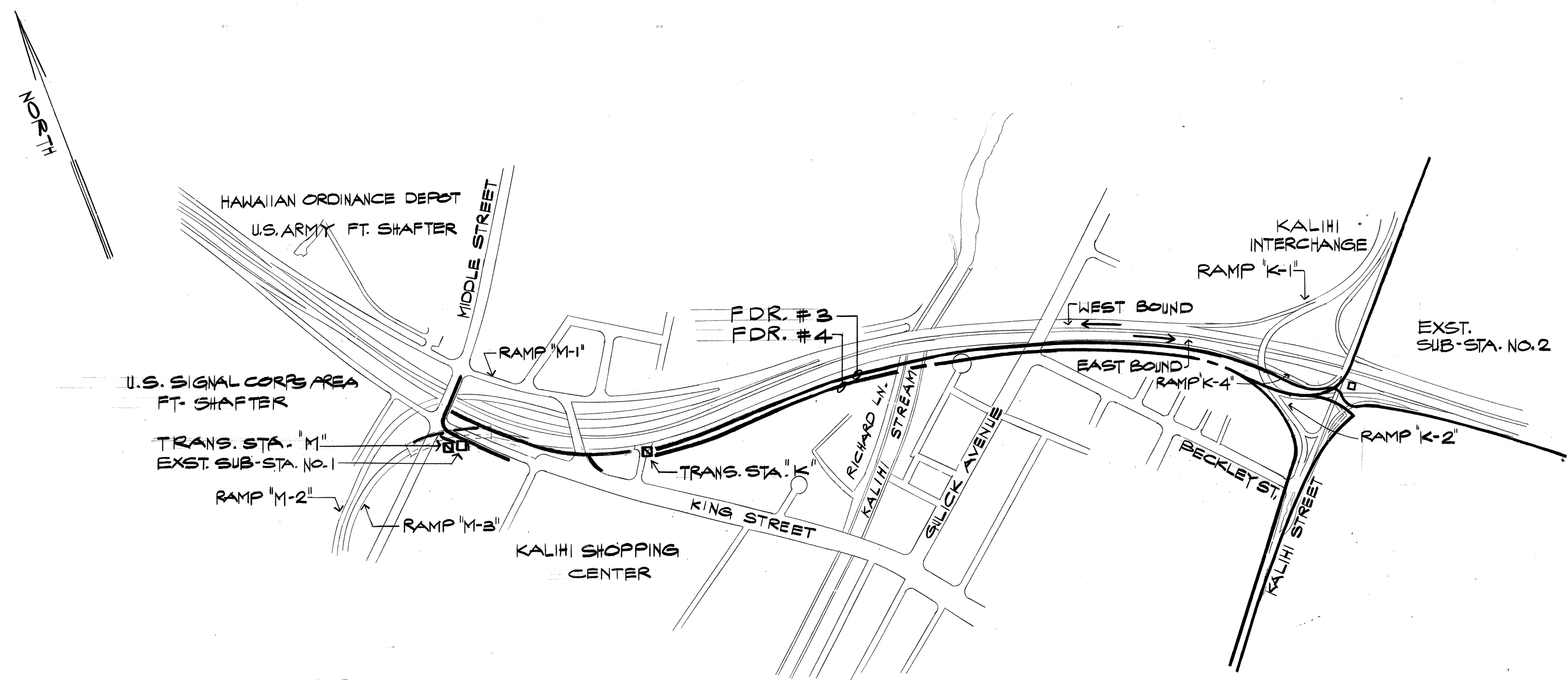




LAYOUT PLAN

LIST OF ABBREVIATIONS

ASSY.	ASSEMBLY	I.E.S.	ILLUMINATING ENG'G. SOCIETY
B.K.T.	BRACKET ARM	J.B.	JUNCTION BOX
C	RACEWAY (TYPE & SIZE AS INDICATED)	K	
CAD	CEMENT ASBESTOS DUCT	LT.	LIGHT
CKT.	CIRCUIT	LTG.	LIGHTING
CONC.	CONCRETE	MT./MTD./MTG.	MOUNT / MOUNTED / MOUNTING
D		N.I.C.	NOT IN CONTRACT
EXST.	EXISTING	NMR	NON METALLIC RACEWAY
E.T.W.	EDGE OF TRAVELED WAY	N.T.S.	NOT TO SCALE
FIXT.	FIXTURE	O	
FDR.	FEEDER (OR BRANCH THEREOF)	PVC	POLYVINYLCHLORIDE CONDUIT
FLUOR.	FLUORESCENT	Q	
FND.	FOUNDATION	RCPT.	RECEPTACLE
FUT.	FUTURE	RGS	RIGID GALV. STL. CONDUIT
GRD.	GROUND	S/B	SLIP BASE
HG	MERCURY VAPOR LAMP	STL.	STEEL
H.P.S.	HIGH PRESSURE SODIUM LAMP	SW.	SWITCH
HWY.	HIGHWAY	SCH'D.	SCHEDULE
HT.	HEIGHT	STD	STANDARD
		TRANS.	TRANSFORMER

NAKAMURA, KAWABATA & ASSOC., INC.
One Kapiolani Bldg., Suite 403
800 Kapiolani Boulevard
Honolulu, Hawaii 96813



Winn M. Nakamura

ELECTRICAL SYMBOLS

EXST.	NEW	
—○—	—○—	HWY. LT. ASSY. w/ 250 WPS (30,000 LUMENS) I.E.S. M-N-III
—○—	—○—	NO CHANGE UNLESS NOTED OTHERWISE
—○—	—○—	REMOVE ASSEMBLY & FOUNDATION
—○—	—○—	MTD. ON CONC. RETAINING WALL
—○—	—○—	TIME SWITCH
—○—	—○—	REPLACE FIXTURE WITH 150 W HPS OR AS INDICATED ON WOOD POLE.
—○—	—○—	REPLACE FIXT. w/ 150 WPS ON EXST. WOOD POLE.
—○—	—○—	HWY. SIGN w/ MERCURY VAPOR UNITS
—○—	—○—	HWY. SIGN, REPLACE LTG. AS NOTED.
—○—	—○—	DIRECT BURIED CABLES TO BE ABANDONED
—○—	—○—	SERIES CKT 1/2 CABLE
—○—	—○—	PVC SCH'D. 40 OR ABS CONDUIT
—○—	—○—	CONC. ENCASED 2" CONDUIT OR W/ IN CONC. STRUCTURE
1	2	1. POLE NUMBER
3	4	2. CIRCUIT ASSIGNMENT NUMBER
5	6	INDICATOR 3. LETTERS, SEE REFERENCE
7	8	4. POLE HT. FROM BASE TO ARM BRACKET
9	10	5, 6 & 7, SEE REFERENCES
11	12	INDICATES POLE TO BE MTD. ON CONC. WALL, DET.
13	14	POLE TO BE MTD. ON GR. BACK OF CONC. WALL
15	16	TRANS. BASE
17	18	REPLACE HWY. LT. ASSY.
19	20	SLIP BASE
21	22	HWY. LT. ASSY. MTD. ON CONC. BARRIER
23	24	WATTAGE, 250 W HPS III
25	26	NO CHANGES FOR POLE ASSY.
27	28	TRUSS ARM BRACKET, LENGTH AS NOTED
29	30	HWY. LT. INSTALLATION
31	32	MEDIUM, SEMI-CUTOFF, TYPE III
33	34	IES DISTRIBUTION
35	36	HANDHOLE, STATE HWY. DIV. TYP. TYPE "A"
37	38	PULLBOX, STATE HWY. DIV., 2' x 3', D.T. 50, SH. 24"
39	40	PHOTO ELEC. SW. w/ RCPT. STATE HWY. DIV. STD.
41	42	MERCURY VAPOR BALLAST IN NEMA-3R ENCL.
43	44	CONDUIT CONN. BETWEEN NEW & EXST.
45	46	HANDHOLE, STATE HWY. DIV. TYP. TYPE "C", NOTE # 4
47	48	OVERHEAD SERIES CKT.
49	50	OVERHEAD MULTIPLE CKT.
51	52	MULTIPLE CKT. IN CONDUIT
53	54	EXPOSED CONDUIT
55	56	INDICATES FIXTURE w/ I.E.S. MED. NON-CUTOFF IV
57	58	INDICATES FIXTURE w/ I.E.S. MED. SEMI-CUTOFF II
59	60	DUCT SECT. A, SEE SH. 22L
61	62	REMOVE OVERHEAD SERIES CKT.
63	64	MULTIPLE CKT. 4 #10 RING MESSENGER

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	92	105

GENERAL NOTES

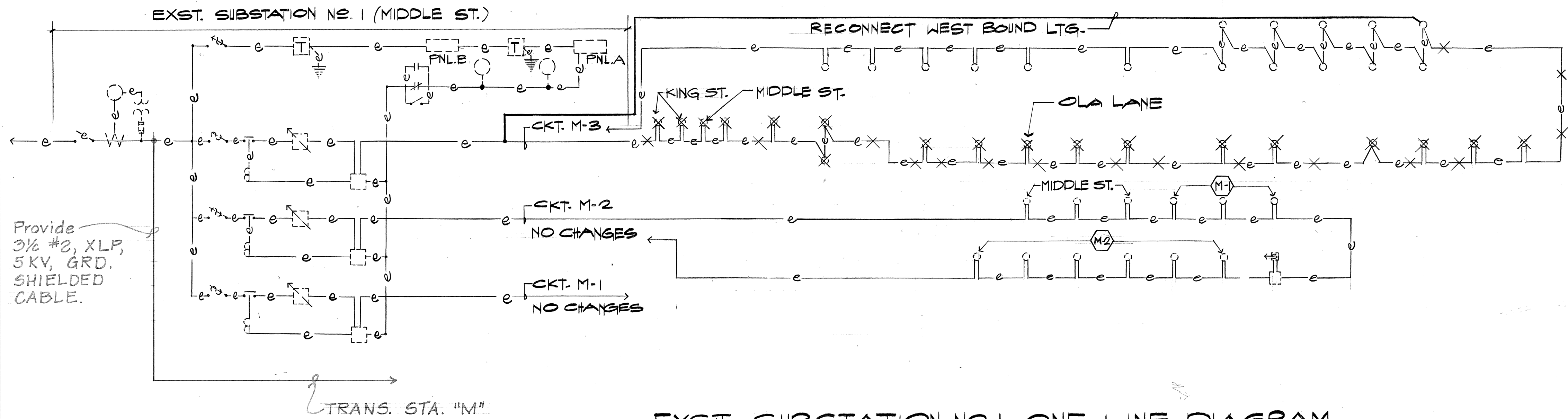
- FOR GROUNDING SYSTEM, PROVIDE #6 TW GREEN BOND AMONG ALL LTB, STDS, PULLBOX, GRD. RODS, JUNCTION BOXES & METAL RACEWAYS.
- FOR BARRIER TYPES, SEE STRUCTURAL DWGS. & PROVIDE 3-FOOT SECTION FOR MTG. OF POLES. ALSO PROVIDE #6 TIE BARS BETWEEN 3-FOOT SECTION & ADJACENT WALLS PER STRUCTURAL DWGS.
- PROVIDE AN EXPANSION DEPLETION FITTING IN ALL RACEWAY AT BRIDGE STRUCTURE EXPANSION JOINTS.
- ALL PULLBOXES TO BE OUTBOARD FROM CURBS, GUARD RAILS & RETAINING WALLS, UNLESS OTHERWISE NOTED.
- DAMAGED HWY. LTG. SYSTEMS PARTS, HARDWARE & COMPONENTS SHALL BE REPLACED w/ NEW ITEMS AT NO COST TO THE STATE.
- STUB OUT: 2" PVC, 5 FT. LONG, TERMINATE w/ DUCT SEAL & BUSHING.
- WHERE EXST. CABLE BECOMES EXPOSED DUE TO NEW GRADES, PROVIDE SLIP DUCTS w/ 3" CONC. JACKET 24" DEEP, & WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT. AT NO TIME SHALL NEW OR EXPOSED CABLES BE DIRECT BURIED.
- IF DIRECT BURIAL SPLICE MUST BE MADE, PROVIDE CONC. MARKER WHICH SHALL BE CONSIDERED INCIDENTAL TO THE CONTRACT.
- PROVIDE INTERIM LTG. FOR HWY, RAMPS, SIGNS, STRUCTURES (TUNNELS) DURING CONSTRUCTION & WORK WILL BE CONSIDERED INCIDENTAL TO THE CONTRACT.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
HIGHWAY LIGHTING SYMBOLS

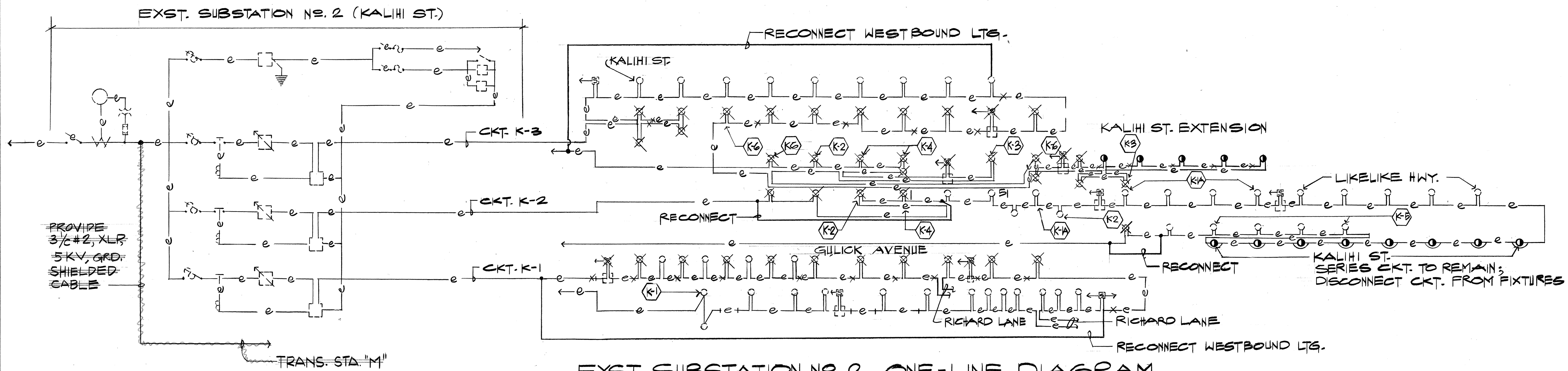
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. 1 -HI-1(178)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	93	165

- SYMBOLS**
- EXST. LUMINAIRE, TO REMAIN
 - ◻ EXST. ILLUM. SIGN, TO REMAIN
 - ◻ INDICATOR FOR RAMP ASSIGNMENT
 - ✕ REMOVE POLE ASSY.
 - REPLACE EXST. FIXTURES w/ HPS & CONNECT TO MULTIPLE CKT.
 - ✕ REPLACE ILLUM. SIGN FLUOR. w/ MERCURY VAPOR FIXTURES & CONNECT TO MULTIPLE CKT.
 - ✕✕ DIRECT BURIED CABLES TO BE ABANDONED

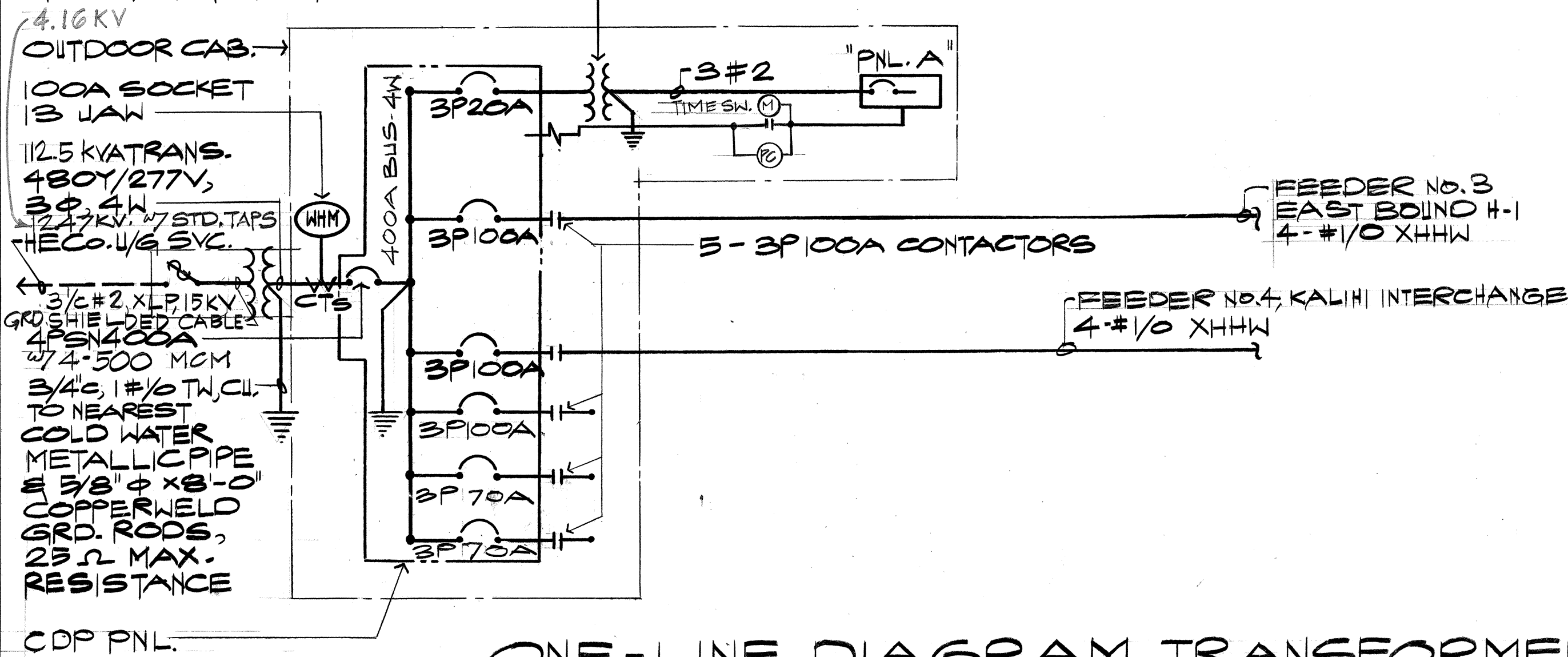


EXST. SUBSTATION NO. 1 ONE-LINE DIAGRAM



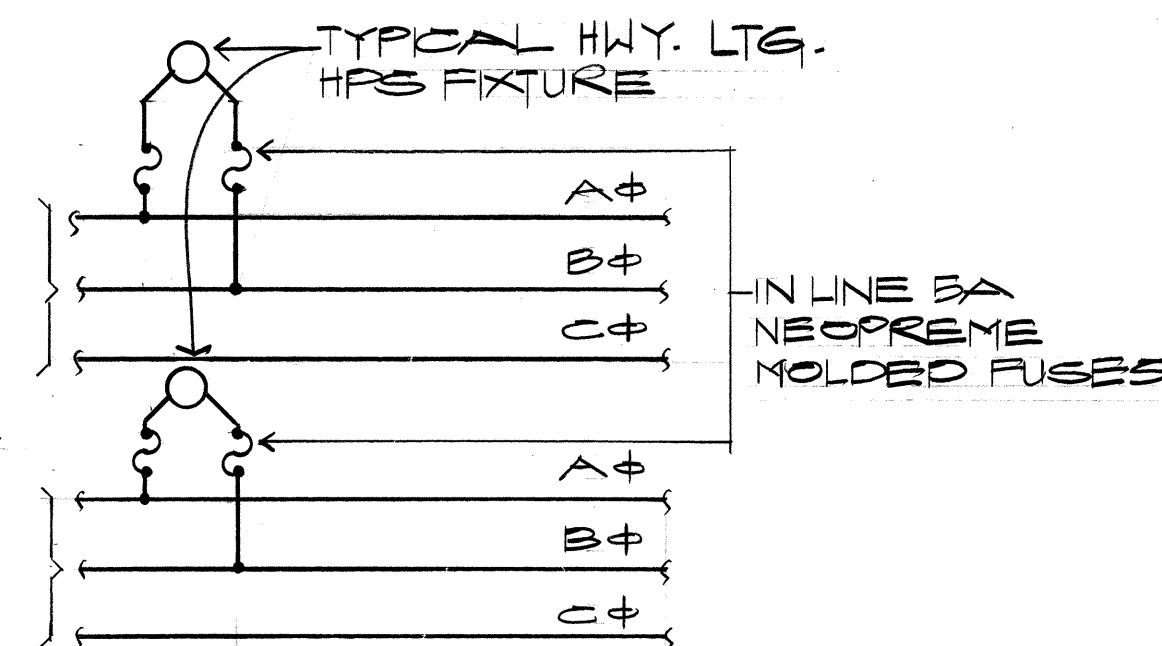
EXST. SUBSTATION NO. 2 ONE-LINE DIAGRAM

5KVA DRY TRANS.
480V-120/240V
1Φ, 3WSN, 2-2 1/2% FCAN
E 2-2 1/2% FCBN TAPS

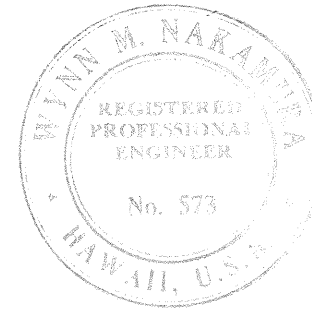


ONE-LINE DIAGRAM, TRANSFORMER STATION "K"

