FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	61	106

ELECTRICAL SYMBOLS

SYMBOL EXST	SYMBOL REMOVE	SYMBOL NEW	DESCRIPTION
			250W High Pressure Sodium Highway Light Standard, See Details Sheets E-21, 22, 23, 24 and E-26
			250W High Pressure Sodium Walkway Light Standard, See Details Sheet E-21
			250W Metal Halide Sign Light, See Detail Sheet E-33
			Traffic Signal Flashing Yellow Warning Light
			New Pedestrian Pushbutton Shall Meet Current American with Disabilities Act (ADA) Accessibility Guidelines, See Details on Sheet E-31
			Pedestrian Pushbutton Post, See Detail A/E-20
T			Traffic Signal Controller and Cabinet
J	J	J	J-Box, See Plan for Size

Abbreviation	Description
BL	Denotes Baseline
Exst / Exist	Denotes Existing
HLPB1	Denotes Highway Lighting Pullbox; "Highway Lighting Pullbox No. 1" Indicated
FOPB1	Denotes Fiber Optics Pullbox; "Fiber Optics Pullbox No. 1" Indicated
EPB1	Denotes Electric Pullbox; "Electric Pullbox No. 1" Indicated

SYMBOL EXST	SYMBOL REMOVE	SYMBOL NEW	DESCRIPTION
			Exst. Pullbox to be Demolished, Cap Exst Conduits & Backfill Pit to 95% Compaction Unless Indicated Otherwise.
			HECO Pullbox/Handhole
			HECO Manhole
			Existing Underground Highway Light Ductline and Wires
			Existing Overhead Utility Lines
			Existing Underground Highway Light Ductline and Wires; Remove Wires, Demolish and Remove Ductline to 12" Below Grade (Minimum), Abandon All Ductline Below 12" Above Grade, In Place
			Existing Overhead Highway Light Circuit to be Removed
			Existing Spare Underground Highway Light Ductline with New Highway Light Circuit Wires
		A 2L	Highway Light / Traffic Signal Ductline with Duct Designations; Item In Circle Indicates Duct Section Type, With Duct Complement Noted Below (Type "A" Duct Indicated with 1-2"L Duct; L=Highway Light Duct; S=Traffic Signal Duct; E=Electric Duct; F=Fiber Optic Duct); See Sheets E-15, E-16 and E-17 for Duct Section Details
			Existing Underground Traffic Signal Ductline and Wires
			Joint Utility Wood Pole By HECO Unless Indicated Otherwise
			Type "A" Metric Highway Light, Fiber Optic, or Electric Pullbox (Approx. 22" X 28"), See Detail A/E-18
			Type "B" Metric Highway Light, Fiber Optic, or Electric Pullbox (Approx. 28" X 40"), See Detail B/E-18
			Type "C" Metric Highway Light, Fiber Optic, or Electric Pullbox (Approx. 28" X 57"), See Detail C/E-18

HIGHWAY LIGHT TAG LEGEND:

1	6, MF6, A-B	Light Pole No., Circuit No., Phase Conn.
2	122+36, 16' Lt	Sta No., Offset from Baseline (Lt=Left, Rt=Right; BGR Indicates Behind Guardrail; BSW Indicates Behind Sidewalk)
3	10', MSII	Bracket Arm Length, Light Distribution
4	A/E-20, BGR	Foundation Type: See Detail Indicated, and Foundation Location: ISW=In Sidewalk, BSW=Behind Sidewalk, IUG=In Upsloping Grade, BPW=Behind Pedestrian Walkway, BGR=Behind Guardrail, OCS=On Concrete Structure

SYMBOL NOTES:

1. "X" Through Symbol Indicates Item to be Removed.

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

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

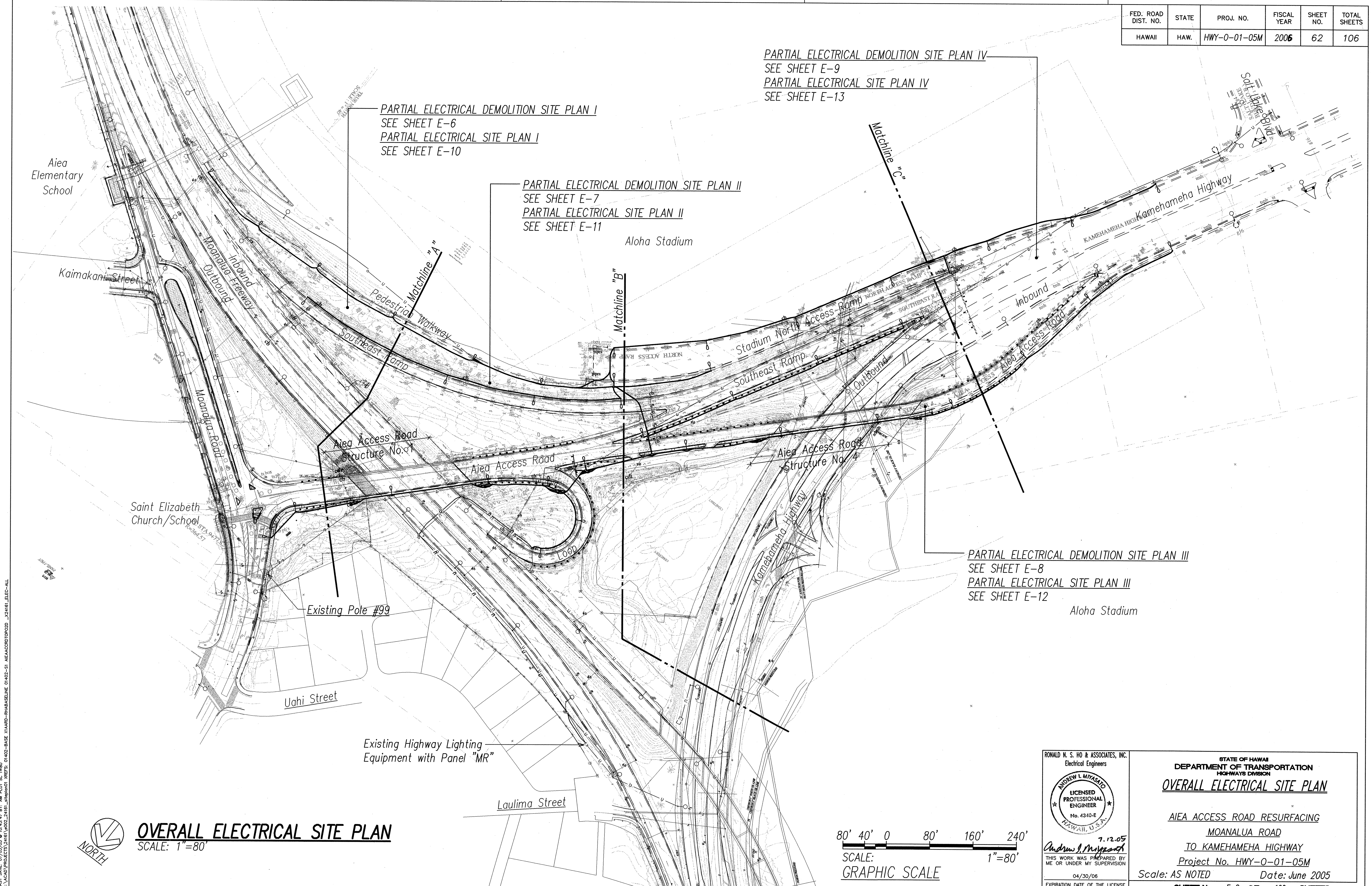
ELECTRICAL SYMBOLS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: NONE Date: June 2005

SHEET No. E-1 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	62	106



OVERALL ELECTRICAL SITE PLAN

SCALE: 1"=80'

80' 40' 0 80' 160' 240'

SCALE: 1"=80'

GRAPHIC SCALE

RONALD N. S. HO & ASSOCIATES, INC.
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7.12.05

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL ELECTRICAL SITE PLAN

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED   Date: June 2005

SHEET No. E-2 OF 106 SHEETS

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HAWAII	HAW.	HWY-0-01-05M	2006	63	106

GENERAL ELECTRICAL NOTES

1. Electrical Work shall be New Unless Indicated Otherwise.
2. Existing Electrical Equipment shall Remain Unless Indicated Otherwise.
3. The Location of Existing Underground Utilities Shown on Plans are from Existing Records and are Approximations Only. Contractor shall Exercise Caution when Construction Crosses or is in Close Proximity to Existing Underground Utilities. Damages to Utility Companies' Existing Facilities shall be Repaired by the Respective Utility Company and Repair Costs shall be Paid by the Contractor at No Additional Cost to the State.
4. For Utility, Traffic Signal and Additional Notes, See Sheets 3 Thru 7, Inclusive.
5. Existing Highway Lighting and Traffic Signal Pullboxes to Remain shall be Cleaned of Debris and Dirt. Cleaning of Existing Pullbox will not be Paid for Separately, but Considered Incidental to the Various Contract Items.
6. CAUTION!!! Existing Hawaiian Electric Company (HECO) Handholes/Pullboxes to be Relocated or Adjusted to Match Finish Grade Contains Energized High Voltage Cables. Contractor shall Exercise Extreme Caution when Working on the Existing Handhole/Pullboxes. All Work on the Existing Handhole/Pullbox shall be Coordinated with the HECO Underground Division. HECO Underground Division Personnel shall be Present whenever the Contractor is Working on Existing Handholes/Pullboxes. Work to be Done by HECO Includes Chipping and Cracking Existing Concrete Jacket and Ductline, Penetrating Existing Pullboxes, Handholes and Manholes and Providing Temporary Protection of Energized Cables. A Minimum of Ten Working Days Notice is Required Prior to the Start of Work.

DEMOLITION NOTES

1. The Contractor shall Verify All Existing Circuit Wiring Prior to Any Demolition Work.
2. Remove All Abandoned Wires and Exposed Raceways.
3. Where Contract Documents Indicate Wiring is to be Removed, Remove Existing Wires, Abandon Concealed Raceways, Remove Exposed Raceways.
4. For Circuit(s) where Existing Electrical Equipment shall be Removed, Contractor shall Provide All Conduit and Wiring Necessary to Maintain Circuit Continuity to Existing Component(s).
5. Existing Highway Lighting System shall Remain Operational During Non Daylight Hours Until New Highway Lighting System is Operational. Contractor Shall Provide Temporary Lighting if the Existing Highway Lights are De-energized Before the New Highway Lights are Operational. Temporary Work shall be Coordinated with and shall be Acceptable to the Engineer. Temporary Highway Lighting System will not be Paid for Separately, but Considered Incidental to the Various Contract Items.

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

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RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
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Andrew I. Miyasato
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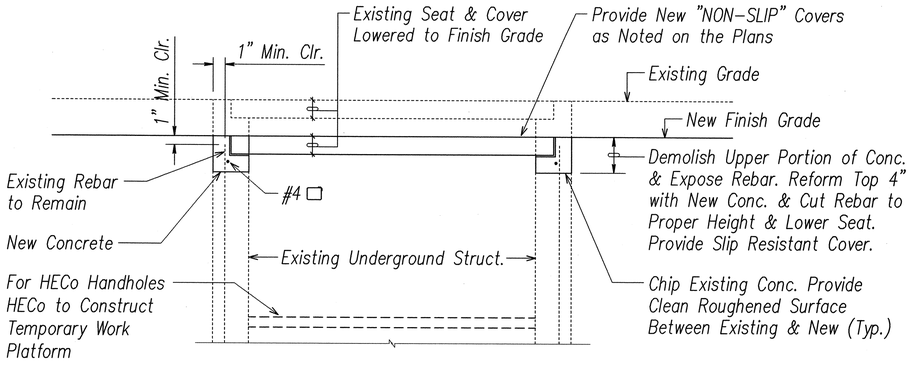
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NOTES, EQUIPMENT SCHEDULE

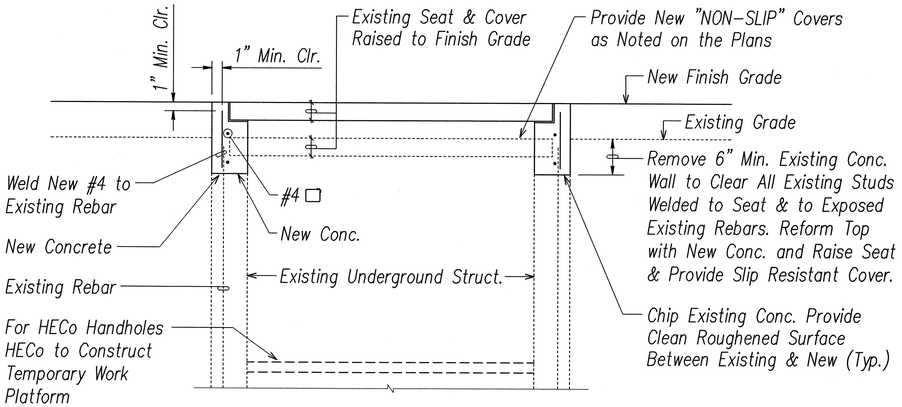
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: NONE Date: June 2005

SHEET No. E-3 OF 106 SHEETS



TYP. LOWER HANDHOLE & SEAT ADJUSTMENT DETAIL



TYP. RAISED HANDHOLE & SEAT ADJUSTMENT DETAIL

A / E-4 **TYPICAL HANDHOLE/PULLBOX & SEAT ADJUSTMENT DETAILS**

NOT TO SCALE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	64	106

GENERAL CONSTRUCTION NOTES

A. Trenching to be by hand digging near and across existing utility lines.

B. Unless otherwise requested by the Board of Water Supply, minimum clearance between water lines and conduits shall be:
Horizontal = 3 feet – Traffic Signal Conduit
3 feet – Highway Light Conduit
Vertical = 6 inches

C. Adjust new conduit alignment, if required to provide clearances. If conduit cannot be realigned, adjustments to existing water system shall be performed in accordance with standards of the Board of Water Supply.

D. Minimum clearance between highway light standards and fire hydrants shall be 3 feet.

E. Underground utilities shown hereon are for information only. No guarantee is made on the accuracy or completeness of said information.

F. All new and existing concrete pullbox and handhole covers which are located in new finished sidewalks shall be provided with new exposed aggregate concrete covers to match new exposed aggregate concrete sidewalk finish.

G. Where necessary, reconstruction of sidewalk, gutter and driveway areas shall conform to the standard details of the governmental agency having jurisdiction over the work.

H. The Contractor shall be responsible for removal of all silt and debris resulting from his work and deposited in drainage facilities, roadways and other areas. The cost for any necessary remedial action by the Chief Engineer shall be payable by the Contractor.

I. The Contractor, at his own expense, shall keep the project area free from dust nuisance. The work shall be in conformance with the air pollution control standards and regulations of the State Department of Health.

J. The Contractor, at his own expense, shall restore all work areas to its original condition. Including installation of approved erosion control matting around light base and trenching and grassing of disturbed areas. Watering of the grass for erosion control shall be incidental to erosion control lump sum Item.

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RONALD N. S. HO & ASSOCIATES, INC.
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ANDREW I. MIYASATO
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL CONSTRUCTION NOTES
& HANDHOLE ADJUSTMENT DETAIL
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-4 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	65	106

HIGHWAY LIGHT NOTES

1. Contractor Shall Be Responsible For Coordinating And Informing HECO, Verizon Hawaii and CATV Of Highway Light Locations On Joint Poles Prior To The Installation Of Highway Lights And Highway Light Secondary Cables On Joint Poles.

2. Contractor To Energize Highway Lights A Minimum Of Six (6) Hours For Final Inspection And Acceptance. Contractor To Assume Costs.

3. Contractor Shall Have One Set Of Approved Plans At The Job Site At All Times During The Construction Work.

4. All Neutral Conductors Shall Have Solid White Insulation. Any Other Method Of Identification Is Unacceptable.

5. Contractor Shall Not Backfill Trenches Until Work Is Approved By The Engineer.

6. The Contractor Shall Inform The Inspector Of All Concrete Pours At Least Two (2) Working Days In Advance. Concrete Shall Not Be Poured Until Approval Is Granted By The Inspector.

7. Luminaire And Pole Count

Poles	Wood:	None
	Alum:	38
Luminaires	250W HPS:	38
Sign Lights	250W Metal Halide:	10

Contractor Shall Verify Counts.

8. All Work Shall Be Done By A Duly Licensed Electrician.

9. Trench Dirt And Material Will Not Be Allowed To Be Stored On Roadway Or Shoulder.

10. Temporary Trench Patches Shall Match Grade.

11. Engineer to Determine Salvagable Material. Deliver all Salvageable Material to the Baseyard as Directed by the Engineer at no Additional Cost to the State. Remaining Material shall be Contractor's Property.

12. Contractor to Contact State to Conduct a joint Inspection and Check the Existing Lights Within the Project Limit two weeks Prior to the Start of Any Electrical Work.

13. Submit Shop Drawings For All Highway Lighting Components Including Luminaires, Lamps, Photocell And Mast Arms, For Approval.

14. The Contractor Shall Notify The Joint Pole Committee Two (2) Weeks In Advance Of Any Relocation Of Utility Pole(s) That Maybe Necessary.

15. Existing Highway Lighting System To Be Kept Operational During Dark Hours Until New Highway Lighting System is Operational. See Demolition Note 5, Sheet E-3.

16. The Contractor Shall Be Responsible For Any Damages To Existing Highway Lighting Facilities And Damages Shall Be Repaired By The Contractor At His Cost With No Additional Cost To The State.

NEW DESIGN REQUIREMENTS FOR LUMINAIRES, POLE STANDARDS AND TRAFFIC SIGNAL STANDARDS

(Highway Lighting Luminaires, Pole Standards, Bracket Arms and Traffic Signal Standards and Mast Arms Being Furnished for This Project Shall Conform with the New Design Requirements noted Below)

1. Equipment manufacturers providing structural supports for Luminaires and Traffic Signals, the following design parameters to be included in the design of the project materials.
2. Modifications to AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 4th Edition, 2002 Interim Revisions, Published by the American Association of State Highway and Transportation Officials.
3. Basic Wind Speed [Article 3.8.2] to determine the design wind pressure shall be 105 mph. For unusual or differing exposure conditions, the basic wind speed should be increased using rational procedures and sound engineering judgement. Alternatively, the design wind pressure may be increased by using a higher Wind Importance Factor [Table 3-2] corresponding to a recurrence interval of at least one level greater than recommended.
4. Wind Importance Factor [Article 3.8.3] noted in Table 3-2 used to determine the design wind pressure for overhead cantilevered support structures over:
   a. Freeways shall be based on a recurrence interval of 100 years
   b. Ramps and other highways with "high" ADT shall be based on a recurrence interval of 100 years unless otherwise directed.
5. Height and Exposure Factor [Article 3.8.4]. For sign and luminaire support structures on bridges, the height and exposure factor shall be determined based on the maximum height they are above the surrounding ground. For severe exposure conditions such as along the coastline, the factor shall be increased based on the latest ANSI/ASCE Standard No. 7, Minimum Design Loads for Buildings and Other Structures.
6. Fatigue Importance Factors [Article 11.6] noted in Table 11-1 for overhead cantilevered sign, traffic signal and luminaire support structures shall be based on the following:
   a. Fatigue Category I - For all structures where failure would result in the structure falling onto the travel way.
   b. Fatigue Category II - For all others.
7. Galloping [Article 11.7.1]. Overhead cantilevered sign and traffic signal support structures shall be designed for galloping-induced cyclic loads unless approved vibration mitigation devices are installed.
8. Vortex Shedding [Article 11.7.2]. Nontapered lighting structures shall be designed to resist vortex shedding-induced loads including cantilevered mast arms and lighting structures that have tapers less than 0.14 in/ft.
9. Natural Wind Gust [Article 11.7.3]. Overhead cantilevered sign, traffic signal and high-level lighting support structures shall be designed to resist an equivalent static natural wind gust pressure. For unusual or differing exposure conditions, the equivalent static natural wind gust pressure should be increased using references noted in the specifications.
10. Truck-Induced Gust [Article 11.7.4, Interim 2002]. Overhead cantilevered sign and traffic signal support structures shall be designed to resist an equivalent static truck gust pressure range based on a truck speed of 65 mph. At the option of the State of Hawaii, Department of Transportation, a lower truck speed maybe used in areas with design speeds not exceeding 45 mph.
11. Equipment manufacturers providing structural supports for Luminaires and Traffic Signals, Is responsible to provide the Engineer with any information that will impact the current foundation design.

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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HAWAII, U.S.A.

7.5.05

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT NOTES

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-5 OF 106 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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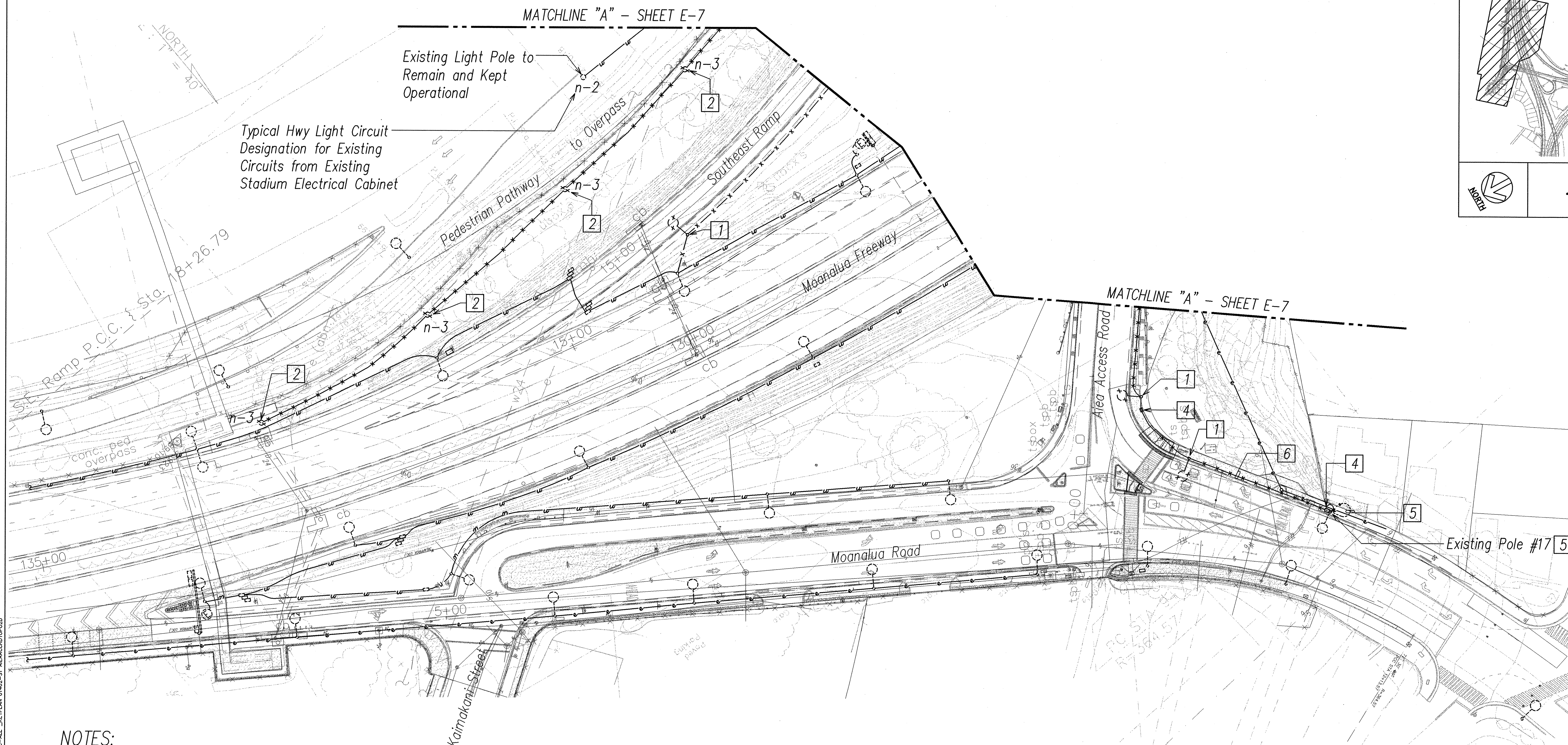

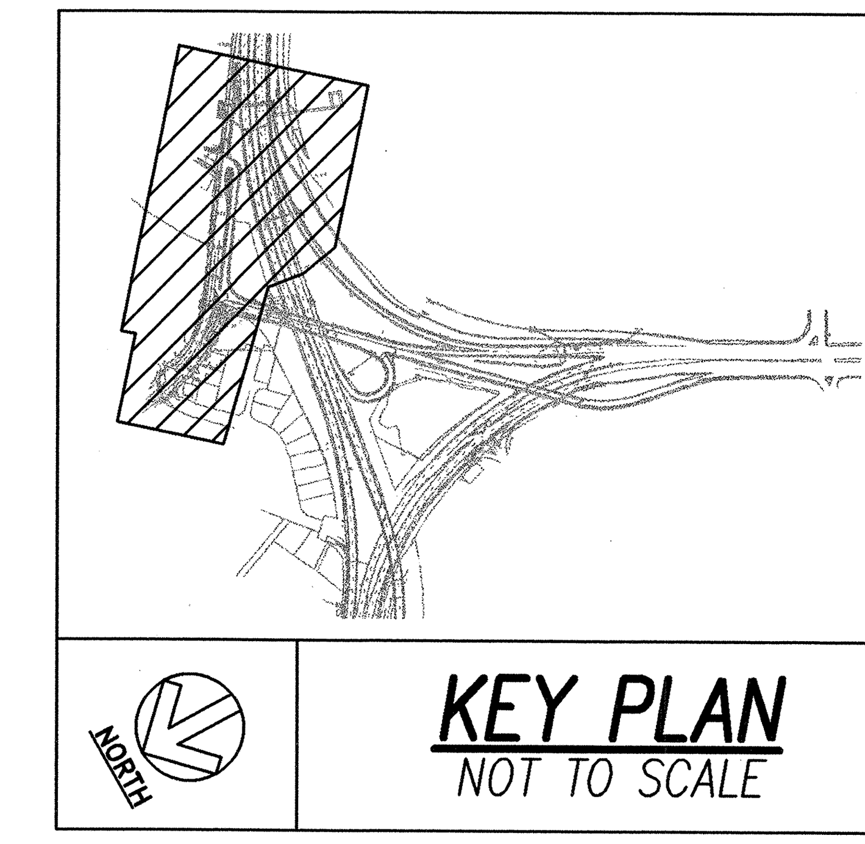

KEY PLAN
NOT TO SCALE

NOTES:

1. Remove Exst Hwy Lt Std, Demolish and Dispose of Entire Conc Foundation. Cap Exst Conduits & Compact Type "A" Backfill to 95% Compaction.
2. Remove Exst Pathway Lt Std, Demolish and Dispose of Entire Conc Foundation. Cap Exst Conduits & Compact Type "A" Backfill to 95% Compaction.
3. See Additional Demolition Notes on Sheet E-3.
4. Demolish and Dispose of Exst Pullbox and Patch Existing Concrete Sidewalk as Required.
5. Existing Utility Pole With Existing HECo Unmetered Highway Lighting Circuit to Remain. Remove Exst Highway Highway Conduit Riser and Cables to Exst Pullbox.
6. Existing Highway Lighting Circuit System to be Disconnected from Existing Unmetered Highway Lighting Circuit and Removed.

PARTIAL ELECTRICAL DEMOLITION SITE PLAN I
SCALE: 1"=40'

40' 20' 0 40' 80' 120'
SCALE: 1"=40'
GRAPHIC SCALE

RONALD N. S. HO & ASSOCIATES, INC.
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PARTIAL ELECTRICAL DEMOLITION SITE PLAN I

AIEA ACCESS ROAD RESURFACING
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TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

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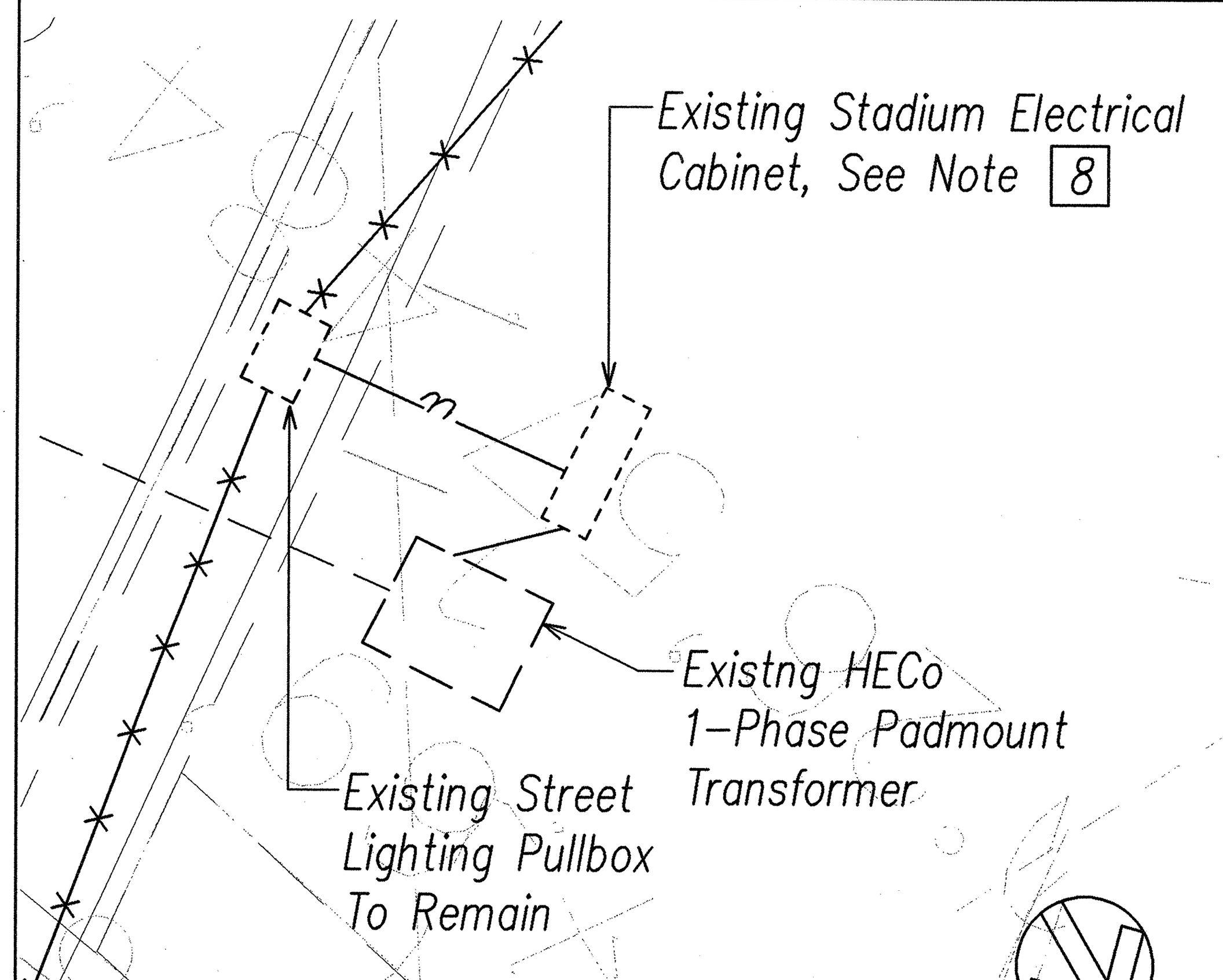
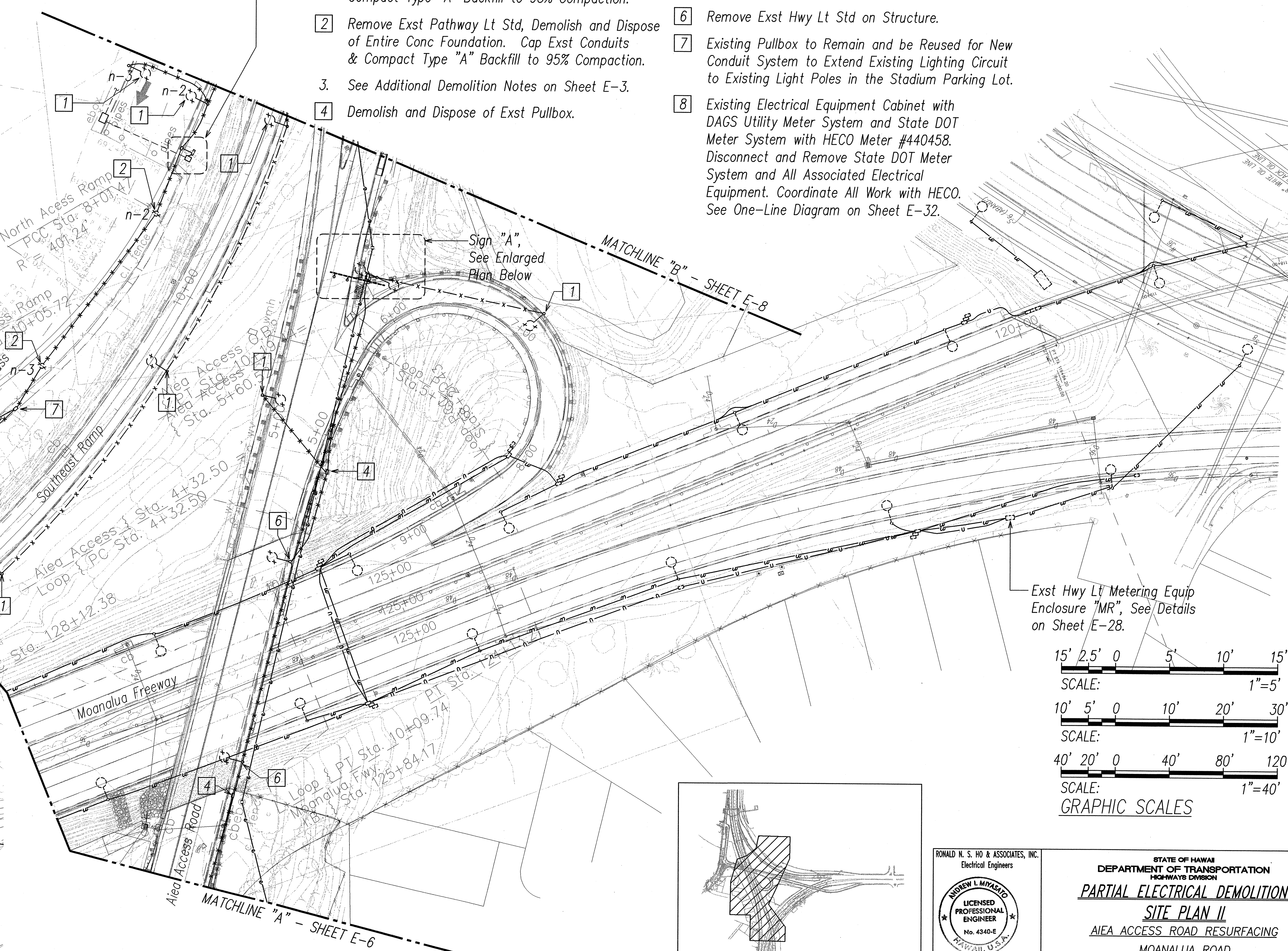


ENLARGED EXISTING STADIUM ELECTRICAL CABINET PLAN

SCALE: 1"=5'

NOTES:

1. Remove Exst Hwy Lt Std, Demolish and Dispose of Entire Conc Foundation. Cap Exst Conduits & Compact Type "A" Backfill to 95% Compaction.
2. Remove Exst Pathway Lt Std, Demolish and Dispose of Entire Conc Foundation. Cap Exst Conduits & Compact Type "A" Backfill to 95% Compaction.
3. See Additional Demolition Notes on Sheet E-3.
4. Demolish and Dispose of Exst Pullbox.
5. Remove Exst Hwy Sign Lts (2) and Conduit, Junction Boxes, and Wiring.
6. Remove Exst Hwy Lt Std on Structure.
7. Existing Pullbox to Remain and be Reused for New Conduit System to Extend Existing Lighting Circuit to Existing Light Poles in the Stadium Parking Lot.
8. Existing Electrical Equipment Cabinet with DAGS Utility Meter System and State DOT Meter System with HECO Meter #440458. Disconnect and Remove State DOT Meter System and All Associated Electrical Equipment. Coordinate All Work with HECO. See One-Line Diagram on Sheet E-32.



