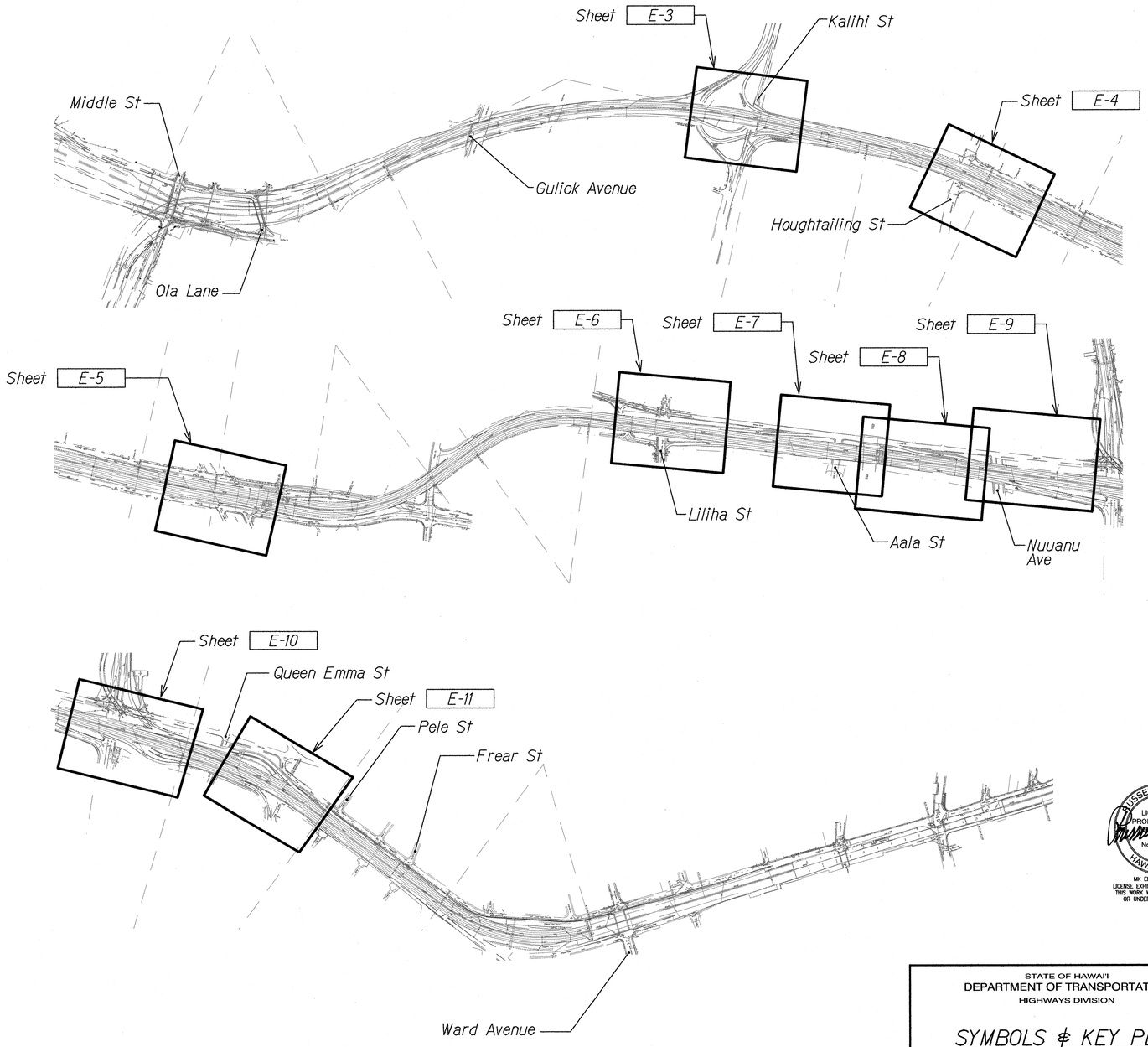
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(242)	2016	340	354

16004

SYMBOLS

- R — *Existing Highway Lighting Standard, 185W LED, Full Cut-off Luminaire, 480V. Relocate Pole, Transformer Base, and Luminaire. Demolish Existing Concrete Foundation.*
- R — *Relocated Highway Lighting Standard, 185W LED, Full Cut-off Luminaire, 480V on New Concrete Foundation.*
- *Existing Pullbox Group, Box Types as Indicated on Plan*
- *New Pullbox Group, Box Types as Indicated on Plan*
- *Existing Underground Ductline*
- *New Underground Ductline*
- *Existing Exposed Conduits (PVC Coated, Galv Rigid Steel) & Wiring*



KEY PLAN
NTS

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.
3/25/16

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

SYMBOLS & KEY PLAN
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-H1-1(242)

Scale: As Noted Date: April 30, 2016

SHEET No. E-1 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	341	354

16004

CONSTRUCTION NOTES & MATERIAL LIST

1. Remove Conductors From Existing 2" Highway Lighting Conduit and Provide New 3#1/0, #1/0 Gnd. Re-Splice Feeder Conductors to Existing in Highway Lighting Pullbox.
2. Highway Lighting Conduit 1 - 2" With 3#1/0, #1/0 Gnd.
3. Disconnect and Relocate Highway Lighting Standard to New Concrete Foundation. See Sheet E-14 for Highway Lighting Standard Foundation Detail.
4. Demolish Existing Highway Lighting Foundation to a Minimum Depth of 12 Inches Below Finished Grade and Backfill Void and Re-Grass Area.
5. Demolish Highway Lighting Power, and Communication Pullboxes. Backfill Void and Re-Grass Area.
6. Existing Conduits (PVC Coated Galv Rigid Steel) Fastened to the Side of Existing Concrete Guard Rail or Bridge Structure.
7. Remove Vertical Portion of Conduits (PVC Coated Galv Rigid Steel) and Provide New Conduits (PVC Coated Galv Rigid Steel).
8. Existing Highway Lighting, Power, and Communication Pullboxes to Remain.
9. Upon Restoration of the Highway Lighting Circuits, Remove Existing Highway Lighting Ductline and Conductors.
10. Existing Conduits (PVC Coated Galv Rigid Steel) Fastened to the Side of Existing Bridge Structure.
11. Intercept Existing Ductline with New Ductline and Extend to Corresponding Pullboxes.
12. Disconnect and Salvage Light Pole and Luminaire. Deliver to Location as Directed by the Contracting Officer.
13. Highway Lighting Conduit in Planting Area Behind Existing Metal Guard Rail or Retaining Wall. See Duct Section (A) on Sheet E-13 .
14. Conduits Under Roadway or Shoulder Area. See Duct Section (B) Sheet E-13 .
15. Conduits Behind Existing Metal Guard Rail or Retaining Wall. See Duct Section (E) on Sheet E-13 .
16. 1"C, 2#8, #8 Gnd to Underpass Lights.
17. Remove Existing Conductors Up To Junction Box at Top of Bridge Structure and Provide New. Splice Existing Conductors to New.
18. Conduits Under Roadway or Shoulder Area. See Duct Section (D) Sheet E-13 .
19. Conduits Behind Existing Metal Guard Rail or Retaining Wall. See Duct Section (C) Sheet E-13 .
20. Not Used.
21. Highway Lighting Type "A" Pullbox. See Standard Plan TE-37.
22. Power Type "A" Pullbox. See Standard Plan TE-37.
23. Communication Type "B" Pullbox. See Standard Plan TE-37.
24. Power Conduit, 1 - 2".
25. Communication Conduit, 2 - 2".

GENERAL NOTES:

1. Existing Highway Lighting System shall Remain in Operation at all Times. Disconnect and Relocate Light Standard to Temporary Concrete Foundation During Construction. Provide Temporary Wiring to Ensure Highway Lighting System Remains Operational. Remove all Temporary Wiring Once the Permanent Highway Lighting System is in Operation.
2. Extra Care shall be taken while Excavating for the Light Pole Foundation and Ductlines. Contractor Shall Tone for Location of Utility Lines prior to Excavation.

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CONSTRUCTION NOTES & MATERIAL LIST

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)

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SHEET No. E-2 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEET
HAWAII	HAW.	IM-HI-1(242)	2016	C.O. 341S-1	354

HAWAIIAN ELECTRIC COMPANY NOTES

1. *Location of Hawaiian Electric Facilities*

   The Location of Hawaiian Electric's Overhead and Underground Facilities Shown on the Plans are From Existing Records With Varying Degrees of Accuracy and are Not Guaranteed as Shown. The Contractor Shall Verify in the Field the Locations of the Facilities and Shall Exercise Proper Care in Excavating and Working in the Area. Wherever Connections of New Utilities to Existing Utilities and Utility Crossings are Shown, the Contractor Shall Expose the Existing Lines at the Proposed Connections and Crossings to Verify the Depths Prior to Excavation for the New Lines. The Contractor Shall be Responsible for Any Damages to Hawaiian Electric's Facilities Whether Shown or Not Shown on the Plans.

2. *Compliance with Hawaii Occupational Safety and Health Laws*

   The Contractor Shall Comply with the State of Hawaii's Occupational Safety and Health Laws and Regulations, Including Without Limitation, Those Related to Working on or Near Exposed or Energized Electrical Lines and Equipment.

3. *Excavation Clearance*

   The Contractor Shall Obtain an Excavation Clearance from Hawaiian Electric's Planning and Design Section of the Customer Installations Department (543-5654) Located at 820 Ward Avenue, 4th Floor, a Minimum of Ten (10) Working Days Prior to Starting Construction.

4. *Caution!!! Electrical Hazard!!!*

   Existing Hawaiian Electric Overhead and Underground Lines are Energized and Will Remain Energized During Construction Unless Prior Special Arrangements Have Been Made with Hawaiian Electric. Only Hawaiian Electric Personnel are to Handle These Energized Lines and Erect Temporary Guards to Protect These Lines from Damage. The Contractor Shall work Cautiously at All Times to Avoid Accidents and Damage to Existing Hawaiian Electric Facilities, Which Can Result in Electrocution.

5. *Overhead Lines*

   State Law (OSHA) Requires That a Worker and the Longest Object He or She May Contact Cannot Come Closer Than a Specified Minimum Radial Clearance When Working Close to or Under Any Overhead Lines. It is the Contractor's Responsibility to be Informed of and comply with the Law.

   At Any Time Should the Contractor Anticipate That His Work Will Result in the Need to Encroach Within the Minimum Required Clearance as Stated in the Law, the Contractor Shall Notify Hawaiian Electric at Least Three (3) Months Prior to the Planned Encroachment so That, if Feasible, the Necessary Protections (e.g. Relocate or De-energize Hawaiian Electric Lines) Can be Investigated. Hawaiian Electric May also be Able to Blanket its Distribution (12kv and Below) Lines to Provide a Visual Aid in Preventing Accidental Contact. Hawaiian Electric's Cost of Safeguarding or Identifying its Lines Will be Charged to the Contractor.