NOTE: FOR SIGN LTG. WIRING, SEE SH. 20L



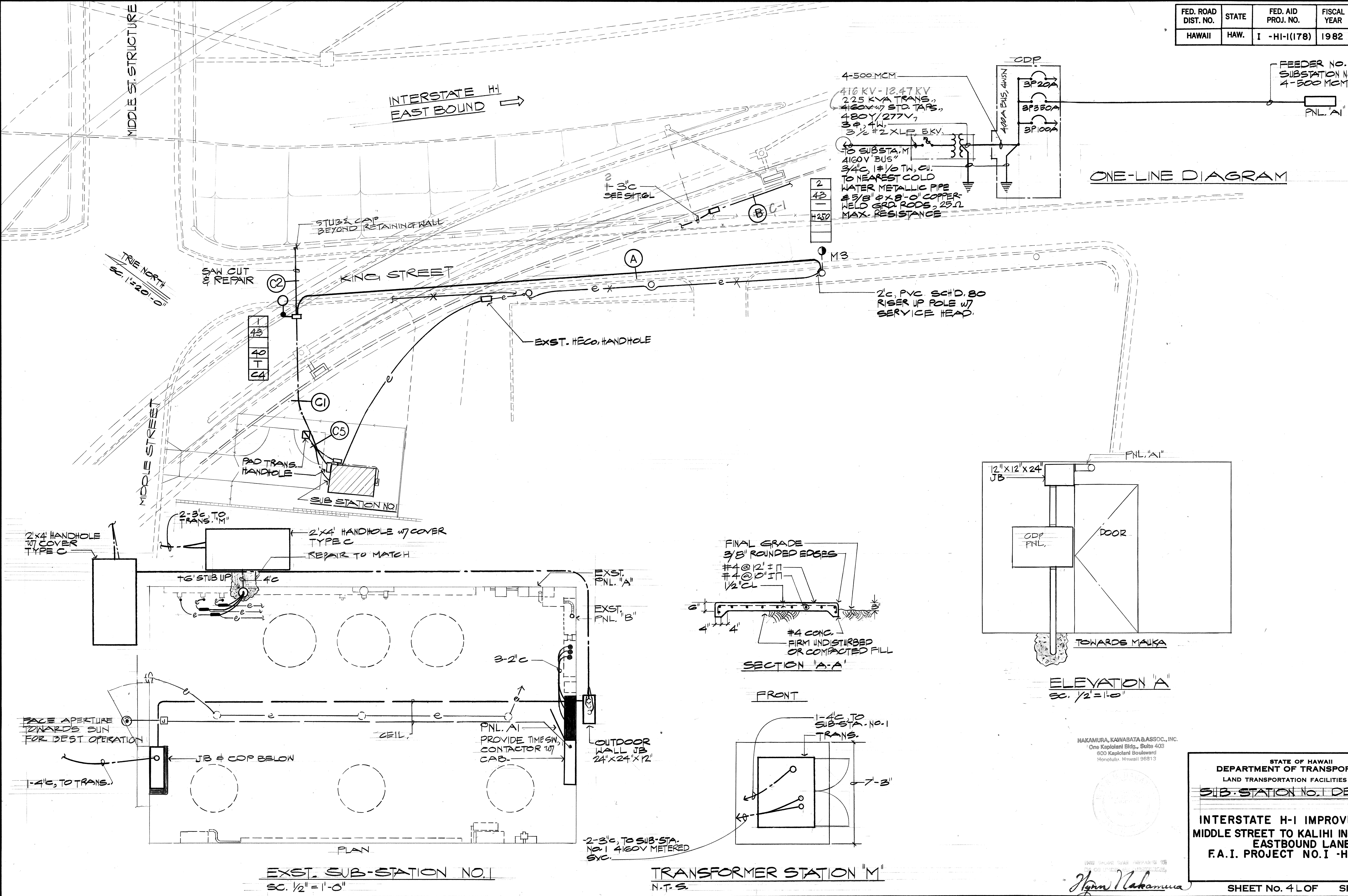
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Honolulu, Hawaii 96813



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
ONE-LINE DIAGRAM
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1(178)

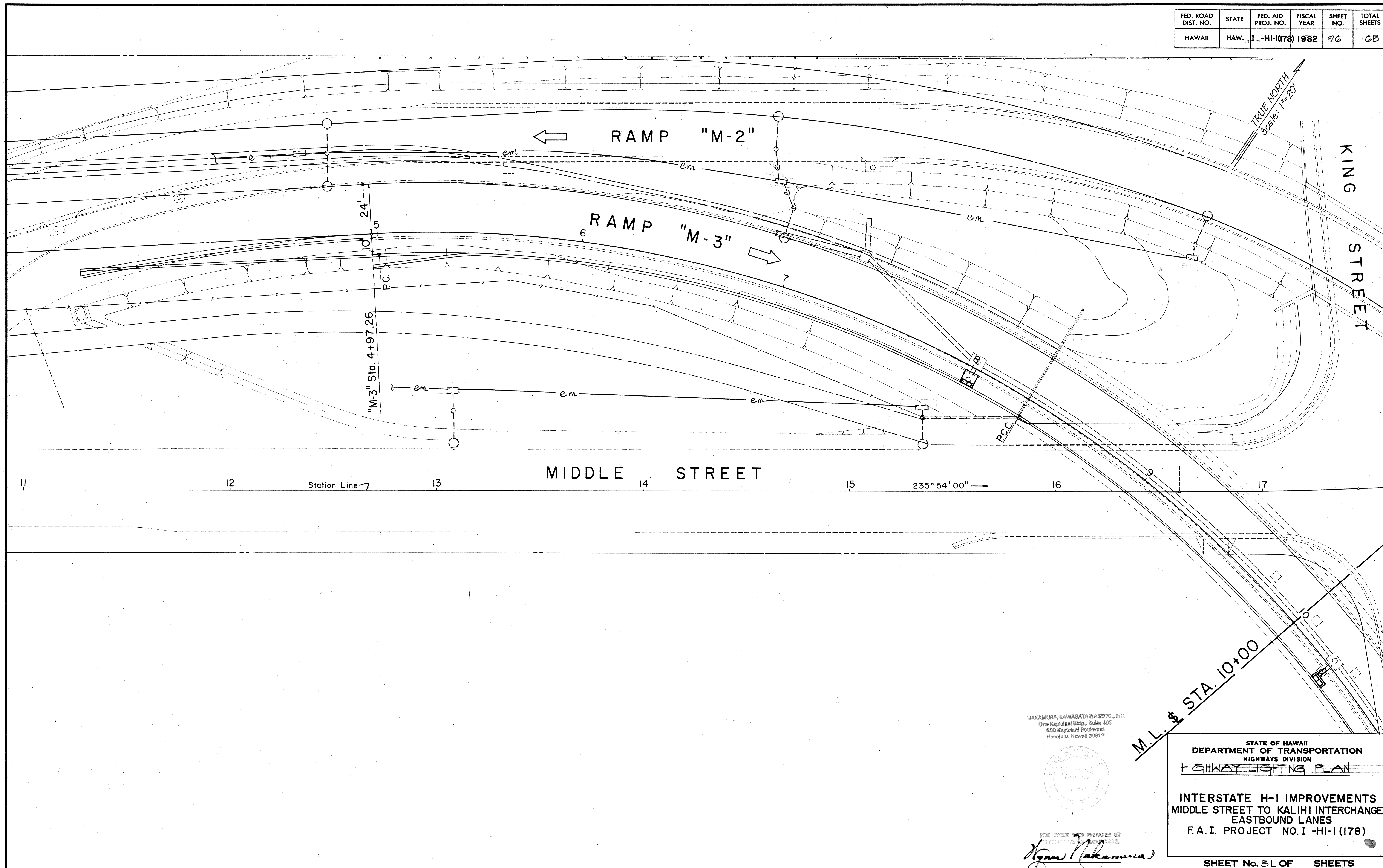
SHEET NO. 22 OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	95	165



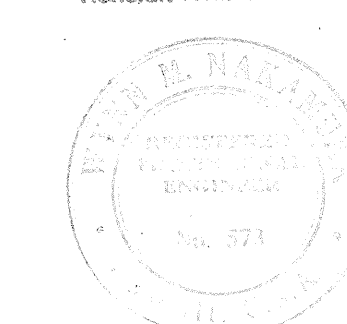
DATE	
SURVEY PLOTTED BY	
PLAN	
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NO.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I.-HI-1(178)	1982	96	105



DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

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800 Kapiolani Boulevard
Honolulu, Hawaii 96813



WAKAMURA, KAWABATA & ASSOC., INC.
Hiram Nakamura

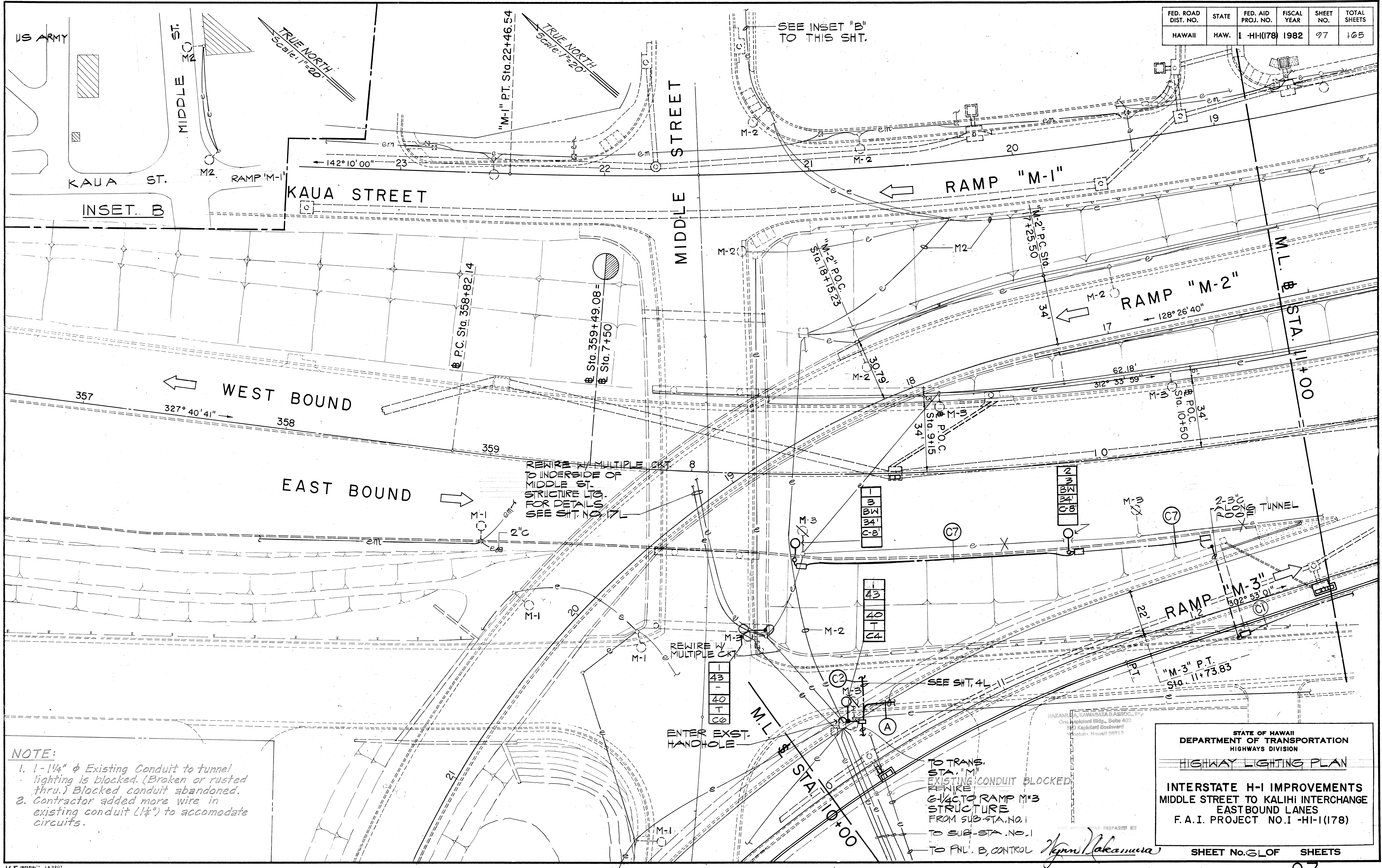
M.L. & STA. 10+00

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING PLAN

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1 (178)

SHEET No. 51 OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1-HI(178)	1982	97	165



DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

NOTE:

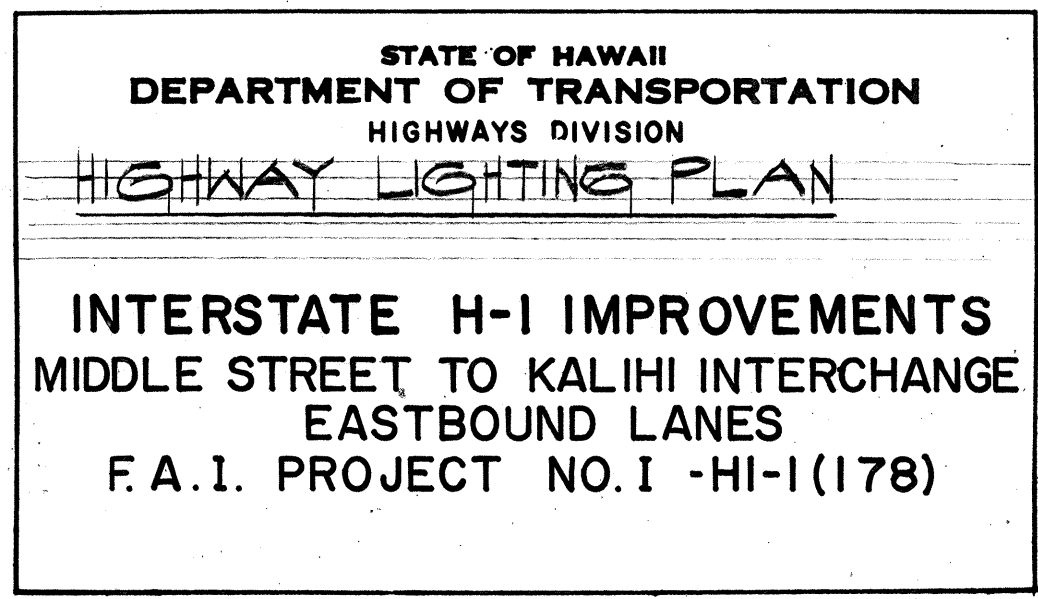
- 1-1 1/4" ϕ Existing Conduit to tunnel lighting is blocked. (Broken or rusted thru.) Blocked conduit abandoned.
- Contractor added more wire in existing conduit (1 1/2") to accommodate circuits.

TO TRANS. STA. "M"
EXISTING CONDUIT BLOCKED
REPAIR
G-1/4" TO RAMP M-3
STRUCTURE
FROM SUB-STA. NO. 1
TO SUB-STA. NO. 1
TO PNL. B. CONTROL

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING PLAN
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EAST BOUND LANES
F.A.I. PROJECT NO. 1-HI-1(178)

SHEET No. 6 OF SHEETS

TRUE NORTH
Scale: 1" = 20'



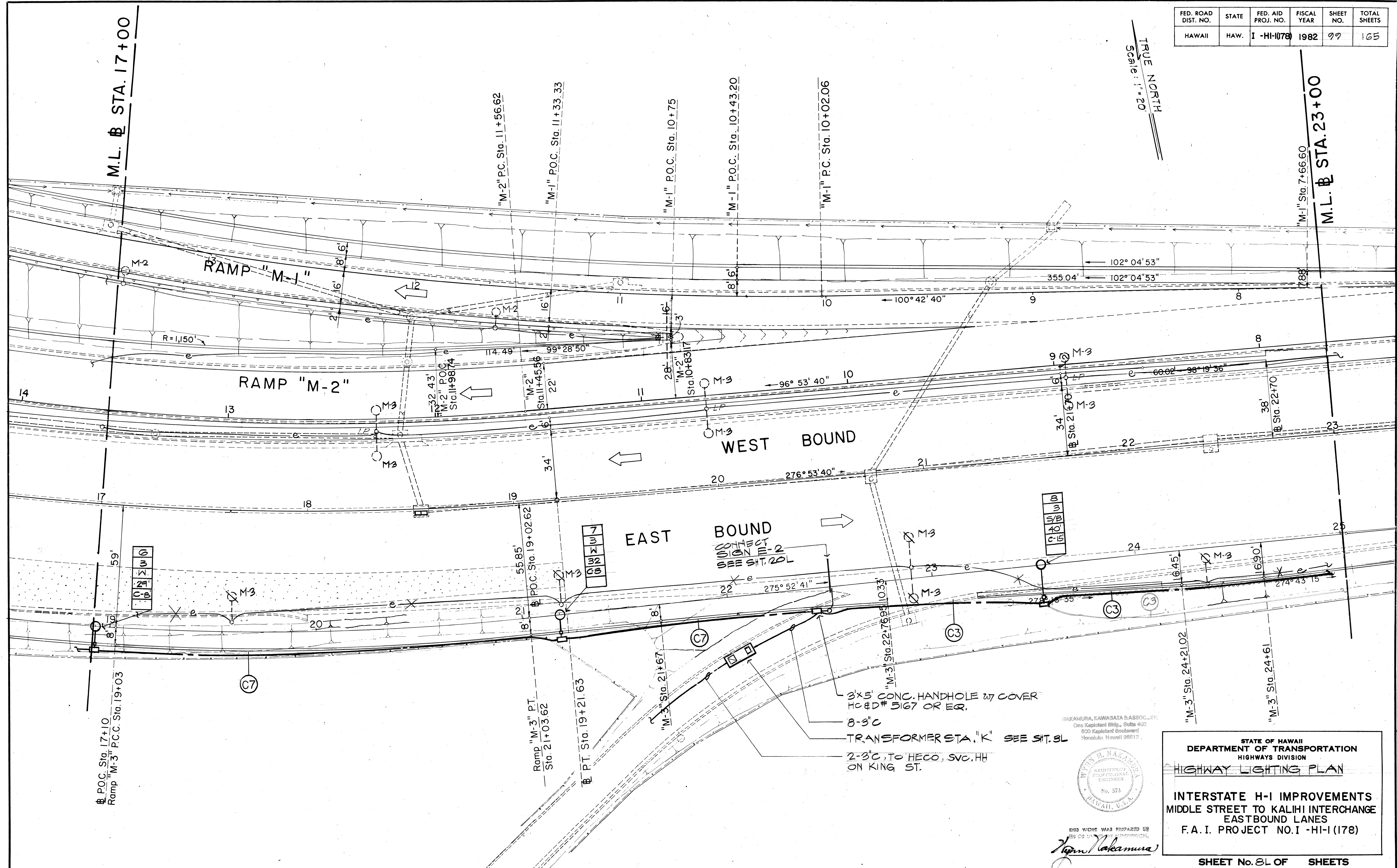
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	99	165

TRUE NORTH
Scale: 1"=20'

M.L. STA. 17+00

M.L. STA. 23+00

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



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Wm. Nakamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING PLAN

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1 (178)

SHEET No. 8L OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	100	165

TRUE NORTH
Scale: 1"=20'

M.L. STA. 23+00

M.L. STA. 29+00

DESIGNED BY	DATE
DRAWN BY	
CHECKED BY	
NOTED BY	
NO.	

