FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	ADD. 99	470

ABBREVIATIONS:

A	=	AMPS EXAMPLE: 40A = 40 AMPS
A.I.C.	=	AMPS INTERRUPTING CAPACITY
BC	=	BARE COPPER
BKR	=	BREAKER
COMM.	=	COMMUNICATION DUCT OR CIRCUIT
FC	=	FOOTCANDLE
GND	=	ELECTRICAL GROUND WIRE OR GROUND
HL	=	HIGHWAY LIGHTING DUCT OR CIRCUIT
K	=	x 1,000 EXAMPLE: 10K = 10,000
MTD	=	MOUNTED
NA	=	SODIUM
N.E.C.	=	NATIONAL ELECTRIC CODE
TYP	=	TYPICAL
U/G	=	UNDERGROUND
XFMR	=	TRANSFORMER
HPS	=	HIGH PRESSURE SODIUM
OS	=	OFFSET FROM REFERENCE BASELINE
LT	=	LEFT
RT	=	RIGHT
E	=	ELECTRIC
T	=	TELEPHONE
SB	=	SLIP BASE PER SHT. U-33
ETIB	=	EMERGENCY TELEPHONE ON INBOUND LANES
ETOB	=	EMERGENCY TELEPHONE ON OUTBOUND LANES
TC	=	TRAFFIC CONTROLLER

SYMBOLS:

- ELECTRICAL MANHOLE IN HAMMERHEAD, 6'-10" X 11', PER STRUCTURAL DWGS
- ELECTRICAL MANHOLE IN GRADE, 6' X 11', PER STRUCTURAL DWGS
- EXISTING ELECTRICAL HANDHOLE IN GRADE, 4' X 6'
- TELEPHONE PULLBOX IN PARAPET
- TELEPHONE PULLBOX IN GRADE, 2' X 4', PER HTCO DWG 34056
- EXISTING TELEPHONE PULLBOX IN GRADE
- EXISTING ELECTRICAL MANHOLE IN GRADE
- EXISTING TELEPHONE MANHOLE IN GRADE
- HIGHWAY LIGHTING PULLBOX, IN GRADE, TYPE A PER STATE DOT STANDARD PLAN TE-41
- HIGHWAY LIGHTING PULLBOX, IN PARAPET
- COMMUNICATION PULLBOX, IN GRADE, TYPE A PER STATE DOT STANDARD PLAN TE-41
- COMMUNICATION PULLBOX, IN PARAPET
- EXISTING HIGHWAY LIGHTING PULLBOX, IN GRADE
- EXISTING COMMUNICATION PULLBOX, IN GRADE
- EXISTING HIGHWAY LIGHT
- PERMANENT LUMINAIRE MOUNTED ON NEW METAL STANDARD
  - LUMINAIRE
  - METAL STANDARD

1	375+95 OS 44' LT
2	2, CKT #2
3	15' TYPE 1, SB
4	40'

- STATION & OFFSET FROM REFERENCE BASELINE
- HIGHWAY LIGHT & POLE NUMBER, CIRCUIT NUMBER
- ARM SPAN IN FEET, POLE FOUNDATION TYPE PER 2 U1U29 AND SLIP BASE TYPE
- LUMINAIRE HEIGHT FROM PAVEMENT FINISH GRADE - 40 FEET NOMINAL

- EMERGENCY TELEPHONE LOCATION
- DUCTLINE
- EXISTING DUCTLINE

- EXISTING OVERHEAD POWER AND TELEPHONE LINES
- NEW OVERHEAD POWER AND TELEPHONE LINES
- P#1 EXISTING POLE AND NUMBER
- NP#1 NEW POLE AND NUMBER
- EXISTING ANCHOR & GUY
- NEW ANCHOR & GUY
- NEW PUSH BRACE
- EXISTING POLE TO BE REMOVED
- EXISTING OVERHEAD POWER AND

ARROW INDICATES DIRECTION OF VIEW

B(IG) C T E E / HL T E E

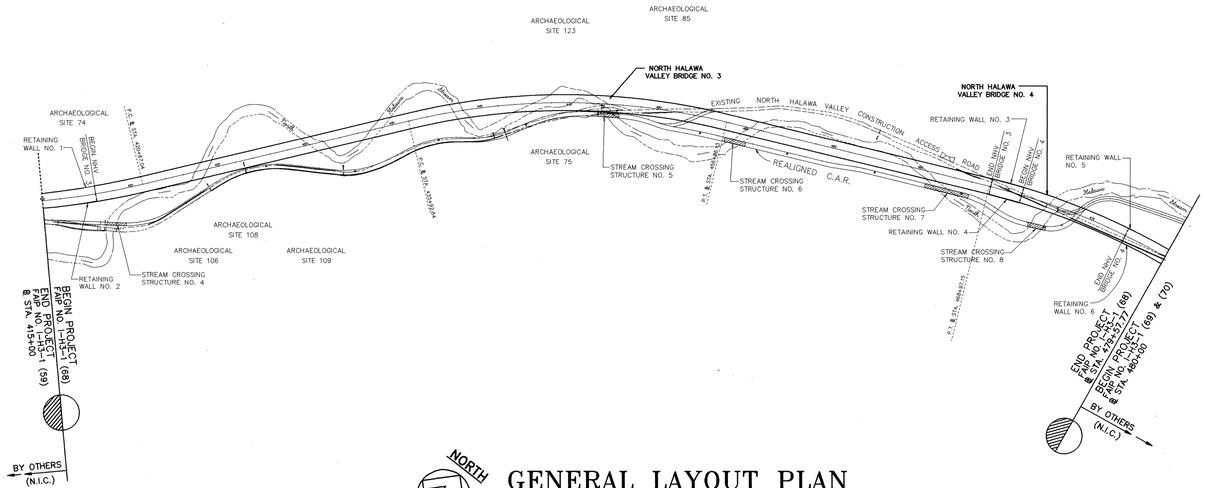
- INDICATES NEW DUCTLINE
- HL INDICATES HIGHWAY LIGHTING 3" DUCT
- C INDICATES COMMUNICATION 3" DUCT
- T INDICATES TELEPHONE 2" DUCT (FOR HTCO CABLES)
- E INDICATES ELECTRIC 5" DUCT (FOR HECO CABLES)

BAR INDICATES CUTTING PLANE

- INDICATES BOTTOM OF DUCT BANK
- B INDICATES DUCTS ON BRIDGE, FOR CONCRETE ENCASEMENT DETAILS SEE STRUCTURAL DRAWINGS
- IG INDICATES DUCTS IN GRADE, FOR DUCT SECTION DETAILS SEE 2 U1U28

VEHICLE DETECTOR STATION

FUTURE CONTROLLER AS INDICATED



NORTH

GENERAL LAYOUT PLAN

SCALE: 1"=400'

7/12/94	ADDED REFERENCE TO DETAILS ON DUCT SECTION INDICATOR
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ABBREVIATIONS, SYMBOLS & ELECTRICAL LAYOUT PLAN

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U1 OF 36 SHEETS

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

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

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H:\ACAD\PROJECTS\93089\LEGENDA

ADD. 99

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	100	470

GENERAL NOTES FOR HAWAIIAN TELEPHONE CO., AND HAWAIIAN ELECTRIC CO. WORK

1. ALL PROPOSED MANHOLES, PULLBOXES, CONDUITS/DUCTLINES, MANHOLE FRAMES AND COVERS, AND GROUND RODS REQUIRED BY HTCO AND HECO AND WITHIN THE HIGHWAY RIGHT-OF-WAY SHALL BE FURNISHED AND INSTALLED BY THE CONTRACTOR.
2. THE STATE'S SPECIAL PROVISIONS, PROPOSAL CONTRACT AND BOND - SECTIONS 630 AND 631 SHALL APPLY TO THE PROJECT.
3. THE TERM ENGINEER FOR THE UTILITY COMPANIES SHALL ALSO MEAN HIS DELEGATED REPRESENTATIVE AND/OR THE UTILITIES' INSPECTOR OF RECORD.
4. THE TERM PULLBOX SHALL MEAN SPLICE CAN, SPLICE OR SERVICE BOX, PULLBOX OR HANDHOLE.
5. THE TERM MANHOLE SHALL MEAN ANY SUBSURFACE ENCLOSURE IN WHICH MEN MUST ENTER TO WORK.
6. THE LOCATION AND DEPTH OF ALL MANHOLES AND PULLBOXES AND THE ROUTING OF ALL DUCTLINES SHALL BE VERIFIED BY THE STATE AND THE UTILITY COMPANIES BEFORE EXCAVATION STARTS.
7. THE CONTRACTOR SHALL FURNISH ALL MATERIALS REQUIRED TO COMPLETE THE CONSTRUCTION OF THE DUCT-LINE SYSTEM. ALL DUCTS FOR HECO CABLES SHALL BE PVC SCHEDULE 40. CONSTRUCTION SHALL CONFORM TO HECO STANDARD SPECIFICATIONS CS7001 AND CS7003, UNLESS OTHERWISE MODIFIED IN THESE PLANS.
8. ALL MANHOLES, PULLBOXES AND DUCTLINES TO BE INSTALLED IN CONCRETE SHALL BE INSPECTED BY THE UTILITY COMPANY AND APPROVED BY THE RESIDENT ENGINEER BEFORE PLACING CONCRETE.
9. MANHOLE DEPTHS SHOWN ON PLANS REFER TO INSIDE DEPTH OF MANHOLE.
10. THE MINIMUM DEPTH OF DUCTLINES FROM FINISH GRADE TO TOP OF CONCRETE ENCASEMENT OR COVER IS AS FOLLOWS:

    A. DOT-STATE OF HAWAII, ELECTRIC DUCTS FOR HECO CABLES _____ 3'-0" WHEN IN STATE HWY R-O-W
    B. DOT-STATE OF HAWAII, TELEPHONE DUCTS FOR HTCO CABLES _____ 3'-0" WHEN IN STATE HWY R-O-W

11. ALL COMPLETED DUCTLINES SHALL BE MANDREL TESTED BY THE CONTRACTOR IN THE PRESENCE OF THE UTILITY COMPANY'S INSPECTOR USING THE UTILITY COMPANY'S STANDARD PRACTICE.
12. THE CONTRACTOR SHALL INSTALL A 1/8"ø POLYOLEFIN PULL LINE IN ALL COMPLETED ELECTRICAL DUCTLINES AFTER MANDREL TESTING IS COMPLETED AND APPROVED.
13. ALL TELEPHONE CONDUITS SHALL HAVE AN 1800#, POLYESTER MULETAPE (NEPTCO WP1800P, GTE HAWAIIAN TEL MATERIAL CODE NO. 571154) INSTALLED THROUGHOUT ITS ENTIRE LENGTH. ALL CONDUITS SHALL BE TEMPORARILY PLUGGED OR CAPPED TO PREVENT THE ENTRANCE OF FOREIGN MATERIAL DURING CONSTRUCTION. THE TEMPORARY CAPS SHALL REMAIN INSTALLED ON EACH CONDUIT ENTERING A PULLBOX AT THE COMPLETION OF THE INSTALLATION.
14. THE CONTRACTOR SHALL FURNISH TO HTCO HIS CONSTRUCTION SCHEDULE TWENTY (20) WORKING DAYS PRIOR TO STARTING ANY HTCO WORK.
15. THE CONTRACTOR SHALL NOTIFY HTCO TEN (10) WORKING DAYS NOTICE TO PROCEED WITH IT'S PORTION OF THE WORK.
16. HTCO SHALL COORDINATE IT'S WORK IN SUCH A MANNER AS NOT TO IMPEDE CONSTRUCTION OPERATIONS.
17. THE CONTRACTOR SHALL FURNISH HIS CONSTRUCTION SCHEDULE TO HECO TWENTY (20) WORKING DAYS PRIOR TO STARTING ANY HECO WORK.
18. THE CONTRACTOR SHALL NOTIFY HECO TEN (10) WORKING DAYS NOTICE TO PROCEED WITH IT'S PORTION OF THE WORK.
19. HECO SHALL COORDINATE IT'S WORK IN SUCH A MANNER AS NOT TO IMPEDE CONSTRUCTION OPERATIONS.
20. THE FOLLOWING TERMS WILL BE USED INTERCHANGEABLY THROUGHOUT THIS PROJECT:

    A. HTCO OR HT FOR HAWAIIAN TELEPHONE CO.
    B. HECO OR HE FOR HAWAIIAN ELECTRIC CO.

21. THE FOLLOWING HECO STANDARD DRAWINGS AND THEIR REFERENCES ARE APPLICABLE TO THIS PLAN:

    MISCELLANEOUS DETAILS, MANHOLES AND HANDHOLES ———— HECO DRAWING 16688 (2-SHEETS)
    TYPICAL DUCT CONSTRUCTION INSTALLATION DETAILS ———— HECO DRAWING 30-1030
    PLASTIC DUCTS INSTALLATION DETAILS ———— HECO DRAWING 30-1035
    STANDARD HECO 31" MANHOLE FRAME AND COVER ———— HECO DRAWING 011327 & 011328

22. THE FOLLOWING HTCO STANDARD DRAWINGS AND THEIR REFERENCES ARE APPLICABLE TO THIS PLAN:

    LARGE PULLBOX NO. 435 T-B (2x4) ———— HTCO DRAWING 34056
    STANDARD DUCT FORMATIONS ———— HTCO DRAWING 34028

23. PROVIDING OF HTCO DUCTLINE SYSTEM SHALL BE IN CONFORMANCE WITH THE REQUIREMENTS OF HTCO "STANDARD SPECIFICATIONS FOR PLACING UNDERGROUND TELECOMMUNICATIONS SYSTEM", JUNE 1989, UNLESS OTHERWISE MODIFIED IN THESE PLANS. CHECK WITH HTCO PRIOR TO ORDERING MATERIAL FOR THE DUCTLINE SYSTEM WORK.
24. THE CONTRACTOR SHALL PROVIDE A 5/8" X 8' COPPERWELD GROUND ROD IN EACH PULLBOX IN GRADE.
25. ALL CONDUITS WILL ENTER AND LEAVE PULLBOXES, MANHOLES, EXPANSION JOINTS, AND DEFLECTION JOINTS AT 90 DEGREES TO THE FACE OF THE BOX.
26. ALL CONDUITS WILL ENTER AND LEAVE PULLBOXES AT 90 DEGREES TO THE FACE OF THE BOX.
27. THE MAXIMUM SIZE CONDUIT THAT MAY ENTER THE SIDE WALL OF A 2' X 4' PULLBOX IS 2".
28. ALL CONDUITS ENTERING PULLBOXES IN GRADE SHALL BE TERMINATED WITH A BELL END. THE BELL END SHALL BE FLUSH WITH THE INSIDE FACE OF THE PULLBOX WALL. NO PROTRUSION OF THE BELL END WILL BE PERMITTED.
29. ALL ENTRANCES INTO PULLBOXES IN GRADE WILL BE GROUTED AROUND THE CONDUIT. THE INSIDE SURFACE SHALL BE FINISHED SMOOTH AND FLUSH WITH THE EXISTING WALL SURFACE.
30. ALL CONDUIT, PULLBOXES, AND MANHOLES PROVIDED BY THE CONTRACTOR FOR USE BY HAWAIIAN TELEPHONE AND HECO SHALL BE SUBJECT TO INSPECTION. THE INSPECTION SHALL TAKE PLACE PRIOR TO BACK FILL OR CONCRETE ENCASEMENT. CALL FOR INSPECTION 3 WORKING DAYS PRIOR TO SCHEDULE THE INSPECTION.
31. AFTER TELEPHONE DUCTLINE HAS BEEN COMPLETED, A MANDREL NOT LESS THAN 12" LONG AND HAVING A DIAMETER OF 1/4" LESS THAN 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 IN THE LINE.
32. TYPE EB AND DB DUCTS ARE NOT ALLOWED.
33. ALL DUCTS FOR HTCO CABLES SHALL BE PVC, TYPE GT-42 OR SCHEDULE 40.
34. AFTER ELECTRIC DUCTLINE FOR HECO CABLES HAS BEEN COMPLETED, A MANDREL NOT LESS THAN 14" LONG AND HAVING A DIAMETER OF 1/2" LESS THAN 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 IN THE LINE. SEE HECO DRAWING 30-1030 SHEET 2 OF 2.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/26/94

DATE	REVISION
7/12/94	REVISED NOTES 6,7,13,23,27, AND 29. REVISED NUMBERING OF NOTES 23 TO 31. ADDED NOTES 33 AND 34.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES FOR HTCO AND HECO WORK

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: NONE DATE: MAR. 1994

SHEET No. U2 OF 36 SHEETS

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ADD. 100

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	101	470

GENERAL NOTES FOR HIGHWAY LIGHTING AND COMMUNICATIONS WORK:

1. PAYMENT FOR ALL WORK RELATED TO HIGHWAY LIGHTING SYSTEM AND COMMUNICATION DUCT SYSTEM SHALL BE MADE UNDER "SECTION 622-HIGHWAY LIGHTING SYSTEM" OF THE SPECIAL PROVISIONS, PROPOSAL CONTRACT AND BOND OF THE PROJECT.
2. ALL HIGHWAY LIGHTING AND COMMUNICATION DUCT MAINS TO BE 3 INCH SCHEDULE 40 PVC DUCTS ENCASED IN A 3" MINIMUM CLASS B CONCRETE JACKET.
3. ALL HIGHWAY PULLBOX TO HIGHWAY LIGHTING FOUNDATION AND ALL COMMUNICATION PULLBOX TO EMERGENCY CABINET RISERS TO BE 2 INCH SCHEDULE 40 PVC DUCTS ENCASED IN A 3 INCH MINIMUM CLASS B CONCRETE JACKET.
4. CONTRACTOR SHALL SUBMIT COMPUTERIZED POINT TO POINT FC LEVEL FOR APPROVAL.
5. CONTRACTOR TO INSTALL HIGHWAY LIGHTING AND POWER CABLES AND MAKE CONNECTION TO EXISTING POWER CABLES AT OR PAST PROJECT INTERFACES AS REQUIRED. IF DUCTS AT INTERFACE ARE NON-EXISTING, CONTRACTOR IS TO LEAVE A 3'-0" COIL IN HIS FIRST/LAST PULLBOX INVOLVED.
6. INSTALL THE DUCT SYSTEM FOR THE DETECTOR LOOP AS SHOWN ON SHEET U-36. THE WIRING FOR THE DETECTOR LOOP IS N.I.C.
7. CAP OR PLUG ALL UNUSED CONDUITS. TEMPORARILY PLUG OR CAP CONDUITS TO PREVENT ENTRANCE OF FOREIGN MATERIAL DURING CONSTRUCTION. THE TEMPORARY CAPS OR PLUGS SHALL REMAIN ON EACH CONDUIT ENTERING A PULLBOX AT COMPLETION OF INSTALLATION.

PERMANENT HIGHWAY LIGHTING CRITERIA:

1. MINIMUM AVERAGE MAINTAINED ILLUMINATION LEVEL: 1 FC
2. MAXIMUM (AVERAGE TO MINIMUM FOOTCANDLE) UNIFORMITY RATIO: 4 TO 1
3. MAINTENANCE FACTOR: 0.80
4. PROVIDE HIGHWAY ILLUMINATION CALCULATIONS (PER IES RECOMMENDATIONS) CERTIFYING CONFORMANCE WITH MINIMUM AVERAGE MAINTAINED ILLUMINATION LEVELS AND MAXIMUM (AVERAGE TO MINIMUM FOOTCANDLES) UNIFORMITY RATIO.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

DATE	REVISION
7/12/94	ADDED NOTE 7

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

GENERAL NOTES FOR HIGHWAY LIGHTING AND COMMUNICATIONS WORK

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U3 OF 36 SHEETS

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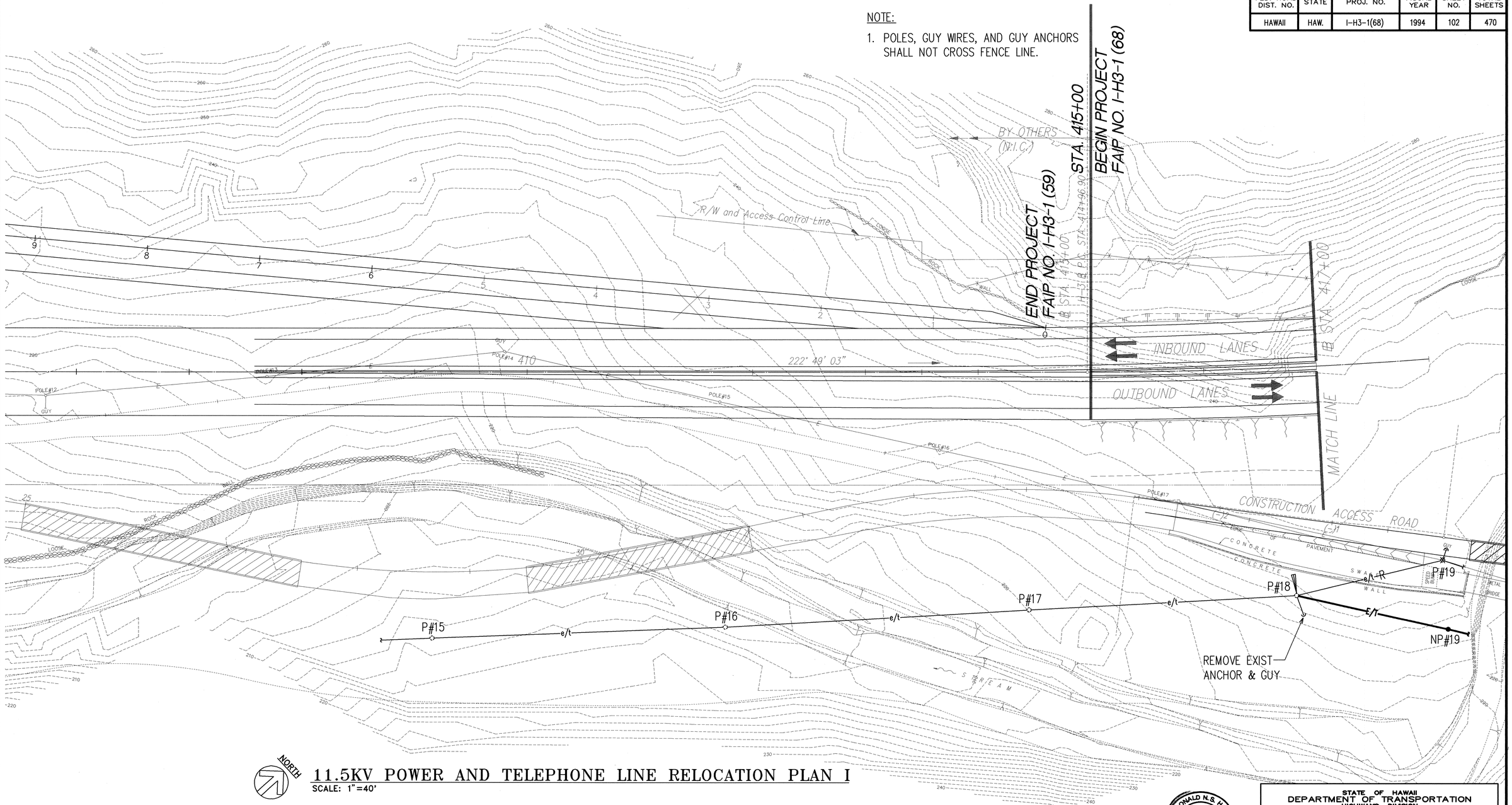
ADD. 101

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	102	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN I

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN I
STA. 415+00 TO STA. 417+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U4 OF 36 SHEETS