ENLARGED PLAN-SIGN "B" LTG

SCALE: 1"=10'

PARTIAL ELECTRICAL DEMOLITION SITE PLAN II

SCALE: 1"=40'

GRAPHIC SCALES

- 15' 2.5' 0 5' 10' 15' — SCALE: 1"=5'
- 10' 5' 0 10' 20' 30' — SCALE: 1"=10'
- 40' 20' 0 40' 80' 120' — SCALE: 1"=40'

KEY PLAN

NOT TO SCALE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 4340-E — HAWAII, U.S.A.
7.12.05

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HIGHWAYS DIVISION

PARTIAL ELECTRICAL DEMOLITION SITE PLAN II

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED — Date: June 2005

SHEET No. E-7 OF 106 SHEETS

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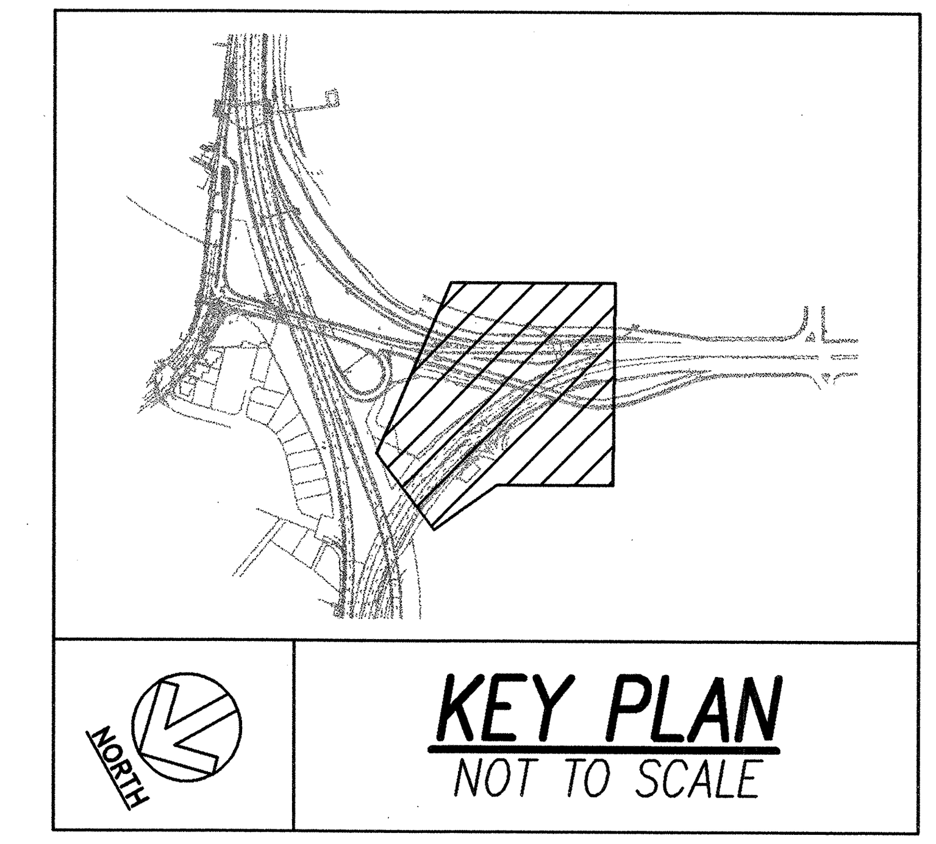
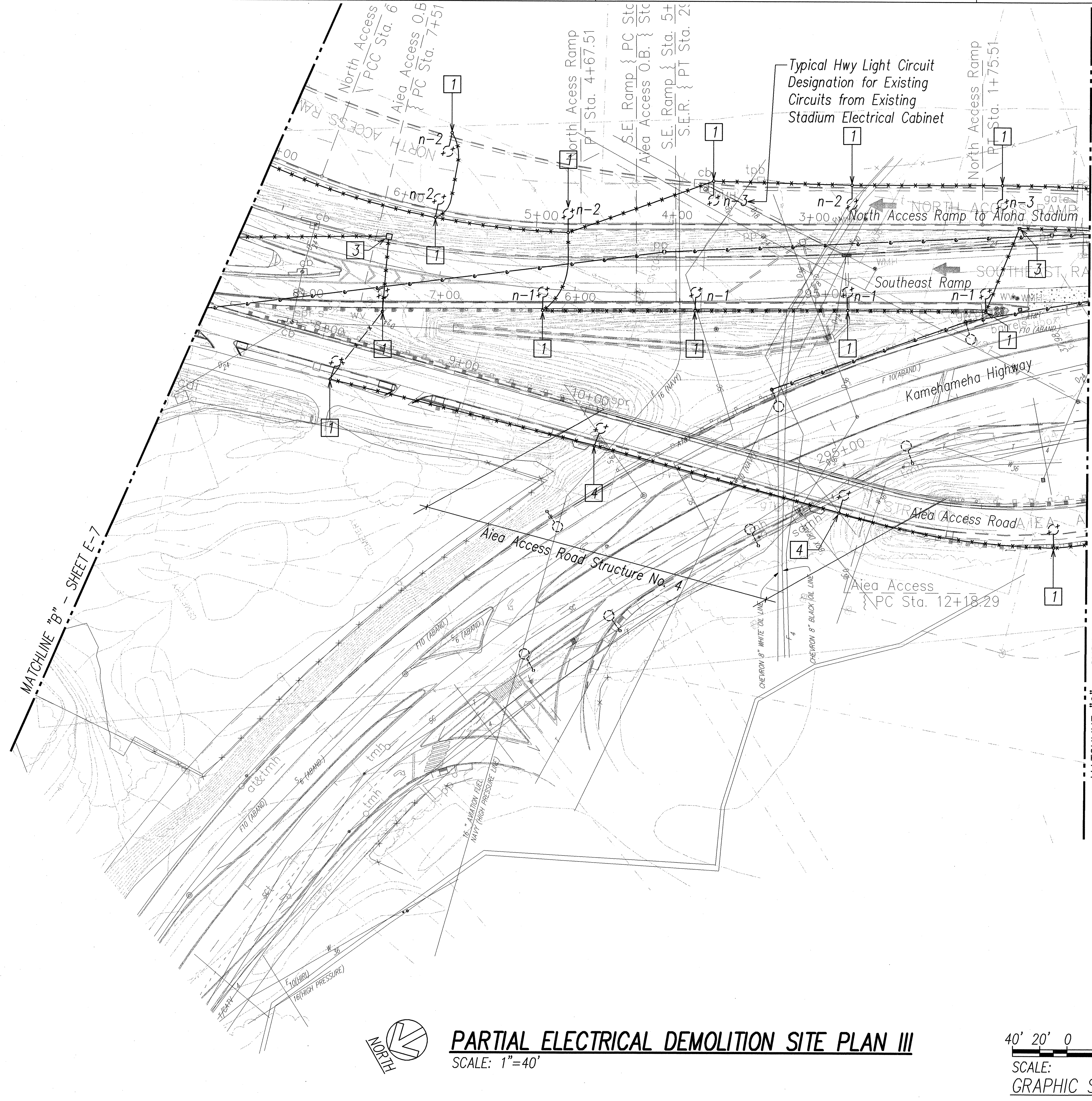
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	68	106



KEY PLAN
NOT TO SCALE



PARTIAL ELECTRICAL DEMOLITION SITE PLAN III

SCALE: 1"=40'

40' 20' 0 40' 80' 120'
SCALE: 1"=40'
GRAPHIC SCALE

NOTES:

1. Remove Exst Hwy Lt Std, Demolish and Dispose of Entire Conc Foundation. Cap Exst Conduits & Compact Type "A" Backfill to 95% Compaction.
2. See Additional Demolition Notes on Sheet E-3.
3. Demolish and Dispose of Exst Pullbox.
4. Remove Exst Hwy Lt Std on Structure.

RONALD N. S. HO & ASSOCIATES, INC.
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PARTIAL ELECTRICAL DEMOLITION SITE PLAN III

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY

Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-8 OF 106 SHEETS

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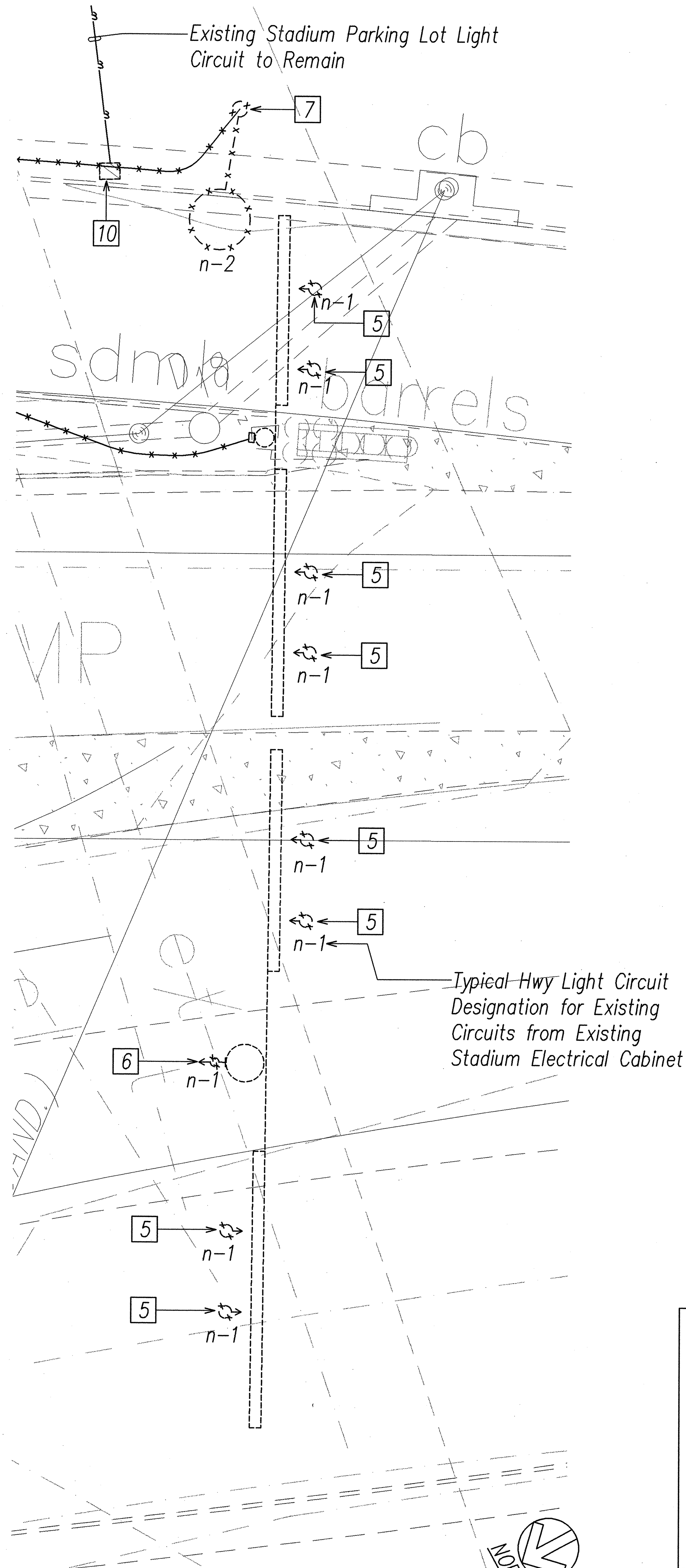
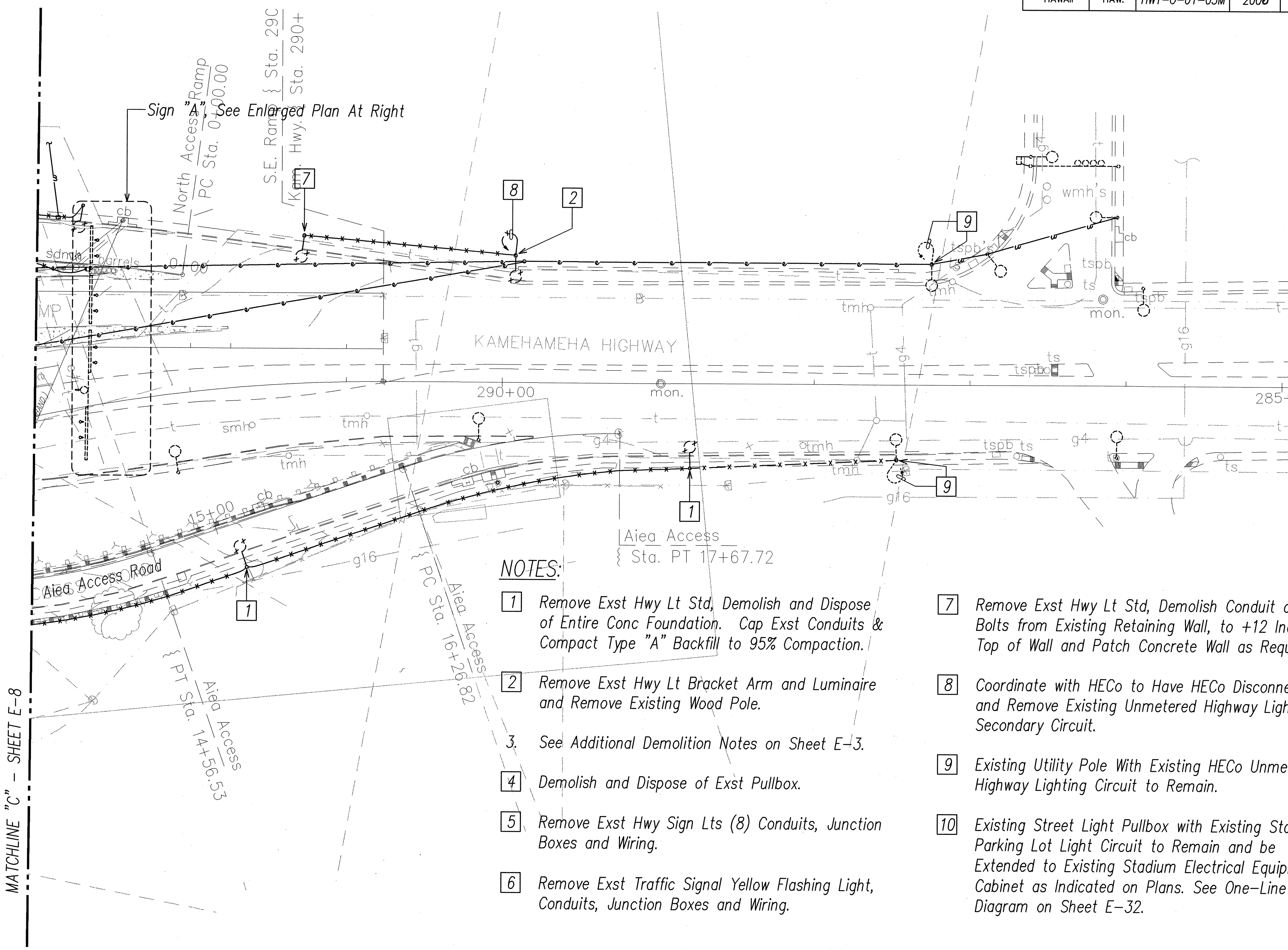
No.		

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	69	106



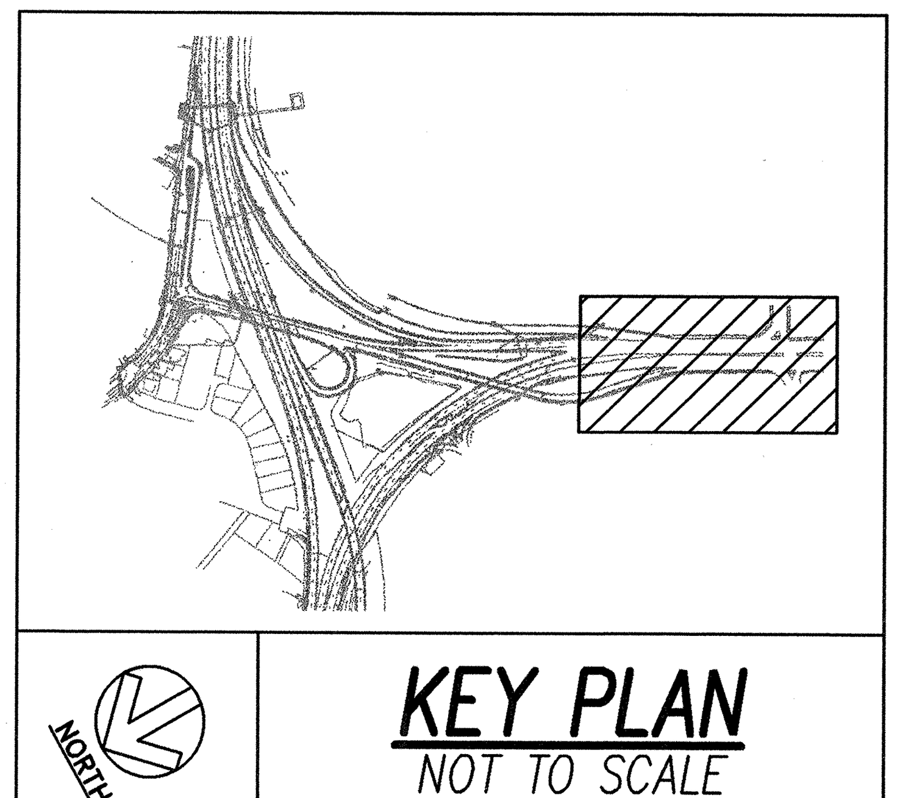
ENLARGED PLAN-SIGN "A" LTG

SCALE: 1"=10'



NOTES:

1. Remove Exst Hwy Lt Std, Demolish and Dispose of Entire Conc Foundation. Cap Exst Conduits & Compact Type "A" Backfill to 95% Compaction.
2. Remove Exst Hwy Lt Bracket Arm and Luminaire and Remove Existing Wood Pole.
3. See Additional Demolition Notes on Sheet E-3.
4. Demolish and Dispose of Exst Pullbox.
5. Remove Exst Hwy Sign Lts (8) Conduits, Junction Boxes and Wiring.
6. Remove Exst Traffic Signal Yellow Flashing Light, Conduits, Junction Boxes and Wiring.
7. Remove Exst Hwy Lt Std, Demolish Conduit and Anchor Bolts from Existing Retaining Wall, to +12 Inches Below Top of Wall and Patch Concrete Wall as Required.
8. Coordinate with HECo to Have HECo Disconnect and Remove Existing Unmetered Highway Lighting Secondary Circuit.
9. Existing Utility Pole With Existing HECo Unmetered Highway Lighting Circuit to Remain.
10. Existing Street Light Pullbox with Existing Stadium Parking Lot Light Circuit to Remain and be Extended to Existing Stadium Electrical Equipment Cabinet as Indicated on Plans. See One-Line Diagram on Sheet E-32.



KEY PLAN

NOT TO SCALE

PARTIAL ELECTRICAL DEMOLITION SITE PLAN IV

SCALE: 1"=40'

10' 5' 0 10' 20' 30'
SCALE: 1"=10'

40' 20' 0 40' 80' 120'
SCALE: 1"=40'

GRAPHIC SCALES

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.12.15

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL DEMOLITION SITE PLAN IV

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY

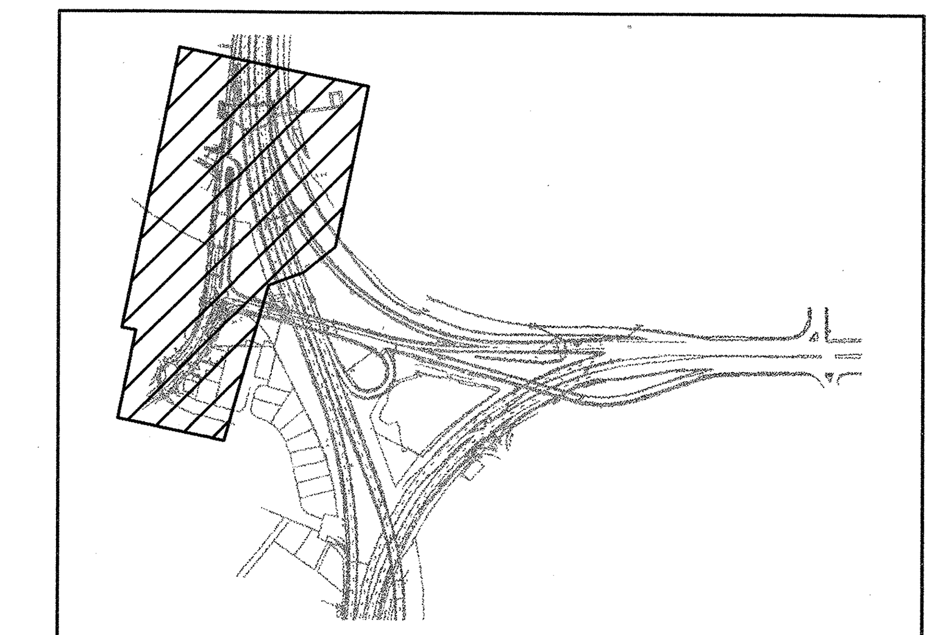
Project No. HWY-0-01-05M

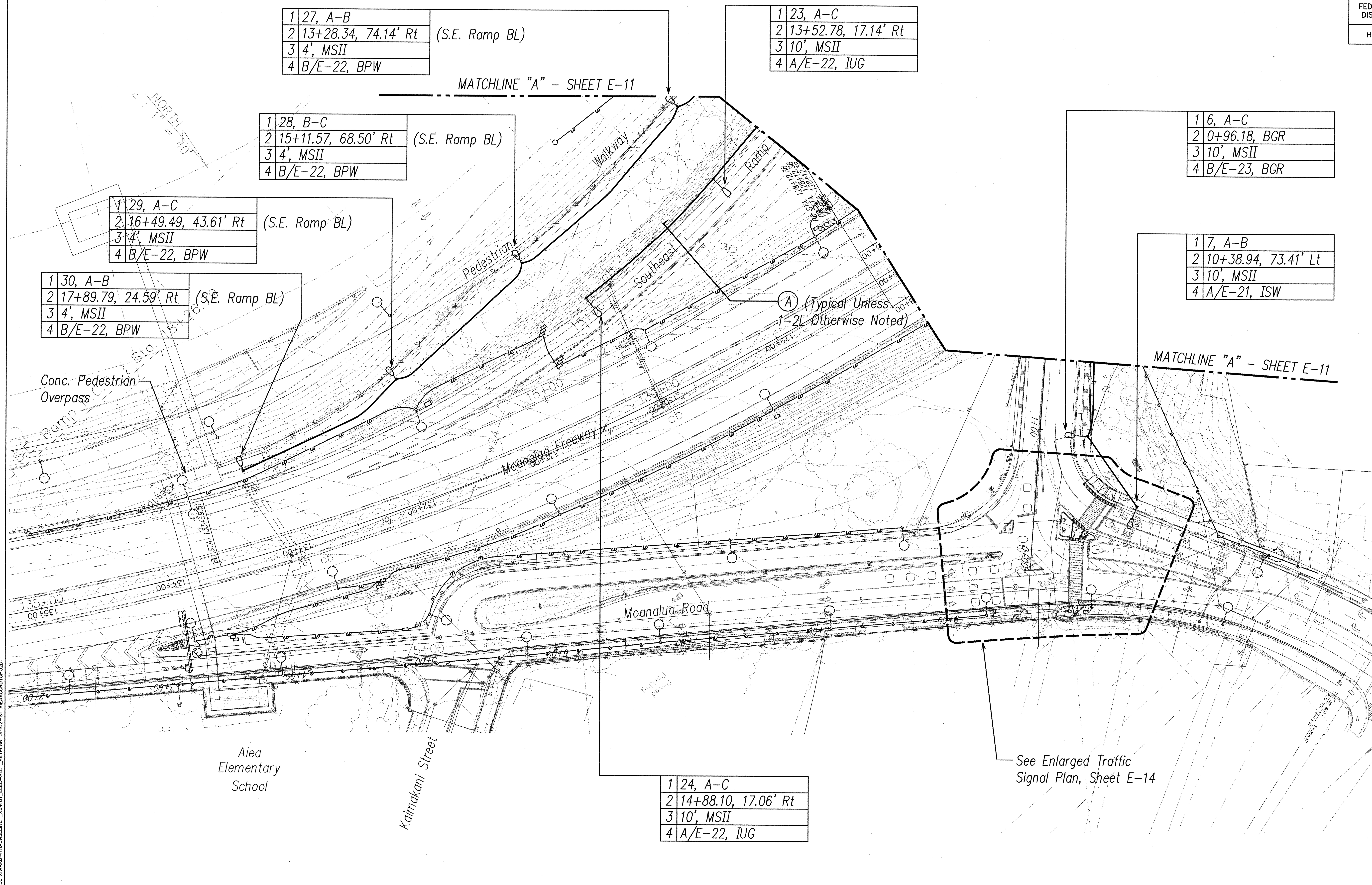
Scale: AS NOTED Date: June 2005

SHEET No. E-9 OF 106 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	70	106





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

PARTIAL ELECTRICAL SITE PLAN I

SCALE: 1"=40'

NORTH

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.12.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

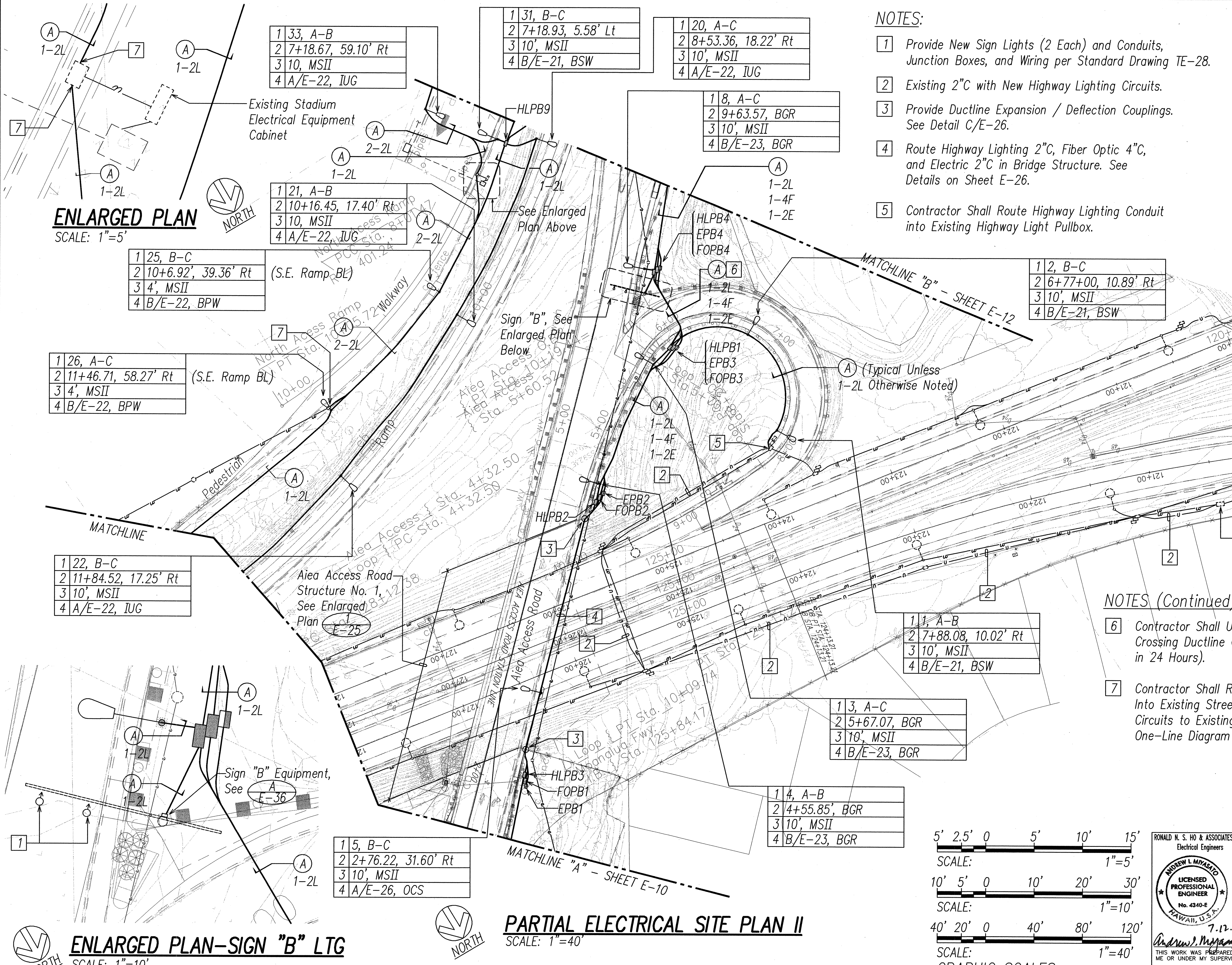
PARTIAL ELECTRICAL SITE PLAN I

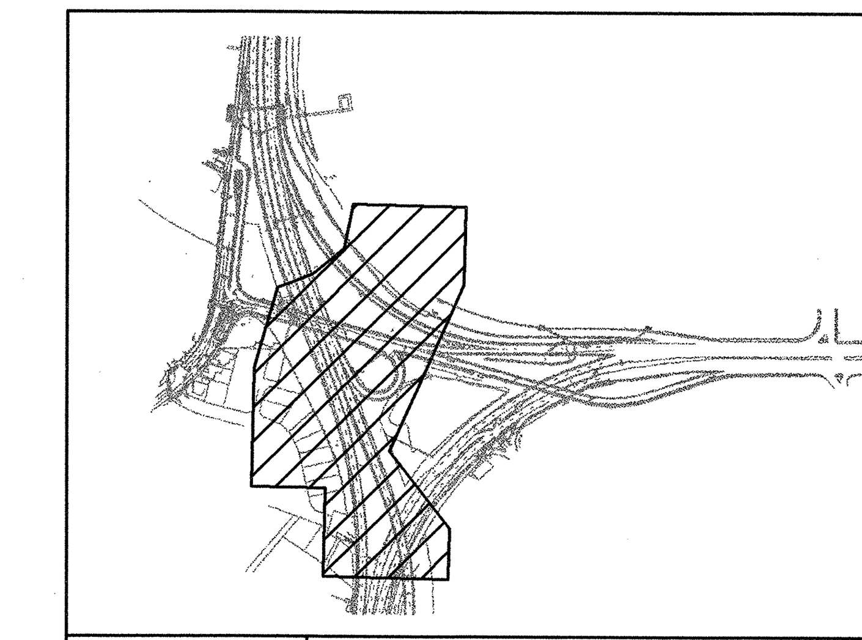
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-10 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	71	106





NOTES:

1. Provide New Sign Lights (2 Each) and Conduits, Junction Boxes, and Wiring per Standard Drawing TE-28.
2. Existing 2"C with New Highway Lighting Circuits.
3. Provide Ductline Expansion / Deflection Couplings. See Detail C/E-26.
4. Route Highway Lighting 2"C, Fiber Optic 4"C, and Electric 2"C in Bridge Structure. See Details on Sheet E-26.
5. Contractor Shall Route Highway Lighting Conduit into Existing Highway Light Pullbox.

