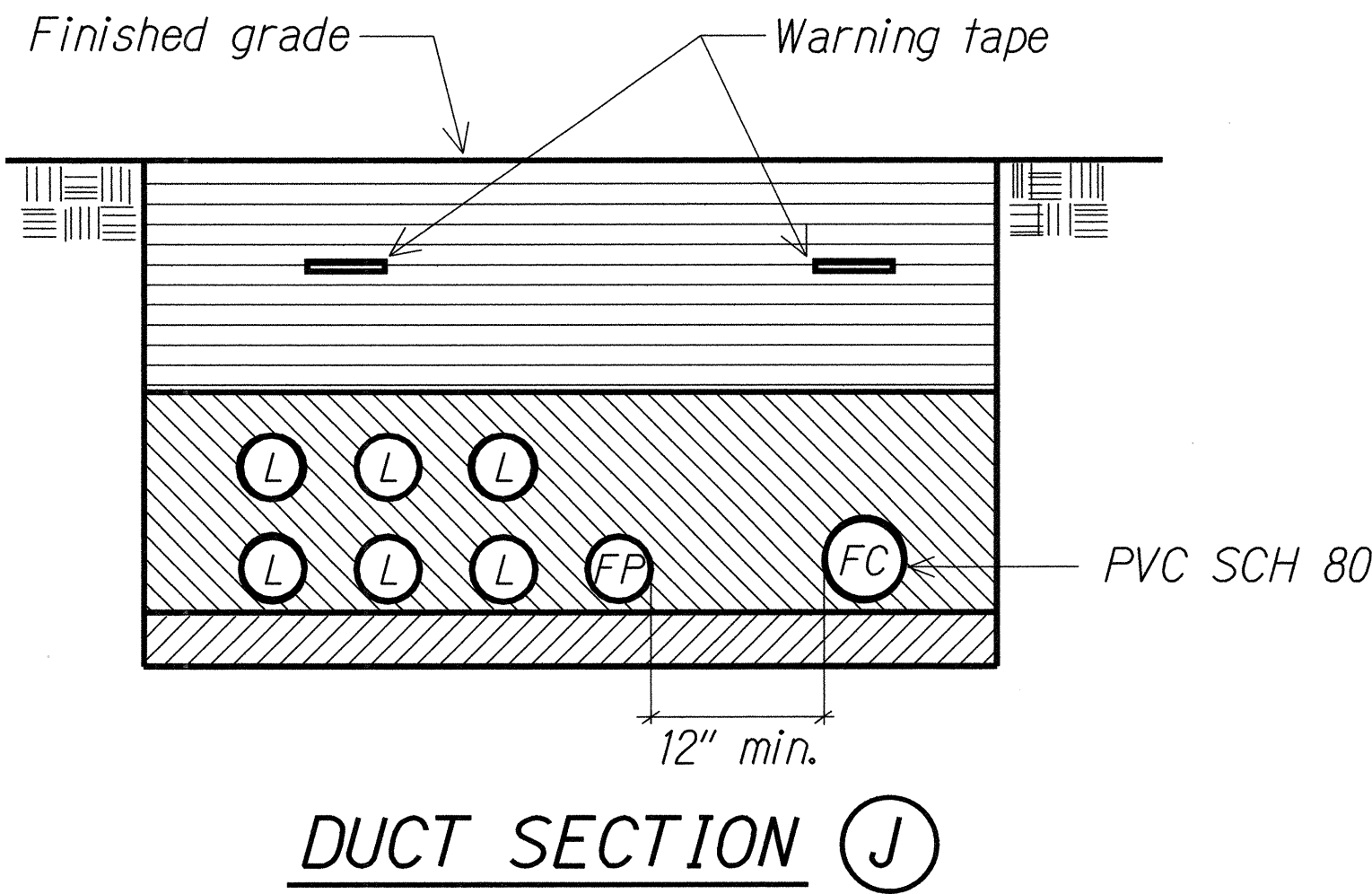
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS