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

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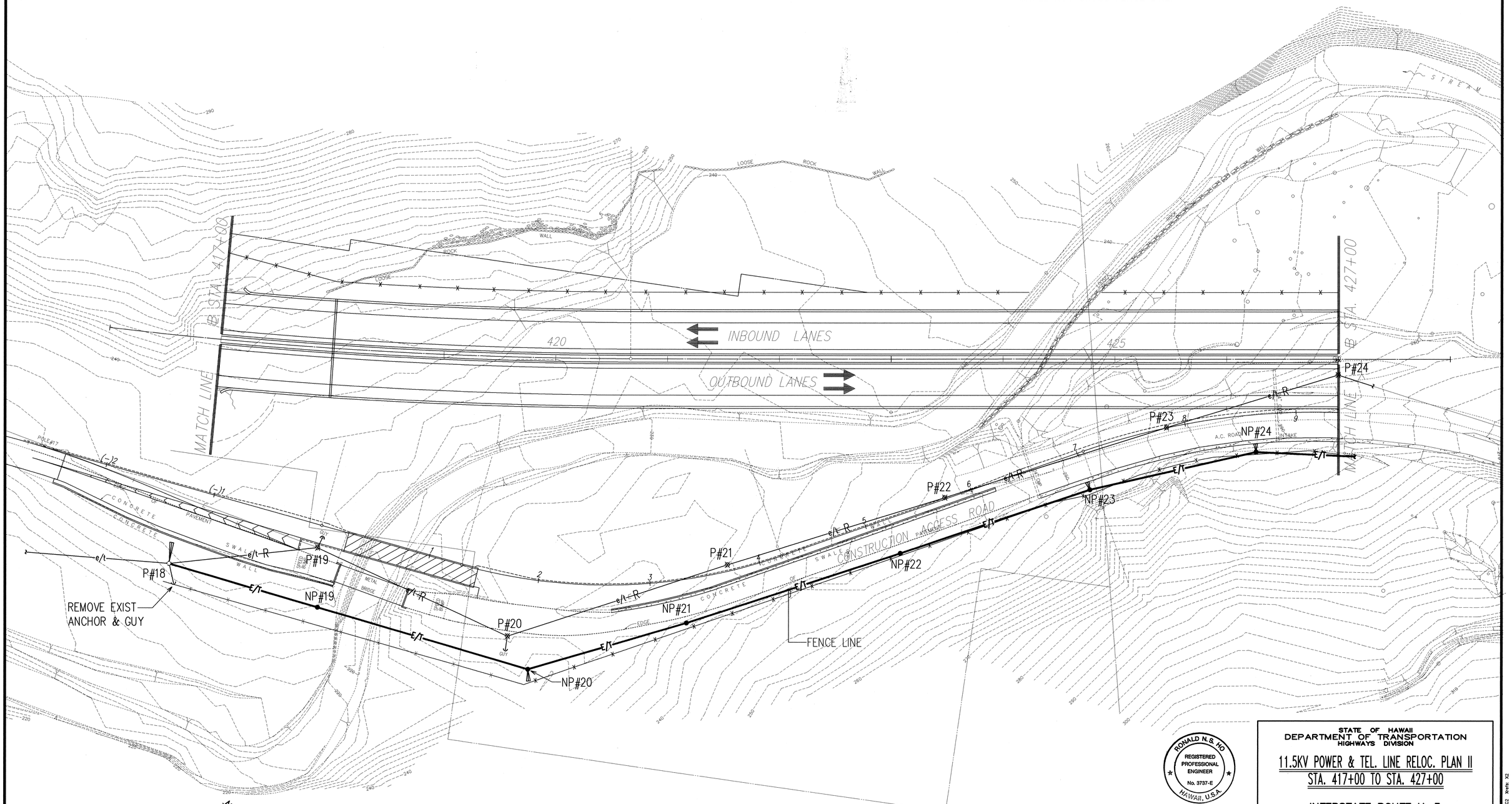
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	103	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN II

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN II
STA. 417+00 TO STA. 427+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U5 OF 36 SHEETS

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

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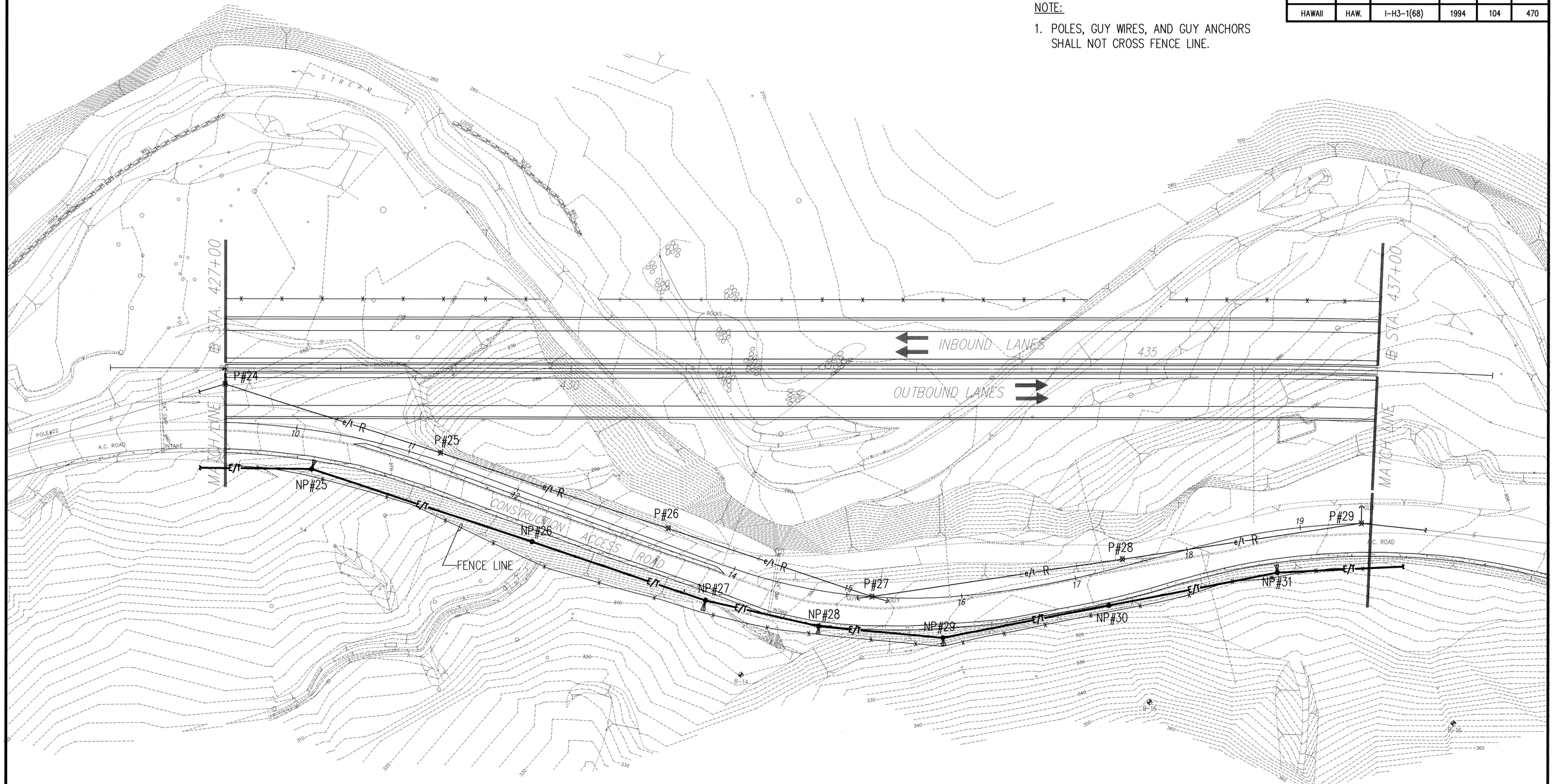
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	104	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN III

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN III
STA. 427+00 TO STA. 437+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U6 OF 36 SHEETS

ORIGINAL PLANS PLOTTED BY
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DESIGNED BY
QUANTITIES BY
CHECKED BY
NOTE BOOK
No.
DATE

Last save: 03/21/94 @ 14:39:26 by: RN

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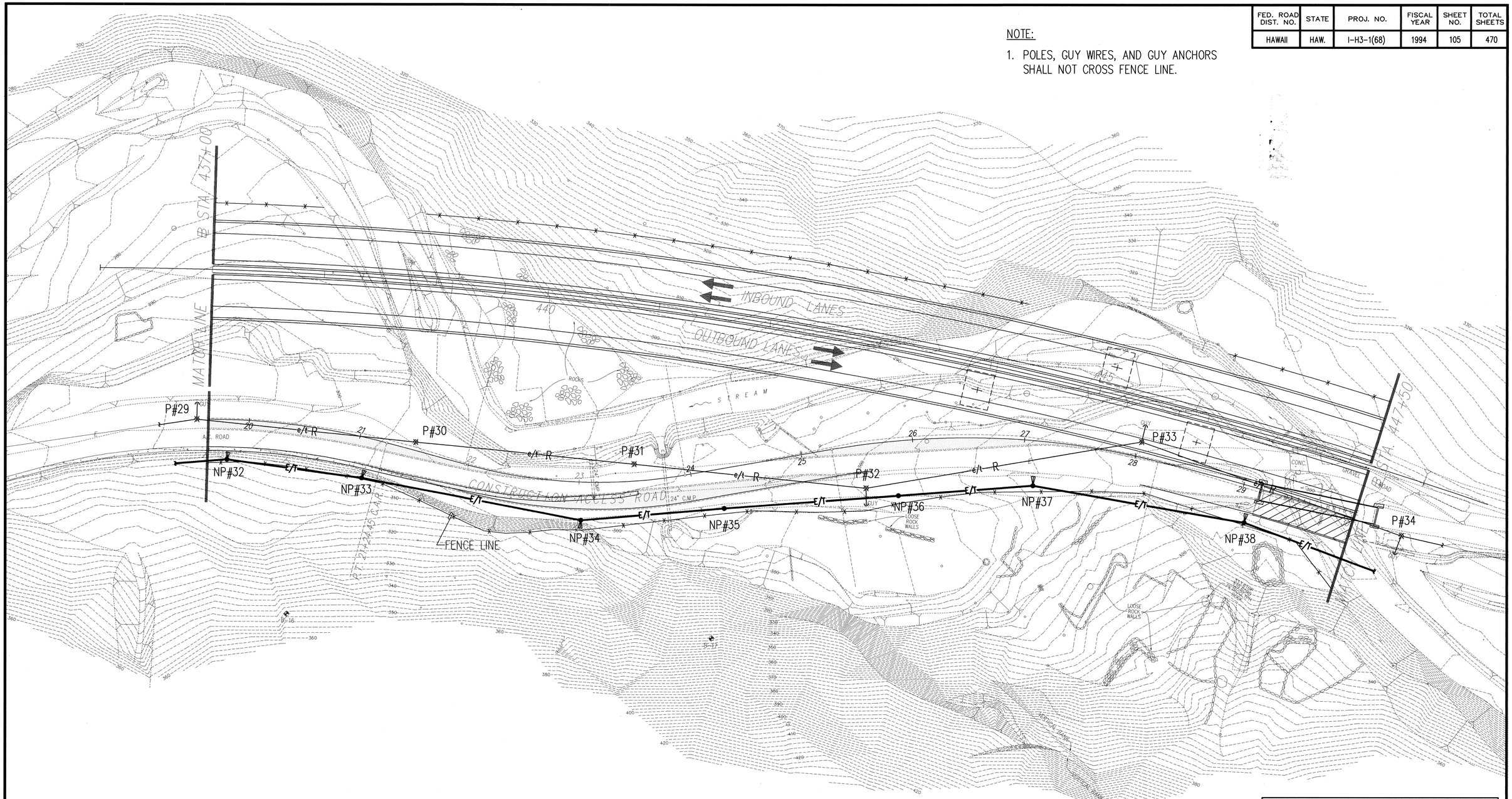
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	105	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN IV

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

5/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN IV
STA. 437+00 TO STA. 447+50

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. 07 OF 36 SHEETS

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

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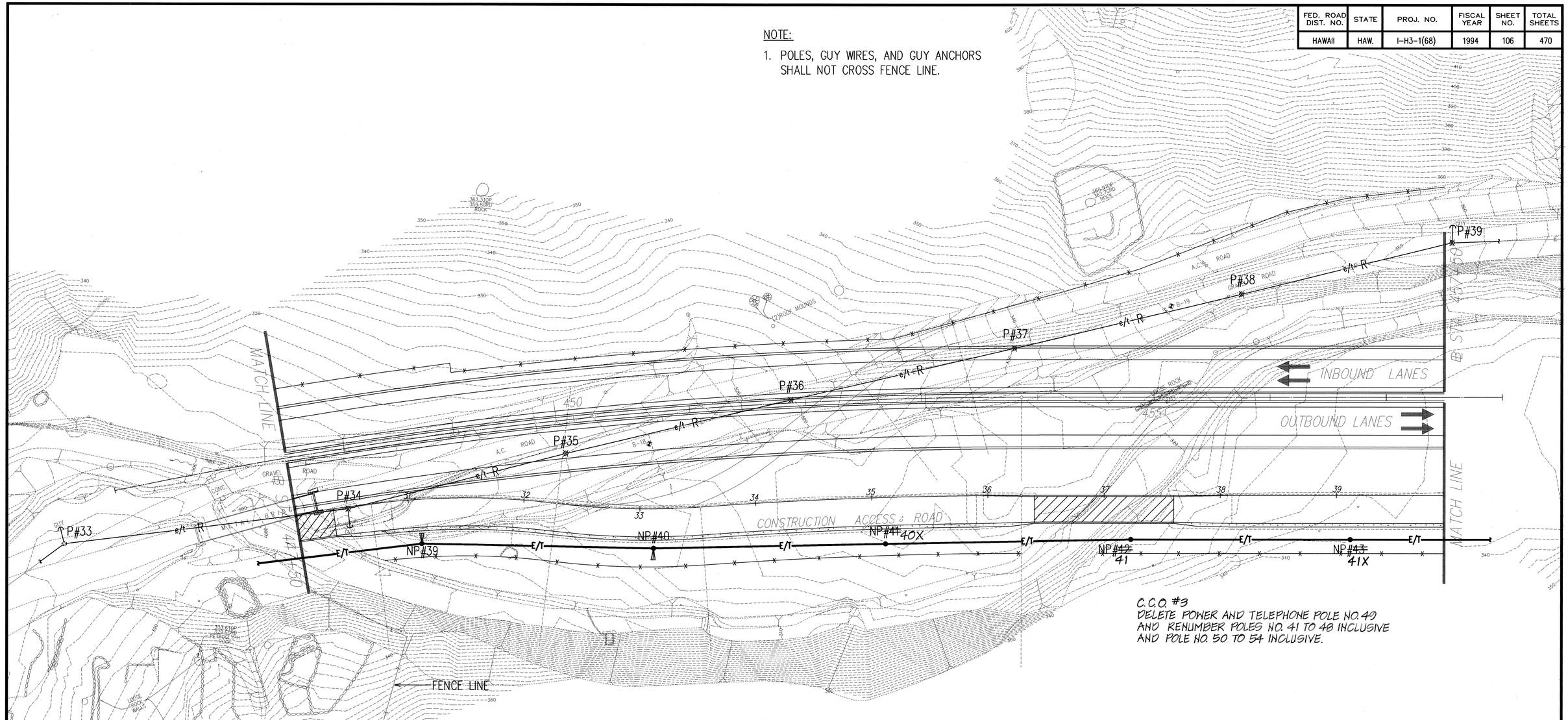
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	106	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



C.C.O. #3
DELETE POWER AND TELEPHONE POLE NO. 40
AND RENUMBER POLES NO. 41 TO 48 INCLUSIVE
AND POLE NO. 50 TO 54 INCLUSIVE.

NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN V

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN V
STA. 447+50 TO STA. 457+50

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. 108 OF 36 SHEETS

ORIGINAL PLAN
NOTE BOOK
No.

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

Last save: 03/21/94 @ 14:46:12 by: RN

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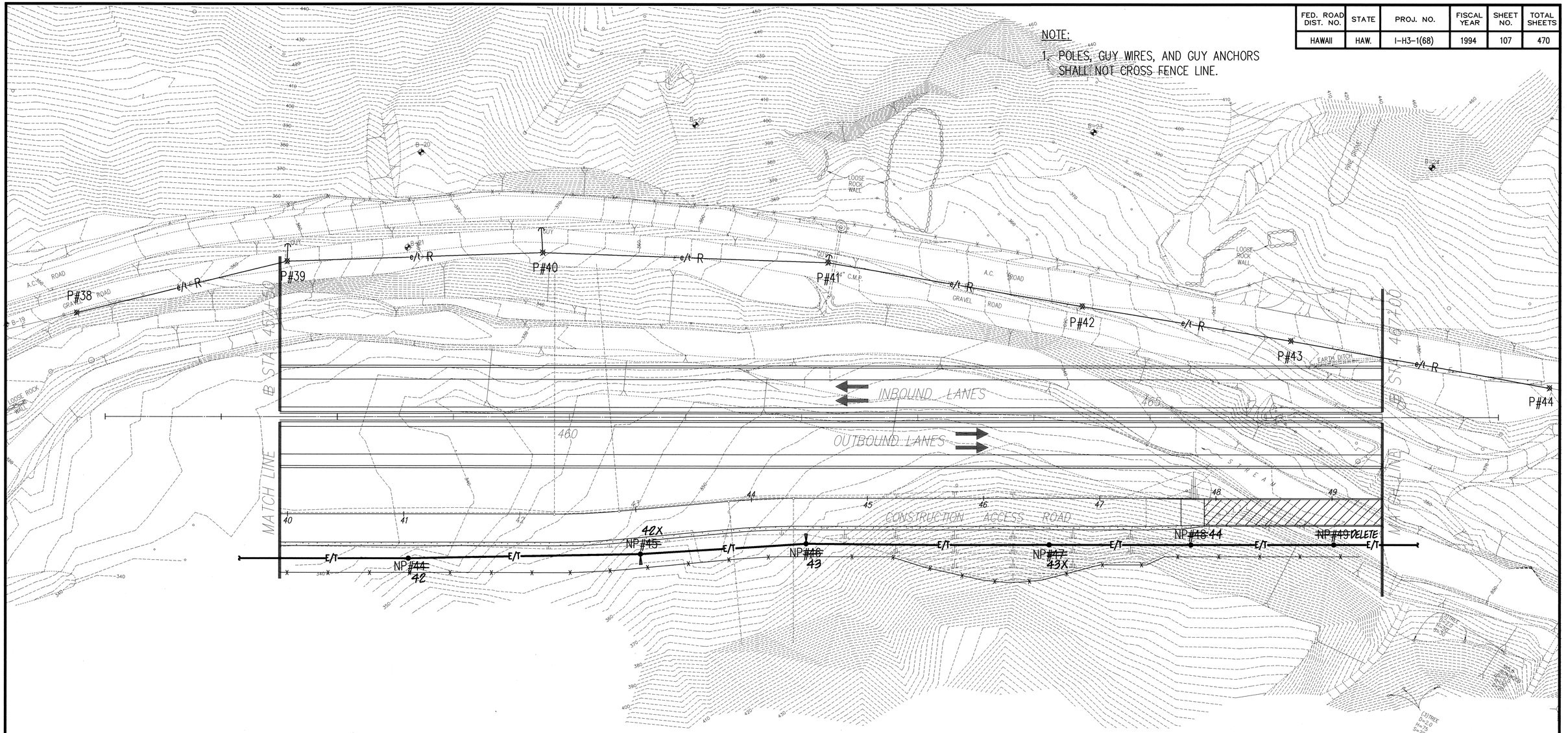
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	107	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



C.C.O. #3
DELETE POWER AND TELEPHONE POLE NO. 49 AND RENUMBER POLES NO. 41 TO 48 INCLUSIVE AND POLES NO. 50 TO 54 INCLUSIVE

NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN VI

SCALE: 1"=40'

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

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN VI
STA. 457+50 TO STA. 467+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U9 OF 36 SHEETS

Last save: 03/21/94 @ 14:49:14 by: RN

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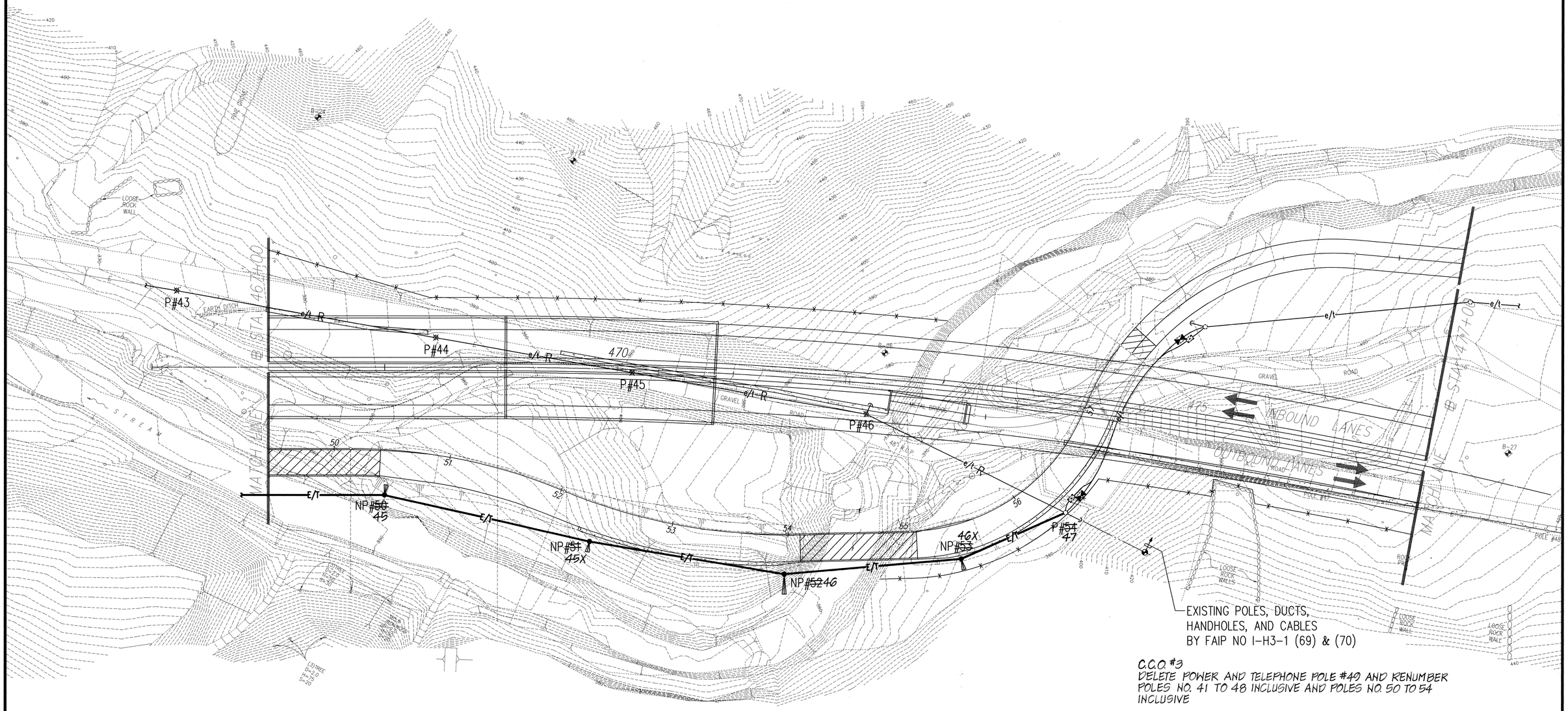
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	108	470

NOTE:

1. POLES, GUY WIRES, AND GUY ANCHORS SHALL NOT CROSS FENCE LINE.



EXISTING POLES, DUCTS, HANDHOLES, AND CABLES BY FAIP NO I-H3-1 (69) & (70)

C.C.O. #3
DELETE POWER AND TELEPHONE POLE #49 AND RENUMBER POLES NO. 41 TO 48 INCLUSIVE AND POLES NO. 50 TO 54 INCLUSIVE

NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN VII

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

ORIGINAL PLANS
NOTE BOOK ____ No. ____

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN VII
STA. 467+00 TO STA. 477+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U10 OF 36 SHEETS

Last save: 03/21/94 @ 14:52:21 by: RN

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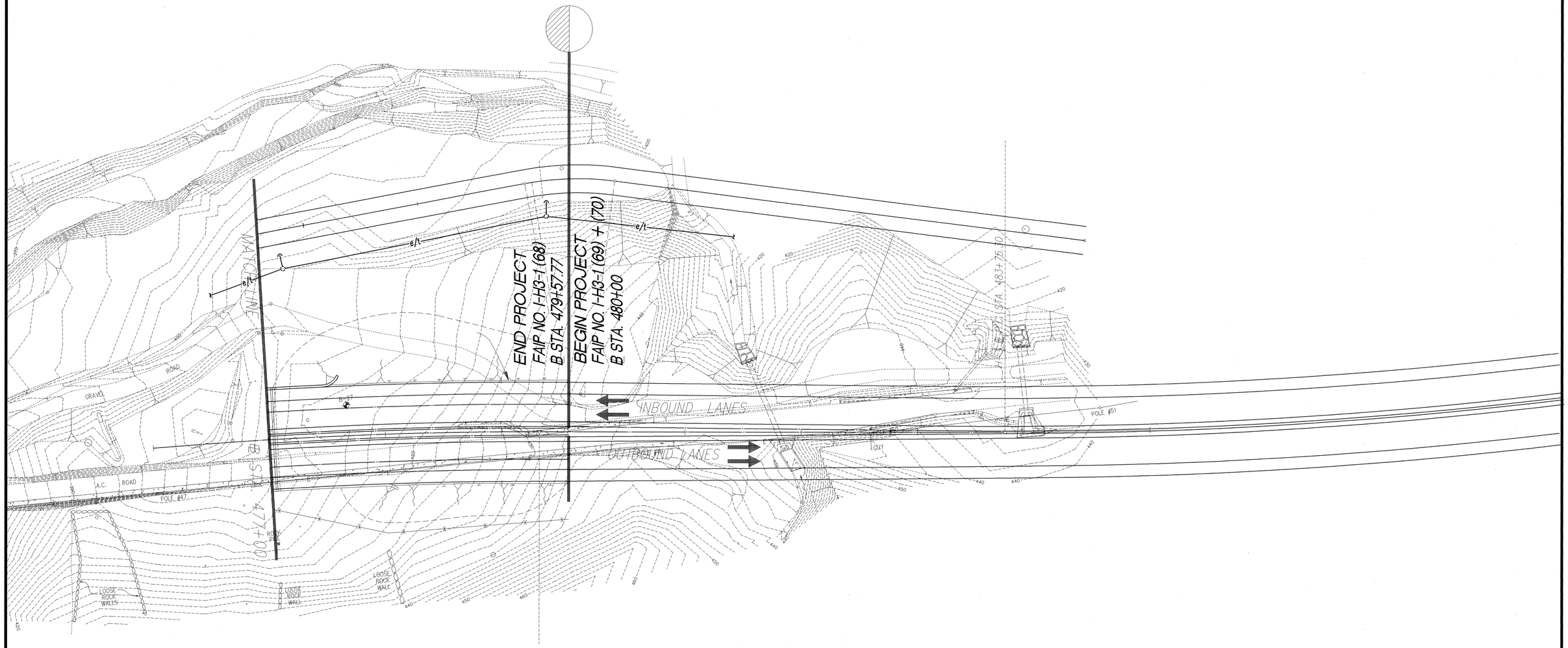
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	109	470



