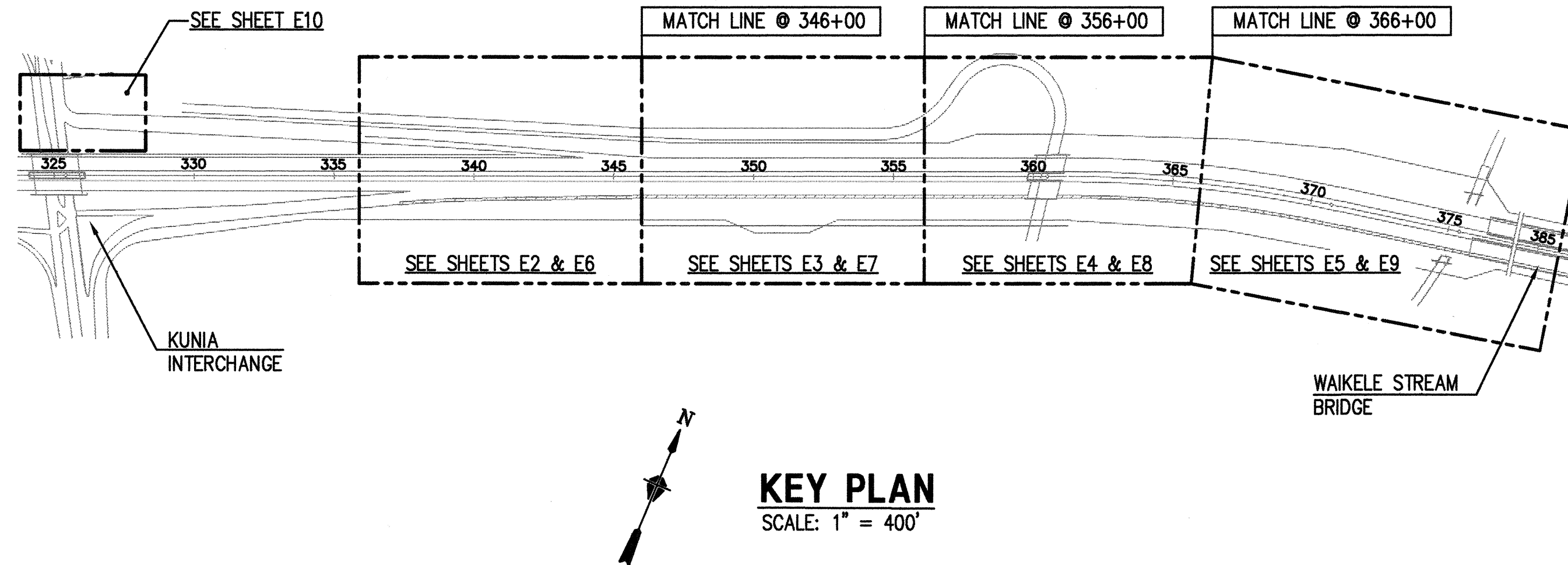
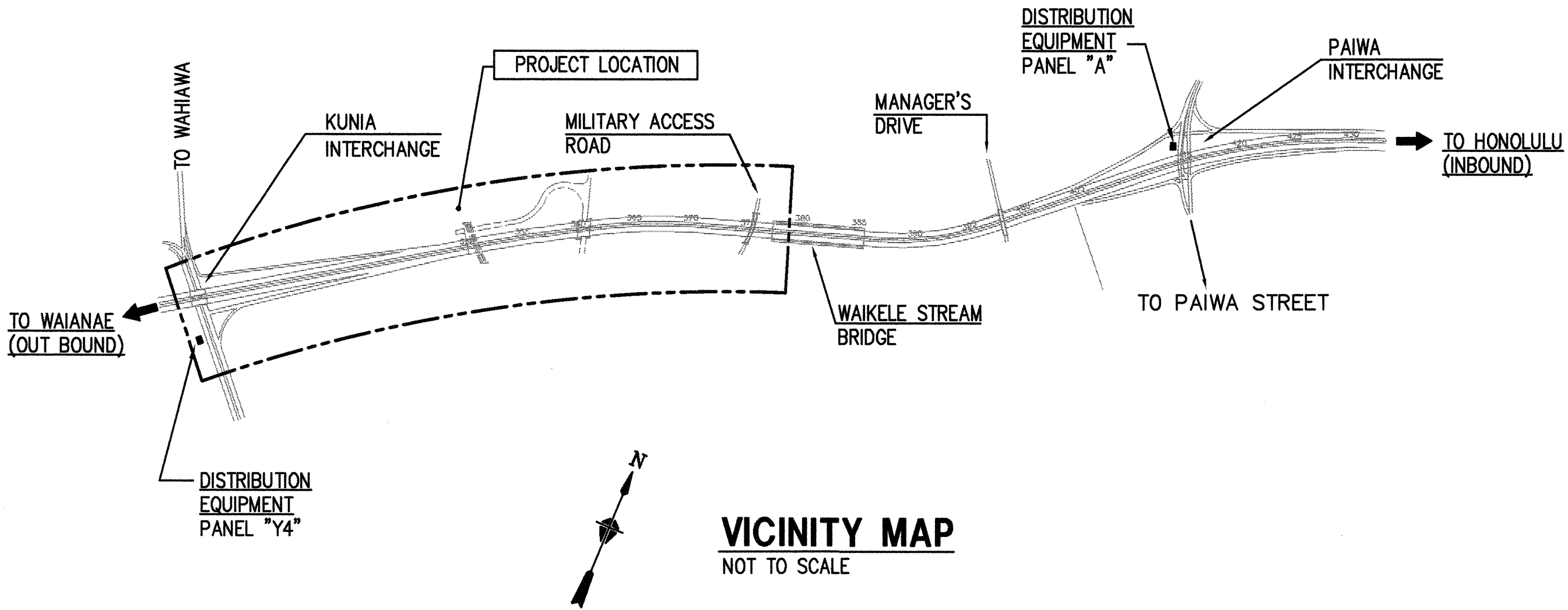


FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	57	84

HIGHWAY LIGHTING NOTES:

1. THE REGISTERED MASTER ELECTRICIAN SHALL BE RESPONSIBLE FOR COORDINATING WITH ELECTRICAL MAINTENANCE SECTION OF DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY DIVISION 72 HOURS IN ADVANCE BEFORE SCHEDULING ANY ENERGIZATION OR DE-ENERGIZATION OF EXISTING HIGHWAY LIGHTING SYSTEM. PHONE: 548-4077
2. ALL LUMINAIRES SHALL BE HIGH PRESSURE SODIUM TYPE WITH WATTAGE AND I.E.S. TYPE LIGHT DISTRIBUTION AS SHOWN ON THE APPROVED PLANS.
3. THE CONTRACTOR SHALL HAVE ONE SET OF APPROVED PLANS AT JOB SITE AT ALL TIMES DURING THE CONSTRUCTION WORK. RECORD ALL CHANGES THAT OCCUR IN CONSTRUCTION OF HIGHWAY LIGHTING SYSTEM.
4. FINAL ACCEPTANCE AND INSPECTION WILL BE UNDERTAKEN ONLY AFTER ALL WORK HAS BEEN COMPLETED.
5. THE CONTRACTOR SHALL MEASURE AND RECORD GROUND RESISTANCE AT EACH STANDARD AND SUBMIT RECORDED GROUND RESISTANCE TO TRAFFIC SECTION, AND OAHU DISTRICT MAINTENANCE SECTION, DEPARTMENT OF TRANSPORTATION, STATE HIGHWAY. THE REGISTERED MASTER ELECTRICIAN SHALL CERTIFY ALL ELECTRICAL TESTS, INCLUDING BUT NOT LIMITED TO: CONTINUITY TEST AND THE GROUND ROD RESISTANT TEST PRIOR TO SUBMISSION TO THE DISTRICT ENGINEER.
6. CONSTRUCTION WORK SHALL BE SCHEDULED IN SUCH A MANNER THAT HIGHWAY LIGHTING IS PROVIDED DURING ALL HOURS OF DARKNESS EITHER WITH NEW OR EXISTING LUMINAIRES OR A COMBINATION THEREOF TEMPORARY CONNECTIONS SHALL BE MADE TO ACCOMPLISH THIS END. THE CONTINUITY OF HIGHWAY LIGHTING CIRCUITS SHALL BE MAINTAINED THROUGH CONSTRUCTION.
7. WHERE EXISTING HIGHWAY LIGHTING LUMINAIRES ON METAL STANDARDS ARE INDICATED TO BE REMOVED, THE LUMINAIRE AND POLE SHALL BE REMOVED AND DISPOSED OF BY THE CONTRACTOR. THE FOUNDATION SHALL BE DEMOLISHED TO 24" BELOW GRADE AND THE SURFACES AFFECTED SHALL BE RESTORED TO MATCH THE SURROUNDINGS.
8. NEW POLE LOCATIONS SHALL BE STAKED AND APPROVAL OF LOCATIONS SHALL BE OBTAINED FROM THE ENGINEER BEFORE INSTALLATION. POLE LOCATIONS IN THE FIELD WILL BE REQUIRED TO CLEAR UNDERGROUND AND AERIAL UTILITY LINES.
9. THE CONTRACTOR SHALL, AT HIS EXPENSE, KEEP THE PROJECT AND SURROUNDING AREA FREE FROM DUST NUISANCE AND SHALL BE RESPONSIBLE FOR CLEANING AND REMOVAL OF ALL SILT AND DEBRIS GENERATED BY THE EXCAVATION WORK AND DEPOSITED AND ACCUMULATED WITHIN DOWNSTREAM WATERWAYS, DITCHES, DRAIN PIPES AND ON PUBLIC ROADWAYS. ANY CITATIONS (FINES) RECEIVED BY THE STATE FOR THE CONTRACTOR'S NONCOMPLIANCE OF ANY DEPARTMENT OF HEALTH REGULATIONS SHALL BE DEDUCTED FROM THE PROGRESS PAYMENT.
10. THE CONTRACTOR SHALL LOCATE EXISTING BURIED UTILITY LINES IN THE VICINITY OF THE EXCAVATION WORK PRIOR TO COMMENCING EXCAVATION, AS A MINIMUM, AN ELECTRONIC MAGNETIC DEVICE FOR DETECTION OF BURIED LINES SHALL BE UTILIZED PRIOR TO EXCAVATION. TRENCHES SHALL BE EXCAVATED WITH CARE. THE CONTRACTOR SHALL BE RESPONSIBLE FOR DAMAGES TO EXISTING UTILITIES RESULTING FROM HIS NEGLIGENCE AND SHALL BEAR COST OF REPAIRS TO THE UTILITIES. METHOD OF REPAIR SHALL BE DETERMINED BY THE STATE.
11. THE CONTRACTOR SHALL RECONNECT ELECTRICAL POWER TO ALL EXISTING SIGN LIGHTING FIXTURES. THE CONTRACTOR SHALL PROVIDE ADDITIONAL WIRING AND CONDUIT AS REQUIRED FOR AN OPERATIONAL SYSTEM, AT NO ADDITIONAL COST TO THE STATE.
12. AFTER THE EXACT LOCATION OF THE LIGHTING POLE BASE IS DETERMINED, PLACE 2" x 2" x 18" HUBS AT THESE LOCATIONS TO INFORM THE CONTRACTING OFFICER OF FINAL LOCATION. OBTAIN APPROVAL PRIOR TO CONSTRUCTION OF LIGHT BASES. ACTUAL FIELD CONDITIONS MAY DIFFER FROM THAT SHOWN ON THESE DRAWINGS. USE EXTREME CAUTION WHEN EXCAVATING FOR NEW DUCTLINES.
13. THE ELECTRICAL CONTRACTOR SHALL HAVE PERSONNEL ON THE PROJECT THAT COMPLY WITH THE FOLLOWING QUALIFICATIONS:
 - a. ONE (1) REGISTERED MASTER ELECTRICIAN IN THE COMPANY.
 - b. CERTIFIED JOURNEYMAN ELECTRICIAN AT EACH CONSTRUCTION LOCATION TO PERFORM SPLICING OF CABLES AND ALL REQUIRED WRING WORK.



HIGHWAY LIGHT STANDARD IDENTIFICATION STANDARD

LEGEND	DESCRIPTION
1 121+93	STATION NUMBER
2 2, CKT #3	STREET LIGHT POLE NUMBER, CIRCUIT NUMBER (VERIFY LIGHT AND POLE NO. WITH D.O.T.)
3 14'	POLE CLEAR SETBACK FROM EDGE OF PAVEMENT, SEE NOTE NO. 1 BELOW
4 15'	LUMINAIRE ARM SPAN IN FEET
5 TB	POLE BASE MOUNTING TYPE, SEE NOTE NO. 2 BELOW
6 35'	LUMINAIRE MOUNTING HEIGHT ABOVE PAVEMENT

SYMBOL NOTES:

1. "BGR" INDICATES SETBACK IS BEHIND GUARD RAIL.
2. "TB" INDICATES BREAKAWAY TRANSFORMER BASE MOUNTING.

ELECTRICAL SYMBOL LIST

SYMBOL	DESCRIPTION
	EXISTING HIGHWAY LIGHTING LUMINAIRE ON POLE STANDARD
	NEW HIGHWAY LIGHTING LUMINAIRE ON POLE STANDARD
	EXISTING UNDERGROUND DUCT LINE (HIGHWAY LIGHTING)
	EXISTING UNDERGROUND DUCT LINE (STREET LIGHTING)
	NEW UNDERGROUND DUCT LINE (HIGHWAY LIGHTING) DIRECT BURIED CONDUIT UNLESS NOTED
	EXISTING EXPOSED CONDUIT (HIGHWAY LIGHTING)
	EXISTING JUNCTION BOX
	EXISTING PULLBOX
	NEW PULLBOX, TYPE "A"
	EXISTING HIGHWAY LIGHTING SERVICE EQUIPMENT
	DUCT INDICATOR, SEE DUCT SCHEDULE ON SHEET E10
	NOTE INDICATOR
	DETAIL INDICATOR: TOP LETTER/NUMBER DENOTES DETAIL I.D. AND BOTTOM NUMBER DENOTES SHEET NUMBER.
	DENOTES DEMOLITION/REMOVAL

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Glenn Karamtsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

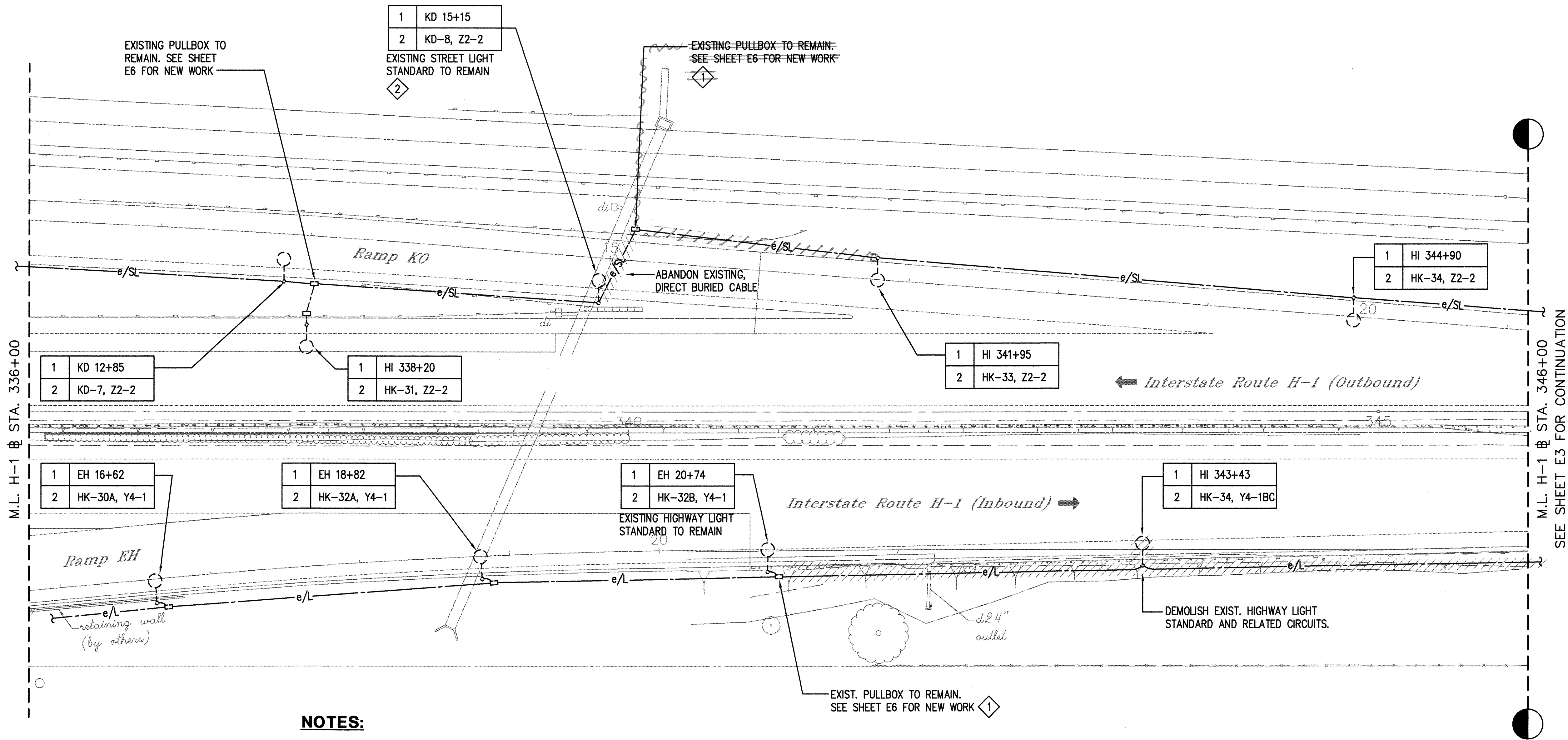
ELECTRICAL SYMBOL LIST/HIGHWAY LIGHTING NOTES/VICINITY MAP/KEY PLAN/HIGHWAY LIGHT STANDARD IDENTIFICATION LEGEND

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waikale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: AS NOTED Date: 4/30/99

SHEET NO. E1 OF E17 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	58	84

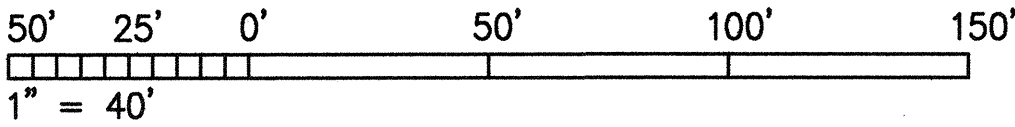


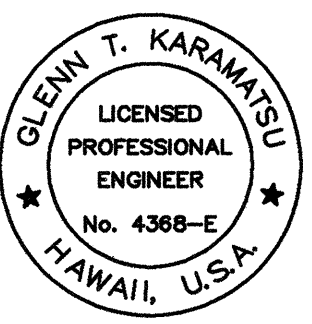
NOTES:

1. TERMINATE EXIST. CIRCUIT IN PULLBOX. PREPARE EXISTING CONDUCTORS FOR RECONNECTION TO NEW CIRCUITS.
2. TERMINATE FEED THRU CABLE IN TRANSFORMER BASE. EXISTING FEED THRU CABLE MAY BE USED FOR TEMPORARY LIGHTING SYSTEM.