NOTES (Continued):

6. Contractor Shall Use Rapid Set Concrete for Ramp Crossing Ductline Concrete Encasement (3000 PSI in 24 Hours).
7. Contractor Shall Route New Highway Light Conduit Into Existing Street Light Pullbox and Splice New Circuits to Existing Street Light Circuits; See One-Line Diagram on Sheet E-32.

GRAPHIC SCALES

SCALE: 1"=5' (5' 2.5' 0 5' 10' 15')

SCALE: 1"=10' (10' 5' 0 10' 20' 30')

SCALE: 1"=40' (40' 20' 0 40' 80' 120')

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW L. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
7.12.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

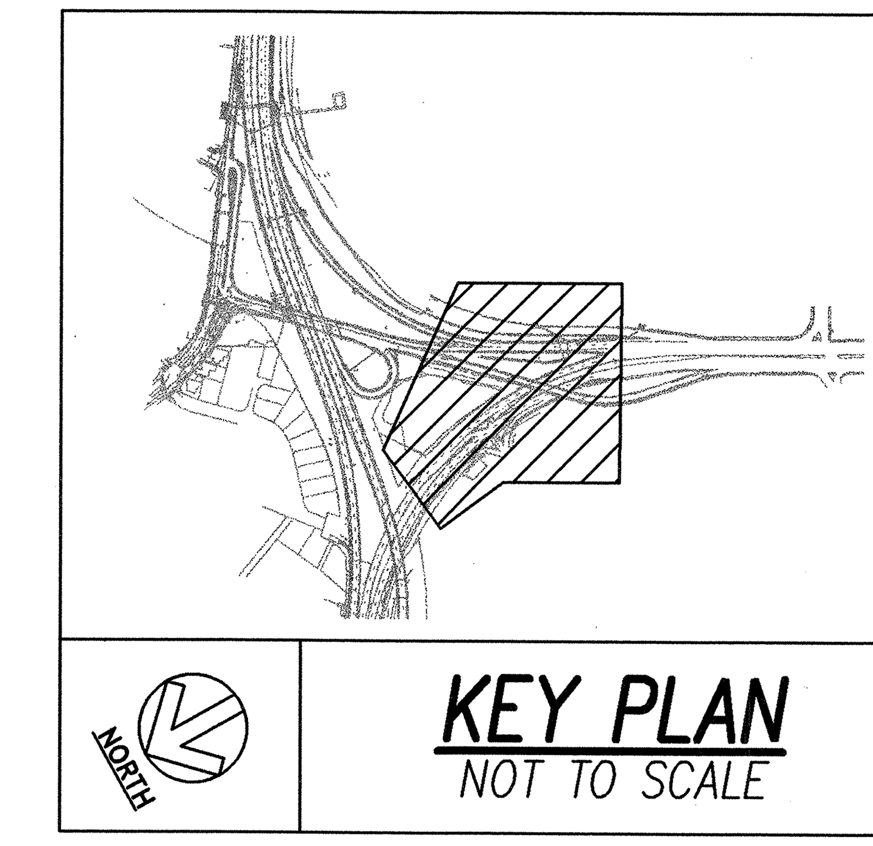
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

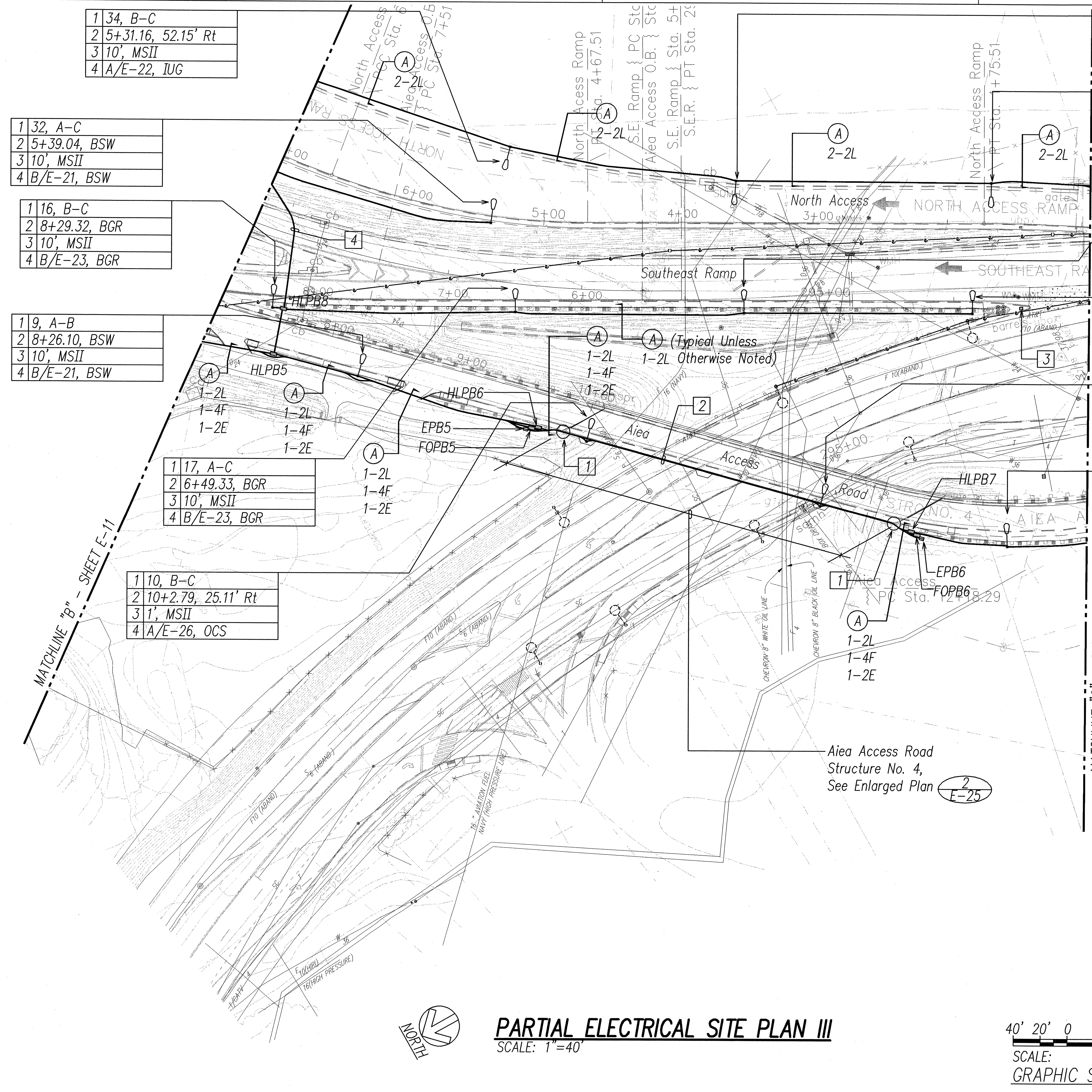
PARTIAL ELECTRICAL SITE PLAN II

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M
Scale: AS NOTED Date: June 2005
SHEET No. E-11 OF 106 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	72	106





NOTES:

1. Provide Ductline Expansion / Deflection Couplings. See Detail C/E-26.
2. Route Highway Lighting 2"C, Fiber Optic 4"C, and Electric 2"C in Bridge Structure. See Details on Sheet E-26.
3. Adjust Top of Existing Traffic Signal Pullbox to New Finish Pavement. See Detals on Sheet E-4.
4. Contractor Shall Use Rapid Set Concrete for Ramp Crossing Ductline Concrete Encasement (3000 PSI in 24 Hours).

PARTIAL ELECTRICAL SITE PLAN III

SCALE: 1"=40'

40' 20' 0 40' 80' 120'
SCALE: 1"=40'
GRAPHIC SCALE

RONALD N. S. HO & ASSOCIATES, INC. Electrical Engineers

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

7.12.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

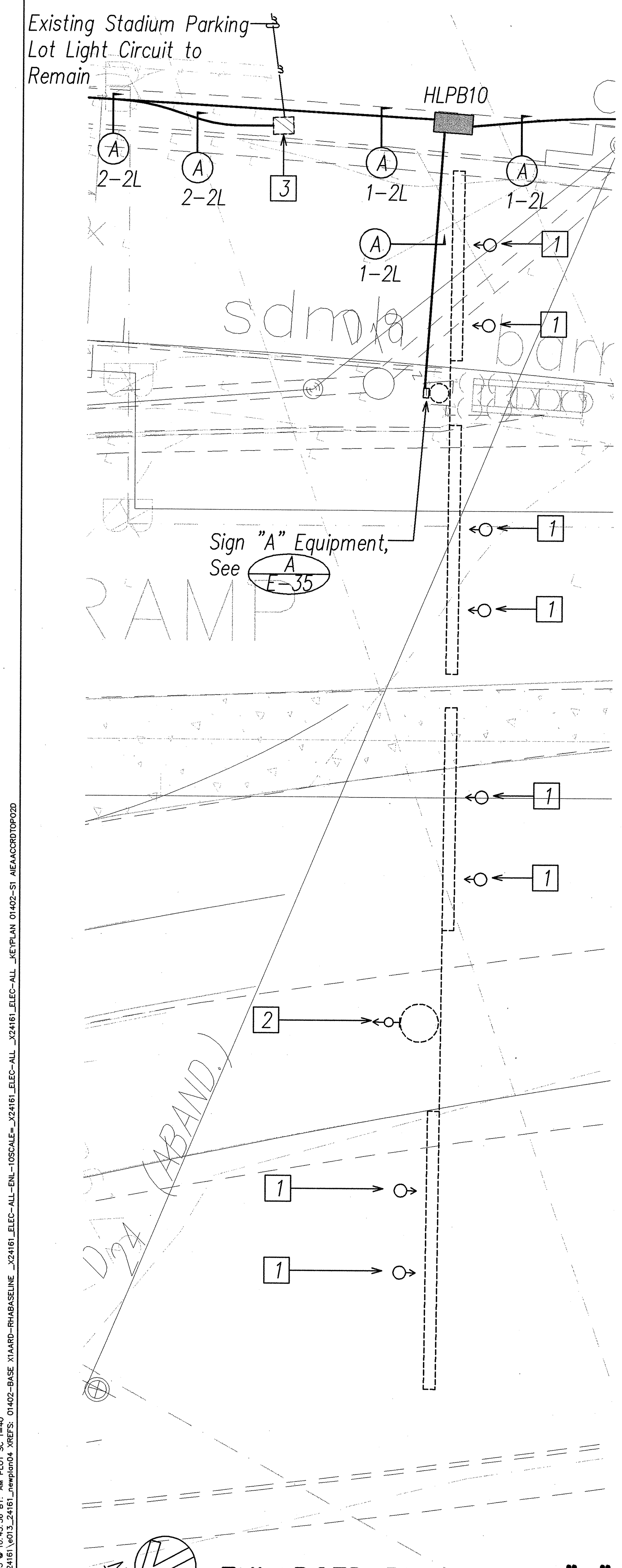
PARTIAL ELECTRICAL SITE PLAN III

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

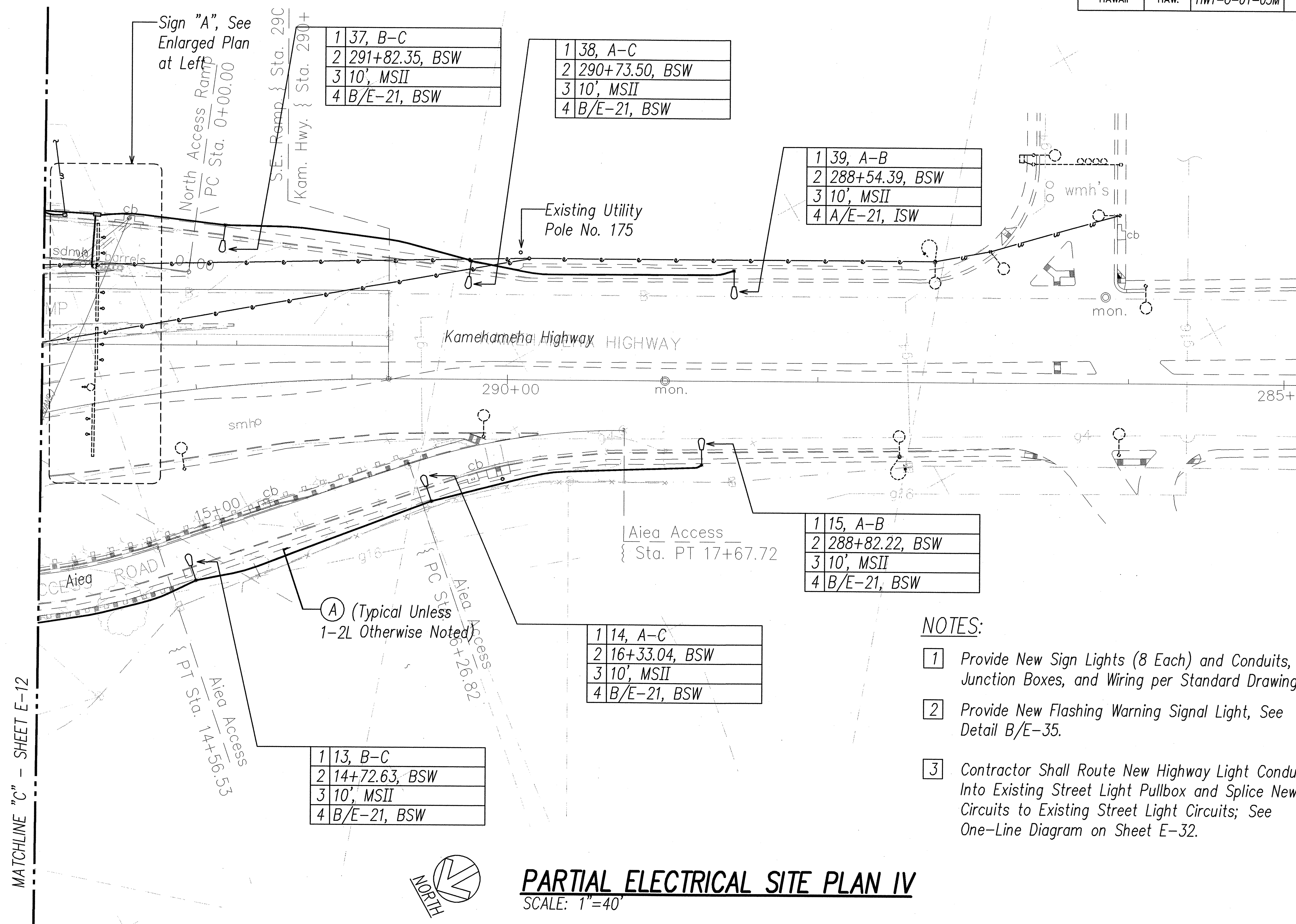
SHEET No. E-12 OF 106 SHEETS

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



ENLARGED PLAN-SIGN "A" LTG

SCALE: 1"=10'

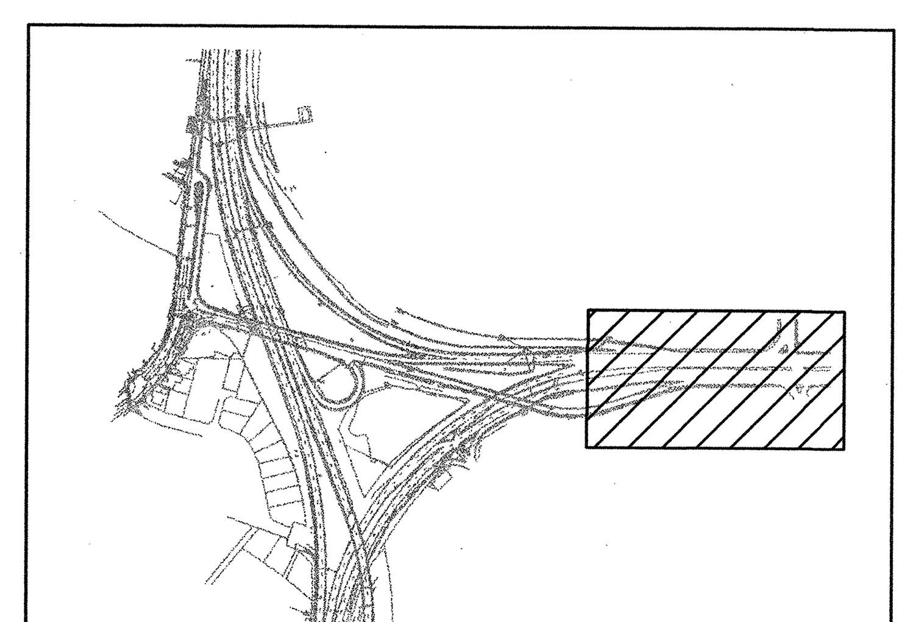


NOTES:

1. Provide New Sign Lights (8 Each) and Conduits, Junction Boxes, and Wiring per Standard Drawing TE-28.
2. Provide New Flashing Warning Signal Light, See Detail B/E-35.
3. Contractor Shall Route New Highway Light Conduit Into Existing Street Light Pullbox and Splice New Circuits to Existing Street Light Circuits; See One-Line Diagram on Sheet E-32.

PARTIAL ELECTRICAL SITE PLAN IV

SCALE: 1"=40'



KEY PLAN

NOT TO SCALE

GRAPHIC SCALES

10' 5' 0 10' 20' 30' — SCALE: 1"=10'

40' 20' 0 40' 80' 120' — SCALE: 1"=40'

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

RONALD N. S. HO & ASSOCIATES, INC. Electrical Engineers

ANDREW L. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A. 7.12.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL SITE PLAN IV

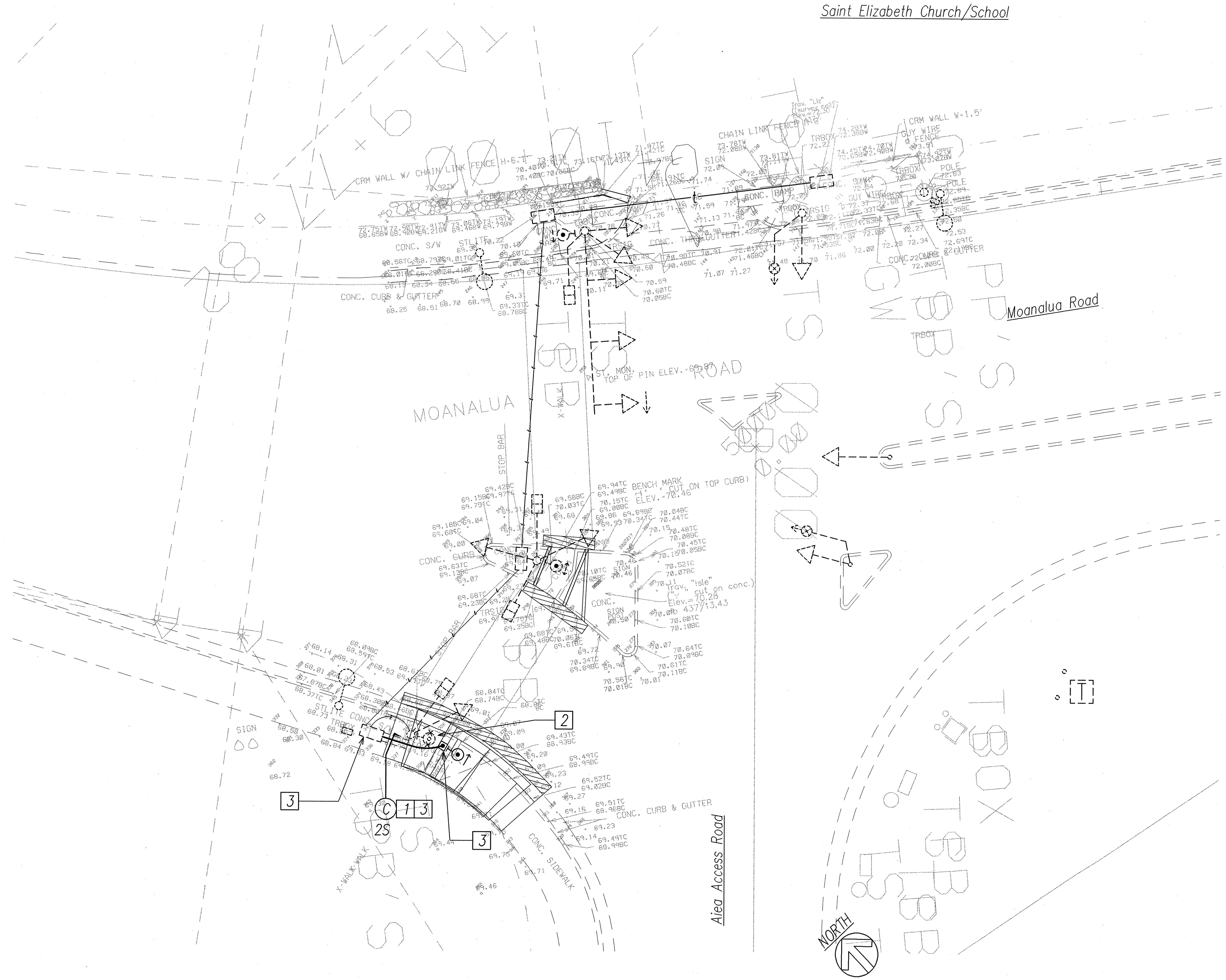
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY

Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-13 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	74	106



NOTES:

1. Provide New 1-2" Conduit with Required Cable Complement for Pedestrian Pushbutton and Pullbox. Penetrate Exst Pullbox for New Conduit Entry. Repair to Match Exst Condition.
2. Remove Exst Pedestrian Pushbutton and Patch Holes in Existing Traffic Signal Standard as Necessary.
3. Provide Ground Wire and Ground Rod as Required In Existing Pullbox and Extend Ground Wire to New Pedestrian Pushbutton and Terminate to Pedestrian Pushbutton Post. See Details on Sheet E-20.

MOANALUA ROAD/AIEA ACCESS ROAD INTERSECTION TRAFFIC SIGNAL PLAN

SCALE: 1"=10'

10' 5' 0 10' 20' 30'

SCALE: 1"=10'

GRAPHIC SCALE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MOANALUA ROAD/AIEA ACCESS ROAD INTERSECTION TRAFFIC SIGNAL PLAN

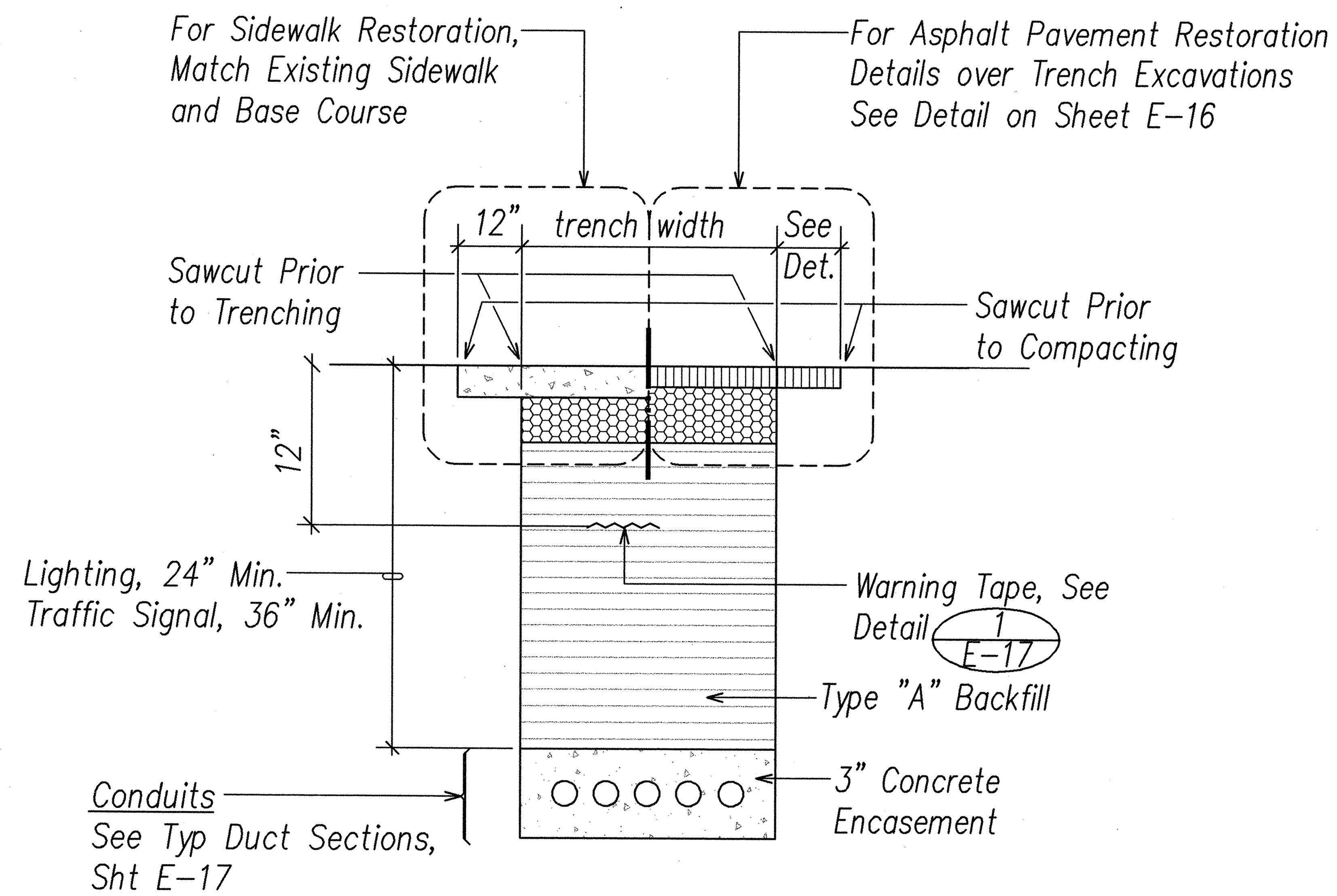
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-14 OF 106 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	75	106

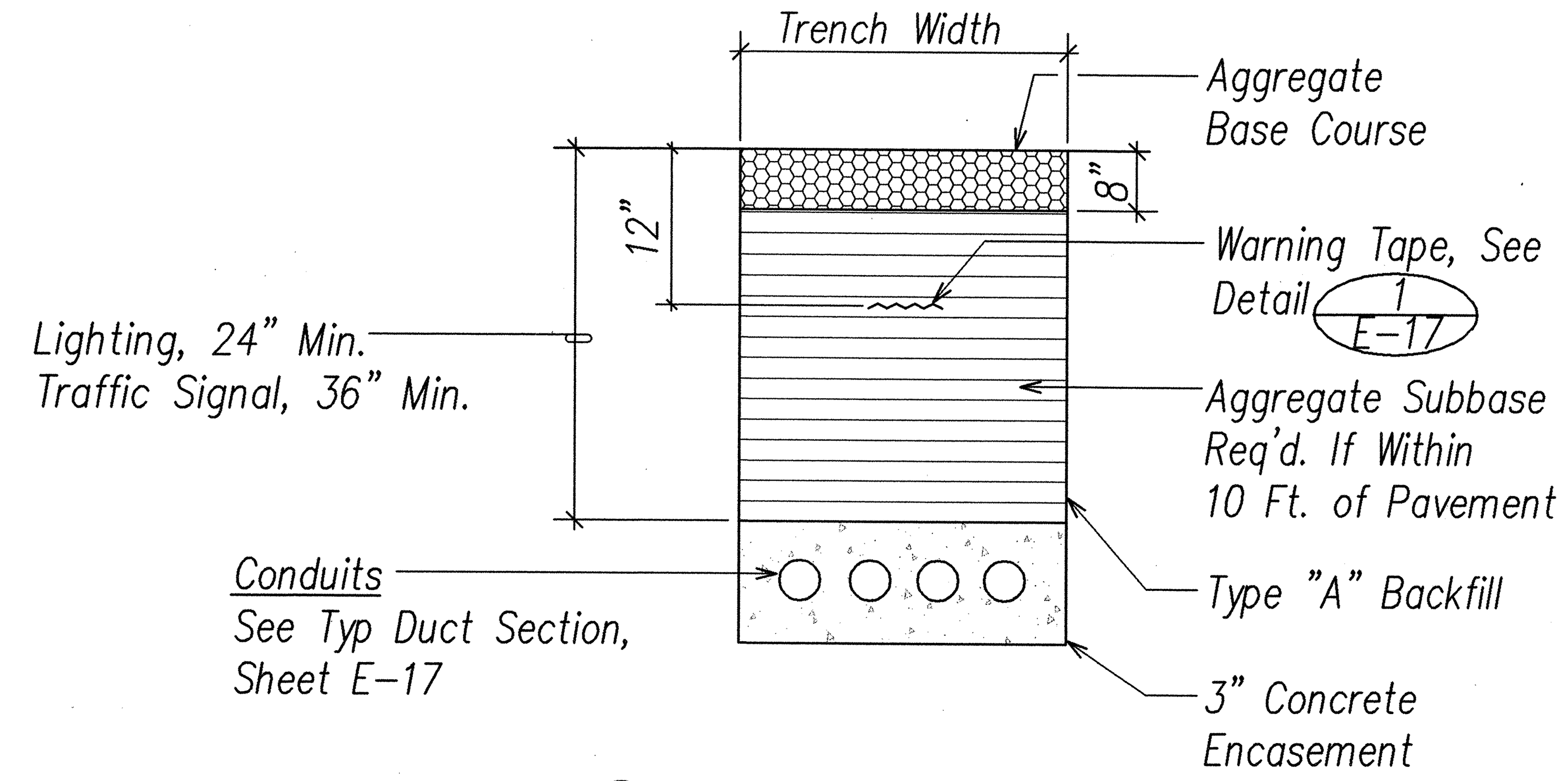


Notes:

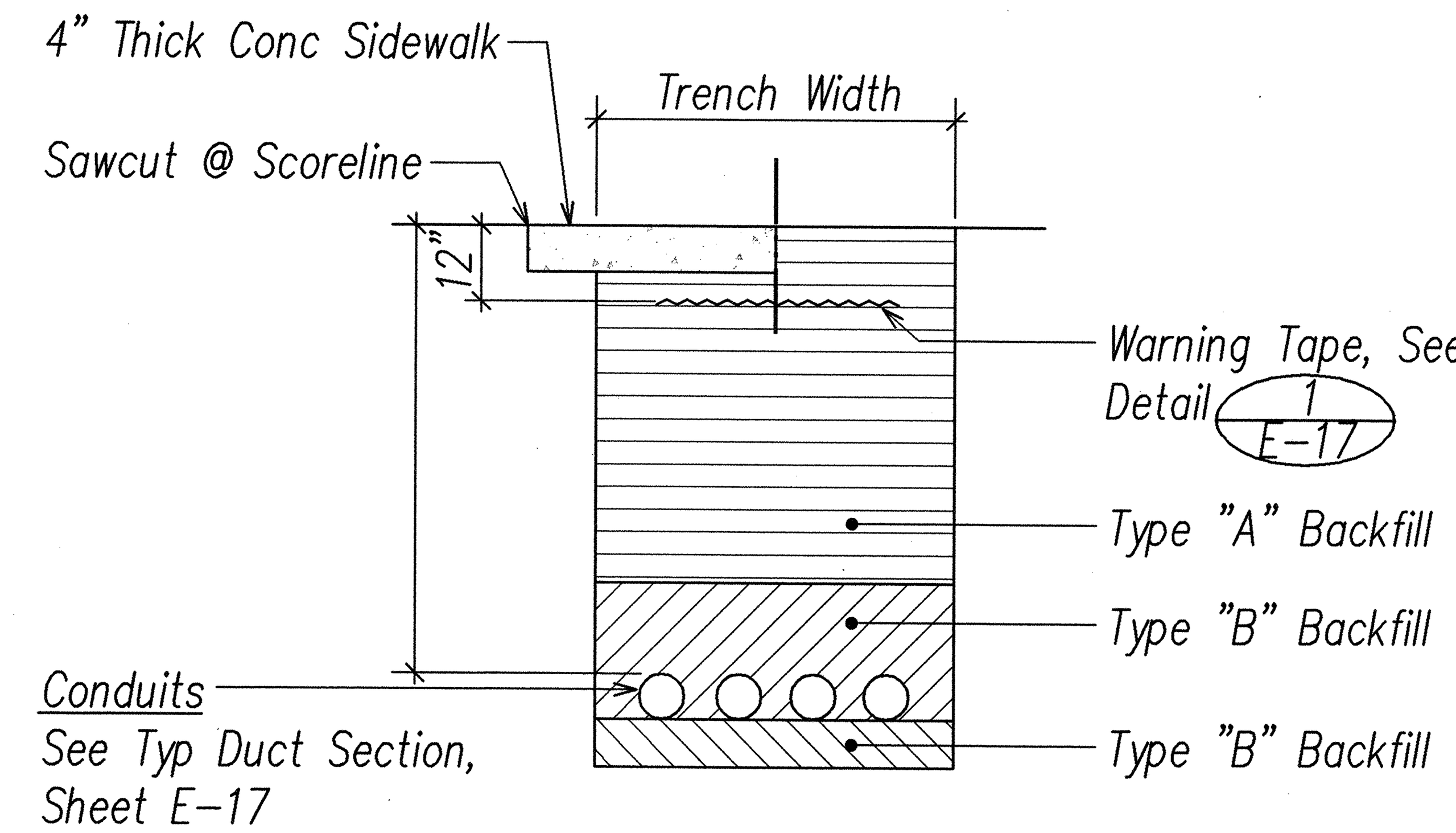
1. This Trench Restoration is to be Used wherever the Pavement is an Asphalt Surface, Including Medians and Paved Areas Between Guardrails. For Trenches Located in Unpaved Area, The Backfill Need not be CLSM and can be Backfilled as Specified in the Standard Specifications.