NORTH

11.5KV POWER AND TELEPHONE LINE RELOCATION PLAN VIII

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TEL. LINE RELOC. PLAN VIII
STA. 477+00 TO END

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U11 OF 36 SHEETS

ORIGINAL PLAN
NOTE BOOK
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QUANTITIES BY
CHECKED BY
DATE

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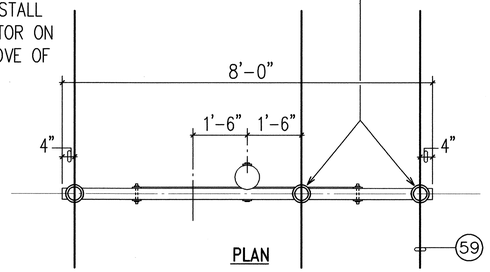
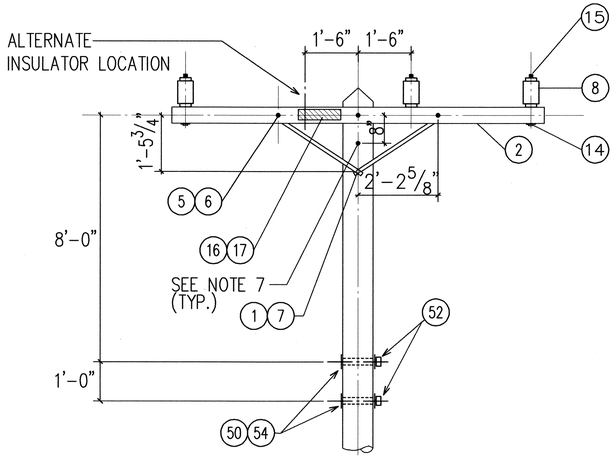
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	110	470

FOR STRAIGHT LINE CONDITION INSTALL THE CONDUCTOR ON CENTER GROOVE OF INSULATOR

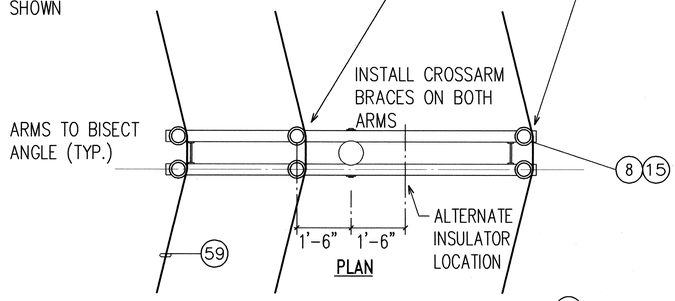


PLAN

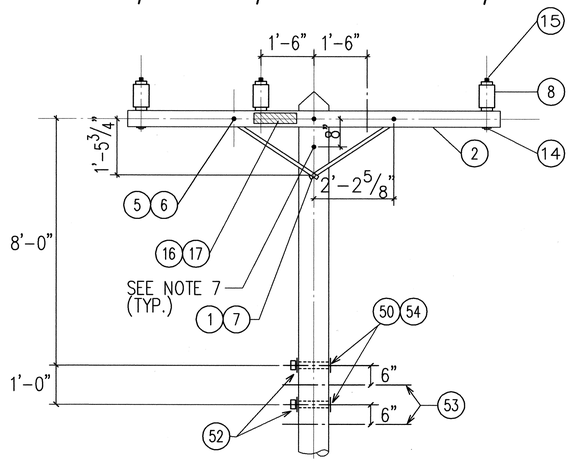


ELEVATION

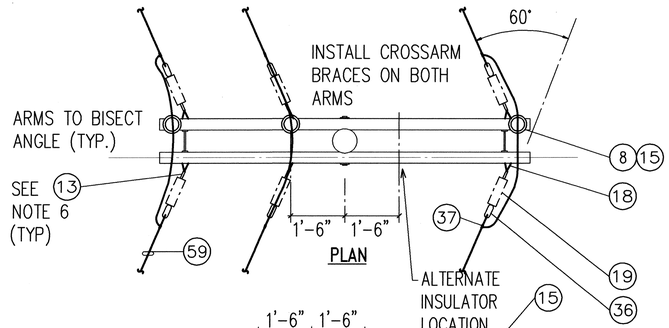
FOR ANGLE CONDITION, INSTALL THE CONDUCTOR ON THE GROOVE AWAY FROM THE ANGLE AS SHOWN



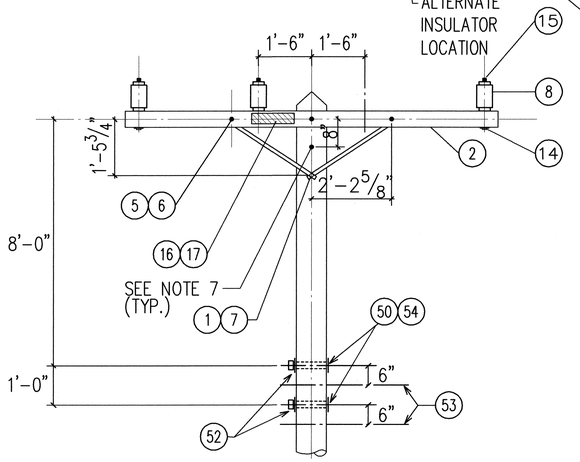
PLAN



ELEVATION



PLAN



ELEVATION

NOTES:

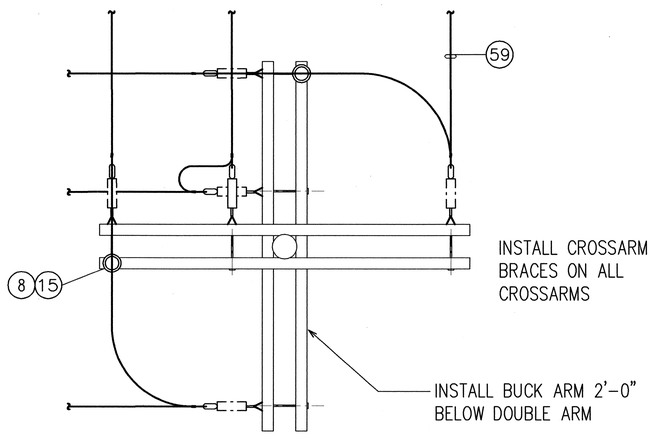
1. MAXIMUM POLE SPAN USING #3/0 AAAC SHALL BE 270 FT.
2. RESULTANT TENSION SHALL NOT EXCEED 400LBS. FOR SINGLE INSULATOR PER DET. 1 / U12|U12
3. RESULTANT TENSION SHALL NOT EXCEED 800LBS. FOR DOUBLE INSULATORS PER DET. 2 / U12|U12
4. USE DOUBLE ARM DOUBLE DEADEND CROSSARM DETAIL 3 / U12|U12 FOR DEVIATION ANGLE TO 60°., OR WHEN RESULTANT TENSION EXCEEDS 800# PER CONDUCTOR.
5. USE DEANDEND AND BUCK DET. 4 / U12|U12 FOR DEVIATION ANGLES 60 TO 90°., OR WHEN RESULTANT TENSION EXCEEDS 800# PER CONDUCTOR.
6. INSTALL GALV. DROP FORGED CLEVIS BETWEEN EYELET AND INSULATOR WHERE THE DEVIATION ANGLE OF THE POLES IS LESS THAN 60°.
7. POINT OF GUY ATTACHMENT WHEN REQUIRED.
8. FOR TELEPHONE FRAMING DETAILS, REFER TO SHEET U-13.

MATERIAL LEGEND

(2) CIRCLE WITH NUMBER WITHIN INDICATES THE POLE LINE MATERIAL LIST ITEM NO. SHOWN ON SHEET U-14.

1 / U12|U12 SINGLE ARM SINGLE INSULATOR CROSSARM DETAIL

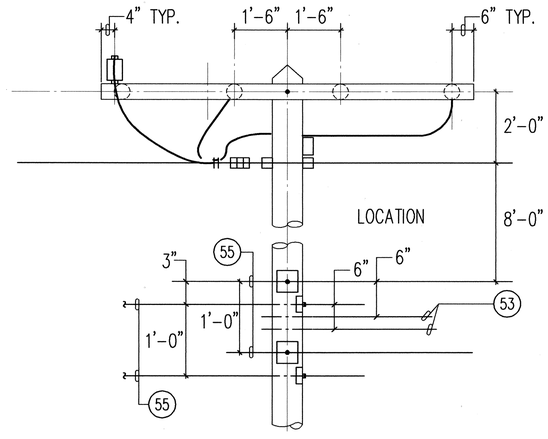
SEE NOTE 2 N.T.S.



PLAN

2 / U12|U12 DOUBLE ARM DOUBLE INSULATOR CROSSARM DETAIL

SEE NOTE 3 N.T.S.



ELEVATION

3 / U12|U12 DOUBLE ARM DOUBLE DEADEND LESS THAN 60° DEVIATION ANGLE CROSSARM DETAIL

SEE NOTE 4 N.T.S.

4 / U12|U12 DEADEND AND BUCK CROSSARM DETAILS

SEE NOTE 5 N.T.S.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV. POWER & TELEPHONE LINE
POLE FRAMING DETAILS

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U12 OF 36 SHEETS

ORIGINAL PLANS PREPARED BY
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DATE
NOTE BOOK
No.

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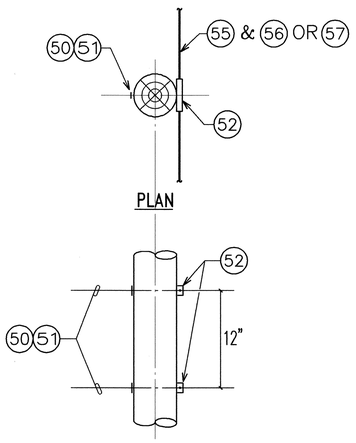
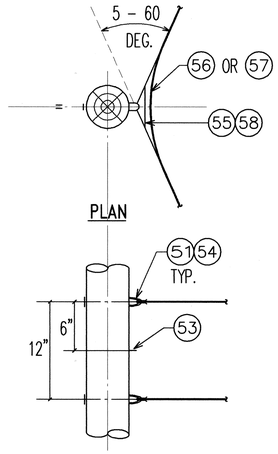
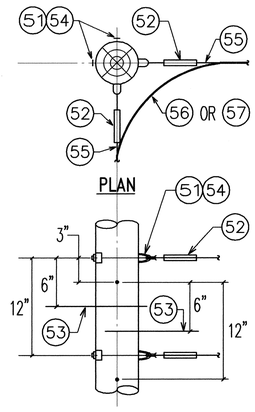
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	111	470



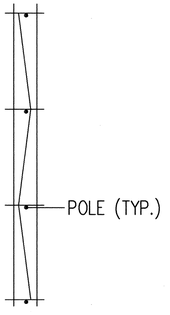
1 / U13 U13 **0 – 5° ANGLE TELEPHONE FRAMING**
N.T.S.



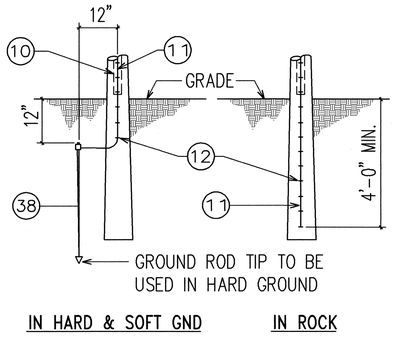
2 / U13 U13 **5 – 60° ANGLE TELEPHONE FRAMING**
N.T.S.



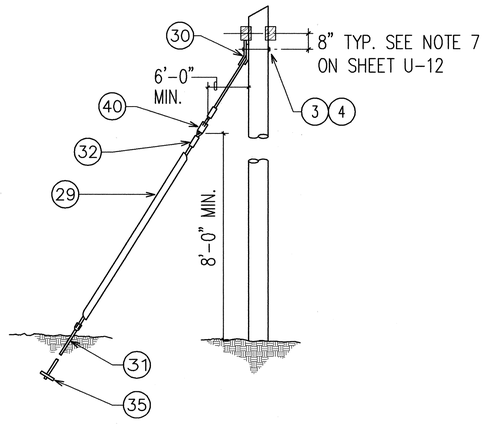
3 / U13 U13 **60 – 90° ANGLE TELEPHONE FRAMING**
N.T.S.



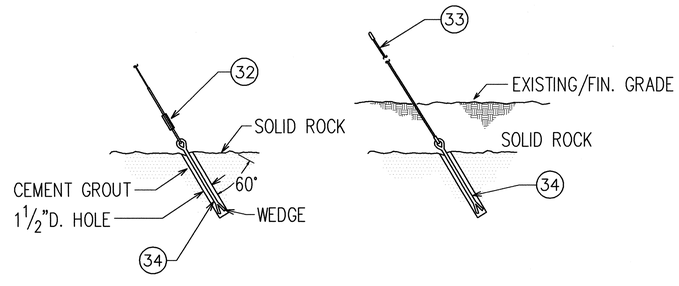
STAGGERING OF CENTER CONDUCTOR
N.T.S.



GROUNDING DETAILS
N.T.S.



TYPICAL GUY & ANCHOR ASSY.
N.T.S.



ROCK ANCHOR DETAILS
N.T.S.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TELEPHONE LINE
POLE FRAMING DETAILS

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U13 OF 36 SHEETS

Last save: 03/21/94 @ 15:00:12 by: RN

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	112	470

POLE LINE MATERIAL LIST (SEE GEN. NOTE 7)

ITEM NO.	DESCRIPTION	ITEM NO.	DESCRIPTION
1	ANGLE BRACE – GALV., 6'-3 1/2"L	21	NOT USED
2	CROSSARM – DOUGLAS FIR, 4" x 5" x 8'-0"	22	NOT USED
3	MACHINE BOLT – GALV., SQ. HEAD & NUT 5/8 x 18"	23	NOT USED
4	WASHER – 2" SQ., GALV., 11/16" HOLE	24	NOT USED
5	MACHINE BOLT – GALV., SQ. HEAD & NUT 1/2" x 8"	25	NOT USED
6	WASHER – 2" SQ. GALV., 5/8" HOLE	26	NOT USED
7	LAG SCREW – GALV., FETTER, 5/8" x 5"	27	NOT USED
8	POST TYPE INSULATOR	28	NOT USED
9	MACHINE BOLT – GALV., SQ. HEAD & NUT 5/8" x 24"	29	GUY GUARD, ROUND, PLASTIC, 8'-0" COLORED YELLOW
10	1 1/2" REDWOOD MOLDING	30	GUY POLE ATTACHMENT
11	NO. 6 AWG. BARE CU. SOLID GROUND WIRE	31	ANCHOR ROD – DOUBLE EYE, 3/4" x 8'-0"
12	STAPLES, 11 GAUGE, 1 1/4"	32	3 – BOLT GUY CLAMP
13	GALV. DROP – FORGED CLEVIS	33	ROCK ANCHOR 1" x 5'-11"
14	STUD FOR POST INSULATOR	34	ROCK ANCHOR & WEDGE 1" x 1'-6" EXTENSION
15	CONDUCTOR CLAMP FOR INSULATOR	35	SCREW TYPE ANCHOR, THIMBLE – EYE, 3/4" DIA. x 8' LONG & HOT DIP GALV.
15A	TIE WIRE, #4 SD BC	36	STRAIGHT BIGHT DEADEND (PRE-FORMED)
16	SIGN "HIGH VOLTAGE" – PLASTIC YELLOW	37	PARALLEL GROVE CLAMP
17	NAIL, SHINGLE, AL. 1 1/4" x 3D STD.	38	GROUND ROD, COPPER – ENCASED, STEEL ROD 3/4" DIA. x 10' LONG
18	EYELET, CLEVIS, GALV., 11/16" HOLE		
19	INSULATOR, SUSPENSION, PORC., 4 1/4" GALV. CAP	39	NOT USED
20	NOT USED	40	INSULATOR, GUY STRAIN

50	BOLT, GALVANIZED MACHINE 5/8 " ø, LENGTH AS REQUIRED
51	BOLT, GALVANIZED THIMBLE EYE FORGED STRAIGHT TYPE 5/8" ø, LENGTH AS REQUIRED
52	CLAMP, 3-BOLT GUY, GALVANIZED STEEL, HEAVY DUTY
53	GUY ATTACHMENT
54	WASHER, 2" x 2" SQUARE GALVANIZED
55	MESSENGER WIRE, STRANDED GALVANIZED STEEL, PER CABLE MANUFACTURERS RECOMMENDATION
56	TELEPHONE CABLE, 25 PAIR
57	TELEPHONE CABLE, 50 PAIR
58	TIE WIRE
59	#3/0 BARE ALUMINUM OVERHEAD TYPE AAAC

GENERAL NOTE:

1. ONLY MAJOR ITEMS ARE DESCRIBED. FURNISH & INSTALL HARDWARE & EQUIPMENT NECESSARY TO PROVIDE A COMPLETE OVER-HEAD POWER LINE, AND TELEPHONE SYSTEM PER SECTION 681 OF THE SPECIAL PROVISIONS PROPOSAL CONTRACT AND BOND OF THE PROJECT.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

11.5KV POWER & TELEPHONE LINE
POLE MATERIAL LIST

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U14 OF 36 SHEETS

112

Last save: 03/21/94 @ 15:01:26 by: RN

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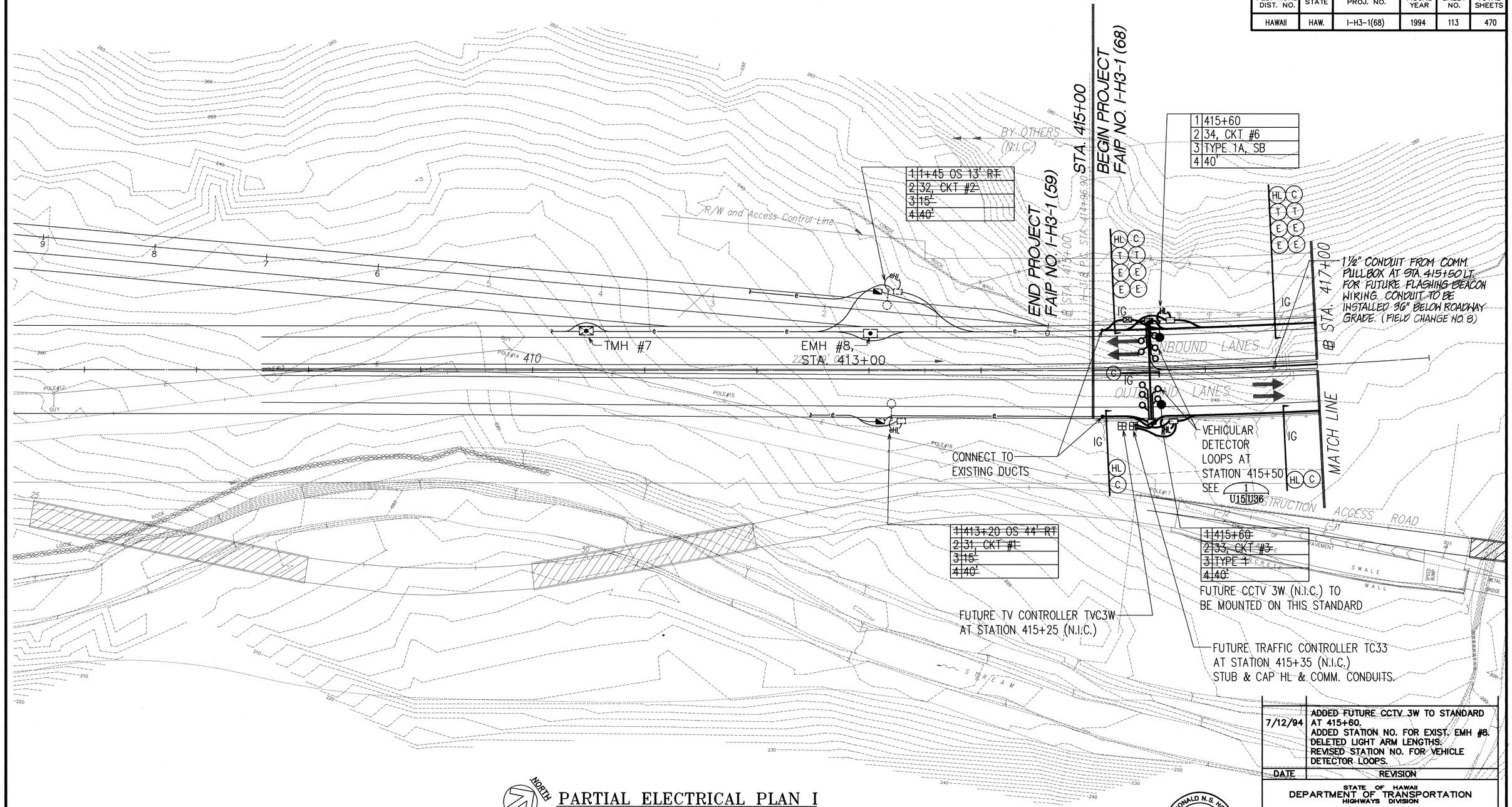
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	113	470



NORTH

PARTIAL ELECTRICAL PLAN I
SCALE: 1"=40'

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

DATE	REVISION
7/12/94	ADDED FUTURE CCTV 3W TO STANDARD AT 415+60. ADDED STATION NO. FOR EXIST. EMH #8. DELETED LIGHT ARM LENGTHS. REVISED STATION NO. FOR VEHICLE DETECTOR LOOPS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN I
STA. 415+00 TO STA. 417+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U15 OF 36 SHEETS

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

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

Last save: 07/22/94 @ 14:51:28 by: PV

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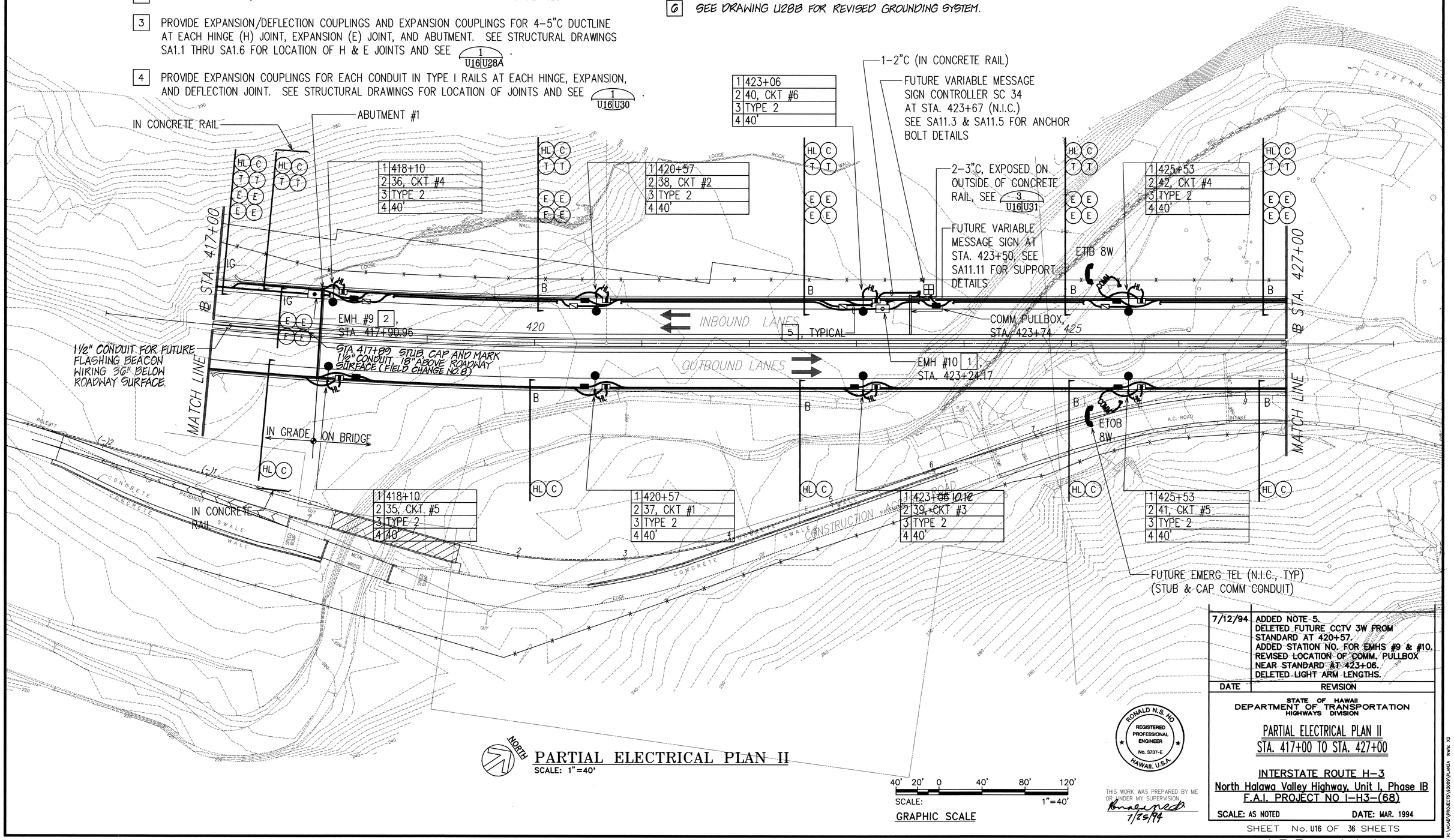
ADD. 113

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	114	470

NOTES:

1. EMH IN BRIDGE ~~HAMMERHEAD~~, SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
2. EMH AT ABUTMENT, SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
3. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT EACH HINGE (H) JOINT, EXPANSION (E) JOINT, AND ABUTMENT. SEE STRUCTURAL DRAWINGS SA1.1 THRU SA1.6 FOR LOCATION OF H & E JOINTS AND SEE 1/U16 U28A.
4. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE 1/U16 U30.
5. SEE DRAWINGS SA1.1 THRU SA1.6 FOR LOCATIONS OF ~~HAMMERHEADS ON~~ PIERS FOR BRIDGE 3. SEE DRAWINGS SA11.8 THRU SA11.10 FOR DETAILS ON TRANSITION OF 4-5"C THRU ~~HAMMERHEADS.~~ PIERS
6. SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM.



