FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	359	524

ELECTRICAL SYMBOLS

SYMBOL	DESCRIPTION
	Highway Light Standard, Bracket Arm and Luminaire on New Concrete Base
	Existing Highway Light Standard, Bracket Arm and Luminaire on Existing Concrete Base
	Highway Light Standard, Bracket Arm and Luminaire Mounted on New Barrier Wall, See Plan for Pole Height
	Underpass Light Fixture, Wall Mounted Under Bridge
--abJTS--	Existing Abandoned Joint Trunking System (JTS) Direct Buried Cable
--eJTS--	Existing Joint Trunking System (JTS) Direct Buried Cable
--e-att-	Existing AT&T Underground Line to Remain
--u-oh--	Indicates Existing Utility Overhead Lines
--eug--	Indicates Existing HECo Conduit and Wires
--tug--	Indicates Existing HTCo Conduit and Wires
--vug--	Indicates Existing OTWC Conduit and Wires
--hl--	Indicates Existing Highway Light Conduit and Wires
--ts--	Indicates Existing Traffic Signal Conduit and Wires

SYMBOL	DESCRIPTION
	Existing Utility Wood Pole
	Utility or Highway Light Wood Pole
	Existing Pole Down Guy & Anchor
	Type "A" Highway Light Pullbox
	Type "B" Highway Light Pullbox
	Type "C" Highway Light Pullbox
	Existing Pullbox or Handhole
ep2	Indicates Existing Joint Utility Pole Designation
	Type "A" Communications Electric Pullbox
	Type "B" Communications Signal Pullbox
	Type "C" Traffic Signal Pullbox
(1) →	Note Indicator Designators, "See Note No. 1" Indicated; "See Note A" Indicated
A →	
(A)	Equipment Indicator
1	Equipment Indicator, See Utility Equipment Schedule on Sheet EA-2
R/W	Denotes "State Right-of-Way"
HECO	Denotes "Hawaiian Electric Company"
HTCO	Denotes "Hawaiian Telcom"
CATV	Denotes "Oceanic Time Warner Cable"
OTWC	Denotes "Oceanic Time Warner Cable"
ATT	Denotes "A T & T Communications System"
JTS	Denotes "Joint Trunking System"

SYMBOL	DESCRIPTION
(TA) 2-4T	Utility System Ductline with Duct Designations, Item In Circle Indicates Duct Section Type, With Duct Complement Noted Below (Type "TA" Duct Indicated with 2-4"T Ducts; E=HECo Ducts; T=Hawaiian Telcom Ducts; V=Oceanic Cable Ducts, C=Communications System Ducts); See Duct Section Detail Sheets EA-9, E-10, E-12, EA-13
(LA) 1-2L	Highway Light and Traffic Signal System Ductline with Duct Designations, Item In Circle Indicates Duct Section Type, With Duct Complement Noted Below (Type "LA" Indicated with 1-2"L Duct; L=Highway Light Ducts; S=Traffic Signal Ducts, SE=Traffic Signal Power Ducts, C=Communication Ducts, CE=Communications Power Ducts); See Duct Section Detail Sheets EA-9 to EA-11

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 359S-1

ELECTRICAL SYMBOLS

SYMBOL EXST	SYMBOL NEW	DESCRIPTION
		Highway Light Standard
		Remove Exst Highway Light Standard, Demolish Exst. Conc. Base 3 Ft. Below Finish Grade & Backfill Pit To 95% Compaction Unless Indicated Otherwise. Repair Pavement To Match Exst.
	M	Metering Equipment
		Utility Pole
		HECO Pole Mounted Transformer
--e-oh--		HECO Overhead Lines
	—SEC-OH—	Secondary Overhead Lines By HECO
--t-oh--		HT Overhead Lines
--v-oh--		CATV Overhead Lines
--ℓ-oh--		Highway Lighting Overhead Lines
-*-ℓ-oh-*-		Remove Exst Highway Lighting Overhead Lines
--g-oh--		Guy Anchor
---→		
---e---		HECO Underground Ductline
---t---		HT Underground Ductline
---v---		CATV Underground Ductline
---sc--		Signal Corps Underground Cable
--att--		AT&T Underground Ductline
-*-ℓ-*-		Remove Exst Highway Lighting Ductline & Wiring
	—-E-—	Electrical Underground Ductline
---c---	—-C-—	State Communication Underground Ductline
--ts--	—-TS-—	Traffic Signal Underground Ductline
---ℓ---	—-L-—	State Highway Lighting Underground Ductline
	——→	Stub, Cap, And Mark Conduits; Provide Pullwire
	--TS/C-EX--	Traffic Signal/Communication Exposed Conduit
		Transition Conduits From Underground To Exposed
		Exst Pullbox Or Handhole
		Exst Pullbox To Be Demolished, Backfill To 95% Compaction Unless Indicated Otherwise. Repair Pavement To Match Exst.
		Electrical 2' X 4' Handhole
		Type "A" Highway Lighting Pullbox
		Type "A" Communication Pullbox
		Type "B" Communication Pullbox
		Type "B" Traffic Signal Pullbox
		Type "C" Traffic Signal Pullbox
		Sawcut And Patch Existing Pavement
---e-(H)	——(A)(H)	Electrical Ductline With Designator, Indicates Type "A" Duct Section With "2-4E" Ducts

EQUIPMENT SCHEDULE

State Of Hawaii Department Of Transportation Handholes And Manholes Shall Be Constructed By The Contractor As Shown On These Drawings And In Accordance With The Following Standard Drawings.

TYPE	DESCRIPTION
Electrical 2' X 4' Handhole (LRFD)	2'-0" X 4'-0" Precast Reinforced Concrete Handhole With Precast LRFD Concrete Covers, Provided In Accordance With HECO Standard Drawing No. 103782. Except With "Elec" Inscribed On Cover.
Type "A" Communications, Traffic Signal, or Highway Lighting Pullbox (State)	Type "A" Metric Precast Concrete Pullbox With Polymer Concrete "Non-Skid" Covers, Provided In Accordance With State Of Hawaii, Department Of Transportation Standard Drawings.
Type "B" Communications, Traffic Signal, or Highway Lighting Pullbox (State)	Type "B" Metric Precast Concrete Pullbox With Polymer Concrete "Non-Skid" Covers, Provided In Accordance With State Of Hawaii, Department Of Transportation Standard Drawings.
Type "C" Communications, Traffic Signal, or Highway Lighting Pullbox (State)	Type "C" Metric Precast Concrete Pullbox With Polymer Concrete "Non-Skid" Covers, Provided In Accordance With State Of Hawaii, Department Of Transportation Standard Drawings.

SYMBOL NOTES:

1. "X" Through Symbol Indicates Item To Be Removed By Contractor.
2. "Behind Guardrail" Indicates Pole Base Located Behind Guardrail. "Breakaway" Indicates Breakaway Transformer Base.

UTILITY LEGEND:

—W16— Exst Water Line, 16" Dia Indicated

—G6— Exst Gas Line, 6" Dia Indicated

—S8— Exst Sewer Line, 8" Dia Indicated

—D24— Exst Drain Line, 24" Dia Indicated

—F10— Exst Fuel Line, 10" Dia Indicated

HIGHWAY LIGHT LEGEND:

1	6, 9AB	← Light No., Circuit No. (Ckt 9, Phases A & B Indicated)
2	122+36, O/S 16' Lt	← Sta. No., Offset From Baseline
3	15', III	← Bracket Arm Length, Light Distribution
4	33'	← Luminaire Mounting Height Above Pavement
5	Behind Guardrail	← Pole Base Location, See Symbol Note #2
6	Breakaway	← Additional Base Information, See Symbol Note #2

AS BUILT

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

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STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
SYMBOLS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EA-15 OF 161 SHEETS

DATE	REVISION

"AS-BUILT"

C.O. 359S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	360	524

GENERAL CONSTRUCTION NOTES

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

B. Unless otherwise requested by the Board ofWwater Supply, minimum clearance between water lines and conduits shall be:
Horizontal = 3 feet
Vertical = 6 feet

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 street 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. All construction work shall be done in accordance with the Standard Specifications for Public Works Construction Sept., 1986 and Standard Details for Public Works Construction, Sept. 1984, as amended, of the Department of Public Works, City and County of Honolulu.

H. The Contractor shall notify the Civil Engineering Branch, Department of Planning and Permitting @ 523-4881, seven (7) days prior to commencement of construction.

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

J. The Contractor, at no increase in contract price or contract time, 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.

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

L. **Where ductline crosses guard rail locations, ductline shall be provided with a minimum of 4'-0" cover from top of concrete encasement to finish grade to ensure clearance to guard rail posts embedded approximately 3'-6" below finish grade.**

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 Increase in Contract Time or Contract Price.

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.

ELECTRICAL DEMOLITION NOTES

1. The Contractor Shall Verify All Existing Circuit Wiring Prior to Any Demolition Work.

2. The Contractor Shall Remove All Abandoned Wires and Exposed Raceways.

3. Where Contract Documents Indicate Wiring is to be Removed, the Contractor Shall Remove Existing Wires, Underground Ductlines and Conduits, Manholes, Handholes, Pullboxes and Exposed Raceways for Existing Utility Lines. Respective Utility Company Shall Remove Their Wires, and Contractor Shall Remove All Underground Ductlines, Manholes, Handholes, Pullboxes and Exposed Conduits and Raceways. Contractor Shall Provide Backfill Material and Backfill Where Items are Removed per the State DOT Backfill and Compaction Requirements and Approval.

4. For Circuits where Contractor Removes Existing Electrical Equipment, 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.

UTILITY EQUIPMENT SCHEDULE

The Hawaiian Electric Co. (HECo), Hawaiian Telcom (HTCo), and Oceanic Time Warner Cable (CATV or OTWC) pullboxes, handholes, and manholes shall be constructed by the Contractor as shown in these drawings, in accordance with the following standard drawings, **and all pullboxes, handholes, and manholes installed shall meet the Latest AASHTO H-20 LRFD Traffic Loading Requirements and shall be so stated in the shop drawing submittal for Each Item. Contractor shall also provide shop drawings of each manhole (including butterfly drawings) to HECo, HTCo and OTWC for their review and approval**:

ITEM	DESCRIPTION
1	HECo 6' x 14' Manhole (Pre-Cast) Per HECo Drawing No. 100912
2	HTCo 5' x 10'-6" x 6'-6" Deep Manhole (Pre-Cast) Per HTCo Drawing Item ID No. 180016
3	CATV 2' x 4' Pullbox (Pre-Cast) Constructed Similar to HTCo Drawing No. 34056 Except with CATV Inscribed on Covers
4	CATV 2' x 6' Pullbox (Pre-Cast) Constructed Similar to HTCo Drawing No. 34078 Except with CATV Inscribed on Covers
5	CATV 3' x 5' Handhole (Pre-Cast) Constructed Similar to HTCo Drawing No. 340110A, Except with OTWC Inscribed on Covers
6	CATV 4' x 6'-6" Manhole, Constructed Similar to Hawaiian Telcom Item ID No. 180014 (Pre-Cast)

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL ELECTRICAL NOTES

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Date: January 20, 2015

SHEET No. EA-2 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	361	524

Hawaiian Telcom (HTCo) General Construction/Design Notes
(January 2007–Revised 01–18–2008)

1. The Contractor shall procure and pay for all licenses and permits and shall give all notices necessary and incident to the due and lawful prosecution of the work.

2. The Contractor shall obtain an excavation permit and toning request from Hawaiian Telcom's Excavation Permit Section, located at 1177 Bishop Street, two weeks prior to the start of construction. Hours of business are 8:00 AM to 11:00 AM and 12:00 PM to 3:00 PM Monday through Friday, except holidays.

3. Prior to the excavation of the ductline, the Contractor shall request Hawaiian Telcom to locate existing ductline wherever required. For underground cable locating and marking, five (5) working days advance notice is required. Three (3) working days advance notice is required for any inspection by a designated representative.

4. The location of existing utilities are approximate only. The Contractor shall exercise extreme caution and shall maintain proper clearances whenever construction crosses or is in close proximity of Hawaiian Telcom facilities. The Contractor shall verify their location and shall be liable for any damages to Hawaiian Telcom facilities. Any damages shall be reported immediately to Hawaiian Telcom's Repair Section at #611 (24 hours) or to the Excavation Permit Section at 546–7746 (normal working hours, Monday through Friday, except holidays). As a result of his operations, adjustments to the new ductline alignment, if required, shall be made to provide required clearances.

5. The Contractor shall take necessary precaution not to damage existing cables or ducts. A Hawaiian Telcom Inspector or designated representative is required to be at any job site whenever there will be breakage into or entry into any structure that contain Hawaiian Telcom facilities. Temporary cable and duct supports shall be provided whenever necessary.

6. The Contractor shall notify Hawaiian Telcom's Inspector or designated representative a minimum of 72 hours prior to excavation, bracing or backfilling of Hawaiian Telcom's structures or facilities.

7. All applicable construction work shall be done in accordance with the "Hawaiian Telcom Standard Specifications for Placing Telephone Systems" dated January 2007. All subsequent amendments and additions, and all other pertinent standards for telephone construction. Contractor shall familiarize his personnel by obtaining applicable specifications.

8. When excavation is adjacent to or beneath Hawaiian Telcom's existing structures or facilities, the Contractor shall:

   a) Sheet and / or brace the excavation to prevent slides, cave–ins or settlements to ensure no movement to Hawaiian Telcom's structures or facilities.

   b) Protect existing structures and/or facilities with beams, struts or underpinnings while excavating beneath them to ensure no movement to Hawaiian Telcom's structures or facilities.

9. The Contractor shall brace all poles or light standards near the new ductline, manhole, or handhole during his operations.

10. The Contractor shall saw–cut a.c. pavement and concrete gutter wherever new manholes, handholes, or ductlines are to be placed and shall restore to existing condition or better.

11. The Contractor shall comply with the policy adopted by the Department of Planning and Permitting, City and County of Honolulu, concerning the replacement of concrete sidewalks after excavation work.

12. The underground pipes, cables or ductlines known to exist by the Engineer from his search of records are indicated on the plans. The Contractor shall verify the locations and depth of the facilities and exercise proper care in excavating in the area. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depth prior to excavation for the new lines.

13. Wherever connections to existing utilities are shown on the plans, the Contractor shall expose the existing lines prior to excavation of the main trenches to verify their locations and depths.

14. The Contractor, at his own expense, shall keep the project and surrounding area free from dust nuisance. The cost for supplementary measures, which will be required by the City and County, shall be borne by the Contractor.

15. The Contractor shall pump all manholes dry during final inspection.

16. The Contractor shall notify Hawaiian Telcom Inspector 24 hours prior to pouring of concrete or backfilling.

17. When connecting to manhole walls, all existing reinforcing bars shall be left intact. Ducts shall be adjusted in the field in order to clear reinforcing.

18. The Contractor shall be responsible for laying out all required lines and grades and shall preserve all bench marks and working points necessary to lay out the work correctly. The new ductline shall be adjusted by the Contractor to suit the existing conditions and the details as described in the plans.

19. Minimum concrete strength shall be:

   a) For Ductline — 2500 PSI at 28 days

   b) For Manhole — 3000 PSI at 28 days or as specified in design notes

20. Bends in the duct alignment, due to changes in grade shall have a minimum radius of 25 feet. All 90 degree c–bends at a pole or at the building floor slab penetration, shall have a bend radius of ten times the diameter of the duct or greater.

21. After ductline has been completed, a mandrel with a square front not less than 12" long and having a diameter of 1/4" less than the inside diameter of the duct, shall be pulled through each duct after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand or gravel have been left inside. Ducts shall be completely dry and clean.

22. All ducts and conduits shall have an 1800# Polyester Mule–Tape (NEPTCO, WP1800P, Hawaiian Telcom Material Code No. 571154) installed throughout its entire length. All ducts shall be capped to prevent entry of foreign material during construction and at the completion of installation.

23. The Contractor shall notify Mr. Clifford Anguay of Hawaiian Telcom (HTCo), at telephone number 546–7789, 40 working days prior to requesting HTCo to proceed with their work, once the Contractor's infrastructure construction work has been completed, approved, and ready for HTCo to perform their work.

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

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.
Andrew I. Miyasato 2015.02.18
Signature
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO GENERAL CONSTRUCTION NOTES

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

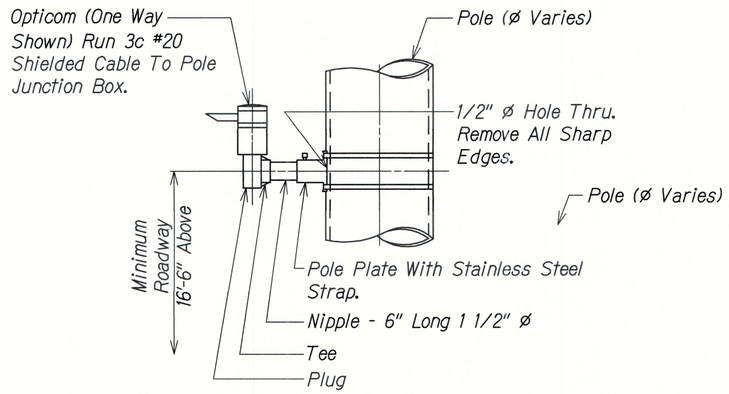
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SHEET No. EA-3 OF 161 SHEETS

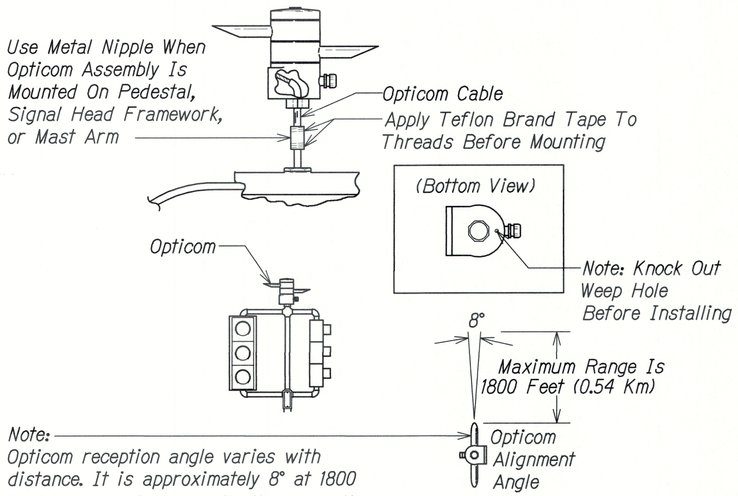
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

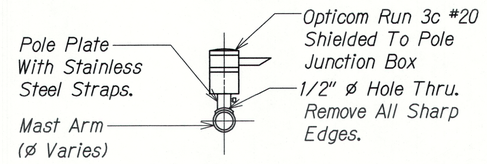
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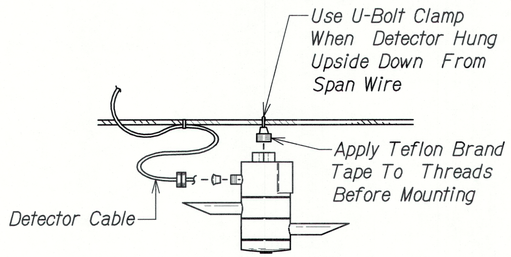
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Not To Scale

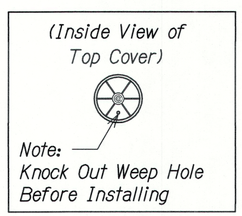


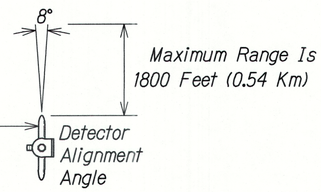
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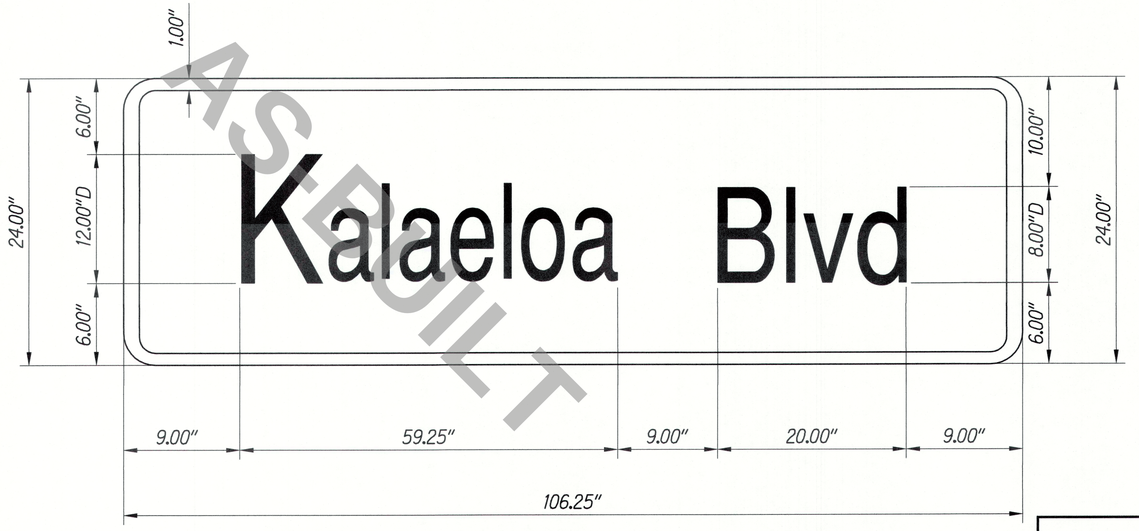
TYPICAL HORIZONTAL MOUNT OF OPTICOM
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TYPICAL SPAN WIRE INSTALLATION OF OPTICOM
Not To Scale



AS-BUILT

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DRAWN BY
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DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

ORIGINAL PLAN
NOTE BOOK
No.

CATHY A. LEONG
LICENSED PROFESSIONAL ENGINEER
No. 10334-C
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
APRIL 30, 2020
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: 1" = 20' Date: November 16, 2018

DATE	REVISION

SHEET No. EA-14 OF 161 SHEETS

"AS-BUILT"

C.O. 361S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 361S-2

GENERAL ELECTRICAL NOTES

1. All Electrical Work Shall Be New Unless Indicated Otherwise.
2. 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.
3. Contractor Shall Verify All Exst Conditions.
4. Existing Highway Lighting, Traffic Signal, & Communication 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.
5. Sawcutting And Repairing Of Existing A.C. And Concrete Pavement, A.C. Concrete, And Lava Rock Curb, And Concrete Gutter Will Not Be Paid For Separately, But Considered Incidental To The Various Contract Items. Reparing Of A.C. Pavement Shall Include Restoring Pavement Markings And Stripings. Pavement Markings And Striping Will Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.
6. Replanting Grass And Providing Topsoil That Was Disturbed By Trench Excavation Will Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.
7. Communication Conduits To Have A Minimum Bending Radii Of 12".
8. For Concrete Encased Stub-Outs, Omit Concrete Encasement For Last Six (6) Inches Of Stub-Out.

DEPARTMENT OF TRANSPORTATION SERVICES (DTS) TRAFFIC SIGNALS AND TECHNOLOGY DIVISION

1. Contractor Shall Notify The Traffic Signals And Technology Division, Department Of Transportation Services, Three (3) Working Days Prior To Commencing Work On The Traffic Signal System (Phone: 768-8388).
2. The Traffic Signal System Shall Be Kept Operational During Construction. Any Relocation Required Shall Be Approved By The Traffic Signals And Technology Division, Department Of Transportation Services, And Performed And Paid For By The Contractor.
3. The Contractor Shall Be Responsible For Any Damages To Existing Traffic Signal Facilities, Including The Traffic Signal Interconnect System. Any And All Damages To These Facilities Shall Be Repaired Immediately (Within One Working Day) By The Contractor At His Cost In Accordance With The Requirements Of The City And County Of Honolulu.
4. Contractor Shall Be Responsible For Any Damages To Existing Traffic Signal Fiber Optic Cable System. Any And All Damages To These Facilities Shall Be Repaired Immediately (Within One Working Day) By The Contractor At His Cost In Accordance With The Requirements Of The City & County Of Honolulu.

DEMOLITION/RELOCATION NOTES

1. Contractor Shall Verify All Exst Circuit Wiring Prior To Any Demolition Work.
2. Existing Traffic Signal System(s) Shall Remain Operational At All Times. Contractor Shall Provide Temporary Traffic Signal System(s) Including Video Vehicle Detector(s) As Required If The Existing Traffic Signal Equipment Are Removed Before The New Traffic Signal System(s) Are Operational. Temporary Work Shall Be Coordinated With And Shall Be Acceptable To The Engineer. Temporary Traffic Signal System(s) Will Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.
3. Coordinate De-Energizing Of Existing Highway Light Electric Services With HECO As Necessary. See Plans For Existing Service Locations.
4. For The Fiber Optic Or Interconnect Cable Relocation Work, The Affected Portion Of The Existing Traffic Signal Fiber Optic Or Interconnect Cable Systems Can Be Shut-Down A Maximum Of One Working Day Or Over The Weekend. Coordinate Shutdown With Department of Transportation Services, Traffic Signals And Technology Division A Minimum of Three (3) Working Days Prior to Shutdown. See DTS Notes 3 and 4.
5. When Excavation Impacts Existing Driveways, At Least Half Of The Existing Driveway Shall Remain Passable To Vehicles While Existing Business Is Open.

AS-BUILT

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STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

NOTES I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EA-16 OF 161 SHEETS

DATE	REVISION

"AS-BUILT"

C.O. 361S-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	362	524

NEW DESIGN REQUIREMENTS FOR LUMINAIRES, POLE STANDARDS AND TRAFFIC SIGNAL STANDARDS (January 7, 2014)

(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. AASHTO Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 6th Edition, 2012 Including Subequent Interim Revisions, Published by the American Association of State Highway and Transportation Officials, as Modified Herein.
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 the rational procedures and sound engineering judgment. 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. The wind maps for Effective Wind Speed, Topographic Effects and Exposure Category included in the State Building Code (Hawaii Administrative Rules, Chapter 3-180) should be used for guidance.
4. Wind Importance Factor [Article 3.8.3] noted in Table 3-2 used to determine the design wind pressure shall be based on the following recurrence intervals:
   a. For Overhead Sign Structures: 100 Years
   b. For Traffic Signal Structures: 50 Years
   c. For Luminaire Support Structures less than 50 feet in height: 25 Years
   d. For other support structures including luminaire support structures 50 feet or more in height, and when luminaire mounted on a traffic Signal Structure: 50 Years
   d. For Roadside Sign Structures and Temporary Support Structures: 10 Years
5. Height and Exposure Factor [Article 3.8.4]. For 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 ASCE Standard ASCE/SEI 7, Minimum Design Loads for Buildings and Other Structures. The wind maps for Effective Wind Speed, Topographic Effects and Exposure Category included in the State Building Code (Hawaii Administrative Rules, Chapter 3-180) should also be used for guidance.
6. Minimum Anchor Bolts [Article 5.17.3]. Cantilevered traffic signal structures with mast arms greater than 40 feet and other cantilevered support structures with design life of 50 years or more shall have base plate connections with a minimum of six (6) anchor bolts. A mimimum of four (4) anchor bolts shall be provided for all other base plate connections.
7. Use of Grout [Article 5.17.3.3]. Grout shall not be used under base plates for all support structures except for ordinary street light poles unless approved by the Bridge Design Engineer. Anchor bolts with leveling nuts shall be designed to transfer all loads from the structure to its base support. A wire cloth screen shall specified to be placed vertically between the base plate and the top of the foundation and wrapped horizontally around the base plate with a 3 inches minimum lap. The wire cloth shall be galvanized steel standard grade plain weave 2x2 mesh 0.063 inch diameter wires. The screen shall be attached to the base plate with stainless steel self-tapping 1/4 inch diameter screws with stainless steel washers spaced at 9 inches on centers. Also, alternate means of protecting the underside of the base plate from debris, birds, bees and other nesting animals may be proposed for consideration.
8. Plumbness of Anchor Bolts [Article 5.17.5.3]. Anchor bolts shall be installed with misalignment of less than 1:40 from vertical. After installation, firm contact shall exist between the anchor bolt nuts, washers, and base plate on any anchor bolt installed in a misaligned position.
9. Fatigue Importance Factors [Article 11.6] noted in Table 11-1 for overhead sign and traffic signal structures shall be based on Fatigue Category I.

   Support structures other than that noted in Table 11-1 with round cross sections under 50 feet, roadside sign structures, and temporary structures do not need to be designed for fatigue.

   Support structures 50 feet or more in height shall be designed for fatigue and be based on Fatigue Category I.
10. Galloping [Article 11.7.1]. Provisions shall be made to install effective vibration mitigation devices on overhead cantilevered sign and traffic signal support structures unless they are designed for galloping-induced cyclic loads. With approval from HDOT, mitigation devices may be installed after construction if vibration due to galloping is identified.
11. Natural Wind Gust [Article 11.7.3]. Overhead sign, traffic signal, and high-level support structures shall be designed to resist an equivalent static natural wind gust pressure.
12. Truck-Induced Gust [Article 11.7.4]. Overhead sign and traffic signal support structures shall be designed to resist an equivalent static truck gust pressure range based on a truck speed of 20 mph over the posted speed.
13. 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.
14. Square or Rectangular Steel Post Sections [Sections 5 and 11]. Square or rectangular steel sections are not recommended to be used for overhead sign and traffic signal supports because they are more prone to poor fatigue performance. However, the post sections contained in the Highways Division Standard Plans (2008) for overhead sign structures (Standard Plans TE-17A through TE-19M) shall be considered acceptable and may still be used. Any special designs or deviations from the Standard Plans shall be considered with the Bridge Design Engineer.

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	CHECKED BY	

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.

Andrew I. Miyasato 2015.02.18
Signature

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL CONSTRUCTION NOTES

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Date: January 20, 2015

SHEET No. EA-4 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	363	524

OCEANIC TIME WARNER CABLE (OTWC) CONSTRUCTION NOTES:

1. The locations of existing utilities are approximate only. TheContractor shall verify their locations and shall be responsible for any damages to these utilities as a result of their operations. Adjustments to the new ductline alignment, if required, shall be made to provide the required clearances.

2. The underground pipes, cables, or ductlines known to exist by the Engineer from their search of records are indicated on the plans. The Contractor shall verify the locations and depths of the facilities and exercise proper care in excavating in the areas. Wherever connections of new utilities to existing utilities are shown on the plans, the Contractor shall expose the existing lines at the proposed connections to verify their locations and depths prior to excavation for the new lines.

3. Prior to the excavation of the ductline, the Contractor shall request that Oceanic Time Warner Hawaii to locate existing ductline wherever required.

4. The Contractor shall take necessary precaution not to damage existing cables or ducts. Any work involving existing cables or ducts shall be done in the presence of the Oceanic Time Warner Hawaii Inspector or their representative.

5. The Contractor shall notify the Oceanic Time Warner Cable Inspector 48 hours prior to the start of work on OTWC infrastructure, pouring of concrete or backfilling. OTWC's Inspector, Moki Place, can be reached at 306-0658.

6. Wherever connections to existing utilities are shown on the plans, the Contractor shall expose the existing lines prior to excavation of the main trenches to verify their locations and depths.

7. The location of OTWC facilities shown on plans are from existing records with varying degrees of accuracy as to its actual fixed location. The Contractor shall use extreme caution when working in close proximity of OTWC facilities.

8. The Contractor shall obtain excavation permit clearance from OTWC's Engineering Section located at 200 Akamainui St., Mililani Tech Park.

9. For any field assistance or verification of OTWC facilities, the Contractor shall call the Technical Operations Center at 625-8378.

10. Any work required to relocate OTWC facilities shall be done by Oceanic Cable and the Contractor shall be responsible for all coordination requirements and associated costs.

11. Any damage to OTWC's facilities shall be reported to OCI's Repair Dispatch Department at 625-8437 or 625-8666.

12. For 3" conduits or larger, the Contractor shall install Neptco SP1800 Muletape or approved equal in all ductlines, leave Muletape in place for future use as a pull or fish line, unless otherwise noted. Reference HTCo Material Code No. 571154. All ducts shall be capped to prevent entry of foreign material during construction and at completion of installation. Endbells are required for conduits 2" and larger.

13. For conduits less than 3", the Contractor shall place poly cord through out project, and secure in manholes, handholes, and pullboxes.

14. Penetration into pullboxes if necessary to be from factory installed opening or from bricks position. penetration from pullbox walls is not acceptable. All conduits shall enter through the end of the pullbox at 90 degrees.

15. A minimum of (2) precast sections must be used on all 2x4 or 2x6 pullboxes.

16. Two minimum layers of bricks to be used shall always be at least one layer lower than the lowest duct entering the pullbox. At no time however, shall there be less than two layers of bricks on each installation.

17. At no time shall cement mortar, wood, or any other material be used between precast sections. Leveling or raising of boxes to grade must be done at brickwork section using cement mortar. The permanent installation of wooden wedges to accomplish this purpose will not be accepted.

18. Concrete precast base may be used as an alternative to bricks.

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

20. Minimum clearance between street light stand and fire hydrants shall be three feet.

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

22. For underground cable locating and marking, five working days advance notice is required. Three working days advance notice is required for any inspection by a Designate Representative. Contractor shall take necessary precaution not to damage any existing cables or ducts. OTWC's Inspector or Designated Representative is required to be at any job site whenever there will be a breakage into or entry into any structure that contain OTWC's facilities.

23. Concrete strength shall be 3000 psi in 28 days.

24. Bends in the duct alignment, due to changes in grade shall have a minimum radius of 20-feet.

25. After ductline has been completed, a mandrel with a square front not less than 12-inch long and having a diameter of $\frac{1}{4}$-inch less than the inside diameter of duct, shall be pulled through each duct after which a brush with stiff bristles shall be pulled through to make certain that no particles of earth, sand, or gravel have been left inside. Ducts shall be completely dry and clean.

26. All construction must be inspected and accepted by Oceanic prior to the installation of any of its facilities and the energizing of its system.

27. Install 4-mil. thick orange color warning tape 3-inch wide, entire length of trench when placing OTWC conduits. Tape should read "Caution Buried Cable Lne Below", manufactured by Harris Industries, Inc., catalog number UT43 or equivalent tape. Tape to be installed 12-inches below grade.

28. (1) 5/8" x 8 Ft. Galvanized Ground Rod Must be Placed by Contractor in all Pullboxes 2' x 4' or Larger. Placement of Ground Rod Must be Near Corner of Pullbox as to Allow for Attachment of Ground Wore by Oceanic, and not to Interfere with Ducts.

29. The Contractor shall notify Mr. Kerick Fujimura of Oceanic Time Warner Cable (OTWC), at telephone number 625-9734, 40 working days prior to requesting OTWC to proceed with their work, once the Contractor's infrastructure construction work has been completed, approved, and ready for OTWC to perform their work.

ORIGINAL PLAN
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CHECKED BY
DATE

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CATV
CONSTRUCTION NOTES
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Date: January 20, 2015

SHEET No. EA-5 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	364	524

HAWAIIAN ELECTRIC COMPANY (HECO) NOTES (Rev. 03/20/12)

1. LOCATION OF HECO FACILITIES

The Location Of HECo's Overhead And Underground Facilities Shown On The Plans Are From Existing Records With Varying Degrees Of Accuracy And Are Not Guaranteed As Shown. The Contractor Shall 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 HECo'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 HECo'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 HECo Overhead And Underground Lines Are Energized And Will Remain Energized During Construction Unless Prior Special Arrangements Have Been Made With HECo. Only HECo 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 HECo 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 HECo At Least Four (4) Weeks Prior To The Planned Encroachment So That, If Feasible, The Necessary Protections (E.G. Relocate Or De–Energize HECo Lines) Can Be Investigated. HECo May Also Be Able To Blanket Its Distribution (12kv And Below) Lines To Provide A Visual Aid In Preventing Accidental Contact. HECo's Cost Of Safeguarding Or Identifying Its Lines Will Be Charged To The Contractor.

Contact HECo's Customer Installations Department At 543–7846 For Assistance In Identifying And Safeguarding Overhead Power Lines.

6. POLE BRACING

A Minimum Clearance Of 10 Feet Must Be Maintained When Excavating Around Utility Poles And/Or Their Anchor System To Prevent Weakening Or Pole Support Failure. Should Work Require Excavating Within 10 Feet Of A Pole And/Or Its Anchor System, The Contractor Shall Protect, Support, Secure, And Take All Other Precautions To Prevent Damage To Or Leaning Of These Poles. The Contractor Is Responsible For All Pole Bracing Designs And Structural Calculations, As Well As The Associated Costs To Brace, Repair, Or Straighten Poles. All Means Of Structural Support For The Pole And/Or Anchor System Proposed By The Contractor Shall Be Submitted To HECo's Customer Installations Department (543–7846) For Review A Minimum Of Ten (10) Working Days Prior To Implementation. The Cost Of HECo's Review/Assistance In Providing Proper Support And Protection Of Its Poles Will Be Charged To The Contractor.

7. UNDERGROUND LINES

The Contractor Shall Exercise Extreme Caution Whenever Construction Crosses Or Is In Close Proximity Of Underground Lines. HECo's Existing Electrical Cables Are Energized And Will Remain Energized During Construction. Only HECo Personnel Are To Break Into Existing HECo Facilities, Handle These Cables, And Erect Temporary Guards To Protect These Cables From Damage. The Cost Of HECo'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 HECo's Customer Installations Department At 543–7846 A Minimum Of Ten (10) Working Days In Advance.

Special Precautions Are Required When Excavating Near HECo's 138kv Underground Lines (See HECo Instructions To Consultants/Contractors On "Excavation Near HECo's Underground 138kv 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 HECo's Underground Fuel Oil Pipelines. Special Precautions Are Required When Excavating Near HECo's Underground Fuel Oil Pipelines (See HECo's Specific Fuel Pipeline "Guidelines" To Consultants/Contractors On Excavation Near HECo's Underground Fuel Pipelines For Detailed Requirements).

9. EXCAVATIONS

When Trench Excavation Is Adjacent To Or Beneath HECo's Existing Structures Or Facilities, The Contractor Is Responsible For:

a) Arranging For HECo 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 HECO FACILITIES

Any Work Required To Relocate Or Modify HECo Facilities Shall Be Done By HECo, Or By The Contractor Under HECo's Supervision. The Contractor Shall Be Responsible For All Coordination, And Shall Provide Necessary Support For HECo'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.

11. CONFLICTS

Any Redesign Or Relocation Of HECo's Facilities Not Shown On The Plans May Be Cause For Lengthy Delays. The Contractor Acknowledges That HECo 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 HECo'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, HECo Should Be Notified Immediately Upon Discovery Or Identification Of Such Conflict.

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Ronald N. S. Ho & Associates, Inc.
Electrical Engineers
ANDREW I. MIYASATO
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO NOTES I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted
Date: January 20, 2015

SHEET No. EA-6 OF 161 SHEETS

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HAWAII	HAW.	IM-HI-1(261)	2015	365	524

12. DAMAGE TO HECO FACILITIES

The Contractor Shall Be Responsible For The Protection Of All HECo Surface And Subsurface Utilities And Shall Be Responsible For Any Damages To HECo's Facilities As A Result Of His Operations. The Contractor Shall Immediately Report Such Damages Or Any Hazardous Conditions Related To HECo's Lines To HECo's Trouble Dispatcher At 548-7961. Repair Work Shall Be Done By HECo Or By The Contractor Under HECo's Supervision. Costs For Damages To HECo's Facilities Shall Be Borne By The Contractor.

In Case Of Damage Or Suspected Damage To HECo's Fuel Pipeline, The Contractor Shall Immediately Notify HECo's Honolulu Power Plant Shift Supervisor At 533-2102 (A 24-Hour Number) So HECo Personnel Can Secure The Damaged Section And Report Any Oil Spills To The Proper Authorities. In Case Of Damage Or Suspected Damage To The Waiau Or Kahe Fuel Pipelines, The Contractor Shall Also Notify Chevron At 682-2227. All Costs Associated With The Damage, Repair, And Oil Spill Cleanup Shall Be Borne By The Contractor.

13. HECO STAND-BY PERSONNEL

The Contractor May Request HECo To Provide An Inspector To Stand-By During Construction Near HECo's Facilities. The Cost Of Such Inspection Will Be Charged To The Contractor.

The Contractor Shall Call HECo's Customer Installations Department At 543-7846 A Minimum Of Five (5) Working Days In Advance To Arrange For HECo Stand-By Personnel.

14. CLEARANCES

The Following Clearances Shall Be Maintained Between HECo's Ductline And All Adjacent Structures (Charted And Uncharted) In The Trench:

Minimum Separation Clearances to Existing Underground Ductlines Horizontal (Parallel)

Utility Being Installed	Existing Direct Buried Cable	Existing Direct Buried in Conduit (No Concrete Encasement)	Existing 3" Concrete Encasement	Applicable Notes:
HECO DB Conduits	12"	3"	0"	
HECO 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	36"	36"	36"	1, 4
Water Service Laterals	12"	12"	12"	
Water (Concrete Jacketed)	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. 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 HECO'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.

Minimum Separation Clearances to Existing Underground Ductlines Vertical (Crossing)

Utility Being Installed	Existing Direct Buried Cable	Existing Direct Buried in Conduit (No Concrete (Encasement)	Existing 3" Concrete Encasement	Applicable Notes:
HECO DB Conduits	6"	3"	0"	
HECO 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"	6"	
Water Service Laterals	6"	6"	6"	
Water DB	6"	6"	6"	2
Water (Concrete Jacketed)	6"	6"	6"	2
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				3

Notes:

1. If Clearance Cannot be Met:
   - If Clearance is Less Than 12", Jacket Sewer Line with Reinforced Concrete (per HECO'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. 12" Vertical Clearance for Pipe Diameters Greater Than 16".
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.

The Contractor Shall Notify The Construction Manager & HECo Of Any Heat Sources (Power Cable Duct Bank, Steamline, Etc.) Encountered That Are Not Properly Identified On The Drawing.

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.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO NOTES II

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Date: January 20, 2015

SHEET No. EA-7 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	366	524

15. INDEMNITY
The Contractor Shall Indemnify, Defend And Hold Harmless HECo 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 HECo.

ADDITIONAL NOTES WHEN WORK INVOLVES CONSTRUCTION OF HECO FACILITIES

16. SCHEDULE
Contractor Shall Furnish His Construction Schedule Six (6) Months Prior To Starting Work On HECo Facilities. Contractor Shall Give HECo, In Writing, Three (3) Months Notice To Proceed With HECo'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 HECo's Underground Facilities Shall Be Constructed In Accordance With The Latest Revisions Of HECo Specifications Cs7001, Cs7003, Cs7202, Cs9301, And Cs9401 And Applicable HECo 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 HECo Prior To Excavation And Prior To Placing Concrete. Contractor Shall Notify HECo's Inspection Division At 543-7520 At Least 48 Hours Prior To Placing Concrete. Contractor To Coordinate Work To Break Into HECo's Existing Electrical Facilities With HECo's Inspection Division At 543-7520 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 HECo 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 HECo Before Proceeding With HECo 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 HECo's Inspector Using HECo's Standard Practice. The Contractor Shall Install A 1/8" Polyolefin 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 HECo With Two Sets Of As-Built Reproducible Tracings Showing The Offsets, Stationing, And Vertical Elevation Of The Duct Line(S) Constructed.

24. *The Contractor shall notify Mr. Fleance Fernando of Hawaiian Electric Company (HECo), at telephone number 543-5642, 40 working days prior to requesting HECo to proceed with their work, once the Contractor's infrastructure construction work has been completed, approved, and ready for HECo to perform their work.*

HECo REFERENCE SPECIFICATIONS

SPEC. NO.	DESCRIPTION
CS7001	Construction of Underground Facilities
CS7003	Construction of Electrical Facilities
CS7202	General Conditions for Construction of Projects
CS9301	Concrete Work
CS9401	Design and Construction of Pre-Cast Manholes and Handholes

HECo REFERENCE DRAWINGS

DWG. NO.	DESCRIPTION
100912	HECo 6' x 14' Manhole (Pre-Cast)
16688	Details, Handholes & Manholes, UG Standards Sheets 1 & 2

ORIGINAL PLAN	
NOTE BOOK	
No.	
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QUANTITIES BY	
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DATE	

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers
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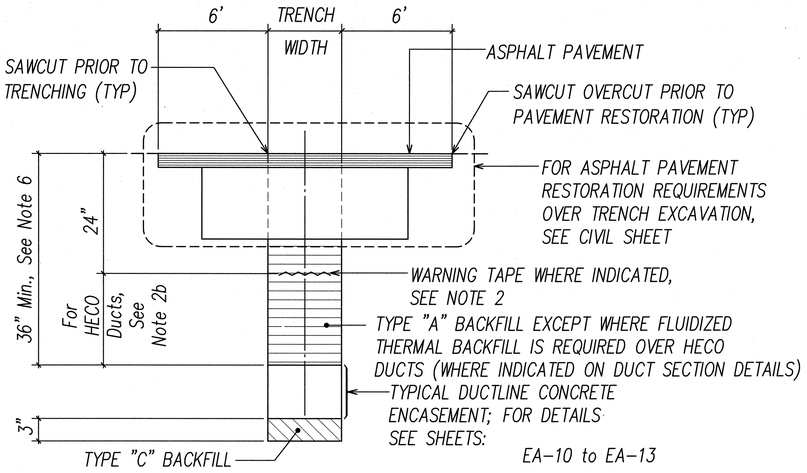
HECO NOTES III

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Date: January 20, 2015

SHEET No. EA-8 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	367	524



1 EA-9 ASPHALT PAVEMENT RESTORATION OVER TRENCH EXCAVATION WITHIN STATE R-O-W

NOT TO SCALE

STATE RIGHT-OF-WAY BACKFILL NOTES

TRENCH BACKFILL MATERIAL "A" When Tested According to AASHTO T176, The Sand Equivalent Value Shall be 20 or Greater.

TRENCH BACKFILL MATERIAL "B" When Tested According to AASHTO T176, The Sand Equivalent Value of the Backfill Material Shall be Equal to or Greater Than the Surrounding Soil.

TRENCH BACKFILL MATERIAL "C" Excavate Material and Provide 3" Backfill Material "A", See Above.

CONCRETE – 3" ENCASEMENT, 3000 PSI COMPRESSIVE STRENGTH @ 28 DAYS.

NOTE:

See Specification Section 703.21 for Additional Trench Backfill Material Requirements.

GENERAL DUCTLINE DUCT SECTION NOTES:

1. If trench is located on unpaved area, the Contractor shall replace 10" A.C. Base Course and 4" A.C. Pavement with Type "A" backfill material.

2. The Metal Detectable Red Plastic Warning Tape shall be a minimum 5 mils thick and 4" wide with a continuous metallic backing and corrosion resistant 1' min thick foil core. For the State DOT traffic signal and highway lighting ducts, the message on the tape shall read, "CAUTION – STATE TRAFFIC SIGNAL AND/OR HWY LIGHTING BURIED BELOW," utilizing 1 1/2 inches series "C" block lettering. The message will be repeated with a 4 1/4" spacing between top line of message and start of next repeat.

   a. For the respective utility company ducts, provide metal detectable warning tape over respective utility company ducts per respective utility company requirements and approval.

   b. For HECo, provide warning tape per HECo Specification M0302-0; place warning tape 12 inches above the HECO ductbank unless backfilling with fluidized thermal backfill (FTB). When FTB is used, place warning tape at the boundary between the FTB and pavement section.

   C. For HTCo:

      1) Contractor shall place Muletape (WP 1800P) in each duct throughout its entire length with protrusions of 2 feet in manholes and handholes at each end, and 1 foot in pullboxes. Muletape is rated for 1800 lb pull and has footage markings for measuring duct lengths.

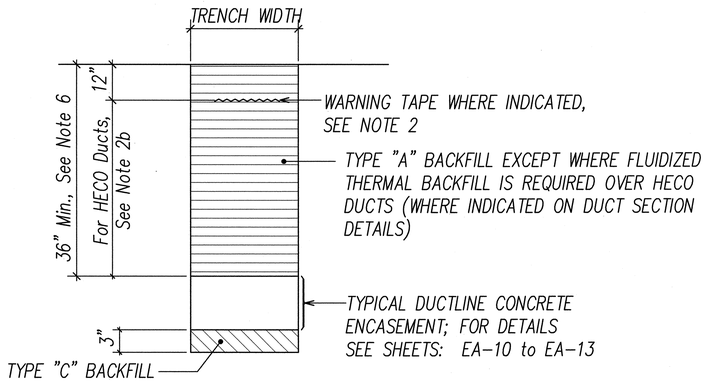
      2) Contractor shall place 8-Mil orange colored plastic warning tape, not less than 4" wide, entire length of trench for all underground installations. Tape should read "Warning-Stop Digging-Call HTCO, Communications Cable Buried Below, Failure to Comply Could Result in Legal Action".

3. The Contractor may begin backfilling the conduit trench when the concrete reaches 3000 psi compressive strength after 3 days.

4. Maximum four (4) Conduits per row for multiple conduit duct section.

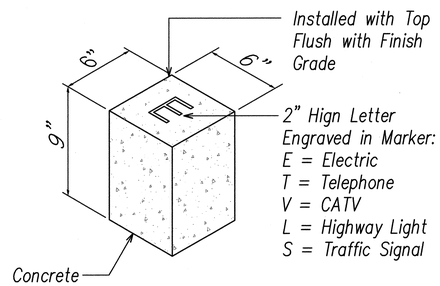
5. Clearances: Refer to HECo Note No. 14 for clearance requirements between all ductlines and all adjacent structures (charted and uncharted) near the trench.

6. **See General Construction Note L. on sheet EA-2 for ductline depth requirements where ductline crosses guard rail locations.**



2 EA-9 BACKFILL SECTION WITHIN STATE R-O-W BEYOND PAVED ROADWAY

NOT TO SCALE



3 EA-9 CONCRETE CONDUIT STUB-OUT MARKER

NOT TO SCALE

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

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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

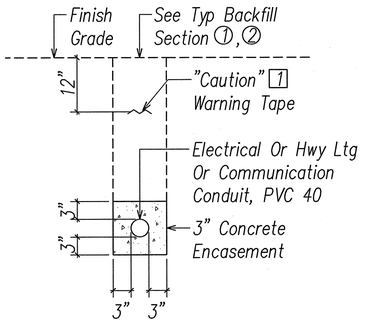
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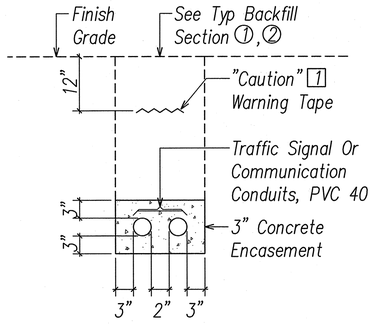
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

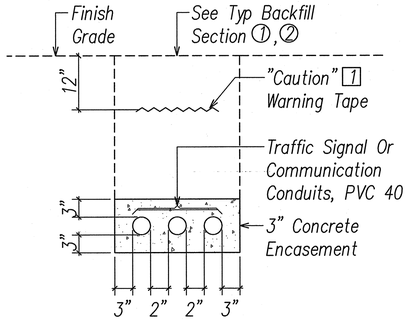
C.O. 367S-1



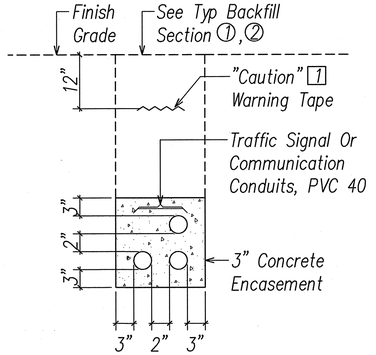
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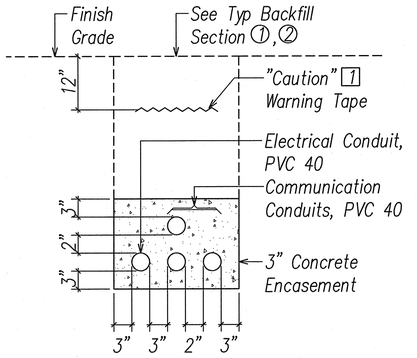
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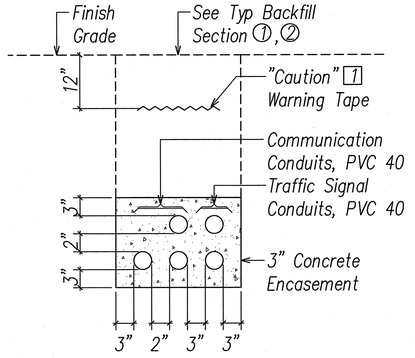
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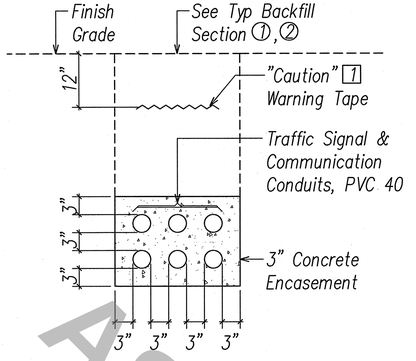
SECTION (D)



SECTION (E)



SECTION (F)



SECTION (G)

AS-BUILT

Notes:

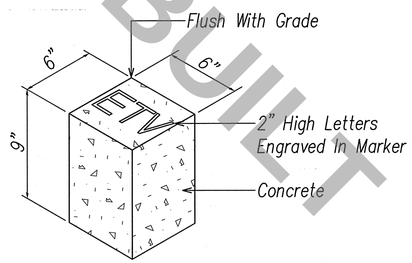
[1] The Metal Detectable Red Warning Tape Shall Be A Minimum Of 5 Mils Thick And 4" Wide With A Continuous Metallic Backing And Corrosion Resistant 1± Mil Thick Foil Core. The Message On The Tape Shall Read, "Caution – Electric Lines Buried Below," Utilizing 2 Inch Series "C" Black Lettering. The Message Will Be Repeated With A 36–Inch Spacing.

TYPICAL DUCT SECTIONS (STATE)

NOT TO SCALE

CONDUIT SCHEDULE

ITEM	DESCRIPTION
(2E)	Electrical 2" Conduit
(1½)	Highway Lighting 1 1/2" Conduit
(2TS)	Traffic Signal 2" Conduit
(1-2TS)	Traffic Signal 3–2" Conduits
(2CP)	D.O.T. Communication 2" Conduit (Power)
(1-2CS)	D.O.T. Communication 2–2" Conduits (Signal)



"E" = Electric
"T" = Telephone
"V" = CATV
"L" = State Highway Lighting
"TS" = Traffic Signal
"CP" = Communication Power
"CS" = Communication Signal

CONCRETE CONDUIT STUB–OUT MARKER

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STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTIONS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

DATE	REVISION

SHEET No. EA-17 OF 161 SHEETS

"AS-BUILT"

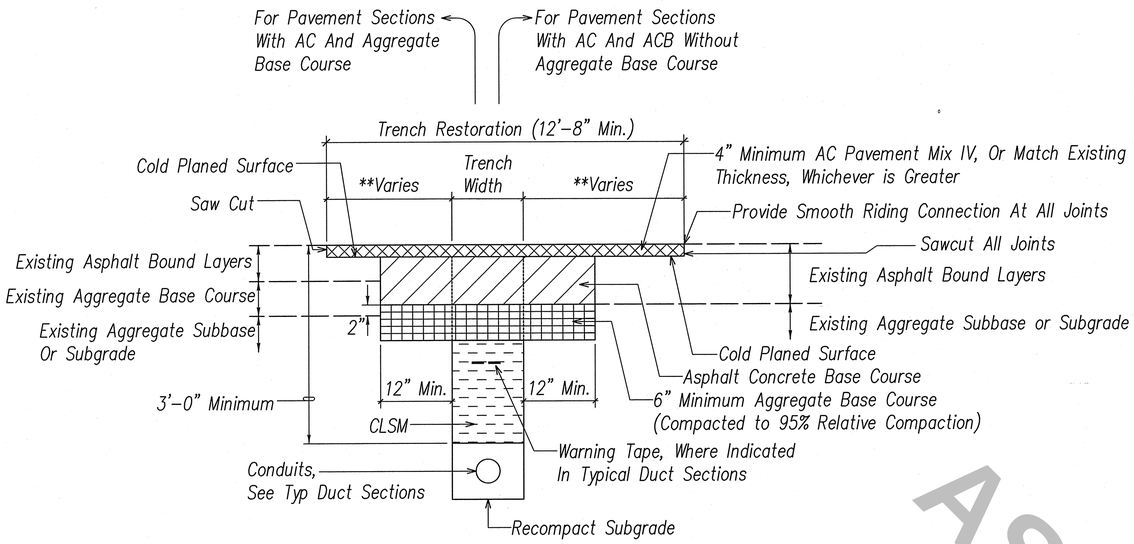
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

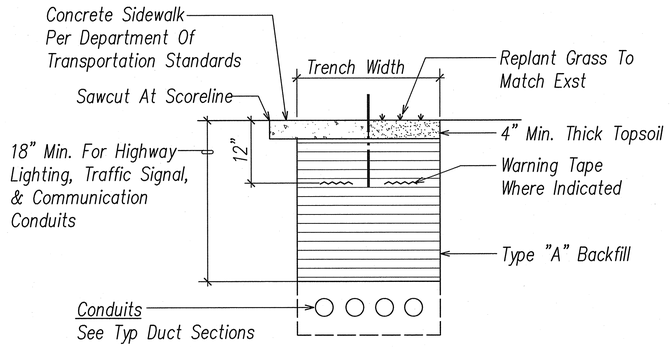
C.O. 367S-2

** Notes For Backfill Section (1)

1. If Trench Aligned Transverse To Direction Of Travel, Sawcut 6 Feet On Each Side Of Trench.
2. If Trench Aligned Along Direction Of Travel, Sawcut 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".



(1) BACKFILL SECTION [1][2]
WITHIN STATE RIGHT-OF-WAY
UNDER EXISTING ROADWAY & PAVED SHOULDER



(2) BACKFILL SECTION [2][3]
WITHIN STATE RIGHT-OF-WAY
UNDER EXISTING CONCRETE SIDEWALK OR GRASSED AREA

BACKFILL NOTES

Type "A" Backfill – Earth & Gravel. Rock Size To Be 1" Max & The Mixture To Contain Not More Than 50% By Volume Of Rock Particles. The Material Shall Be Nonexpansive. 95% Compaction.

Note – If Normal Material At Bottom Of Trench Is Not Type "B", An Additional 3" Shall Be Excavated & Type "B" Backfill Provided.

Type "B" Backfill – Earth & Gravel. Mixture Must Pass A 1/2" Mesh Screen & Contain Not More Than 20% By Volume Of Rock Particles. 95% Compaction.

Concrete – 3" Encasement, 2500 PSI Compressive Strength @ 28 Days.

Notes:

[1] Sawcutting & Repairing Of Exst A.C. Pavement Shall Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.

[2] Sawcutting & Repairing Of Exst Concrete Pavement Shall Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.

[3] Replanting Grass And Providing Top Soil Shall Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.

TYPICAL BACKFILL SECTIONS (STATE)

NOT TO SCALE

AS-BUILT

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NOTE BOOK | No.

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BACKFILL DETAILS

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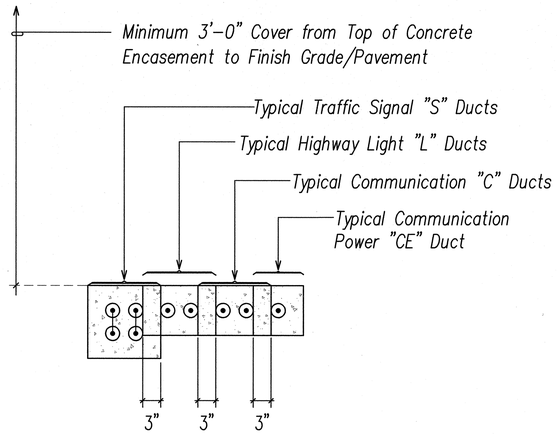
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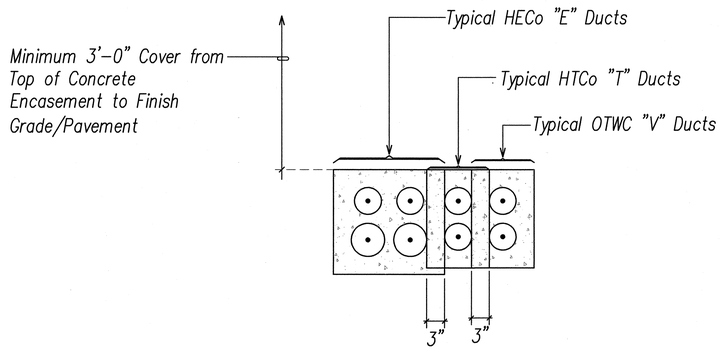
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	368	524



TYPICAL SPACING DETAIL BETWEEN HIGHWAY LIGHT AND TRAFFIC SIGNAL DUCT SECTIONS

Not To Scale



TYPICAL SPACING DETAIL BETWEEN UTILITY DUCT SECTIONS

Not To Scale

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HIGHWAYS DIVISION

TYPICAL SPACING DETAILS BETWEEN DUCT SECTIONS

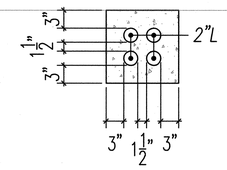
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

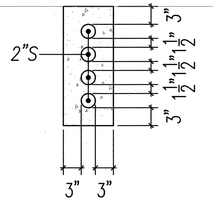
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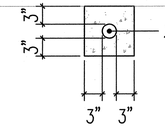
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HAWAII	HAW.	IM-HI-1(261)	2015	369	524



SECTION (LA)

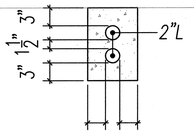


SECTION (LB)

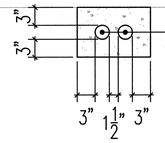


Section LC1 Similar Except Replace 2"L with 1"L

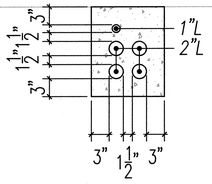
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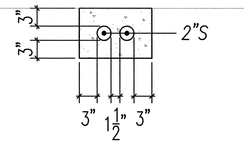
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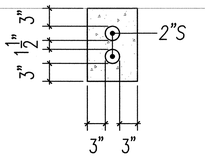
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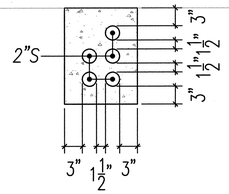
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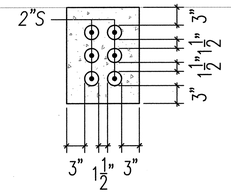
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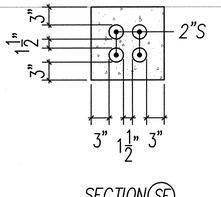
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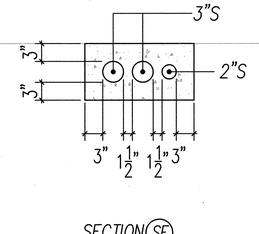
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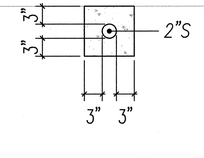
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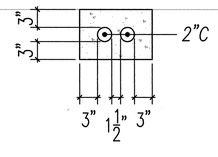
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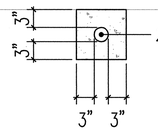
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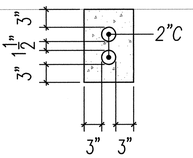
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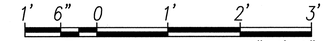
SECTION (CA)



SECTION (CB)



SECTION (CC)



SCALE: 1"=1'-0"

GRAPHIC SCALE

Notes:

1. For Typical Duct Section Backfill Detail and Notes, See the Following Sheets: EA-9.
2. For Typical Spacing Detail Between Highway Light, Traffic Signal, and Communication Duct Sections, See Sheet EA-10.

HIGHWAY LIGHT, TRAFFIC SIGNAL AND COMMUNICATION DUCT SECTION DETAILS

Scale: 1"=1'-0"

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.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

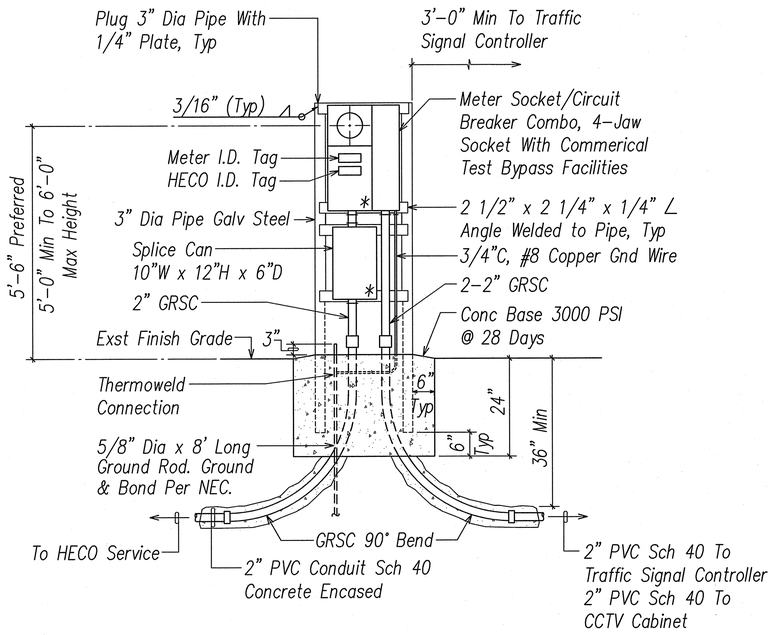
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SHEET No. EA-11 OF 161 SHEETS

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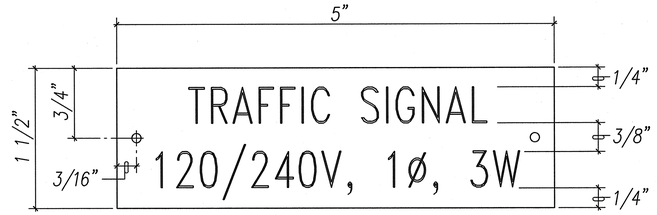
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 369S-1



Notes:

1. Contractor Shall Make All Electrical Connections To Traffic Signal Controller Cabinet And CCTV Cabinet. Provide 2-1P50A Breakers, 1-PFB, Ground, Conductors, And Conduits.
2. All Conduits To Contain A Polyolefin Pull Line. (Jet Line Cat #232 or Equiv)
3. Pedestal Shall Be Hot-Dipped Galvanized After Fabrication.
4. All Fastening Bolts, Nuts & Washers Shall Be Stainless Steel. Provide One Coat Shop Primer & Two Coats Of Acrylic Enamel Finish, Color To Match Traffic Signal Controller Cabinet.
5. Provide A Minimum Of 4 Feet Clear And Level Workspace Clearance In Front Of Metering And Service Equipment.
6. Provide Permanent Identification Labels For All Meter Sockets To Identify The Load Served.
7. Provide Barrier Posts For Protection Of Meter And Service Equipment Should Equipment Have Vehicular Contact Exposure.
8. At Time Of Installation, Provide And Install Meter Socket Covers (Plastic) And Bands For All Blank Meter Sockets. Identify Covers So They Can Be Returned.
9. * - Provision for HECO Seal



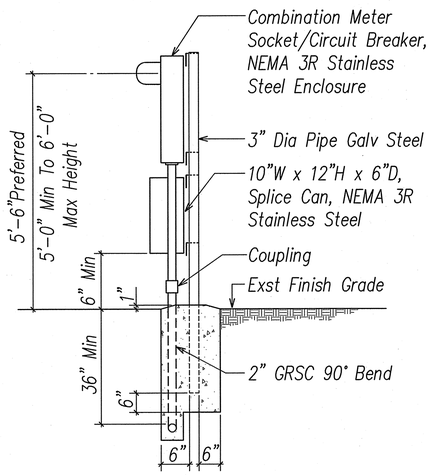
Notes:

1. Use 2-Ply Plastic, Black-White
2. TRAFFIC SIGNAL Letters Shall be 3/8" High, 1/16" Stroke, (White In Color).
3. 120/240V, 1ø, 3W Letters And Numbers Shall Be 1/4" High And Engraved 1/32" Wide (White In Color).
4. Attach To Meter Enclosure With No. 7 Stainless Steel Drive Screws.

METER SOCKET I.D. TAG DETAIL

NOT TO SCALE

FRONT ELEVATION



SIDE ELEVATION

TRAFFIC SIGNAL METER PEDESTAL DETAIL

NOT TO SCALE



Notes:

1. Use 3-Ply Laminated Flexible Plastic, Black-White-Black Thickness: Black Cap Sheet-0.010", White Base Sheet-0.052", Black Base Sheet-0.010".
2. Attach To Meter Socket Using Scotch 3M Brand Very High Bond (VHB) Double Coated Acrylic Foam Tape Or Equivalent.
3. Letters/Numbers Shall Be 1/16" Stroke, (White In Color).
4. Letters/Numbers Area Inscribed By Cutting Through "Black Cap Sheet" To Expose White Letters/Numbers.
5. * Address To Be Determined At Time Of Installation

HECO I.D. TAG DETAIL

NOT TO SCALE

AS-BUILT

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

METER DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EA-19 OF 161 SHEETS

DATE	REVISION

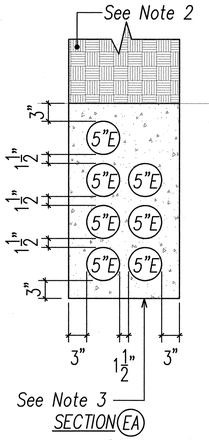
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NOTE BOOK | No.

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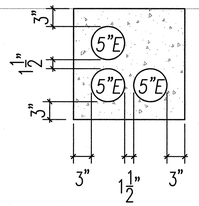
"AS-BUILT"

C.O. 369S-1

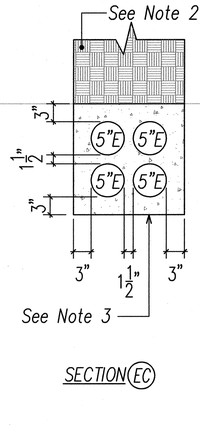
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	370	524



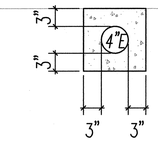
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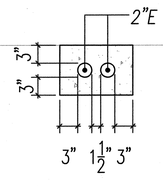
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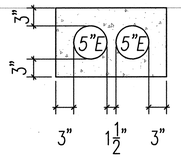
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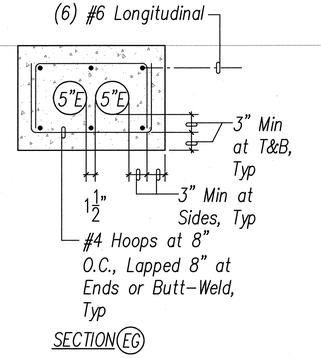
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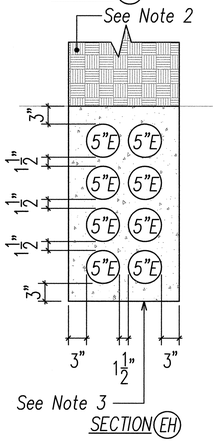
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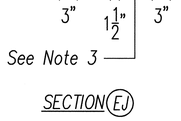
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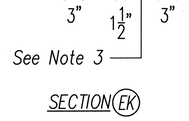
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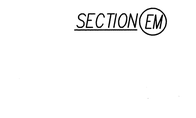


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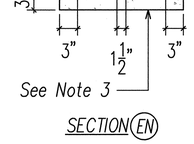


SECTION (EK)

SECTION (EL)



SECTION (EM)



SECTION (EN)



SECTION (EO)

Notes:

1. For Typical Duct Section Backfill Detail and Notes, See the Following Sheets: EA-9.
2. Fluidized Thermal Backfill, 100 PSI Min. Compressive Strength, per HECo Standard Spec CS 9301.
3. Thermal Concrete Jacket Per HECo Standards.
4. For Typical Spacing Detail Between Utility Duct Sections, See Sheet EA-10.

UTILITY COMPANY DUCT SECTION DETAILS I

Scale: 1"=1'-0"

1' 6" 0 1' 2' 3'

SCALE: 1"=1'-0"

GRAPHIC SCALE

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

NOTE BOOK | No.

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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

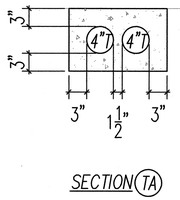
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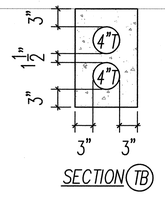
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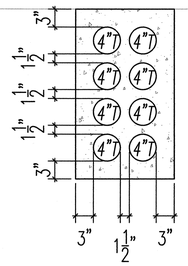
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	371	524



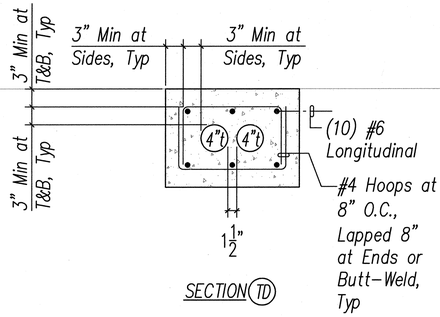
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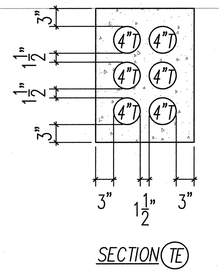
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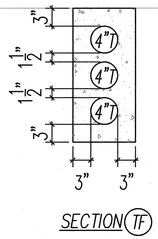
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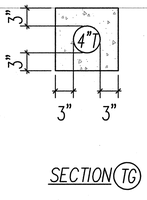
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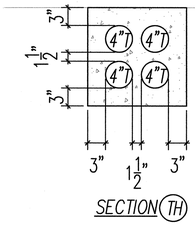
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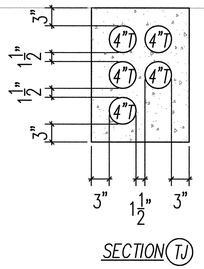
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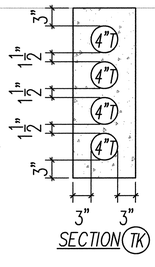
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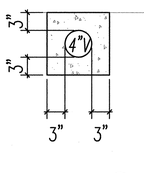
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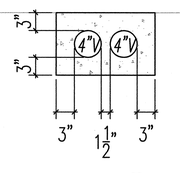
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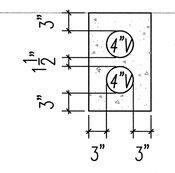
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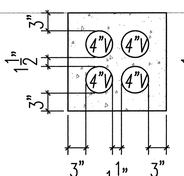
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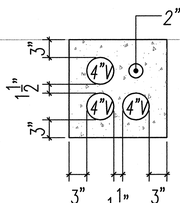
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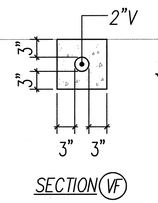
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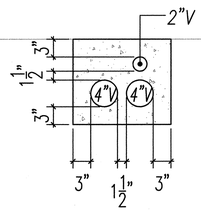
SECTION (VD)



SECTION (VE)



SECTION (VF)



SECTION (VG)

Notes:

1. For Typical Duct Section Backfill Detail and Notes, See the Following Sheets: EA-9.
2. For Typical Spacing Detail Between Utility Duct Sections, See Sheet EA-10.

UTILITY COMPANY DUCT SECTION DETAILS II

Scale: 1"=1'-0"

1' 6" 0 1' 2' 3'

SCALE: 1"=1'-0"

GRAPHIC SCALE

ORIGINAL PLAN | NOTE BOOK | No.

STUDY PLOTTED BY ..... DATE
DRAWN BY .....
TRACED BY .....
DESIGNED BY .....
QUANTITIES BY .....
CHECKED BY .....

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

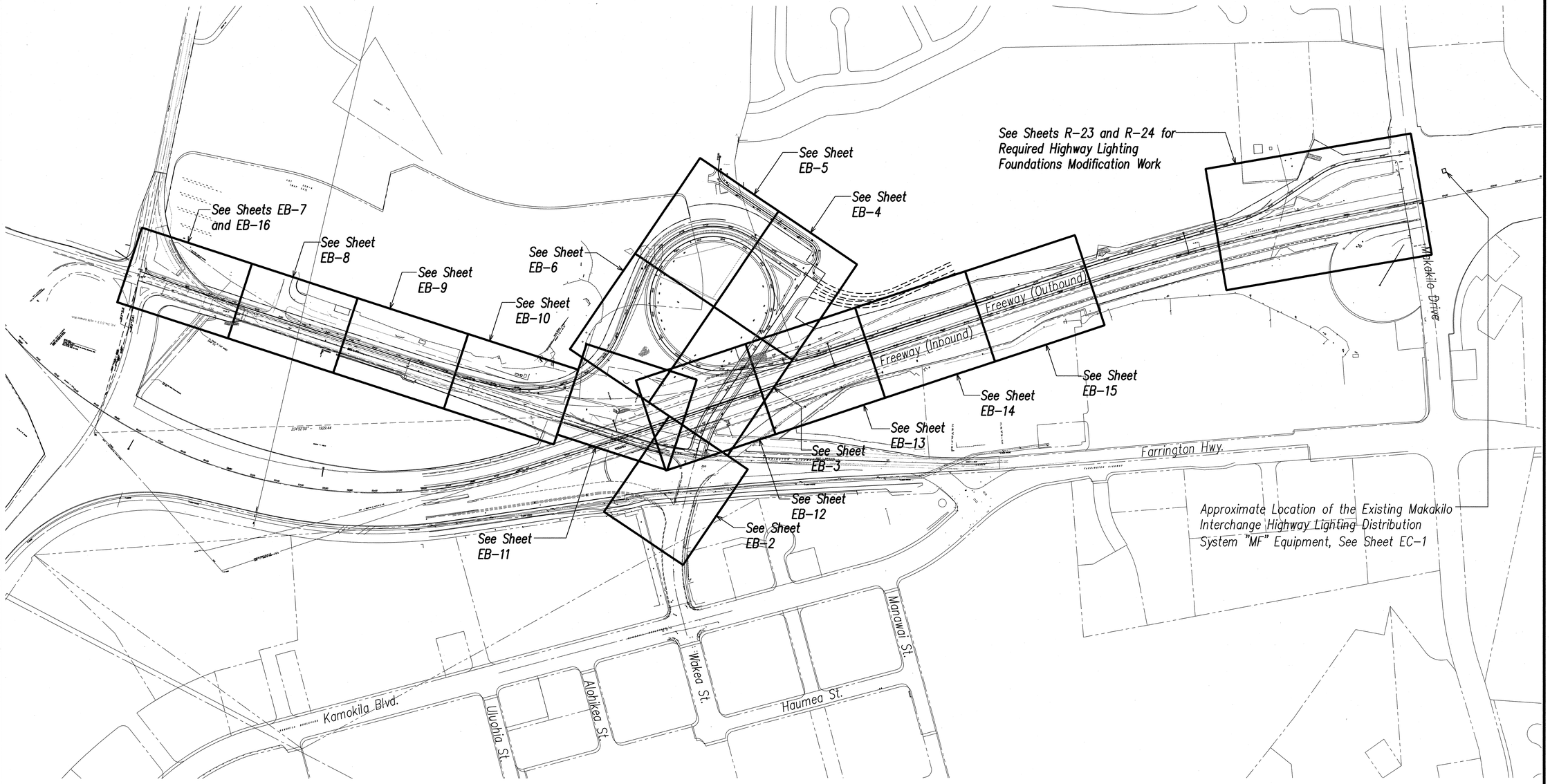
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SHEET No. EA-13 OF 161 SHEETS

371

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	372	524



OVERALL HIGHWAY LIGHTING PLAN

SCALE: 1"=200'

NORTH

200' 100' 0 200' 400' 600'

SCALE: 1"=200'

GRAPHIC SCALE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
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Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL HIGHWAY LIGHTING PLAN

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-1 OF 161 SHEETS

372

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 372S-1

		CONDUIT AND CABLE SCHEDULE			
△	CONDUIT	CABLE	△	CONDUIT	CABLE
1	2-2"	2-26C#14	4	1-2"	1-26C#14
	2-2"	7-2C#14		1-2"	OPTICOM
	1-2"	4-OPTICOM		2-2"	2-SPARE
	1-2"	1-12PAIR #19 INTERCONNECT	5	1-2"	1-26C#14
	1-2"	CCTV CAMERA CABLES		3-2"	3-SPARE
	1-2"	1-SPARE	6	1-2"	1-26C#14
2	1-2"	1-26C#14		1-2"	3-2C#14
	1-2"	1-2C#14		1-2"	OPTICOM
	1-2"	2-OPTICOM		1-2"	1-SPARE
	1-2"	1-SPARE	7	1-2"	1-26C#14
	1-2"	CCTV CAMERA CABLES		1-2"	6-2C#14
3	1-2"	1-26C#14		1-2"	OPTICOM
	1-2"	1-2C#14		1-2"	1-SPARE
	1-2"	OPTICOM			
	1-2"	1-SPARE			

TRUE NORTH
SCALE: 1" = 20'

Install Traffic Signal Pole and Head
Install Type "B" TSPB
Install 1 Ea 2-6'x6' Loop Detectors Centered in Lane
Install Traffic Signal Pole, EVP Detector and Head
Install Type "B" TSPB
Install Traffic Signal Pole, Head, PPB(L) and PPB(R) with Instructional Signs
Install Type "B" TSPB
Install 1 Ea 2-6'x6' Loop Detectors Centered in Lane
Install 1 Ea 4-6'x6' Loop Detectors Centered in Lane
Install Traffic Signal Pole, Mast Arm, EVP Detector, and Heads
Install Type "B" TSPB
Install Street Name Sign
Install Type "C" TSPB
Install Type "B" TSPB
Install Traffic Signal Pole, Heads, and PPB(L/R) with Instructional Sign
Install PPB(L) with Instructional Sign
Install Type "B" TSPB
Install Controller
Install Traffic Signal Pole, Heads, and PPB(R) with Instructional Sign
Install Traffic Signal Pole, Heads, and PPB(R) with Instructional Sign
Install 1 Ea 4-6'x6' Loop Detectors Centered in Lane
Install 1 Ea 2-6'x6' Loop Detectors Centered in Lane

r/w
To Waianae
Farrington Highway
Kalaeloa Boulevard
0+00
1+00
2+00
3+00
-7+00
-6+00
-4+00
-1+00

PHASE DIAGRAM		
PHASE 1	PHASE 3	PHASE 4
←	↑ ↑	↓ ↓

BARRIER

1 2 3 4
5 6 7 8

PHASE ASSIGNMENT DIAGRAM

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

SIGNAL INDICATIONS

A-2 B-3 A-3 D-1
B-1 C-1 B-2 H-1
B-4

A-1 F-2
E-1 G-1
F-1 H-2

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

"AS-BUILT"

CATHY A. LEONG
LICENSED PROFESSIONAL ENGINEER
No. 10334-C
HAWAII, U.S.A.

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APRIL 30, 2020
WILSON OKAMOTO CORPORATION LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

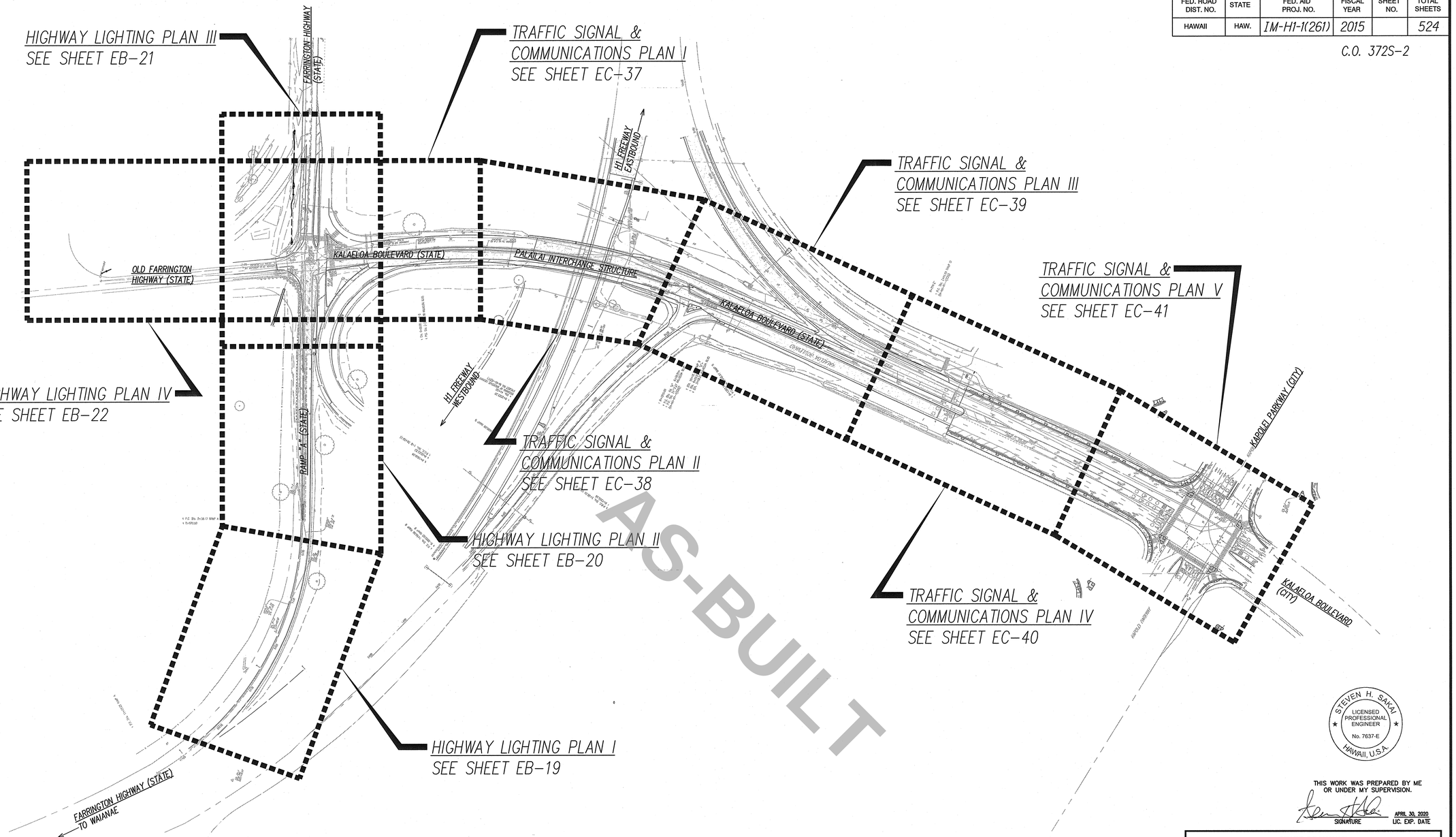
TRAFFIC SIGNAL PLAN

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)
Scale: 1" = 20' Date: November 16, 2018

SHEET No. EB-17 OF 161 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 372S-2



NORTH

ELECTRICAL SITE PLAN
SCALE: 1"=100'

100' 50' 0 100' 200' 300'
SCALE: 1"=100'
GRAPHIC SCALE

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

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STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL SITE PLAN

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

DATE	REVISION

SHEET No. EB-18 OF 161 SHEETS

"AS-BUILT"

C.O. 372S-2

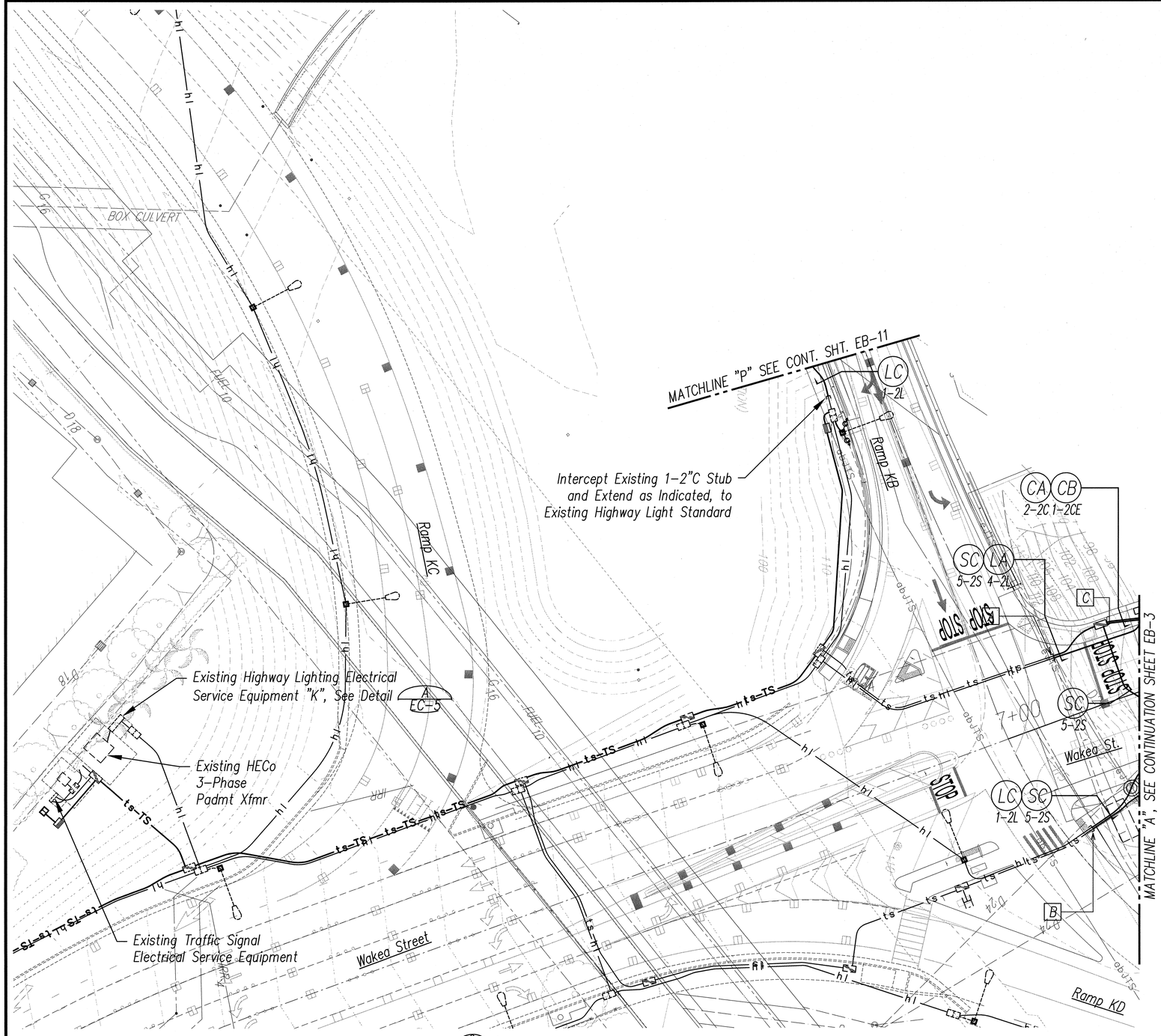
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	373	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Intercept Existing 4–2" Hwy Light Ducts and Existing 5–2" Traffic Signal Ducts and Extend as Indicated.

B Intercept Existing 1–2" Hwy Light Ducts and Existing 2–2" Traffic Signal Ducts and Extend as Indicated.

C Terminate 2–2" Comm and 1–2" Comm Electric Ducts for Future Extension in New Type "C" Traffic Signal Pullbox.



HIGHWAY LIGHTING PLAN 1 – WAKEA ST.

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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.

Andrew I. Miyasato Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 1 - WAKEA ST.

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-2 OF 161 SHEETS

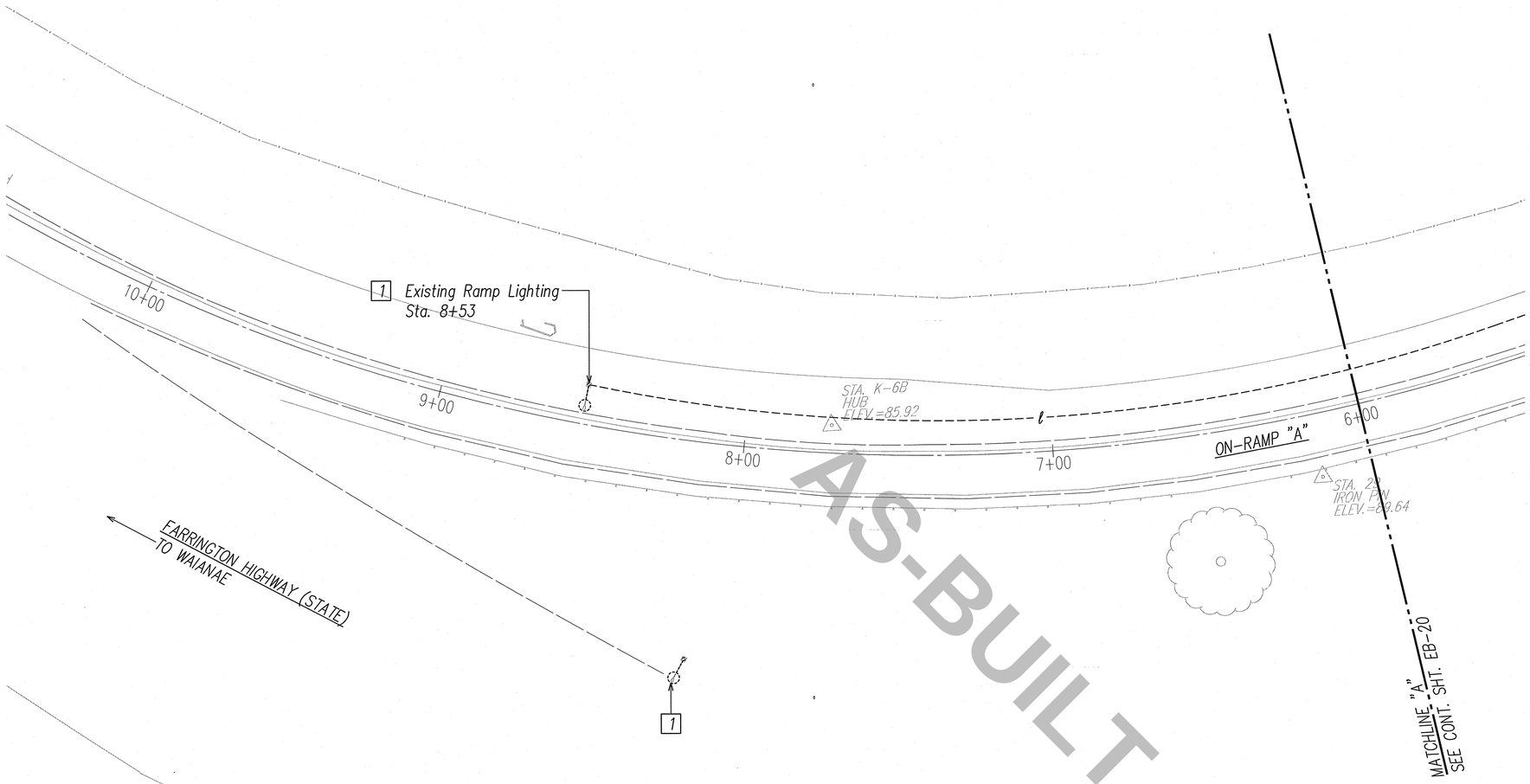
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 373S-1

Notes:

1 Existing Highway Light To Remain.



AS-BUILT

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

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NORTH

STATE HIGHWAY LIGHTING PLAN I
SCALE: 1"=20'

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

DATE	REVISION

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING PLAN I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EB-19 OF 161 SHEETS

"AS-BUILT"

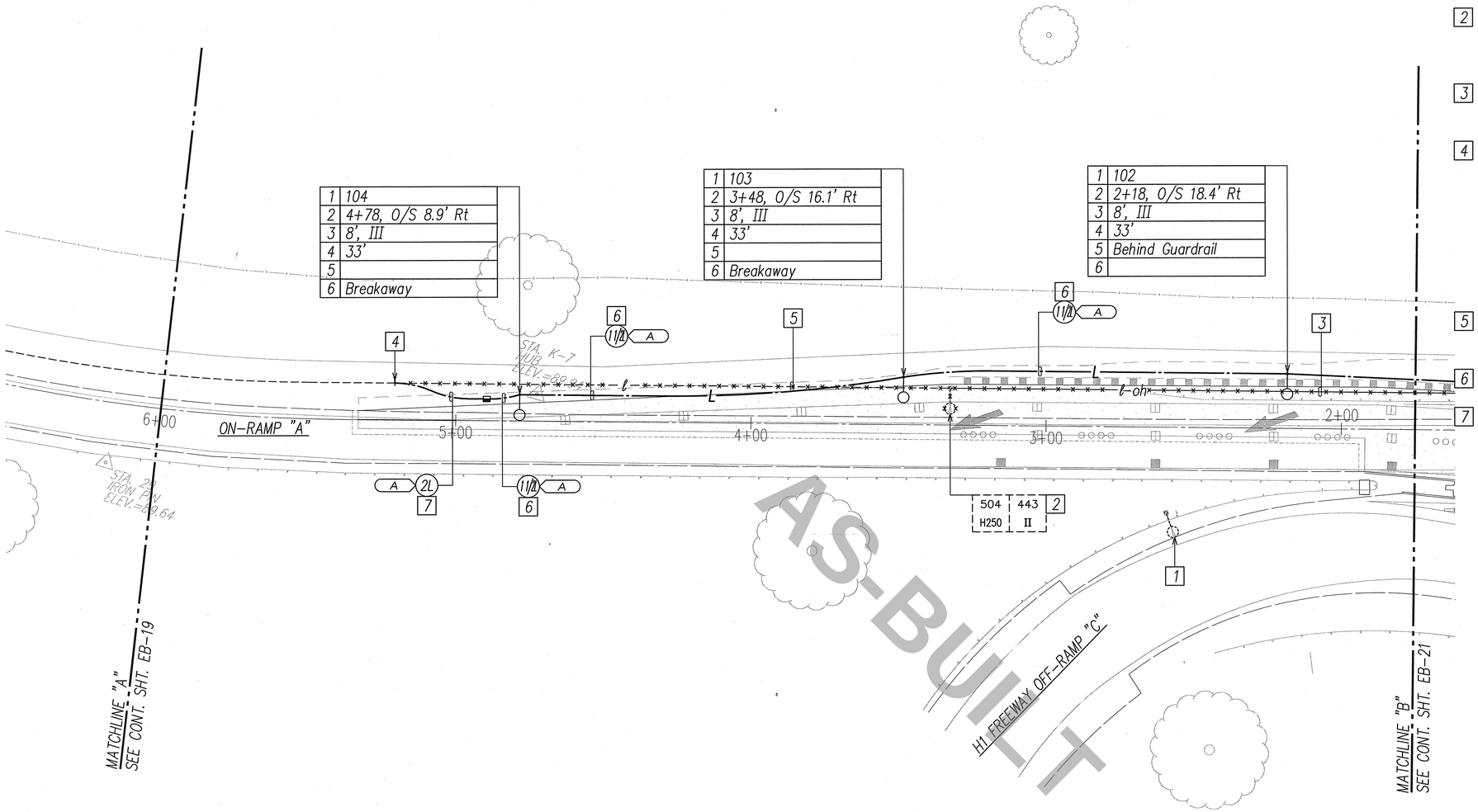
C.O. 373S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

Notes:

C.O. 373S-2

1. Existing Highway Light To Remain.
2. Remove Existing Highway Light Standard. Demolish And Remove Existing Concrete Foundation. See General Notes 1 & 2.
3. Remove Overhead Highway Lighting Conductors.
4. Intercept Existing Underground Highway Lighting Ductline And/Or Direct Buried Conductors. Provide Couplings And Extend New Conduits To New Pullbox. Size Of Conduits To Match Existing. Assume 1–2" Conduit. For Direct Buried Conductors, Provide 1–2" Split Duct Over Conductors And Reroute Existing Conductors To New Pullbox.
5. Remove Existing Underground Highway Lighting Ductline And Conductors.
6. 1 1/2"C, 2#6 RHW–USE, #10 Gnd.
7. 2"C, Existing 3#2 Conductors.



AS-BUILT

General Notes:

1. Contractor To Dispose Of Exst HPS Light Fixtures And/Or Steel Light Poles.
2. Contractor To Salvage Exst LED Light Fixtures And/Or Aluminum Light Poles. Deliver Parts To HDOT Oahu District Baseyard At Kakoi Street. Contact Victor Chan At (808) 831–6700, Ext 137.

NORTH

STATE HIGHWAY LIGHTING PLAN II

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

DATE	REVISION

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING PLAN II

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EB-20 OF 161 SHEETS

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

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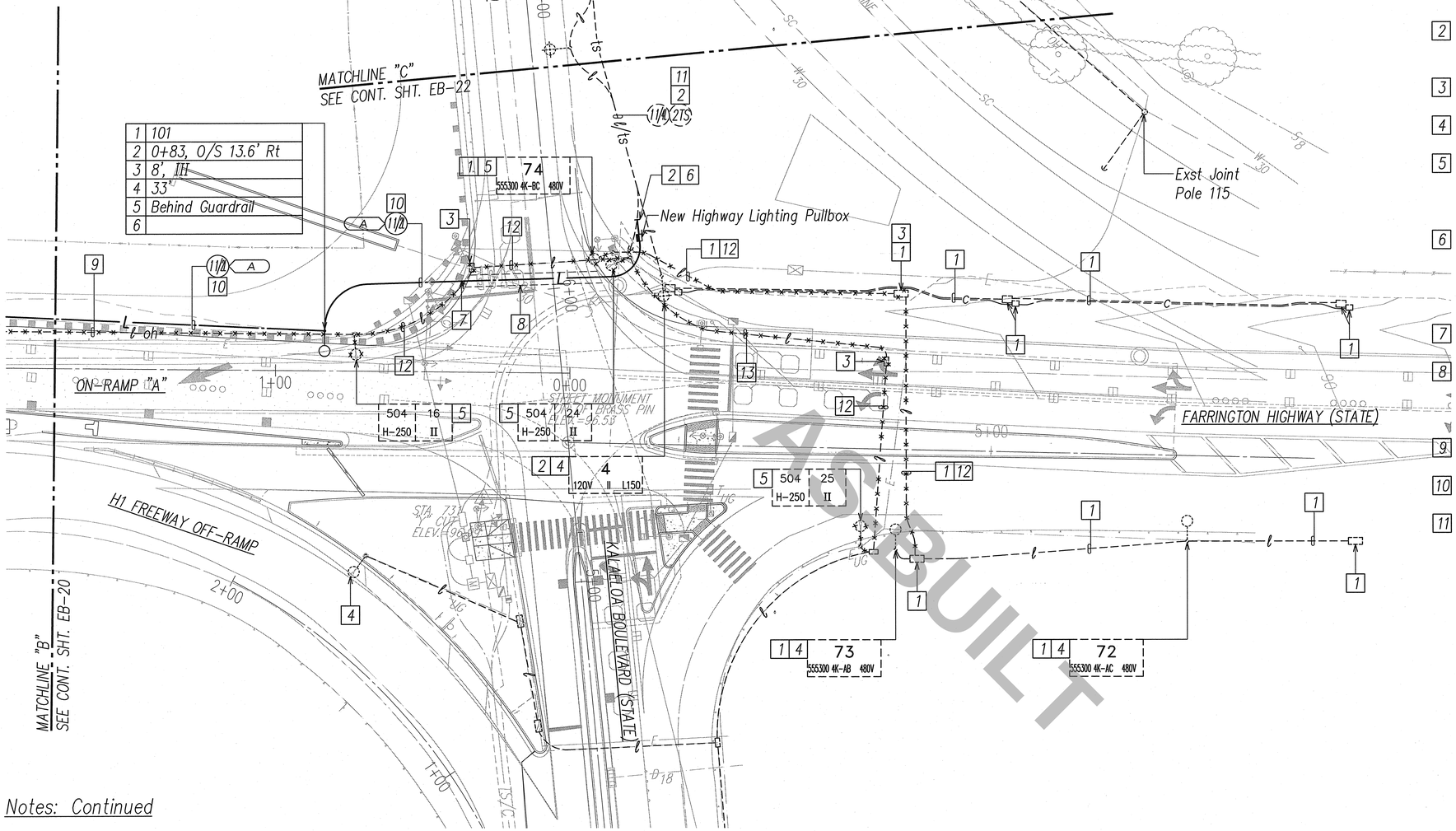
"AS-BUILT"

C.O. 373S-2

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

General Notes:

1. Contractor To Dispose Of Exst HPS Light Fixtures And/Or Steel Light Poles.
2. Contractor To Salvage Exst LED Light Fixtures And/Or Aluminum Light Poles. Deliver Parts To HDOT Oahu District Baseyard At Kakoi Street. Contact Victor Chan At (808) 831-6700, Ext 137.
3. See Traffic Signal & Communication Plans For Additional Work On Traffic Signal & Communcation Systems.



Notes: C.O. 373S-3

1. Existing Facilities Installed Under HDOT Project "Interstate Route H-1 Addition And Modification Of Freeway Access (Kapolei Interchange Complex), Phase 2, Federal Aid Project No. IM-H1-1(261)."
2. Existing Facilities Installed Under "Wet 'N' Wild Access Road" Project By Aina Nui Corporation.
3. Remove Existing Highway Lighting Pullbox.
4. Existing Highway Light To Remain.
5. Remove Existing Highway Light Standard. Demolish And Remove Existing Concrete Foundation. See General Notes 1 & 2.
6. Intercept Existing Traffic Signal Conduit Stub-Out. Re-purpose Conduit For Ramp Lighting. Provide Couplings And Extend Ductline To New Pullbox. Provide 2#6 RHW-USE, #10 Gnd.
7. Route Conduit To Avoid New Guardrail.
8. Sawcut Existing AC Pavement And Demolish Existing Pavement Prior To Trench Excavation. Repair Per State Standards.
9. Remove Overhead Highway Lighting Conductors.
10. 1 1/2"C, 2#6 RHW-USE, #10 Gnd.
11. Existing Traffic Signal Conduit. Re-purpose Conduit For Ramp Lighting. Provide 2#6 RHW-USE, #10 Gnd In Existing Conduit.

Notes: Continued

12. Remove Existing Underground Highway Lighting Ductline And Conductors.
13. Remove Existing Direct Buried Highway Lighting Conductors.

AS-BUILT

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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NORTH

STATE HIGHWAY LIGHTING PLAN III
SCALE: 1"=20'

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

DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING PLAN III

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EB-21 OF 161 SHEETS

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

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"AS-BUILT"

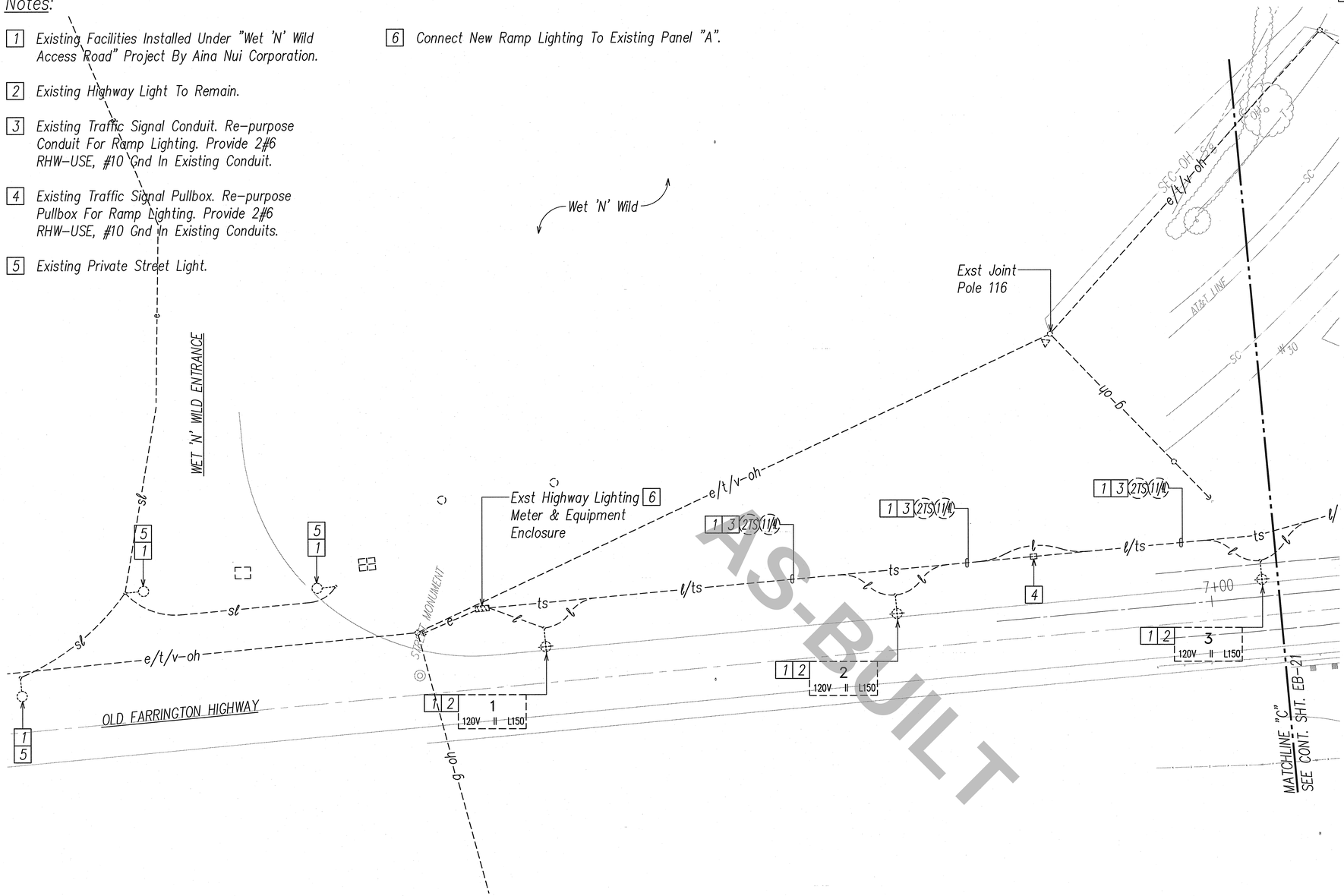
C.O. 373S-3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 373S-4

Notes:

1. Existing Facilities Installed Under "Wet 'N' Wild Access Road" Project By Aina Nui Corporation.
2. Existing Highway Light To Remain.
3. Existing Traffic Signal Conduit. Re-purpose Conduit For Ramp Lighting. Provide 2#6 RHW-USE, #10 Gnd In Existing Conduit.
4. Existing Traffic Signal Pullbox. Re-purpose Pullbox For Ramp Lighting. Provide 2#6 RHW-USE, #10 Gnd In Existing Conduits.
5. Existing Private Street Light.
6. Connect New Ramp Lighting To Existing Panel "A".