   Contact Hawaiian Electric's Customer Installations Department at 543-7846 For Assistance in Identifying and Safeguarding Overhead Power Lines.

6. *Pole Bracing*

   Contractor Shall Not Excavate Within 10 Feet from Hawaiian Electric's Utility Poles or any Anchor System Supporting the Utility Pole. If Contractor Must Excavate Closer than 10 Feet From a Utility Pole or its Anchor System, Contractor will be Responsible for Protecting, Supporting, Securing and Taking All Precautions to Prevent Damage to or Leaning of Existing Poles. Before Commencing Such Excavation, Contractor Must Submit its Bracing Calculations and Drawings, Prepared and Stamped by a Licensed Structural Engineer, to Hawaiian Electric's Customer Installations Department (543-7846) for Review. Hawaiian Electric Requires a Minimum of Ten (10) Working Days to Conduct the Review of Contractor's Submittal. Contractor Shall be Responsible for the Design, Installation, and Removal of the Temporary Pole Bracing System, as Well as All Costs Incurred by Hawaiian Electric to review contractor's drawings and to repair or straighten poles impacted by contractor's Activities, Including Response and Restoration Costs Incurred by Hawaiian Electric Arising Out of or Related to Outages Caused by Contractor's Failure to Meet the Foregoing Requirements. Hawaiian Electric's Review and Approval of Any Contractor Submittals Including its Work Procedure Shall Not Relieve Contractor From Any Liability Resulting From Contractor's Excavation Near or Around Hawaiian Electric's Utility Poles.

7. *Underground Lines*

   The Contractor Shall Exercise Extreme Caution Whenever Construction Crosses or is in Close Proximity of Underground Lines. Hawaiian Electric's Existing Electrical Cables are Energized and Will Remain Energized During Construction. Only Hawaiian Electric Personnel are to Break Into Existing Hawaiian Electric Facilities, Handle These Cables, and Erect Temporary Guards to Protect These Cables From Damage. The Cost of Hawaiian Electric's Assistance in Providing Proper Support and Protection of Its Underground Lines Will be Charged to the Contractor. For Assistance/Coordination in Providing Proper Support and Protection of These Lines, the Contractor Shall Call Hawaiian Electric's Customer Installations Department at 543-7846 a Minimum of Ten (10) Working Days in Advance.

   Special Precautions are Required When Excavating Near Hawaiian Electric's 138kv or 46kv Underground Lines (See Hawaiian Electric Instructions to Consultants/Contractors on "Excavation Near Hawaiian Electric's Underground 138kv and/or 46kv Lines" for Detailed Requirements).

   For Verification of Underground Lines, the Contractor Shall Call the Hawaii One Call Center at 866-423-7287 Minimum of Five (5) Working Days in Advance.

8. *Underground Fuel Pipelines*

   The Contractor Shall Exercise Extreme Caution Whenever Construction Crosses or is in Close Proximity of Hawaiian Electric's Underground Fuel Oil Pipelines. Special Precautions are Required When Excavating Near Hawaiian Electric's Underground Fuel Oil Pipelines (See Hawaiian Electric's Specific Fuel Pipeline "Guidelines" to Consultants/Contractors on Excavation Near Hawaiian Electric's Underground Fuel Pipelines for Detailed Requirements).

9. *Excavations*

   When Trench Excavation is Adjacent to or Beneath Hawaiian Electric's Existing Structures or Facilities, the Contractor is Responsible for:

   a) *Arranging for Hawaiian Electric Standby Personnel to Observe Work at Contractor's Cost.*
   b) *Sheeting, Bracing, or Otherwise Supporting the Excavation and Stabilizing the Existing Ground to Render it Safe and Secure and to Prevent Possible Slides, Cave-Ins, and Settlements.*
   c) *Properly Supporting Existing Structures or Facilities with Beams, Struts, Under-Pinnings, or Other Necessary Methods to Fully Protect it From Damage.*
   d) *Backfilling with Proper Backfill Material Including Special Thermal Backfill Where Existing (Refer to Engineering Department for Thermal Backfill Specifications).*

10. *Relocation of Hawaiian Electric Facilities*

    Any Work Required to Relocate or Modify Hawaiian Electric Facilities Shall be Done by Hawaiian Electric, or by the Contractor Under Hawaiian Electric's Supervision. The Contractor Shall be Responsible for All Coordination, and Shall Provide Necessary Support for Hawaiian Electric's Work, Which May Include, but Not be limited to, Staking of Pole/Anchor Locations, Identifying Right of Way and Property Lines, Excavation and Backfill, Permits and Traffic Control, Barricading, and Restoration of Pavement, Sidewalks, and Other Facilities.

    All Costs Associated With Any Relocation or Modification (Either Temporary or Permanent) For the Convenience of the Contractor, or to Enable the Contractor to Perform His Work In a Safe and Expeditious Manner in Fulfilling His Contract Obligations Shall be Borne by the Contractor.

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
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5/5/16
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

2 HECo Notes - 1

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)

Scale: As Noted Date: April 30, 2016

SHEET No. E-2A OF 15 SHEETS

C.O. 341S-1

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HAWAII	HAW.	IM-H1-1(242)	2016	C.O. 341S-2	354

HAWAIIAN ELECTRIC COMPANY NOTES (CONT'D)

11. Conflicts

Any Redesign or Relocation of Hawaiian Electric's Facilities Not Shown on the Plans May be Cause for Lengthy Delays. The Contractor Acknowledges That Hawaiian Electric is Not Responsible for Any Delay or Damage That May Arise as a Result of Any Conflicts Discovered or Identified With Respect to the Location or Construction of Hawaiian Electric's Electrical Facilities in the Field, Regardless of Whether the Contractor has Met the Requested Minimum Advance Notices. In Order to Minimize Any Delay or Impact Arising From Such Conflicts, Hawaiian Electric Should be Notified Immediately Upon Discovery or Identification of Such Conflict.

12. Damage to Hawaiian Electric Facilities

The Contractor Shall be Responsible for the Protection of All Hawaiian Electric Surface and Subsurface Utilities and Shall be Responsible for Any Damages to Hawaiian Electric's Facilities as a Result of His Operations. The Contractor Shall Immediately Report Such Damages or Any Hazardous Conditions Related to Hawaiian Electric's Lines to Hawaiian Electric's Trouble Dispatcher at 548-7961. Repair Work Shall be Done by Hawaiian Electric or by the Contractor Under Hawaiian Electric's Supervision. Costs for Damages to Hawaiian Electric's Facilities Shall be Borne by the Contractor.

In Case of Damage or Suspected Damage to Hawaiian Electric's Fuel Pipeline, the Contractor Shall Immediately Notify Hawaiian Electric's Security Command Center at 543-7685 (a 24-Hour Number) so Hawaiian Electric Personnel can Secure the Damaged Section and Report Any Oil Spills to the Proper Authorities. All Costs Associated with the Damage, Repair, and Oil Spill Cleanup Shall be Borne by the Contractor.

13. Hawaiian Electric Stand-by Personnel

The Contractor May Request Hawaiian Electric to Provide an Inspector to Stand-by During Construction Near Hawaiian Electric's Facilities. The Cost of Such Inspection Will be Charged to the Contractor.

The Contractor Shall Call Hawaiian Electric's Customer Installations Department at 543-7846 a Minimum of Two (2) Months in Advance to Arrange for Hawaiian Electric Stand-by Personnel.

14. Clearances

The Following Clearances Shall be Maintained Between Hawaiian Electric's Ductline and All Adjacent Structures (Charted and Uncharted) in the Trench:

Guidelines for Minimum Horizontal (Parallel) Clearances Between Hawaiian Electric and Other Underground Utilities

Underground Utility	Hawaiian Electric Direct Buried Cable	Hawaiian Electric Direct Buried in Conduit (No Concrete Encasement)	Hawaiian Electric 3" (Minimum) Concrete Encasement	Applicable Notes:
Hawaiian Electric DB Conduits	12"	3"	0"	
Hawaiian Electric 3" Encasement	0"	0"	0"	
Telephone/CATV DB	12"	12"	6"	
Telephone/CATV DB Ducts	12"	12"	6"	
Telephone/CATV 3" Encasement	0"	0"	0"	5
Traffic Signal	12"	12"	12"	
Water DB (BWS Owned)	36"	36"	36"	1 & 4
Customer Owned Water Service Laterals	12"	12"	12"	
Water (Concrete Jacketed) (BWS Owned)	36"	36"	36"	1 & 4
Gas DB	12"	12"	12"	1
Gas (Concrete Jacketed)	12"	12"	12"	1
Sewer DB	36"	36"	36"	1 & 2
Sewer (Concrete Jacketed)	36"	36"	36"	1 & 2
Drain	12"	12"	12"	1
Fuel Pipelines				3

Notes:

1. If Clearance Cannot be Met:
   - If Clearance is Less Than 12", Jacket Sewer Line With Reinforced Concrete (Per Hawaiian Electric's Std. 30-1030) for a Distance of 5' Plus Pipe Diameter.
   - If Clearance is Between 12" and 24", Jacket Sewer Line With Plain Concrete.
2. All Fuel Pipeline Crossings Shall be Reviewed and Approved by The Company That Owns and Maintains it.
3. For Situations With 0" Minimum Separation, a 6" Separation is Recommended.
4. Clearances Measured From Outer Edges or Diameters of Utilities. Whenever Concrete Jackets are Involved, Clearances Shall be Total Clear Distance Between the Concrete Jacket and Utility Concerned.
5. 36" Clearance is Required for Trenchless Installation Work.

1. Where Space is Available, Parallel Clearance to Other Utilities, or Foreign Structures Other Than Communication or Traffic Signal Shall be 36".
2. If 36" Clearance Cannot be Met:
   - If Clearance is Less Than 12", Jacket Sewer Line With Reinforced Concrete (Per Hawaiian Electric's Std. 30-1030) For a Distance of 5' Plus Pipe Diameter.
   - If Clearance is Between 12" and 36", Jacket Sewer Line With Plain Concrete.
3. All Fuel Pipeline Crossings Shall be Reviewed and Approved by the Company That Owns and Maintains it.
4. 5 Feet Clear to Water Mains 16" and Larger.
5. For Situations With 0" Minimum Separation, a 6" Separation is Recommended.
6. Clearances Measured From Outer Edges or Diameters of Utilities. Whenever Concrete Jackets are Involved, Clearances Shall be Total Clear Distance Between the Concrete Jacket and Utility Concerned.