PARTIAL HIGHWAY LIGHTING PLAN I - DEMOLITION
SCALE: 1" = 40'

GRAPHIC SCALE



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	PARTIAL HIGHWAY LIGHTING PLAN I - DEMOLITION	
	INTERSTATE ROUTE H-1 RESURFACING Kunia IC to Waikale Stream Bridge FAIP No. NH-H1-1(235)	
	Scale: 1"=40'	Date: 4/30/99

SHEET NO. E2 OF E17 SHEETS

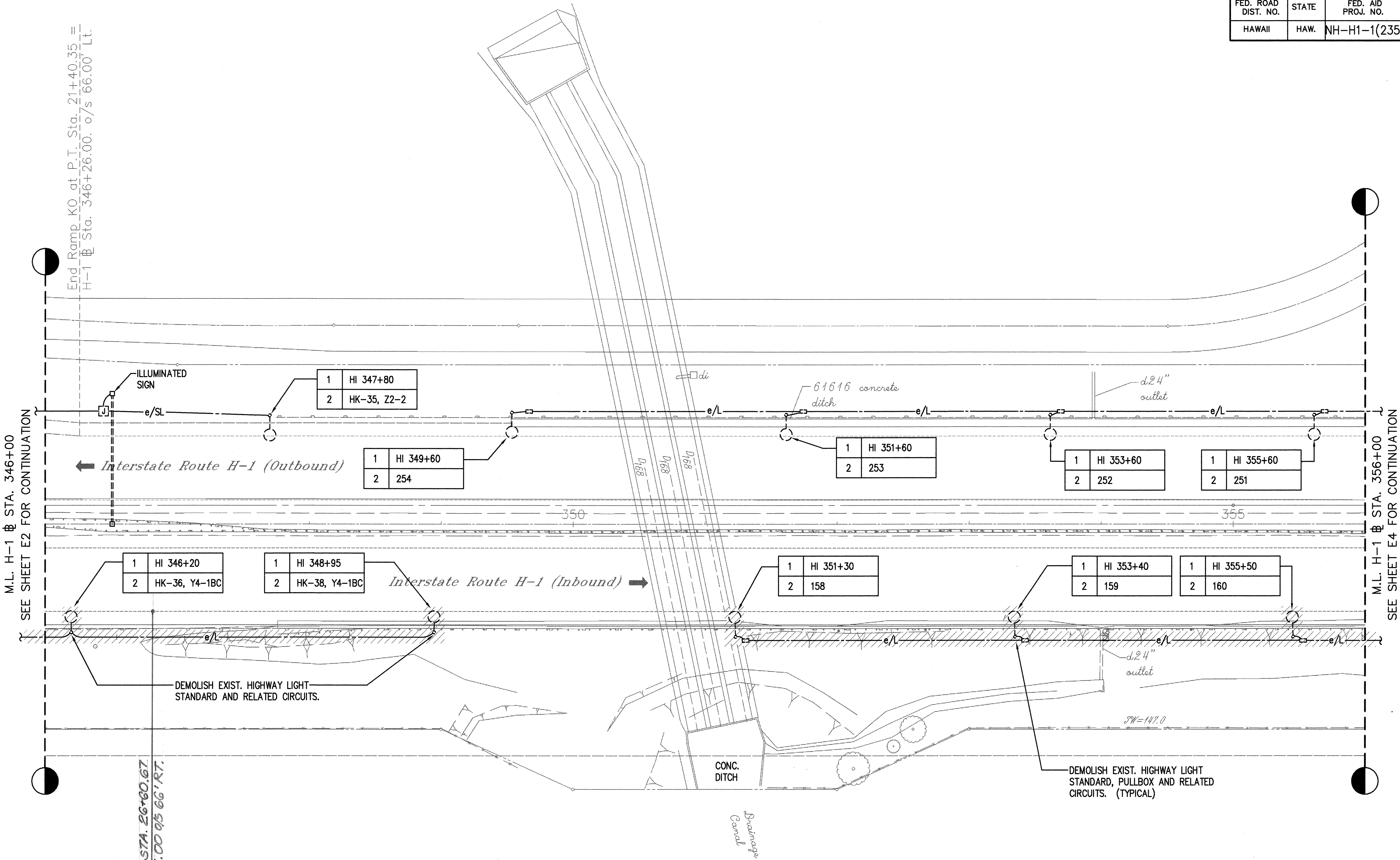
"AS-BUILT"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOVEMBER	DRAWN BY	
	QUANTIFIED BY	
	CHECKED BY	

DATE: 1"=40'
SCALE: 103-4e02
FILE:

PM: OPER: REVISED:

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	59	84



ORIGINAL PLAN	DATE
NOVEMBER	
CHECKED BY	
QUANTITIES BY	
DESIGNED BY	
DRAWN BY	
SURVEY PLOTTED BY	

DATE: 11/30/99
SCALE: 1"=40'
FILE: 103-4e03

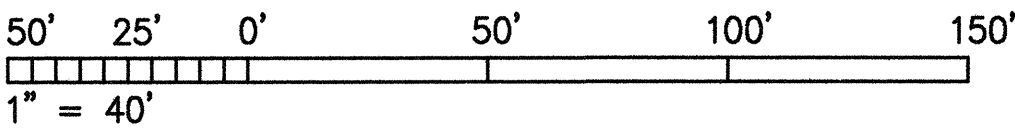
PN: OPER: REVISD:

END RAMP KE @ STA. 26+60.67
H-1 @ STA. 346+31.00 o/s 66' RT.

PARTIAL HIGHWAY LIGHTING PLAN II - DEMOLITION

SCALE: 1" = 40'

GRAPHIC SCALE



GLENN T. KARAMTSU
LICENSED PROFESSIONAL ENGINEER
No. 4388-E
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL HIGHWAY LIGHTING
PLAN II - DEMOLITION**

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

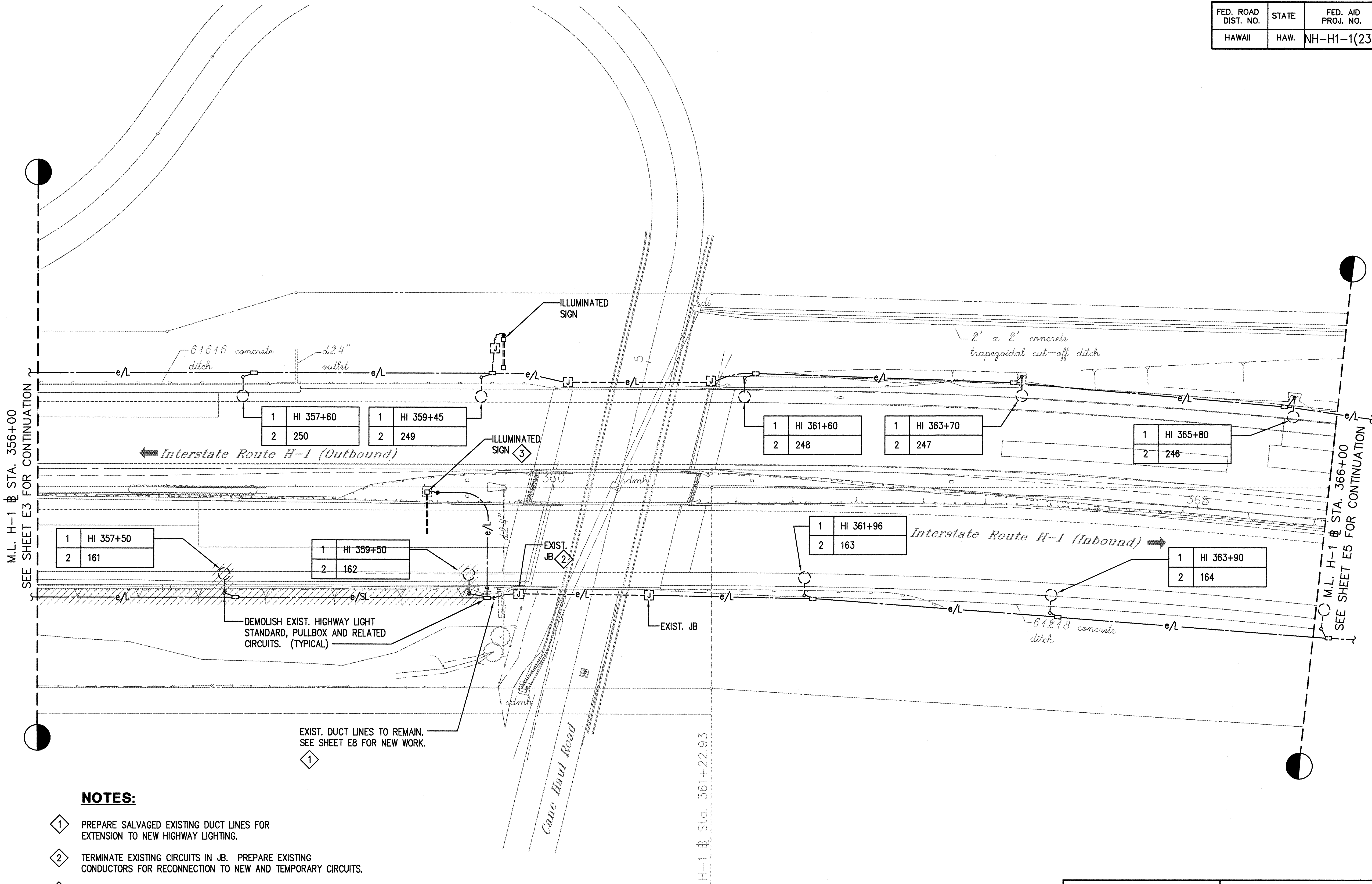
SHEET NO. E3 OF E17 SHEETS

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"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	60	84

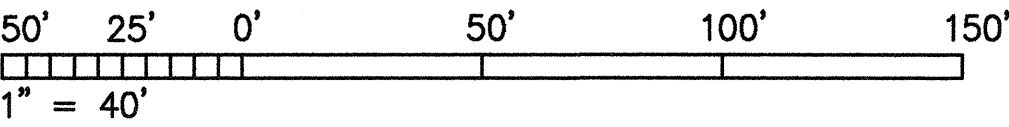


NOTES:

- 1. PREPARE SALVAGED EXISTING DUCT LINES FOR EXTENSION TO NEW HIGHWAY LIGHTING.
- 2. TERMINATE EXISTING CIRCUITS IN JB. PREPARE EXISTING CONDUCTORS FOR RECONNECTION TO NEW AND TEMPORARY CIRCUITS.
- 3. PROTECT EXISTING DUCT LINE FOR RECONNECTION TO NEW LIGHTING SEE E8.

PARTIAL HIGHWAY LIGHTING PLAN III - DEMOLITION
SCALE: 1" = 40'

GRAPHIC SCALE



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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL HIGHWAY LIGHTING
PLAN III - DEMOLITION**

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeke Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

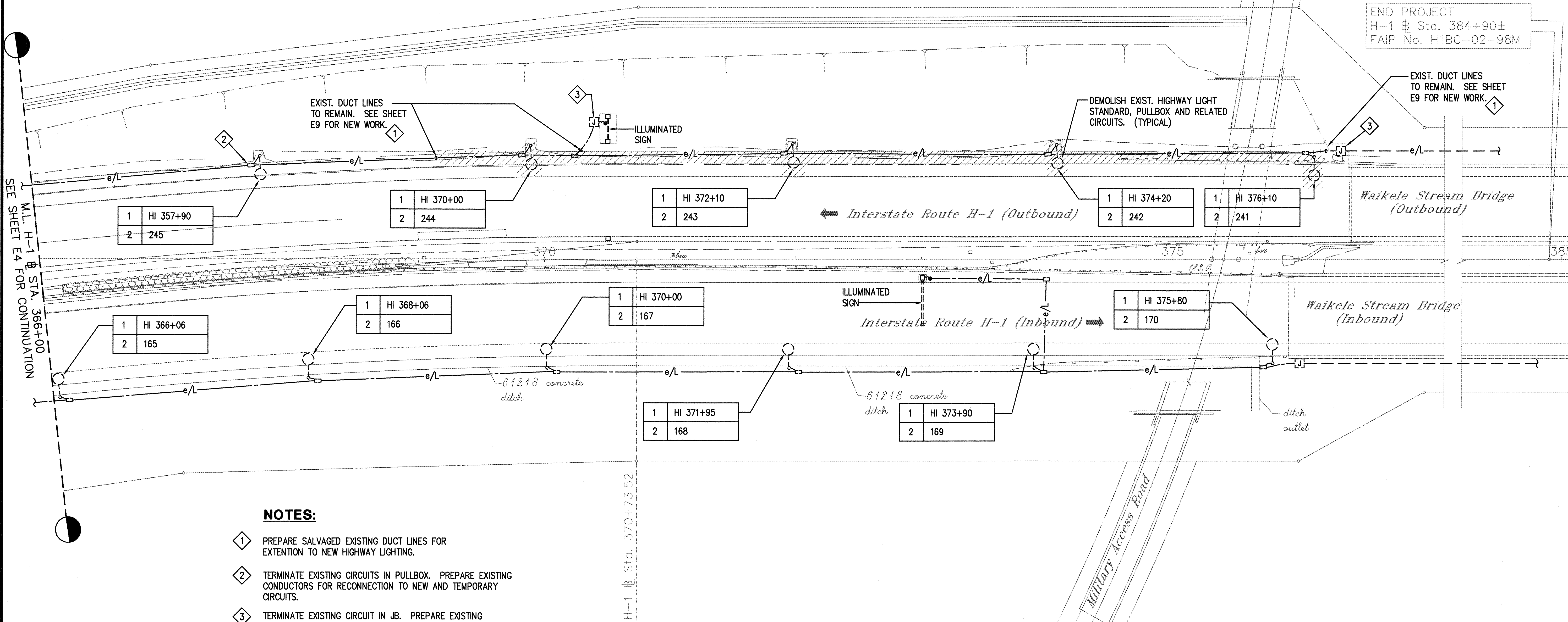
SHEET NO. E4 OF E17 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOVEMBER	DRAWN BY	
	CHECKED BY	
	QUANTITIES BY	
	FILED BY	

DATE: 1"=40'
SCALE: 103-4e04
FILE:

PM: OPER: REVISED:

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	61	84

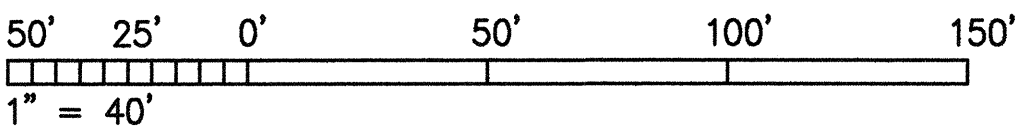


NOTES:

1. PREPARE SALVAGED EXISTING DUCT LINES FOR EXTENTION TO NEW HIGHWAY LIGHTING.
2. TERMINATE EXISTING CIRCUITS IN PULLBOX. PREPARE EXISTING CONDUCTORS FOR RECONNECTION TO NEW AND TEMPORARY CIRCUITS.
3. TERMINATE EXISTING CIRCUIT IN JB. PREPARE EXISTING CONDUCTORS FOR RECONNECTION TO NEW AND TEMPORARY CIRCUIT.

PARTIAL HIGHWAY LIGHTING PLAN IV - DEMOLITION
SCALE: 1" = 40'

GRAPHIC SCALE



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Glenn Karamitsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL HIGHWAY LIGHTING
PLAN IV - DEMOLITION**

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waikele Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

SHEET NO. E5 OF E17 SHEETS

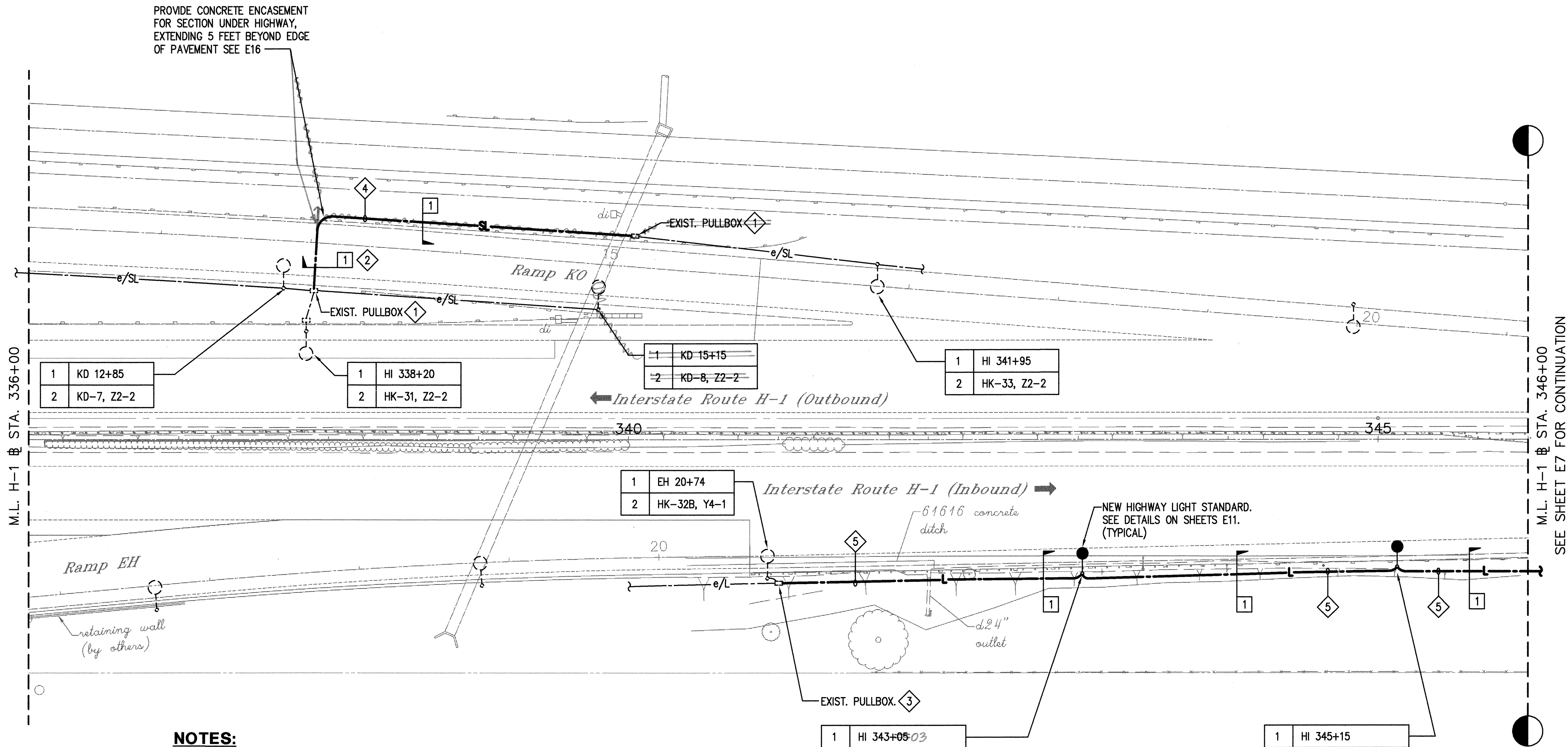
SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITIES BY	
CHECKED BY	
NO.	

DATE: 10-3-46
SCALE: 1"=40'
FILE: 103-4605

PM: OPER: REVISED:

SEE SHEET E4 FOR CONTINUATION
M.L. H-1 @ STA. 366+00

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	62	84

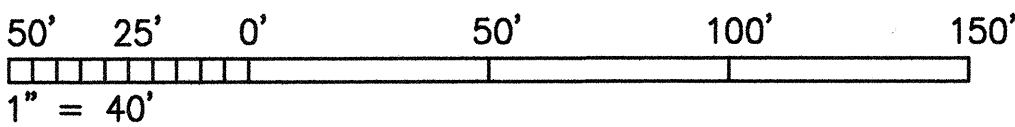


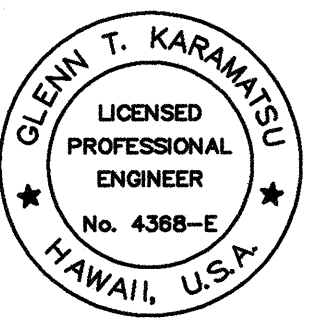
NOTES:

1. PROVIDE NEW DUCT LINE FROM EXISTING PULLBOX TO PULLBOX FOR EXISTING STREET LIGHT STANDARD. INTERCEPT EXISTING CIRCUIT IN PULLBOX AND EXTEND TO MAINTAIN CIRCUIT CONTINUITY.
2. OFF RAMP MUST BE OPEN TO TRAFFIC AT ALL TIMES. PROVIDE ONE HALF OF DUCT CROSSING AT A TIME. SEE TRAFFIC CONTROL PLANS.
3. EXTEND NEW DUCT LINE AND CIRCUIT FROM EXISTING PULLBOX TO RESTORE CIRCUIT CONTINUITY.
4. 2#1/0 RHW-USE, #6 GND (240V, 1Ø)
5. 2#1/0 RHW-USE, #6 GND (480V, 1Ø)
6. SEE SHEET E10 FOR DUCT SCHEDULE.