Ramp "M-3" P.C.
Sta. 25+03.88

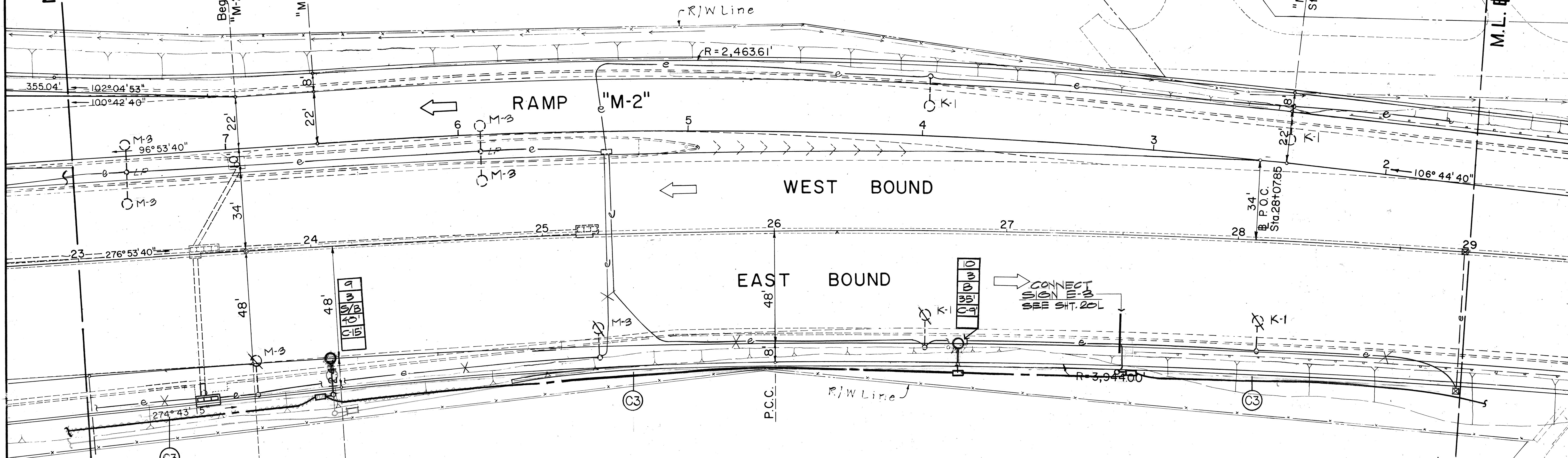
P.C. Sta. 23+72.15
End Ramp "M-3"
P.T. Sta. 25+73.99

P.O.C. Sta. 24+09.37

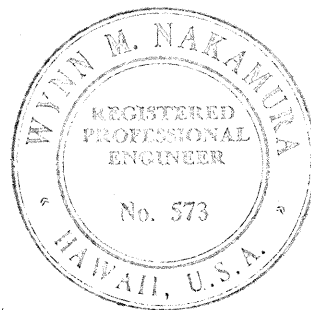
Begin Ramp "M-1" Sta. 6+88.06
"M-2" Sta. 6+94.39

"M-2" P.T. Sta. 6+60.81

"M-2" P.C.
Sta. 2+42.44



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STATE OF HAWAII
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HIGHWAYS DIVISION
HIGHWAY LIGHTING PLAN

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I-HI-1(178)

SHEET No. 91 OF SHEETS

E-6. 100

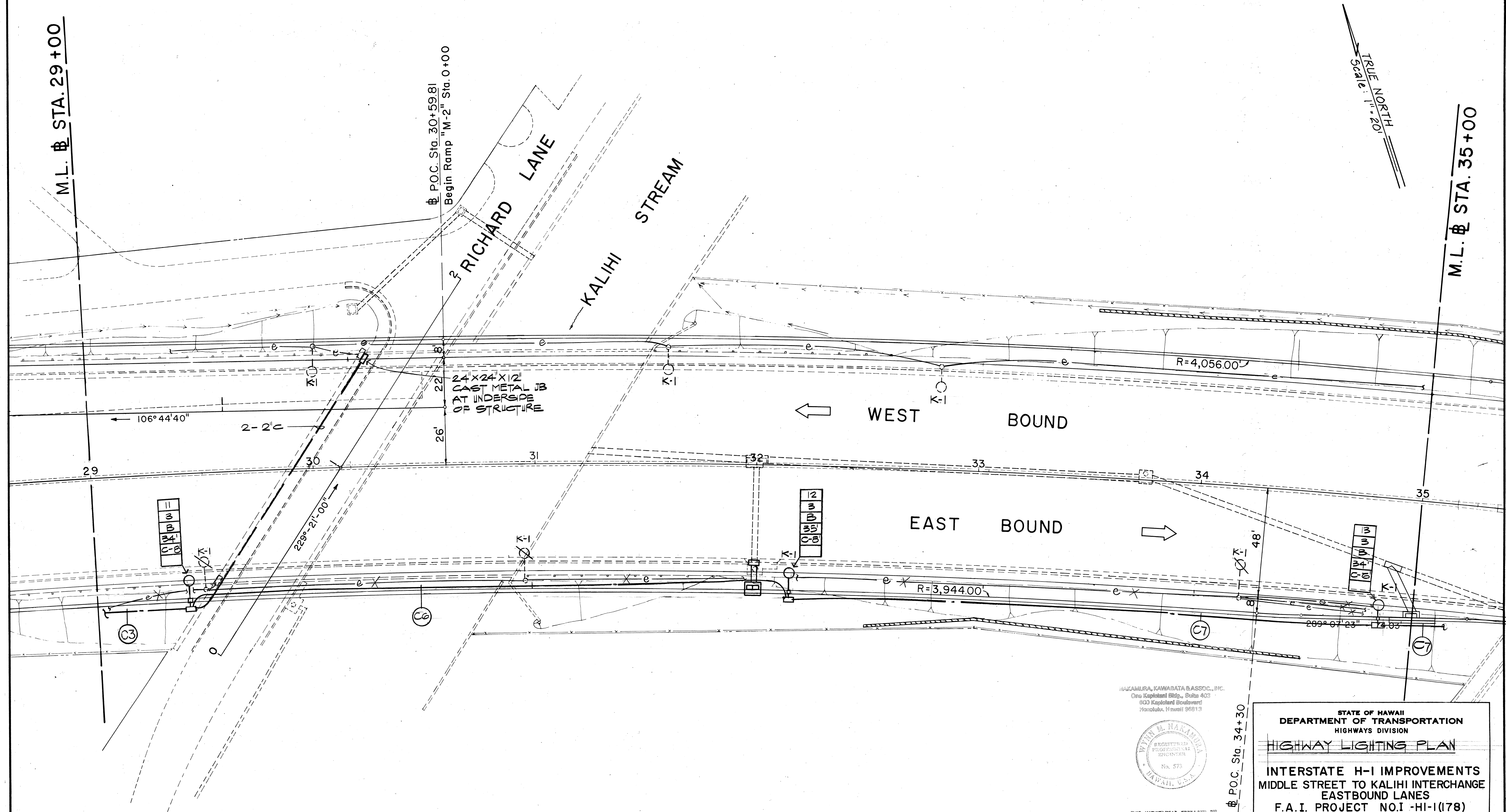
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(178)	1982	101	165

TRUE NORTH
Scale: 1"=20'

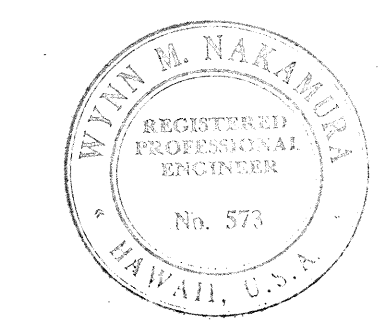
M.L. STA. 29+00

M.L. STA. 35+00

SURVEY PLOTTED BY	DATE
DRAWN BY	
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NOTE BOOK	
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Oni Kawabata

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HIGHWAYS DIVISION

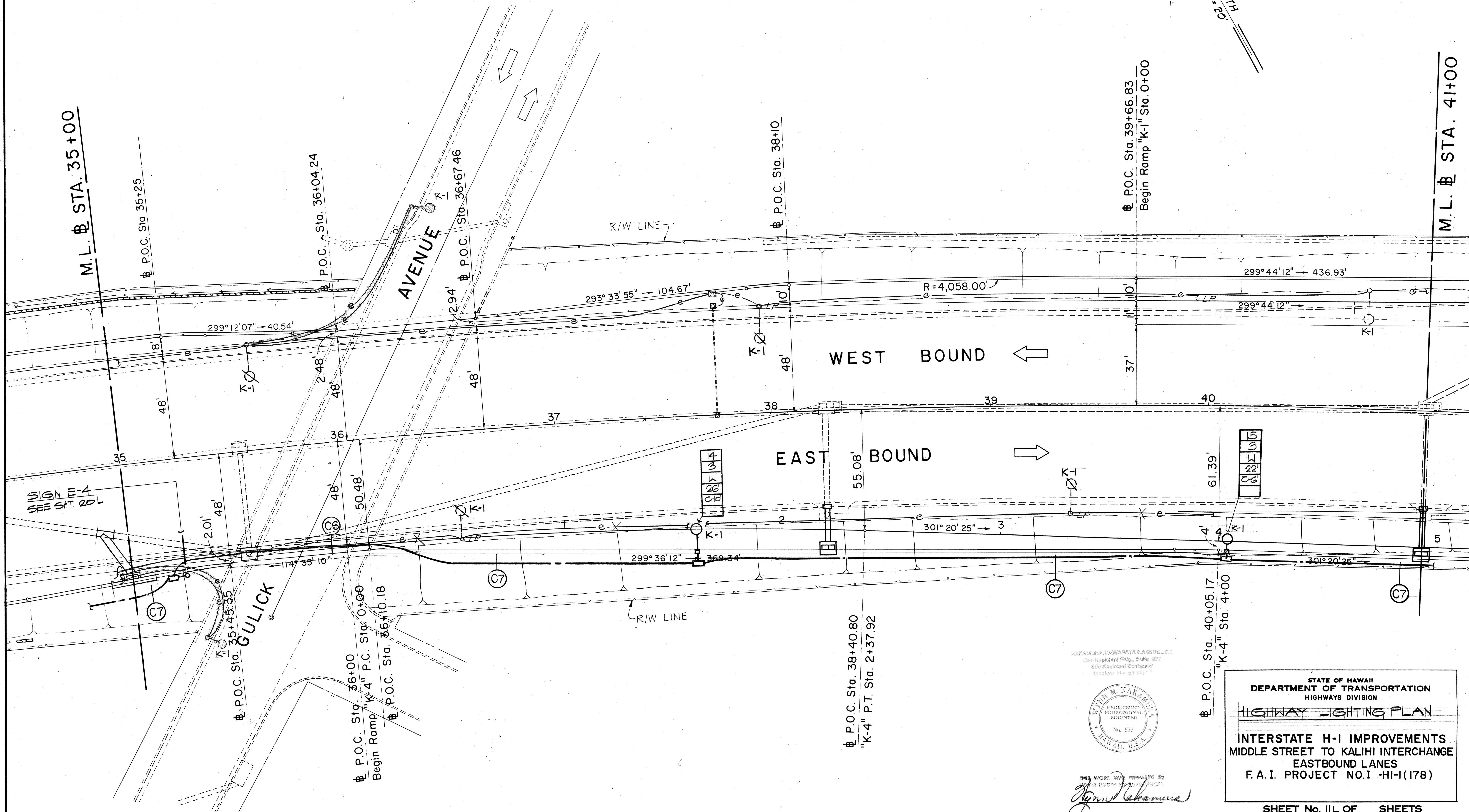
HIGHWAY LIGHTING PLAN

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I-HI-1(178)

SHEET No. 101 OF SHEETS

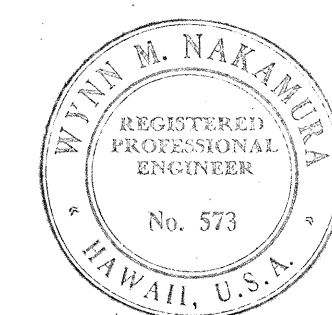
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	102	105

TRUE NORTH
Scale: 1" = 50'



ORIGINAL PLAN	DATE
DRAWN BY	
DESIGNED BY	
CHECKED BY	
NO. BOOK	
NO.	

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THIS WORK WAS PREPARED BY
AKAMURA, KAWABATA & ASSOC., INC.
FOR THE
Wynn M. Nakamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1(178)

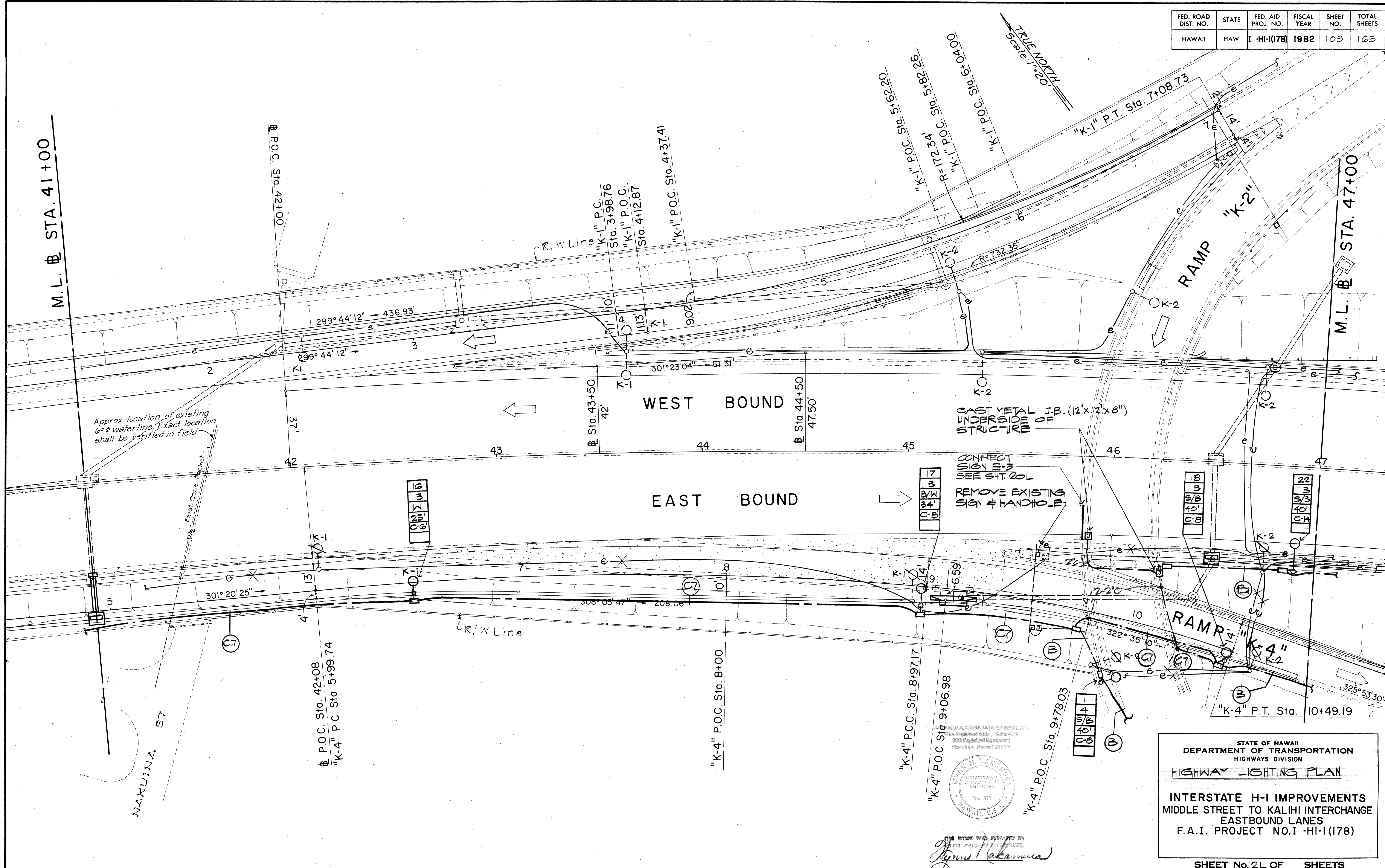
SHEET No. 111 OF SHEETS

E-8

102

INTERSTATE
H-1 IMPROVEMENTS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(178)	1982	103	165



ORIGINAL	DATE
PLANNED BY	
DESIGNED BY	
NOTED BY	
CHECKED BY	

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING PLAN
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I-HI-1(178)

SHEET No. 12 L OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(178)	1982	104	165

TRUE NORTH
Scale: 1"=20'

M.L. STA. 47+00

KALIHI STREET

Sta. 50+80.31

P.O.C. Sta. 49+00

RAMP "K-5"

WEST BOUND

EAST BOUND

RAMP "K-2"

RAMP "K-6"

RAMP "K-4"

2" OUTBD. FACE OF STRUCTURE

P.O.C. Sta. 49+00

P.O.C. Sta. 49+40.01

P.T. Sta. 50+32.42

EXST. TRANSFORMER STATION NO. 2

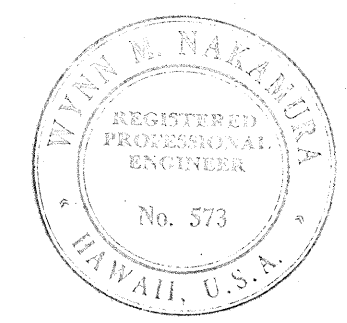
24" X 24" X 12" CAST METAL JUNCTION BOX

EXST. PIER
2" UNDERSIDE OF PEDESTRIAN BRIDGE NEXT TO BEAM

SEE SHT. 131

SURVEY PLOTTED BY	DATE
DRAWN BY	
TRACED BY	
QUANTITIES BY	
CHECKED BY	
No.	