NORTH

PARTIAL ELECTRICAL PLAN II

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

DATE	REVISION
7/12/94	ADDED NOTE 5. DELETED FUTURE CCTV 3W FROM STANDARD AT 420+57. ADDED STATION NO. FOR EMHS #9 & #10. REVISED LOCATION OF COMM. PULLBOX NEAR STANDARD AT 423+06. DELETED LIGHT ARM LENGTHS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN II
STA. 417+00 TO STA. 427+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Ronald N.S. Ho
7/25/94

SHEET No. U16 OF 36 SHEETS

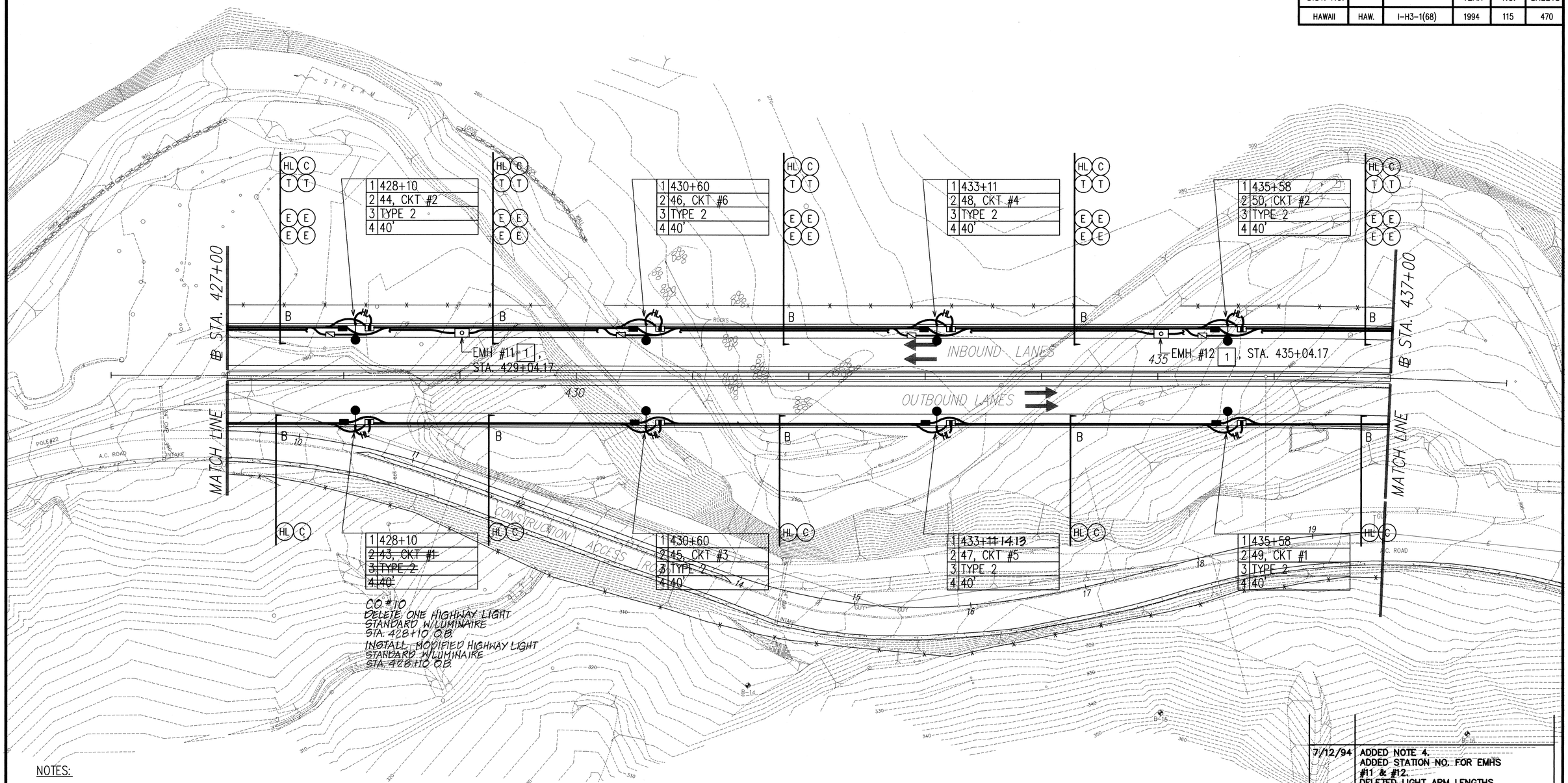
ORIGINAL PLANS WERE PLOTTED BY ____ DATE
SURVEY PLOTTED BY ____
DRAWN BY ____
TRACED BY ____
DESIGNED BY ____
QUANTITIES BY ____
CHECKED BY ____
NOTE BOOK ____ No. ____

Last save: 07/22/94 @ 15:08:48 by: PV

H:\ACAD\PROJECTS\93089\PLANS\A trans X2

ADD. 114

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	115	470



NOTES:

1. EMH IN BRIDGE ~~HAMMERHEAD,~~ SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
2. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT EACH HINGE (H) JOINT AND EXPANSION (E) JOINT. SEE STRUCTURAL DRAWINGS SA1.1 THRU SA1.6 FOR LOCATION OF H & E JOINTS AND SEE 1/U17|U28A .
3. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE 1/U17|U30 .
4. SEE DRAWINGS SA1.1 THRU SA1.6 FOR LOCATIONS OF ~~HAMMERHEADS ON~~ PIERS FOR BRIDGE 3. SEE DRAWINGS SA11.8 THRU SA11.10 FOR DETAILS ON TRANSITION OF 4-5"C THRU ~~HAMMERHEADS.~~ PIERS
5. SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM.

NORTH

PARTIAL ELECTRICAL PLAN III

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO REGISTERED PROFESSIONAL ENGINEER No. 3737-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

7/26/94

DATE	REVISION
7/12/94	ADDED NOTE 4. ADDED STATION NO. FOR EMHS #11 & #12. DELETED LIGHT ARM LENGTHS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN III
STA. 427+00 TO STA. 437+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U17 OF 36 SHEETS

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

Last save: 07/22/94 @ 13:47:44 by: PV

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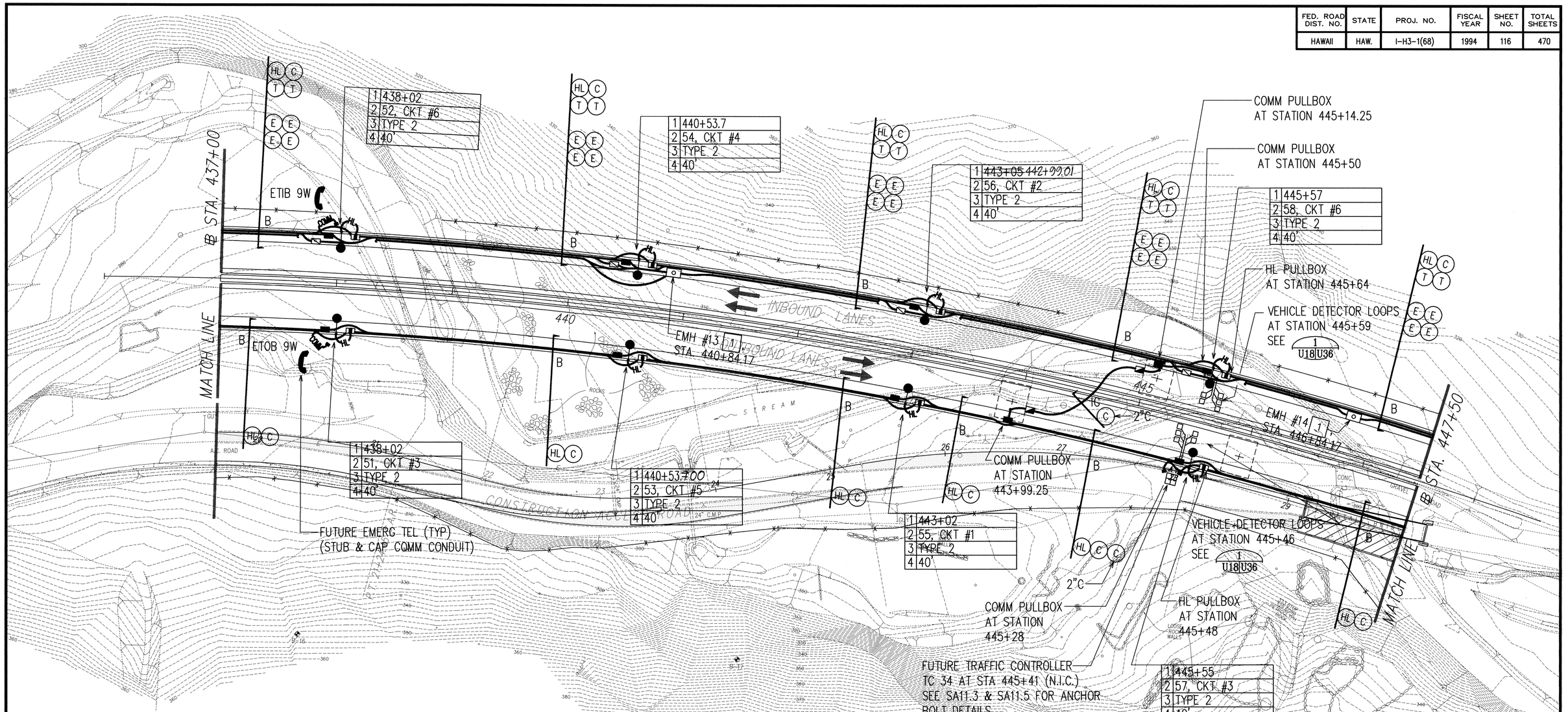
ADD. 115

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	116	470



NOTES:

1. EMH IN BRIDGE ~~HAMMERHEAD,~~ SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
2. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT EACH HINGE (H) JOINT AND EXPANSION (E) JOINT. SEE STRUCTURAL DRAWINGS SA1.1 THRU SA1.6 FOR LOCATION OF H & E JOINTS AND SEE 1 / U18|U28A .
3. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE 1 / U18|U30 .
4. SEE DRAWINGS SA1.1 THRU SA1.6 FOR LOCATIONS OF ~~HAMMERHEADS ON~~ PIERS FOR BRIDGE 3. SEE DRAWINGS SA11.8 THRU SA11.10 FOR DETAILS ON TRANSITION OF 4-5"C THRU ~~HAMMERHEADS.~~ PIERS
5. SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM.

NORTH

PARTIAL ELECTRICAL PLAN IV
SCALE: 1"=40'

40' 20' 0 40' 80' 120'
SCALE: 1"=40'
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
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

DATE	REVISION
7/12/94	ADDED STATION NO. FOR PULLBOXES NEAR STANDARDS AT 445+55 & 445+57. ADDED STATION NO. FOR EMHS #13 & #14. DELETED LIGHT ARM LENGTHS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN IV
STA. 437+00 TO STA. 447+50

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U18 OF 36 SHEETS

H:\CAD\PROJECTS\93060\PLANS\ Xrefs: X4

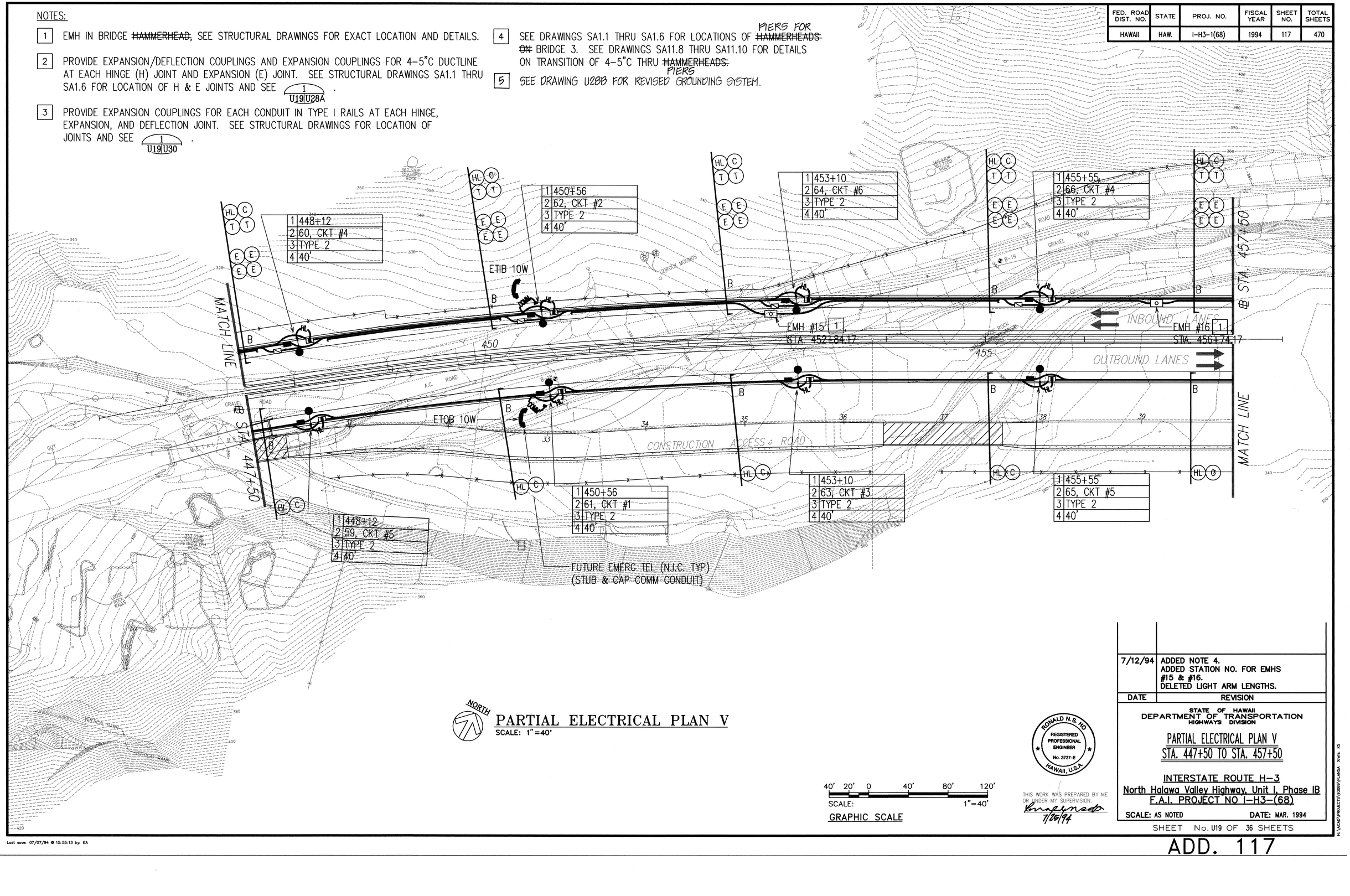
Last save: 07/22/94 @ 15:14:35 by: PV

ADD. 116

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	117	470

NOTES:

1. EMH IN BRIDGE ~~HAMMERHEAD~~, SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
2. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT EACH HINGE (H) JOINT AND EXPANSION (E) JOINT. SEE STRUCTURAL DRAWINGS SA1.1 THRU SA1.6 FOR LOCATION OF H & E JOINTS AND SEE (1 / U19 U28A).
3. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE (1 / U19 U30).
4. SEE DRAWINGS SA1.1 THRU SA1.6 FOR LOCATIONS OF ~~HAMMERHEADS ON~~ PIERS FOR BRIDGE 3. SEE DRAWINGS SA11.8 THRU SA11.10 FOR DETAILS ON TRANSITION OF 4-5"C THRU ~~HAMMERHEADS.~~ PIERS
5. SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM.



NORTH

PARTIAL ELECTRICAL PLAN V

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

DATE	REVISION
7/12/94	ADDED NOTE 4. ADDED STATION NO. FOR EMHS #15 & #16. DELETED LIGHT ARM LENGTHS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN V
STA. 447+50 TO STA. 457+50

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U19 OF 36 SHEETS

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

Last save: 07/07/94 @ 15:55:13 by: EA

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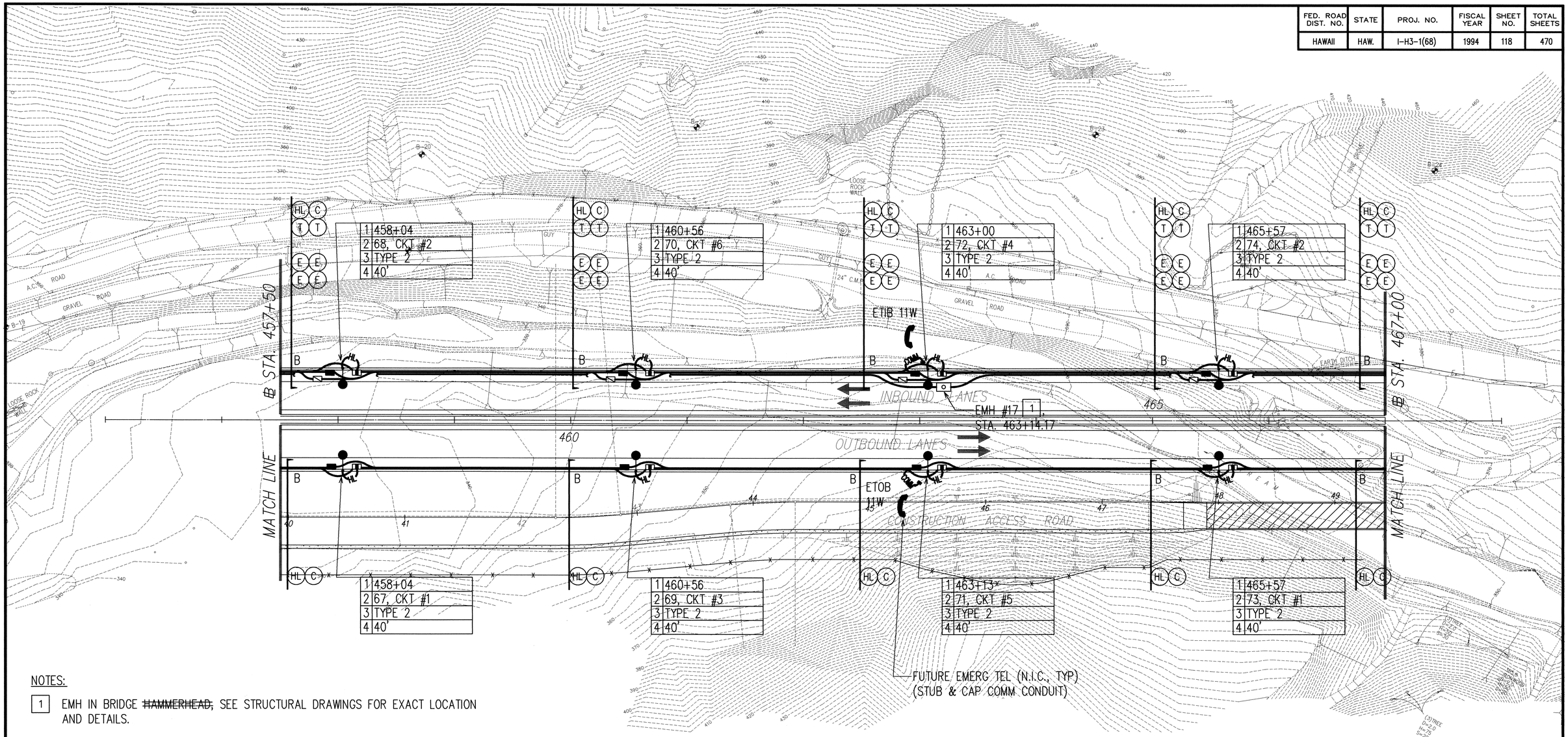
ADD. 117

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	118	470



NOTES:

1. EMH IN BRIDGE ~~HAMMERHEAD,~~ SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.

2. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT EACH HINGE (H) JOINT AND EXPANSION (E) JOINT. SEE STRUCTURAL DRAWINGS SA1.1 THRU SA1.6 FOR LOCATION OF H & E JOINTS AND SEE 1/U20|U28A .

3. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE 1/U20|U30 .

4. SEE DRAWINGS SA1.1 THRU SA1.6 FOR LOCATIONS OF ~~HAMMERHEADS~~ PIERS FOR ~~ON~~ BRIDGE 3. SEE DRAWINGS SA11.8 THRU SA11.10 FOR DETAILS ON TRANSITION OF 4-5"C THRU ~~HAMMERHEADS.~~ PIERS

5. SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM.

NORTH

PARTIAL ELECTRICAL PLAN VI

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

7/25/94

DATE	REVISION
7/12/94	ADDED NOTE 4. ADDED STATION NO. FOR EMH #17. DELETED LIGHT ARM LENGTHS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN VI
STA. 457+50 TO STA. 467+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U20 OF 36 SHEETS

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

Last save: 07/07/94 @ 15:59:30 by: EA

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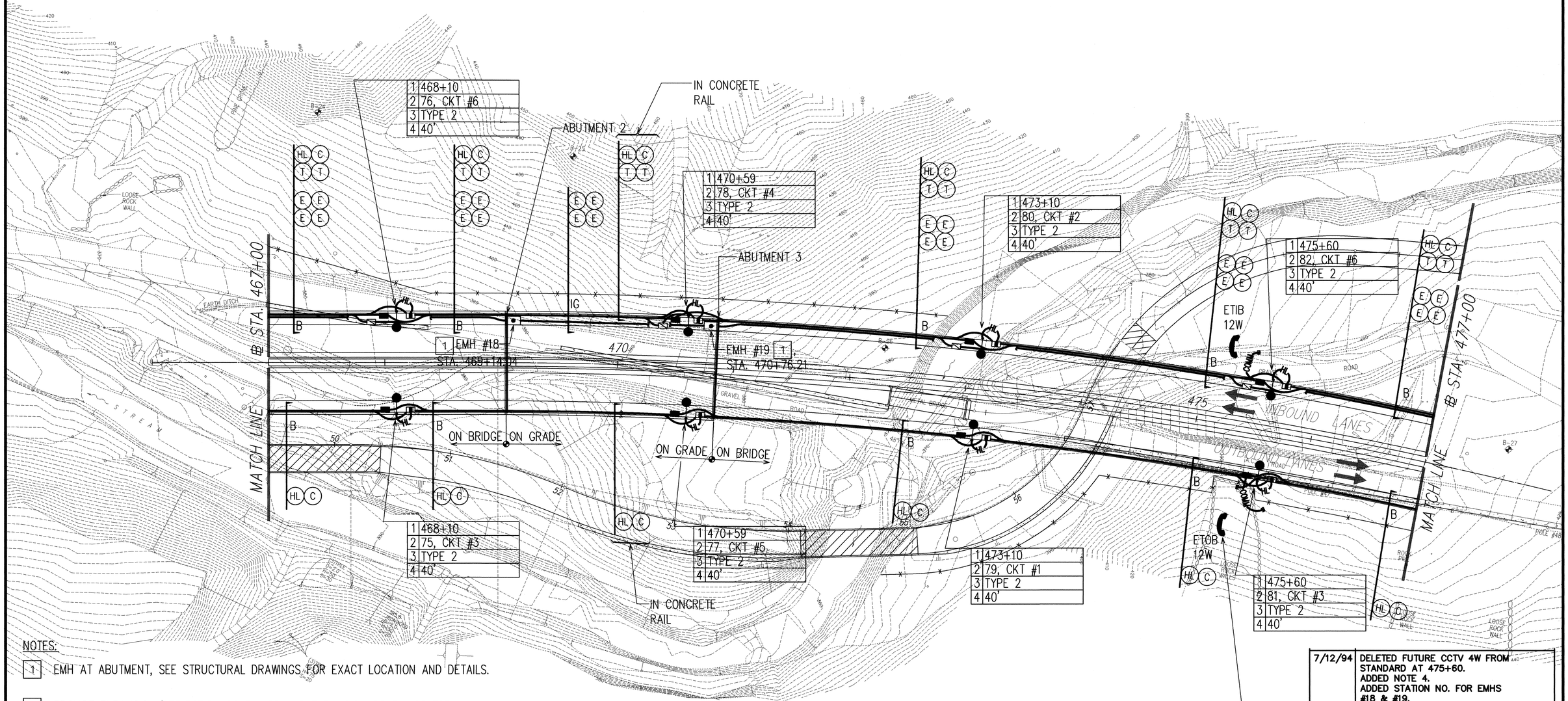
ADD. 118

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	119	470



NOTES:

1. EMH AT ABUTMENT, SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
2. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT EACH HINGE (H) JOINT, EXPANSION (E) JOINT, AND ABUTMENT. SEE STRUCTURAL DRAWINGS SA1.1 THRU SA1.6 FOR LOCATION OF H & E JOINTS AND SEE 1/U21|U28A.
3. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE 1/U21|U30.
4. SEE DRAWINGS SA1.1 THRU SA1.6 FOR LOCATIONS OF ~~HAMMERHEADS ON~~ PIERS FOR BRIDGE 3. SEE DRAWINGS SA11.8 THRU SA11.10 FOR DETAILS ON TRANSITION OF 4-5"C THRU ~~HAMMERHEADS.~~ PIERS
5. SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM.