PARTIAL HIGHWAY LIGHTING PLAN I - NEW
SCALE: 1" = 40'

GRAPHIC SCALE





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Glenn Karamtsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL HIGHWAY LIGHTING PLAN I - NEW

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

SHEET NO. E6 OF E17 SHEETS

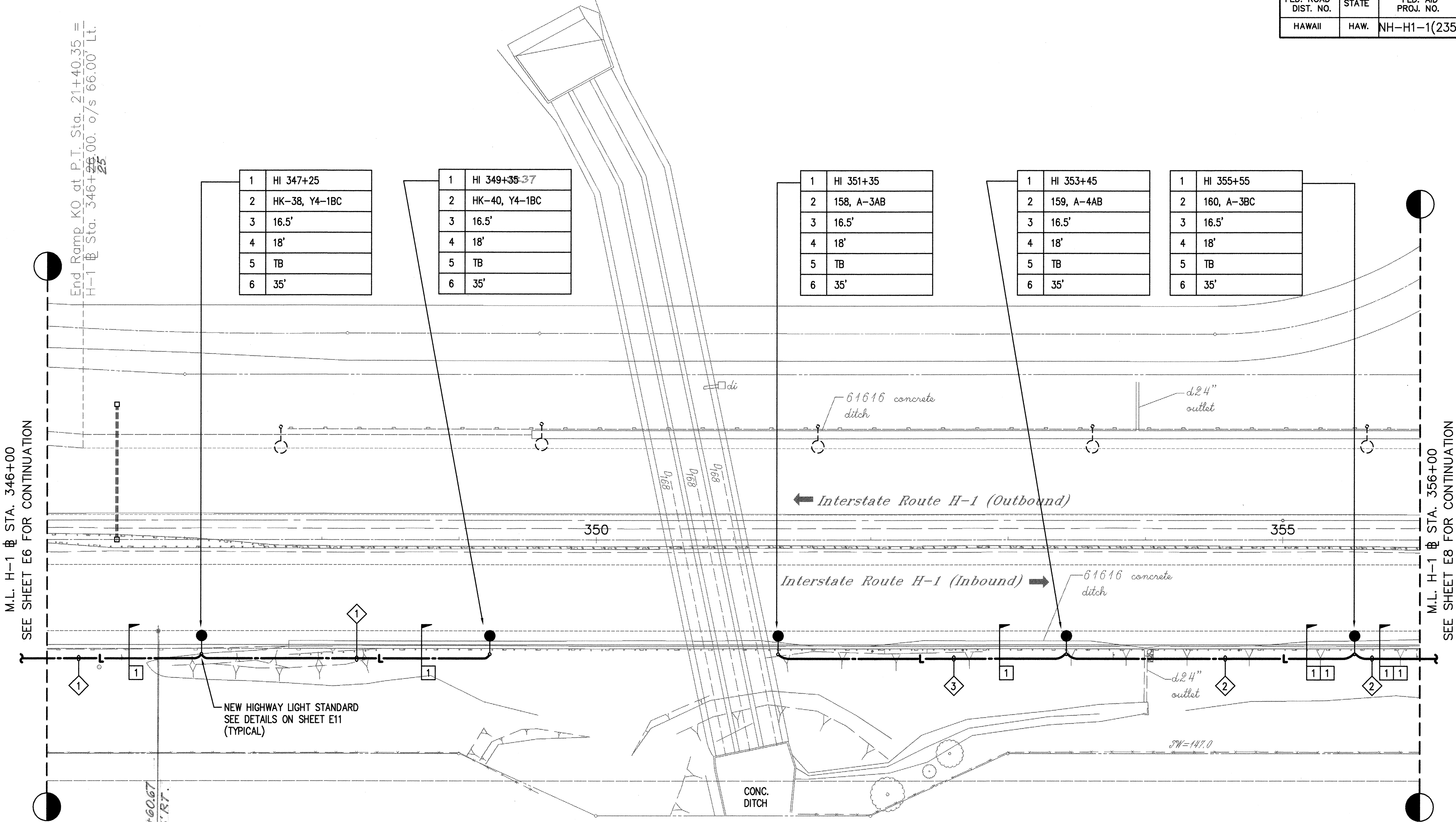
"AS-BUILT"

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NO. _____	_____	_____
NO. _____	_____	_____
NO. _____	_____	_____
NO. _____	_____	_____
NO. _____	_____	_____

DATE: 1"=40'
SCALE: 103-4e06
FILE:

PM: OPER: REVISD:

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	63	84



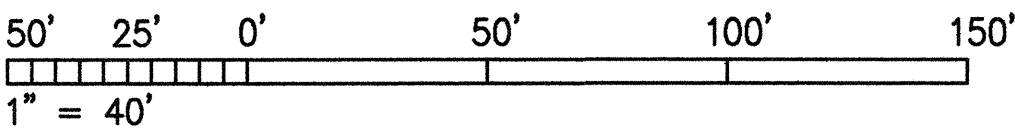
NOTES:

- 1 2#1/0 RHW-USE, #6 GND (480V, 1ø)
- 2 (2) 3#2 RHW-USE, #6 GND (480V, 3ø)
- 3 2#2 RHW-USE, #6 GND (480V, 1ø)
- 4 SEE SHEET E10 FOR DUCT SCHEDULE.

PARTIAL HIGHWAY LIGHTING PLAN II - NEW

SCALE: 1" = 40'

GRAPHIC SCALE



GLENN T. KARAMAN
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL HIGHWAY LIGHTING
PLAN II - NEW**

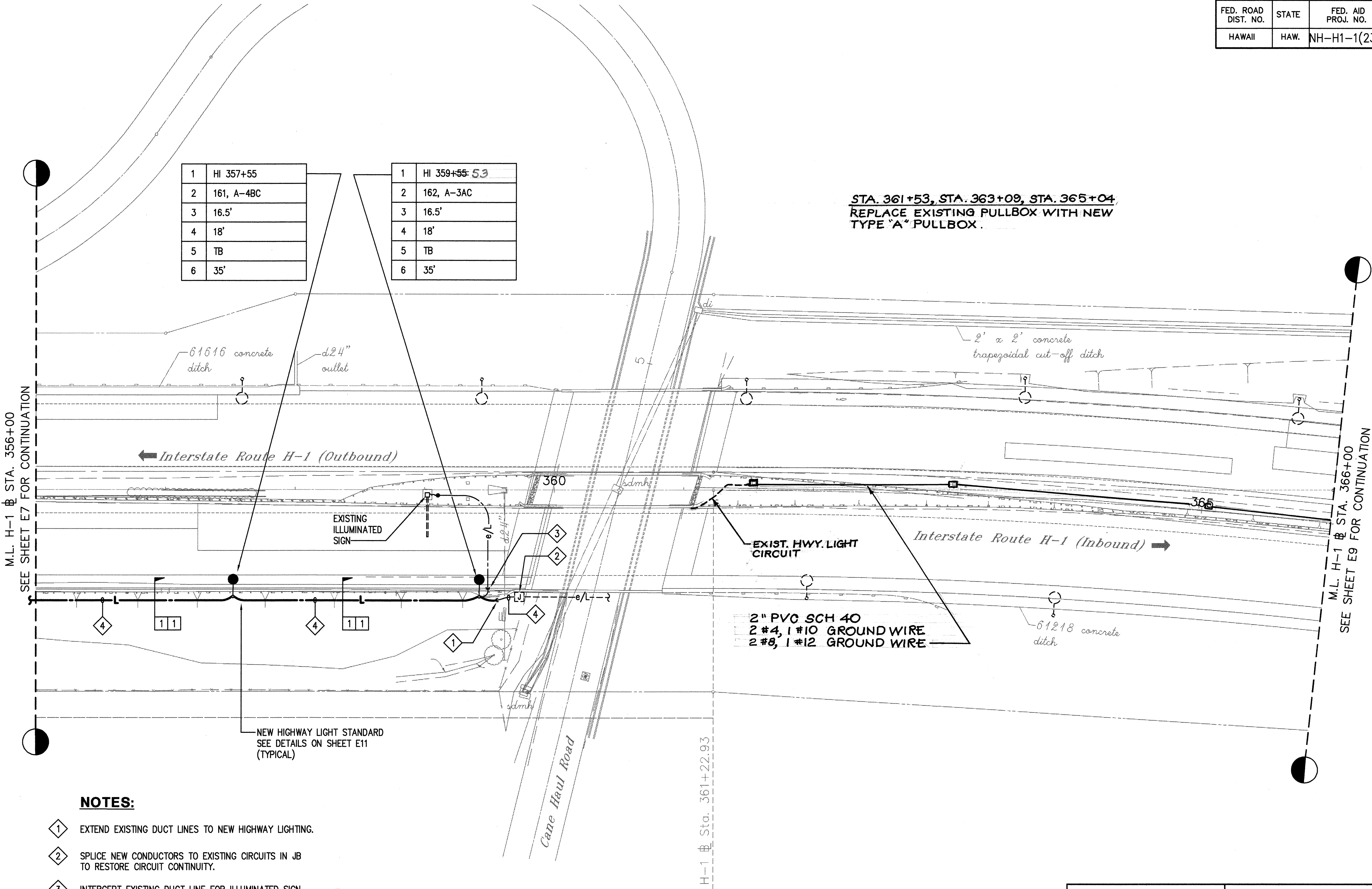
INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

SHEET NO. E7 OF E17 SHEETS

"AS-BUILT"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	64	84



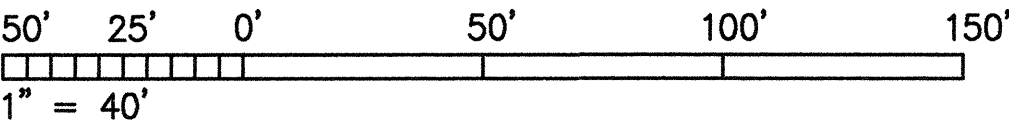
NOTES:

- 1 EXTEND EXISTING DUCT LINES TO NEW HIGHWAY LIGHTING.
- 2 SPLICE NEW CONDUCTORS TO EXISTING CIRCUITS IN JB TO RESTORE CIRCUIT CONTINUITY.
- 3 INTERCEPT EXISTING DUCT LINE FOR ILLUMINATED SIGN AND EXTEND TO NEW HIGHWAY LIGHT BASE. PROVIDE NEW CONDUCTORS TO ORIGINAL CIRCUIT TO RESTORE OPERATION.
- 4 (2) 3#2 RHW-USE, #6 GND (480V, 3ø) IN EXISTING DUCTS.
- 5 SEE SHEET E10 FOR DUCT SCHEDULE.

PARTIAL HIGHWAY LIGHTING PLAN III - NEW

SCALE: 1" = 40'

GRAPHIC SCALE



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Glenn Karamatsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL HIGHWAY LIGHTING
PLAN III - NEW**

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

SHEET NO. E8 OF E17 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
QUANTITY BY	
CHECKED BY	
ORIGINAL PLAN	
NOVEMBER	
FILE	

DATE: 11-4-99
SCALE: 1"=40'
FILE: 103-4e08

PM: OPER: REVISED:
DATE: 11-4-99
SCALE: 1"=40'
FILE: 103-4e08

"AS-BUILT"

C.O.64

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	65	84

1	HI 370+00
2	244, A-1AC
3	18'
4	18'
5	TB
6	35'

STA. 367+05, STA. 371+01, STA. 375+64, STA. 376+30
REPLACE EXIST. PULL BOX WITH NEW TYPE "A" PULL BOX.

1	HI 372+10
2	243, A-2AC
3	18'
4	18'
5	TB
6	35'

1	HI 374+20
2	242, A-1AB
3	18'
4	18'
5	TB
6	35'

END PROJECT
H-1 @ Sta. 384+90±
FAIP No. H1BC-02-98M

SEE SHEET E8 FOR CONTINUATION
M.L. H-1 @ STA. 366+00

2" PVC SCH 40
2 #4, 1 #10 GROUND WIRE
2 #8, 1 #12 GROUND WIRE

61218 concrete ditch

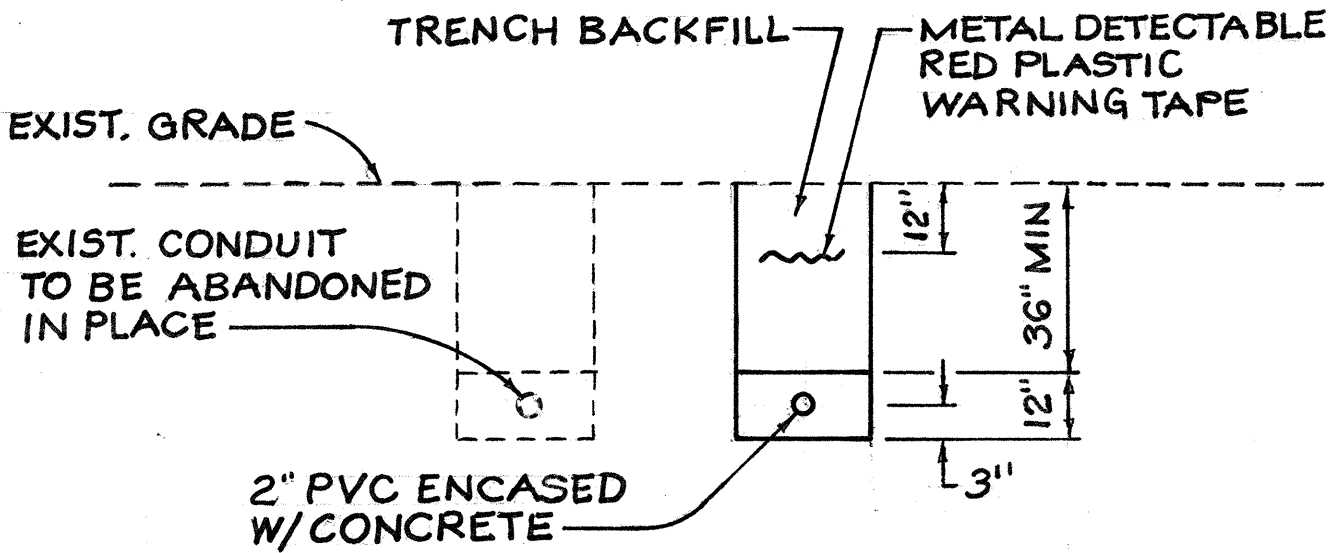
61218 concrete ditch

ditch outlet

1	HI 376+15.14
2	241, A-2AB
3	18'
4	18'
5	TB
6	35'

NOTES:

- 1 EXTEND EXISTING DUCT LINES TO NEW HIGHWAY LIGHTING.
- 2 SPLICE NEW CONDUCTORS TO EXISTING CIRCUITS IN PULLBOX TO RESTORE CIRCUIT CONTINUITY.
- 3 SPLICE NEW CONDUCTORS TO EXISTING CIRCUITS IN JB TO RESTORE CIRCUIT CONTINUITY.
- 4 (2) 3#2 RHW-USE, #6 GND (480V, 3Ø)
5. SEE SHEET E10 FOR DUCT SCHEDULE.

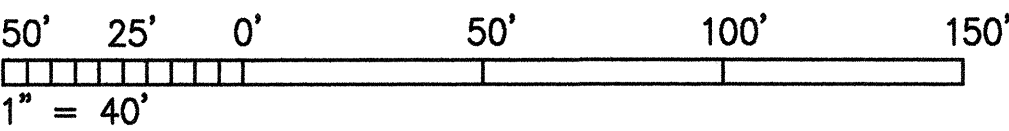


TYPICAL TRENCH DETAIL
N.T.S.

PARTIAL HIGHWAY LIGHTING PLAN IV - NEW

SCALE: 1" = 40'

GRAPHIC SCALE



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Glenn Karamatsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL HIGHWAY LIGHTING
PLAN IV - NEW**

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: 1"=40' Date: 4/30/99

SHEET NO. E9 OF E17 SHEETS

C.O. 65

ORIGINAL PLAN	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTITY BY	
CHECKED BY	
NO.	

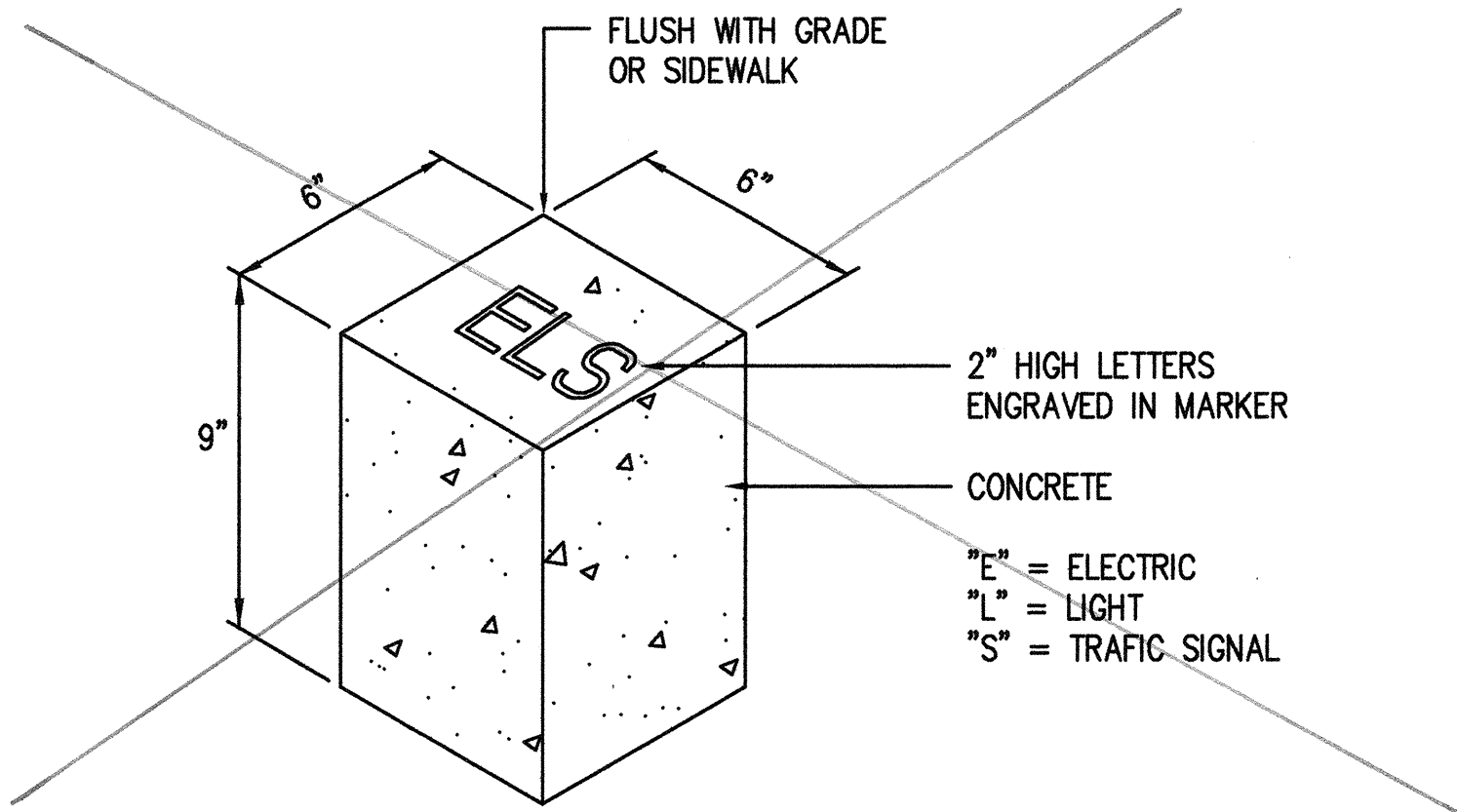
DATE: 1"=40'
SCALE: 103-4e09
FILE:

DATE: 1"=40'
SCALE: 103-4e09
FILE:

FILE NAME: 103-4e09

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	66	84

- NOTES:**
- OFF-RAMP MUST BE OPEN TO TRAFFIC AT ALL TIMES. PROVIDE ONE-HALF OF DUCT CROSSING AT A TIME. SEE TRAFFIC CONTROL PLANS.
 - THE UNDERGROUND PIPES, CABLES OR DUCT LINES KNOWN TO EXIST FROM AVAILABLE RECORD DRAWINGS ARE INDICATED ON THE PLAN. THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE UNDERGROUND UTILITIES AND EXERCISE PROPER CARE IN EXCAVATING THE AREA AFFECTED BY INSTALLATION OF NEW DUCT LINES.
 - STUB OUT AND CAP NEW DUCT LINES UNDER SIDEWALK. PROVIDE DUCT MARKER TO IDENTIFY STUB OUT LOCATION. SEE 2/E10.
 - STUB UP NEW DUCT LINE INTO EXISTING STREET LIGHT PULLBOX. REPAIR ANY DAMAGES TO SIDEWALK, CURB AND GUTTER.
 - PROVIDE CONCRETE ENCASEMENT UNDER ROADWAY, EXTENDING 5 FEET BEYOND EDGE OF PAVEMENT OR 1 FOOT BEYOND EDGE OF EXISTING CURB.