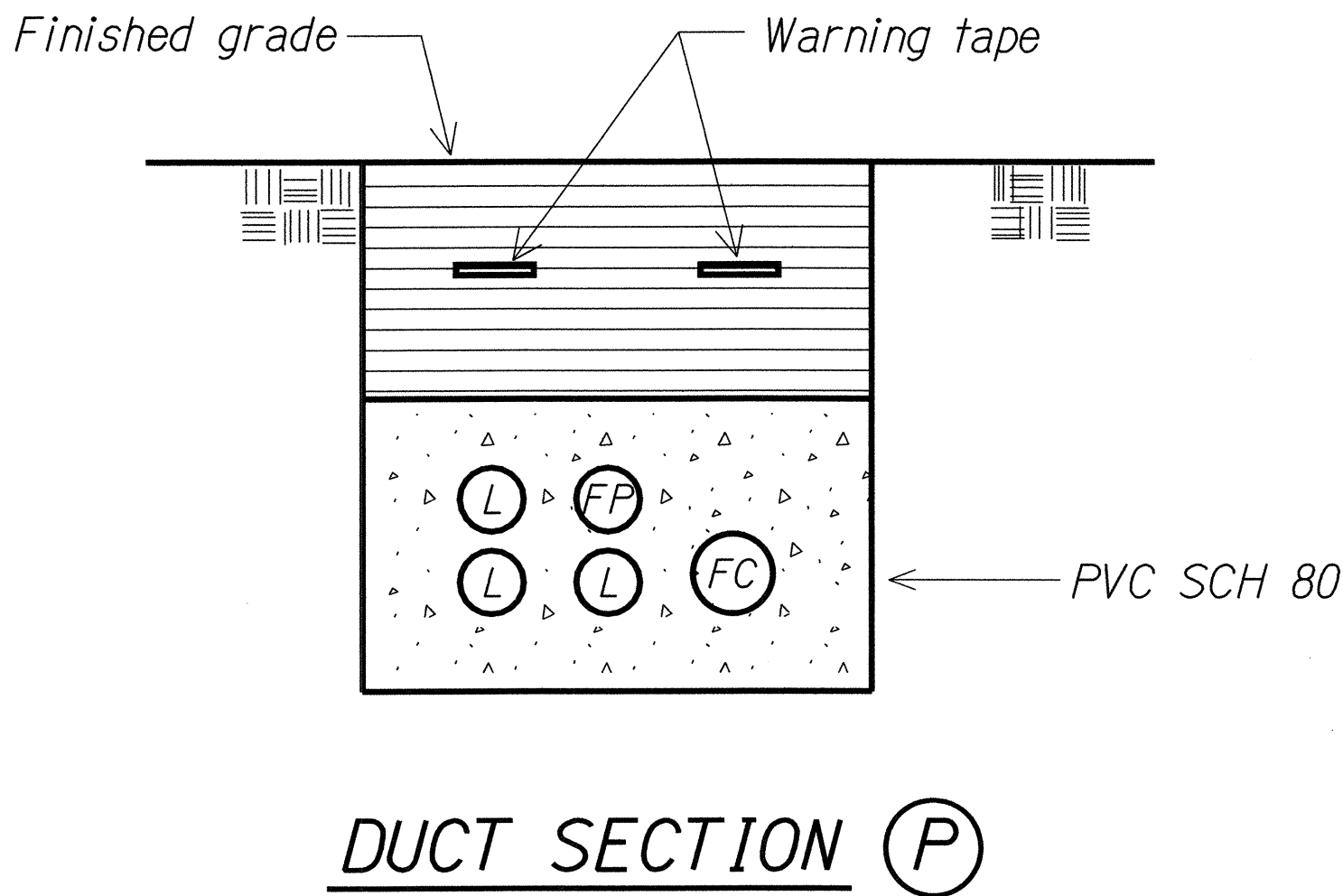
MOANALUA FREEWAY LIGHTING IMPROVEMENTS
Kamehameha Highway to H1 Halawa Interchange
Proj. No. 78A-01-02M
Oahu, Hawaii

Scale: As Noted Date: May 2002
SHEET No. E-35 OF 92 SHEETS

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



- NOTES:**
- See structural drawings for attachment detail.
 - Conduits shall be PVC Coated rigid conduit, coated on the inside.
 - Provide expansion and deflection/expansion fittings at every structure expansion joint.
 - Expansion fittings shall
 - be PVC coated rigid steel
 - have 4" movement
 - Deflection/expansion fittings shall:
 - be NEMA 4 watertight
 - suitable for use with PVC coated rigid conduit
 - have stainless steel bands
 - will allow for 30° deflection from normal in any direction
 - Fasten conduits to structure a minimum of every 5' on center.