NORTH

PARTIAL ELECTRICAL PLAN VII
SCALE: 1"=40'

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

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

DATE	REVISION
7/12/94	DELETED FUTURE CCTV 4W FROM STANDARD AT 475+60. ADDED NOTE 4. ADDED STATION NO. FOR EMHS #18 & #19. DELETED LIGHT ARM LENGTHS.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN VII
STA. 467+00 TO STA. 477+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

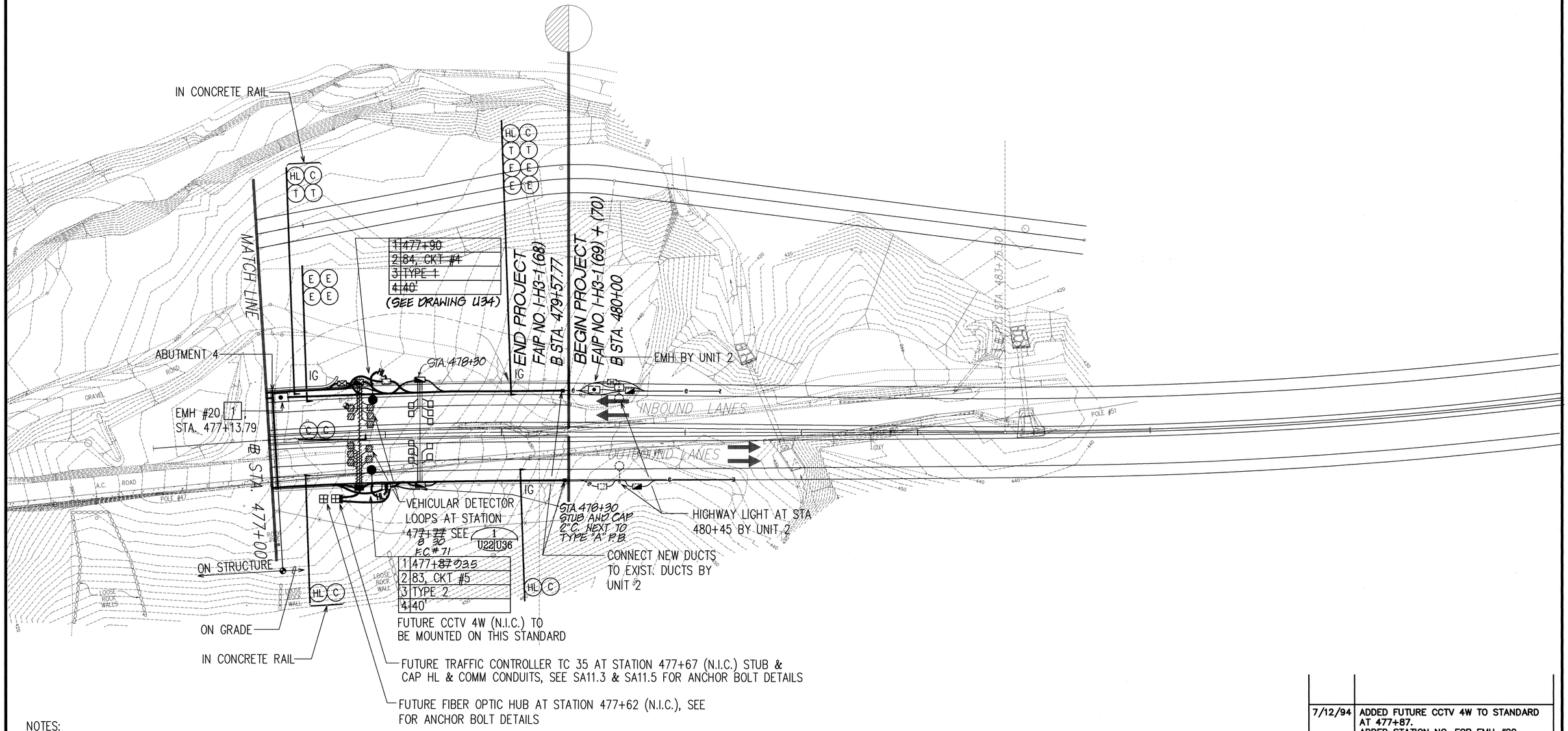
SHEET No. U21 OF 36 SHEETS

H:\CAD\PROJECTS\93089\PLAN7A Xrefs: X7

Last save: 07/07/94 @ 16:04:42 by: EA

ADD. 119

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	120	470



NOTES:

1. EMH AT ABUTMENT, SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION AND DETAILS.
2. PROVIDE EXPANSION/DEFLECTION COUPLINGS AND EXPANSION COUPLINGS FOR 4-5"C DUCTLINE AT ABUTMENT. SEE 1 / U22 U28A.
3. PROVIDE EXPANSION COUPLINGS FOR EACH CONDUIT IN TYPE I RAILS AT EACH HINGE, EXPANSION, AND DEFLECTION JOINT. SEE STRUCTURAL DRAWINGS FOR LOCATION OF JOINTS AND SEE 1 / U22 U30.

NORTH

PARTIAL ELECTRICAL PLAN VIII

SCALE: 1"=40'

40' 20' 0 40' 80' 120'

SCALE: 1"=40'

GRAPHIC SCALE

DATE	REVISION
7/12/94	ADDED FUTURE CCTV 4W TO STANDARD AT 477+87. ADDED STATION NO. FOR EMH #20. DELETED LIGHT ARM LENGTHS.

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

PARTIAL ELECTRICAL PLAN VIII
STA. 477+00 TO END

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U22 OF 36 SHEETS

ADD. 120

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

Last save: 07/22/94 @ 15:04:50 by: PV

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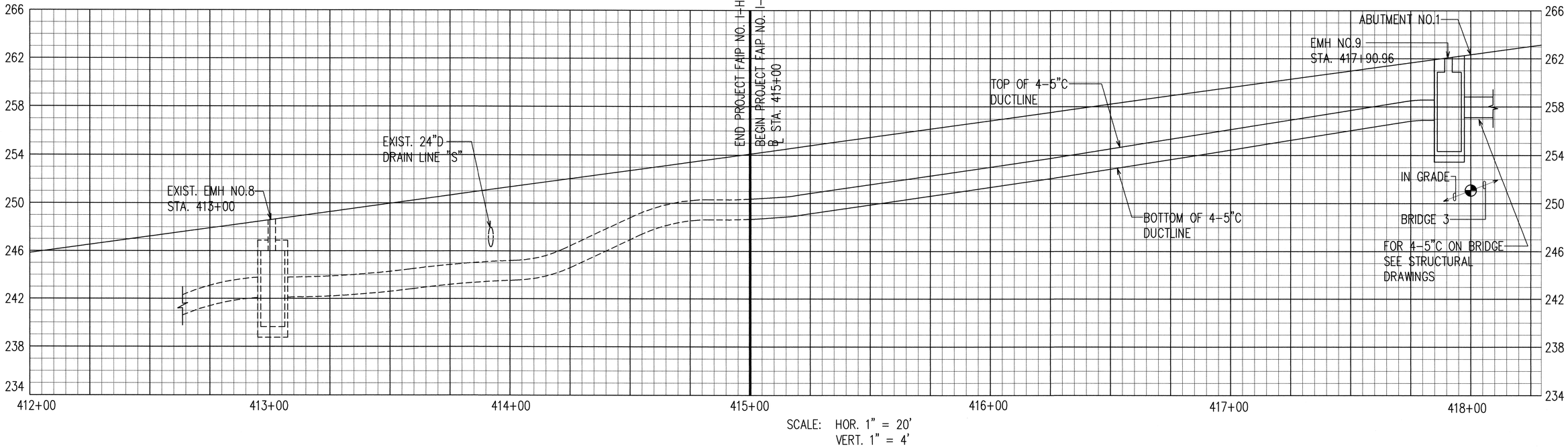
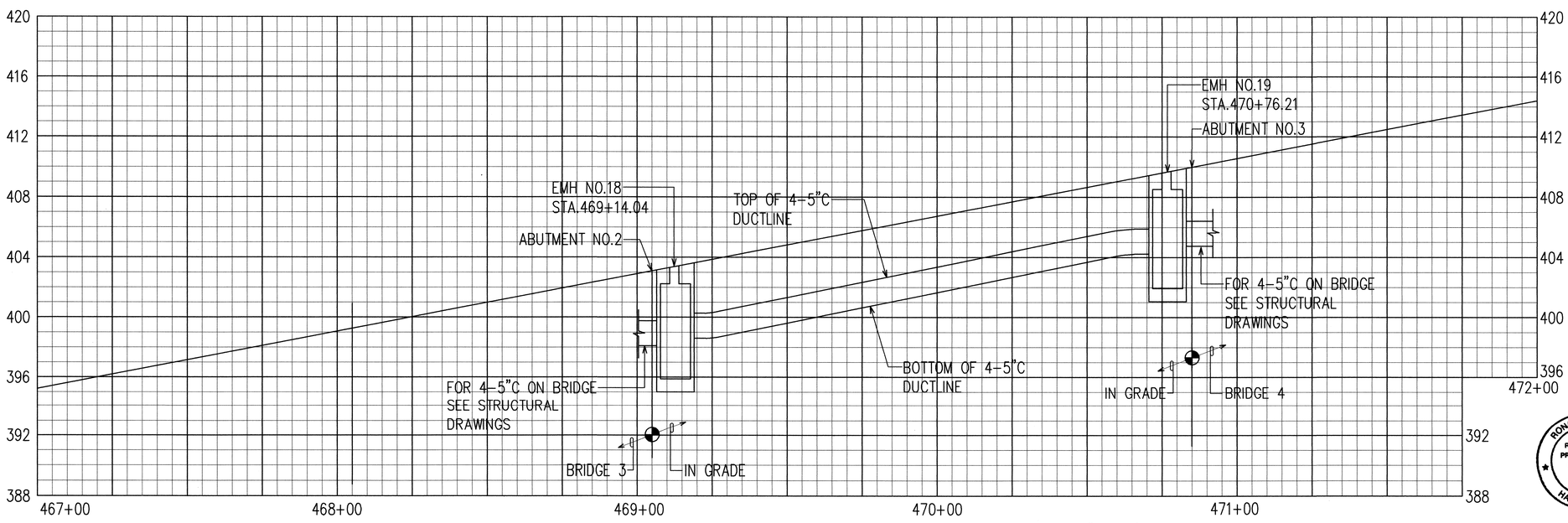
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	121	470



SCALE: HOR. 1" = 20'
VERT. 1" = 4'



SCALE: HOR. 1" = 20'
VERT. 1" = 4'

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

DATE	REVISION
7/12/94	REVISED EMH #8, #9, #18 & #19 PROFILES. ADDED STATION NO. FOR EMH #8, #9, #18 & #19.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL DUCTLINE PROFILES
STA. 415+00 TO 418+00 AND STA. 469+00 TO 471+00

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U23 OF 36 SHEETS

Last save: 07/23/94 @ 10:52:49 by: HL

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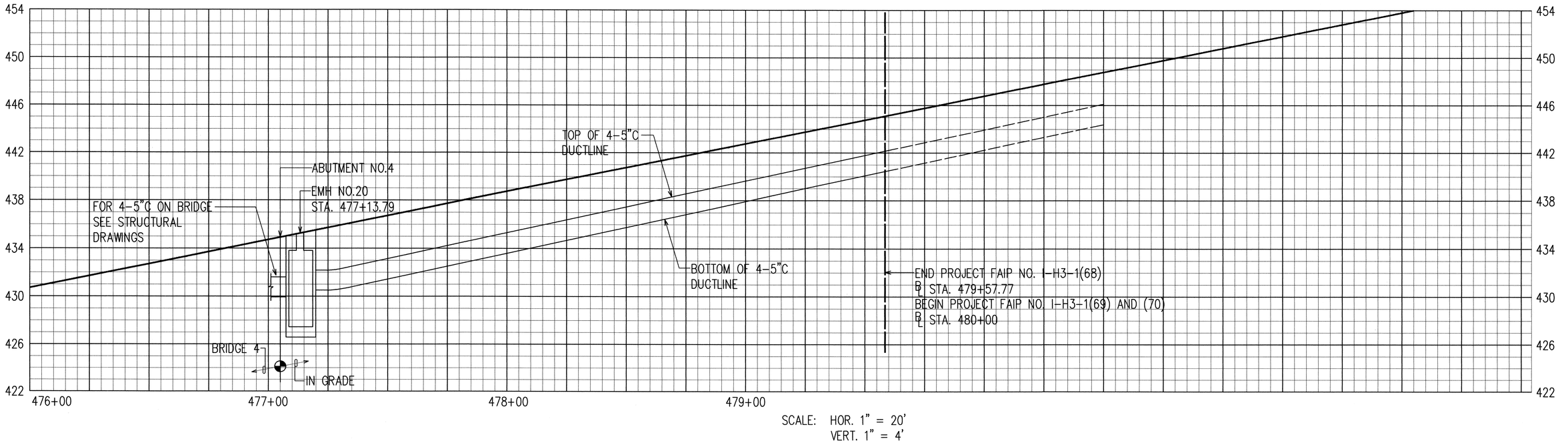
ADD. 121

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	122	470



SCALE: HOR. 1" = 20'
VERT. 1" = 4'

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

DATE	REVISION
7/12/94	REVISED EMH #20 PROFILE. ADDED STATION NO. FOR EMH #20.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELECTRICAL DUCTLINE PROFILE
STA. 477+00 TO 479+57.77

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U24 OF 36 SHEETS

ADD. 122

Last save: 07/22/94 @ 12:08:24 by: PV

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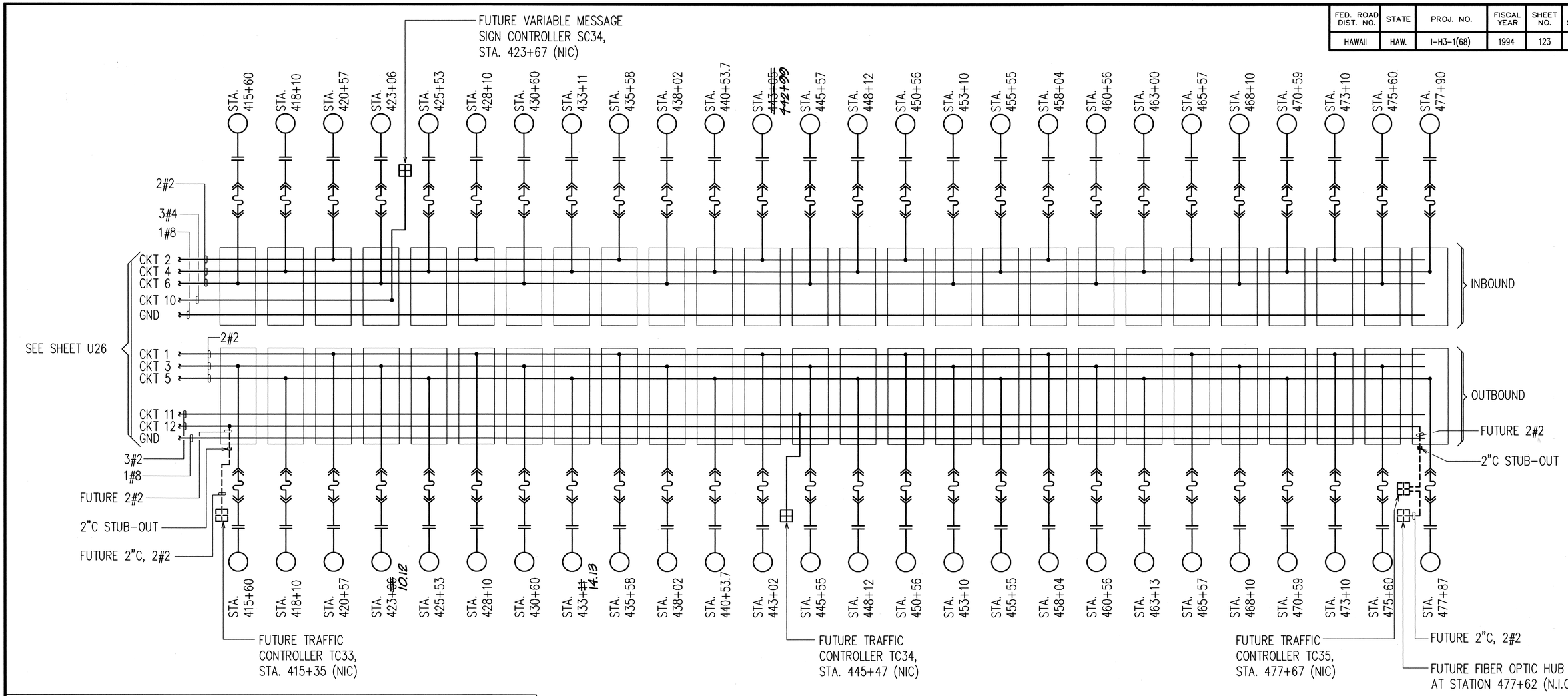
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	123	470



ONE-LINE DIAGRAM LEGEND:

EXISTING	NEW	DESCRIPTION
	5	STREET LIGHT AND CIRCUIT NUMBER
		FUSE ELEMENT – 3 AMP UNLESS NOTED OTHERWISE
		CONNECTION
		GROUND – NOTE: ALL STEEL POLES TO BE GROUNDED SEE DRAWING U28B FOR REVISED GROUNDING SYSTEM
M		METER
PRIMARY SECONDARY		CONNECTION TO TRANSFORMER SECONDARY

1 U25|U25 HIGHWAY LIGHTING ONE-LINE DIAGRAM I

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

RONALD N.S. HO REGISTERED PROFESSIONAL ENGINEER No. 3737-E HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING
ONE-LINE DIAGRAM I

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U25 OF 36 SHEETS

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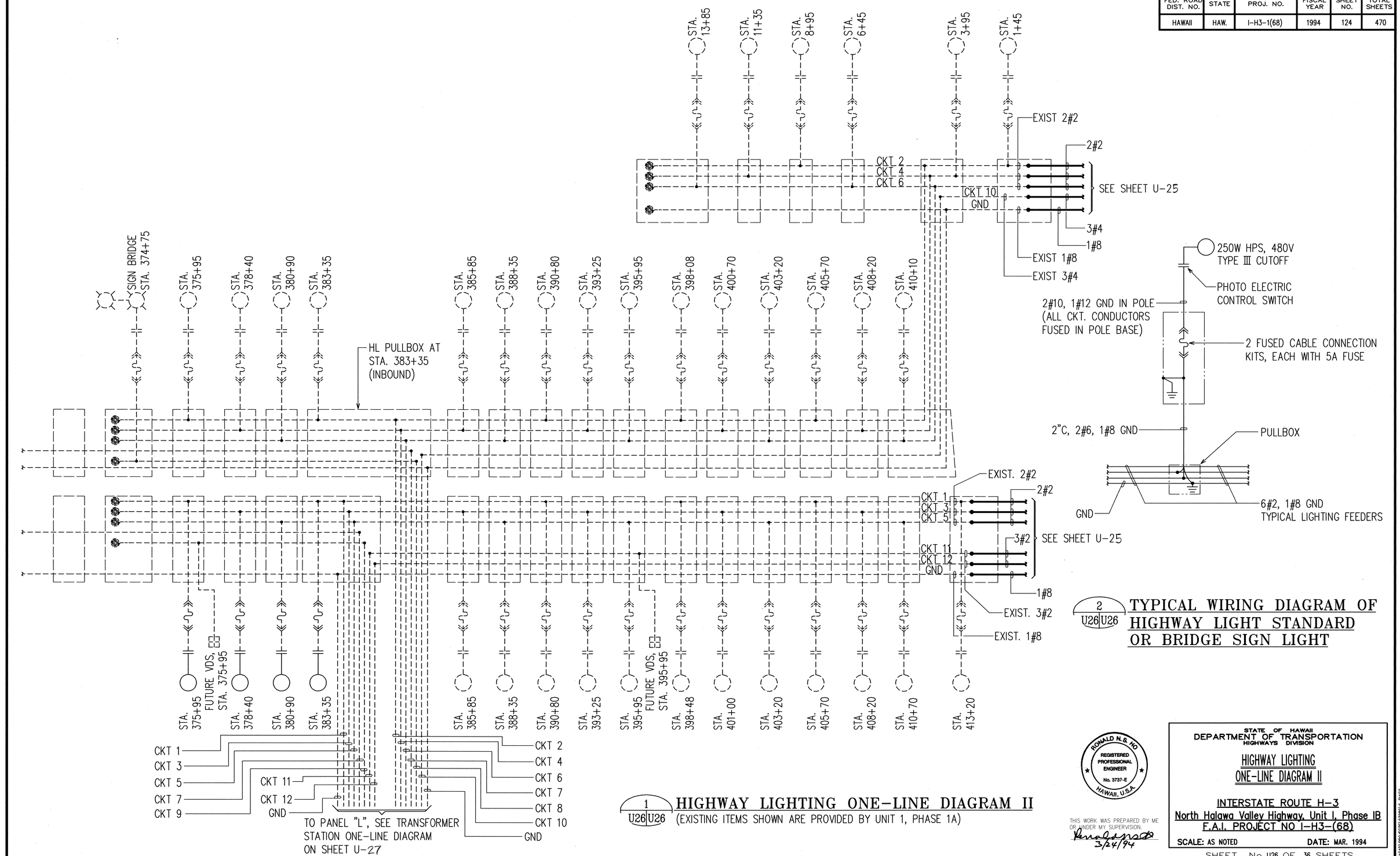
Last save: 03/23/94 @ 11:36:32 by: RN

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	124	470



2 U26|U26 TYPICAL WIRING DIAGRAM OF HIGHWAY LIGHT STANDARD OR BRIDGE SIGN LIGHT

1 U26|U26 HIGHWAY LIGHTING ONE-LINE DIAGRAM II
(EXISTING ITEMS SHOWN ARE PROVIDED BY UNIT 1, PHASE 1A)

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING
ONE-LINE DIAGRAM II

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U26 OF 36 SHEETS

Last save: 03/21/94 @ 15:43:35 by: RN

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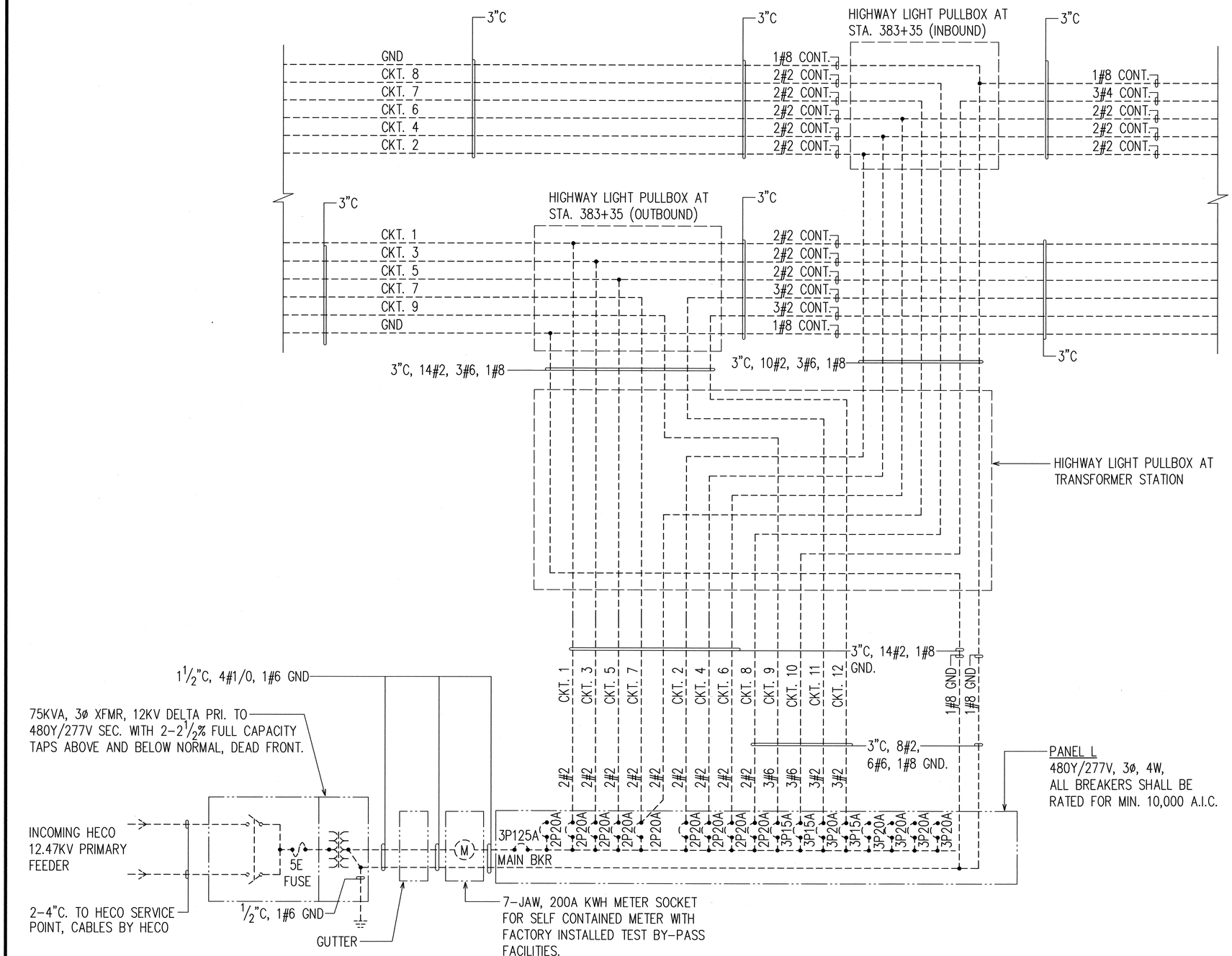
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	125	470



NOTES:

1. HIGHWAY LIGHTING CONNECTIONS NOT SHOWN TO PRESERVE CLARITY. REFER TO SHEETS U25 AND U26 FOR TYPICAL HIGHWAY LIGHT CONNECTIONS AND INDIVIDUAL HIGHWAY LIGHT CIRCUIT ASSIGNMENT.
2. ITEMS SHOWN ON THIS SHEET ARE PROVIDED BY UNIT 1, PHASE 1A. ITEMS SHOWN ARE FOR INFORMATIONAL PURPOSES.