AS-BUILT

NORTH

STATE HIGHWAY LIGHTING PLAN IV
SCALE: 1"=20'

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

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

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DATE | REVISION

"AS-BUILT"

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING PLAN IV

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EB-22 OF 161 SHEETS

C.O. 373S-4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 373S-5

General Notes:

1. Existing Highway Lighting Systems Shall Remain Operational During Non Daylight Hours Until New Highway Lights Are Installed. Contractor Shall Provide Temporary Lighting If Existing Highway Lights Are De-Energized Before The New Highway Lights Are Operational. Temporary Work Shall Be Coordinated With And Shall Be Acceptable To Engineer. Temporary Highway Lighting System Will Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.
2. Contractor To Dispose Of Exst HPS Light Fixtures And/Or Steel Light Poles.
3. Contractor To Salvage Exst LED Light Fixtures And/Or Aluminum Light Poles. Deliver Parts To HDOT Oahu District Baseyard At Kakoi Street. Contact Victor Chan At (808) 831-6700, Ext 137.

Notes:

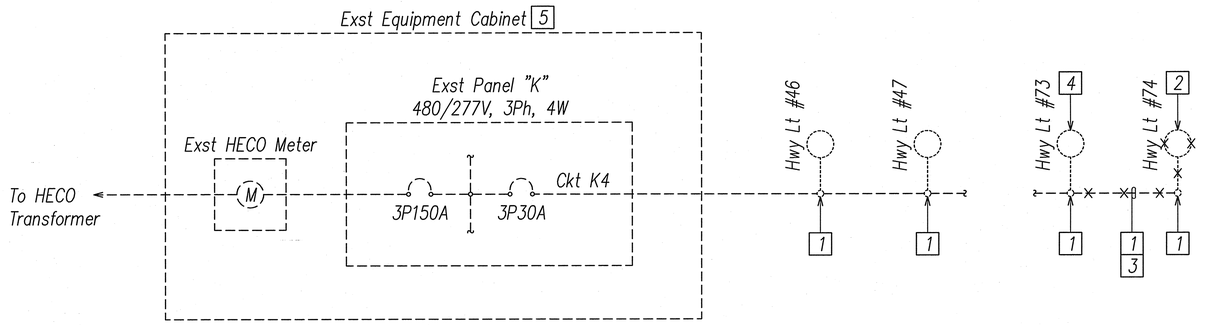
[1] Existing Facilities Installed Under HDOT Project, "Interstate Route H-1 Addition And Modification of Freeway Access (Kapolei Interchange Complex), Phase 2, Federal Aid Project No. IM-H1-1(261)."

[2] Remove Existing Highway Lighting Standard. Demolish And Remove Existing Concrete Foundation. See General Notes 2 & 3.

[3] Remove Existing Highway Lighting Ductline And Conductors.

[4] Existing 185W LED Highway Light To Remain.

[5] Existing Highway Lighting Electrical Equipment Located Near Off-Ramp On Wakea Street Behind Consolidated Theaters Kapolei.



EXISTING KAPOLEI INTERCHANGE DISTRIBUTION SYSTEM "K"

EXISTING STATE HIGHWAY LIGHTING ONELINE "K"

NOT TO SCALE

General Notes:
See General Notes Above.

Notes:

[1] Remove Existing Highway Lighting Standard. Demolish And Remove Existing Concrete Foundation. See General Notes 2 & 3.

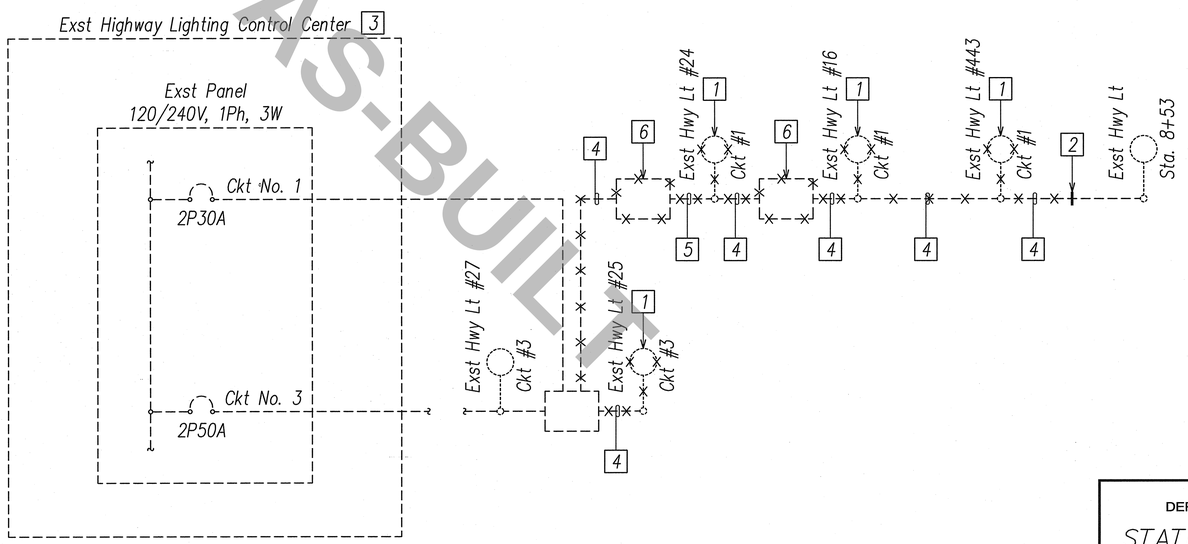
[2] Intercept Existing Underground Highway Lighting Ductline And/Or Direct Buried Conductors. See State Highway Lighting Oneline "W" For Continuation.

[3] Existing Highway Lighting Electrical Equipment Located Near Existing HECO Transformer V10282 And Existing Utility Pole #39. See Traffic Signal & Communications Plan II For Location.

[4] Remove Existing Highway Lighting Ductline And Conductors.

[5] Remove Existing Highway Lighting Direct Buried Conductors.

[6] Remove Existing Highway Lighting Pullbox.



EXISTING PALAILAI INTERCHANGE SYSTEM

EXISTING STATE HIGHWAY LIGHTING ONELINE "P"

NOT TO SCALE

AS-BUILT

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING EXST ONELINE DIAGRAMS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: — Date: November 16, 2018

SHEET No. EB-23 OF 161 SHEETS

DATE	REVISION

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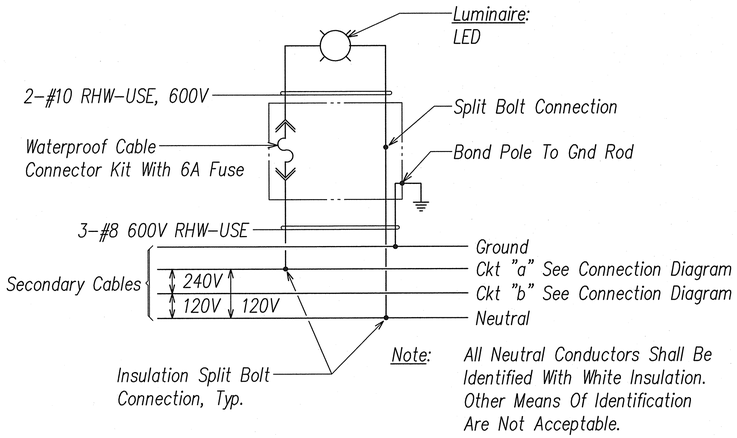
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"AS-BUILT"

C.O. 373S-5

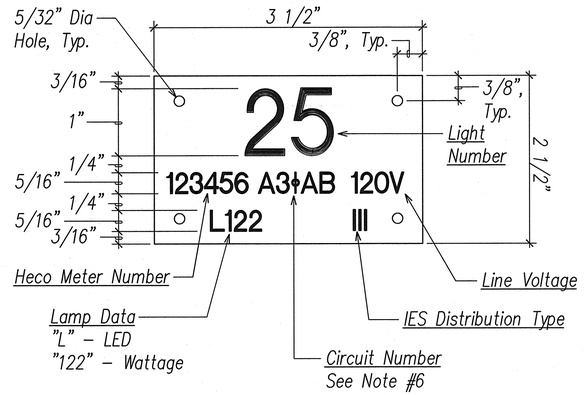
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 373S-6



TYPICAL STATE HWY LIGHT CONNECTION DIAGRAM

NOT TO SCALE (120/240V Metered System)



IDENTIFICATION TAG DETAIL

NOT TO SCALE (Metered System)

Notes:

1. Use 3 Ply Laminated Flexible Plastic, Black-White-Black. Thickness: Black Cap & Base Sheet - 0.010", White Middle Sheet - 0.052".
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, 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; "ØAB" Indicates Connection To Phase "A" And "B").
7. Contractor To Verify All Items Of I.D Tag With State DOT Prior To Fabrication.

General Notes:

1. Existing Highway Lighting Systems Shall Remain Operational During Non Daylight Hours Until New Highway Lights Are Installed. Contractor Shall Provide Temporary Lighting If Existing Highway Lights Are De-Energized Before The New Highway Lights Are Operational. Temporary Work Shall Be Coordinated With And Shall Be Acceptable To Engineer. Temporary Highway Lighting System Will Not Be Paid For Separately, But Considered Incidental To The Various Contract Items.

Notes:

[1] Existing Facilities Installed Under "Wet 'N' Wild Access Road" Project By Aina Nui Corporation.

[2] Existing Traffic Signal Conduit. Re-purpose Conduit For Ramp Lighting. Provide 2#6 RHW-USE, #10 Gnd In Existing Conduit.

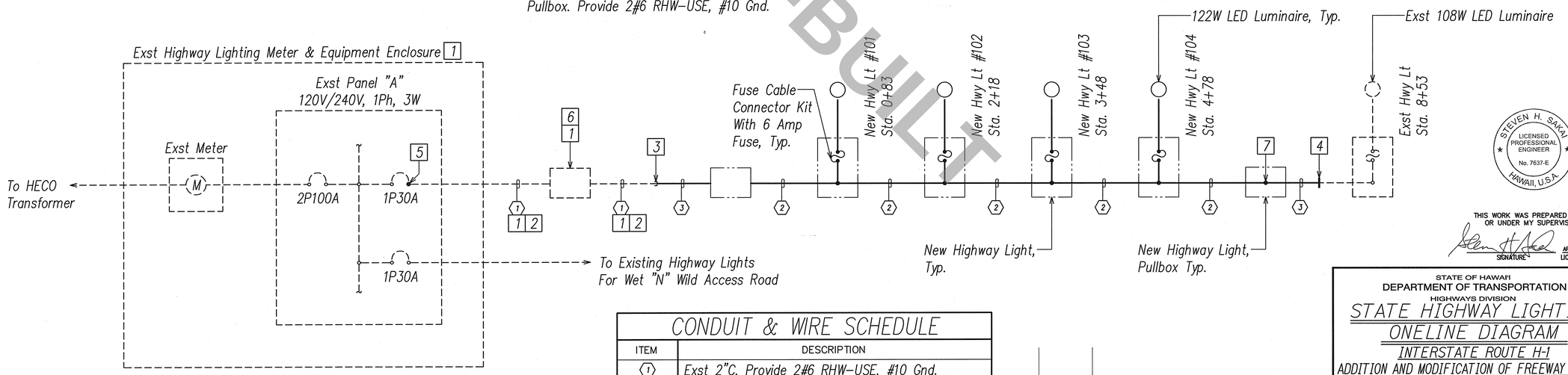
[3] Intercept Existing Traffic Signal Conduit Stub-Out. Re-purpose Conduit For Ramp Lighting. Provide Couplings And Extend Ductline To New Pullbox. Provide 2#6 RHW-USE, #10 Gnd.

[4] Intercept Existing Underground Highway Lighting Ductline And/Or Direct Buried Conductors. Provide Couplings And Extend New Conduits To New Pullbox. Size Of Conduits To Match Existing. Assume 1-2" Conduit. For Direct Buried Conductors, Provide 1-2" Split Duct Over Conductors And Reroute Existing Conductors To New Pullbox.

[5] Connect Ramp Conductors To Existing Spare Breaker.

[6] Existing Traffic Signal Pullbox. Re-Purpose Pullbox For Ramp Lighting.

[7] Splice Existing Conductors To New Conductors.



STATE HIGHWAY LIGHTING ONELINE "W"

NOT TO SCALE

CONDUIT & WIRE SCHEDULE	
ITEM	DESCRIPTION
(1)	Exst 2"C, Provide 2#6 RHW-USE, #10 Gnd.
(2)	1 1/2"C, 2#6 RHW-USE, #10 Gnd
(3)	2"C, Exst 3#2 Conductors.

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING ONELINE DIAGRAM

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EB-24 OF 161 SHEETS

DATE	REVISION

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C.O. 373S-6

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	374	524

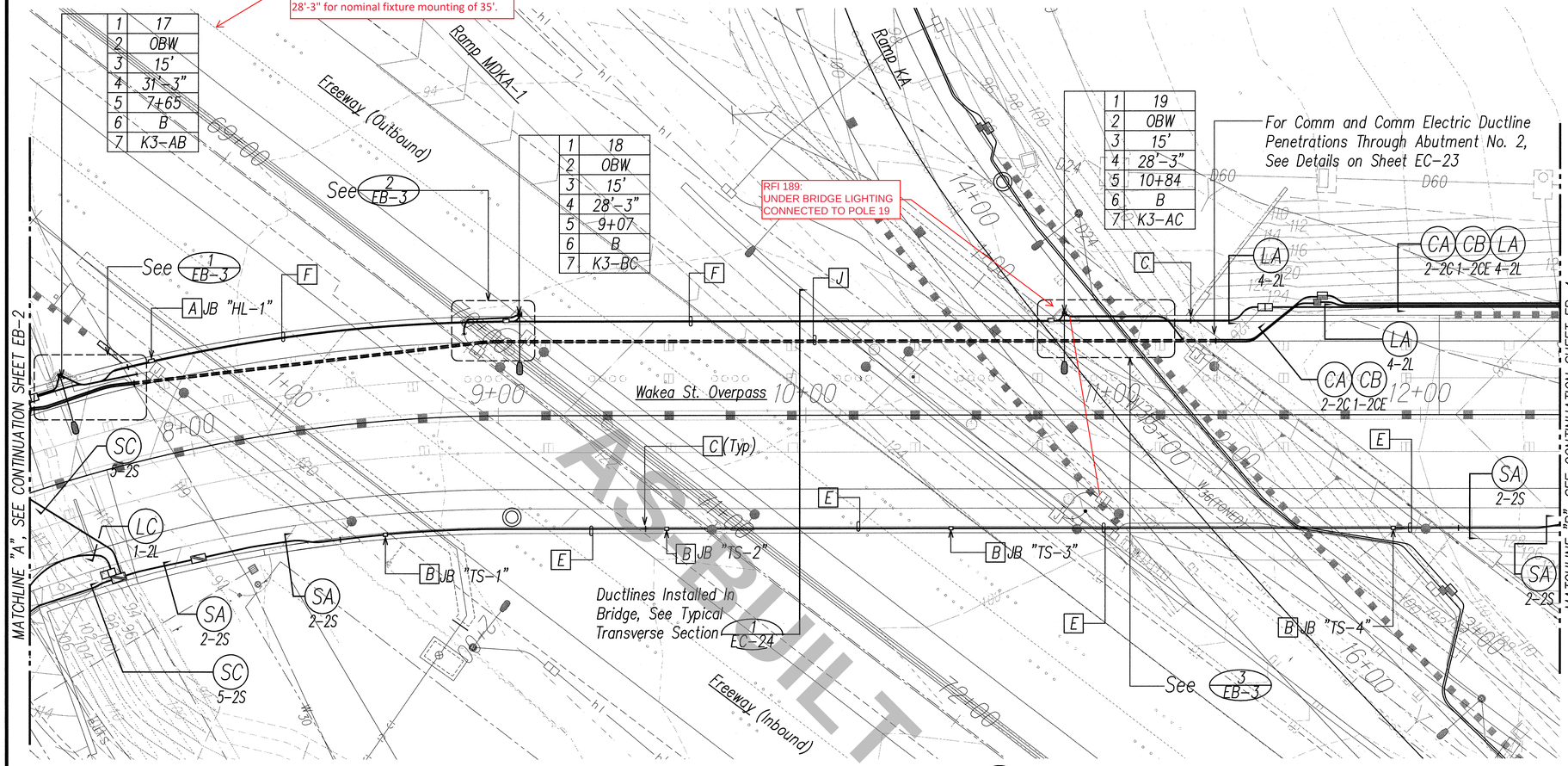
RFI 101:
Light Pole 17 should be located on Retaining Wall No.2 and the pole height should be 28'-3" for nominal fixture mounting of 35'.

1	17
2	OBW
3	15'
4	31'-3"
5	7+65
6	B
7	K3-AB

1	18
2	OBW
3	15'
4	28'-3"
5	9+07
6	B
7	K3-BC

1	19
2	OBW
3	15'
4	28'-3"
5	10+84
6	B
7	K3-AC

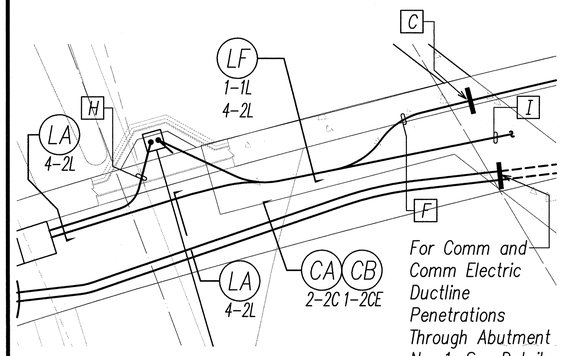
RFI 189:
UNDER BRIDGE LIGHTING CONNECTED TO POLE 19



HIGHWAY LIGHTING PLAN 2 – WAKEA ST. OVERPASS

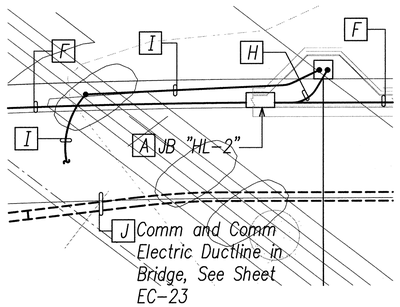
SCALE: 1"=20'

NORTH

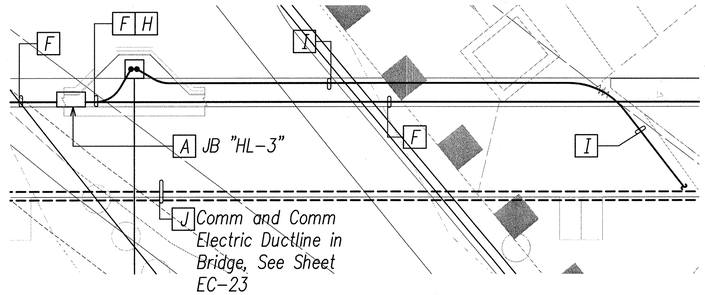


For Comm and Comm Electric Ductline Penetrations Through Abutment No. 1, See Details on Sheet EC-23

1 EB-3 HWY LT 17 BASE
SCALE: 1" = 5'



2 EB-3 HWY LT 18 BASE
SCALE: 1" = 5'



3 EB-3 HWY LT 19 BASE
SCALE: 1" = 5'

PLAN NOTES: (Items Identified on Plans as Boxed Items)

- A 18" Square x 8"D NEMA 4 Cast Iron Highway Light Junction Box, Mounted in Concrete Bridge Rail, Sheet EC-22.
- B 16" Square x 6"D NEMA 4 Cast Iron Traffic Signal Junction Box, Mounted in Concrete Bridge Rail, See Sheet EC-22.
- C Conduit Expansion / Deflection Couplings across Open Joint. See Sheet EC-22.
- D not used.
- E Route 2-2" Traffic Signal Conduits within Concrete Bridge Rail, See Sheet EC-21.
- F Route 4-2" Highway Light Conduits within Concrete Bridge Rail, See Sheet EC-20.
- G not used.
- H 1-2" Highway Light Conduit.
- I 1-1" Highway Light Conduit To Junction Box for Underpass Light Cirucits; See Highway Lighting Plan XI, Sheet EB-12.
- J Route 3-2" Communication Ducts in Bridge Structure, See Details on Sheet EC-23.

5' 2.5' 0 5' 10' 15'
SCALE: 1"=5'
20' 10' 0 20' 40' 60'
SCALE: 1"=20'
GRAPHIC SCALES

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

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ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 2 - WAKEA ST. OVERPASS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-3 OF 161 SHEETS

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"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	375	524

MATCHLINE "C", SEE CONTINUATION SHEET EB-5

MATCHLINE "B", SEE CONTINUATION SHEET EB-3

1	47
2	52' Lt
3	15'
4	31'-3"
5	30+91
6	BPS/A
7	K4-BC

1	22
2	27' Lt
3	15'
4	31'-3"
5	2+31
6	IDG/A
7	K3-AC

1	21
2	27' Lt
3	15'
4	31'-3"
5	1+09
6	IDG/A
7	K3-BC

1	20
2	BGR
3	15'
4	31'-3"
5	12+61
6	IDG/B
7	K3-AB

1	23
2	27' Lt
3	15'
4	31'-3"
5	3+42
6	IDG/A
7	K3-AB

1	49
2	34' Lt
3	15'
4	31'-3"
5	29+42
6	IUG/A
7	K4-AB

1	46
2	BGR
3	15'
4	31'-3"
5	14+60
6	BGR/B
7	K4-AB

1	48
2	20' Rt
3	15'
4	31'-3"
5	0+44
6	BPS/A
7	K4-AC

Future Traffic Signal Equipment, See Enlarged Plan 1/EB-4

Ramp KA

Ramp KA-1

Wakea St.

CA CB LC 2-2C 1-2CE 1-2L

CA CB LA 2-2C 1-2CE 4-2L

LC 1-2L

SE 4-2S

SD 6-2S

LE 2-2L

SA 2-2S

LE SE 2-2L 4-2S

SE CA CB LC 4-2S 2-2C 1-2CE 1-2L

LC SE 1-2L 4-2S

Future Traffic Signal Controller and Electrical Service Equipment

A

Future HECo Transformer Pad

Future OTWC Equipment

NORTH

1/EB-4 ENLARGED FUTURE TRAFFIC SIGNAL EQUIPMENT PLAN

SCALE: 1"=5'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Stub and Cap Ducts and Provide Concrete Duct Marker, See Detail on Sheet EA-9.

HIGHWAY LIGHTING PLAN 3 - RAMPS KA, KA-1, WAKEA ST.

SCALE: 1"=20'

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	QUANTITIES BY	
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HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 3 - RAMPS KA, KA-1, WAKEA ST.

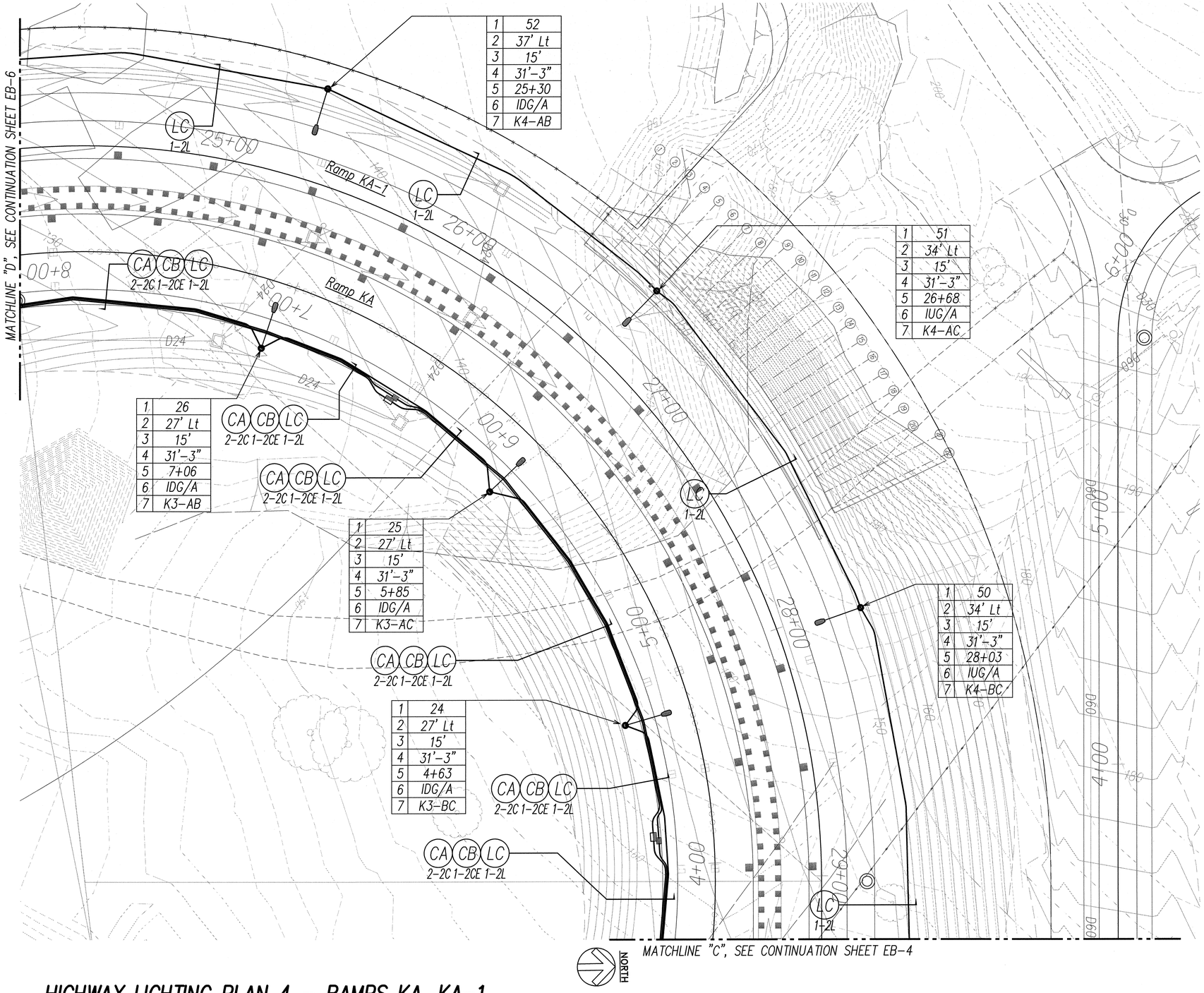
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	376	524



1	52
2	37' Lt
3	15'
4	31'-3"
5	25+30
6	IDG/A
7	K4-AB

1	51
2	34' Lt
3	15'
4	31'-3"
5	26+68
6	IUG/A
7	K4-AC

1	26
2	27' Lt
3	15'
4	31'-3"
5	7+06
6	IDG/A
7	K3-AB

1	25
2	27' Lt
3	15'
4	31'-3"
5	5+85
6	IDG/A
7	K3-AC

1	24
2	27' Lt
3	15'
4	31'-3"
5	4+63
6	IDG/A
7	K3-BC

1	50
2	34' Lt
3	15'
4	31'-3"
5	28+03
6	IUG/A
7	K4-BC

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 4 - RAMPS KA, KA-1

SCALE: 1"=20'

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 4 - RAMPS KA, KA-1

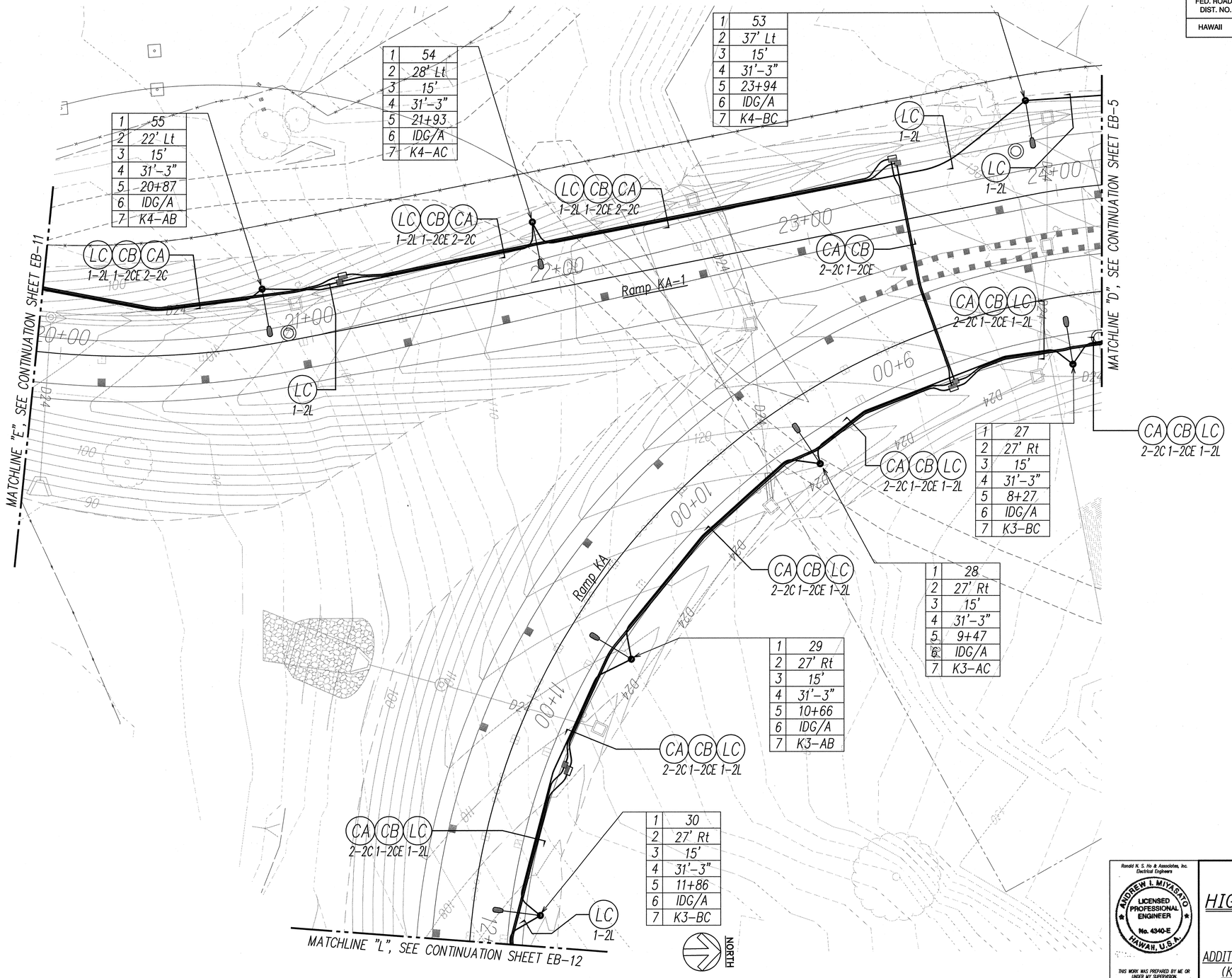
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-5 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	377	524



20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 5 - RAMPS KA, KA-1

SCALE: 1"=20'

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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Electrical Engineers

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HAWAII, U.S.A.

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 5 - RAMPS KA, KA-1

INTERSTATE ROUTE H-1

ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2

Federal-Aid Project No. IM-HI-1 (261)

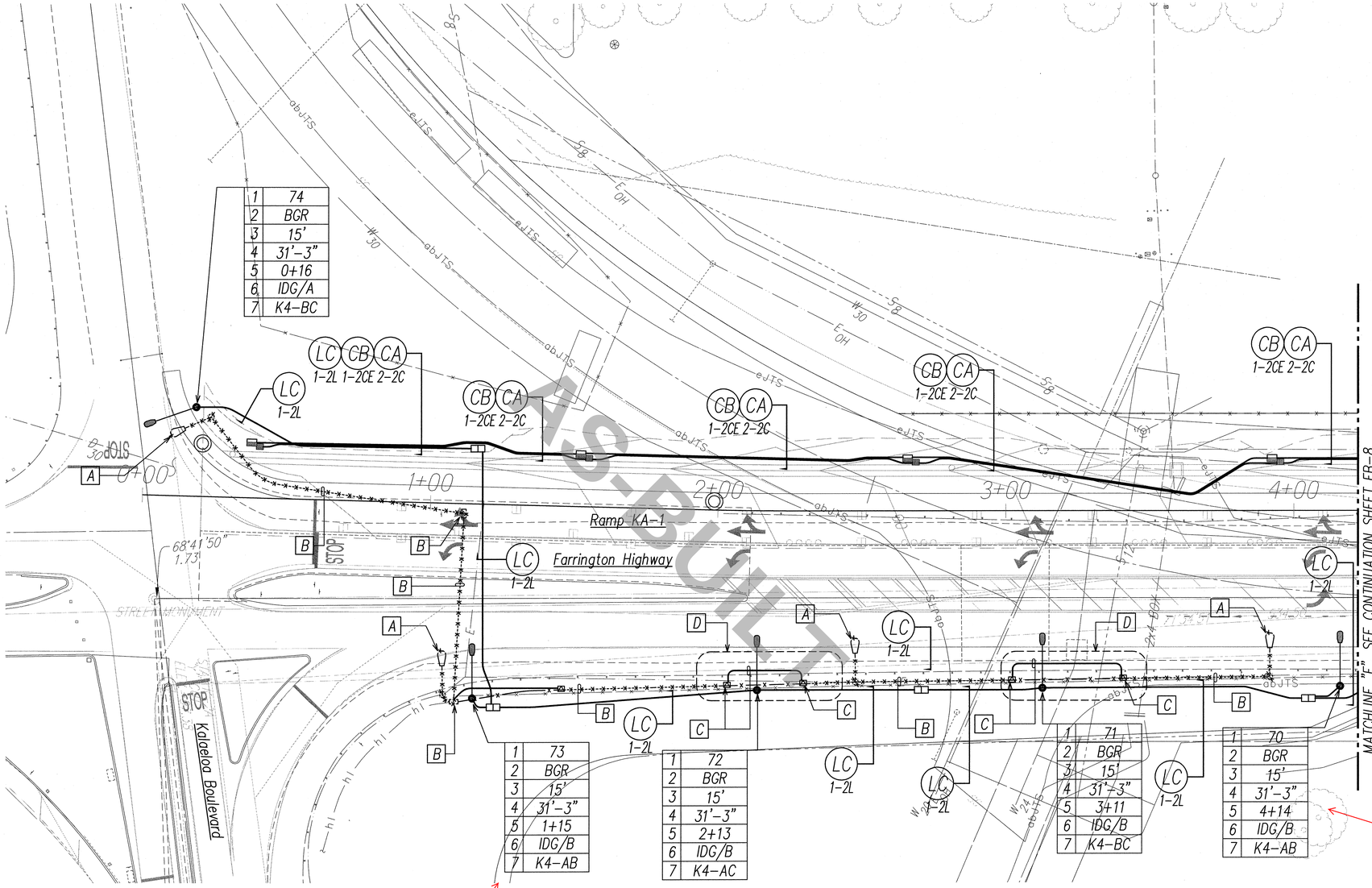
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	378	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Remove and Salvage Existing Highway Light Standard, Bracket Arm, and Luminaire; Deliver to D.O.T. Oahu District Baseyard at Kakoi Street. Demolish and Remove Existing Concrete Foudation.

B Disconnect and Remove Existing Highway Light Conductors; Demolish and Remove Existing Highway Light Pullbox and Conduits.

C Disconnect and Remove Temporary Direct Buried 2"C, and Temporary 3#2, 1#6 Ground.

D See Sheet EB-16 for Temporary Highway Light Circuit Relocation Plan, to Maintain Operation of Existing Highway Lighting System During Construction of New Highway Light System.

PER EMAIL DATED 3/14/2018 (JACOB PLAN): SCOPE OF WORK FOR POLES, DUCTLINE, AND HANDHOLES FOR POLES 70, 71, 72, 73 IS DELETED FROM SCOPE OF WORK, EXISTING TO REMAIN.

PER EMAIL DATED 3/14/2018 (JACOB PLAN): SCOPE OF WORK FOR POLES, DUCTLINE, AND HANDHOLES FOR POLES 70, 71, 72, 73 IS DELETED FROM SCOPE OF WORK, EXISTING TO REMAIN.

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 6 - RAMP KA-1

SCALE: 1"=20'

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

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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Signature 2015.02.18

License Exp. Date: 04.30.2016

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 6 - RAMP KA-1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-7 OF 161 SHEETS

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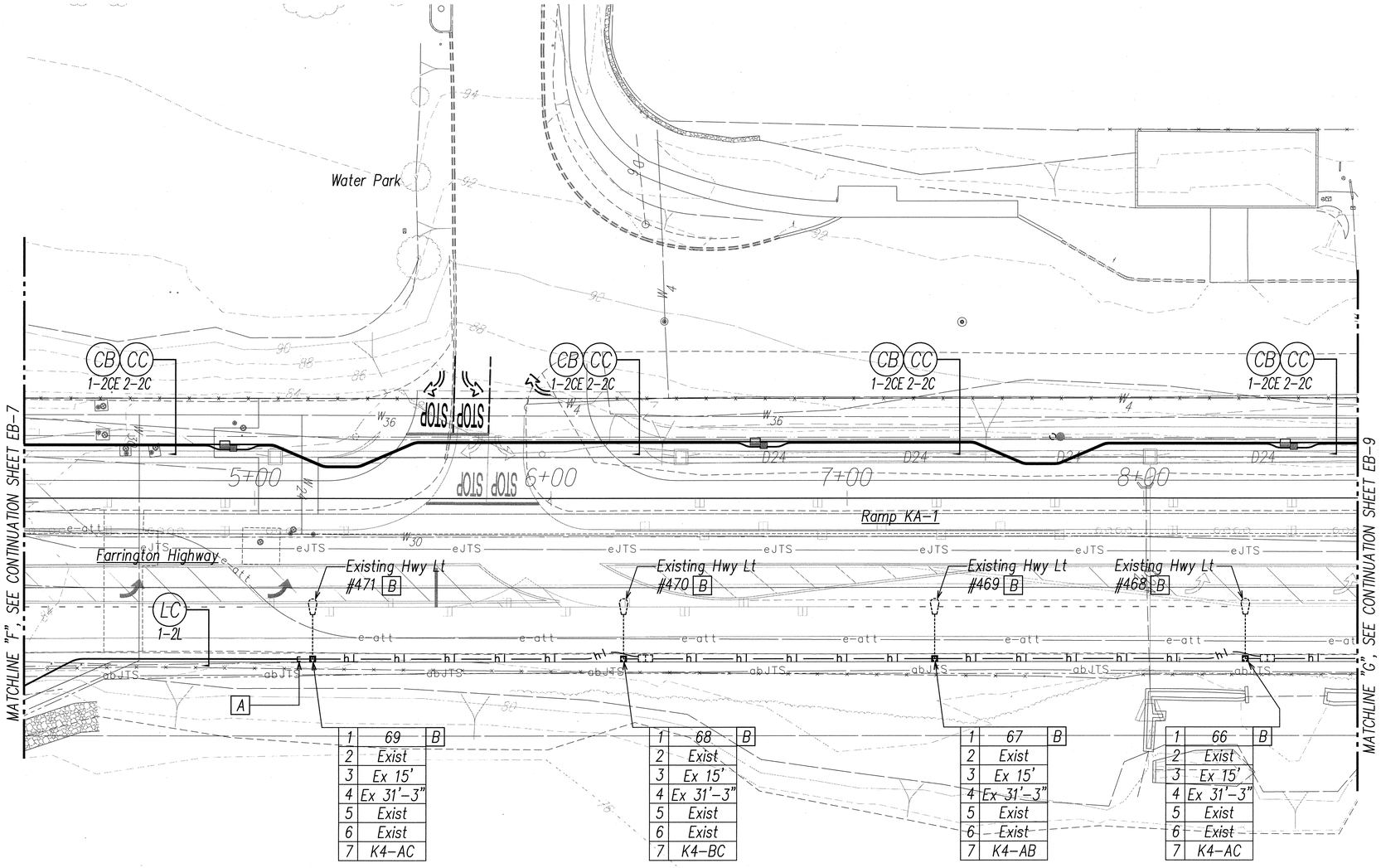
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	379	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Locate Existing 1–2" Highway Lighting Conduit Stub and Connect to New 1–2" Highway Lighting Conduit.

B Replace Existing Highway Light I.D. Tag with New Highway Light I.D. Tag per Schedule on Sheet EC–14.



NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 7 – RAMP KA–1

SCALE: 1"=20'

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

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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 7 - RAMP KA-1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-8 OF 161 SHEETS

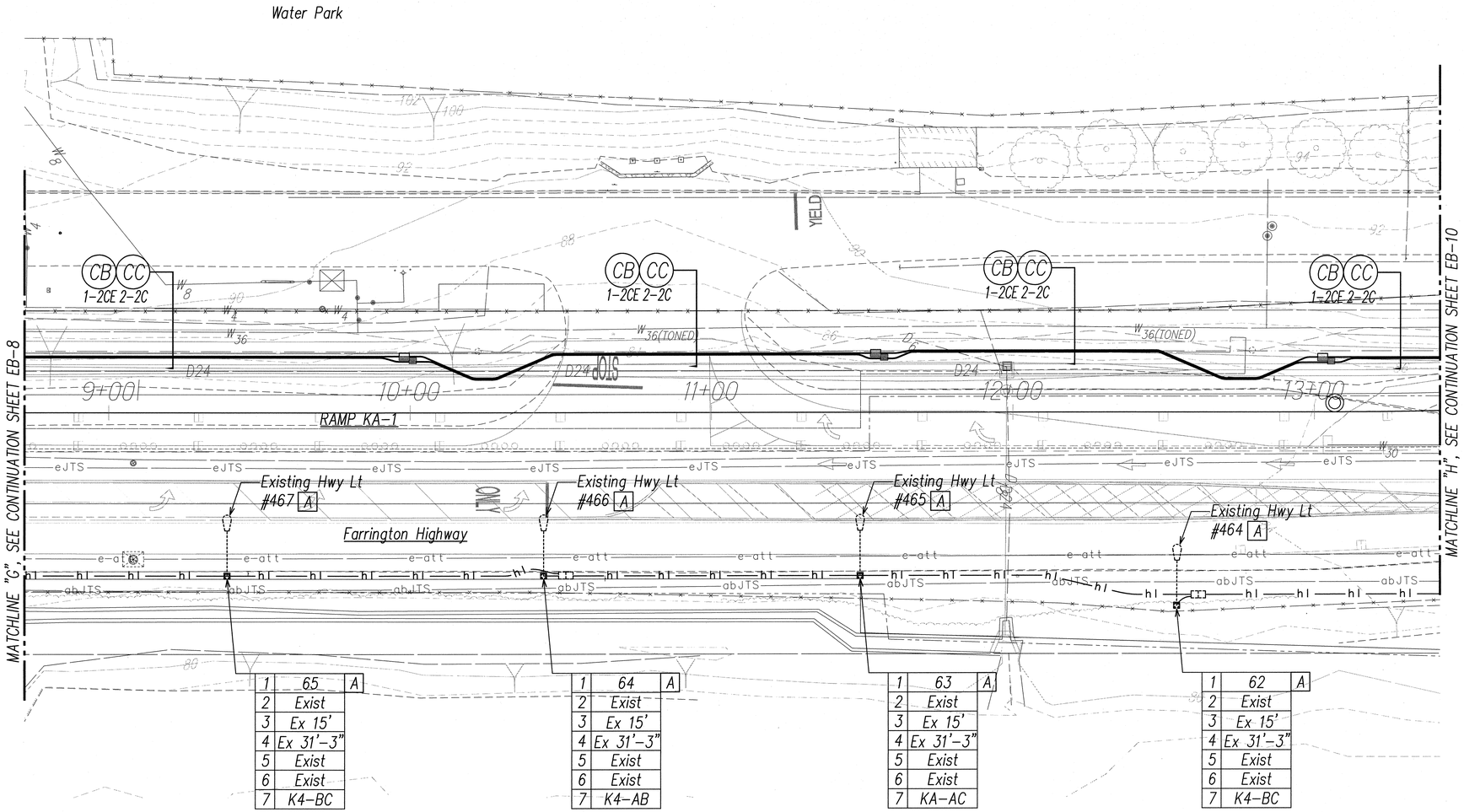
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	380	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Replace Existing Highway Light I.D. Tag with New Highway Light I.D. Tag per Schedule on Sheet EC-14.



1	65 A
2	Exist
3	Ex 15'
4	Ex 31'-3"
5	Exist
6	Exist
7	K4-BC

1	64 A
2	Exist
3	Ex 15'
4	Ex 31'-3"
5	Exist
6	Exist
7	K4-AB

1	63 A
2	Exist
3	Ex 15'
4	Ex 31'-3"
5	Exist
6	Exist
7	KA-AC

1	62 A
2	Exist
3	Ex 15'
4	Ex 31'-3"
5	Exist
6	Exist
7	K4-BC

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

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 8 - RAMP KA-1

SCALE: 1"=20'

Ronald N. S. Ho & Associates, Inc. Electrical Engineers

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Signature 02.02.18

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HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 8 - RAMP KA-1

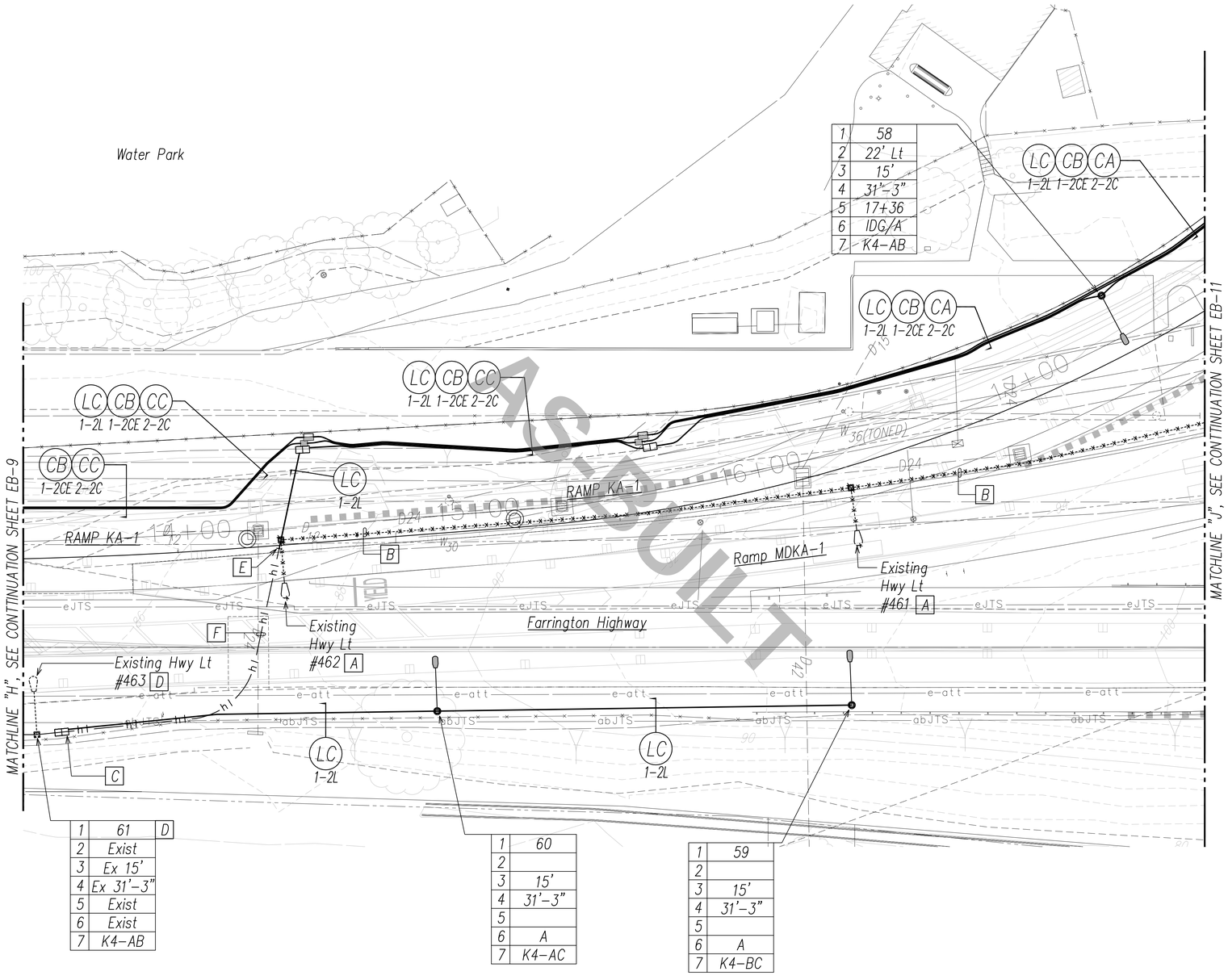
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-9 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	381	524



NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'
GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 9 - RAMPS KA-1, MDKA1

SCALE: 1"=20'

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Remove and Salvage Existing Highway Light Standard, Bracket Arm, and Luminaire; Deliver to D.O.T. Oahu District Baseyard at Kakoi Street.

B Disconnect and Remove Existing Highway Light Conductors; Demolish and Remove Existing Highway Light Pullbox and Conduits.

C Intercept Existing Highway Light Circuit with New Highway Light Pullbox and Connect to New Highway Light Conductors.

D Replace Existing Highway Light I.D. Tag with New Highway Light I.D. Tag per Schedule on Sheet EC-14.

E Excavate to Expose Existing Conduit, Remove Existing Conductors, Couple and Extend to Pullbox.

F Remove Existing Conductors and Provide 3 No. 1, 1 No. 2 Ground From Pullbox to Pullbox.

RFI 99

Location of SL 59 and SL 60

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CHECKED BY	

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Electrical Engineers

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 9
RAMPS KA-1, MDKA-1
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)
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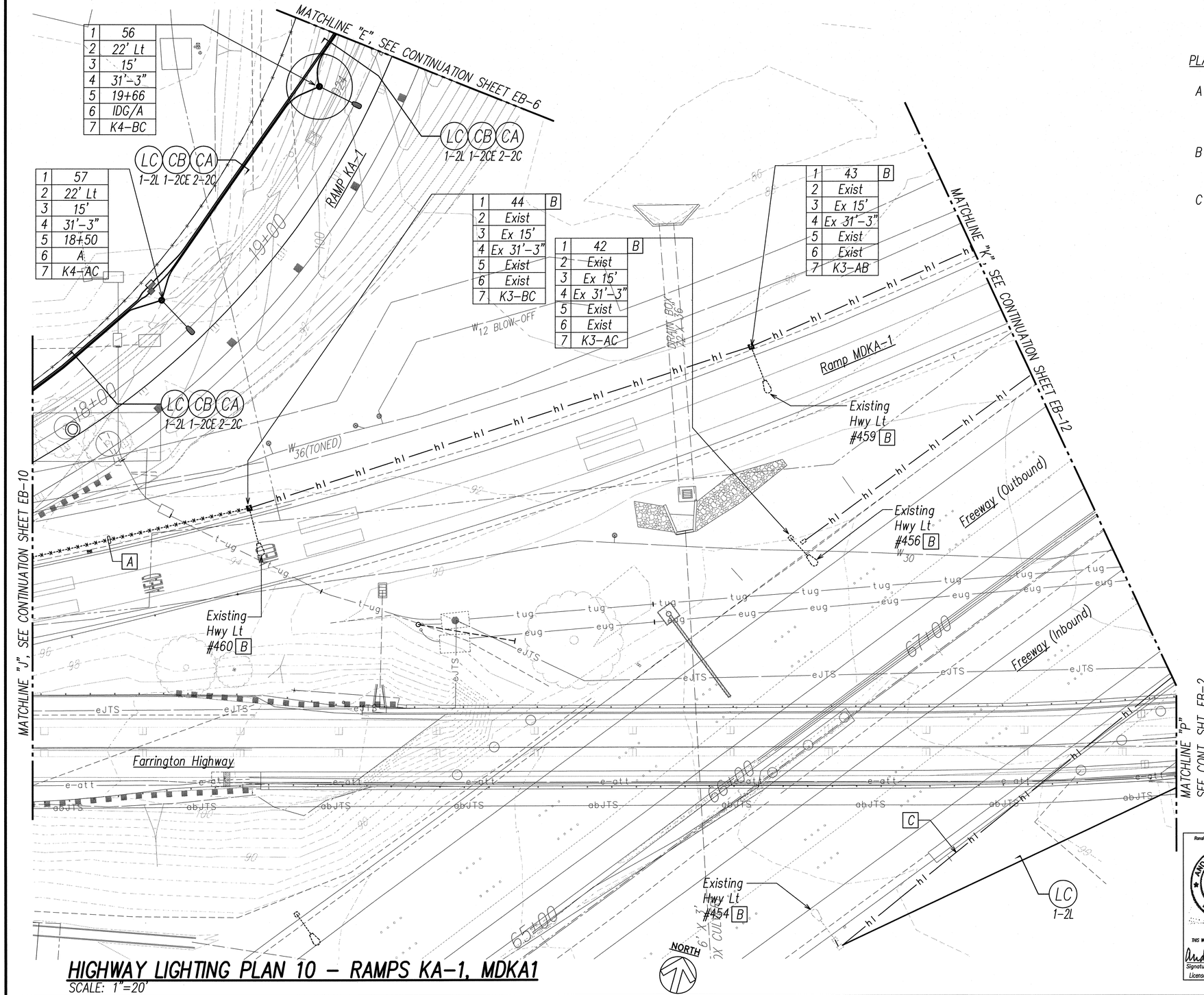
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	382	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Disconnect and Remove Existing Highway Light Conductors; Demolish and Remove Existing Highway Light Pullbox and Conduits.

B Replace Existing Highway Light I.D. Tag with New Highway Light I.D. Tag per Schedule on Sheet EC-14.

C Existing 2" Highway Light Conduit; Provide New Highway Light Wiring per Kapolei Interchange Highway Lighting Distribution "K" Diagram 2 on Sheet EC-5.



HIGHWAY LIGHTING PLAN 10 – RAMPS KA-1, MDKA1

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc. Electrical Engineers

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

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STATE OF HAWAII
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HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 10 - RAMPS KA-1, MDKA-1

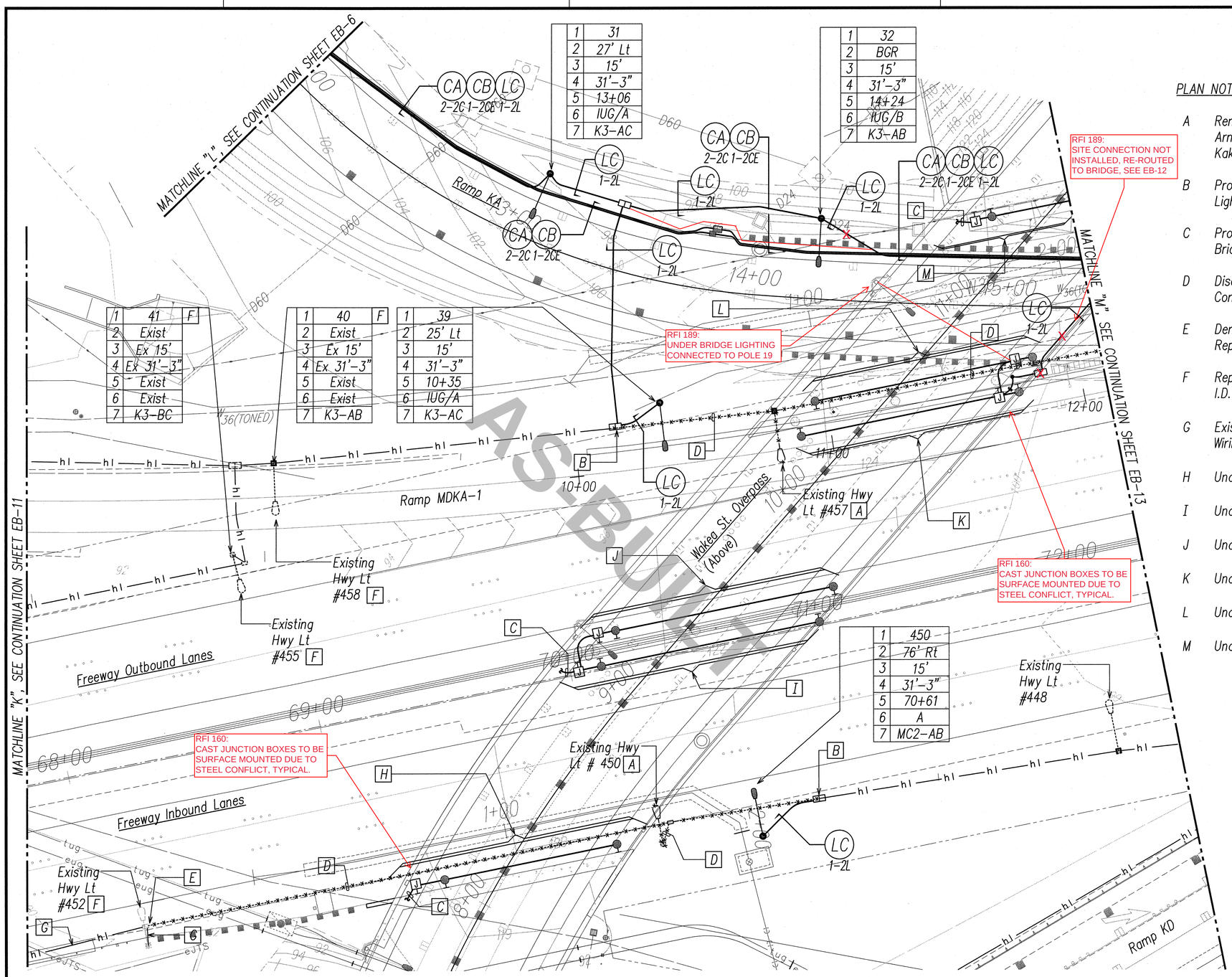
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-11 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	383	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Remove and Salvage Existing Highway Light Standard, Bracket Arm, and Luminaire; Deliver to D.O.T. Oahu District Baseyard at Kakoi Street.

B Provide New Highway Light Pullbox to Intercept Existing Highway Lighting Circuit to Maintain Existing Circuitry.

C Provide Conduit Riser up Wall to Highway Light Standard on Bridge; See Sheet EB-3 for Continuation.

D Disconnect and Remove Existing Highway Lighting Conductors and Conduits.

E Demolish and Remove Existing Highway Lighting Pullbox and Replace with New Highway Lighting Pullbox.

F Replace Existing Highway Light I.D. Tag with New Highway Light I.D. Tag per Schedule on Sheet EC-14.

G Existing 2" Highway Light Conduit; Provide New Highway Light Wiring per Diagram on Sheet EC-5.

H Underpass Light, See Abutment No. 1 Wall Elevation 1/EC-15.

I Underpass Light, See Pier Wall No. 1 Elevation 1/EC-16.

J Underpass Light, See Pier Wall No. 1 Elevation 2/EC-16.

K Underpass Light, See Pier Wall No, 2 Elevation 1/EC-17.

L Underpass Light, See Pier Wall No. 2 Elevation 2/EC-17.

M Underpass Light, See Abutment No. 2 Wall Elevation 2/EC-15.

ORIGINAL PLANS	SHEET PLOTTED BY	DATE
	SHEETS BY	
NOTE BOOK	TRACED BY	
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No.	QUANTITIES BY	
	CHECKED BY	

HIGHWAY LIGHTING PLAN 11 – RAMPS KA, MDKA1

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 11 - RAMPS KA, MDKA-1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

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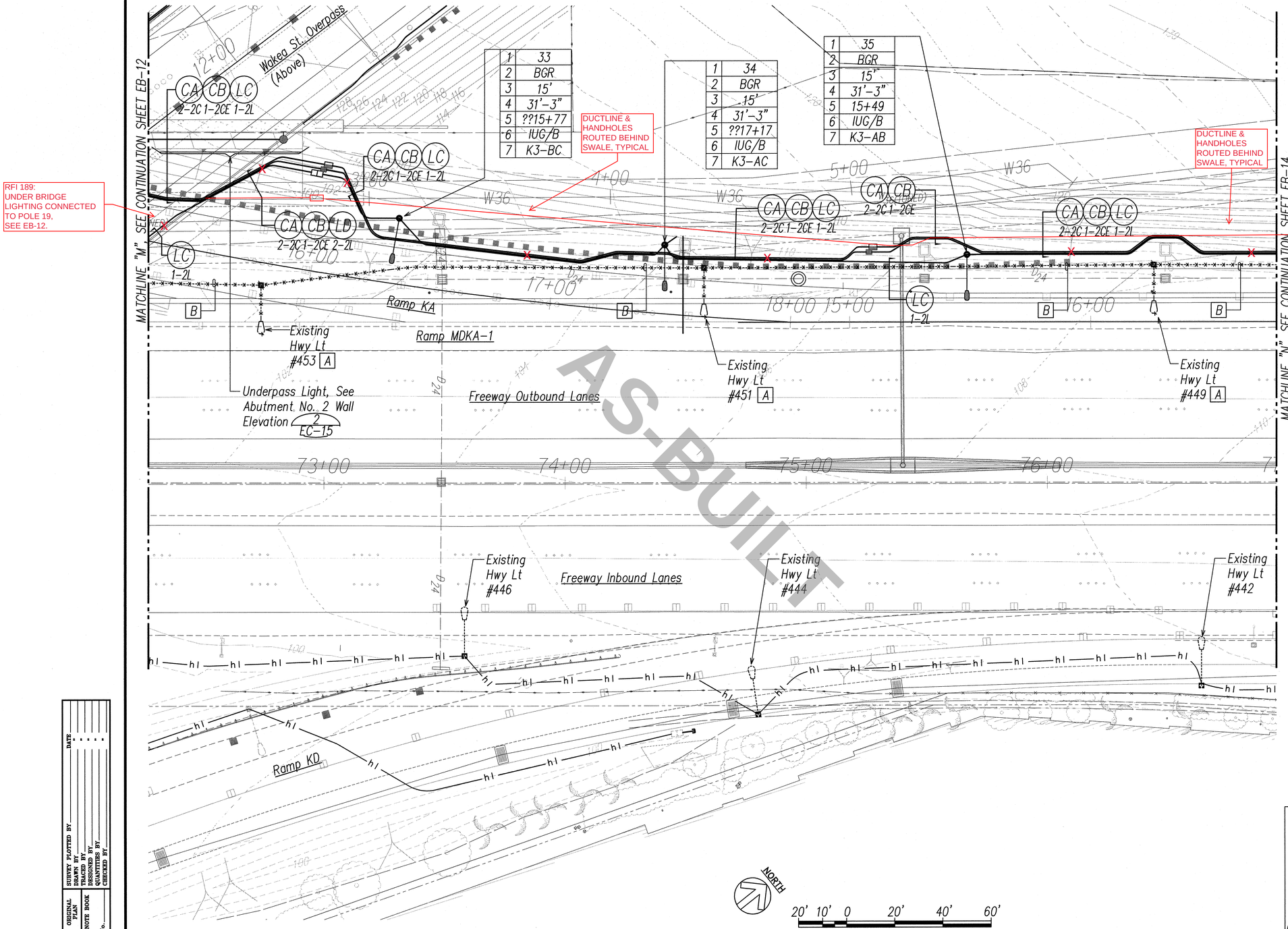
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	384	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Remove and Salvage Existing Highway Light Standard, Bracket Arm, and Luminaire; Deliver to D.O.T. Oahu District Baseyard at Kakoi Street.

B Disconnect and Remove Existing Highway Light Conductors; Demolish and Remove Existing Highway Light Pullbox and Conduits.



AS-BUILT

HIGHWAY LIGHTING PLAN 12 – RAMPS KA, MDKA1

SCALE: 1"=20'

ORIGINAL PLAN	SEWER PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
No.	DESIGNED BY	
	QUANTITIES BY	
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Electrical Engineers

ANDREW I. MIYASATO
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HAWAII, U.S.A.

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HIGHWAY LIGHTING PLAN 12 - RAMPS KA, MDKA-1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

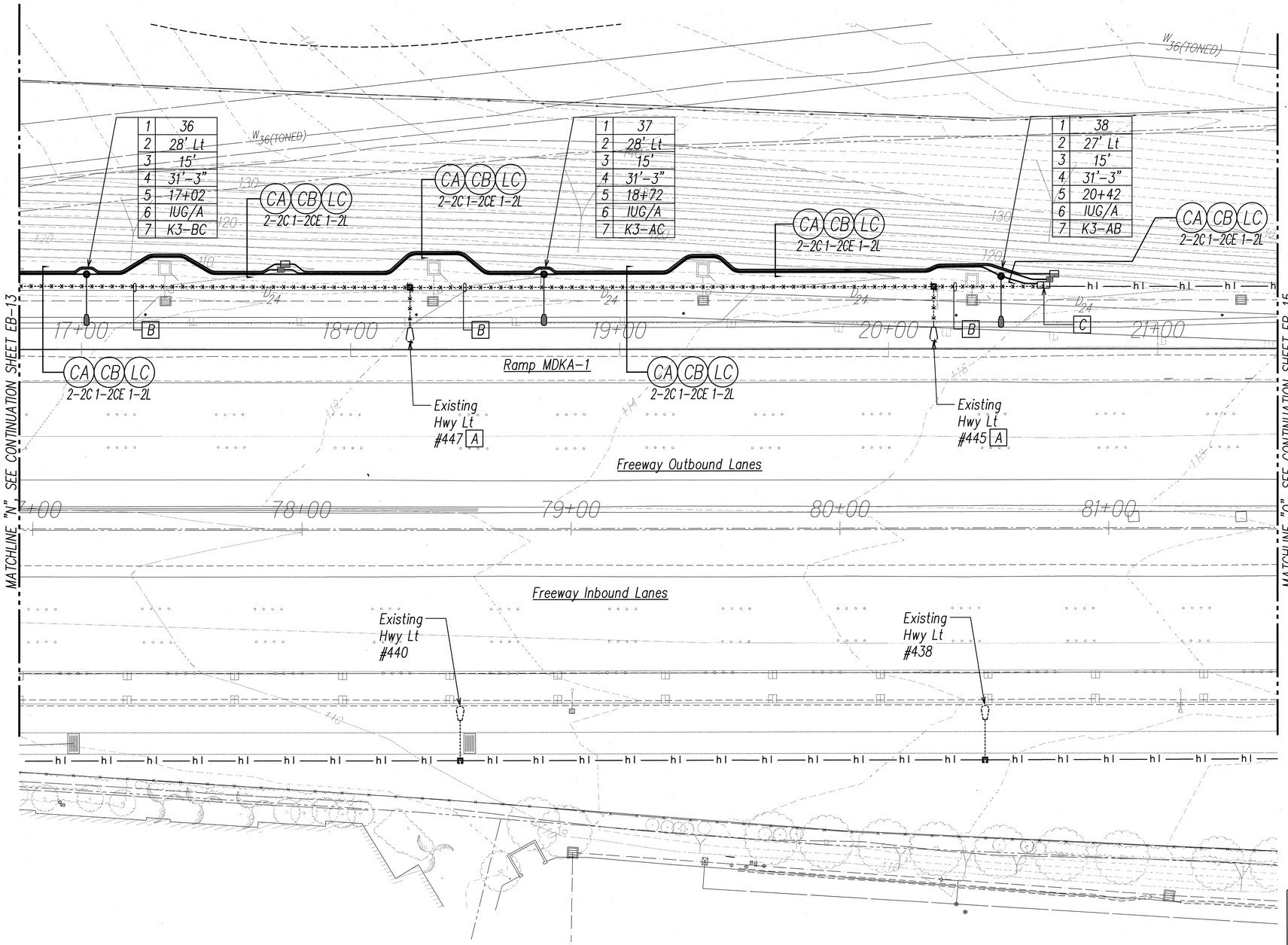
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"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	385	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Remove and Salvage Existing Highway Light Standard, Bracket Arm, and Luminaire; Deliver to D.O.T. Oahu District Baseyard at Kakoi Street.

B Disconnect and Remove Existing Highway Light Conductors; Demolish and Remove Existing Highway Light Pullbox and Conduits.

C Intercept Existing Highway Light Circuit with New Highway Light Pullbox and Connect to New Highway Light Conductors.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
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NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

HIGHWAY LIGHTING PLAN 13 – RAMP MDKA1

SCALE: 1"=20'

Ronald N. S. Ho & Associates, Inc.
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN 13 - RAMP MDKA-1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

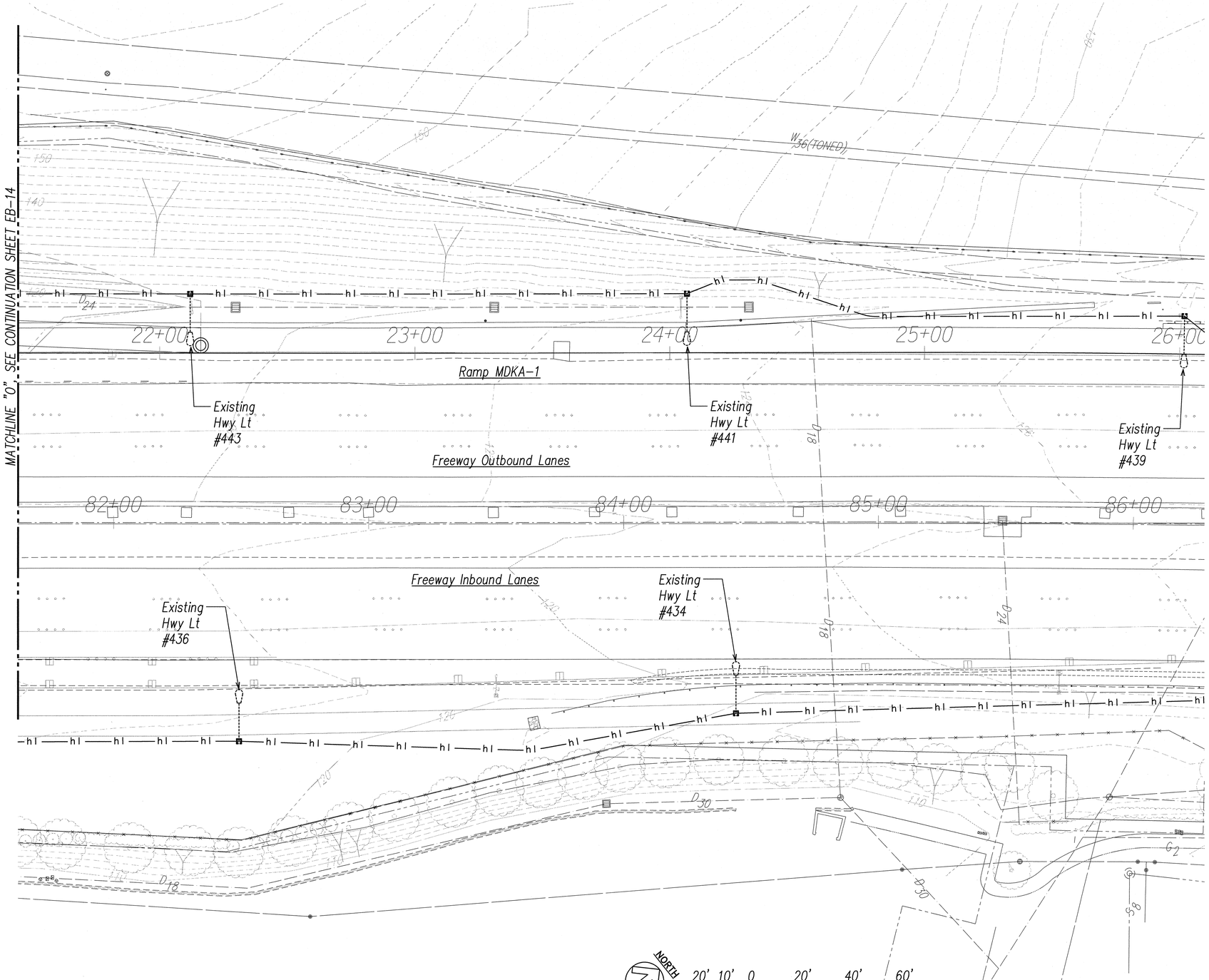
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	386	524



HIGHWAY LIGHTING PLAN 14 – RAMP MDKA1

SCALE: 1"=20'

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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Electrical Engineers
ANDREW I. MIYASATO
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No. 4340-E
HAWAII, U.S.A.

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HIGHWAYS DIVISION

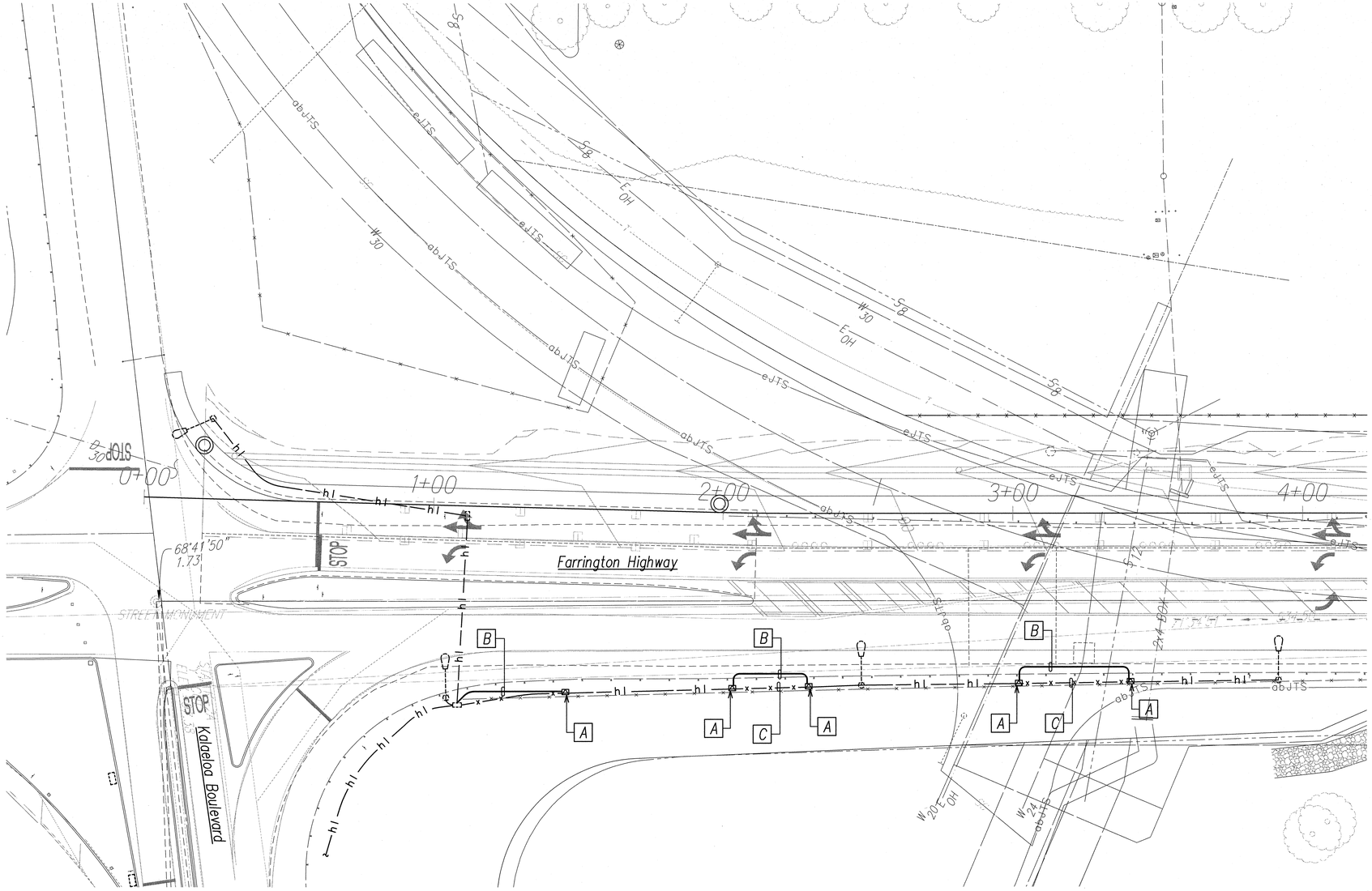
HIGHWAY LIGHTING PLAN 14 - RAMP MDKA-1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EB-15 OF 161 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	387	524



PLAN NOTES: *(Items Identified on Plans as Boxed Items)*

A *Intercept Existing Highway Light Circuit with Temporary Type "A" Highway Light Pullbox and Route Circuit Around Proposed New Highway Light Standard Foundation to Maintain Operation of Existing Highway Lights During Construction of New Highway Lighting System.*

B *Provide Temporary Direct Buried 2" Schedule 80 PVC Conduit, with Temporary 3#2, 1#6 Ground, and Connect to Existing Highway Light Circuit; Conduit to be Buried with a Minimum of 36" Cover to Existing Finish Grade.*

C *Disconnect and Remove Existing Highway Lighting Circuit Conductors and Conduits.*

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

TEMPORARY HIGHWAY LIGHTING CIRCUIT PLAN

SCALE: 1"=20'

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Electrical Engineers

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Andrew I. Miyasato
Signature 2015.02.18

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STATE OF HAWAI'I
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HIGHWAYS DIVISION

TEMPORARY HIGHWAY LIGHTING CIRCUIT PLAN

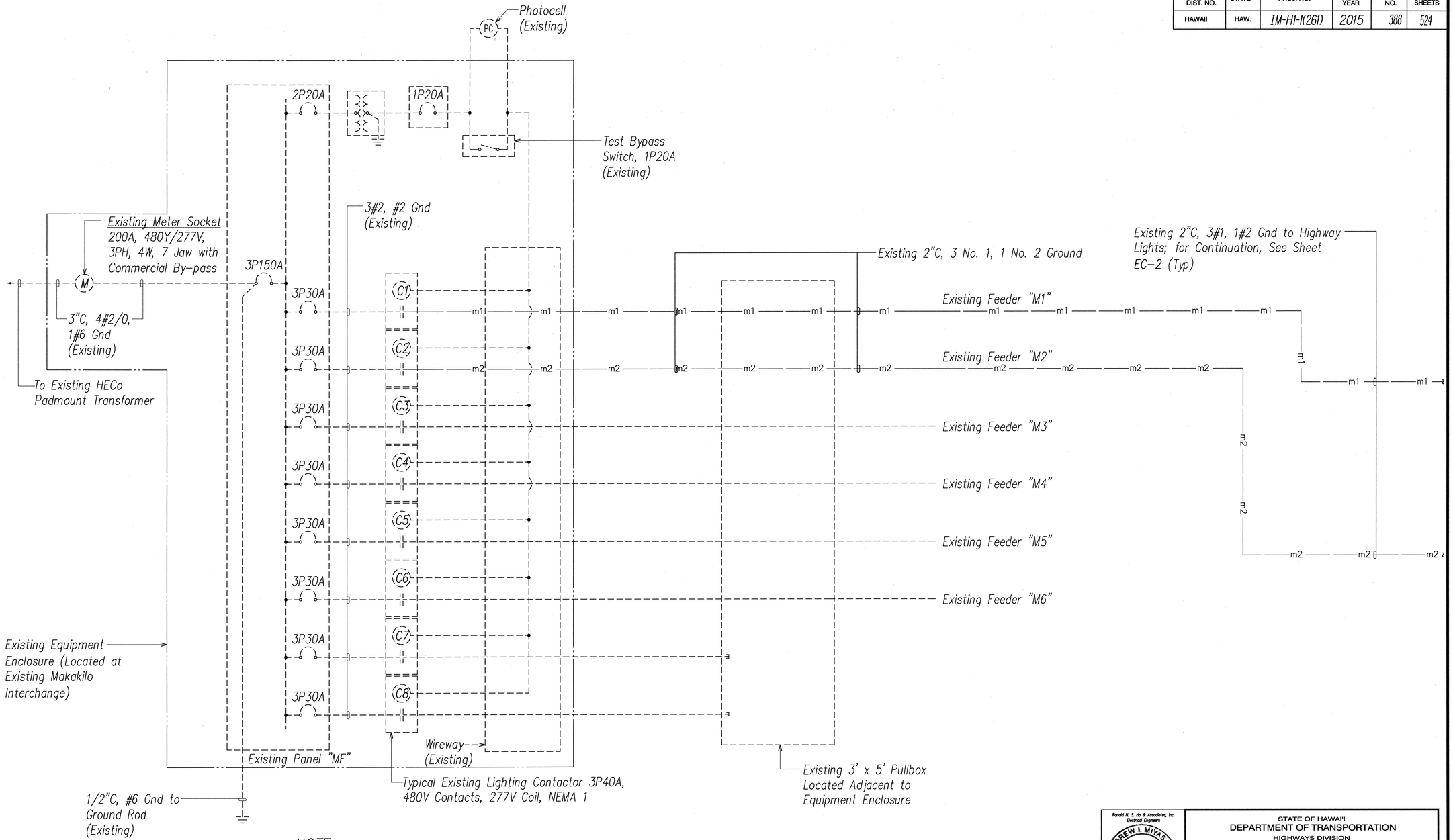
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	388	524



NOTE:

All Equipment and Wiring are Existing.

EXISTING MAKAKILO INTERCHANGE DISTRIBUTION SYSTEM "MF" ONE-LINE DIAGRAM WITH MODIFICATIONS

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

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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

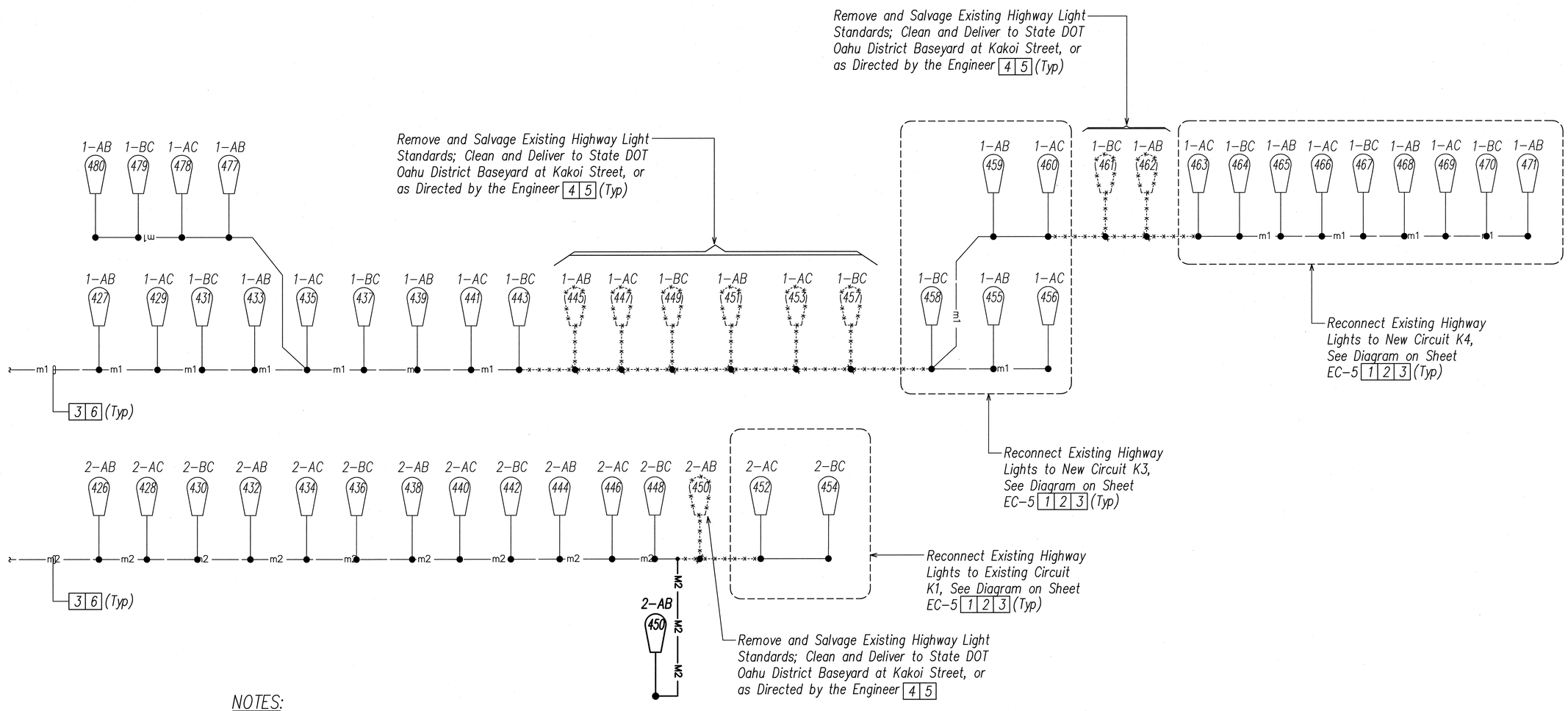
HIGHWAY LIGHTING SYSTEM
"MF" DIAGRAM 1
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-1 OF 161 SHEETS

388

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	389	524



NOTES:

1. Existing Highway Light Standard; Provide New ID Tag. See Highway Light ID Tag Schedule, Sheet EC-14.
2. Existing Highway Light Circuits from Existing Makakilo Interchange Distribution System "MF" to be Rewired to Existing Kapolei Interchange Distribution System "K".
3. Existing 2"C, with Existing 3 No. 1, 1 No. 2 Ground.
4. Remove Existing Highway Light Standard and Salvage.
5. Disconnect and Remove Existing Highway Light Conductors and Conduits.
6. Existing Highway Light Circuits from Existing Makakilo Intechange Distribution System "MF". See Diagram on Sheet EC-1 for Continuation.
7. General Notes:
   a. Not all Highway Light Pullboxes are shown; See Highway Lighting Plans for Conduit and Pullbox Requirements.
   b. For Typical Highway Lighting Standard Wiring Connection Diagram, See Sheet EC-6.

EXISTING MAKAKILO INTERCHANGE HIGHWAY LIGHTING DISTRIBUTION "MF" DIAGRAM WITH MODIFICATIONS

ORIGINAL PLAN
NOTE BOOK
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DATE

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING SYSTEM
"MF" DIAGRAM 2
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

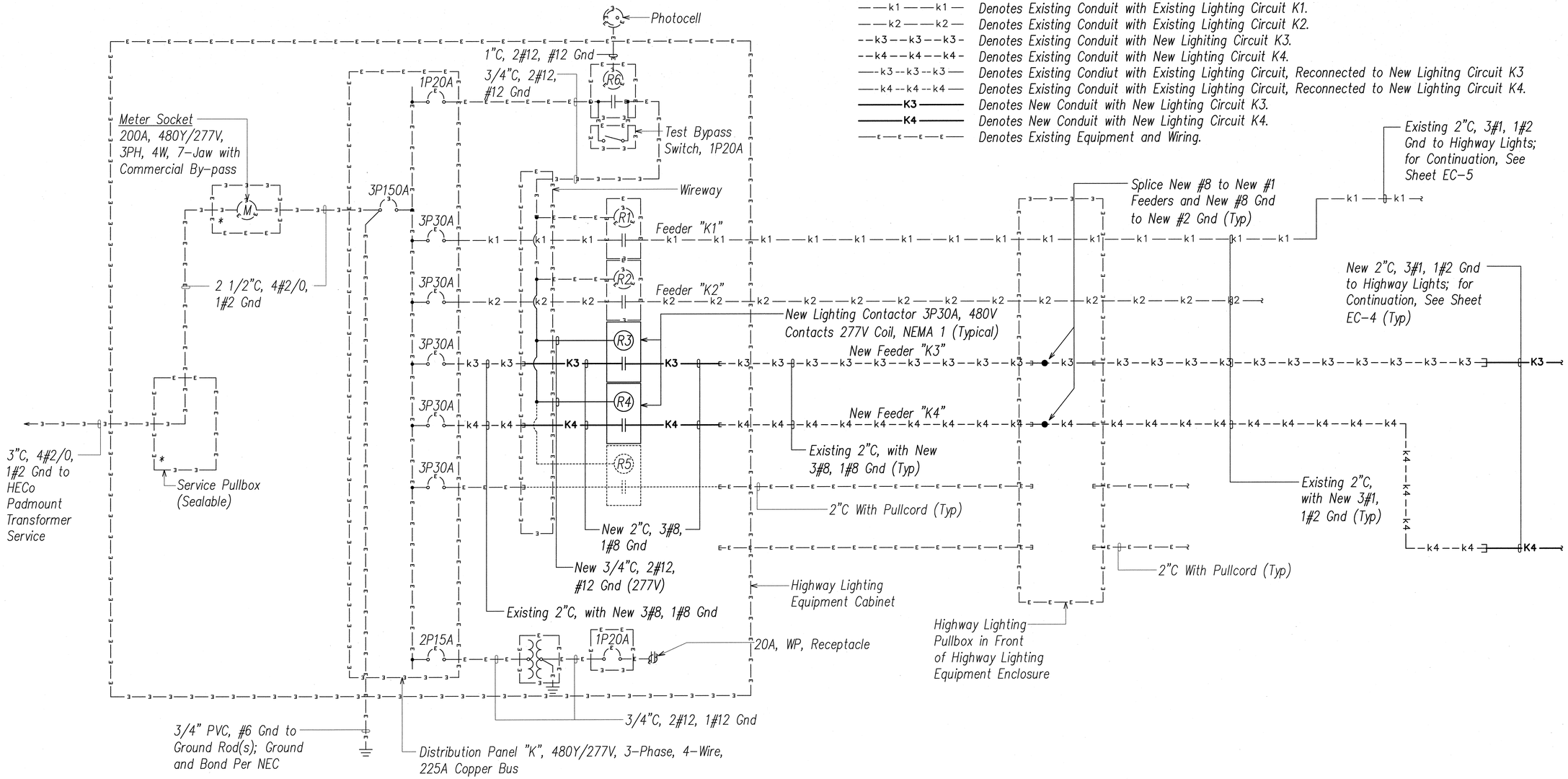
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	390	524

DIAGRAM WIRING SYMBOLS:

Symbol	Description
——k1——k1——	Denotes Existing Conduit with Existing Lighting Circuit K1.
——k2——k2——	Denotes Existing Conduit with Existing Lighting Circuit K2.
--k3--k3--k3-	Denotes Existing Conduit with New Lighiting Circuit K3.
--k4--k4--k4-	Denotes Existing Conduit with New Lighting Circuit K4.
——k3--k3--k3——	Denotes Existing Condiut with Existing Lighting Circuit, Reconnected to New Lighitng Circuit K3
——k4--k4--k4——	Denotes Existing Conduit with Existing Lighting Circuit, Reconnected to New Lighting Circuit K4.
K3	Denotes New Conduit with New Lighting Circuit K3.
K4	Denotes New Conduit with New Lighting Circuit K4.
——ε——ε——ε——	Denotes Existing Equipment and Wiring.



ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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HIGHWAY LIGHTING ONE-LINE DIAGRAM - EXISTING KAPOLEI INTERCHANGE DISTRIBUTION SYSTEM "K"

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM "K" DIAGRAM 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

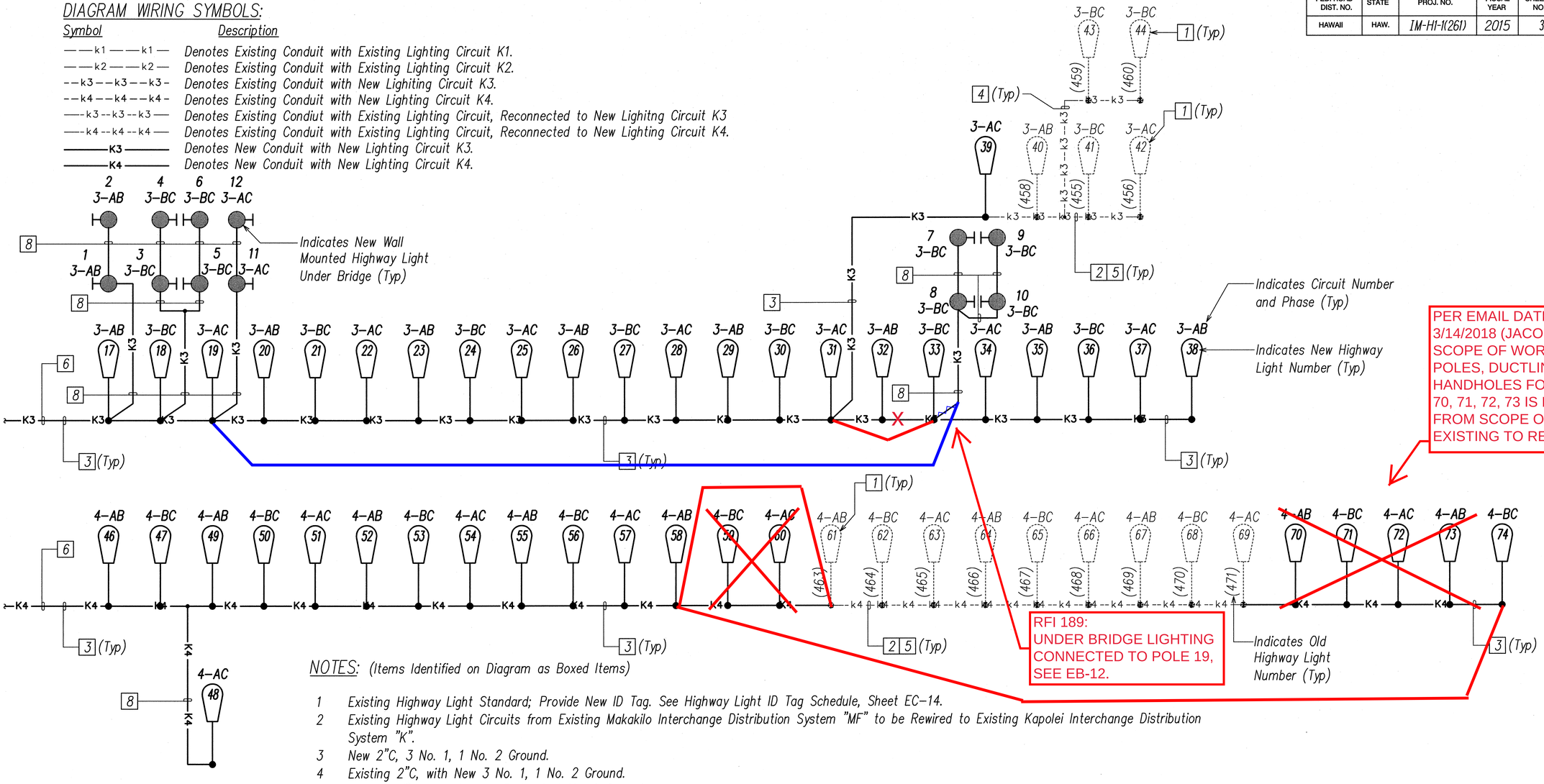
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	391	524

DIAGRAM WIRING SYMBOLS:

Symbol	Description
——k1——k1——	Denotes Existing Conduit with Existing Lighting Circuit K1.
——k2——k2——	Denotes Existing Conduit with Existing Lighting Circuit K2.
--k3--k3--k3-	Denotes Existing Conduit with New Lighiting Circuit K3.
--k4--k4--k4-	Denotes Existing Conduit with New Lighting Circuit K4.
——k3--k3--k3——	Denotes Existing Condiut with Existing Lighting Circuit, Reconnected to New Lighitng Circuit K3
——k4--k4--k4——	Denotes Existing Conduit with Existing Lighting Circuit, Reconnected to New Lighting Circuit K4.
——K3——	Denotes New Conduit with New Lighting Circuit K3.
——K4——	Denotes New Conduit with New Lighting Circuit K4.



PER EMAIL DATED 3/14/2018 (JACOB PLAN): SCOPE OF WORK FOR POLES, DUCTLINE, AND HANDHOLES FOR POLES 70, 71, 72, 73 IS DELETED FROM SCOPE OF WORK; EXISTING TO REMAIN.

RFI 189: UNDER BRIDGE LIGHTING CONNECTED TO POLE 19, SEE EB-12.

NOTES: (Items Identified on Diagram as Boxed Items)

1. Existing Highway Light Standard; Provide New ID Tag. See Highway Light ID Tag Schedule, Sheet EC-14.
2. Existing Highway Light Circuits from Existing Makakilo Interchange Distribution System "MF" to be Rewired to Existing Kapolei Interchange Distribution System "K".
3. New 2"C, 3 No. 1, 1 No. 2 Ground.
4. Existing 2"C, with New 3 No. 1, 1 No. 2 Ground.
5. Existing 2"C, with Existing 3 No. 1, 1 No. 2 Ground.
6. New Highway Light Circuits from New Kapolei Intechange Distribution System "K". See Diagram on Sheet EC-3 for Continuation.
7. Remove Existing Highway Light Standard and Maintain Existing Highway Lighting Circuit Continuity.
8. New 1"C, 2 No. 10, 1 No. 12 Ground.
9. General Notes:

a. Not all Highway Light Pullboxes are shown; See Highway Lighting Plans for Conduit and Pullbox Requirements.
b. For Typical Highway Lighting Standard Wiring Connection Diagram, See Sheet EC-6.
10. Pullboxes and Junction Boxes Are Not Shown on Diagram for Clarity.

ORIGINAL PLAN	SHEET PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
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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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM "K" DIAGRAM 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-4 OF 161 SHEETS

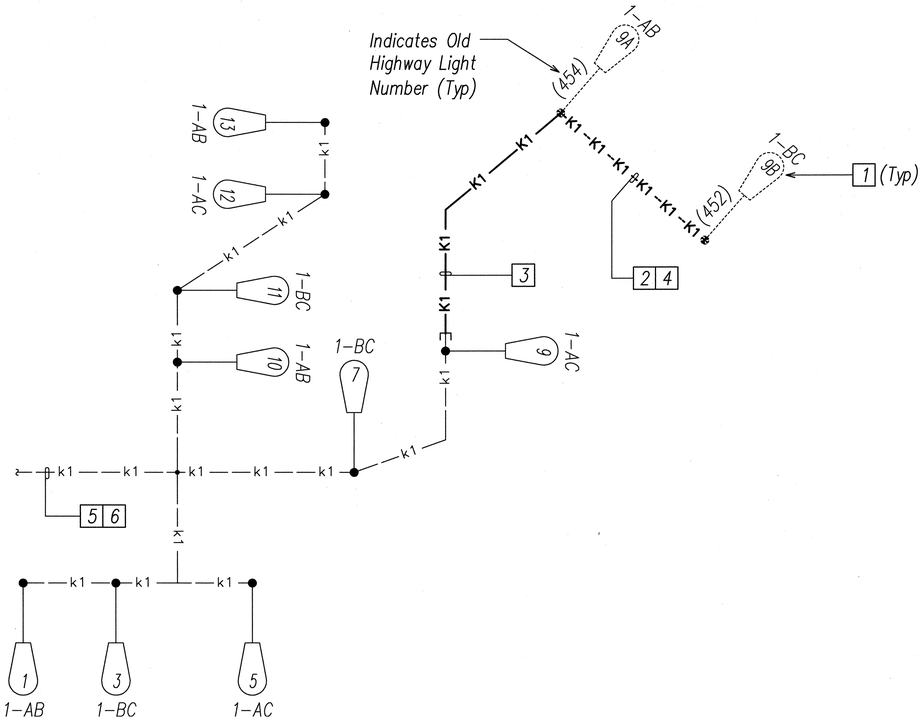
KAPOLEI INTERCHANGE HIGHWAY LIGHTING DISTRIBUTION "K" DIAGRAM 1

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"AS-BUILT"

391

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	392	524



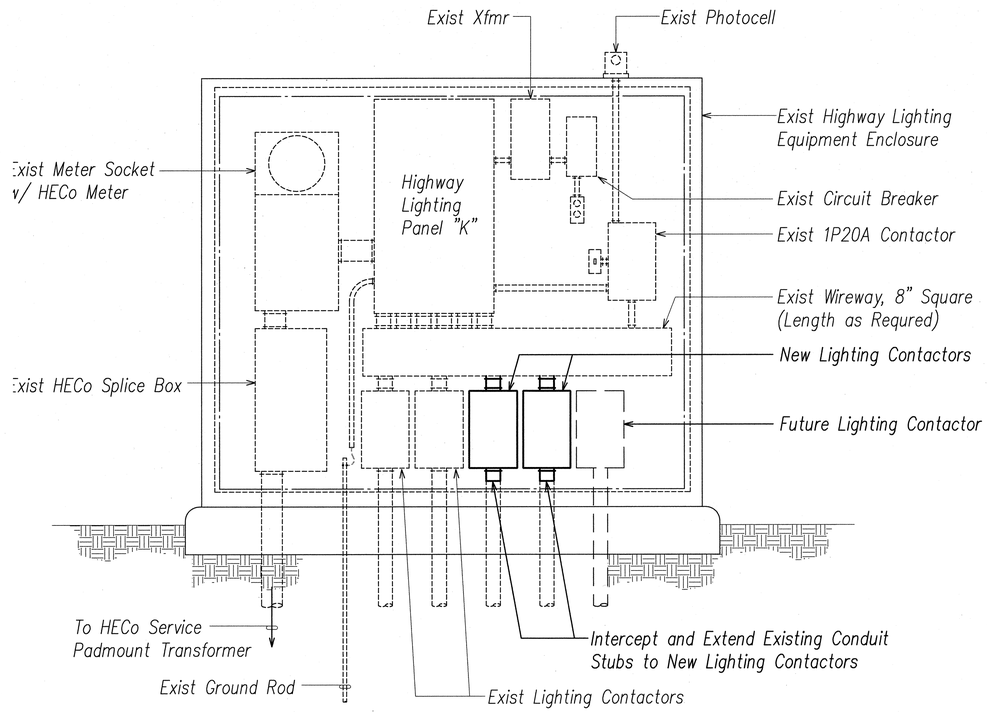


DIAGRAM WIRING SYMBOLS:

Symbol	Description
——k1——k1——	Denotes Existing Conduit with Existing Lighting Circuit K1.
——K1——K1——	Denotes New Conduit with New Lighting Circuit K1.
—K1–K1–K1–K1—	Denotes Existing Conduit with New Lighiting Circuit K1.

NOTES: (Items Identified on Diagram as Boxed Items)

1. Existing Highway Light Standard; Provide New ID Tag. See Highway Light ID Tag Schedule, Sheet EC-14.
2. Existing Highway Light Circuits from Existing Makakilo Interchange Distribution System "MF" to be Rewired to Existing Kapolei Interchange Distribution System "K".
3. New 2"C, 3 No. 1, 1 No. 2 Ground.
4. Existing 2"C, with New 3 No. 1, 1 No. 2 Ground.
5. Existing 2"C, with Existing 3 No. 1, 1 No. 2 Ground.
6. New Highway Light Circuits from New Kapolei Intechange Distribution System "K". See Diagram on Sheet EC-3 for Continuation.

General Notes:

a. Not all Highway Light Pullboxes are shown; See Highway Lighting Plans for Conduit and Pullbox Requirements.
b. For Typical Highway Lighting Standard Wiring Connection Diagram, See Sheet EC-6.
c. Pullboxes and Junction Boxes Are Not Shown on Diagram for Clarity.