Guidelines For Minimum Vertical (Crossings) Clearances Hawaiian Electric and Other Underground utilities

Underground Utility	Hawaiian Electric Direct Buried Cable	Hawaiian Electric Direct Buried in Conduit (No Concrete Encasement)	Hawaiian Electric 3" (Minimum) Concrete Encasement	Applicable Notes:
Hawaiian Electric DB Conduits	6"	3"	0"	
Hawaiian Electric 3" Encasement	0"	0"	0"	
Telephone/CATV DB	12"	12"	6"	
Telephone/CATV DB Ducts	12"	12"	6"	
Telephone/CATV 3" Encasement	0"	0"	0"	4
Traffic Signal	12"	12"	6"	
Water DB (BWS Owned)	12"	12"	12"	5
Customer Owned Water Service Laterals	6"	6"	6"	
Water (Concrete Jacketed) (BWS Owned)	12"	12"	12"	5
Gas DB	12"	12"	12"	
Gas (Concrete Jacketed)	12"	12"	12"	
Sewer DB	24"	24"	24"	1
Sewer (Concrete Jacketed)	24"	24"	24"	1
Drain	12"	12"	6"	
Fuel Pipelines				2

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△2 HECo Notes - 2

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-H1-1(242)
Scale: As Noted Date: April 30, 2016

SHEET No. E-2B OF 15 SHEETS

C.O. 341S-2

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HAWAII	HAW.	IM-H1-1(242)	2016	C.O. 341S-3	354

16004

HAWAIIAN ELECTRIC COMPANY NOTES (CONT'D)

The Contractor Shall Notify the Construction Manager & Hawaiian Electric of Any Heat Sources (Power Cable Duct Bank, Steamline, Etc.) Encountered That are Not Properly Identified on the Drawing.

15. Idemnity

The Contractor Shall Indemnify, Defend and Hold Harmless Hawaiian Electric From and Against All Losses, Damages, Claims, and Actions, Including but Not Limited to Reasonable Attorney's Fees and Costs Based Upon or Arising Out of Damage to Property or Injuries to Persons, or Other Tortious Acts Caused or Contributed to by Contractor or Anyone Acting Under its Direction or Control or on Its Behalf; Provided Contractor's Indemnity Shall Not be Applicable to Any Liability Based Upon the Sole Negligence of Hawaiian Electric.

Additional Notes When Work Involves Construction of Hawaiian Electric Facilities

16. Schedule

Contractor Shall Furnish His Construction Schedule Six (6) Months Prior to Starting Work on Hawaiian Electric Facilities. Contractor Shall Give Hawaiian Electric, in Writing, Three (3) Months Notice to Proceed with Hawaiian Electric's Portion of Work.

17. Authority

All Construction, Restoration Work, and Inspection Shall be Subject to Whichever Governmental Agency has Authority Over the Work.

18. Specifications

Construction of Hawaiian Electric's Underground Facilities Shall be Constructed in Accordance With the Latest Revisions of Hawaiian Electric Specifications cs7001, cs7003, cs7202, cs9301, and cs9401 and Applicable Hawaiian Electric Standards.

19. Construction

Contractor Shall Furnish All Labor, Materials, Equipment, and Services to Properly Perform and Fully Complete All Work Shown on the Contract, Drawings, and Specifications. All Materials Shall be New and Manufactured in the United States of America. All Manhole, Handhole, and Ductline Installations Shall be Inspected and Approved by Hawaiian Electric Prior to Excavation and Prior to Placing Concrete. Contractor Shall Notify Hawaiian Electric's Inspection Division at 543-4329 at Least Five (5) Working Days Prior to Installing Facilities or Placing Concrete.

Contractor to Coordinate Work to Break Into Hawaiian Electric's Existing Electrical Facilities with Hawaiian Electric's Inspection Division at 543-4329 at Least Ten (10) Working Days in Advance.

20. Stakeout

The Contractor Shall Arrange for Toneouts of All Underground Facilities and Shall Stakeout All Proposed Hawaiian Electric Facilities Within the Project Area so as to Not Conflict With Any Utility (Existing or Proposed) and Any Proposed Construction or Improvement Work for Verification by Hawaiian Electric Before Proceeding With Hawaiian Electric Work.

21. Ductlines

All Ductline Installations Shall be PVC Schedule 40 Encased in Concrete, Unless Otherwise Noted. All Completed Ductlines Shall be Mandrel Tested by the Contractor in the Presence of Hawaiian Electric's Inspector using Hawaiian Electric's Standard Practice. the Contractor Shall Install 1800# Tensile Strength Muletape Pull Line in All Completed Ductlines After Mandrel Testing is Complete.

22. Joint Pole Removal

The Last Joint Pole Occupant Off the Poles Shall Remove the Poles.

23. As-Built Plans

The Contractor Shall Provide Hawaiian Electric With a Set of Electronic and Hard Copy Plans of Each Sheet Showing the Offsets, Stationing, and Vertical Elevation of the Duct Line(s) Constructed.

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2 HECo Notes - 3

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
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SHEET No. E-2C OF 15 SHEETS

C.O. 341S-3

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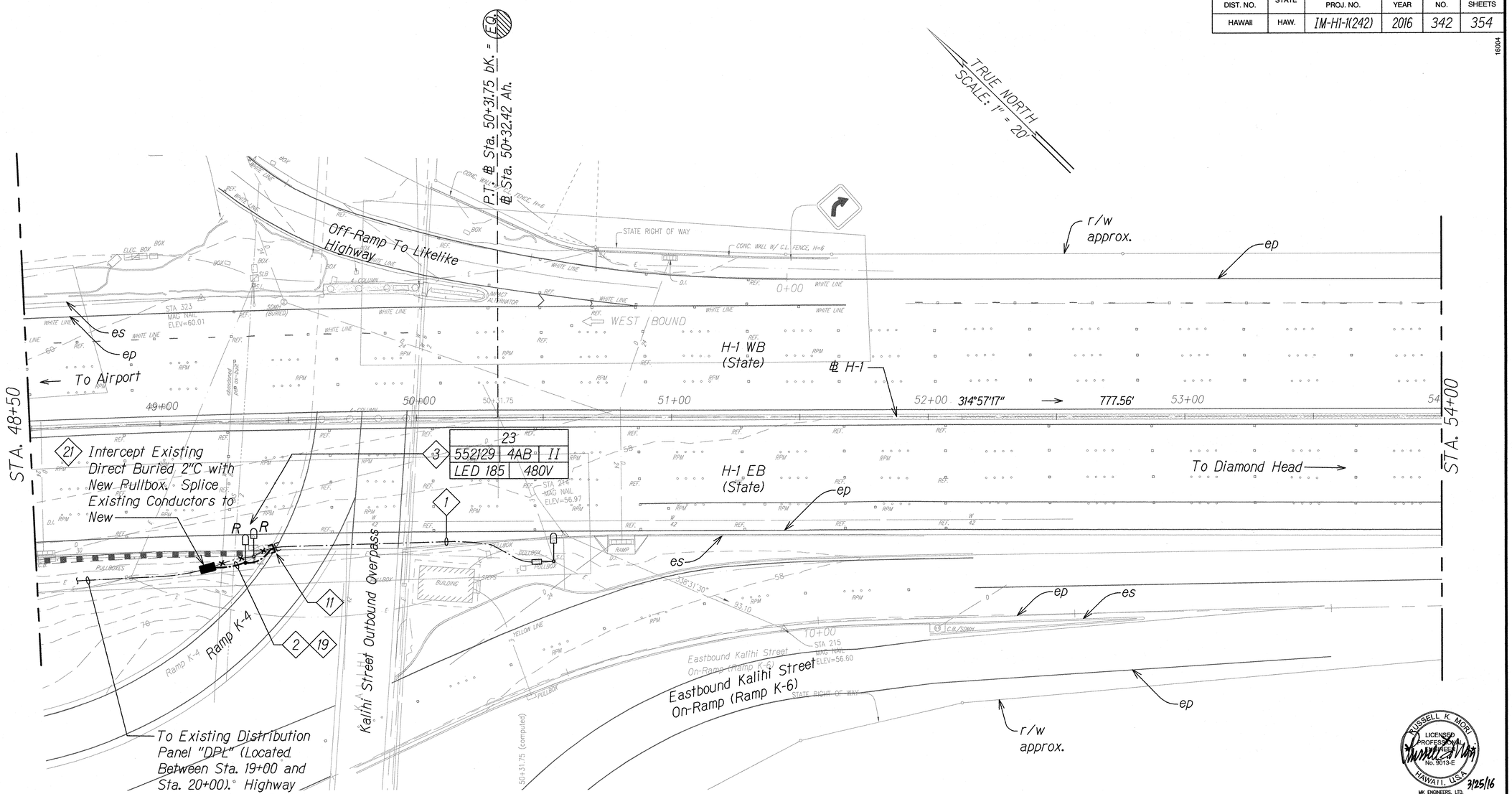

HIGHWAY LIGHTING PLAN
(STA. 48+50 TO 54+00)

Scale: 1" = 20'

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   —×—×— "X" Denotes Removal Work

GRAPHIC SCALE:

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

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STATE OF HAWAII
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HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 48+50 TO 54+00)

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
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SHEET No. E-3 OF 15 SHEETS