1 / U27|U27 EXISTING TRANSFORMER STATION ONE-LINE DIAGRAM

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRANSFORMER STATION
ONE-LINE DIAGRAM

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U27 OF 36 SHEETS

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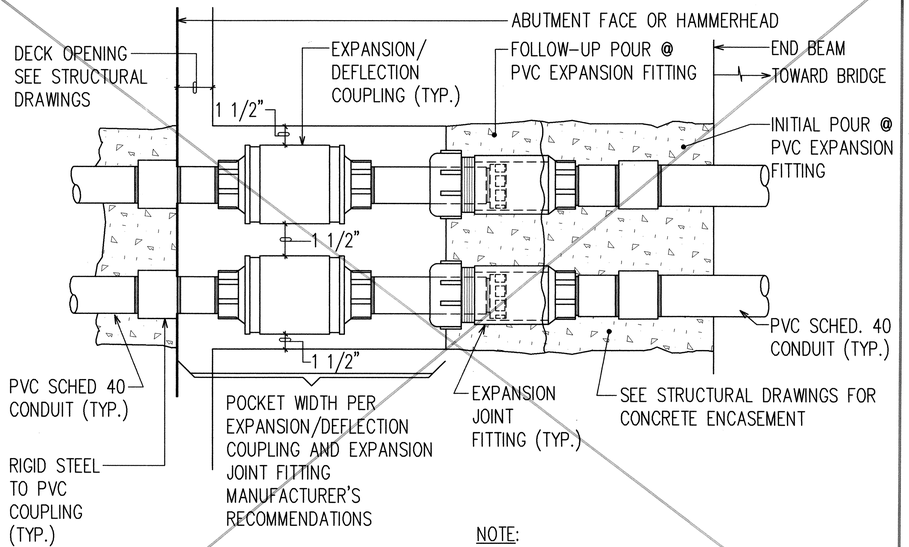
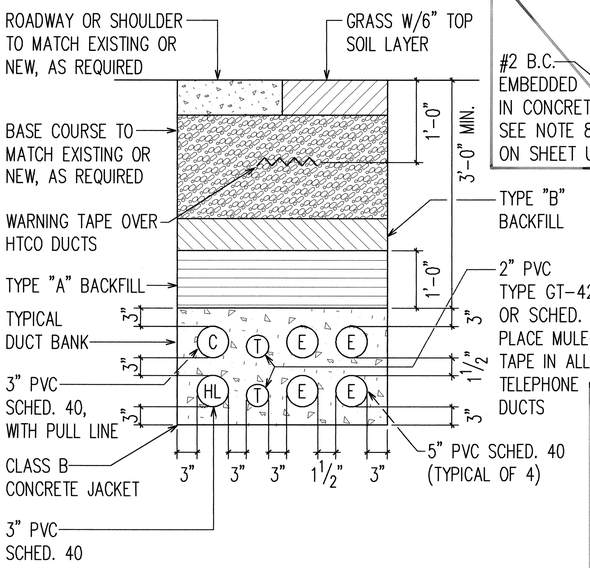
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	126	470



NOTE:
SUBMIT SHOP DRAWINGS FOR EXPANSION JOINT AND EXPANSION/DEFLECTION COUPLINGS FOR APPROVAL

1 / U28 — **TYPICAL DUCTLINE EXPANSION AND DEFLECTION DETAIL (4-5"C)**
N.T.S.

U16,U17,U18 U19,U20,U21,U22



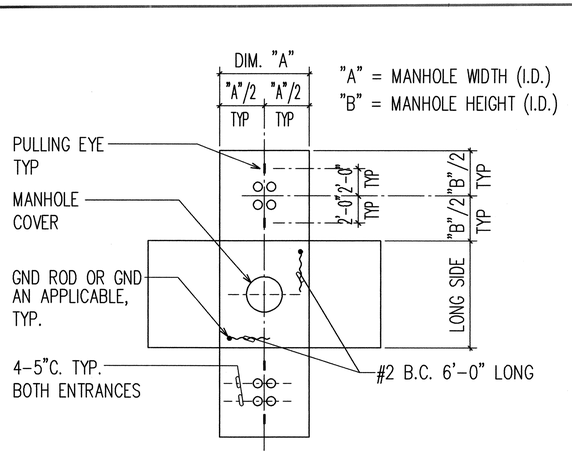
2 / U1 U28 — **TYPICAL IN GRADE DUCT SECTION**
N.T.S.

LEGEND:

TYPE "A" BACKFILL SHALL CONSIST OF:
BEACH SAND, EARTH OR EARTH AND GRAVEL. IF EARTH AND GRAVEL, THE MAXIMUM ROCK SIZE SHALL BE 1" AND THE MIXTURE SHALL CONTAIN NOT MORE THAN 50% BY VOLUME OF ROCK PARTICLES.

TYPE "B" BACKFILL SHALL CONSIST OF:
BEACH SAND, EARTH OR EARTH AND GRAVEL. IF EARTH AND GRAVEL, THE MIXTURE MUST PASS A 1/2" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES.

IF THE NORMAL MATERIAL IN THE BOTTOM OF THE TRENCH IS NOT TYPE "B", AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL SHALL BE PROVIDED.



3 / U28 U28 — **ELECTRIC MANHOLE TYPICAL DUCT ENTRANCE DETAIL**
N.T.S.

DUCT DIMENSIONS:

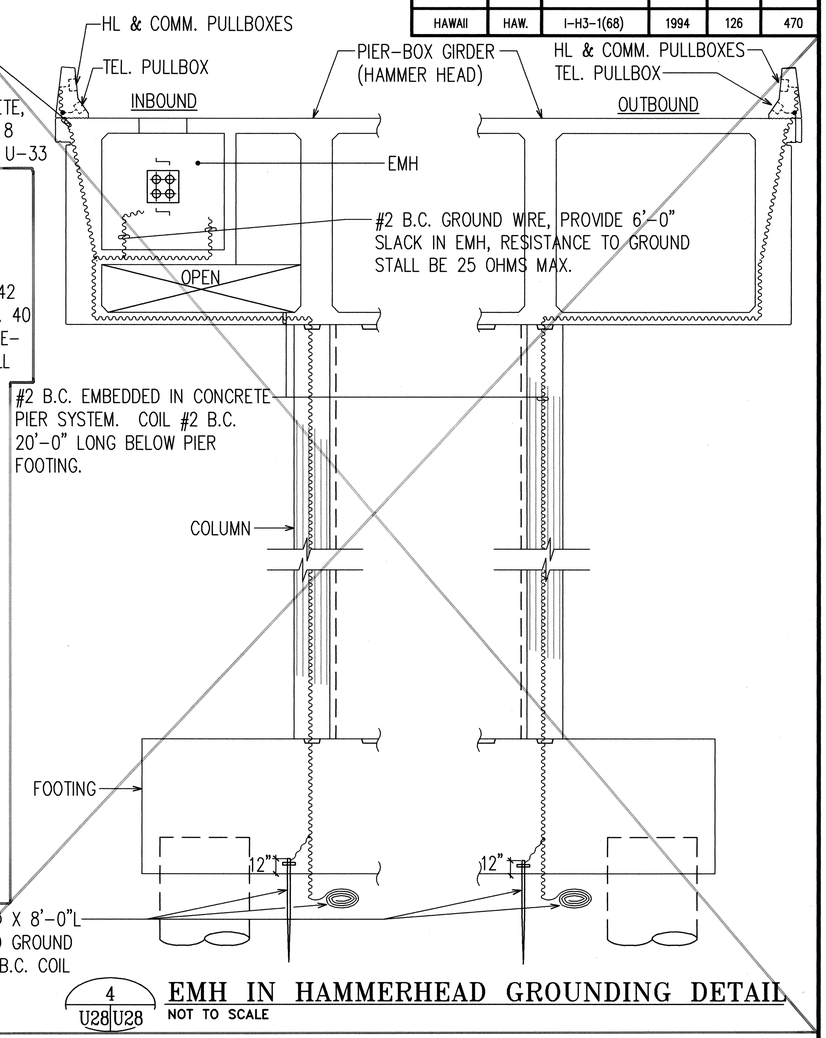
ID	OD
2" -	2.375(3/8)"
3" -	3.500(1/2)"
4" -	4.500(1/2)"
5" -	5.563(9/16)"

DUCT SEPARATION REQUIREMENTS IN RUNS:

E - E	= 1 1/2"	E = ELECTRIC
E - T	= 3"	T = TELEPHONE
T - T	= 1 1/2"	C = COMM
T - C	= 3"	HL = HWY LT
T - HL	= 3"	
C - HL	= 3"	

DUCT SEPARATION REQUIREMENTS @ MH FACE:

E - E = 8" ON CENTER



4 / U28 U28 — **EMH IN HAMMERHEAD GROUNDING DETAIL**
NOT TO SCALE

NOTE:
EMH GROUNDING DETAIL AND 46 KV DUCTLINE - TYPICAL EXPANSION DEFLECTION FITTING DETAIL SHOWN ON SHEET NO. U28R

NOTES:

1. PLACE WARNING TAPE ABOVE HTCO DUCTS AS SHOWN.
2. PLACE MULETAPES IN ALL HTCO DUCTS.
3. PLACE PULL LINES IN ALL "E" AND "C" DUCTS.
4. TYPE EB AND DB DUCTS ARE NOT ALLOWED.

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7/26/94

DATE	REVISION
12/97	DELETED EMH IN HAMMERHEAD GROUNDING DETAIL AND TYPICAL DUCTLINE EXPANSION AND DEFECTION DETAIL (4-5"C)
7/12/94	REVISED TYPICAL DUCT SECTION TITLE AND ADDED SPEC FOR TEL DUCT. REVISED EMH IN HAMMERHEAD GROUNDING DETAIL.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS, TYPICAL SECTIONS AND GENERAL NOTES

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U28 OF 36 SHEETS

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

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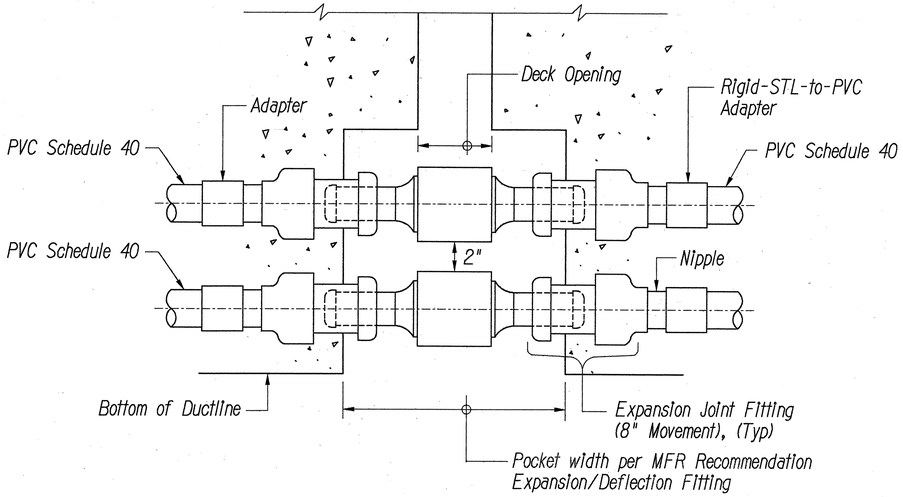
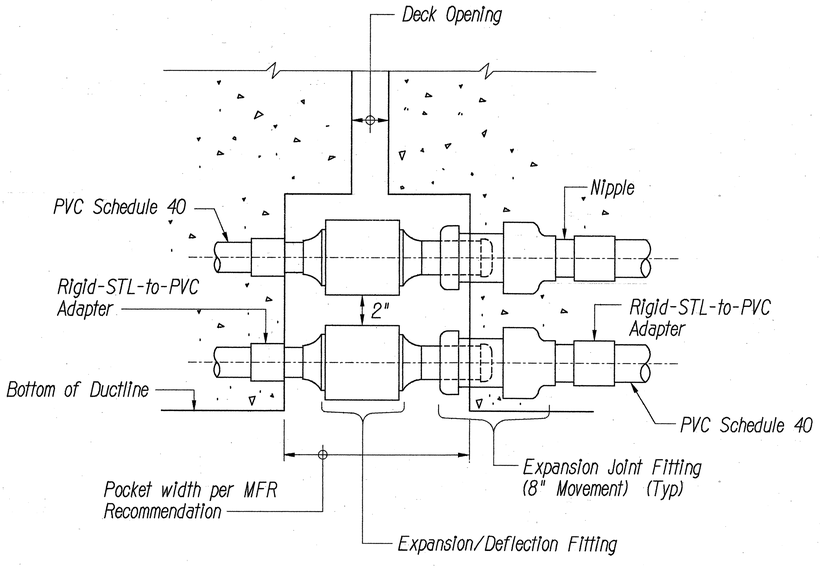
C.O. ADD. 126

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	126	470



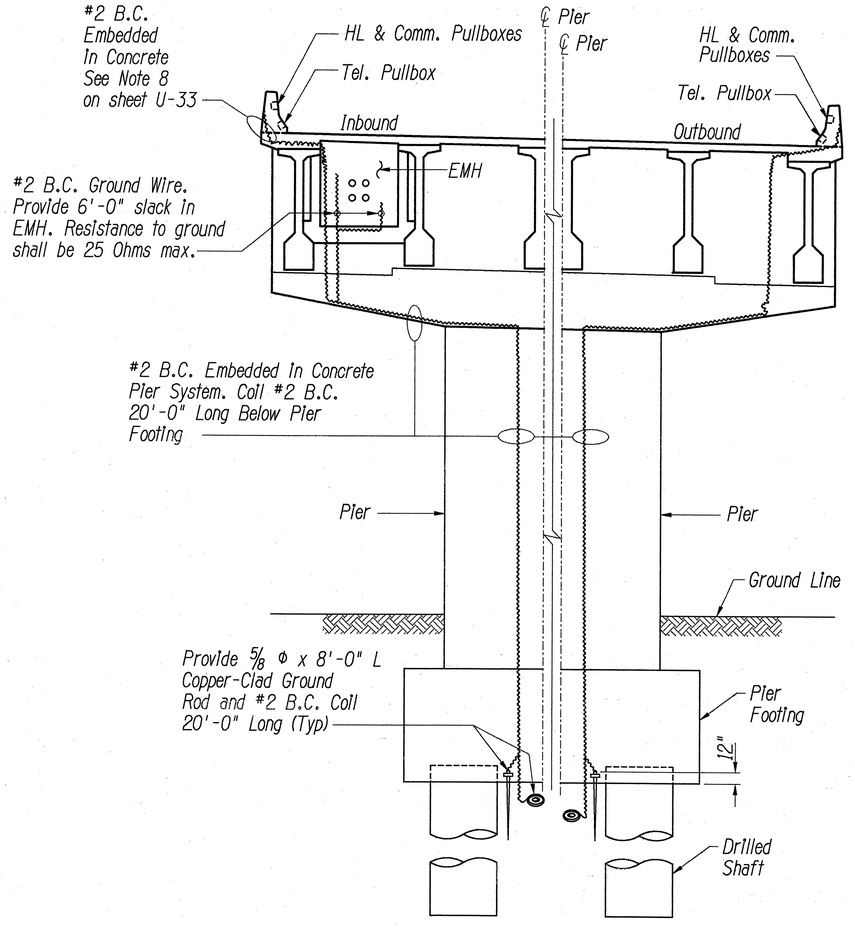
46KV DUCTLINE-TYPICAL EXPANSION/DEFLECTION FITTING DETAIL (FOR HINGE & END PIER JOINTS)

N.T.S.



46KV DUCTLINE-TYPICAL EXPANSION/DEFLECTION FITTING DETAIL (FOR ABUTMENT JOINTS)

N.T.S.



EMH GROUNDING DETAIL

N.T.S.

EMH Grounding Notes:

1. #2 B.C. shall be continuous without splices

Coupler Notes:

1. Expansion/Deflection Fitting Detail for Signal, Power, Ltg., Comm. and 12KV Ductline shall be similar.
2. See Structural drawing for location of Deck Expansion Joints.
3. Submit shop drawings of expansion /deflection couplings for approval.
4. See Sheet NO. U28B for revised grounding system.

Notes:

1. Information shown revises corresponding parts on sheet U28 of Basic Bridge Drawings.
2. See U28 for typical duct and ground wire entrance details for electrical manholes.

JAMES C. TAI LICENSED PROFESSIONAL ENGINEER NO 7447-S HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

T.Y. LIN INTERNATIONAL

4/96	B	Revised per review comments &
		Minor clarifications
2/96	A	Revised per review comments

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

BRIDGE NO.3 - ALTERNATIVE DESIGN

DUCT COUPLER DETAILS & EMH GROUNDING DETAIL

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO. I-H3-1(68)

SCALE: AS NOTED DATE: OCT. 1994

SHEET NO. U28~~A~~A OF 36~~XX~~ SHEETS

C.O. ADD. 126 S-1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	126	470

Notes:

Contact Grounding System for Bridges No. 3 and 4 shall be revised as follows:

1– *Pier Column Ground #2 awg shall be installed at the following locations: H3, H6, H9, H12, H15, H18, H20, H24, K3, K7, K10, K13, K17, K20, K23, K26, IP3 and OP3. (18 locations)*

2– *A #2 awg Bridge Ground shall run along both side of the Highway Bridge from abutment #1 to #2 and from abutment #3 to #4.*

This Bridge Ground shall be bonded to the #5 Parapet Rebar System at the above pier columns and at each pullbox group location.

3– *Each Electric Manhole ground shall have two #2 awg – 6' tails in the manholes and shall be bonded to the pier column ground. (8 locations)*

4– *Each Telephone, Communication and Light pullbox shall have a #6 awg ground wire bonded to the #2 awg Bridge Ground and crimp lugged to the outside of the pullbox.*

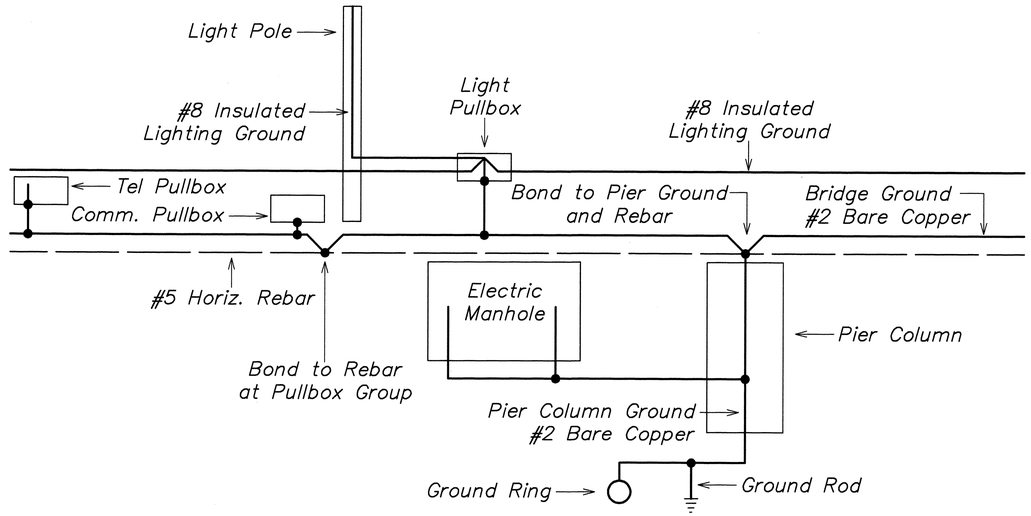
5– *The #8 awg light circuit ground running down each light pole and in the lighting conduits shall be "split bolted" to the #6 awg ground wire described in item 4 above. (49 locations)*

The #8 awg light circuit ground shall also be bonded inside the base of each street light. (49 locations)

6– *As required by GTE Hawaiian Telephone, a #6 awg – 2' tail shall be installed in the Telephone pullboxes. (up to 24 locations)*

7– *All ground wire shall be stranded, copper wire.*

8– *The ground shall be a maximum of 25 ohms.*



REVISED GROUNDING SYSTEM
Not to Scale

10/06/98	FIELD CHANGE NO. 1 REVISED GROUNDING SYSTEM.
DATE	REVISION

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

DUCT SECTION DETAILS, TYPICAL SECTION AND GENERAL NOTES

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit 1, Phase 1B
F.A.I. PROJECT NO. I-H3-1(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U28B OF 36 SHEETS