KAPOLEI INTERCHANGE HIGHWAY LIGHTING DISTRIBUTION "K" DIAGRAM 2

NOTES:

1. All Equipment Enclosure in Service Equipment Cabinet Shall be NEMA Type 1.

A / EC-5 **EXISTING KAPOLEI INTERCHANGE HIGHWAY LIGHTING DISTRIBUTION SYSTEM "K" ELEVATION WITH MODIFICATIONS**

Not to scale

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM "K" DIAGRAM 3

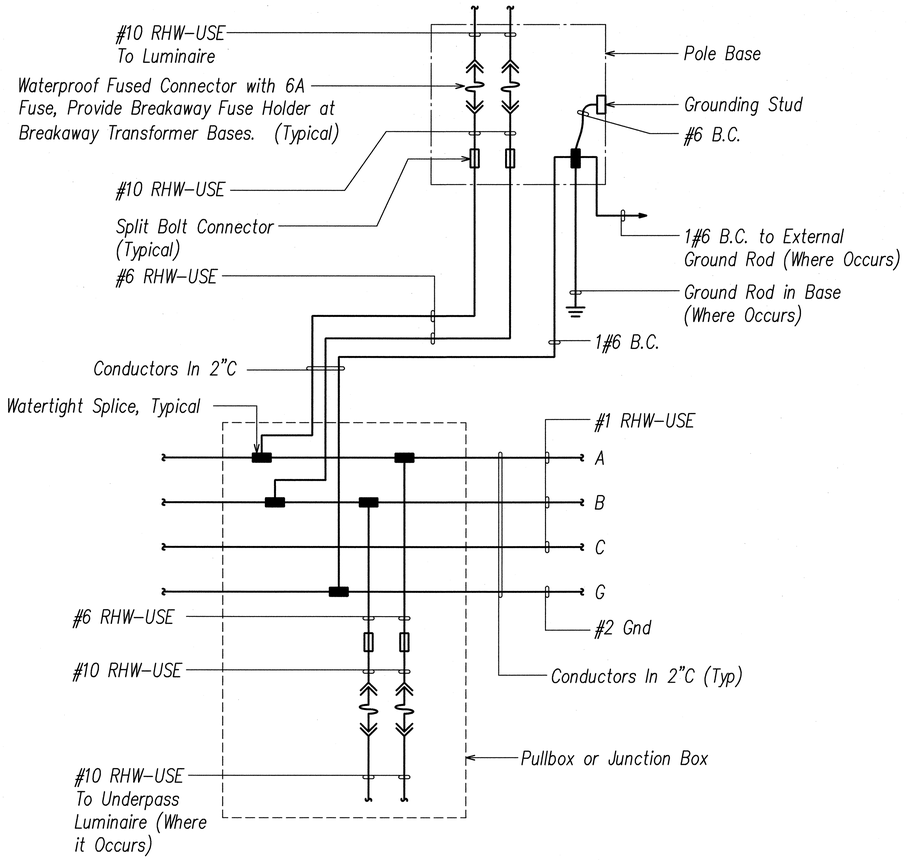
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

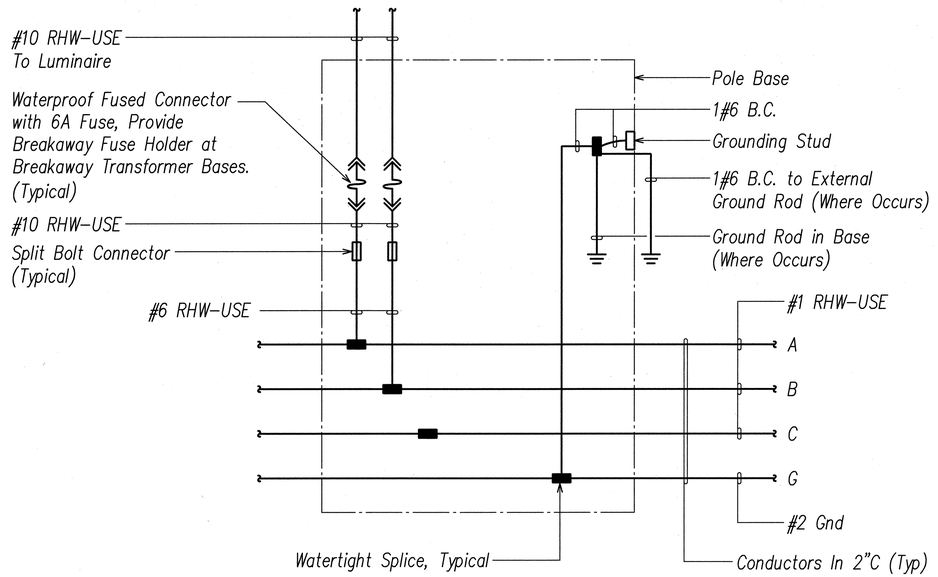
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	393	524



A EC-6 **WIRING CONNECTION DIAGRAM – HIGHWAY LIGHTING STANDARD WHERE PULLBOX INSTALLED**



B EC-6 **WIRING CONNECTION DIAGRAM TYPICAL HIGHWAY LIGHTING STANDARD**

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DATE:

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers
ANDREW L. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
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2015.02.18
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING TYPICAL CONNECTION DIAGRAM

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

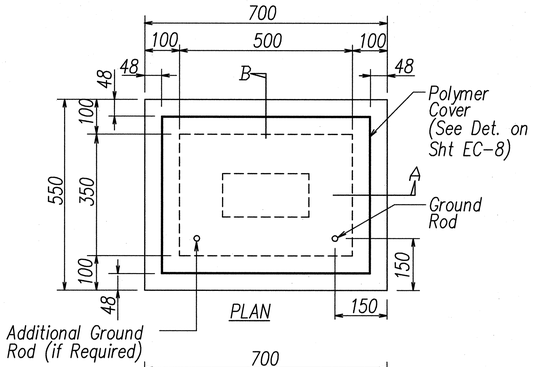
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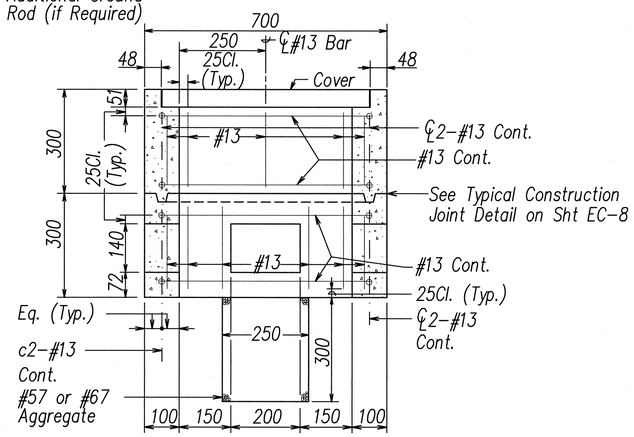
SHEET No. EC-6 OF 161 SHEETS

393

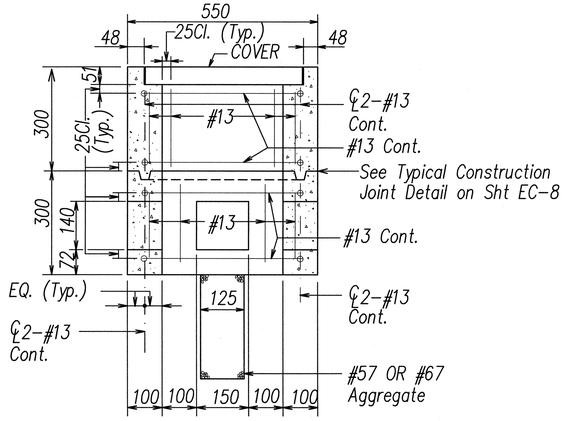
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	394	524





SECTION A–A

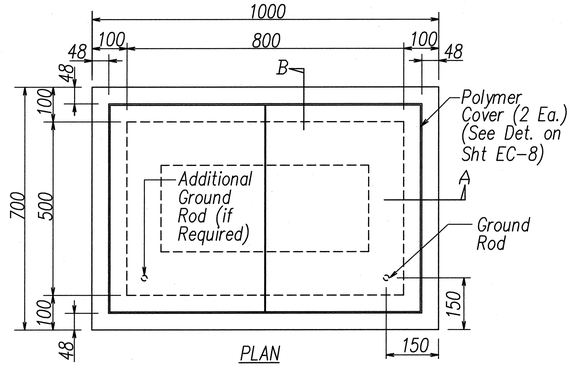


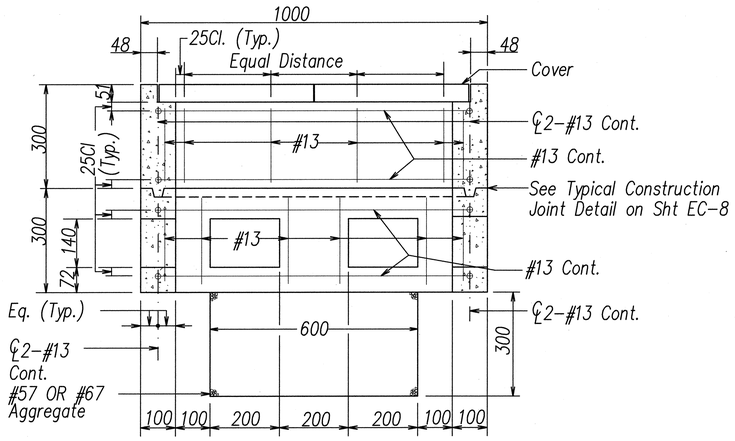
SECTION B–B

NOTE:
See General Notes on Sht EC-8

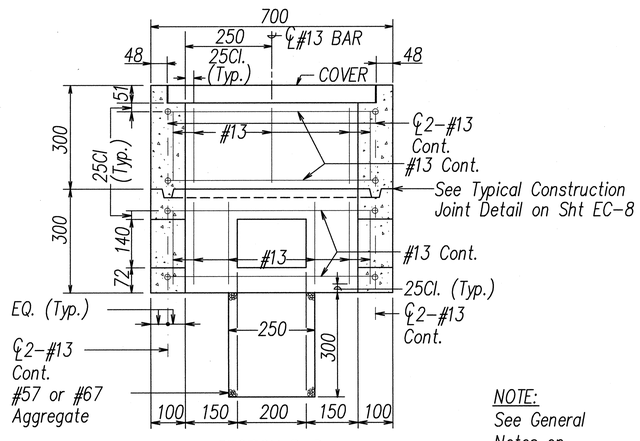
TYPE "A" PULLBOX

NOT TO SCALE





SECTION A–A



SECTION B–B

NOTE:
See General Notes on Sht EC-8

TYPE "B" PULLBOX (OLD TYPE "C")

NOT TO SCALE

All Dimensions on this Sheet are in Millimeters

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	DESIGNED BY	
	QUANTITIES BY	
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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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT & TRAFFIC SIGNAL PULLBOX DETAILS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-7 OF 161 SHEETS

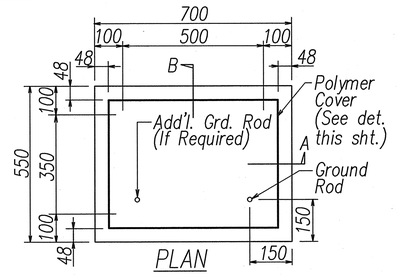
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

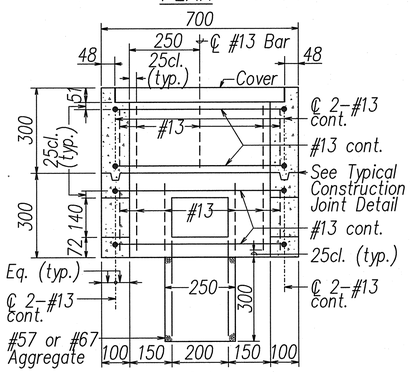
GENERAL NOTES

C.O. 394S-1

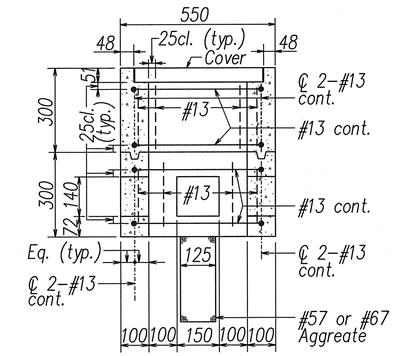
1. Provide A Minimum Of One 16 dia. x 2.5m Copperweld Ground Rod In Each Pullbox. When Directed By The Traffic Signal Inspector/Engineer, Install Additional Ground Rods. Cost of Ground Rods Shall Be Incidental To The Pullboxes.
2. All Pre-Cast Concrete Pullboxes Shall Be Manufactured In Two Pieces.
3. 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



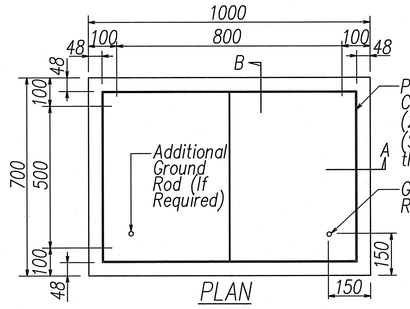
SECTION A-A



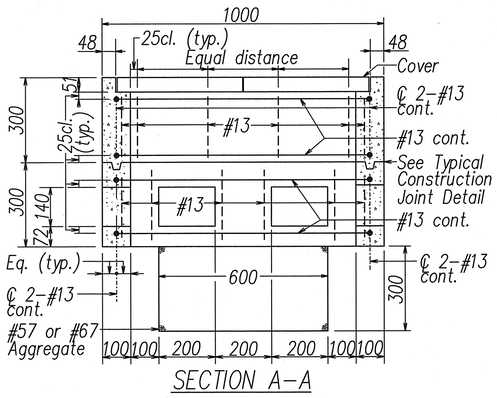
SECTION B-B

TYPE "A" PULLBOX (OLD TYPE "B")

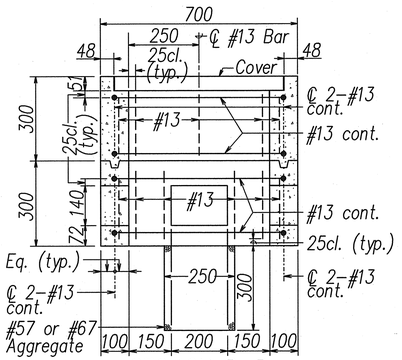
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PLAN



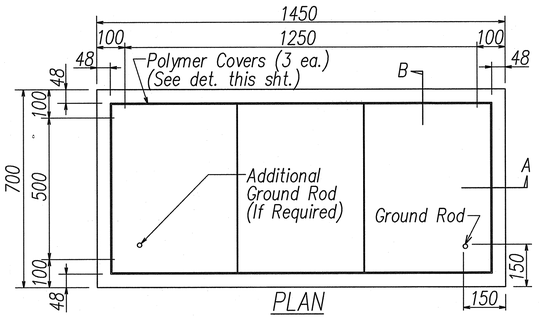
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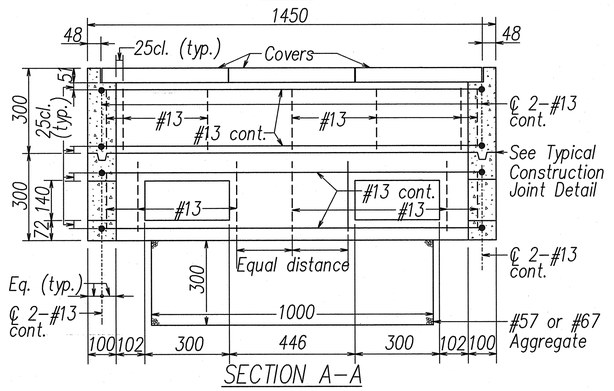
SECTION B-B

TYPE "B" PULLBOX - (OLD TYPE "C")

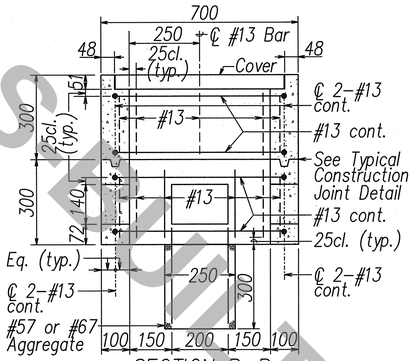
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PLAN



SECTION A-A

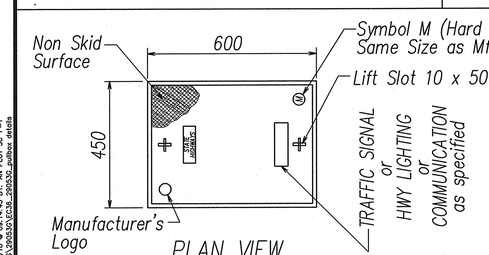


SECTION B-B

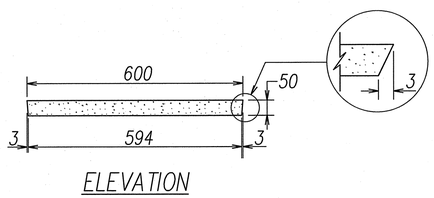
TYPE "C" PULLBOX - (OLD TYPE "D")

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AS-BUILT



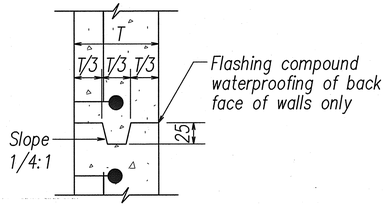
PLAN VIEW



ELEVATION

POLYMER CONCRETE COVER

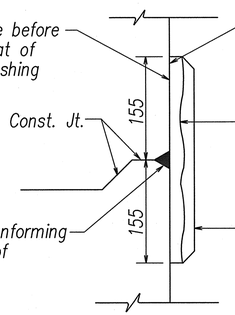
NOT TO SCALE



TYPICAL CONSTRUCTION JOINT DETAIL

NOT TO SCALE

Clean concrete surface before application of first coat of primer coating and flashing compound



Flashing compound conforming to the requirements of ASTM D 4586

TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS

NOT TO SCALE

All Dimensions Are In Millimeters Unless Otherwise Shown

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EC-36 OF 161 SHEETS

DATE	REVISION

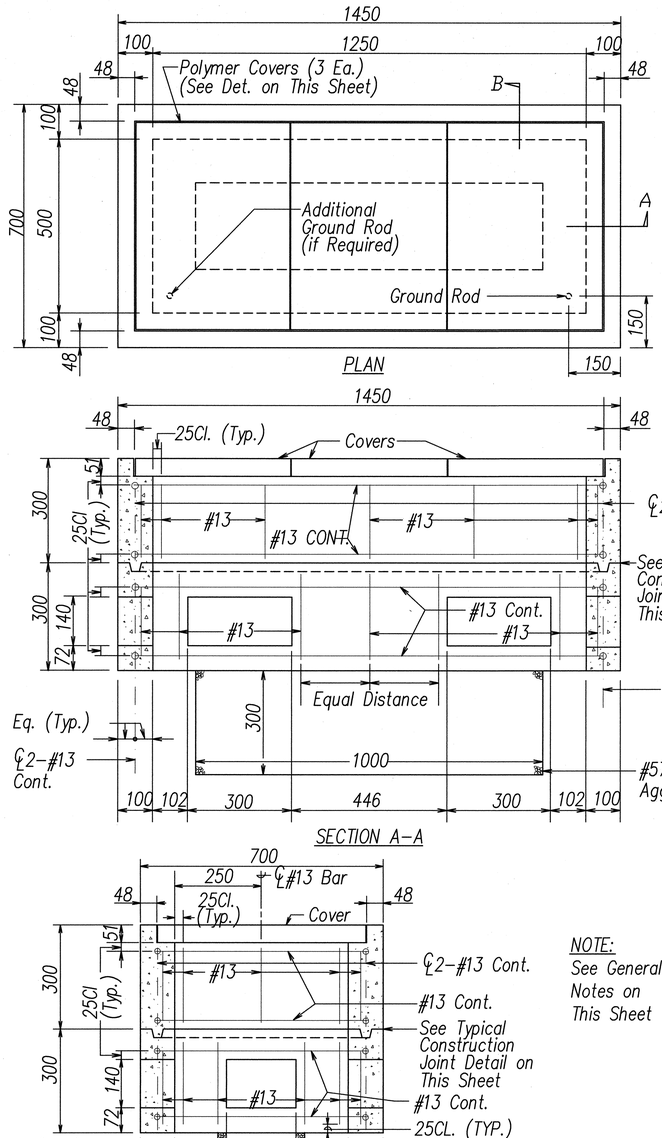
ORIGINAL PLAN
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
NOTE BOOK
No.
DATE

LAST SAVE: 11/16/18 @ 09:14:45 BY: AN PLOT SC: 1"=1"
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"AS-BUILT"

C.O. 394S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	395	524

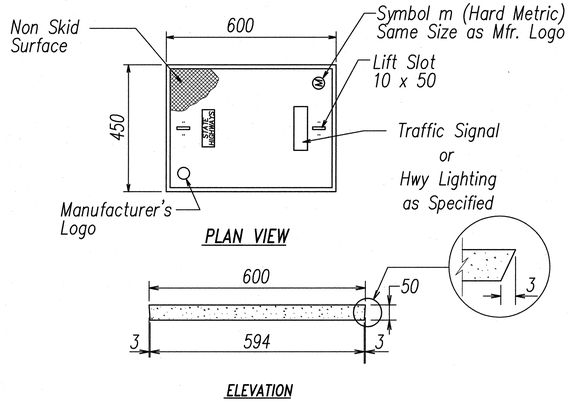


NOTE:
See General
Notes on
This Sheet

TYPE "C" PULLBOX
NOT TO SCALE

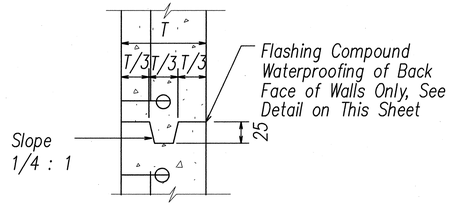
GENERAL NOTES FOR HIGHWAY LIGHT AND TRAFFIC SIGNAL PULLBOX DETAILS ON THIS SHEET AND SHEET EC-7

1. Provide a minimum of one 16mm 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).



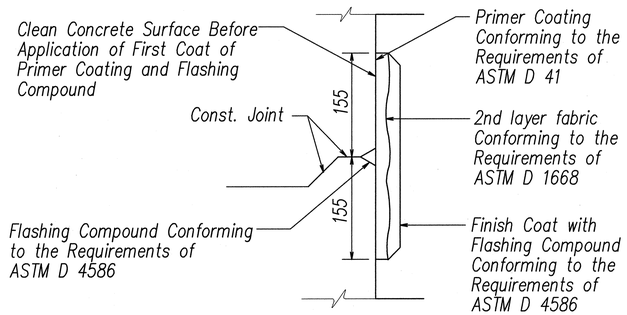
Note: See Highway Lighting and Traffic Signal Pullbox Details on This Sheet and Sht EC-7

POLYMER CONCRETE COVER
NOT TO SCALE



Note: See Highway Lighting and Traffic Signal Pullbox Details on This Sheet and Sht EC-7

TYPICAL CONSTRUCTION JOINT DETAIL
NOT TO SCALE



TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS
NOT TO SCALE

All Dimensions on this Sheet are in Millimeters Unless Otherwise Shown

SURVEY PLOTTED BY
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DATE

ORIGINAL PLAN
NOTE BOOK
No.

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers
ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4540-E
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature
2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHT & TRAFFIC SIGNAL PULLBOX DETAILS 2

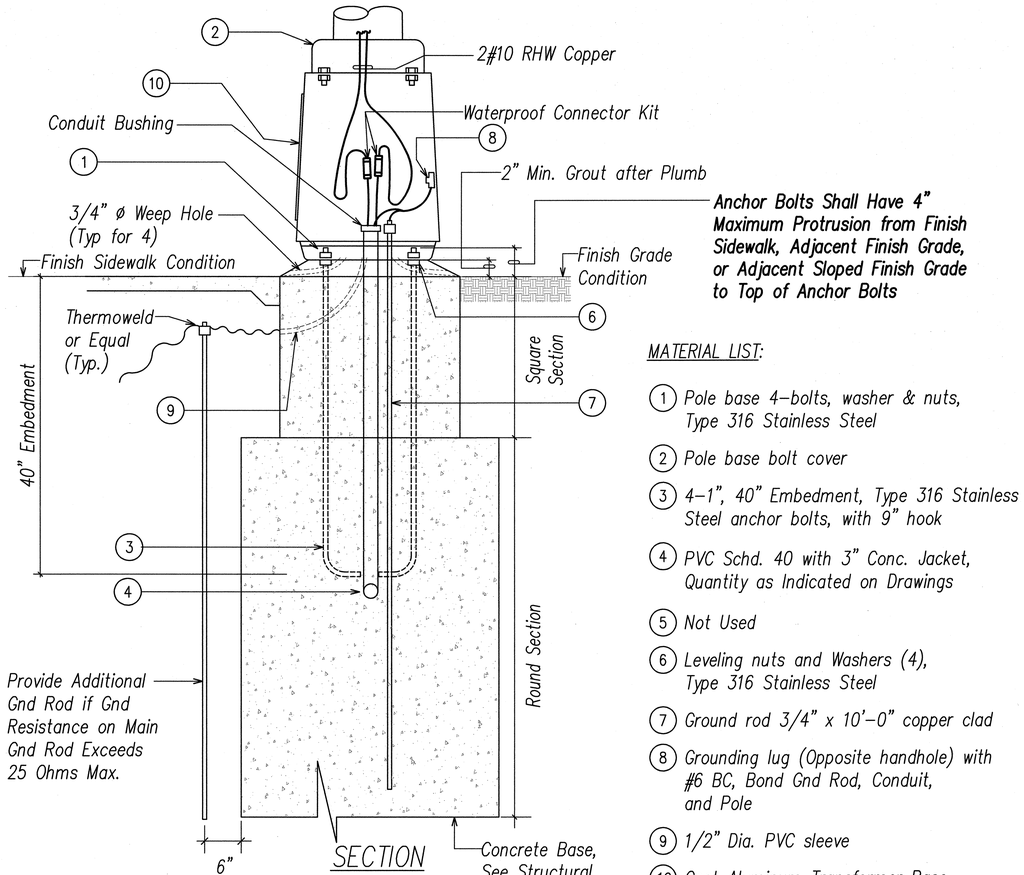
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-8 OF 161 SHEETS

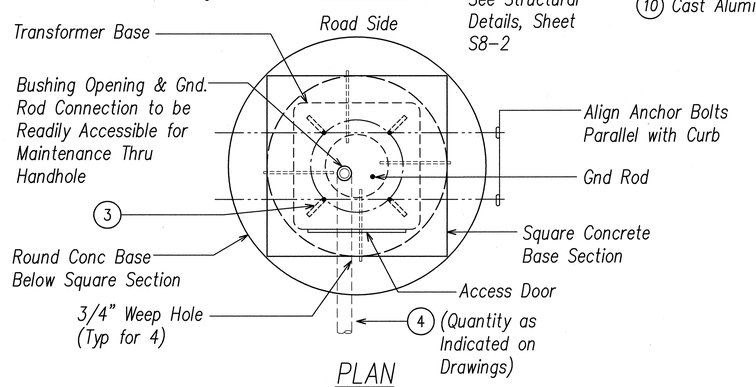
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	396	524



MATERIAL LIST:

1. Pole base 4-bolts, washer & nuts, Type 316 Stainless Steel
2. Pole base bolt cover
3. 4-1", 40" Embedment, Type 316 Stainless Steel anchor bolts, 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), Type 316 Stainless Steel
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

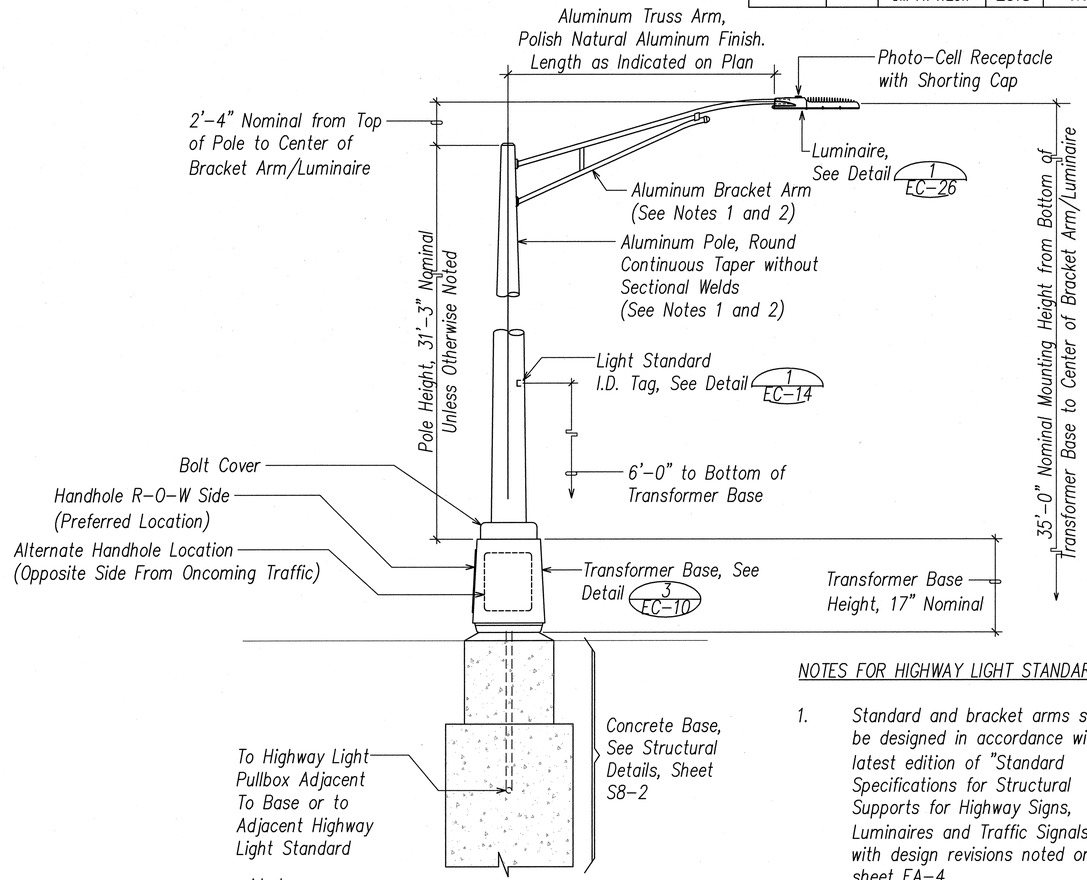


Note:

1. For Additional Highway Light Standard Details, See Standard Plan Sheet TE-47.

1 EC-9 TYPICAL HIGHWAY 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 EA-4.
2. Submit shop drawings and Structural calculations for approval.

Note:

1. For Additional Highway Light Standard Details, See Standard Plan Sheet TE-47.

2 EC-9 TYPICAL HIGHWAY LIGHT STANDARD DETAIL

NOT TO SCALE

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

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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM DETAILS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

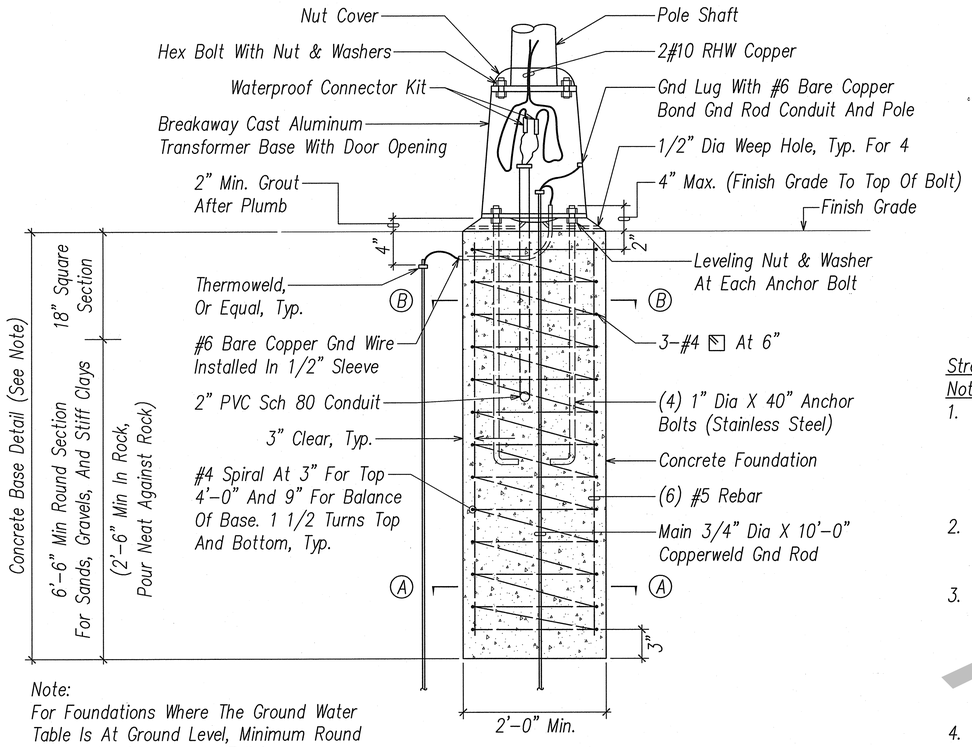
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396

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 396S-1

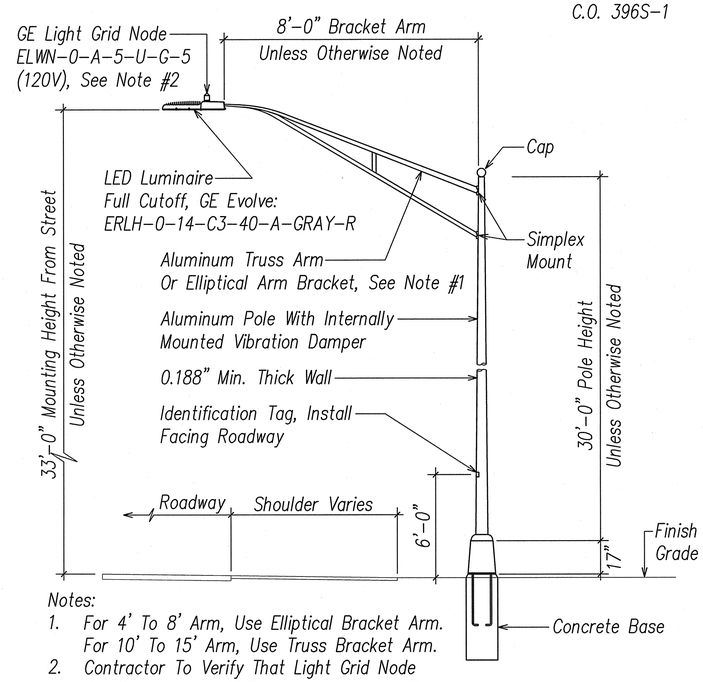


Note:
For Foundations Where The Ground Water Table Is At Ground Level, Minimum Round Section Lengths Are As Follows:
8'-6" For Sand And Gravel
6'-6" For Stiff Clay
2'-6" For Rock

ELEVATION

Street Light Standards
Note To Pole & Bracket Arm Manufacturer

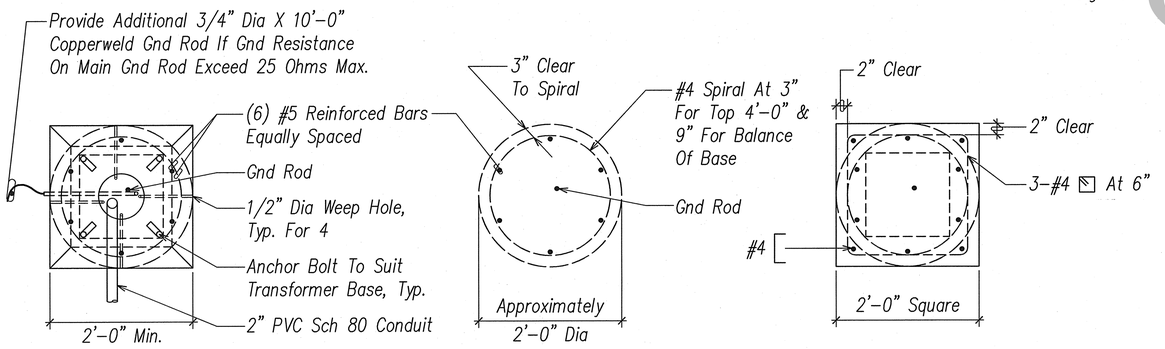
1. Design Shall Be In Accordance With The Latest AASHTO Standard Specifications For The Structural Supports For Highway Signs, Luminaires, And Traffic Signals. The Contractor Shall Submit Catalog Cuts, Shop Drawings And Calculations To The Engineer For Approval.
2. Loads:
   A. Basic Wind Speed = 105 MPH
   B. Recurrence Interval Of 50 Years
3. Materials:
   A. All Connection Bolts Shall Be AASHTO M164 Bolts. All Anchor Bolts Shall Be AASHTO -105 Bolts.
   B. Aluminum Members And Surfaces In Contact With Structural Steel Shall Be Isolated With Neoprene Material As Approved By The Engineer.
4. Size, Length, Diameter And Anchorage Detail Of Anchor Bolts Shall Be As Designed And Recommended By Manufacturer. Use Template While Installing The Anchor Bolts. Anchor Bolts Shall Be Vertical Plumb In Accordance To AASHTO Standard Specifications For The Structural Supports For Highway Signs, Luminaires, And Traffic Signals.



Notes:
1. For 4' To 8' Arm, Use Elliptical Bracket Arm. For 10' To 15' Arm, Use Truss Bracket Arm.
2. Contractor To Verify That Light Grid Node Will Connect To HDOT Highways Network Prior To Ordering.

TYPICAL LIGHT STANDARD INSTALLATION WITH TRANSFORMER BASE

NOT TO SCALE



TYPICAL CONCRETE FOUNDATION AND TRANSFORMER BASE DETAIL

NOT TO SCALE

AS-BUILT

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING DETAILS I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: — Date: November 16, 2018

SHEET No. EC-34 OF 161 SHEETS

DATE	REVISION

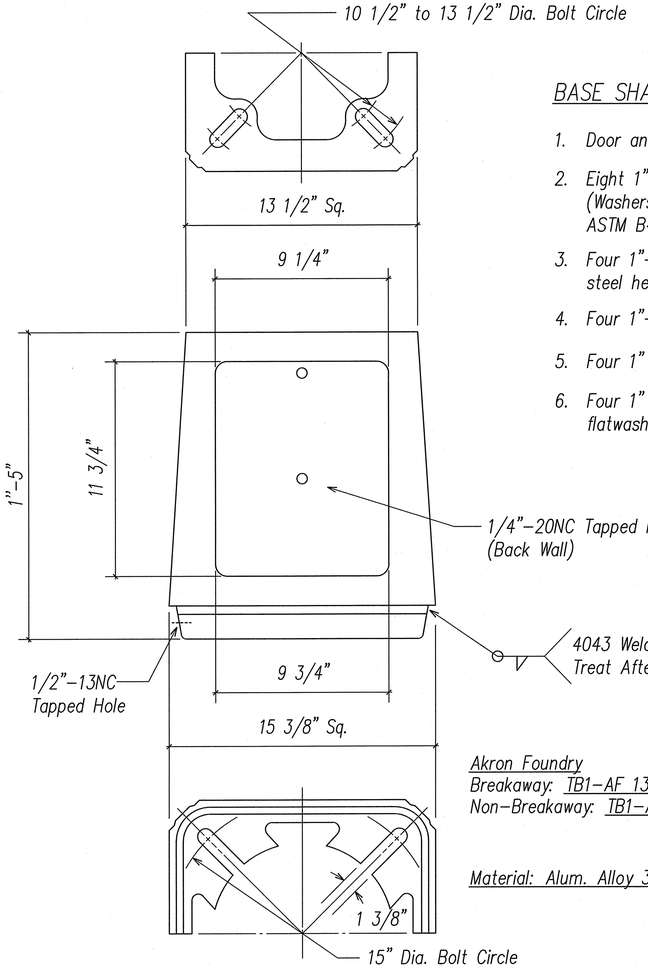
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NOTE BOOK | No.

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C.O. 396S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 396S-2



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

BREAKAWAY AND NON-BREAKAWAY TRANSFORMER BASE DETAIL

NOT TO SCALE

AS-BUILT

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

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STEVEN H. SAKAI
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No. 7637-E
HAWAII, U.S.A.

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STATE HIGHWAY LIGHTING DETAILS II

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

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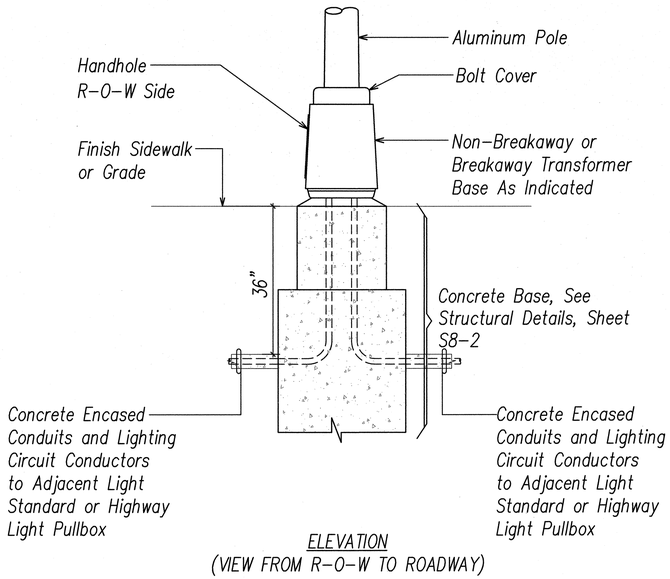
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DATE	REVISION

"AS-BUILT"

C.O. 396S-2

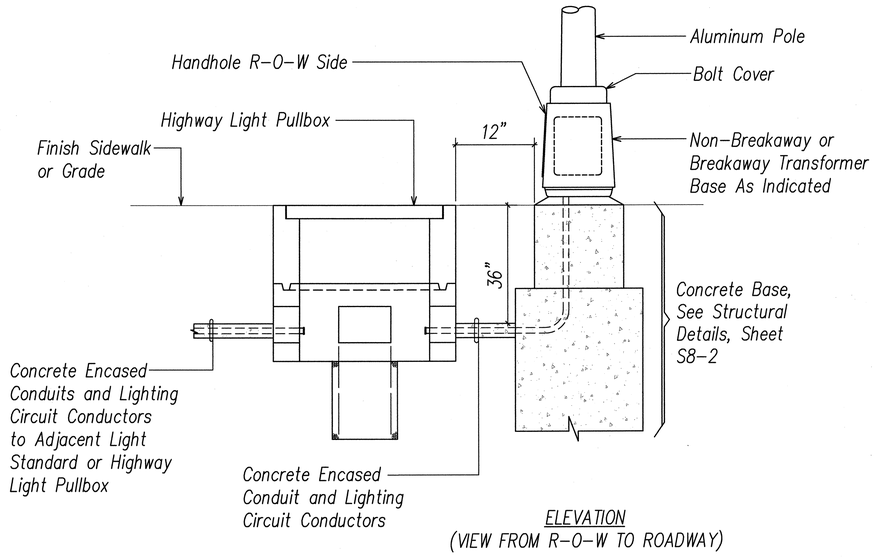
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	397	524



ELEVATION
(VIEW FROM R-O-W TO ROADWAY)

1 EC-10 HIGHWAY LIGHT STANDARD WITHOUT PULLBOX DETAIL

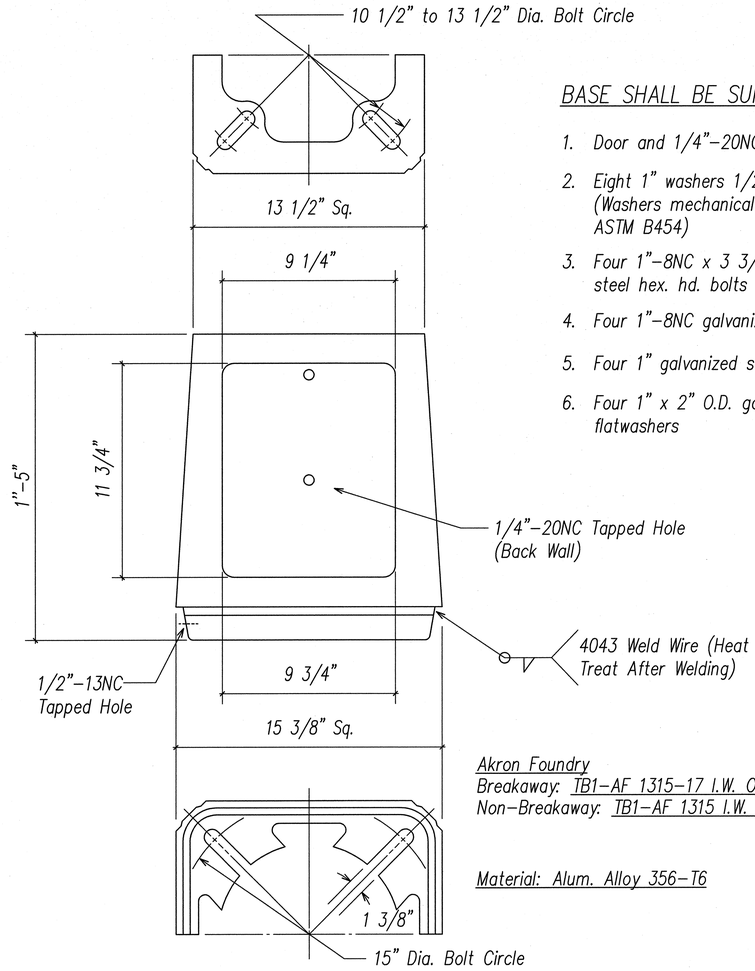
NOT TO SCALE



ELEVATION
(VIEW FROM R-O-W TO ROADWAY)

2 EC-10 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
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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

3 EC-10 BREAKAWAY AND NON-BREAKAWAY TRANSFORMER BASE DETAIL

NOT TO SCALE

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM DETAILS 2

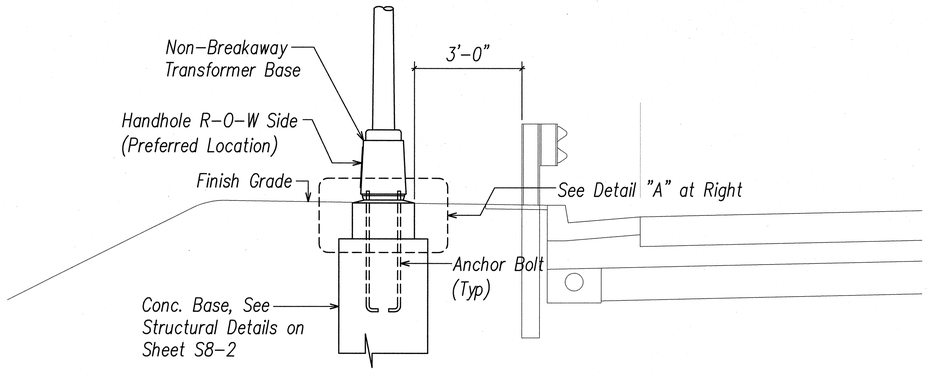
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-10 OF 161 SHEETS

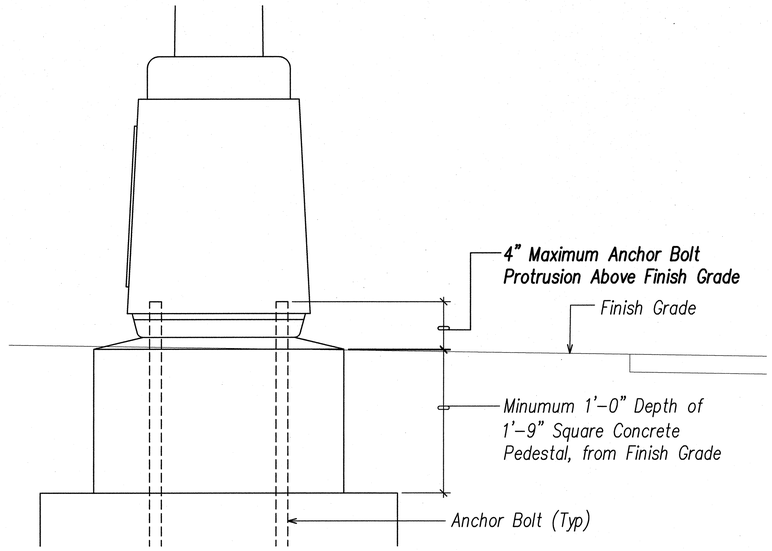
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	398	524



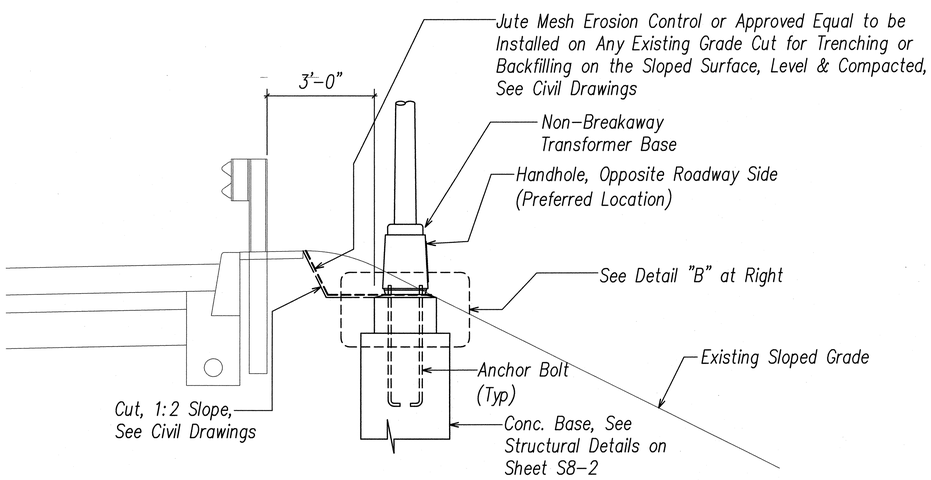
1 / EC-11 **HIGHWAY LIGHT STANDARD LOCATION DETAIL BEHIND GUARDRAIL (BGR) LOCATION**

Not To Scale



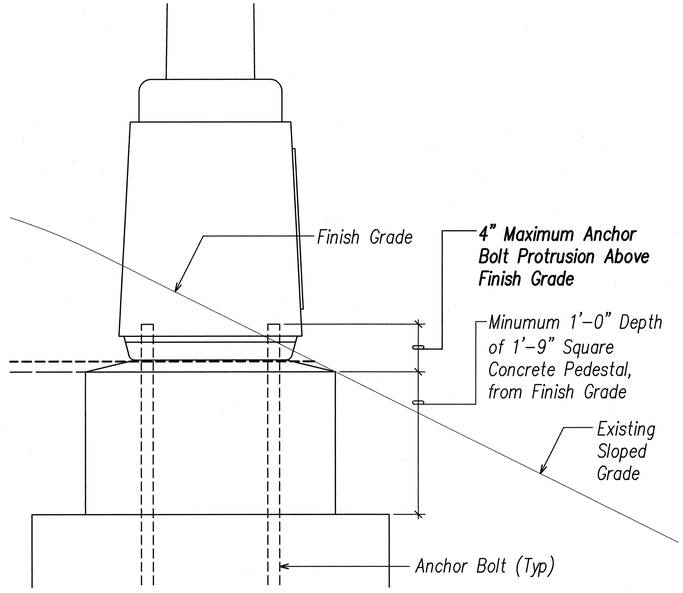
DETAIL "A"

Not To Scale



2 / EC-11 **HIGHWAY LIGHT STANDARD LOCATION DETAIL BEHIND GUARDRAIL / IN DOWN SLOPING GRADE (BGR/IDG) LOCATION**

Not To Scale



DETAIL "B"

Not To Scale

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	DESIGNED BY	
No.	QUANTITIES BY	
	CHECKED BY	

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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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM DETAILS 3

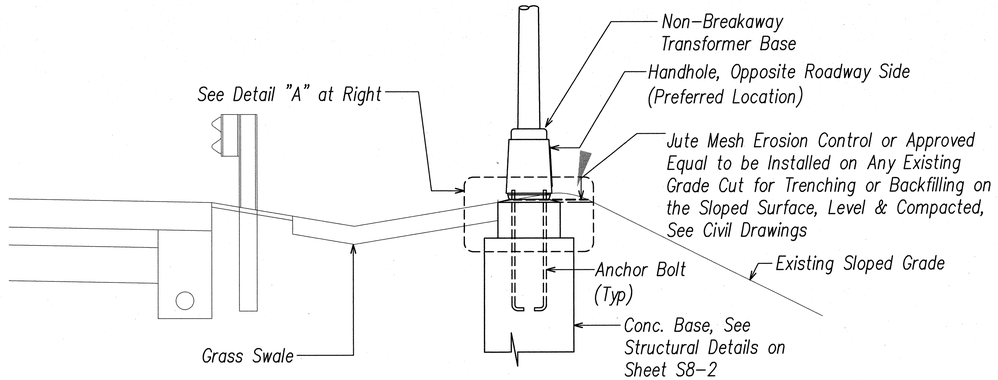
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-11 OF 161 SHEETS

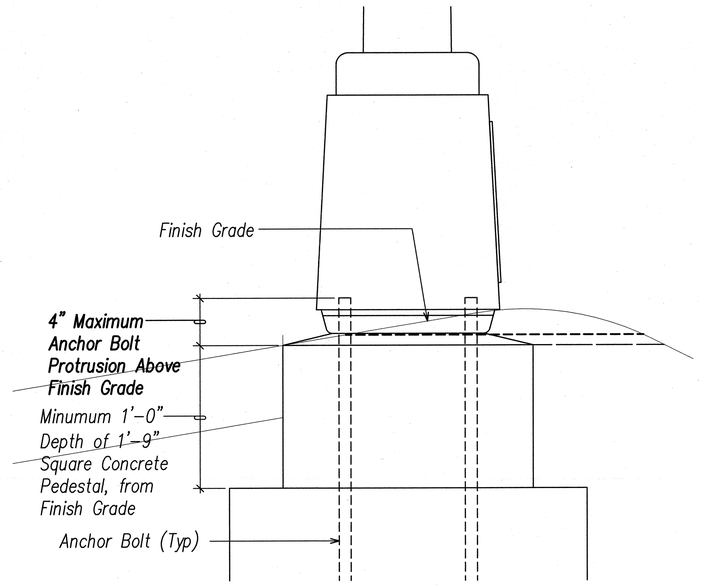
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	399	524



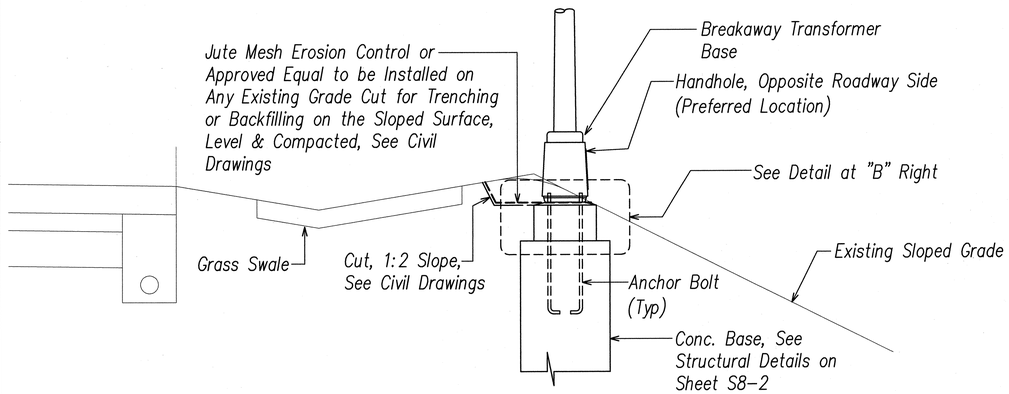
1 EC-12 **HIGHWAY LIGHT STANDARD LOCATION DETAIL BEHIND GUARDRAIL / BEHIND GRASS SWALE (BGR/BGS) LOCATION**

Not To Scale



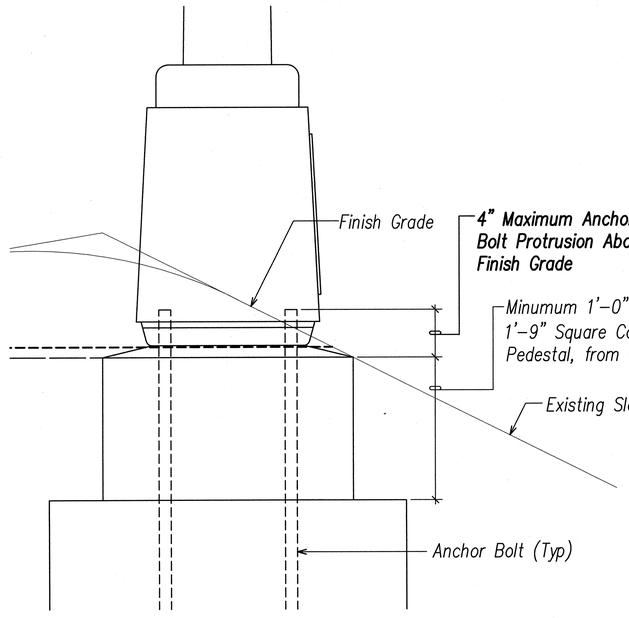
DETAIL "A"

Not To Scale



2 EC-12 **HIGHWAY LIGHT STANDARD LOCATION DETAIL BEHIND GRASS SLOPE / IN DOWN SLOPING GRADE (BGS/IDG) LOCATION**

Not To Scale



DETAIL "B"

Not To Scale

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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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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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING SYSTEM DETAILS 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

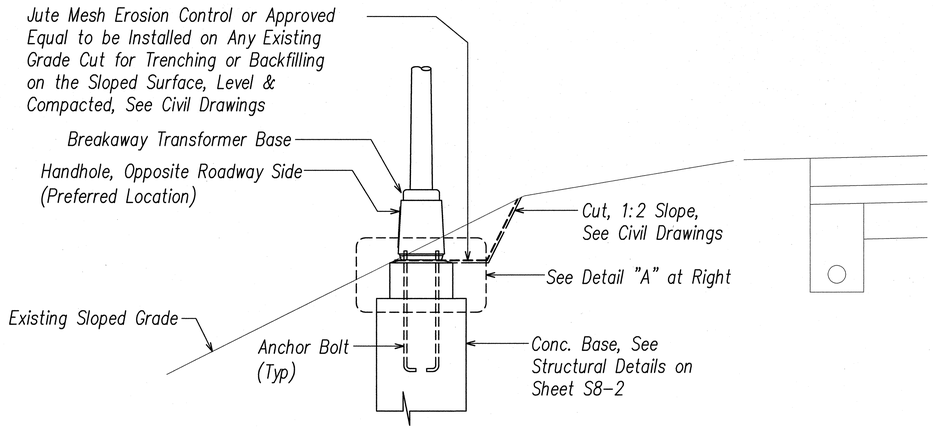
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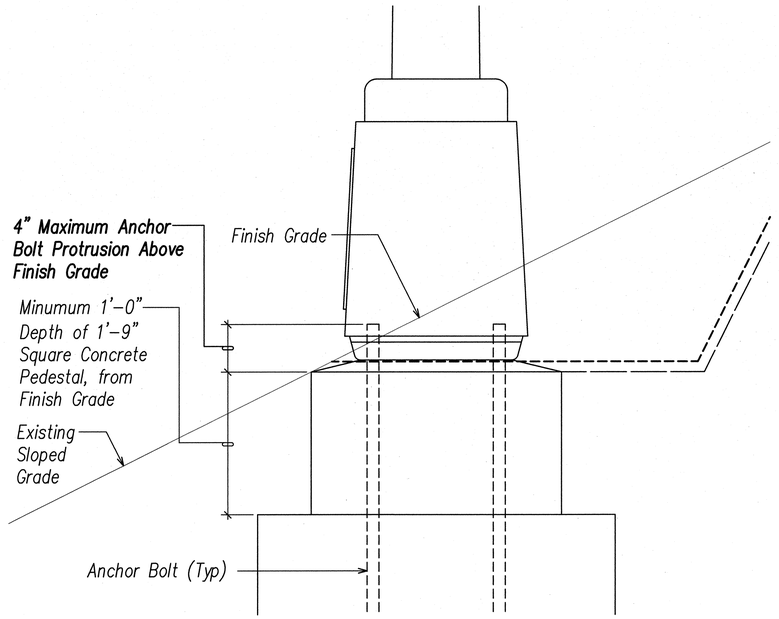
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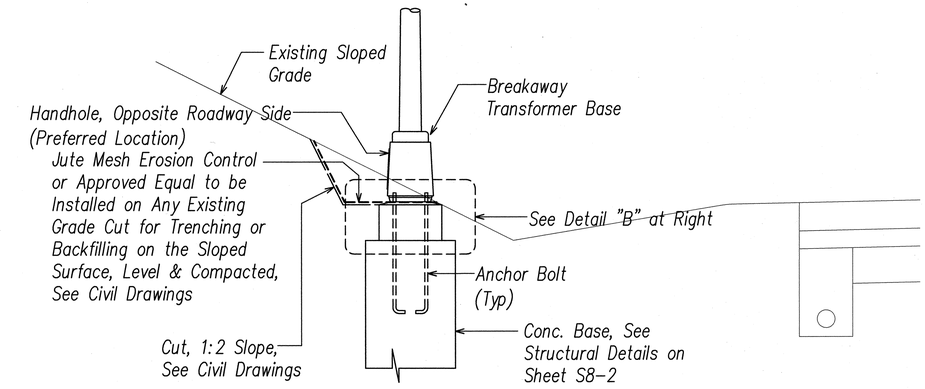
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	400	524



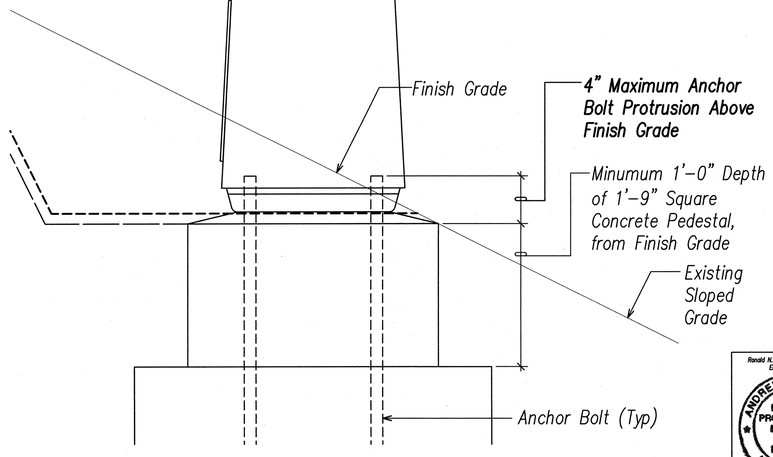
1 EC-13 **HIGHWAY LIGHT STANDARD LOCATION DETAIL BEHIND PAVED SHOULDER / IN DOWN SLOPING GRADE (BPS/IDG) LOCATION**
Not To Scale



DETAIL "A"
Not To Scale



2 EC-13 **HIGHWAY LIGHT STANDARD LOCATION DETAIL BEHIND PAVED SHOULDER / IN UP SLOPING GRADE (BPS/IUG) LOCATION**
Not To Scale



DETAIL "B"
Not To Scale

ORIGINAL PLAN | SURVEY PLOTTED BY | DRAWN BY | TRACED BY | DESIGNED BY | QUANTITIES BY | CHECKED BY | DATE
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HIGHWAY LIGHTING SYSTEM DETAILS 5

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-13 OF 161 SHEETS

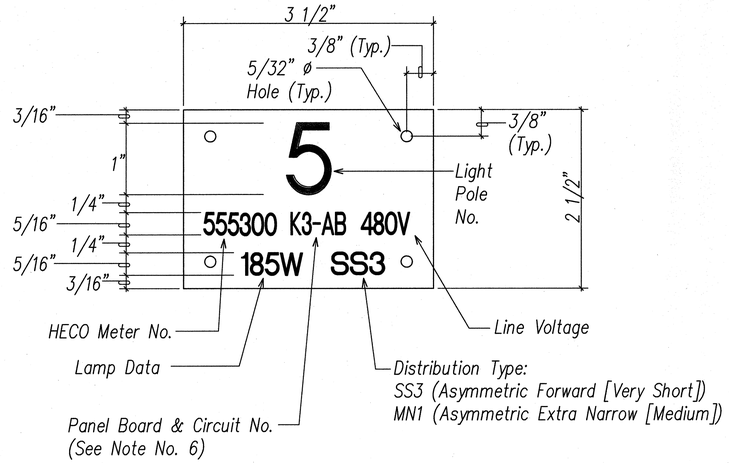
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	401	524

HIGHWAY LIGHT ID TAG SCHEDULE

ID TAG ITEMS						ID TAG ITEMS					
LIGHT POLE NO.	HECO METER NO.	CIRCUIT NO. & PHASE	LINE VOLTAGE	LAMP DATA	DISTRIBUTION	LIGHT POLE NO.	HECO METER NO.	CIRCUIT NO.	LINE VOLTAGE	LAMP DATA	DISTRIBUTION
17	555300	See Plans	480V	185W	SS3	57	555300	See Plans	480V	185W	MN1
18	555300	See Plans	480V	185W	SS3	58	555300	See Plans	480V	185W	MN1
19	555300	See Plans	480V	185W	SS3	59	555300	See Plans	480V	185W	SS3
20	555300	See Plans	480V	185W	SS3	60	555300	See Plans	480V	185W	SS3
21	555300	See Plans	480V	185W	MN1	61	555300	See Plans	480V	185W	SS3
22	555300	See Plans	480V	185W	MN1	62	555300	See Plans	480V	185W	SS3
23	555300	See Plans	480V	185W	MN1	63	555300	See Plans	480V	185W	SS3
24	555300	See Plans	480V	185W	MN1	64	555300	See Plans	480V	185W	SS3
25	555300	See Plans	480V	185W	MN1	65	555300	See Plans	480V	185W	SS3
26	555300	See Plans	480V	185W	MN1	66	555300	See Plans	480V	185W	SS3
27	555300	See Plans	480V	185W	MN1	67	555300	See Plans	480V	185W	SS3
28	555300	See Plans	480V	185W	MN1	68	555300	See Plans	480V	185W	SS3
29	555300	See Plans	480V	185W	MN1	69	555300	See Plans	480V	185W	SS3
30	555300	See Plans	480V	185W	MN1	70	555300	See Plans	480V	185W	SS3
31	555300	See Plans	480V	185W	MN1	71	555300	See Plans	480V	185W	SS3
32	555300	See Plans	480V	185W	MN1	72	555300	See Plans	480V	185W	SS3
33	555300	See Plans	480V	185W	SS3	73	555300	See Plans	480V	185W	SS3
34	555300	See Plans	480V	185W	SS3	74	555300	See Plans	480V	185W	SS3
35	555300	See Plans	480V	185W	SS3						
36	555300	See Plans	480V	185W	SS3						
37	555300	See Plans	480V	185W	SS3						
38	555300	See Plans	480V	185W	SS3						
39	555300	See Plans	480V	185W	SS3						
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43	555300	See Plans	480V	185W	SS3						
44	555300	See Plans	480V	185W	SS3						
45	555300	See Plans	480V	185W	SS3						
46	555300	See Plans	480V	185W	SS3						
47	555300	See Plans	480V	185W	MN1						
48	555300	See Plans	480V	185W	SS3						
49	555300	See Plans	480V	185W	MN1						
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51	555300	See Plans	480V	185W	MN1						
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53	555300	See Plans	480V	185W	MN1						
54	555300	See Plans	480V	185W	MN1						
55	555300	See Plans	480V	185W	MN1						
56	555300	See Plans	480V	185W	MN1						

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.
3. Provide New Highway Light I.D. Tag on Existing Highway Lights Which Are to Remain and Be Reconnected to New Highway Light Circuit.



NOTES:
1. Use 3 ply laminated flexible plastic, black–white–black. thickness: black cap sheet–0.010", white base sheet–0.052", black base sheet–0.010".
2. Light pole number size shall be 1" high and engraved 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. Light Numbers shall be obtained from the State. Use Alphabet Suffix to designate lights mounted on the same pole (e.g. 123A & 123).
8. Contractor to verify all items of I.D. tag with State D.O.T. prior to fabrication.

1 / EC-14 HIGHWAY LIGHT POLE ID TAG DETAIL FOR METERED SYSTEM
NOT TO SCALE

AS-BUILT

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	QUANTITIES BY	
	CHECKED BY	

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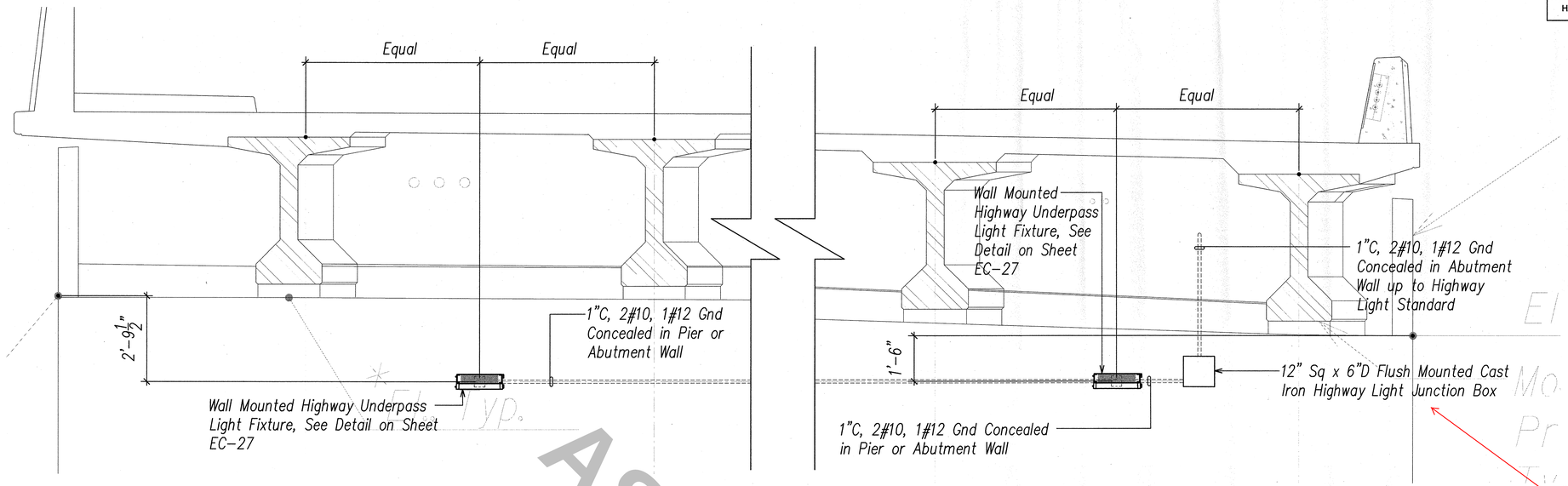
STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING ID TAG DETAILS
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-14 OF 161 SHEETS

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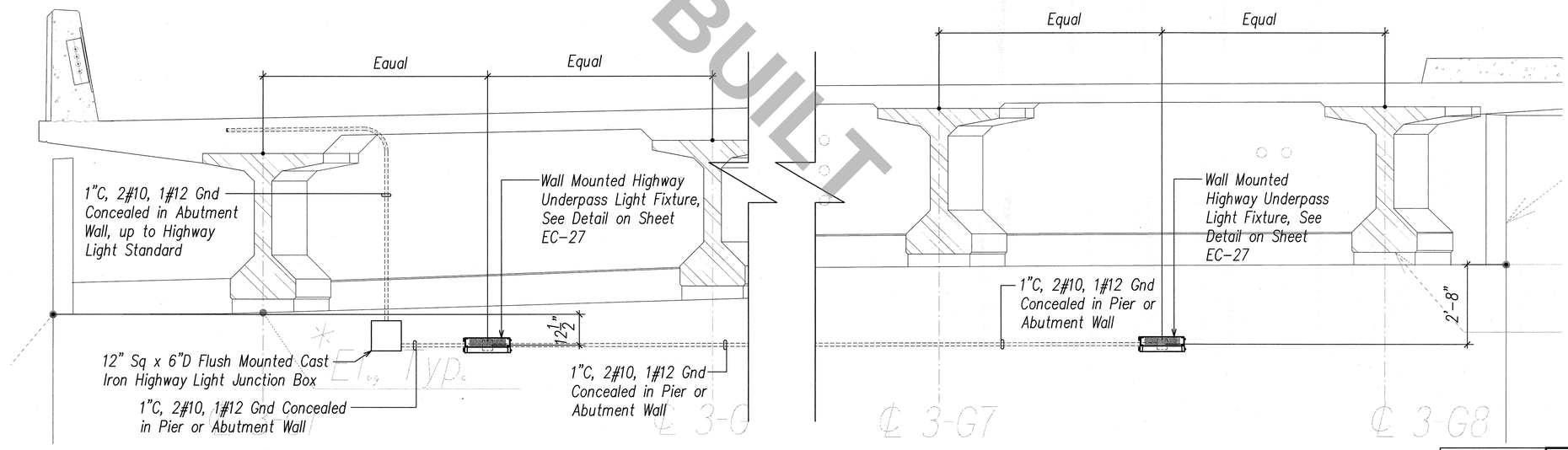
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	402	524



1 EC-15 **ABUTMENT WALL NO. 1 MAKAI ELEVATION**

RFI 160:
CAST JUNCTION BOXES TO BE SURFACE MOUNTED DUE TO STEEL CONFLICT, TYPICAL.



2 EC-15 **ABUTMENT WALL NO. 2 MAUKA ELEVATION**

2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"
GRAPHIC SCALE

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
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UNDERPASS HIGHWAY LIGHTING SYSTEM INSTALLATION DETAILS I

SCALE: 1/2"=1'-0"

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UNDERPASS HIGHWAY LIGHTING DETAILS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

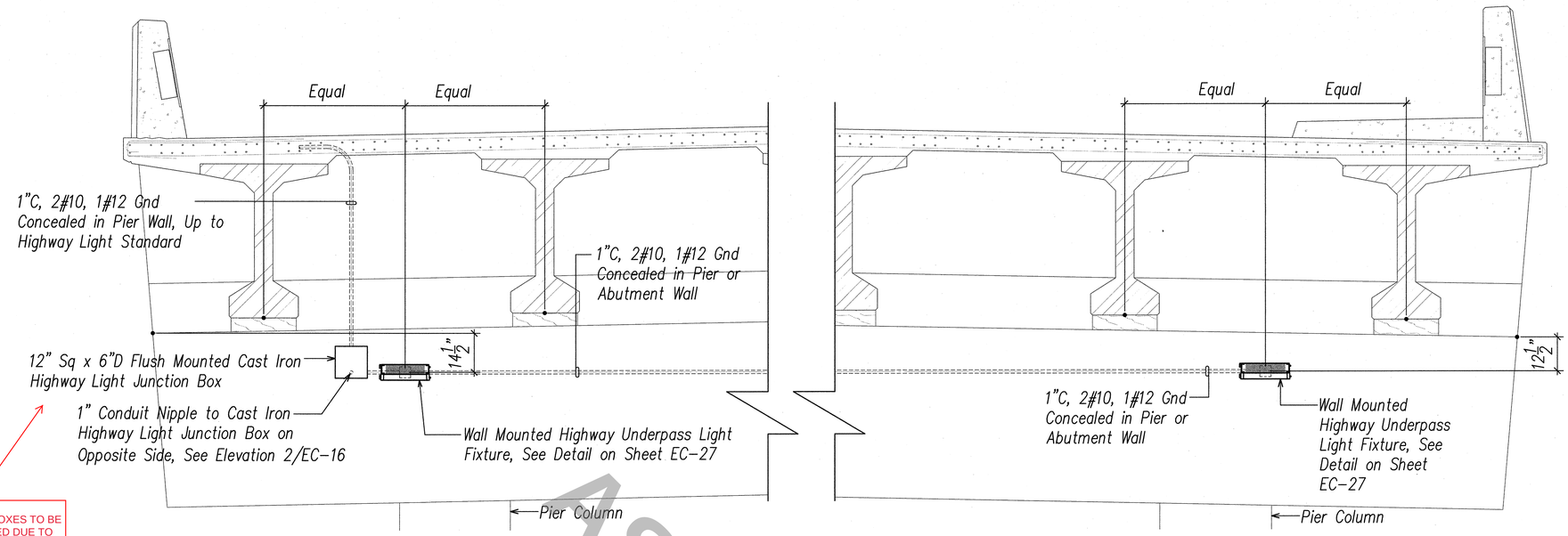
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SHEET No. EC-15 OF 161 SHEETS

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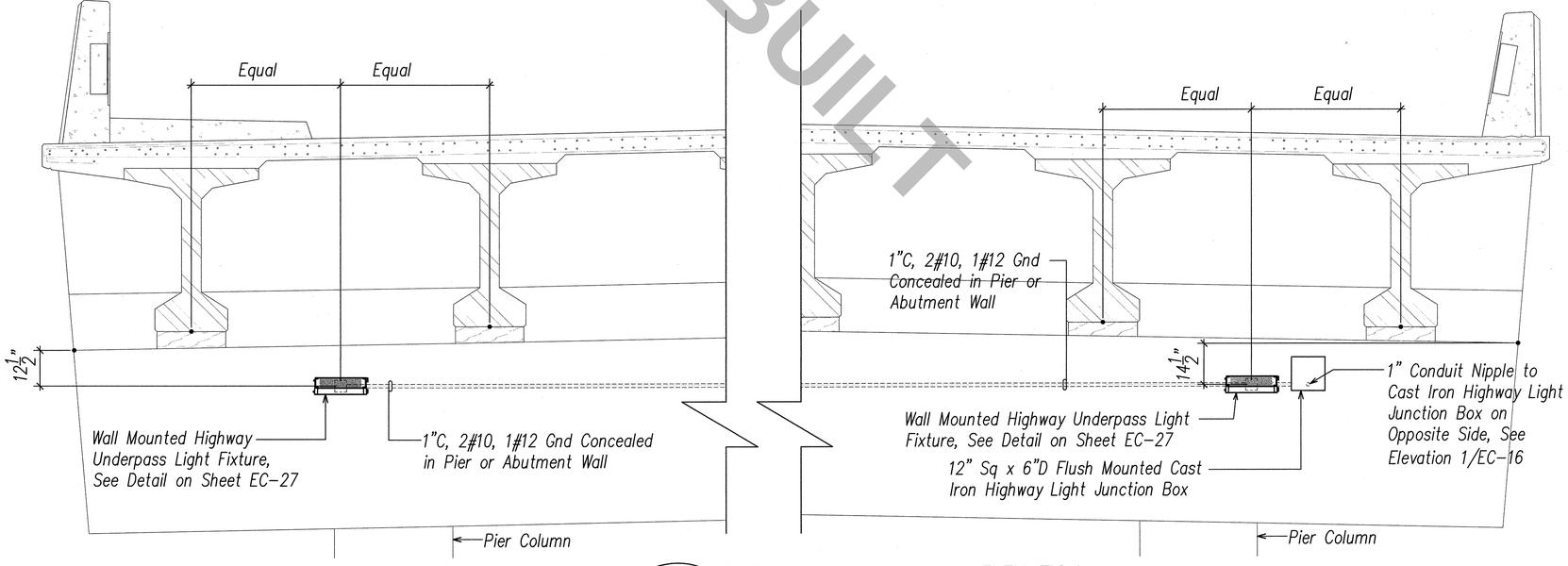
"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	403	524



RFI 160:
CAST JUNCTION BOXES TO BE SURFACE MOUNTED DUE TO STEEL CONFLICT, TYPICAL.

1 / EC-16 **PIER WALL NO. 1 MAKAI ELEVATION**



2 / EC-16 **PIER WALL NO. 1 MAUKA ELEVATION**

2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"
GRAPHIC SCALE

UNDERPASS HIGHWAY LIGHTING SYSTEM INSTALLATION DETAILS II

SCALE: 1/2"=1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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Electrical Engineers
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HAWAII, U.S.A.
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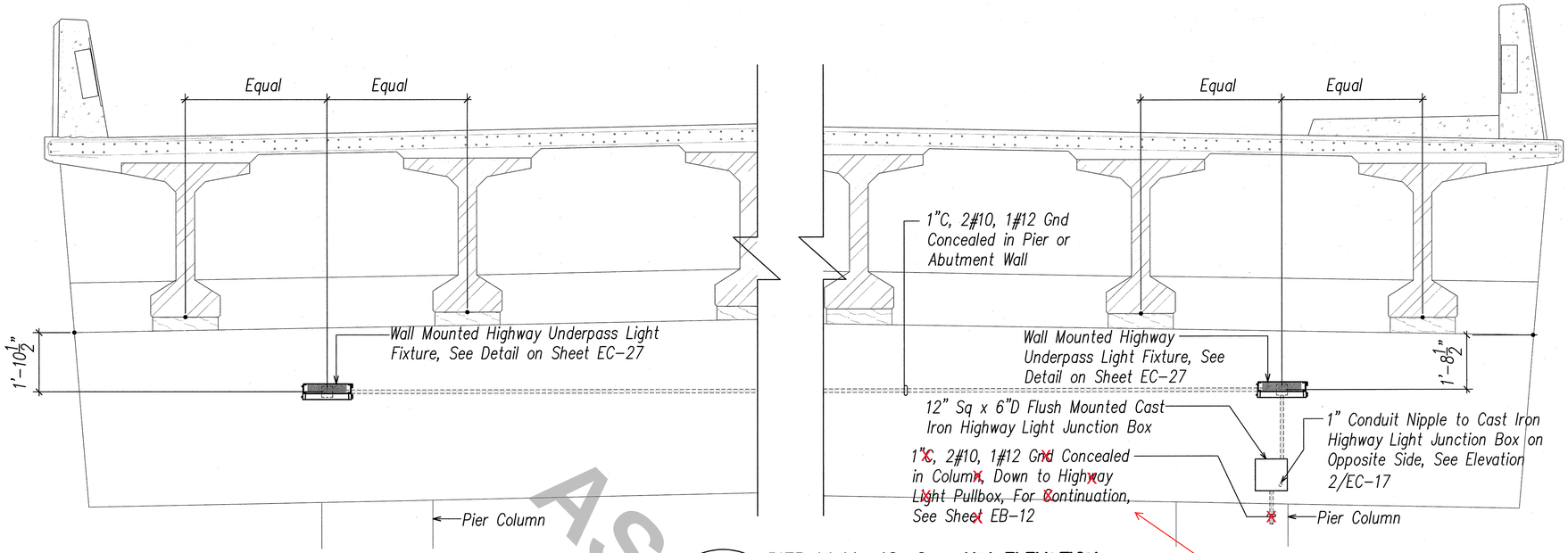
STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
UNDERPASS HIGHWAY LIGHTING DETAILS 2
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-16 OF 161 SHEETS

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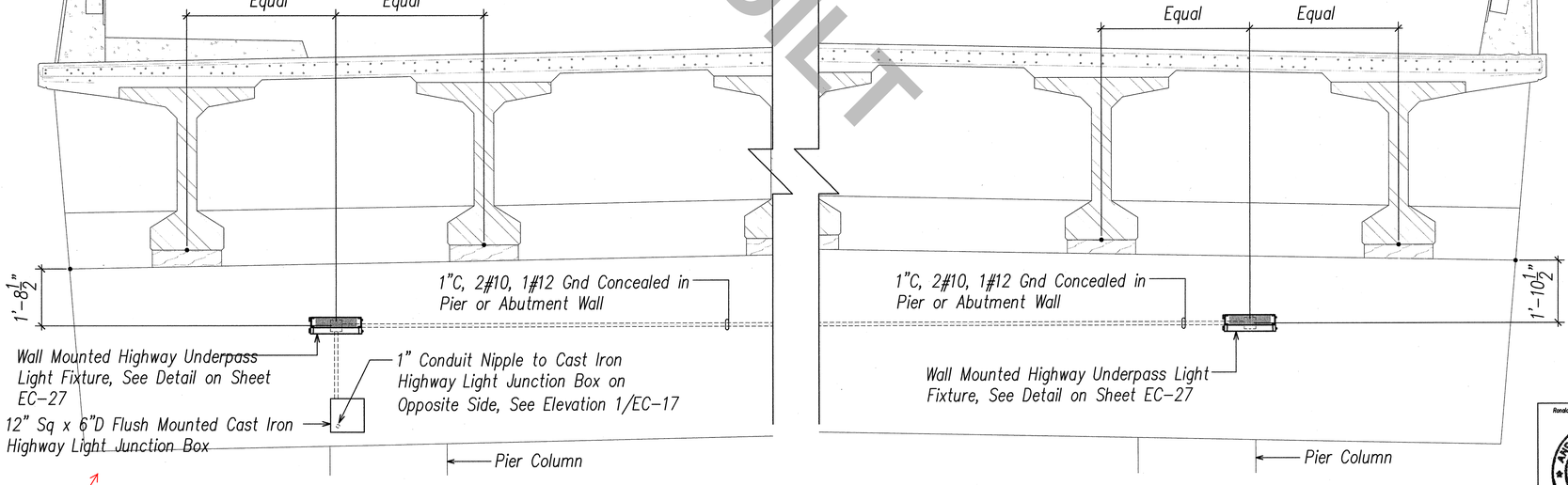
AS-BUILT
"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	404	524



1 EC-17 **PIER WALL NO. 2 MAKAI ELEVATION**

RFI 189:
UNDER BRIDGE LIGHTING CONNECTED TO POLE 19, SEE EB-12.



2 EC-17 **PIER WALL NO. 2 MAUKA ELEVATION**

RFI 160:
CAST JUNCTION BOXES TO BE SURFACE MOUNTED DUE TO STEEL CONFLICT, TYPICAL.

UNDERPASS HIGHWAY LIGHTING SYSTEM INSTALLATION DETAILS III

SCALE: 1/2"=1'-0"

2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"
GRAPHIC SCALE

ORIGINAL PLAN	DATE
NOTE BOOK	STUFF PLOTTED BY
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

UNDERPASS HIGHWAY LIGHTING DETAILS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

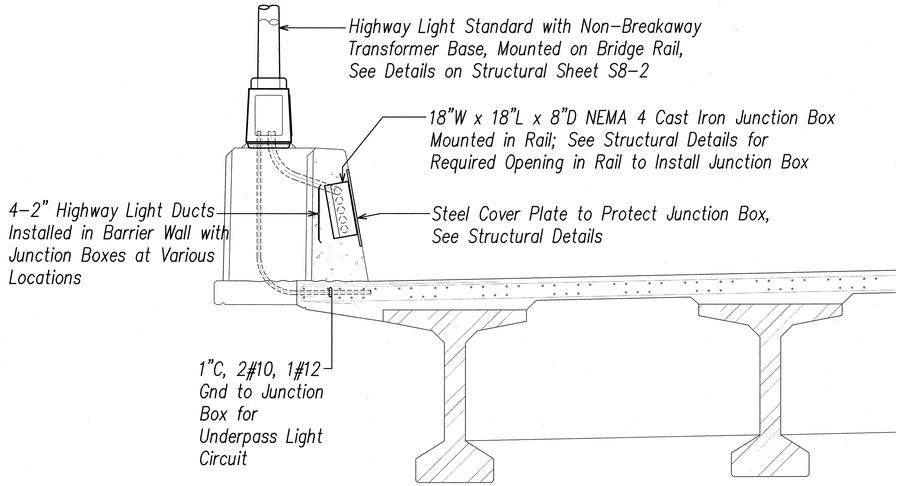
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AS-BUILT

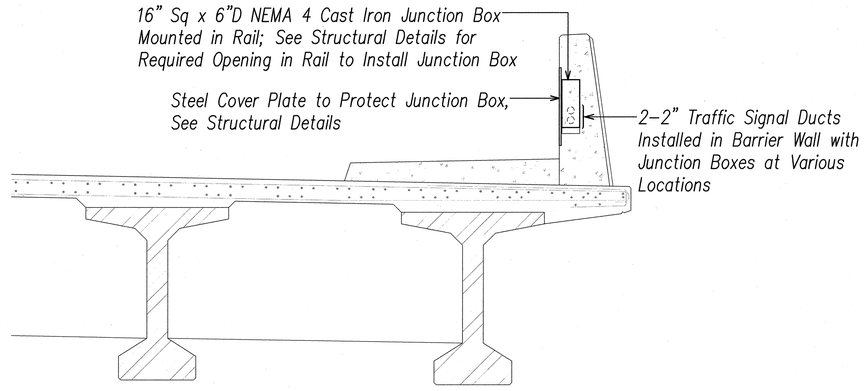
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"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	405	524



1 EC-18 BARRIER WALL MOUNTED HIGHWAY LIGHT STANDARD DETAIL
SCALE: 1/2"=1'-0"



1 EC-18 BARRER WALL MOUNTED TRAFFIC SIGNAL PULLBOX DETAIL
SCALE: 1/2"=1'-0"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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No.	TRACED BY	
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	QUANTITIES BY	
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2' 1' 0 2' 4' 6'
SCALE: 1/2"=1'-0"
GRAPHIC SCALE

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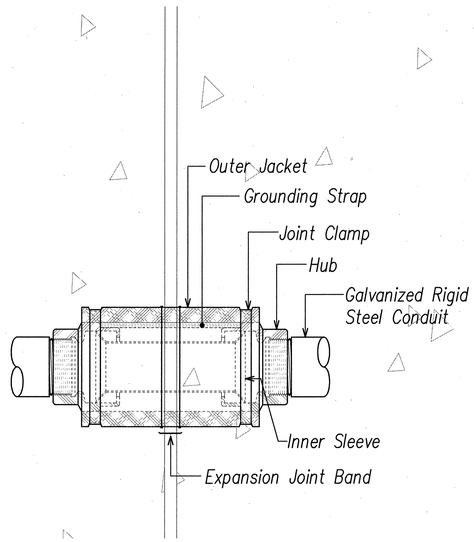
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
BARRIER WALL MOUNTED EQUIPMENT DETAILS
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-18 OF 161 SHEETS

405

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	406	524



Notes:

1. Type XD Expansion / Deflection Coupling shall be Embedded in the Concrete Barrier Wall and Installed at all Wall Joints.

2. Coupling shall have 3/4" Expansion / Contraction and 3/4" Deflection Adjustment from Relaxed Position.

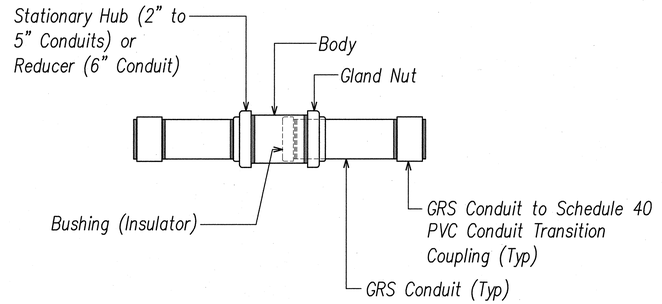
3. Standard Materials:

   a. Hubs: Feraloy Iron Alloy.
   b. Outer Jacket: Molded Neoprene
   c. Jacket Clamps: Stainless Steel
   d. Inner Sleeve: Molded Plastic
   e. Ground Straps: Tinned Copper Flexible Braid

4. Manufactured by Cooper Crouse-Hinds, Thomas & Betts or Approved Equivalent.

1 EXPANSION / DEFLECTION CONDUIT COUPLING DETAIL

EC-19 Not To Scale



EXPANSION COUPLING SPECIFICATIONS:

A. Applications:
To accommodate linear movement of conduit installations caused by thermal expansion and contraction and by structural shift.

B. Features: Weatherproof; Concrete tight; Durable construction; Corrosion resistant finish; UL listed and CSA Certified with bonding jumpers in indoor and outdoor locations.

C. Standard Materials: Fitting body and cap-malleable iron; Grounding ring-braided and tinned copper wire; Packing seal-lubricated textile fiber; Bushing-phenolic plastic; Washer-zinc plated steel.
Gasket-fiber stock; Body (6" size only)-zinc plated steel.

D. Standard Finishes: Fitting body and cap-hot dipped galvanized; Other components parts-see standard materials information.

E. Size Range: 1/2" thru 5" diameter conduit, 4" conduit movement; 6" diameter conduit, 8" conduit movement.

F. Compliances: UL 514B; CSA C22.2 Number 18; Federal spec WF-408E; NEMA FB1

G. Manufacturer: Appleton "XJ" Series, Crouse-Hinds "XJ" Series, or Approved Equal.

2 EXPANSION CONDUIT COUPLING DETAIL

EC-19 Not To Scale

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 I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

EXPANSION AND DEFLECTION COUPLING DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

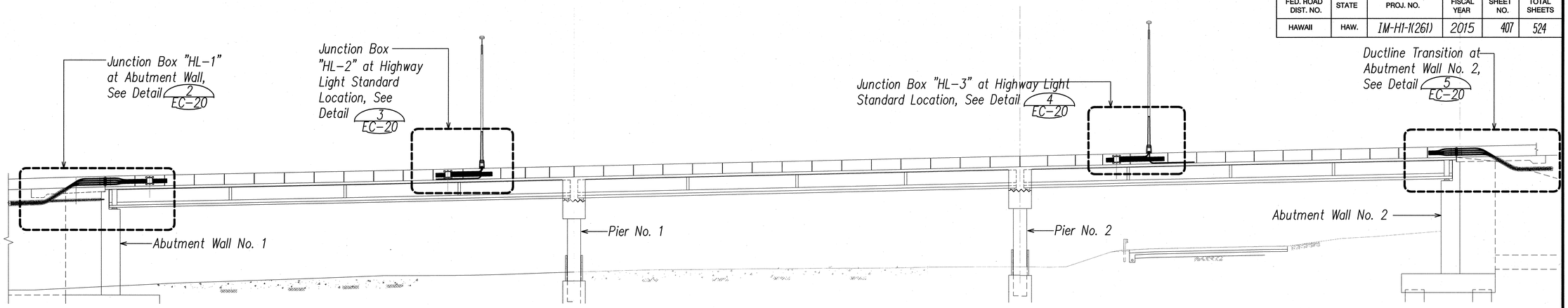
Scale: As Noted Date: January 20, 2015

SHEET No. EC-19 OF 161 SHEETS

406

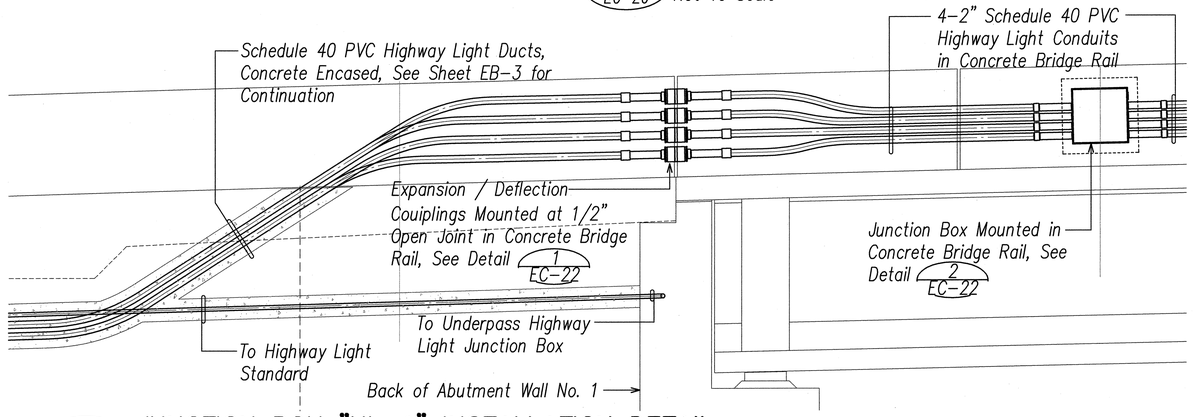
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	407	524



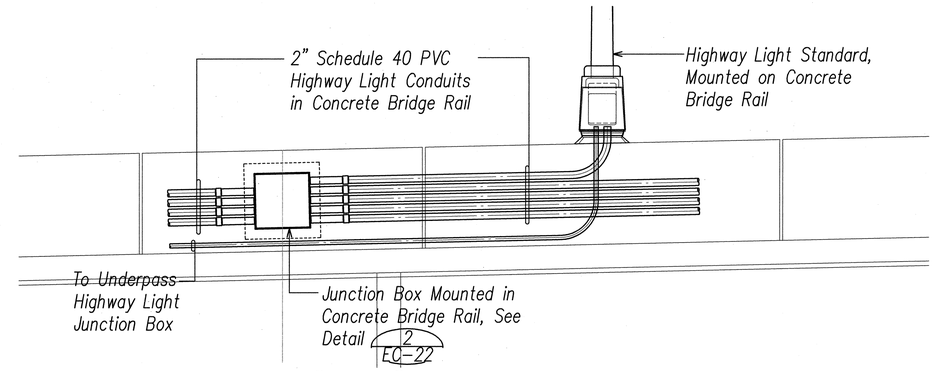
1 EC-20 BRIDGE RAIL ELEVATION-INSTALLATION OF HIGHWAY LIGHT CONDUITS AND JUNCTION BOXES

Not To Scale



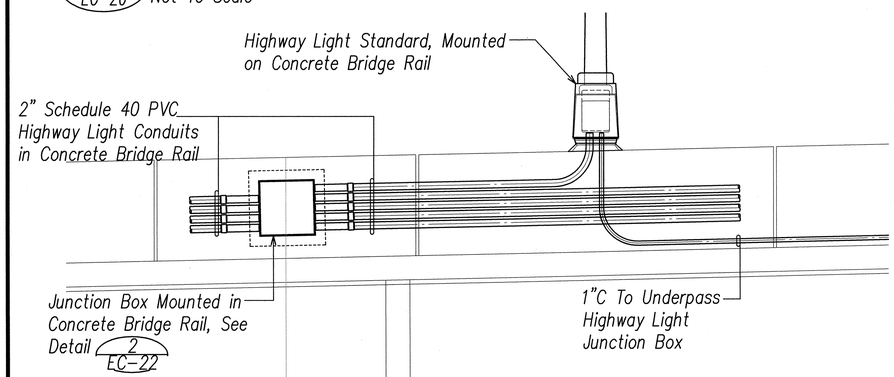
2 EC-20 JUNCTION BOX "HL-1" INSTALLATION DETAIL

Not To Scale



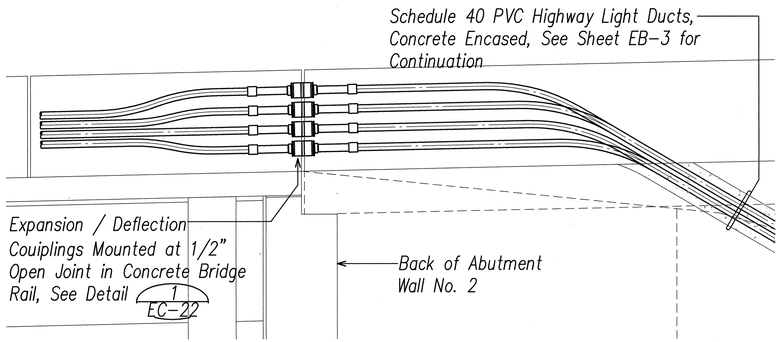
3 EC-20 JUNCTION BOX "HL-2" INSTALLATION DETAIL AT HWY LIGHT 18

Not To Scale



4 EC-20 JUNCTION BOX "HL-3" INSTALLATION DETAIL AT HWY LIGHT 19

Not To Scale



5 EC-20 DUCTLINE INSTALLATION AT ABUTMENT WALL NO. 2

Not To Scale

SURVEY PLOTTED BY	DATE
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ORIGINAL PLAN	
NOTE BOOK	
No.	

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW L. MIYASATO
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Andrew L. Miyasato
Signature
2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE RAIL INSTALLED CONDUIT DETAILS 1

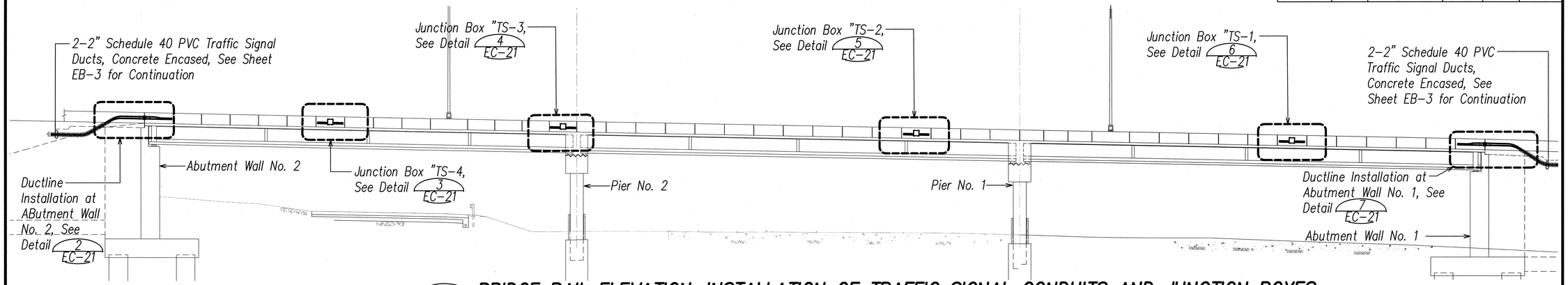
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-20 OF 161 SHEETS

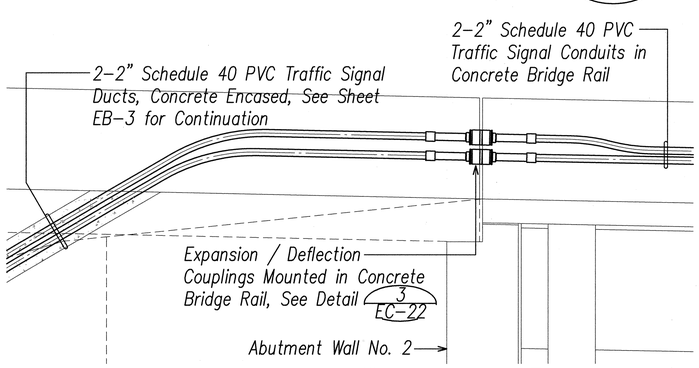
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	408	524



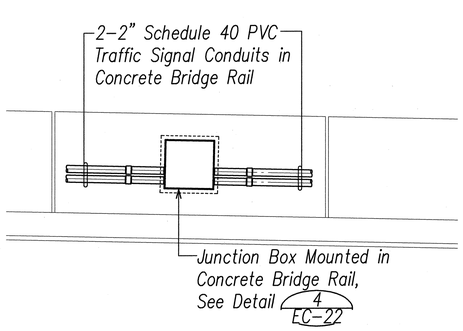
1 EC-21 BRIDGE RAIL ELEVATION-INSTALLATION OF TRAFFIC SIGNAL CONDUITS AND JUNCTION BOXES

Not To Scale



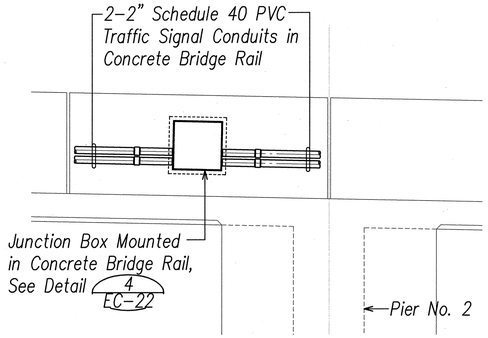
2 EC-21 DUCTLINE INSTALLATION AT ABUTMENT WALL NO. 2

Not To Scale



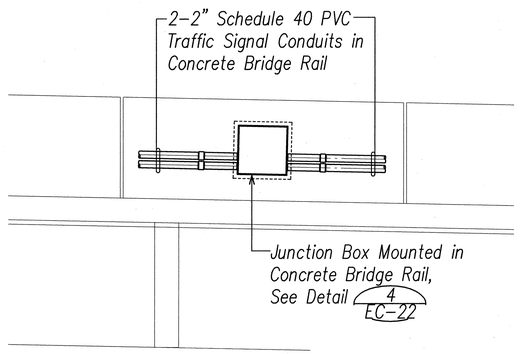
3 EC-21 JUNCTION BOX "TS-4" INSTALLATION DETAIL

Not To Scale



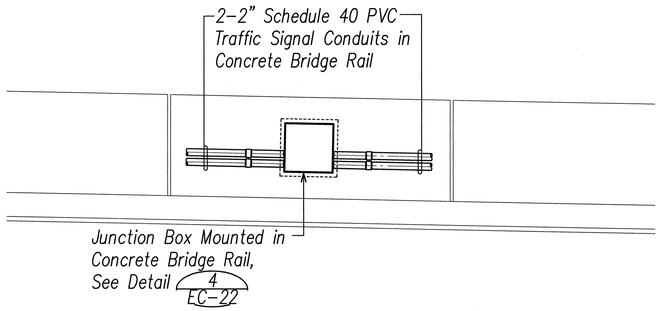
4 EC-21 JUNCTION BOX "TS-3" INSTALLATION DETAIL

Not To Scale



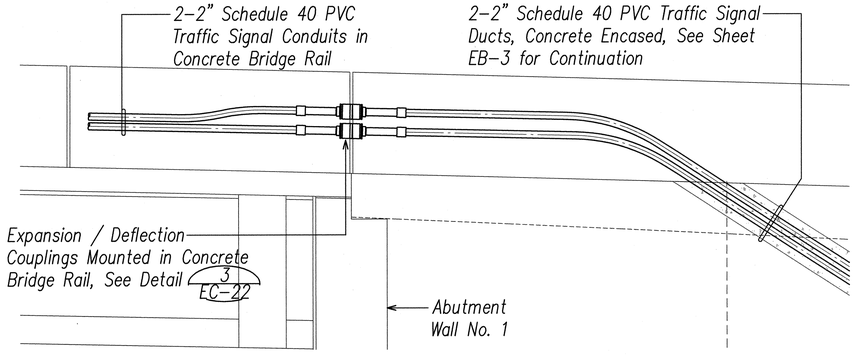
5 EC-21 JUNCTION BOX "TS-2" INSTALLATION DETAIL

Not To Scale



6 EC-21 JUNCTION BOX "TS-1" INSTALLATION DETAIL

Not To Scale



7 EC-21 DUCTLINE INSTALLATION AT ABUTMENT WALL NO. 1

Not To Scale

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

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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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE RAIL INSTALLED CONDUIT DETAILS 2

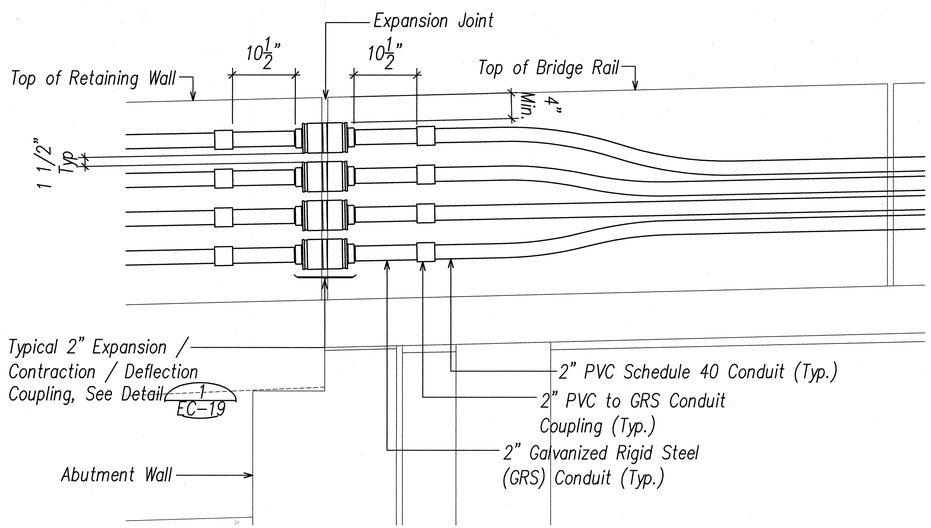
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-21 OF 161 SHEETS

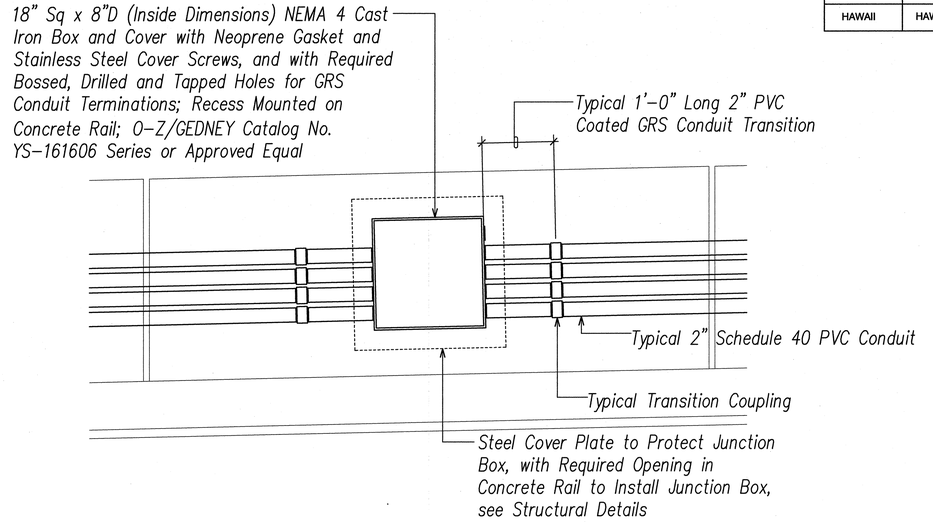
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	409	524



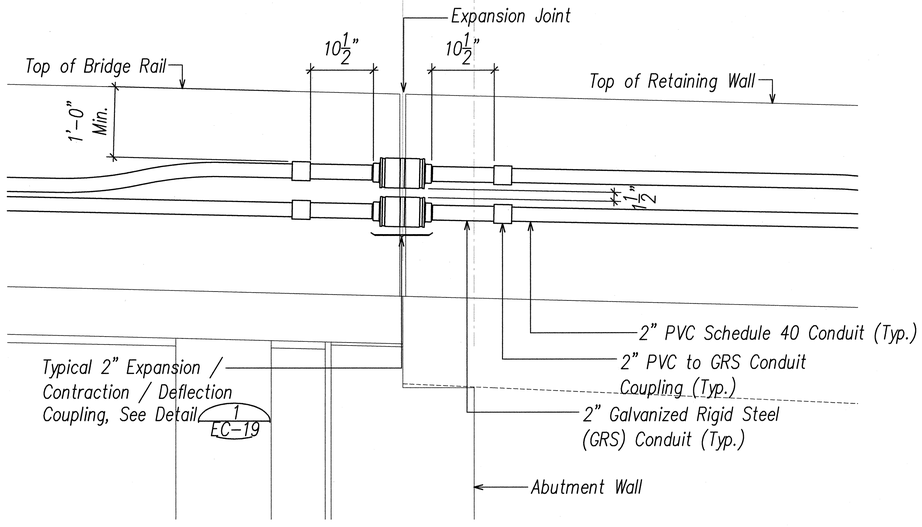
1 EC-22 TYPICAL IN BRIDGE RAIL HIGHWAY LIGHTING EXPANSION / DEFLECTION CONDUIT COUPLING DETAIL

Not to Scale



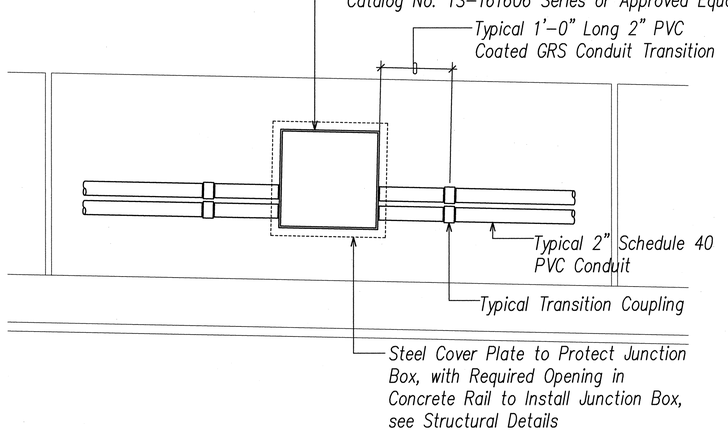
2 EC-22 TYPICAL IN BRIDGE RAIL HIGHWAY LIGHTING JUNCTION BOX DETAIL

Not to Scale



3 EC-22 TYPICAL IN BRIDGE RAIL TRAFFIC SIGNAL EXPANSION / DEFLECTION CONDUIT COUPLING DETAIL

Not to Scale



4 EC-22 TYPICAL IN BRIDGE RAIL TRAFFIC SIGNAL JUNCTION BOX DETAIL

Not to Scale

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
	DESIGNED BY	
	QUANTITIES BY	
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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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License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE RAIL INSTALLED CONDUIT DETAILS 3

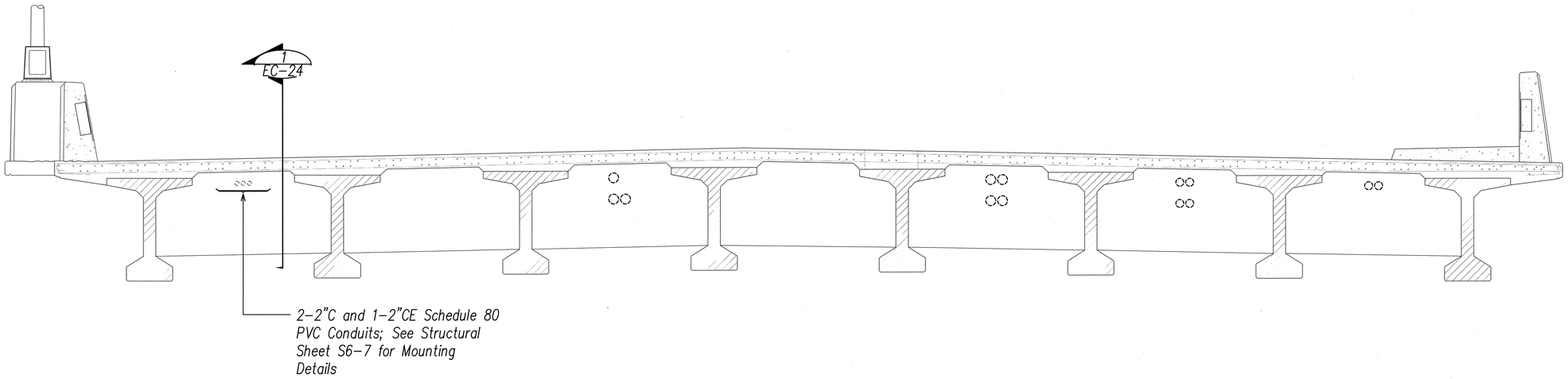
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-22 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	410	524



1 EC-23 BRIDGE TRANSVERSE SECTION WITH TRAFFIC SIGNAL DUCT DETAILS

SCALE: 3/8"=1'-0"

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

2' 1' 0 2' 4' 6' 8'

SCALE: 3/8"=1'-0"

GRAPHIC SCALE

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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DUCTS IN BRIDGE DETAILS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-23 OF 161 SHEETS

410

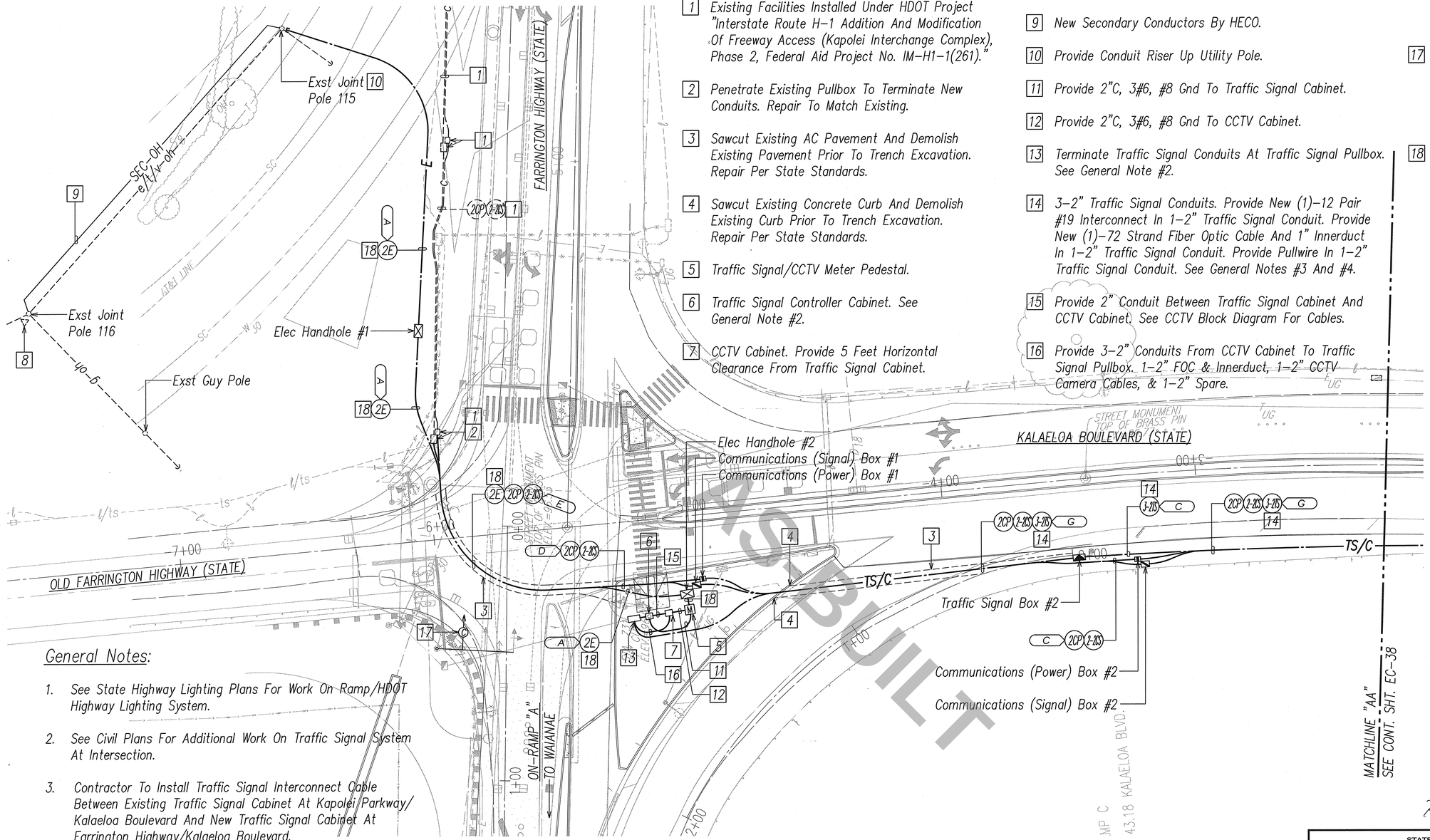
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 410S-1

Notes:

1. Existing Facilities Installed Under HDOT Project "Interstate Route H-1 Addition And Modification Of Freeway Access (Kapolei Interchange Complex), Phase 2, Federal Aid Project No. IM-H1-1(261)."
2. Penetrate Existing Pullbox To Terminate New Conduits. Repair To Match Existing.
3. Sawcut Existing AC Pavement And Demolish Existing Pavement Prior To Trench Excavation. Repair Per State Standards.
4. Sawcut Existing Concrete Curb And Demolish Existing Curb Prior To Trench Excavation. Repair Per State Standards.
5. Traffic Signal/CCTV Meter Pedestal.
6. Traffic Signal Controller Cabinet. See General Note #2.
7. CCTV Cabinet. Provide 5 Feet Horizontal Clearance From Traffic Signal Cabinet.
8. Existing 25kVA Pole Top Transformer.
9. New Secondary Conductors By HECO.
10. Provide Conduit Riser Up Utility Pole.
11. Provide 2"C, 3#6, #8 Gnd To Traffic Signal Cabinet.
12. Provide 2"C, 3#6, #8 Gnd To CCTV Cabinet.
13. Terminate Traffic Signal Conduits At Traffic Signal Pullbox. See General Note #2.
14. 3-2" Traffic Signal Conduits. Provide New (1)-12 Pair #19 Interconnect In 1-2" Traffic Signal Conduit. Provide New (1)-72 Strand Fiber Optic Cable And 1" Innerduct In 1-2" Traffic Signal Conduit. Provide Pullwire In 1-2" Traffic Signal Conduit. See General Notes #3 And #4.
15. Provide 2" Conduit Between Traffic Signal Cabinet And CCTV Cabinet. See CCTV Block Diagram For Cables.
16. Provide 3-2" Conduits From CCTV Cabinet To Traffic Signal Pullbox. 1-2" FOC & Innerduct, 1-2" CCTV Camera Cables, & 1-2" Spare.
17. New CCTV Camera Mounted To Traffic Signal Standard Mast Arm. See General Note #2.
18. 2"C, 3#2. See Traffic Signal & CCTV Oneline.