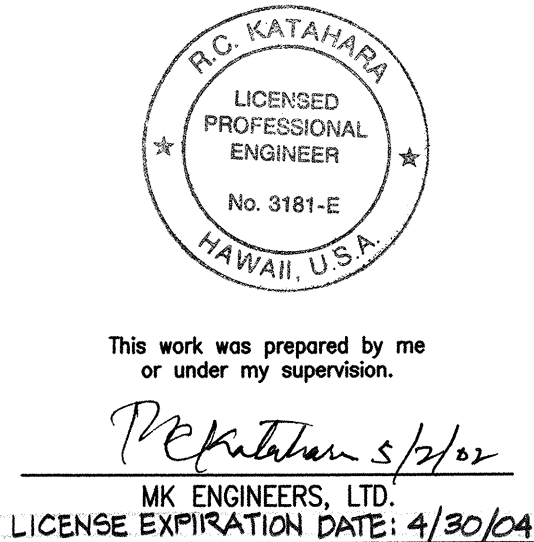


DUCT SECTION DETAILS

Not to Scale

- NOTES:**
- Refer to sheet E-34 for additional details.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	DESIGNED BY	
	CHECKED BY	
	CHECKED BY	



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

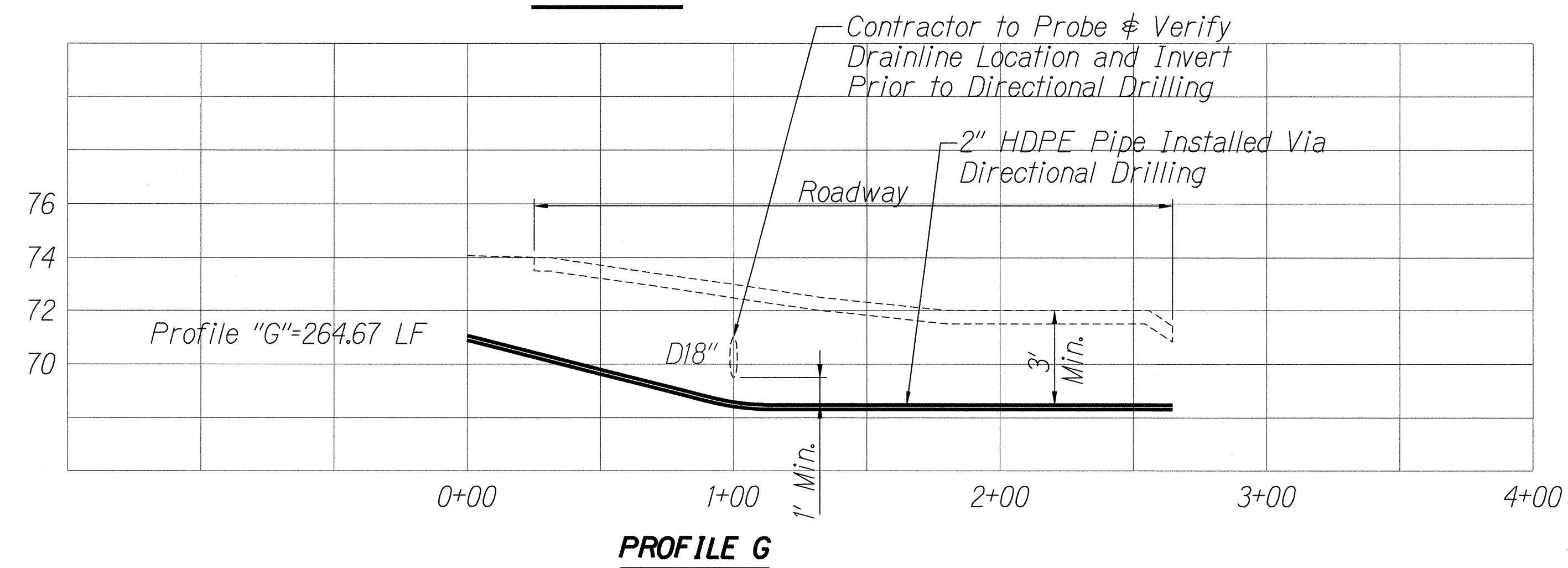
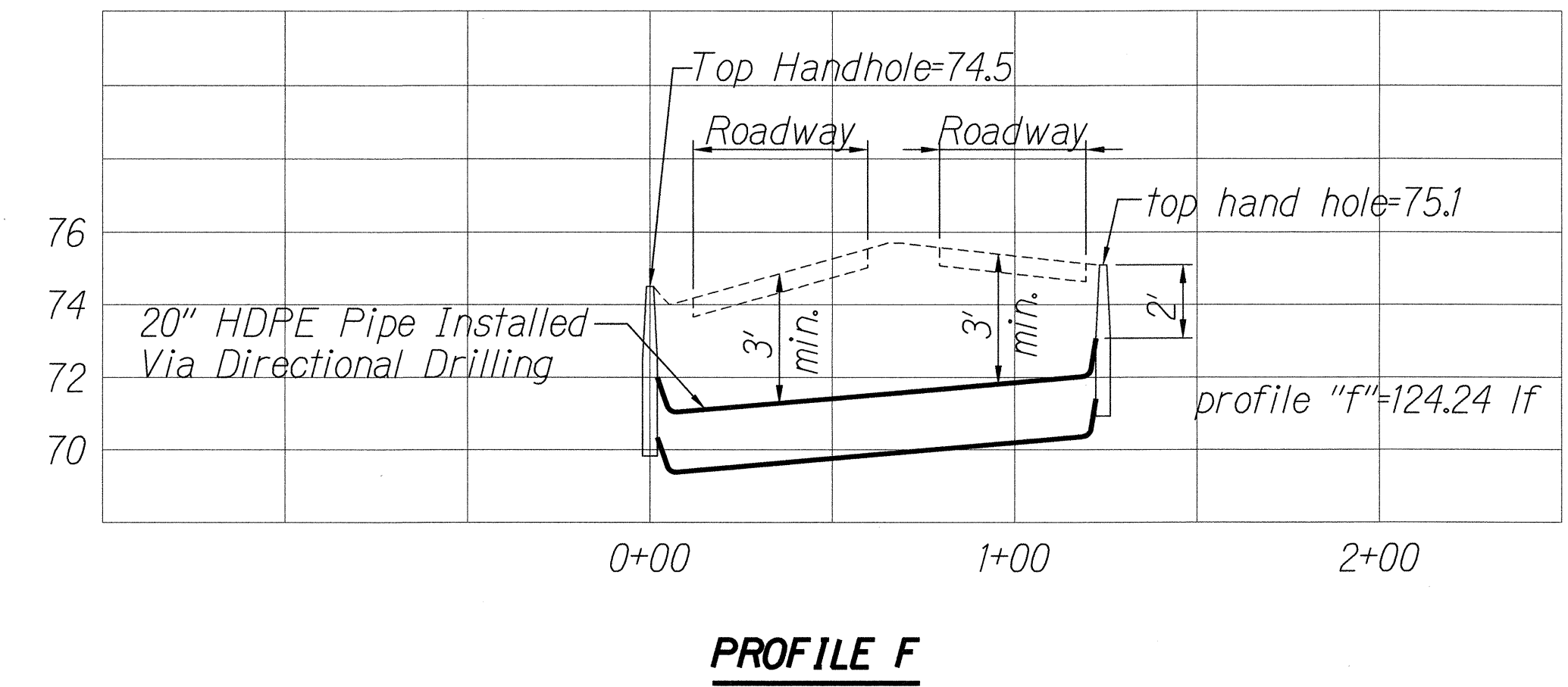