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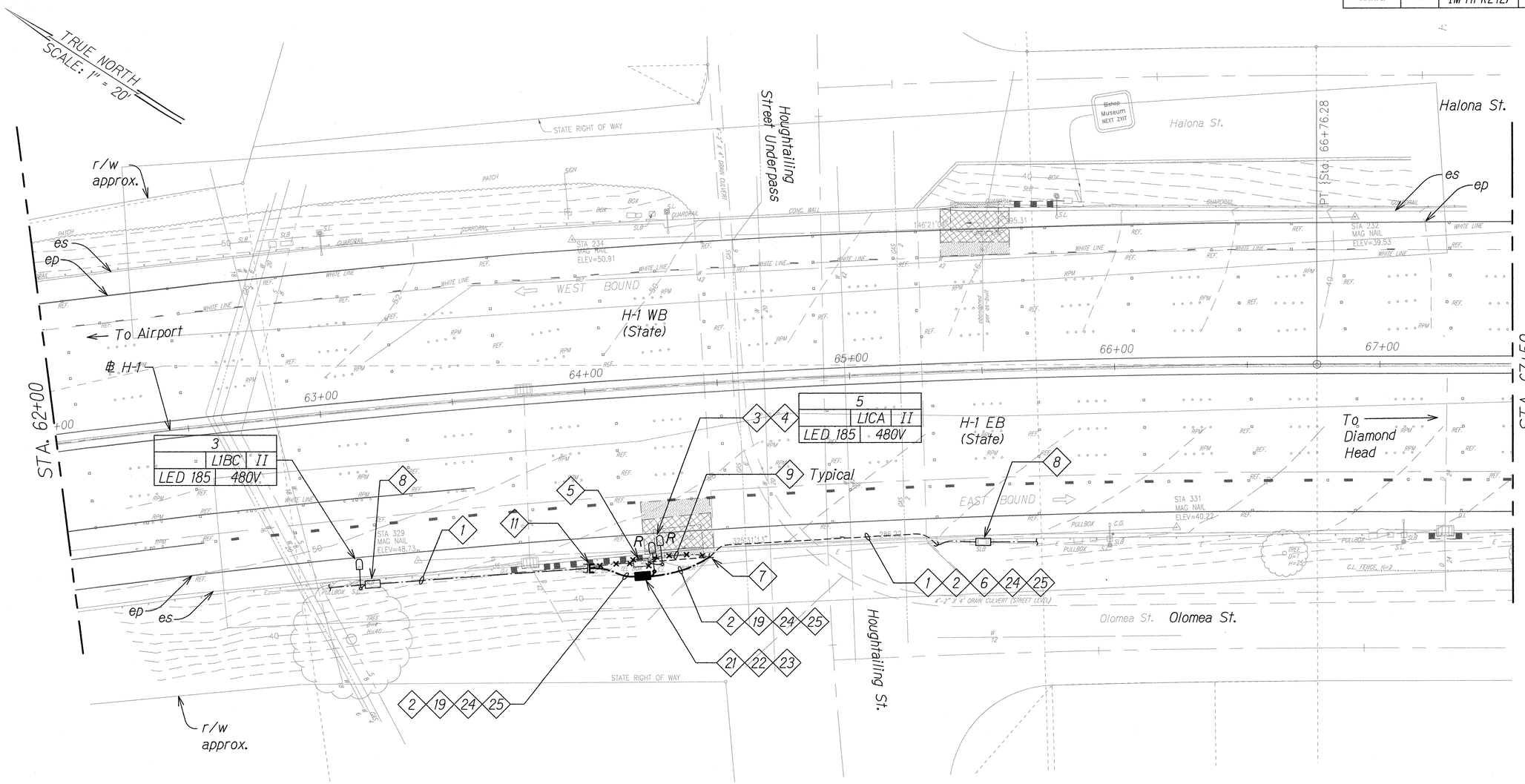

HIGHWAY LIGHTING PLAN
(STA. 62+00 TO 67+50)

Scale: 1" = 20'

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   —×—×— "X" Denotes Removal Work

GRAPHIC SCALE:

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

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DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 62+00 TO 67+50)

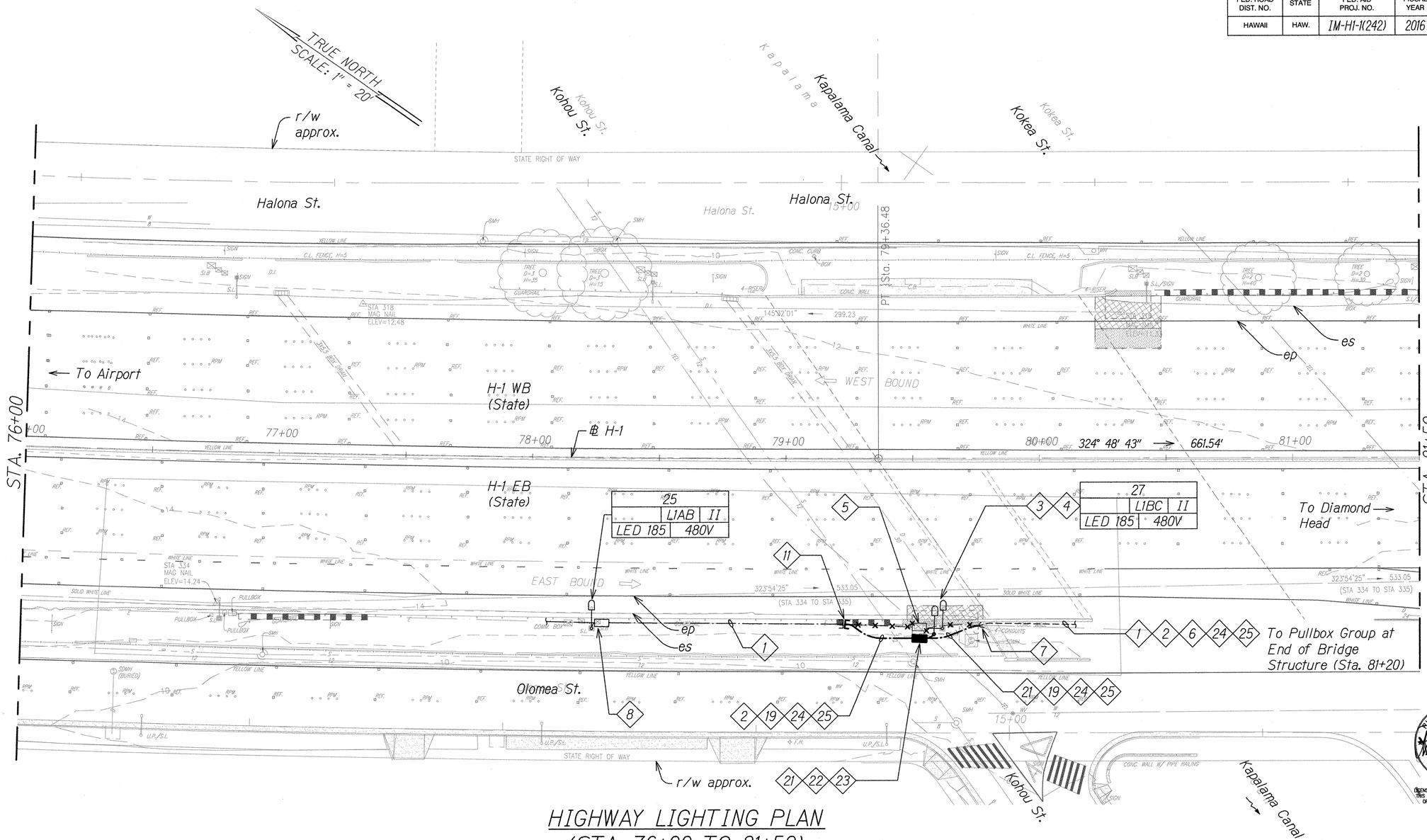
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)

Scale: As Noted Date: April 30, 2016

SHEET No. E-4 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	344	354

16004



HIGHWAY LIGHTING PLAN
(STA. 76+00 TO 81+50)

Scale: 1" = 20'

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   —×—×— "X" Denotes Removal Work

GRAPHIC SCALE:

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

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.
3/25/16
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/16
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

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

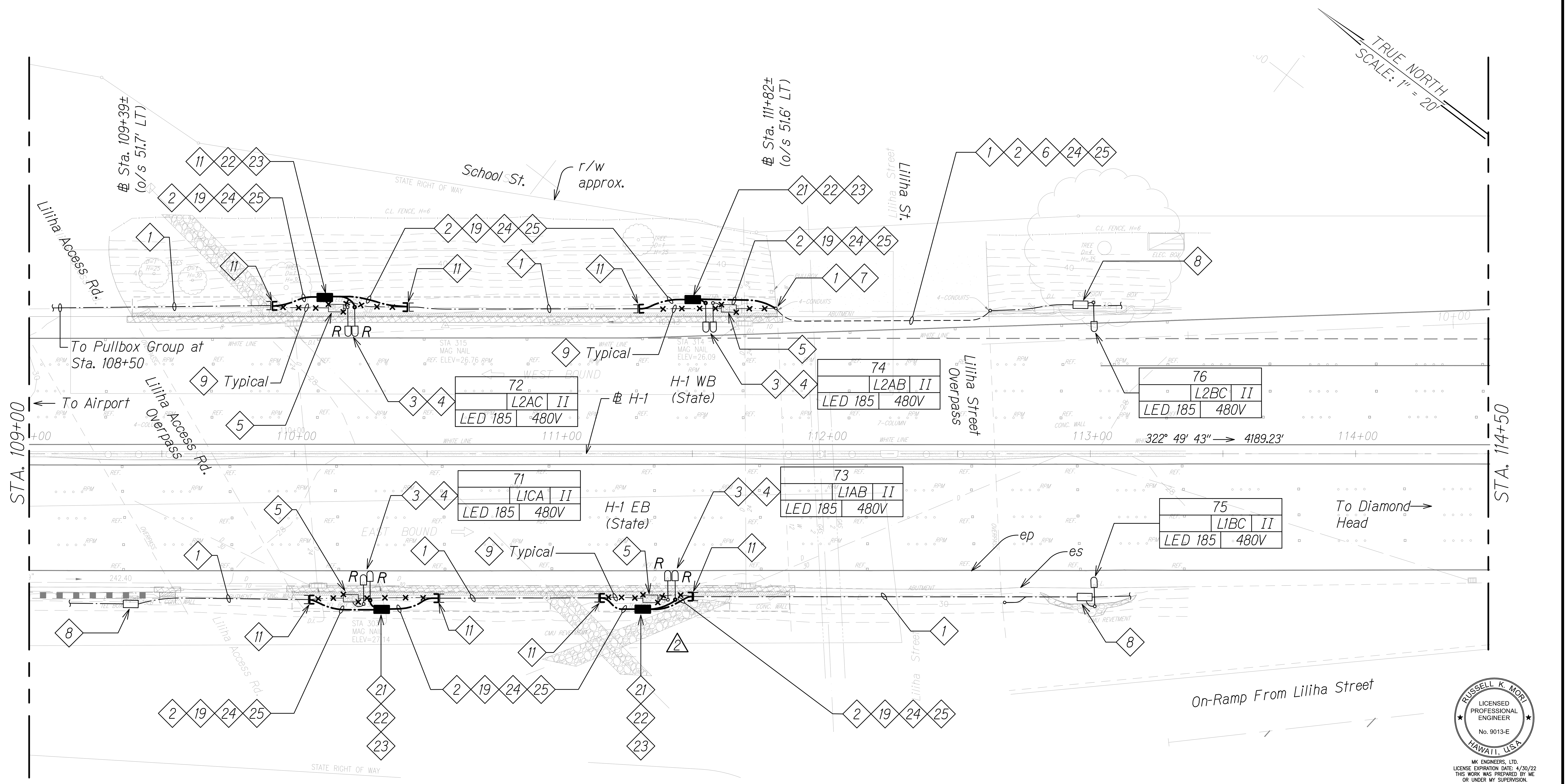
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 76+00 TO 81+50)
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)
Scale: As Noted Date: April 30, 2016

SHEET No. E-5 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(242)	2016	C.O. 345	354

16004



RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.

MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/22
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

HIGHWAY LIGHTING PLAN
(STA. 109+00 TO 114+50)

Scale: 1" = 20'

LEGEND FOR AS-BUILT POSTINGS	
~~	Squiggly line for as-built deletion
~~100.00~~	Double line for as-built deletion
Roadway	Text for as-built posting

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   —x—x— "X" Denotes Removal Work

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

DATE	REVISION
r12/15/16	2 Revised Exist. Elec. Line

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 109+00 TO 114+50)
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-H1-1(242)

Scale: As Noted — Date: April 30, 2016

SHEET No. E-6 OF 15 SHEETS

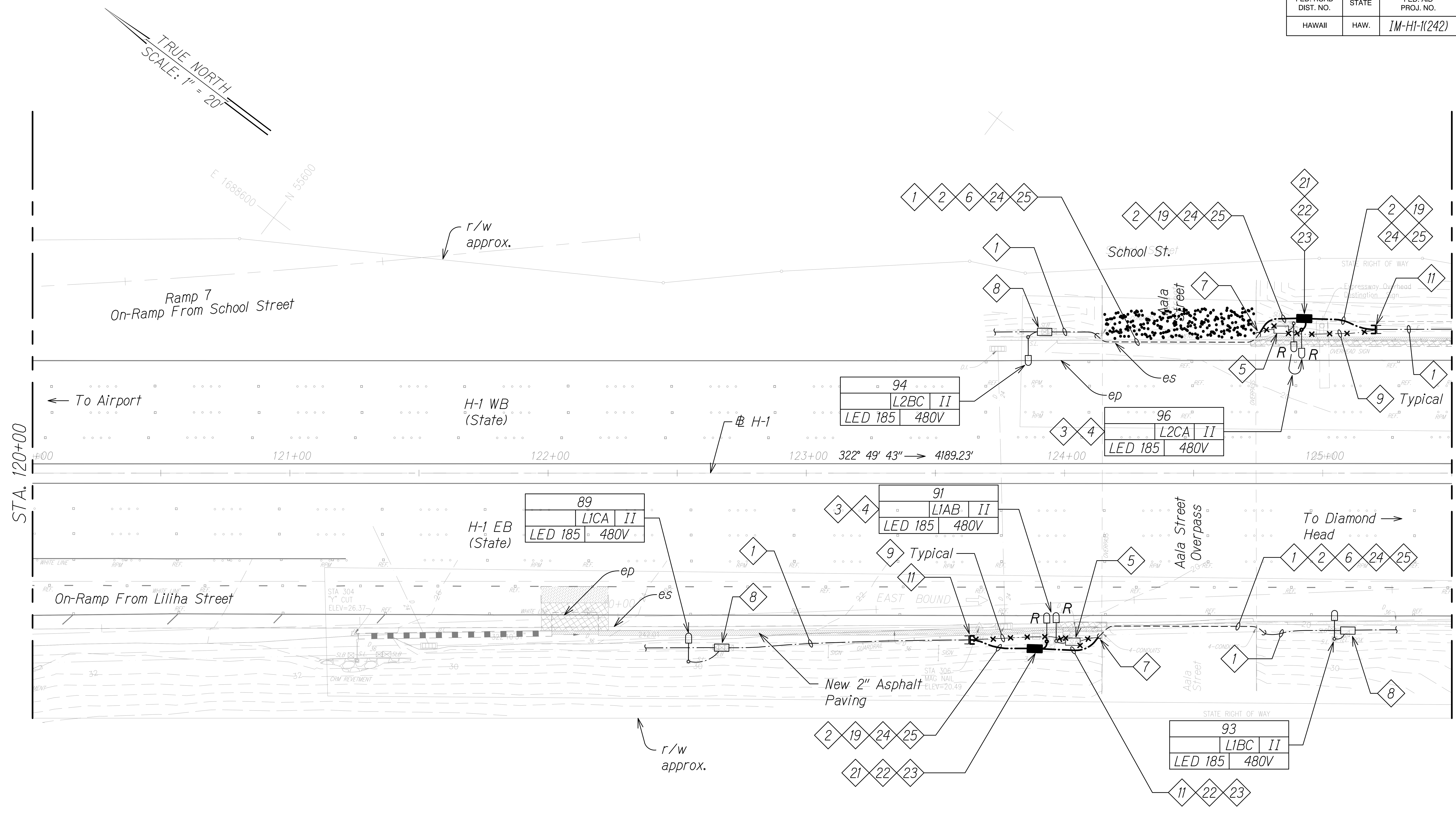
ORIGINAL PLAN	SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY	DATE
NOTE BOOK No.		

"AS-BUILT"

C.O. 345

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(242)	2016	346	354

16004



RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.

MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/22
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

HIGHWAY LIGHTING PLAN
(STA. 120+00 TO 125+50)

Scale: 1" = 20'

NOTES:

1. Light Lines Denote Existing Condition

   Bold Lines Denote New Work

   "X" Denotes Removal Work

GRAPHIC SCALE:

20' 10' 0 20' 40'

SCALE: 1" = 20'

LEGEND FOR AS-BUILT POSTINGS

~~	**Squiggly line for as-built deletion**
~~100.00~~	**Double line for as-built deletion**
Roadway	**Text for as-built posting**

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 120+00 TO 125+50)

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-H1-1(242)

Scale: As Noted Date: April 30, 2016

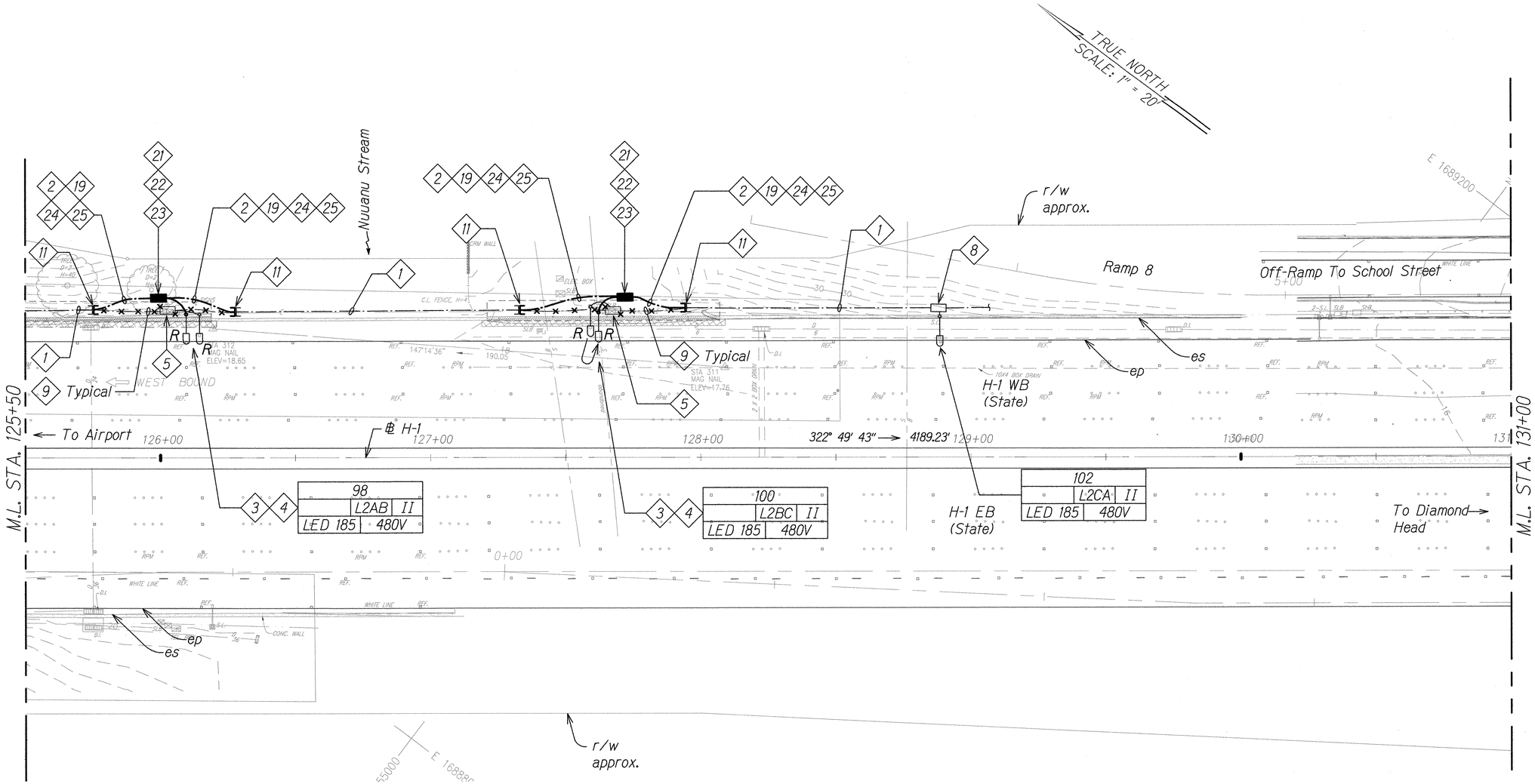
SHEET No. E-7 OF 15 SHEETS

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

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	347	354

16004



HIGHWAY LIGHTING PLAN
(STA. 125+50 TO 131+00)

Scale: 1" = 20'

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   —x—x— "X" Denotes Removal Work

GRAPHIC SCALE:

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

RUSSELL K. MORI LICENSED PROFESSIONAL ENGINEER No. 9013-E HAWAII, U.S.A. 3/25/16

MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/16
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ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
NOTE BOOK | No.