General Notes:

1. See State Highway Lighting Plans For Work On Ramp/HDOT Highway Lighting System.
2. See Civil Plans For Additional Work On Traffic Signal System At Intersection.
3. Contractor To Install Traffic Signal Interconnect Cable Between Existing Traffic Signal Cabinet At Kapolei Parkway/ Kalaeloa Boulevard And New Traffic Signal Cabinet At Farrington Highway/Kalaeloa Boulevard.
4. Contractor To Install CCTV Fiber Optic Cable Between Existing CCTV Cabinet At Kapolei Parkway/Kalaeloa Boulevard And New CCTV Cabinet At Farrington Highway/Kalaeloa Boulevard.

NORTH

TRAFFIC SIGNAL & COMMUNICATIONS PLAN I
SCALE: 1"=20'

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

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

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DATE | REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL & COMMUNICATIONS PLAN I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EC-37 OF 161 SHEETS

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

"AS-BUILT"

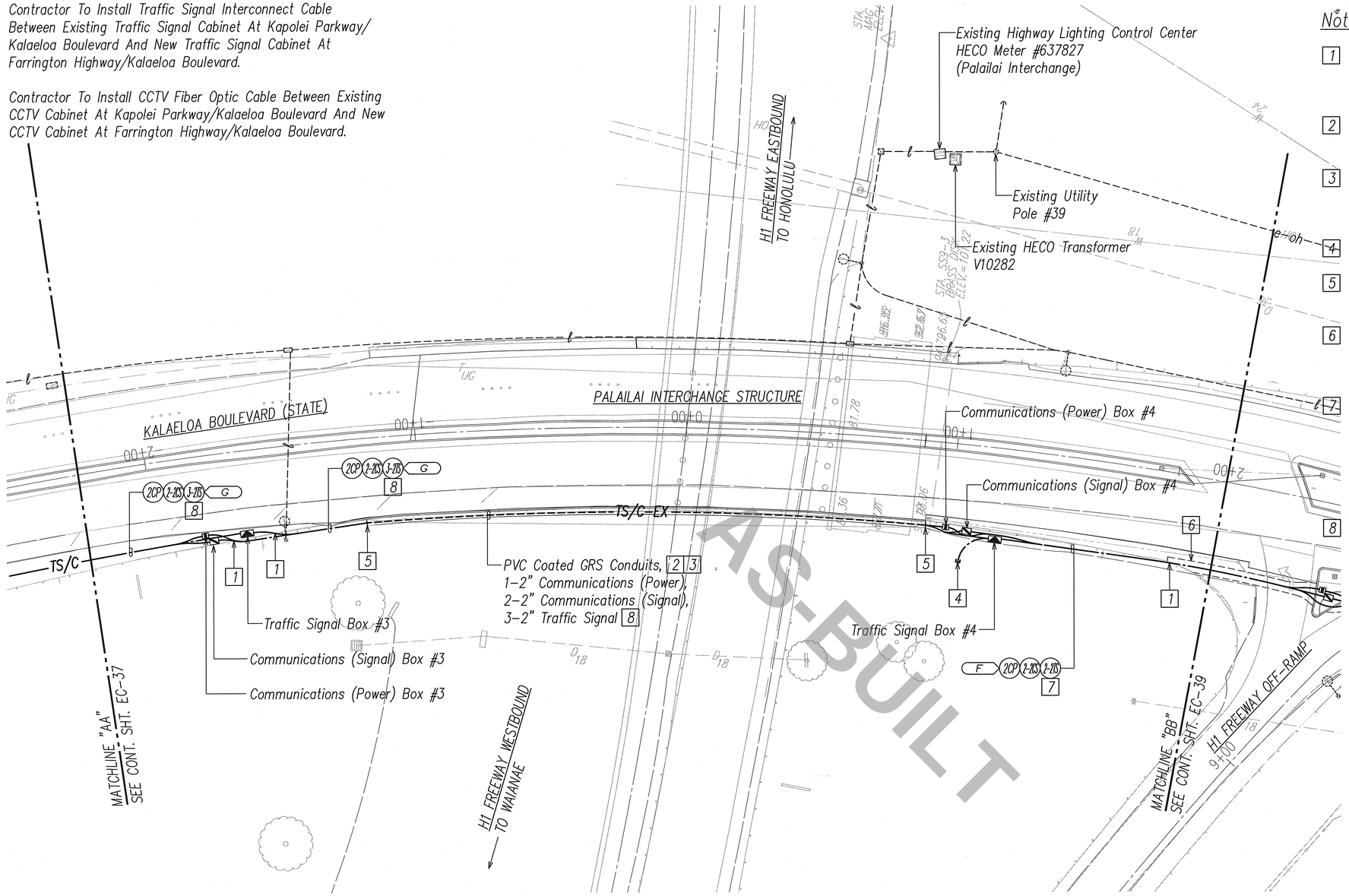
C.O. 410S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

General Notes:

1. Contractor To Install Traffic Signal Interconnect Cable Between Existing Traffic Signal Cabinet At Kapolei Parkway/ Kalaeloa Boulevard And New Traffic Signal Cabinet At Farrington Highway/Kalaeloa Boulevard.

2. Contractor To Install CCTV Fiber Optic Cable Between Existing CCTV Cabinet At Kapolei Parkway/Kalaeloa Boulevard And New CCTV Cabinet At Farrington Highway/Kalaeloa Boulevard.



Notes:

C.O. 410S-2

1 Remove Existing Guardrail As Necessary To Install Ductline. Repair Guardrail To Match Existing.

2 Strap Conduits To Existing Palailai Interchange Structure. See Structural Support Details.

3 Provide Expansion Couplings At Expansion Joints. Provide Expansion And Deflection Couplings At Abutments.

4 Stub-Out 1–2" Traffic Signal Conduit.

5 Transition Conduits From Underground To Exposed.

6 Sawcut Existing AC Pavement And Demolish Existing Pavement Prior To Trench Excavation. Repair Per State Standards.

7 2–2" Traffic Signal Conduits. Provide New (1)–12 Pair #19 Interconnect In 1–2" Traffic Signal Conduit. Provide New (1)–72 Strand Fiber Optic Cable And 1" Innerduct In 1–2" Traffic Signal Conduit. See General Notes #1 And #2.

8 3–2" Traffic Signal Conduits. Provide New (1)–12 Pair #19 Interconnect In 1–2" Traffic Signal Conduit. Provide New (1)–72 Strand Fiber Optic Cable And 1" Innerduct In 1–2" Traffic Signal Conduit. Provide Pullwire In 1–2" Traffic Signal Conduit. See General Notes #1 And #2.

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

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

LAST SAVE: 11/16/18 @ 09:14:12 BY: AN PLOT SC: 1=20.00000
Z:\Acad\PROJECTS\X2653D\EC38_2953SC_1a plan 02 XREFS X-WOC-SITE_PH2 WOC-SITE 16008-10-MERGED _XRH_2953SC_BACKGROUND _XRH_2953SC_ELEC ALL

NORTH

TRAFFIC SIGNAL & COMMUNICATIONS PLAN II
SCALE: 1"=20'

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

DATE	REVISION

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL & COMMUNICATIONS PLAN II

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EC-38 OF 161 SHEETS

"AS-BUILT"

C.O. 410S-2

General Notes:

1. Contractor To Install Traffic Signal Interconnect Cable Between Existing Traffic Signal Cabinet At Kapolei Parkway/ Kalaeloa Boulevard And New Traffic Signal Cabinet At Farrington Highway/Kalaeloa Boulevard.

2. Contractor To Install CCTV Fiber Optic Cable Between Existing CCTV Cabinet At Kapolei Parkway/Kalaeloa Boulevard And New CCTV Cabinet At Farrington Highway/Kalaeloa Boulevard.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

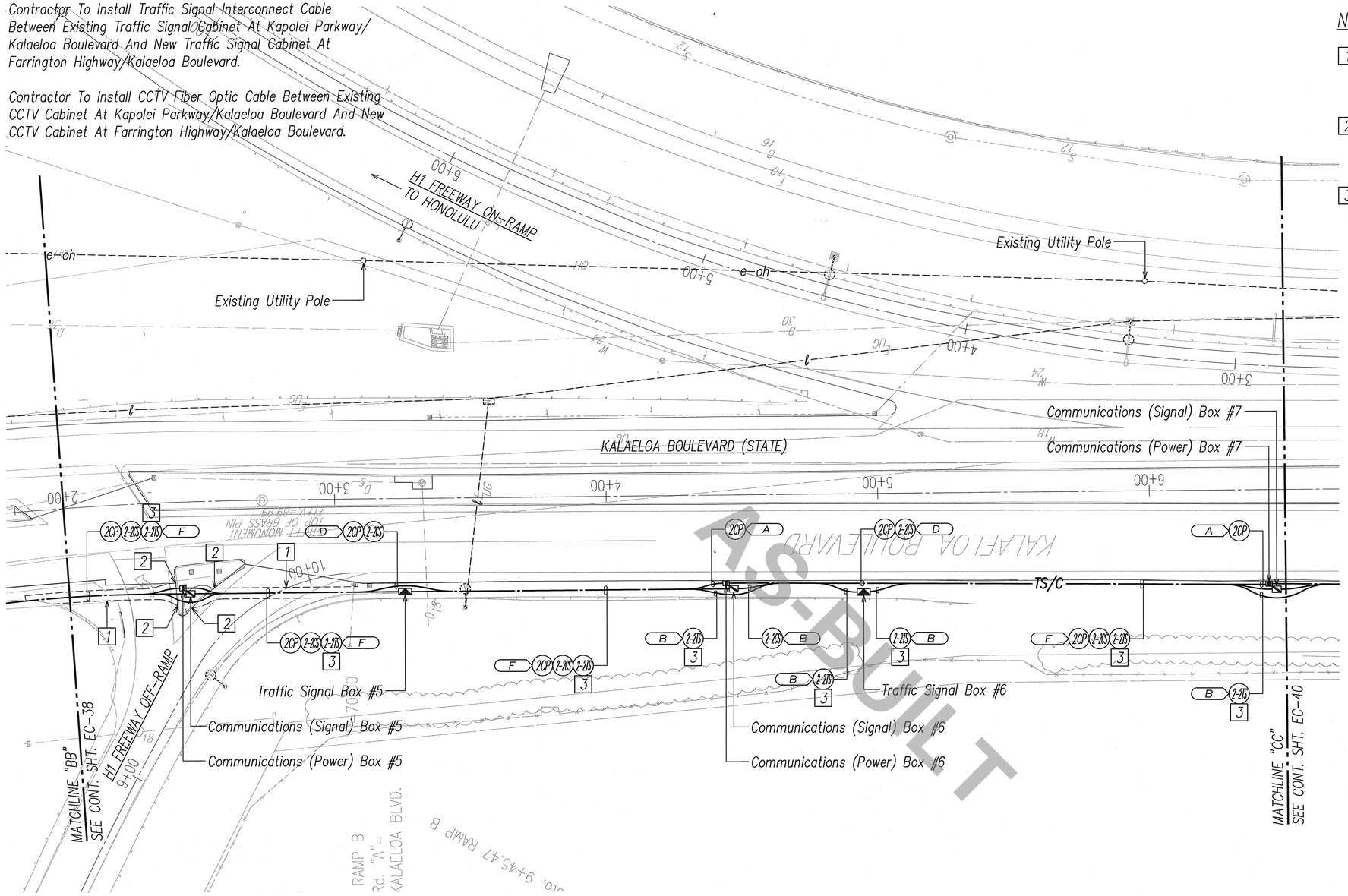
Notes:

C.O. 410S-3

1. Sawcut Existing AC Pavement And Demolish Existing Pavement Prior To Trench Excavation. Repair Per State Standards.

2. Sawcut Existing Concrete Curb And Demolish Existing Curb Prior To Trench Excavation. Repair Per State Standards.

3. 2–2" Traffic Signal Conduits. Provide New (1)–12 Pair #19 Interconnect In 1–2" Traffic Signal Conduit. Provide New (1)–72 Strand Fiber Optic Cable And 1" Innerduct In 1–2" Traffic Signal Conduit. See General Notes #1 And #2.



AS-BUILT

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

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

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NORTH

TRAFFIC SIGNAL & COMMUNICATIONS PLAN III
SCALE: 1"=20'

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

DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL & COMMUNICATIONS PLAN III

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EC-39 OF 161 SHEETS

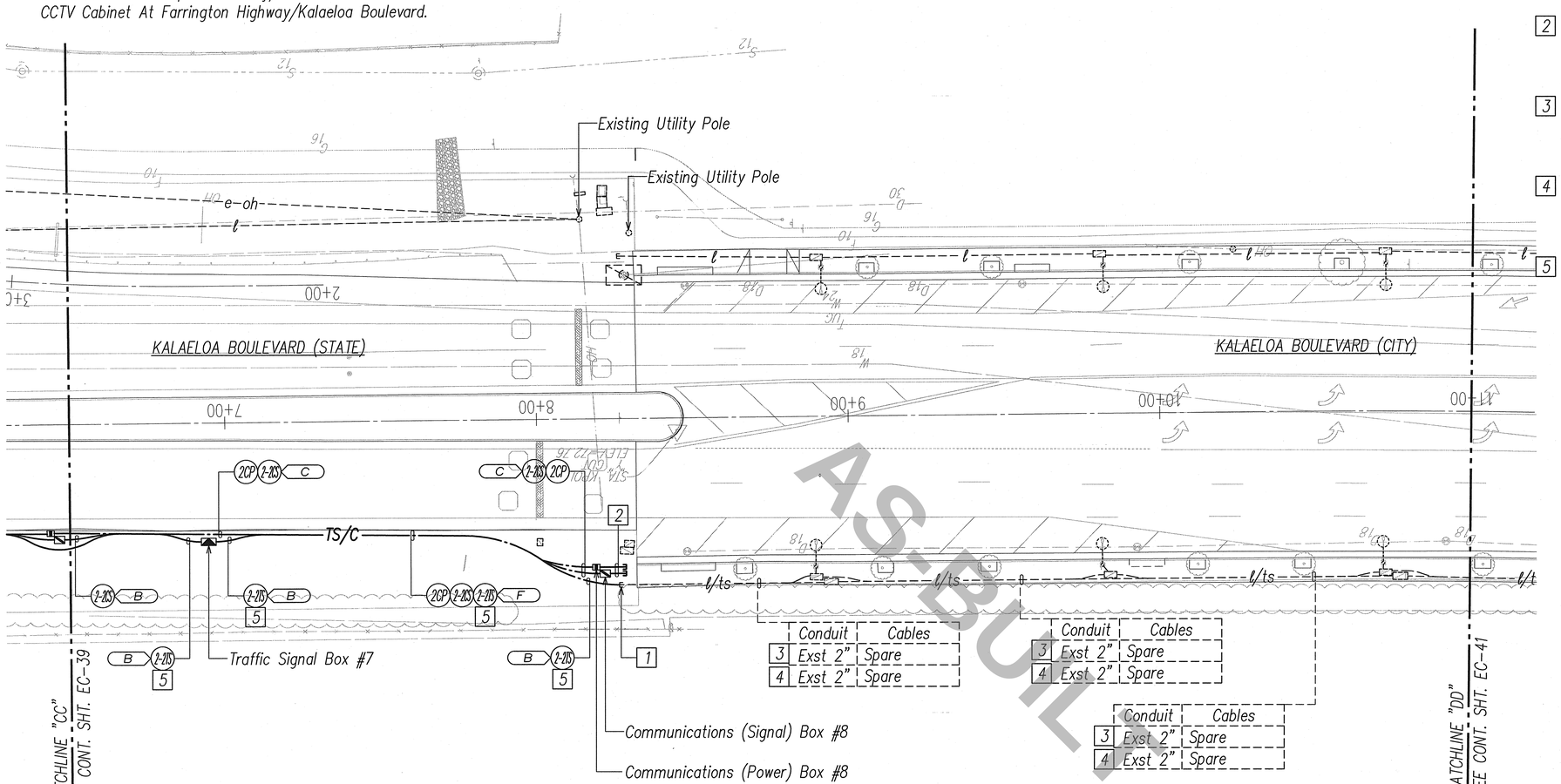
"AS-BUILT"

C.O. 410S-3

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

General Notes:

1. Contractor To Install Traffic Signal Interconnect Cable Between Existing Traffic Signal Cabinet At Kapolei Parkway/ Kalaeloa Boulevard And New Traffic Signal Cabinet At Farrington Highway/Kalaeloa Boulevard.
2. Contractor To Install CCTV Fiber Optic Cable Between Existing CCTV Cabinet At Kapolei Parkway/Kalaeloa Boulevard And New CCTV Cabinet At Farrington Highway/Kalaeloa Boulevard.
3. Street Lighting Conduits Not Identified For Clarity.



Notes:

C.O. 410S-4

1. Existing Traffic Signal & Highway Lighting Stub-Out. Expose Exst Traffic Signal Conduits, Provide Couplings And Extend Traffic Signal Ductline To New Pullbox.
2. Stub-Out 1-2" Communication Power Conduit And 2-2" Communication Signal Conduits. Provide Concrete Stub-Out Marker.
3. Provide New (1)-12 Pair #19 Interconnect Cable In Existing Traffic Signal Conduit. See General Note #1.
4. Provide New (1)-72 Strand Fiber Optic Cable And 1" Innerduct In Existing Traffic Signal Conduit. See General Note #2.
5. 2-2" Traffic Signal Conduits. Provide New (1)-12 Pair #19 Interconnect In 1-2" Traffic Signal Conduit. Provide New (1)-72 Strand Fiber Optic Cable And 1" Innerduct In 1-2" Traffic Signal Conduit. See General Notes #1 And #2.

AS-BUILT

NORTH

TRAFFIC SIGNAL & COMMUNICATIONS PLAN IV

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

DATE	REVISION

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL & COMMUNCATIONS PLAN IV

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EC-40 OF 161 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
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LAST SAVE: 11/19/19 @ 09:13:35 BY MARK.FUJIMOTO
Z:\Used\PROJECTS\2905301\EC-40_2905301_ia plan 04 2002TS X-WOC-SITE_PH2 WOC-SITE 16008-10-MEFNSD _XRH_2905301_BACKGROUND _XRH_2905301_ELEC ALL

"AS-BUILT"

C.O. 410S-4

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 410S-5

Notes:

1. Provide New (1)–12 Pair #19 Interconnect Cable In Existing Traffic Signal Conduit. See General Note #1.
2. Provide New (1)–72 Strand Fiber Optic Cable And 1" Innerduct In Existing Traffic Signal Conduit. See General Note #2.
3. See Enlarged Traffic Signal & CCTV Plan.

Conduit	Cables
Exst 2"	Exst 9–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare
Exst 2"	Spare
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
1 Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 8–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 8–2/C #14
Exst 2"	Exst 1–4/C #20
1 Exst 2"	Spare
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 8–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare
1 Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 8–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare
1 Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 12–2/C #14
Exst 2"	Exst 3–4/C #20
Exst 2"	Exst CCTV Camera Cables
Exst 2"	Spare
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 12–2/C #14
Exst 2"	Exst 2–4/C #20
Exst 2"	Exst CCTV Camera Cables

Conduit	Cables
Exst 3"	Exst 2–26/C #14, #8 Gnd
Exst 3"	Exst 2–26/C #14, #8 Gnd
Exst 2"	Exst 10–2/C #14
Exst 2"	Exst 9–2/C #14
Exst 2"	Exst 9–2/C #14
Exst 2"	Exst 4–4/C #20
Exst 2"	Exst 1–12 Pr #19 Interconnect
Exst 2"	Exst CCTV Camera Cables

Existing Traffic Signal Cabinet

Conduit	Cables
Exst 3"	Exst CCTV Cabinet Cables

Existing CCTV Cabinet

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Spare 2

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 7–2/C #14
Exst 2"	Exst 2–4/C #20
Exst 2"	Exst CCTV Camera Cables
Exst 2"	Spare 2

Conduit	Cables
Exst 2"	Exst 7–2/C #14
Exst 2"	Exst 2–4/C #20
Exst 2"	Exst CCTV Camera Cables
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Spare 2

Conduit	Cables
Exst 2"	Exst 6–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare
Exst 2"	Spare
Exst 2"	Spare

Conduit	Cables
1 Exst 2"	Spare
2 Exst 2"	Spare

Conduit	Cables
1 Exst 2"	Spare
2 Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Spare 2

Conduit	Cables
Exst 2"	Exst 1–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare
Exst 2"	Spare

Conduit	Cables
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–26/C #14, #8 Gnd
Exst 2"	Exst 1–2/C #14
Exst 2"	Exst 1–4/C #20
Exst 2"	Spare 2
Exst 2"	Spare

KALAELOA BOULEVARD (CITY)

KAPOLEI PARKWAY (CITY)

MATCHLINE "DD" SEE CONT. SHT. EC-40

General Notes:

1. Contractor To Install Traffic Signal Interconnect Cable Between Existing Traffic Signal Cabinet At Kapolei Parkway/ Kalaeloa Boulevard And New Traffic Signal Cabinet At Farrington Highway/Kalaeloa Boulevard.
2. Contractor To Install CCTV Fiber Optic Cable Between Existing CCTV Cabinet At Kapolei Parkway/Kalaeloa Boulevard And New CCTV Cabinet At Farrington Highway/Kalaeloa Boulevard.
3. Street Lighting Conduits Not Identified For Clarity.

NORTH

TRAFFIC SIGNAL & COMMUNICATIONS PLAN V

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

AS-BUILT

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL & COMMUNCATIONS PLAN V

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EC-41 OF 161 SHEETS

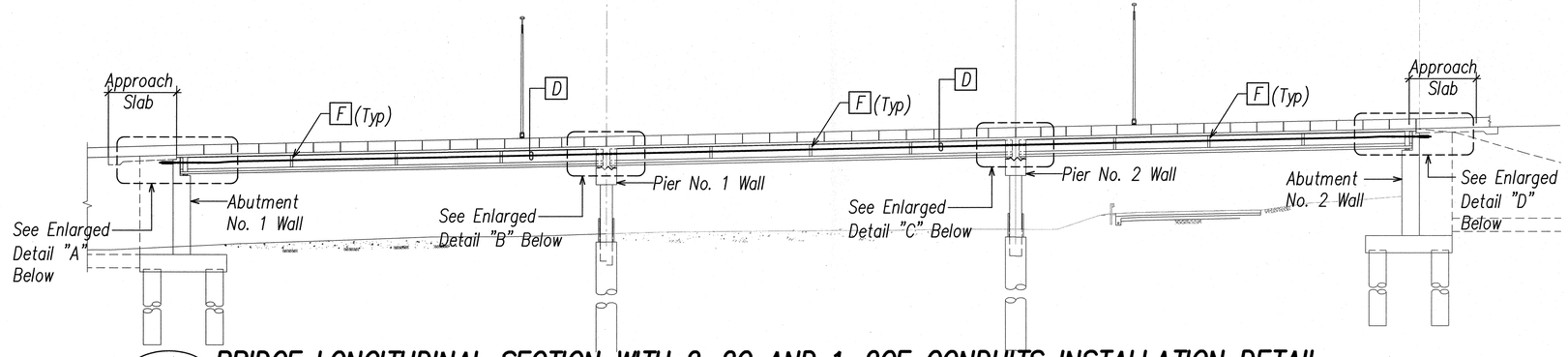
DATE	REVISION

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

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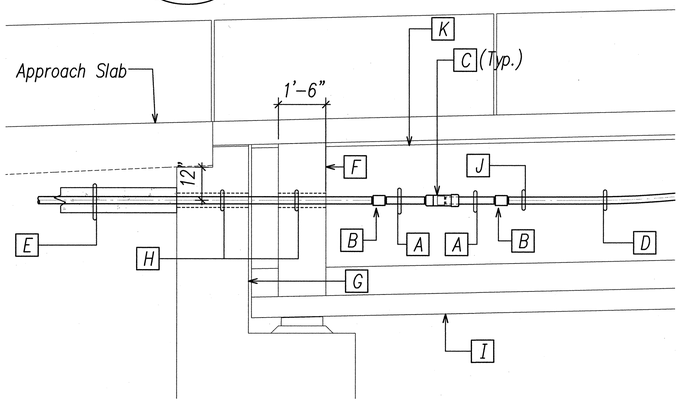
"AS-BUILT" C.O. 410S-5

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	411	524



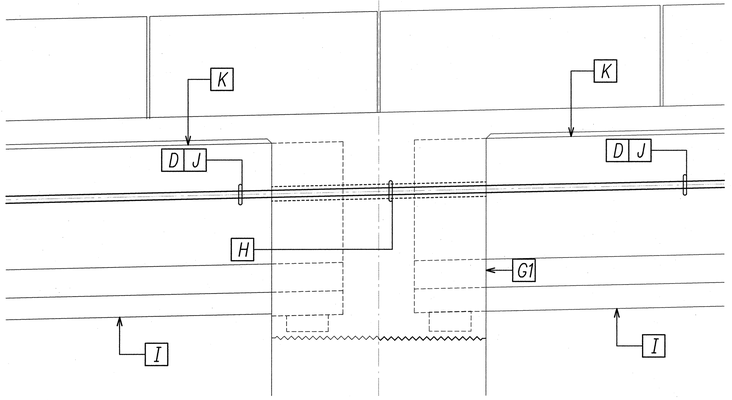
1 EC-24 BRIDGE LONGITUDINAL SECTION WITH 2-2C AND 1-2CE CONDUITS INSTALLATION DETAIL

SCALE: 1"=20'



2 EC-24 Detail "A" AT ABUTMENT WALL NO. 1

Not to Scale



3 EC-24 Detail "B" AT PIER WALL NO. 1

Not to Scale

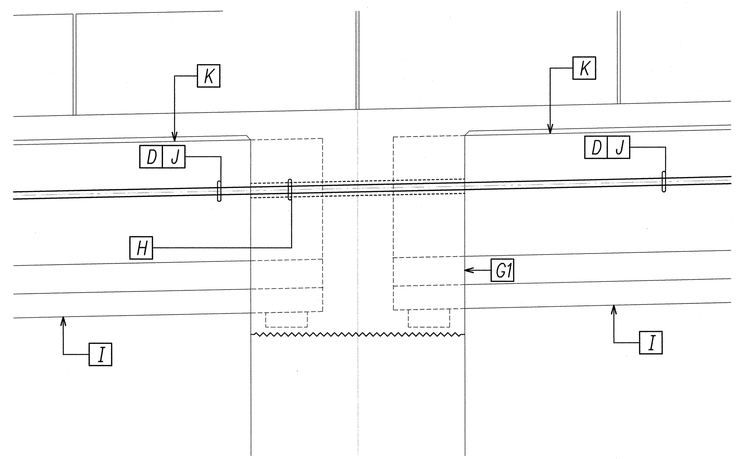
NOTES: (Items Identifed on Details as Boxed Items)

- A 3-2" PVC Coated GRS Conduits to Transition from Exposed PVC Conduits to Expansion Couplings.
- B 2" GRS Conduit to Schedule 80 PVC Conduit Transition Coupling.
- C 2" Expansion Coupling.
- D 3-2" Schedule 80 PVC Conduits, Exposed, Installed Under Bridge, See Structural Sheets for Conduit Mounting Hangar Details and Requirements.
- E 3-2" Schedule 40 PVC Ductline, See Sheet EB-3 for Continuation.
- F Bridge Diaphragm with Required Pipe Sleeves for 3-2" Schedule 40 PVC Conduits Installed Through Diaphragm.
- G Abutment Wall with Required Pipe Sleeves for 3-2" Schedule 40 PVC Conduits Installed Through Abutment Wall.
- G1 Pier Wall Crossbeam with Required Pipe Sleeves for 3-2" Schedule 40 PVC Conduits Installed Through Pier Wall Crossbeams.
- H 3-2" Schedule 40 PVC Conduits, with Required Pipe Sleeves for 3-2" Schedule 40 PVC Conduits Installed Through Bridge Diaphragms, Abutment Walls and Pier Wall Crossbeams.
- I Bottom of Bridge Girder.
- J 3-2" Schedule 80 PVC Conduits, Exposed.
- K Top of Bridge Girder.

20' 10' 0 20' 40' 60'

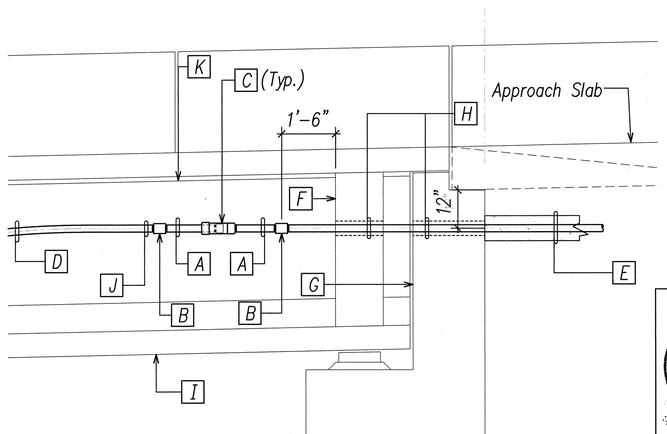
SCALE: 1"=20'

GRAPHIC SCALE



4 EC-24 Detail "C" AT PIER WALL NO. 2

Not to Scale



5 EC-24 Detail "D" AT ABUTMENT WALL NO. 2

Not to Scale

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

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.

Andrew I. Miyasato Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DUCTS IN BRIDGE DETAILS 2

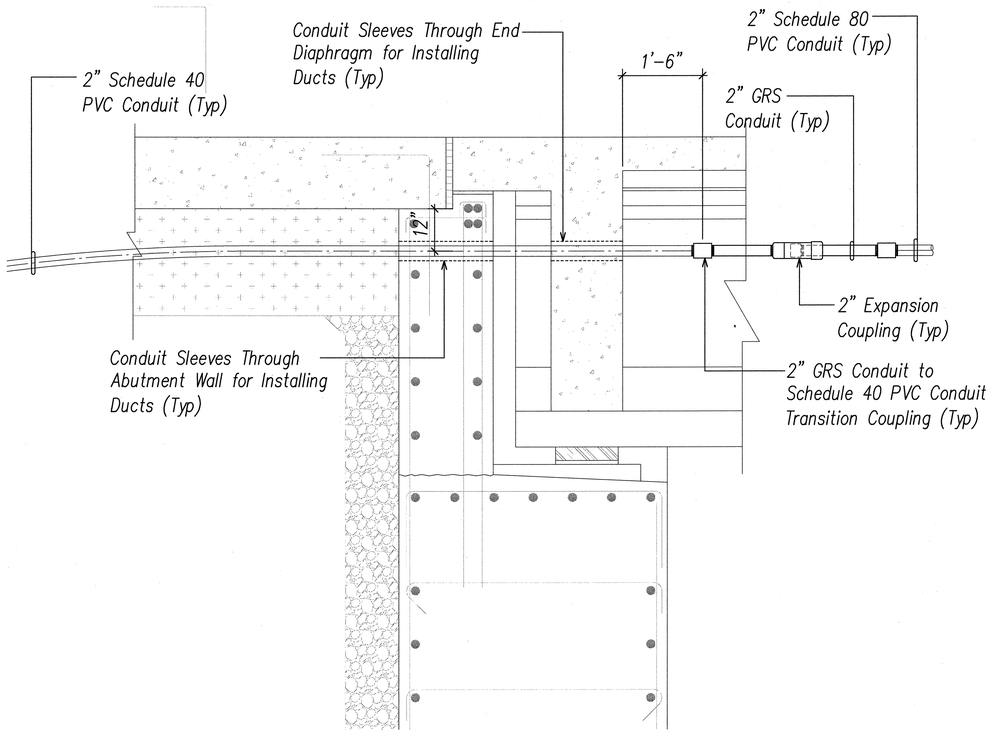
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-24 OF 161 SHEETS

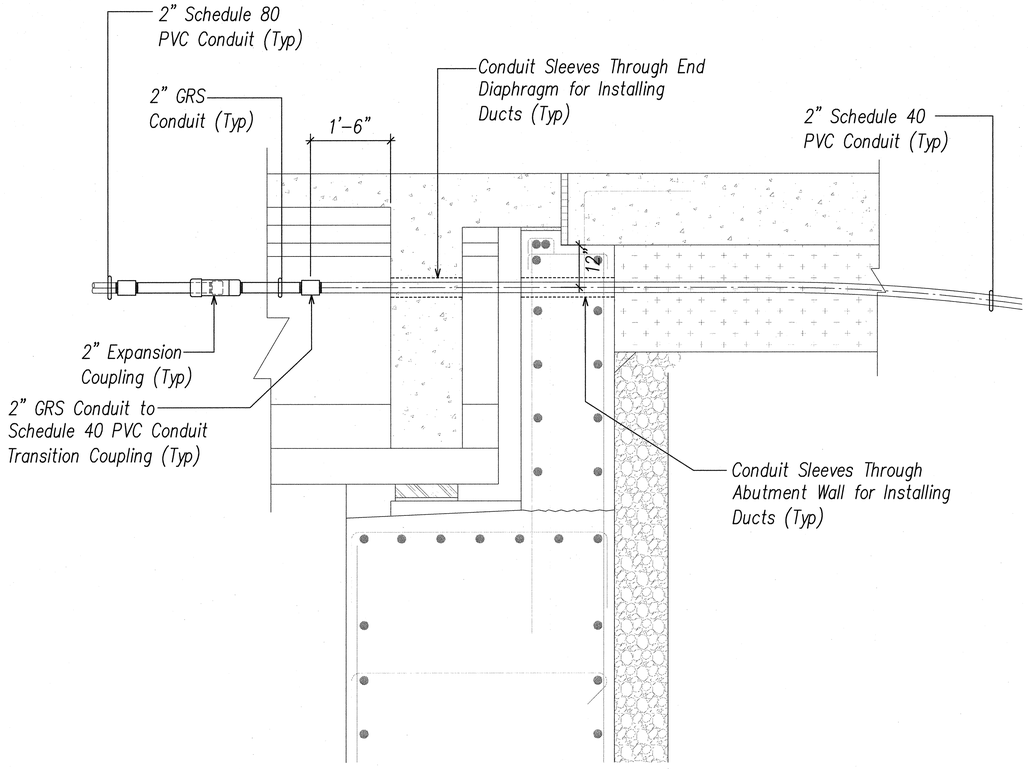
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	412	524



1 EC-25 **PARTIAL ABUTMENT NO. 1 SECTION WITH 2" DUCTLINE PENETRATION DETAILS**

Not to Scale



2 EC-25 **PARTIAL ABUTMENT NO. 2 SECTION WITH 2" DUCTLINE PENETRATION DETAILS**

Not to Scale

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DUCTS IN BRIDGE DETAILS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

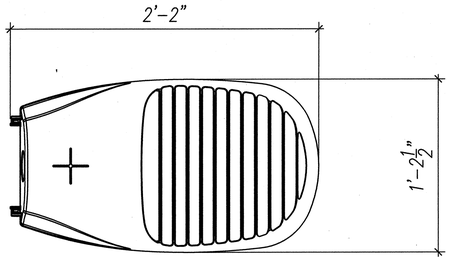
Scale: As Noted Date: January 20, 2015

SHEET No. EC-25 OF 161 SHEETS

412

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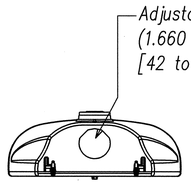
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	413	524



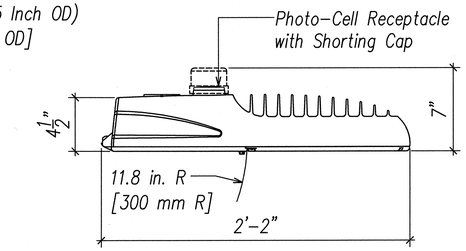
TOP VIEW

Lamp: LED
Voltage: 480V System, Unless Otherwise Noted
Lumens: 15,860
Watts: 185
Photometric Types: S3–Asymmetric Forward
M2–Asymmetric Medium

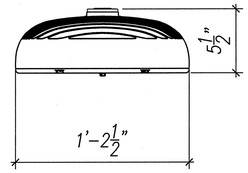
Notes:
1. All dimensions shown are nominal.



BACK VIEW



SIDE VIEW



FRONT VIEW

1 EC-26 LED HIGHWAY LUMINAIRE DETAIL N.T.S.

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

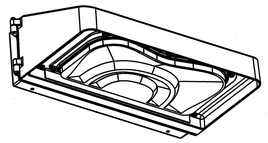
STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
LED HIGHWAY LUMINARE DETAILS
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-26 OF 161 SHEETS

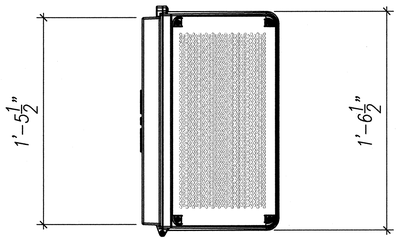
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	414	524



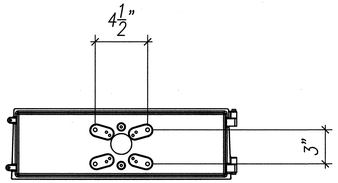
ISOMETRIC VIEW



TOP VIEW

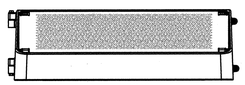
Lamp: LED
Voltage: 480V System, Unless Otherwise Noted
Lumens: 6,810
Watts: 106
Optic Type: Type IV Asymmetric Forward

Notes:
1. All dimensions shown are nominal.



BACK VIEW

SIDE VIEW



FRONT VIEW

LED WALLPACK LUMINAIRE DETAIL
N.T.S.

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

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.

Signature 15.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

LED WALLPACK LUMINARE DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-27 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	415	524

Kapolei Interchange Phase 2

2013-12-16

Pn 29053/K

Roadway Optimized Illumination Calculations Summary using LED Roadway Luminaires

Roadway Illumination Requirements:	Interstate freeway / Intermediate
Average Maintained fc:	**0.6 to 0.9**
Minimum fc:	**0.2**
Avg to Min Uniformity ratio:	**3:1 or 4:1**

Roadway Locations	Pole Setback	Pole Spacing (ft)	Pole Layout Type 1S, SS, OS See Note *** Below	35' luminaire mounting height, 15' bracket arm					
				footcandles			uniformity ratio		Photometric Data
				average	maximum	**minimum**	max / min	**avg / min**	
Ramp KA-1 and Farr Hwy: 3-12' Lanes	6'	**146**	1S	**1.10**	2.37	**0.28**	8.46	**3.93**	GE454962.IES
Ramp KA-1 and Farr Hwy: 5-12' Lanes	6'	**149**	1S	**1.00**	2.37	**0.26**	9.12	**3.85**	GE454962.IES
Ramp KA-1 and Farr Hwy: 4-12' Lanes	6'	**146**	1S	**1.10**	2.37	**0.28**	8.46	**3.93**	GE454962.IES
Ramp KA-2: 4-12' Lanes-Pole on Barrier Wall	14'	**161**	1S	**0.95**	2.30	**0.24**	9.58	**3.96**	GE454962.IES
Ramp KA-2: 3-12' Lanes	10'	**150**	1S	**1.11**	2.49	**0.29**	8.59	**3.83**	GE454962.IES
Ramp KA: 2-15' Lanes	10'	**131***	1S	**1.05**	4.09	**0.27**	15.15	**3.89**	GE454922.IES
Ramp KA-1: 2-15' Lanes	10'	**167****	1S	**1.05**	4.09	**0.27**	15.15	**3.89**	GE454922.IES

Roadway Illumination Requirements:	Interstate freeway / Intermediate
Average Maintained fc:	**0.6 to 0.9**
Minimum fc:	**0.2**
Avg to Min Uniformity ratio:	**3:1 or 4:1**

Roadway Locations	Pole Setback	Pole Spacing (ft)	Pole Layout Type 1S, SS, OS See Note *** Below	35' luminaire mounting height, 15' bracket arm					
				footcandles			uniformity ratio		Photometric Data
				average	maximum	**minimum**	max / min	**avg / min**	
Freeway 3-Inbound Lanes	25'	**166**	1S	**0.93**	2.23	**0.24**	9.29	**3.88**	GE454962.IES
Freeway 3-Outbound Lanes & Ramp MDKA1	25'	**172**	1S	**0.78**	2.24	**0.21**	10.67	**3.71**	GE454962.IES
Freeway 3-Outbound Lanes & 2-Ramp Lanes	15'	**164**	1S	**0.82**	2.23	**0.22**	10.14	**3.73**	GE454962.IES

Notes:

* Pole located on the inside curve so calculated pole spacing was multiplied by 0.55 [238' x 0.55 =131']

** Pole located on the outside curve so calculated pole spacing was multiplied by 0.70 [238' x 0.70 = 167']

*** 1S = One Row One Side Spacing; SS = Two Rows Staggered Spacing; OS = Two Rows Opposite Spacing.

For the Roadway Luminaire Shop Drawings, Contractor shall provide roadway optimization illumination calculations using AGI Roadway Optimizer software (or equal) for the various roadway locations noted above to confirm pole spacing will meet or exceed the pole spacing noted above. For illumination calculations noted above see sheets EC-29 to EC-33.

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.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ILLUMINATION CALCULATIONS SUMMARY

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-28 OF 161 SHEETS

415

LAST SAVE: 02/17/15 @ 10:34:40 BY: AM
57
FILE PATH: Z:\Acad\PROJECTS\29053\ec028_29053_Illumination_calculation_summary.dwg CAD USER: andy PLOT DATE: 2015.02.18

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	416	524

General:

RAMP KA: 2-15' LANES - 10' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Near Side; 1RNS
Roadway Width: 30 ft
Lanes In Direction Of Travel: 2
Driver's Side Of Roadway: Right

Luminaire Information:

GE456288 219B 15860 Lume
Description: ERS2_H3EX740 219B
File Name: GE456288 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

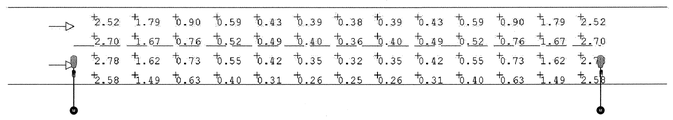
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Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
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GE456288 219B 15860...	615	-10	35	90	0	0
GE456288 219B 15860...	410	-10	35	90	0	0
GE456288 219B 15860...	205	-10	35	90	0	0
GE456288 219B 15860...	0	-10	35	90	0	0
GE456288 219B 15860...	-205	-10	35	90	0	0
GE456288 219B 15860...	-410	-10	35	90	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 1

RoadOpt_Illum



Illuminance (Fc)
Average = 1
Maximum = 2.78
Minimum = 0.25
Avg/Min Ratio = 4
Max/Min Ratio = 11.12
Max/Avg Ratio = 2.78

General:

RAMP KA-1: 2-15' LANES - 10' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 30 ft
Lanes In Direction Of Travel: 2
Driver's Side Of Roadway: Right

Luminaire Information:

GE456288 219B 15860 Lume
Description: ERS2_H3EX740 219B
File Name: GE456288 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

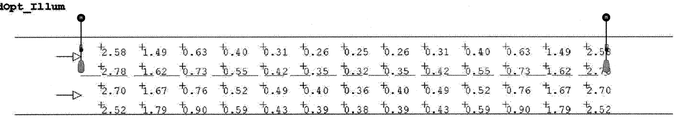
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GE456288 219B 15860...	-205	40	35	270	0	0
GE456288 219B 15860...	0	40	35	270	0	0
GE456288 219B 15860...	205	40	35	270	0	0
GE456288 219B 15860...	410	40	35	270	0	0
GE456288 219B 15860...	615	40	35	270	0	0
GE456288 219B 15860...	820	40	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 2

RoadOpt_Illum



Illuminance (Fc)
Average = 1
Maximum = 2.78
Minimum = 0.25
Avg/Min Ratio = 4
Max/Min Ratio = 11.12
Max/Avg Ratio = 2.78

ORIGINAL PLAN | NOTE BOOK | No. ____
SURVEY PLOTTED BY ____ DATE
DRAWN BY
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.
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROADWAY ILLUMINATION CALCULATIONS 1
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-29 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	417	524

General:

RAMP KA-1 AND FARR HWY: 3-12' LANES - 6' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R2 (Diffuse And Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 36 ft
Lanes In Direction Of Travel: 3
Driver's Side Of Roadway: Right

Luminaire Information:

GE456283 219B 15860 Lume
Description: ERS2_H3DX740 219B
File Name: GE456283 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

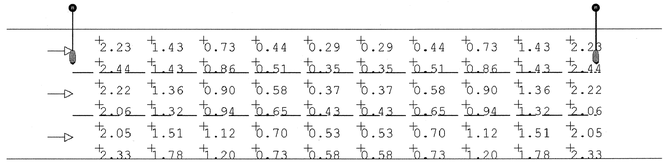
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Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
GE456283 219B 15860...	584	42	35	270	0	0
GE456283 219B 15860...	438	42	35	270	0	0
GE456283 219B 15860...	292	42	35	270	0	0
GE456283 219B 15860...	146	42	35	270	0	0
GE456283 219B 15860...	0	42	35	270	0	0
GE456283 219B 15860...	-146	42	35	270	0	0
GE456283 219B 15860...	-292	42	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 1

RoadOpt_Illum



Illuminance (Fc)
Average = 1.14
Maximum = 2.44
Minimum = 0.29
Avg/Min Ratio = 3.93
Max/Min Ratio = 8.41
Max/Avg Ratio = 2.14

General:

RAMP KA-1 AND FARR HWY: 5-12' LANES - 6' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R2 (Diffuse And Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 60 ft
Lanes In Direction Of Travel: 5
Driver's Side Of Roadway: Right

Luminaire Information:

GE456283 219B 15860 Lume
Description: ERS2_H3DX740 219B
File Name: GE456283 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

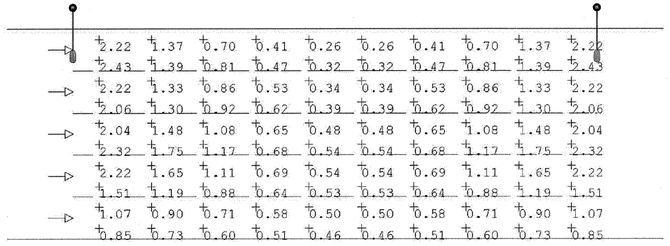
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GE456283 219B 15860...	600	66	35	270	0	0
GE456283 219B 15860...	450	66	35	270	0	0
GE456283 219B 15860...	300	66	35	270	0	0
GE456283 219B 15860...	150	66	35	270	0	0
GE456283 219B 15860...	0	66	35	270	0	0
GE456283 219B 15860...	-150	66	35	270	0	0
GE456283 219B 15860...	-300	66	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 2

RoadOpt_Illum



Illuminance (Fc)
Average = 1.02
Maximum = 2.43
Minimum = 0.26
Avg/Min Ratio = 3.92
Max/Min Ratio = 9.35
Max/Avg Ratio = 2.38

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
ROADWAY ILLUMINATION CALCULATIONS 2
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EC-30 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	418	524

General:

RAMP KA-1 AND FARR HWY: 4-12' LANES - 6' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R2 (Diffuse And Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 48 ft
Lanes In Direction Of Travel: 4
Driver's Side Of Roadway: Right

Luminaire Information:

GE456283 219B 15860 Lume
Description: ERS2_H3DX740 219B
File Name: GE456283 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

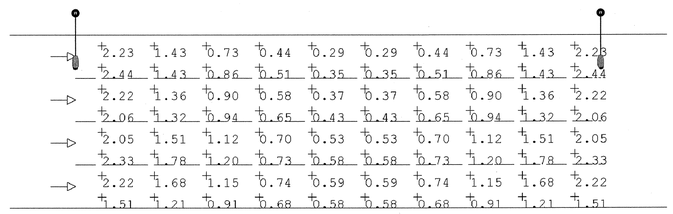
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GE456283 219B 15860...	584	54	35	270	0	0
GE456283 219B 15860...	438	54	35	270	0	0
GE456283 219B 15860...	292	54	35	270	0	0
GE456283 219B 15860...	146	54	35	270	0	0
GE456283 219B 15860...	0	54	35	270	0	0
GE456283 219B 15860...	-146	54	35	270	0	0
GE456283 219B 15860...	-292	54	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 3

RoadOpt_Illum



Illuminance (Fc)
Average = 1.13
Maximum = 2.44
Minimum = 0.29
Avg/Min Ratio = 3.9
Max/Min Ratio = 8.41
Max/Avg Ratio = 2.16

General:

RAMP KA-2: 4-12' LANES - 14' SETBACK - POLE ON BARRIER WALL

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 48 ft
Lanes In Direction Of Travel: 4
Driver's Side Of Roadway: Right

Luminaire Information:

GE456288 219B 15860 Lume
Description: ERS2_H3EX740 219B
File Name: GE456288 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

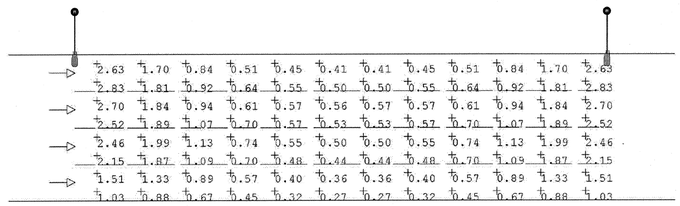
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Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
GE456288 219B 15860...	700	62	35	270	0	0
GE456288 219B 15860...	525	62	35	270	0	0
GE456288 219B 15860...	350	62	35	270	0	0
GE456288 219B 15860...	175	62	35	270	0	0
GE456288 219B 15860...	0	62	35	270	0	0
GE456288 219B 15860...	-175	62	35	270	0	0
GE456288 219B 15860...	-350	62	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 2

RoadOpt_Illum



Illuminance (Fc)
Average = 1.06
Maximum = 2.83
Minimum = 0.27
Avg/Min Ratio = 3.93
Max/Min Ratio = 10.48
Max/Avg Ratio = 2.67

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

LAST SAVE: 02/17/15 @ 10:34:57 BY: AM
ID:
FILE PATH: Z:\Acad\PROJECTS\29053\xc03f_29053_Illumination_calculation_sheet_3.dwg CAD USER: andy PLOT DATE: 2015.02.18

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ILLUMINATION CALCULATIONS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-31 OF 161 SHEETS

418

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	419	524

General:

RAMP KA-2: 3-12' LANES - 10' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 36 ft
Lanes In Direction Of Travel: 3
Driver's Side Of Roadway: Right

Luminaire Information:

GE456288 219B 15860 Lume
Description: ERS2_H3EX740 219B
File Name: GE456288 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

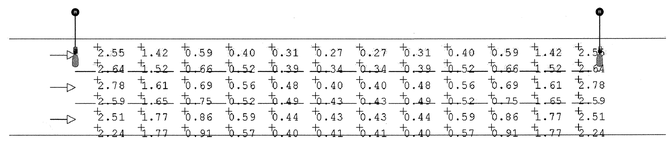
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GE456288 219B 15860...	784	46	35	270	0	0
GE456288 219B 15860...	588	46	35	270	0	0
GE456288 219B 15860...	392	46	35	270	0	0
GE456288 219B 15860...	196	46	35	270	0	0
GE456288 219B 15860...	0	46	35	270	0	0
GE456288 219B 15860...	-196	46	35	270	0	0
GE456288 219B 15860...	-392	46	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 3

RoadOpt_Illum



Illuminance (Fc)
Average = 1.04
Maximum = 2.78
Minimum = 0.27
Avg/Min Ratio = 3.85
Max/Min Ratio = 10.3
Max/Avg Ratio = 2.67

General:

FREEWAY 3-INBOUND LANES - 25' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Near Side; 1RNS
Roadway Width: 36 ft
Lanes In Direction Of Travel: 3
Driver's Side Of Roadway: Right

Luminaire Information:

GE456283 219B 15860 Lume
Description: ERS2_H3DX740 219B
File Name: GE456283 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

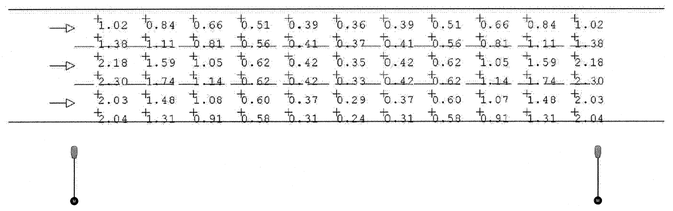
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GE456283 219B 15860...	668	-25	35	90	0	0
GE456283 219B 15860...	501	-25	35	90	0	0
GE456283 219B 15860...	334	-25	35	90	0	0
GE456283 219B 15860...	167	-25	35	90	0	0
GE456283 219B 15860...	0	-25	35	90	0	0
GE456283 219B 15860...	-167	-25	35	90	0	0
GE456283 219B 15860...	-334	-25	35	90	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 1

RoadOpt_Illum



Illuminance (Fc)
Average = 0.95
Maximum = 2.30
Minimum = 0.24
Avg/Min Ratio = 3.96
Max/Min Ratio = 9.58
Max/Avg Ratio = 2.42

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ILLUMINATION CALCULATIONS 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EC-32 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	420	524

General:

FREEWAY 3-OUTBOUND LANES & RAMP MDKA1-25' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 48 ft
Lanes In Direction Of Travel: 4
Driver's Side Of Roadway: Right

Luminaire Information:

GE456283 219B 15860 Lume
Description: ERS2_H3DX740 219B
File Name: GE456283 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

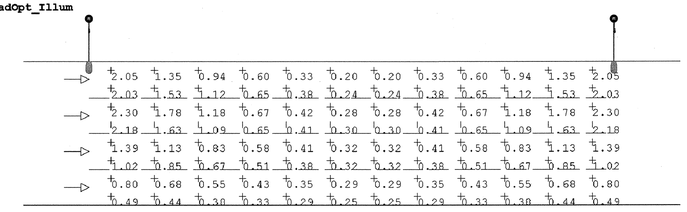
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Label	X-Coord	Y-Coord	Z-Coord	Orient	Tilt	Spin
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GE456283 219B 15860...	525	73	35	270	0	0
GE456283 219B 15860...	350	73	35	270	0	0
GE456283 219B 15860...	175	73	35	270	0	0
GE456283 219B 15860...	0	73	35	270	0	0
GE456283 219B 15860...	-175	73	35	270	0	0
GE456283 219B 15860...	-350	73	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 2

RoadOpt_Illum



Illuminance (Fc)
Average = 0.79
Maximum = 2.30
Minimum = 0.20
Avg/Min Ratio = 3.95
Max/Min Ratio = 11.5
Max/Avg Ratio = 2.91

General:

FREEWAY 3-OUTBOUND LANES & 2-RAMP LANES-15' SETBACK

Roadway Standard: IES RP-8-2000
R-Table: R3 (Slightly Specular), Q0=0.07 Actual Q0 Value: 0.07

Roadway Layout:

Layout Type: One Row, Far Side; 1RFS
Roadway Width: 60 ft
Lanes In Direction Of Travel: 5
Driver's Side Of Roadway: Right

Luminaire Information:

GE456283 219B 15860 Lume
Description: ERS2_H3DX740 219B
File Name: GE456283 219B 15860 Lumens.ies
Lumens Per Lamp: N.A.
Number Of Lamps: 1
Total Lamp Lumens: N.A.
Luminaire Lumens: 15860
Luminaire Watts: 185
Efficiency (%): N.A.
Total Light Loss Factor: 0.760
Luminaire Arrangement: SINGLE
Arm Length: 15 ft
Offset: 0 ft

Luminaire Location Summary:
Coordinates in ft

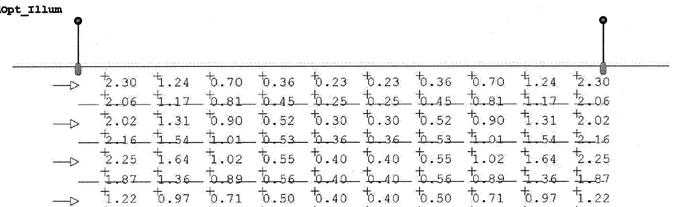
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GE456283 219B 15860...	-328	75	35	270	0	0
GE456283 219B 15860...	-164	75	35	270	0	0
GE456283 219B 15860...	0	75	35	270	0	0
GE456283 219B 15860...	164	75	35	270	0	0
GE456283 219B 15860...	328	75	35	270	0	0
GE456283 219B 15860...	492	75	35	270	0	0
GE456283 219B 15860...	656	75	35	270	0	0

Total Number of locations: 7

Roadway Optimizer - Layout 3

RoadOpt_Illum



Illuminance (Fc)
Average = 0.85
Maximum = 2.30
Minimum = 0.23
Avg/Min Ratio = 3.7
Max/Min Ratio = 10
Max/Avg Ratio = 2.71

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

ORIGINAL PLAN
NOTE BOOK
No.

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.
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2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ROADWAY ILLUMINATION CALCULATIONS 5

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

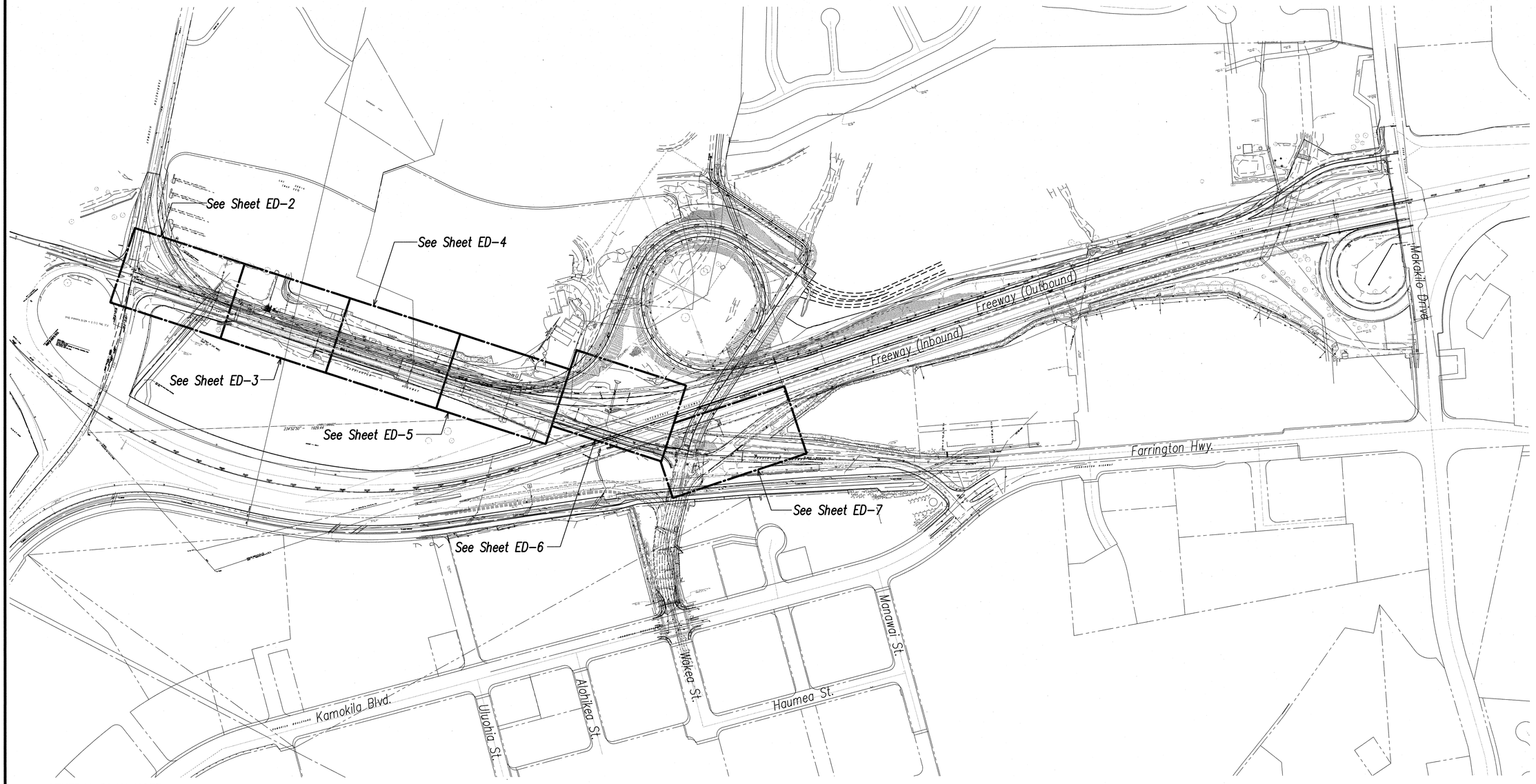
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SHEET No. EC-33 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	421	524



GENERAL PLAN NOTE:

Contractor Shall Coordinate with HECo Prior to any Grading Work Along Farrington Highway.

PHASE 1 OVERALL ELECTRICAL UTILITY RELOCATION PLAN

SCALE: 1"=200'

NORTH

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

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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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 1 OVERALL UTILITY RELOCATION PLAN

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

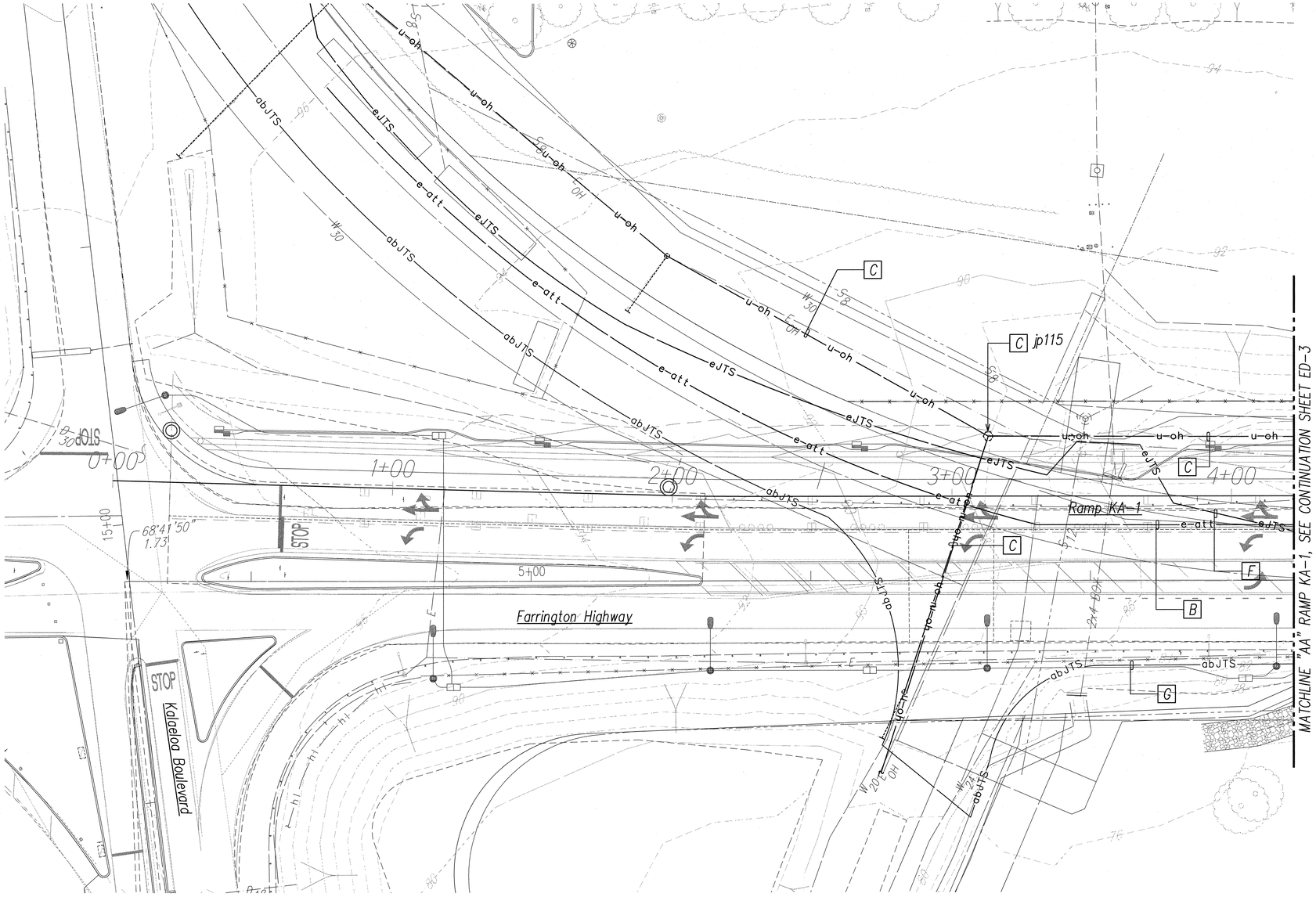
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	422	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Not used.
B Existing AT&T Underground Ductline to Remain.
C Existing Joint Utility Pole and Overhead Lines to Remain.
D Proposed New Wood / Fiberglass Utility Pole / Guys and Anchors (Provided by Respective Utility Company).
E Proposed New Alignment of Utility Company's Overhead Lines.
F Existing JTS Cable C-5112.
G Existing JTS Cable C-5133 (Abandoned).



GENERAL PLAN NOTE:

Contractor Shall Coordinate with HECo Prior to any Grading Work Along Farrington Highway.

NORTH

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

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 1
SCALE: 1"=20'

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

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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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 1
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. ED-2 OF 161 SHEETS

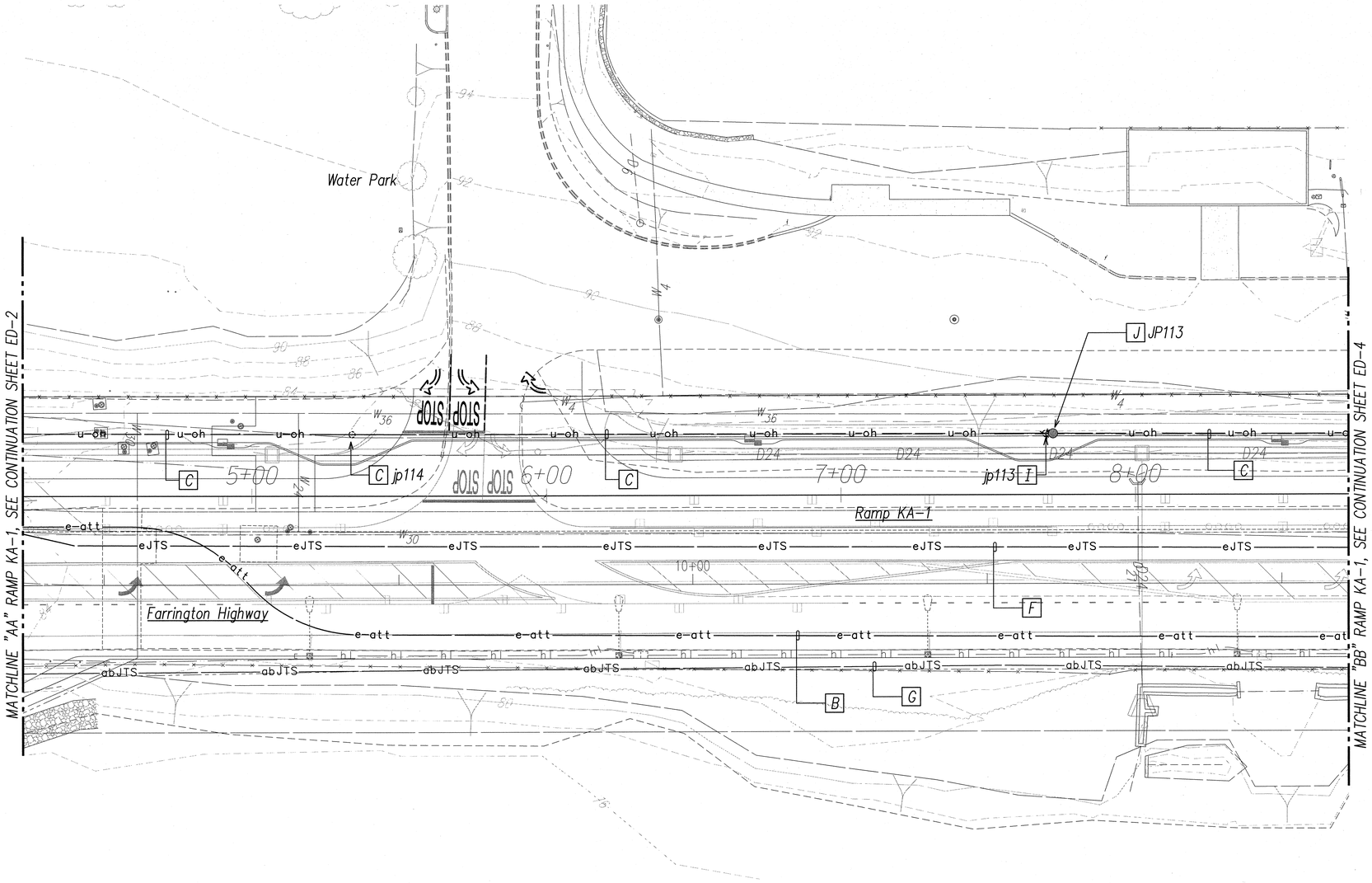
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	423	524

PLAN NOTES: *(Items Identified on Plans as Boxed Items)*

- A Not used.
- B Existing AT&T Underground Ductline to Remain.
- C Existing Joint Pole and Overhead Lines to Remain.
- D Proposed New Wood / Fiberglass Utility Pole / Guys and Anchors (Provided by Respective Utility Company).
- E Proposed New Alignment of Utility Company's Overhead Lines.
- F Existing JTS Cable C-5112.
- G Existing JTS Cable C-5133 (Abandoned).
- H Not used.
- I Existing Joint Pole #113 to be Removed by HECo.
- J New Joint Pole #113 to be Installed by HECo (See General Plan Note Below).



GENERAL PLAN NOTE:

Contractor Shall Coordinate with HECo Prior to any Grading Work Along Farrington Highway.

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

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 2

SCALE: 1"=20'

Ronald N. S. Ho & Associates, Inc. Electrical Engineers

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

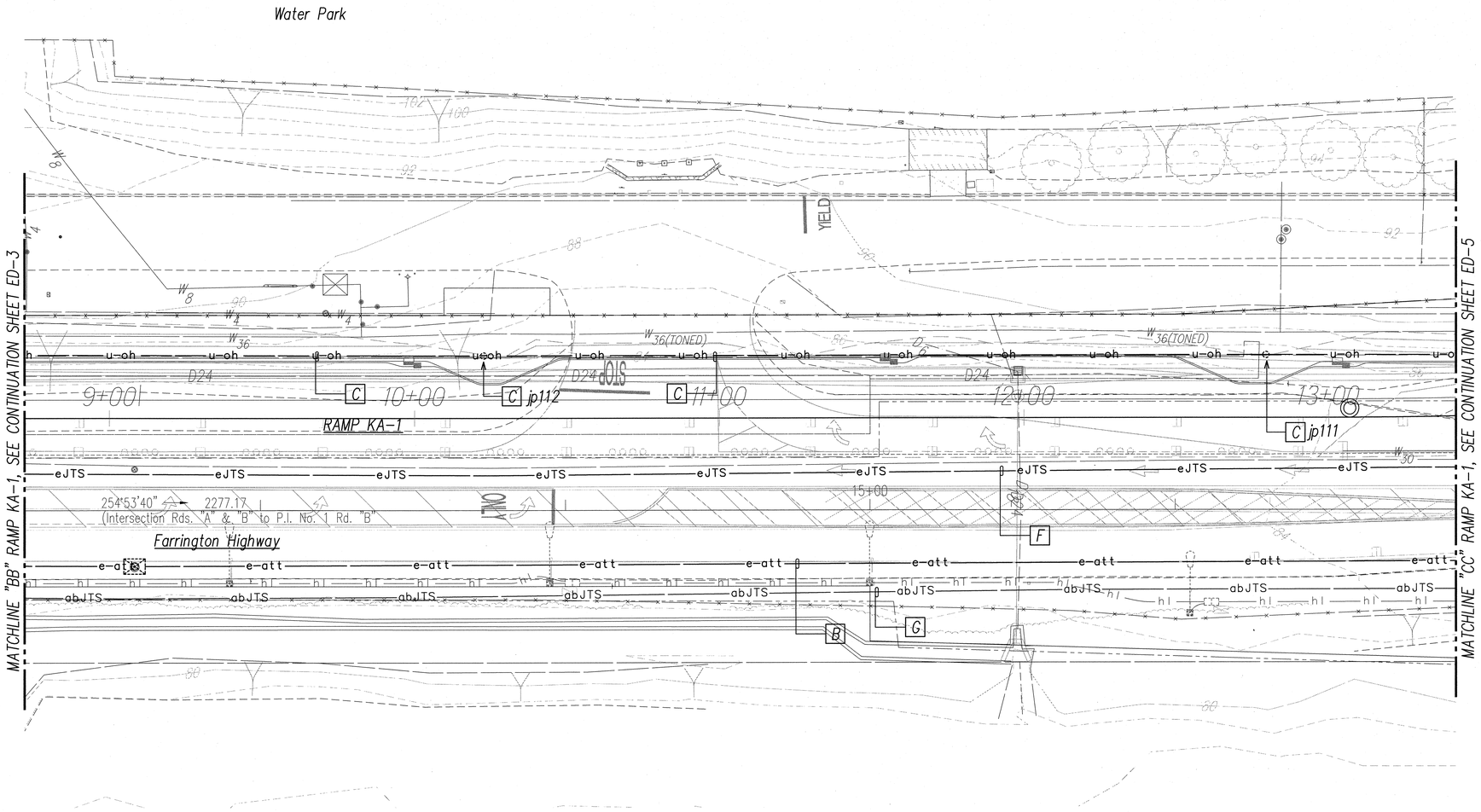
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	424	524

PLAN NOTES: *(Items Identified on Plans as Boxed Items)*

- A Not used.
- B Existing AT&T Underground Ductline to Remain.
- C Existing Joint Utility Pole and Overhead Lines to Remain.
- D Proposed New Wood / Fiberglass Utility Pole / Guys and Anchors (Provided by Respective Utility Company).
- E Not used.
- F Existing JTS Cable C-5112.
- G Existing JTS Cable C-5133 (Abandoned).



GENERAL PLAN NOTE:

Contractor Shall Coordinate with HECo Prior to any Grading Work Along Farrington Highway.

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 3

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

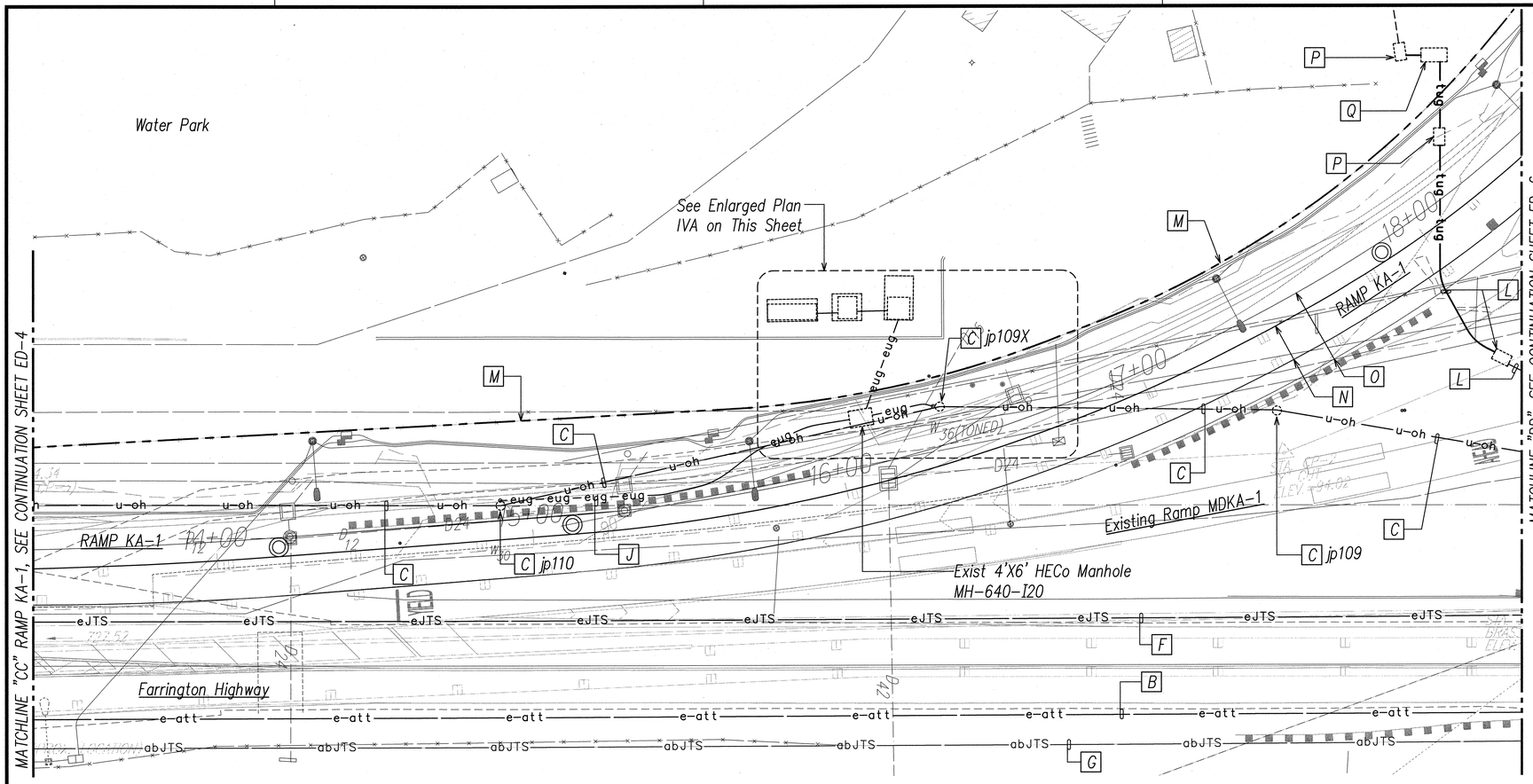
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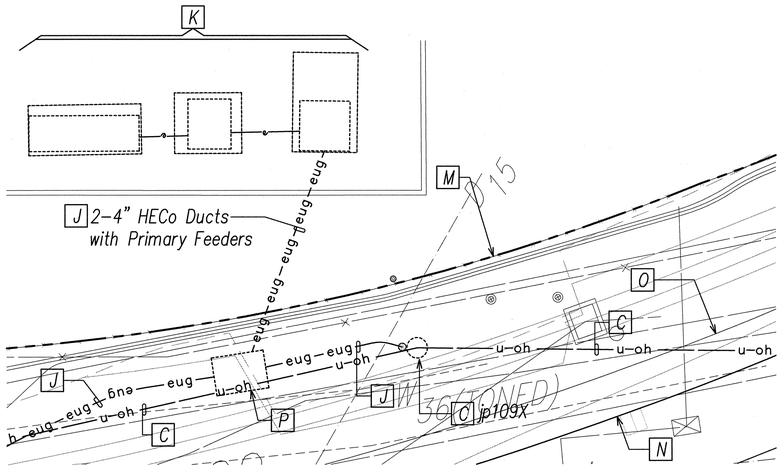
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	425	524





ENLARGED ELECTRICAL UTILITY RELOCATION PLAN 4A

SCALE: 1"=10'

PLAN NOTES: *(Items Identified on Plans as Boxed Items)*

- A Not used.
- B Existing AT&T Underground Ductline to Remain.
- C Existing Joint Utility Pole and Overhead Lines to Remain.
- D Not used.
- E Not used.
- F Existing JTS Cable C-5112.
- G Existing JTS Cable C-5133 (Abandoned).
- H Not Used
- I Not used.
- J Existing Underground HECo Ductline and Cables to Remain.
- K Existing Water Park Electrical Service Equipment to Remain or be Relocated by Others.
- L Existing Water Park Telephone Service Underground Wiring and Pullbox to be Relocated in Phase 2 Electrical Construction.
- M Right-of-Way Line.
- N Edge of New Travelway.
- O Edge of New Shoulder.
- P Existing HECo 4' x 6' Manhole MH-640-I20 to Remain.
- Q Existing Water Park Telephone Service Equipment.

GENERAL PLAN NOTE:

Contractor Shall Coordinate with HECo Prior to any Grading Work Along Farrington Highway.

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 4

SCALE: 1"=20'

NORTH

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

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

GRAPHIC SCALES

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

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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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

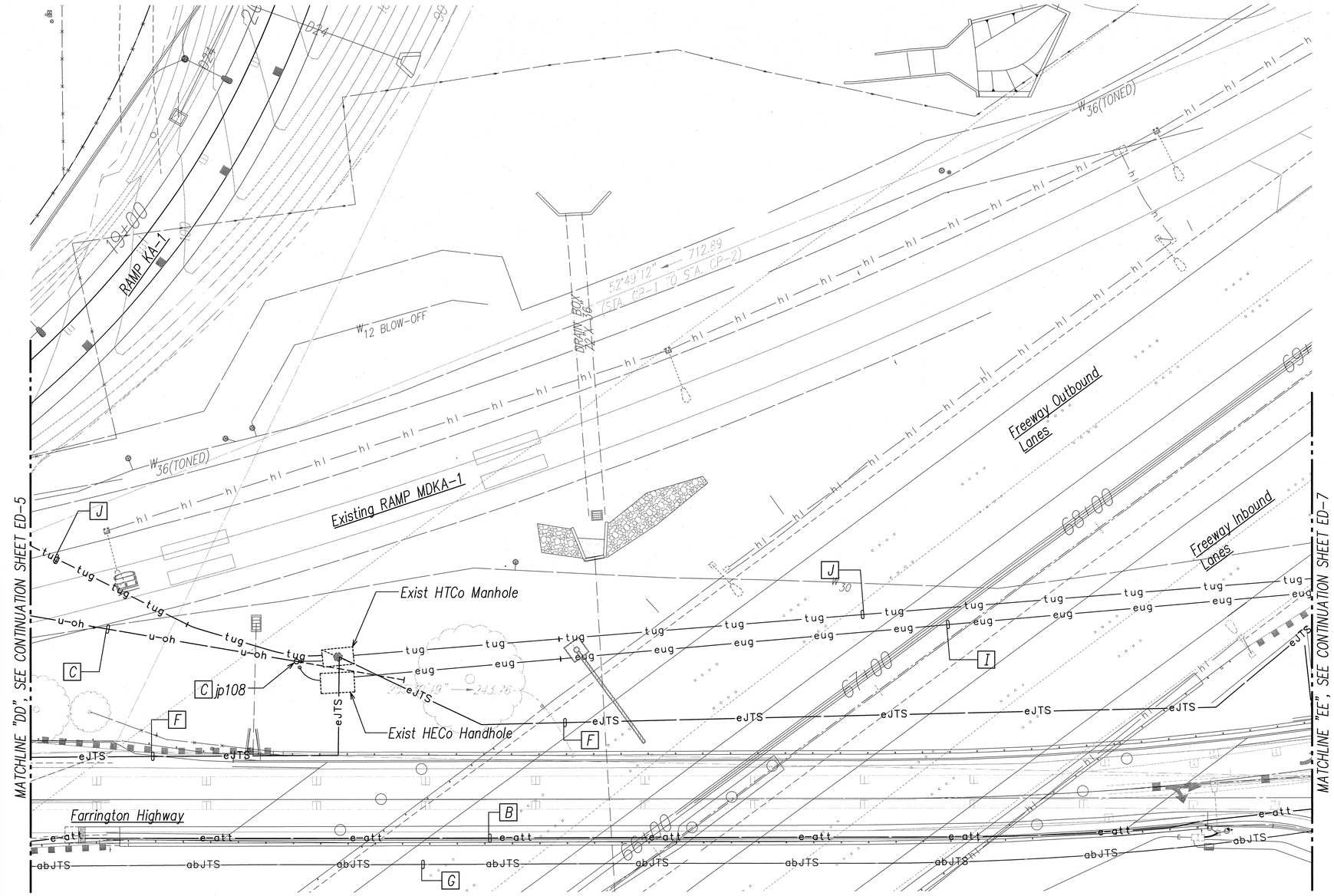
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	426	524

PLAN NOTES: *(Items Identified on Plans as Boxed Items)*

- A Not used.
- B Existing AT&T Underground Ductline to Remain.
- C Existing Joint Utility Pole and Overhead Lines to Remain.
- D Not used.
- E Not used.
- F Existing JTS Cable C-5112.
- G Existing JTS Cable C-5133 (Abandoned).
- H Not used.
- I Existing HECo Underground Ductline to Remain.
- J Existing HTCo Underground Ductline to Remain.



PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 5

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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HAWAII, U.S.A.

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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 5

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

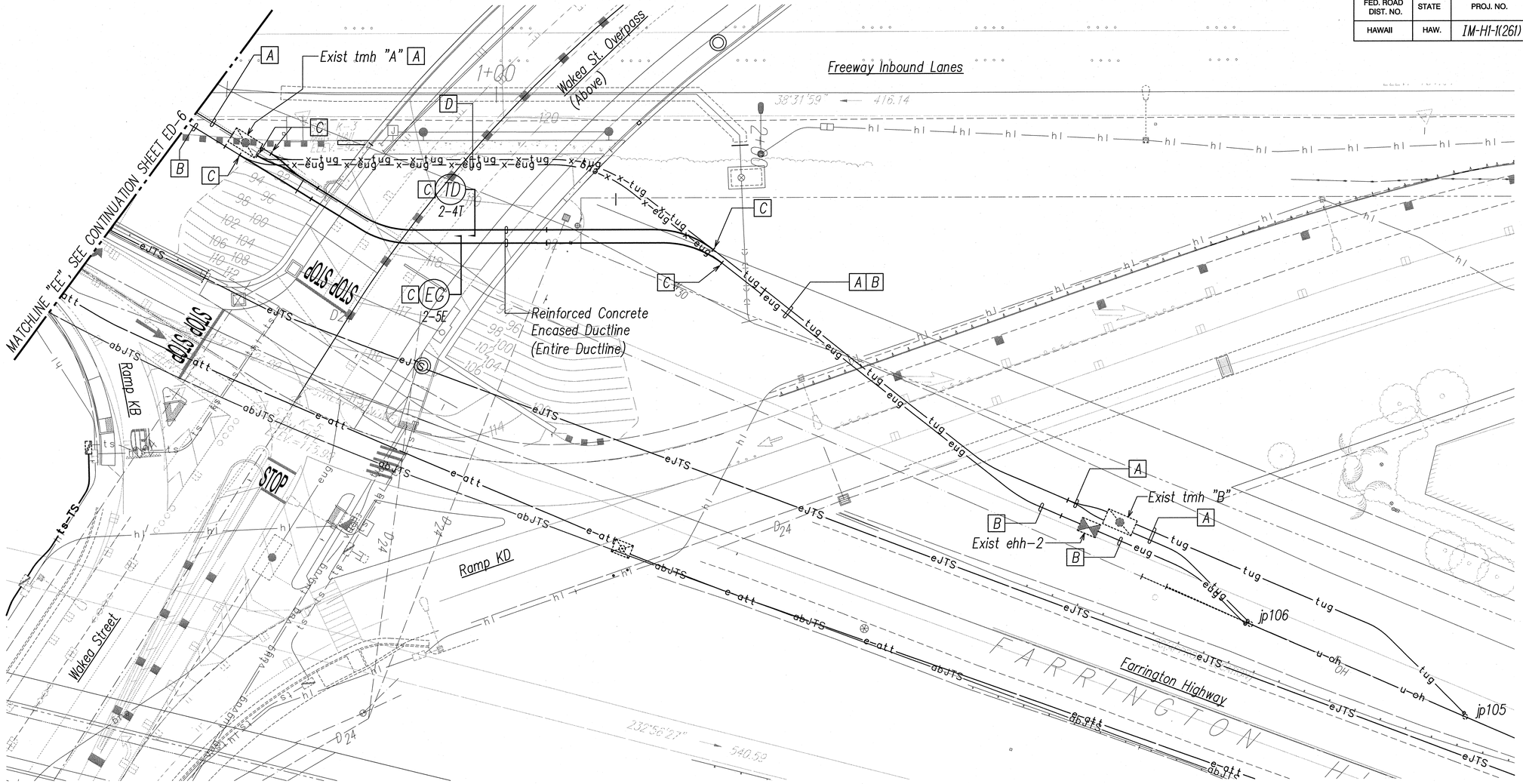
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	427	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Existing Hawaiian Telcom (HTCo) 8–4"C Ductline/ Manhole/ Handhole to Remain.

B Existing Hawaiian Electric Company (HECo) 2–5"C Ductline/ Manhole/ Handhole to Remain.

C Construction Phasing of Providing New HECo and HTCo Ductlines for Clearing New Abutment Wall Foundation:

1. Contractor to Intercept Existing Spare Ducts and Reroute Via New Reinforced Concrete Encased Ducts to Clear New Abutment Wall Foundation.
2. HECo and HTCo to Install New Temporary Cables in Rerouted Ductlines and Remove Existing Cables.
3. For Additional Work to HECo Facilities, Contractor to Intercept Existing HECo Duct (After Existing Cables are Removed) and Reroute Via New Reinforced Concrete Encased Duct to Clear Abutment Wall Foundation. Contractor to Contact HECo to Break into Existing Energized Ductline.

D After Existing Underground HECo and HTCo Cables are Removed by the Respective Utility Company, Contractor to Demolish and Remove Existing Reinforced Concrete Encased Underground Ductlines.

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 6

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 1 ELECTRICAL UTILITY RELOCATION PLAN 6

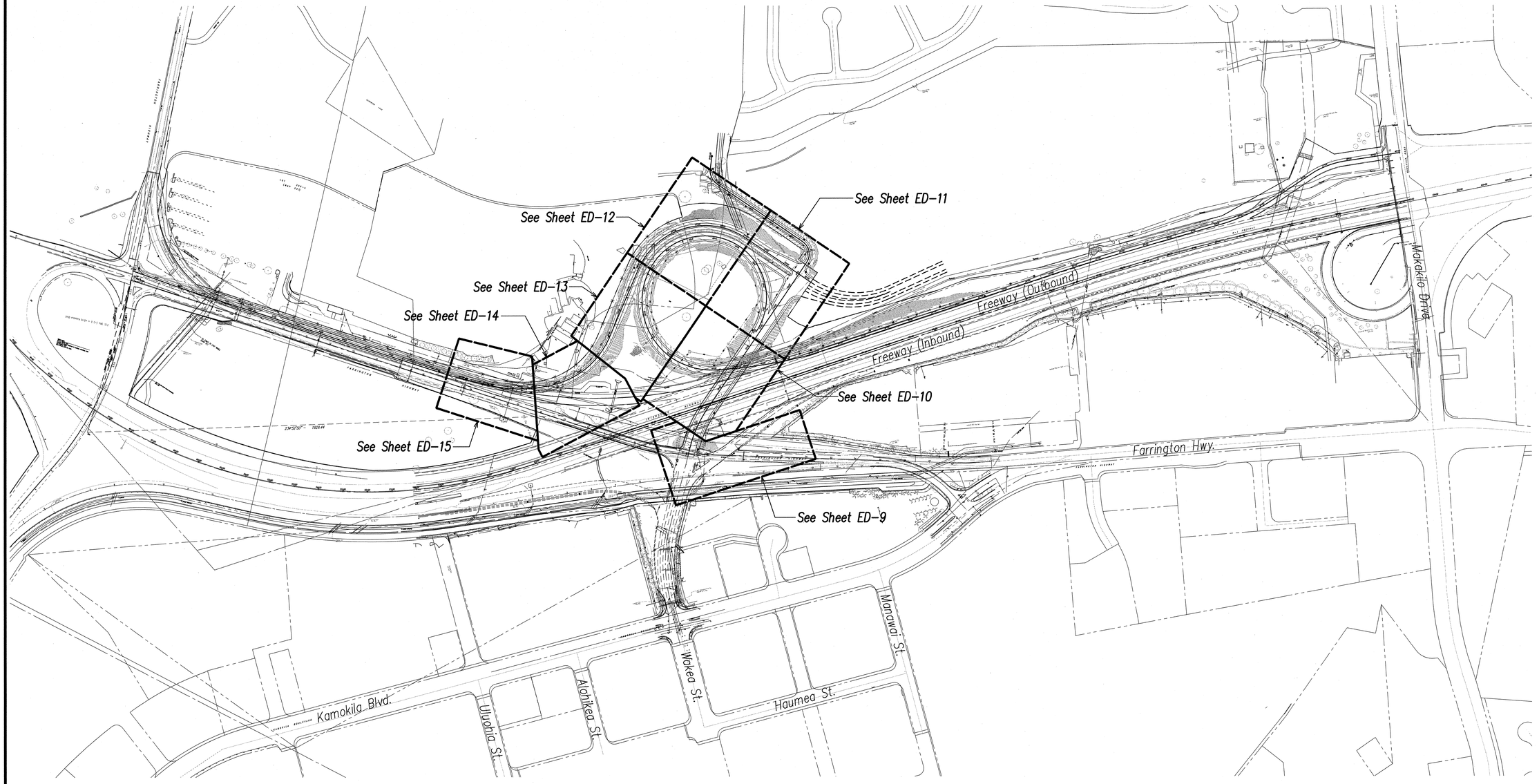
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. ED-7 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	428	524



PHASE 2 OVERALL ELECTRICAL UTILITY PLAN

SCALE: 1"=200'

NORTH

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For Catv Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-16.

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2 OVERALL
ELECTRICAL UTILITY PLAN
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

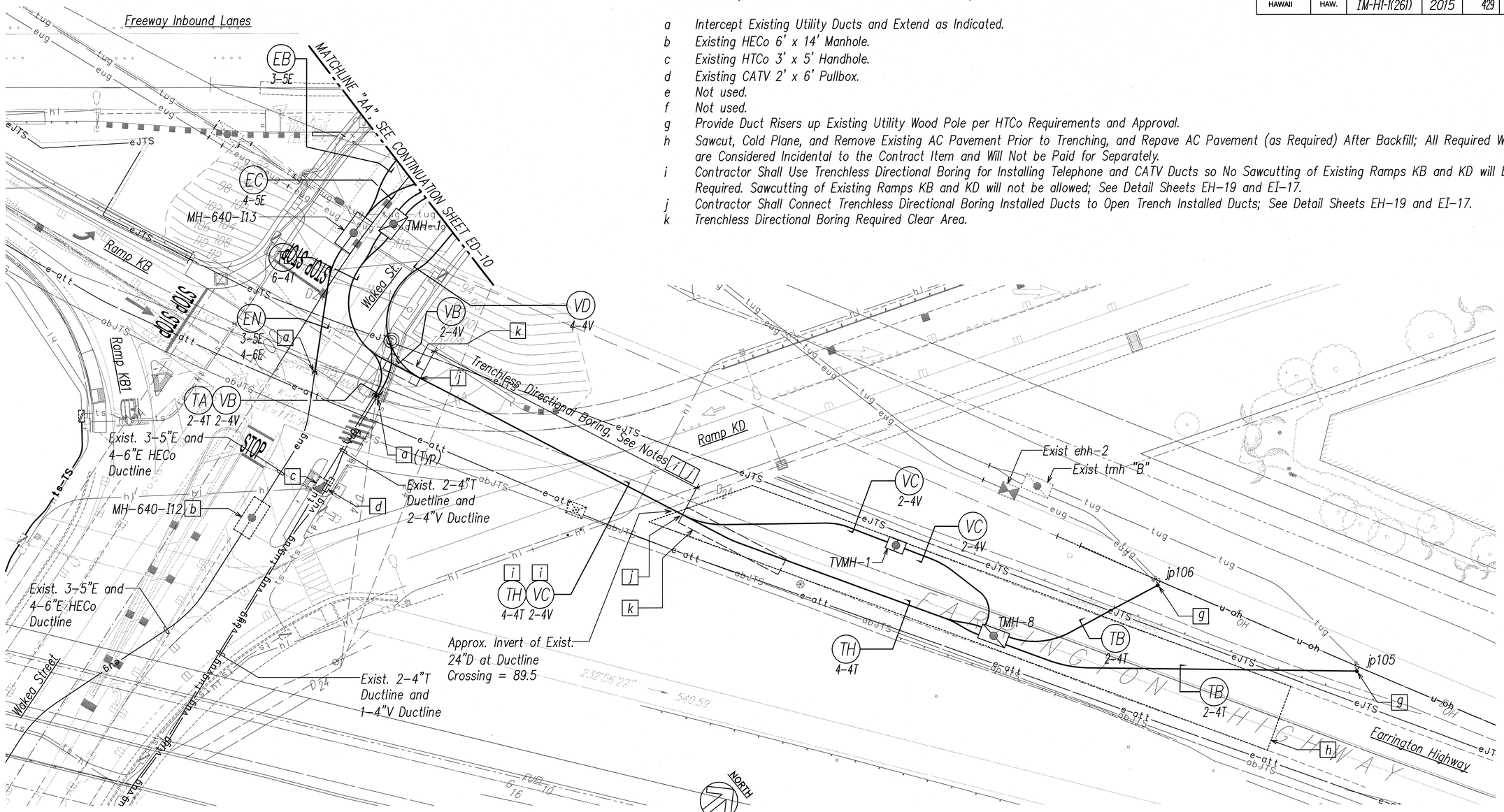
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	429	524

PLAN NOTES: (Items Identified on Plans as Boxed Items)

a Intercept Existing Utility Ducts and Extend as Indicated.
b Existing HECo 6' x 14' Manhole.
c Existing HTCo 3' x 5' Handhole.
d Existing CATV 2' x 6' Pullbox.
e Not used.
f Not used.
g Provide Duct Risers up Existing Utility Wood Pole per HTCo Requirements and Approval.
h Sawcut, Cold Plane, and Remove Existing AC Pavement Prior to Trenching, and Repave AC Pavement (as Required) After Backfill; All Required Work are Considered Incidental to the Contract Item and Will Not be Paid for Separately.
i Contractor Shall Use Trenchless Directional Boring for Installing Telephone and CATV Ducts so No Sawcutting of Existing Ramps KB and KD will be Required. Sawcutting of Existing Ramps KB and KD will not be allowed; See Detail Sheets EH-19 and EI-17.
j Contractor Shall Connect Trenchless Directional Boring Installed Ducts to Open Trench Installed Ducts; See Detail Sheets EH-19 and EI-17.
k Trenchless Directional Boring Required Clear Area.



PHASE 2 ELECTRICAL UTILITY PLAN 1

SCALE: 1"=20'

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-16.

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

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

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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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2
ELECTRICAL UTILITY PLAN 1
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

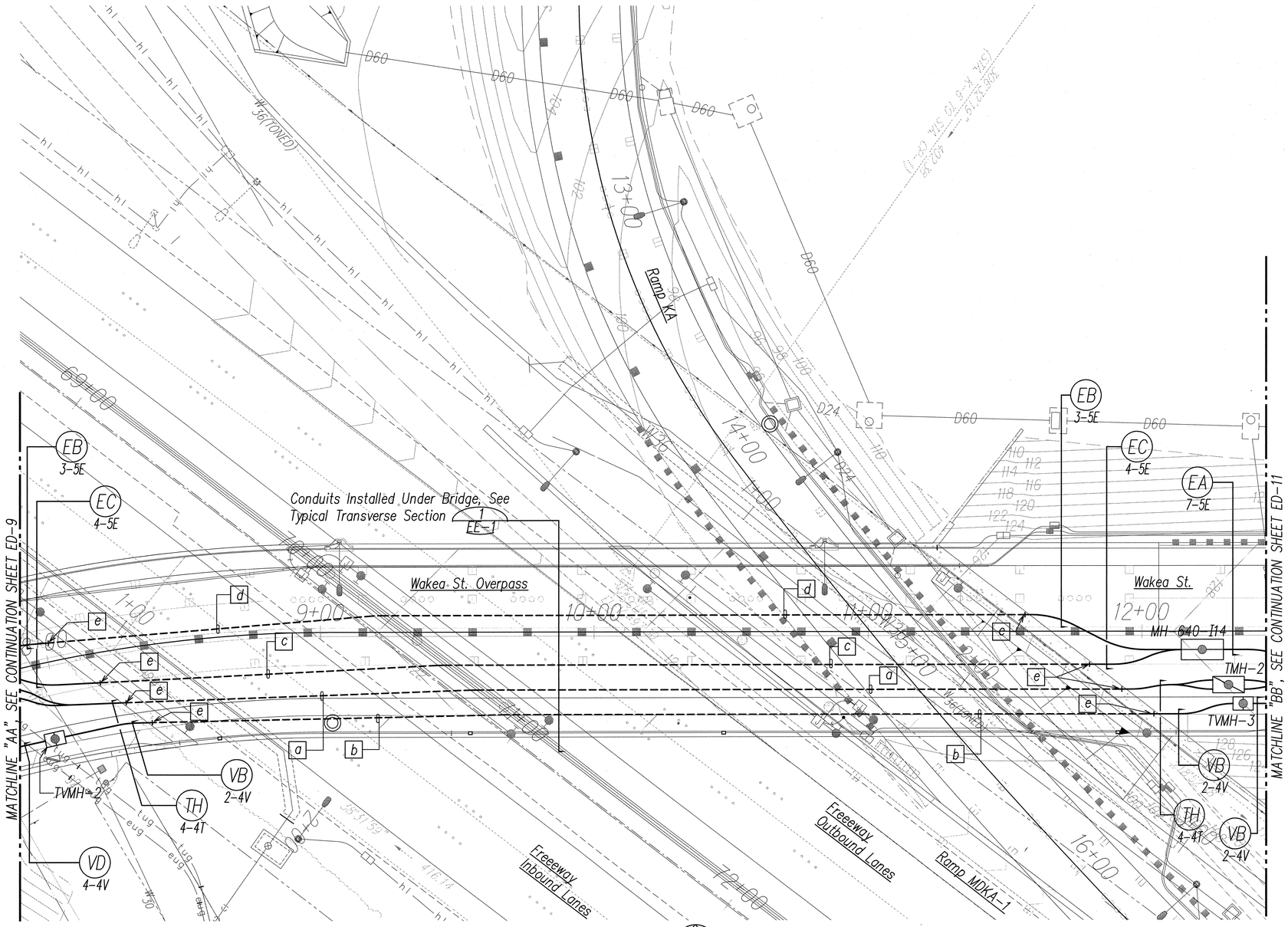
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SHEET No. ED-9 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	430	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

a Route 4–4" Telephone Conduits Under Bridge Structure, See Details on Sheets EE–1 and EE–6.

b Route 2–4" CATV Conduits Under Bridge Structure, See Details on Sheets EE–1 and EE–8.

c Route 4–5" Electric Conduits Under Bridge Structure, See Details on Sheets EE–1 and EE–2.

d Route 3–5" Electric Conduits Under Bridge Structure, See Details on Sheets EE–1 and EE–4.

e Conduit Transition Through Abutment Wall, See Details on Sheets EE–3, EE–5, EE–7 and EE–9.