2. Tack Coat Exst Asphalt Bound Material Faces Prior to Filling Excavation with Asphalt Bound Material.

(1) Backfill Section
Within State Right-of-way
Under Existing Roadway & Paved Shoulder



(2) Backfill Section
Within State Right-of-way
Under Unpaved Shoulder



(3) Backfill Section
Within State Right-of-way
Beyond Unpaved Shoulder or
Under Existing Concrete Sidewalk [4]

STATE RIGHT-OF-WAY BACKFILL NOTES

Trench Backfill Material "A" Beach Sand, Earth or Earth and Gravel; If Earth and Gravel Used, Rock Size to be 1" Maximum and the Mixture Shall Contain Not More Than 50% by Volume of Rock Particles; Maximum 8" Loose Fill per Lift; Obtain 95% Compaction for Each Lift.

Trench Backfill Material "B" Beach Sand, Earth or Earth and Gravel; If Earth and Gravel Used, Mixture Must Pass a 1/2" Mesh Screen and Shall Contain Not More Than 20% by Volume of Rock Particles; Maximum 8" Loose Fill per Lift; Obtain 95% Compaction for Each Lift.

If Material Below Duct is Not Equivalent to Backfill Material "B", Excavate Material & Provide 3" Backfill Material "B", See Above

Concrete – 3" Encasement, 3000 PSI Compressive Strength @ 3 Days; For Concrete Encasement of Ductline Crossing the Aiea Loop Ramp and the Southeast Ramp, Provide 3000 PSI Compressive Strength In 24 Hours, Rapid Set Concrete.

Notes:

[1] Base Course & Sub-base Course per 1994 State Standard Specifications For Highway Construction.

[2] A.C. Pavement and Base Course, & Aggregate Sub-Base to Match Existing Thickness or the Minimum Thickness Shown, Whichever is Greater.

[3] Sawcutting, Removing of Slurry Generated During Sawcut and Repairing of Existing A.C. Pavement shall not be Paid for Seperately, but considered Incidental to the Various Contract Items.

[4] Sawcutting, Removing of Slurry Generated During Sawcut and Repairing of Existing Concrete Pavement shall not be Paid for Seperately, but considered Incidental to the Various Contract Items.

TYPICAL BACKFILL SECTIONS

NOT TO SCALE

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

LAST SAVE: 07/06/05 @ 10:46:17 BY: AM PLOT SC: 1"=1'
Z:\ACAD\PROJECTS\24161\e05_24161_Duct01 XREFS: _X24161_DUCT SECTION DETAILS

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL BACKFILL SECTIONS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-15 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	76	106

CONSTRUCTION REQUIREMENTS

1. ALL WORK PERFORMED SHALL BE SUBJECT TO INSPECTION BY THE STATE AND SHALL BE TO THE STATE'S SATISFATION.

2. CONSTRUCT THE TRENCH RESTORATION IN ACCORDANCE WITH THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION AND ITS SPECIAL PROVISIONS, AND THE SPECIFICATION OF INSTALLATION OF MISCELLANEOUS IMPROVEMENTS WITHIN STATE HIGHWAYS.

3. PAVEMENT SMOOTHNESS

a. OBTAIN A PROFILE OF THE EXISTING ROADWAY SURFACE THAT IS TO HAVE A NEW SURFACE AS A RESULT OF THE RESTORATION OF THE TRENCH EXCAVATION AND SUBMIT THE PROFILE TO THE DISTRICT ENGINEER BEFORE ANY WORK FOR TRENCH EXCAVATION BEGINS.

b. OBTAIN A PROFILE OF THE ROADWAY SURFACE AFTER THE ROADWAY SURFACE HAS BEEN REPAVED AND SUBMIT THE PROFILE TO THE DISTRICT ENGINEER. THE PROFILE OF THE ROADWAY SURFACE AFTER REPAVING SHALL BE EQUAL TO OR SMOOTHER THAN THE PROFILE OBTAINED BEFORE TRENCH EXCAVATION BEGAN.

c. THE DISTANCE FROM THE PAVED SURFACE TO THE TESTING EDGE OF A TEN-FOOT LONG STRAIGHT EDGE BETWEEN TWO POINTS OF CONTACT SHALL NOT EXCEED 3/16 INCH.

4. PLACE ALL UNBOUND MATERIALS IN THE TRENCH AS FOLLOWS:

a. COMPACTION BY WATER JETTING OR PONDING IS NOT PERMITTED.

b. ALL UNBOUND MATERIALS, EXCEPT THE PERMEABLE BASE AND ASTM C-33 SIZE 67:

1) PLACE MATERIAL IN ACCORDANCE WITH SUBSECTION 206.03 (E) STRUCTURE AND TRENCH BACKFILL OF THE HAWAII STANDARD SPECIFICATIONS FOR ROAD, BRIDGE, AND PUBLIC WORKS CONSTRUCTION.

2) TAKE ONE COMPACTION TEST FOR 300 LINEAR FEET OF TRENCH. SUBMIT COMACTION TEST RESULTS TO THE DISTRICT ENGINEER.

c. PERMEABLE BASE:

1) PLACE PERMEABLE MATERIAL IN UNIFORM HORIZONTAL LAYER NOT EXCEEDING 9 INCHES IN COMPACTED THICKNESS.

2) COMPACT EACH LAYER WITH 8 PASSES OF A VIBRATING PLATE COMPACTOR. USE HAND TAMPER IF TRENCH TOO NARROW TO ACCOMMODATE THE VIBRATING PLATE COMPACTOR.

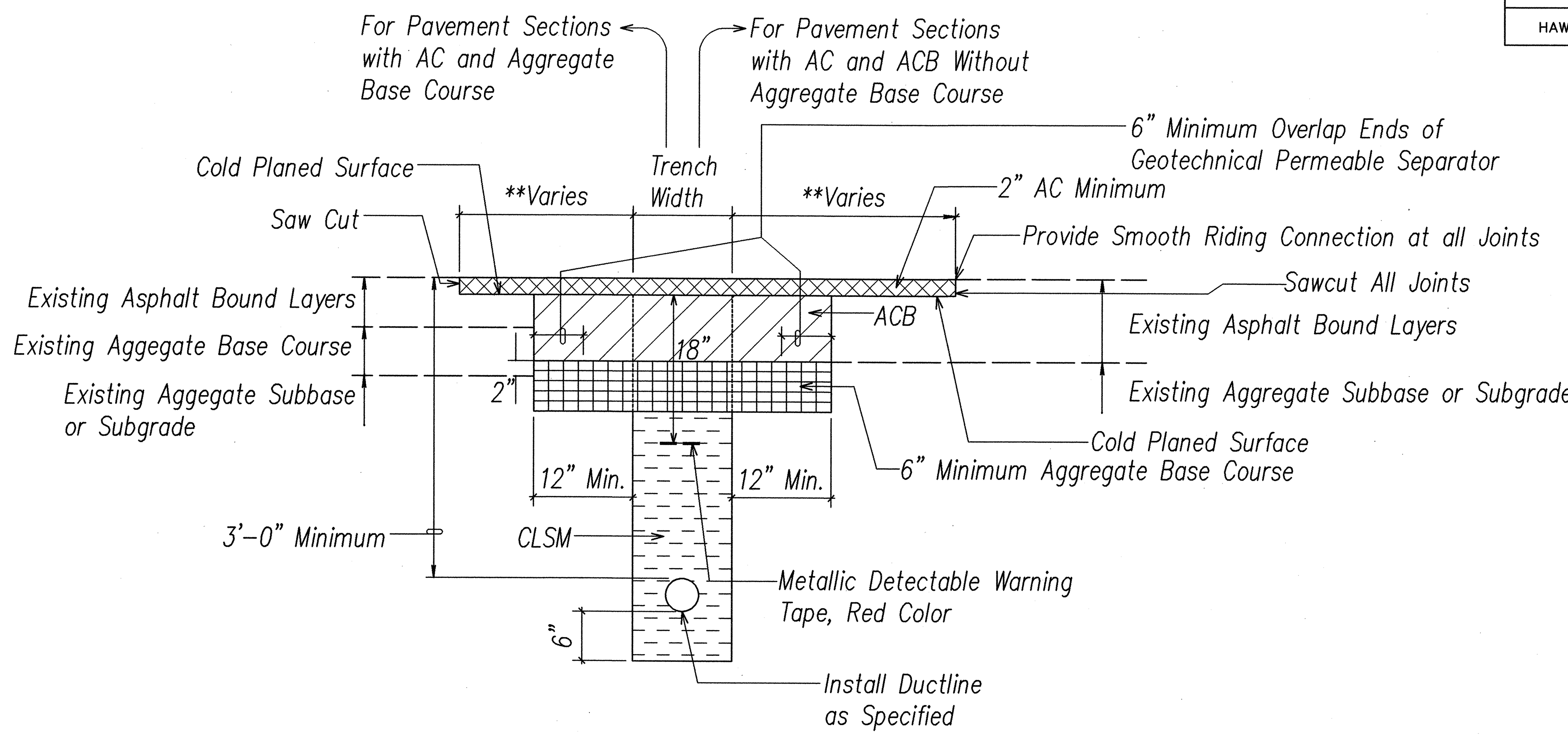
d. ASTM C-33, SIZE 67:

1) MATERIAL PLACED UNDER WATER NEED NOT BE COMPACTED.

2) MATERIAL PLACED ABOVE WATER:

a) PLACE MATERIAL IN UNIFORM HORIZONTAL LAYER NOT EXCEEDING 9 INCHES IN LOOSE THICKNESS.

b) COMPACT EACH LAYER WITH 8 PASSES OF A VIBRATING PLATE COMACTOR. USE HAND TAMPER IF TRENCH TOO NARROW TO ACCOMMODATE THE VIBRATING PLATE COMPACTOR.



** Note

1. If Trench Aligned Transverse to Direction of Travel, 6 Feet on Each Side of Trench.

2. If Trench Aligned Along Direction of Travel, to Edge of Lane in which Edge of Trench is Located.

3. Smoothness of Paved Surfaces: The Distance from the Paved Surface to the Testing Edge of a Ten-foot Straight Edge Between Two Points of Contact shall not Exceed 3/16".

ASPHALT PAVEMENT RESTORATION OVER TRENCH EXCAVATIONS FOR EXISTING PAVEMENTS (STATE)

NOT TO SCALE

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

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

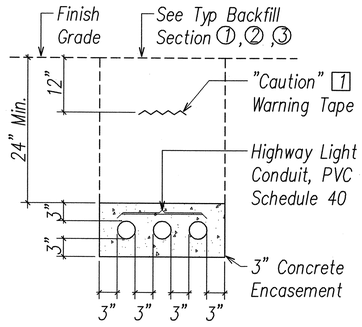
ASPHALT PAVEMENT RESTORATION OVER TRENCH EXCAVATIONS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

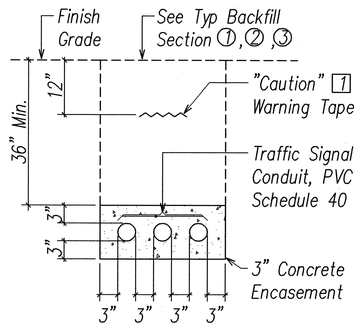
Scale: AS NOTED Date: June 2005

SHEET No. E-16 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	77	106



SECTION (A)



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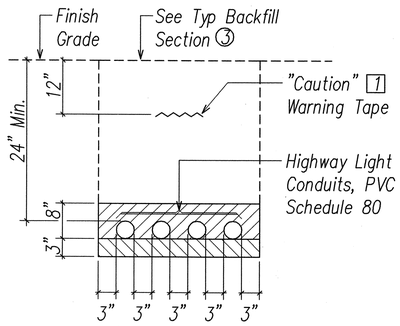
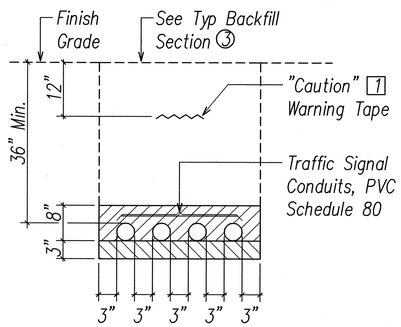


SECTION (B)

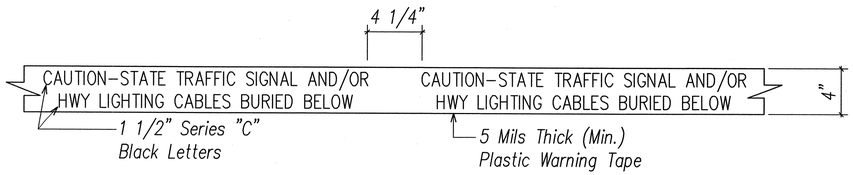


SECTION (D)

Note: For Size & Quantity of Conduits, See Plan Shts; For Typ Backfill Sections & Backfill Notes, See Sheets E-15 & E-16.

TYPICAL DUCT SECTIONS

NOT TO SCALE



For Additional Information, See Above Note [1]

(1 / E-17) METAL DETECTABLE RED PLASTIC WARNING TAPE DETAIL

NOT TO SCALE

Notes:

[1] The Metal Detectable Red Warning Tape shall be a Minimum of 5 Mils Thick and 4-Inch 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 CABLES BURIED BELOW", Utilizing 2-Inch Series "C" Black Lettering. The Message Will be Repeated with a 4 1/4-Inch Spacing Between the End of the Top Lines of the Message and Start of the Next Repeat Message. See Detail (1 / E-17)

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

LAST SAVE: 07/05/05 @ 10:46:26 PM PLOT SC 1"=1"
J:\HWY-0-01-05M\PROJECT\SHEETS\HWY_0_01_05M_E_SHEET_DUCT SECTION DETAILS

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

7.5.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

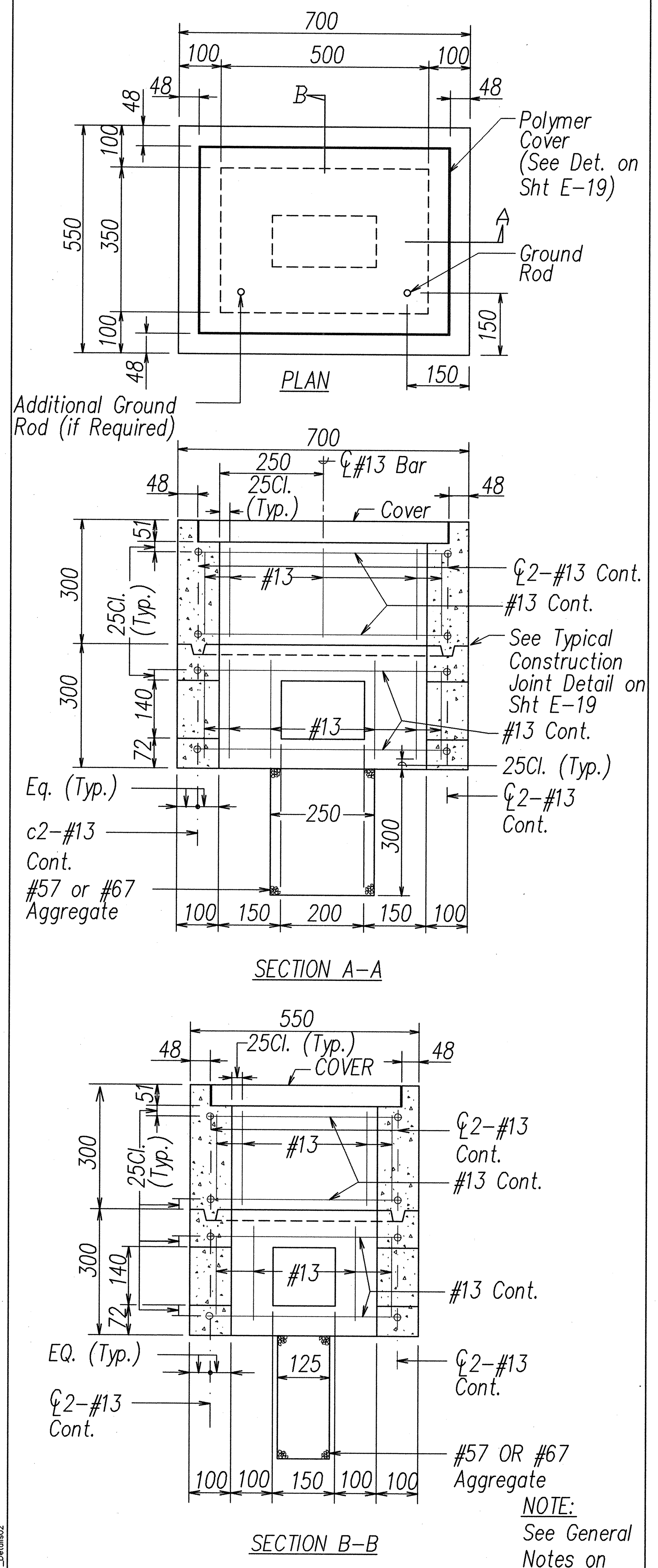
TYPICAL DUCT SECTIONS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

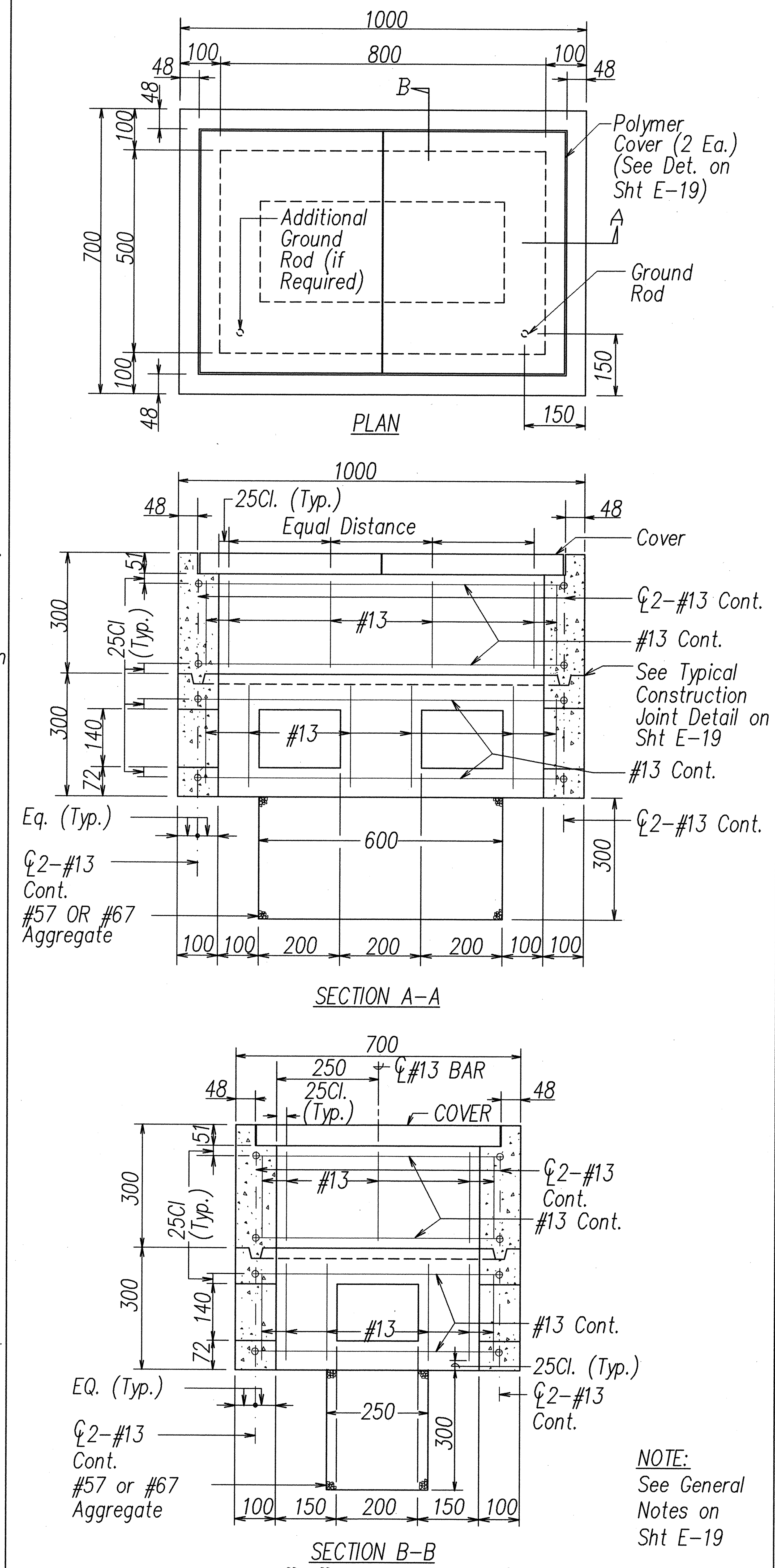
SHEET No. E-17 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	78	106



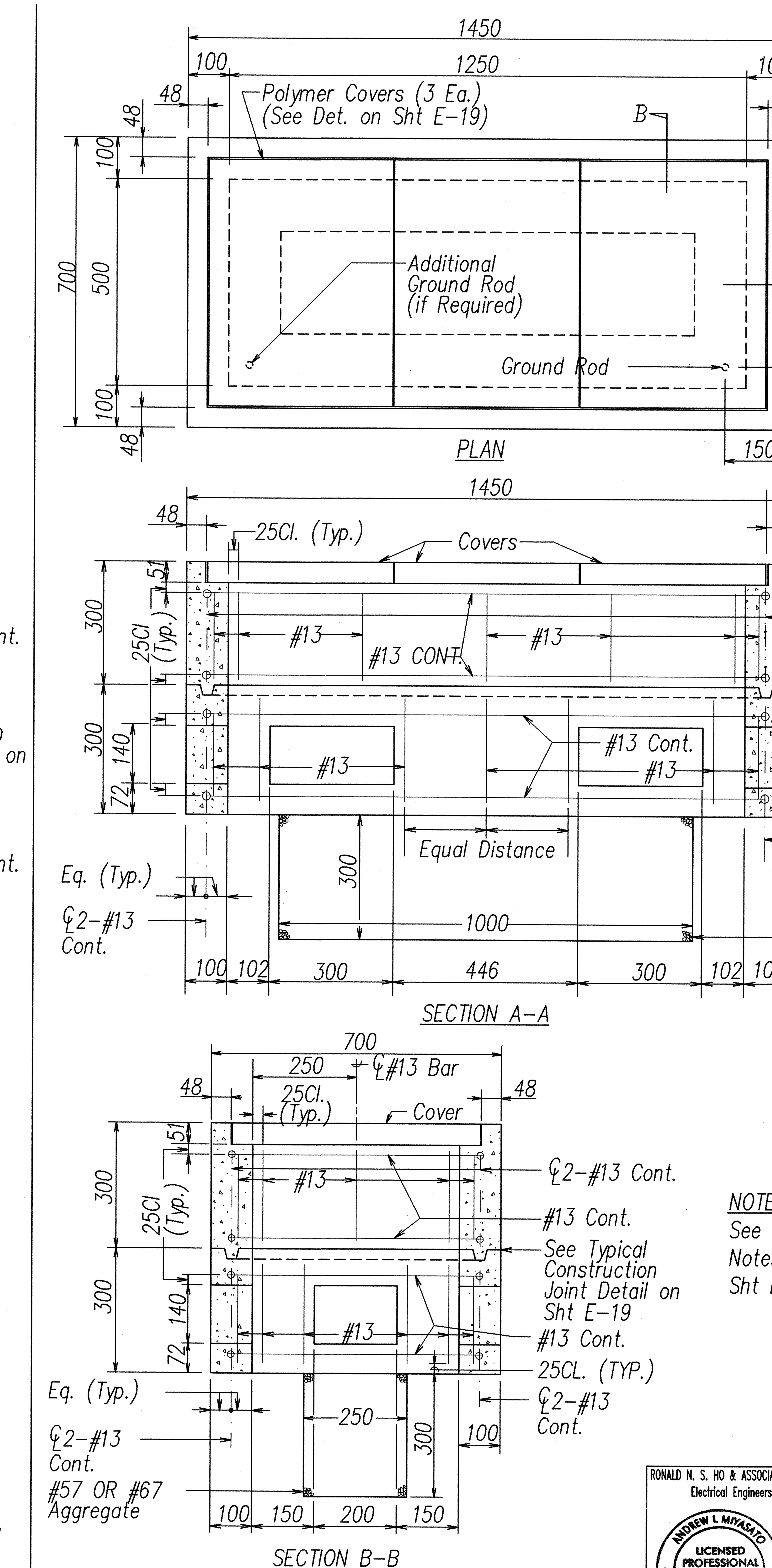
NOTE:
See General Notes on Sht E-19

TYPE "A" PULLBOX OLD TYPE "B"
(A / E-18) NOT TO SCALE



NOTE:
See General Notes on Sht E-19

TYPE "B" PULLBOX (OLD TYPE "C")
(B / E-18) NOT TO SCALE



TYPE "C" PULLBOX (OLD TYPE "D")
(C / E-18) NOT TO SCALE

All Dimensions on this Sheet are in Millimeters

NOTE:
See General Notes on Sht E-19

RONALD N. S. HO & ASSOCIATES, INC.
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HAWAII, U.S.A.

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX DETAILS I
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

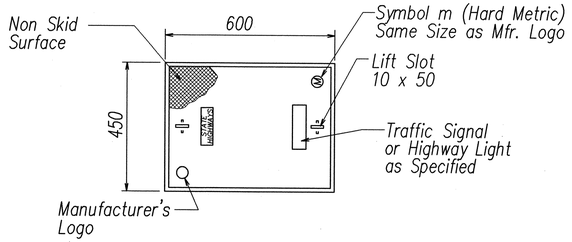
Scale: AS NOTED Date: June 2005

SHEET No. E-18 OF 106 SHEETS

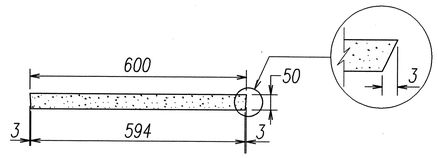
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	79	106

GENERAL NOTES FOR PULLBOX DETAILS ON SHEET E-18

1. Provide a minimum of one 16ft x 2.5m copperweld 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.
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 the trench.
8. All concrete shall be class A (25MPA, min.)
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 D 448).
11. Type "C" pullbox shall be installed in a location protected from vehicular traffic (i.e. raised sidewalk, behind a.c. curbs, traffic signal standard or pipe guards).

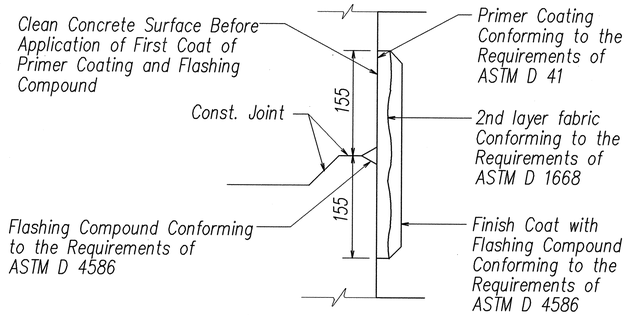


PLAN VIEW



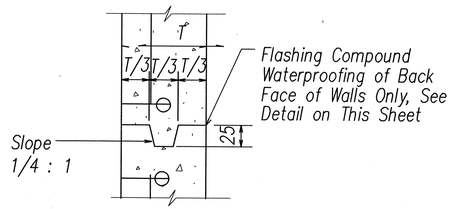
ELEVATION

Note: See Highway Lighting and Traffic Signal Pullbox Details on Sht E-18



A E-19 **TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS**
NOT TO SCALE

B E-19 **POLYMER CONCRETE COVER**
NOT TO SCALE



Note: See Highway Lighting and Traffic Signal Pullbox Details on Sht E-18

All Dimensions on this Sheet are in Millimeters Unless Otherwise Shown

C E-19 **TYPICAL CONSTRUCTION JOINT DETAIL**
NOT TO SCALE

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LAST SAVE: 07/05/04 @ 10:46:55 BY: AM PLOT SC: 1'-0"=1"
Z:\LAND\PROJECTS\HWY-0-01-05M\PULLBOX_DETAILS.dgn

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

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No. 4340-E
HAWAII, U.S.A.