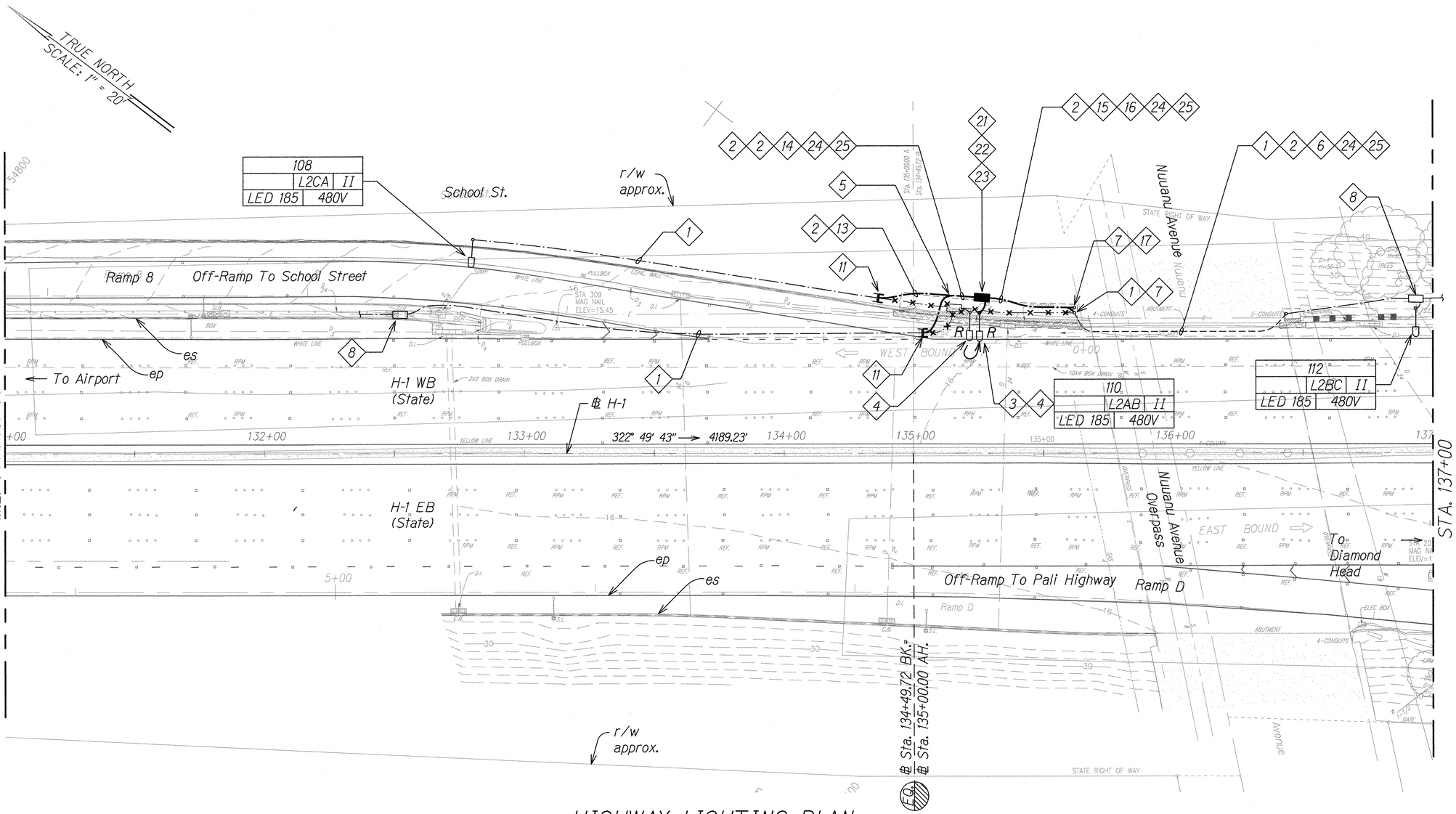
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 125+50 TO 131+00)
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)
Scale: As Noted Date: April 30, 2016

SHEET No. E-8 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	348	354

16004



HIGHWAY LIGHTING PLAN
(STA. 131+00 TO 137+00)

Scale: 1" = 20'

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   —×—×— "X" Denotes Removal Work

GRAPHIC SCALE:

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

ORIGINAL PLAN
NOTE BOOK
No.

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

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.
3/25/16
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/16
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 131+00 TO 137+00)
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)
Scale: As Noted Date: April 30, 2016

SHEET No. E-9 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	349	354

16004

TRUE NORTH
SCALE: 1" = 20'

1690000 N 1536

r/w approx.

122		
	L2AB	II
LED 185	480V	

126A		
	L4BC	II
LED 185	480V	

126B		
	L4BC	II
LED 185	480V	

124		
	L4AB	II
LED 185	480V	

Ramp G

Ramp H

On-Ramp To Punchbowl Street

Off-Ramp To Punchbowl Street

Ramp B

Pali Highway Overpass

Pali Highway

Pali Off-Ramp

← To Airport

H-1 WB (State)

℄ H-1

H-1 EB (State)

LUNALILO FREEWAY

143+00 322° 49' 43" → 4189.23'

144+00

145+00

146+00

147+00

STA. 142+00

STA. 147+50

To Diamond Head →

9 Typical

ep

es

STATE RIGHT OF WAY

15+00

Panel "L"

Approximate Location of Substation No. 3

r/w approx.

NOTES:

1. ——— Light Lines Denote Existing Condition
——— Bold Lines Denote New Work
—x—x— "X" Denotes Removal Work

GRAPHIC SCALE:

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

HIGHWAY LIGHTING PLAN
(STA. 142+00 TO 147+50)

Scale: 1" = 20'

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

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.
3/25/16

MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/16
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 142+00 TO 147+50)

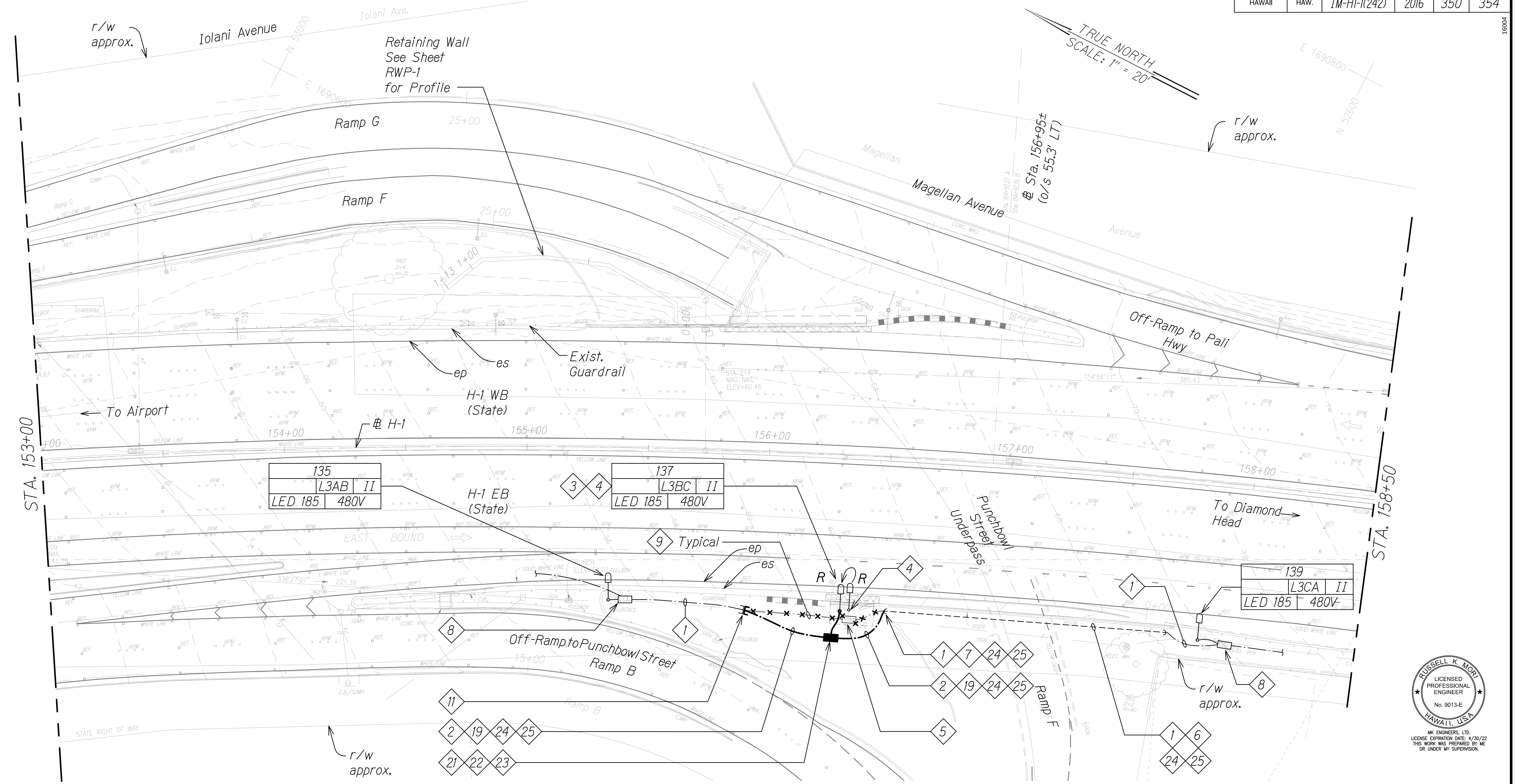
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)

Scale: As Noted Date: April 30, 2016

SHEET No. E-10 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(242)	2016	350	354

16004



HIGHWAY LIGHTING PLAN
(STA. 153+00 TO 158+50)

Scale: 1" = 20'

GRAPHIC SCALE:

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

NOTES:

1. ——— Light Lines Denote Existing Condition
——— Bold Lines Denote New Work
—×—×— "X" Denotes Removal Work

LEGEND FOR AS-BUILT POSTINGS

~~	Squiggly line for as-built deletion
~~100.00~~	Double line for as-built deletion
Roadway	Text for as-built posting

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(STA. 153+00 TO 158+50)
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-H1-1(242)
Scale: As Noted Date: April 30, 2016