DUCT SCHEDULE	
TYPE	DESCRIPTION
1	2" PVC, SCHEDULE 80, DIRECT BURIED UNLESS NOTED OTHERWISE HIGHWAY LIGHT DUCT LINE
2	2" PVC, SCHEDULE 40, CONCRETE ENCASED TRAFFIC SIGNAL DUCT LINE
3	3" PVC, SCHEDULE 40, CONCRETE ENCASED STREET LIGHT DUCT LINE

ESTIMATED QUANTITIES:

PAY ITEM:

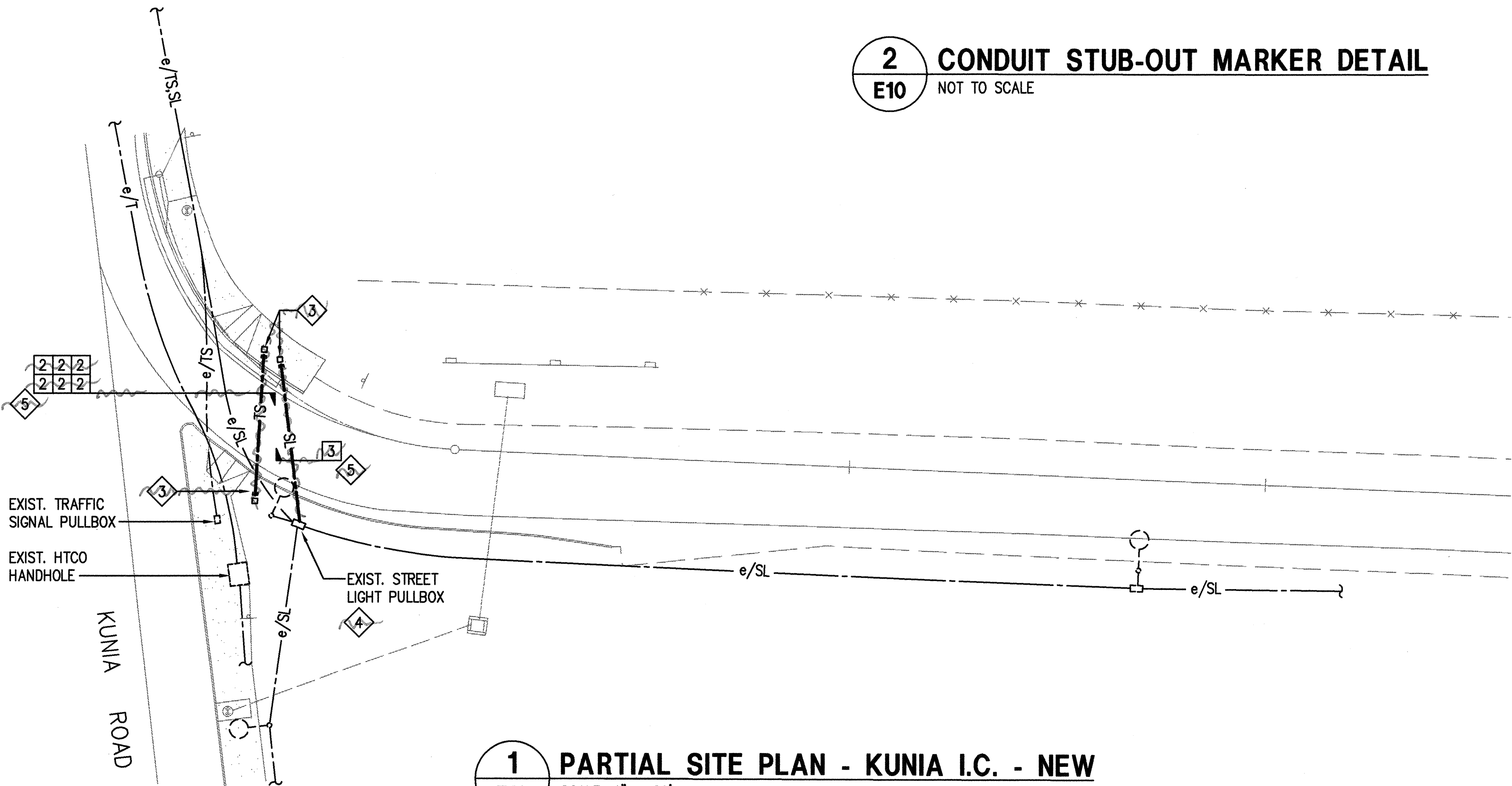
ONE 3-INCH PVC SCHEDULE 40, - 80 LIN. FT.
CONCRETE ENCASED DUCT FOR STREET LIGHT PROVISION.

INCIDENTAL ITEM:

SIX 2-INCH PVC SCHEDULE 40, - 80 LIN. FT.
CONCRETE ENCASED DUCTS FOR TRAFFIC SIGNAL PROVISION.

STREET LIGHTING DUCT MARKER 1 EACH

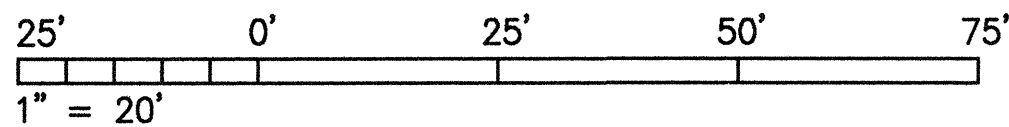
TRAFFIC SIGNAL DUCT MARKER 2 EACH



1 PARTIAL SITE PLAN - KUNIA I.C. - NEW
E10 SCALE: 1" = 20'

2 CONDUIT STUB-OUT MARKER DETAIL
E10 NOT TO SCALE

GRAPHIC SCALE



 THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION. <i>Glenn Karamatsu</i>	STATE OF HAWAII DEPARTMENT OF TRANSPORTATION HIGHWAYS DIVISION PARTIAL SITE PLAN: KUNIA IC-NEW/ DETAIL/DUCT SCHEDULE INTERSTATE ROUTE H-1 RESURFACING Kunia IC to Waialeale Stream Bridge FAIP No. NH-H1-1(235)	
	Scale: AS NOTED	Date: 4/30/99
	SHEET NO. E10 OF E17 SHEETS	
	66	

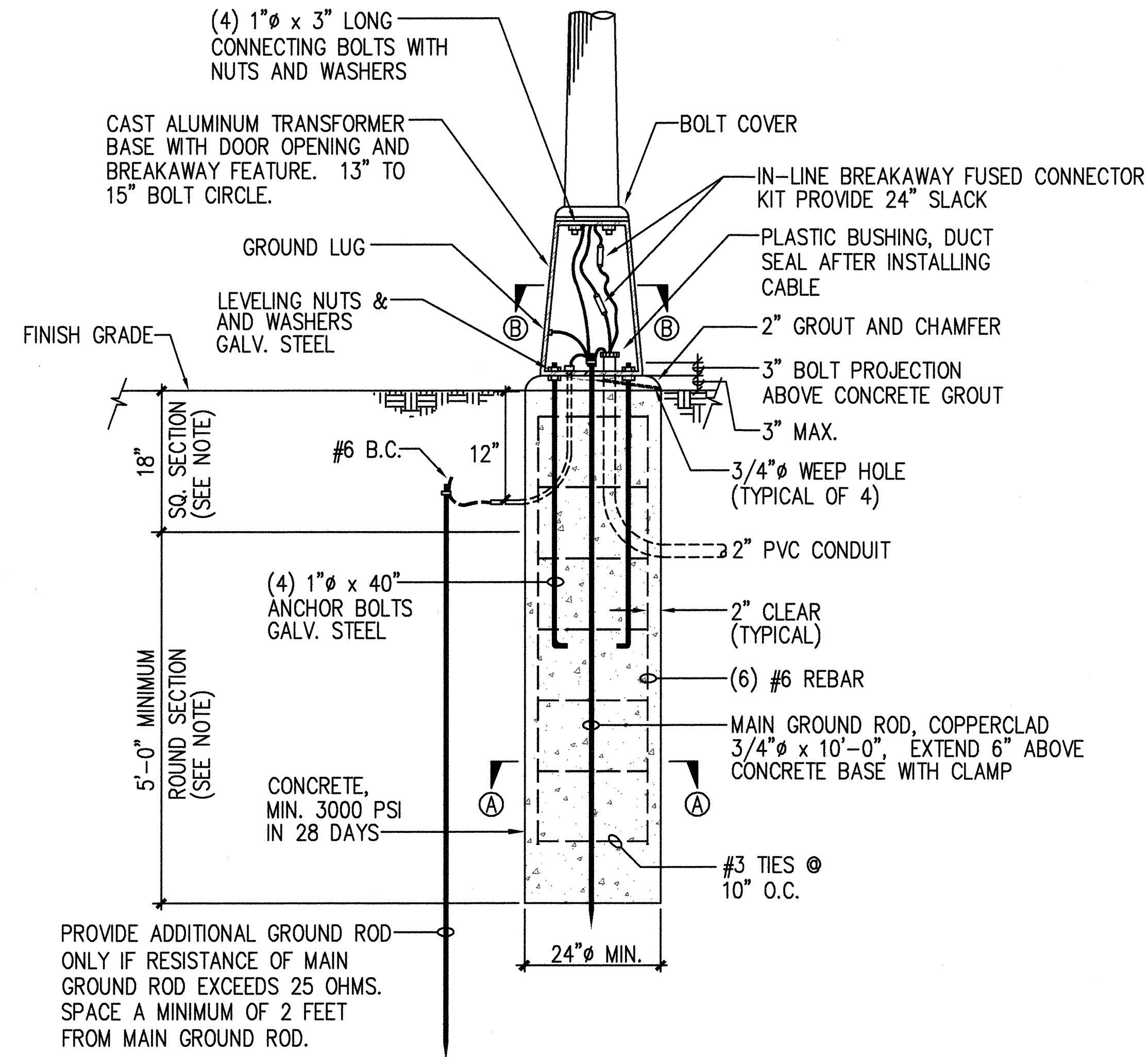
"AS-BUILT"

ORIGINAL PLAN	DATE
NOTED BY	
DESIGNED BY	
CHECKED BY	
QUANTITIES BY	
FILE	103-459

DATE: 103-459
SCALE: 1" = 20'
FILE: 103-459

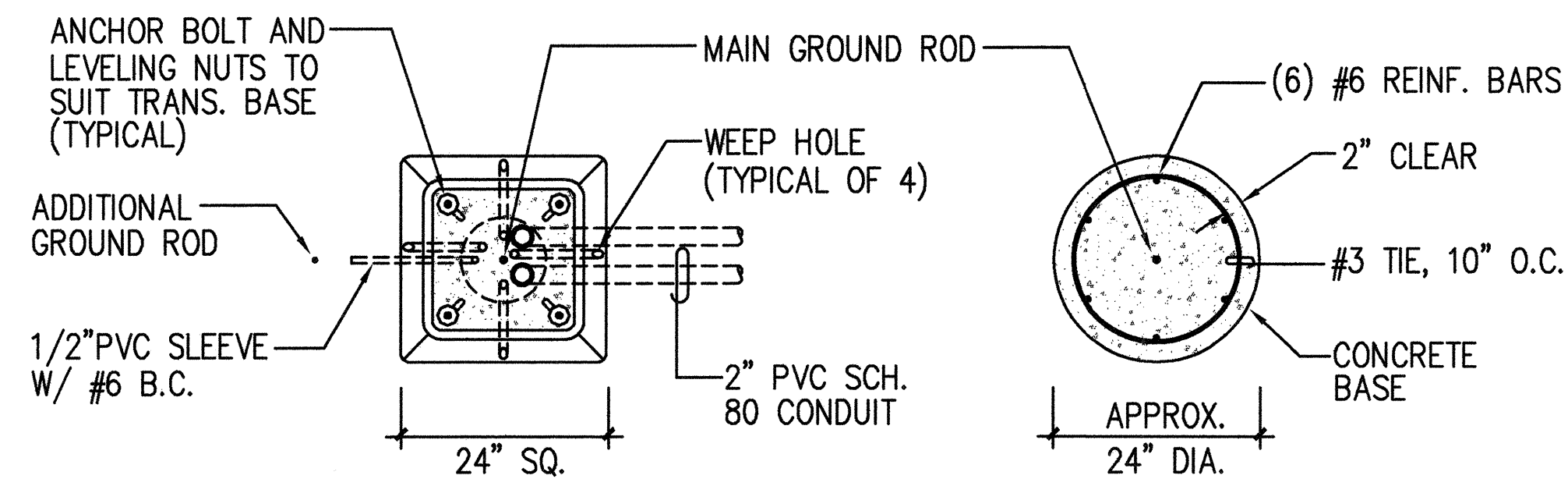
FILE NAME: 103-4E10

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	67	84



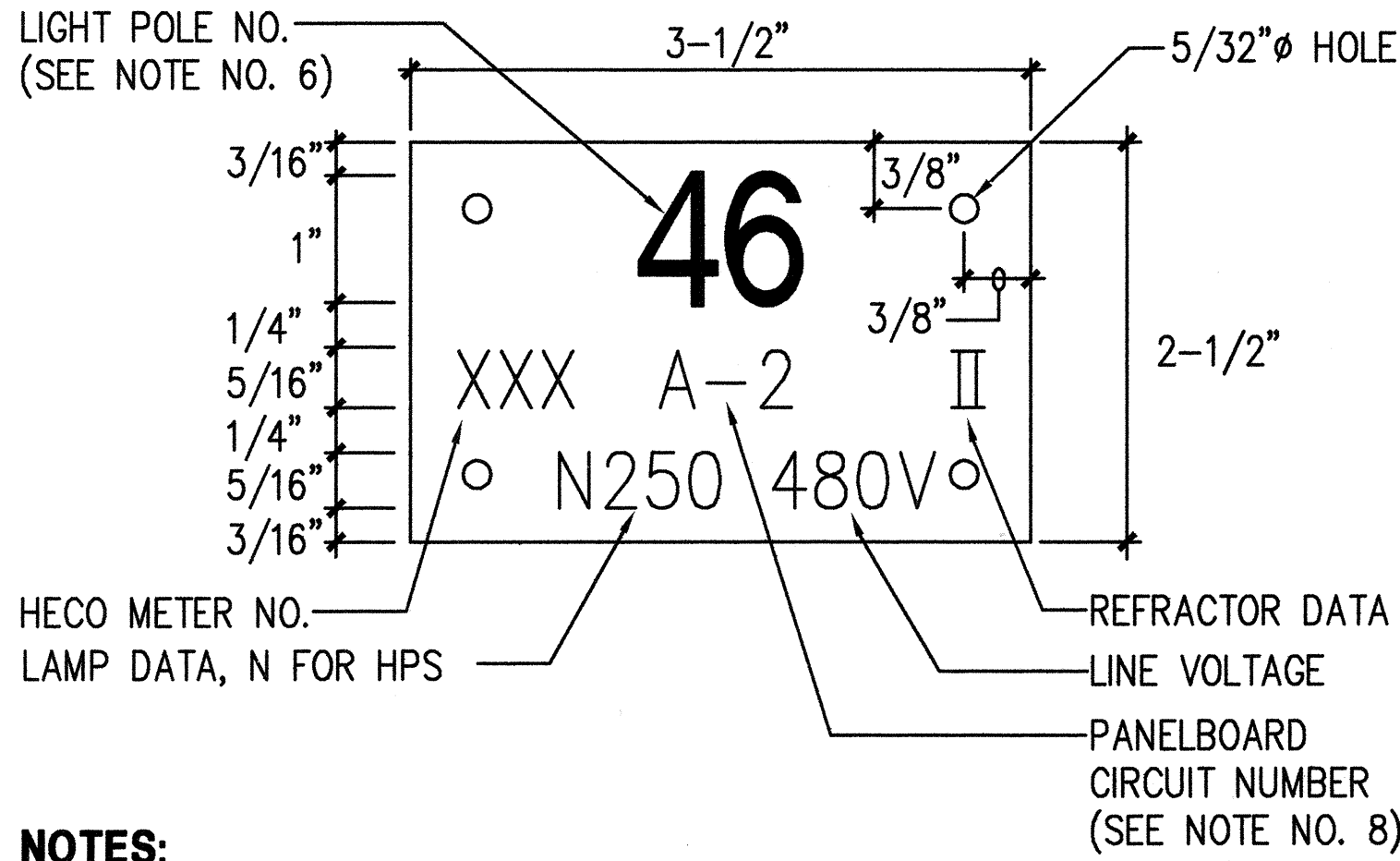
NOTE:
PROVIDE 2 FEET OF SQUARE SECTION AND 6 FEET 6 INCH OF ROUND SECTION CONCRETE BASE FOR LIGHT STANDARDS BETWEEN STA. 343+00 TO 360+00

A
E11 **TYPICAL CONCRETE BASE AND POLE MOUNTING DETAILS WITH BREAKAWAY TRANSFORMER BASE**
NOT TO SCALE



B
E11 **TYPICAL LIGHT STANDARD INSTALLATION WITH BREAKAWAY TRANSFORMER BASE**
NOT TO SCALE

RAMP I.D. → **R01-1** ← LIGHT NO.
LIGHT NUMBER FOR POLE ON RAMP
(SEE NOTE NO. 7)



- NOTES:**
- 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".
 - LIGHT POLE NUMBER SIZE SHALL BE 1" HIGH AND ENGRAVED 1/8" WIDE, WHITE IN COLOR (NUMBER AS REQUIRED).
 - NOMENCLATURE SIZE SHALL BE 5/16" HIGH AND ENGRAVED 1/32" WIDE, WHITE IN COLOR (HECO VAULT NUMBER PANEL BOARD AND CIRCUIT NUMBER, LINE VOLTAGE, LAMP DATA AND REFRACTOR DATA AS REQUIRED).
 - ATTACH TO ALUMINUM AND STEEL POST WITH NO. 8 STAINLESS STEEL, 1/2" LONG DRIVE SCREWS IN 1/8" DRILL HOLE. ATTACH TO WOOD POLES WITH 4D ALUMINUM NAILS.
 - NUMBERS ARE INSCRIBED BY CUTTING THROUGH "BLACK CAP SHEET" TO EXPOSE "WHITE LETTERS".
 - LIGHT NUMBERS SHALL BE OBTAINED FROM THE STATE. USE AN ALPHABET SUFFIX TO DESIGNATE LIGHTS MOUNTED ON THE SAME POLE (e.g. 123A & 123B).
 - FOR LIGHT POLES INSTALLED ON RAMP, ASSIGN NUMBERS TO INCLUDE RAMP I.D. AND LIGHT NUMBER. LEGEND MAY BE LESS THAN ONE (1) INCH IN HEIGHT.
 - NOMENCLATURE REQUIRED FOR SYSTEMS WITH TWO OR MORE CIRCUITS. (LETTERS INDICATES PANELBOARD, NUMBER INDICATES CIRCUIT.)