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

PHASE 2 ELECTRICAL UTILITY PLAN 2

SCALE: 1"=20'

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG–1 to EG–19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH–1 to EH–18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI–1 to EI–16.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2

ELECTRICAL UTILITY PLAN 2

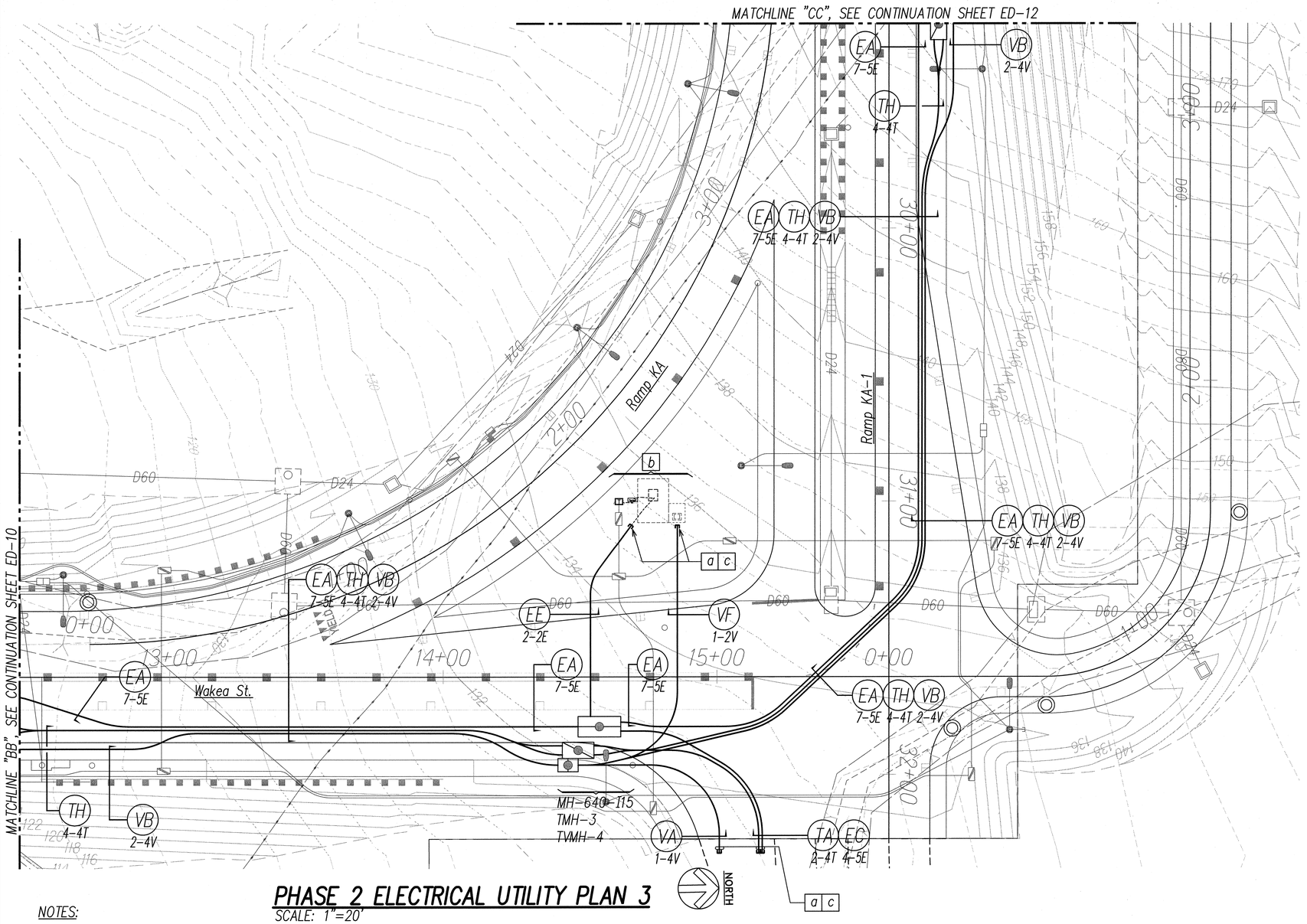
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. ED-10 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	431	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

a Stub and Cap Ducts for Future Use.

b Future Traffic Signal Service Equipment; Future HECo Single Phase Padmount Transformer; Future CATV Equipment.

c Provide Concrete Duct Marker, See Detail on Sheet EA-9.

PHASE 2 ELECTRICAL UTILITY PLAN 3

SCALE: 1"=20'

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-16.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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 I. MIYASATO
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2

ELECTRICAL UTILITY PLAN 3

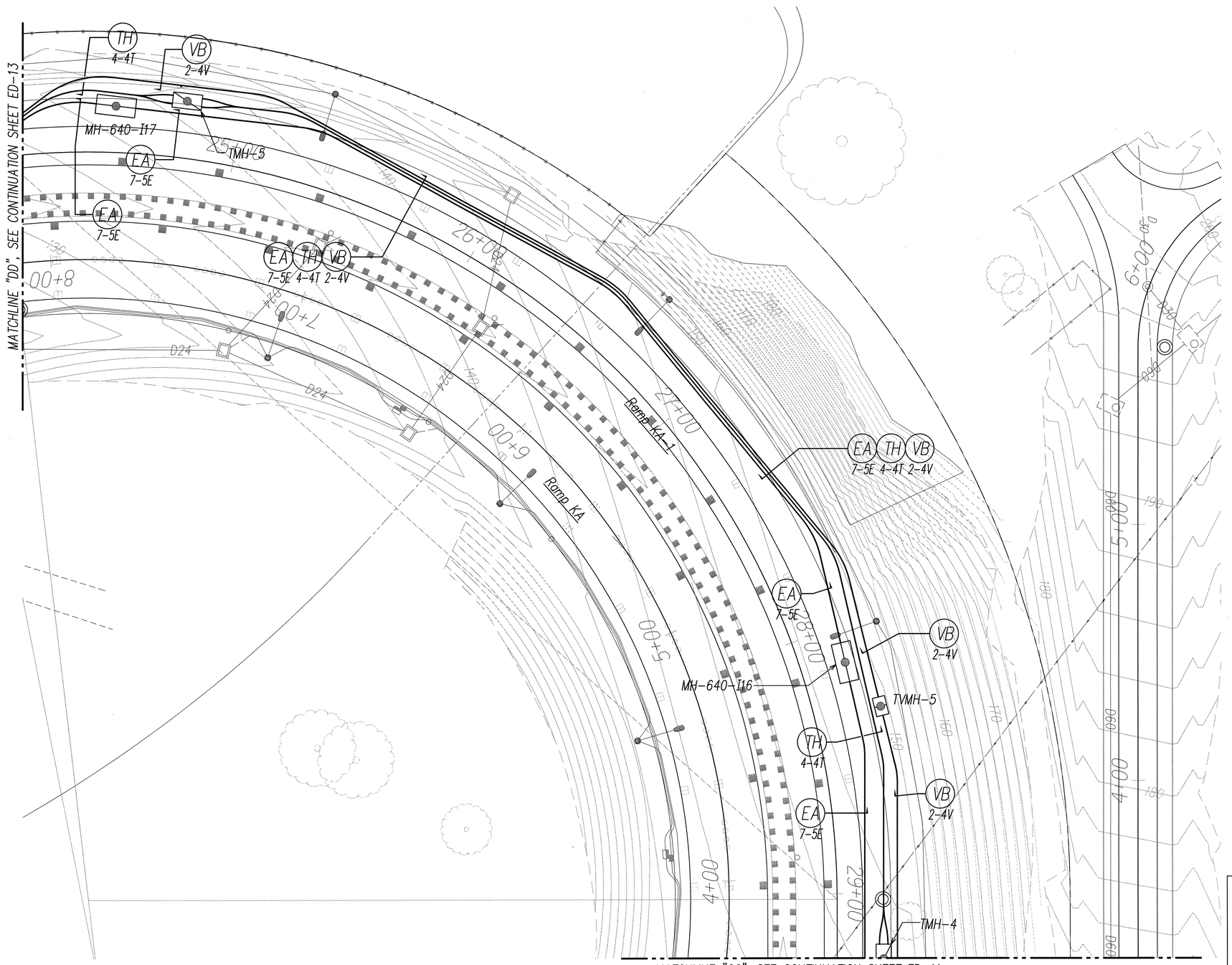
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	432	524



PHASE 2 ELECTRICAL UTILITY PLAN 4

SCALE: 1"=20'

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-16.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2

ELECTRICAL UTILITY PLAN 4

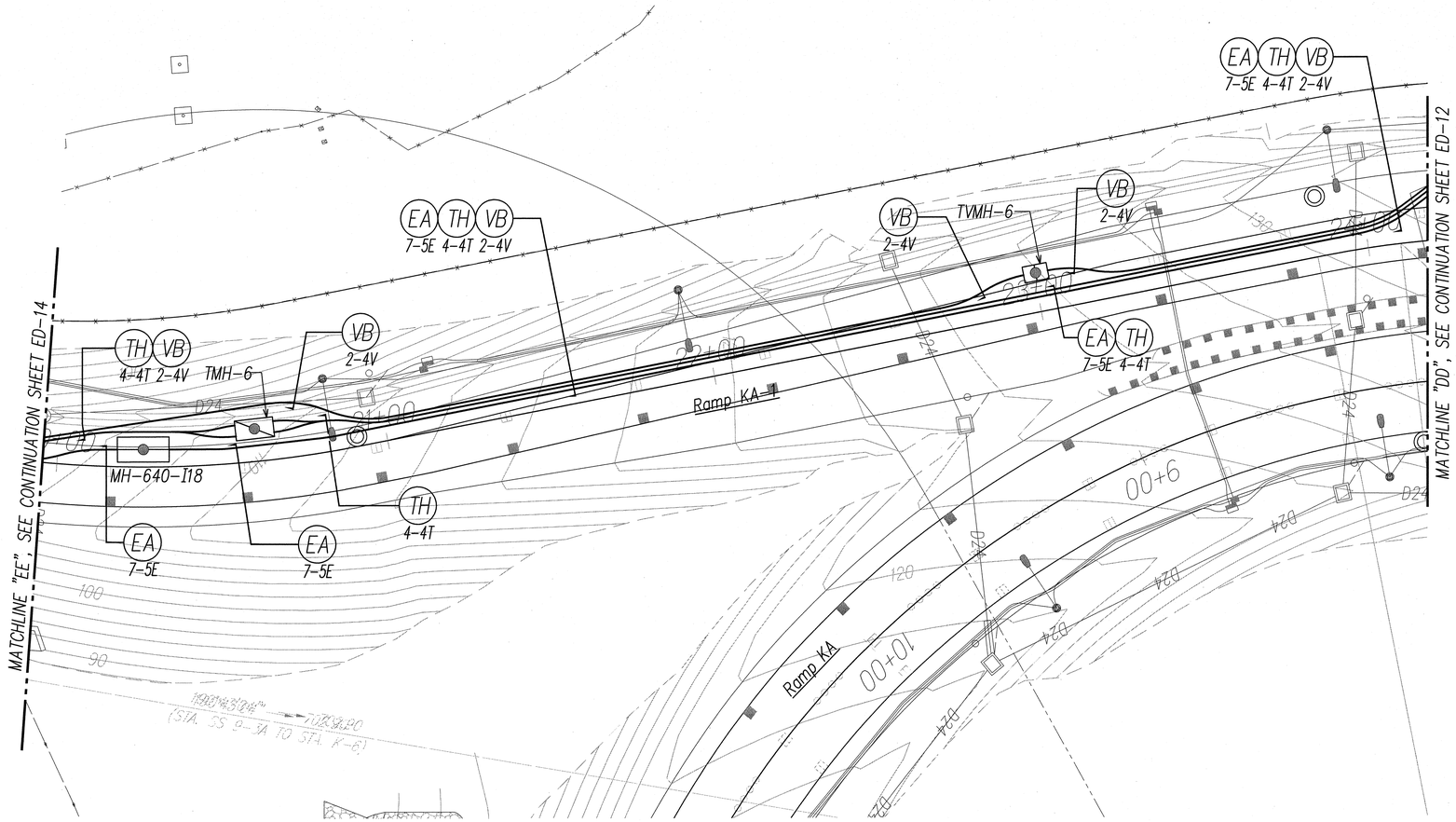
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. ED-12 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	433	524



PHASE 2 ELECTRICAL UTILITY PLAN 5

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-16.

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.

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2

ELECTRICAL UTILITY PLAN 5

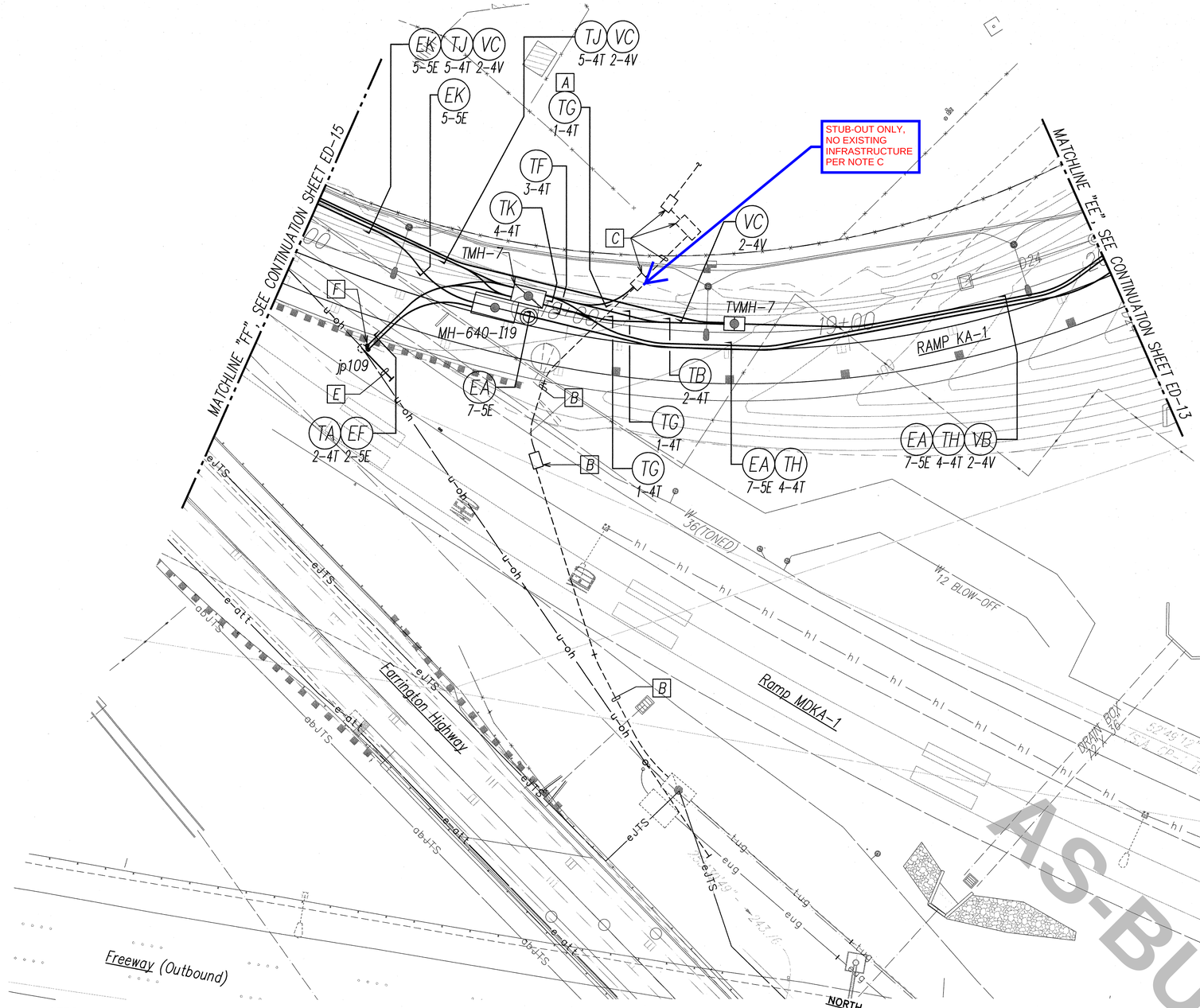
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	434	524



AS-BUILT

PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Route New 4"T Duct into Existing HTCo Handhole for New Telephone Service to Water Park.

B After New Telephone Service to Water Park is Fully Restored and HTCo has Removed the Existing Cables, Contractor Shall Demolish and Remove Existing 4" Conduits and Handhole, Except Under Existing Ramp MDKA1, 4" Conduits to be Abandoned in Place. See Sheet ED-11 for Demolition and Removal Work.

C Existing Telephone Service Items for Water Park to Remain.

D Not Used.

E Proposed New Guys and Anchors (Provided by Respctive Utility Company).

F New Duct Risers Up Existing Utility Pole with Long Radius Bends, per Respective Utility Company Requirements and Approval.

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-16.

PHASE 2 ELECTRICAL UTILITY PLAN 6

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2
ELECTRICAL UTILITY PLAN 6
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

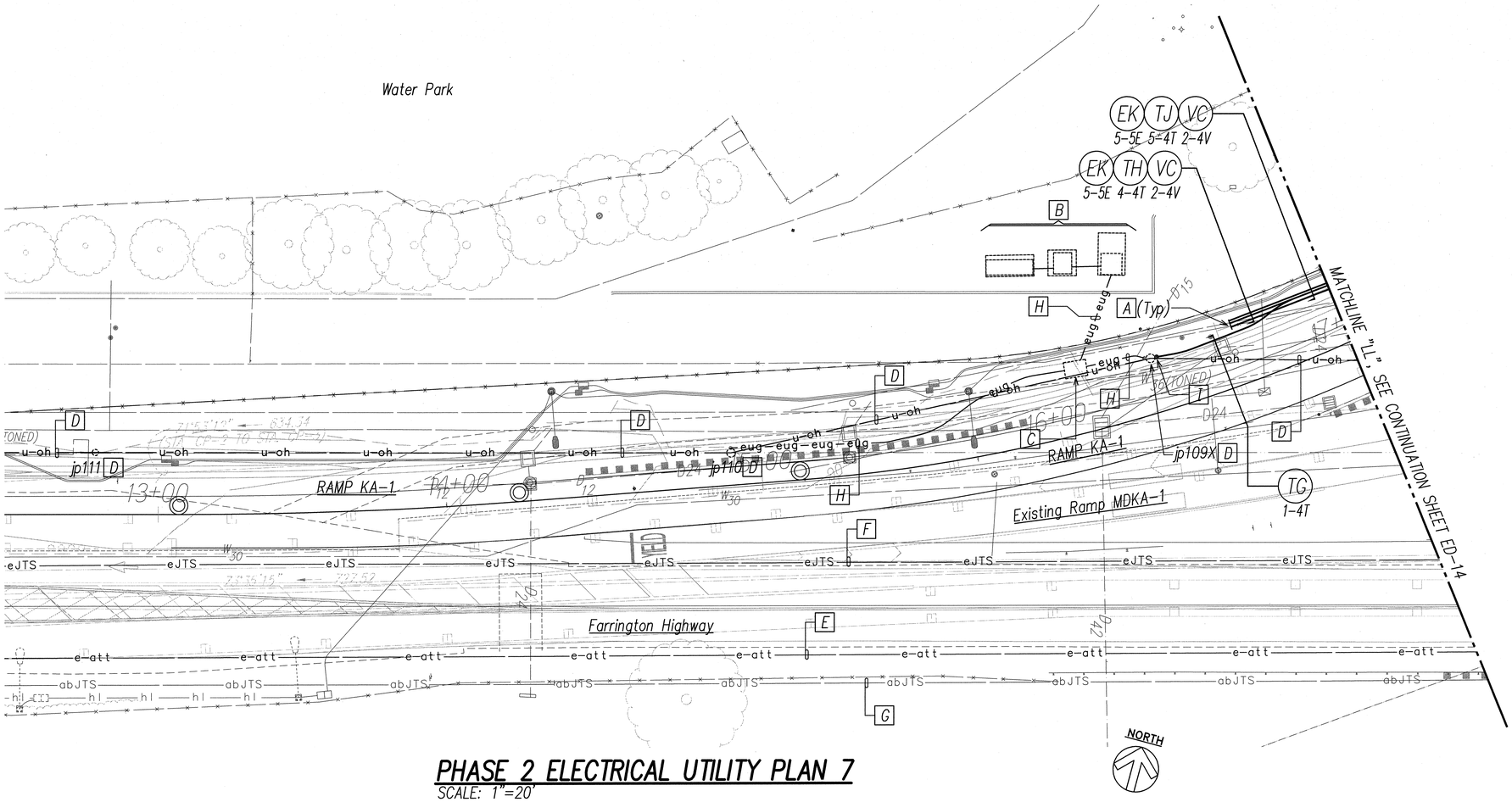
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"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	435	524



PHASE 2 ELECTRICAL UTILITY PLAN 7

SCALE: 1"=20'

PLAN NOTES: (Items Identified on Plans as Boxed Items)

- A — Stub and Cap Ducts for Future Use by Respective Utility Company.
- B — Existing Water Park Electrical Service Equipment to Remain.
- C — Existing HECo 4' x 6' Manhole to Remain.
- D — Existing Joint Utility Poles and Overhead Lines to Remain.
- E — Existing AT&T Underground Ductline to Remain.
- F — Existing JTS Cable C-5112.
- G — Existing JTS Cable C-5133 (Abandoned).
- H — Existing HECo Underground Ductline to Remain (Existing Service to Water Park).
- I — New Duct Riser Up Existing Utility Pole with Long Raduis Bend, per HTCo Requirements and Approval.

NOTES:

1. For Electric Ductline Horizontal Tie Down Plans and Profiles, See Sheets EG-1 to EG-19.
2. For Telephone Ductline Horizontal Tie Down Plans and Profiles, See Sheets EH-1 to EH-18.
3. For CATV Ductline Horizontal Tie Down Plans and Profiles, See Sheets EI-1 to EI-18.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 2

ELECTRICAL UTILITY PLAN 7

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. ED-15 OF 161 SHEETS

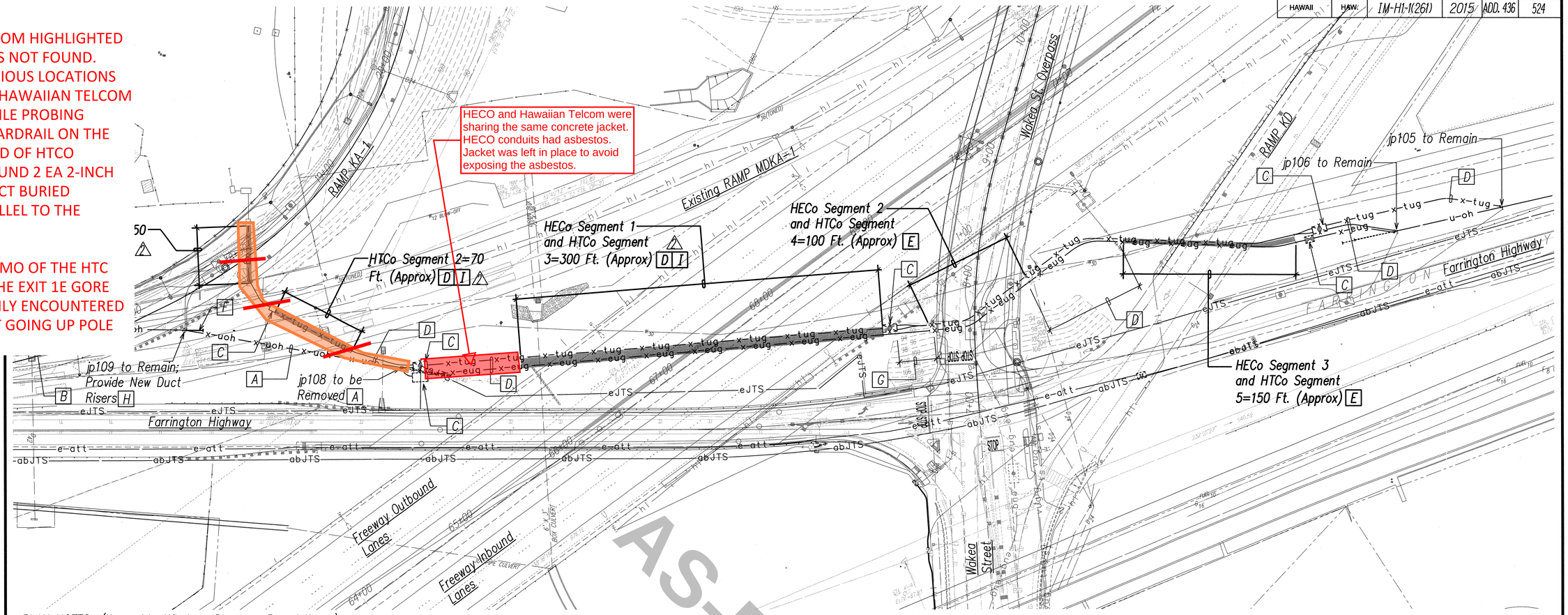
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	ADD. 436	524

LEGEND

HAWAIIAN TELCOM HIGHLIGHTED IN ORANGE WAS NOT FOUND. PROBED AT VARIOUS LOCATIONS ALONG WHERE HAWAIIAN TELCOM IS SHOWN. WHILE PROBING ALONG THE GUARDRAIL ON THE WET N WILD END OF HTCO SEGMENT 2, FOUND 2 EA 2-INCH CONDUITS DIRECT BURIED RUNNING PARALLEL TO THE GUARDRAIL.

DURING THE DEMO OF THE HTC MANHOLE AT THE EXIT 1E GORE AREA, CREW ONLY ENCOUNTERED THE HTC JACKET GOING UP POLE NO. JP108



AS-BUILT

PLAN NOTES: (Items Identified on Plans as Boxed Items)

- A Existing Utility Wood Pole, Overhead Lines, Guys and Anchors to be Removed by Respective Utility Company.
- B Existing Joint Utility Pole and Overhead Lines to Remain.
- C Contractor to Demolish and Remove Existing HECo / HTCo Manhole / Handhole. Contractor Shall Bring in Fill to Backfill the Area where the Manholes and Handholes were Removed per DOT Backfill and Compaction Requirements and Approval.
- D Respective Utility Company to Remove Existing Cables and Contractor to Demolish and Remove Existing Concrete Encased Ductlines. **If Utility Ducts to be Removed are Asbestos–Containing Transite Ducts, Contractor Shall Perform Required Hazardous Material Removal Work per Federal, State, and County Requirements.** Contractor Shall Bring in Fill to Backfill the Area where the Manholes and Handholes were Removed per DOT Backfill and Compaction Requirements and Approval.
- **E Respective Utility Company to Remove Existing Cables from Existing Ducts under Freeway and Ramp KD. Contractor Shall Fill with Concrete and Abandon in Place.**
- F New Down Guys and Anchors to be Provided by Respective Utility Company.
- G Respective Utility Company to Remove Existing Cables and Contractor to Demolish and Remove Existing Reinforced Concrete Encased Ductlines. Contractor Shall Bring in Fill to Backfill the Area where the Manholes and Handholes were Removed per DOT Backfill and Compaction Requirements and Approval.
- H Contractor Shall Provide New Duct Risers Up Existing Utility Pole with Long Radius Bends, per HECo & HTCo Requirements and Approval.
- ⚠1 I **Contractor Shall Perform Concrete Encased Ductline Removal work by Trenchless Method as Required; HDOT will not Allow Concrete Encased Ductline Removal work to be Done by Open Trench Excavation.**

PHASE 3 ELECTRICAL UTILITY DEMOLITION PLAN

SCALE: 1"=40'

NORTH

ORIGINAL PLAN | NOTE BOOK | No. ____

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

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

DATE	REVISION
⚠1 05/18/15	Revised Note

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.

Signature C2015.05.12

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PHASE 3 ELECTRICAL UTILITY DEMOLITION PLAN

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

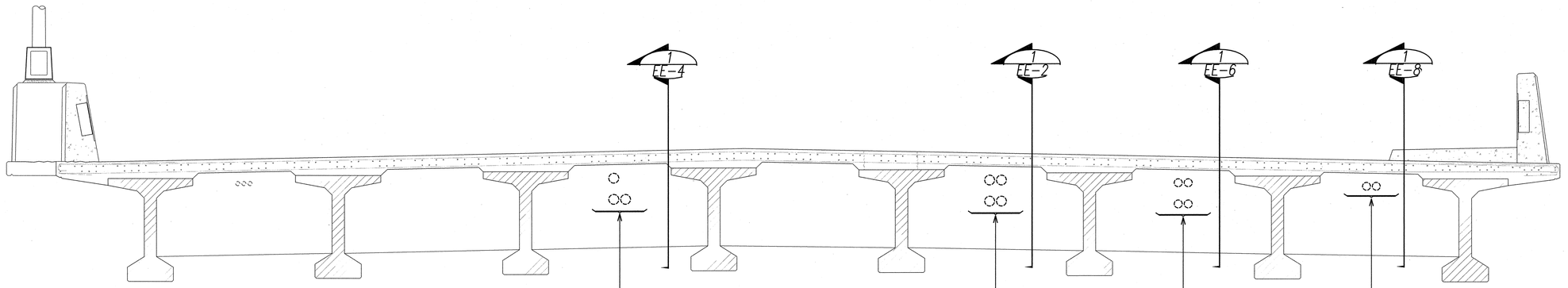
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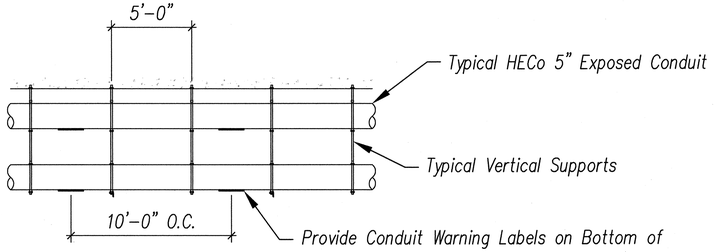
ADD.436

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	437	524



1 EE-1 BRIDGE TRANSVERSE SECTION WITH UTILITY DUCT DETAILS

SCALE: 3/8"=1'-0"



Conduit Warning Label Specifications:
Black-on-Orange Colors Shall Conform to ANSI Z535.1 andards for Safety Color Codes;
Orange Background with Black Letters, 12" x 2.5" with 1.25" High Letters: "HIGH VOLTAGE";
Self-Adhesive Electrical Pipe Label Includes Permanent Acrylic Adhesive with Easy-to-Remove Backing Strip;
Features a 2.5-mil Clear Laminate Coating that is UV, Chemical, Abrasion and Moisture Resistant;
Printed with UV-Stable Ink Suitable for Indoor or Outdoor Use at Temperatures from -40 Degrees to +176 Degrees F.
Manufactured by ComplianceSigns, SKU: PIPE-CUSTOM_Black_on_Orange, or Approved Equivalent.

2 EE-1 TYPICAL HECO CONDUIT WARNING LABEL INSTALLATION DETAIL

Not to Scale

2' 1' 0 2' 4' 6' 8'

SCALE: 3/8"=1'-0"

GRAPHIC SCALE

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED UTILITY DUCT DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

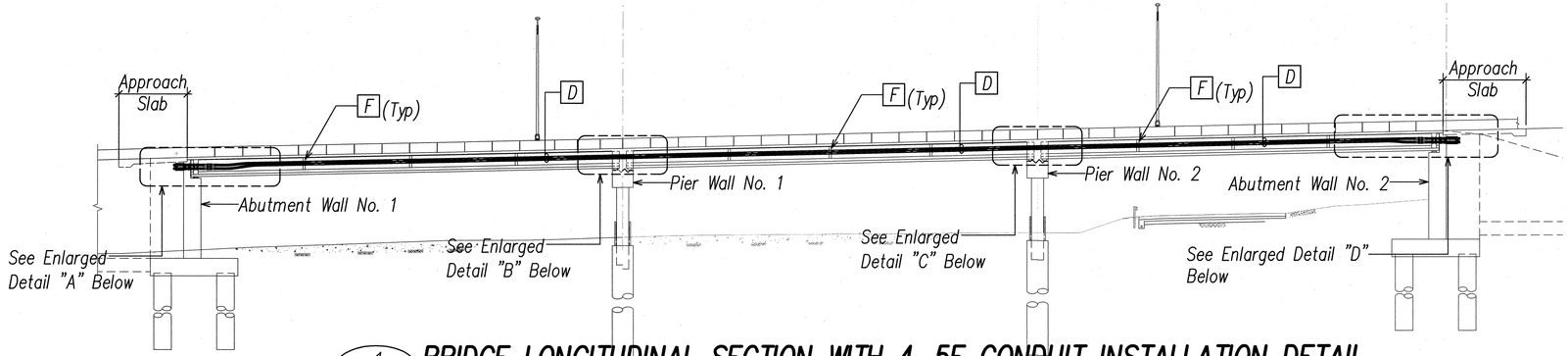
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SHEET No. EE-1 OF 161 SHEETS

437

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	438	524

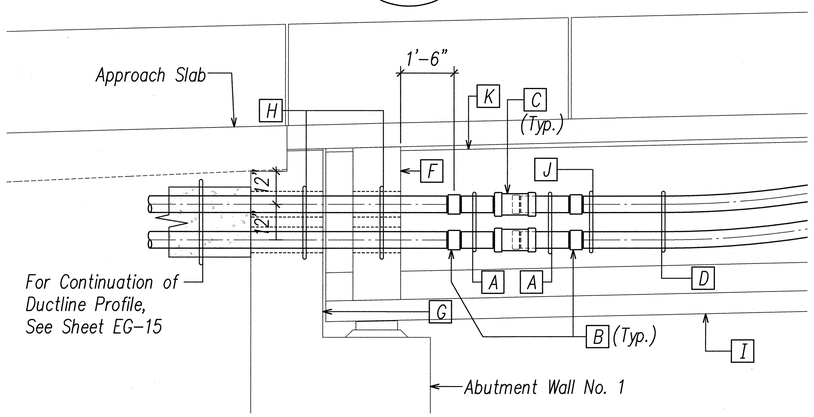


1 EE-2 BRIDGE LONGITUDINAL SECTION WITH 4-5E CONDUIT INSTALLATION DETAIL

SCALE: 1"=20'

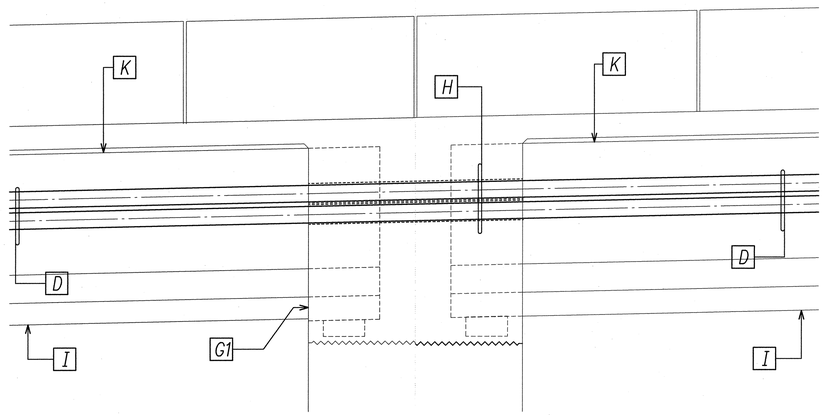
NOTES: (Items Identified on Details as Boxed Items)

- A 4-5" PVC Coated GRS Conduits to Transition from Exposed PVC Conduits to Expansion Couplings.
- B 5" GRS Conduit to Schedule 80 PVC or Schedule 40 PVC Conduit Transition Coupling.
- C 5" Expansion Coupling, See Detail 2/EC-19.
- D 4-5"E Schedule 80 PVC Conduits, Exposed, Installed Under Bridge, See Structural Sheets for Conduit Mounting Hangar Details and Requirements.
- E not used.
- F Bridge Diaphragm with Required Pipe Sleeves for 4-5" Schedule 40 PVC Conduits Installed Through Diaphragm.
- G Abutment Wall with Required Pipe Sleeves for 4-5" Schedule 40 PVC Conduits Installed Through Abutment Wall.
- G1 Pier Wall Crossbeam with Required Pipe Sleeves for 4-5" Schedule 40 PVC Conduits Installed Through Pier Wall Crossbeams.
- H 4-5" Schedule 40 PVC Conduits, with Required Pipe Sleeves for 4-5" Schedule 40 PVC Conduits Installed Through Bridge Diaphragms, Abutment Walls, and Pier Wall Crossbeams.
- I Bottom of Bridge Girder.
- J 4-5" Schedule 80 PVC Conduits, Exposed.
- K Top of Bridge Girder.



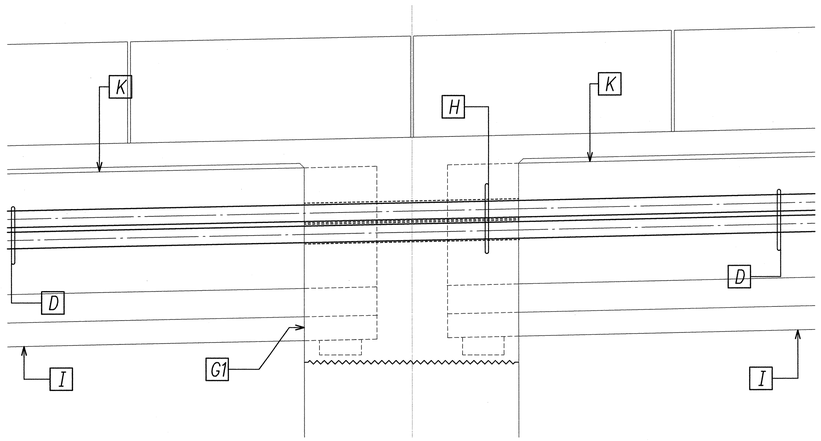
2 EE-2 Detail "A" AT ABUTMENT WALL NO. 1

Not to Scale



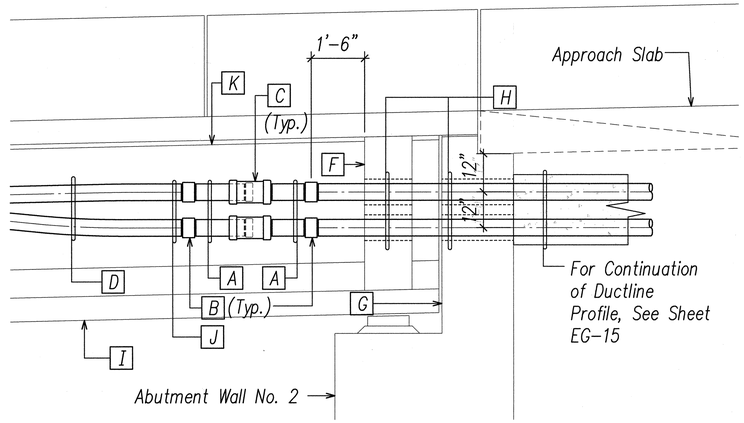
3 EE-2 Detail "B" AT PIER WALL NO. 1

Not to Scale



4 EE-2 Detail "C" AT PIER WALL NO. 2

Not to Scale



5 EE-2 Detail "D" AT ABUTMENT WALL NO. 2

Not to Scale

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 4-5E UTILITY DUCTS DETAILS 1

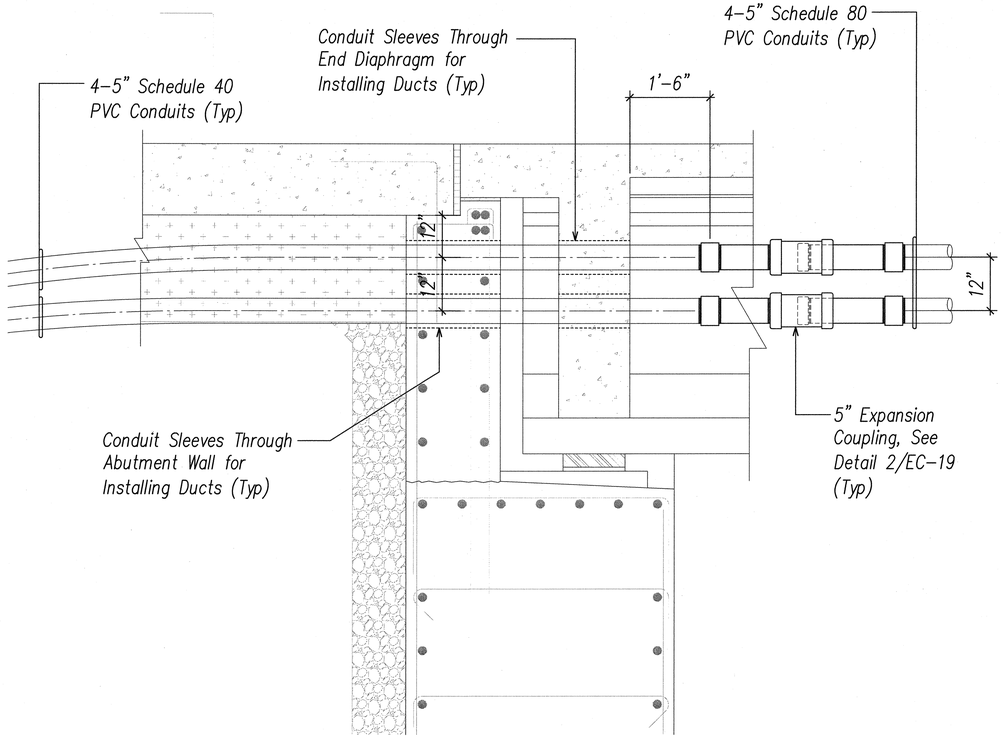
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-2 OF 161 SHEETS

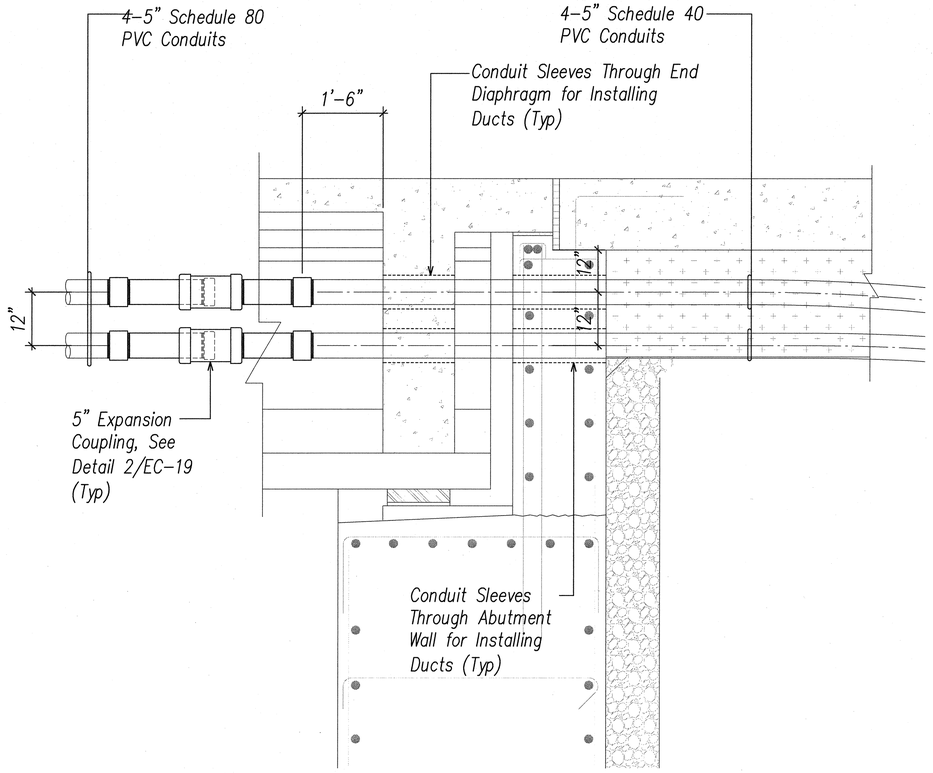
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	439	524



1 / EE-3 **PARTIAL ABUTMENT NO. 1 SECTION WITH 4–5" DUCTLINE PENETRATION DETAILS**

Not to Scale



2 / EE-3 **PARTIAL ABUTMENT NO. 2 SECTION WITH 4–5" DUCTLINE PENETRATION DETAILS**

Not to Scale

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. MIYASAKO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Andrew I. Miyasako 2015.02.18
Signature

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 4-5E UTILITY DUCTS DETAILS 2

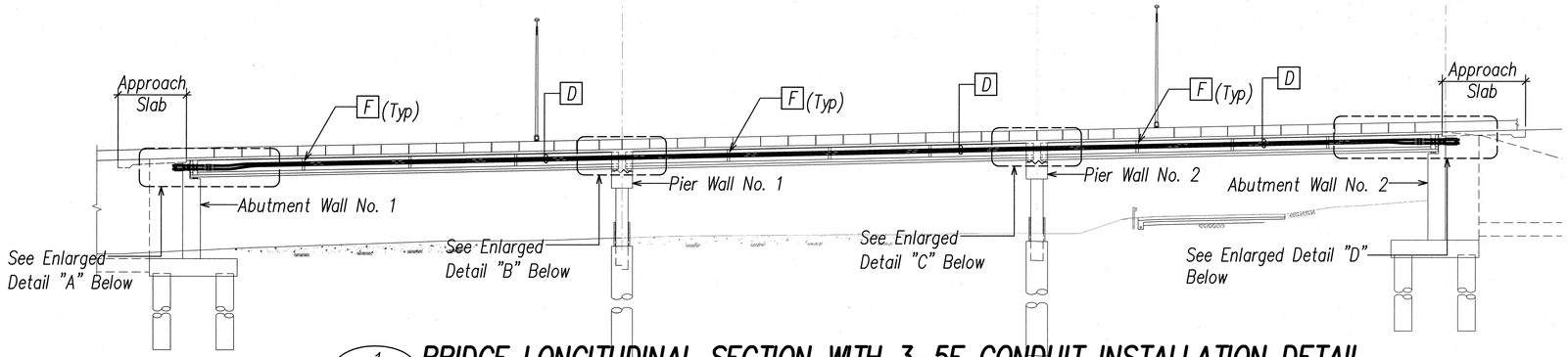
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-3 OF 161 SHEETS

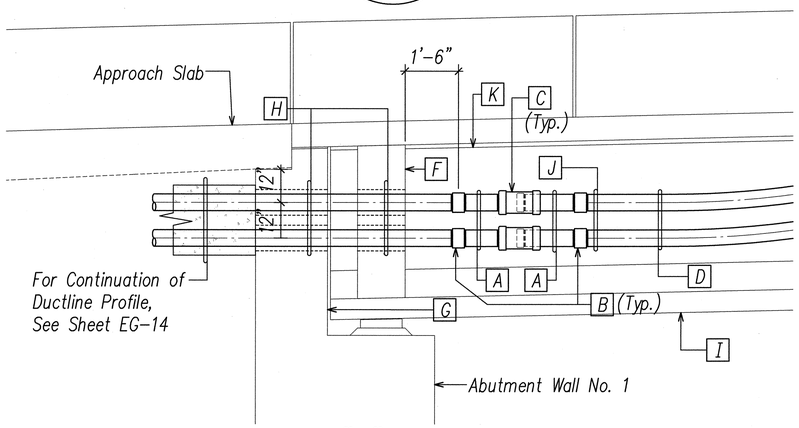
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	440	524



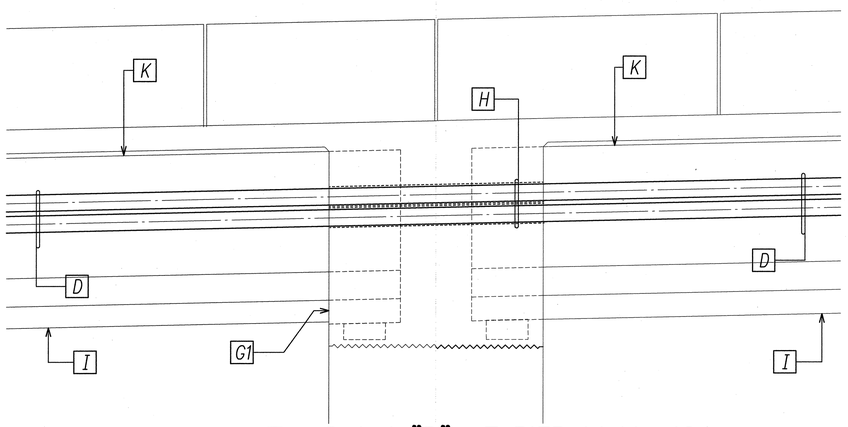
1 EE-4 BRIDGE LONGITUDINAL SECTION WITH 3-5E CONDUIT INSTALLATION DETAIL

SCALE: 1"=20'



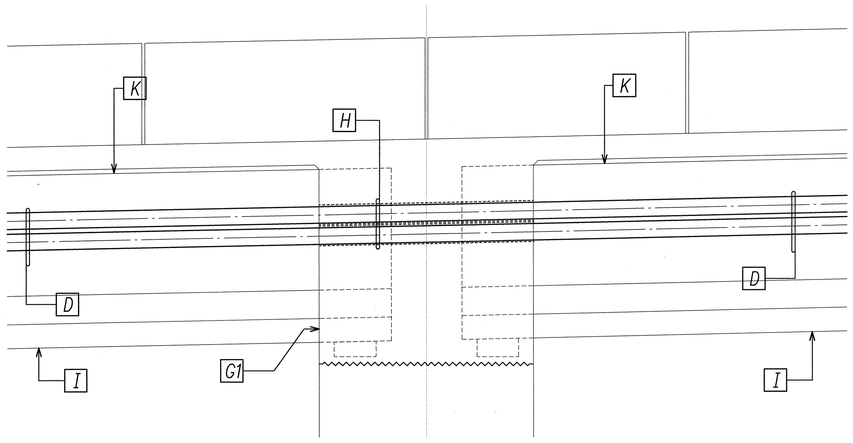
2 EE-4 Detail "A" AT ABUTMENT WALL NO. 1

Not to Scale



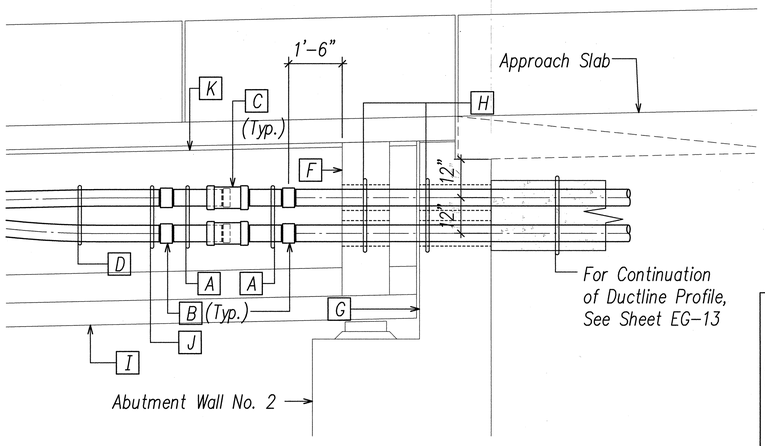
3 EE-4 Detail "B" AT PIER WALL NO. 1

Not to Scale



4 EE-4 Detail "C" AT PIER WALL NO. 2

Not to Scale



3 EE-4 Detail "D" AT ABUTMENT WALL NO. 2

Not to Scale

NOTES: (Items Identified on Details as Boxed Items)

- A 3-5" PVC Coated GRS Conduits to Transition from Exposed PVC Conduits to Expansion Couplings.
- B 5" GRS Conduit to Schedule 80 PVC or Schedule 40 PVC Conduit Transition Coupling.
- C 5" Expansion Coupling, See Detail 2/EC-19.
- D 3-5"E Schedule 80 PVC Conduits, Exposed, Installed Under Bridge, See Structural Sheets for Conduit Mounting Hangar Details and Requirements.
- E not used.
- F Bridge Diaphragm with Required Pipe Sleeves for 3-5" Schedule 40 PVC Conduits Installed Through Diaphragm.
- G Abutment Wall with Required Pipe Sleeves for 3-5" Schedule 40 PVC Conduits Installed Through Abutment Wall.
- G1 Pier Wall Crossbeam with Required Pipe Sleeves for 3-5" Schedule 40 PVC Conduits Installed Through Pier Wall Crossbeams.
- H 3-5" Schedule 40 PVC Conduits, with Required Pipe Sleeves for 3-5" Schedule 40 PVC Conduits Installed Through Bridge Diaphragms, Abutment Walls, and Pier Wall Crossbeams.
- I Bottom of Bridge Girder.
- J 3-5" Schedule 80 PVC Conduits, Exposed.
- K Top of Bridge Girder.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 3-5E UTILITY DUCTS DETAILS 1

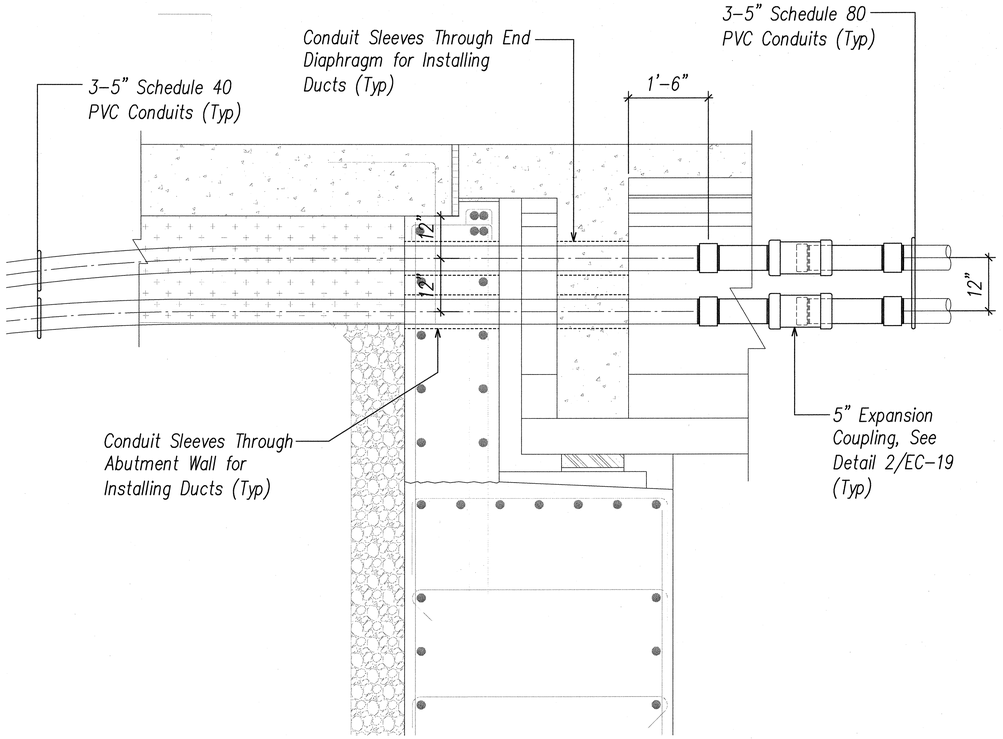
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-4 OF 161 SHEETS

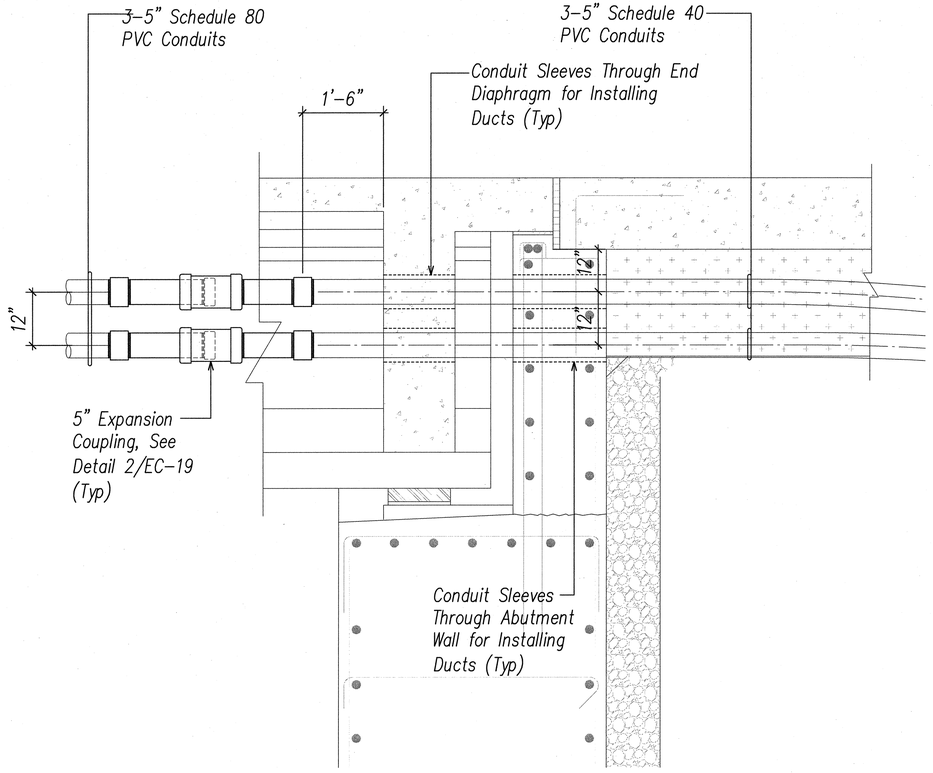
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	441	524



1 / EE–5 PARTIAL ABUTMENT NO. 1 SECTION WITH 3–5" DUCTLINE PENETRATION DETAILS

Not to Scale



2 / EE–5 PARTIAL ABUTMENT NO. 2 SECTION WITH 3–5" DUCTLINE PENETRATION DETAILS

Not to Scale

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 3-5E UTILITY DUCTS DETAILS 2

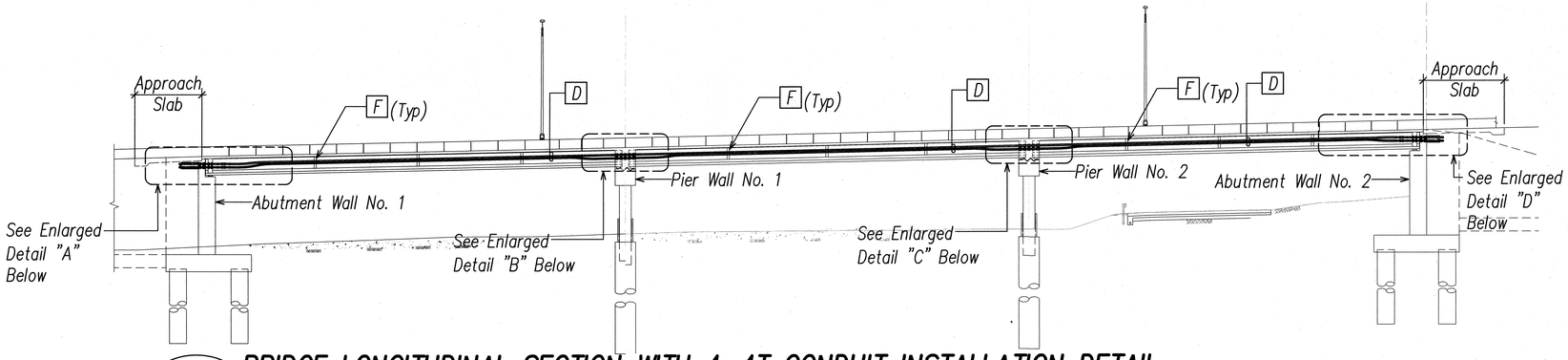
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-5 OF 161 SHEETS

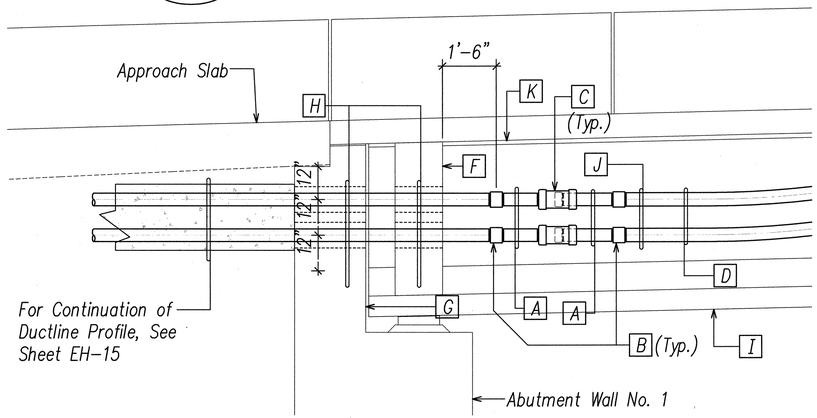
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	442	524



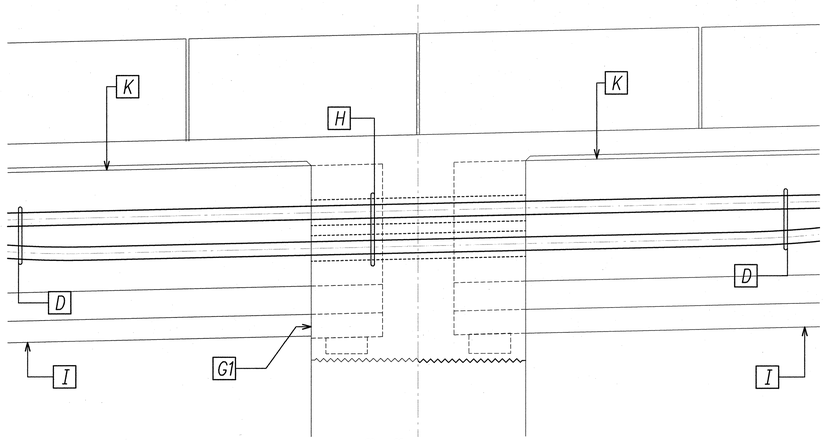
1 EE-6 BRIDGE LONGITUDINAL SECTION WITH 4-4T CONDUIT INSTALLATION DETAIL

SCALE: 1"=20'



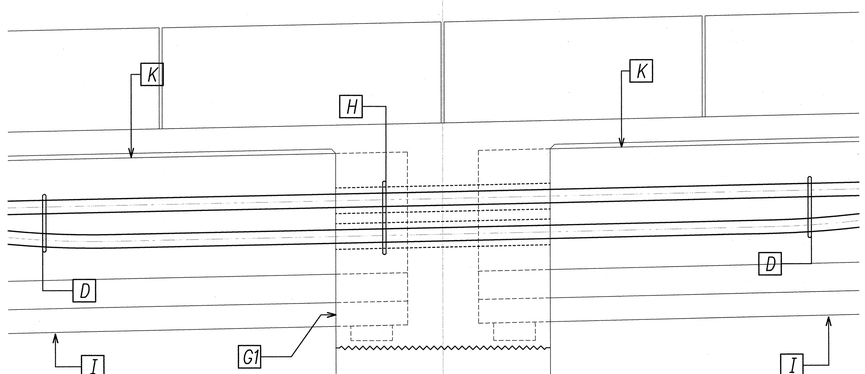
2 EE-6 Detail "A" AT ABUTMENT WALL NO. 1

Not to Scale



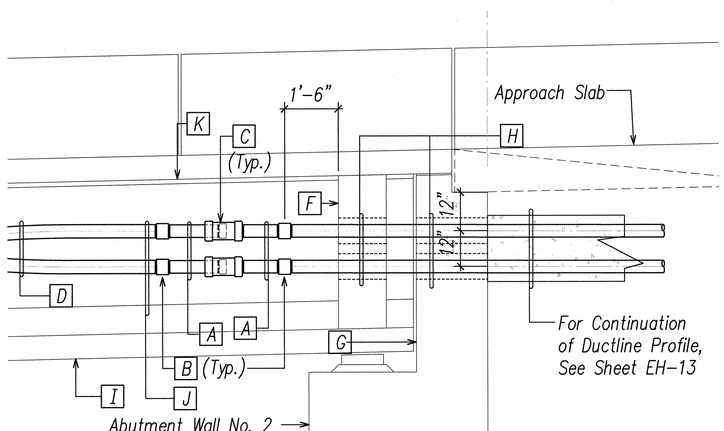
3 EE-6 Detail "B" AT PIER WALL NO. 1

Not to Scale



4 EE-6 Detail "C" AT PIER WALL NO. 2

Not to Scale



3 EE-6 Detail "D" AT ABUTMENT WALL NO. 2

Not to Scale

NOTES: (Items Identified on Details as Boxed Items)

- A 4-4" PVC Coated GRS Conduits to Transition from Exposed PVC Conduits to Expansion Couplings.
- B 4" GRS Conduit to Schedule 80 PVC or Schedule 40 PVC Conduit Transition Coupling.
- C 4" Expansion Coupling, See Detail 2/EC-19.
- D 4-4" Schedule 80 PVC Conduits, Exposed, Installed Under Bridge, See Structural Sheets for Conduit Mounting Hangar Details and Requirements.
- E not used.
- F Bridge Diaphragm with Required Pipe Sleeves for 4-4" Schedule 40 PVC Conduits Installed Through Diaphragm.
- G Abutment Wall with Required Pipe Sleeves for 4-4" Schedule 40 PVC Conduits Installed Through Abutment Wall.
- G1 Pier Wall Crossbeam with Required Pipe Sleeves for 4-4" Schedule 40 PVC Conduits Installed Through Pier Wall Crossbeams.
- H 4-4" Schedule 40 PVC Conduits, with Required Pipe Sleeves for 4-4" Schedule 40 PVC Conduits Installed Through Bridge Diaphragms, Abutment Walls, and Pier Wall Crossbeams..
- I Bottom of Bridge Girder.
- J 4-4" Schedule 80 PVC Conduits, Exposed.
- K Top of Bridge Girder.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc. Electrical Engineers

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 4-4T UTILITY DUCTS DETAILS 1

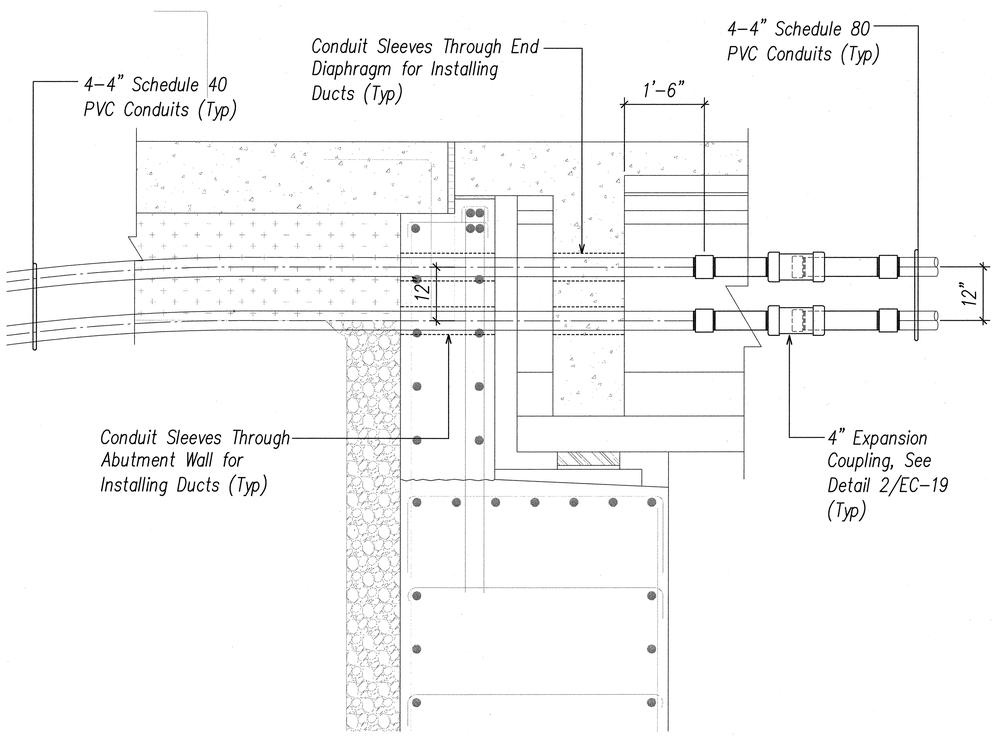
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-6 OF 161 SHEETS

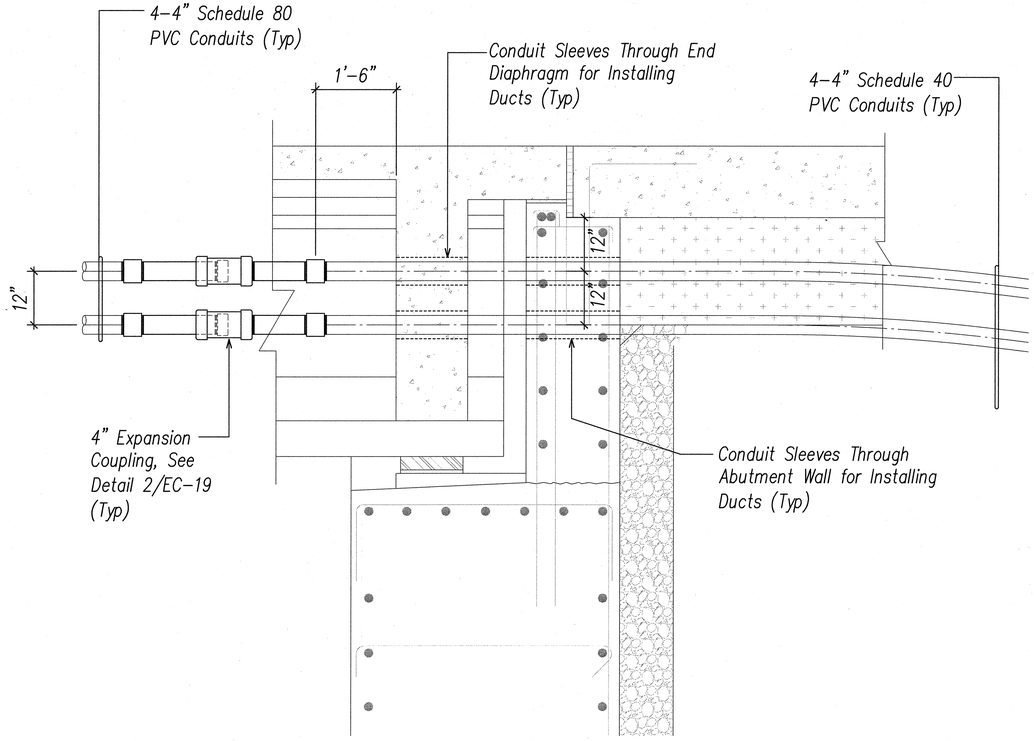
LAST SAVE: 02/17/15 @ 10:38:35 BY: AM PLOT SC 1/2"=1"
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FILE PATH: Z:\Acad\PROJECTS\29053\ee006_29053_4_4T_under_bridge_conduit_installation_details_IK.dwg CAD USER: andy PLOT DATE: 2015.02.18

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	443	524



1 EE–7 **PARTIAL ABUTMENT NO. 1 SECTION WITH 4–4"T DUCTLINE PENETRATION DETAILS**

Not to Scale



2 EE–7 **PARTIAL ABUTMENT NO. 2 SECTION WITH 4–4"T DUCTLINE PENETRATION DETAILS**

Not to Scale

ORIGINAL PLAN

NOTE BOOK No.

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

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.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 4-4T UTILITY DUCTS DETAILS 2

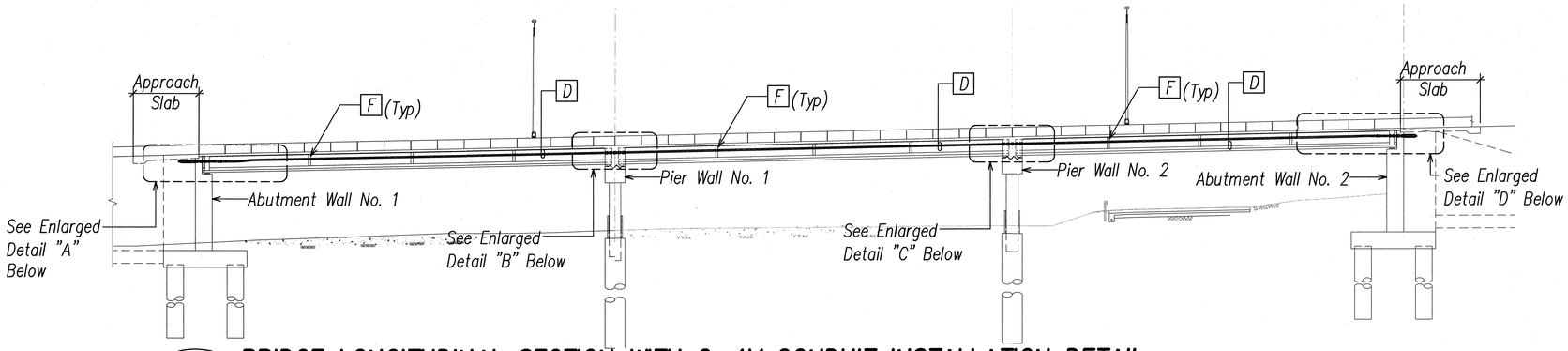
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-7 OF 161 SHEETS

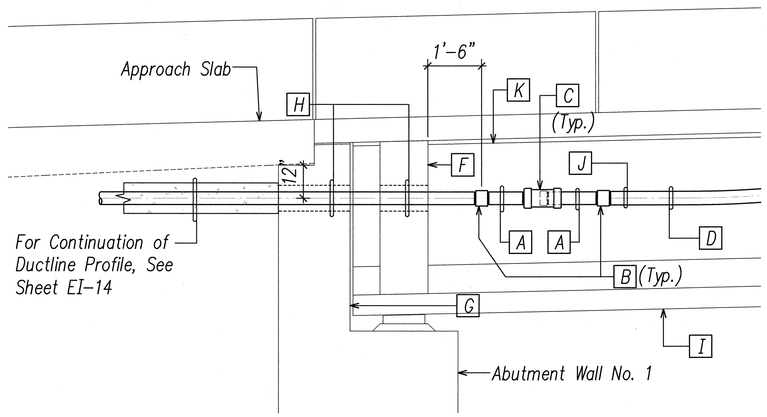
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	444	524



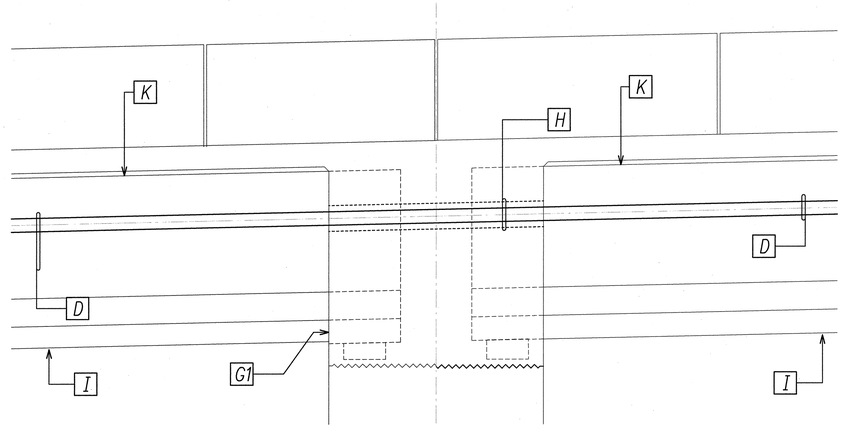
1 / EE-8 BRIDGE LONGITUDINAL SECTION WITH 2-4V CONDUIT INSTALLATION DETAIL

SCALE: 1"=20'



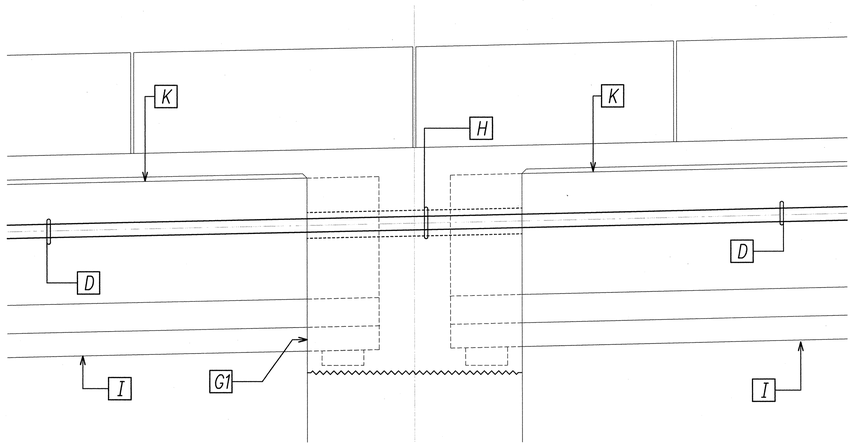
2 / EE-8 Detail "A" AT ABUTMENT WALL NO. 1

Not to Scale



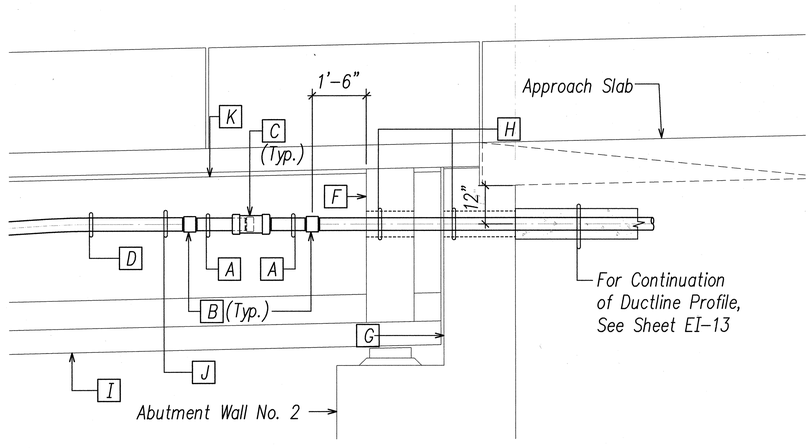
3 / EE-8 Detail "B" AT PIER WALL NO. 1

Not to Scale



4 / EE-8 Detail "C" AT PIER WALL NO. 2

Not to Scale



3 / EE-8 Detail "D" AT ABUTMENT WALL NO. 2

Not to Scale

NOTES: (Items Identified on Details as Boxed Items)

- A 2-4" PVC Coated GRS Conduits to Transition from Exposed PVC Conduits to Expansion Couplings.
- B 4" GRS Conduit to Schedule 80 PVC or Schedule 40 PVC Conduit Transition Coupling.
- C 4" Expansion Coupling, See Detail 2/EC-19.
- D 2-4" Schedule 80 PVC Conduits, Exposed, Installed Under Bridge, See Structural Sheets for Conduit Mounting Hangar Details and Requirements.
- E not used.
- F Bridge Diaphragm with Required Pipe Sleeves for 2-4" Schedule 40 PVC Conduits Installed Through Diaphragm.
- G Abutment Wall with Required Pipe Sleeves for 2-4" Schedule 40 PVC Conduits Installed Through Abutment Wall.
- G1 Pier Wall Crossbeam with Required Pipe Sleeves for 2-4" Schedule 40 PVC Conduits Installed Through Pier Wall Crossbeams.
- H 2-4" Schedule 40 PVC Conduits, with Required Pipe Sleeves for 2-4" Schedule 40 PVC Conduits Installed Through Bridge Diaphragms, Abutment Walls, and Pier Wall Crossbeams.
- I Bottom of Bridge Girder.
- J 2-4" Schedule 80 PVC Conduits, Exposed.
- K Top of Bridge Girder.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 2-4V UTILITY DUCTS DETAILS 1

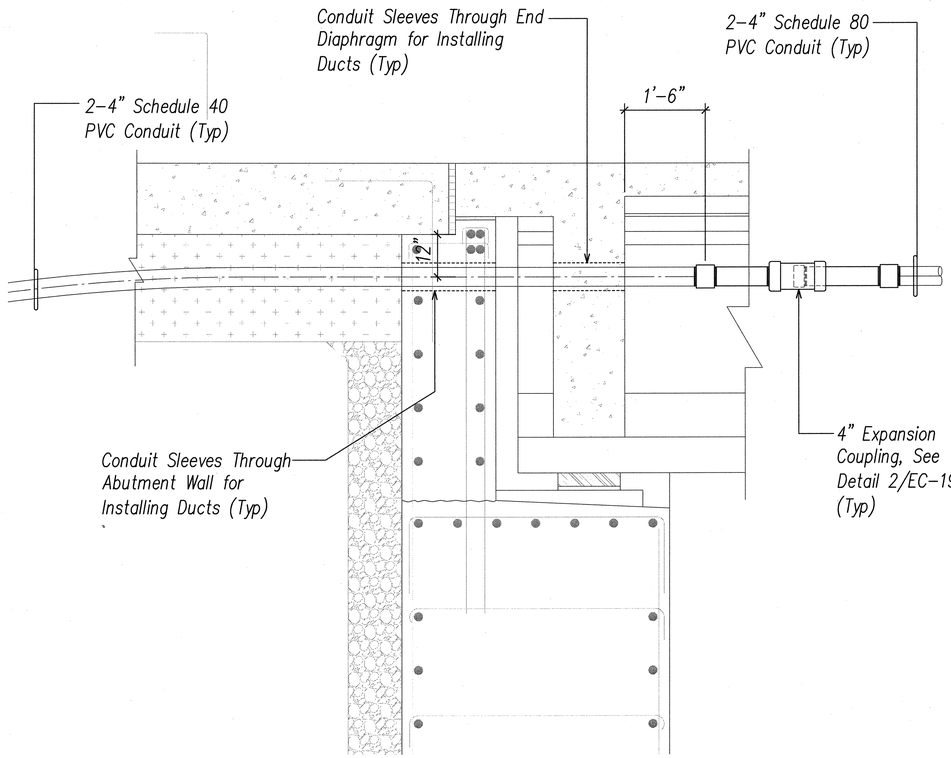
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-8 OF 161 SHEETS

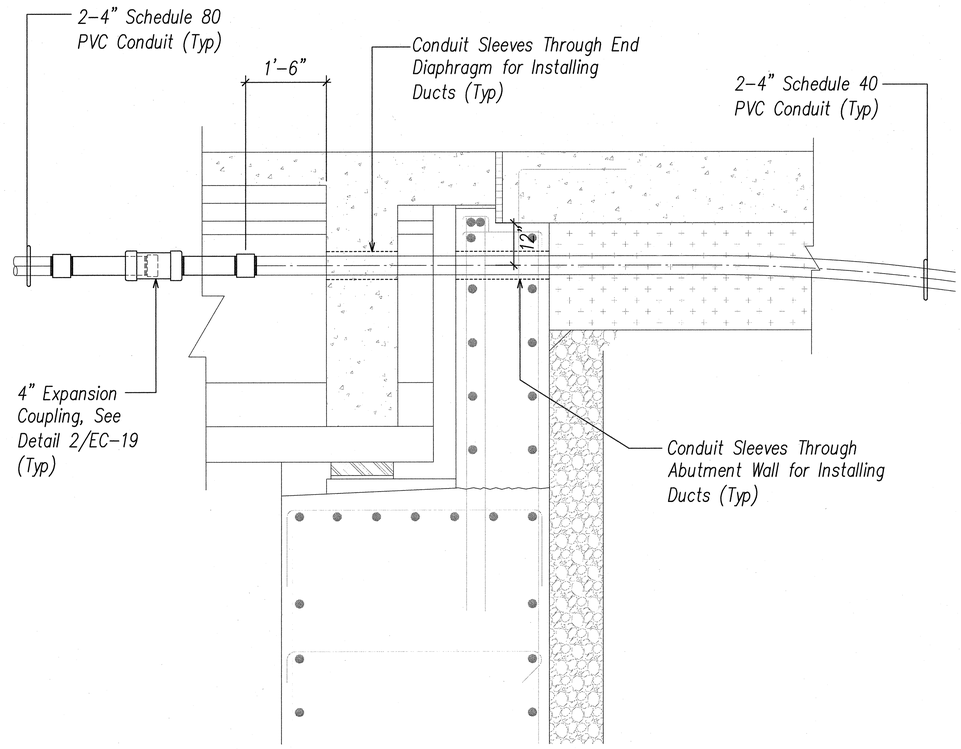
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	445	524



1 EE–9 PARTIAL ABUTMENT NO. 1 SECTION WITH 2–4"V DUCTLINE PENETRATION DETAILS

Not to Scale



2 EE–9 PARTIAL ABUTMENT NO. 2 SECTION WITH 2–4"V DUCTLINE PENETRATION DETAILS

Not to Scale

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

Ronald N. S. Ho & Associates, Inc.
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE INSTALLED 2-4V UTILITY DUCTS DETAILS 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EE-9 OF 161 SHEETS

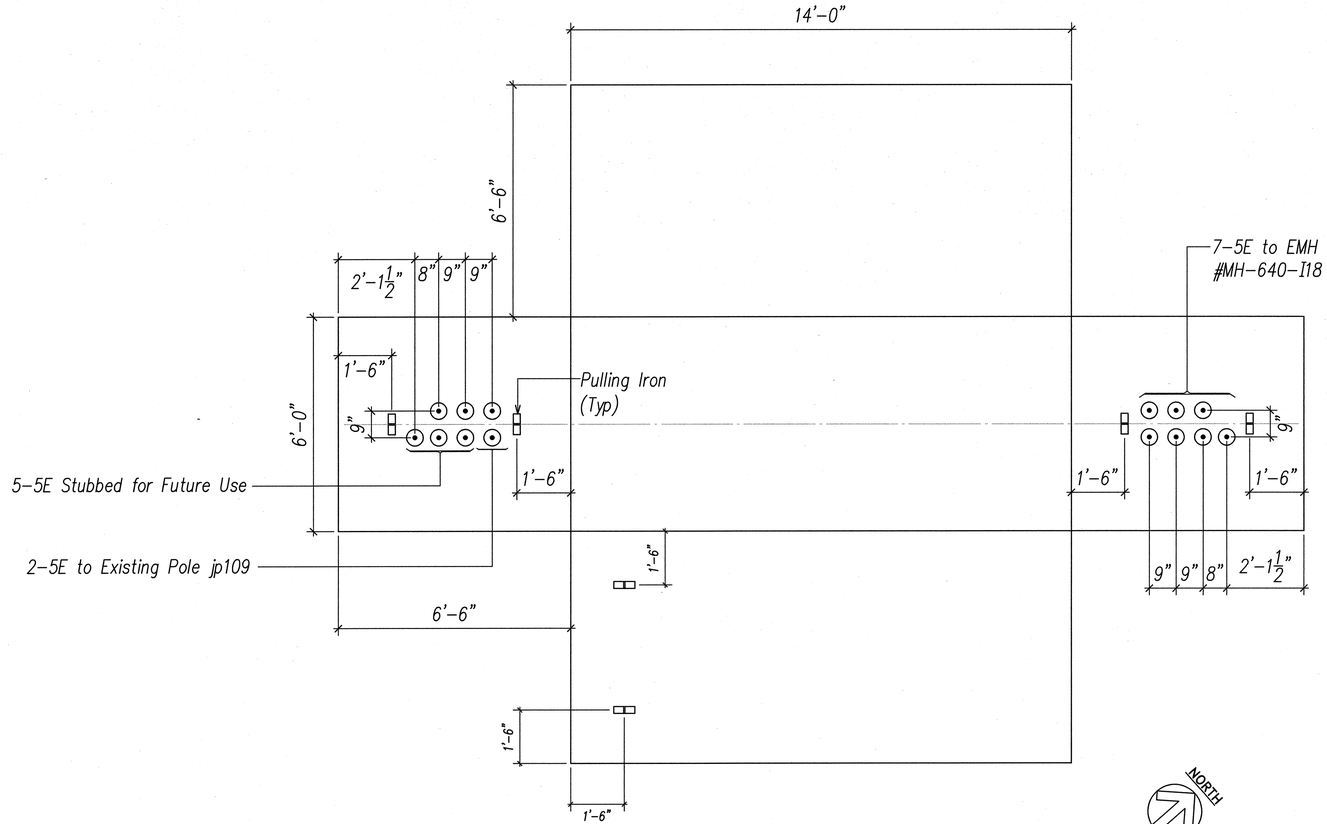
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	446	524

MANHOLE AND HANDHOLE NOTES:

1. *Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.*

2. *Manholes Shall be Constructed with a 12" Minimum and an 18" Maximum Neck Dimension.*



HECO 6' X 14' MANHOLE MH-640-I19 (Pre-Cast)

Not to Scale

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Andrew I. Miyasato 2015.02.18
Signature

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO MANHOLE & HANDHOLE DEVELOPMENT PLANS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-1 OF 161 SHEETS

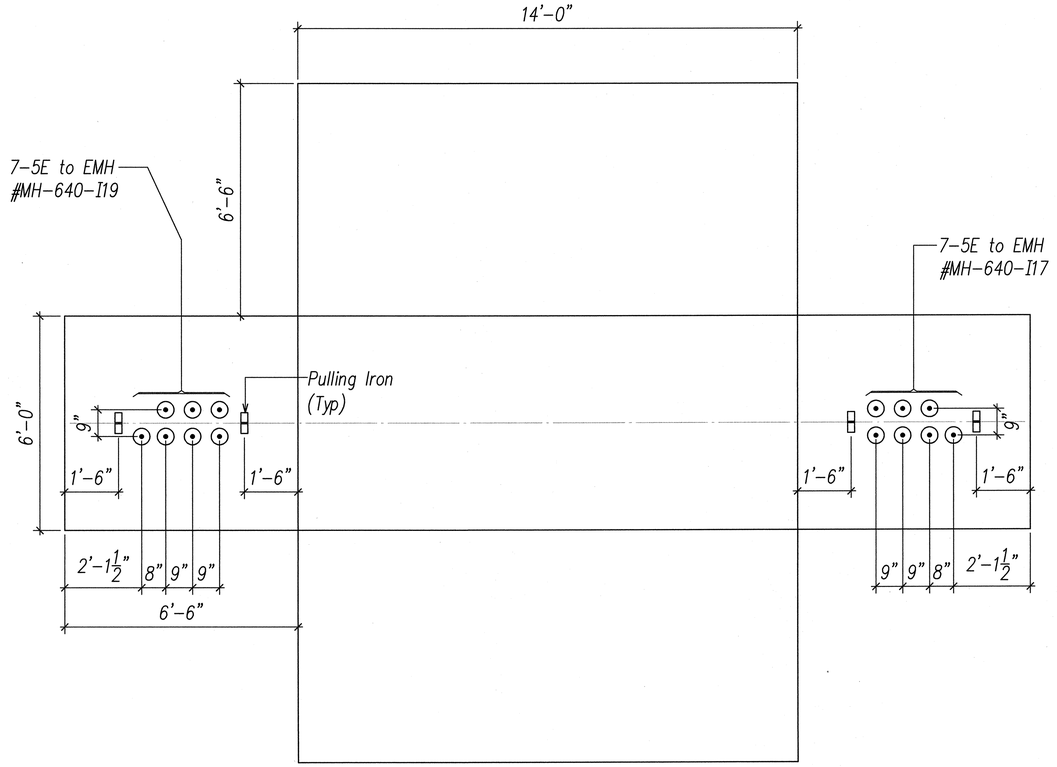
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	447	524

MANHOLE AND HANDHOLE NOTES:

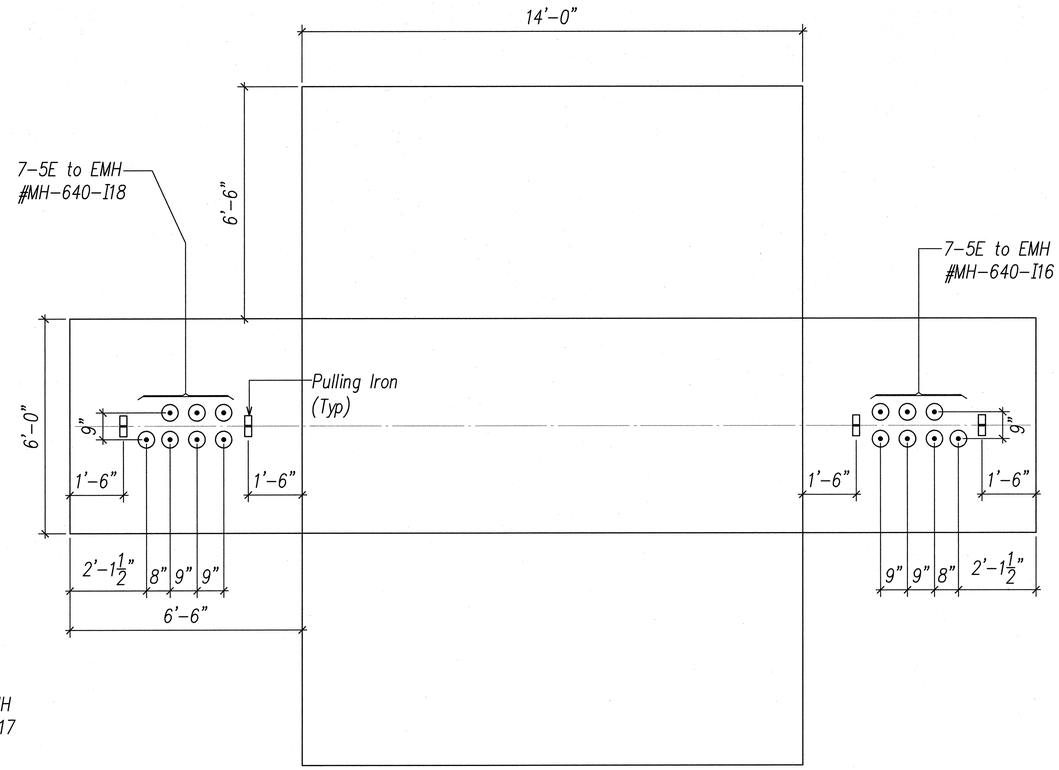
1. *Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.*

2. *Manholes Shall be Constructed with a 12" Minimum and an 18" Maximum Neck Dimension.*



HECO 6' X 14' MANHOLE MH-640-I18 (Pre-Cast)

Not to Scale



HECO 6' X 14' MANHOLE MH-640-I17 (Pre-Cast)

Not to Scale

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
	DRAWN BY	
NOTE BOOK	TRACED BY	
	DESIGNED BY	
No.	QUANTITIES BY	
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Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO MANHOLE & HANDHOLE DEVELOPMENT PLANS 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-2 OF 161 SHEETS

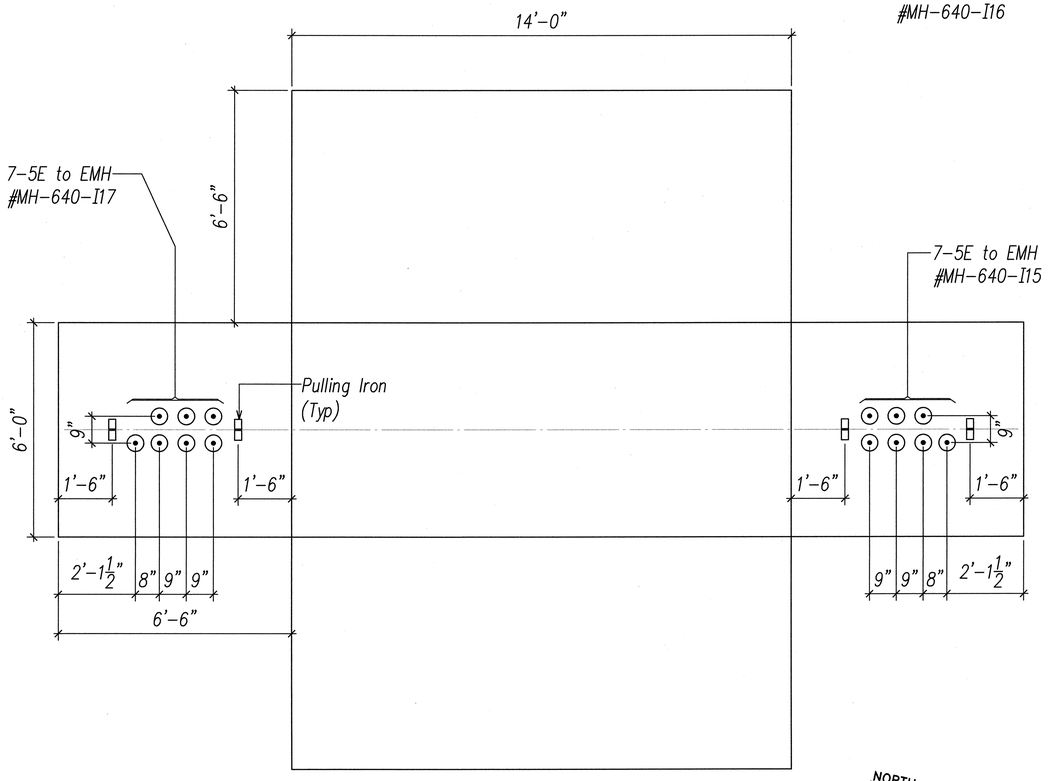
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	448	524

MANHOLE AND HANDHOLE NOTES:

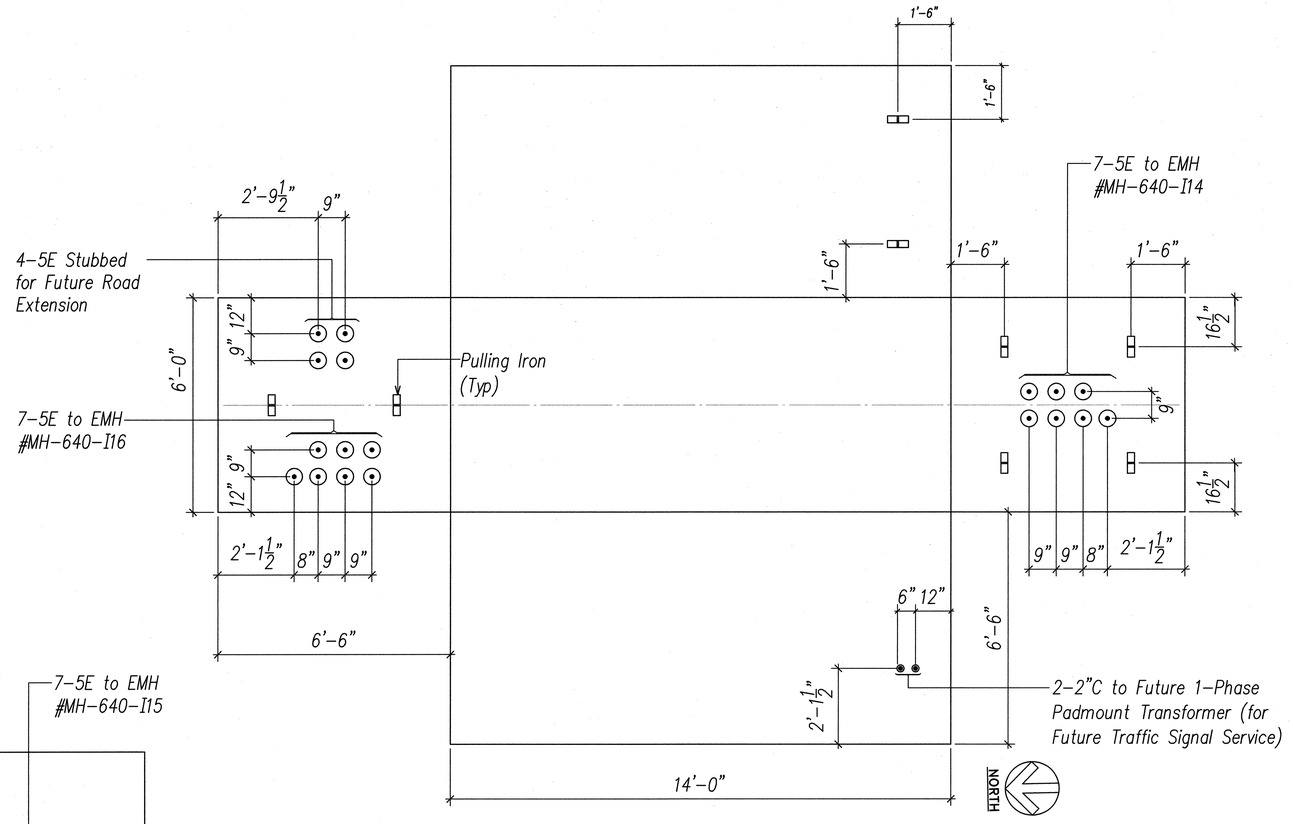
1. *Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.*

2. *Manholes Shall be Constructed with a 12" Minimum and an 18" Maximum Neck Dimension.*



HECO 6' X 14' MANHOLE MH-640-I16 (Pre-Cast)

Not to Scale



HECO 6' X 14' MANHOLE MH-640-I15 (Pre-Cast)

Not to Scale

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW L. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4540-E
HAWAII, U.S.A.

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO MANHOLE & HANDHOLE DEVELOPMENT PLANS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

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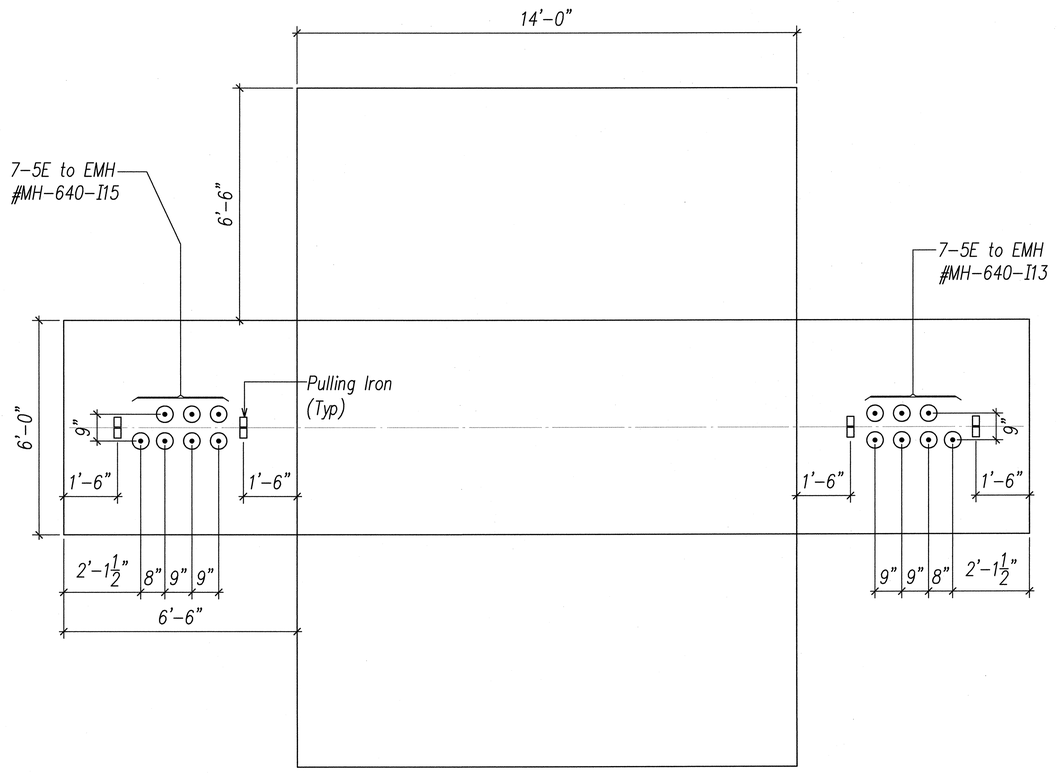
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	449	524

MANHOLE AND HANDHOLE NOTES:

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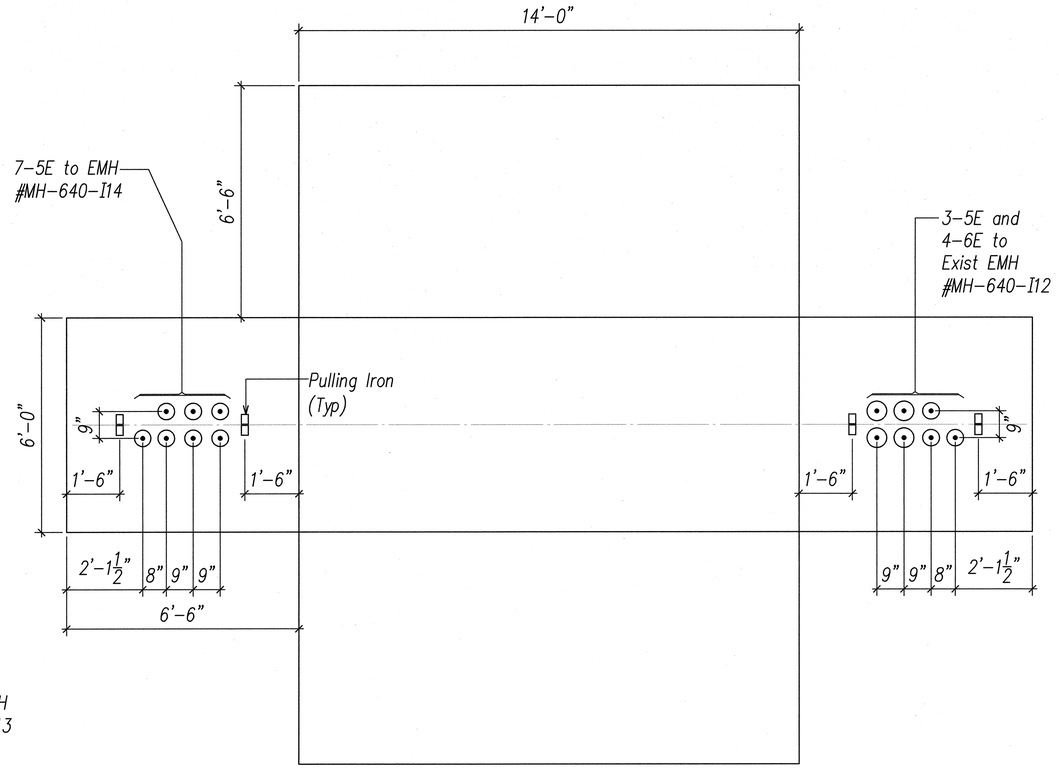
2. *Manholes Shall be Constructed with a 12" Minimum and an 18" Maximum Neck Dimension.*



NORTH

HECO 6' X 14' MANHOLE MH-640-I14 (Pre-Cast)

Not to Scale



NORTH

HECO 6' X 14' MANHOLE MH-640-I13 (Pre-Cast)

Not to Scale

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO MANHOLE & HANDHOLE DEVELOPMENT PLANS 4

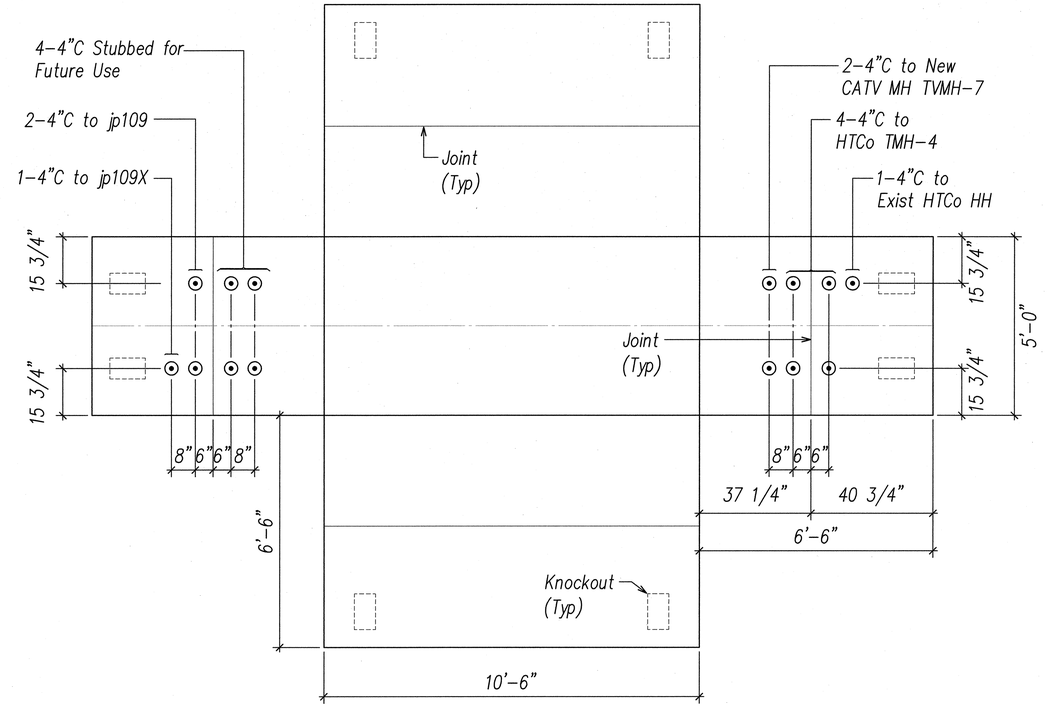
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-4 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	450	524



HTCO 5' X 10' X 6'-6" MANHOLE TMH-7

NOT TO SCALE

NORTH

MANHOLE AND HANDHOLE NOTES:

Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.