7.5.05

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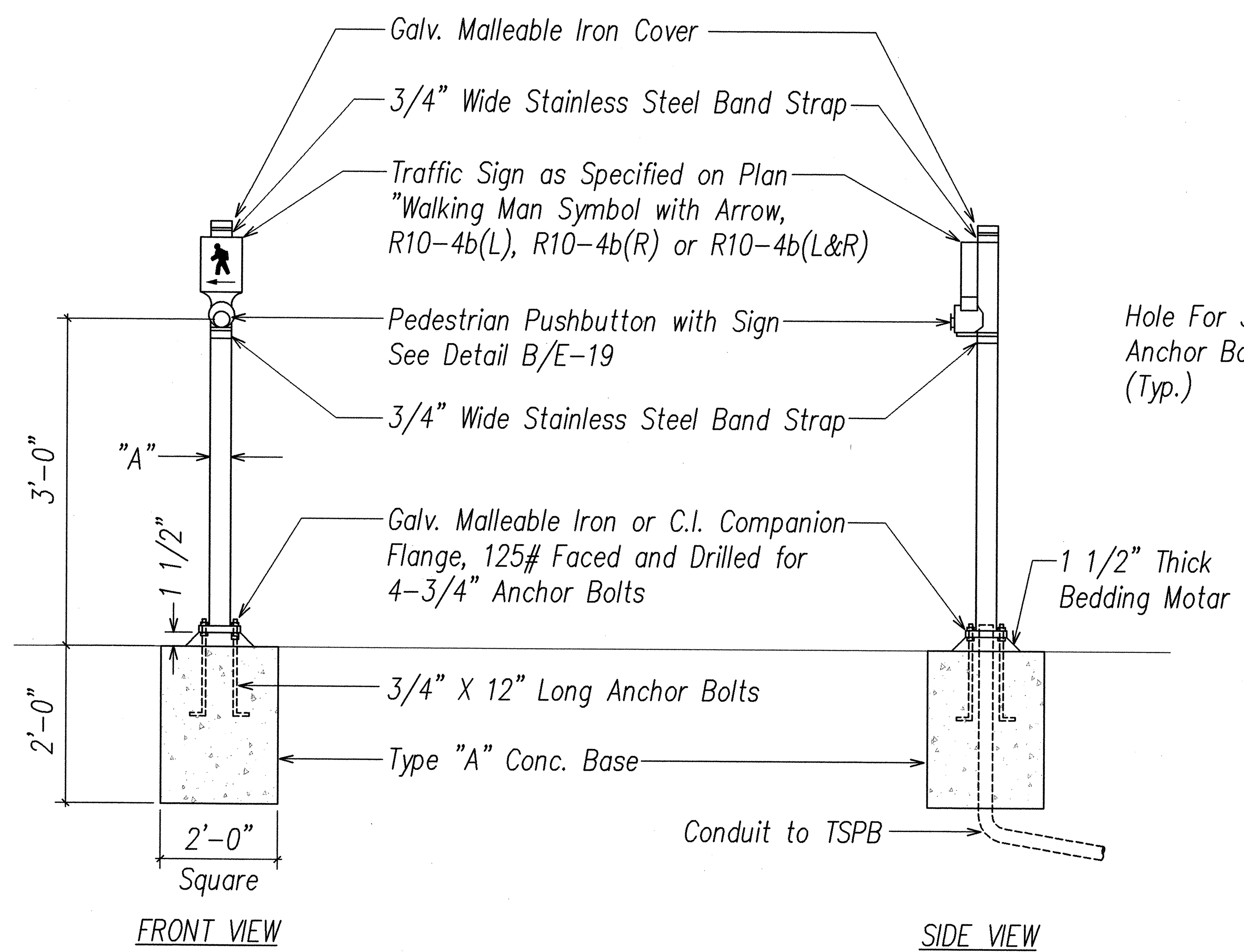
04/30/06
EXPIRATION DATE OF THE LICENSE

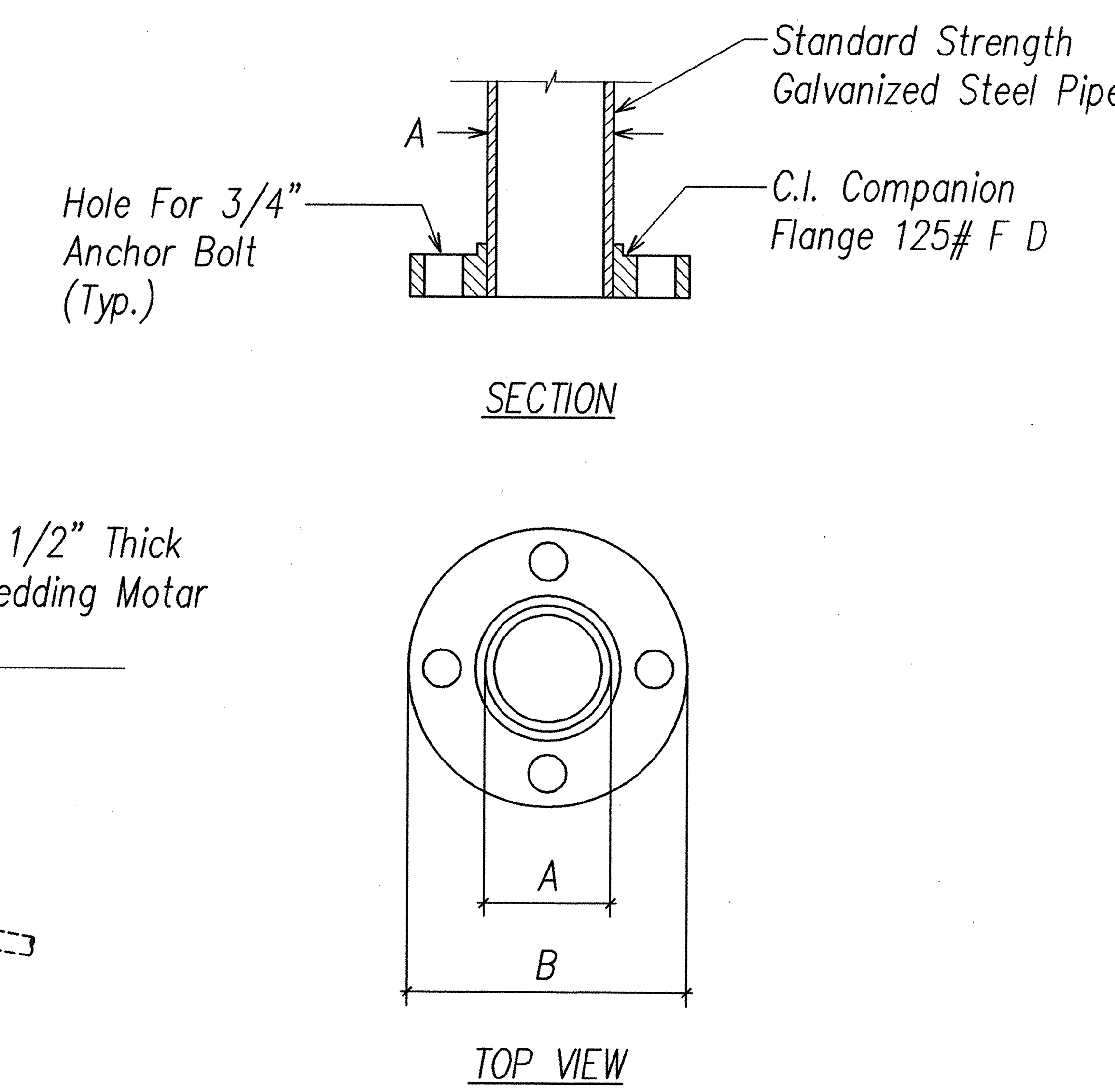
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX DETAILS II
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M
Scale: AS NOTED Date: June 2005

SHEET No. E-19 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	80	106

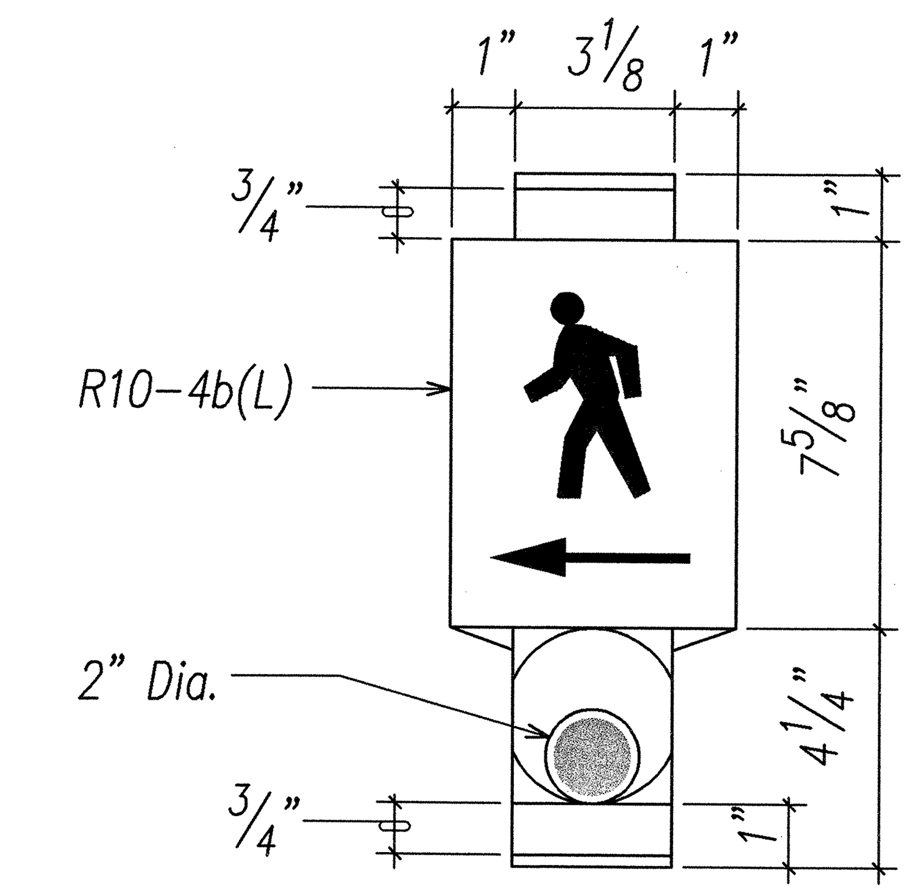




FLANGE DETAIL

DETAIL NOTES:

1. The pedestrian pushbutton unit shall consist of a one piece assembly with a raise walking man, arrow indication and push button.
2. The pushbutton activator shall be of the mushroom plunger type, ADA acceptable, 2 inches in diameter that requires less than 5 lbs. of pressure to activate.
3. The raised man and arrows shall be directional and match the directional indication as shown on the plans.
4. The pushbutton shall be tamper proof, weatherproof and constructed so that electrical shocks are impossible.
5. The color scheme shall be:
   White – Man, arrow and pushbutton
   Black – Background



B/E-20 PEDESTRIAN PUSHBUTTON DETAIL

NOT TO SCALE

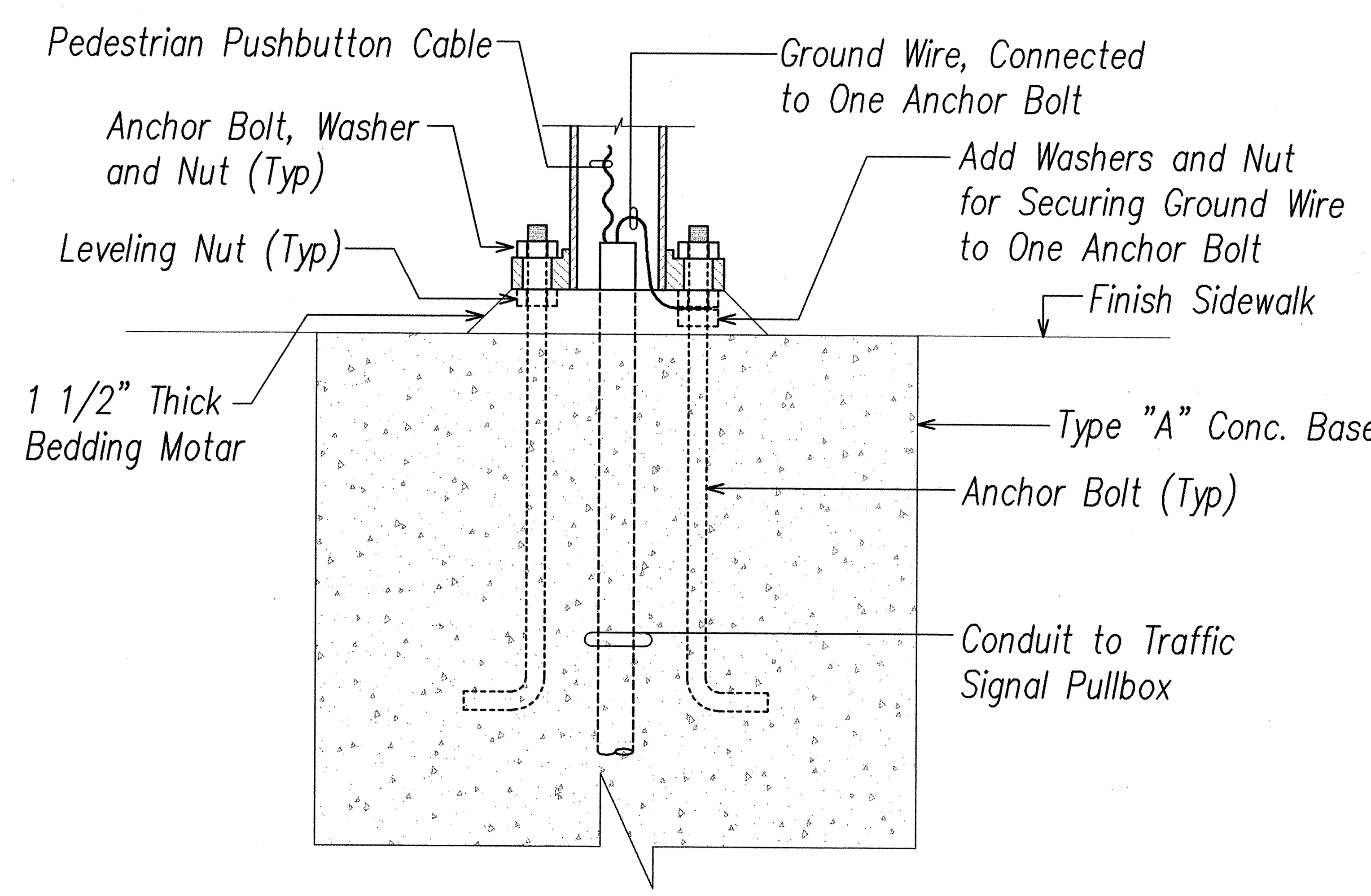
NOTE:

1. Conduits shall Protrude 2" Max above Finished Surface of Foundation.
2. Conduits Shall slope away from Post Foundation.

DATA TABLE FOR PPB POST		
AMOUNT OF PPB	DIMENSIONS	
	A	B
1	3 1/2"	8"
2-3	4 1/2"	9"

A/E-20 PEDESTRIAN PUSHBUTTON POST AND FOOTING DETAIL

NOT TO SCALE



C/E-20 PEDESTRIAN PUSHBUTTON POST GROUNDING DETAIL

NOT TO SCALE

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RONALD N. S. HO & ASSOCIATES, INC.
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7.5.15

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

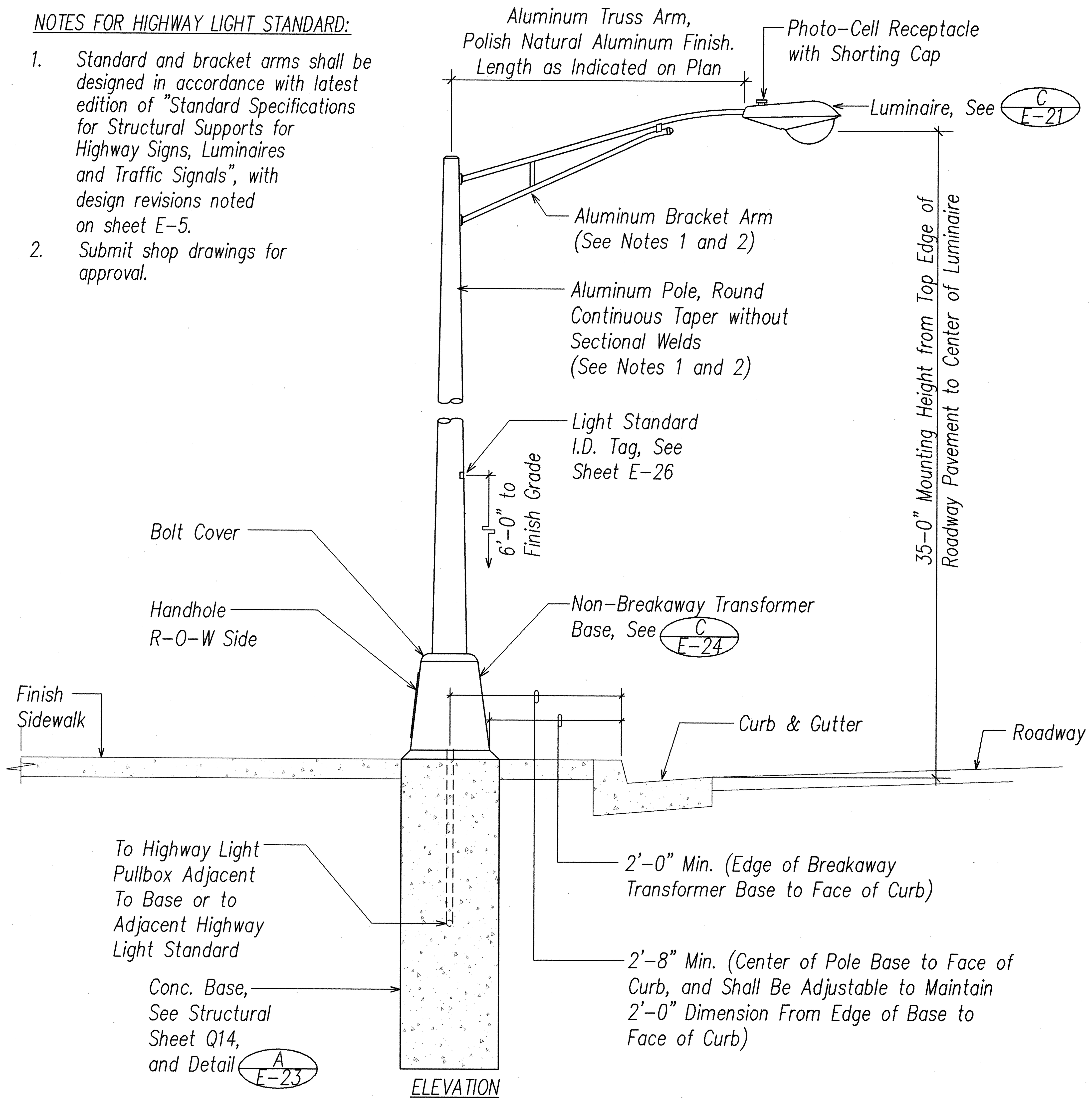
Scale: NONE | Date: June 2005

SHEET No. E-20 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-O-01-05M	2006	81	106

NOTES FOR HIGHWAY LIGHT STANDARD:

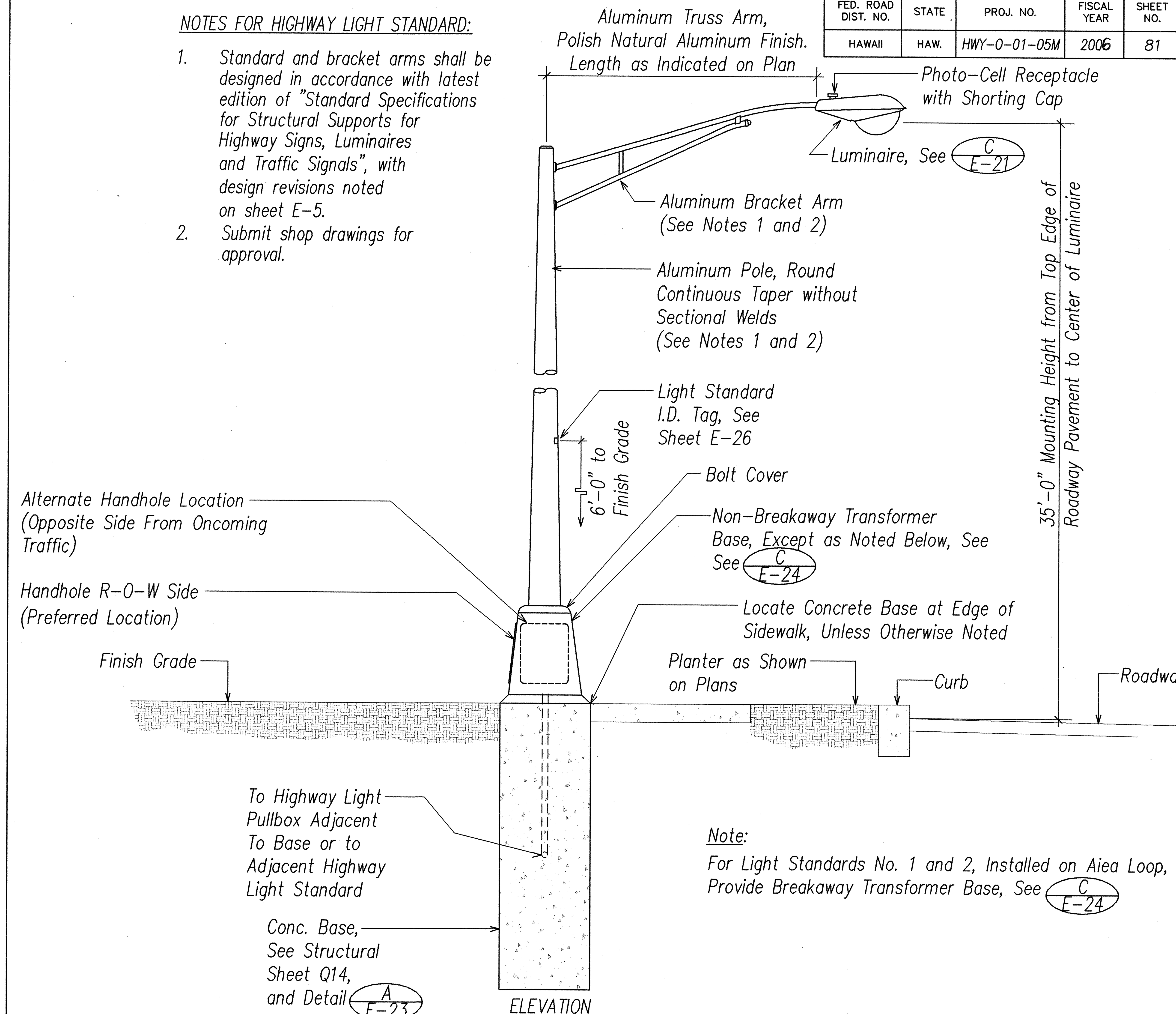
1. Standard and bracket arms shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on sheet E-5.
2. Submit shop drawings for approval.



A E-21 **HIGHWAY LIGHT STANDARD DETAIL IN SIDEWALK (ISW) LOCATION**
NOT TO SCALE

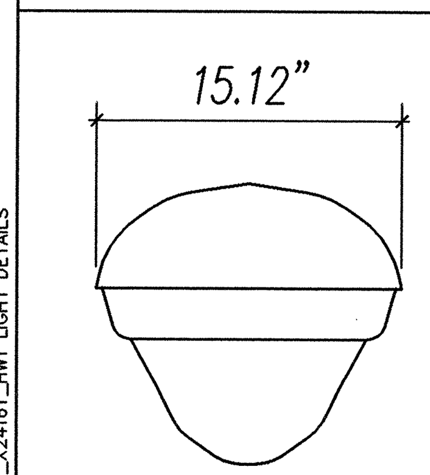
NOTES FOR HIGHWAY LIGHT STANDARD:

1. Standard and bracket arms shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on sheet E-5.
2. Submit shop drawings for approval.

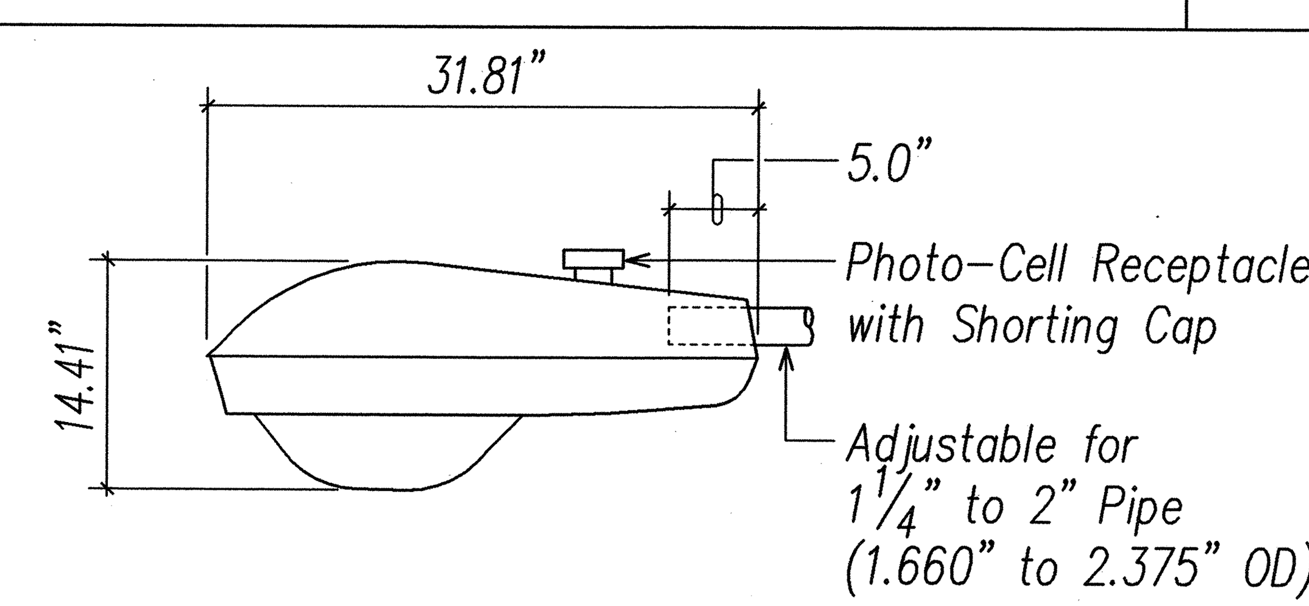


Note:
For Light Standards No. 1 and 2, Installed on Aiea Loop, Provide Breakaway Transformer Base, See C E-24

B E-21 **HIGHWAY LIGHT STANDARD DETAIL BEHIND SIDEWALK (BSW) LOCATION**
NOT TO SCALE



Lamp:	250W HPS, Unless Otherwide Noted
Voltage:	277/480V System, Unless Otherwise Noted
IES Distrib.:	Medium, Semi-Cutoff, Type II, Unless Otherwise Noted
EPA:	1.4 Sq Ft (Max)



Note:
1. All dimensions shown are nominal.
2. Fixture shall be capable of adding a "house-side" shield, if necessary, after it has been installed.

C E-21 **LUMINAIRE DETAIL**
N.T.S.

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7.5.05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT DETAILS I

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-O-01-05M

Scale: NONE   Date: June 2005
SHEET No. E-21 OF 106 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY / DRAWN BY / TRACED BY	DATE
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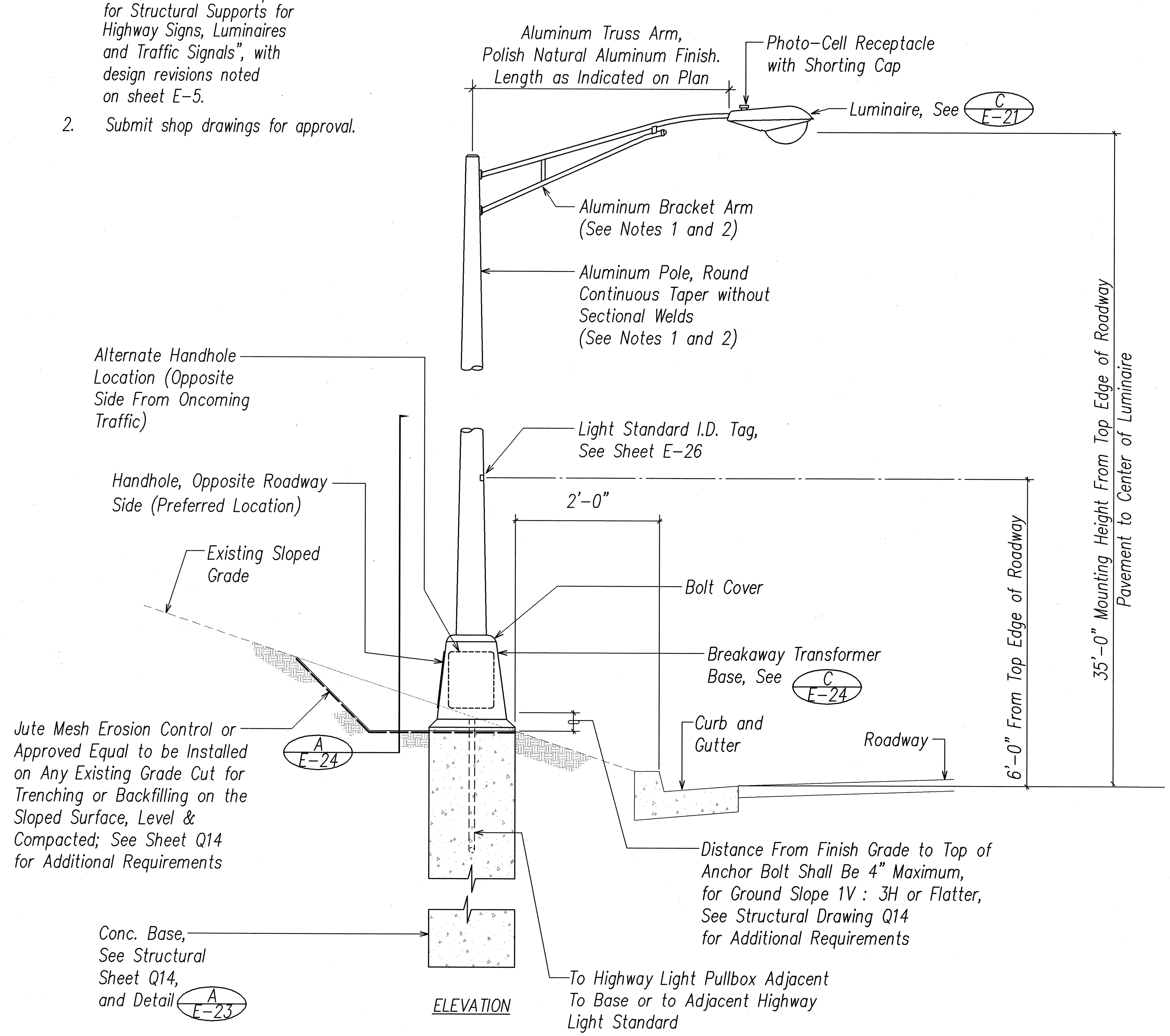
No.		

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	82	106

NOTES FOR HIGHWAY LIGHT STANDARD:

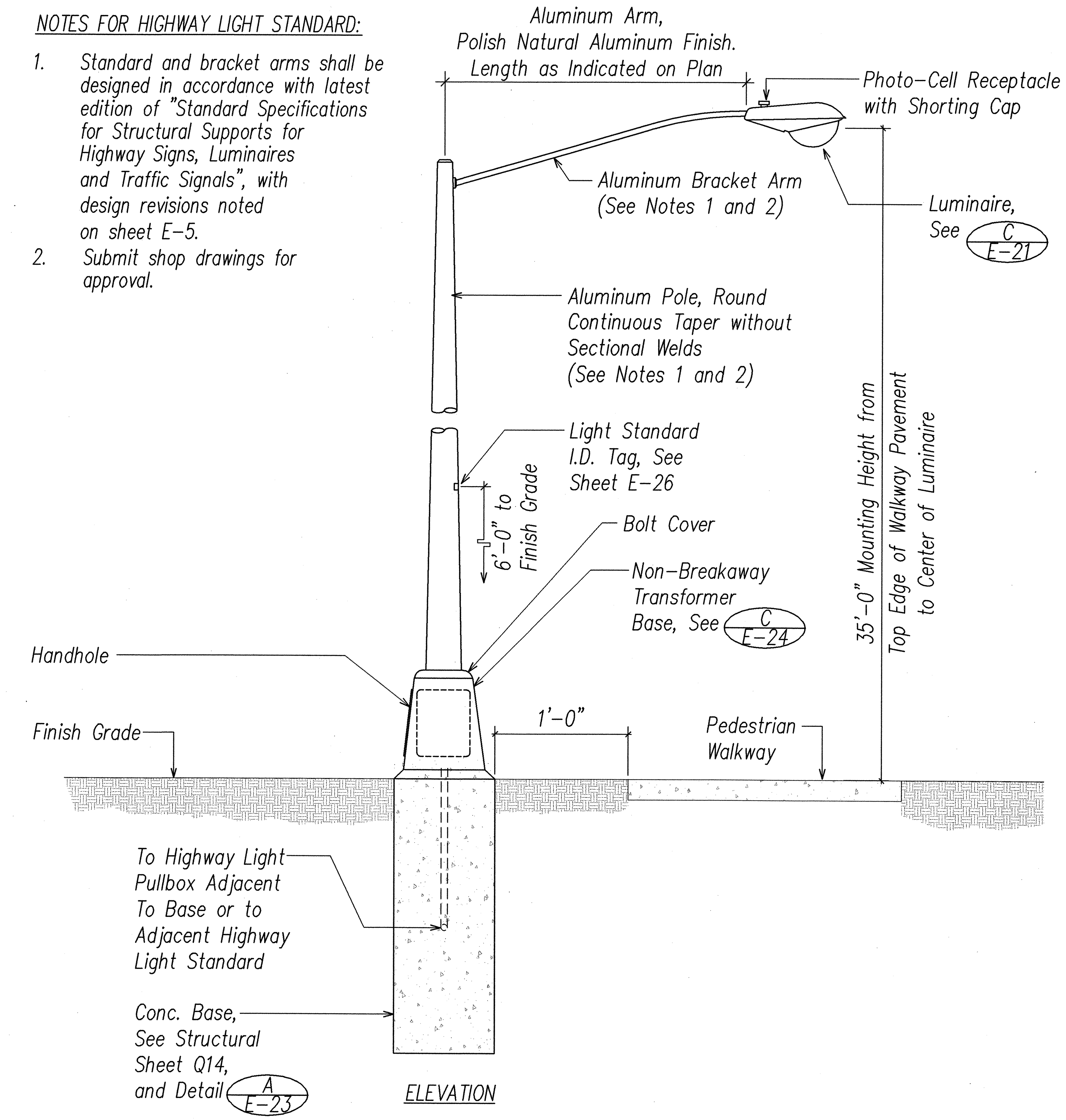
1. Standard and bracket arms shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on sheet E-5.
2. Submit shop drawings for approval.