D
E11 **HIGHWAY LIGHT POLE TAG DETAIL METERED SYSTEM**
NOT TO SCALE

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Glenn Karamitsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING DETAILS AND BREAKAWAY TRANSFORMER BASE POLE

INTERSTATE ROUTE H-1 RESURFACING

Kunia IC to Waikale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: NONE Date: 4/30/99

SHEET NO. E11 OF E17 SHEETS

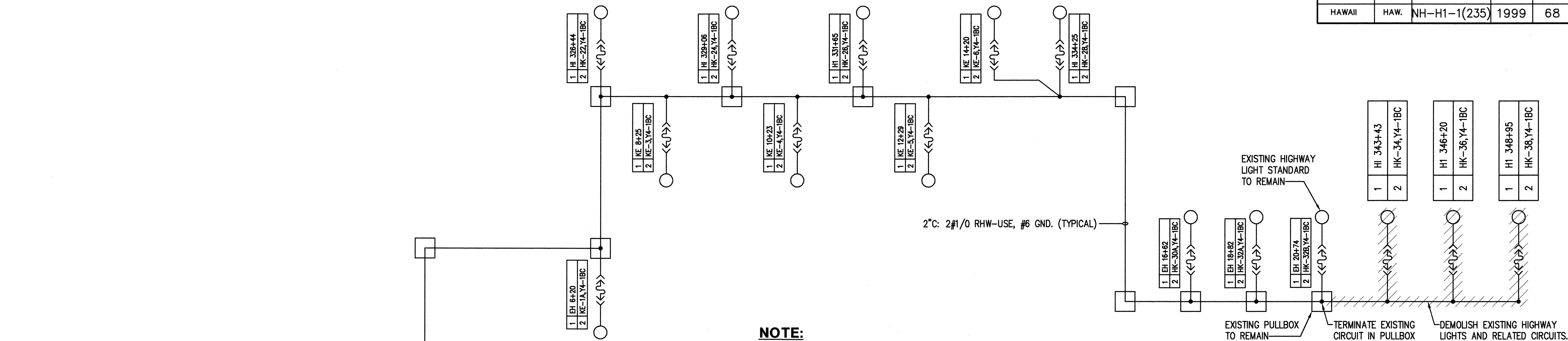
SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
QUANTIFIED BY	
CHECKED BY	
ORIGINAL PLAN	
NOVEMBER	
FILE	

C
E11 **TYPICAL CONCRETE FOUNDATION & BREAKAWAY TRANSFORMER BASE DETAIL**
NOT TO SCALE

SECTION B-B

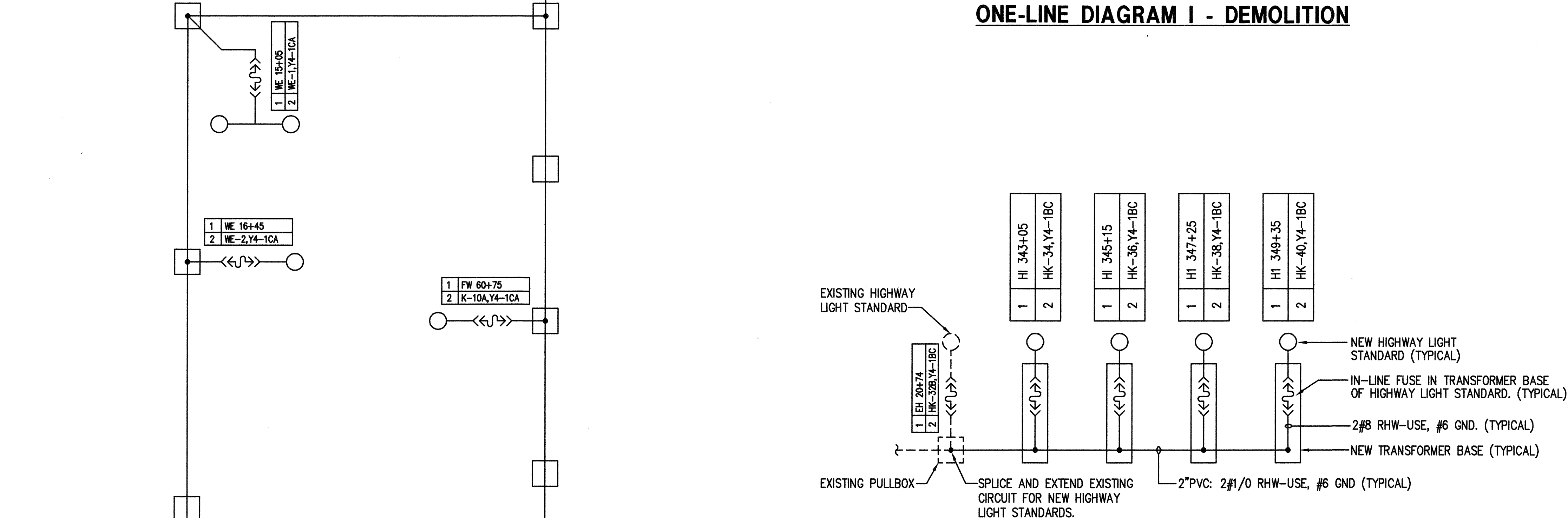
SECTION A-A

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	68	84



NOTE:
INFORMATION ON EXISTING HIGHWAY LIGHT STANDARDS ARE SHOWN FOR REFERENCE ONLY.

ONE-LINE DIAGRAM I - DEMOLITION



NOTE:
SEE WIRING CONNECTION DIAGRAM ON SHEET E-14 FOR SPLICING AND TERMINATION DETAILS.

PARTIAL ONE-LINE DIAGRAM I - NEW

GLENN T. KARAMATSU

LICENSED PROFESSIONAL ENGINEER

No. 4388-E

HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Glenn Karamatsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ONE-LINE DIAGRAM I - DEMOLITION

PARTIAL ONE-LINE DIAGRAM I - NEW

INTERSTATE ROUTE H-1 RESURFACING

Kunia IC to Waialeale Stream Bridge

FAIP No. NH-H1-1(235)

Scale: NONE

Date: 4/30/99

SHEET NO. E12 OF E17 SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
REVISIONS	DRAWN BY	
NOTED BY	CHECKED BY	
QUANTITIES BY		
CHECKED BY		

DATE: NONE
SCALE: 103-e12
FILE: 103-e12

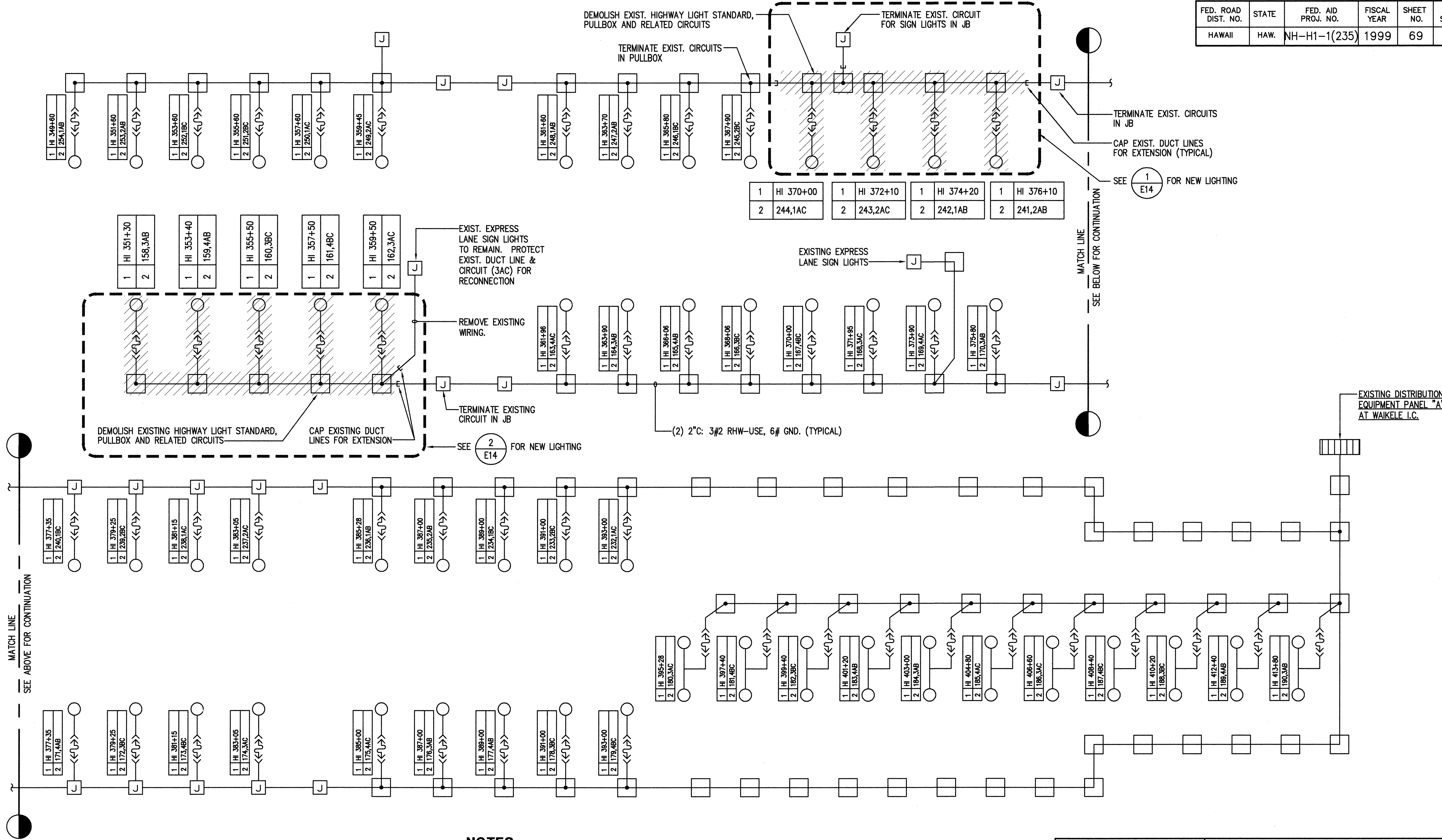
PM: RD
OPER: RD
REVISED:

EXISTING DISTRIBUTION
EQUIPMENT PANEL "Y4"
AT KUNIA I.C.

FILE NAME: 103-4e12

68

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	69	84



NOTES:

1. INFORMATION ON EXISTING HIGHWAY LIGHT STANDARDS ARE SHOWN FOR REFERENCE ONLY.
2. SEE SHEET E14 FOR NEW WORK.

ONE-LINE DIAGRAM II - DEMOLITION

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Glenn Karamatsu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

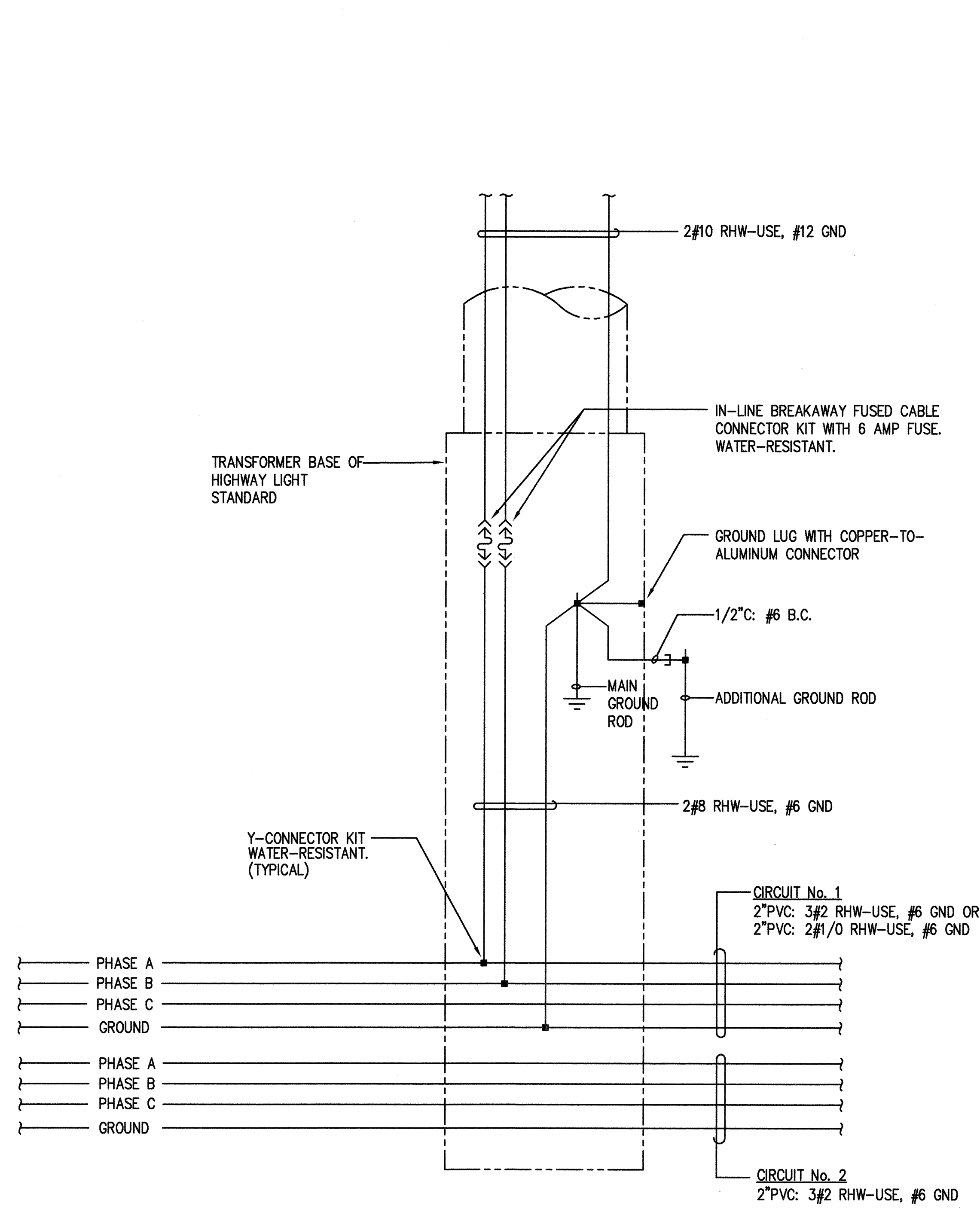
ONE-LINE DIAGRAM II - DEMOLITION

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waikale Stream Bridge
FAIP No. NH-H1-1(235)

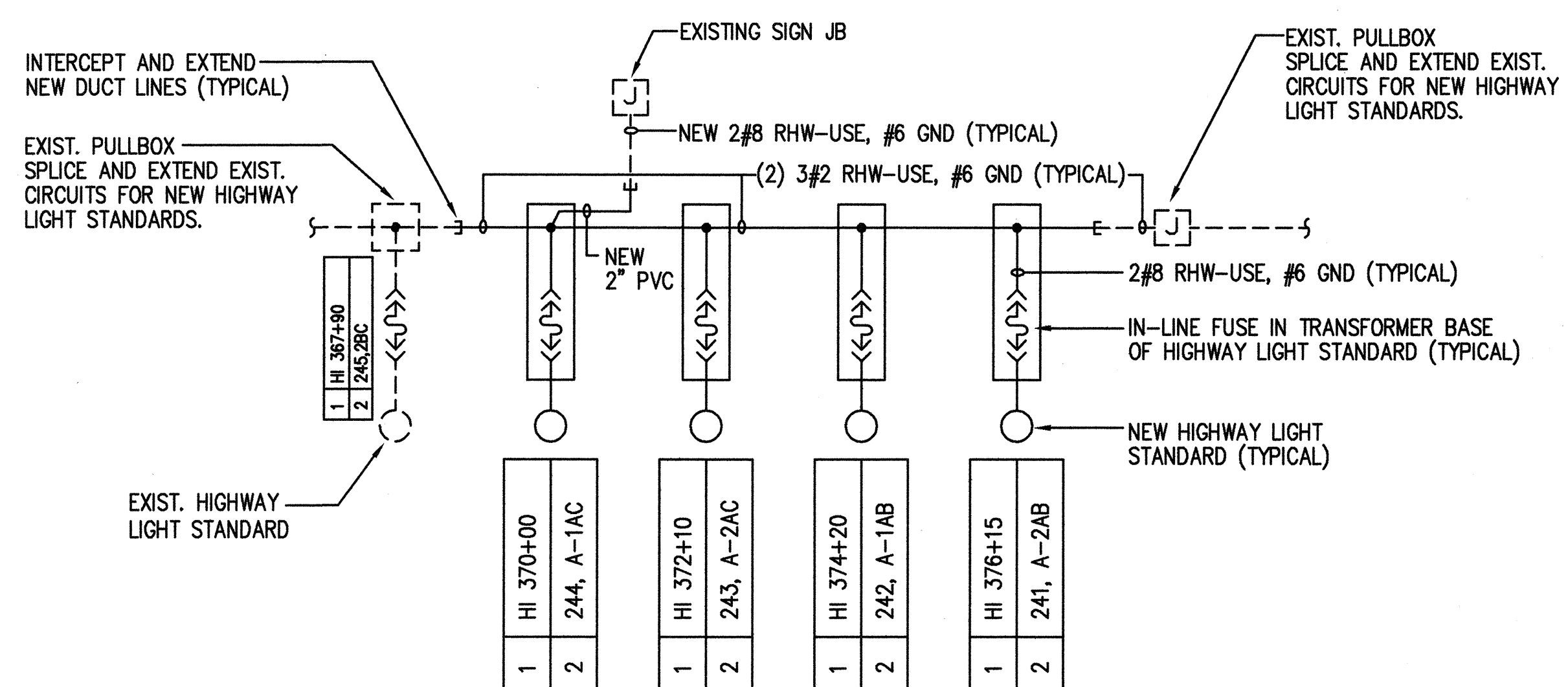
Scale: NONE Date: 4/30/99

SHEET NO. E13 OF E17 SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	70	84

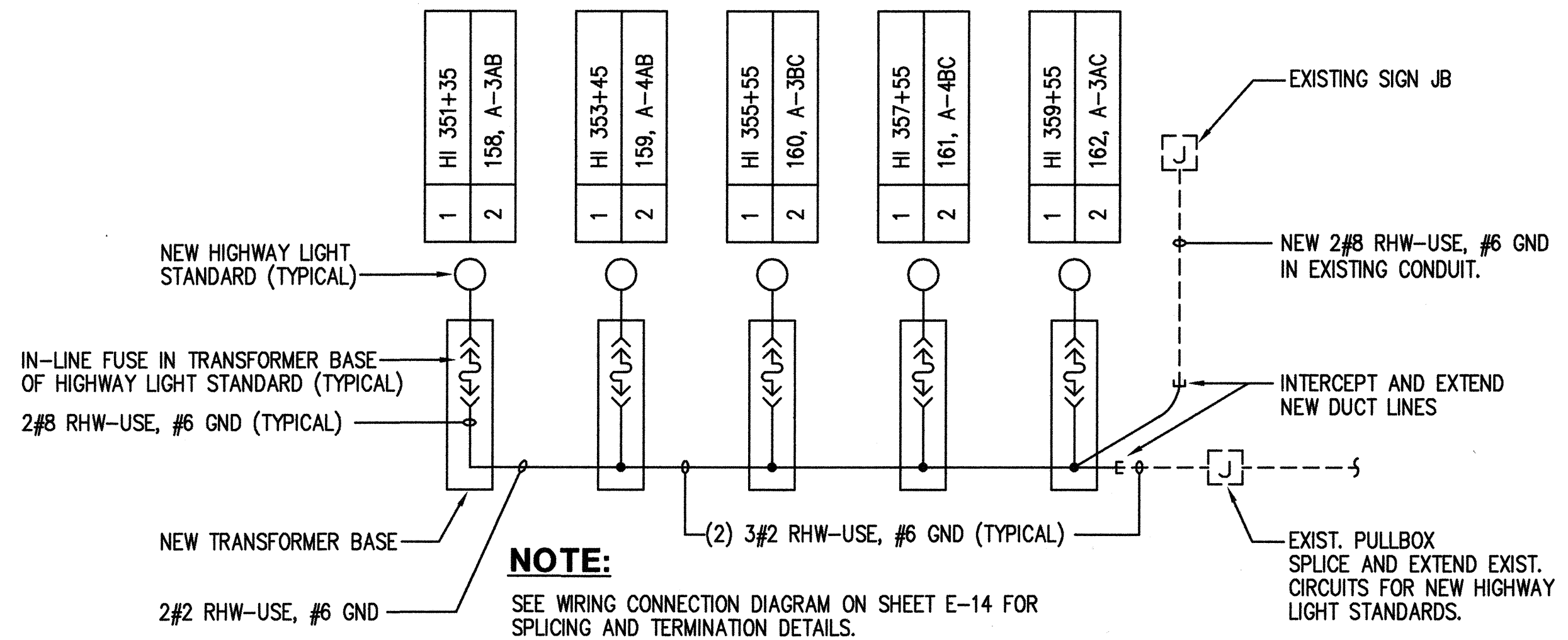


WIRING CONNECTION DIAGRAM



NOTE:
SEE WIRING CONNECTION DIAGRAM ON SHEET E-14 FOR SPLICING AND TERMINATION DETAILS.