YAMAMURA, KAWABATA & ASSOC., INC.
One Kapiolani Bldg., Suite 402
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Honolulu, Hawaii 96815

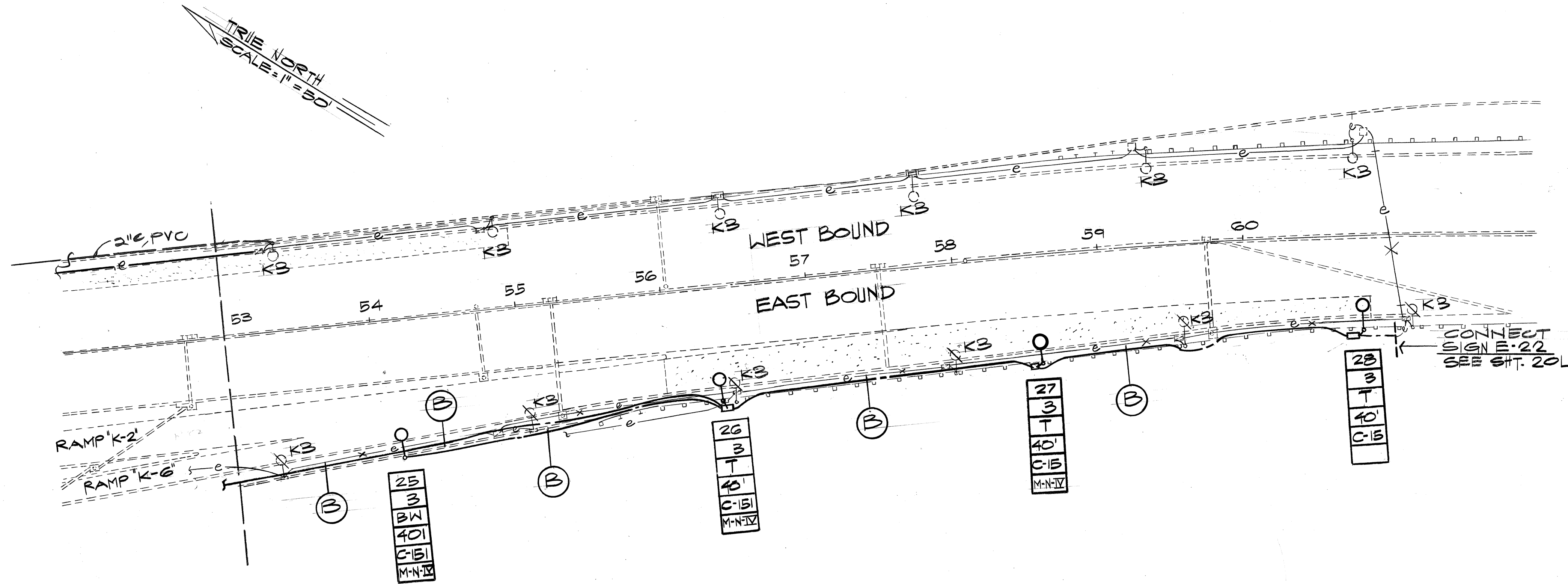


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OR UNDER MY SUPERVISION
Y. Yamamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING PLAN
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO.1 -HI-1(178)

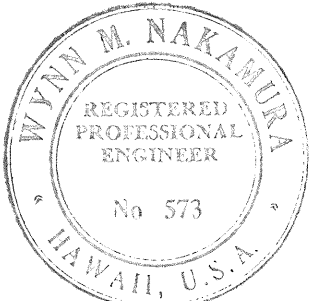
SHEET No. 131 OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	105	165



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

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Wynn M. Nakamura

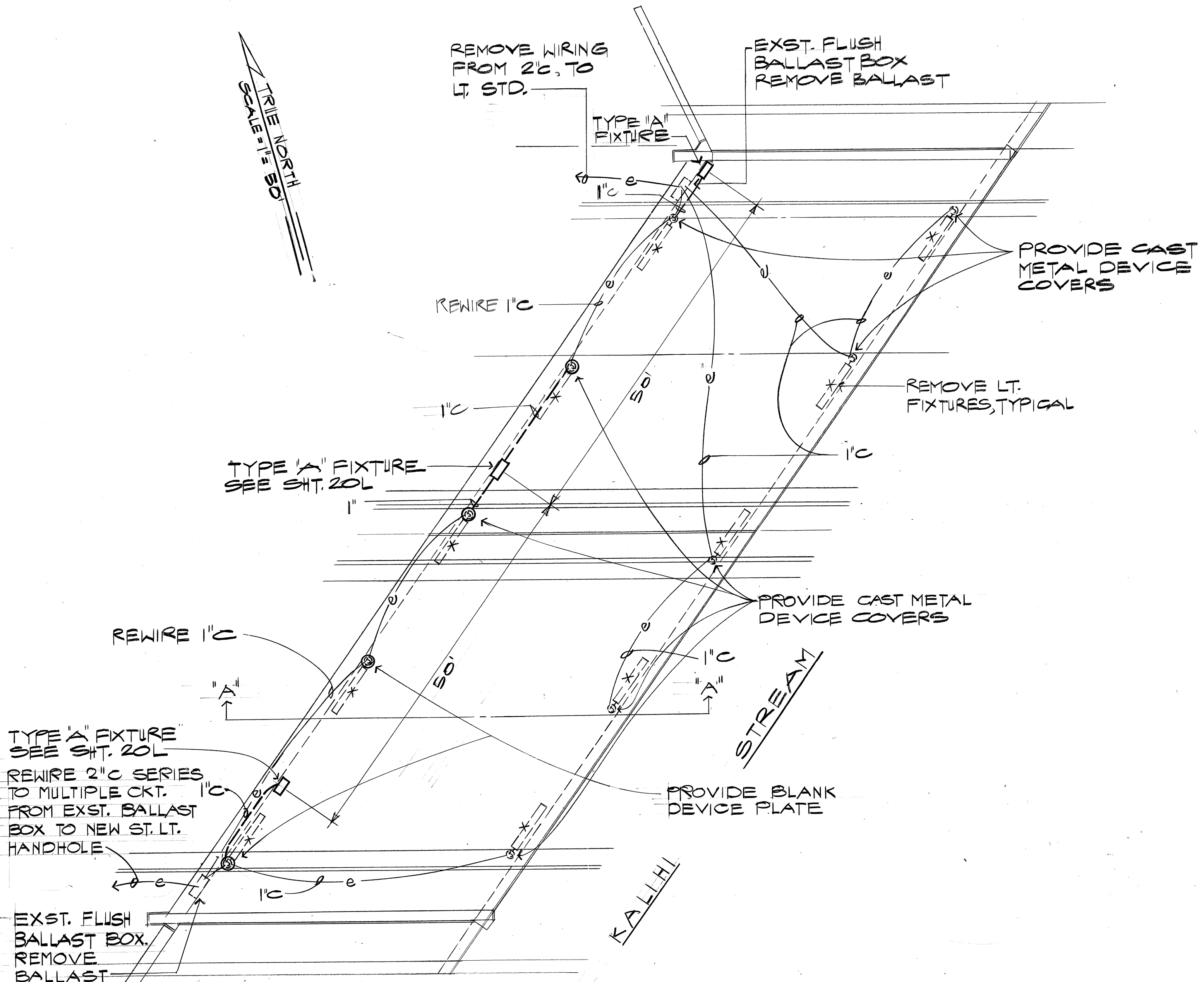
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING PLAN
(H-1 EAST OF KALIHU INTERCHANGE)

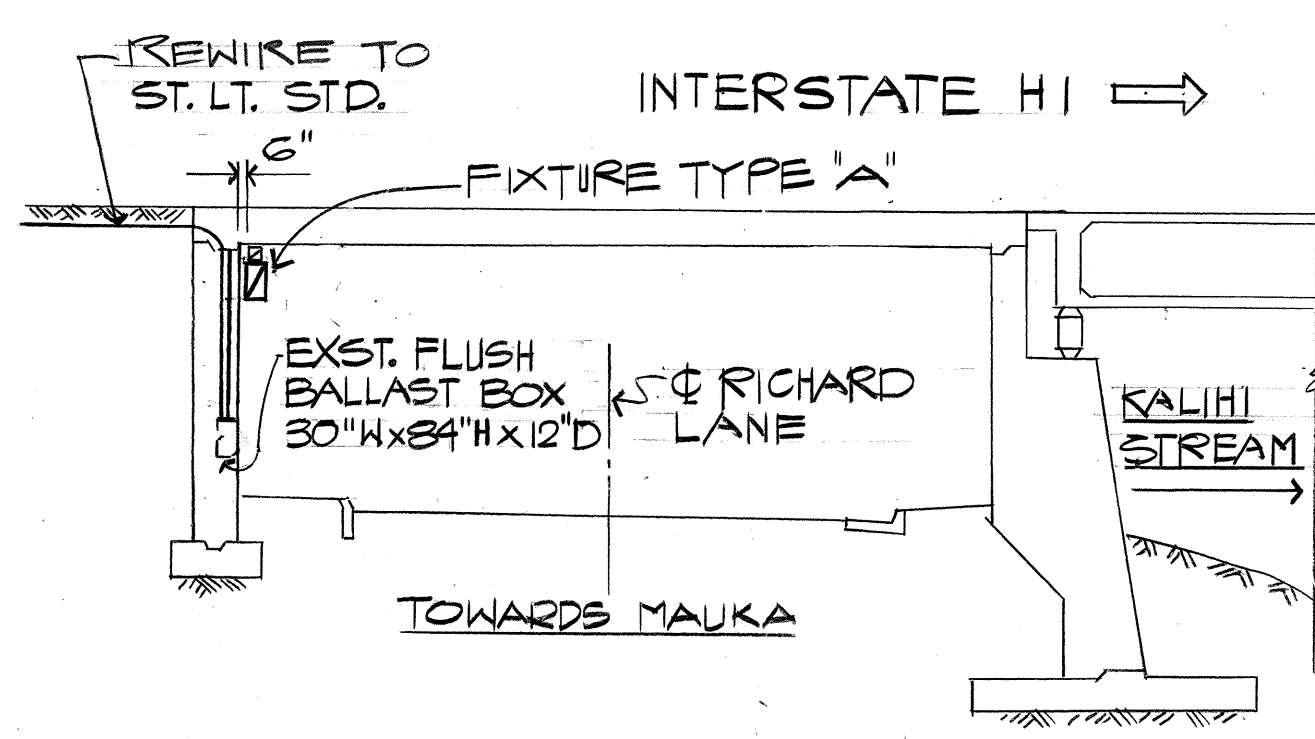
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHU INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1(178)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1 -HI-1(178)	1982	107	125

TRUE NORTH
SCALE: 1"=30'

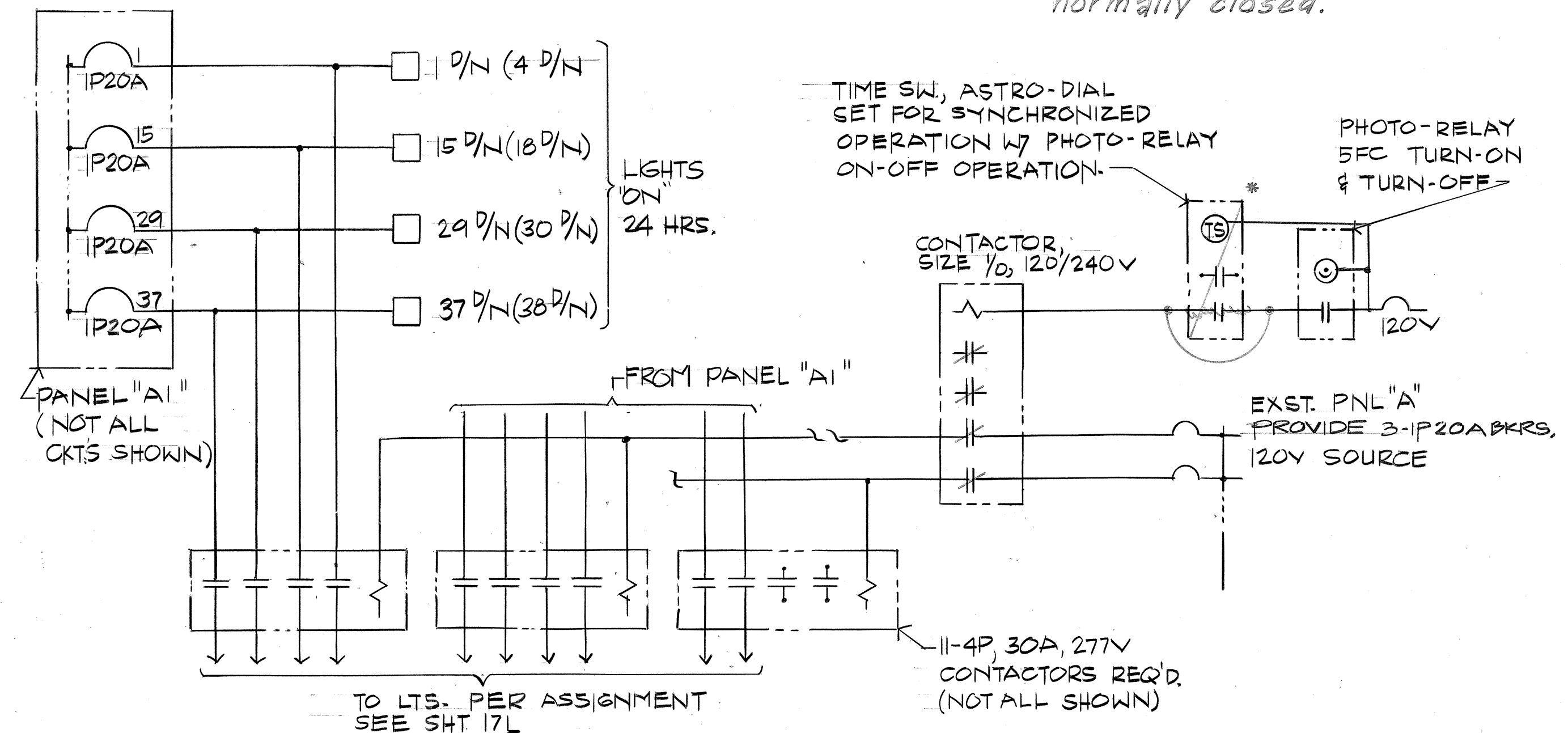


**RICHARD LANE (UNDERPASS)
LIGHTING PLAN**
SCALE: 1"=10'-0"



SECTION "A-A"
SCALE: 1"=10'

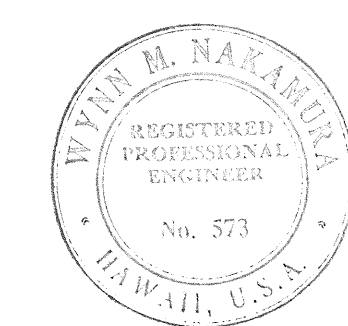
NOTE:
* Time Clock not in use.
Disconnected.
Contractor changed to normally closed.



**TUNNEL
RAMP "M" STRUCTURE
LIGHTING CONTROL**

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

W. M. NAKAMURA, P.E.
One Kapiolani Bldg., Suite 403
500 Kapiolani Boulevard
Honolulu, Hawaii 96812

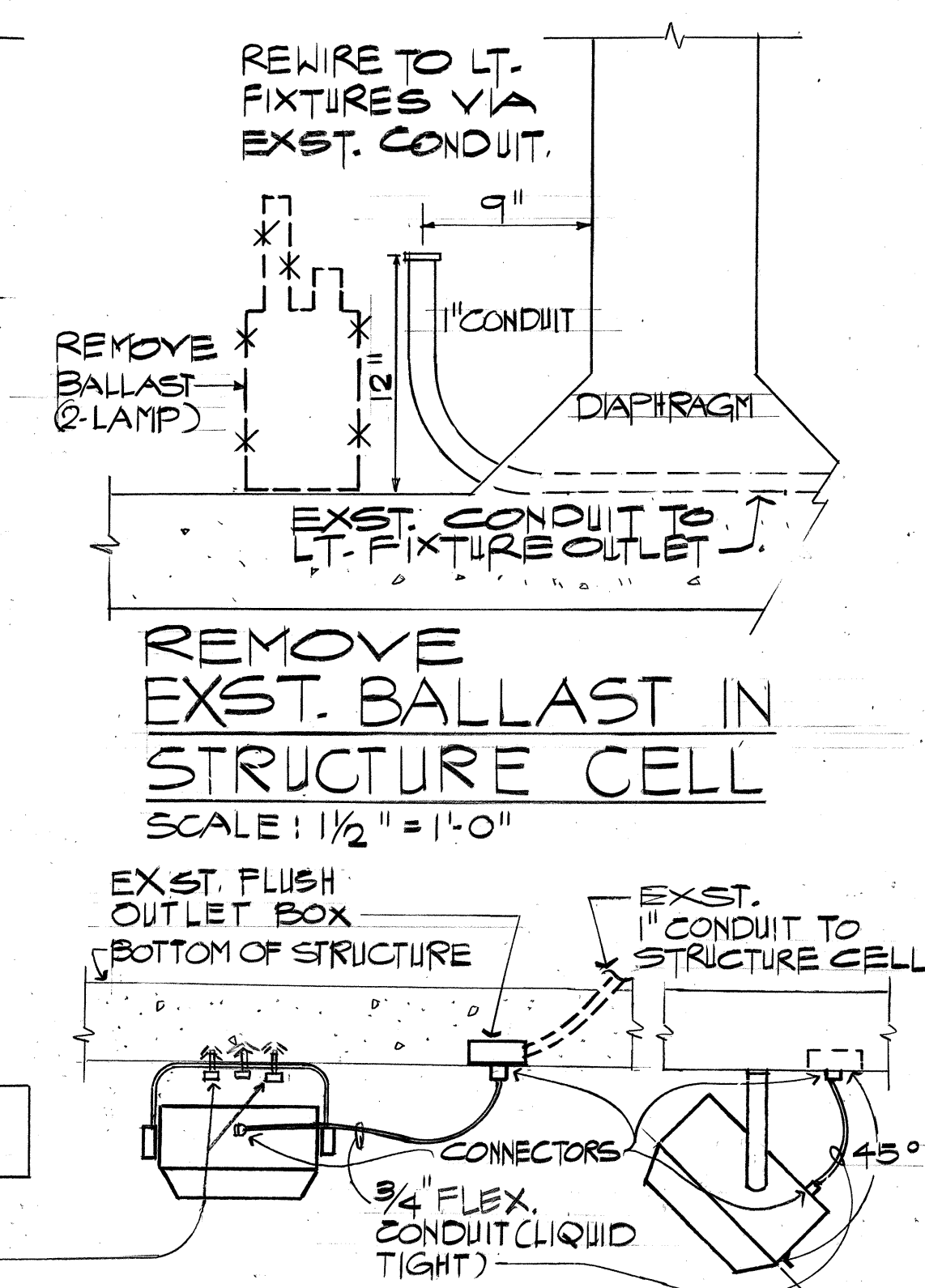
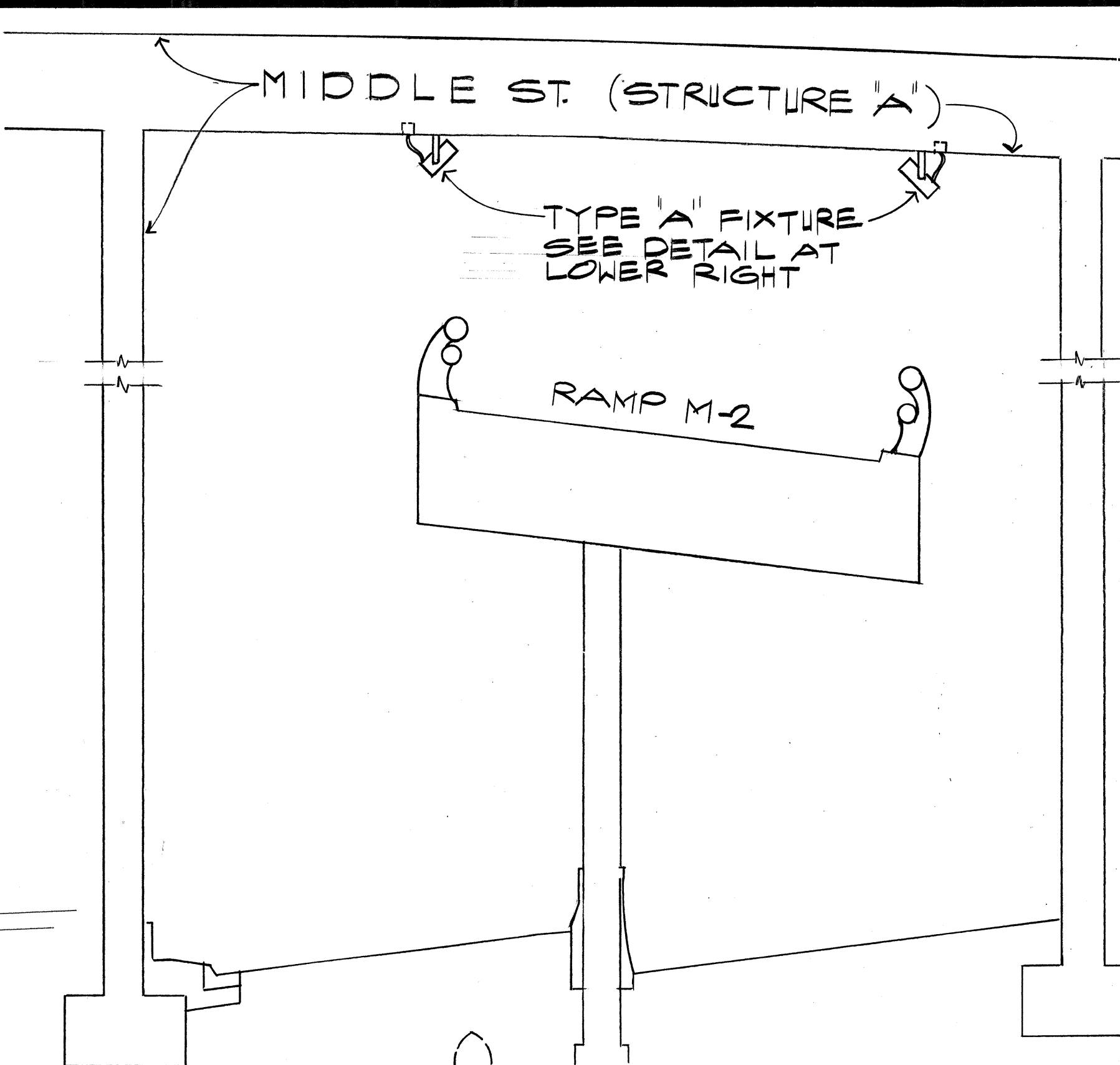
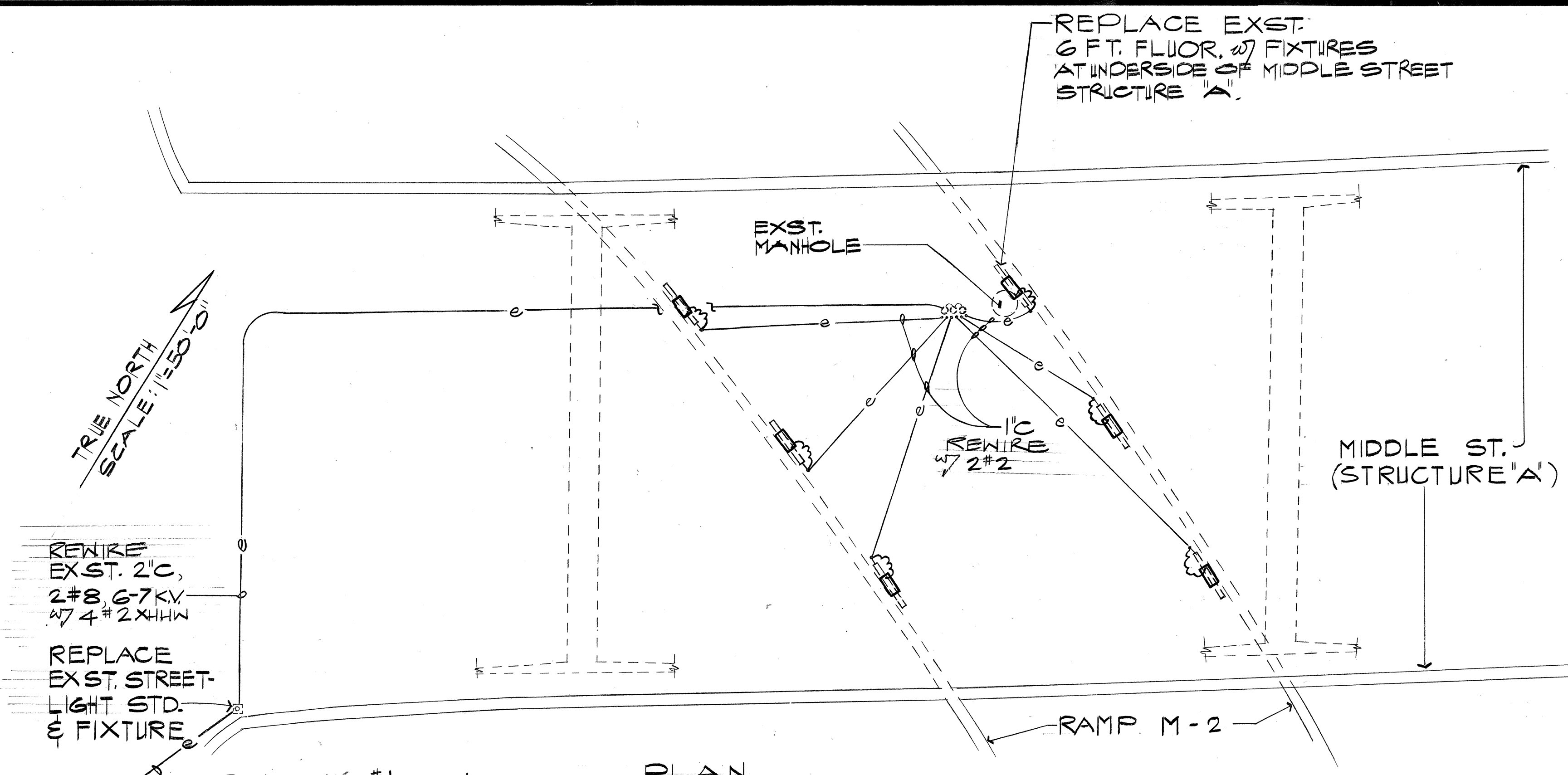


THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

W. M. Nakamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**KALIHI STREAM BRIDGE
(RICHARD LANE)**
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO.1 -HI-1(178)

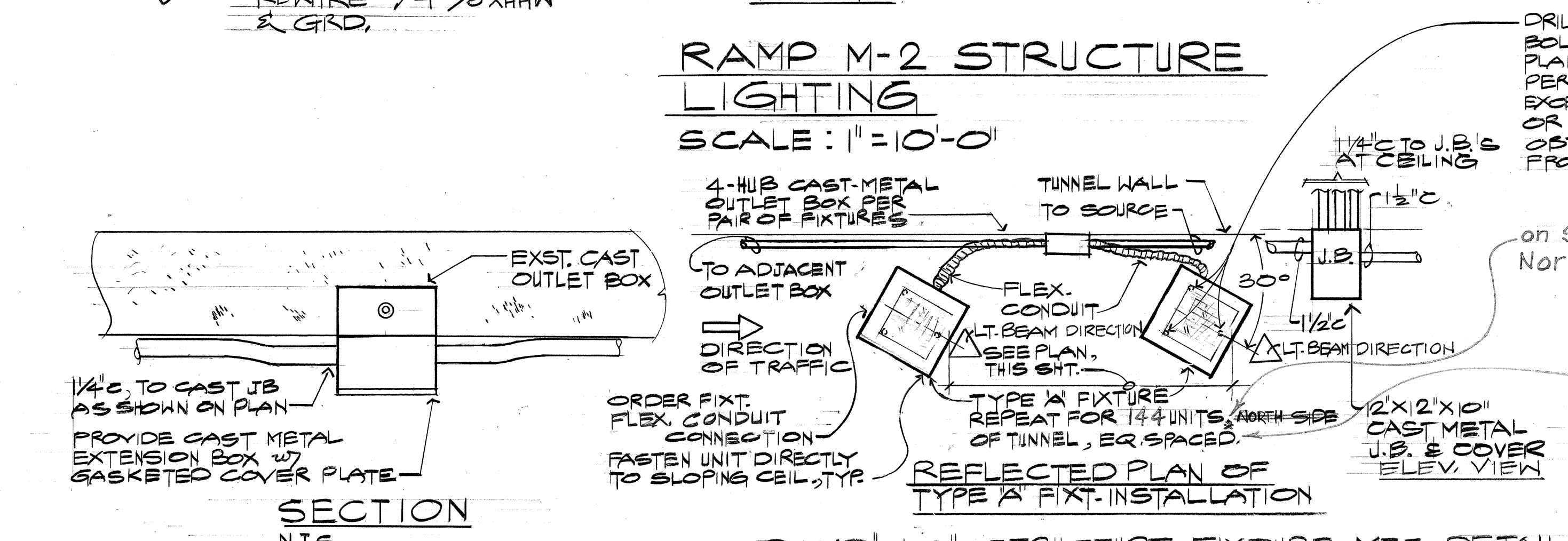
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I - HI-1(178)	1982	108	165



RAMP M-2 STRUCTURE LIGHTING
SCALE: 1" = 10'-0"

SECTION RAMP M-2 STRUCTURE LIGHTING
SCALE: HORIZONTAL 1" = 10'
VERTICAL 1" = 5'

SIDE VIEW END VIEW TYPE "A" MOUNTING FOR RAMP M-2
SCALE: 1/2" = 1'-0"

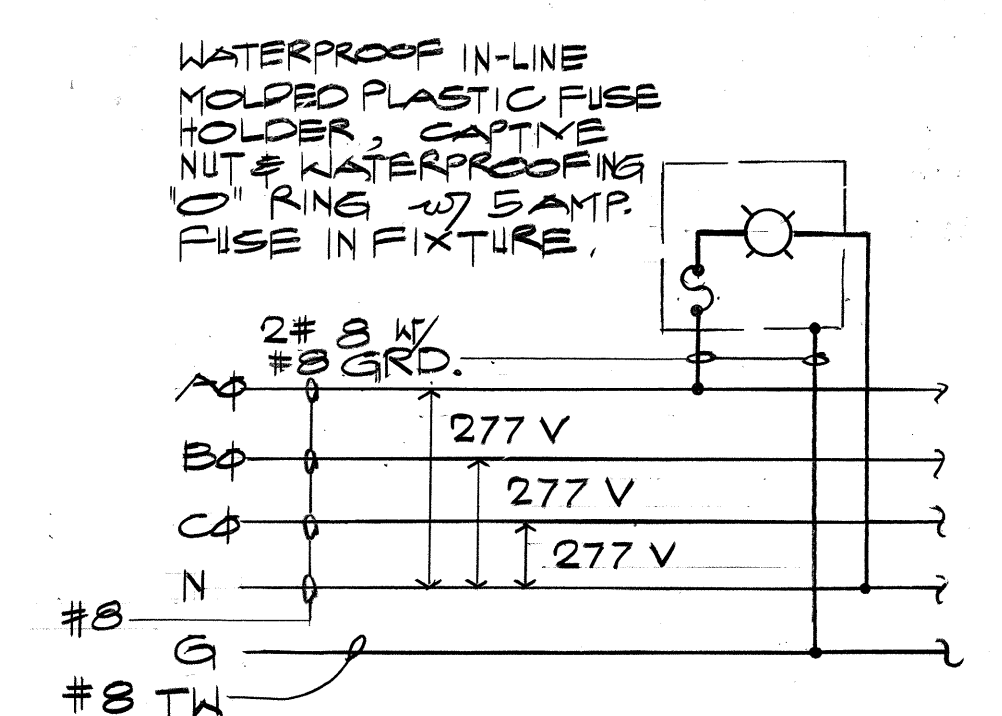
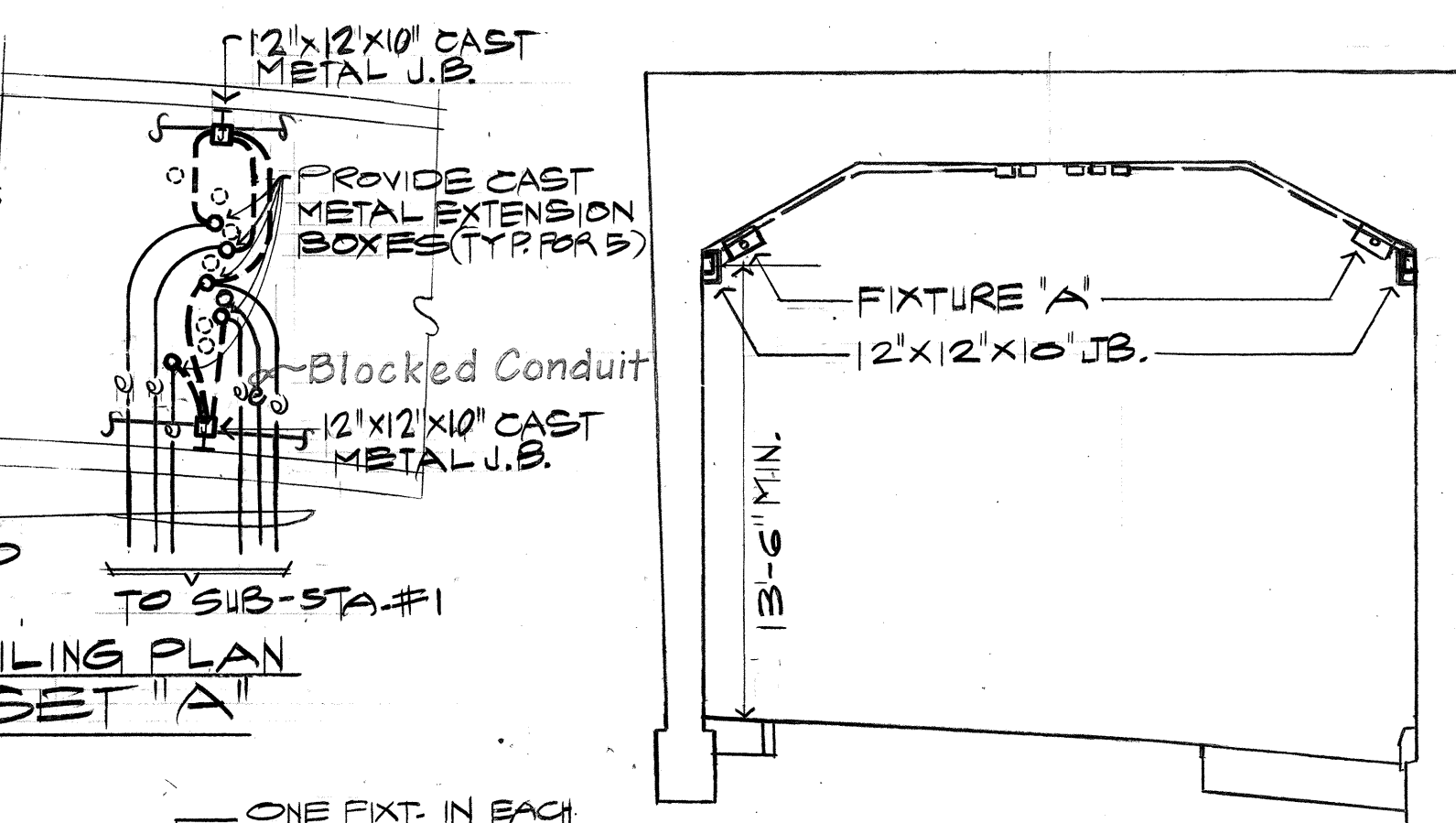


DRILL & PROVIDE EXPANSION BOLTS w/ AM. STD. REG. SQ. NUT #14 PLAIN BRASS WASHERS (3 REQ'D PER FIXTURE). CAUTION SHALL BE EXERCISED AS NOT TO DAMAGE OR INTERFERE w/ THE REINFORCEMENT. OBTAIN REINFORCEMENT DETAIL FROM D.O.T. PROJECT ENGINEER.

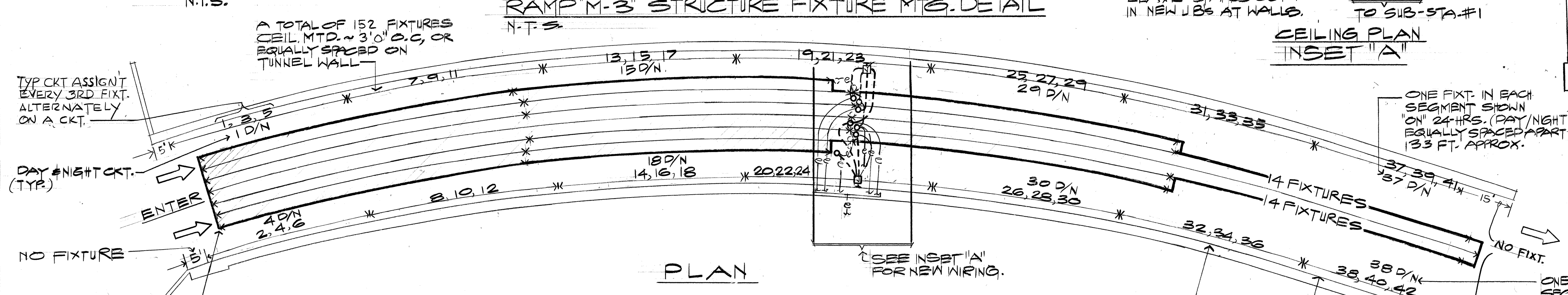
on South and 152 units on North Wall.

24-Hrs. (Day/Night) Fixtures shall be mounted so that Lt. Beam Direction to be 90° from Tunnel Wall.

REWIRE EACH EXST. 1/4" w/ 14 #10 THIN LEAVE SPARES COILED IN NEW JBS AT WALLS.



RAMP M-3 STRUCTURE FIXTURE MTS. DETAIL
N.T.S.



SECTION RAMP M-3 STRUCTURE
SCALE: HORIZONTAL 1" = 10'
VERTICAL 1" = 5'

RAMP M-3 STRUCTURE LIGHTING
SCALE: 1" = 20'-0"

TOTAL: 296 FIXTURES, LAMPS TO BE 400 W HPB w/ 50,000 INITIAL LUMENS.

A TOTAL OF 144 FIXTURES, CEIL. MOUNTED, ~ 3' 0" O.C. OR EQUALLY SPACED ON TUNNEL WALL.

TYP. CKT. ASSIGN'T EVERY 3RD. FIXT. ALTERNATELY ON A CKT.

DAY # NIG # T CKT. (TYP.)

NO FIXTURE

REMOVE A TOTAL OF 327, 2-FOOT 1/2" CW/R/S WATERTIGHT FLUOR FIXTURES.

PREPARED BY: KAMAHARA, KAMAHARA & ASSOC., INC.
One Kapiolani Blvd., Suite 400
Honolulu, Hawaii 96815