A/E-22 **HIGHWAY LIGHT STANDARD DETAIL IN UP SLOPING GRADE (IUG) LOCATION**
NOT TO SCALE

NOTES FOR HIGHWAY LIGHT STANDARD:

1. Standard and bracket arms shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on sheet E-5.
2. Submit shop drawings for approval.



B/E-22 **HIGHWAY LIGHT STANDARD DETAIL BEHIND PEDESTRIAN WALKWAY (BPW) LOCATION**
NOT TO SCALE

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

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers
ANDREW I. MIYASATO, LICENSED PROFESSIONAL ENGINEER, No. 4340-E, HAWAII, U.S.A.
7.5.05
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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

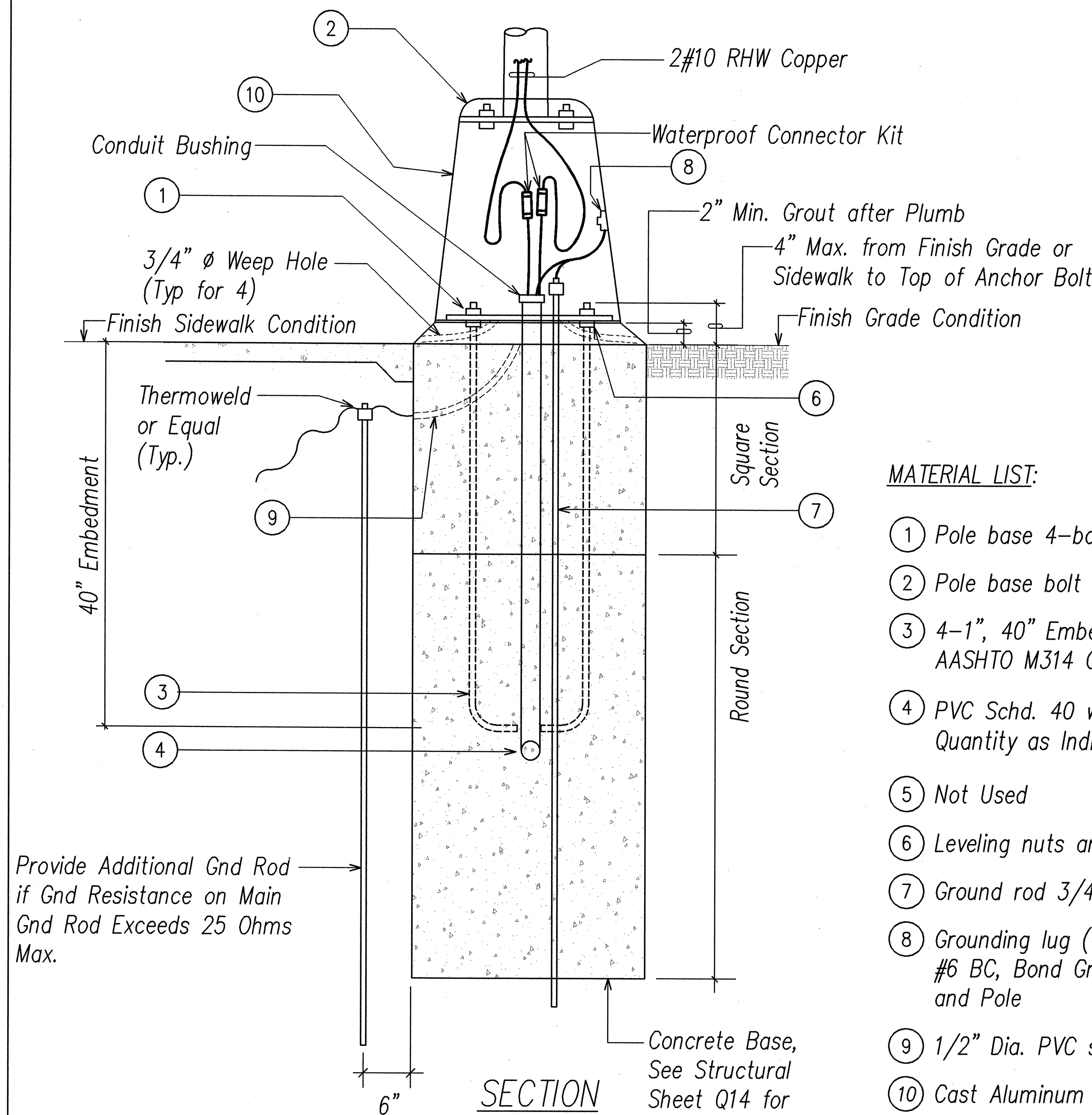
HIGHWAY LIGHT DETAILS II

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: NONE Date: June 2005

SHEET No. E-22 OF 106 SHEETS

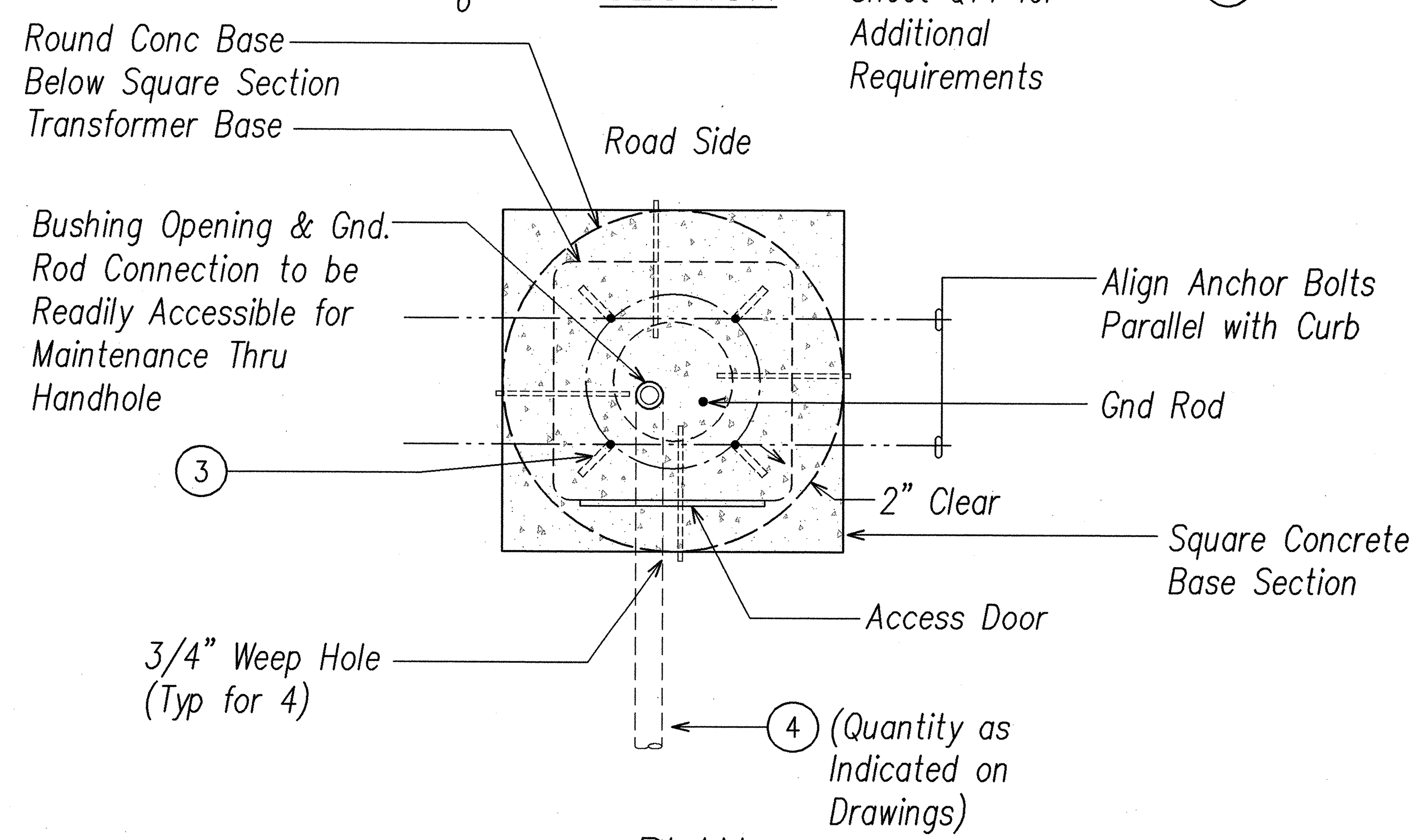
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	83	106



SECTION

MATERIAL LIST:

1. Pole base 4-bolts, washer & nuts
2. Pole base bolt cover
3. 4-1", 40" Embedment, Galv. anchor bolts; AASHTO M314 GR55 with 9" hook
4. PVC Schd. 40 with 3" Conc. Jacket, Quantity as Indicated on Drawings
5. Not Used
6. Leveling nuts and Washers (4)
7. Ground rod 3/4" x 10'-0" copper clad
8. Grounding lug (Opposite handhole) with #6 BC, Bond Gnd Rod, Conduit, and Pole
9. 1/2" Dia. PVC sleeve
10. Cast Aluminum Transformer Base

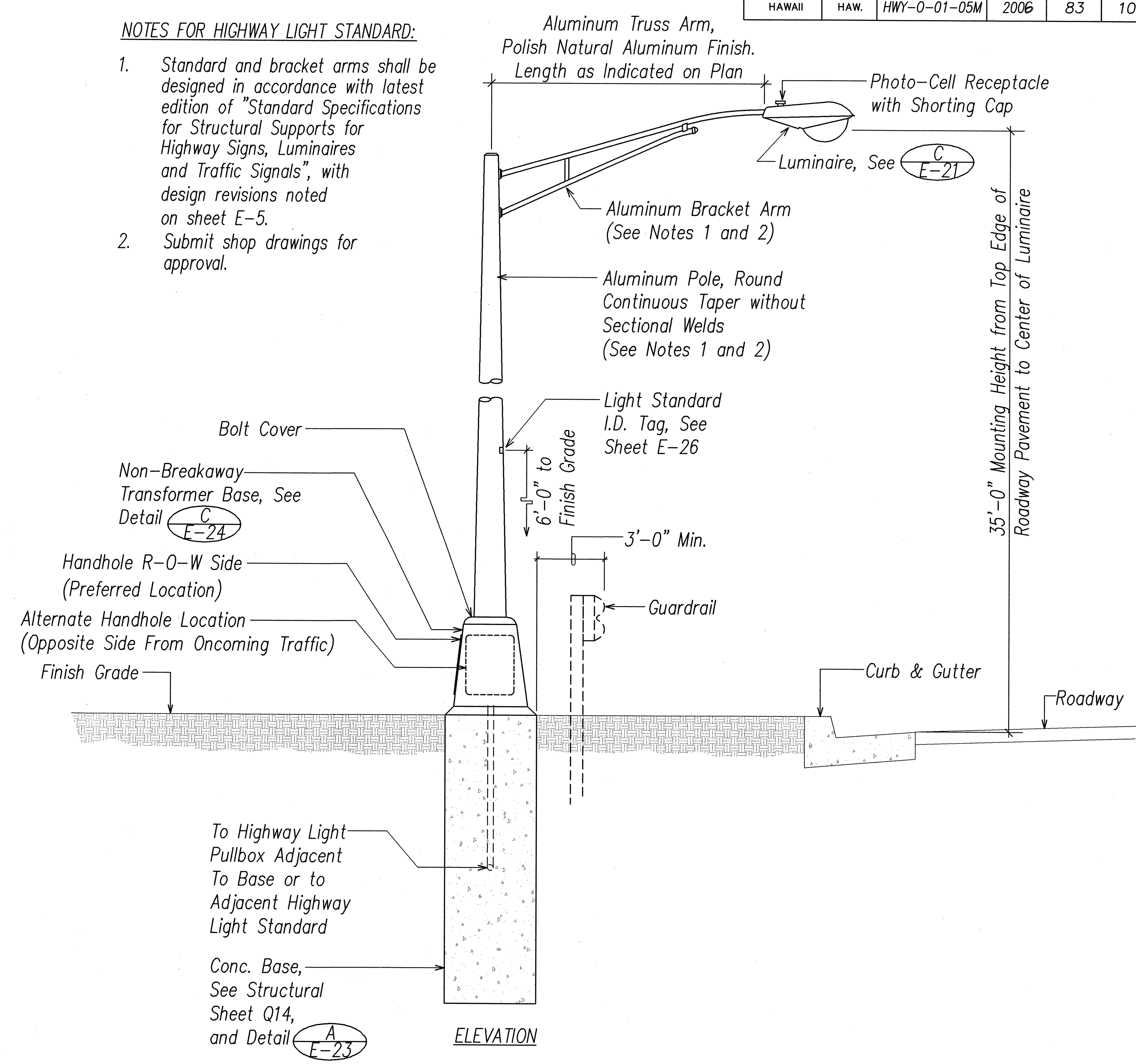


PLAN

A/E-23 TYPICAL LIGHT STANDARD CONCRETE FOUNDATION DETAIL
N.T.S.

NOTES FOR HIGHWAY LIGHT STANDARD:

1. Standard and bracket arms shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on sheet E-5.
2. Submit shop drawings for approval.



ELEVATION

B/E-23 HIGHWAY LIGHT STANDARD DETAIL BEHIND GUARDRAIL (BGR) LOCATION
NOT TO SCALE

RONALD N. S. HO & ASSOCIATES, INC.
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No. 4340-E
HAWAII, U.S.A.
7.5.05

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT DETAILS III

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M
Scale: AS NOTED Date: June 2005
SHEET No. E-23 OF 106 SHEETS

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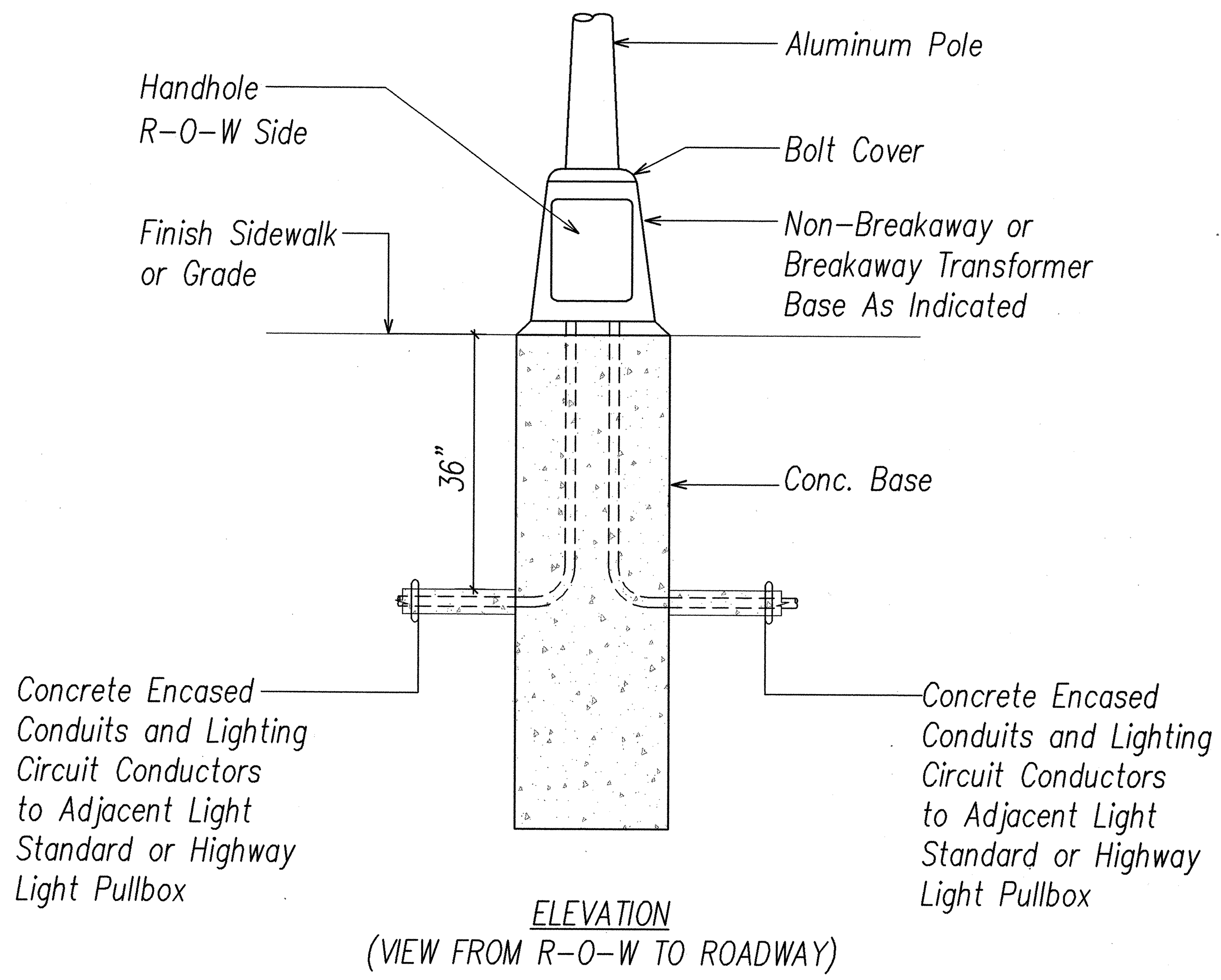
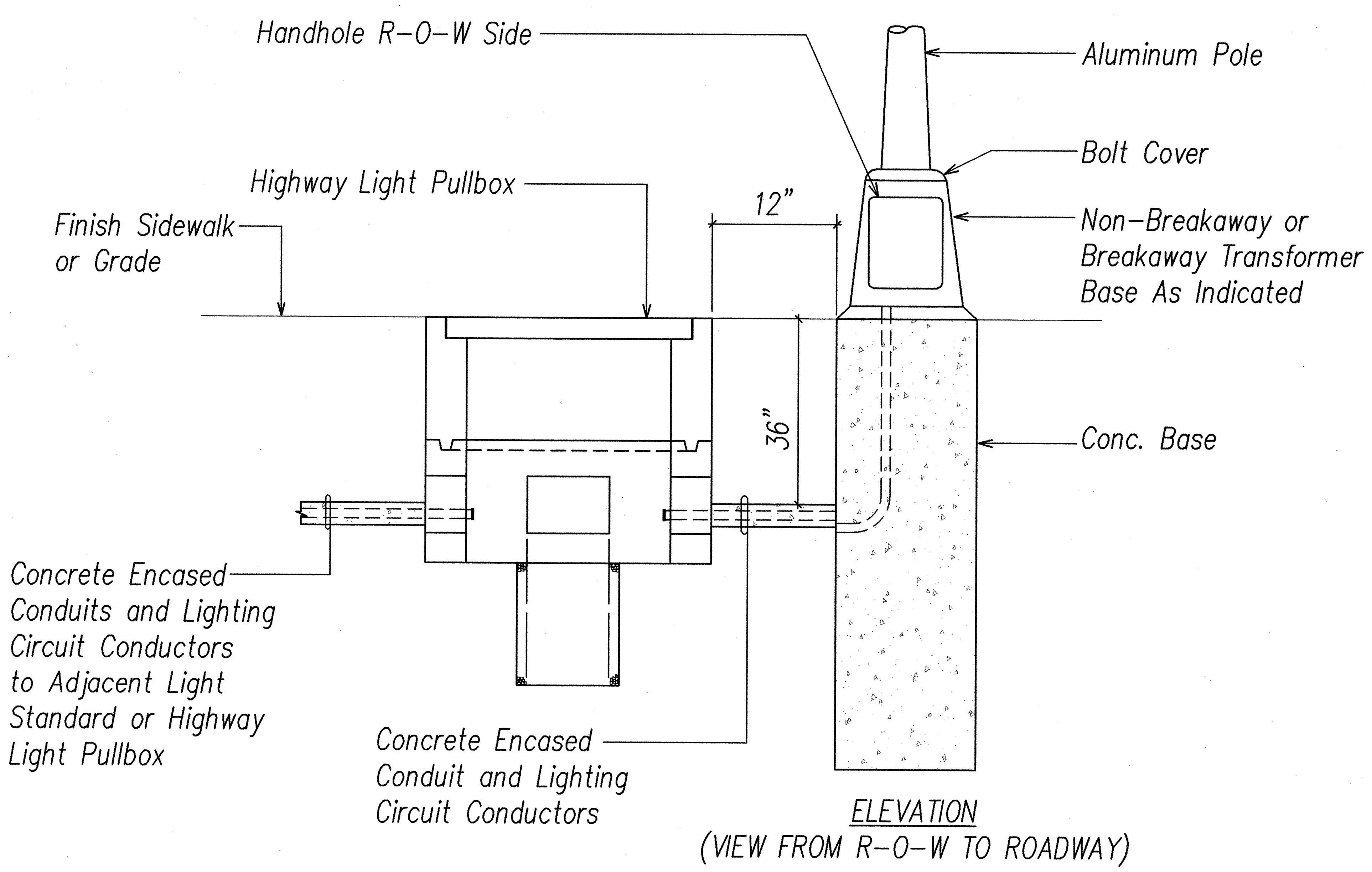
	TRACED BY
NOTE BOOK	DESIGNED BY
	QUANTITIES BY
No.	CHECKED BY
	DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	84	106



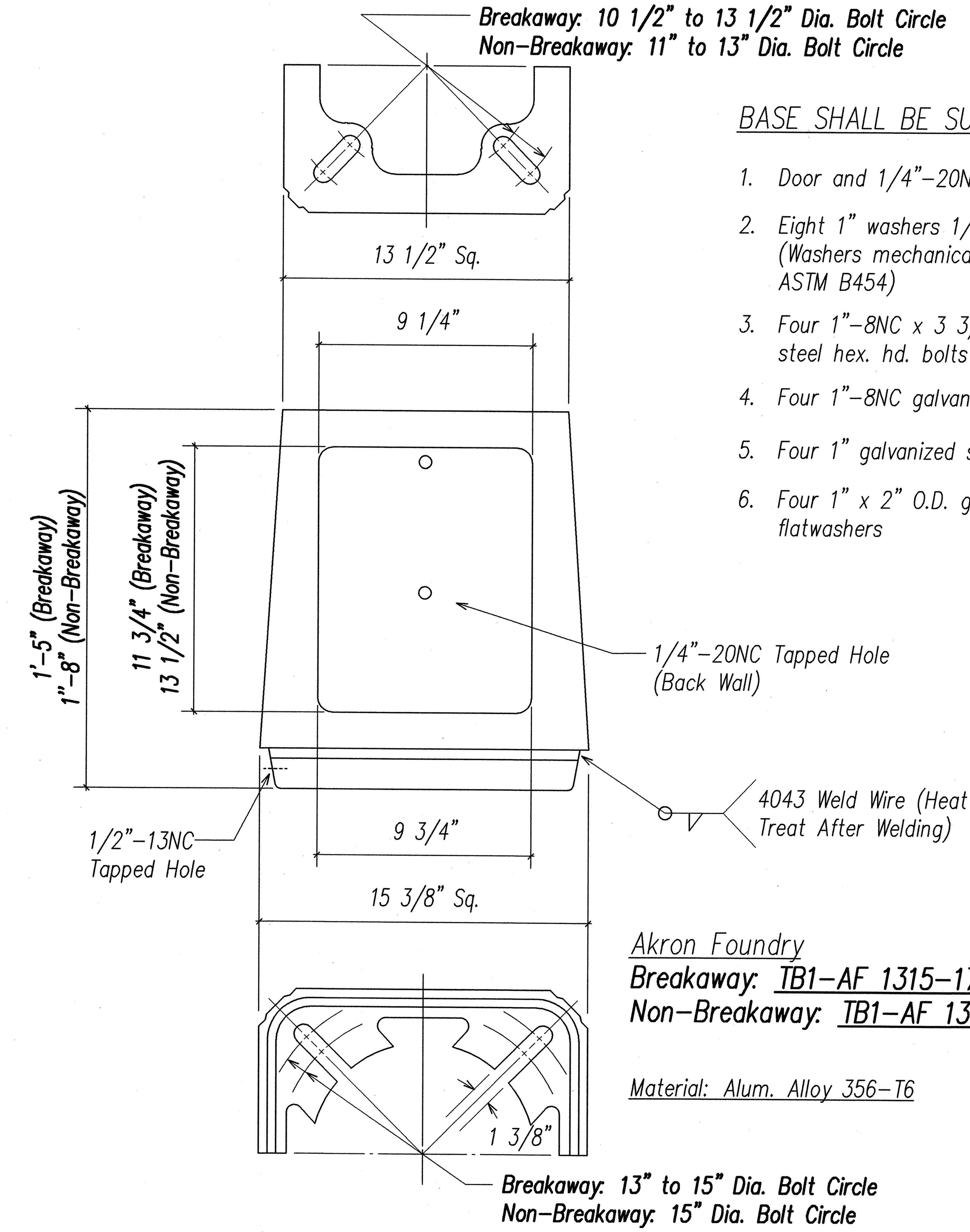
A / E-24 **HIGHWAY LIGHT STANDARD WITHOUT PULLBOX DETAIL**

NOT TO SCALE



B / E-24 **HIGHWAY LIGHT STANDARD WITH PULLBOX LOCATION DETAIL**

NOT TO SCALE



BASE SHALL BE SUPPLIED WITH:

1. Door and 1/4"-20NC S.S. screw
2. Eight 1" washers 1/2" thick x 2 3/4" O.D. (Washers mechanical galvanized per ASTM A153 or ASTM B454)
3. Four 1"-8NC x 3 3/4" long galvanized steel hex. hd. bolts
4. Four 1"-8NC galvanized steel hex. nuts
5. Four 1" galvanized stl. lock washers
6. Four 1" x 2" O.D. galvanized stl. flatwashers

Akron Foundry
Breakaway: TB1-AF 1315-17 I.W. OR Equal (Plus Hardware)
Non-Breakaway: TB1-AF 1315 I.W. OR Equal (Plus Hardware)

Material: Alum. Alloy 356-T6

C / E-24 **BREAKAWAY AND NON-BREAKAWAY TRANSFORMER BASE DETAIL**

NOT TO SCALE

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYAMOTO — LICENSED PROFESSIONAL ENGINEER — No. 4340-E — HAWAII, U.S.A.
7-5-05
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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT DETAILS IV

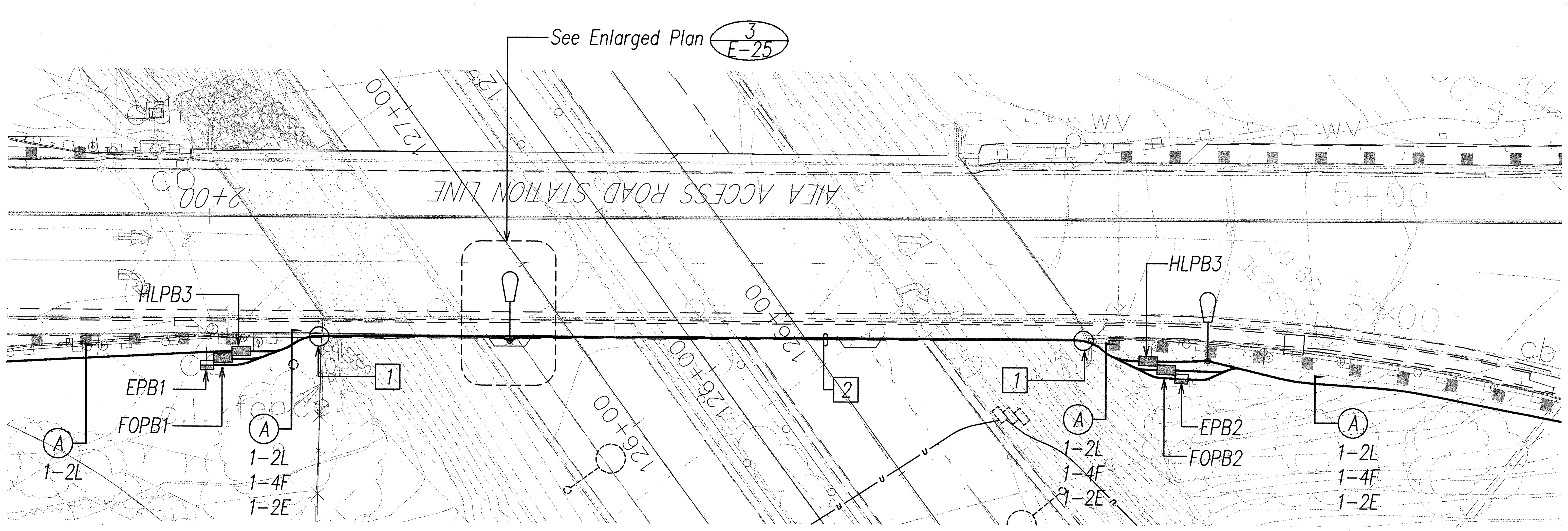
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: NONE | Date: June 2005

SHEET No. E-24 OF 106 SHEETS

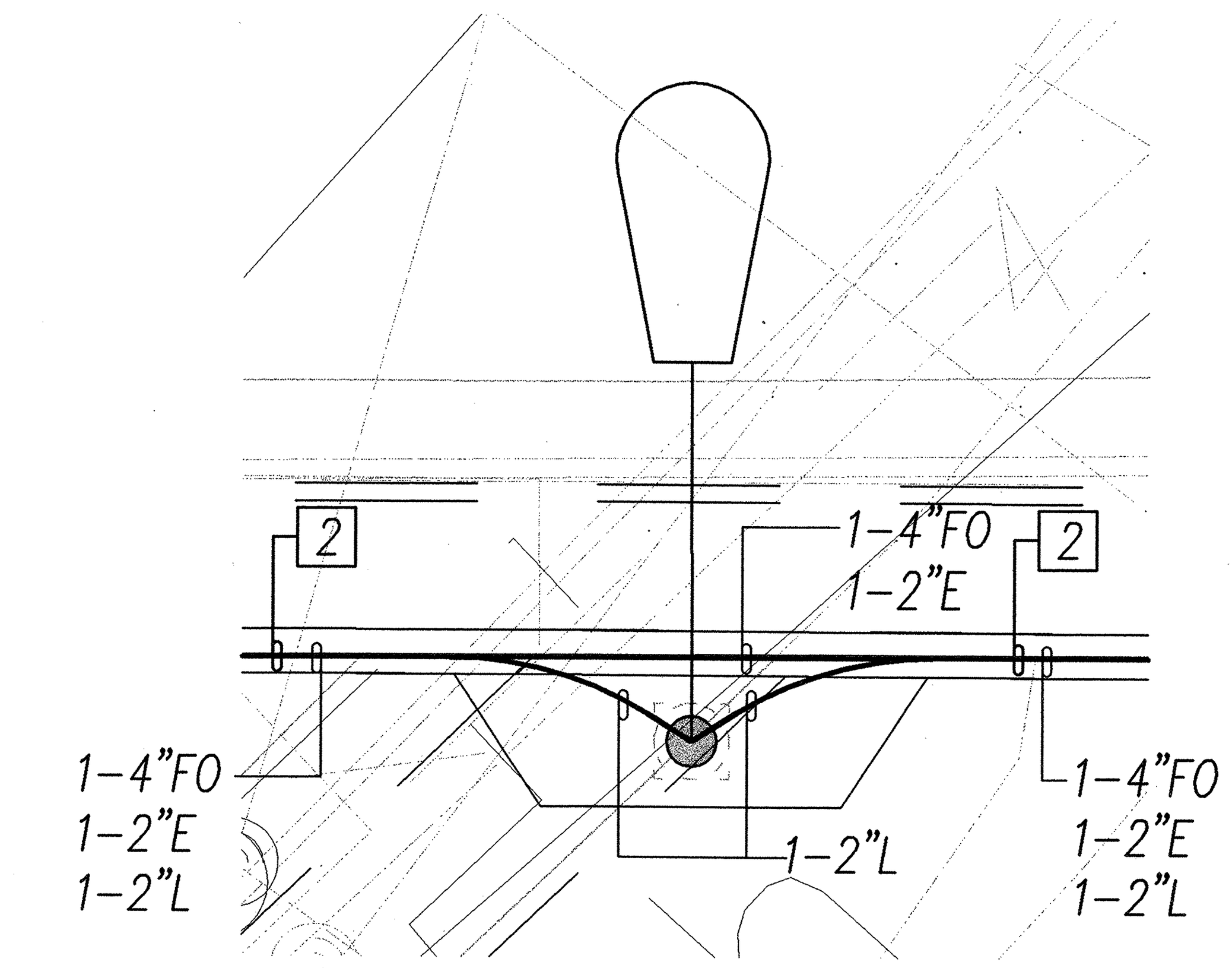
ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY
NOTE BOOK | No. | DATE

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	85	106

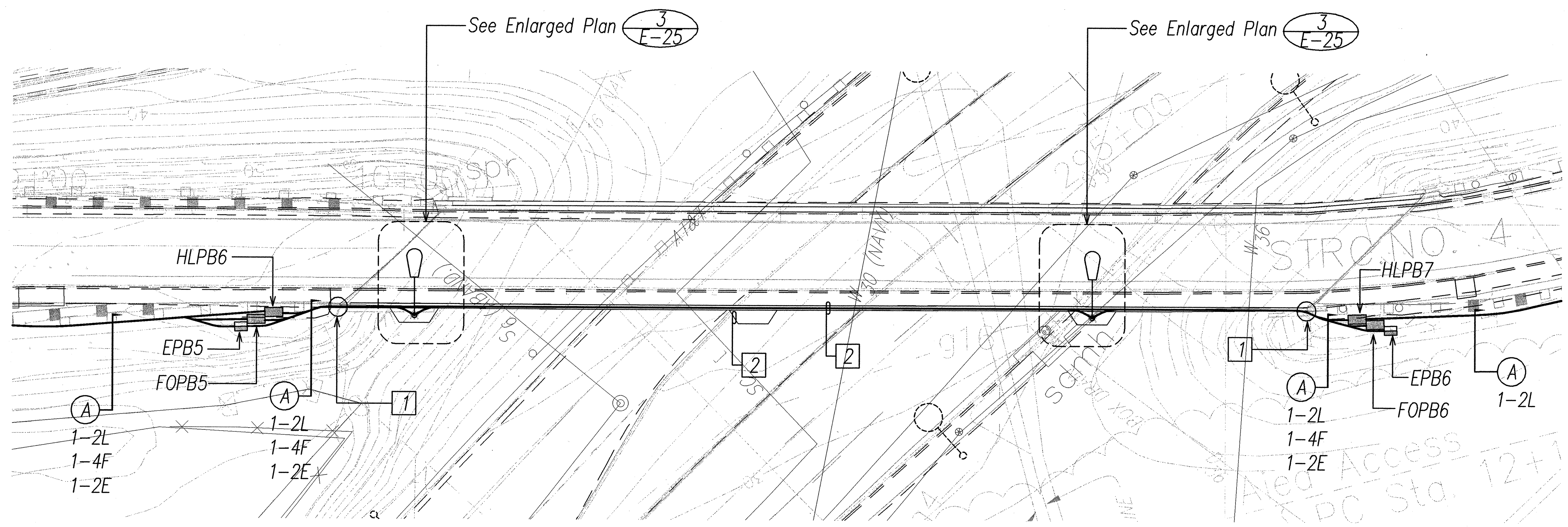


1/E-25 **STRUCTURE NO. 1 ENLARGED ELECTRICAL PLAN**
SCALE: 1"=20'

NORTH



3/E-25 **TYPICAL CONDUIT ROUTING AT HIGHWAY LIGHT STANDARD ON STRUCTURE**
SCALE: 1"=10'



2/E-25 **STRUCTURE NO. 4 ENLARGED ELECTRICAL PLAN**
SCALE: 1"=20'

NORTH

NOTES:

1. Provide Ductline Expansion / Deflection Couplings. See Detail C/E-26.
2. Route Highway Lighting 2"C, Fiber Optic 4"C, and Electric 2"C in Bridge Structure. See Details on Sheet E-26 and on Structural Sheets.