1 PARTIAL ONE-LINE DIAGRAM IIA - NEW
E14



NOTE:
SEE WIRING CONNECTION DIAGRAM ON SHEET E-14 FOR SPLICING AND TERMINATION DETAILS.

2 PARTIAL ONE-LINE DIAGRAM IIB - NEW
E14

PM: OPER: RD
REVIS: E14

DATE: NONE
SCALE: NONE
FILE: E14

ORIGINAL PLAN	DATE
NOVEMBER	
CHECKED BY	
DESIGNED BY	
DRAWN BY	
SURVEY PLOTTED BY	

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Glen Karamatsu

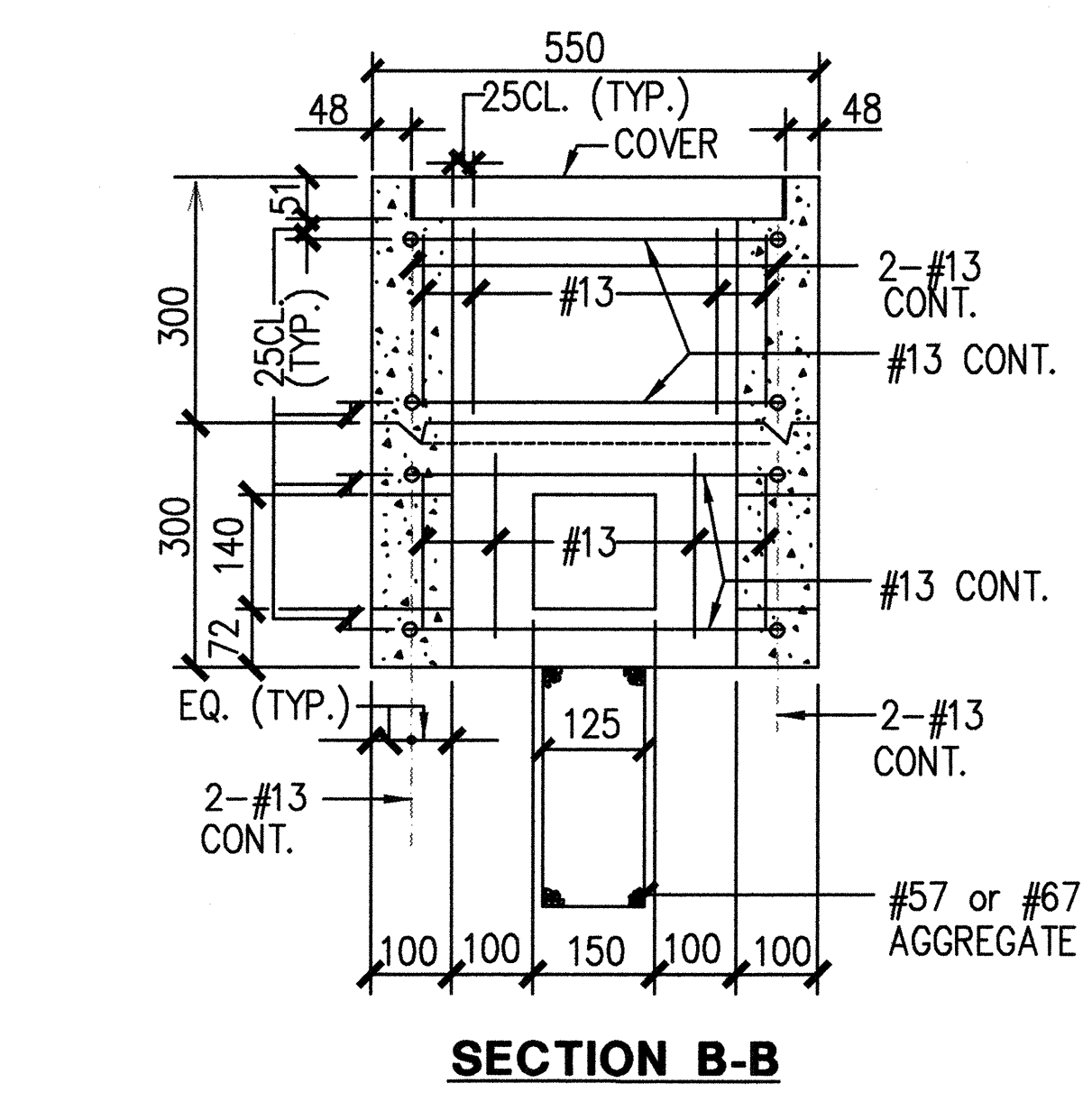
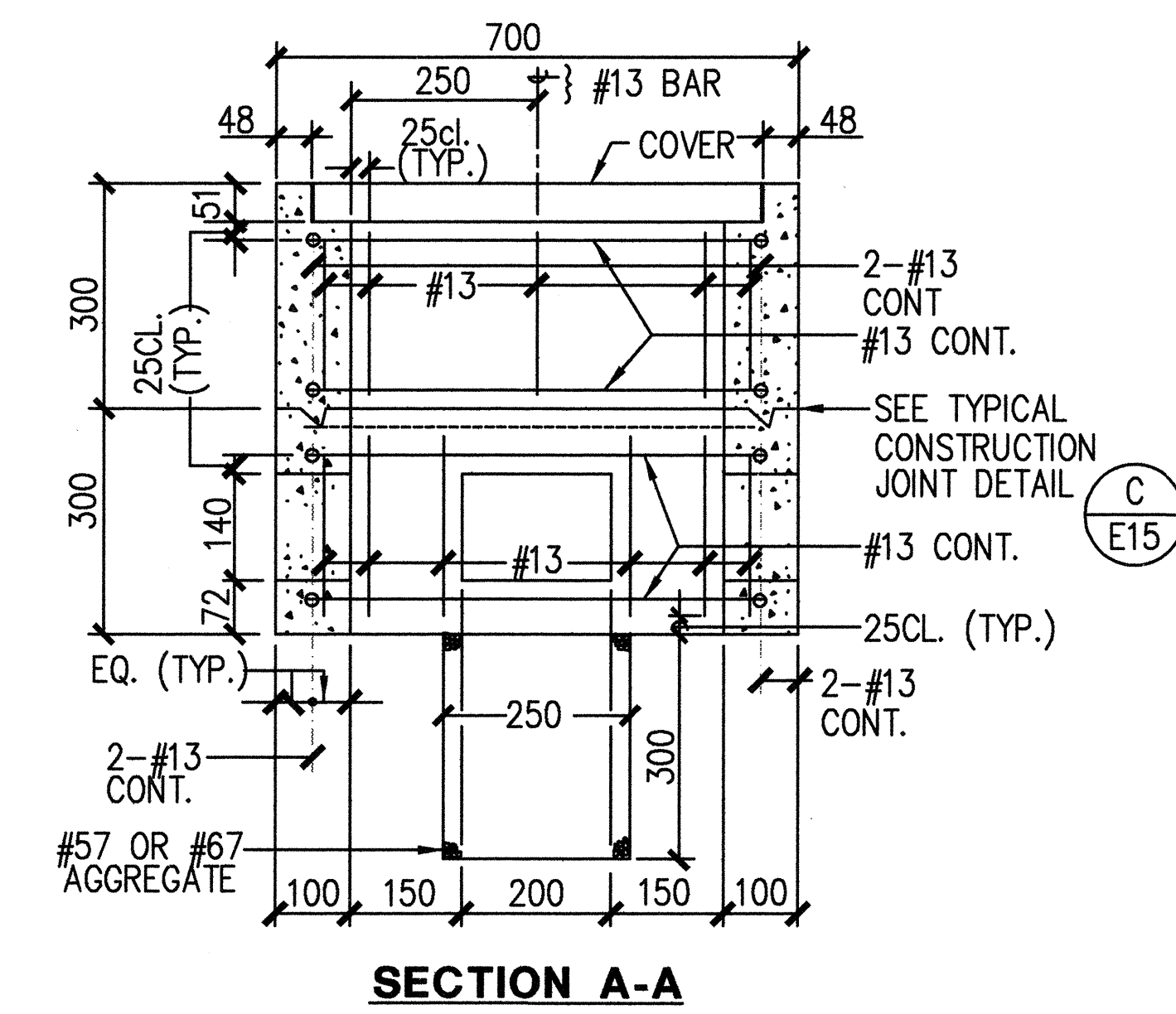
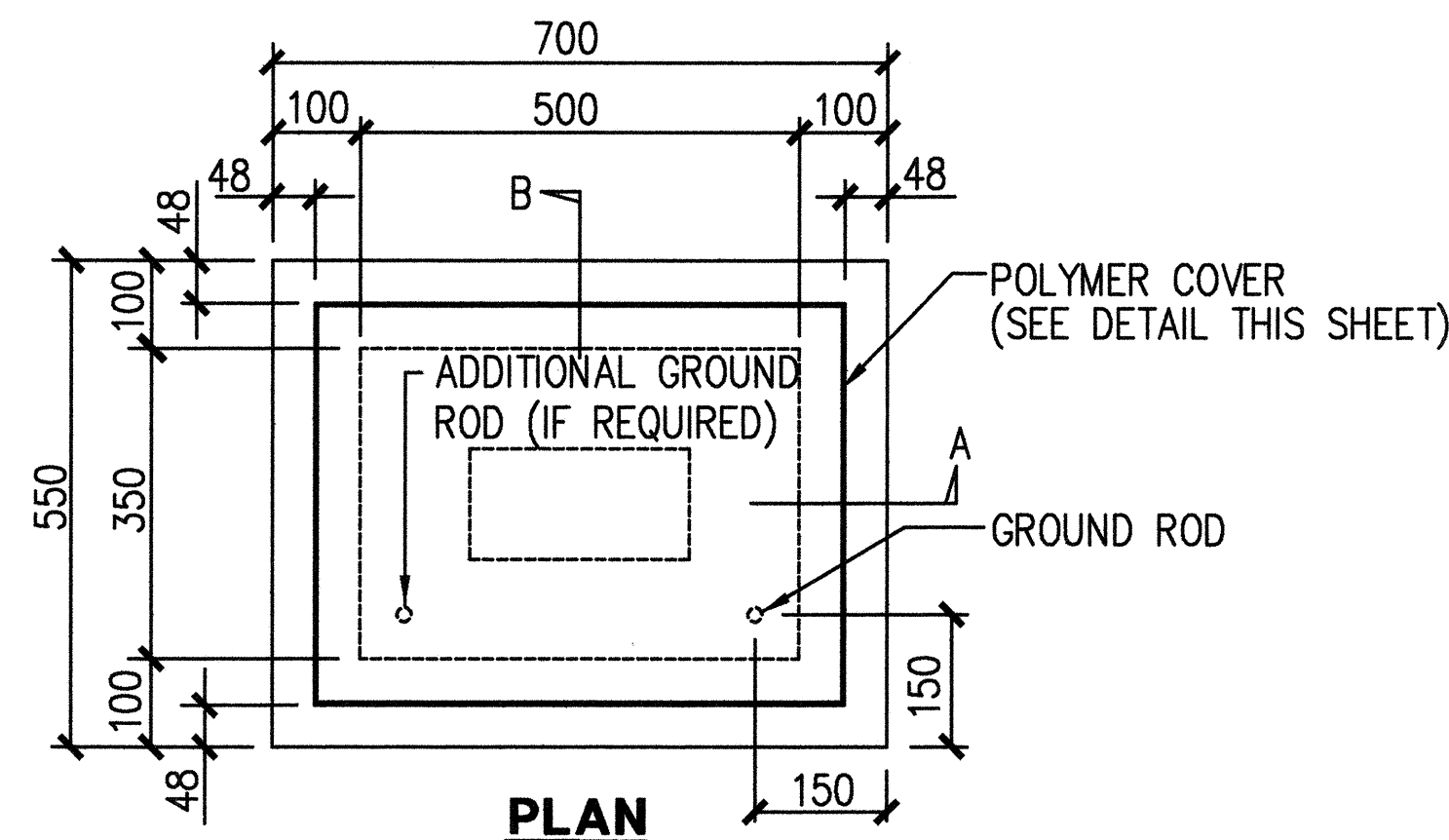
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**PARTIAL ON-LINE DIAGRAMS IIA & IIB
NEW WIRING CONTROL DIAGRAM**

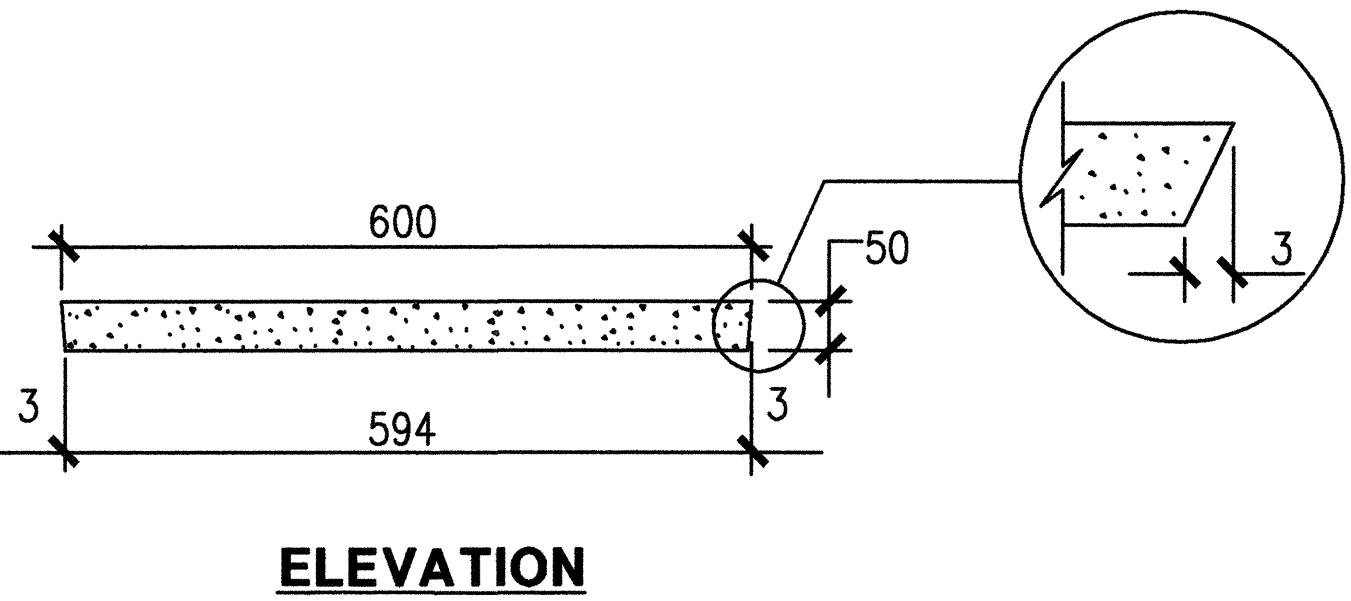
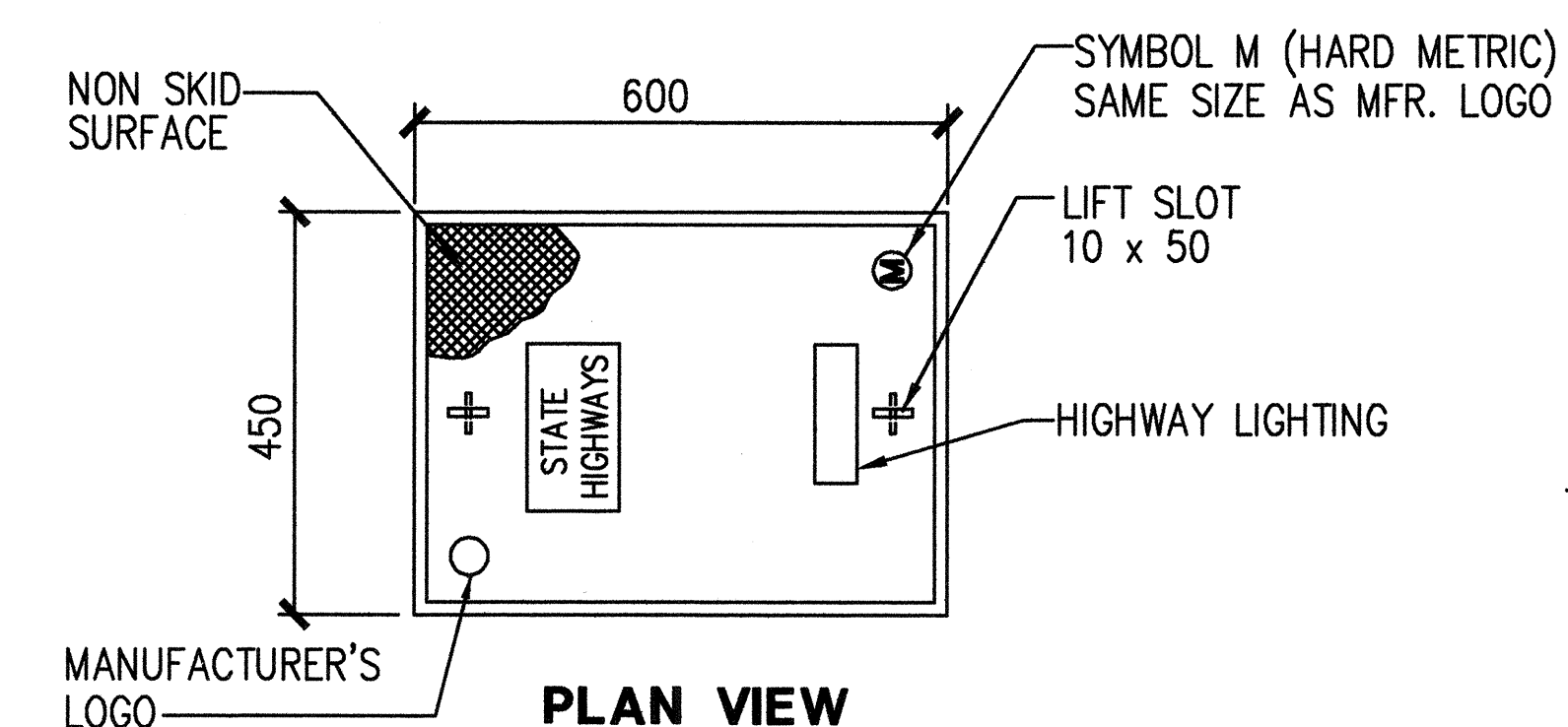
INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: NONE Date: 4/30/99

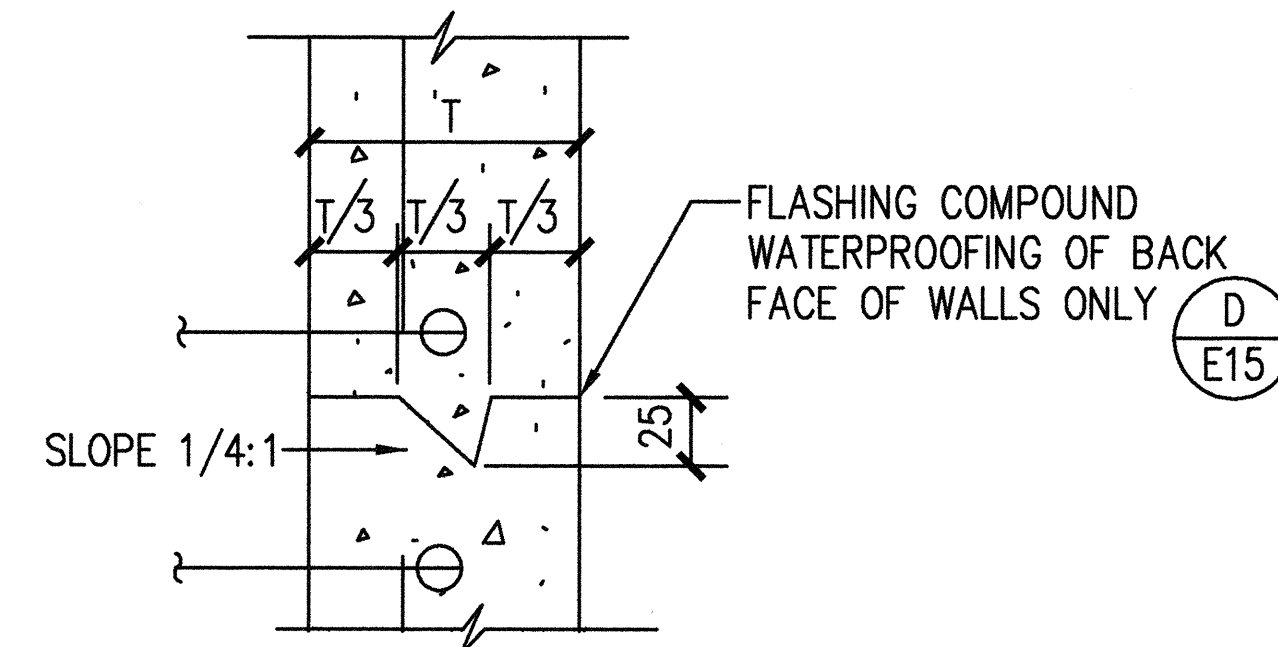
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	71	84