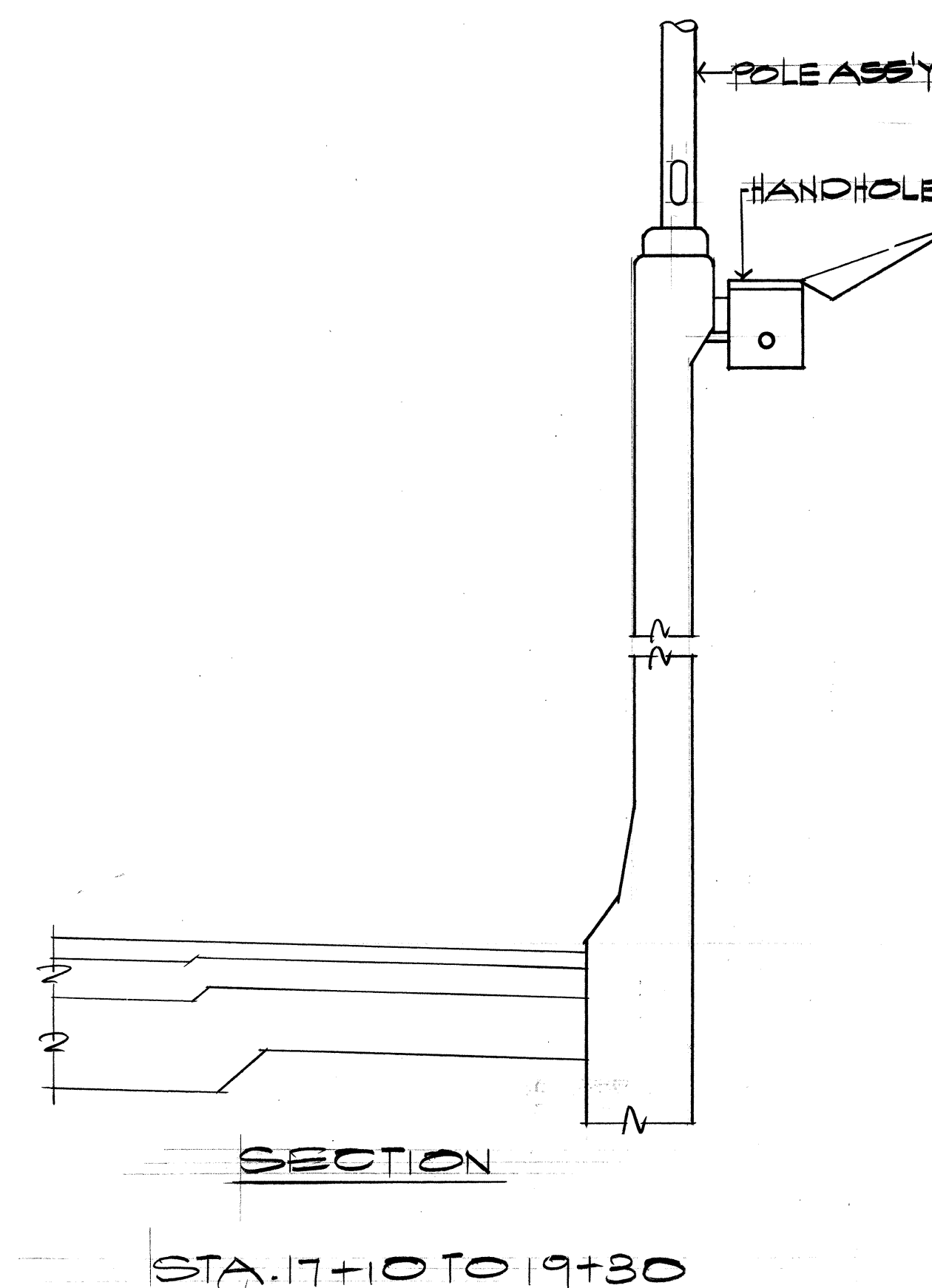
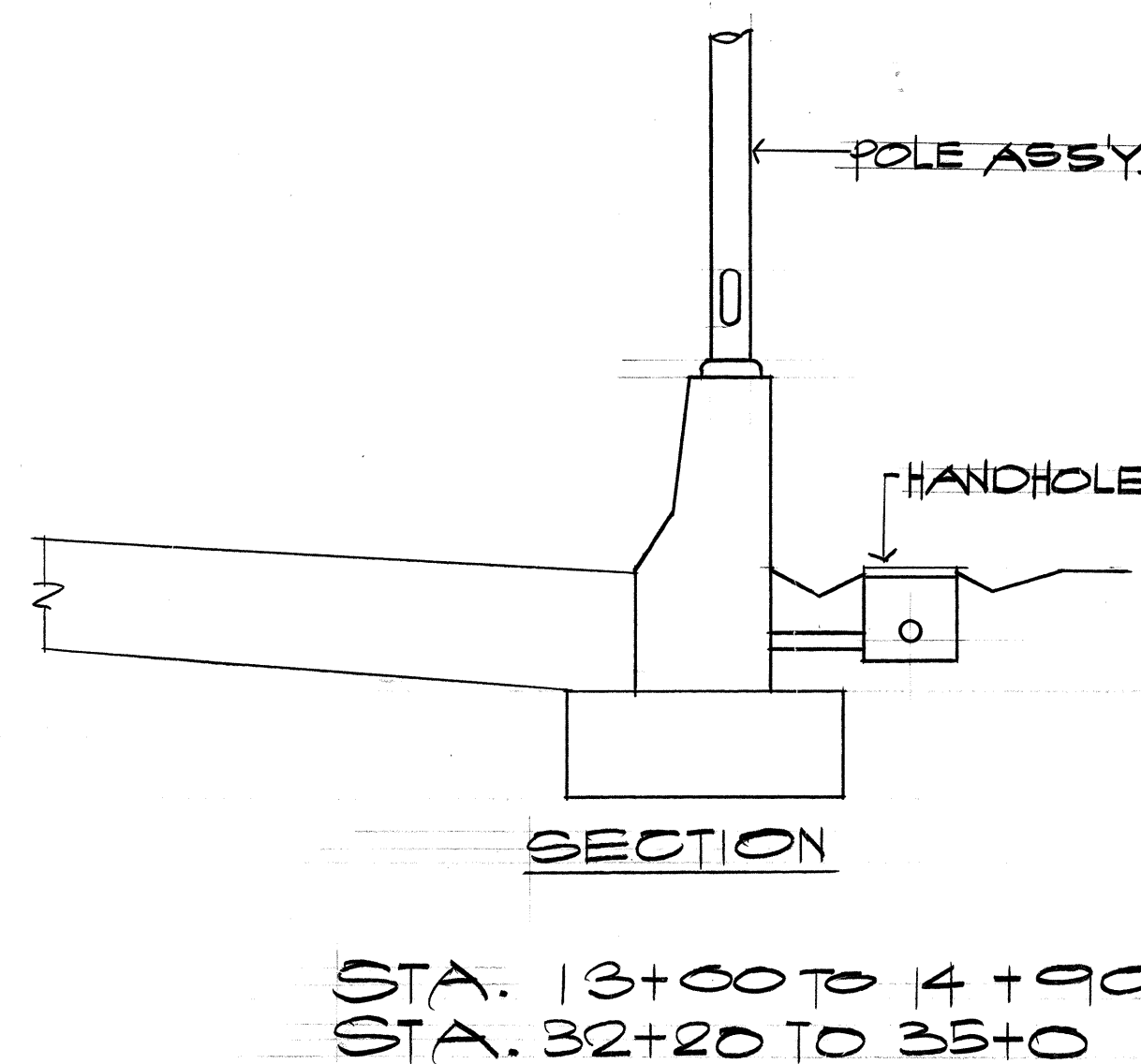
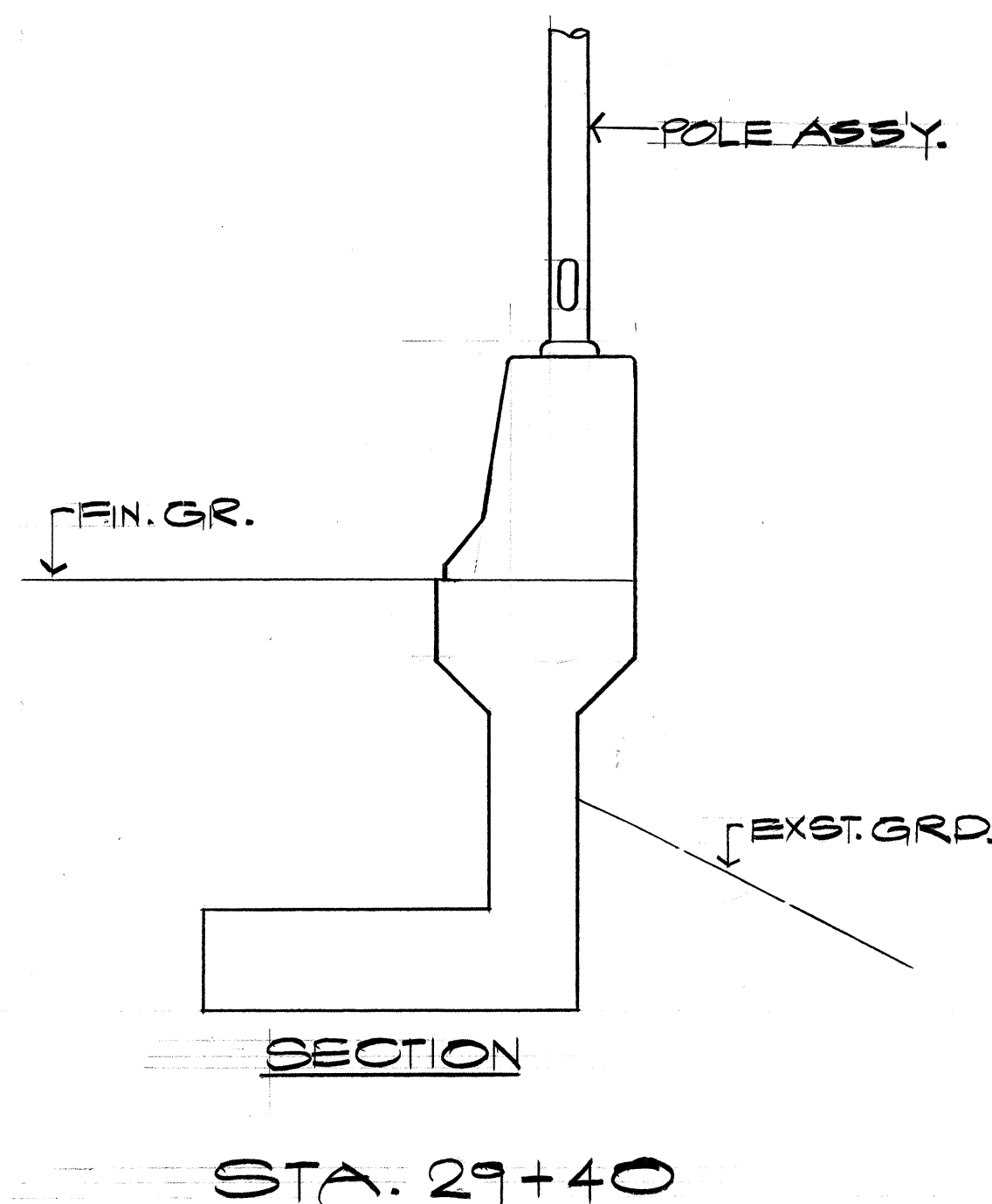
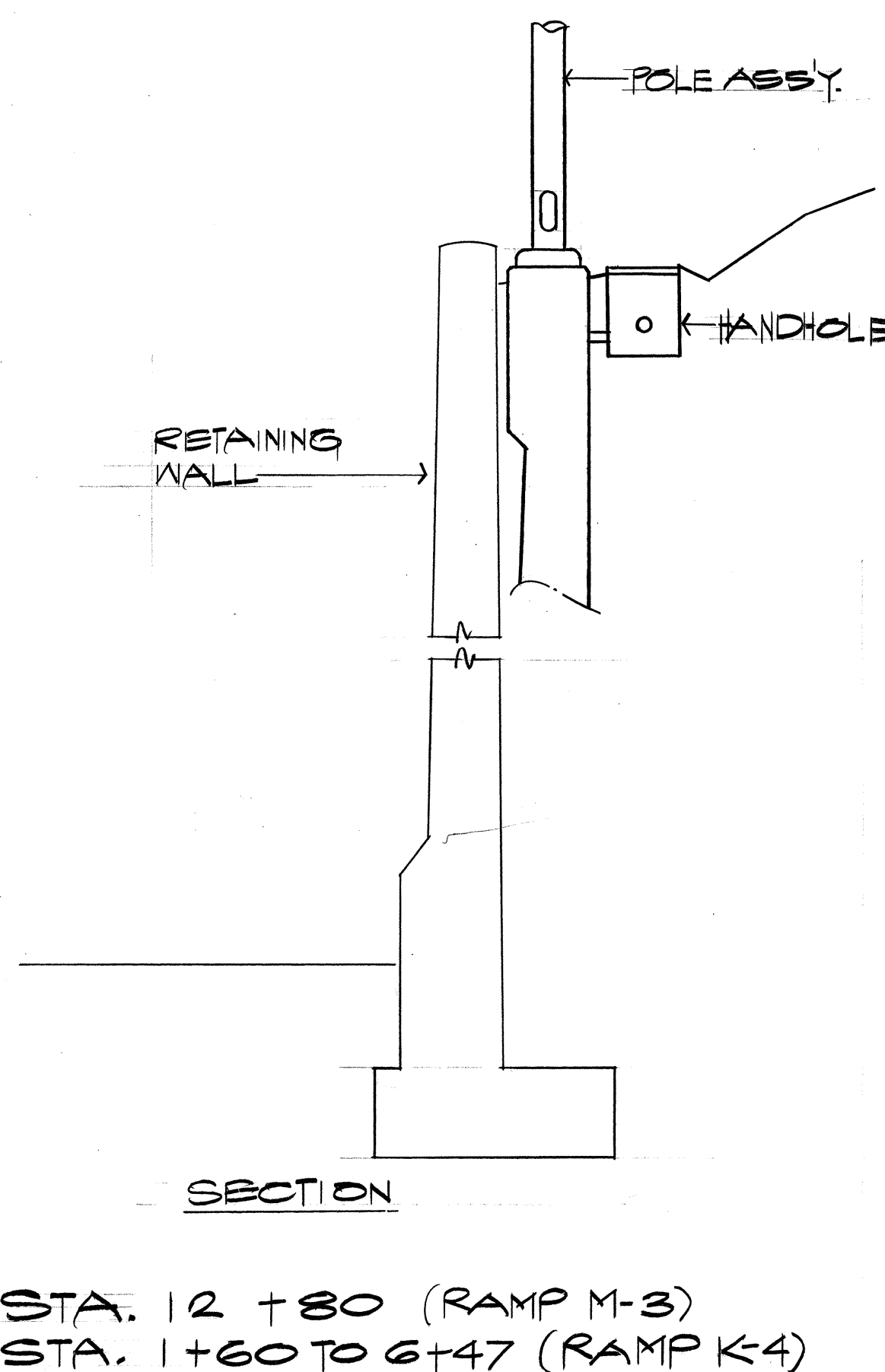
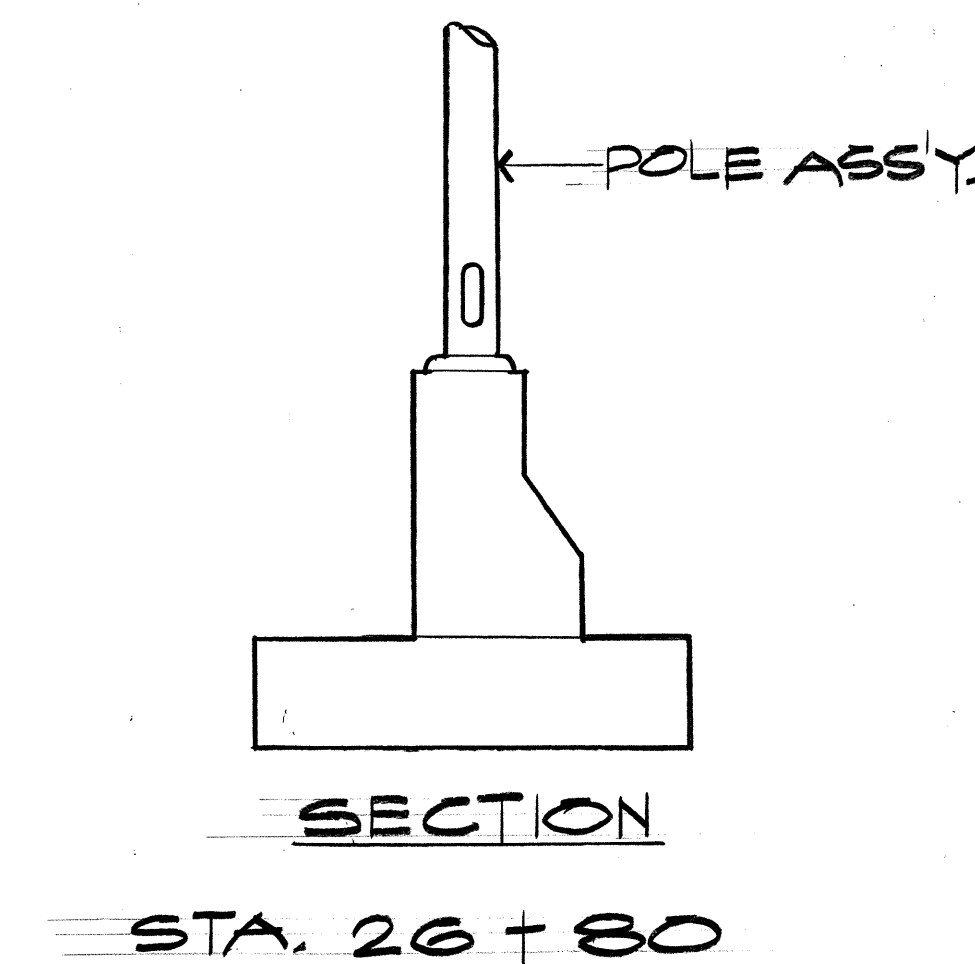
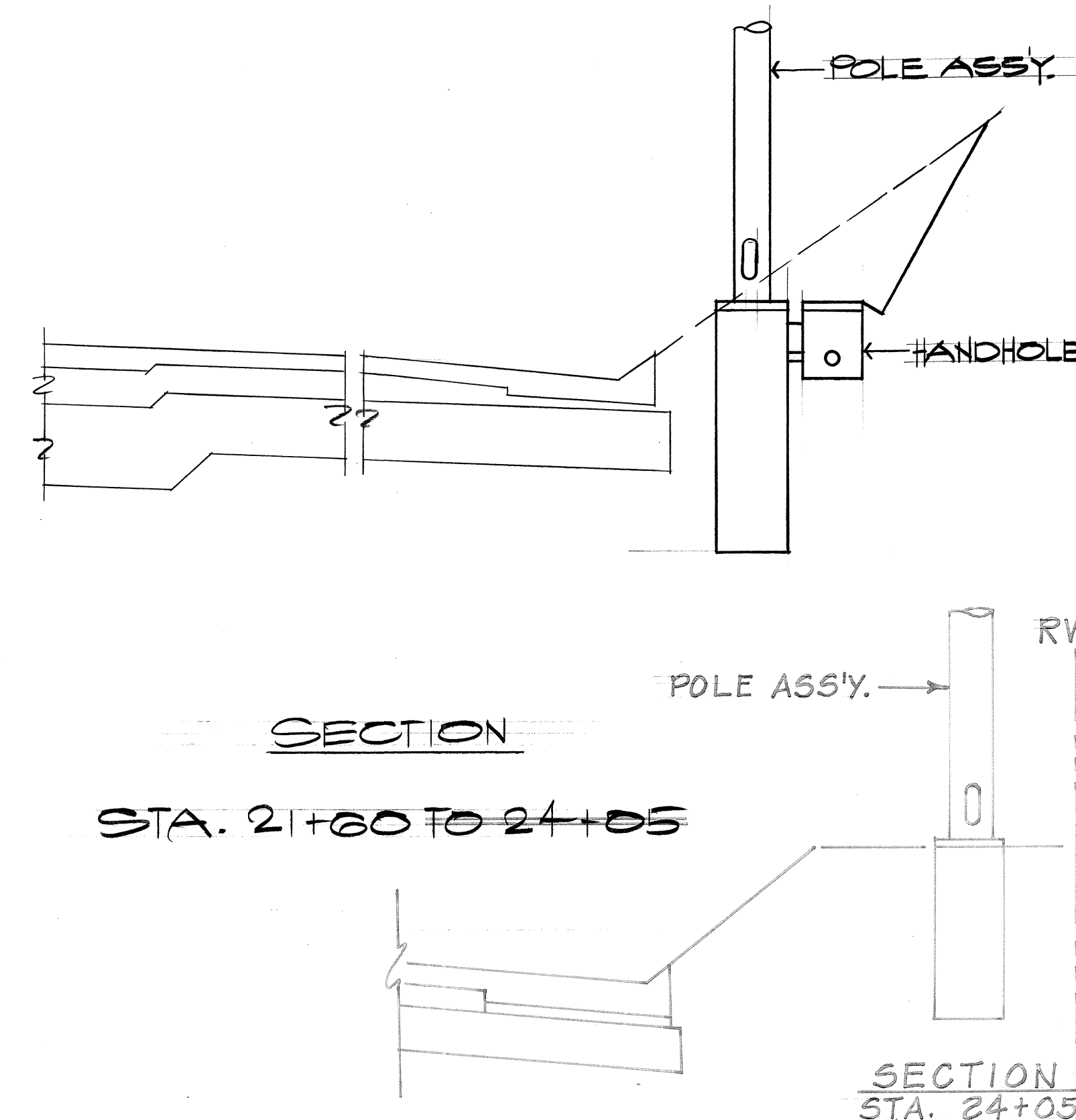
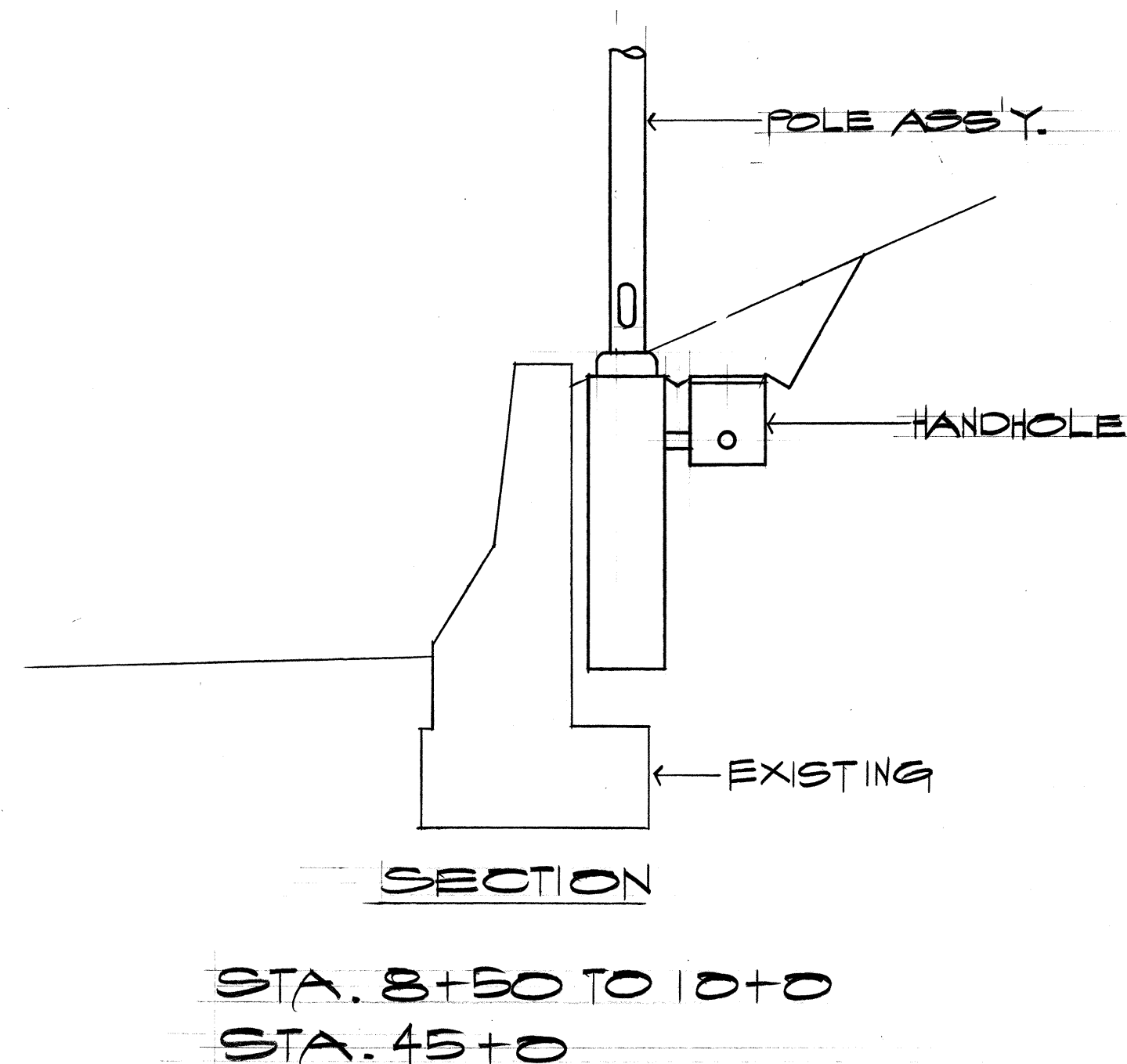
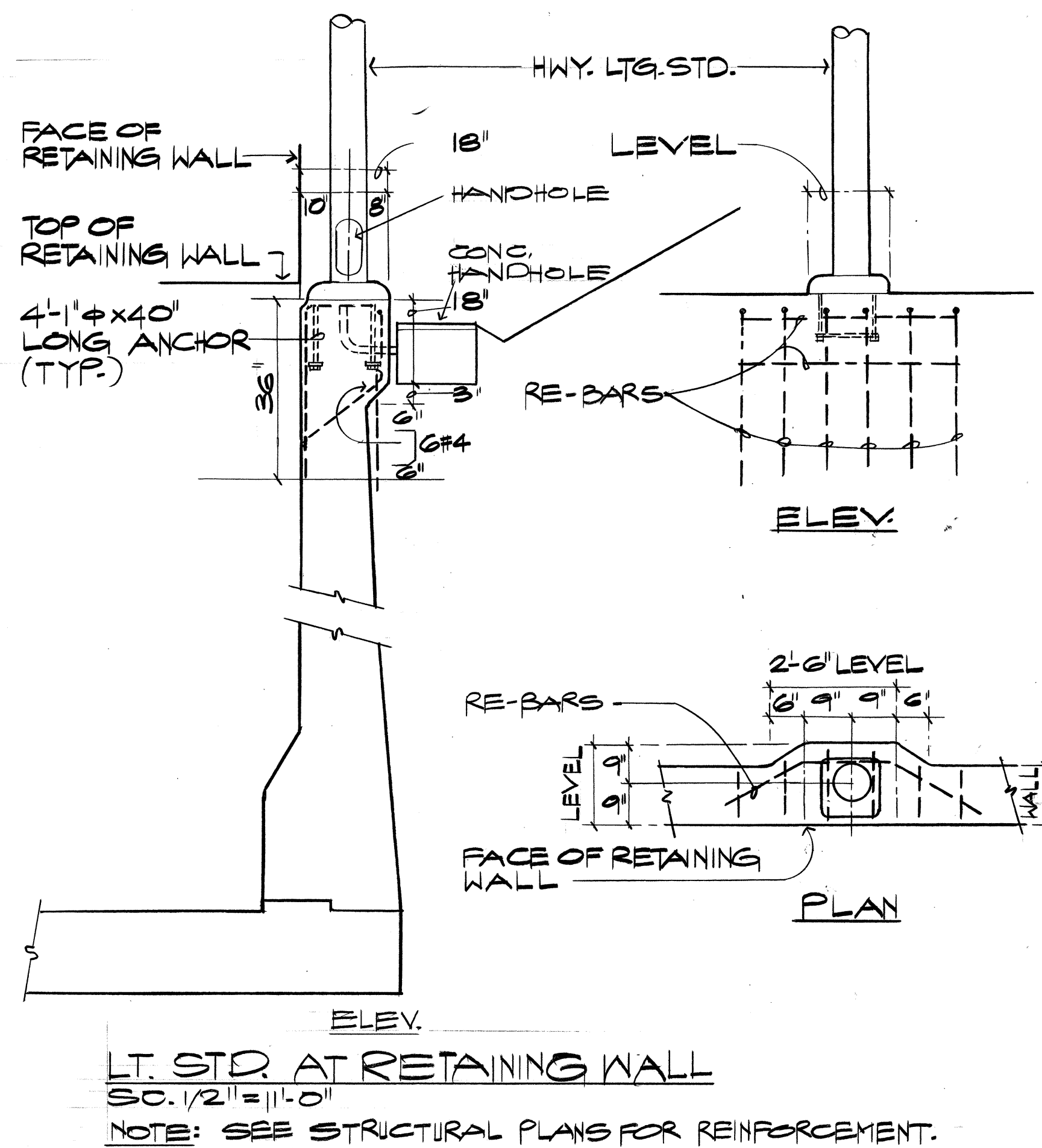
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

John Nakamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

RAMP "M-2" STRUCTURE
RAMP "M-3" EASTBOUND STRUCTURE
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I - HI-1(178)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I - HI-1(178)	1982	109	125



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Honolulu, Hawaii 96813



THIS WORK WAS PREPARED BY
OR UNDER HIS SUPERVISION
Wynn M. Nakamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
POLE ASS'Y. ON STRUCTURES
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO.1 -HI-1(178)

SHEET No. 8L OF SHEETS

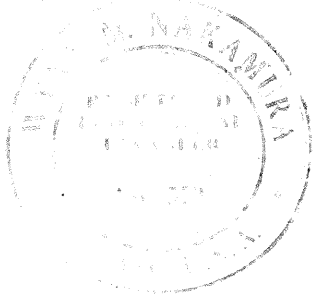
ORIGINAL PLAN	DATE
SURVEY PLOTTED BY	
DRAWN BY	
DESIGNED BY	
QUANTITIES BY	
CHECKED BY	
No.	

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	110	165

MATERIAL LIST

- ① LUMINAIRE
- ② TRUSS BRACKET
- ③ POLE
- ④ POLE BASE 4-BOLTS, WASHER & NUTS
- ⑤ POLE BASE BOLT COVER
- ⑥ GROUNDING LUGS
- ⑦ TRANSFORMER BASE w/ ACCESS COVER
- ⑧ 4-1"X40" GALV. ANCHOR BOLTS
- ⑨ GRD. ROD 5/8" ϕ X 10'-0" COPPER CLAD
- ⑩ PVC SCH'D. 40, 36" DEEP MIN.
- ⑪ CONC. w/ 6#3 BARS UNLESS OTHERWISE NOTED
- ⑫ WIRING ACCESS HANDHOLE
- ⑬ SLIP BASE INSERT STD.
- ⑭ REINFORCED CONC. FOUNDATION INCLUDING 1#10 TW BONDED GRD. LUGS TO GRD. ROD. SIMILAR TO DETAIL 'A' w/ EXCEPTIONS AS NOTED
- ⑮ DOUBLE BRACKET CONDITION, COMPLETE w/ LUMINAIRES & WIRING. SEE PLAN FOR LOCATION.
- ⑯ PROVIDE 1#10 TW BOND BETWEEN POLE LUG & GRD. ROD
- ⑰ PROVIDE 1#10 TW BOND BETWEEN POLE LUG & PULL BOX GRD. ROD
- ⑱ AT EXST. CUT, INCREASE ROUND SECT. DEPTH BY 12 INCH PER 12 INCH VERT. DIFFERENCE FROM FOUNDATION TOP TO FIN. GR.
- ⑲ ALL POLES TALLER THAN 25' INCREASE ROUND SECT. DEPTH TO 66 INCHES

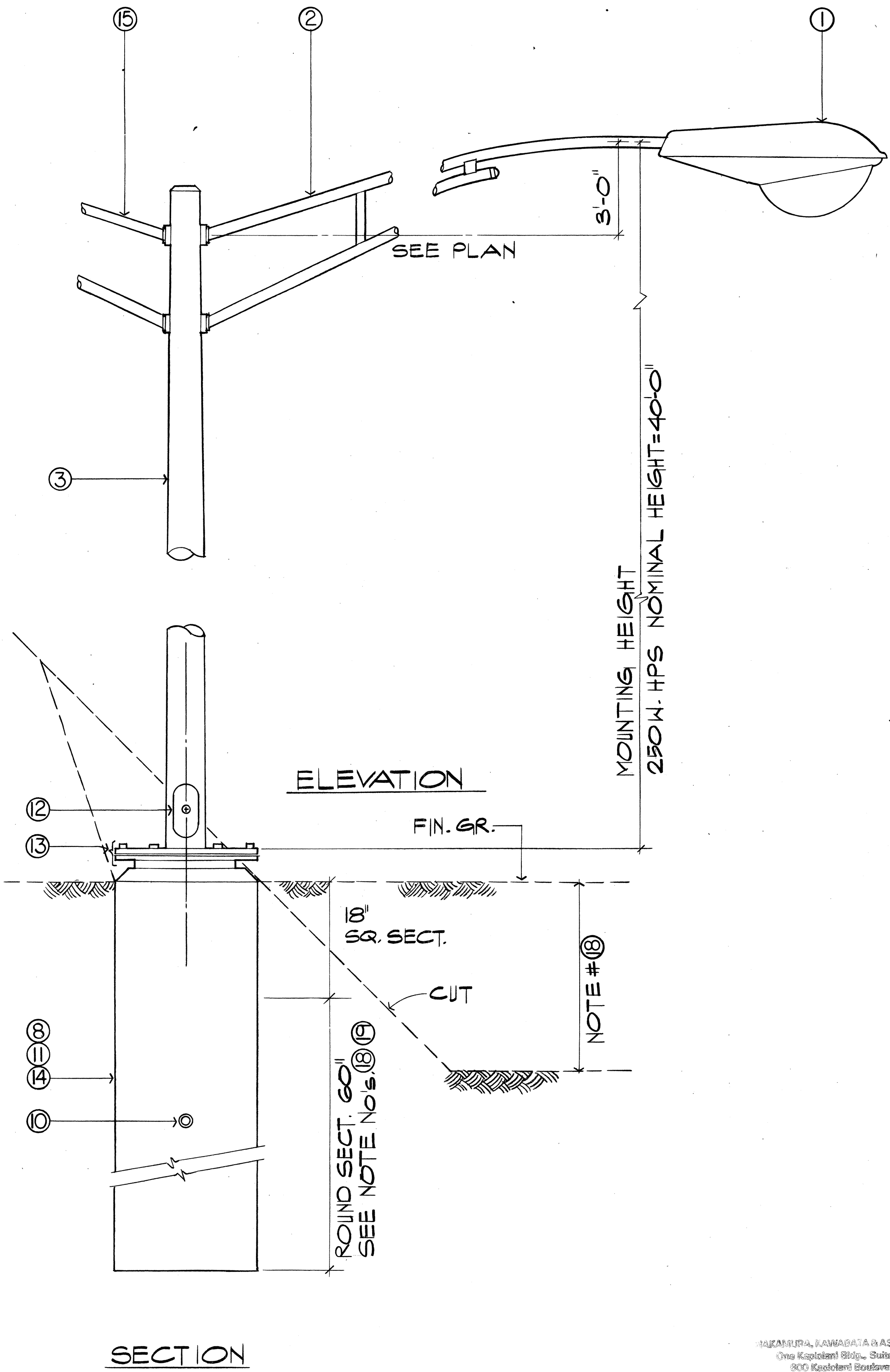
SAKABURA, KAWASATA & ASSOC., P.C.
One Kapiolani Blvd., Suite 400
9835 Kapiolani Boulevard
Honolulu, Hawaii 96817



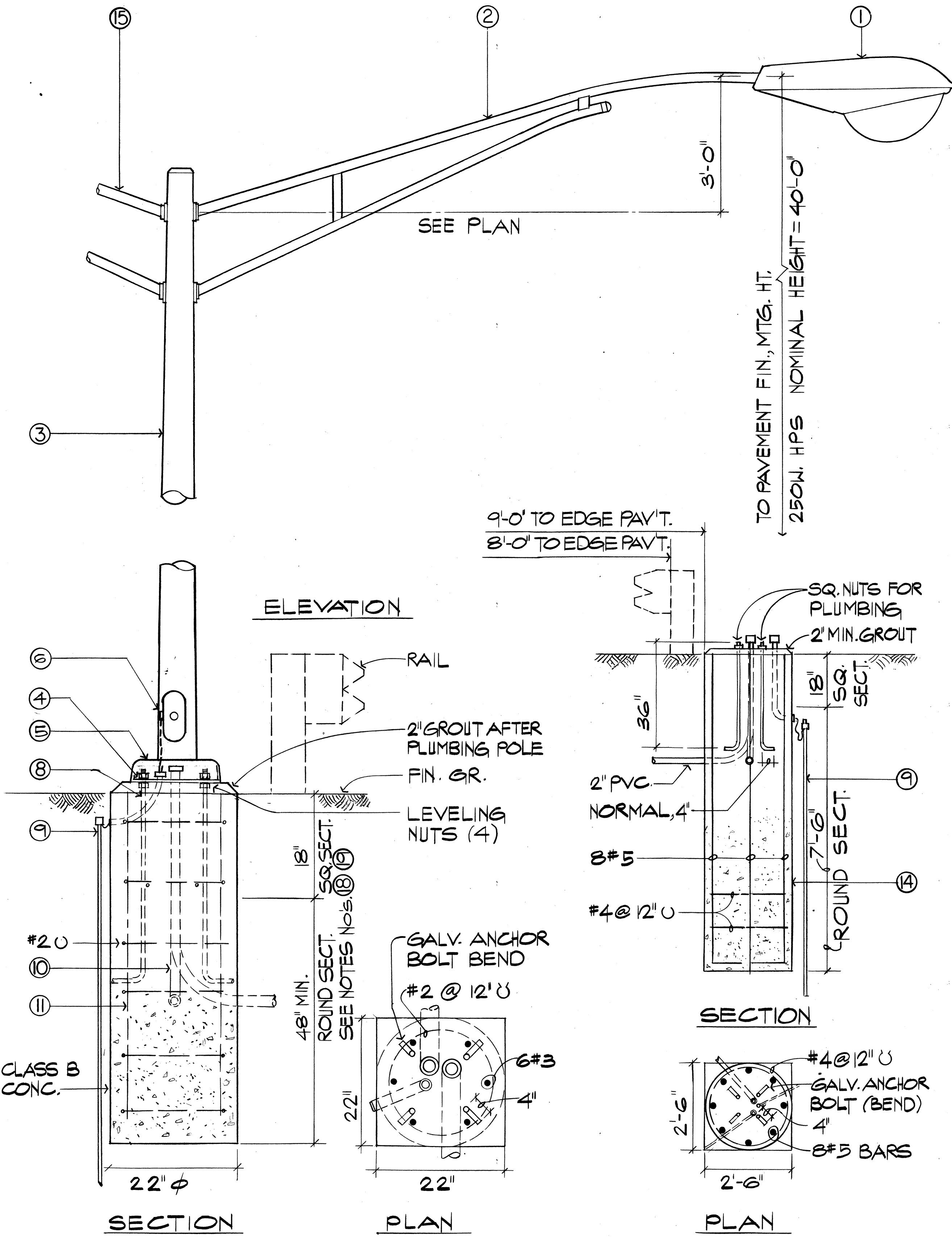
THIS SET OF PLANS PREPARED BY
SAKABURA, KAWASATA & ASSOC., P.C.
FOR THE HONOLULU CITY ENGINEERS OFFICE

John Nakamura

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
**HIGHWAY LIGHTING
STANDARD DETAILS**
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1 (178)