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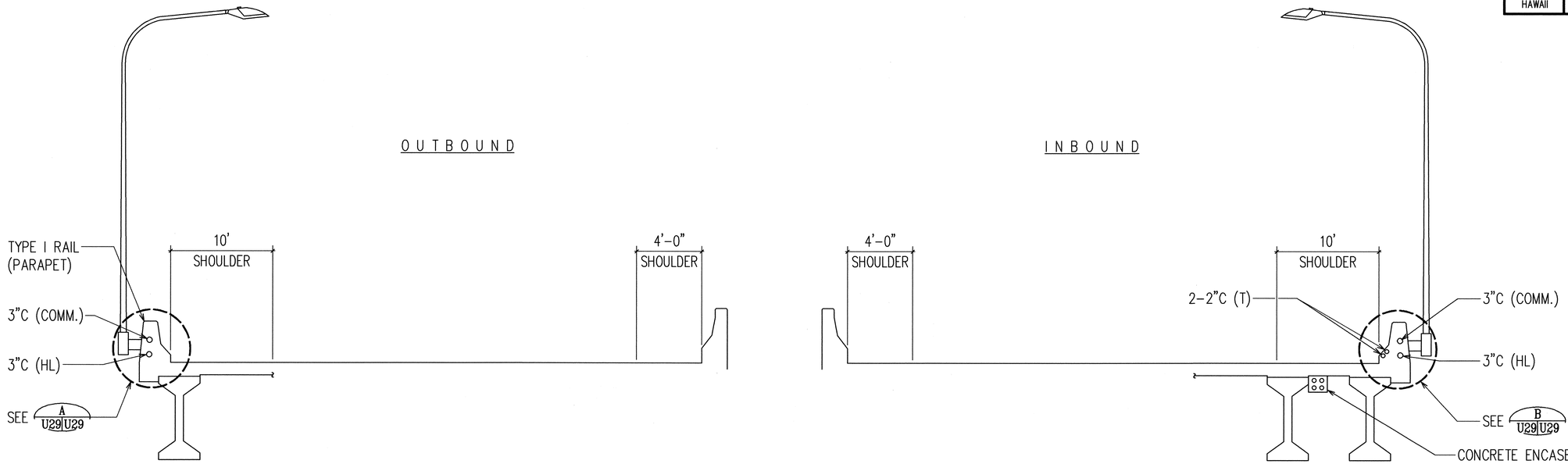
No.	DESIGNED BY	
	QUANTITIES BY	
	CHECKED BY	

C.O. ADD. 126S-2

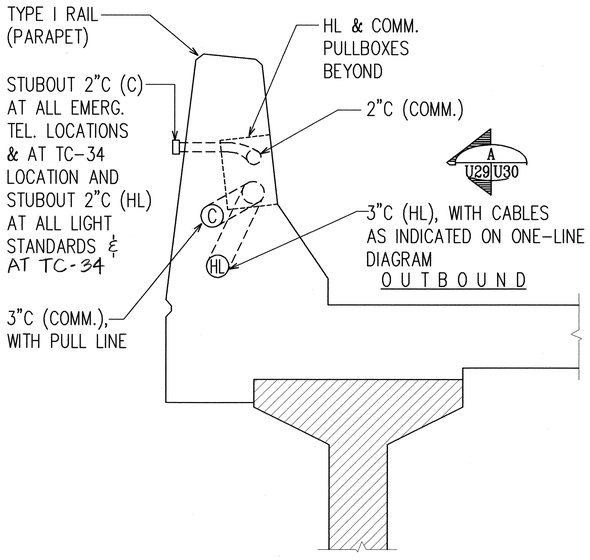
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	127	470



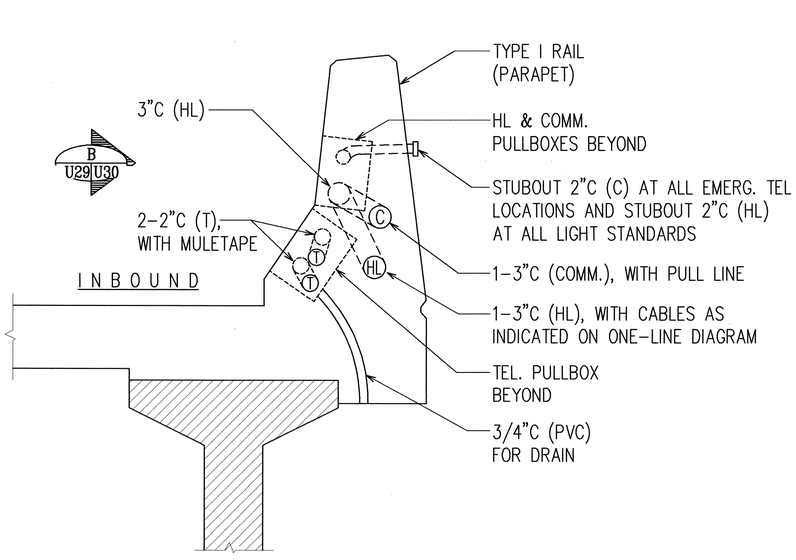
TYPICAL SECTION ON BRIDGE

NOTES:

1. SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION OF PULLBOXES AND CONDUITS IN TYPE I RAIL.



A U29 U29 U30 SECTION N.T.S.



B U29 U29 U30 SECTION N.T.S.

ORIGINAL PLAN
NOTE BOOK No.
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RONALD N.S. HO REGISTERED PROFESSIONAL ENGINEER No. 3737-E HAWAII, U.S.A.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL SECTIONS ON BRIDGE

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U29 OF 36 SHEETS

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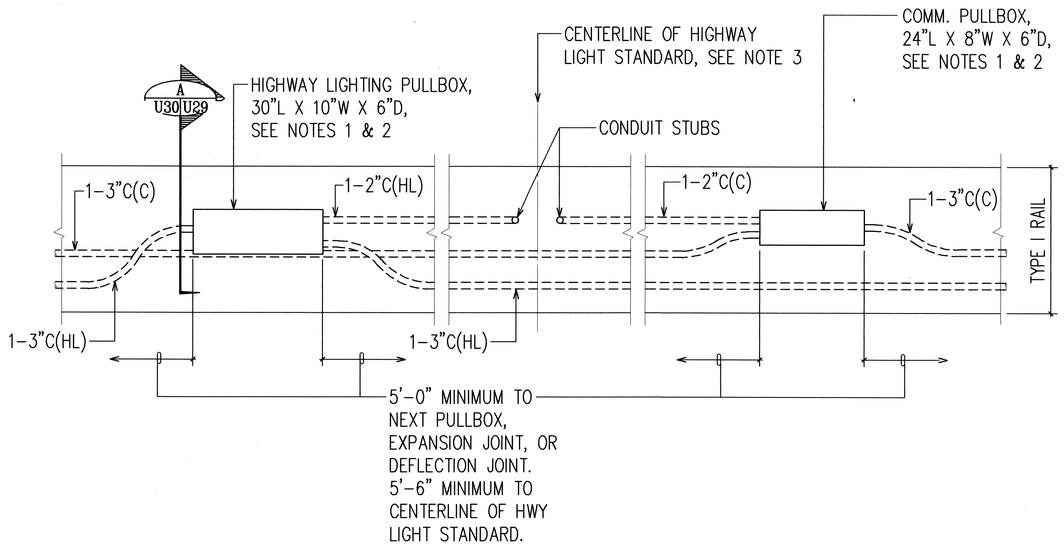
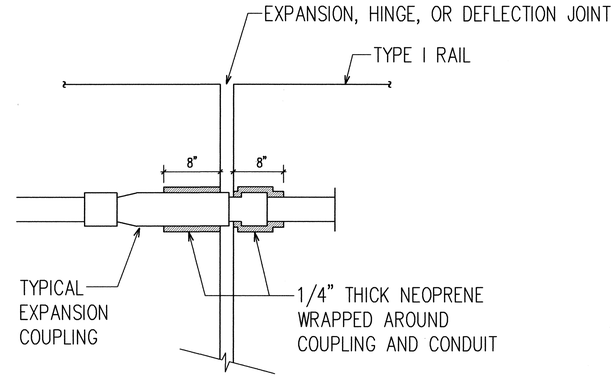
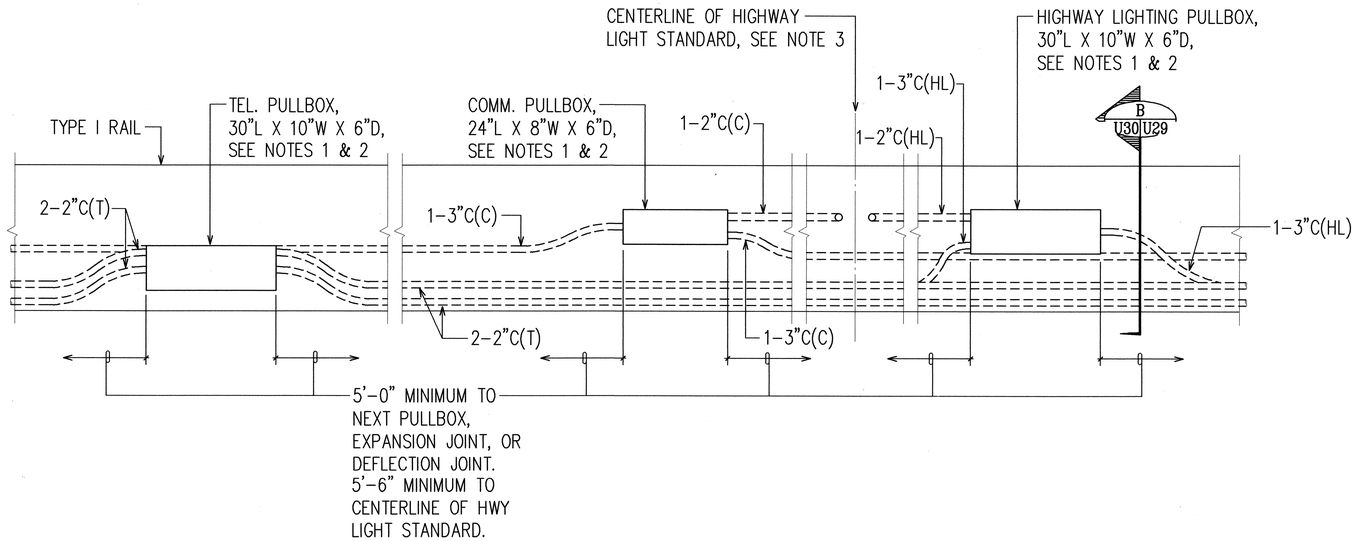
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	128	470



A U29 U30 **ELEVATION**
NOT TO SCALE



1 U30 U16,U17,U18 U19,U20,U21,U22 **TYPICAL EXPANSION DETAIL AT TYPE I RAILS (SECTION OF RAIL SHOWN)**
NOT TO SCALE



B U27 U28 **ELEVATION**
NOT TO SCALE

NOTES:

1. ALL PULLBOXES IN PARAPET WALLS SHALL BE HOT DIP GALVANIZED CAST IRON WITH NEOPRENE GASKET, CHECKERED STEEL COVER RATED FOR VEHICULAR TRAFFIC, AND STAINLESS STEEL SCREWS.
2. DIMENSIONS INDICATED FOR PULLBOXES ARE INSIDE CLEAR DIMENSIONS. THE MAXIMUM OVERALL DEPTH FOR ALL PULLBOXES SHALL BE $7\frac{3}{8}$" DEEP.
3. LIGHT STANDARD SHALL BE 5'-6" MINIMUM FROM ANY EXPANSION JOINT OR DEFLECTION JOINT.
4. SEE STRUCTURAL DRAWINGS FOR EXACT LOCATION OF PULLBOXES AND CONDUITS IN TYPE I RAIL.

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ELEVATIONS

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U30 OF 36 SHEETS

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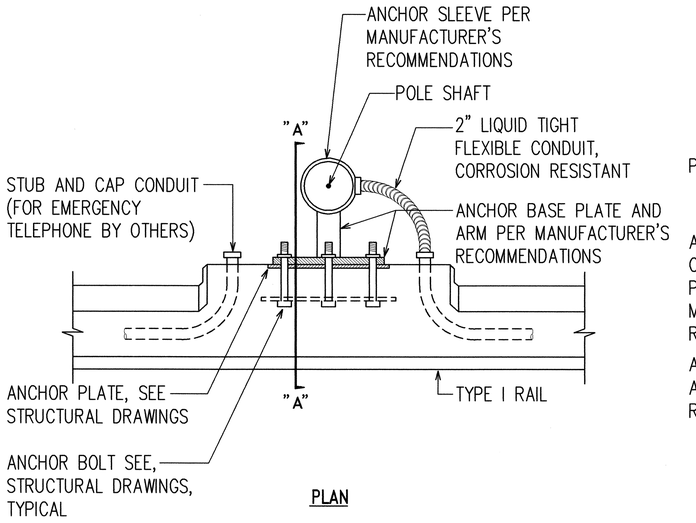
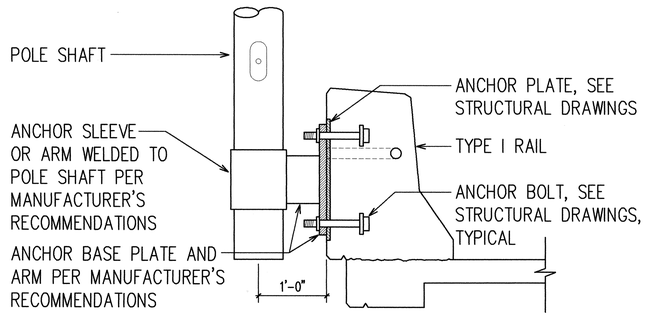
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	129	470



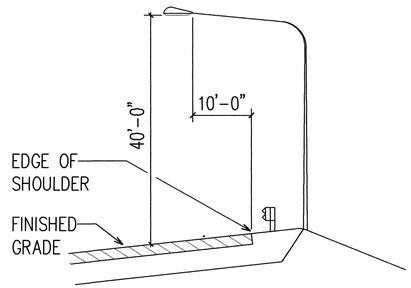
PLAN



SECTION "A-A"

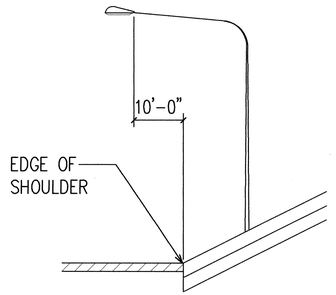
1 / U31|U31 TYPICAL HIGHWAY LIGHTING AND COMMUNICATION DUCTS WITH HIGHWAY LIGHTING AND EMERGENCY TELEPHONE BEHIND CONCRETE BARRIER/PARAPET (OUTBOUND TRAVEL WAY SHOWN, INBOUND SIMILAR)

N.T.S.



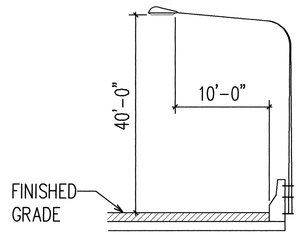
IN GRADE FOUNDATION PER 3 / U31|U34

TYPE 1



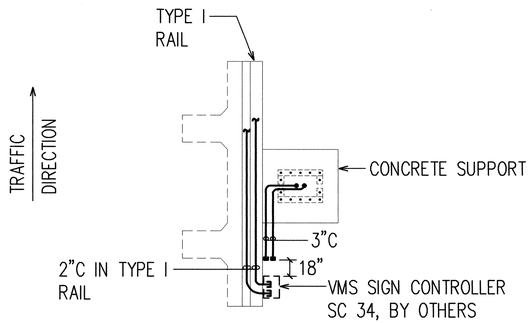
IN GRADE FOUNDATION PER 3 / U31|U34

TYPE 1A

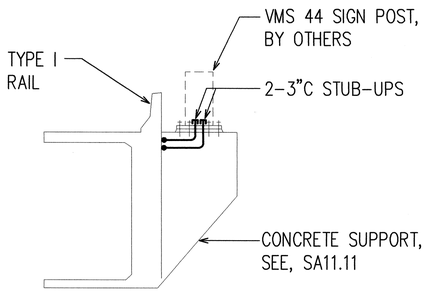


BEHIND CONC BARRIER/ PARAPET PER 1 / U31|U31

TYPE 2



PLAN



SECTION

3 / U16|U31 VMS 44 SIGN DETAILS

N.T.S.

2 / U32|U31 U1 TYPICAL HWY. LT. FOUNDATION TYPES

N.T.S.

DATE	REVISION
7/12/94	ADDED DIMENSION TO LT. TYPE 1 AND 1A DETAILS. ADDED NOTE TO CALL OUT LIQUID-TIGHT FLEX. CONDUIT. DELETED 13'-0" DIMENSION FROM LT. TYPE 2 DETAIL.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING AND CONSTRUCTION
MISCELLANEOUS DETAILS II

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U31 OF 36 SHEETS

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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7/25/94

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DESIGNED BY ____
QUANTITIES BY ____
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NOTE BOOK ____ No. ____

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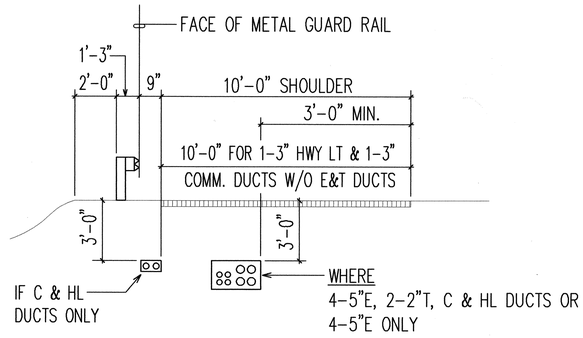
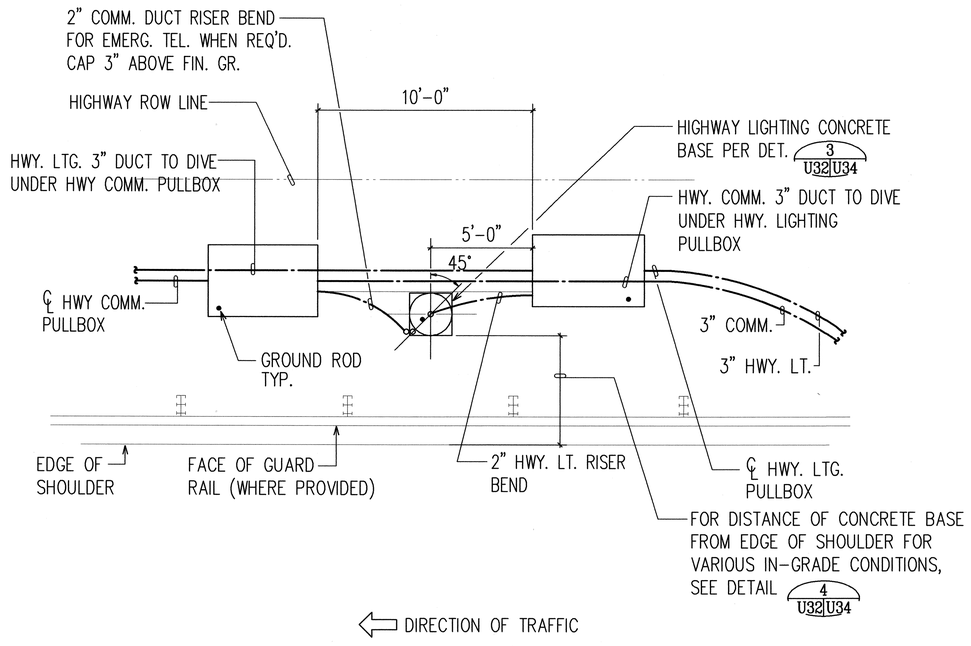
ADD. 129

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	130	470



1 / U32|U32 **TYPICAL IN-GRADE CROSS-SECTION DETAIL**
N.T.S.



2 / U32|U32 **TYPICAL IN GRADE HIGHWAY LIGHTING AND COMMUNICATION PULLBOX CONNECTIONS DETAIL**
N.T.S.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

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3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING AND COMMUNICATION
MISCELLANEOUS DETAILS III

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U32 OF 36 SHEETS

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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	131	470

STATE HIGHWAYS

LIGHTING

1 / U33|U33 **LIGHTING COVER DETAILS - IN-GRADE**
N.T.S.

STATE HIGHWAYS
LIGHTING

2 / U33|U33 **LIGHTING COVER DETAIL - IN TYPE I RAIL**
N.T.S.

STATE HIGHWAYS

COMM

3 / U33|U33 **COMM COVER DETAILS - IN-GRADE**
N.T.S.

STATE HIGHWAYS
COMM

4 / U33|U33 **COMM COVER DETAIL - IN TYPE I RAIL**
N.T.S.

TEL | TEL

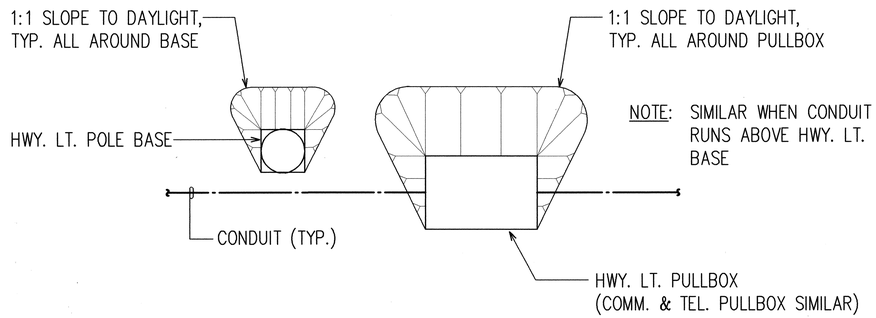
5 / U33|U33 **TELEPHONE COVER DETAILS - IN-GRADE**
N.T.S.

TEL

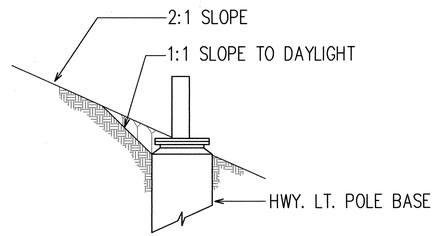
6 / U33|U33 **TELEPHONE COVER DETAIL - IN TYPE I RAIL**
N.T.S.

PULLBOX REFERENCE NOTES:

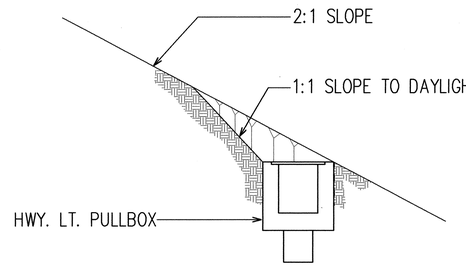
1. HIGHWAY LIGHTING PULLBOX, FOR IN-GRADE INSTALLATION SHALL BE PER SDOT STANDARD PLAN TE-41 TYPE A PULLBOXES. COVER MARKING PER DETAIL 1 / U33|U33
2. HIGHWAY LIGHTING PULLBOX, FOR CONCRETE TYPE I RAIL INSTALLATION SHALL HAVE COVER MARKING PER DETAIL 2 / U33|U33
3. COMMUNICATION PULLBOX, FOR IN-GRADE INSTALLATION SHALL BE PER SDOT STANDARD PLAN TE-41 TYPE A PULLBOXES. COVER MARKING PER DETAIL 3 / U33|U33
4. COMMUNICATION PULLBOX, FOR CONCRETE TYPE I RAIL INSTALLATION SHALL HAVE COVER MARKING PER DETAIL 4 / U33|U33
5. TELEPHONE PULLBOX, FOR IN-GRADE INSTALLATION SHALL BE PER HTCO DWG 34056. COVER MARKING PER DETAIL 5 / U33|U33
6. TELEPHONE PULLBOX, FOR CONCRETE TYPE I RAIL INSTALLATION SHALL HAVE COVER MARKING PER DETAIL 6 / U33|U33
7. INSTALL A $\frac{5}{8}$" DIA. X 8'-0" LONG GROUND ROD IN ALL LIGHTING, TELEPHONE AND COMMUNICATION IN-GRADE PULLBOXES.
8. IN ALL LIGHTING, TELEPHONE AND COMMUNICATIONS PULLBOXES IN CONCRETE PARAPETS, INSTALL A CONTINUOUS #2 BC TIE TO THE PARAPET RE-BAR SYSTEM AND ANOTHER CONTINUOUS #2 BC RING GROUND ALONG THE PARAPET REINF. RE-BAR SYSTEM TO THE NEAREST SUPPORT COLUMN, DOWN THE COLUMN REINF. SYSTEM, AND TERMINATING IN A GROUND RING COIL 2'-6" MINIMUM BELOW PIER FOOTING IN DIRECT CONTACT WITH THE EARTH. THE COIL SHALL CONSIST OF A 20' MINIMUM LENGTH OF THE #2 BC CONDUCTOR. LEAVE 2' TAILS IN PULLBOXES.
9. GROUNDS SHALL BE 25 OHMS MAXIMUM.



5 / U33|U33 **TYPICAL GRADING PLAN AROUND HIGHWAY LIGHT BASE AND PULLBOX AT 2:1 SLOPE**
N.T.S.



6 / U33|U33 **TYPICAL GRADING SECTION THRU HIGHWAY LIGHT POLEBASE AT 2:1 SLOPE**
N.T.S.