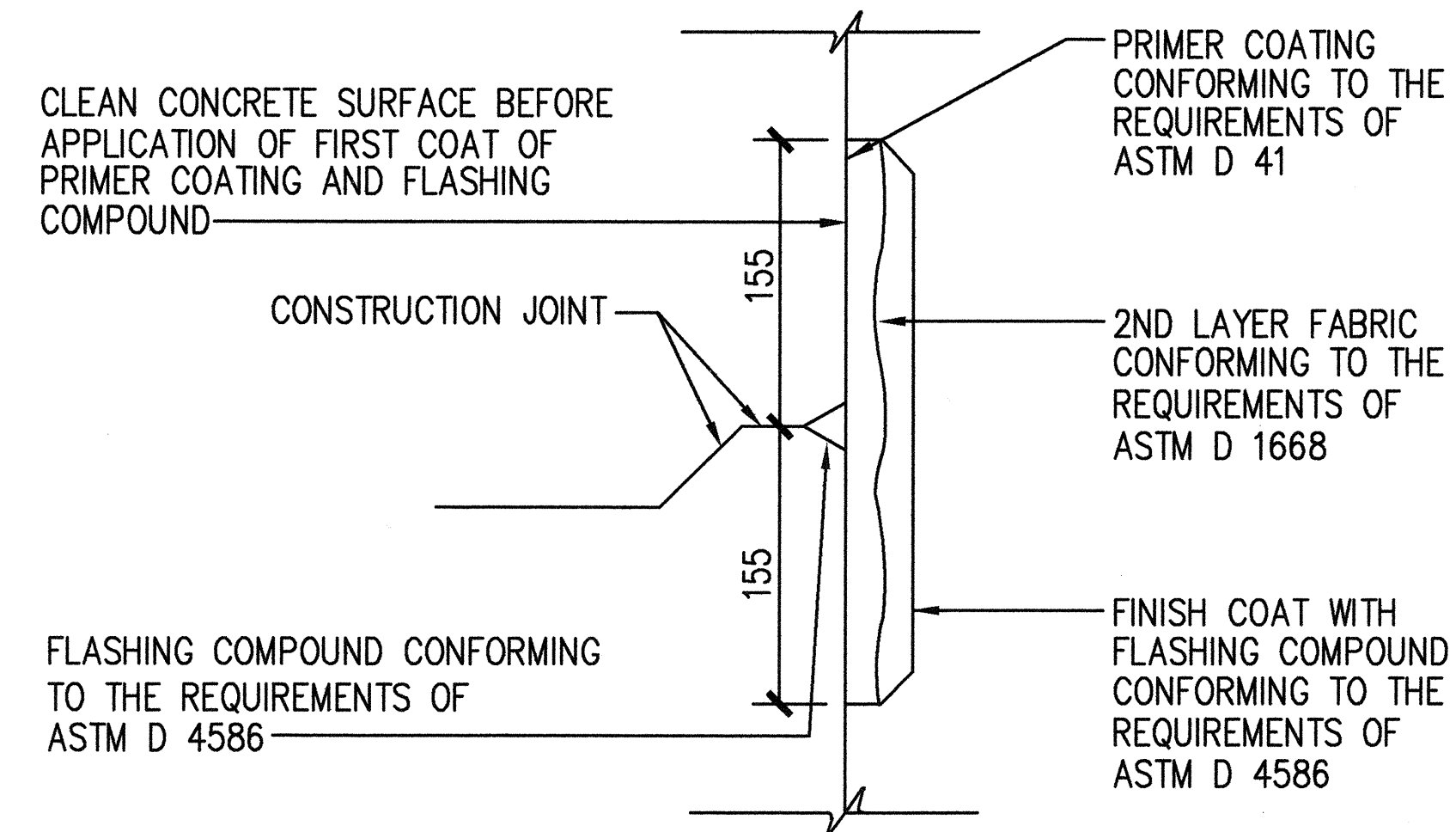
A TYPE "A" PULLBOX
E15 NOT TO SCALE



B POLYMER CONCRETE COVER
E15 NOT TO SCALE



C TYPICAL CONSTRUCTION JOINT DETAIL
E15 NOT TO SCALE



D TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS
E15 NOT TO SCALE

GENERAL PULLBOX NOTES:

1. PROVIDE A MINIMUM OF ONE 16Ø 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).

NOTE:

1. ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN.

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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PULLBOX DETAILS

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waikele Stream Bridge
FAIP No. NH-H1-1(235)

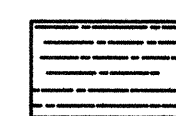
Scale: NONE Date: 4/30/99

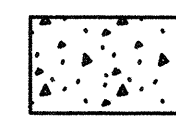
SHEET NO. E15 OF E17 SHEETS

SURVEY PLOTTED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
QUANTIFIED BY	
CHECKED BY	
ORIGINAL PLAN	
NOTED	
FILE	

FILE NAME: 103-4e15

STATE RIGHT-OF-WAY BACKFILL NOTES

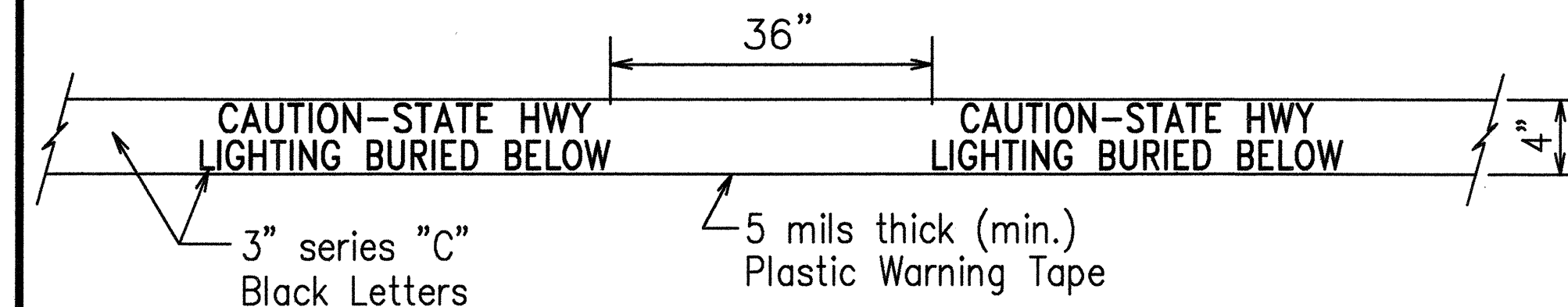
 Trench Backfill Material "A"
Beach Sand, Earth, or Earth and Gravel. If Earth and Gravel used, the maximum shall contain not more than 50% by volume of rock particles. Maximum 8" loose fill per lift. Obtain 95% compaction for each lift.

 Rapid set Concrete
3000 psi compressive strength @ 24 hours. Other mixes as approved by engineer.

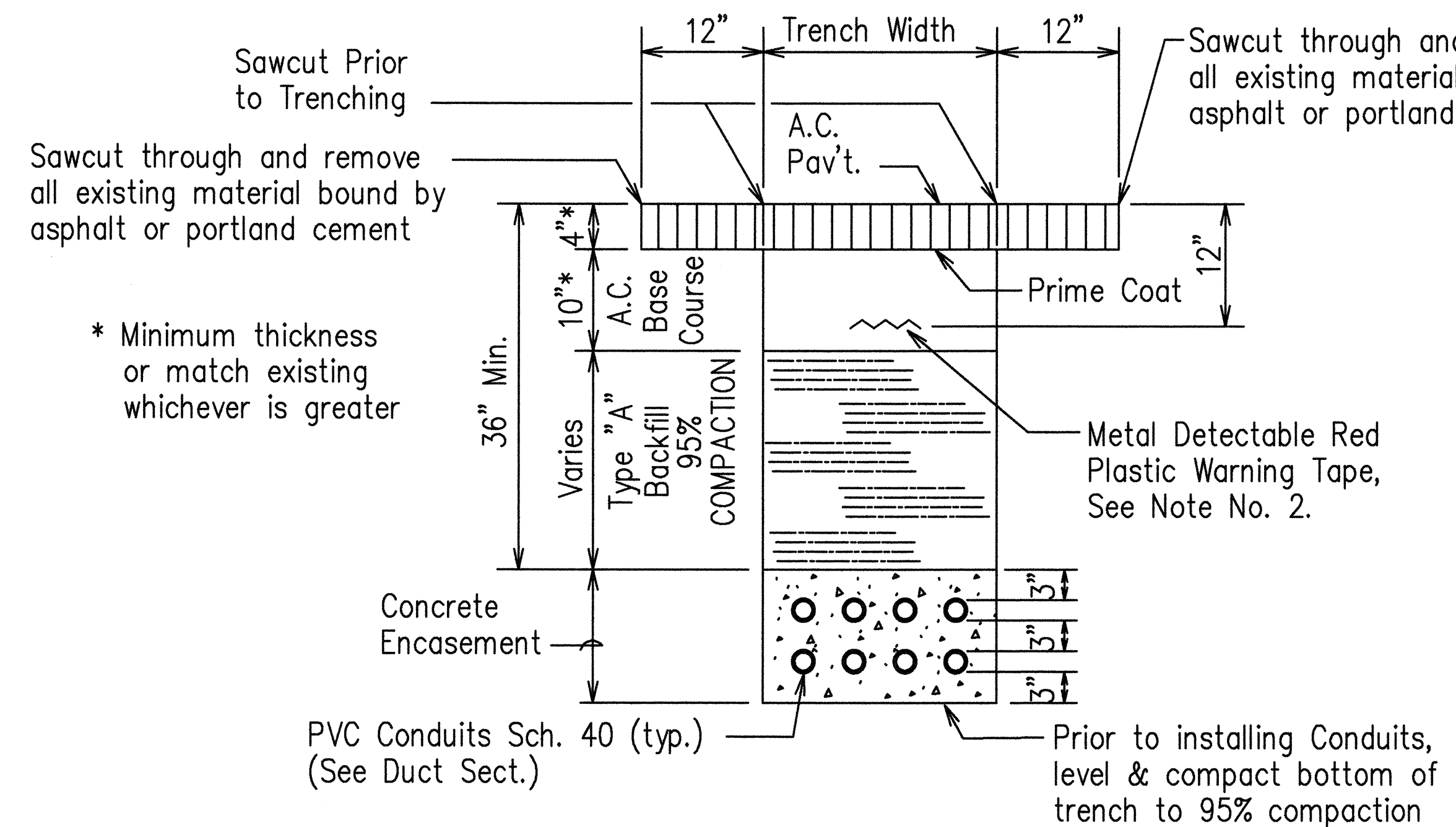
NOTE:
Base Course & Sub-Base Course per 1994 State Standard Specifications for Highway Construction.

GENERAL NOTES

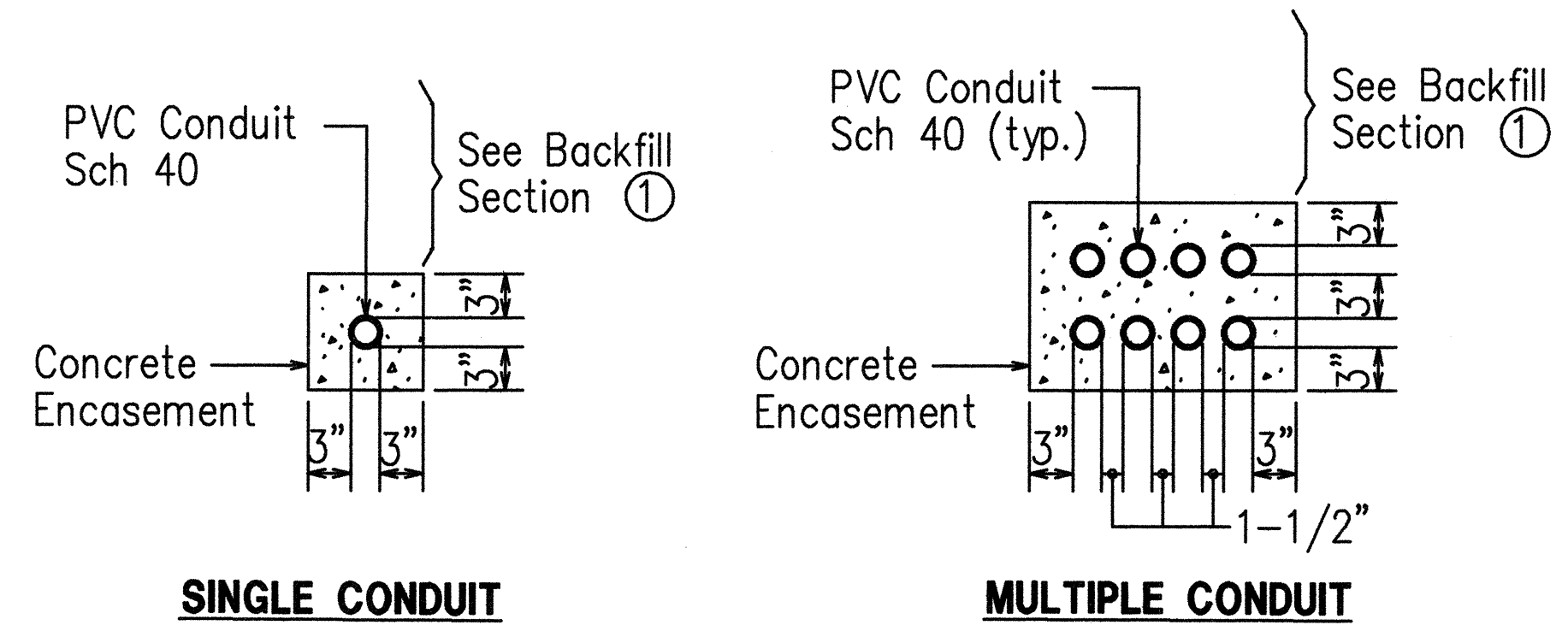
- If trench is located on unpaved area, the Contractor shall replace 10" A.C. Base Course and 4" A.C. Pavement with Type "B" backfill material.
- The Metal Detectable Red Plastic Warning Tape shall be a minimum 5 mils thick and 4" wide with a continuous metallic backing and corrosion resistant 1 mil thick foil core. The message on the tape shall read, "CAUTION - STATE HWY LIGHTING BURIED BELOW," utilizing 3 inch series "C" black lettering. The message will be repeated with a 36" spacing between top line of message and start of next repeat.
- The Contractor may begin backfilling the conduit trench when concrete encasement has reached 50% (1500 PSI min) design strength.
- Maximum four (4) Conduits per row for multiple conduit duct section.
- For direct buried duct sections, the concrete jacket required at the conduit by-pass for various utilities, shall not be paid for separately but considered incidental to the direct buried conduits.
- After installing all the highway lighting cables, the Contractor shall duct seal all conduits in the pullboxes and highway lighting standard base. The duct seal material shall be approved by the Traffic Signal Inspector/Engineer and shall not be paid for separately but considered incidental to the direct buried and/or concrete encased conduits.



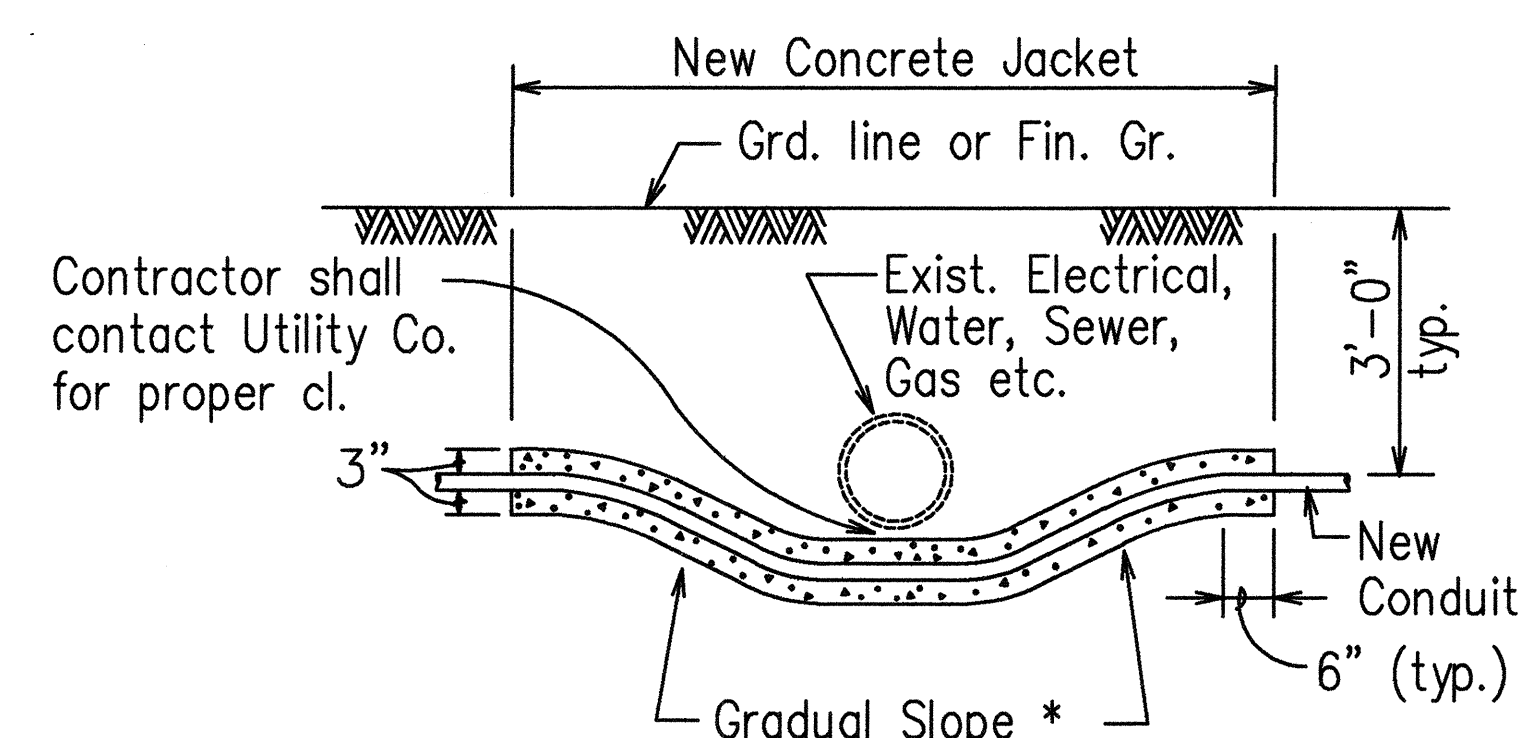
For additional information see note no. 2.
METAL DETECTABLE RED PLASTIC WARNING TAPE