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.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 05.02.16
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO MANHOLE DEVELOPMENT PLANS 1

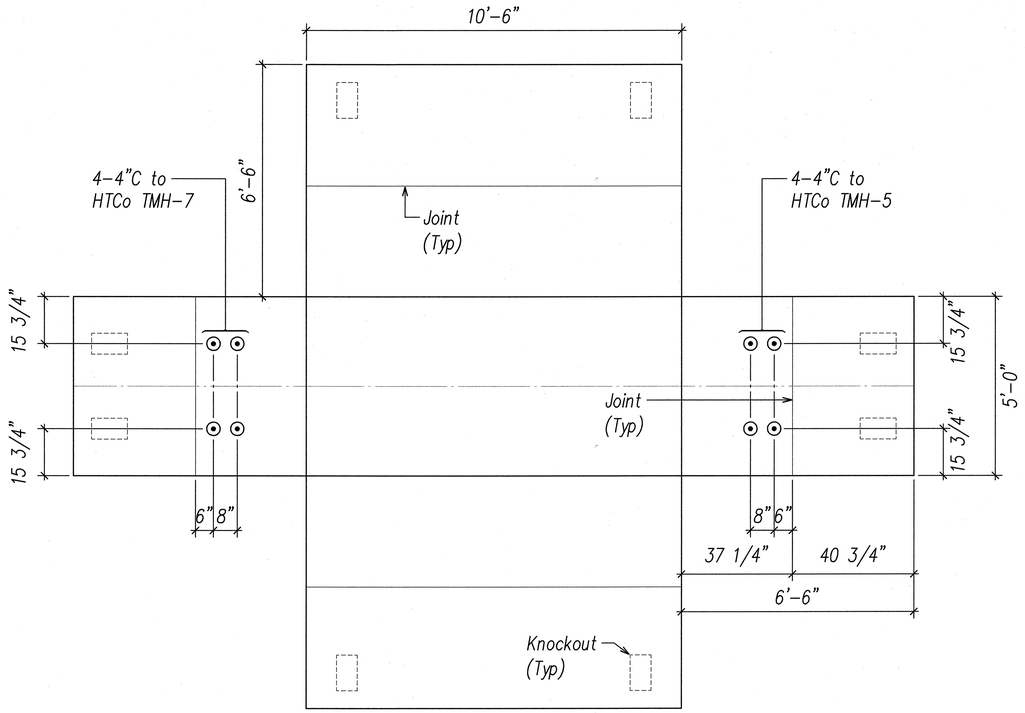
INTERSTATE ROUTE H-1
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(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-5 OF 161 SHEETS

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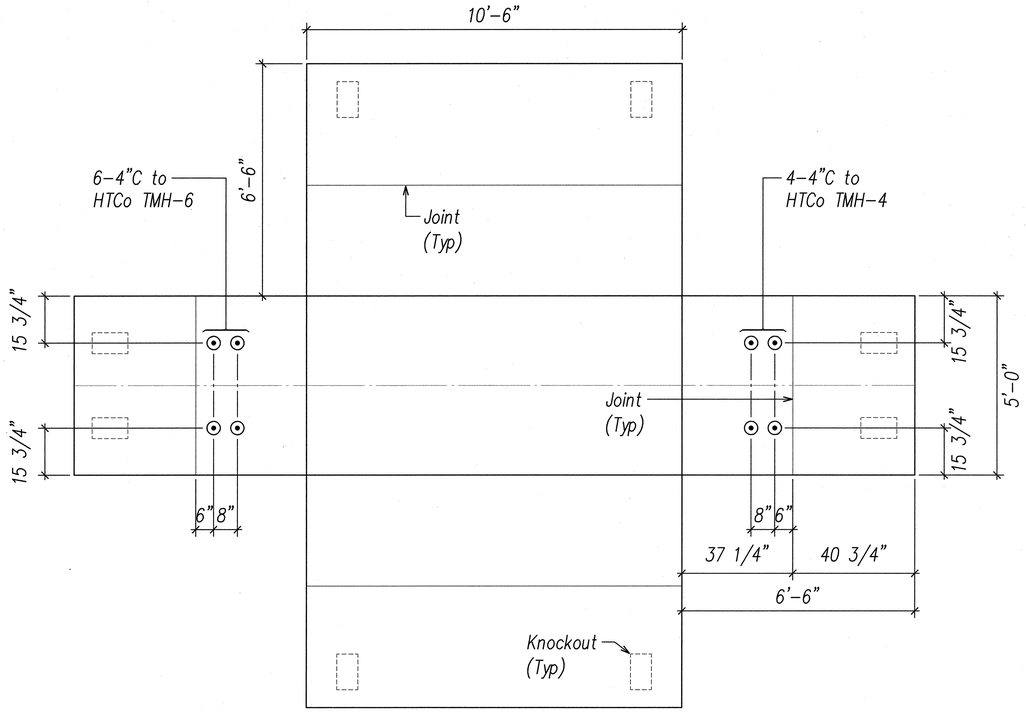
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	451	524



HTCO 5' X 10' X 6'-6" MANHOLE TMH-6

NOT TO SCALE

NORTH



HTCO 5' X 10' X 6'-6" MANHOLE TMH-5

NOT TO SCALE

NORTH

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

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Electrical Engineers

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

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Signature
Jan.5.2016
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO MANHOLE DEVELOPMENT PLANS 2

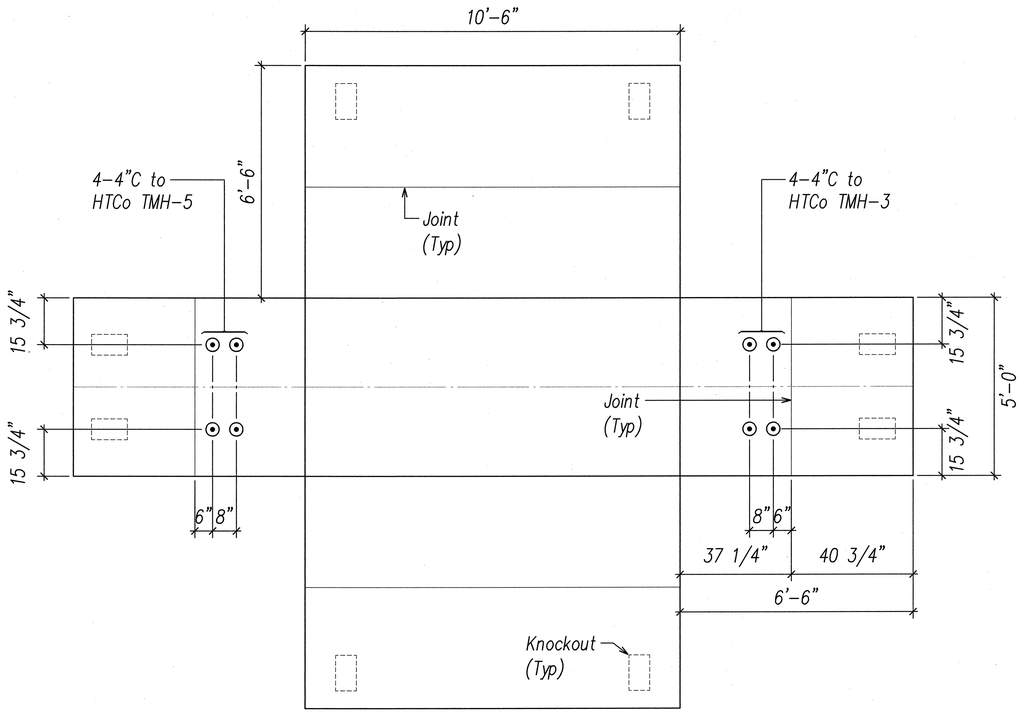
INTERSTATE ROUTE H-1
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(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-6 OF 161 SHEETS

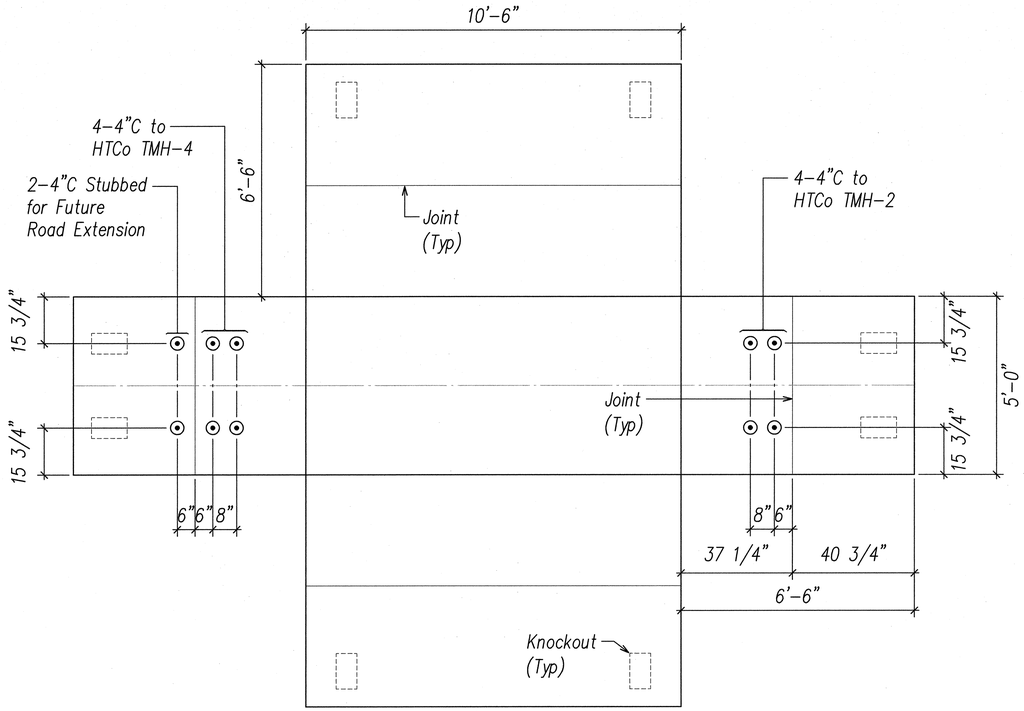
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	452	524



HTCO 5' X 10' X 6'-6" MANHOLE TMH-4

NOT TO SCALE



HTCO 5' X 10' X 6'-6" MANHOLE TMH-3

NOT TO SCALE

NORTH

MANHOLE AND HANDHOLE NOTES:

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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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 02.05.16

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO MANHOLE DEVELOPMENT PLANS 3

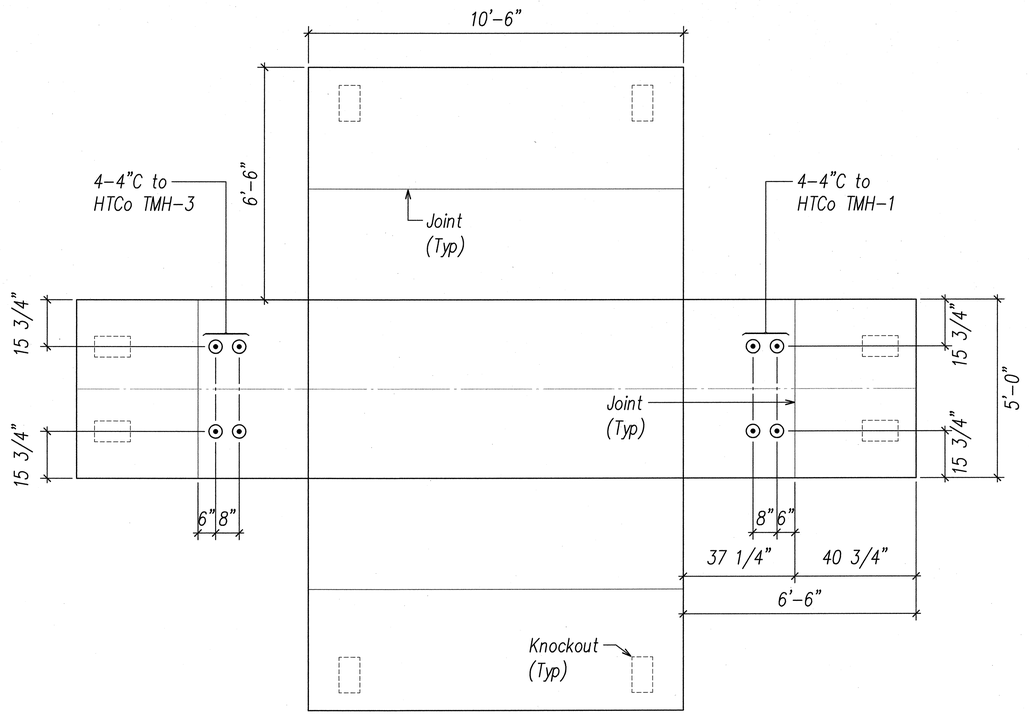
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-7 OF 161 SHEETS

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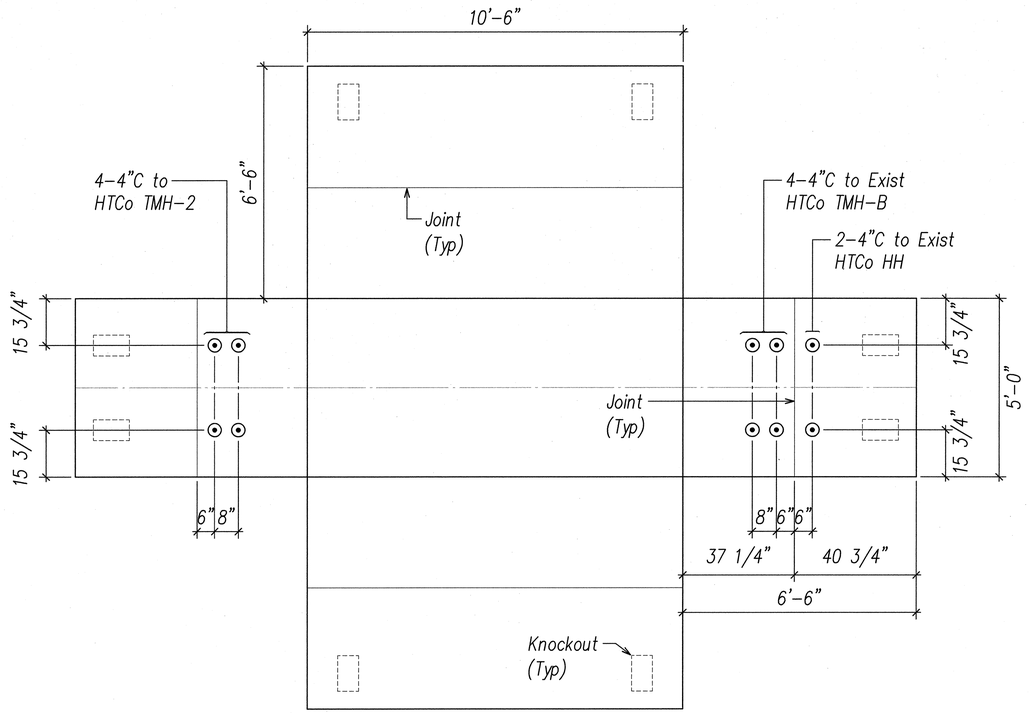
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	453	524



HTCO 5' X 10' X 6'-6" MANHOLE TMH-2

NOT TO SCALE

NORTH



HTCO 5' X 10' X 6'-6" MANHOLE TMH-1

NOT TO SCALE

NORTH

MANHOLE AND HANDHOLE NOTES:

Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.

ORIGINAL PLAN
NOTE BOOK No.

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

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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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO MANHOLE DEVELOPMENT PLANS 4

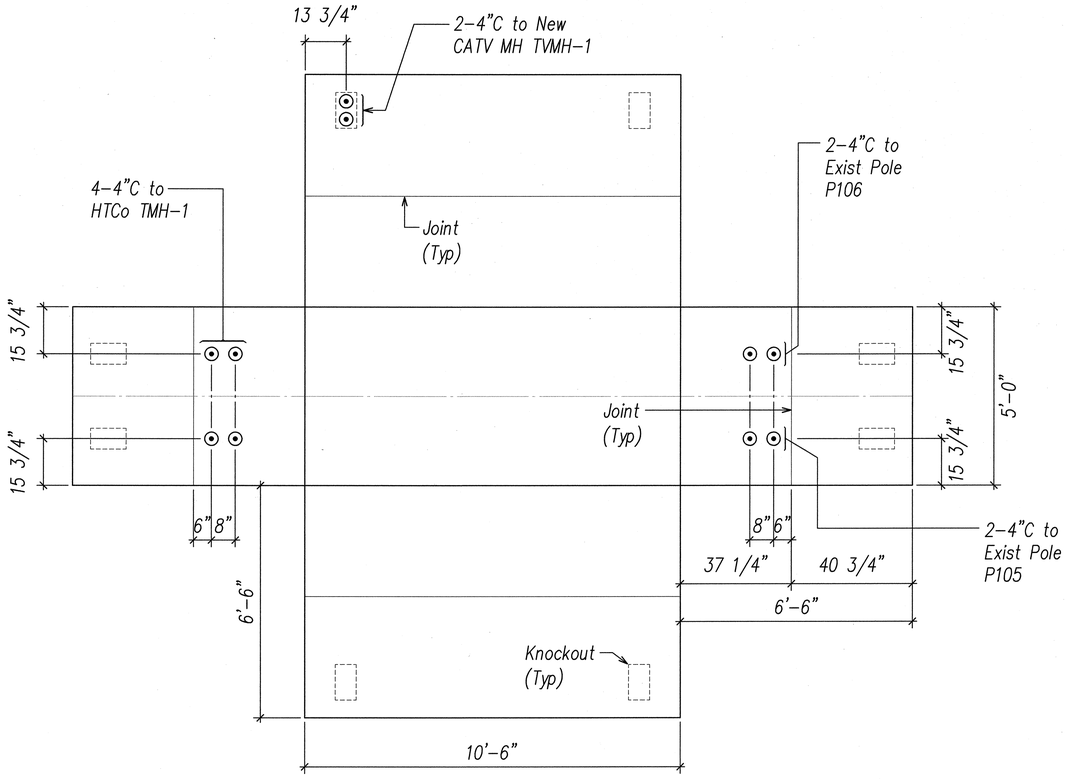
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-8 OF 161 SHEETS

LAST SAVED: 02/17/15 @ 10:40:49 BY: AM PLOT SC: 1/2"=1'
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	454	524



HTCO 5' X 10' X 6'-6" MANHOLE TMH-8

NOT TO SCALE

NORTH

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ORIGINAL PLAN
NOTE BOOK
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Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO MANHOLE DEVELOPMENT PLANS 5

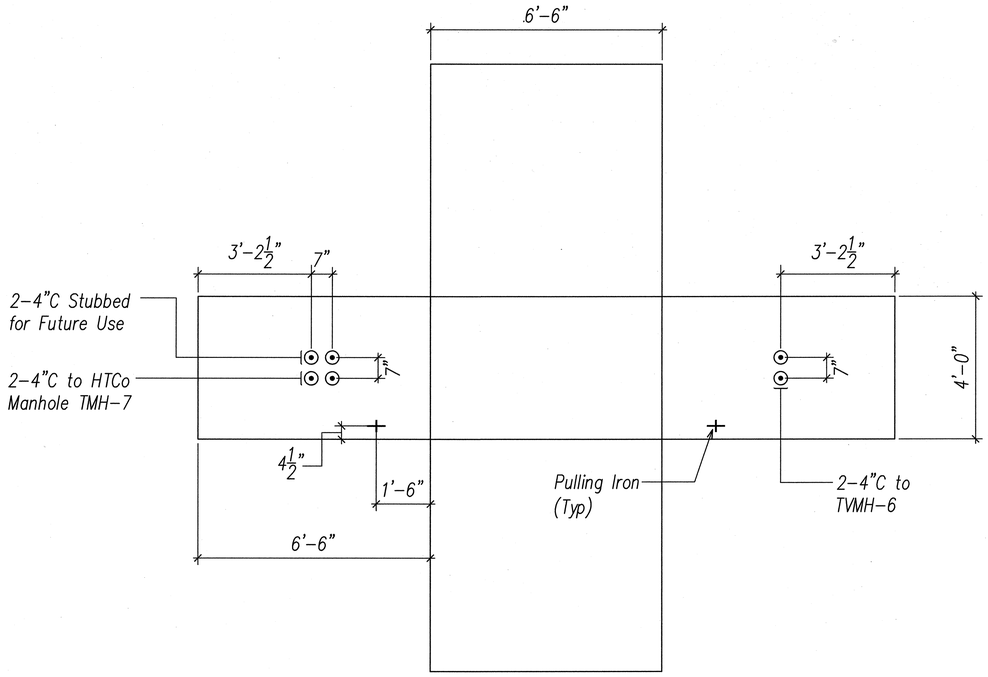
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-9 OF 161 SHEETS

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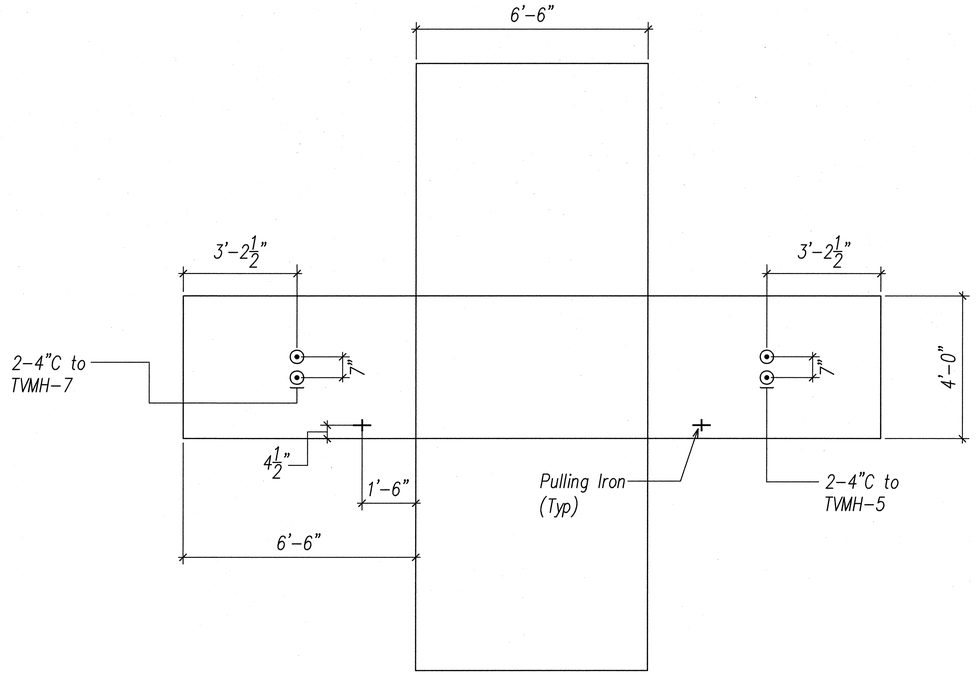
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	455	524



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-7

NOT TO SCALE

NORTH



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-6

NOT TO SCALE

NORTH

MANHOLE AND HANDHOLE NOTES:

Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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	QUANTITIES BY	
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OTWC MANHOLE
DEVELOPMENT PLANS 1

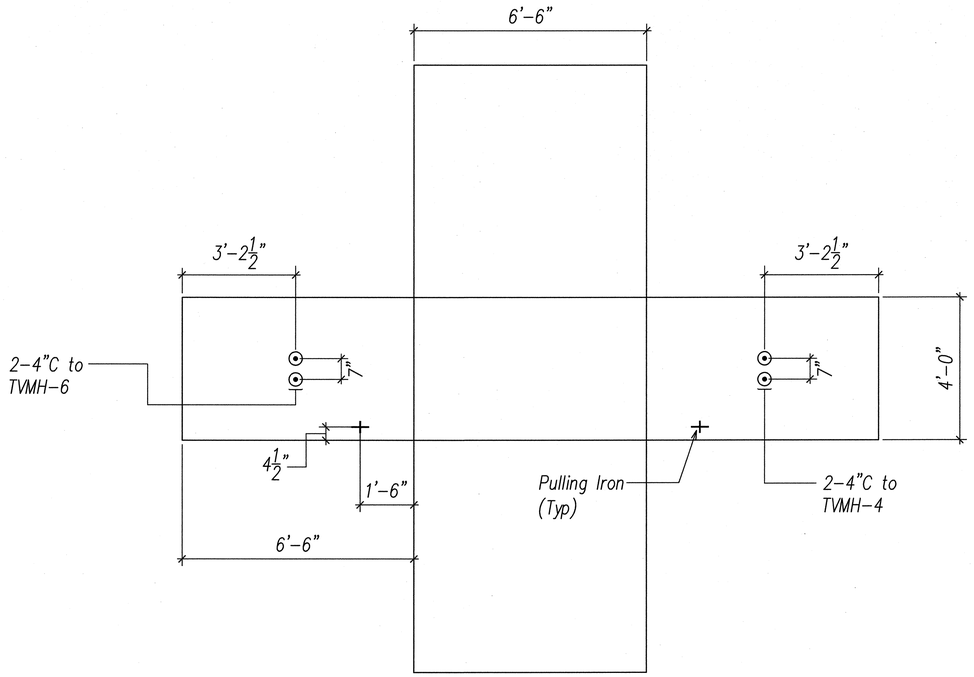
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EF-10 OF 161 SHEETS

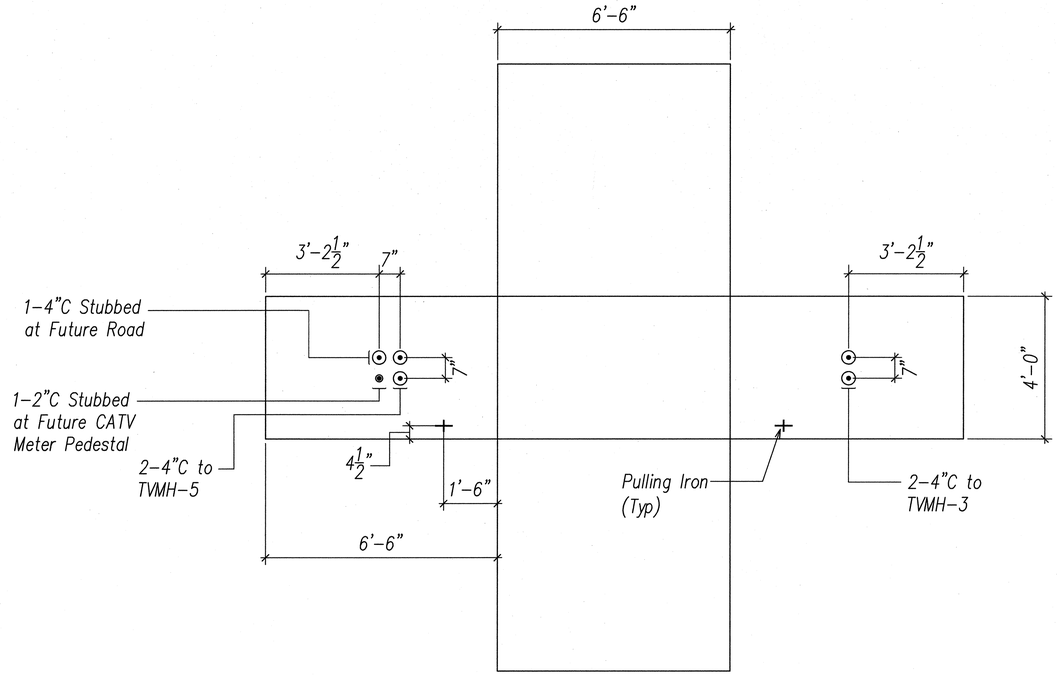
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	456	524



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-5

NOT TO SCALE



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-4

NOT TO SCALE

MANHOLE AND HANDHOLE NOTES:

Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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2015.02.18
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OTWC MANHOLE DEVELOPMENT PLANS 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

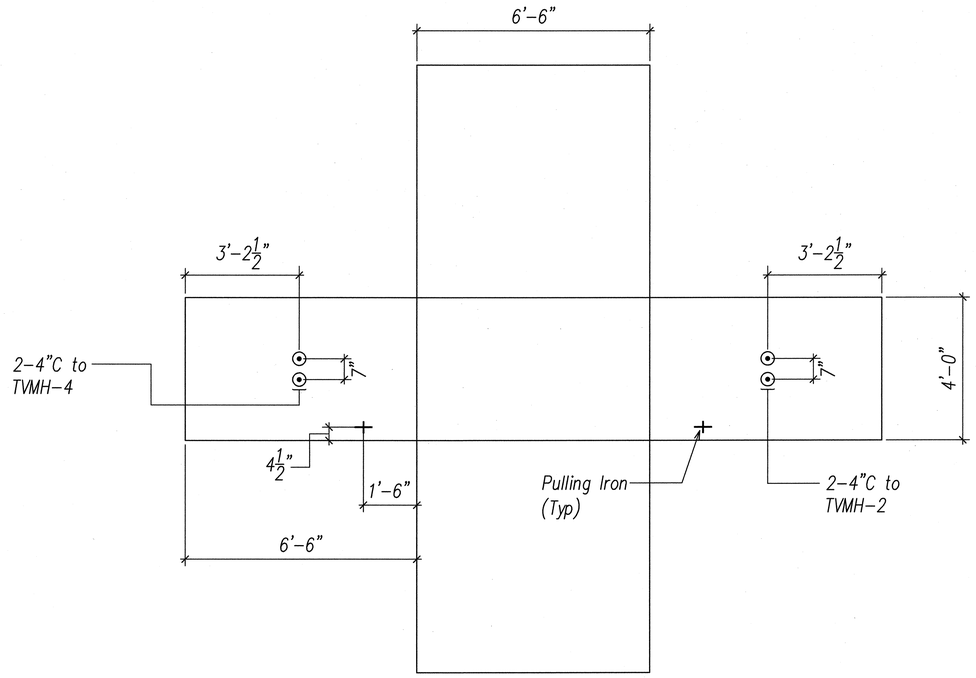
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SHEET No. EF-11 OF 161 SHEETS

456

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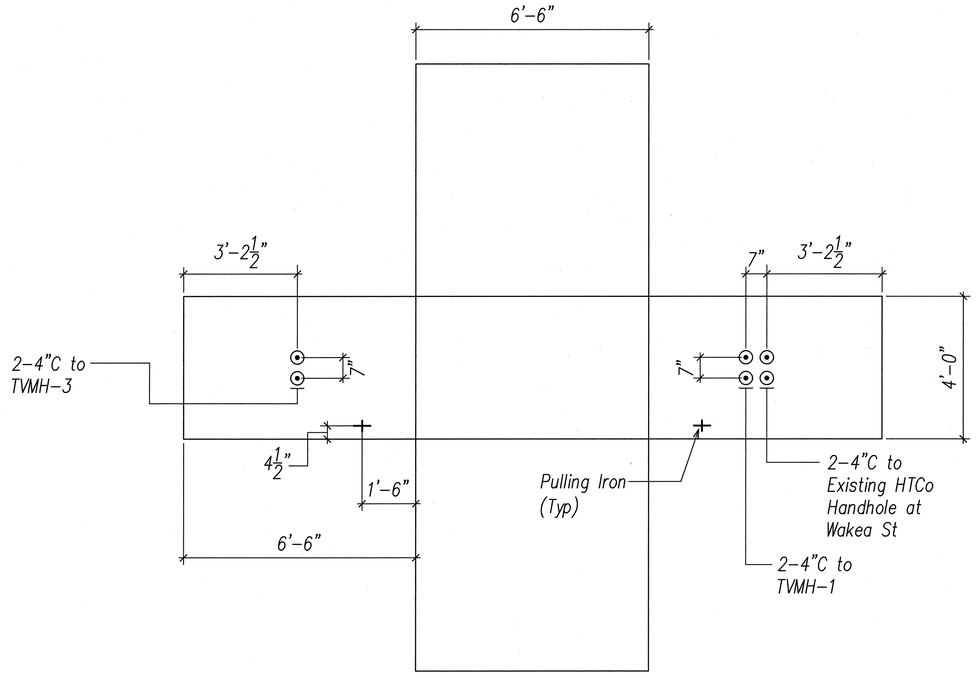
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	457	524



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-3

NOT TO SCALE

NORTH



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-2

NOT TO SCALE

NORTH

MANHOLE AND HANDHOLE NOTES:

Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.

ORIGINAL PLAN | NOTE BOOK

No. ____

SURVEY PLOTTED BY ____ DATE
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OTWC MANHOLE DEVELOPMENT PLANS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

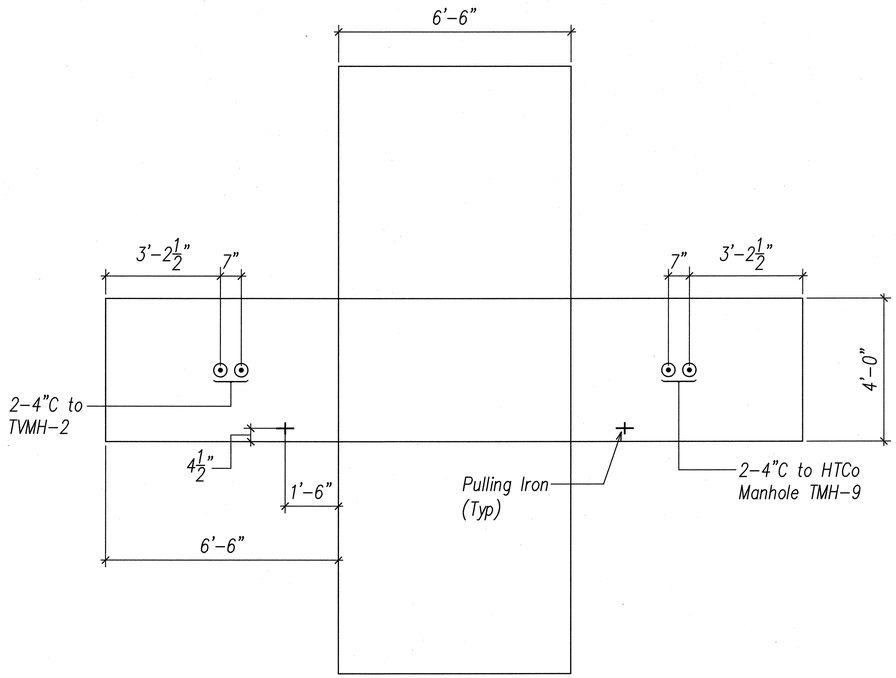
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SHEET No. EF-12 OF 161 SHEETS

457

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	458	524



OTWC 4' X 6'-6" X 6'-6"D MANHOLE TVMH-1

NOT TO SCALE

NORTH

MANHOLE AND HANDHOLE NOTES:

Manhole and Handhole Shop Drawings and Structural Calculations Shall be Submitted to Utility Company for Review and Approval prior to Fabrication and/or Construction.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
No.	TRACED BY	
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OTWC MANHOLE DEVELOPMENT PLANS 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

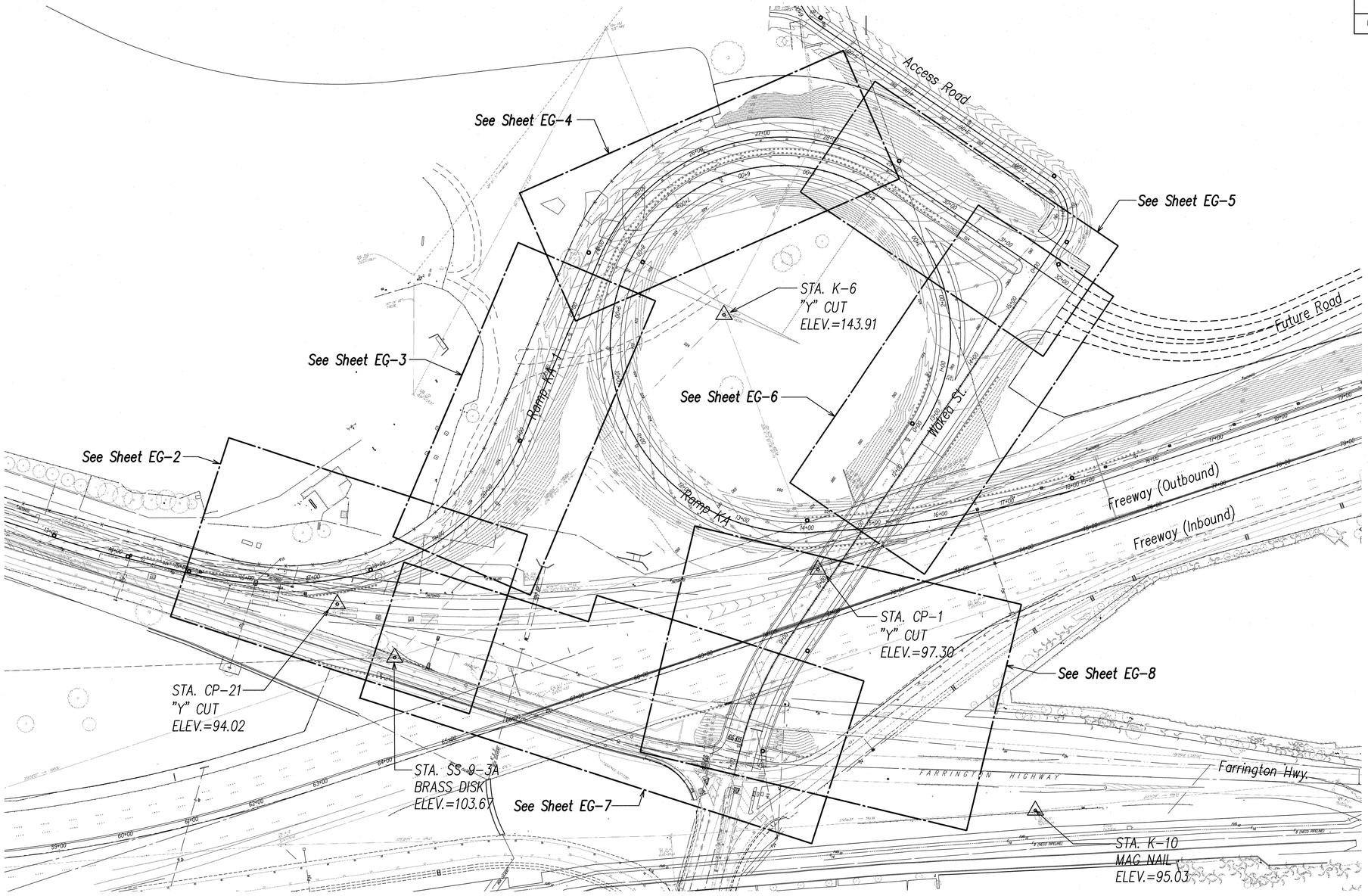
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SHEET No. EF-13 OF 161 SHEETS

458

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	459	524



OVERALL PLAN – HECO DUCTLINE HORIZONTAL TIES

SCALE: 1"=80'

NORTH

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

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL PLAN - HECO DUCTLINE HORIZONTAL TIES

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

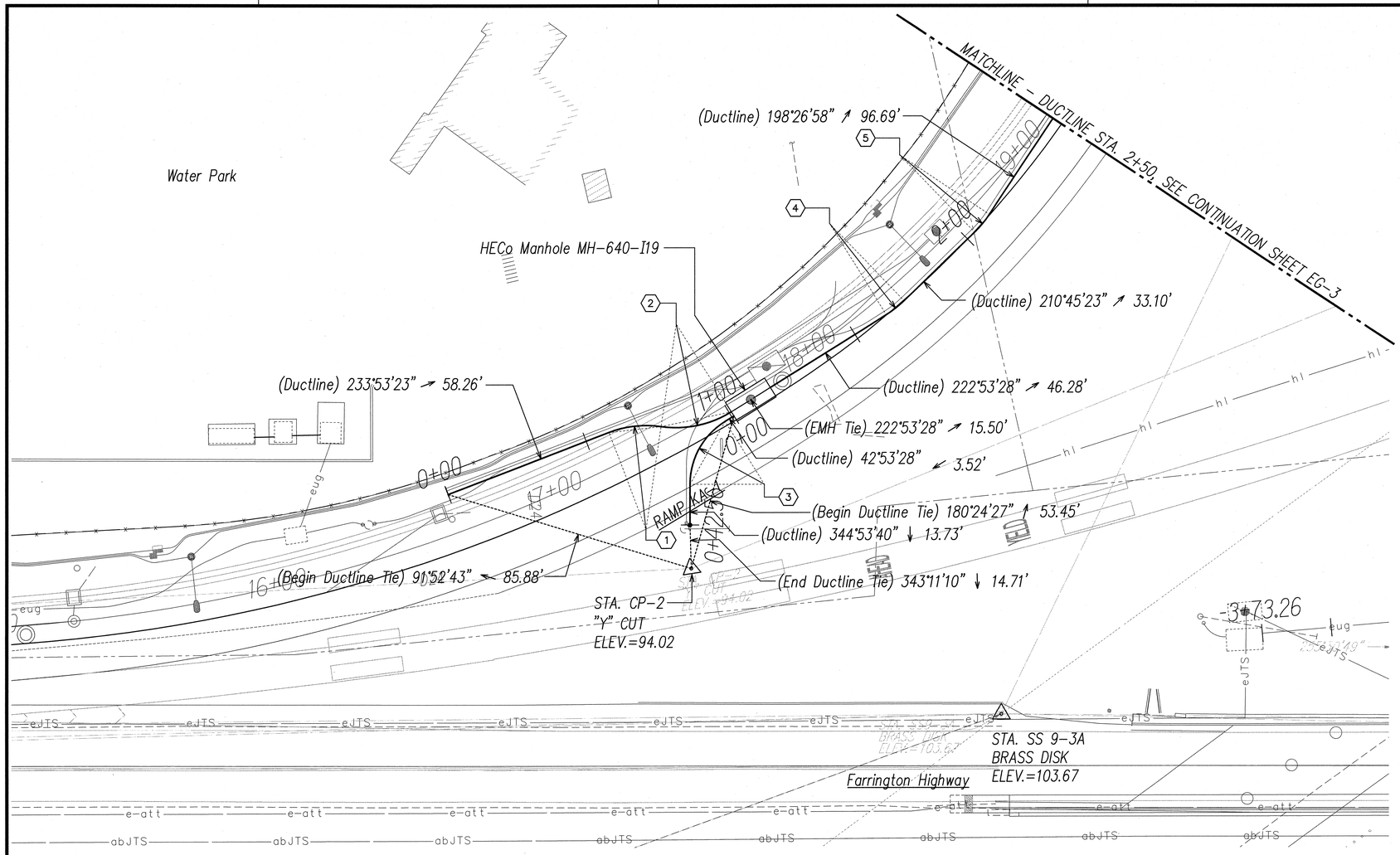
SHEET No. EG-1 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	460	524

NOTES:

1. For Electric Ductline Profiles, See Sheets EG-10 and EG-18.



HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 1

SCALE: 1"=20'

NORTH

CURVE DATA						
ID	Δ	Δ/ 2	RADIUS	T	C	Lc
⟨1⟩	29°17'22"	14°38'40.9"	35.00'	9.15'	17.70'	17.89'
⟨2⟩	40°17'16"	20°8'38.2"	35.00'	12.84'	24.11'	24.61'
⟨3⟩	57°59'48"	28°59'53.8"	25.00'	13.86'	24.24'	25.31'
⟨4⟩	12°8'5"	6°4'2.4"	36.30'	3.86'	7.67'	7.69'
⟨5⟩	12°18'25"	6°9'12.3"	36.30'	3.91'	7.78'	7.80'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc.
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HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

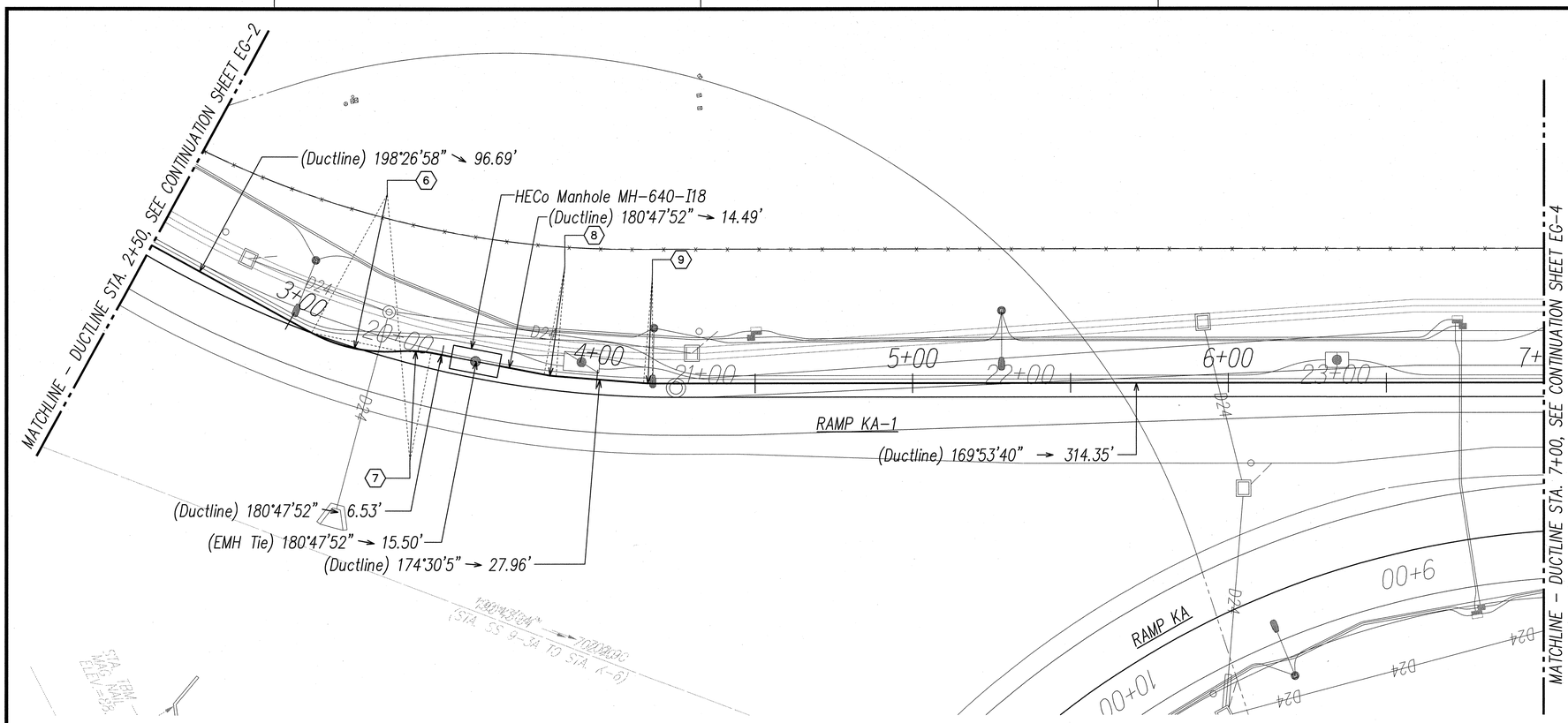
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SHEET No. EG-2 OF 161 SHEETS

460

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	461	524



NOTES:

1. For Electric Ductline Profiles, See Sheets EG-10 and EG-11.

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
6	33°22'56"	16°41'28.0"	50.00'	14.99'	28.72'	29.13'
7	15°43'50"	7°51'54.8"	35.00'	4.83'	9.58'	9.61'
8	6°17'47"	3°8'53.4"	35.00'	1.93'	3.84'	3.85'
9	4°36'25"	2°18'12.4"	35.00'	1.41'	2.81'	2.81'

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 2

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

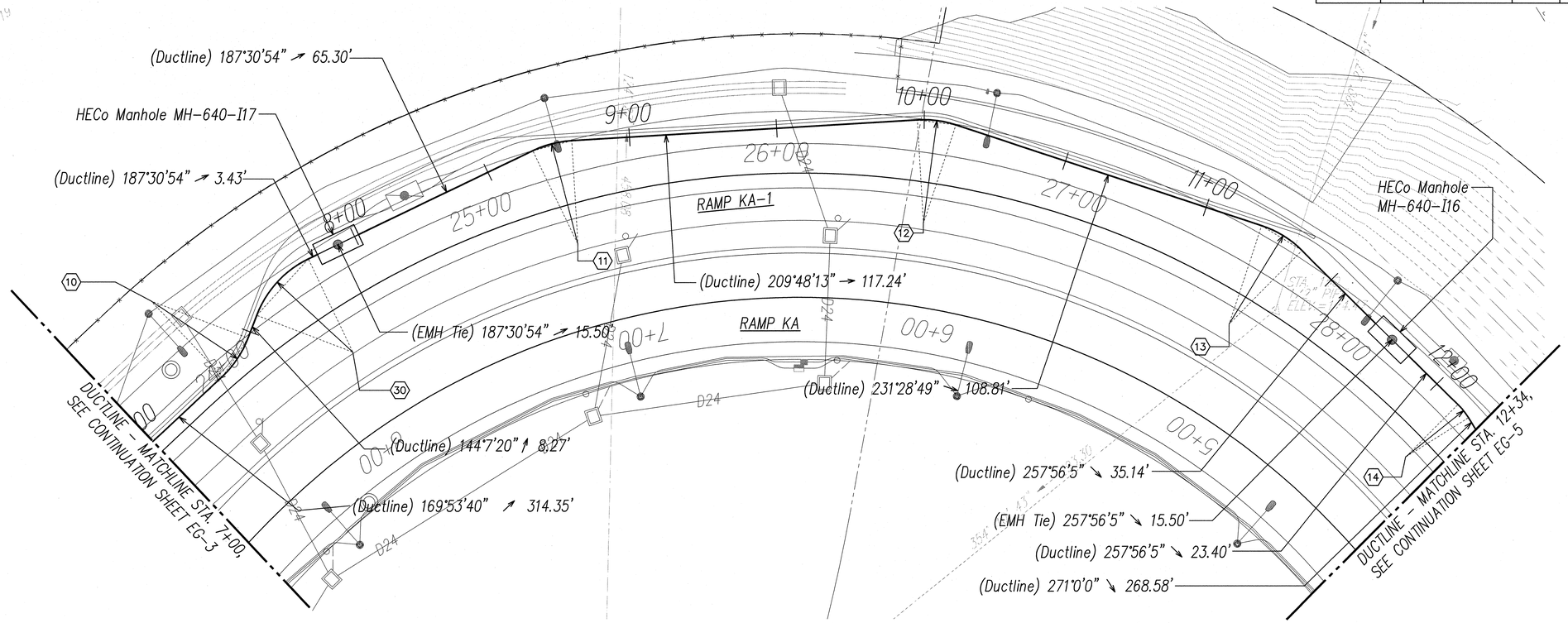
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SHEET No. EG-3 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	462	524



CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
10	25°46'20"	12°53'10.2"	35.00'	8.01'	15.61'	15.74'
11	22°17'19"	11°8'39.5"	35.00'	6.89'	13.53'	13.62'
12	21°40'36"	10°50'18.1"	35.00'	6.70'	13.16'	13.24'
13	26°27'16"	13°13'37.8"	35.00'	8.23'	16.02'	16.16'
14	13°3'55"	6°31'57.7"	25.00'	2.86'	5.69'	5.70'
30	43°23'34"	21°41'46.9"	35.00'	13.93'	25.88'	26.51'

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 3

SCALE: 1"=20'

NORTH

NOTES:

1. For Electric Ductline Profiles, See Sheets EG-11 and EG-12.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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DATE

ORIGINAL PLAN
NOTE BOOK
No.

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

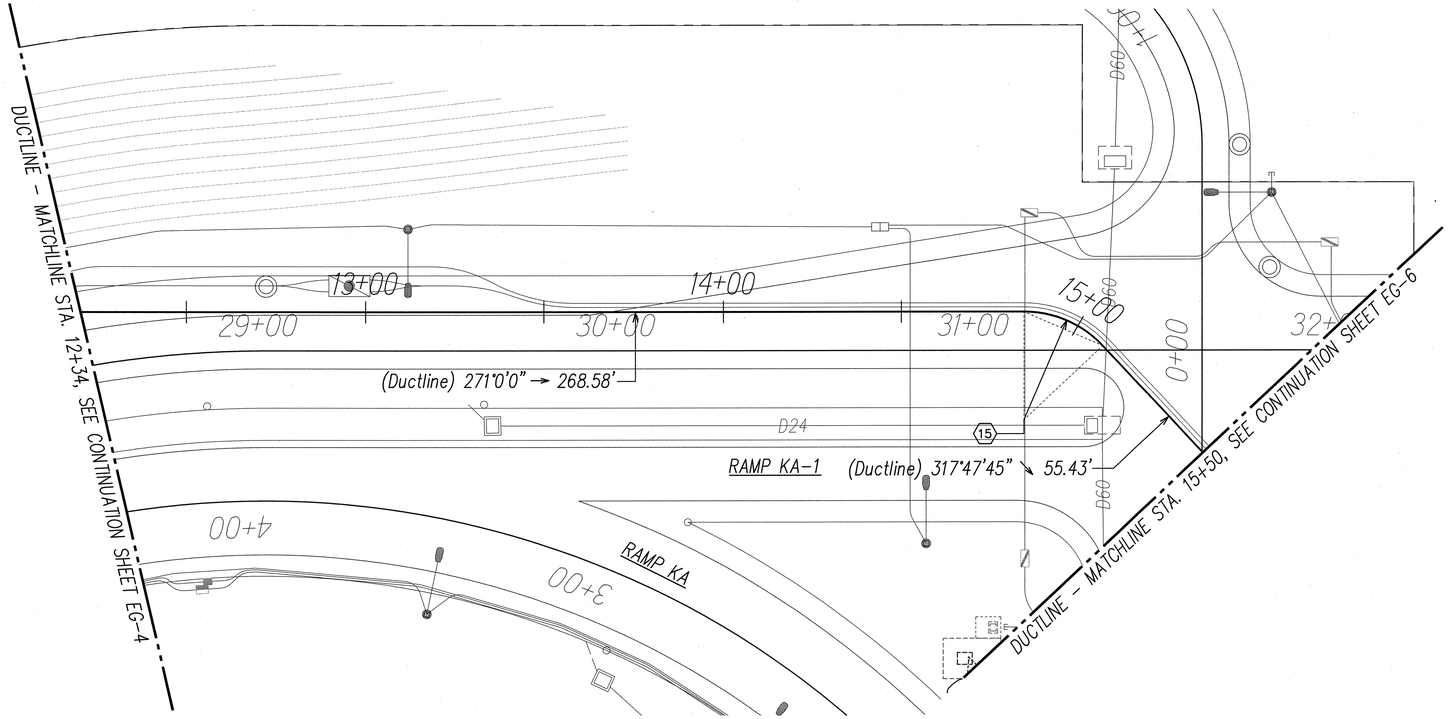
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SHEET No. EG-4 OF 161 SHEETS

462

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	463	524



HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 4

SCALE: 1"=20'

NOTES:

1. For Electric Ductline Profiles, See Sheets EG-12 and EG-13.

NORTH

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
⟨15⟩	46°47'45"	23°23'52.5"	30.25'	13.09'	24.03'	24.71'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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.

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 4

INTERSTATE ROUTE H-1

ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2

Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

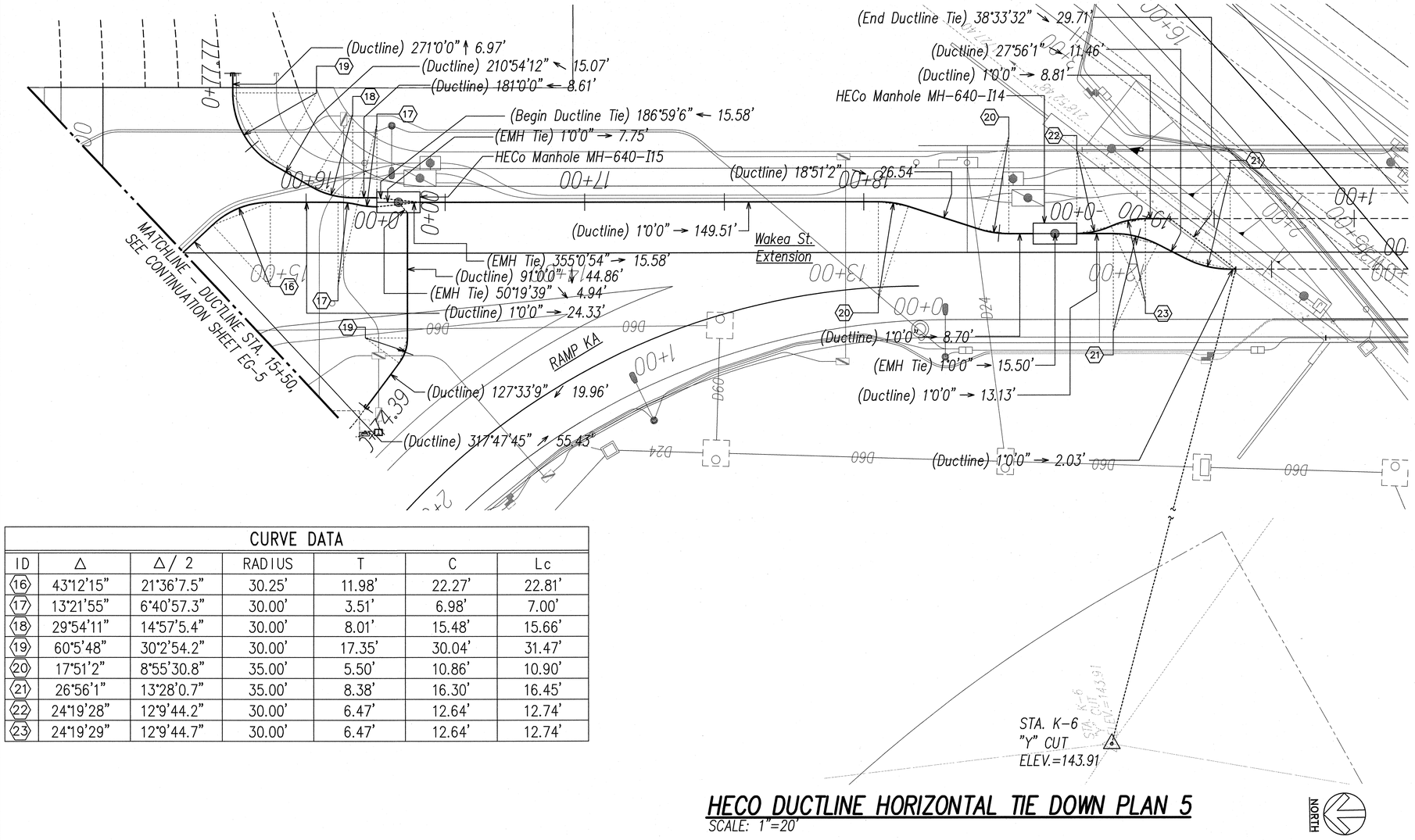
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105
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	464	524

NOTES:

1. For Electric Ductline Profiles, See Sheets EG-13, EG-14, EG-16, EG-18 and EG-19.



CURVE DATA

ID	Δ	Δ / 2	RADIUS	T	C	Lc
⟨16⟩	43°12'15"	21°36'7.5"	30.25'	11.98'	22.27'	22.81'
⟨17⟩	13°21'55"	6°40'57.3"	30.00'	3.51'	6.98'	7.00'
⟨18⟩	29°54'11"	14°57'5.4"	30.00'	8.01'	15.48'	15.66'
⟨19⟩	60°5'48"	30°2'54.2"	30.00'	17.35'	30.04'	31.47'
⟨20⟩	17°51'2"	8°55'30.8"	35.00'	5.50'	10.86'	10.90'
⟨21⟩	26°56'1"	13°28'0.7"	35.00'	8.38'	16.30'	16.45'
⟨22⟩	24°19'28"	12°9'44.2"	30.00'	6.47'	12.64'	12.74'
⟨23⟩	24°19'29"	12°9'44.7"	30.00'	6.47'	12.64'	12.74'

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 5

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

NORTH

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 5

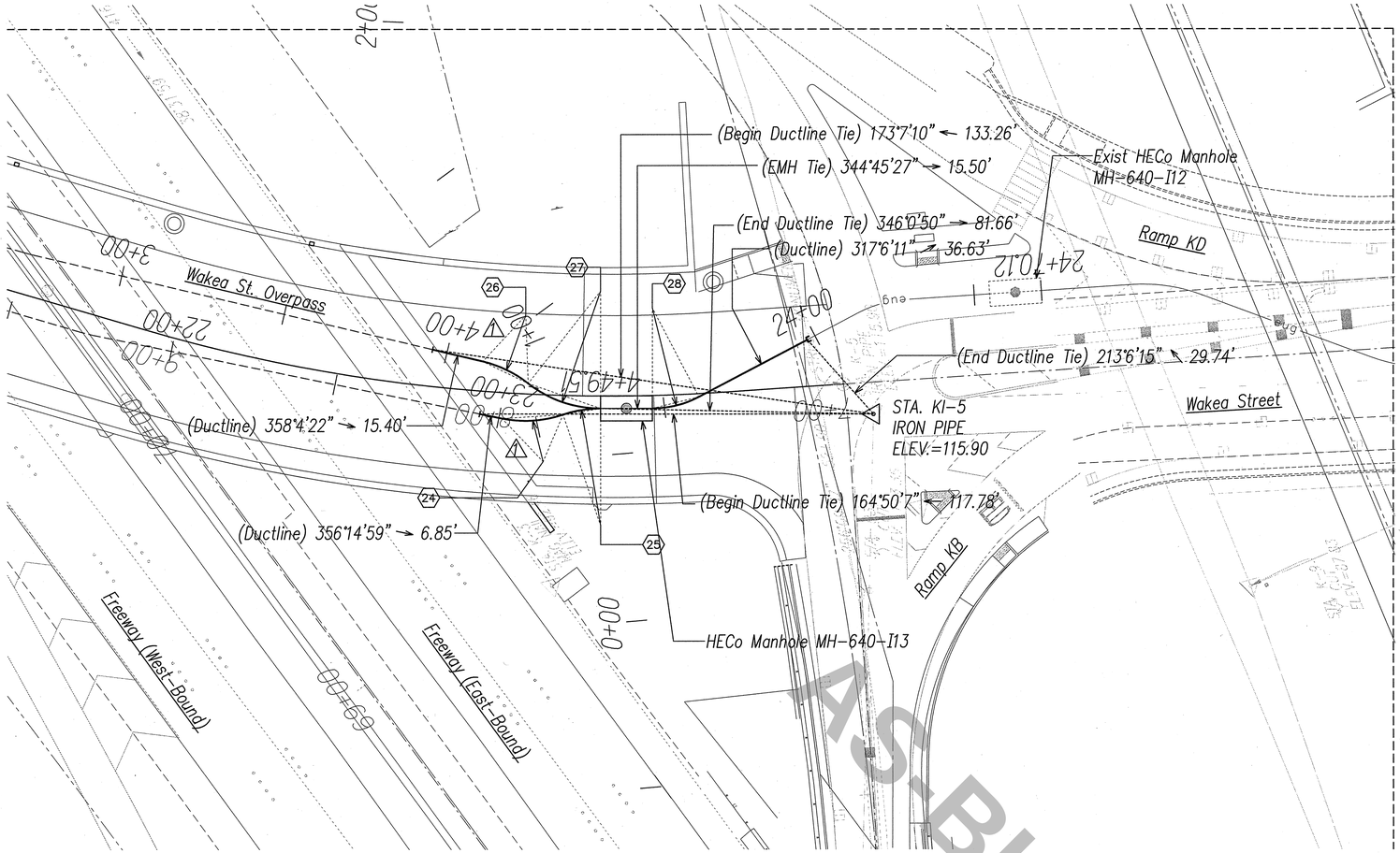
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-6 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	C.O. 465	524



AS-BUILT

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 6

SCALE: 1"=20'

NOTES:

1. For Electric Ductline Profiles, See Sheets EG-15 and EG-16.

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
24	30°11'52"	15°5'56.2"	35.00'	9.44'	18.23'	18.45'
25	18°42'21"	9°21'10.5"	35.00'	5.76'	11.38'	11.43'
26	24°52'35"	12°26'17.7"	35.00'	7.72'	15.08'	15.20'
27	38°11'30"	19°5'45.2"	35.00'	12.12'	22.90'	23.33'
28	27°39'16"	13°49'37.9"	30.00'	7.38'	14.34'	14.48'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

NORTH

DATE	REVISION
9/20/2016	⚠ Revised Note Arrows

RFI 70

Ronald N. S. Ho & Associates, Inc.
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ANDREW I. MIYASATO
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Andrew I. Miyasato 2016.09.30
Signature

License Exp. Date: 04.30.2018

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 6

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-7 OF 161 SHEETS

SURVEY PLOTTED BY
DRAWN BY
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DESIGNED BY
QUANTITIES BY
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DATE

ORIGINAL PLANS
NOTE BOOK
No.

LAST SAVE: 09/20/16 @ 07:20:15 BY: AM PLOT SC 1=20
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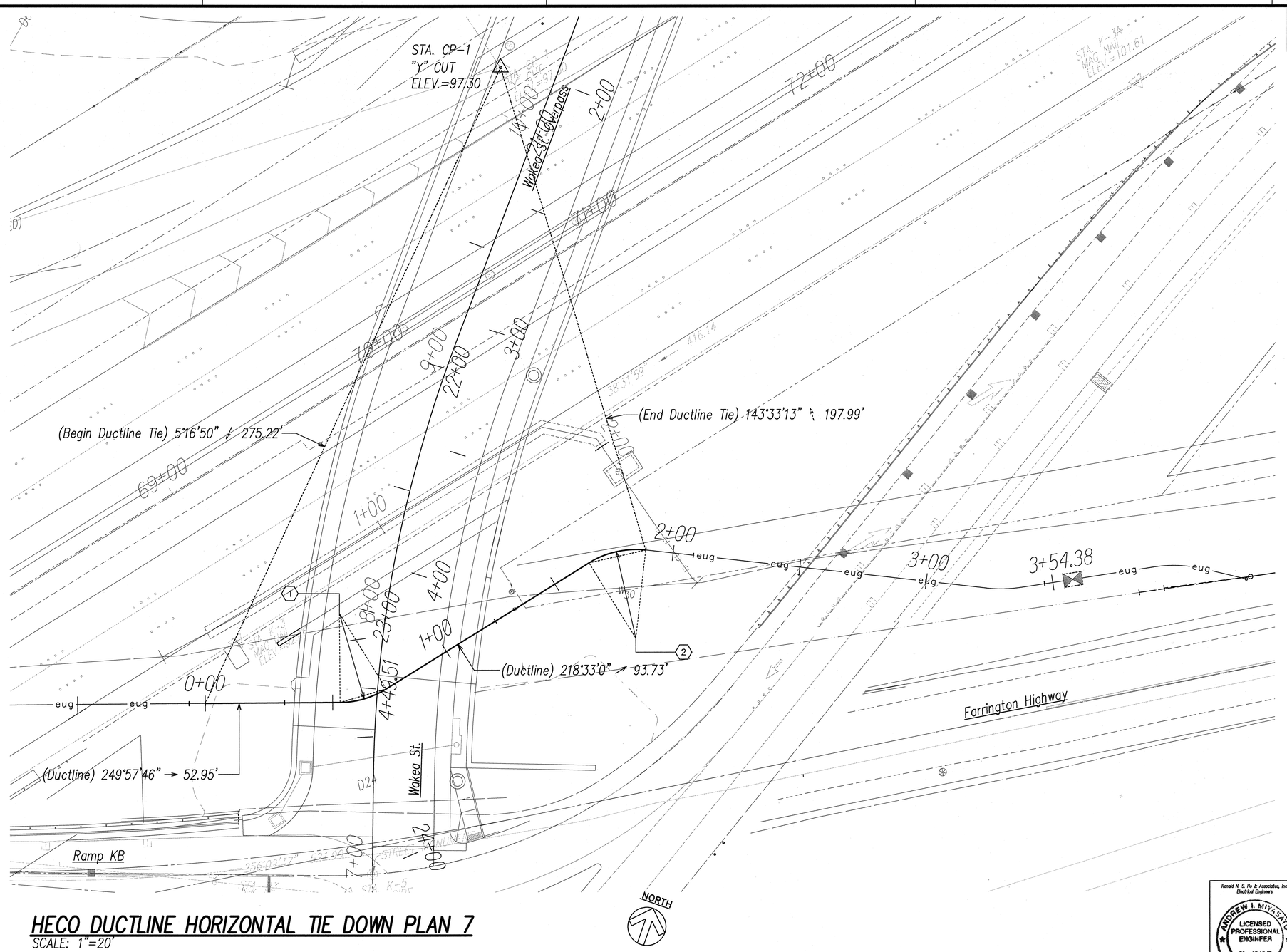
"AS-BUILT"

C.O. 465

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	466	524

NOTES:

1. For Electric Ductline Profiles, See Sheet EG-17.



HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 7

SCALE: 1"=20'

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	31°24'46"	15°42'22.9"	35.00'	9.84'	18.95'	19.19'
2	38°18'50"	19°9'25.0"	35.00'	12.16'	22.97'	23.40'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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HAWAII, U.S.A.

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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE HORIZONTAL TIE DOWN PLAN 7

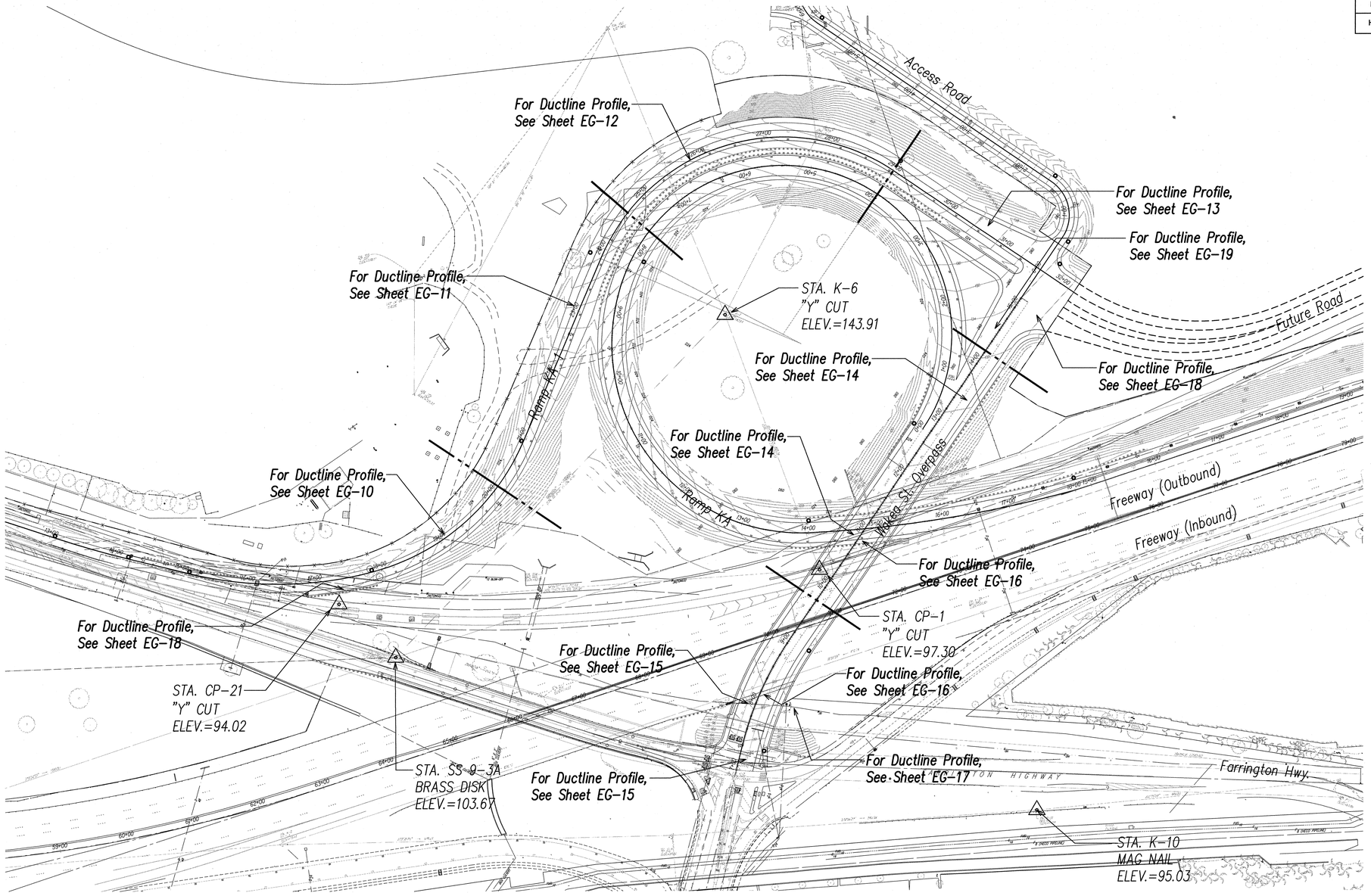
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-8 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	467	524



OVERALL PLAN – HECO DUCTLINE PROFILES

SCALE: 1"=80'

NORTH

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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HIGHWAYS DIVISION

OVERALL PLAN - HECO DUCTLINE PROFILES

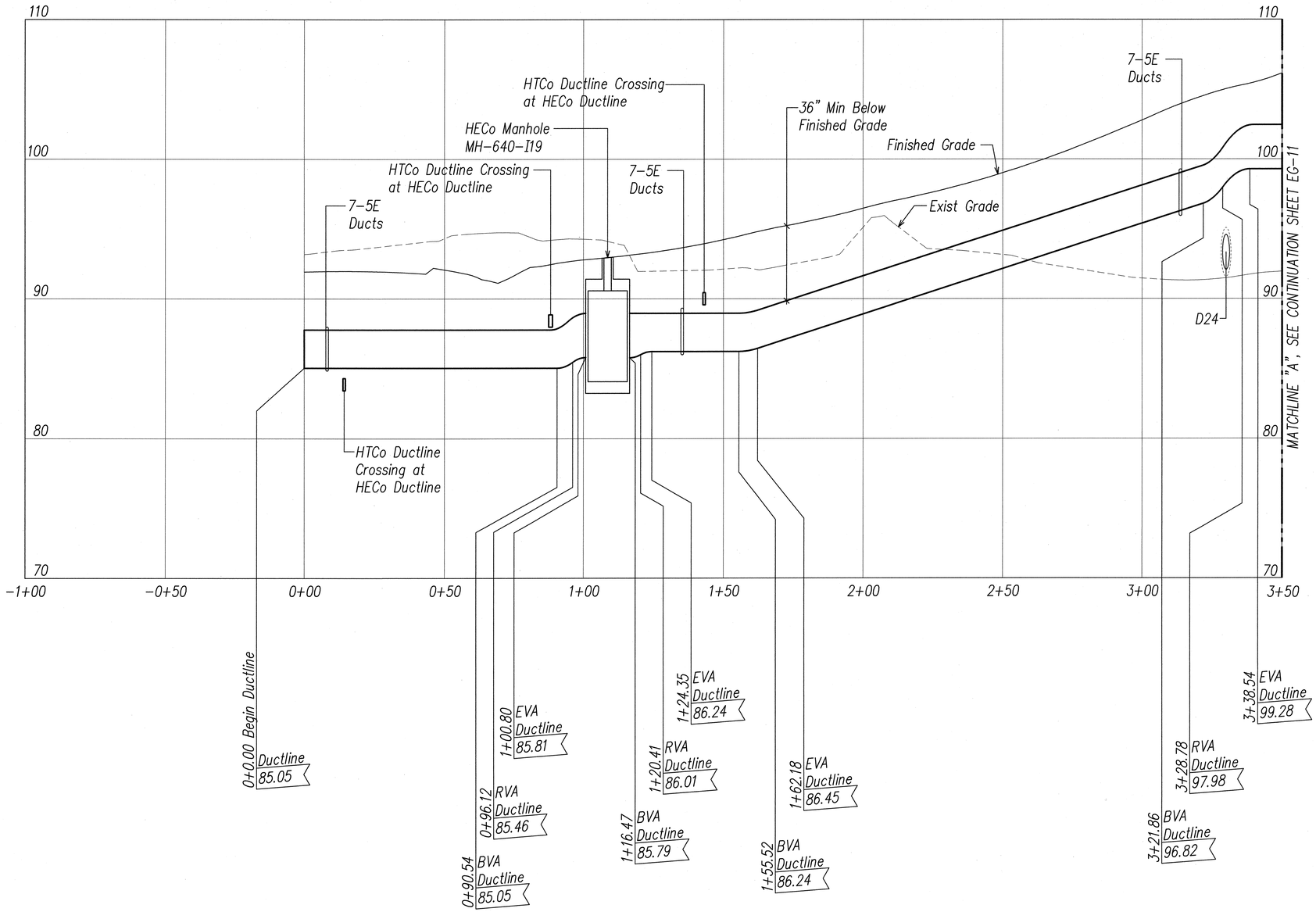
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-9 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	468	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheets EG-2 and EG-3.

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

HECO DUCTLINE PROFILE 1

SCALES: Horiz: 1"=20'
Vert: 1"=4'

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

LICENSED PROFESSIONAL ENGINEER
ANDREW I. MIYASATO
No. 4340-E
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Signature 2015.02.18
License Exp. Date: 04.30.2016

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DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 1

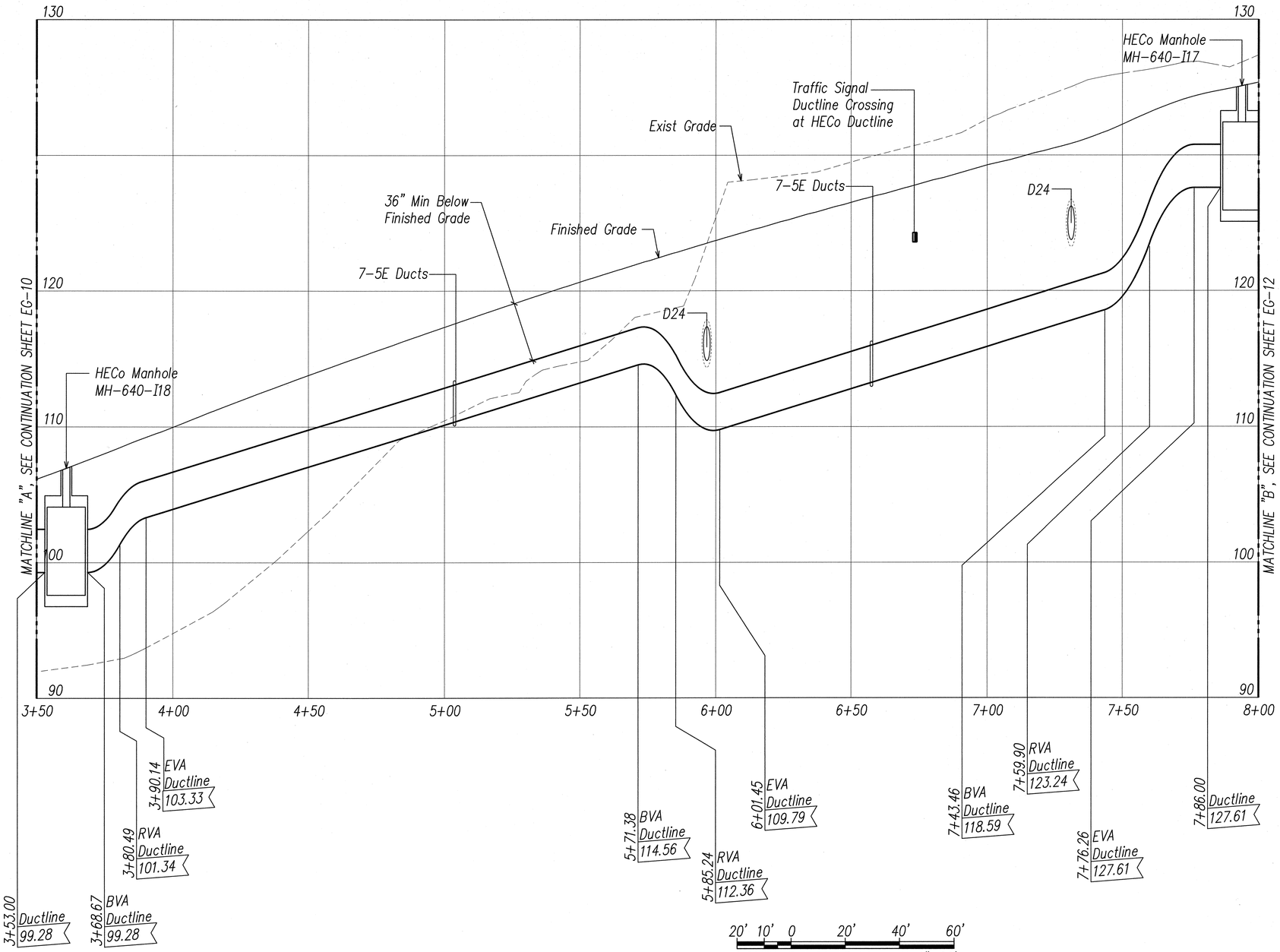
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-10 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	469	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheets EG-3 and EG-4.

HECO DUCTLINE PROFILE 2

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

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

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STATE OF HAWAII
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HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 2

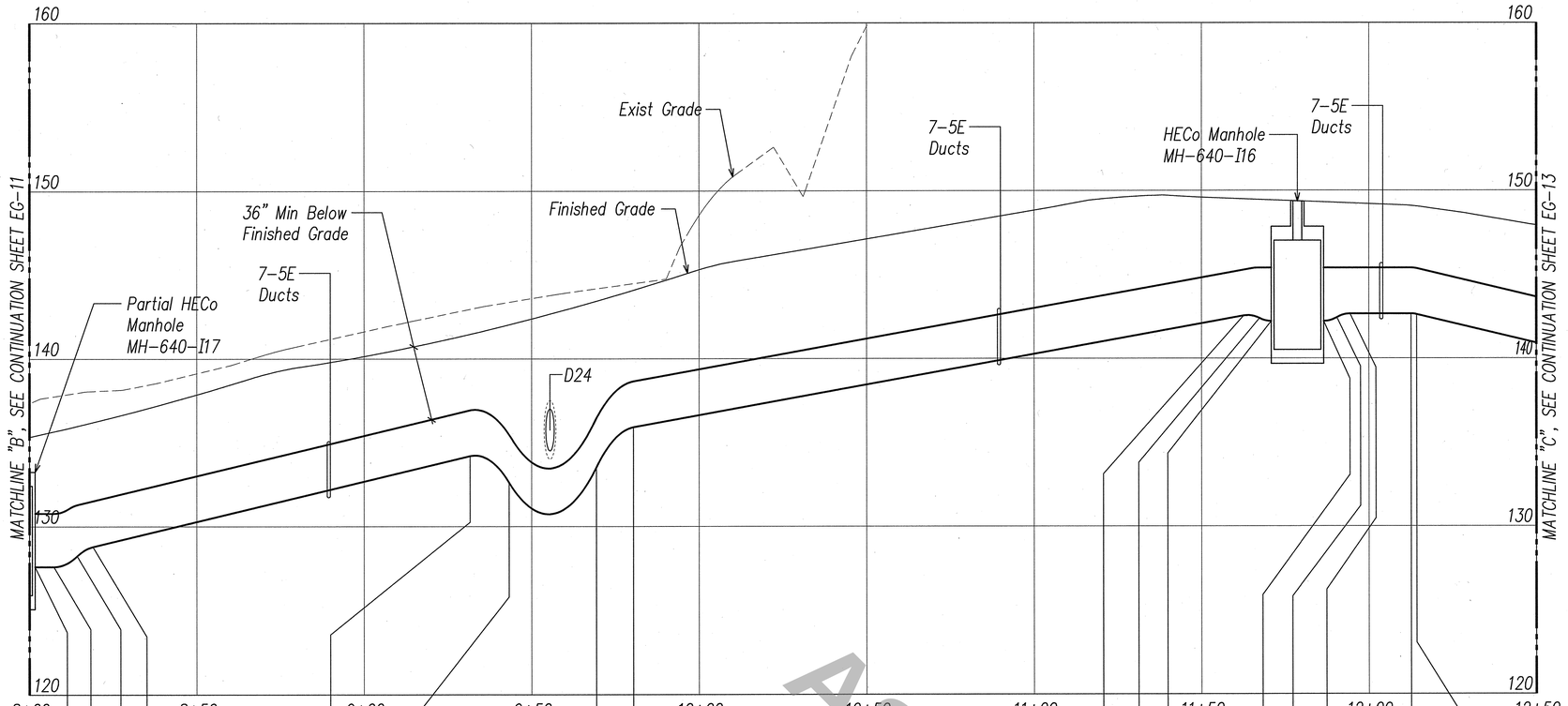
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-11 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	C.O. 470	524



HECO DUCTLINE PROFILE 3

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheets EG-4 and EG-5.

AS-BUILT

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

RFI 70

DATE	REVISION
9/20/2016	⚠ Revised Profile Station Numbers and Elevations

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ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
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Signature
2016.09.20
License Exp. Date: 04.30.2018

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

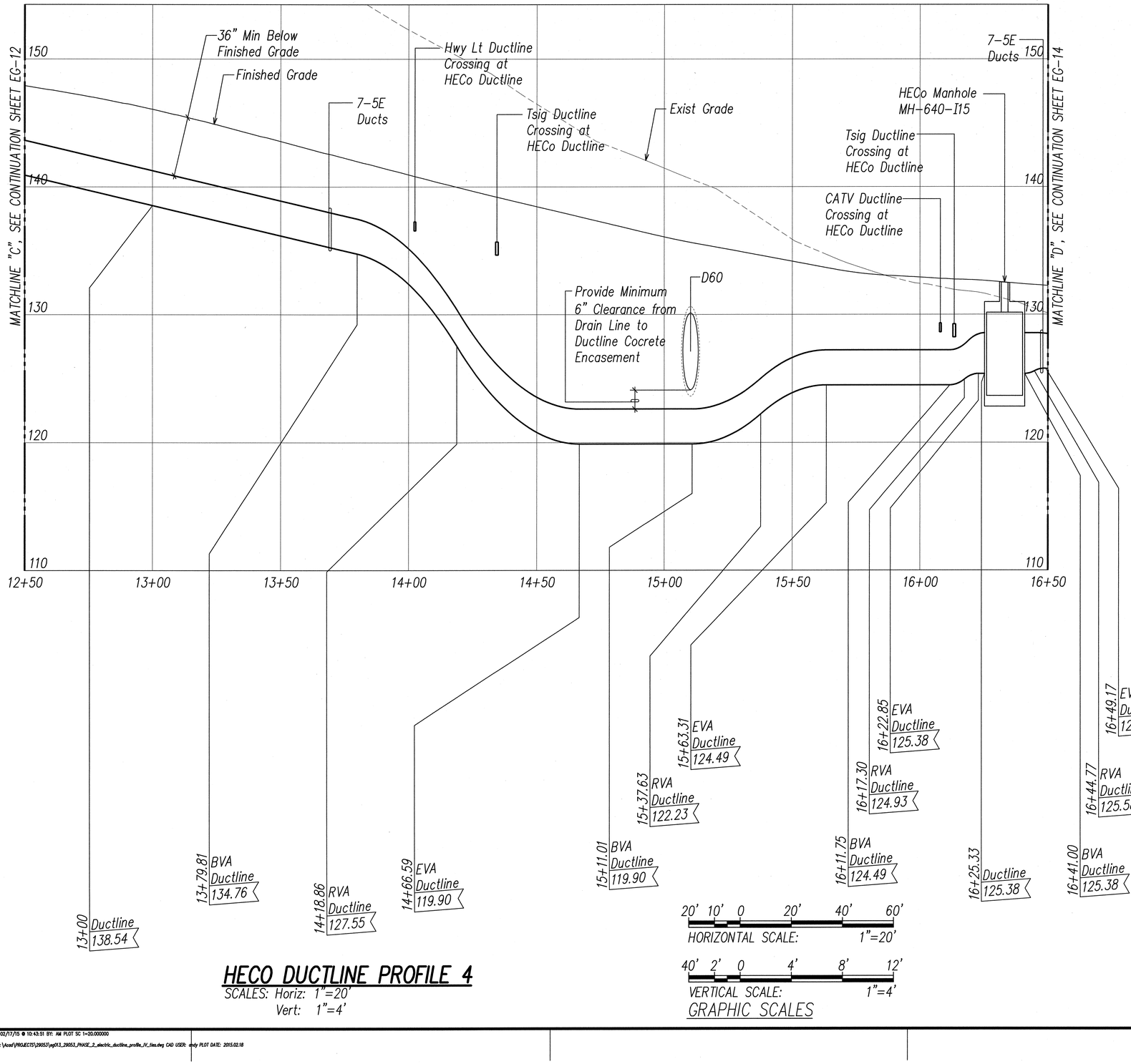
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"AS-BUILT"

C.O. 470

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	471	524



HECO DUCTLINE PROFILE 4

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheets EG-5 and EG-6.

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
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NOTE BOOK	TRACED BY	
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	QUANTITIES BY	
	CHECKED BY	

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Electrical Engineers

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LICENSED PROFESSIONAL ENGINEER
No. 4340-E
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 4

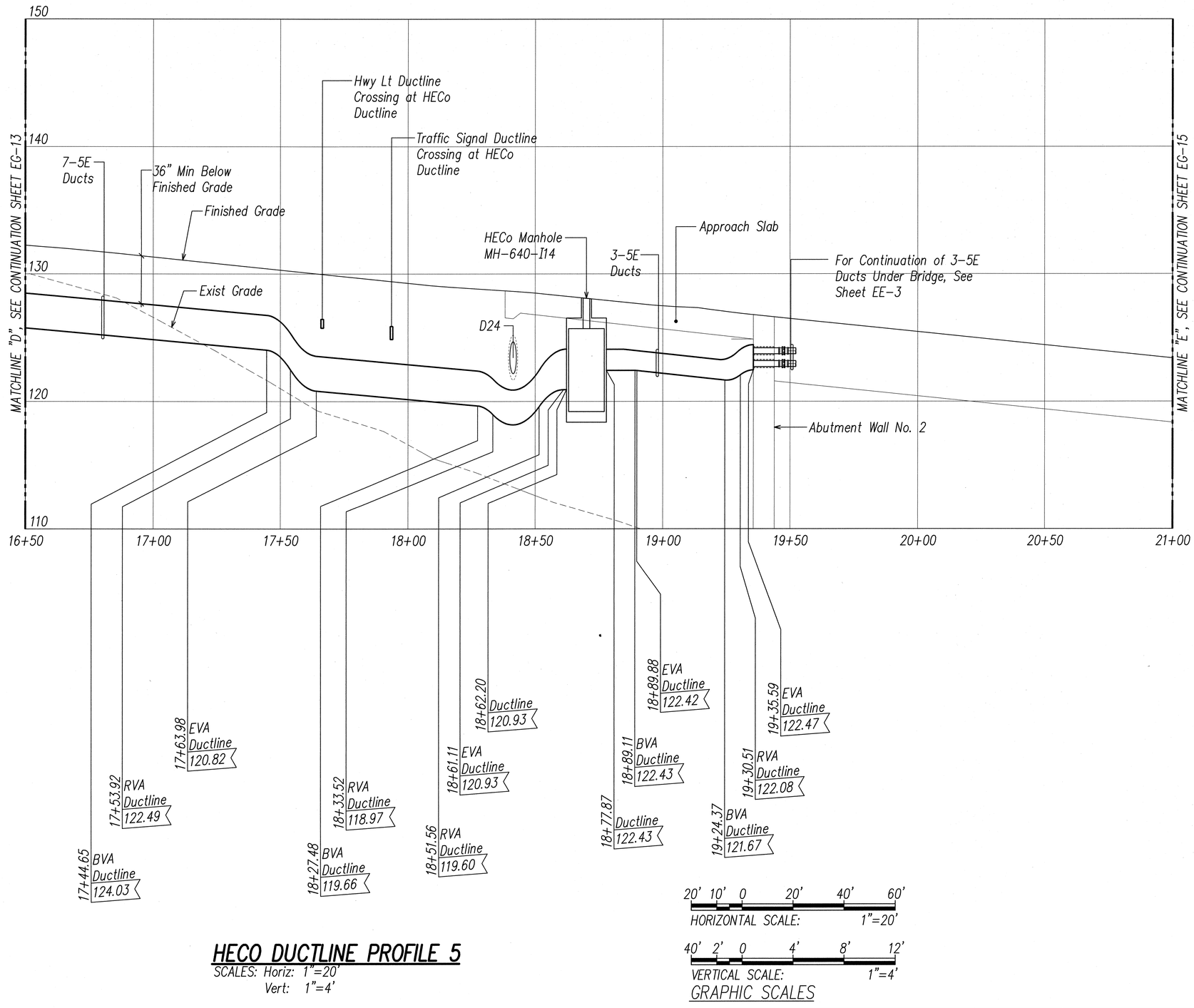
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-13 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	472	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheet EG-6.

HECO DUCTLINE PROFILE 5

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

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

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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 5

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

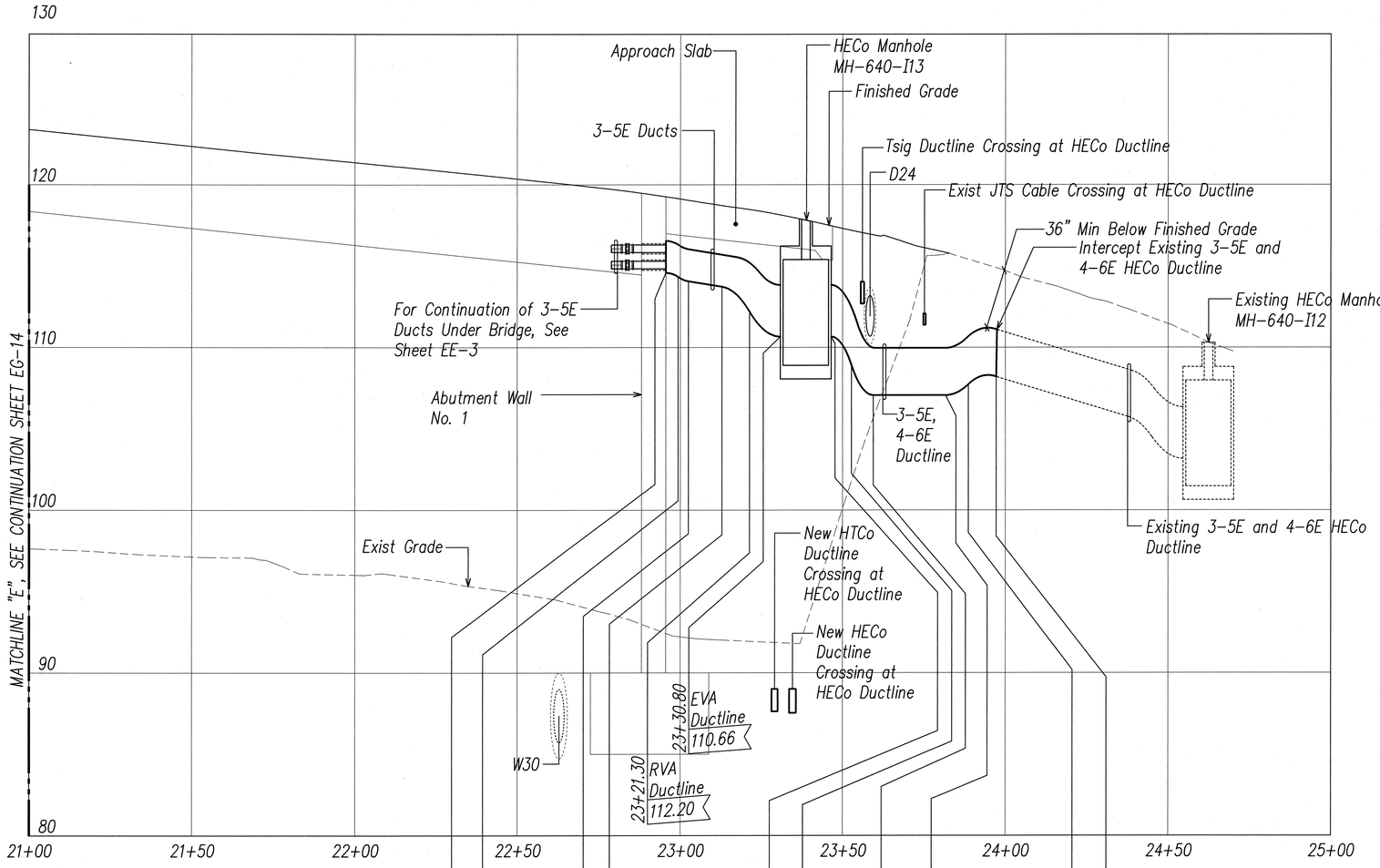
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SHEET No. EG-14 OF 161 SHEETS

472

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	473	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheet EG-7.

HECO DUCTLINE PROFILE 6

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 6

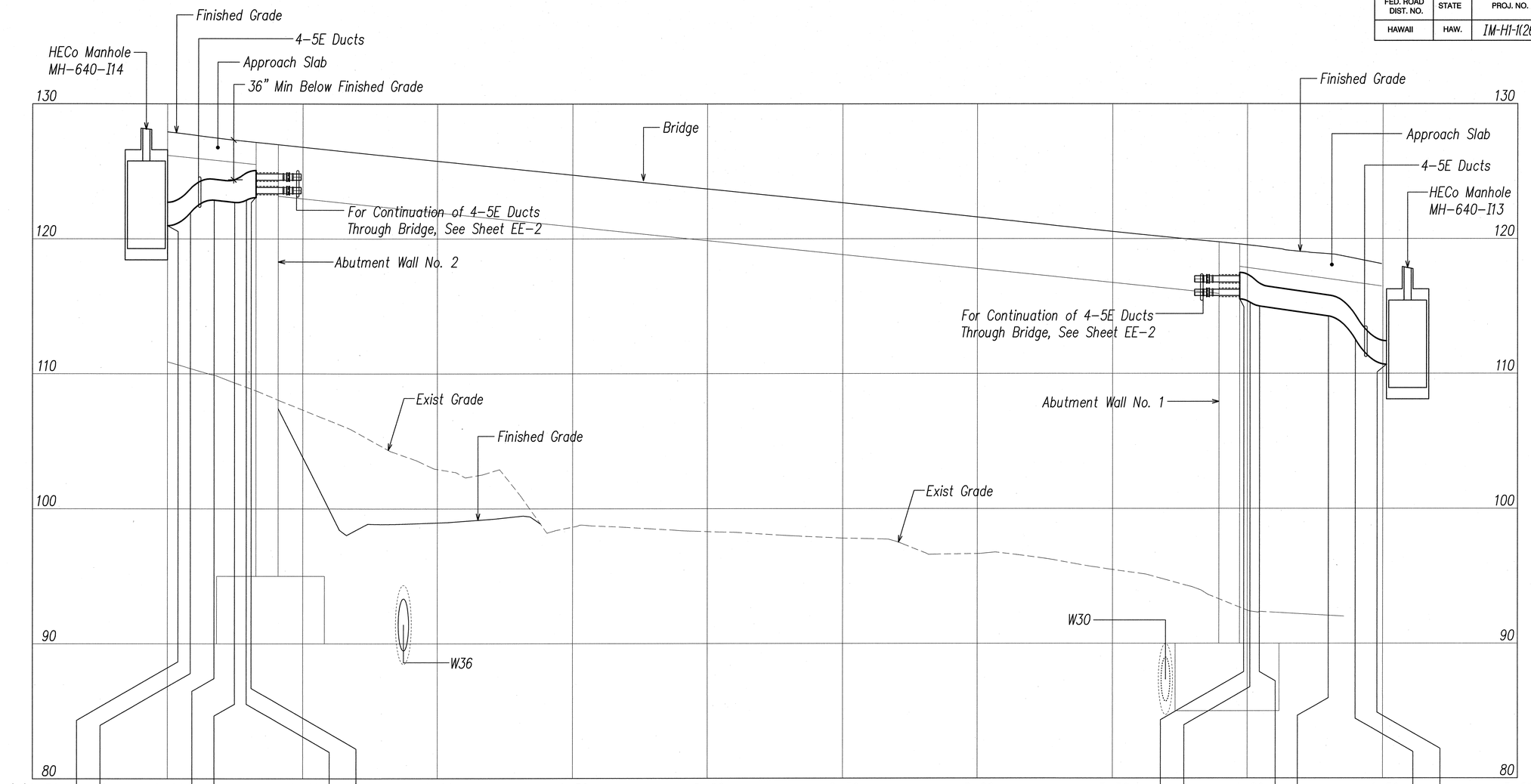
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-15 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:44:08 BY: AM PLOT SC 1=20.000000
115
FILE PATH: Z:\Acad\PROJECTS\29053\sp015_29053_PHASE_2_electric_ductline_profile_M_files.dwg CAD USER: cindy PLOT DATE: 2015.02.18

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	474	524



NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheets EG-6 and EG-7.

HECO DUCTLINE PROFILE 7

SCALES: Horiz: 1"=20'
Vert: 1"=4'

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

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No. 4340-E
HAWAII, U.S.A.
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 7

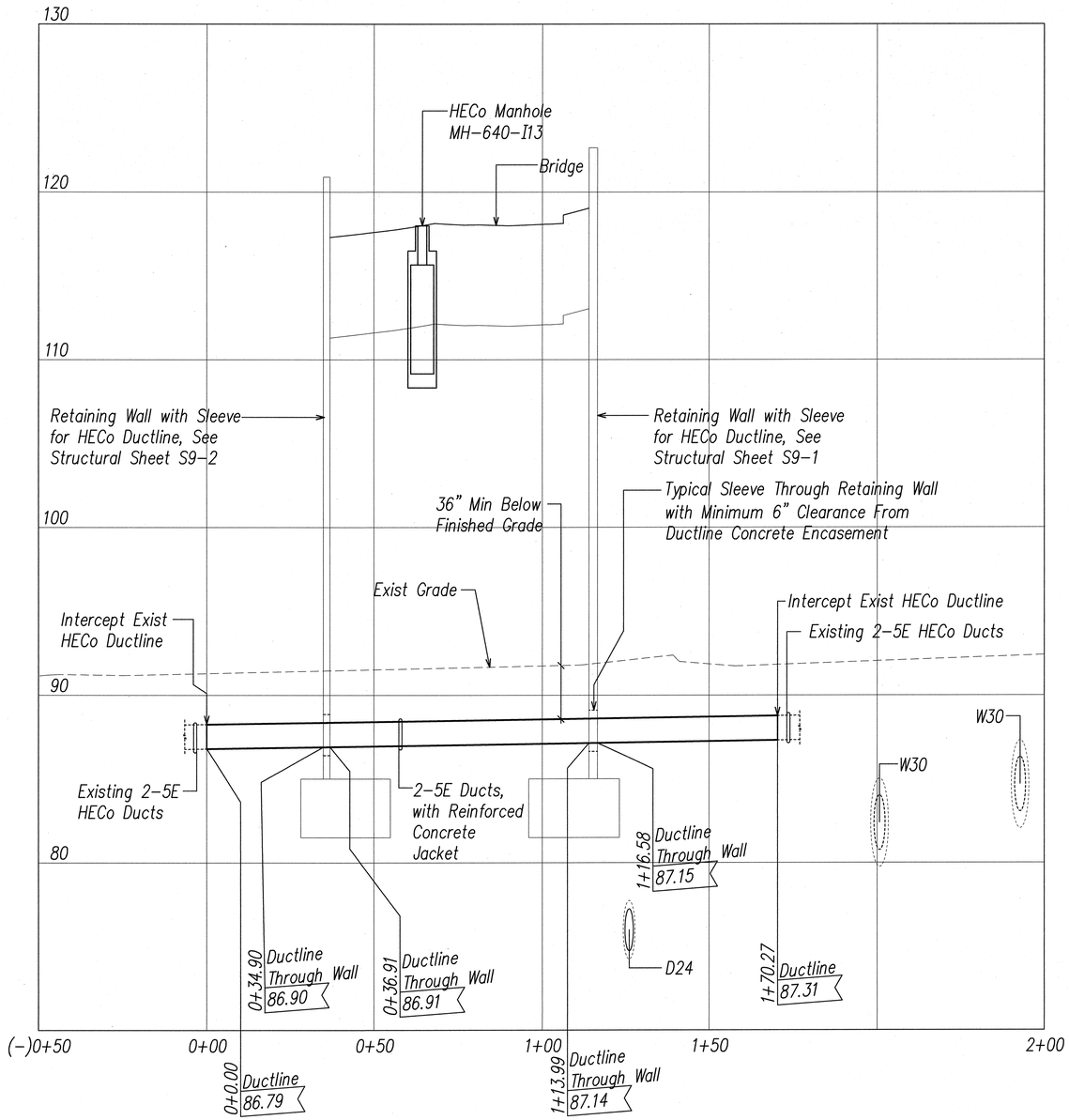
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-16 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:44:17 BY: AM PLOT SC 1=20.000000
116
FILE PATH: Z:\Acad\PROJECTS\29053\pg016_29053_PHASE_2_electric_ductline_profile_W_ties.dwg CAD USER: cindy PLOT DATE: 2015.02.18

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	475	524



HECO DUCTLINE PROFILE 8

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheet EG-8.

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 I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 8

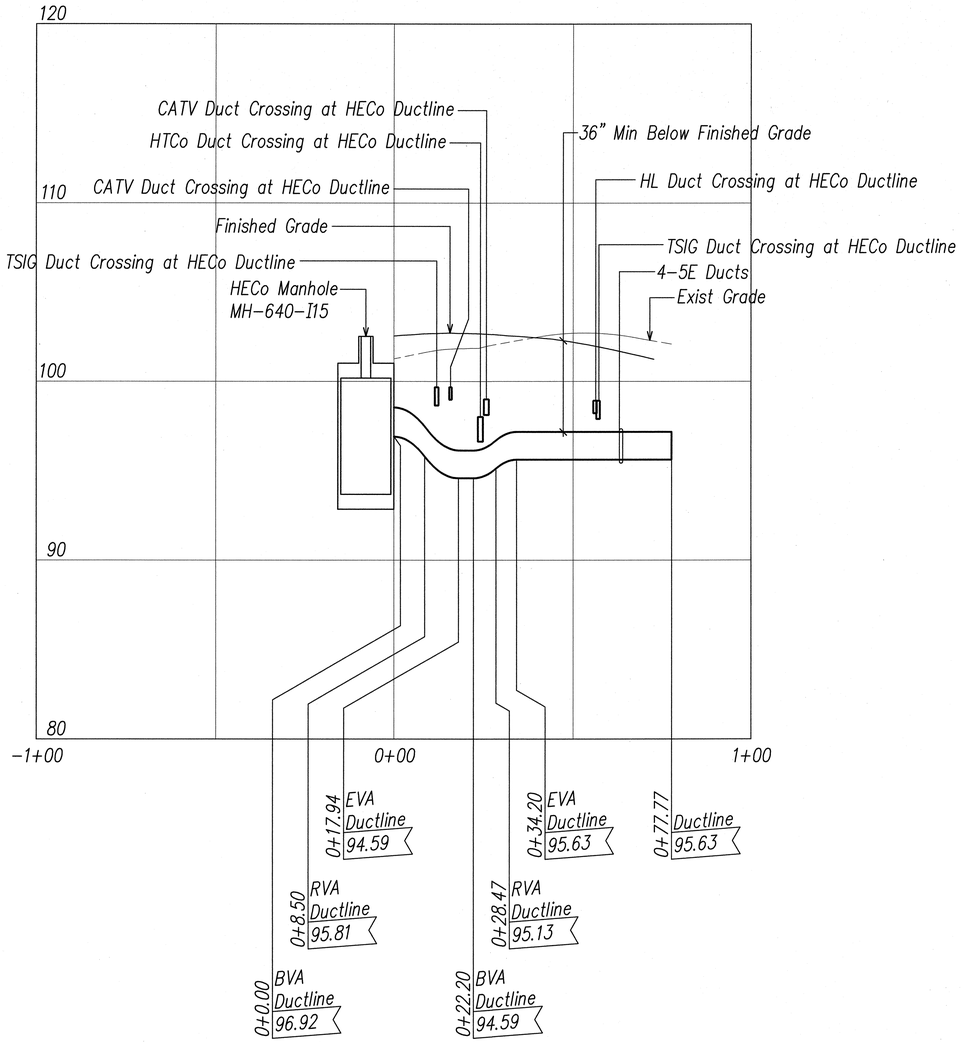
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-17 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:44:25 BY: AM PLOT SC 1=20.000000
117
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	476	524



NOTES:

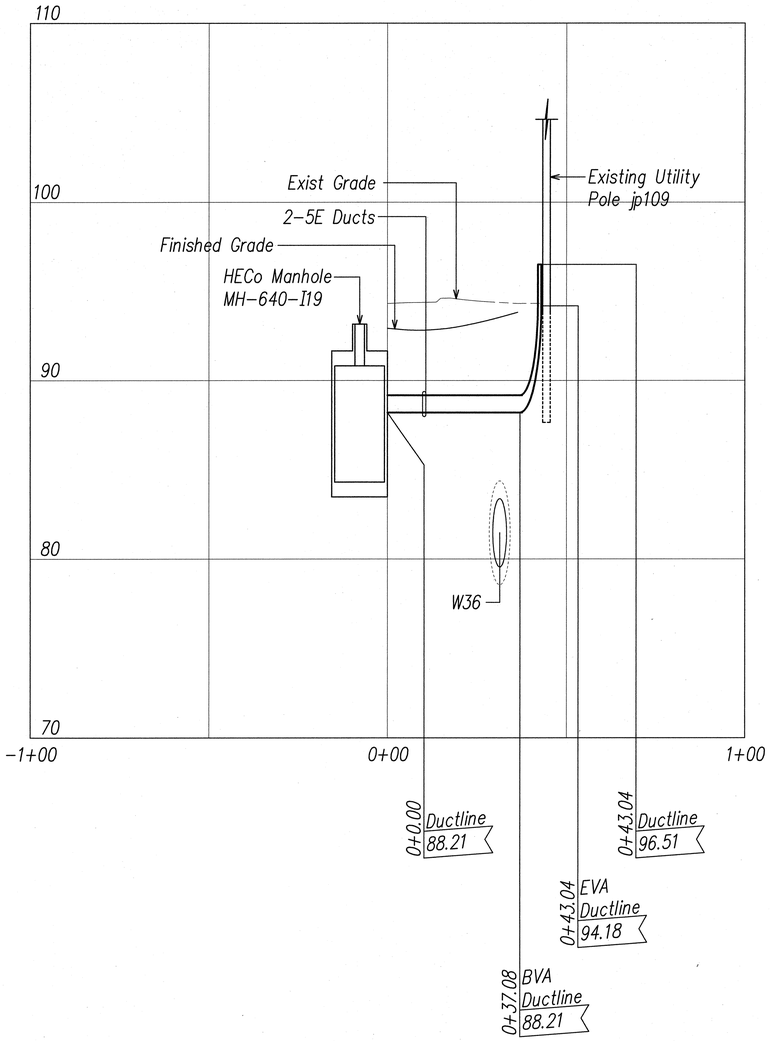
1. For Electric Ductline Horizontal Tie Downs, See Sheet EG-6.