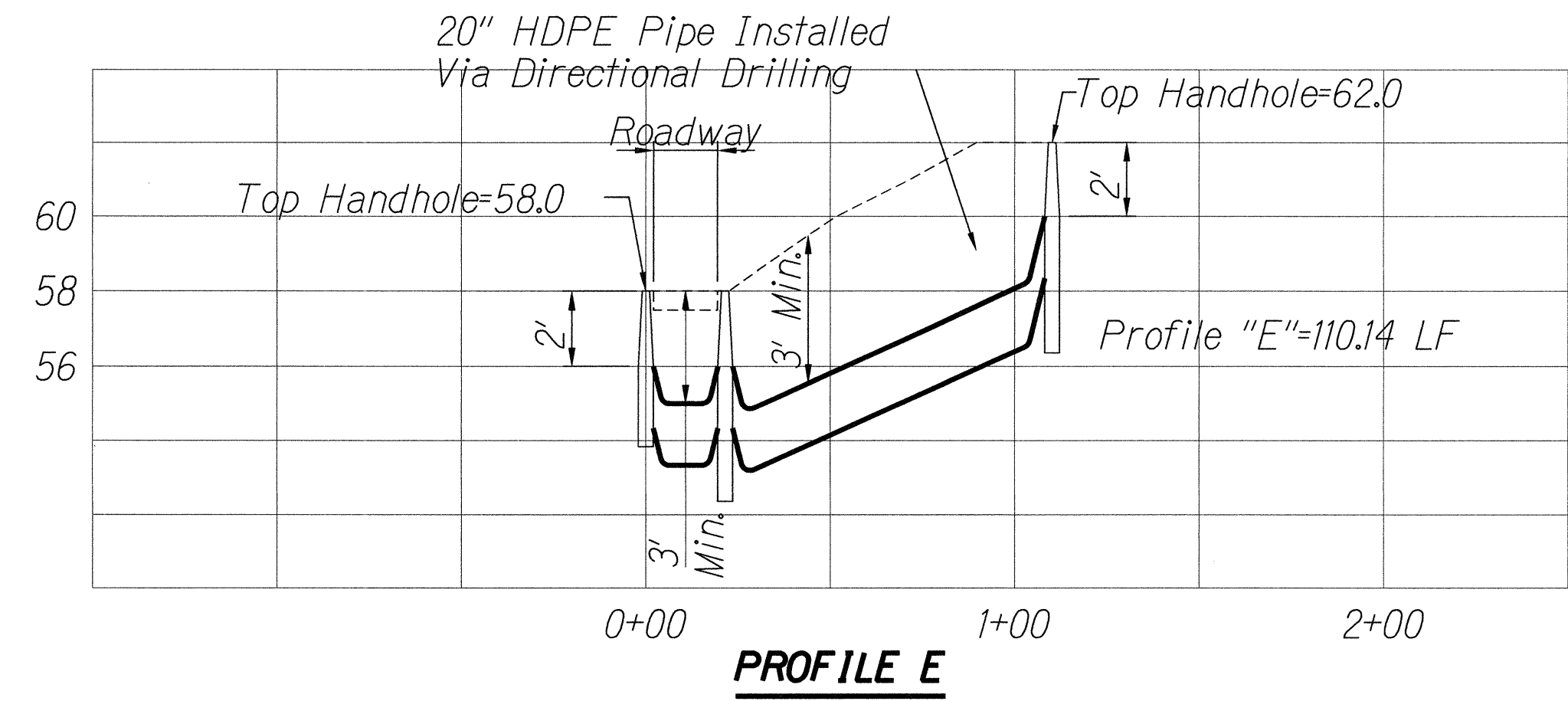
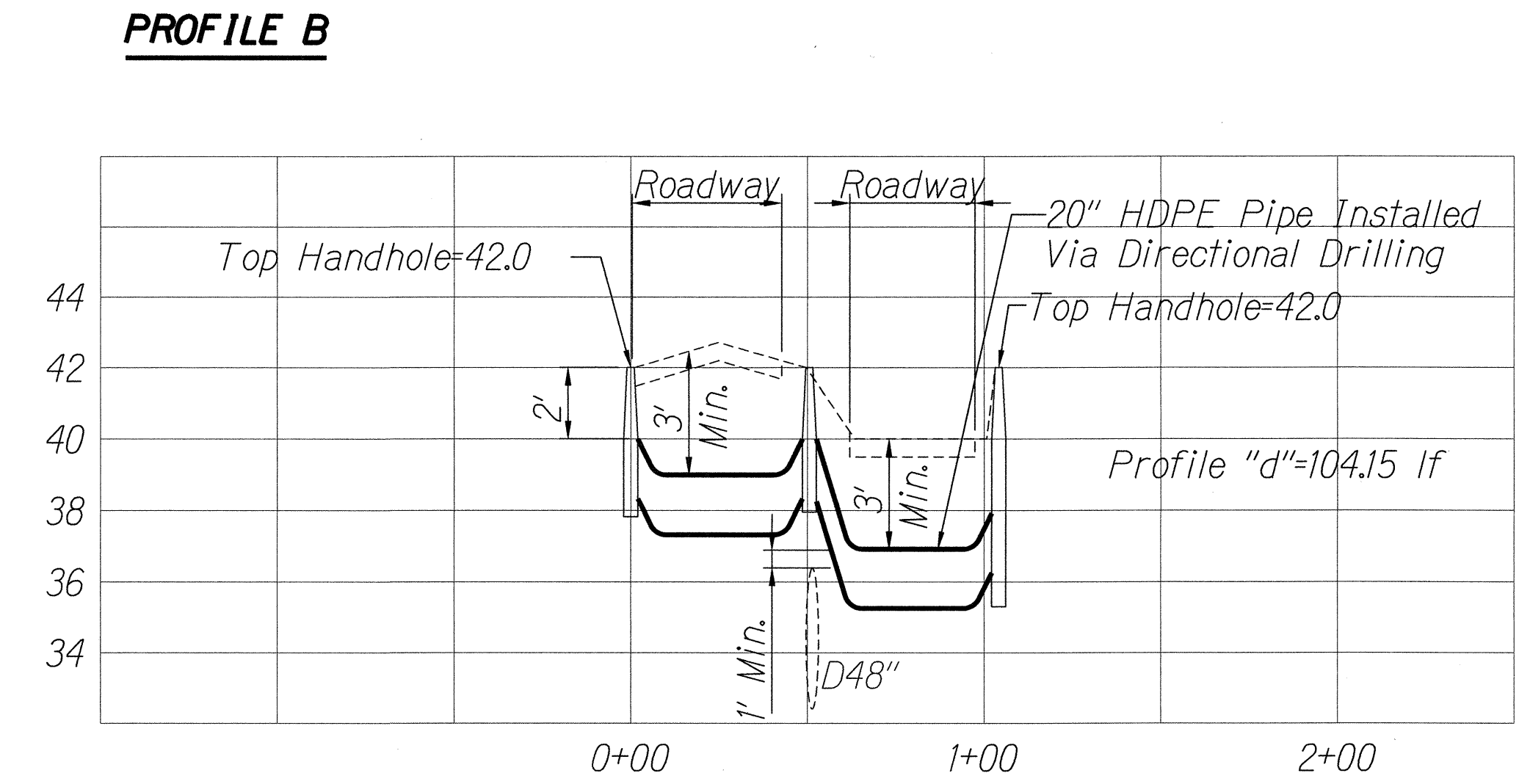
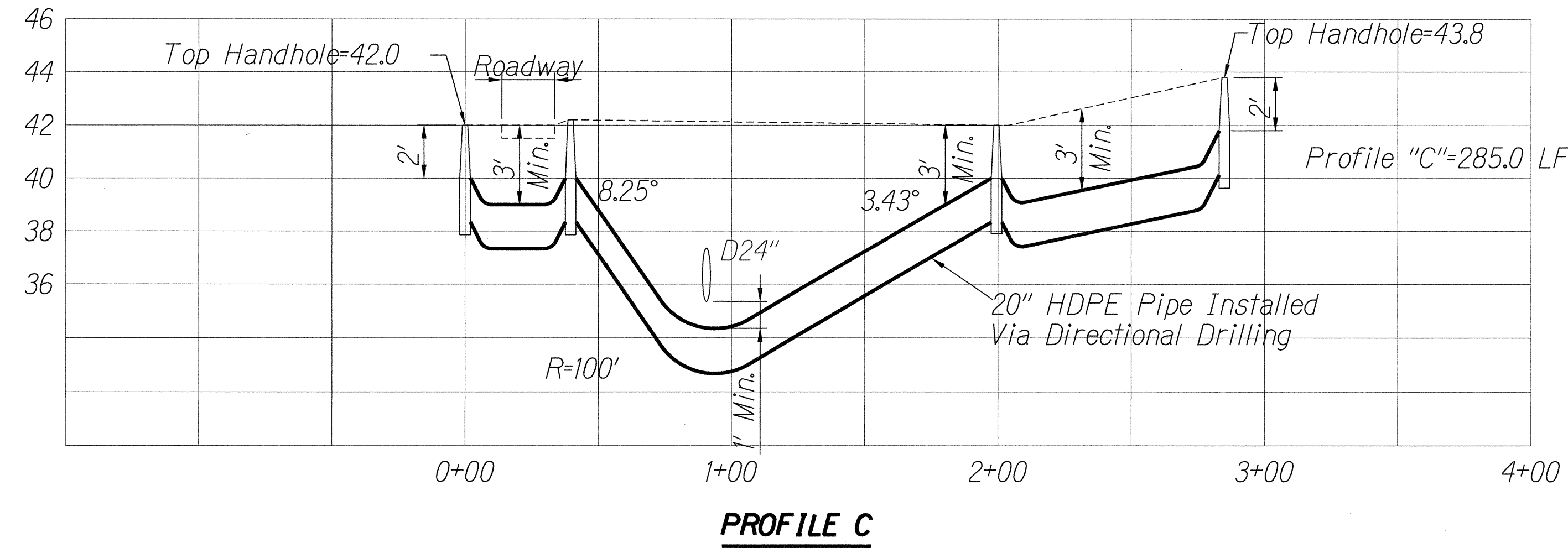
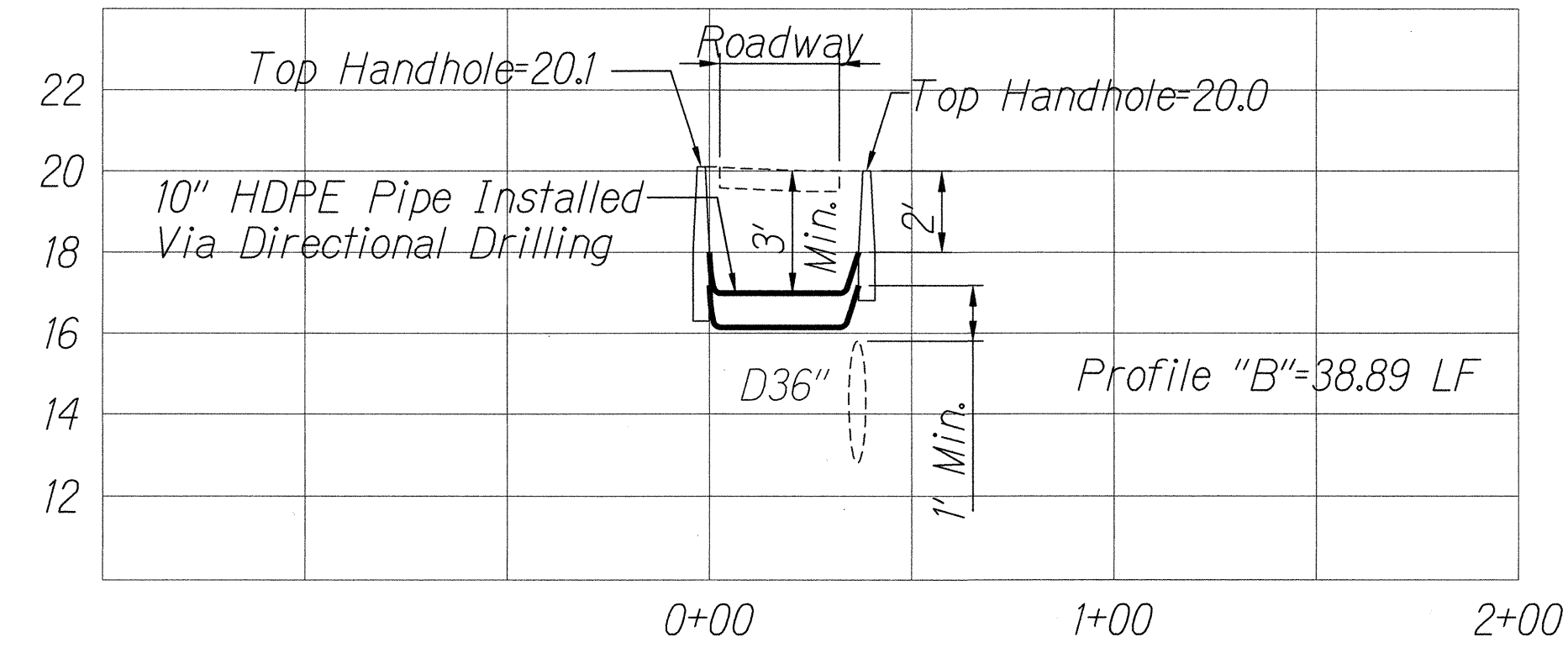
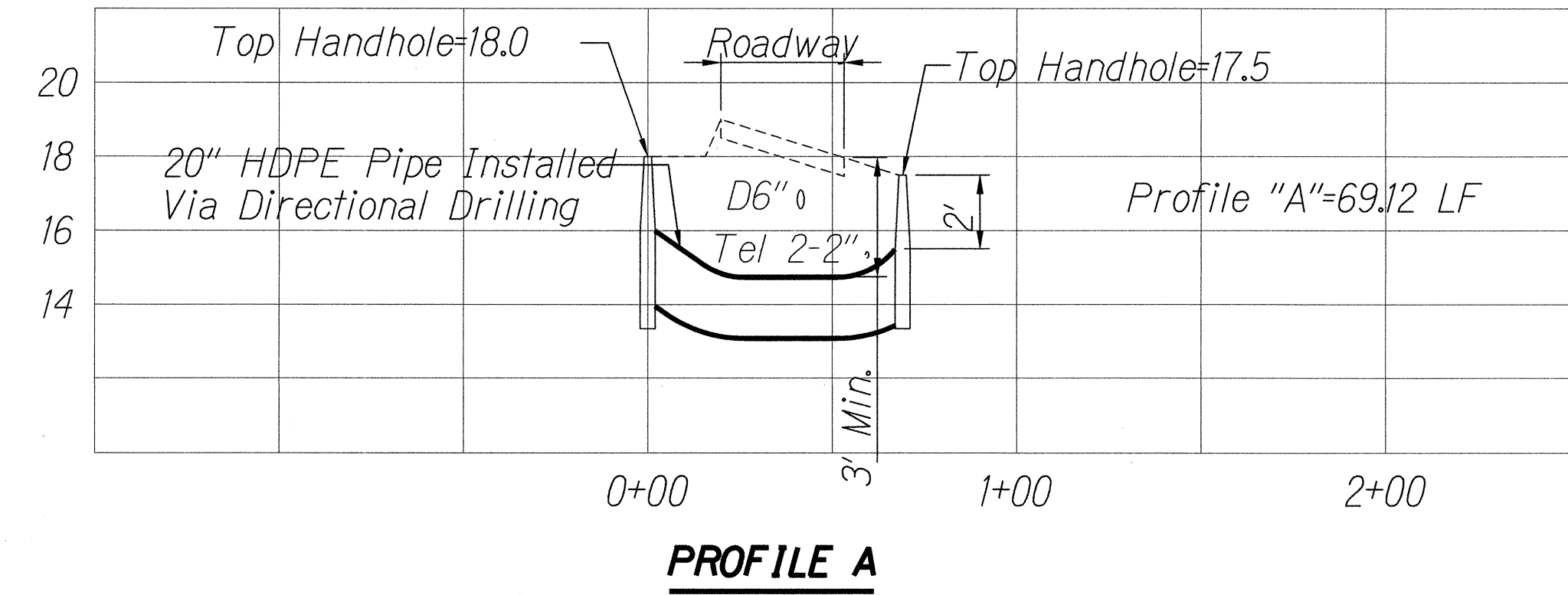
DUCT SECTION DETAILS

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

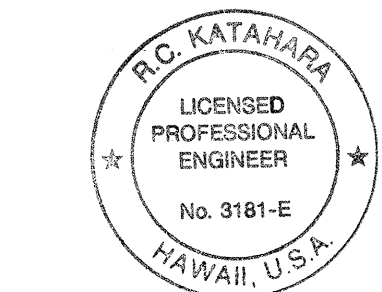
Scale: As Noted Date: May 2002

SHEET No. E-36 OF 92 SHEETS

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



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



This work was prepared by me
or under my supervision.
P.C. KATAHARA 5/6/02
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/04.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PROFILES

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-37 OF 92 SHEETS