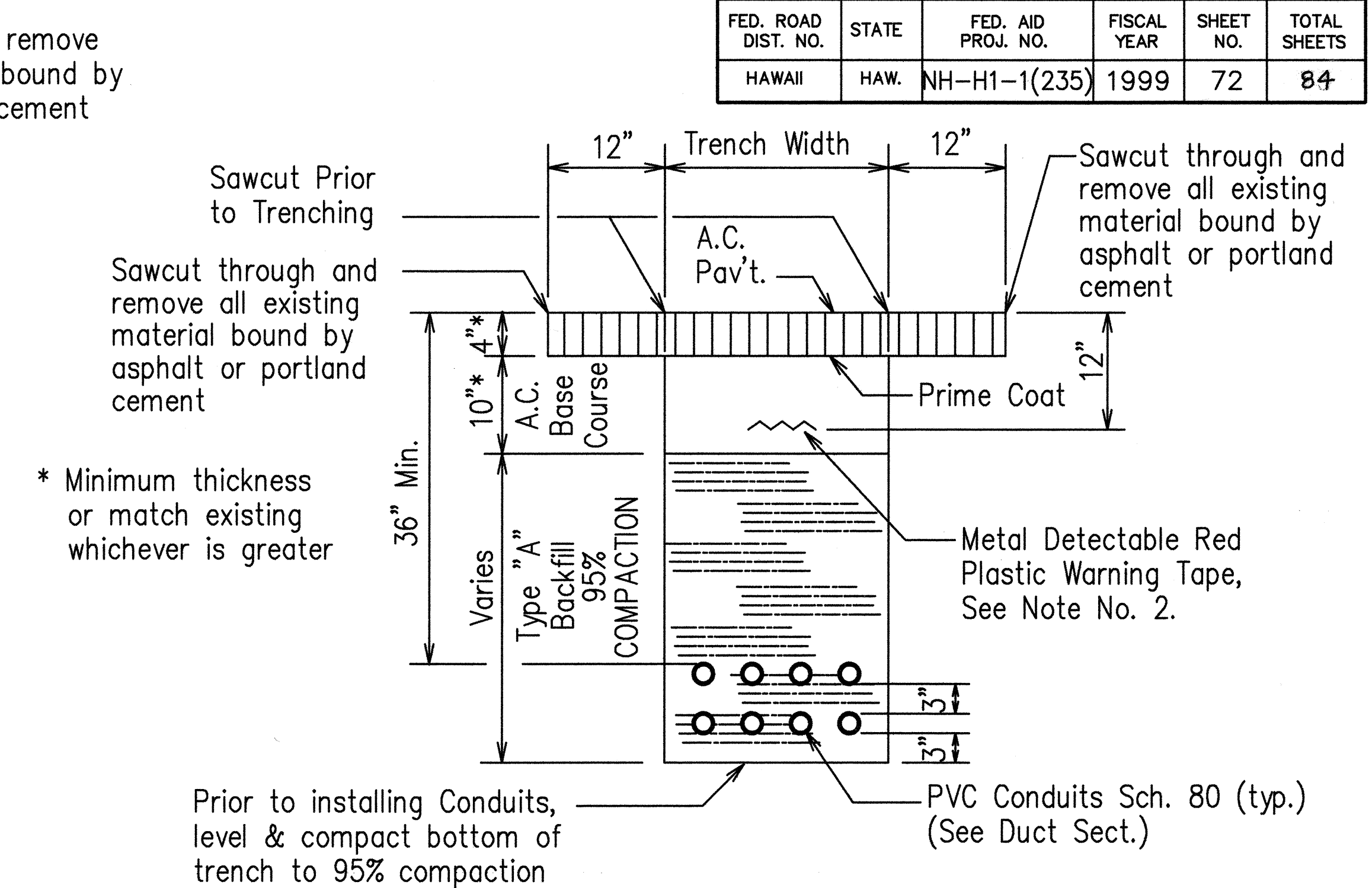
① **TYPICAL BACKFILL SECTION WITH CONCRETE ENCASED DUCTS**



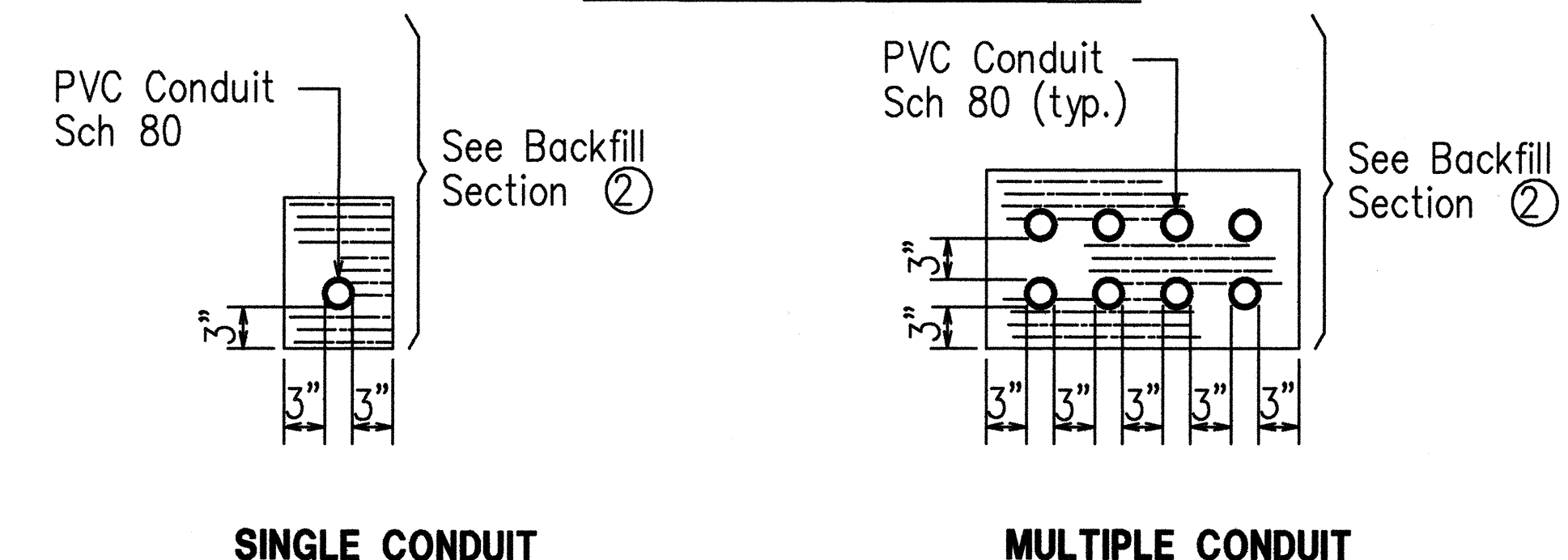
DUCT SECTIONS - CONC. ENCASED



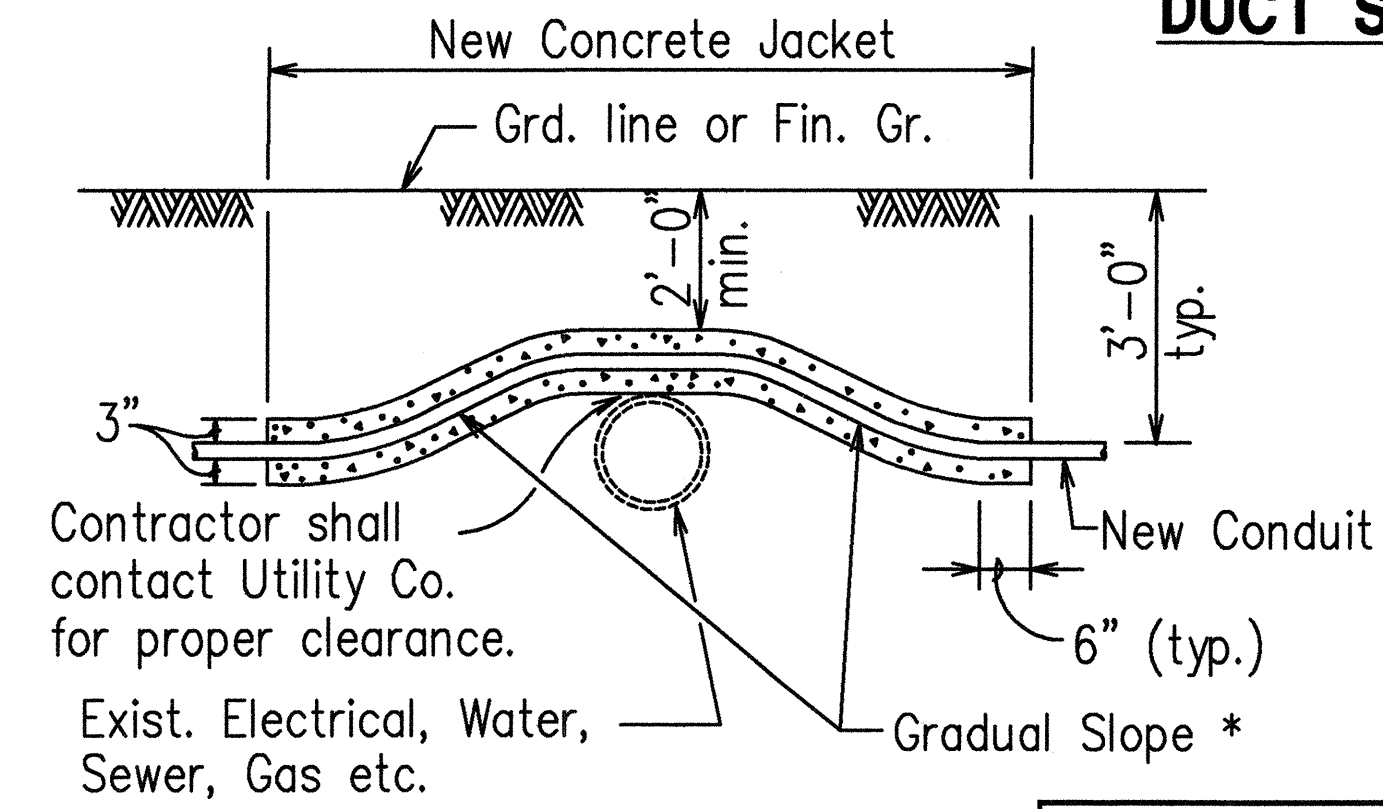
* To be determined by County Electrical Inspector/Engineer
CONDUIT BY-PASS DETAIL AT VARIOUS UTILITIES
Not to Scale

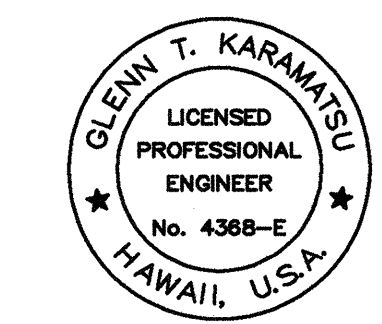


② **TYPICAL BACKFILL SECTION DIRECT BURIED DUCTS**



DUCT SECTIONS - DIRECT BURIED





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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

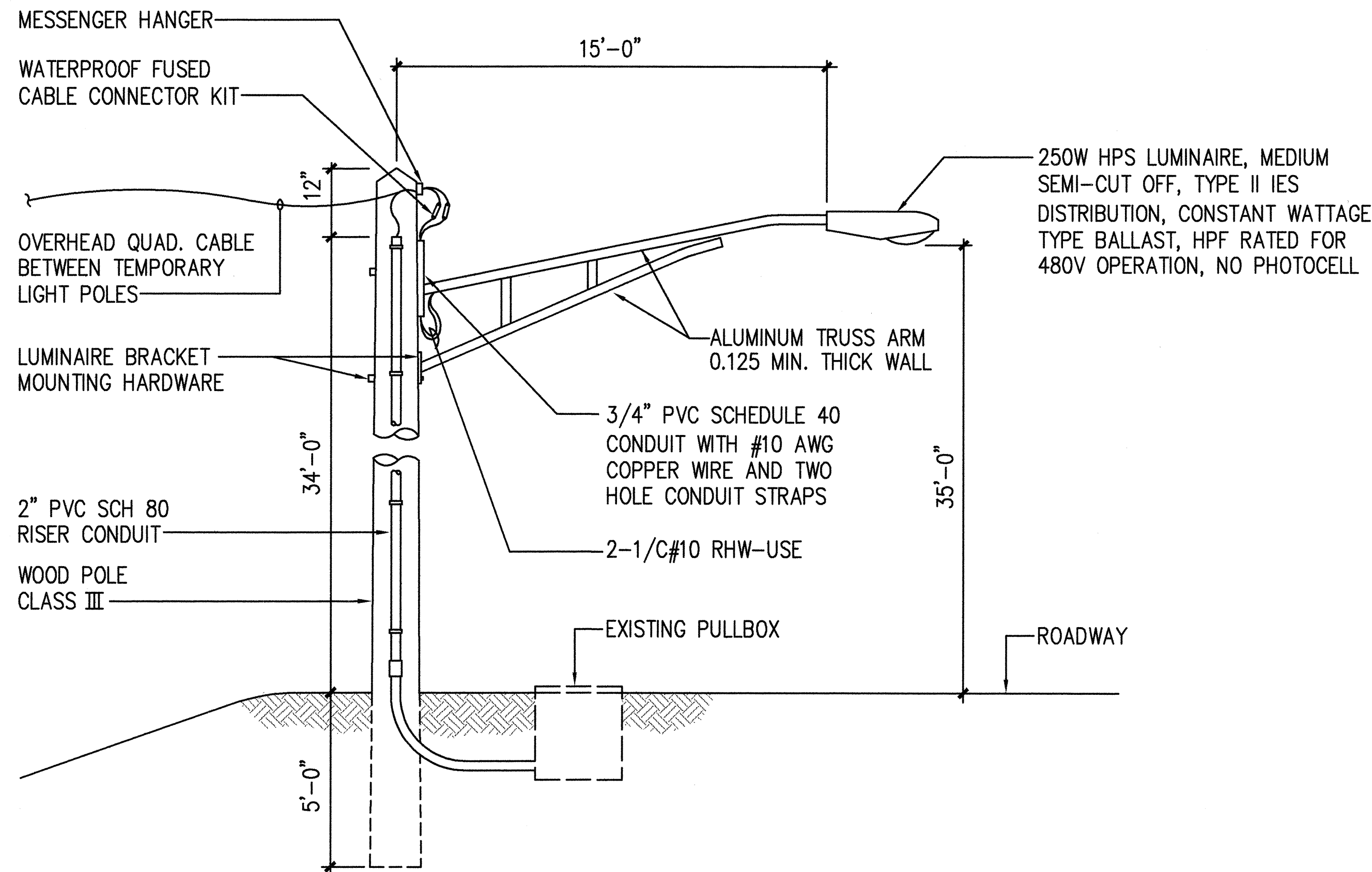
Scale: NONE Date: 4/30/99

SHEET NO. E16 OF E17 SHEETS

DATE: 103-4e16
 SCALE: 103-4e16
 FILE: 103-4e16
 SURVEY PLOTTED BY: X
 DRAWN BY: X
 CHECKED BY: X
 REVISIONS: X
 NO. OF SHEETS: X
 TOTAL SHEETS: X

FILE NAME: 103-4e16

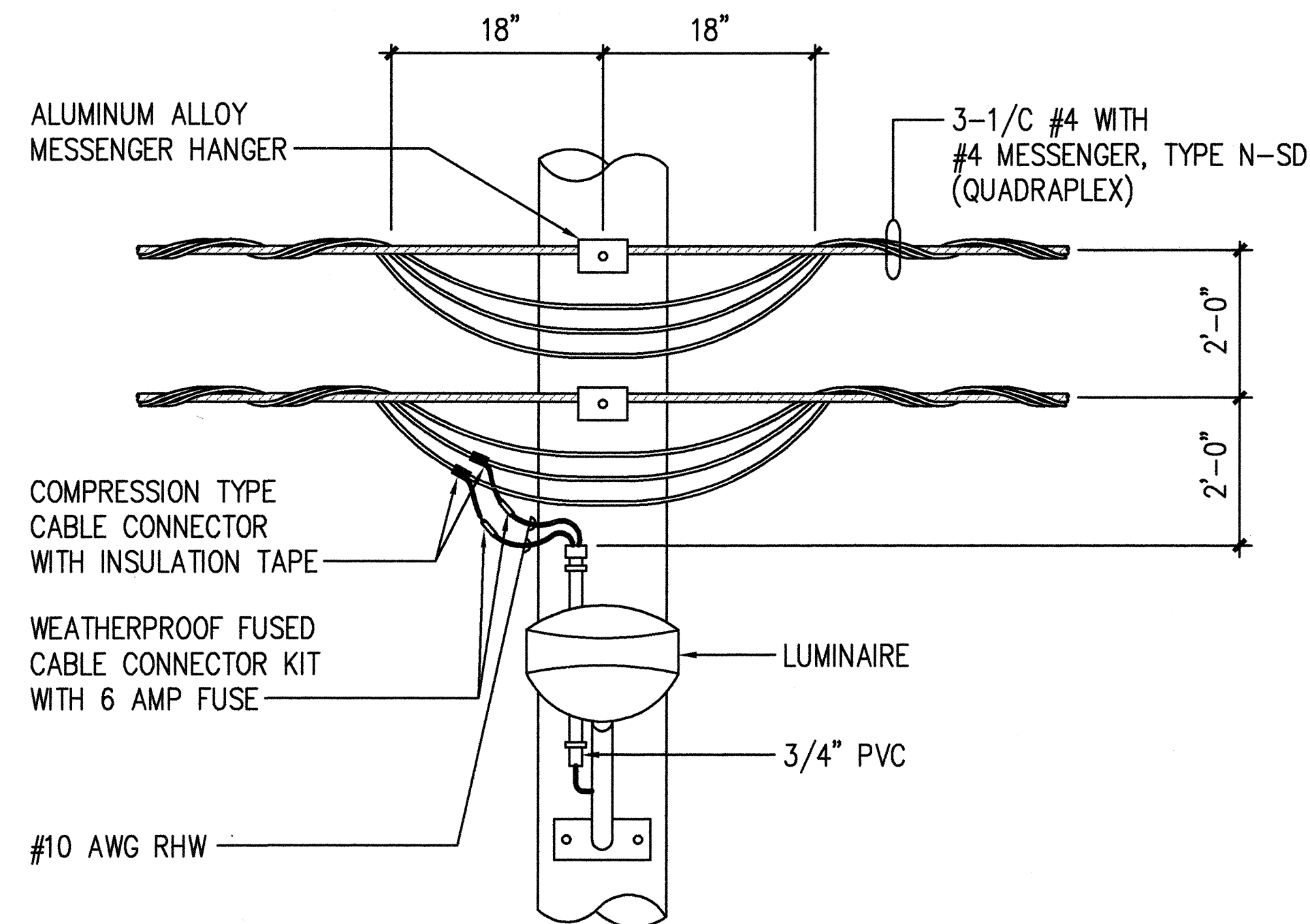
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	NH-H1-1(235)	1999	73	84



A
E17 **TEMPORARY HIGHWAY LIGHT ON 40' WOOD POLE - RISER**
NOT TO SCALE

NOTES:

1. TEMPORARY HIGHWAY LIGHTING DETAILS ARE SHOWN AS A SUGGESTION FOR BIDDING PURPOSES ONLY. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH THE STATE FOR THE EXACT TEMPORARY HIGHWAY LIGHTING ARRANGEMENT TO BE IMPLEMENTED FOR THIS PROJECT.
2. TEMPORARY HIGHWAY LIGHTS SHALL BE LOCATED WITHIN 15 FEET OF EITHER SIDE OF EXISTING HIGHWAY LIGHT STATION MARKER, AT NO MORE THAN 225 FEET ON CENTER.
3. TEMPORARY HIGHWAY LIGHTS MAY BE PLACED IN MEDIAN AS LONG AS ABOVE CRITERIA IS MET. OVERHEAD CABLES CROSSING HIGHWAY SHOULD HAVE A MINIMUM OF 25 FEET CLEARANCE ABOVE THE ROADWAY.
4. ALL TEMPORARY HIGHWAY LIGHTS, POLES AND CIRCUITS SHALL BE REMOVED WHEN PERMANENT HIGHWAY LIGHTING SYSTEM IS COMPLETE AND OPERATIONAL. ANY OPENING LEFT AFTER REMOVAL OF POLES SHALL BE FILLED AND PATCHED TO MATCH SURROUNDING FINISH.



B
E17 **TEMPORARY HIGHWAY LIGHT SERVICE**
DETAIL - (2 CIRCUITS)
NOT TO SCALE

DATE: NONE
SCALE: 103-4e17
FILE: 103-4e17

SURVEY PLOTTED BY	DATE
DRAWN BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	

GLENN T. KARAMITU
LICENSED PROFESSIONAL ENGINEER
No. 4388-E
HAWAII, U.S.A.

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Glenn Karamitu

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TEMPORARY HIGHWAY LIGHTING SYSTEM

INTERSTATE ROUTE H-1 RESURFACING
Kunia IC to Waialeale Stream Bridge
FAIP No. NH-H1-1(235)

Scale: NONE Date: 4/30/99

SHEET NO. E17 OF E17 SHEETS