10' 5' 0 10' 20' 30'
SCALE: 1"=10'

20' 10' 0 20' 40' 60'
SCALE: 1"=20'

GRAPHIC SCALES

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers
ANDREW L. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
7.12.05
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION
04/30/06
EXPIRATION DATE OF THE LICENSE

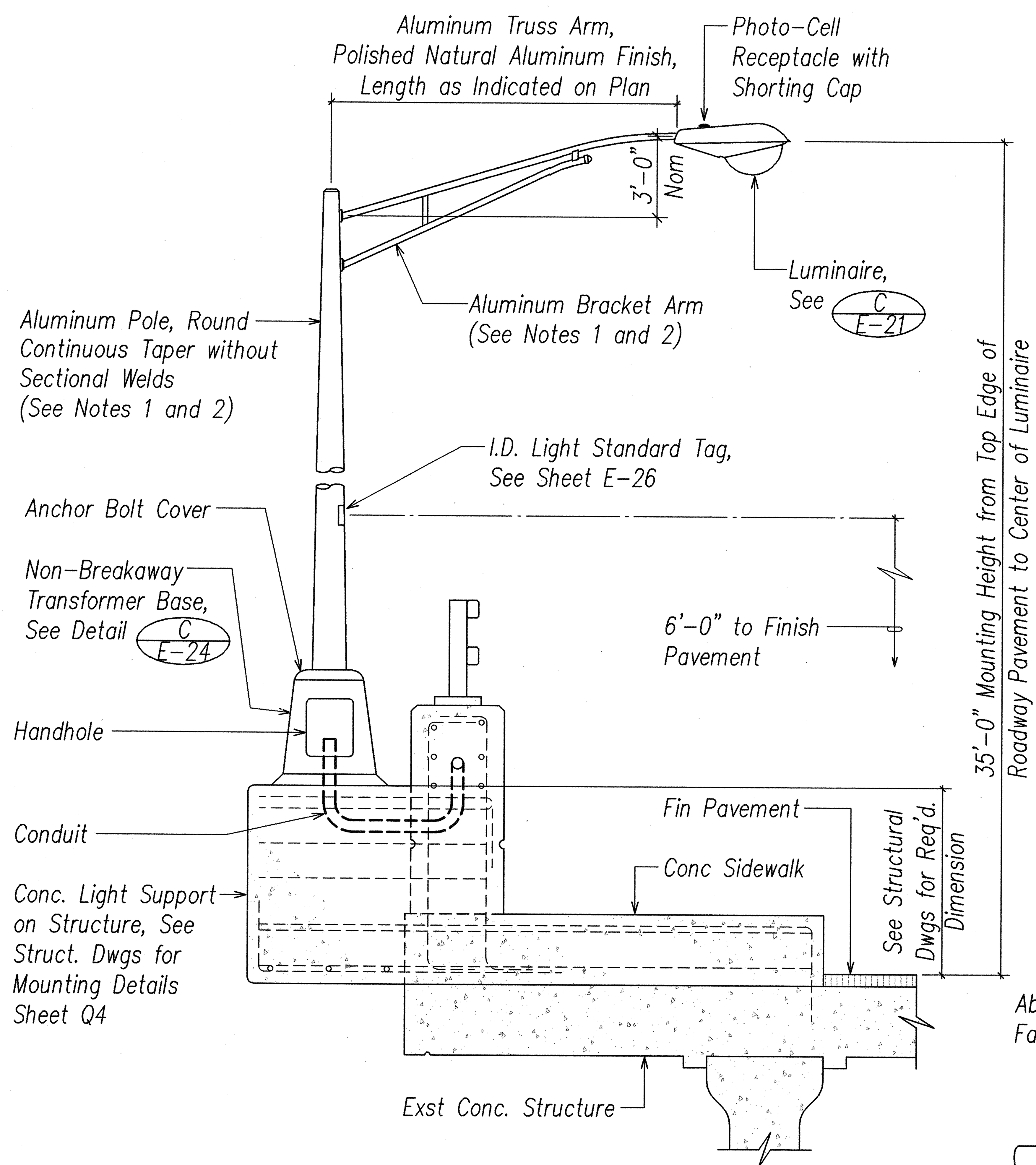
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCTLINE ROUTING THROUGH STRUCTURES 1 AND 3

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M
Scale: AS NOTED Date: June 2005
SHEET No. E-25 OF 106 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	86	106

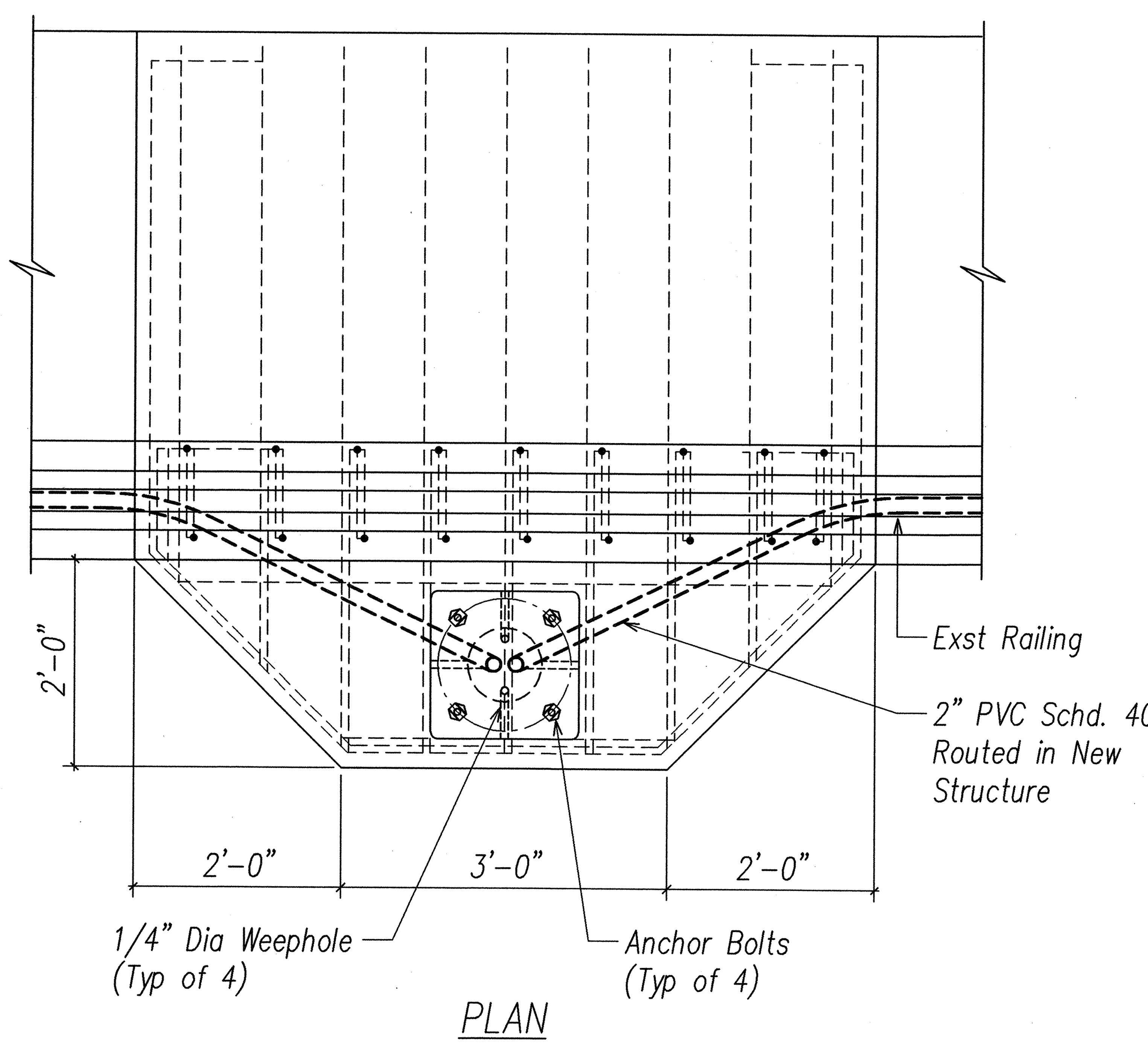


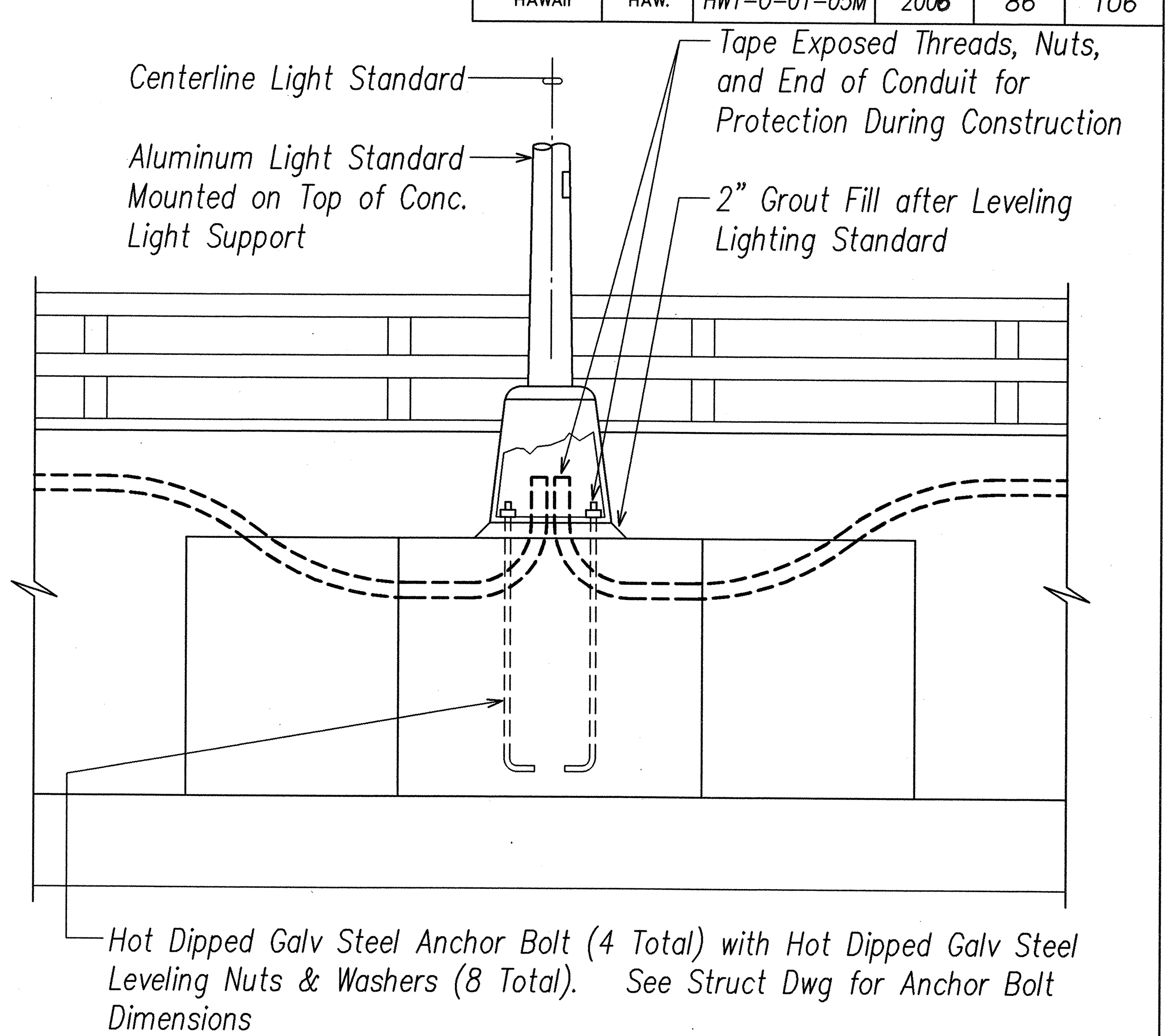
NOTES FOR HIGHWAY LIGHT STANDARD:

1. Standard and bracket arms shall be designed in accordance with latest edition of "Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals", with design revisions noted on on sheet E-5.
2. Submit shop drawings for approval.
3. Fiber Optic 4"C and Electric 2"C Not Shown for Clarity. See Structural Sheets for Locations.

A / E-26 HIGHWAY LIGHT STANDARD ON CONCRETE STRUCTURE (OCS) LOCATION

Not To Scale



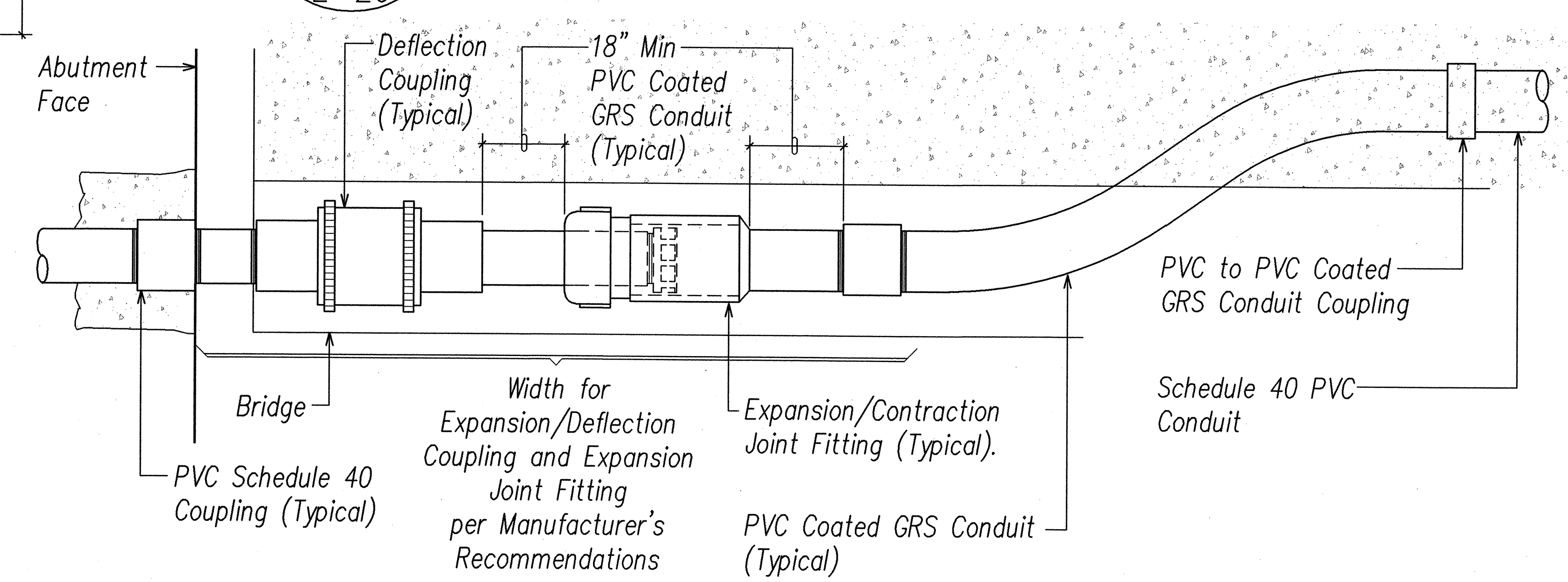


NOTE:

1. Fiber Optic 4"C and Electric 2"C Not Shown for Clarity. See Structural Sheets for Locations.

B / E-26 HIGHWAY LIGHT STANDARD MOUNTING DETAILS ON CONCRETE STRUCTURE

Not To Scale



Notes:

1. Expansion/Deflection Fitting Assembly shall Accommodate a Minimum of 4" Expansion, 4" Contraction and ±4" Transverse Movement in the Horizontal Plane.
2. The Contractor shall Submit Shop Drawings for Expansion/Deflection Fitting Assembly for Approval.
3. Expansion/Deflection Fitting Assembly shall be Installed as Close to Abutment as Practicable.
4. Provide Supports for Expansion/Deflection Fitting Assembly as Required. Assembly shall not be Strapped to Supports.
5. Expansion Fitting Assembly Similar Except without Deflection Coupling.

C / E-26 TYPICAL DUCTLINE EXPANSION/ DEFLECTION FITTING DETAIL

NOT TO SCALE

RONALD N. S. HO & ASSOCIATES, INC. Electrical Engineers

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

7.5.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06 EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT DETAILS IV

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-26 OF 106 SHEETS

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

LAST SAVE: 07/05/05 @ 10:52:49 BY: AM PLOT SC 1"=1'
Z:\ACAD\PROJECTS\24181\W026_24181_D402

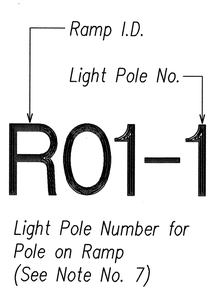
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	87	106

HIGHWAY LIGHT ID TAG SCHEDULE

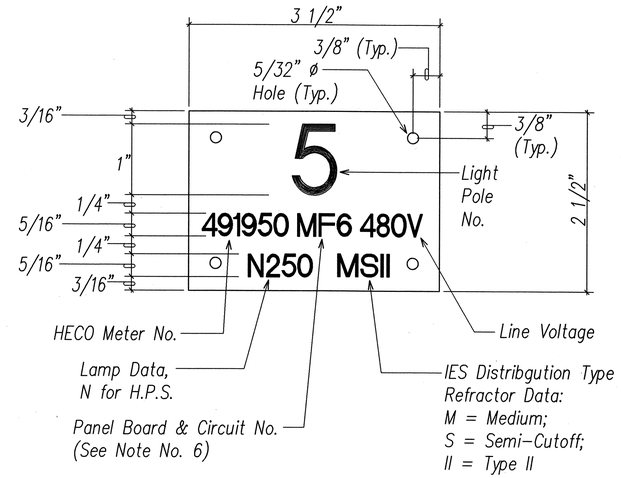
ID TAG ITEMS											
LIGHT POLE NO.	HECO METER NO.	CIRCUIT NO. & PHASE	LINE VOLTAGE	LAMP DATA	REFRACTOR DATA	LIGHT POLE NO.	HECO METER NO.	CIRCUIT NO.	LINE VOLTAGE	LAMP DATA	REFRACTOR DATA
1	491950	MF6	480V	N250	MSII	35	491950	MF6	480V	N250	MSII
2	491950	MF6	480V	N250	MSII	36	491950	MF6	480V	N250	MSII
3	491950	MF6	480V	N250	MSII	37	491950	MF6	480V	N250	MSII
4	491950	MF6	480V	N250	MSII	38	491950	MF6	480V	N250	MSII
5	491950	MF6	480V	N250	MSII	39	491950	MF6	480V	N250	MSII
6	491950	MF6	480V	N250	MSII						
7	491950	MF6	480V	N250	MSII						
8	491950	MF6	480V	N250	MSII						
9	491950	MF6	480V	N250	MSII						
10	491950	MF6	480V	N250	MSII						
11	491950	MF6	480V	N250	MSII						
12	491950	MF6	480V	N250	MSII						
13	491950	MF6	480V	N250	MSII						
14	491950	MF6	480V	N250	MSII						
15	491950	MF6	480V	N250	MSII						
16	491950	MF6	480V	N250	MSII						
17	491950	MF6	480V	N250	MSII						
18	491950	MF6	480V	N250	MSII						
19	491950	MF6	480V	N250	MSII						
20	491950	MF6	480V	N250	MSII						
21	491950	MF6	480V	N250	MSII						
22	491950	MF6	480V	N250	MSII						
23	491950	MF6	480V	N250	MSII						
24	491950	MF6	480V	N250	MSII						
25	491950	MF6	480V	N250	MSII						
26	491950	MF6	480V	N250	MSII						
27	491950	MF6	480V	N250	MSII						
28	491950	MF6	480V	N250	MSII						
29	491950	MF6	480V	N250	MSII						
30	491950	MF6	480V	N250	MSII						
31	491950	MF6	480V	N250	MSII						
32	491950	MF6	480V	N250	MSII						
33	491950	MF6	480V	N250	MSII						
34	491950	MF6	480V	N250	MSII						

NOTES:

1. Verify highway light pole number with State D.O.T. prior to fabrication of I.D. tags.
2. Verify HECo meter number with State D.O.T. and HECO prior to fabrication of I.D. tags.



Light Pole Number for Pole on Ramp (See Note No. 7)



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 1/8" wide, white in color (number as required).
3. Nomenclature size shall be 5/16" high and engraved 1/32" wide, white in color (meter number, panel board & circuit number, line voltage, lamp data and refractor data as required).
4. Attach to aluminum pole with no. 8 stainless steel, 1/2" long drive screws in 1/8" drill hole.
5. Numbers and letters are inscribed by cutting through "black cap sheet" to expose "white letters".
6. Assign circuit number (letter indicates panelboard, number indicates circuit).
7. For Light Poles installed on Ramp, assign Number to include Ramp I.D. and Pole Number. Legend may be less than one inch in height.
8. Light Numbers shall be obtained from the State. Use Alphabet Suffix to designate lights mounted on the same pole (e.g. 123A & 123).
9. Contractor to verify all items of I.D. tag with State D.O.T. prior to fabrication.

A E-27 HIGHWAY LIGHT POLE ID TAG DETAIL FOR METERED SYSTEM

NOT TO SCALE

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

LAST SAVE: 07/05/05 @ 10:11:06 BY AM PLOT SC: 1'-0"=1"
Z:\HDOT\PROJECTS\HWY-0-01-05M\Highway Light ID Tag.dwg

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

7.5.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

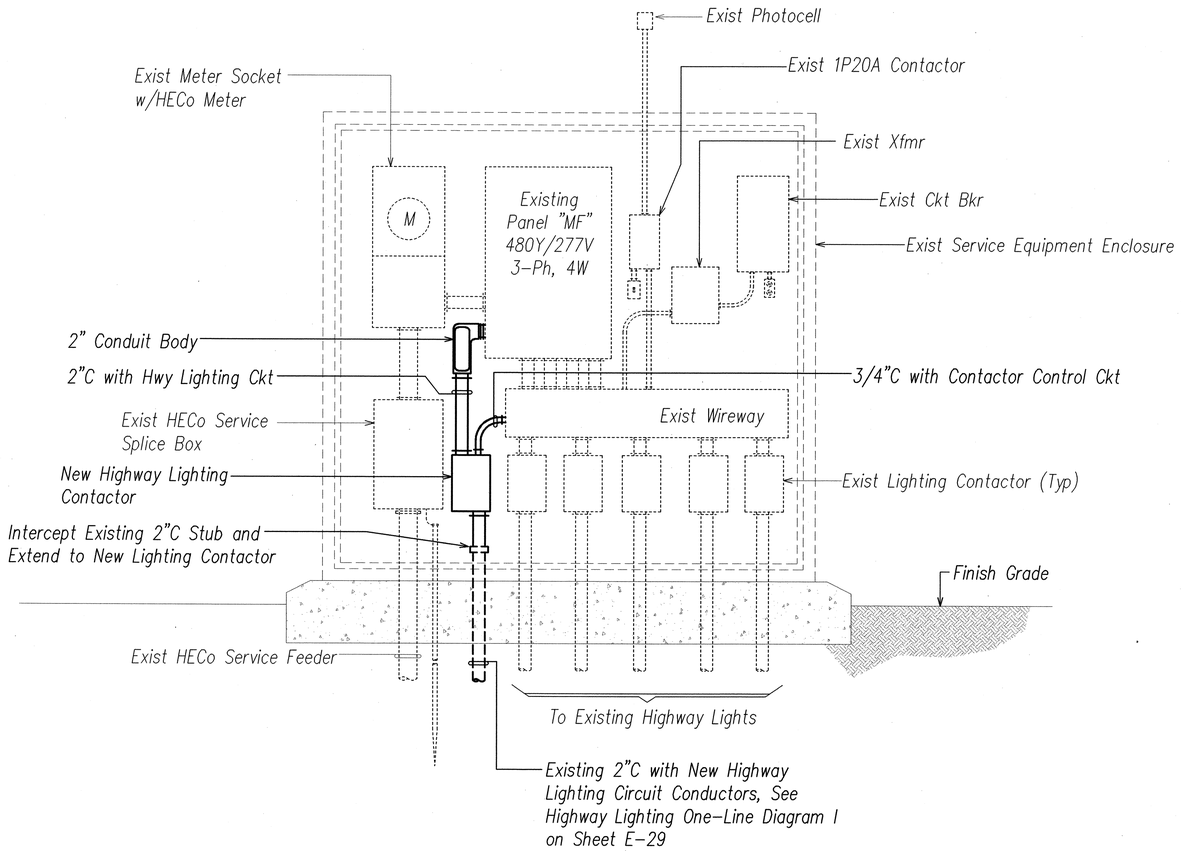
HIGHWAY LIGHT ID TAG DETAILS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-27 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	88	106



A / E-28 **EXISTING HIGHWAY LIGHTING EQUIPMENT ELEVATION WITH MODIFICATIONS**
Not to scale

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

LAST SAVE: 07/05/06 @ 10:15:32 BY: AM PLOT SC: 1'-0"=1"
J:\ROAD PROJECTS\2005\HWY-0-01-05M\Hwy lighting enclosure detail XREFS: _X24161-HIGHWAY-LIGHT-ENCLOSURE-DETAIL

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.06

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

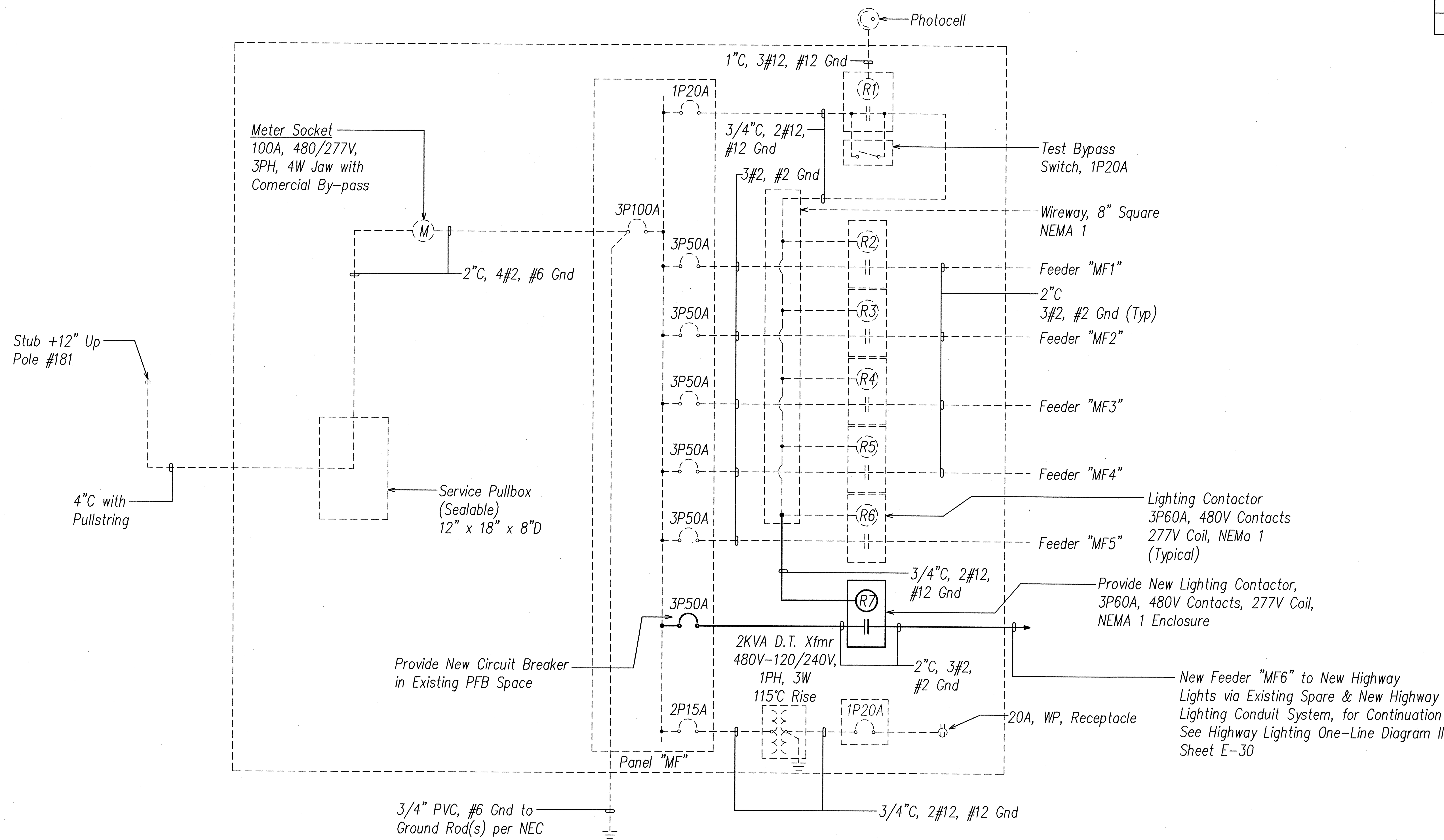
04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PANEL "MF"
EQUIPMENT ELEVATION
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M
Scale: N.T.S. Date: June 2005

SHEET No. E-28 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	89	106



NOTES:

1. ----- Light Dashed Lines Denote Existing Condition.
—— Bold Solid Lines Denote New Work.