HECO DUCTLINE PROFILE 9

SCALES: Horiz: 1"=20'
Vert: 1"=4'

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

20' 10' 0 20' 40' 60'
HORIZONTAL SCALE: 1"=20'
40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES



NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheet EG-2.

HECO DUCTLINE PROFILE 10

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

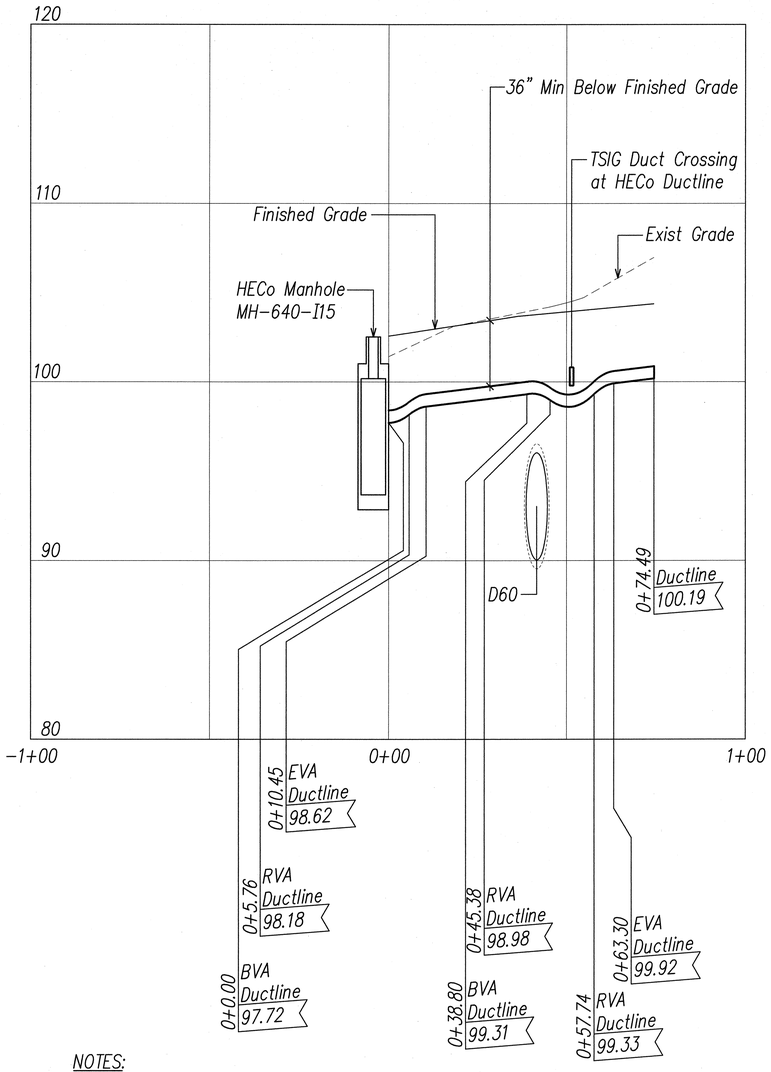
Ronald N. S. Ho & Associates, Inc.
Electrical Engineers
ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HECO DUCTLINE
PROFILES 9 AND 10
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EG-18 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:44:34 BY: AM PLOT SC 1=20.000000
118
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	477	524



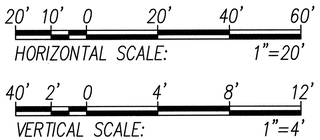
NOTES:

1. For Electric Ductline Horizontal Tie Downs, See Sheet EG-6.

HECO DUCTLINE PROFILE 11

SCALES: Horiz: 1"=20'
Vert: 1"=4'

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



GRAPHIC SCALES

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HECO DUCTLINE PROFILE 11

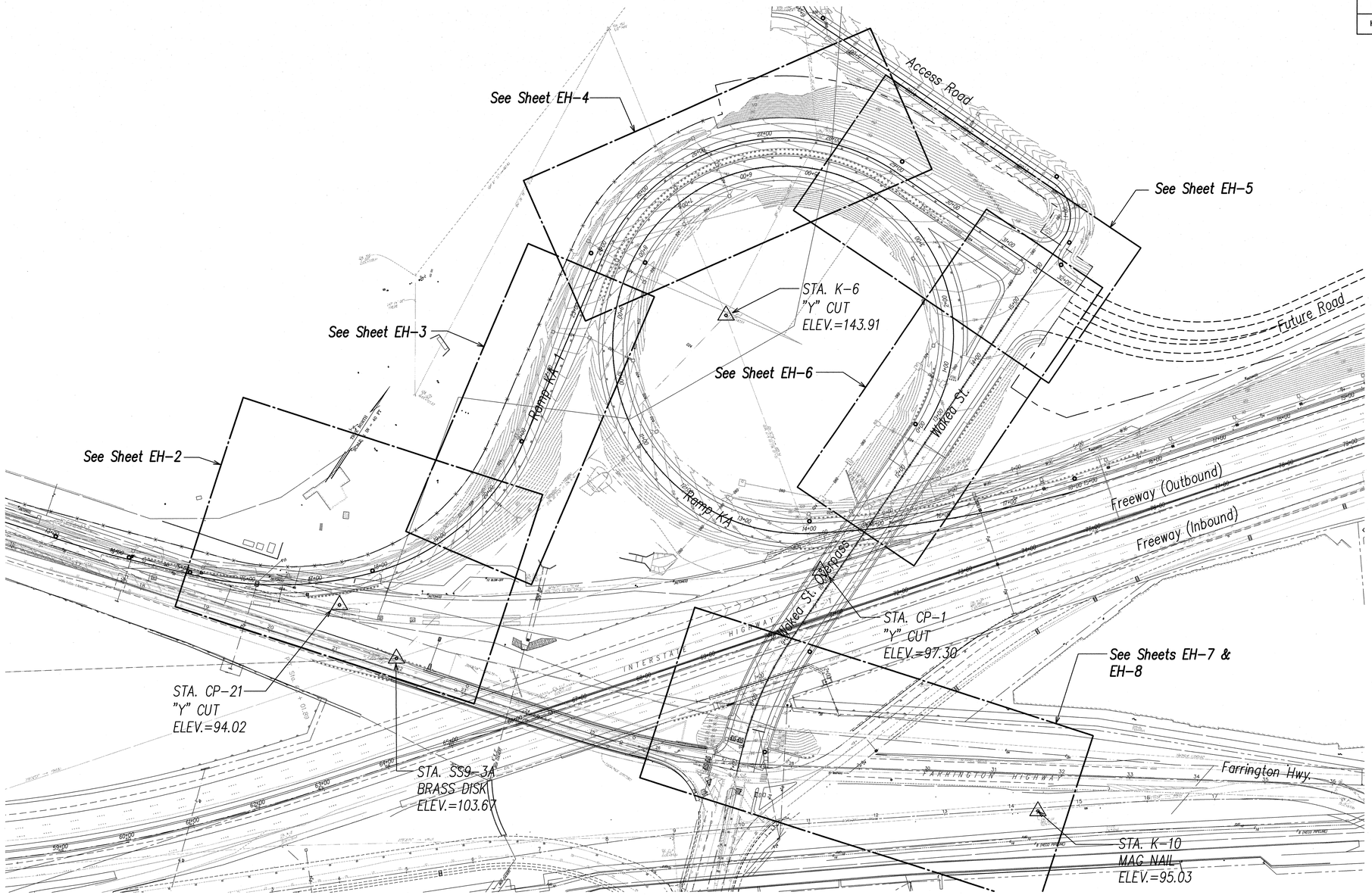
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EG-19 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:44:42 BY: AM PLOT SC 1=20.000000
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	478	524



OVERALL PLAN – HTCO DUCTLINE HORIZONTAL TIES

SCALE: 1"=80'

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

Ronald N. S. Ho & Associates, Inc.
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL PLAN - HTCO DUCTLINE HORIZONTAL TIES

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

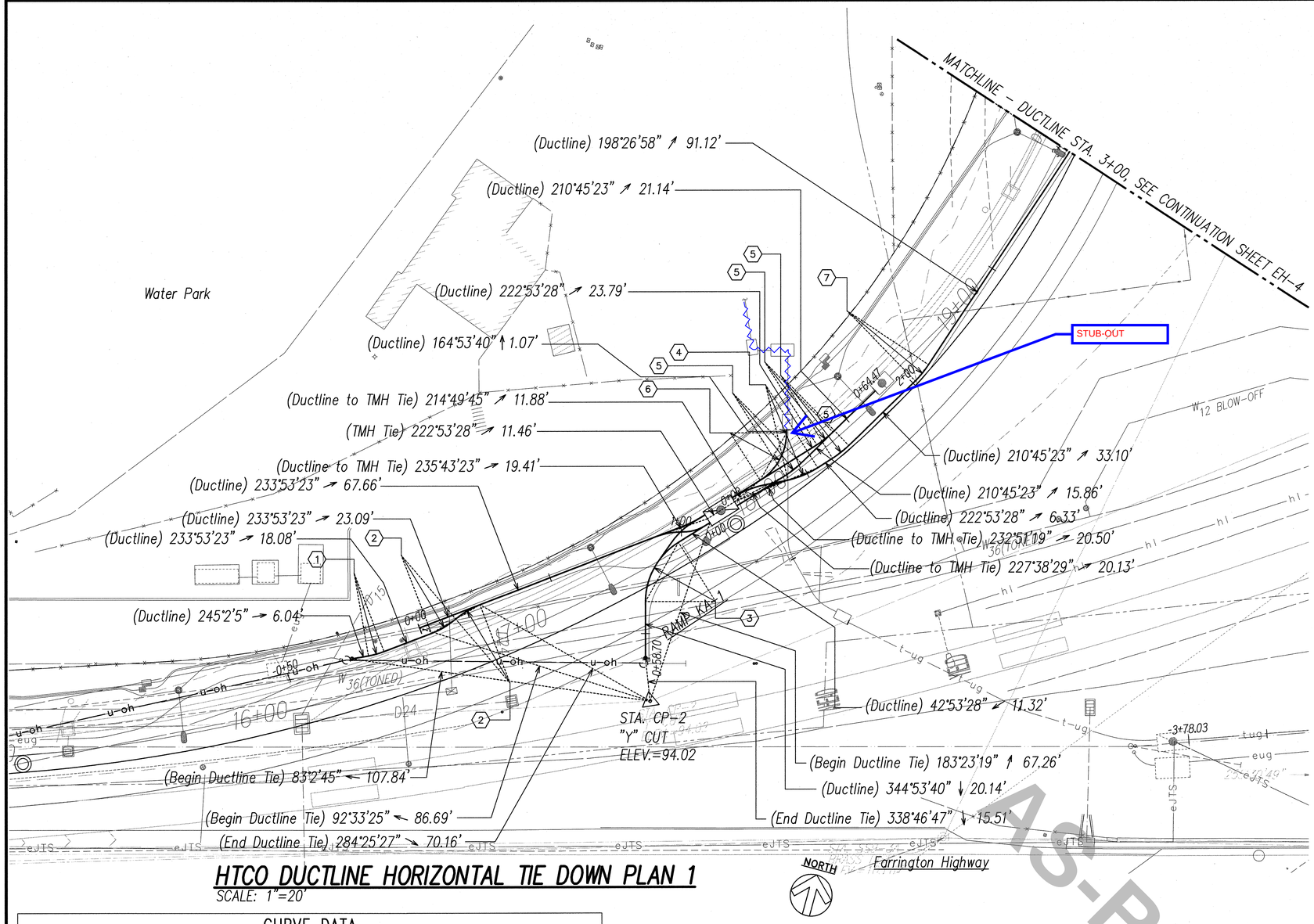
Scale: As Noted Date: January 20, 2015

SHEET No. EH-1 OF 161 SHEETS

478

LAST SAVE: 02/17/15 @ 10:44:51 BY: AM PLOT SC 1=80.000000
120
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	479	524



HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 1

SCALE: 1"=20'

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
⟨1⟩	11°8'42"	5°34'21.1"	30.00'	2.93'	5.83'	5.84'
⟨2⟩	19°15'12"	9°37'35.8"	30.00'	5.09'	10.03'	10.08'
⟨3⟩	57°59'48"	28°59'53.8"	25.00'	13.86'	24.24'	25.31'
⟨4⟩	18°51'57"	9°25'58.4"	35.00'	5.81'	11.47'	11.52'
⟨5⟩	12°8'5"	6°4'2.4"	35.00'	3.72'	7.40'	7.41'
⟨6⟩	57°59'48"	28°59'53.8"	20.00'	11.09'	19.39'	20.24'
⟨7⟩	12°18'25"	6°9'12.3"	35.00'	3.77'	7.50'	7.52'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

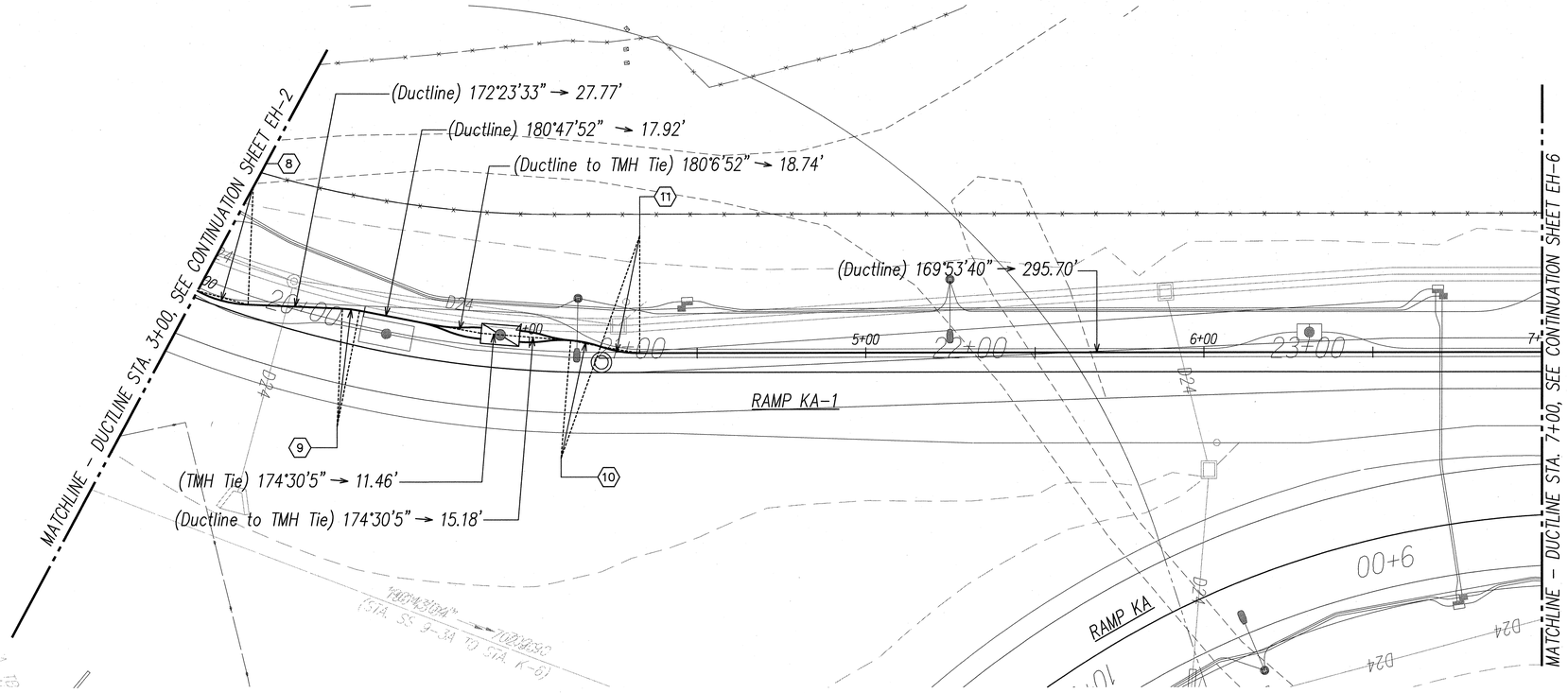
SHEET No. EH-2 OF 161 SHEETS

AS-BUILT

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121
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"AS-BUILT"

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	480	524



CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
⟨8⟩	26°3'25"	13°1'42.7"	35.00'	8.10'	15.78'	15.92'
⟨9⟩	8°24'19"	4°12'9.4"	35.00'	2.57'	5.13'	5.13'
⟨10⟩	14°40'58"	7°20'29.2"	35.00'	4.51'	8.94'	8.97'
⟨11⟩	19°17'23"	9°38'41.7"	35.00'	5.95'	11.73'	11.78'

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 2

SCALE: 1"=20'

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

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

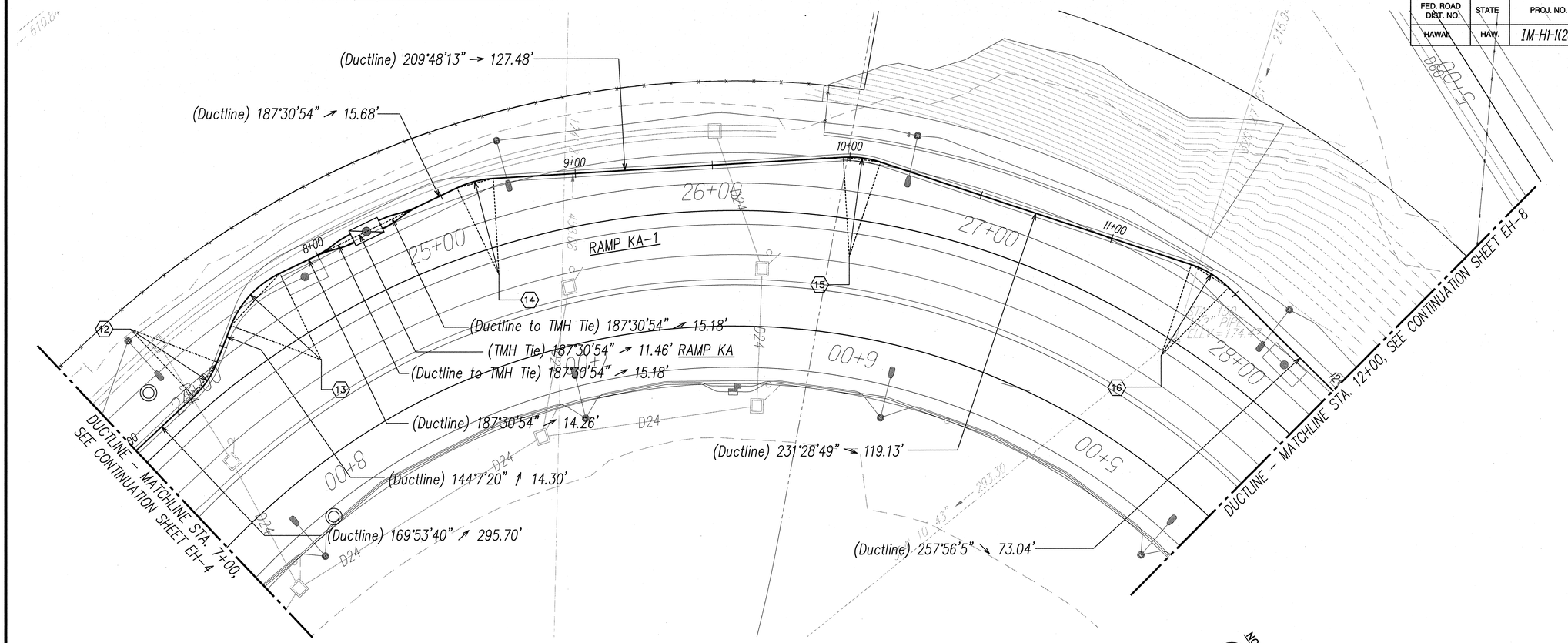
Scale: As Noted Date: January 20, 2015

SHEET No. EH-3 OF 161 SHEETS

480

LAST SAVE: 02/17/15 @ 10:45:18 BY: AM PLOT SC 1=20
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	481	524



CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
12	25°46'20"	12°53'10.2"	33.70'	7.71'	15.03'	15.16'
13	43°23'34"	21°41'46.9"	35.00'	13.93'	25.88'	26.51'
14	22°17'19"	11°8'39.5"	35.00'	6.89'	13.53'	13.62'
15	21°40'36"	10°50'18.1"	36.30'	6.95'	13.65'	13.73'
16	26°27'16"	13°13'37.8"	35.00'	8.23'	16.02'	16.16'

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 3

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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

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Andrew I. Miyasato 2015.02.18
Signature

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 3

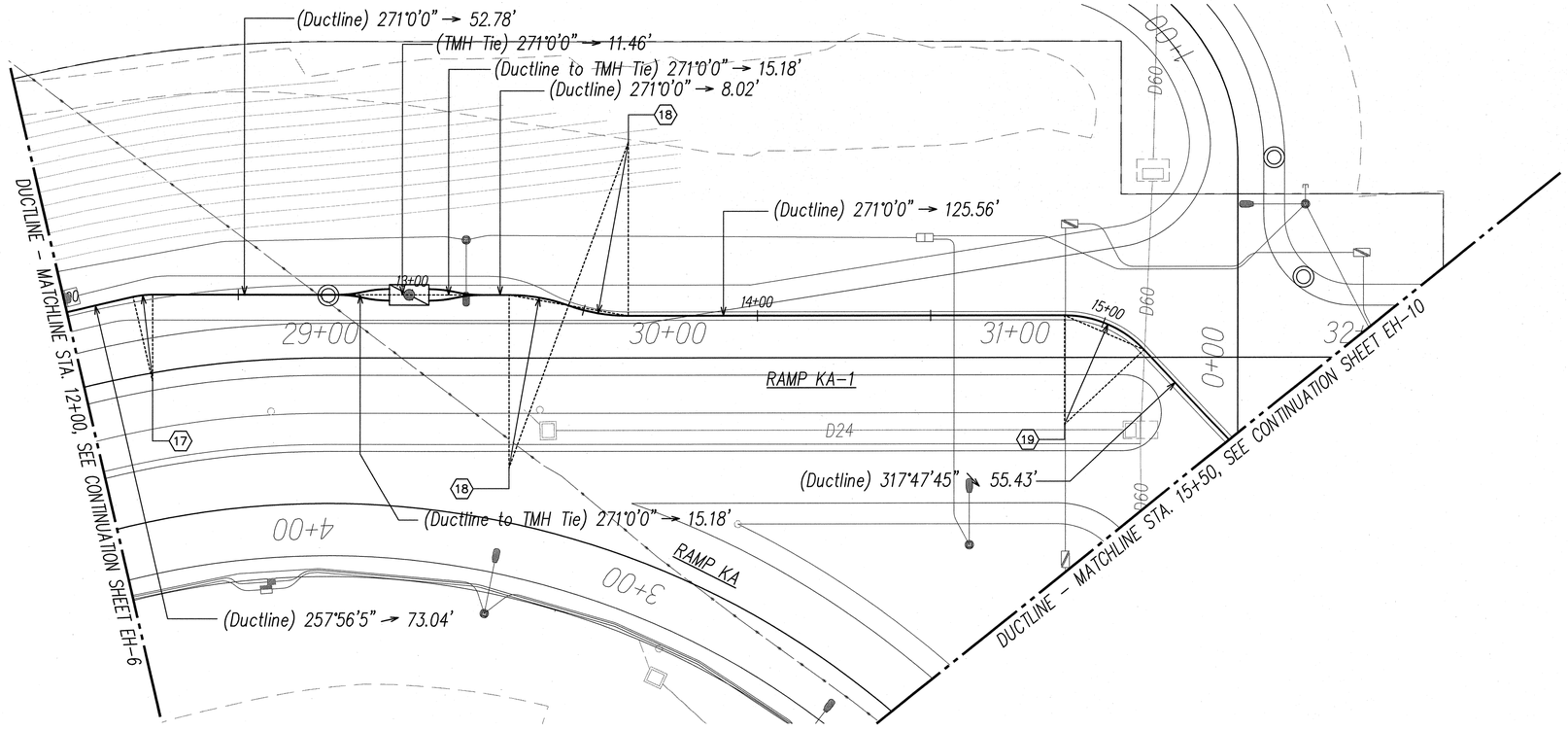
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-4 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:45:32 BY: AM PLOT SC 1=20
123
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	462	524



CURVE DATA						
ID	Δ	Δ/ 2	RADIUS	T	C	Lc
17	13°3'55"	6°31'57.7"	25.00'	2.86'	5.69'	5.70'
18	20°1'8"	10°0'34.1"	50.00'	8.82'	17.38'	17.47'
19	46°47'45"	23°23'52.5"	31.55'	13.65'	25.06'	25.77'

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 4

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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Signature 2015.02.16

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

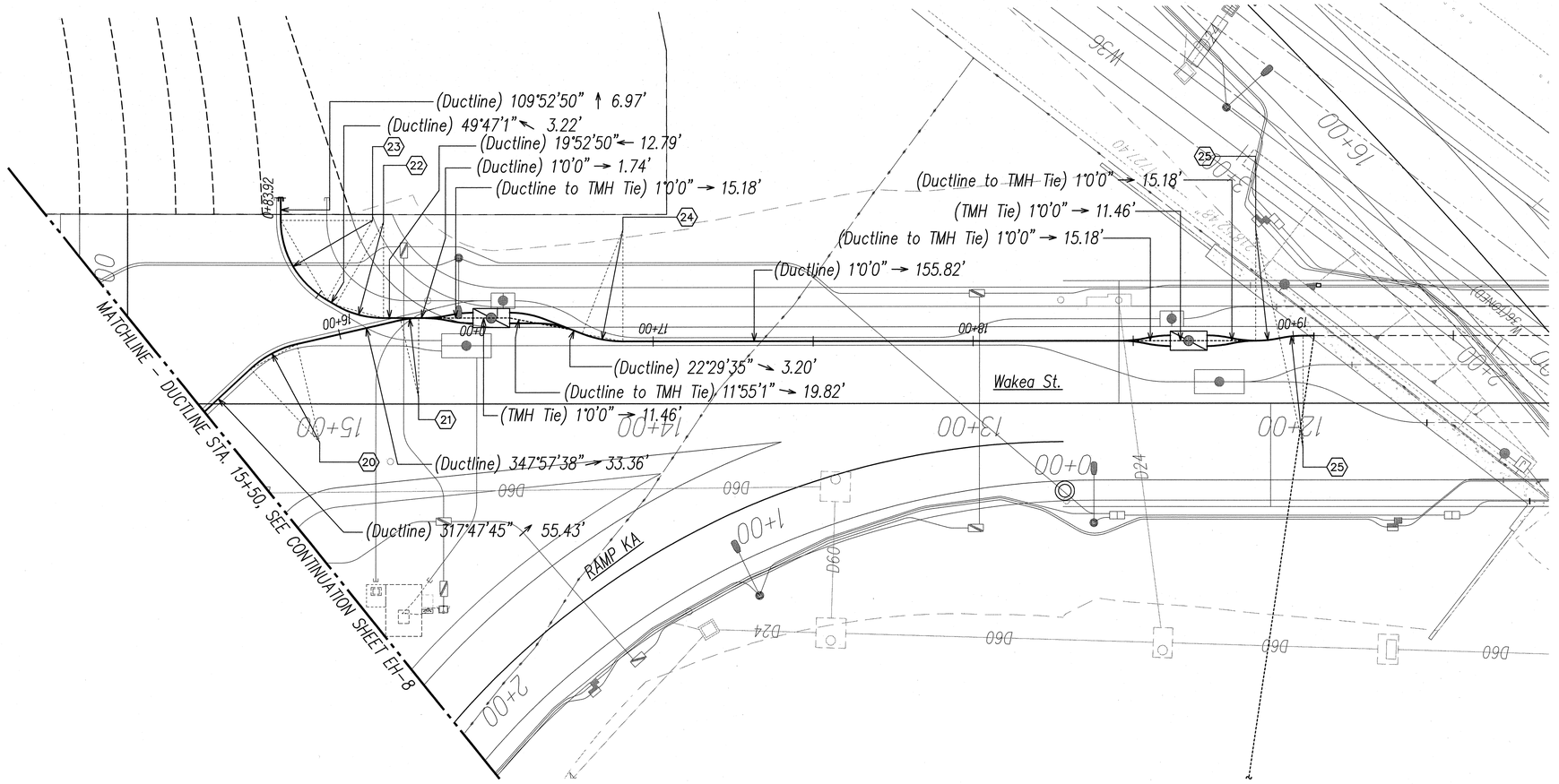
Scale: As Noted Date: January 20, 2015

SHEET No. EH-5 OF 161 SHEETS

482

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	483	524



CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
⟨20⟩	30°9'53"	15°4'56.4"	31.55'	8.50'	16.42'	16.61'
⟨21⟩	13°2'23"	6°31'11.5"	25.00'	2.86'	5.68'	5.69'
⟨22⟩	29°54'12"	14°57'6.1"	30.00'	8.01'	15.48'	15.66'
⟨23⟩	60°5'48"	30°2'54.2"	28.70'	16.60'	28.74'	30.10'
⟨24⟩	21°29'35"	10°44'47.4"	35.00'	6.64'	13.05'	13.13'
⟨25⟩	12°10'28"	6°5'14.0"	35.00'	3.73'	7.42'	7.44'

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 5

SCALE: 1"=20'

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.

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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 5

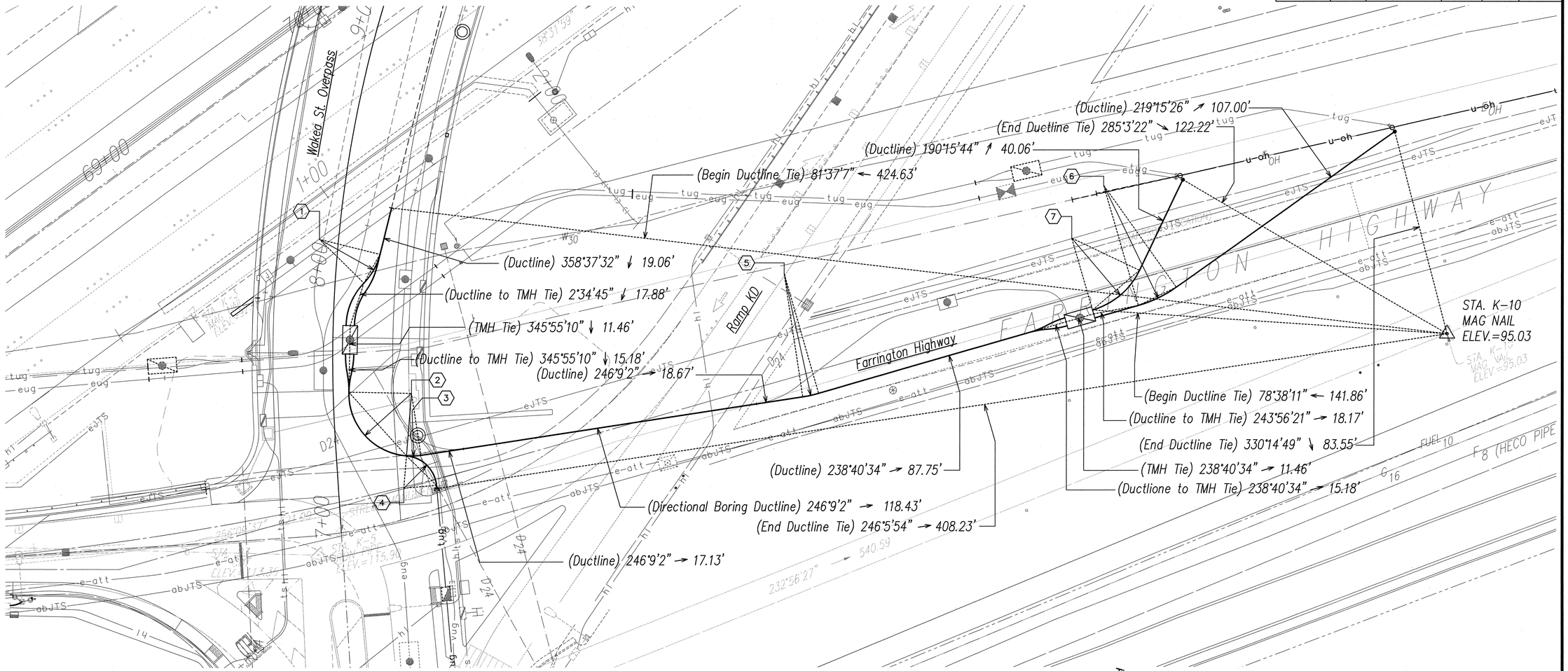
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-6 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:40:58 BY: AM PLOT SC 1=20
125
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	484	524



CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	30°33'12"	15°16'35.8"	25.00'	6.83'	13.17'	13.33'
2	86°34'0"	43°17'0.2"	25.00'	23.55'	34.28'	37.77'
3	13°12'8"	6°36'3.8"	25.00'	2.89'	5.75'	5.76'
4	80°18'44"	40°9'21.8"	13.00'	10.97'	16.77'	18.22'
5	7°28'28"	3°44'13.9"	50.00'	3.27'	6.52'	6.52'
6	19°25'8"	9°42'34.0"	50.00'	8.56'	16.87'	16.95'
7	48°24'49"	24°12'24.4"	30.00'	13.49'	24.60'	25.35'

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 6

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 6

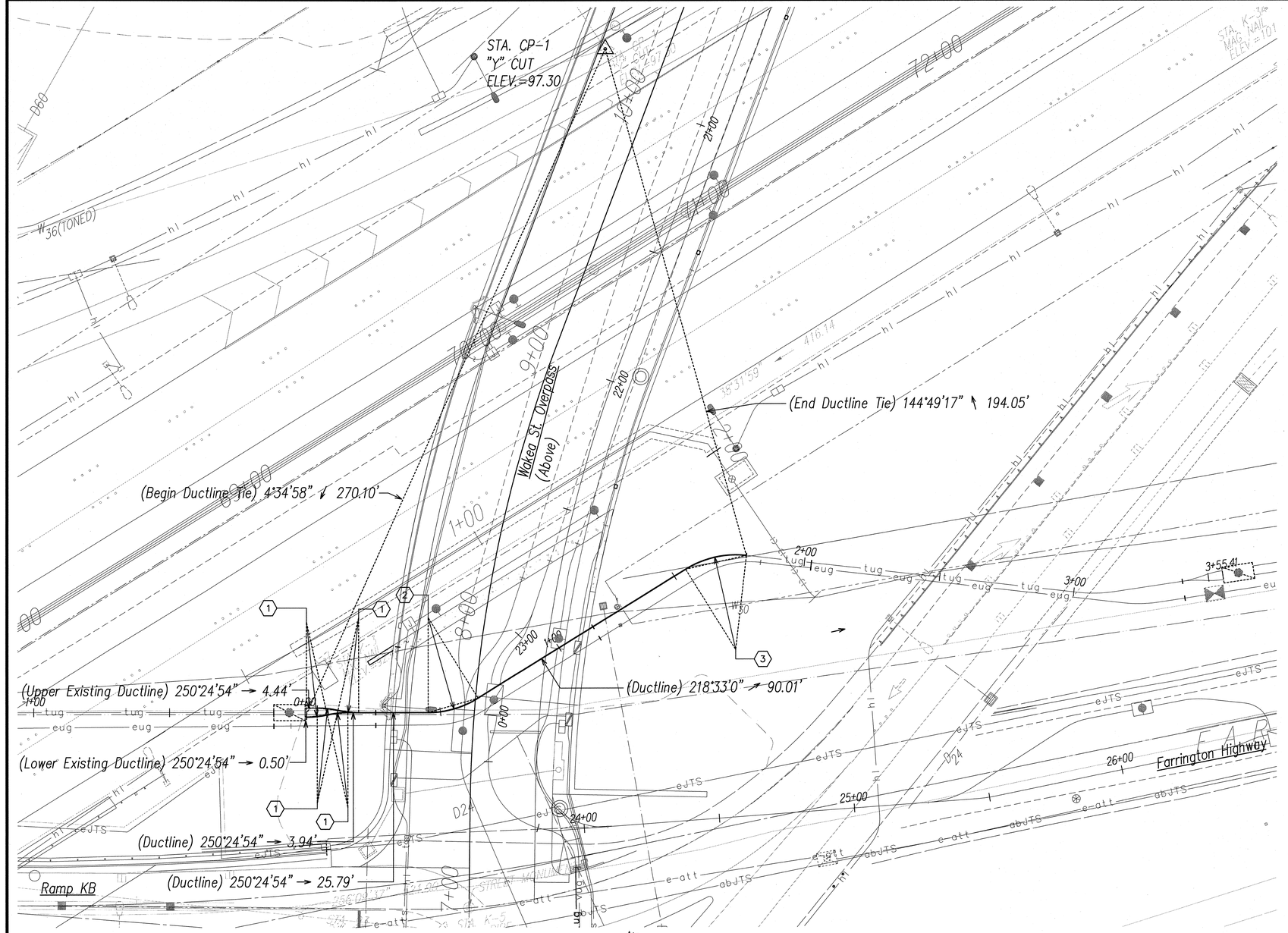
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-7 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:46:12 BY: AM PLOT SC 1=20
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	485	524



HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 7

SCALE: 1"=20'

CURVE DATA

ID	Δ	Δ / 2	RADIUS	T	C	Lc
1	12°31'40"	6°15'50.2"	35.00'	3.84'	7.64'	7.65'
2	31°51'54"	15°55'57.1"	35.00'	9.99'	19.22'	19.47'
3	38°18'50"	19°9'25.0"	35.00'	12.16'	22.97'	23.40'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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.

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Andrew Miyasato
Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE HORIZONTAL TIE DOWN PLAN 7

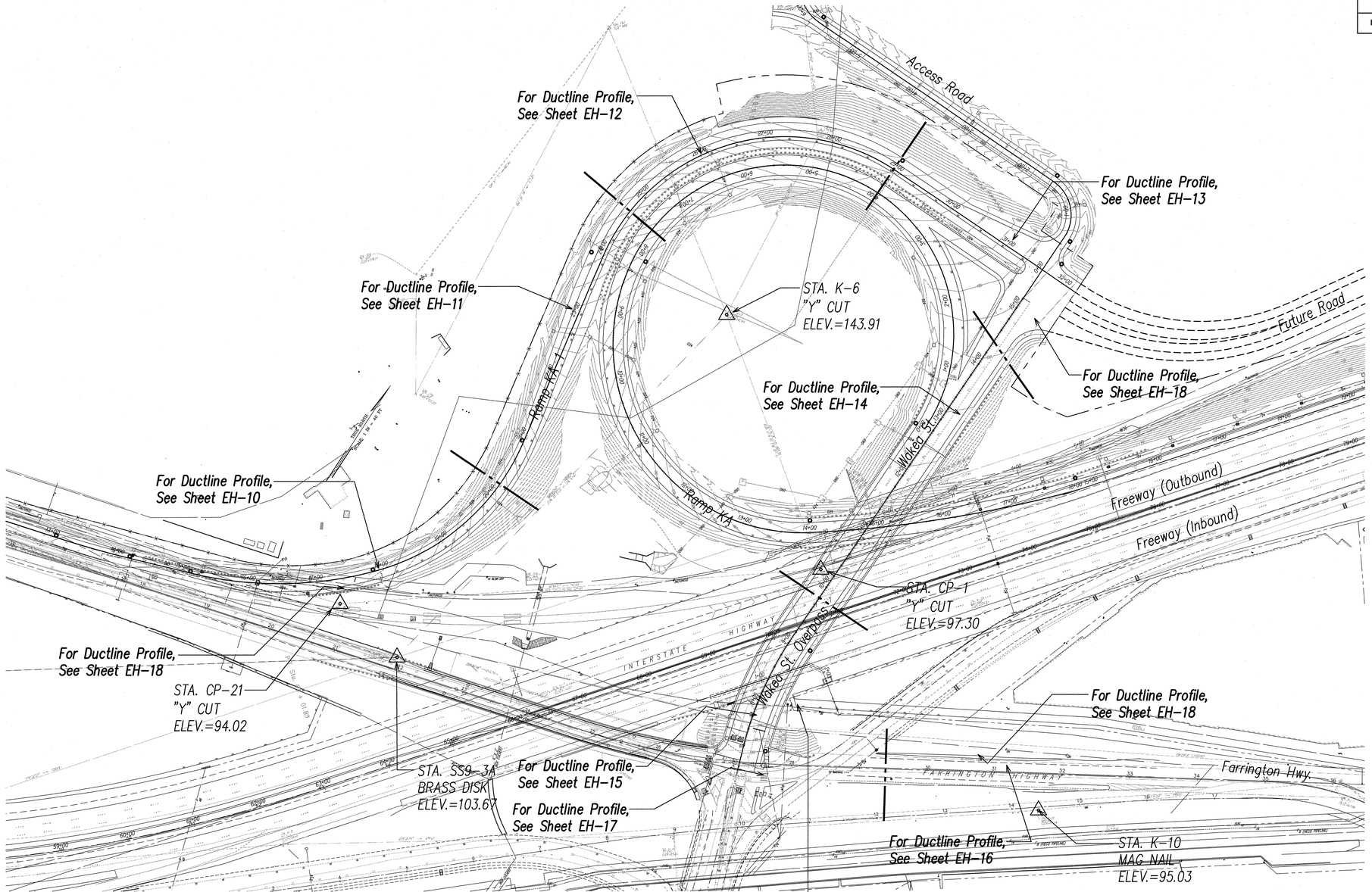
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-8 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	486	524



OVERALL PLAN – HTCO DUCTLINE PROFILES

SCALE: 1"=80'

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

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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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL PLAN - HTCO DUCTLINE PROFILES

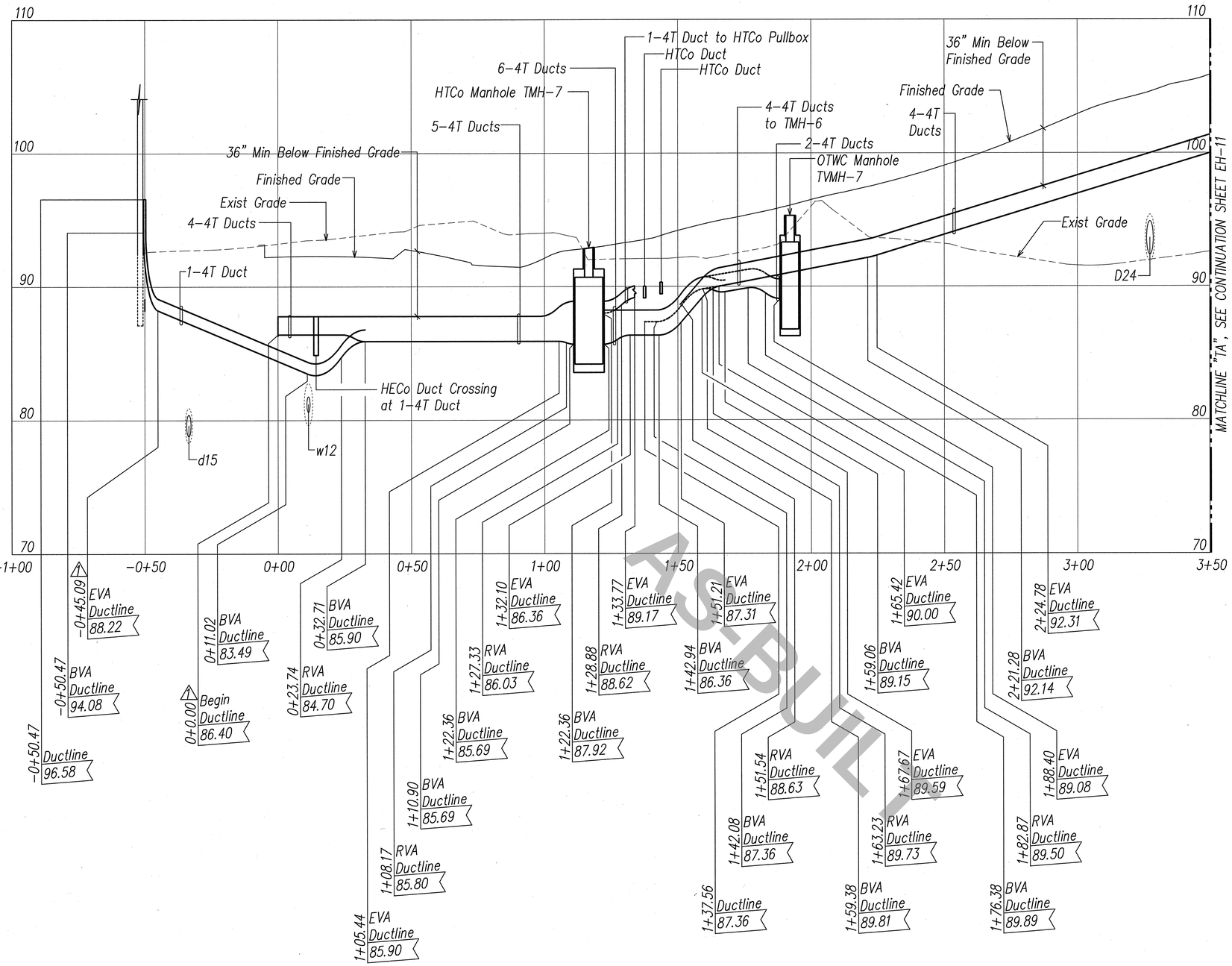
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-9 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	C.O. 487	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

RFI 70

DATE	REVISION
9/20/2016	⚠1 Revised Profile Station Numbers and Elevations

Ronald N. S. Ho & Associates, Inc. Consulting Engineers
ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
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Signature 2016.09.20
License Exp. Date: 04.30.2018

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-10 OF 161 SHEETS

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

HTCO DUCTLINE PROFILE 1
SCALES: Horiz: 1"=20'
Vert: 1"=4'

AS-BUILT

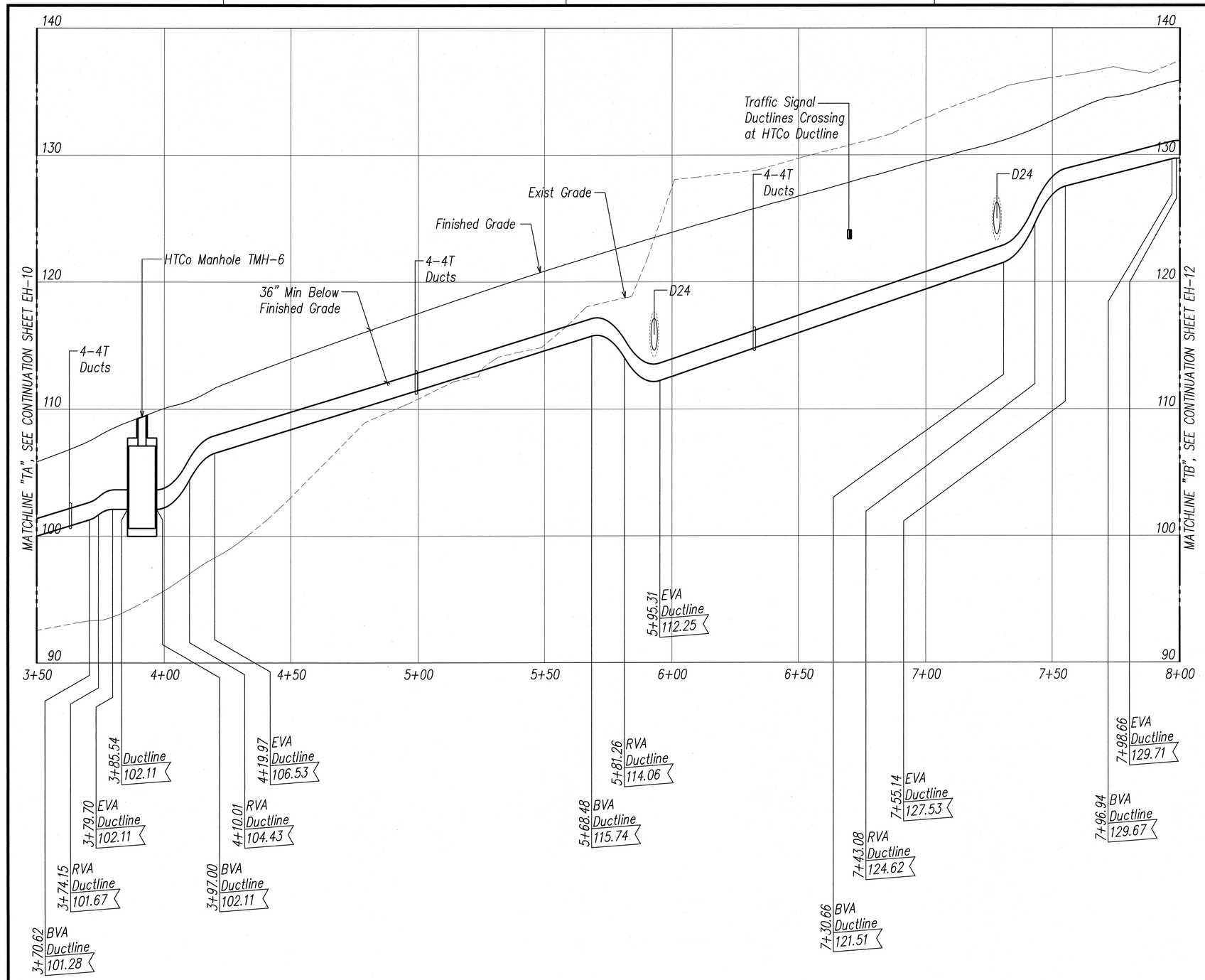
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C.O. 487

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	488	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



HTCO DUCTLINE PROFILE 2

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

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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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

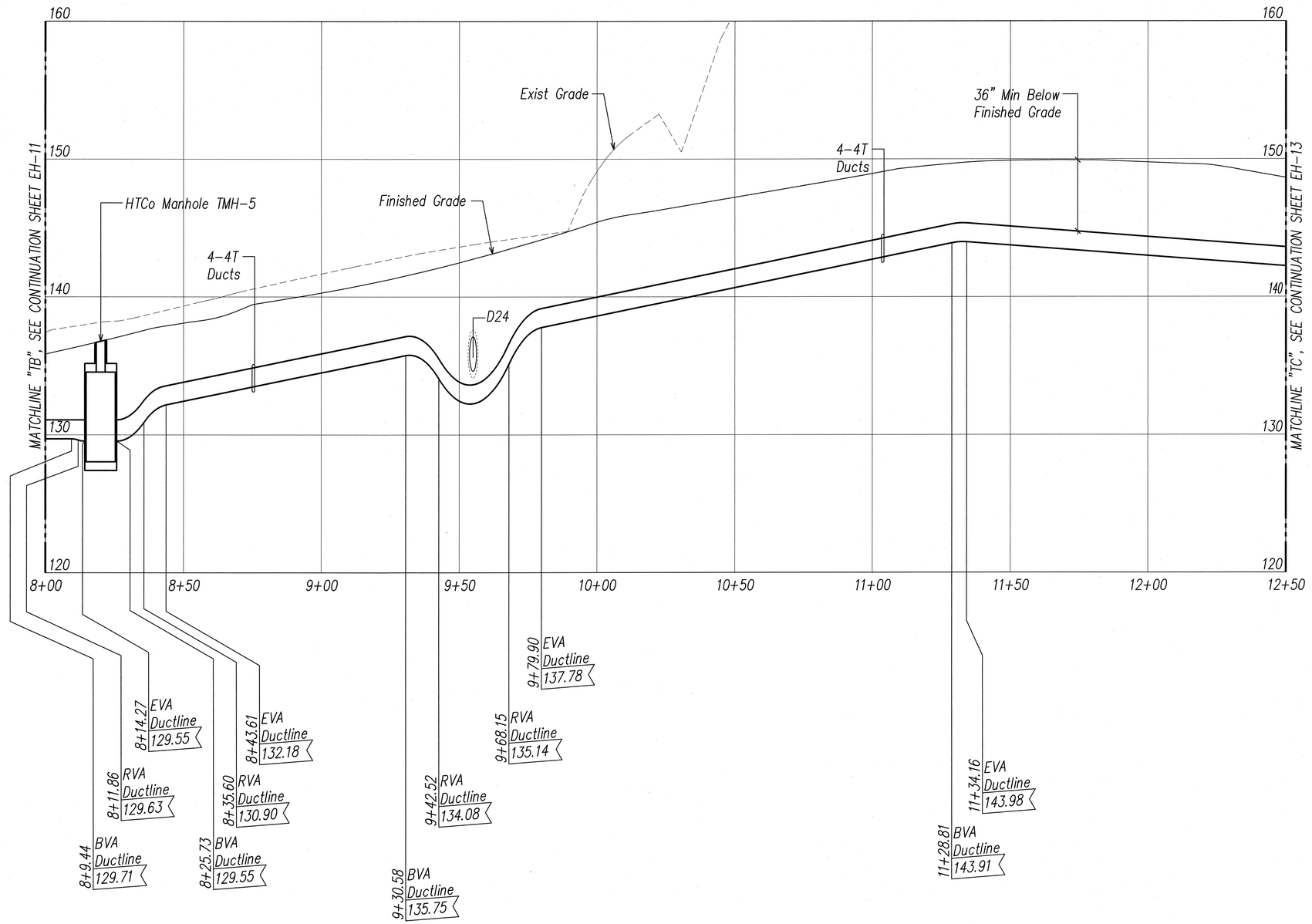
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	489	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

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

HTCO DUCTLINE PROFILE 3

SCALES: Horiz: 1"=20'
Vert: 1"=4'

Ronald N. S. Ho & Associates, Inc.
Doctrical Engineers

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

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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

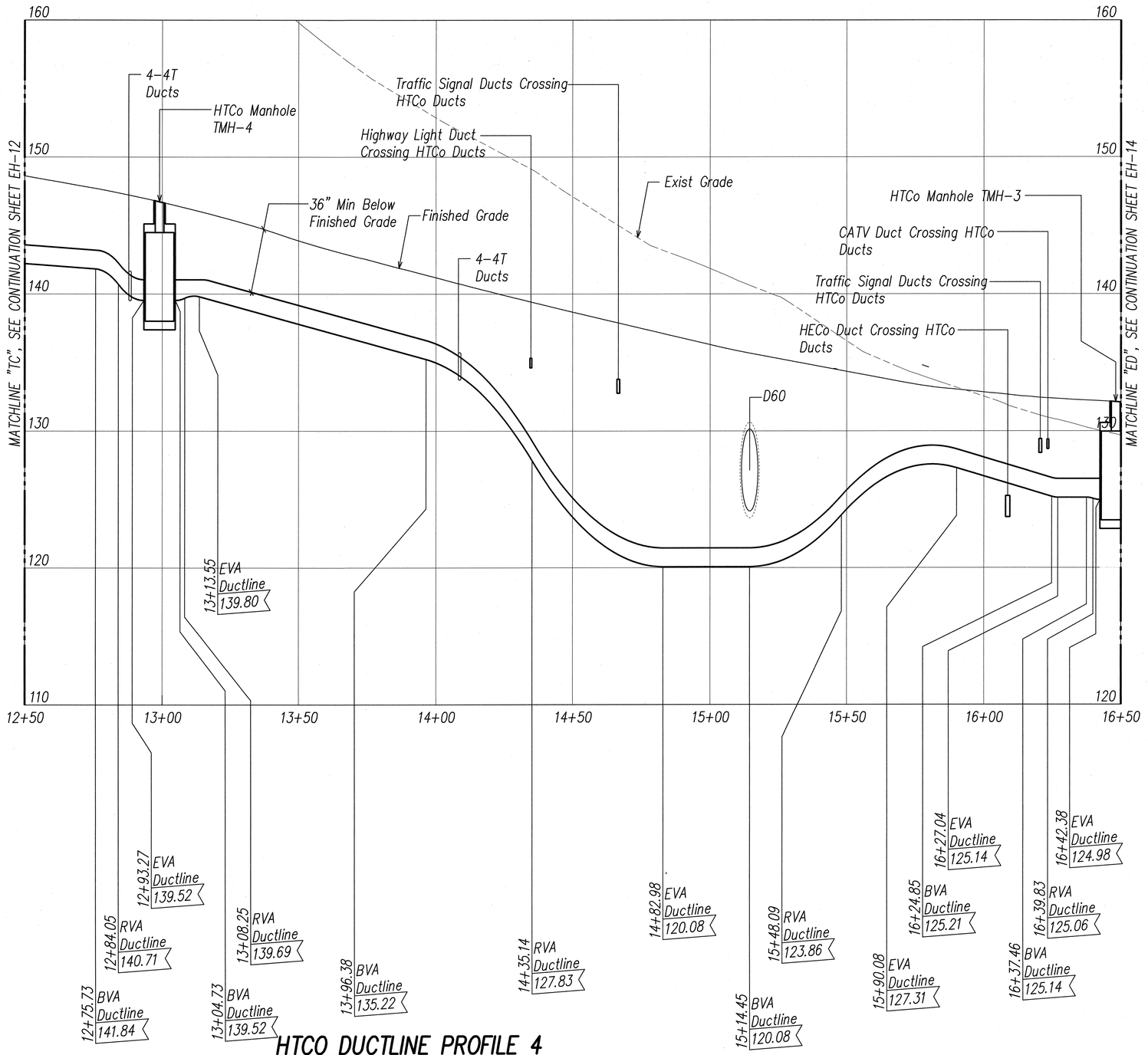
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	490	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



HTCO DUCTLINE PROFILE 4

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

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Electrical Engineers
ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
HAWAII, U.S.A.
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

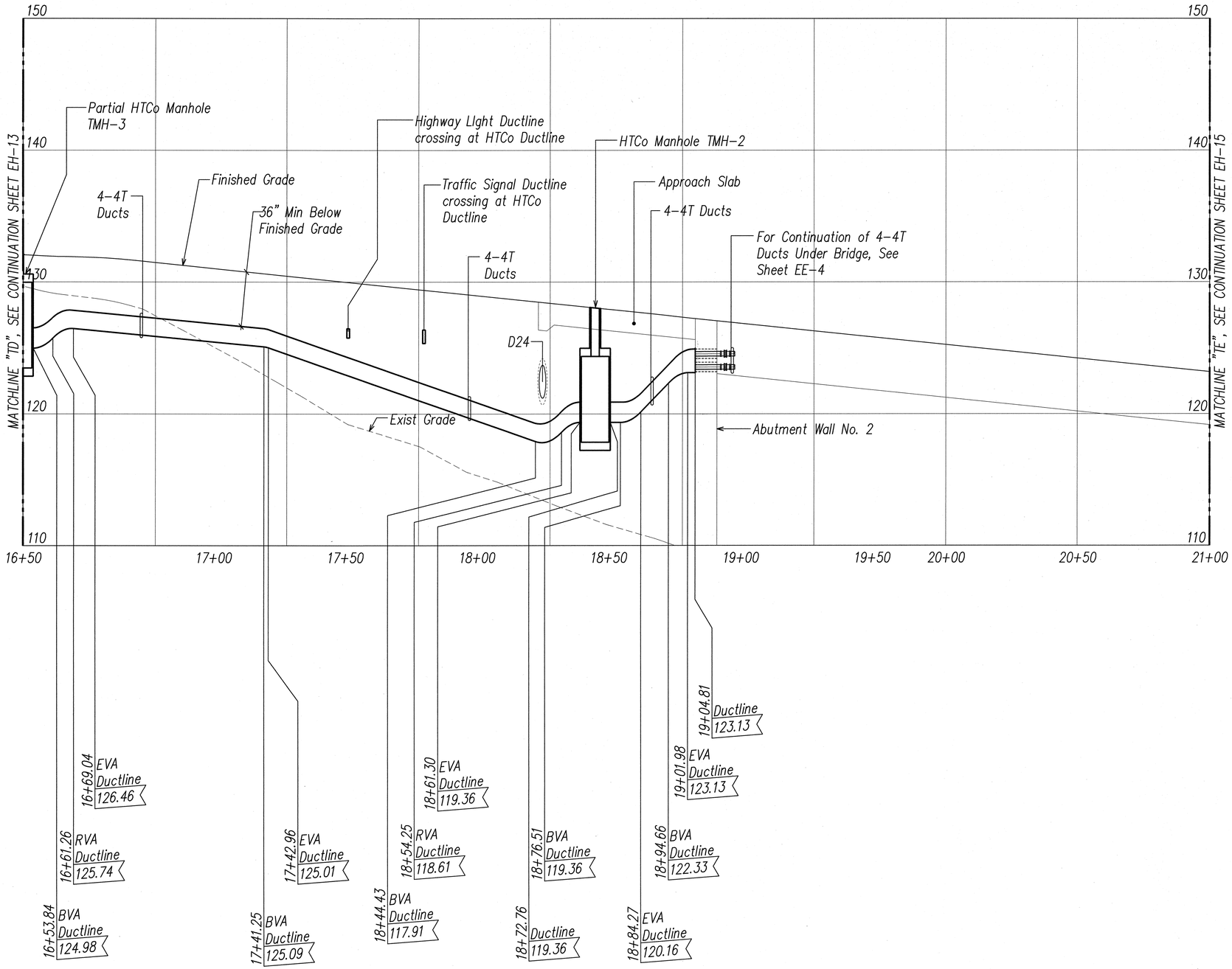
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SHEET No. EH-13 OF 161 SHEETS

490

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	491	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

HTCO DUCTLINE PROFILE 5

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

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Electrical Engineers

ANDREW I. MIYASATO
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No. 4340-E
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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 5

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

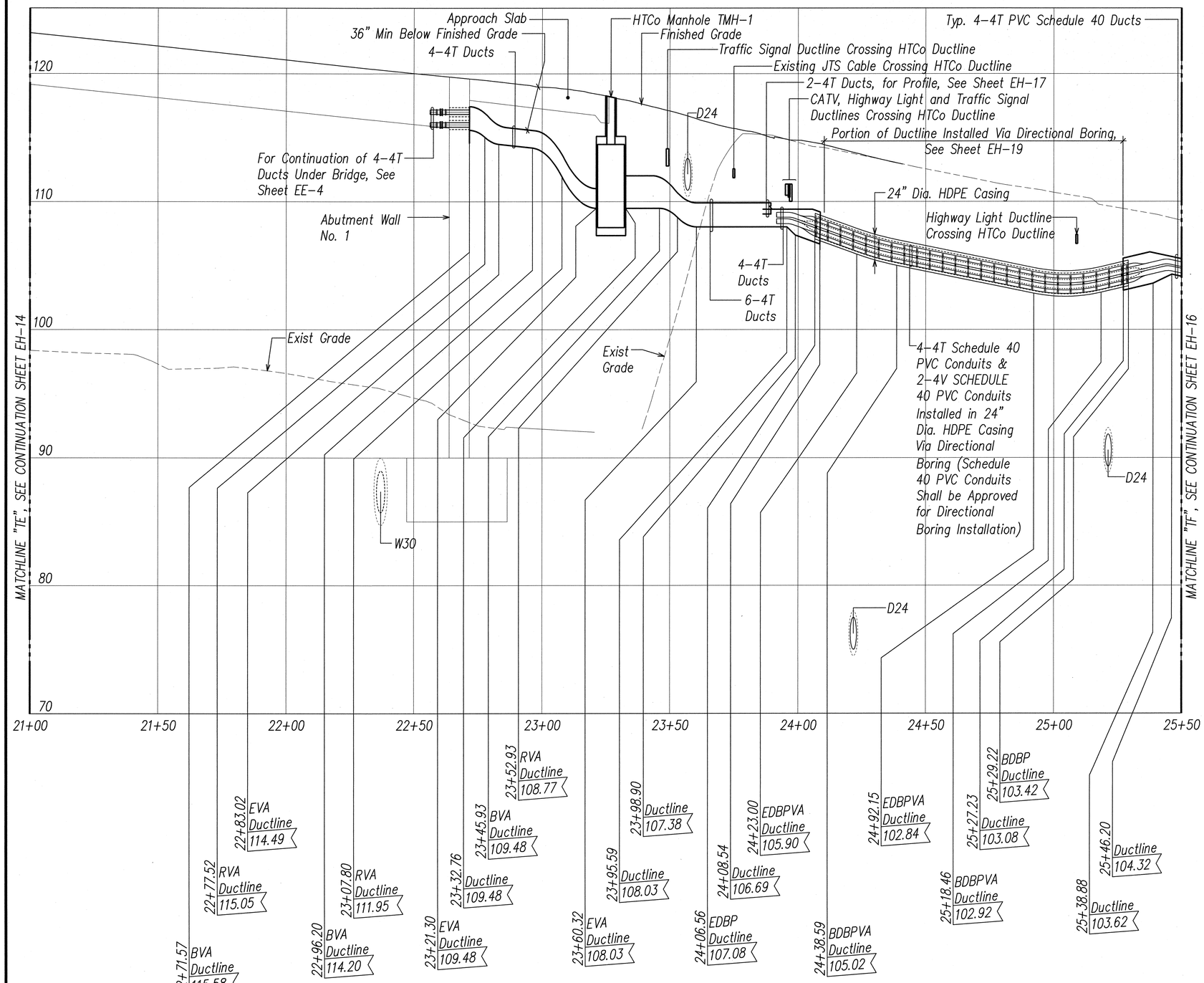
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	492	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC
BDBPVA	BEGIN DIRECTIONAL BORE HDPE PIPE VERTICAL ARC
EDBPVA	END DIRECTIONAL BORE HDPE PIPE VERTICAL ARC
BDBP	BEGIN DIRECTIONAL BORE HDPE PIPE
EDBP	END DIRECTIONAL BORE HDPE PIPE



HTCO DUCTLINE PROFILE 6

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

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ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
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Signature 02.02.16
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 6

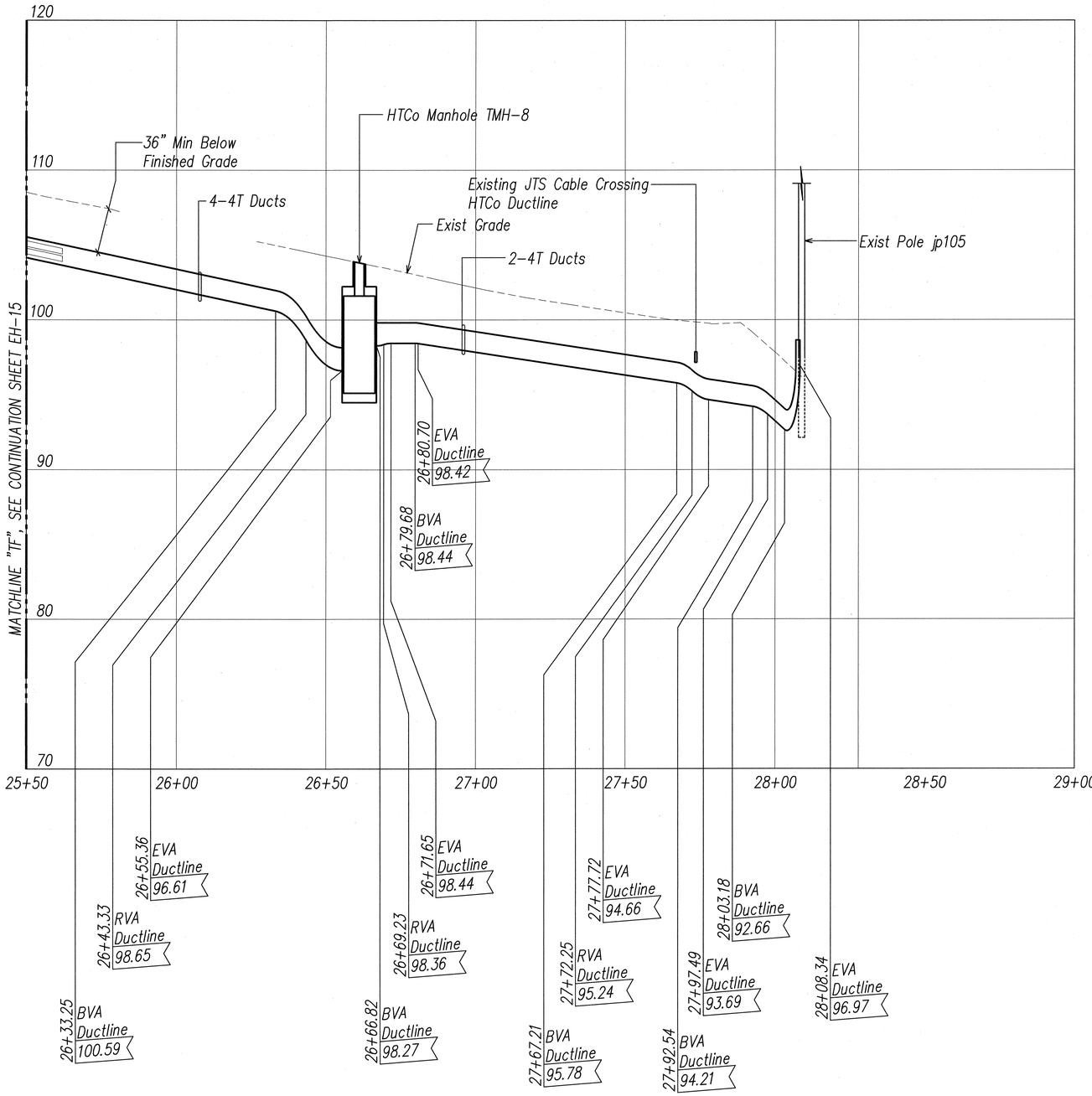
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-15 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:47:17 BY: AM PLOT SC 1=20.000000
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	493	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

HTCO DUCTLINE PROFILE 7

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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 I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILE 7

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

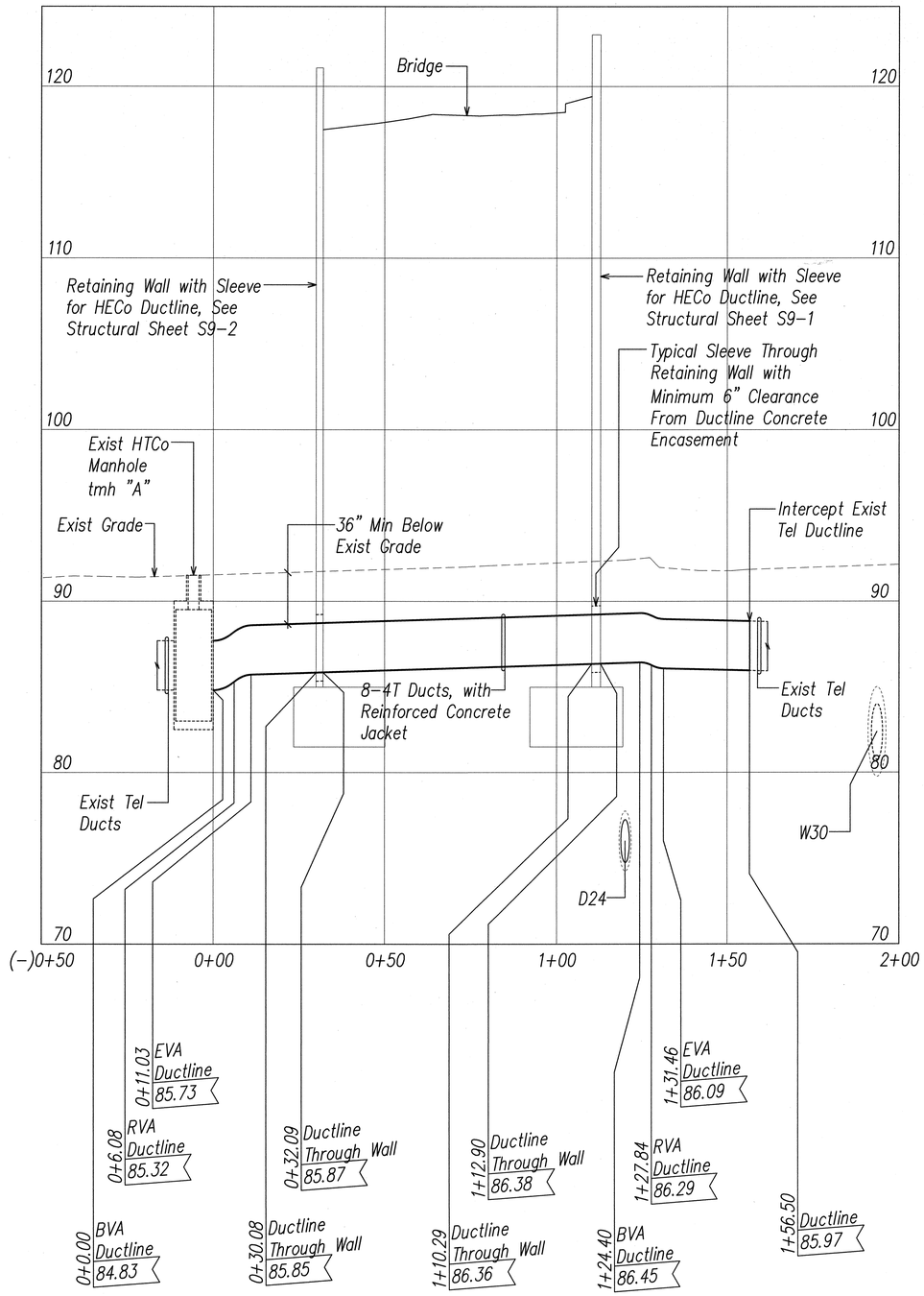
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SHEET No. EH-16 OF 161 SHEETS

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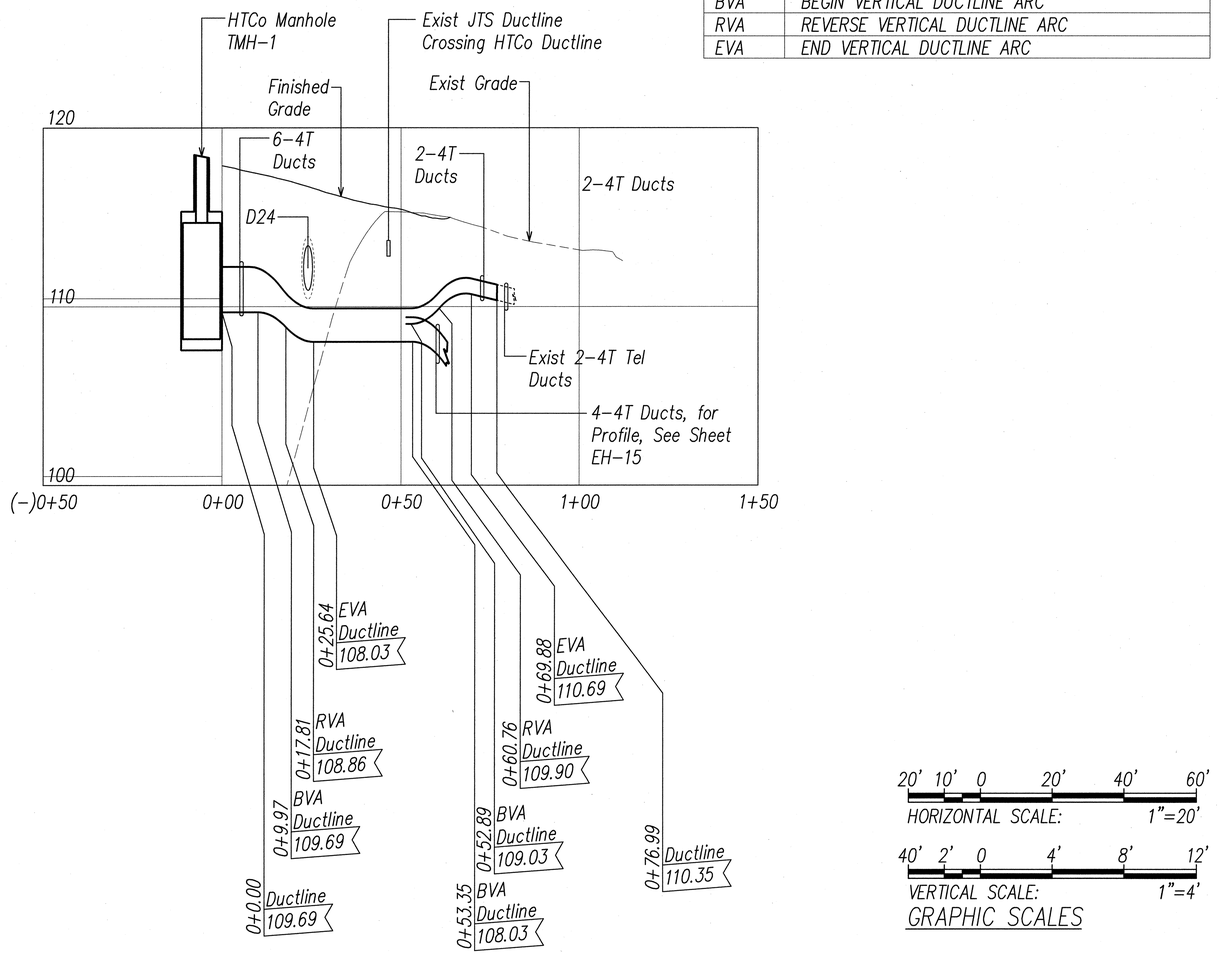
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	494	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



HTCO DUCTLINE PROFILE 8

SCALES: Horiz: 1"=20'
Vert: 1"=4'



HTCO DUCTLINE PROFILE 9

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

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

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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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILES 8 AND 9

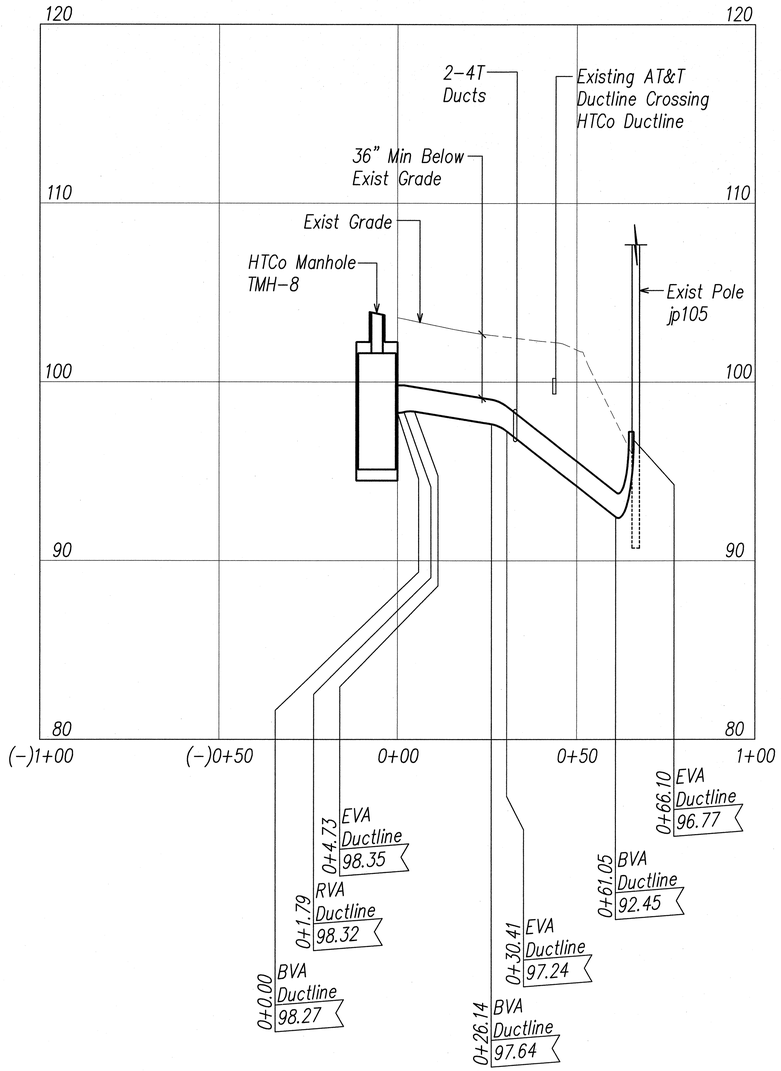
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-17 OF 161 SHEETS

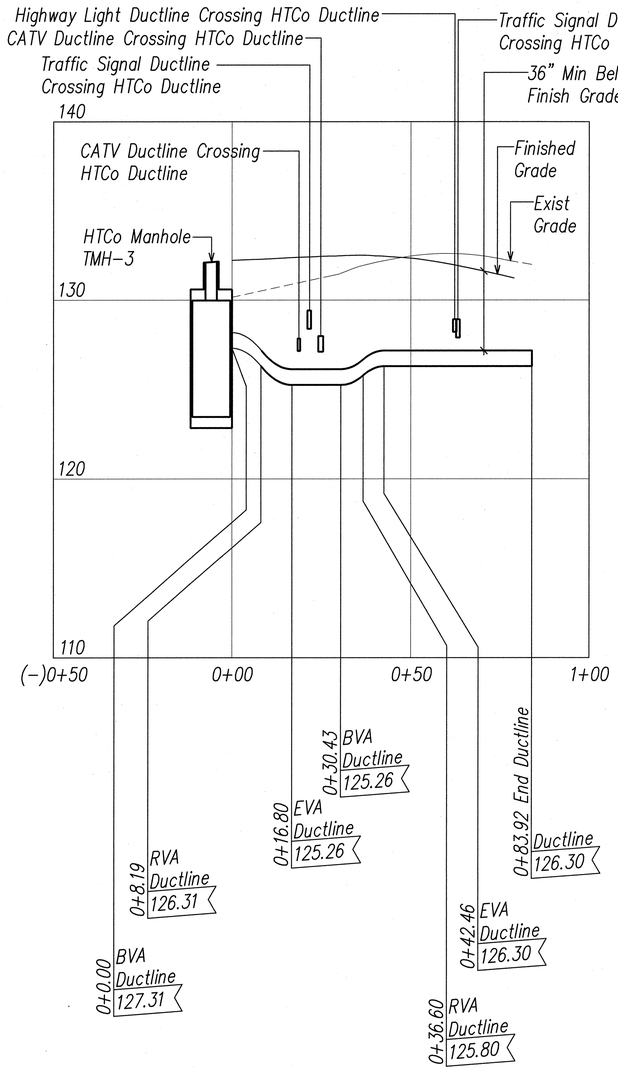
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	495	524



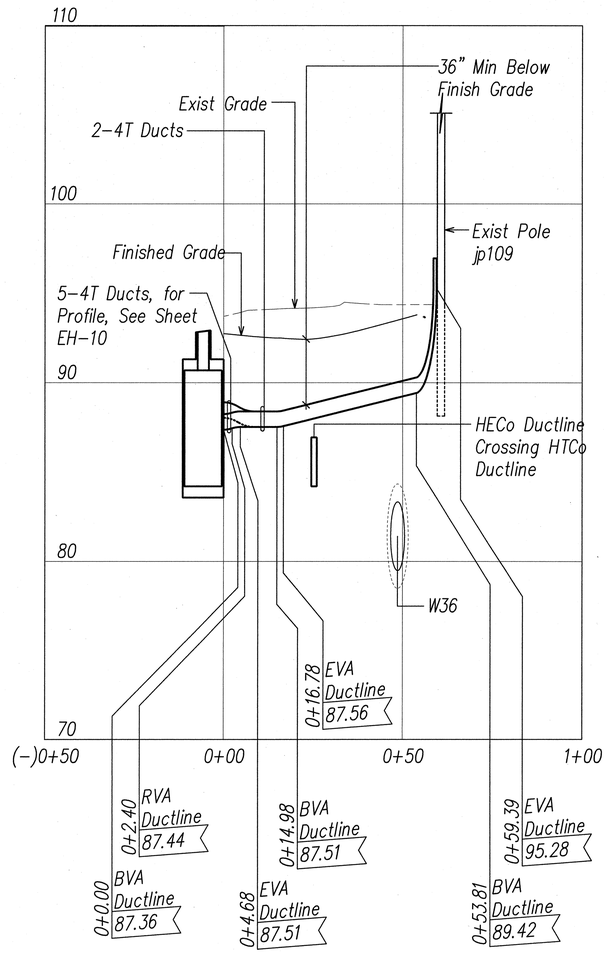
HTCO DUCTLINE PROFILE 10

SCALES: Horiz: 1"=20'
Vert: 1"=4'



HTCO DUCTLINE PROFILE 11

SCALES: Horiz: 1"=20'
Vert: 1"=4'



HTCO DUCTLINE PROFILE 12

SCALES: Horiz: 1"=20'
Vert: 1"=4'

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

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

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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DUCTLINE PROFILES 10, 11 AND 12

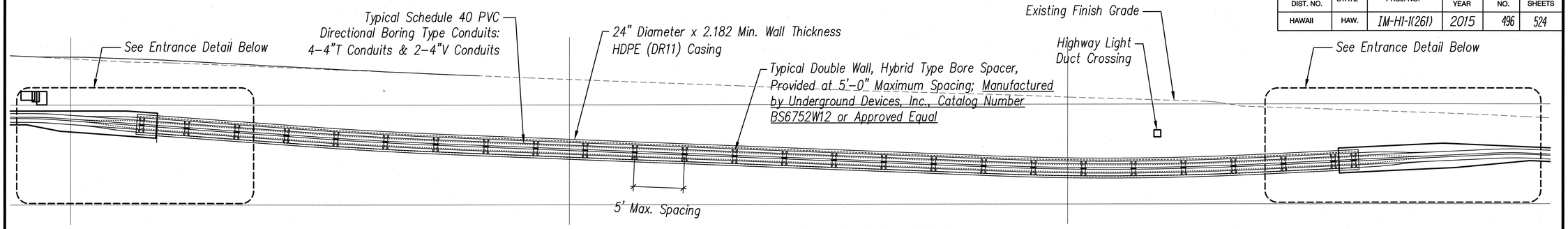
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EH-18 OF 161 SHEETS

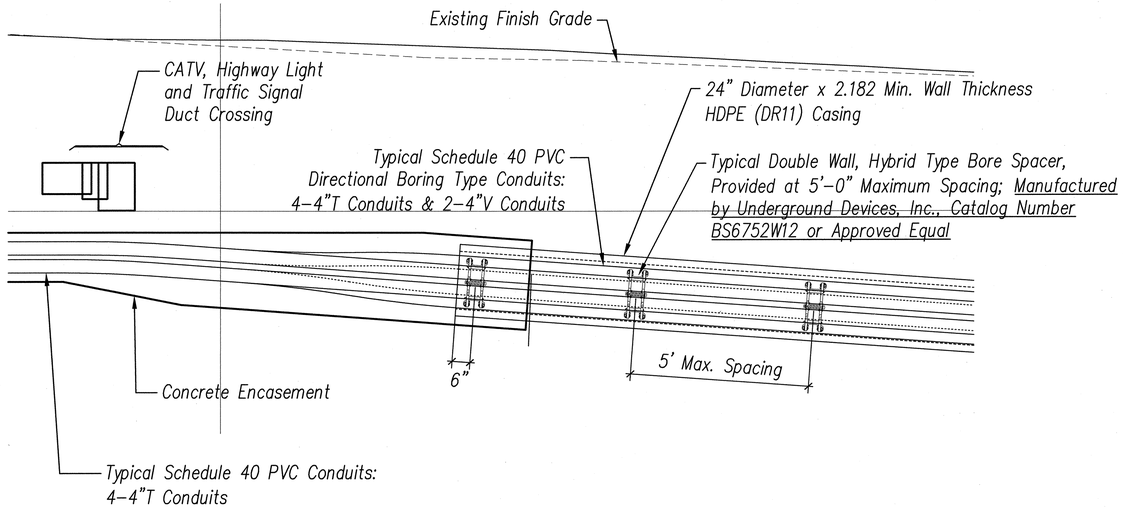
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	496	524



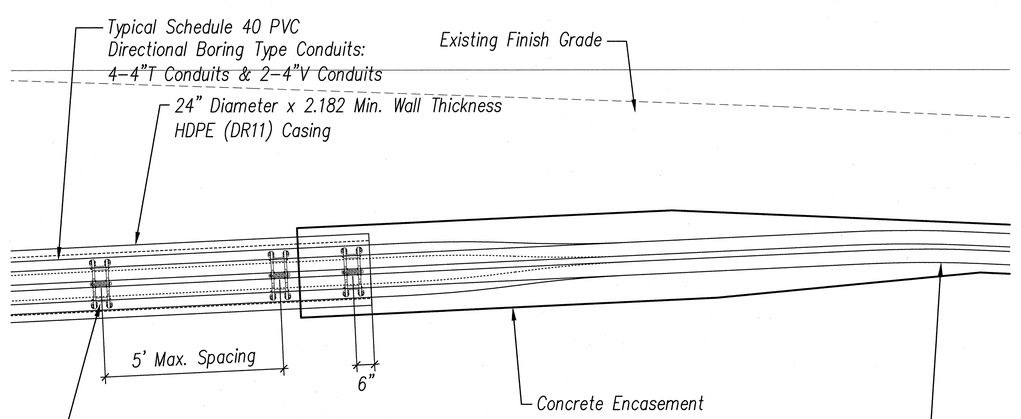
HTCO DIRECTIONAL BORING DUCTLINE ELEVATION

SCALE: 1"=5'



HTCO DIRECTIONAL BORING DUCTLINE EXIT DETAIL

SCALE: 1"=2'



HTCO DIRECTIONAL BORING DUCTLINE ENTRANCE DETAIL

SCALE: 1"=2'

HTCO DIRECTIONAL BORING INSTALLATION NOTES:

1. The Contractor shall use an open trench excavation during the directional drilling at the receiving end to attach the pipe so that it can be pulled back. Therefore, the Contractor needs to fit the pipe under the crossing utilities without damaging these existing utilities. And, the excavation must be made prior to the directional drilling. It is not acceptable to do the excavation after the directional drilling, as it will be too close to the existing utilities to steer the pipe, and the radius will be not acceptable, along with too steep of an exit angle.
2. It is acceptable for the drill to stay at the pavement grade rather than residing in an excavation.
3. The utilities should not be installed within the open trenches (within about 50 feet of the 2 ends of the planned directional drilling), prior to the directional drilling. After the conduits are installed in the directional drilling, then the transition to the open–trench construction can be made.
4. The maximum hole diameter created during the drilling, reaming, and during the pullback of the pipe assembly shall be no larger than 30 inches.
5. Any misdirected hole should be filled with cement grout, not cement–bentonite mix, and not bentonite mix.
6. If the HDD work causes heave or settlement of the road, the Contractor is responsible to fix the problem per work plan to be developed by HDOT.

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

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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HTCO DIRECTIONAL BORING DUCTLINE DETAILS

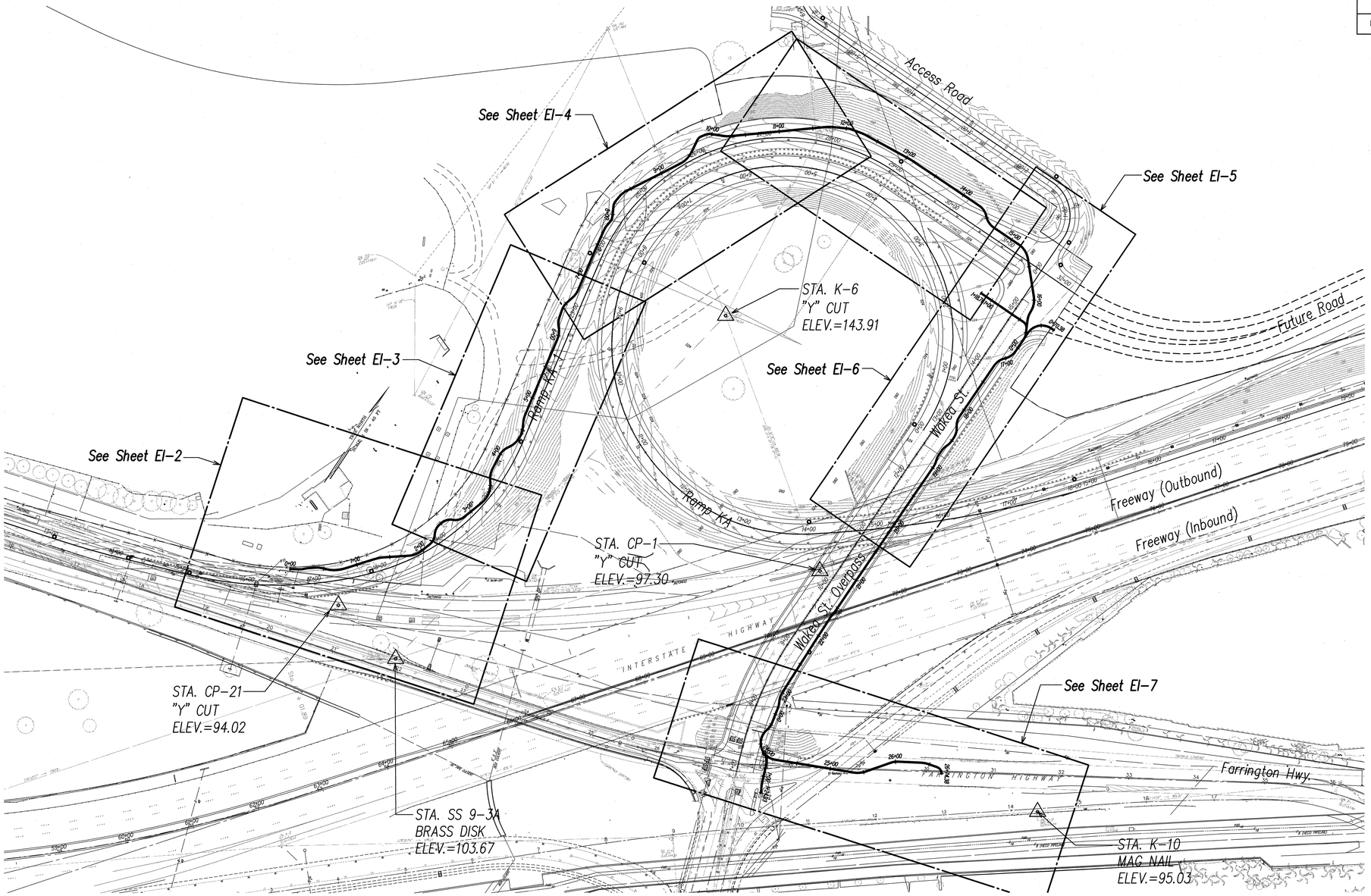
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

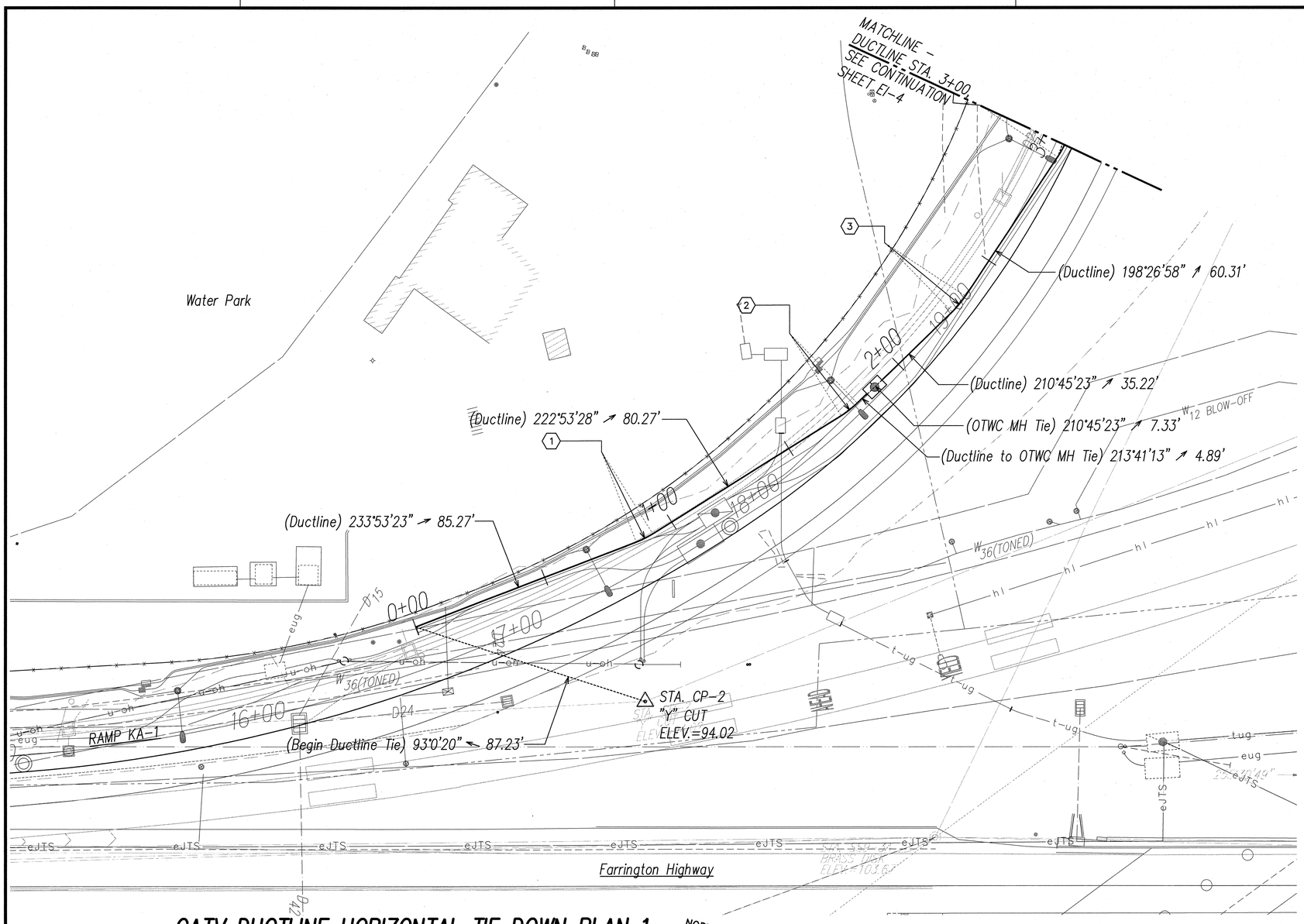
SHEET No. EH-19 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	497	524


See Sheet EI-4
See Sheet EI-5
See Sheet EI-3
See Sheet EI-2
See Sheet EI-6
See Sheet EI-7
Access Road
Future Road
Ramp KA
Ramp KA
Ramp KA

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	498	524



CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 1

SCALE: 1"=20'

CURVE DATA						
ID	Δ	Δ/2	RADIUS	T	C	Lc
1	10°59'55"	5°29'57.5"	35.00'	3.37'	6.71'	6.72'
2	12°8'5"	6°4'2.4"	35.00'	3.72'	7.40'	7.41'
3	12°18'25"	6°9'12.3"	35.00'	3.77'	7.50'	7.52'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

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.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 1

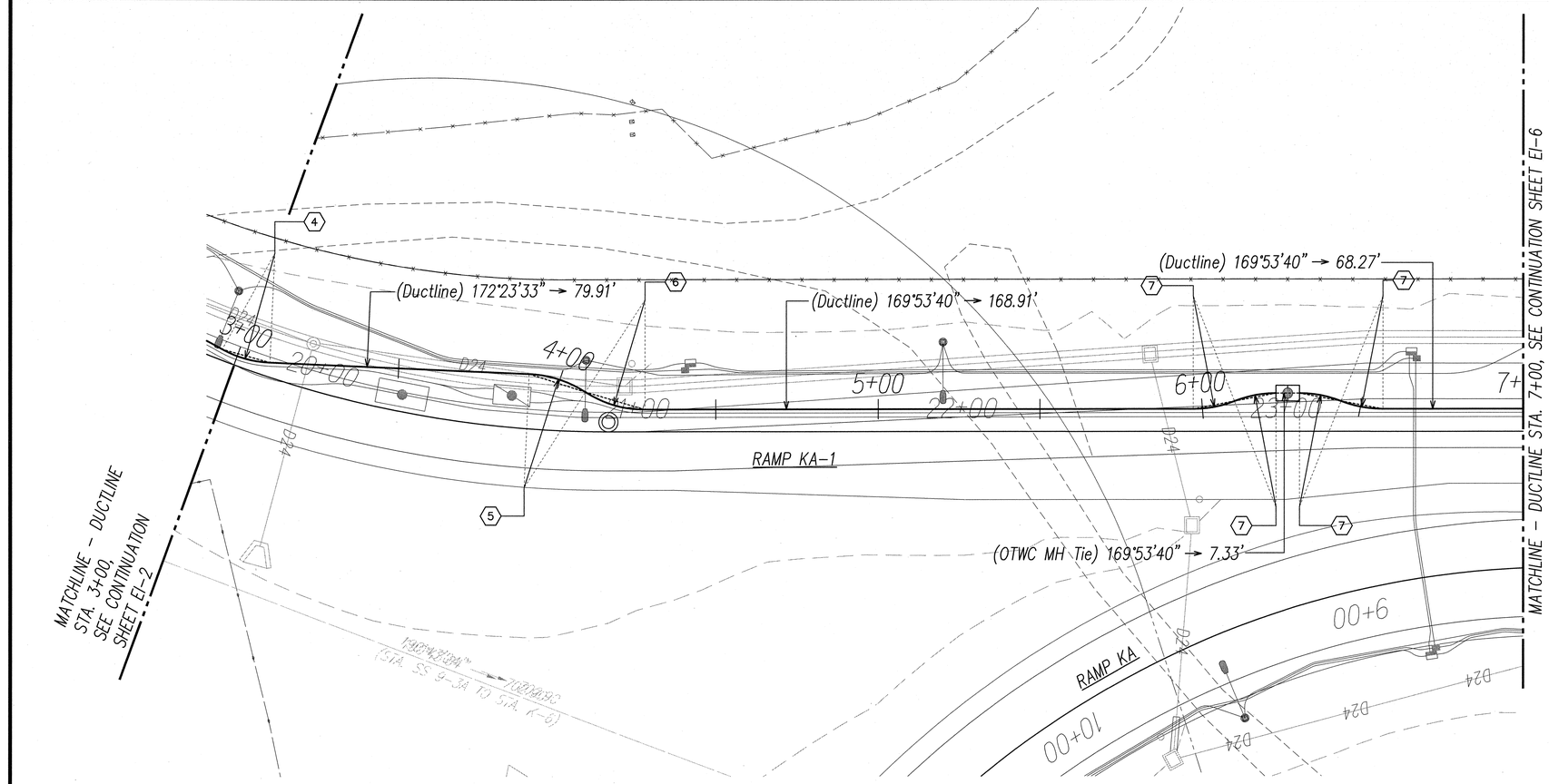
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-2 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	499	524



CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 2

SCALE: 1"=20'

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
4	26°3'25"	13°1'42.7"	33.88'	7.84'	15.27'	15.41'
5	30°22'34"	15°11'17.2"	35.00'	9.50'	18.34'	18.56'
6	32°52'27"	16°26'13.6"	33.88'	9.99'	19.17'	19.44'
7	21°26'41"	10°43'20.3"	35.00'	6.63'	13.02'	13.10'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 2

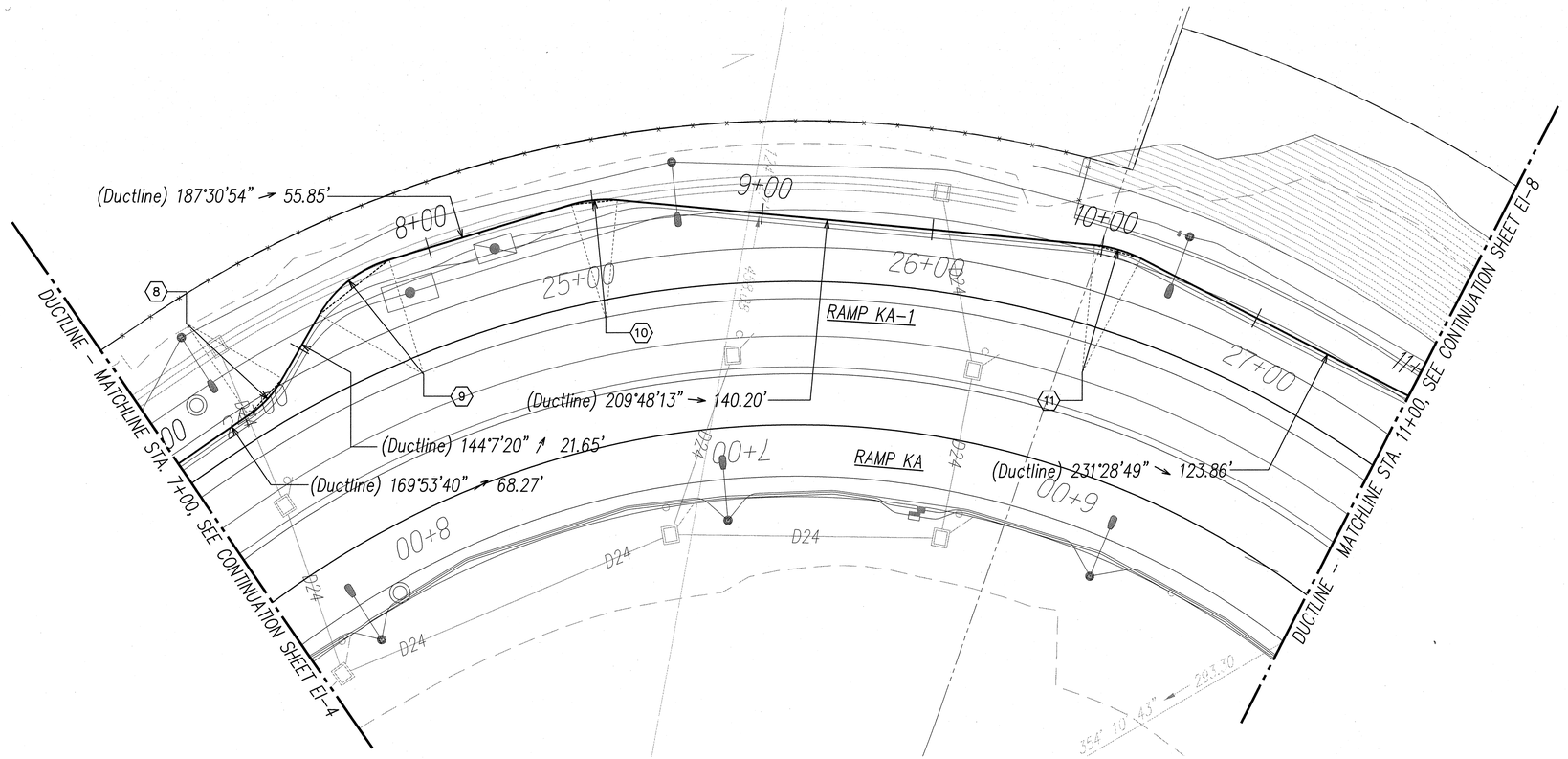
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. E1-3 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	500	524



CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 3

SCALE: 1"=20'

NORTH

CURVE DATA						
ID	Δ	Δ/ 2	RADIUS	T	C	Lc
⟨8⟩	25°46'20"	12°53'10.2"	32.57'	7.45'	14.53'	14.65'
⟨9⟩	43°23'34"	21°41'46.9"	35.00'	13.93'	25.88'	26.51'
⟨10⟩	22°17'19"	11°8'39.5"	35.00'	6.89'	13.53'	13.62'
⟨11⟩	21°40'36"	10°50'18.1"	37.43'	7.17'	14.08'	14.16'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

ORIGINAL PLAN | NOTE BOOK No.____

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

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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STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 3

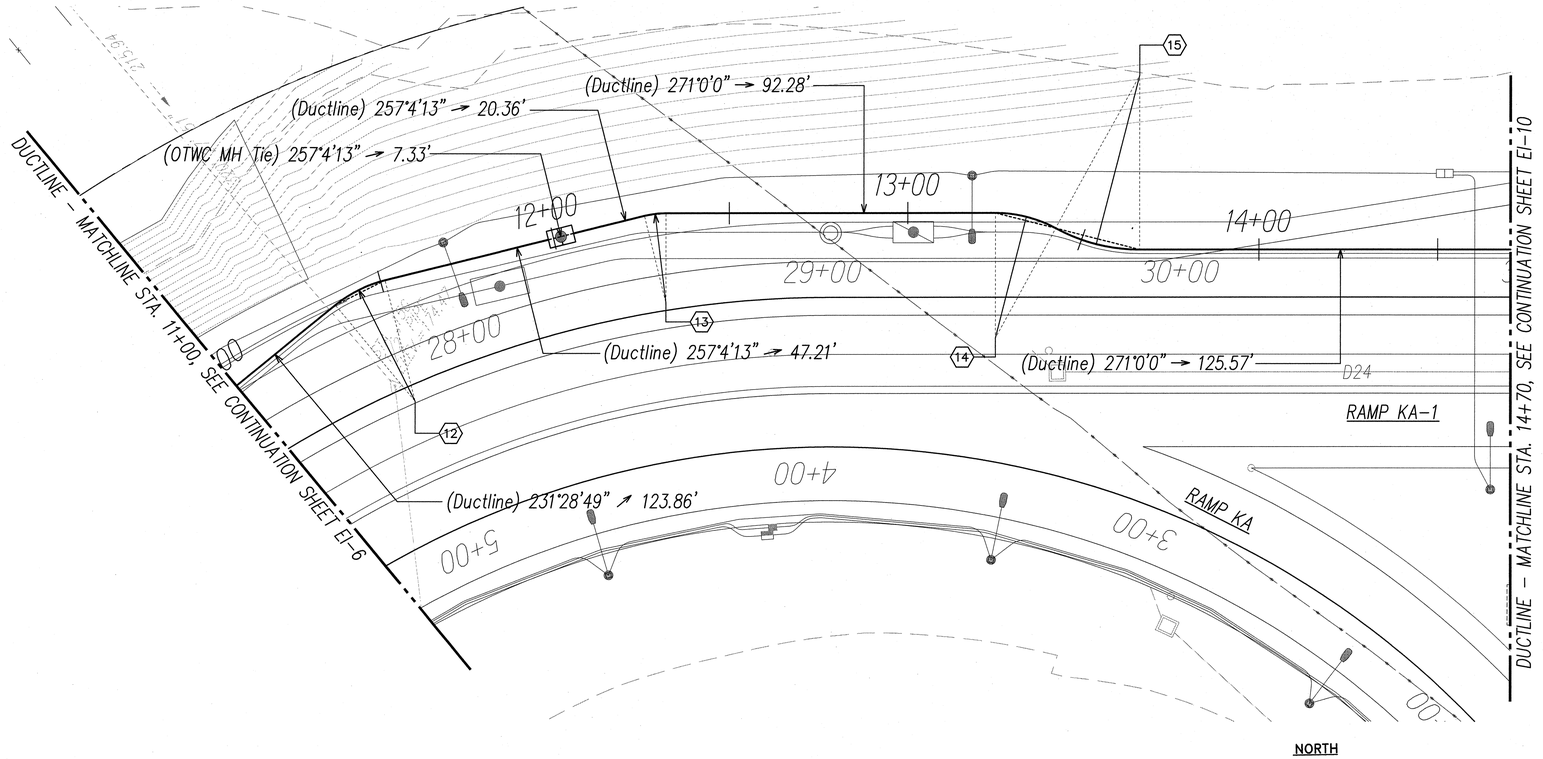
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. E1-4 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:48:34 BY: AM PLOT SC 1=20
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	501	524