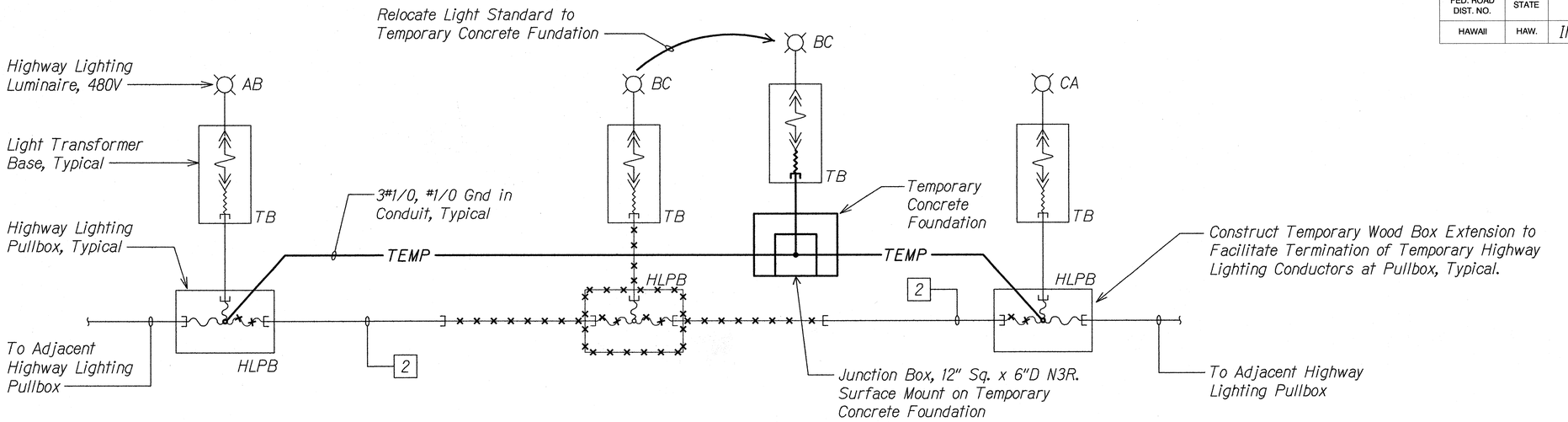
SHEET No. E-11 OF 15 SHEETS

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

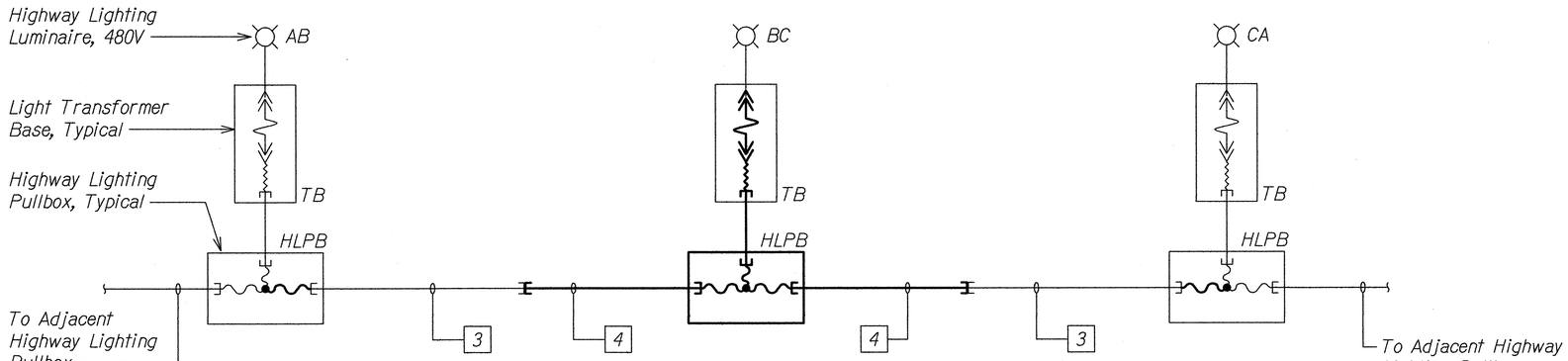
"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	351	354

16004



DEMOLITION/TEMPORARY WORK



NEW WORK

HIGHWAY LIGHTING ONE-LINE DIAGRAM

No Scale

NOTES:

1. ——— Light Lines Denote Existing Condition
   ——— Bold Lines Denote New Work
   -x-x-x- "X" Denotes Removal Work

2 Remove Highway Lighting Conductors From Existing 2"C. 2"C to be Reused.

3 Provide New 3#1/0, #1/0 Gnd in Existing 2"C.

4 2"C, 3#1/0, #1/0 Gnd.

5. Existing Highway Lighting System shall Remain in Operation at All Times. Disconnect and Relocate Light Standard to Temporary Concrete Foundation During Construction. Provide Temporary Wiring to Ensure Highway Lighting System Remains Operational. Remove All Temporary Wiring Once the Permanent Highway Lighting System is in Operation.

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

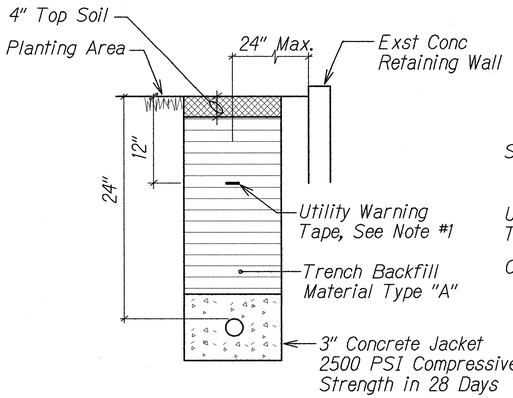
RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.
3/25/16
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/16
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING ONE-LINE DIAGRAM
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)
Scale: As Noted Date: April 30, 2016

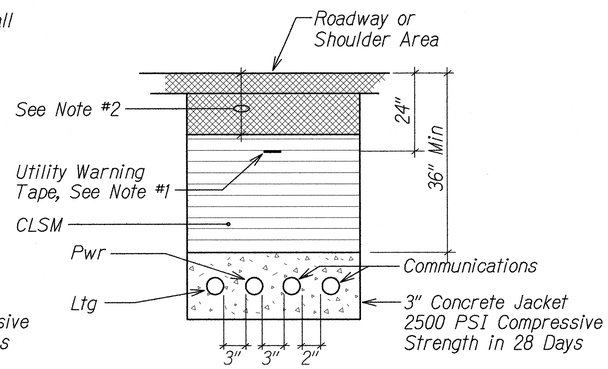
SHEET No. E-12 OF 15 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	352	354

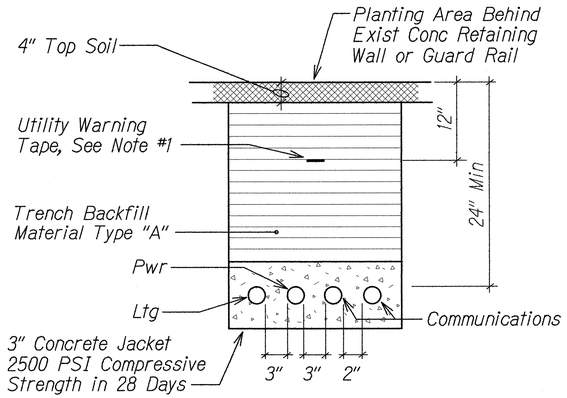
16004



DUCT SECTION (A)
NTS



DUCT SECTION (B)
NTS



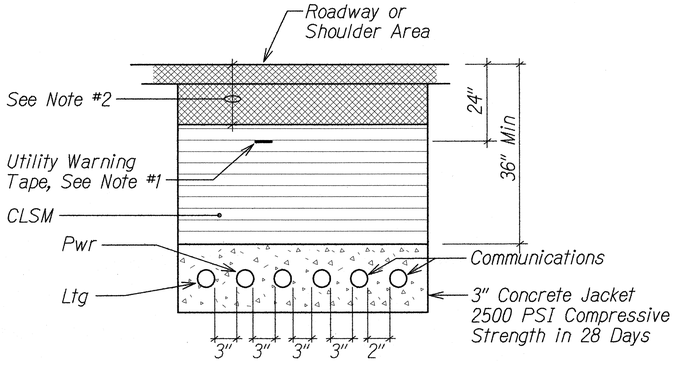
DUCT SECTION (C)
NTS

TYPICAL DUCT SECTIONS

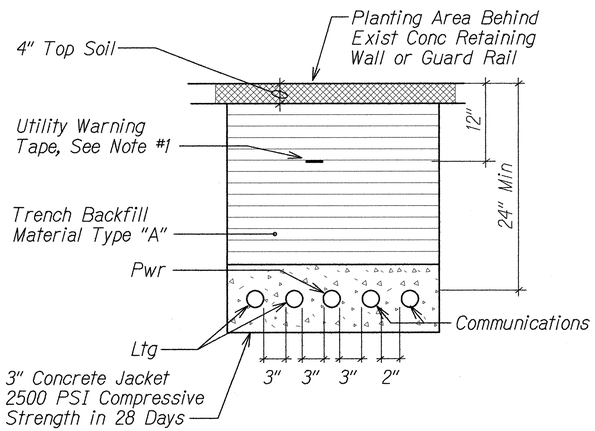
NTS

NOTES:

1. See Standard Plan TE-36, General Note #2 for Warning Tape requirements.
2. See Roadway Plans for Pavement Thickness (SMA, HMA Mix IV, HMAB) by Station Location. For Areas on the Roadway Plans Showing Resurfacing Only, the Pavement Thickness Shall be as Shown for the Mainline Weakend Pavement Reconstruction. SMA, HMA Mix IV and HMAB Shall be Paid Under the Applicable Pay Item.
3. Trench Backfill Top, Soil & CLSM Shall be Included in Pay Item 622.1000 Roadway Lighting System.



DUCT SECTION (D)
NTS



DUCT SECTION (E)
NTS

DUCT SECTION DETAILS

No Scale

ORIGINAL PLAN

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

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, U.S.A.
3/25/16

MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/15
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

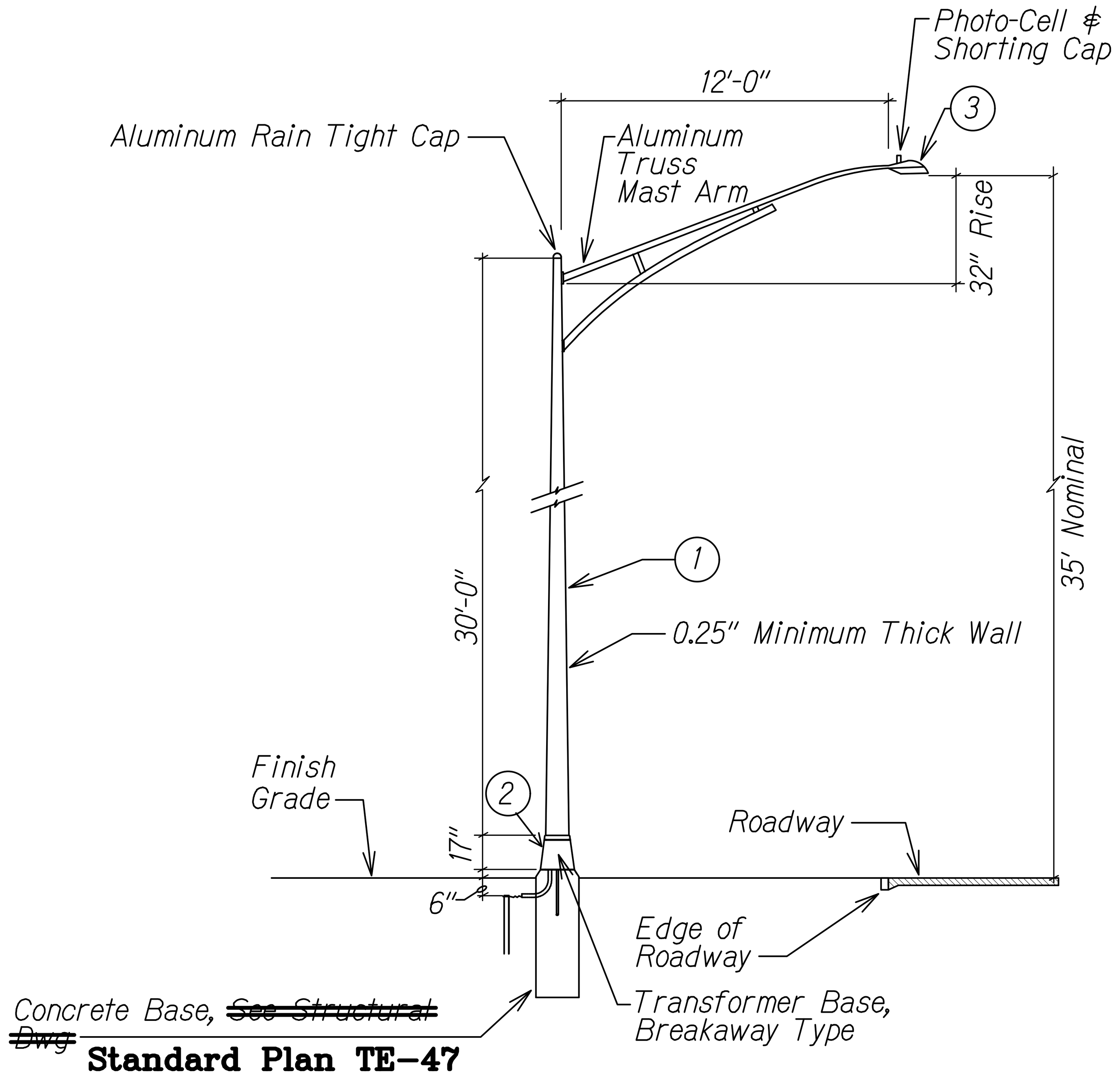
DUCT SECTION DETAILS
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)
Scale: As Noted Date: April 30, 2016