A/E-29 EXISTING HIGHWAY LIGHTING ONE-LINE DIAGRAM I WITH MODIFICATIONS

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING ONE-LINE DIAGRAM I

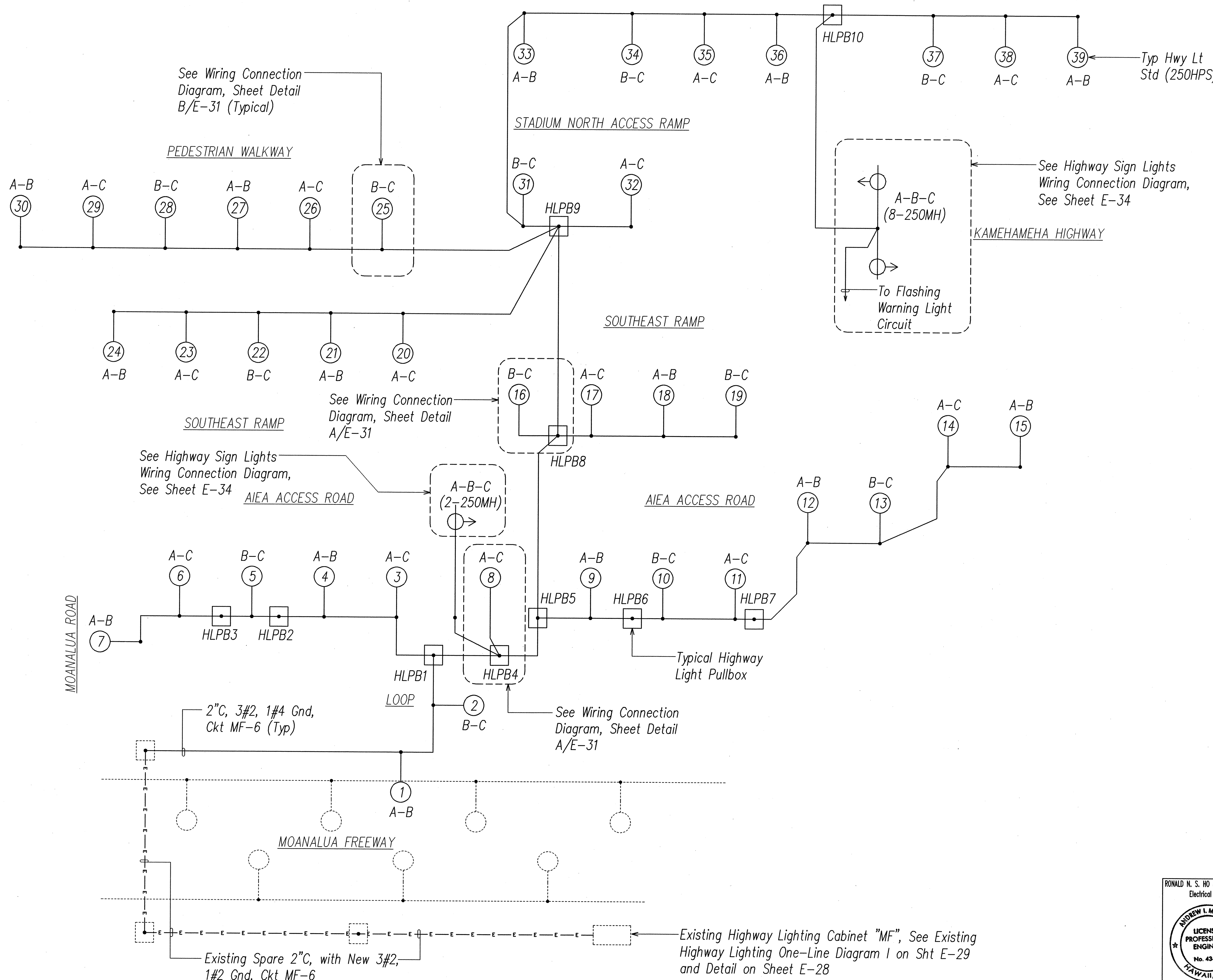
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-29 OF 106 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	90	106



A/E-30 **HIGHWAY LIGHTING ONE-LINE DIAGRAM II**

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

LAST SAVE: 07/05/05 @ 10:18:14 BY: AM PLOT SC 1"=2'=1" Z:\ACAD\PROJECTS\24161\e030-24161 hwy lt diagram ii.dwg XREFS: _X24161 ST LT DIAGRAM

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

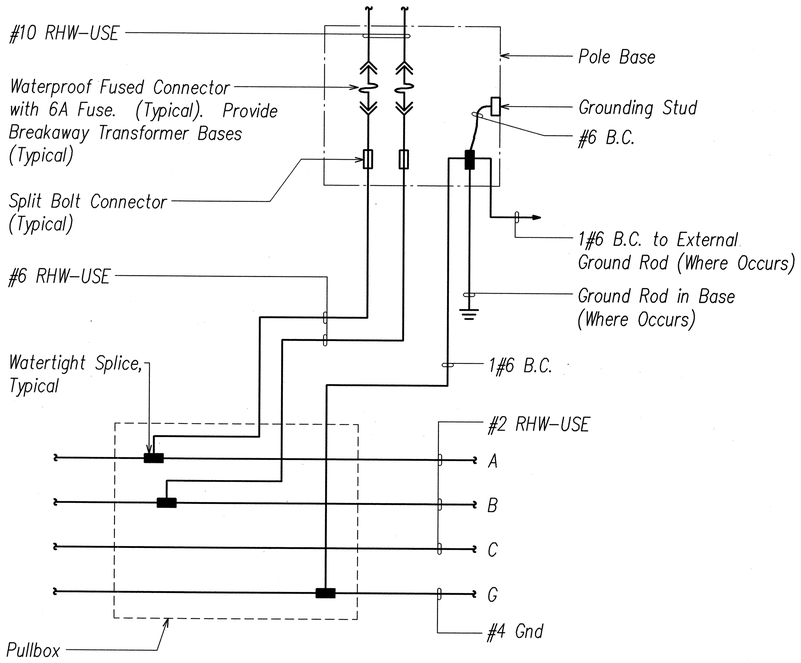
HIGHWAY LIGHTING ONE-LINE DIAGRAM II

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

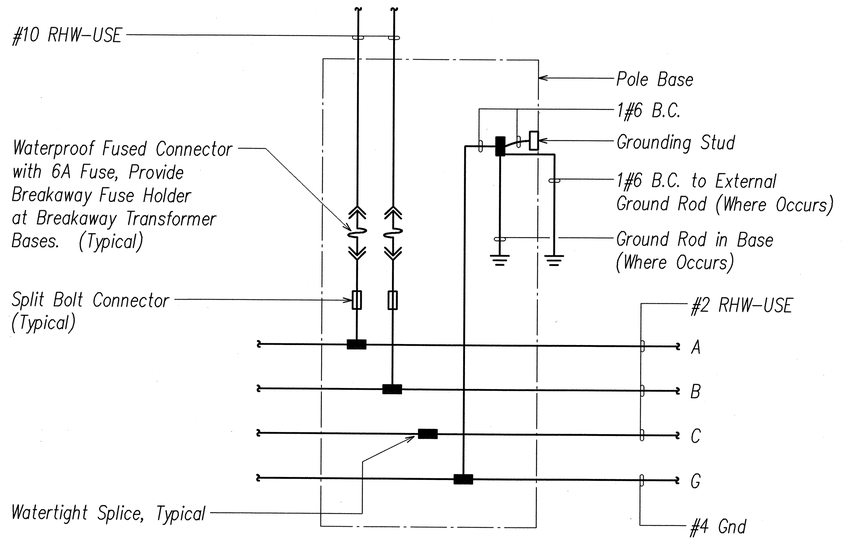
Scale: AS NOTED Date: June 2005

SHEET No. E-30 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	91	106



A E-31 **WIRING CONNECTION DIAGRAM – HIGHWAY LIGHTING STANDARD WHERE PULLBOX INSTALLED**



B E-31 **WIRING CONNECTION DIAGRAM TYPICAL HIGHWAY LIGHTING STANDARD**

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

LAST SAVE: 07/05/06 @ 10:37:17 BY: AM PLOT SIZE: 1"=0"x61"
Z:\ACAD\PROJECTS\HWY-0-01-05M\E-31 Hwy Lt Diagrams @ 40SCS - JOB161 ST LT DIAGRAM

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.06

Andrew I Miyasato

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING TYPICAL CONNECTION DIAGRAMS

AIEA ACCESS ROAD RESURFACING

MOANALUA ROAD

TO KAMEHAMEHA HIGHWAY

Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-31 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	92	106

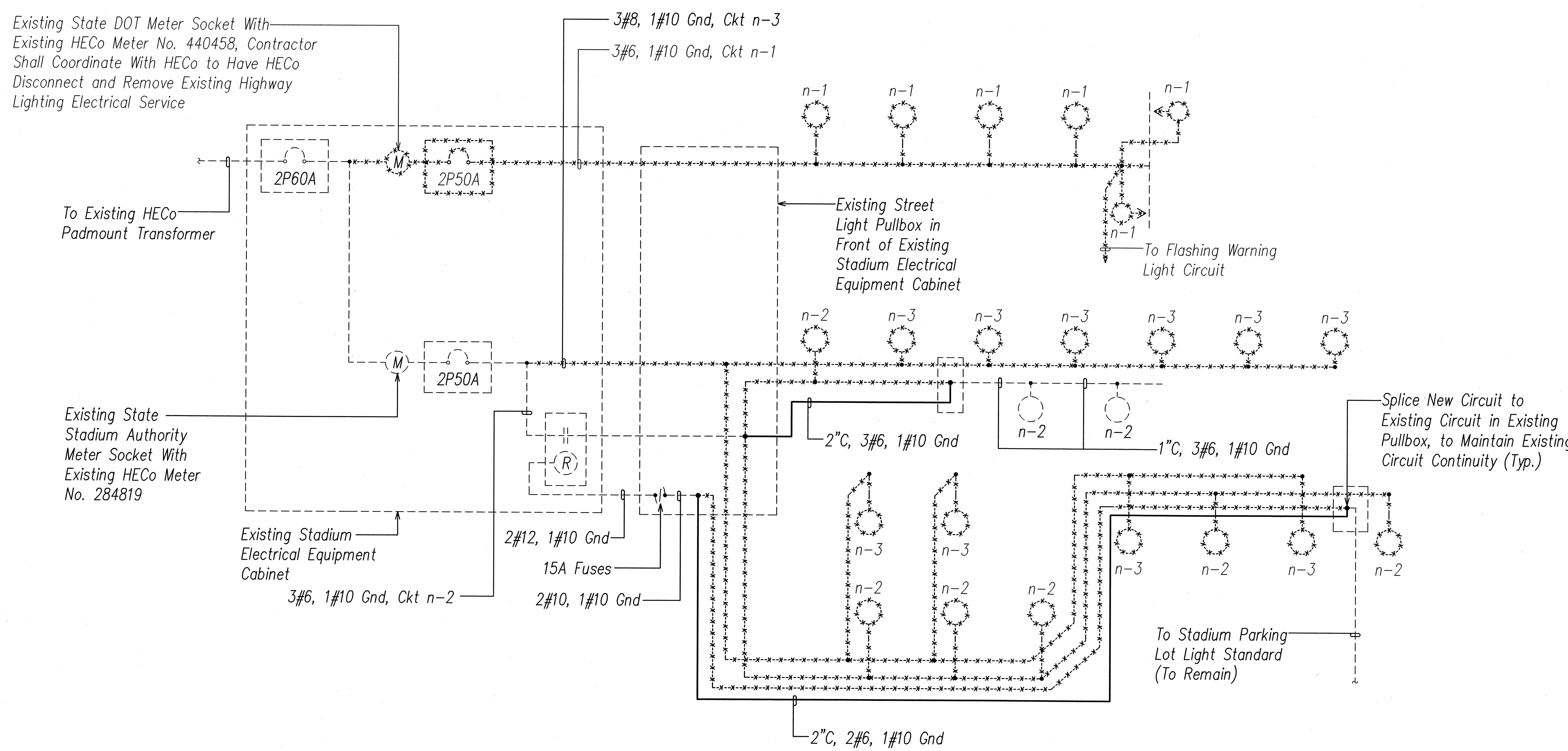


DIAGRAM LEGEND:

- ----- Denote Existing Equipment and Wiring to Remain
- —— Denote New Equipment and Wiring to be Provided.
- -x-x-x- Denote Existing Equipment and Wiring to be Removed.

1 / E-32 EXISTING STADIUM ELECTRICAL EQUIPMENT ONE-LINE DIAGRAM WITH MODIFICATIONS

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW L. MIYASATO — LICENSED PROFESSIONAL ENGINEER — No. 4340-E — HAWAII, U.S.A.

7-5-05

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04/30/06
EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING ONE-LINE DIAGRAM III

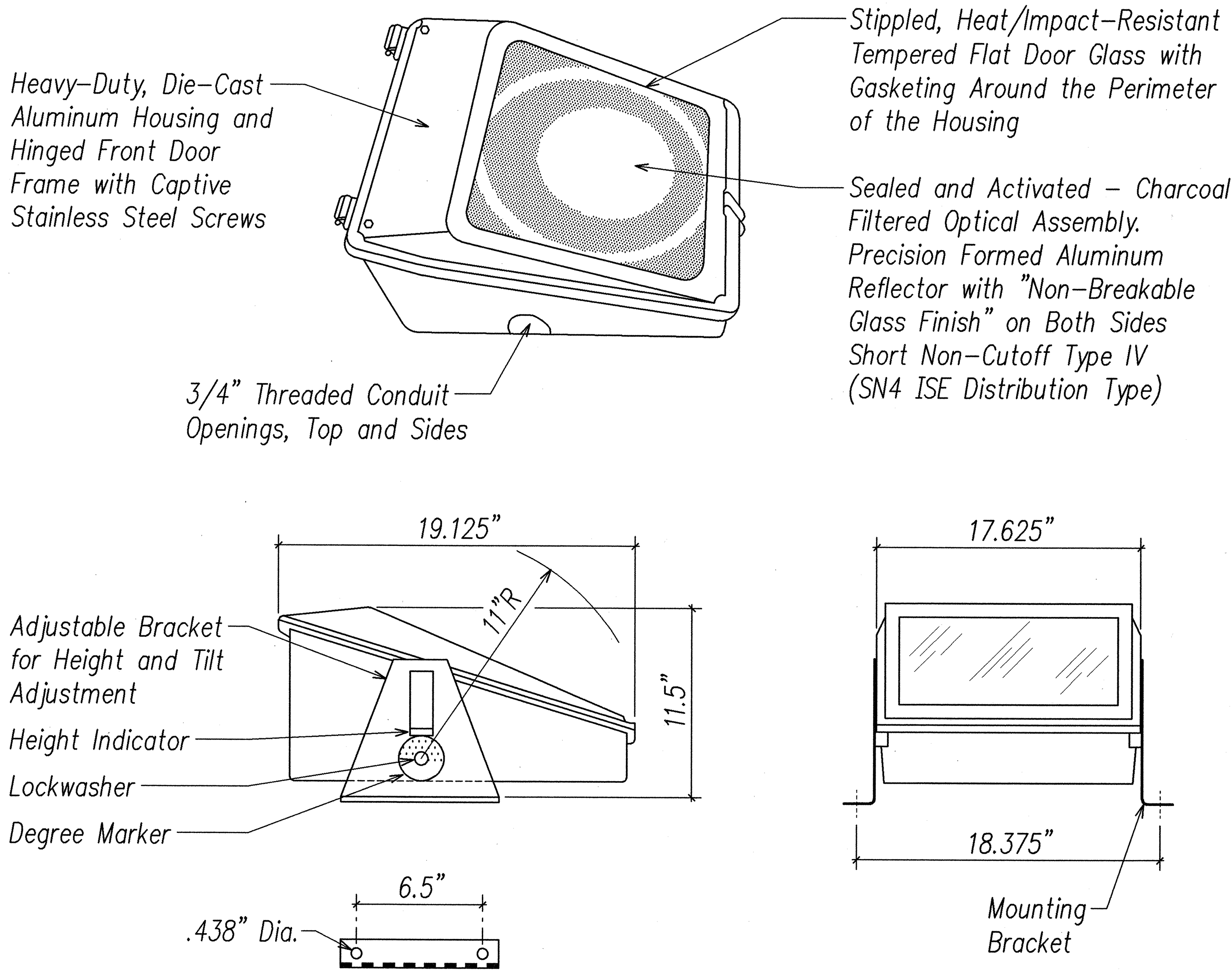
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED — Date: June 2005

SHEET No. E-32 OF 106 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	93	106



Lamp: 250W Metal Halide

Ballast: 480V Auto Regulator Type (Integral with Unit)

Finish: Gray

Note: Contractor shall Aim Light Fixtures to Provide Even Illumination of Signs.

For Additional Luminaire Mounting Information, See State Standard Dwg. No. TE-28.

A/E-33 SIGN LUMINAIRE DETAIL

NOT TO SCALE

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

LAST SAVE: 07/05/05 @ 10:38:14 BY: AM PLOT SC 1"-0"=1"

RONALD N. S. HO & ASSOCIATES, INC. Electrical Engineers

ANDREW L. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

7.5.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

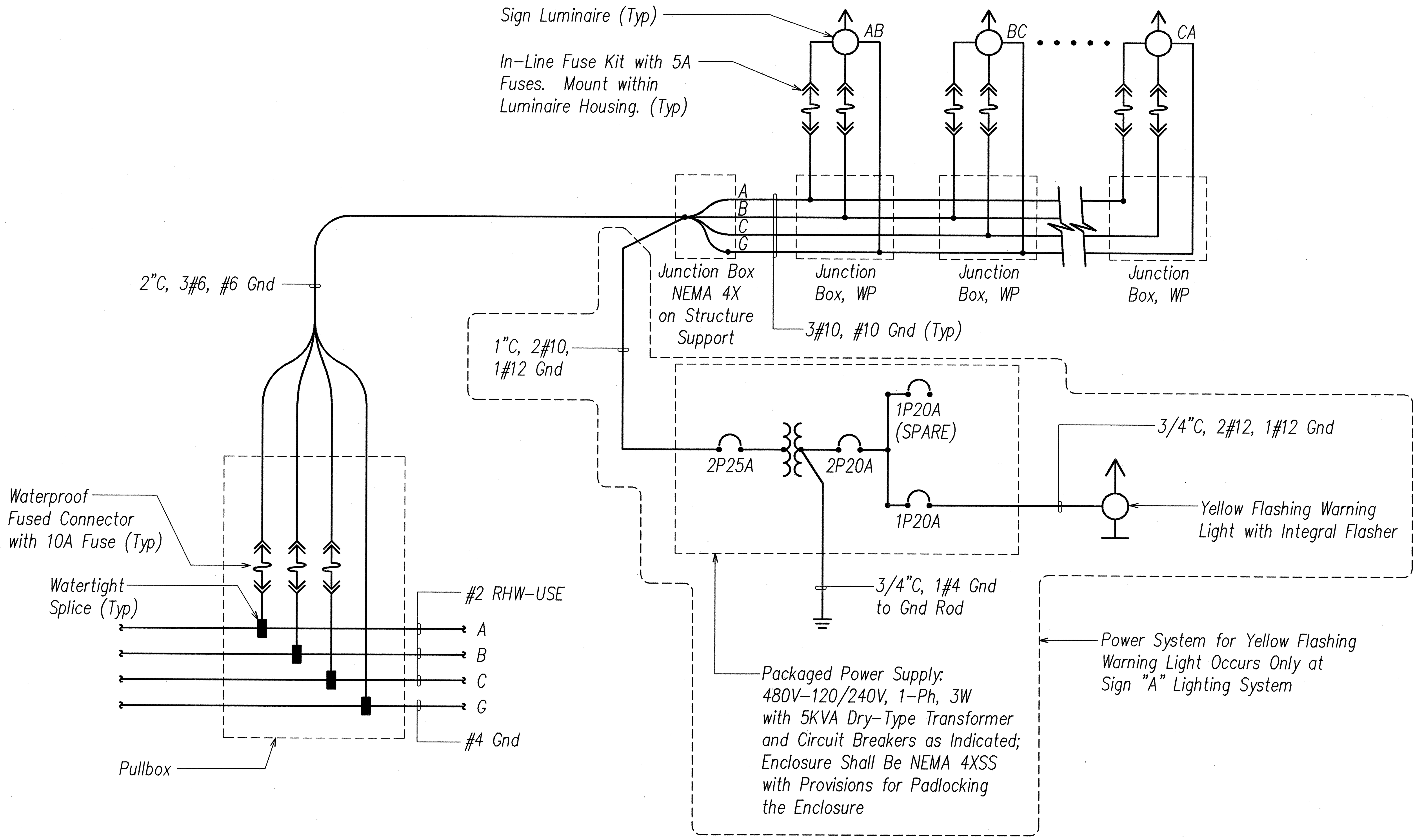
SIGN LIGHTING DETALS

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-33 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	94	106



A / E-34

WIRING CONNECTION DIAGRAM – SIGN "A" LIGHTING [SIGN "B" LIGHTING SIMILAR EXCEPT AS NOTED]

ORIGINAL PLAN | NOTE BOOK | No.

SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE

RONALD N. S. HO & ASSOCIATES, INC. Electrical Engineers

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.

7.5.05

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06

EXPIRATION DATE OF THE LICENSE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

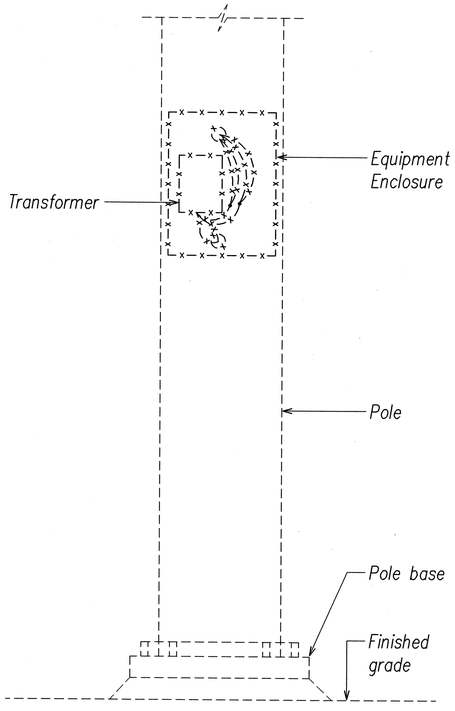
SIGN LIGHTING CONNECTION DIAGRAM

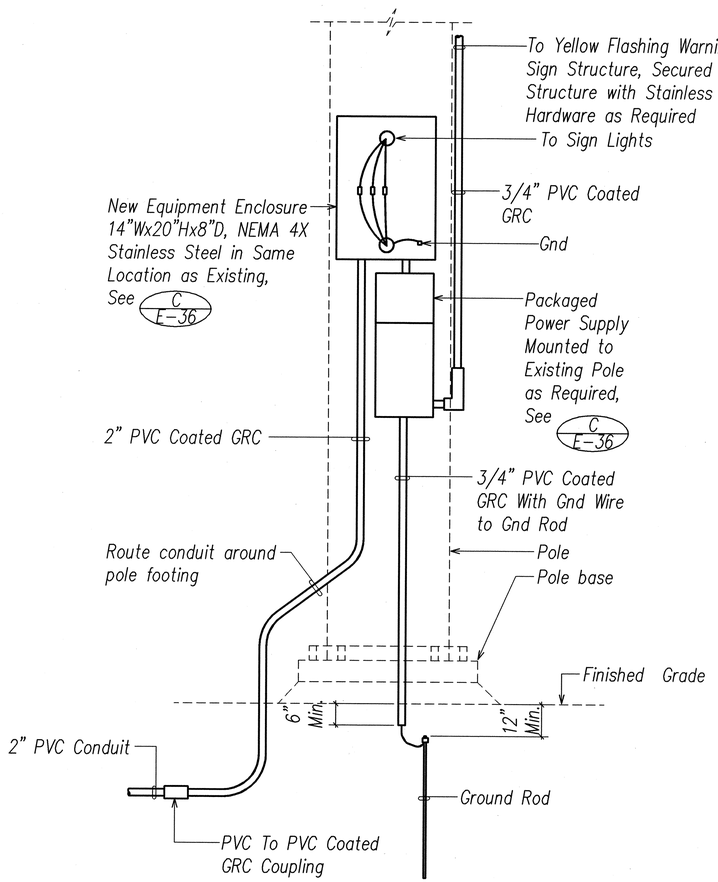
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

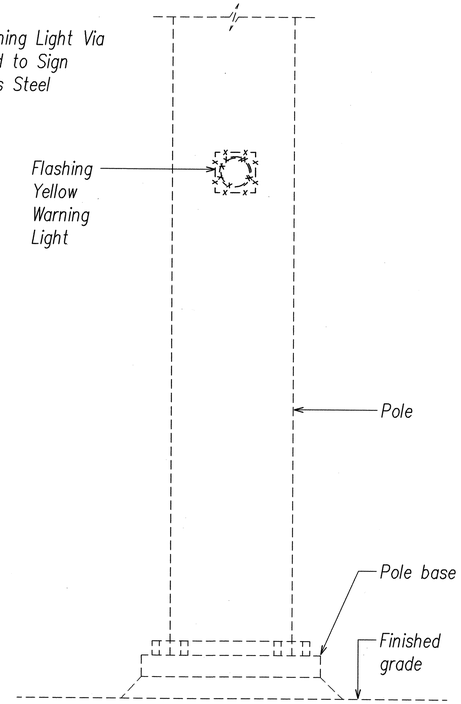
Scale: AS NOTED   Date: June 2005

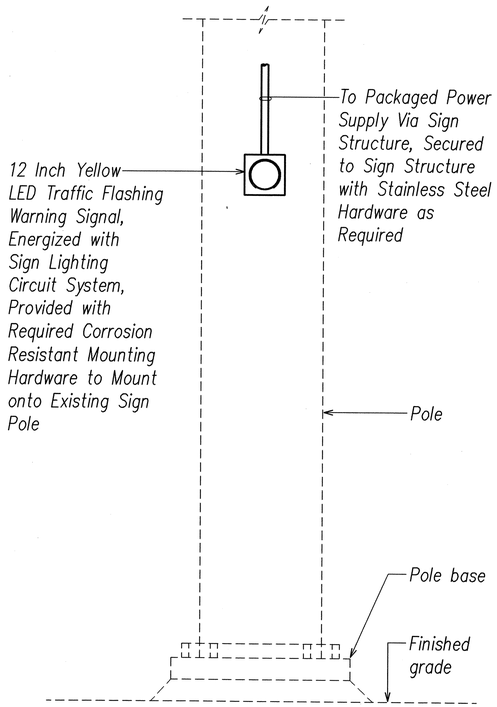
SHEET No. E-34 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	95	106









EXISTING ELEVATION

NEW ELEVATION

EXISTING ELEVATION

NEW ELEVATION

NOTES:

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

NOTES:

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

A E-35 **EQUIPMENT ELEVATION DETAILS AT SIGN "A"**
NOT TO SCALE

B E-35 **WARNING LIGHT ELEVATION DETAILS AT SIGN "A"**
NOT TO SCALE

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

LAST SAVE: 07/05/06 @ 10:41:54 BY: AM PLOT SC: 1=1
Z:\ACAD\PROJECTS\HWY-0-01-05M\SHEETS\E-SC4161-SIGN-LIGHT-DETAILS

RONALD N. S. HO & ASSOCIATES, INC.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

7.5.05
Andrew Miyasato

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

04/30/06
EXPIRATION DATE OF THE LICENSE

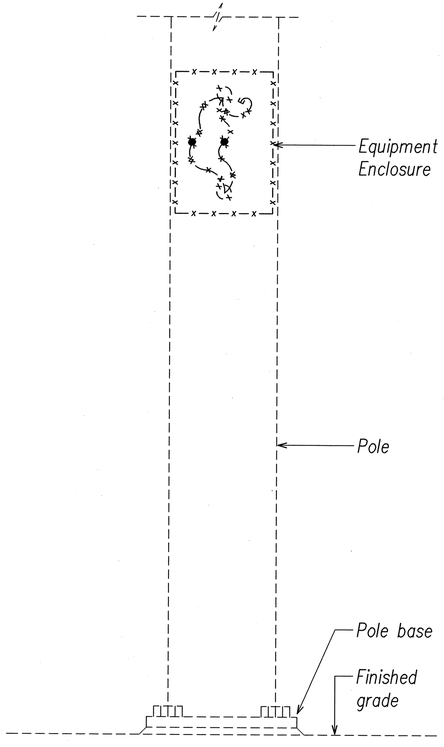
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN LIGHT ELEVATIONS I

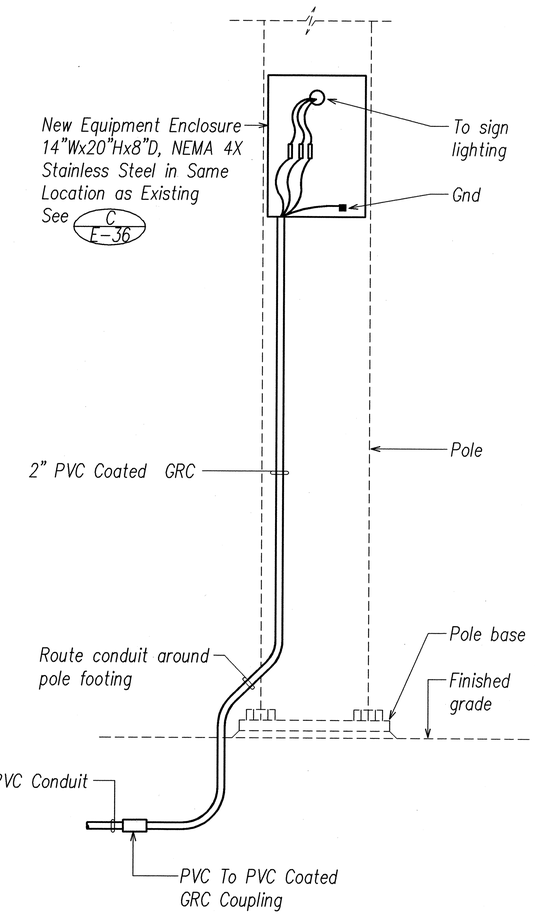
AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M
Scale: AS NOTED Date: June 2005

SHEET No. E-35 OF 106 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	HWY-0-01-05M	2006	96	106



EXISTING ELEVATION



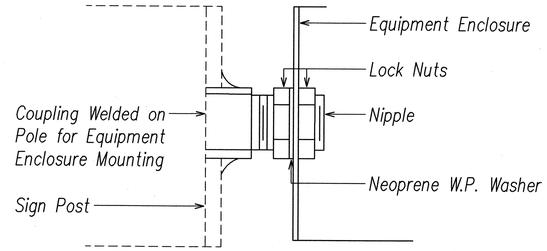
NEW ELEVATION

NOTES:

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

A E-36 EQUIPMENT ELEVATION DETAILS AT SIGN "B"

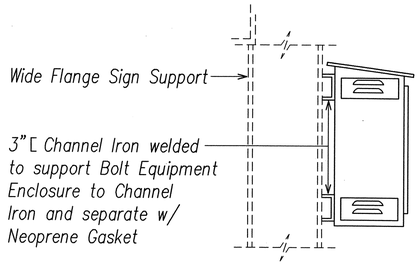
NOT TO SCALE



WIRING HUB DETAIL

B E-36 EQUIPMENT ENCLOSURE MOUNTING DETAIL "A"

NOT TO SCALE



C E-36 EQUIPMENT ENCLOSURE MOUNTING DETAIL "B"

NOT TO SCALE

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

LAST SAVE: 07/05/06 @ 10:42:45 BY: AM PLOT SC: 1"=1"
Z:\LAND\PROJECTS\AIEA\WORK_SHEETS\AIEA-SIGN-LIGHT-DETAILS

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SIGN LIGHT ELEVATIONS II

AIEA ACCESS ROAD RESURFACING
MOANALUA ROAD
TO KAMEHAMEHA HIGHWAY
Project No. HWY-0-01-05M

Scale: AS NOTED Date: June 2005

SHEET No. E-36 OF 106 SHEETS