NORTH

CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 4

SCALE: 1"=20'

CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
12	25°35'24"	12°47'42.0"	35.00'	7.95'	15.50'	15.63'
13	13°55'47"	6°57'53.5"	25.00'	3.05'	6.06'	6.08'
14	28°39'57"	14°19'58.4"	35.00'	8.94'	17.33'	17.51'
15	28°39'57"	14°19'58.4"	48.87'	12.49'	24.20'	24.45'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW I. MIYASATO
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 4

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

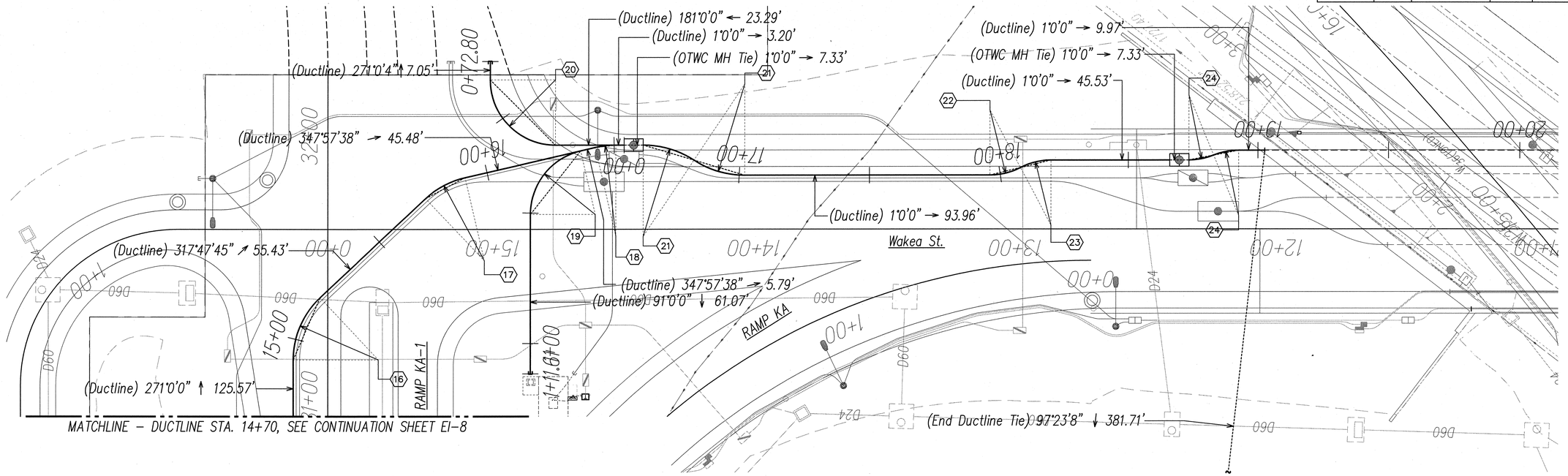
Scale: As Noted Date: January 20, 2015

SHEET No. EI-5 OF 161 SHEETS

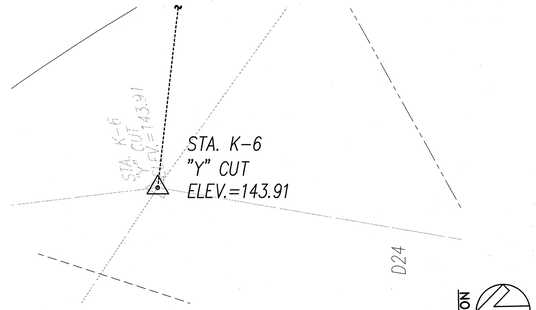
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	502	524



CURVE DATA						
ID	Δ	Δ / 2	RADIUS	T	C	Lc
16	46°47'45"	23°23'52.5"	32.68'	14.14'	25.95'	26.69'
17	30°9'53"	15°4'56.4"	32.68'	8.81'	17.01'	17.20'
18	13°2'22"	6°31'11.1"	35.00'	4.00'	7.95'	7.97'
19	76°57'38"	38°28'48.9"	25.00'	19.87'	31.11'	33.58'
20	90°0'1"	45°0'0.5"	25.00'	25.00'	35.36'	39.27'
21	33°30'7"	16°45'3.7"	35.00'	10.53'	20.17'	20.47'
22	27°47'10"	13°53'35.2"	25.00'	6.18'	12.01'	12.12'
23	27°47'12"	13°53'35.8"	25.00'	6.18'	12.01'	12.12'
24	22°17'51"	11°8'55.4"	25.00'	4.93'	9.67'	9.73'



CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 5

SCALE: 1"=20'

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

ORIGINAL PLAN
NOTE BOOK
No.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

LICENSED PROFESSIONAL ENGINEER
ANDREW I. MIYASATO
No. 4340-E
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License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE HORIZONTAL TIE DOWN PLAN 5

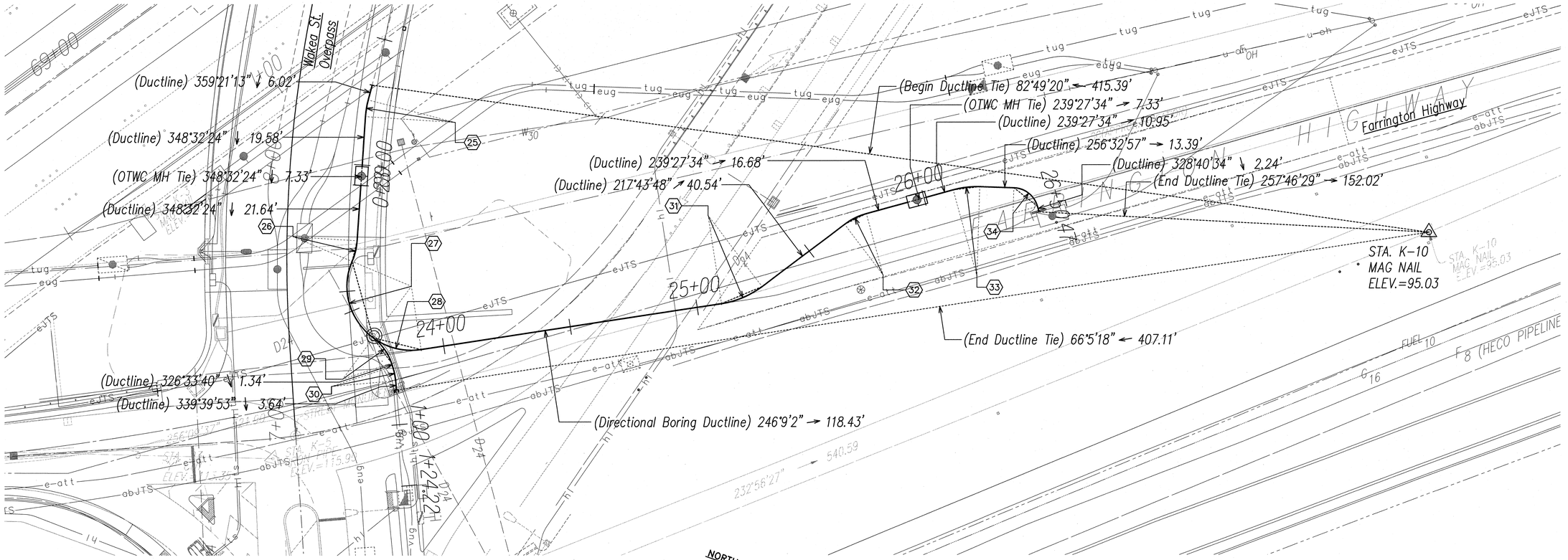
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

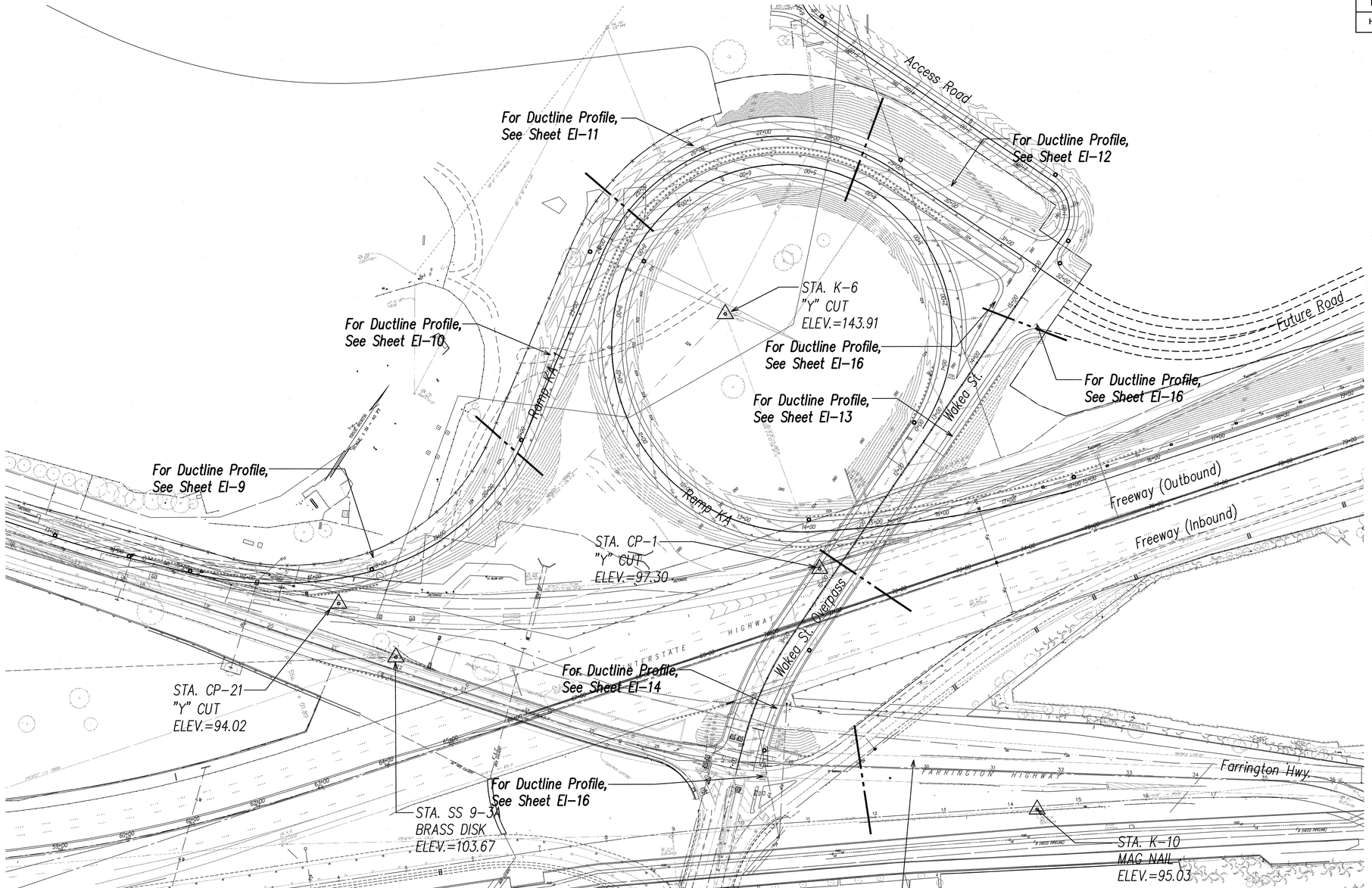
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	503	524


Waiawa Stream
Waiawa Stream
Waiawa Stream

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	504	524



OVERALL PLAN – CATV DUCTLINE PROFILES

SCALE: 1"=80'

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Andrew L. Miyasato
Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

OVERALL PLAN - CATV DUCTLINE PROFILES

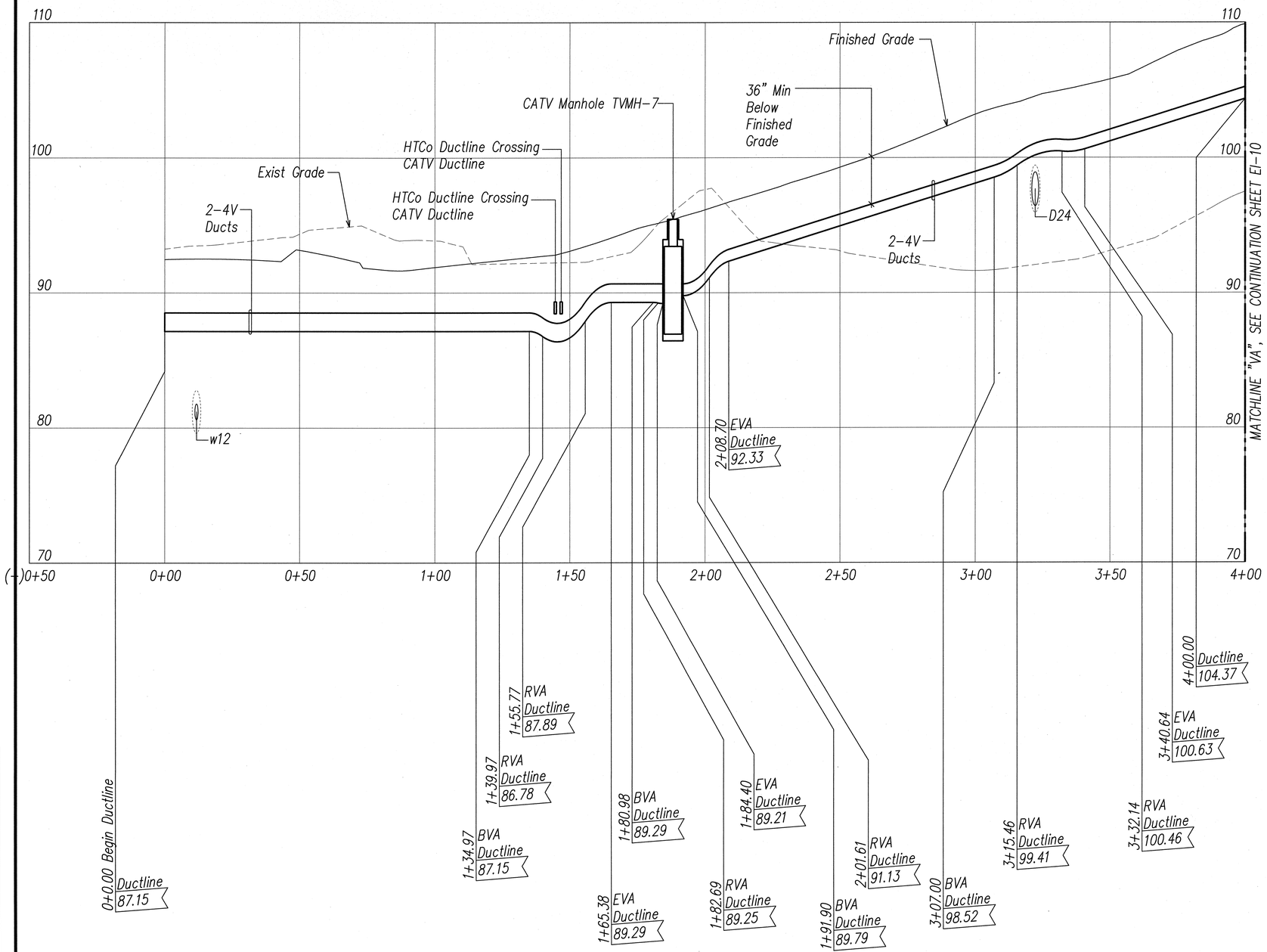
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-8 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:49:25 BY: AM PLOT SC 1=80.000000
146
FILE PATH: Z:\Acad\PROJECTS\29053\st008_29053_phase_2_OVERALL_ductline_profile_____ceh.dwg CAD USER: cindy PLOT DATE: 2015.02.18

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015	505	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

CATV DUCTLINE PROFILE 1

SCALES: Horiz: 1"=20'
Vert: 1"=4'

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW I. MIYASATO
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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 1

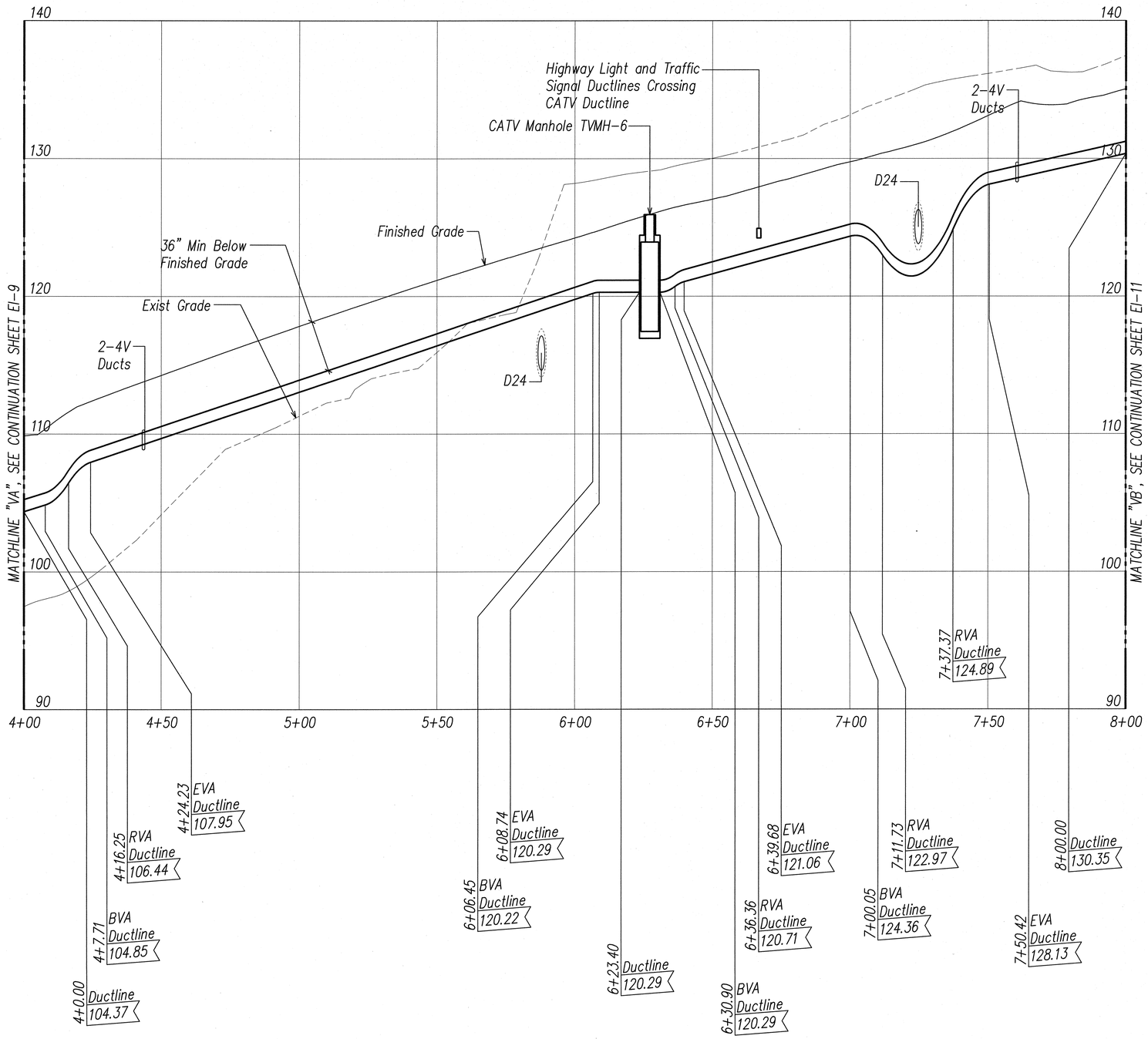
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-9 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:49:33 BY: AM PLOT SC 1=20.000000
147
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	506	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

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

CATV DUCTLINE PROFILE 2

SCALES: Horiz: 1"=20'
Vert: 1"=4'

Ronald N. S. Ho & Associates, Inc.
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ANDREW I. MIYASATO
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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 2

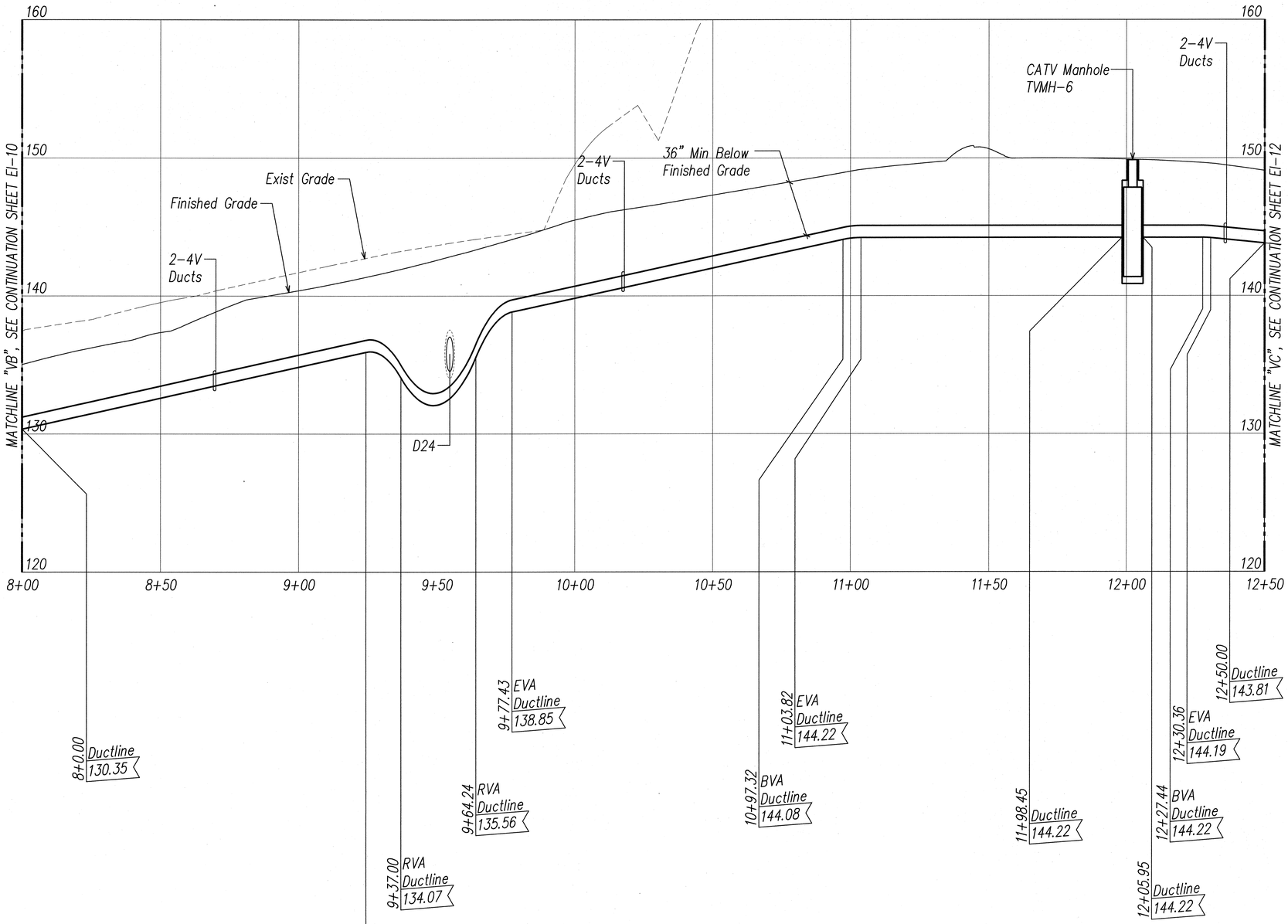
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-10 OF 161 SHEETS

LAST SAVE: 02/17/15 @ 10:49:39 BY: AM PLOT SC 1=20.000000
148
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	507	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

CATV DUCTLINE PROFILE 3

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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 I. MIYASATO
LICENSED PROFESSIONAL ENGINEER
No. 4340-E
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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

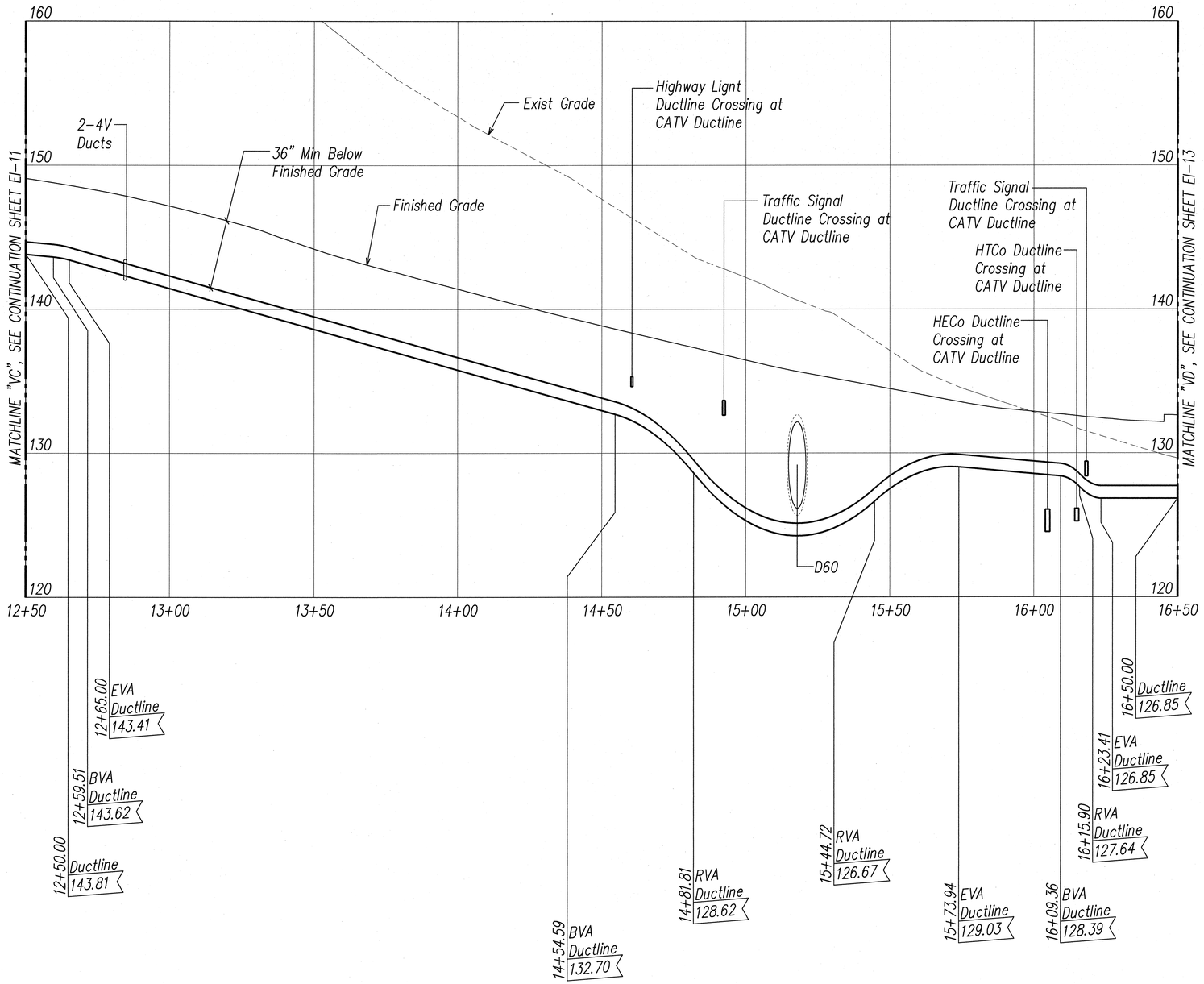
Scale: As Noted Date: January 20, 2015

SHEET No. EI-11 OF 161 SHEETS

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149
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	508	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

CATV DUCTLINE PROFILE 4

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

LAST SAVE: 02/17/15 @ 10:49:53 BY: AM PLOT SC 1=20.000000
100
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Ronald N. S. Ho & Associates, Inc.
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ANDREW I. MIYASATO
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No. 4340-E
HAWAII, U.S.A.
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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 4

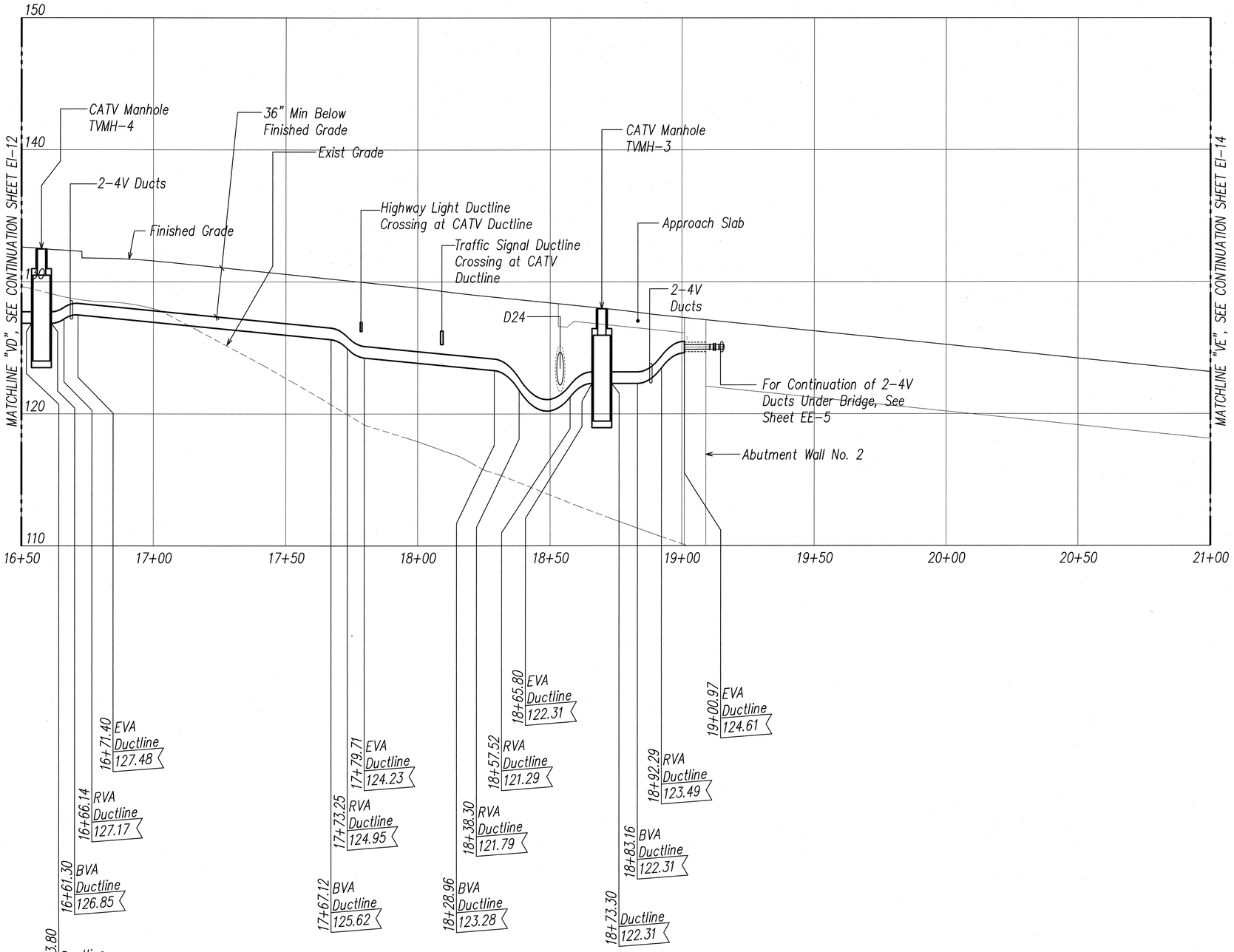
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-12 OF 161 SHEETS

508

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	509	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'
GRAPHIC SCALES

CATV DUCTLINE PROFILE 5

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

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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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 5

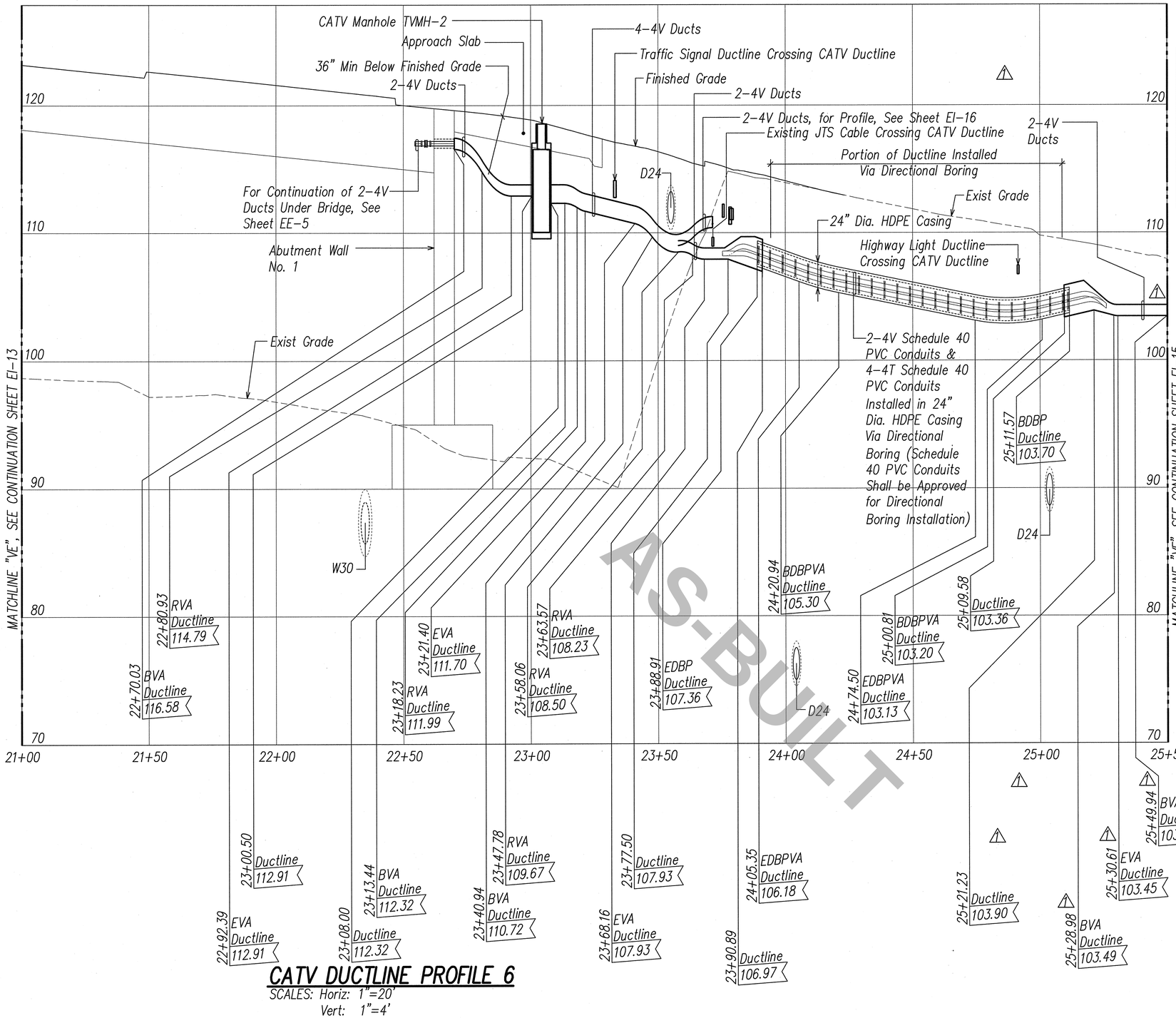
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-13 OF 161 SHEETS

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151
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	C.O. 510	524



PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC
BDBPVA	BEGIN DIRECTIONAL BORE HDPE PIPE VERTICAL ARC
EDBPVA	END DIRECTIONAL BORE HDPE PIPE VERTICAL ARC
BDBP	BEGIN DIRECTIONAL BORE HDPE PIPE
EDBP	END DIRECTIONAL BORE HDPE PIPE

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

AS-BUILT

CATV DUCTLINE PROFILE 6

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

DATE	REVISION
10/20/2016	⚠1 Revised OTWC Manhole Location, Profile Station Numbers, and Elevations

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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Signature 10.16.20
License Exp. Date: 04.30.2018

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 6

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-14 OF 161 SHEETS

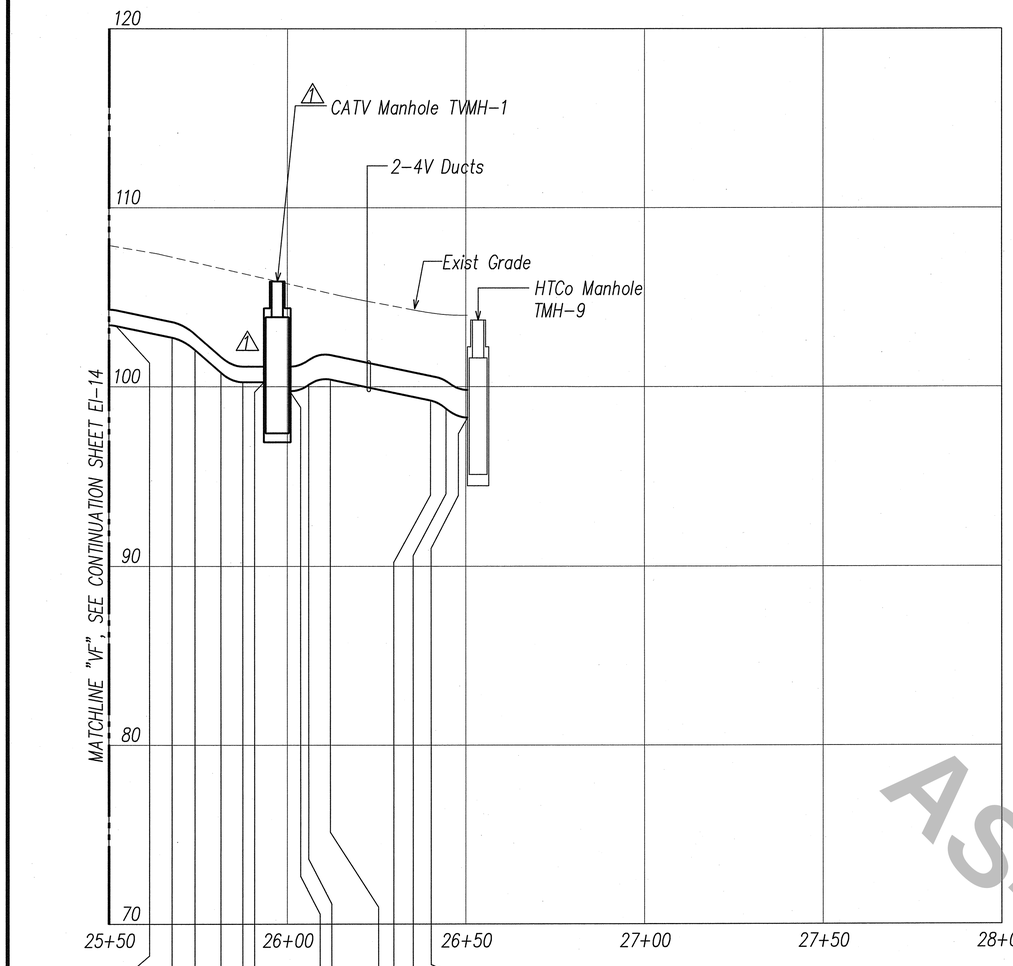
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152
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"AS-BUILT"

C.O. 510

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	C.O. 511	524

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



CATV DUCTLINE PROFILE 7

SCALES: Horiz: 1"=20'
Vert: 1"=4'

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

40' 2' 0 4' 8' 12'
VERTICAL SCALE: 1"=4'

GRAPHIC SCALES

DATE	REVISION
10/20/2016	⚠1 Revised OTWC Manhole Location, Profile Station Numbers, and Elevations

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.
Signature 2016.10.20
License Exp. Date: 04.30.2018

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILE 7

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-15 OF 161 SHEETS

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

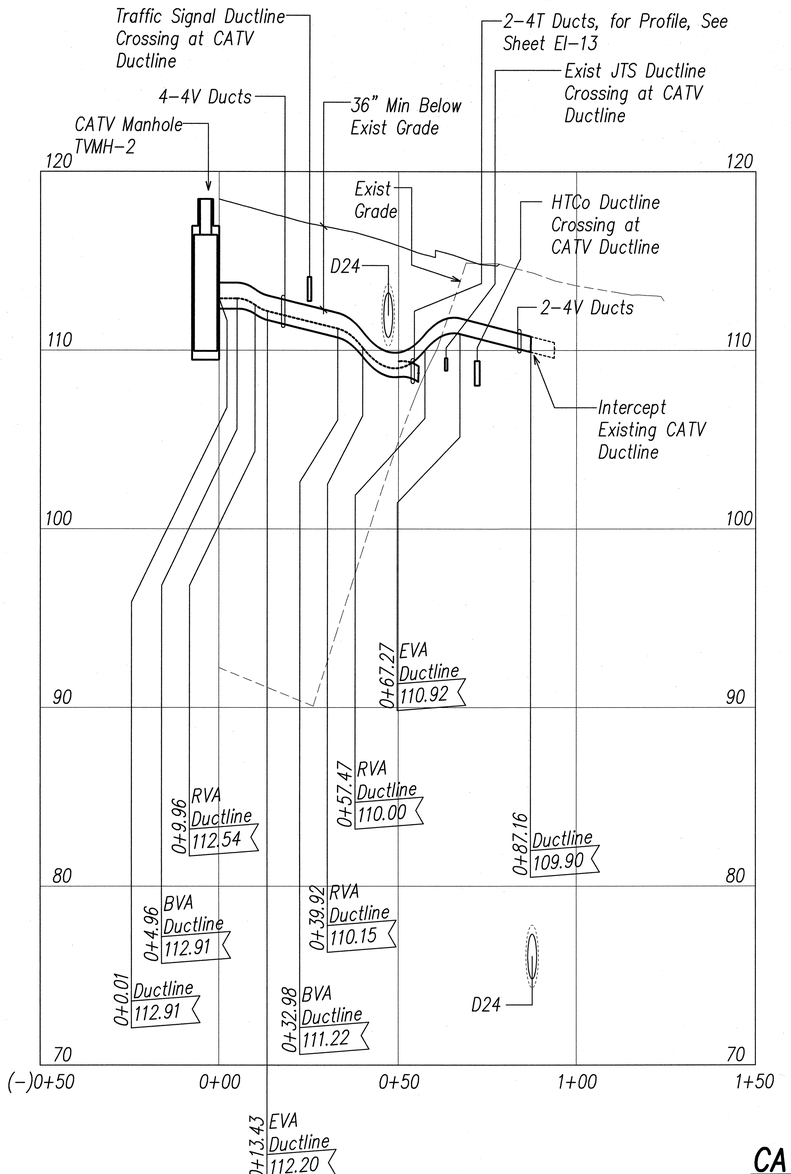
AS-BUILT

"AS-BUILT"

C.O. 511

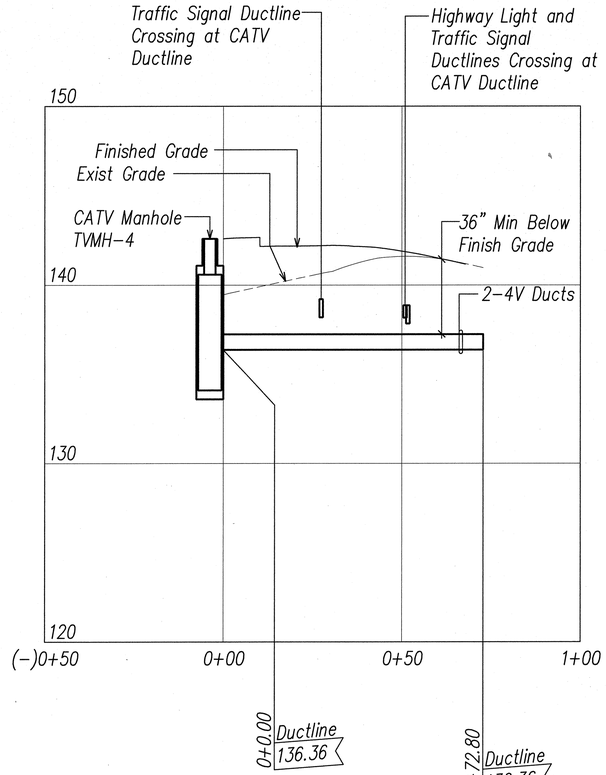
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	512	524



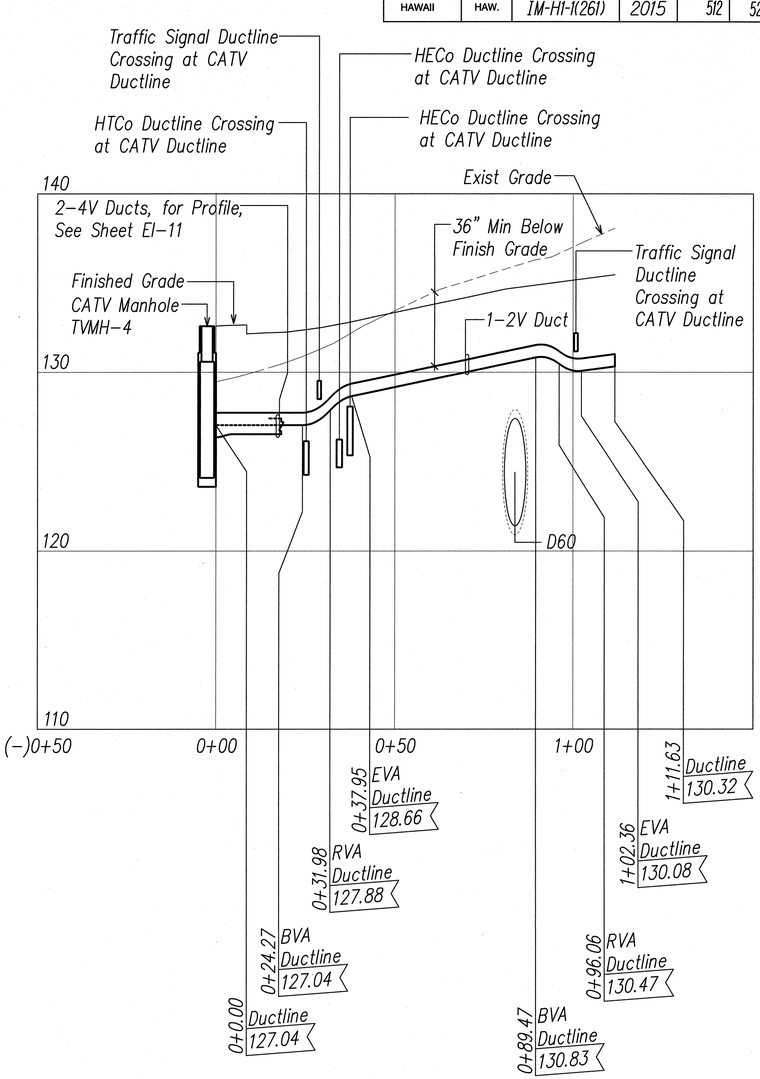
CATV DUCTLINE PROFILE 8

SCALES: Horiz: 1"=20'
Vert: 1"=4'



CATV DUCTLINE PROFILE 9

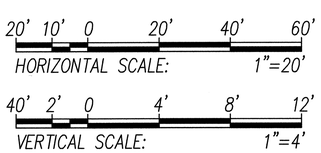
SCALES: Horiz: 1"=20'
Vert: 1"=4'



CATV DUCTLINE PROFILE 10

SCALES: Horiz: 1"=20'
Vert: 1"=4'

PROFILE LEGEND	
ITEM	DESCRIPTION
BVA	BEGIN VERTICAL DUCTLINE ARC
RVA	REVERSE VERTICAL DUCTLINE ARC
EVA	END VERTICAL DUCTLINE ARC



GRAPHIC SCALES

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

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

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Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CATV DUCTLINE PROFILES 8, 9 AND 10

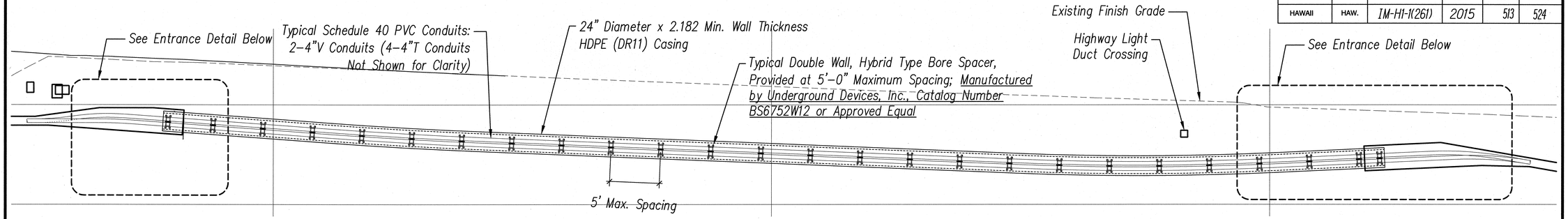
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EI-16 OF 161 SHEETS

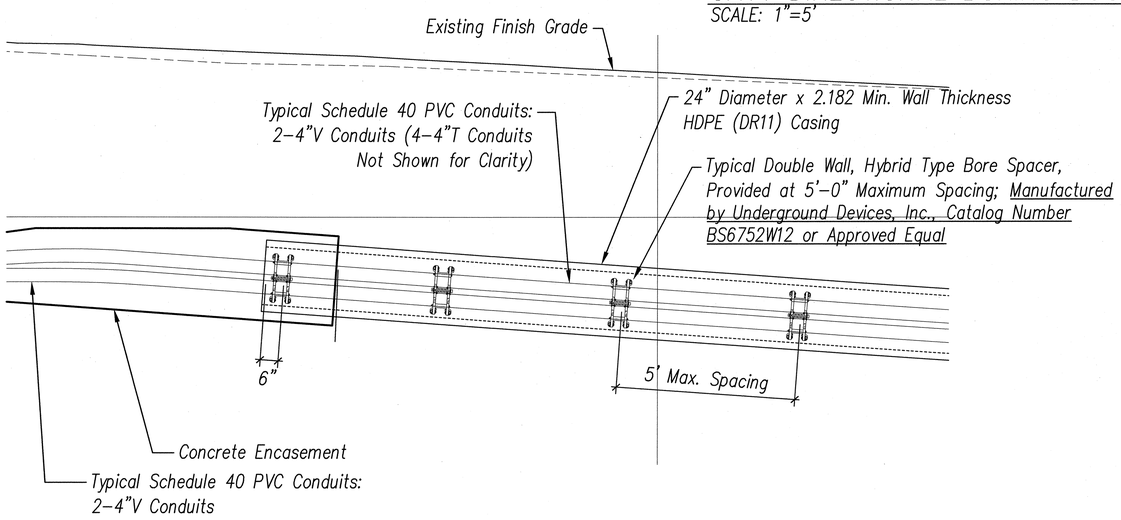
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154
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	513	524



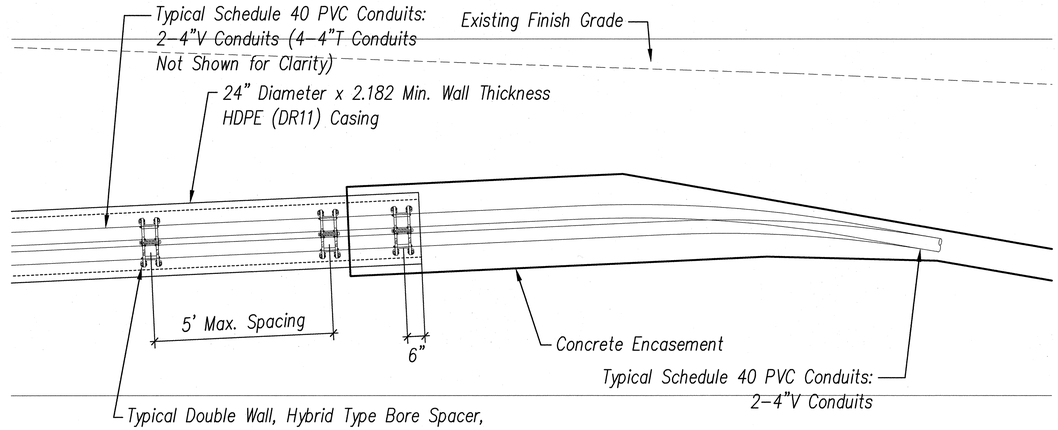
CATV DIRECTIONAL BORING DUCTLINE ELEVATION

SCALE: 1"=5'



CATV DIRECTIONAL BORING DUCTLINE EXIT DETAIL

SCALE: 1"=2'



CATV DIRECTIONAL BORING DUCTLINE ENTRANCE DETAIL

SCALE: 1"=2'

DIRECTIONAL BORING INSTALLATION NOTES:

1. The Contractor shall use an open trench excavation during the directional drilling at the receiving end to attach the pipe so that it can be pulled back. Therefore, the Contractor needs to fit the pipe under the crossing utilities without damaging these existing utilities. And, the excavation must be made prior to the directional drilling. It is not acceptable to do the excavation after the directional drilling, as it will be too close to the existing utilities to steer the pipe, and the radius will be not acceptable, along with too steep of an exit angle.
2. It is acceptable for the drill to stay at the pavement grade rather than residing in an excavation.
3. The utilities should not be installed within the open trenches (within about 50 feet of the 2 ends of the planned directional drilling), prior to the directional drilling. After the conduits are installed in the directional drilling, then the transition to the open–trench construction can be made.
4. The maximum hole diameter created during the drilling, reaming, and during the pullback of the pipe assembly shall be no larger than 30 inches.
5. Any misdirected hole should be filled with cement grout, not cement–bentonite mix, and not bentonite mix.
6. If the HDD work causes heave or settlement of the road, the Contractor is responsible to fix the problem per work plan to be developed by HDOT.

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

Ronald N. S. Ho & Associates, Inc.
Electrical Engineers

ANDREW I. MIYASATO
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HAWAII, U.S.A.

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Signature
2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DIRECTIONAL BORING CATV DUCTLINE DETAILS

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

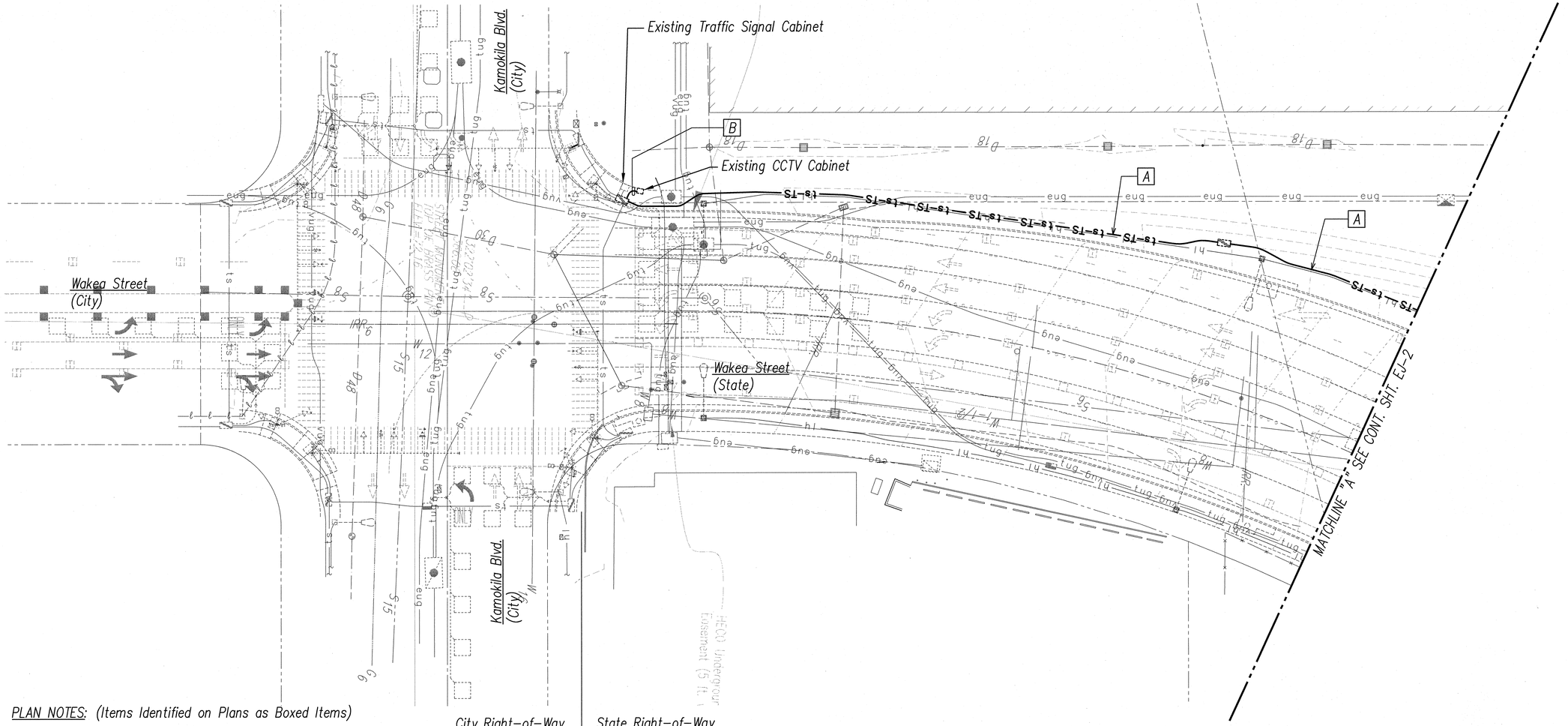
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SHEET No. EI-17 OF 161 SHEETS

513

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	514	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Existing 4-2" Traffic Signal Conduits, One with Existing 3#6, 1#8 Gnd, and 3 Spares; Use 1 Spare 2"C and Provide New Fiber Optic Cable to Existing CCTV Cabinet at the Wakea Street / Kamokila Boulevard Intersection.

B Existing 4-2" Traffic Signal Conduits, One with Existing 3#6, 1#8 Gnd, One with Existing Camera Cable, and 2 Spares; Use 1 Spare 2"C and Provide New Fiber Optic Cable to New CCTV Cabinet.

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

NORTH

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

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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Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV INSTALLATION PLAN 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EJ-1 OF 161 SHEETS

EXISTING CCTV PLAN – KAMOKILA BOULEVARD / WAKEA STREET INTERSECTION

SCALE: 1"=20'

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156
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 514S-1

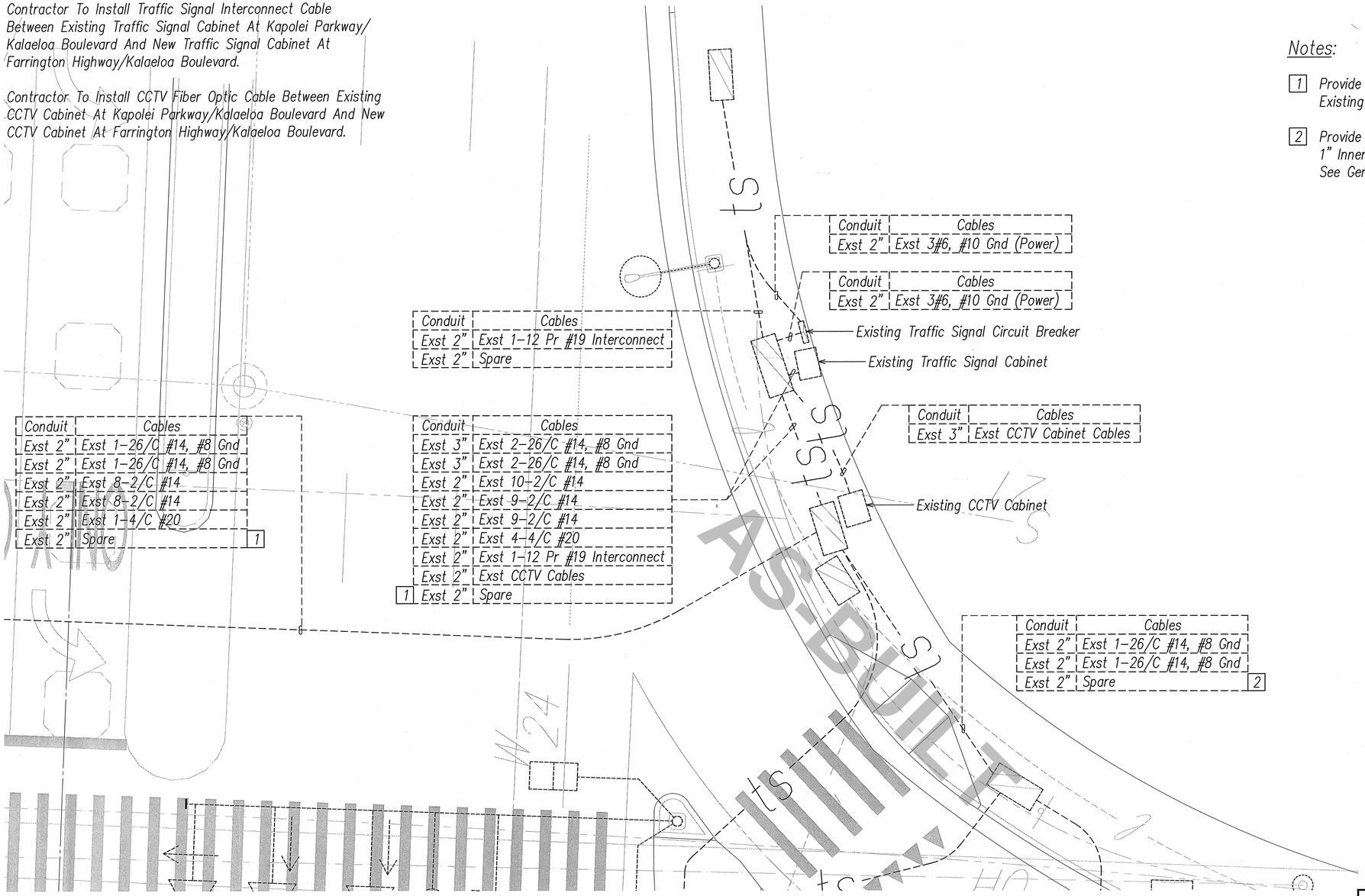
General Notes:

1. Contractor To Install Traffic Signal Interconnect Cable Between Existing Traffic Signal Cabinet At Kapolei Parkway/ Kalaeloa Boulevard And New Traffic Signal Cabinet At Farrington Highway/Kalaeloa Boulevard.
2. Contractor To Install CCTV Fiber Optic Cable Between Existing CCTV Cabinet At Kapolei Parkway/Kalaeloa Boulevard And New CCTV Cabinet At Farrington Highway/Kalaeloa Boulevard.

Notes:

[1] Provide New (1)–12 Pair #19 Interconnect Cable In Existing Traffic Signal Conduit. See General Note #1.

[2] Provide New (1)–72 Strand Fiber Optic Cable And 1" Innerduct In Existing Traffic Signal Conduit. See General Note #2.



NORTH

ENLARGED TRAFFIC SIGNAL & CCTV PLAN
SCALE: 1"=5'

5' 2.5' 0 5' 10' 15'
SCALE: 1"=5'
GRAPHIC SCALE

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ENLARGED TRAFFIC SIGNAL & CCTV PLAN

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EJ-7 OF 161 SHEETS

DATE	REVISION

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

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"AS-BUILT"

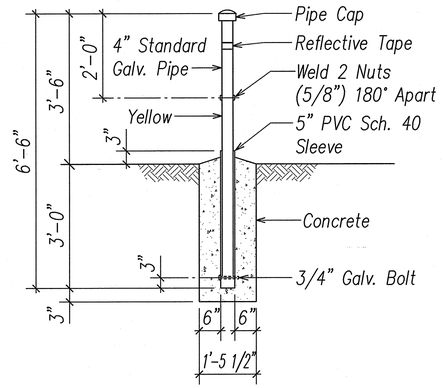
C.O. 514S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 514S-2

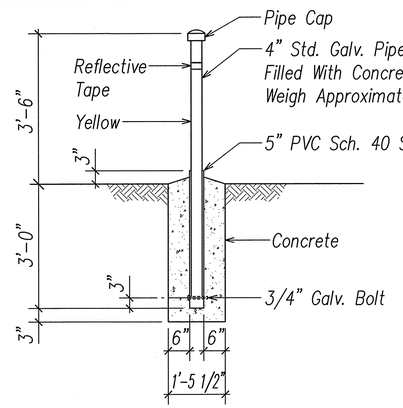
Notes:

1. Refer To HECO Standard 30-5000 For Locations And Clearances.
2. Post Barriers Shall Be Painted Yellow Per ANSI Spec Z535.1 To Comply With OSHA 1910.144 For Color Coding. A 2" Wide Strip Of Reflective Tape Shall Be Placed 6" Below Top The Top Of Post.
3. Post Barriers Height Shall Be At A Minimum Of 3'-6" Above Ground Level For Visibility To Vehicular Traffic.
4. Post Barriers Will Be Removable For The Front Of The Equipment To Facilitate Maintenance, Operation, And Installation Of Equipment. Additional Removable Barriers May Be Required To Further Ease Installation And Removal Of Equipment.
5. Post Barriers Shall Have A Maximum Separation Of 3'-6" To Prevent Automobiles, Trucks, Forklifts, And Other Vehicles From Contacting HECO Equipment.
6. All Barriers Shall Be Installed Outside Clear Zones. The Only Exception For Reduced Barrier Positions Is When Front Clear Space Is Shared By The Roadway, The Front Barriers Can Be Placed Up To 4 Feet Min. From Pad (For TSF) And Equipment (For Switchgear) To Allow Cabinet Doors To Open. Roadway Will Allow HECO Personnel To Operate Equipment With The Required 8'-0" Clearance. Parking Stalls Are Not Considered Part Of The Roadway. Regardless Of The Post Barrier Locations All Clear Zones Shall Be Maintained.
7. Provide Post Barriers In Accordance With HECO Standard 30-5000.



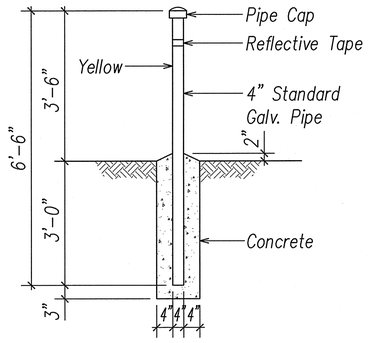
DETAIL A

Placed In Front And Also To Be Right Of The Equipment Doors. This Allows For Switching And Bayonet Fuse Replacements. Shall Not Be Filled With Concrete. Welded Nuts Are For Inserting Bolts To Act As "Handles" For Lifting Barrier. The Bolts Are To Be Removed After Installation.



DETAIL B

Removable Concrete Filled Post Barrier. Intended To Allow Access For HECO Line Trucks, Crances Or Forklifts, For The Replacement Of Unit.



DETAIL C

Permanent Non-Removable Non-Concrete Filled Post Barrier. Intended For The Rear Of Equipment When Access Is From The Front

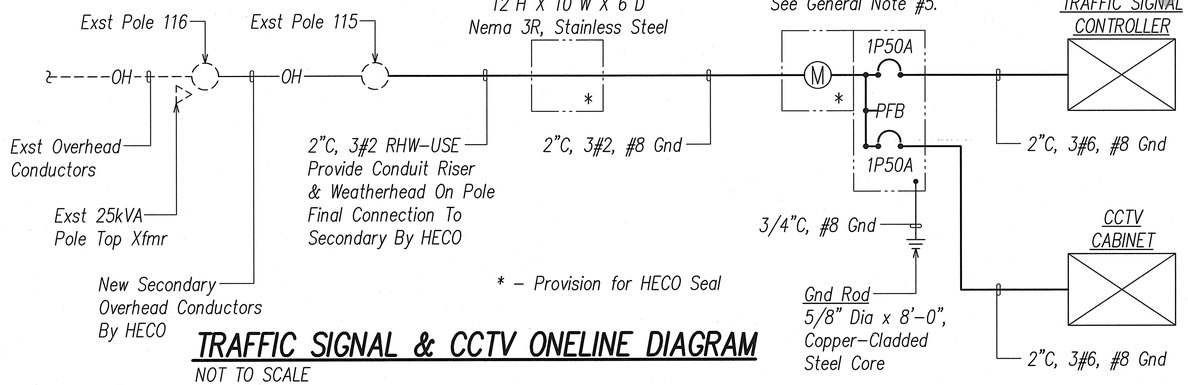
POST BARRIER DETAILS

NOT TO SCALE

General Notes:

1. Provide A Minimum Of 4 Feet Clear & Level Workspace Clearance In Front Of Metering & Service Equipment.
2. Provide Permanent Identification Labels For All Meter Sockets To Identify The Load Served.
3. Provide Barrier Posts For Protection Of Meter And Service Equipment Should Equipment Have Vehicular Contact Exposure.
4. At Time Of Installation, Provide & Install Meter Socket Covers (Plastic) & Bands For All Blank Meter Sockets. Identify Covers So They Can Be Returned.
5. Provide 2-1P50A Breakers And 1-Single Pole PFB/Blank With Combination Meter Socket.

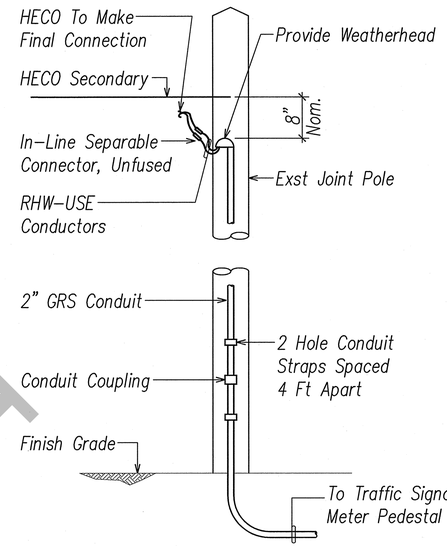
COMBINATION METER SOCKET
4-Jaw, 120V/240V, 1Ph, 3W, With Factory Installed Commercial Test Bypass Facilities, Breakers As Indicated, Nema 3R, Stainless Steel See General Note #5.



* - Provision for HECO Seal

TRAFFIC SIGNAL & CCTV ONELINE DIAGRAM

NOT TO SCALE



CONDUIT RISER DETAIL

NOT TO SCALE

STEVEN H. SAKAI
LICENSED PROFESSIONAL ENGINEER
No. 7637-E
HAWAII, U.S.A.

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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL & CCTV ONELINE DIAGRAM
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: — Date: November 16, 2018

SHEET No. EJ-8 OF 161 SHEETS

DATE	REVISION

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

NOTE BOOK | No.

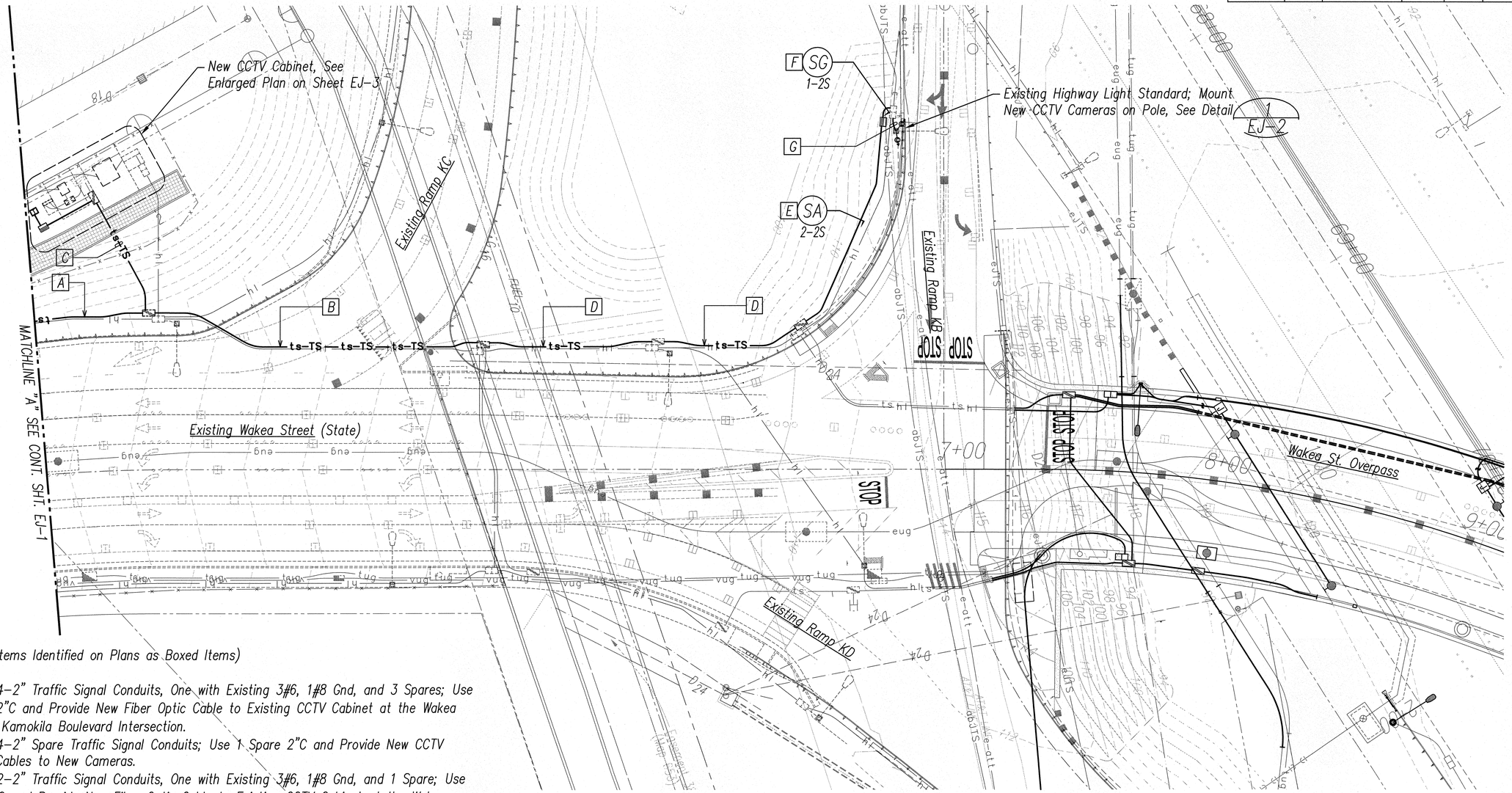
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AS-BUILT

"AS-BUILT"

C.O. 514S-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	515	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

- A Existing 4–2" Traffic Signal Conduits, One with Existing 3#6, 1#8 Gnd, and 3 Spares; Use 1 Spare 2"C and Provide New Fiber Optic Cable to Existing CCTV Cabinet at the Wakea Street / Kamokila Boulevard Intersection.
- B Existing 4–2" Spare Traffic Signal Conduits; Use 1 Spare 2"C and Provide New CCTV Camera Cables to New Cameras.
- C Existing 2–2" Traffic Signal Conduits, One with Existing 3#6, 1#8 Gnd, and 1 Spare; Use Spare 2"C and Provide New Fiber Optic Cable to Existing CCTV Cabinet at the Wakea Street / Kamokila Boulevard Intersection and CCTV Camera Cables to New Cameras.
- D Existing 5–2" Spare Traffic Signal Conduits; Use 1 Spare 2"C and Provide New CCTV Camera Cables to New Cameras.
- E New 2–2" Traffic Signal Conduits, One with New CCTV Camera Cables.
- F New 1–2" Traffic Signal Conduit with New CCTV Camera Cables.
- G Existing 1–2" Highway Lighting Conduit with Conductors, Add New CCTV Camera Cables to New CCTV Cameras Mounted on Existing Highway Light Standard.

CCTV SYSTEM PLAN – WAKEA STREET / KAPOLEI INTERCHANGE INTERSECTION

SCALE: 1"=20'

NORTH

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Signature 2015.02.18

License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV INSTALLATION PLAN 2

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

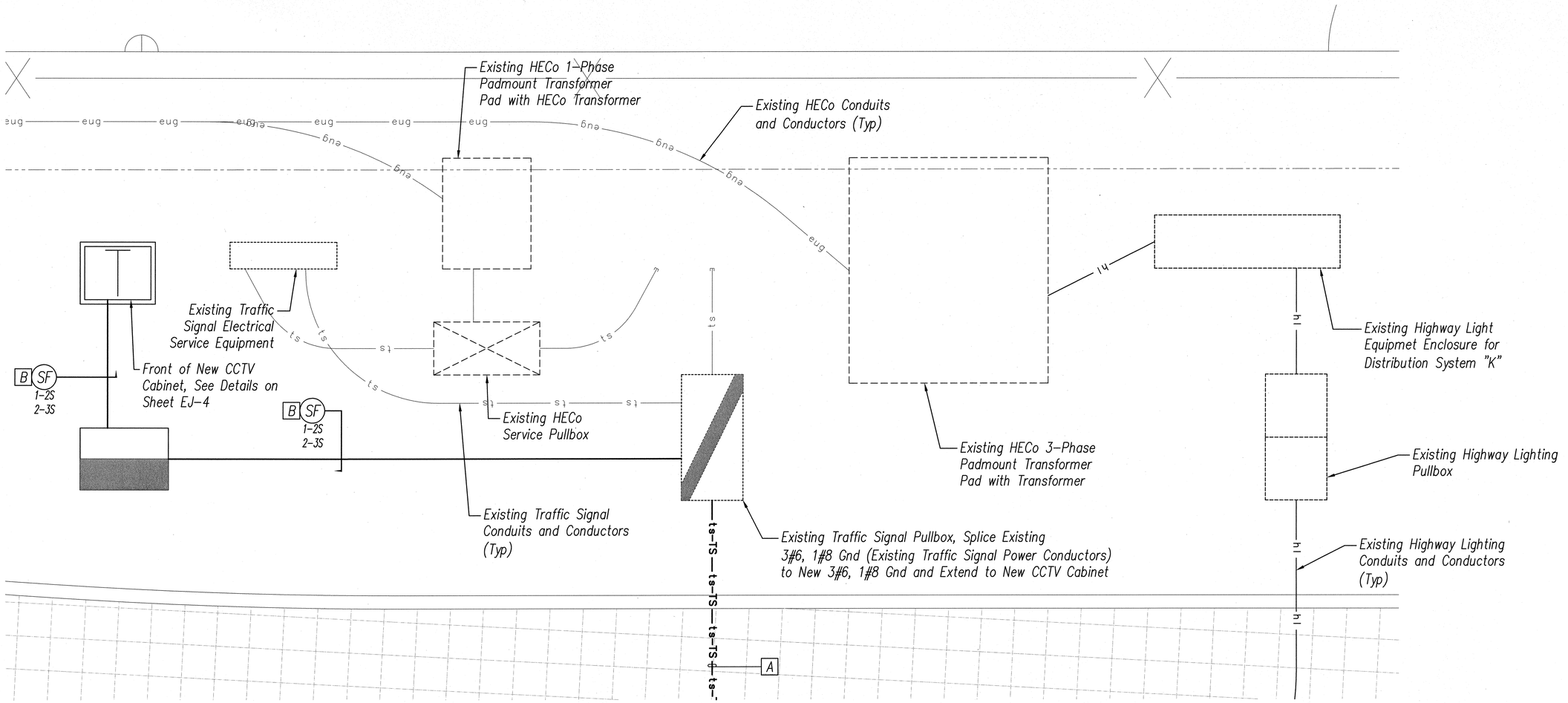
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SHEET No. EJ-2 OF 161 SHEETS

515

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	516	524



PLAN NOTES: (Items Identified on Plans as Boxed Items)

A Existing 2-2" Traffic Signal Conduits, One with Existing 3#6, 1#8 Gnd, and 1 Spare; Use Spare 2"C and Provide New Fiber Optic Cable to Existing CCTV Cabinet at the Wakea Street / Kamokila Boulevard Intersection and CCTV Camera Cables to New Cameras.

B Provide FOC and CCTV Camera Cables in 1-3"C; Provide 3#6, 1#8 Gnd in 1-2"C; Provide Pullcord in 1-3"C.

NORTH

1 / EJ-3 NEW CCTV SYSTEM EQUIPMENT ENCLOSURE PLAN
SCALE: 1/2"=1'-0"

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

Ronald M. 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.
Signature (2015.02.18)
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CCTV SYSTEM EQUIPMENT ENCLOSURE PLAN
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS (Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)
Scale: As Noted Date: January 20, 2015

SHEET No. EJ-3 OF 161 SHEETS

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 516S-1

General Notes:

1. Letter In Circle Indicates Dedicated Fiber Pair To Be Terminated At Designated Equipment.

2. Coordinate Interconnection Of New CCTV System With The City's Existing Traffic Control System With The City Department Of Transportation Services.

Notes:

[1] 72-Strand Single Mode Fiber Optic Cable.

[2] Category 5e Cable.

[3] Ethernet Cable.

[4] Camera Power Cable With Sun Resistant Jacket.

[5] Provide New IP Card At Traffic Signal Controller. Verify Requirement With Department Of Transportation Services.

[6] Fiber Optic Cabling As Required.

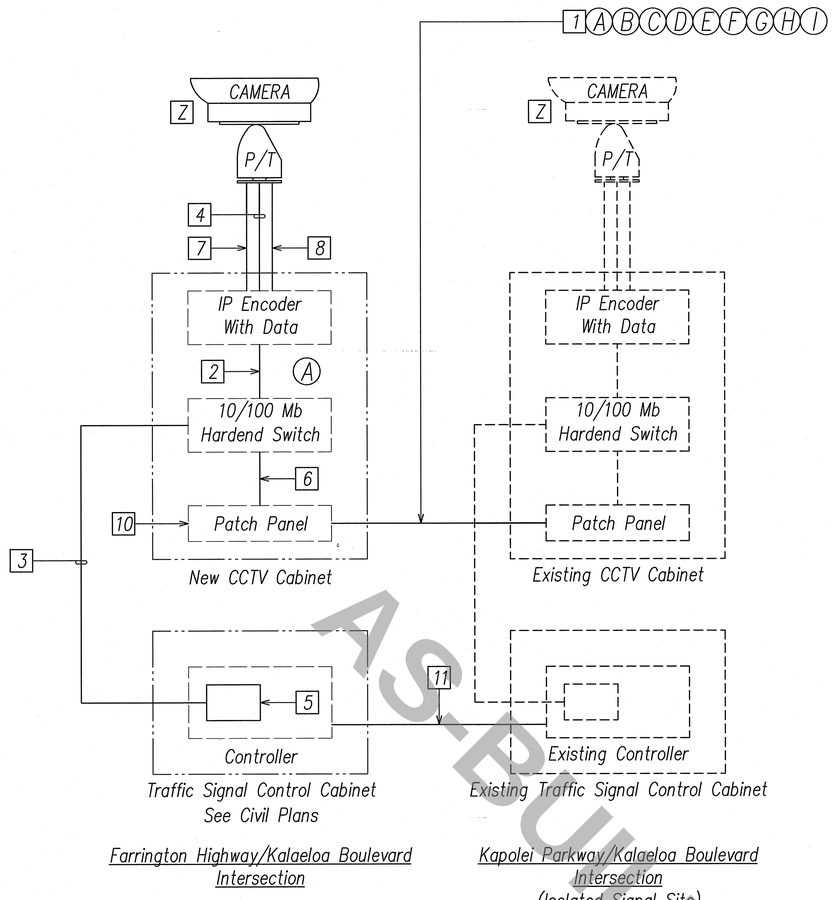
[7] One 2 Pair #18 Cable With Sun Resistant Jacket For Camera Controls.

[8] Coaxial Video Cable With Sun Resistant Jacket.

[9] 24-Strand Single Mode Fiber Optic Cable.

[10] 72 Port Patch Panel. In A Splice Tray, Fusion Splice ST Connectors To Each Fiber. Connect Fibers To Back Of Patch Panel Using The ST Connectors.

[11] One 12-Pair #19 Interconnect Cable.



CCTV BLOCK DIAGRAM
NOT TO SCALE

AS-BUILT

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
CCTV BLOCK DIAGRAM

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EJ-9 OF 161 SHEETS

DATE	REVISION

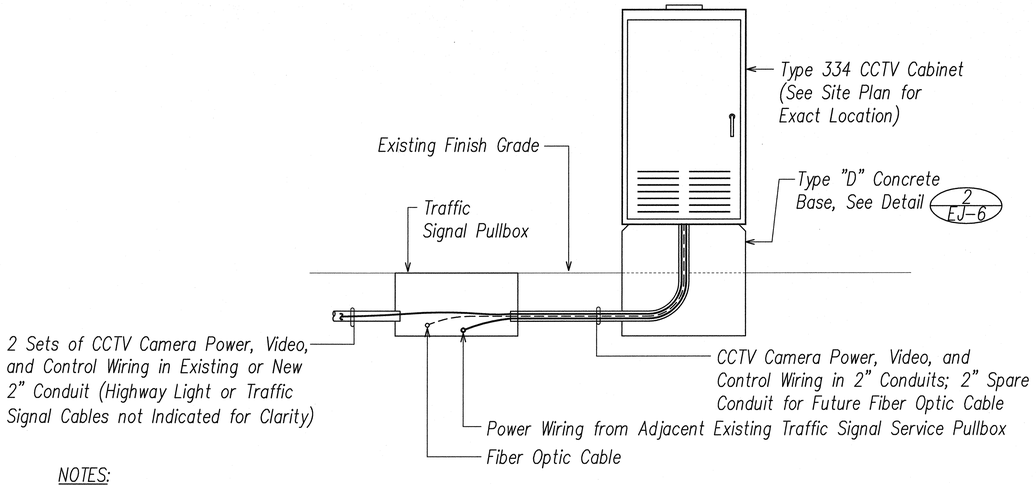
ORIGINAL PLAN
NOTE BOOK No.
SURVEY PLOTTED BY DATE
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY

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"AS-BUILT"

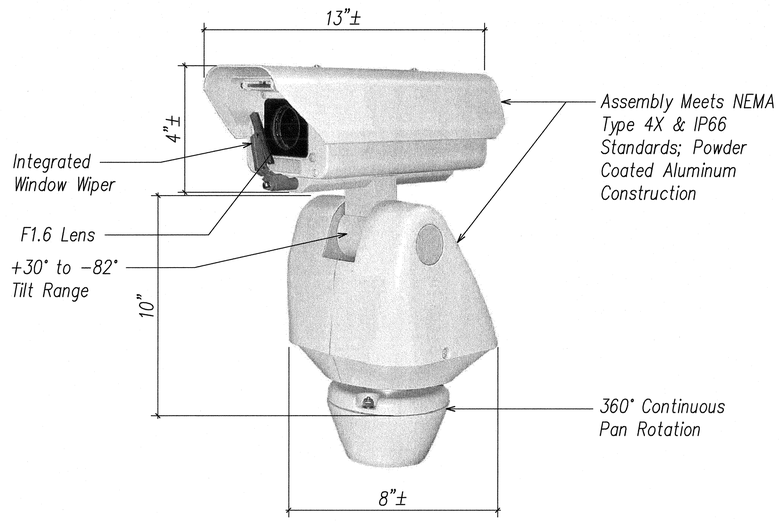
C.O. 516S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	517	524



NOTES:
1. Coordinate aimimg of camera with the City Department of Transporation Services.

1/EJ-4 **CCTV CABINET DETAIL**
NOT TO SCALE



NOTES:
1. Digital position and zoom control feedback using "D" protocol.
2. UL Listed, rated for full continuious duty, CE Class B.
3. Assembly rated for 90 MPH operation.

2/EJ-4 **CCTV CAMERA DETAIL**
NOT TO SCALE

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.
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ANDREW L. MIYASATO
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No. 4940-E
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THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV SYSTEM DETAILS 1

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

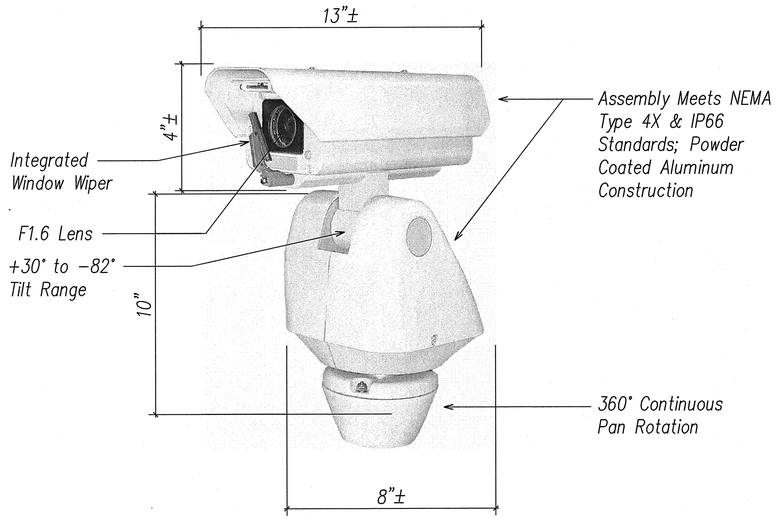
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517

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015		524

C.O. 517S-1

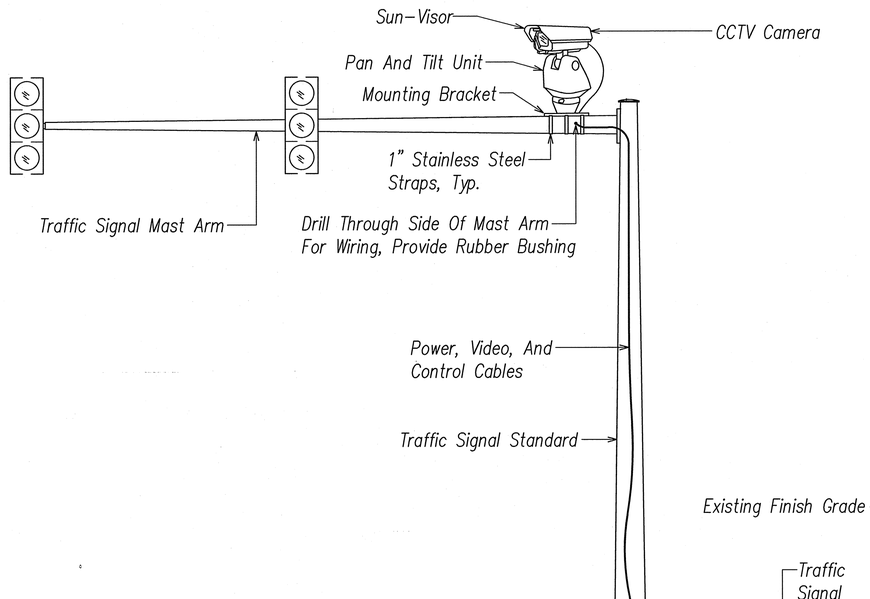


NOTES:

1. Digital Position And Zoom Control Feedback Using "D" Protocol.
2. UL Listed, Rated For Full Continuious Duty, CE Class B.
3. Assembly Rated For 90 MPH Operation.

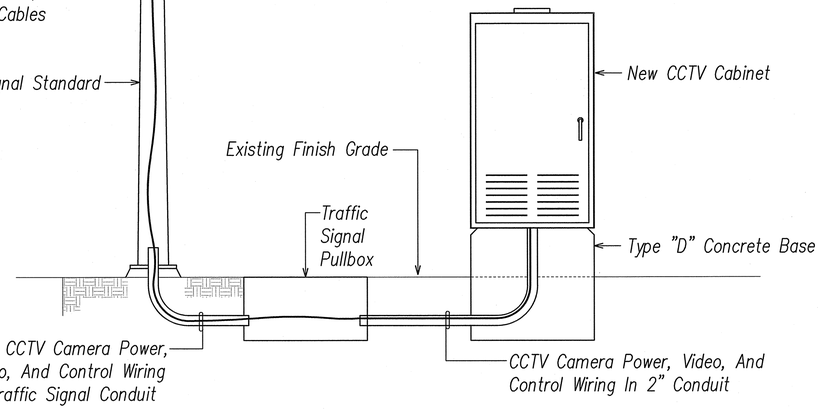
CCTV CAMERA DETAIL

NOT TO SCALE



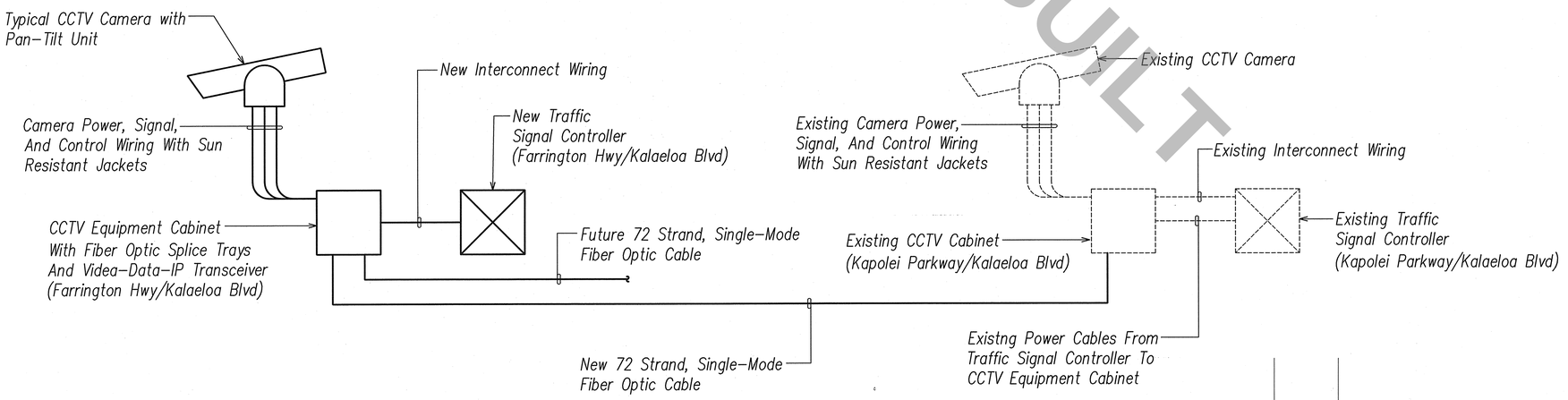
NOTES

1. Coordinate Aiming Of Camera With The City Department Of Transporation Services.



CCTV CAMERA MOUNTING DETAIL

NOT TO SCALE



CCTV TRAFFIC CAMERA SYSTEM DIAGRAM

NOT TO SCALE

AS-BUILT

STEVEN H. SAKAI
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SIGNATURE — APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV DETAILS I

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: Date: November 16, 2018

SHEET No. EJ-10 OF 161 SHEETS

DATE	REVISION

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

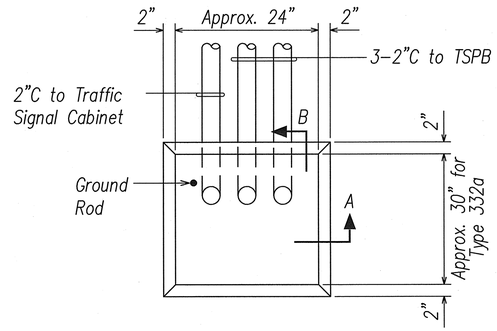
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"AS-BUILT"

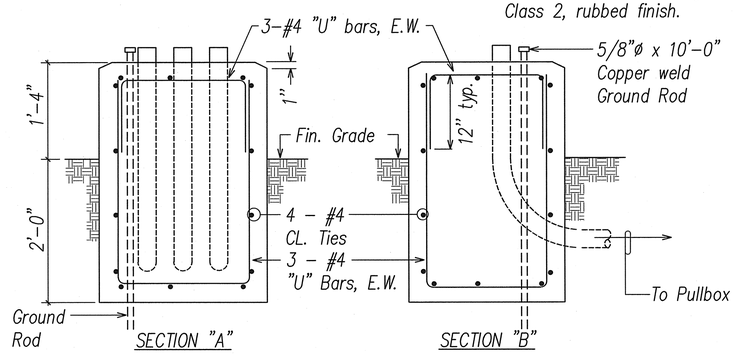
C.O. 517S-1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-H1-1(261)	2015		524

C.O. 517S-2



PLAN

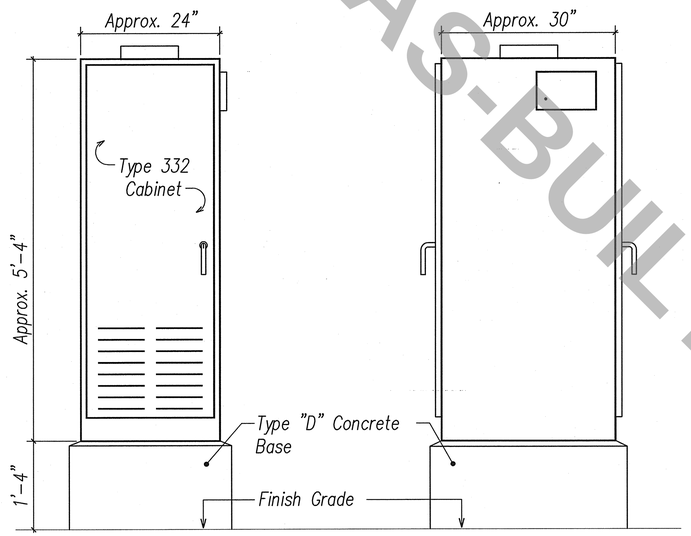


NOTES:

1. Concrete shall be Class "A".
2. Dimensions shall be altered to suit CCTV cabinet actually furnished.
3. Conduit bends and drain are incidental to concrete base.
4. Refer to cabinet manufacturer's specifications for details of anchor bolts and base setting.
5. All exposed surfaces of concrete base shall be given a Class 2, rubbed finish.

TYPE "D" CONCRETE BASE DETAIL

NOT TO SCALE



FRONT VIEW SIDE VIEW

TYPE 332A CCTV CABINET DETAIL

NOT TO SCALE

AS-BUILT

STEVEN H. SAKAI LICENSED PROFESSIONAL ENGINEER No. 7637-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

SIGNATURE APRIL 30, 2020 LIC. EXP. DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV DETAILS II

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-H1-1 (261)

Scale: Date: November 16, 2018

SHEET No. EJ-11 OF 161 SHEETS

DATE	REVISION

ORIGINAL PLAN
NOTE BOOK No.

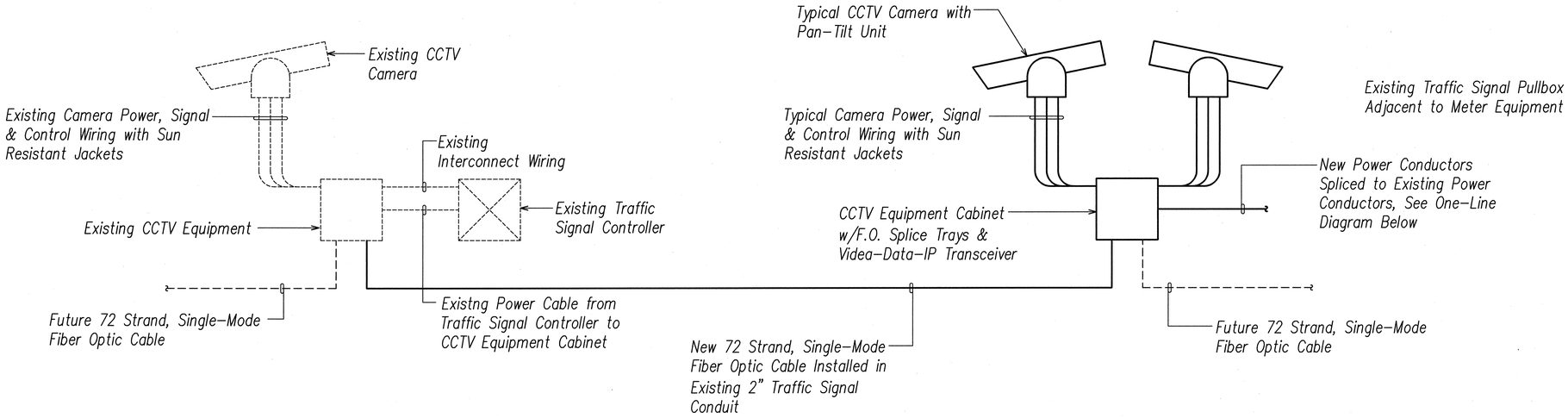
SURVEY PLOTTED BY
DRAWN BY
TRACED BY
DESIGNED BY
QUANTITIES BY
CHECKED BY
DATE

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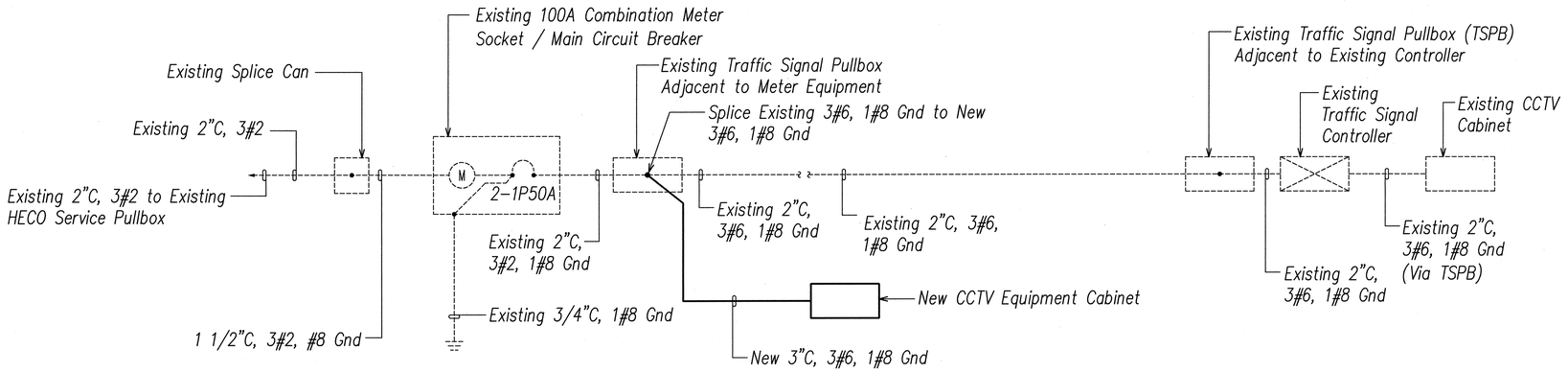
"AS-BUILT"

C.O. 517S-2

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	518	524



1 / EJ-5 **CCTV TRAFFIC CAMERA SYSTEM DIAGRAM**



2 / EJ-5 **NEW CCTV SYSTEM ONE-LINE DIAGRAM**

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV SYSTEM DETAILS 2

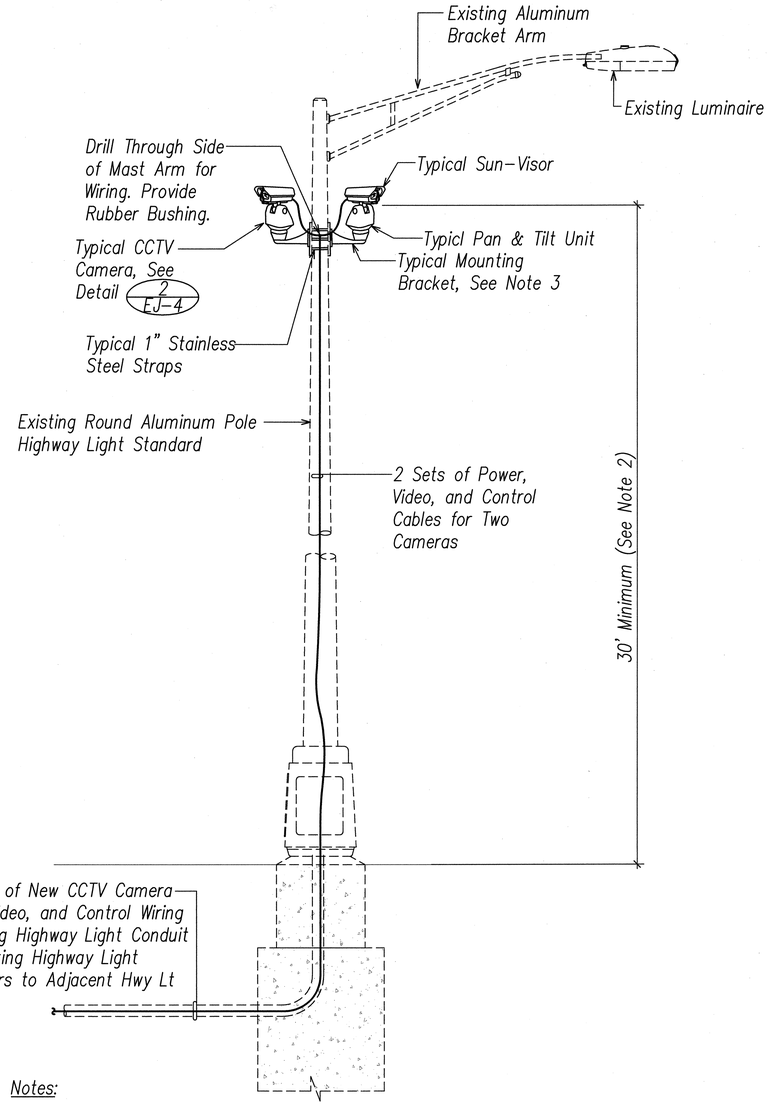
INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EJ-5 OF 161 SHEETS

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160
FILE PATH: Z:\Acad\PROJECTS\29053\ej\D05_29053_cctv_details_II.dwg CAD USER: andy PLOT DATE: 2015.02.18

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	IM-HI-1(261)	2015	519	524

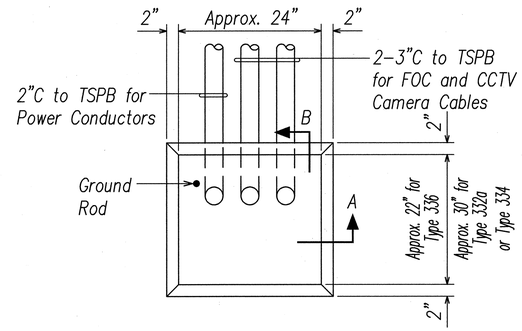


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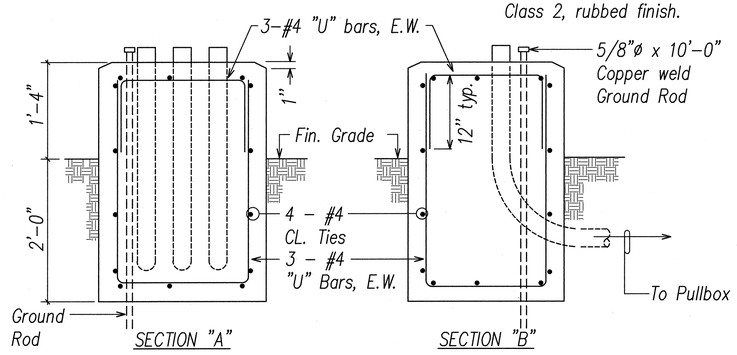
1. Coordinate Aiming of All Cameras with the State Department of Transportation.
2. Confirm Mounting Heights with the State DOT and Adjust Mounting Height as Required to Provide Required Coverage.
3. Camera shall be Mounted Level, and Provide a Level View of the Horizon. An Appropriate Mounting Bracket shall be Furnished to Provide the Required View.

1/EJ-6 NEW CCTV CAMERA MOUNTING DETAIL ON EXISTING HIGHWAY LIGHT STANDARD

NOT TO SCALE



PLAN



NOTES:

1. Concrete shall be Class "A".
2. Dimensions shall be altered to suit CCTV cabinet actually furnished.
3. Conduit bends and drain are incidental to concrete base.
4. Refer to cabinet manufacturer's specifications for details of anchor bolts and base setting.
5. All exposed surfaces of concrete base shall be given a Class 2, rubbed finish.

2/EJ-6 TYPE "D" CONCRETE BASE DETAIL

NOT TO SCALE

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

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

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Signature 2015.02.18
License Exp. Date: 04.30.2016

STATE OF HAWAI'I
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CCTV SYSTEM DETAILS 3

INTERSTATE ROUTE H-1
ADDITION AND MODIFICATION OF FREEWAY ACCESS
(Kapolei Interchange Complex), Phase 2
Federal-Aid Project No. IM-HI-1 (261)

Scale: As Noted Date: January 20, 2015

SHEET No. EJ-6 OF 161 SHEETS

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