7 / U33|U33 **TYPICAL GRADING SECTION THRU HIGHWAY LIGHT, COMMUNICATION, OR TELEPHONE PULLBOX AT 2:1 SLOPE**
N.T.S.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

MISCELLANEOUS DETAILS I

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U33 OF 36 SHEETS

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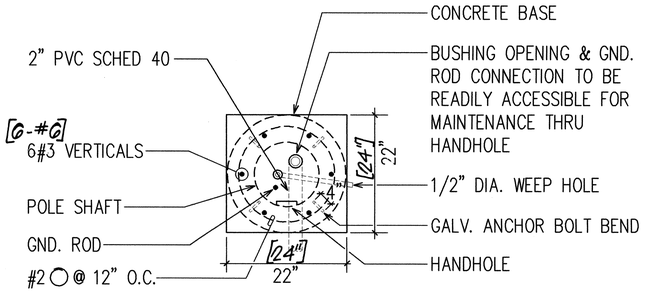
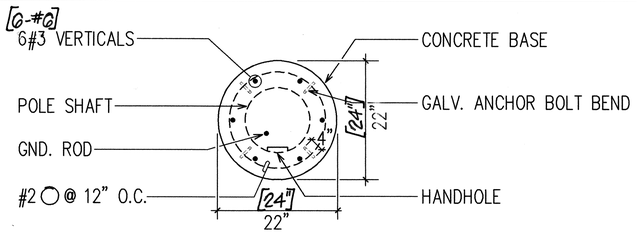
Last save: 03/21/94 @ 15:54:23 by: RN

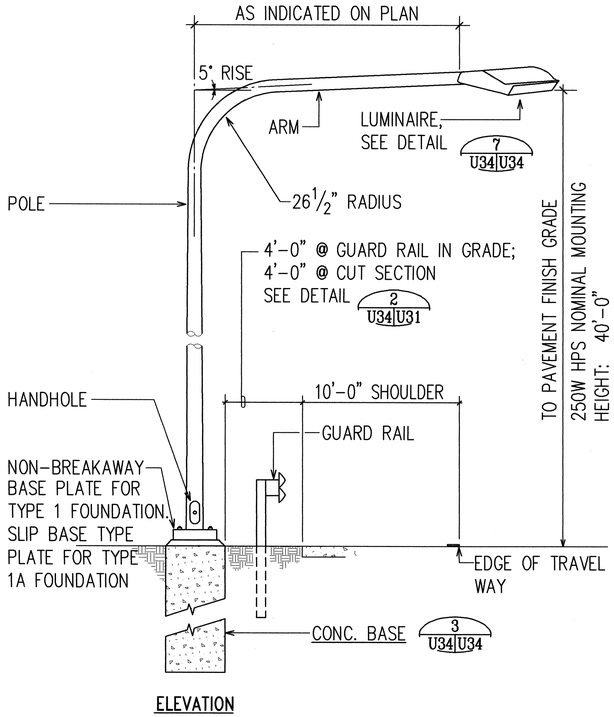
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	132	470



1 / U34|U34 **CONCRETE BASE PLAN** N.T.S.

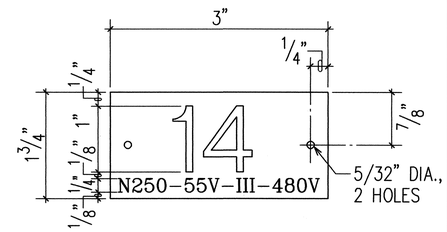


2 / U34|U34 **CONCRETE BASE PLAN** N.T.S.



ELEVATION

4 / U32|U34 **HIGHWAY LIGHTING STANDARD DETAIL** N.T.S.

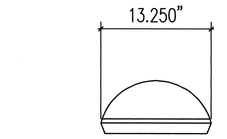


14 = POLE & LIGHT NUMBER PER STATE REQM'TS.
N250 = LAMP TYPE & WATTAGE, N = HIGH PRESSURE SODIUM
55V = LAMP VOLTAGE
III = IES TYPE DISTRIBUTION
480V = BALLAST VOLTAGE

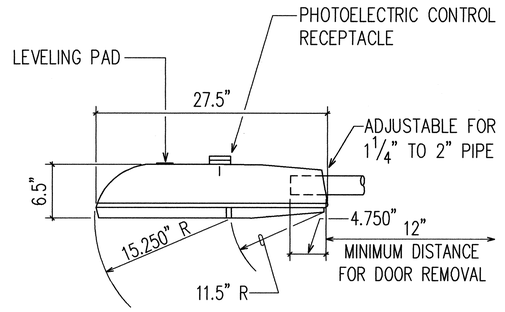
NOTES:

1. USE 3-PLY PLASTIC - BLACK, WHITE, BLACK.
2. NUMBER SIZE SHALL BE 1" HIGH & ENGRAVED 1/8" WIDE, WHITE IN COLOR (NO. AS REQUIRED).
3. NOMENCLATURE SIZE SHALL BE 1/4" HIGH & ENGRAVED 1/32" WIDE, WHITE IN COLOR (WATTAGE, LAMP VOLTAGES, IES DISTRIBUTION & BALLAST VOLTAGE).
4. ATTACH SECURELY TO POLE WITH NO. 7 CADIUM PLATES SCREWS.
5. "N" FOR SODIUM LAMPS.
6. ATTACH TAG 6'-0" ABOVE FINISH GRADE ON HIGHWAY SIDE.

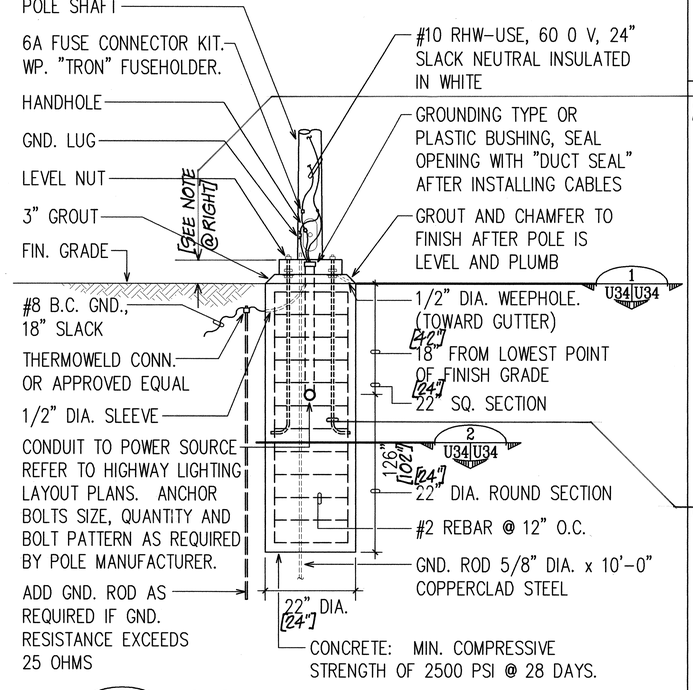
5 / U34|U34 **I.D. TAG DETAIL** N.T.S.



LAMP: 250W HPS
VOLTAGE: 480V, 1ø
IES DISTRIB.: MEDIUM, CUTOFF, TYPE III



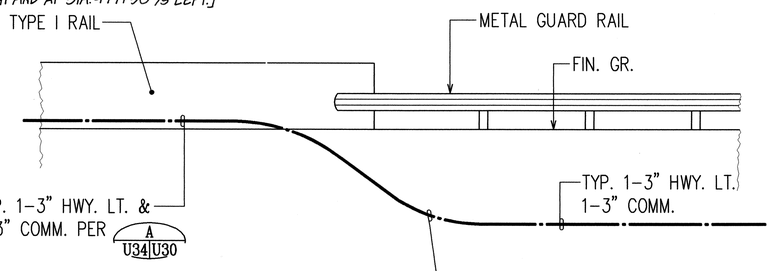
7 / U34|U34 **LUMINAIRE DETAIL** N.T.S.



3 / U34|U34 / U31, U32 **CONCRETE BASE ELEVATION** N.T.S.

[C.O.#8] INDICATES MODIFIED CONCRETE BASES FOR FUTURE LIGHT/CCTV CAMERA POLES AT STA. 415+60 9% RIGHT (POLE NO. 33) AND AT STA. 417+20 9% LEFT (POLE NO. 34).

NOTE:
[THE THREADED PORTION OF THE FOUR ANCHOR BOLTS SHALL EXTEND 4" ABOVE THE FINISH GRADE AND THE THREADS SHALL BE HEAVILY GREASED AND SECURELY WRAPPED WITH TAR PAPER. DELETE TWO LIGHT POLES AND LUMINAIRES AT STA. 415+60 9% RIGHT AND AT STA. 417+20 9% LEFT.]



[FOUR EA. GALV. ASTM A449 ANCHOR BOLTS 1" DIAMETER AND 36" LONG MINIMUM WITH 6" 90° HOOK AT THE BOTTOM. THE BOLT CIRCLE SHALL BE 17 1/2" DIAMETER AND SHALL BE ORIENTED SUCH THAT THE LUMINAIRE ARM WILL BE PERPENDICULAR TO THE ROADWAY WHEN THE POLE IS INSTALLED.]

6 / U16|U34 / U22 **TYPICAL IN-GRADE TO TYPE I RAIL CONNECTION DETAIL** N.T.S. ELEVATION LOOKING TOWARDS TYPE I RAIL

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

DATE	REVISION
7/12/94	REVISED DETAIL 6. REVISED CONCRETE BASE DEPTH.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING AND COMMUNICATION
MISCELLANEOUS DETAILS IV

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U34 OF 36 SHEETS

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

Last save: 07/22/94 @ 14:58:38 by: PV

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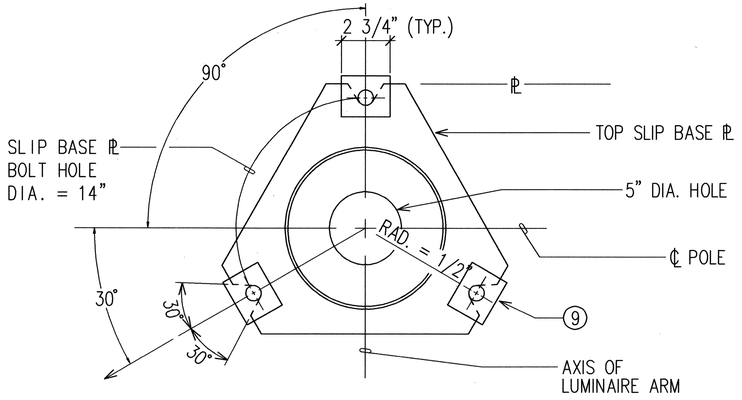
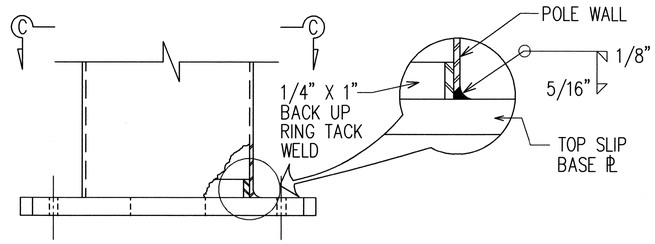
ADD. 132

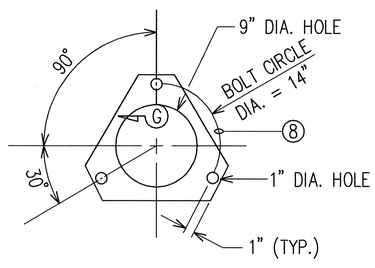
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	133	470



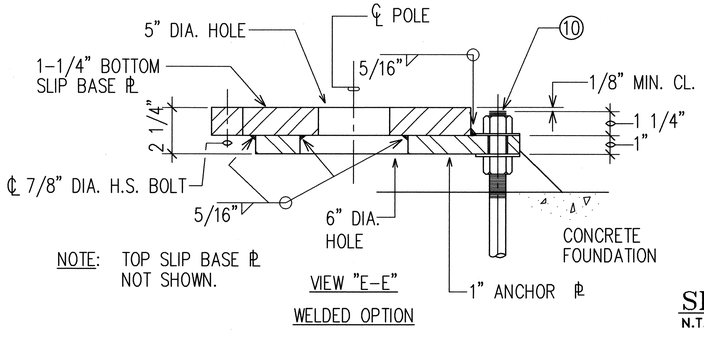
VIEW "C-C"



1" TOP SLIP BASE PLATE



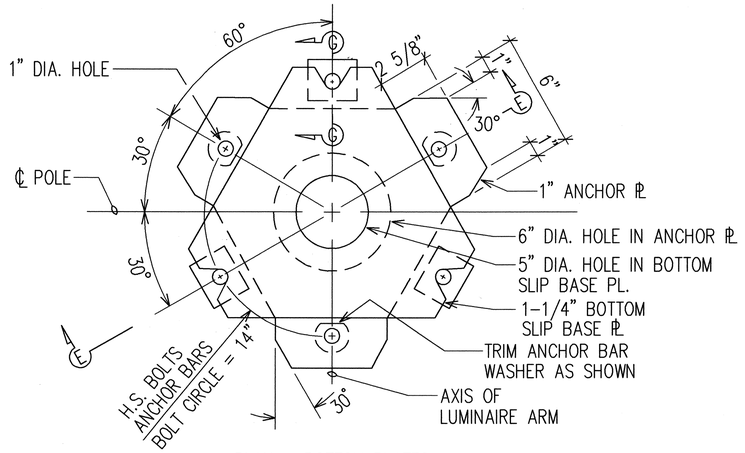
28 GA. KEEPER PLATE



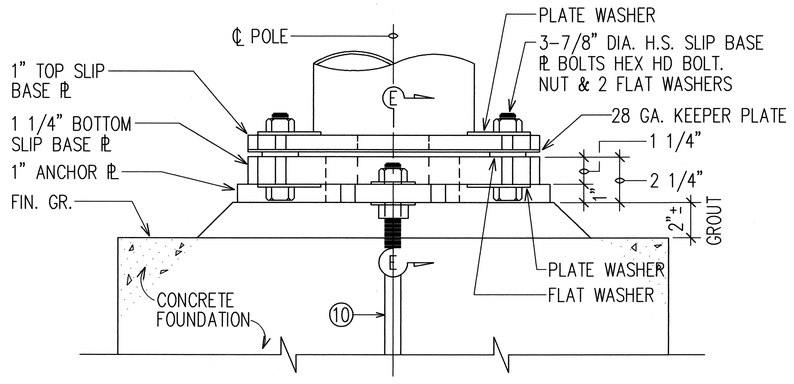
NOTE: TOP SLIP BASE ℄ NOT SHOWN.

VIEW "E-E"

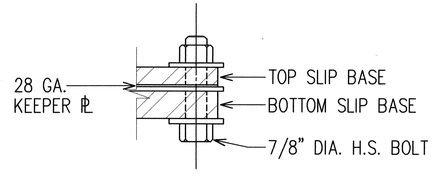
WELDED OPTION



PLAN - BOTTOM PLATES



BOTTOM SLIP BASE PLATE



SECTION "G-G"

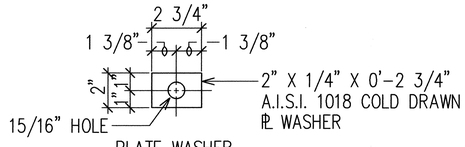
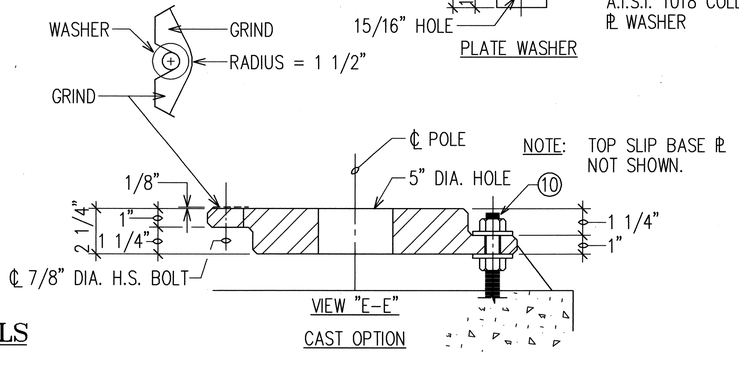


PLATE WASHER



VIEW "E-E"

CAST OPTION

NOTES:

1. ALL STEEL SHAFTS, PLATES, MAST ARMS, BOLTS, SCREWS, NUTS & WASHERS TO BE GALVANIZED AFTER FABRICATION OR MODIFICATION.
2. PLATES TO CONFORM TO ASTM A-36.
3. CAST OPTION TO CONFORM TO ASTM A-486 CL. 90.
4. TORQUE 7/8" DIAMETER H.S. SLIP BASE PLATE BOLTS TO 84 FEET PER POUND.
5. 7/8" DIAMETER H.S. ANCHOR BARS, WRENCH TIGHTEN - TORQUE REQUIREMENT WAIVED.
6. FABRICATORS ELECTING LARGER THAN MINIMUM ARM DIAMETERS MUST ADJUST DETAILS AS REQUIRED TO PERMIT SOLID SEATING OF CAP SCREWS. IN LIEU OF TORQUE REQUIREMENTS FOR H.S. BOLTS, CAP SCREWS SHALL BE TIGHTENED BY THE TURN OF NUT METHOD 1/6 TURN FROM SNUG CONDITION. NO WASHER WILL BE REQUIRED.
7. 4" X 6 1/2" HANDHOLE REINFORCED WITH #3 GAUGE RING 1/2" WIDE WELDED TO OUTSIDE OF POLE COVER OF 10 GAUGE PLATE LOCATE 90 DEGREES OF MAST ARM UNLESS SHOWN OTHERWISE.
8. 28 GAUGE KEEPER PLATE, PLACE ON TOP OF MIDDLE FLAT WASHER, ASTM A-526 125 COMMERCIAL.
9. PLATE WASHER.
10. 3 - 7/8" DIAMETER H.S. BARS, THREAD 6" & GALVANIZED 10", WITH HEX., HEAD, NUT, LEVELING NUT & WASHER.
11. HEX. HEAD NUT SHOWN OR AS AN ALTERNATE DETAIL ANCHOR PLATES MAY BE RETAINED WITH 5/16" FILLET WELDS ALL AROUND OR FORMED HEADS.
12. ROUND TAPERED STEEL TUBE WITH MAXIMUM TAPER OF 0.15"/FOOT.
13. NO. 11 GAUGE SHEET STEEL OF WELDABLE GRADE ACCEPTABLE IF STEEL AFTER FABRICATION HAS A MINIMUM YIELD STRENGTH OF 40,000 P.S.I.

SLIP BASE DETAILS

N.T.S.

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

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
3/24/94

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING
SLIP BASE DETAILS

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U35 OF 36 SHEETS

Last save: 03/21/94 @ 16:01:36 by: RN

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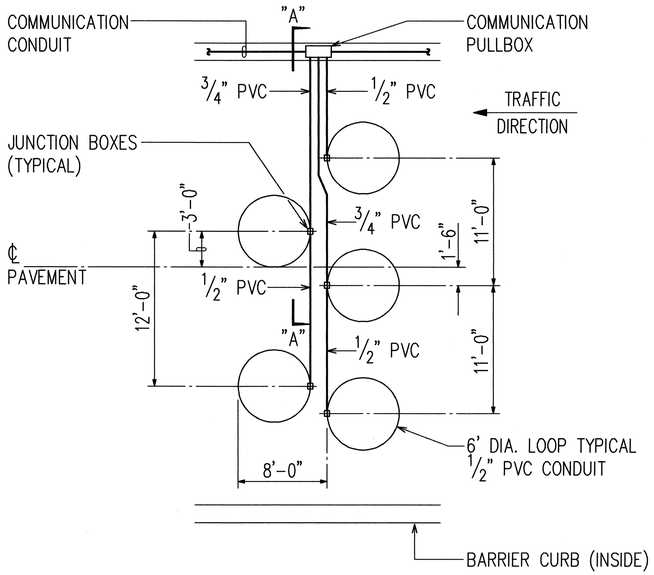
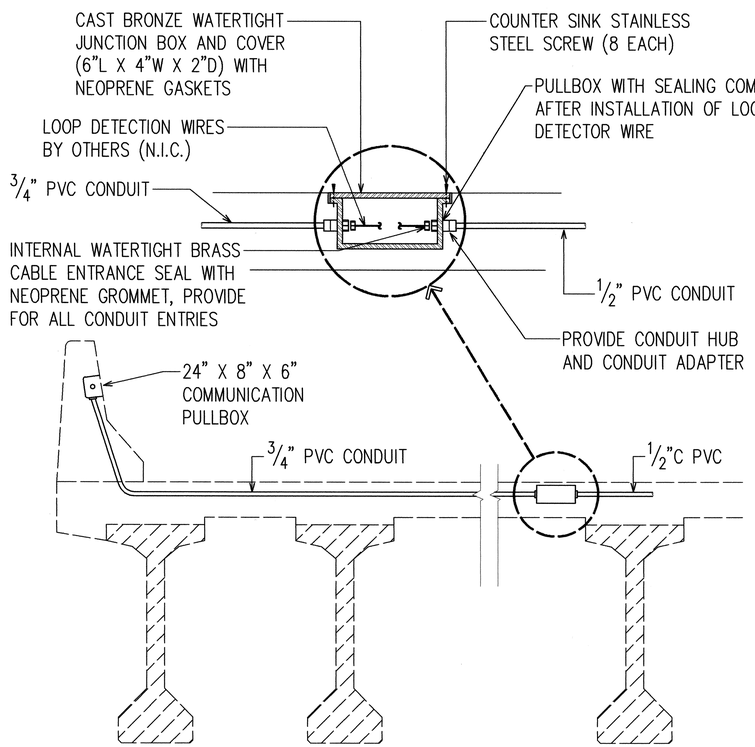
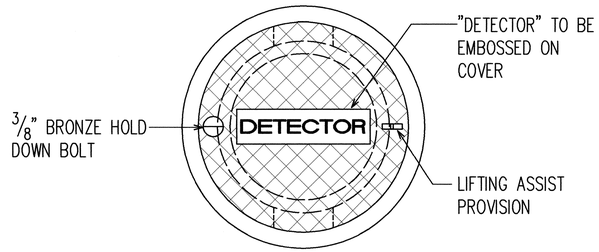
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-H3-1(68)	1994	134	470



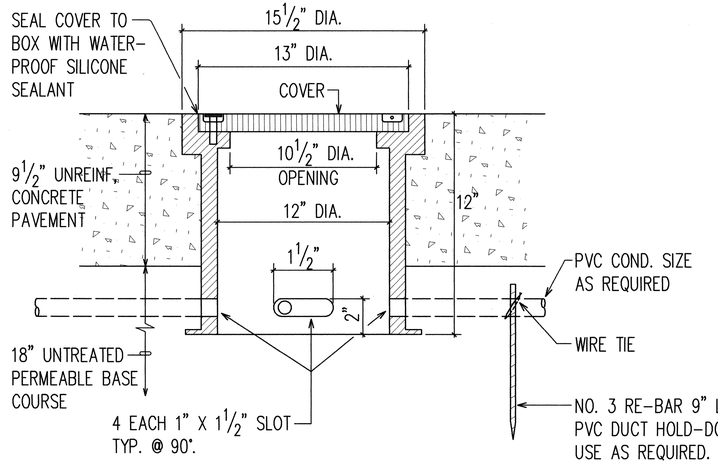
PLAN



SECTION "A-A" - ON BRIDGE



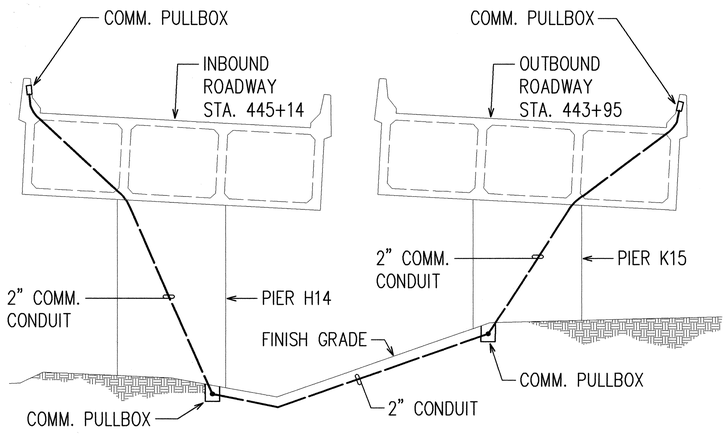
PLAN VIEW



SECTION "A-A" - ON-GRADE

1 U15 U36 U18, U22 N.T.S.

TYPICAL VEHICLE DETECTOR STATION DETAILS



2 U18 U36 N.T.S.

COMMUNICATIONS CONDUIT DETAIL

NOTES:

1. JUNCTION BOXES, FRAMES, AND COVERS SHALL BE RATED FOR H20 LOADING.
2. LOOP DETECTOR CABLES TO BE INSTALLED BY OTHERS.
3. SEE DRAWING SA10.1 FOR COORDINATION BETWEEN DETECTOR CONDUITS AND BRIDGE DECK REINFORCEMENT.

DATE	REVISION
7/12/94	ADDED NOTE 3. REVISED CONDUIT SIZE TO 2" IN DETAIL 2/U18/U36.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TYPICAL VEHICLE DETECTOR STATION DETAILS - ON BRIDGE

INTERSTATE ROUTE H-3
North Halawa Valley Highway, Unit I, Phase IB
F.A.I. PROJECT NO I-H3-(68)

SCALE: AS NOTED DATE: MAR. 1994

SHEET No. U36 OF 36 SHEETS

RONALD N.S. HO
REGISTERED PROFESSIONAL ENGINEER
No. 3737-E
HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
7/25/94

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

Last save: 07/22/94 @ 12:25:60 by: PV

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ADD. 134