SHEET No. E-13 OF 15 SHEETS

352

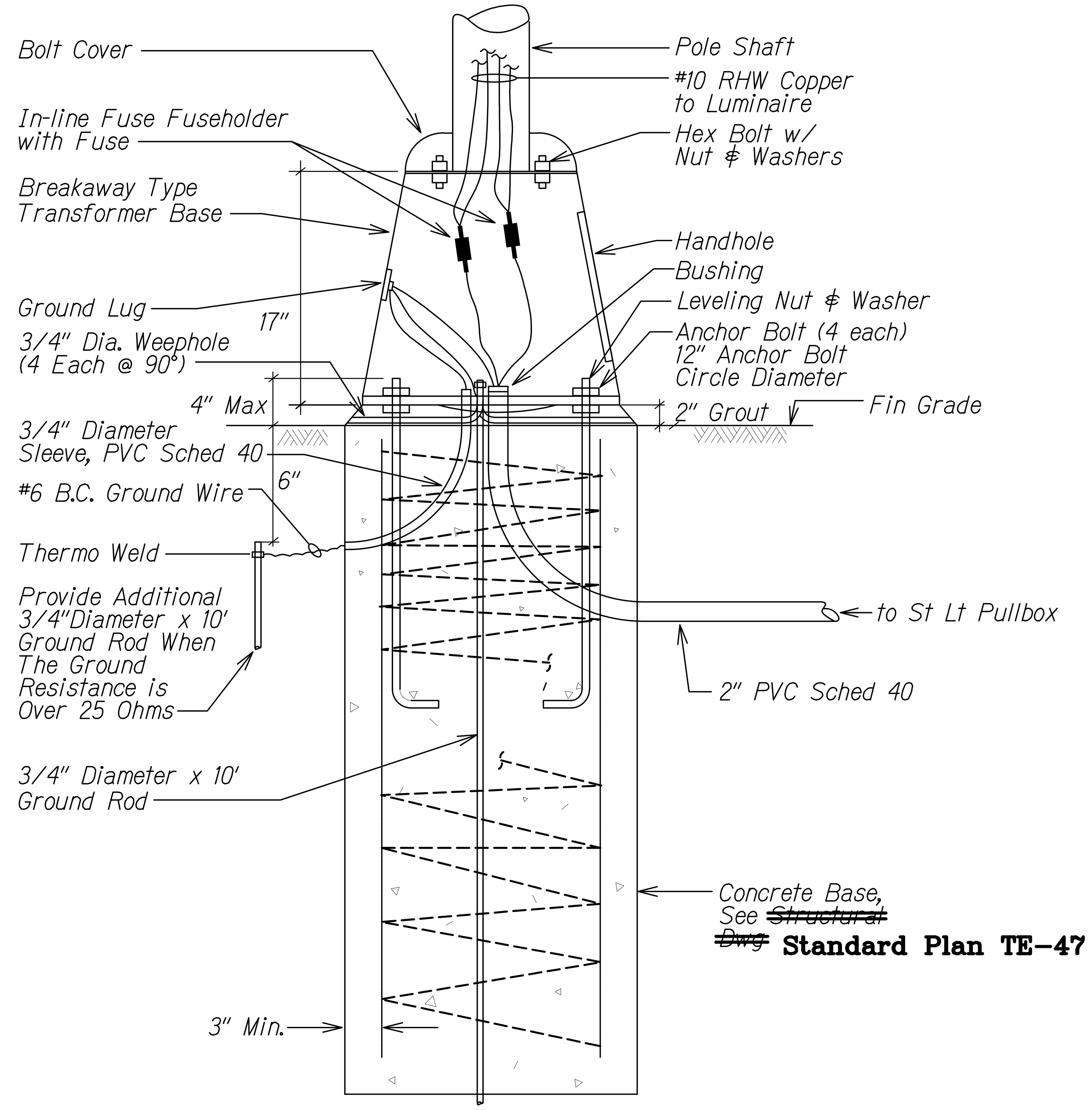
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(242)	2016	353	354

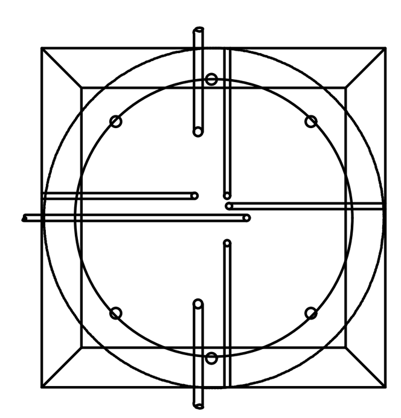
16004



A E-1 E-14 STREET LIGHT STANDARD DETAIL
NTS

MATERIAL LIST (EXISTING)		
ITEM	DESCRIPTION	MANUFACTURER
1	Light Pole, 30', Alum	
2	Transformer Base (Alum) (Breakaway Type)	
3	Luminaire, 185W LED	





PLAN

B E-14 E-14 TYPICAL TRANSFORMER BASE WIRING DETAIL
NTS

LEGEND FOR AS-BUILT POSTINGS

(squiggly line)	**Squiggly line for as-built deletion**
~~100.00~~	**Double line for as-built deletion**
Roadway	**Text for as-built posting**

RUSSELL K. MORI
LICENSED PROFESSIONAL ENGINEER
No. 9013-E
HAWAII, USA
MK ENGINEERS, LTD.
LICENSE EXPIRATION DATE: 4/30/22
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT STANDARD DETAIL

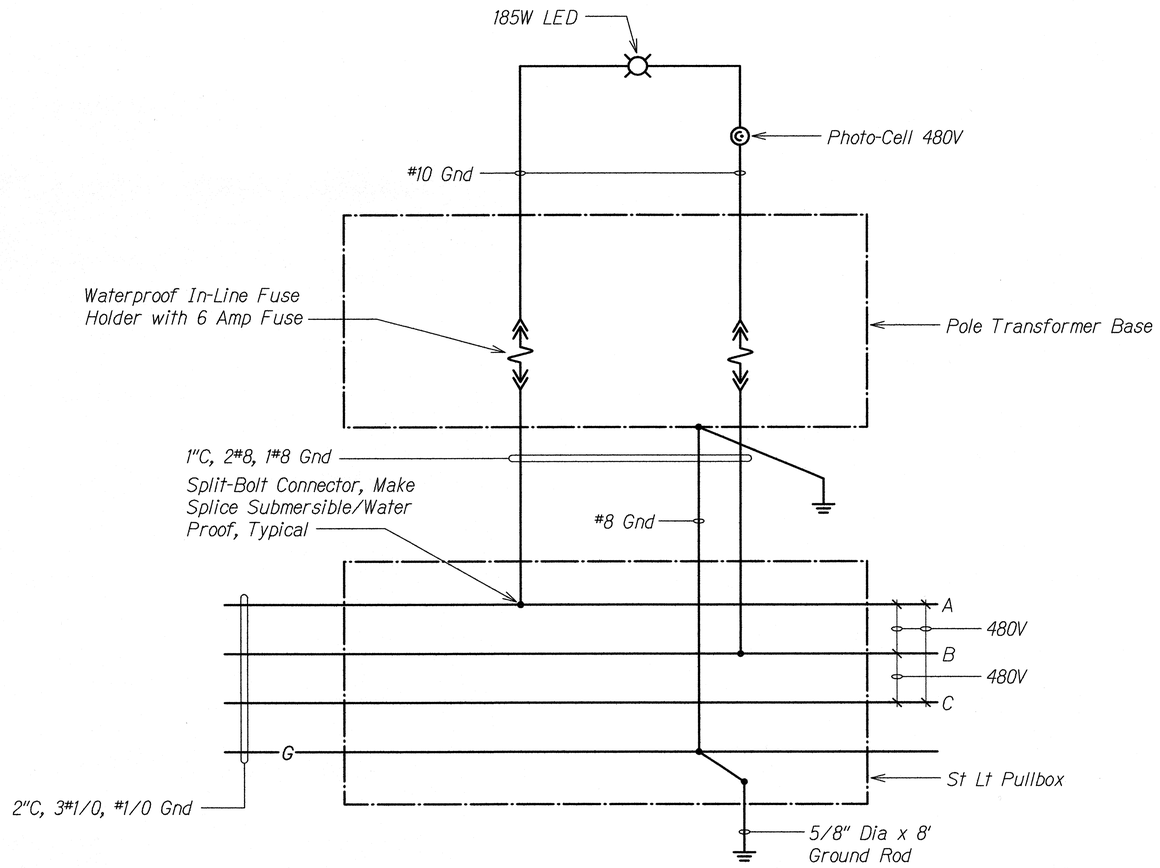
INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-H1-1(242)
Scale: As Noted Date: April 30, 2016

SHEET No. E-14 OF 15 SHEETS

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(242)	2016	354	354

16004



TYPICAL STREET LIGHT WIRING DIAGRAM

No Scale

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

RUSSELL K. MORI
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No. 9013-E
HAWAII, U.S.A.
3/25/16

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL LIGHTING WIRING DIAGRAM

INTERSTATE ROUTE H-1
GUARDRAIL AND SHOULDER IMPROVEMENTS
Middle Street to Punchbowl Off-Ramp
Fed. Aid Project No. IM-HI-1(242)

Scale: As Noted Date: April 30, 2016

SHEET No. E-15 OF 15 SHEETS