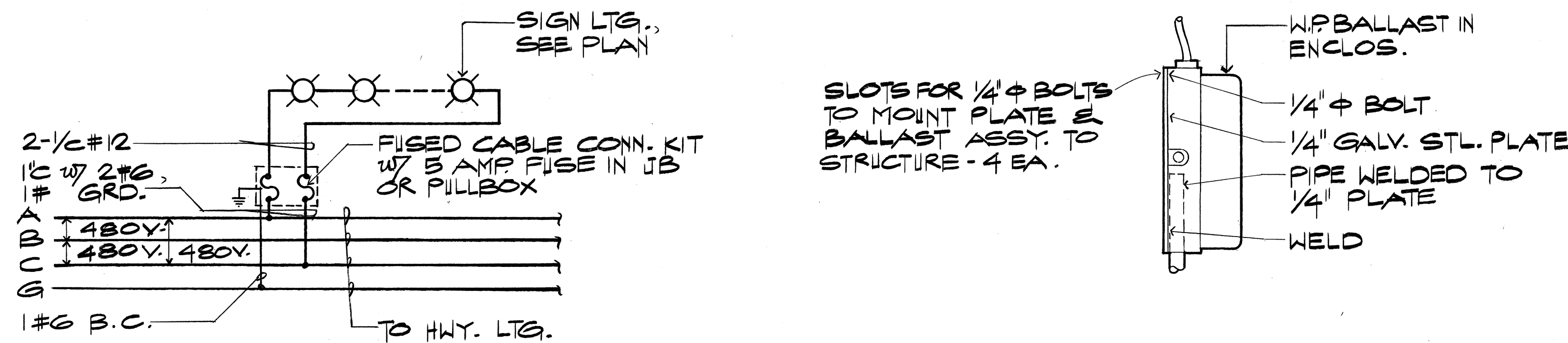
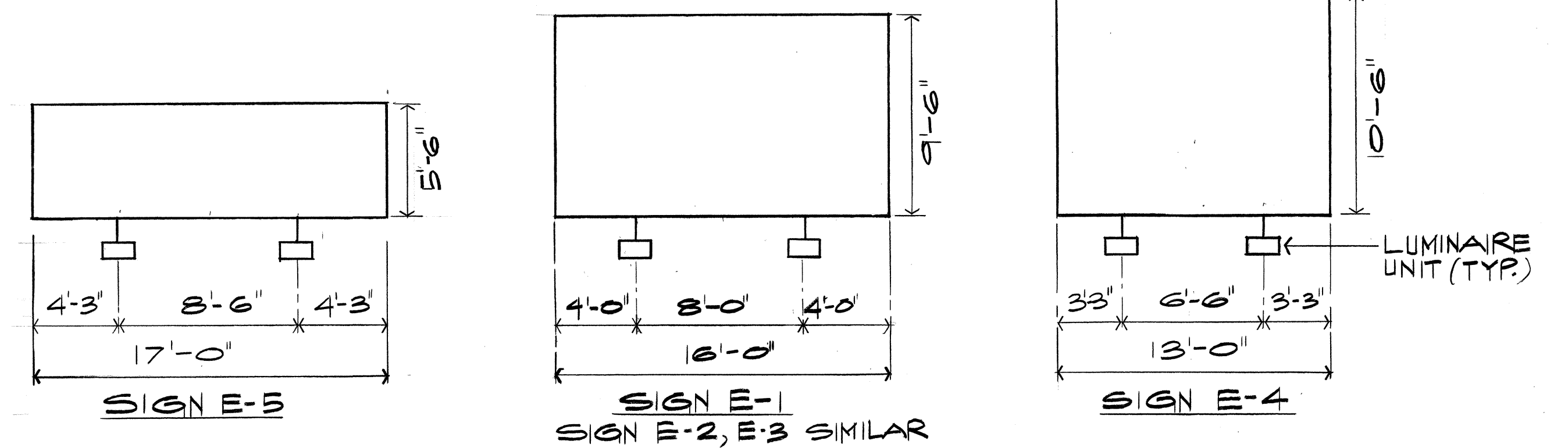
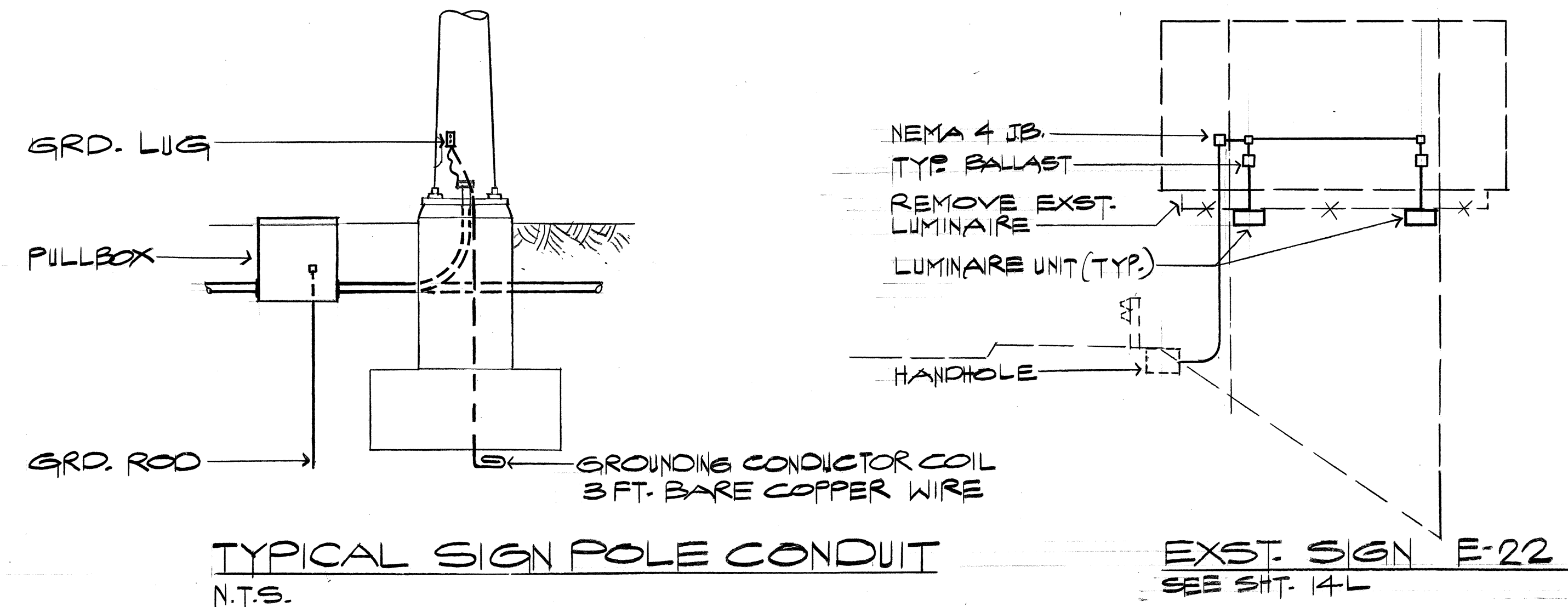
SECTION
HIGHWAY LIGHTING
STANDARD DETAIL
TYPE "B"
SCALE: 1"=1'-0"
FOR USE IN CUT SLOPE



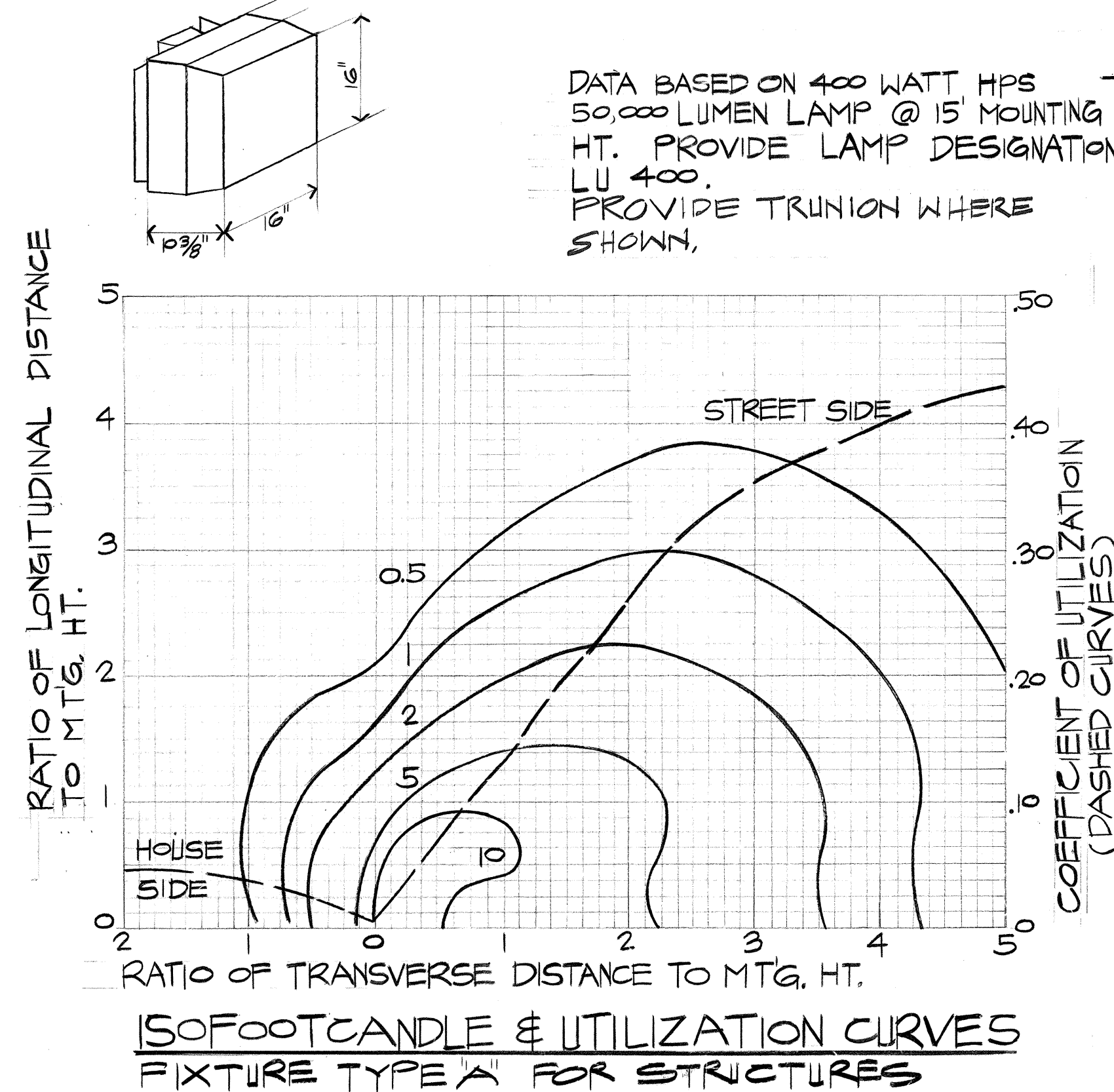
SECTION
HIGHWAY LIGHTING
STANDARD DETAIL
TYPE "A"
SCALE: 1"=1'-0"
FOR USE IN LEVEL AREA
AS SHOWN ON PLAN

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

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	111	165

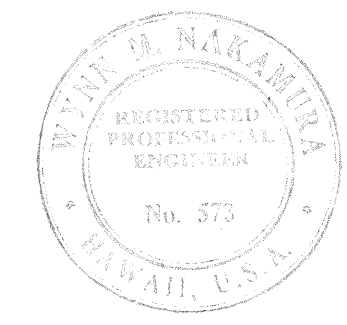


- NOTES:**
1. SUPPORT CONDUITS AT 10'-0" ± MAX. INTERVALS. SUPPORT CONDUITS 3'-0" MAX. FROM JB.
 2. UNIFORMITY RATIO 3.1/1 WHEN SPACED 10'-0" O.C. WHEN RETROFLECTING SIGN IS USED (1200' VIEWING DISTANCE) MIN. AVG. FTL 17.
 3. PIPE & STL. PLATE ASSY. TO BE CAPABLE OF SUPPORTING LUMINAIRE & BALLAST TO W/STAND 100 MPH WINDS. BOLTS ATTACHING BALLAST TO STL. PLATE & STL. PLATE TO STRUCTURE TO BE PER MFRS. RECOMMENDATIONS & SHALL SUPPORT THE LUMINAIRE, BALLAST PIPE & STL. PIPE & STL. ASSY. TO W/STAND DAMAGE AGAINST 100 MPH WINDS.
 4. CONDUITS TO BE 3/4" GALV. RIGID STL.
 5. ALL EQUIP. TO BE NEMA 3R OUTDOOR TYPE.
 6. FOR CONN. OF SIGN LTG. TO HWY. LTG. CKT. SEE SIGN LIGHTING WIRING, NOTE 7. THIS SHT.
 7. LUMINAIRE ASSY. PRISMATIC REFRACTOR THERMAL SHOCK RESISTANT GLASS W/ RETRODISPERSING REFLECTOR FOR UNIFORM SIGN LUMINANCE. MAIN HSG. CAST ALUM. SLIPFITTER TYPE BALLAST BACK MTD. 480V. REGULATOR TYPE W/ H/PF ABV. 90%, RIF SUPPRESSION TYPE.
 8. FOR APPLICABLE REQUIREMENTS, SEE SHT. 25L DT 208



TYPICAL CONDUIT ROUTING
N.T.S.
EXST. SIGN E-21 AT RAMP K-2, SIMILAR
SEE SHT. 13L

MEASURA, KAWAHATA ASSOC., INC.
One Kapiolani Blvd., Suite 400
Honolulu, Hawaii 96812



DESIGNED BY: [Signature]
CHECKED BY: [Signature]
DATE: [Signature]

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
SIGN LIGHTING DETAILS
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO.1 -HI-1(178)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	1 -HI-1(178)	1982	112	165

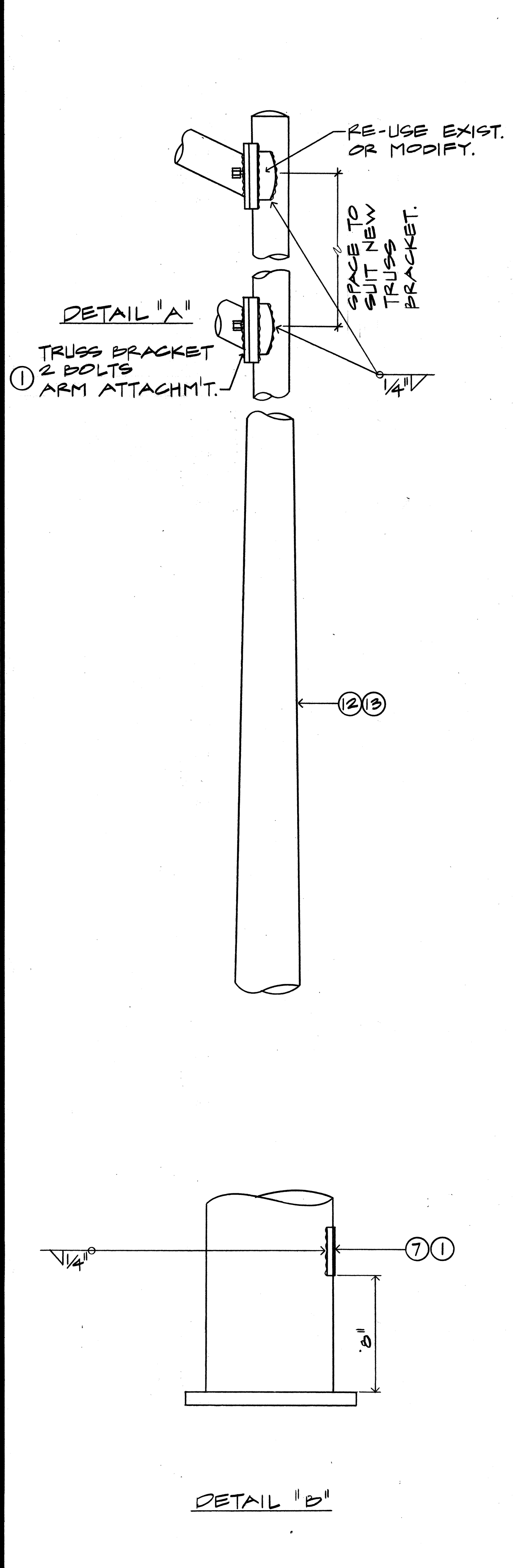
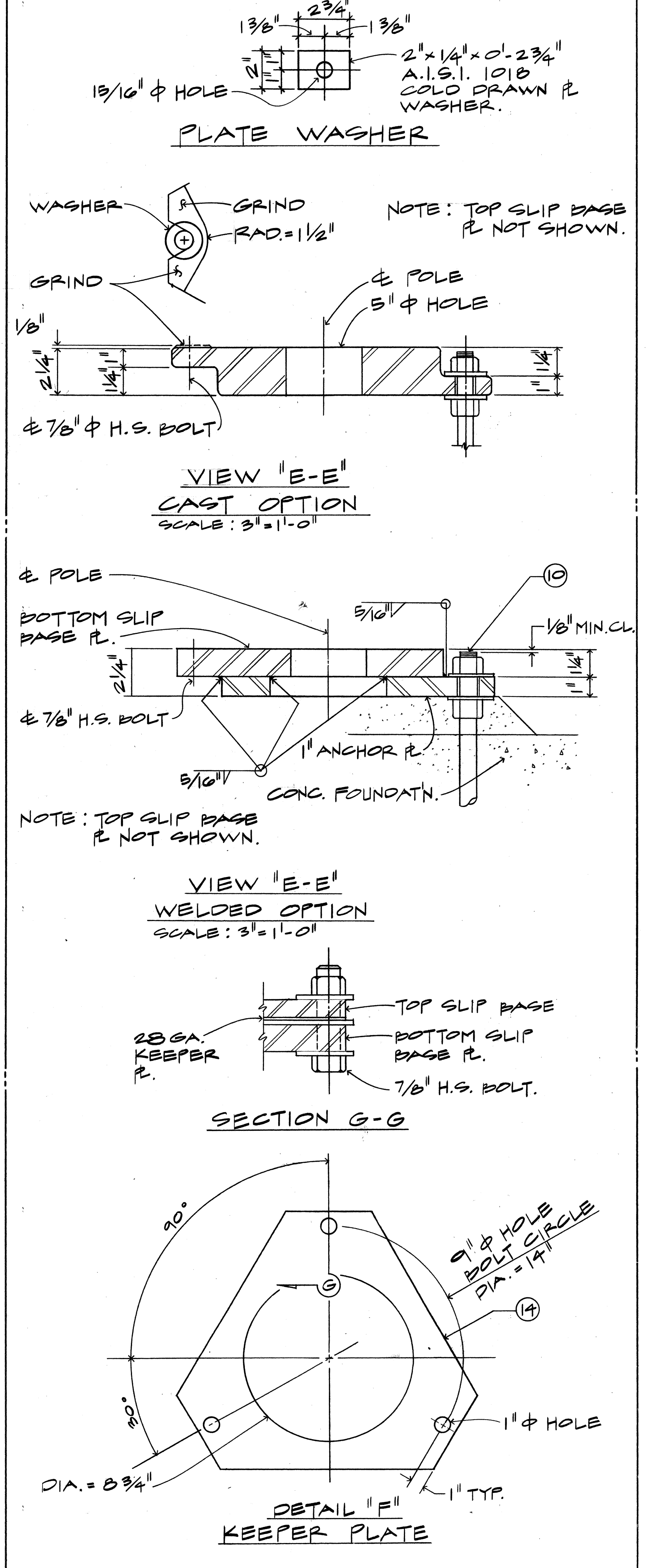
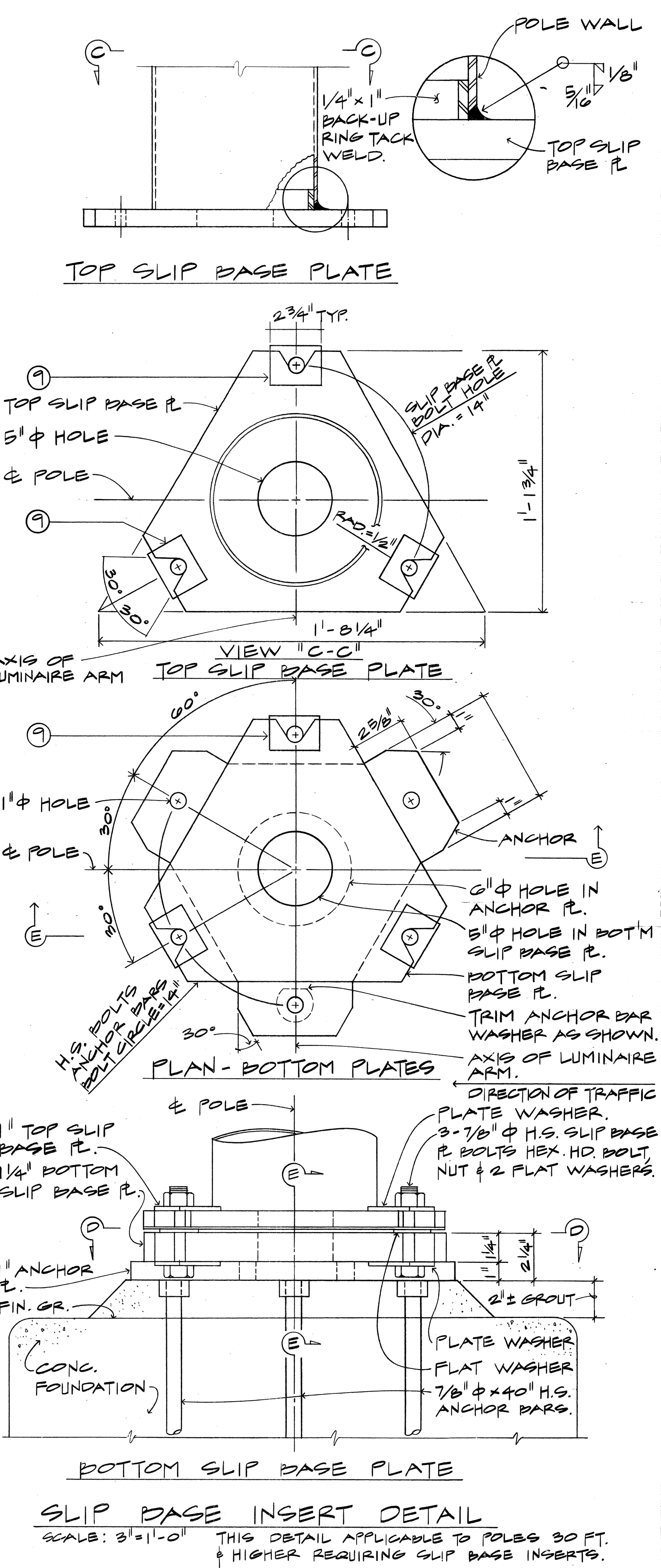
NOTES:

- ① ALL STEEL SHAFTS, P'S, MAST ARMS, BOLTS, SCREWS, NUTS & WASHERS TO BE GALV. AFTER FAB. OR MODIFICATION.
- ② P'S TO CONFORM TO ASTM A-36.
- ③ CAST OPTION TO CONFORM TO ASTM A-486 CL.90.
- ④ TORQUE 7/8" ϕ H.S. SLIP BASE P. BOLTS TO 1000 INCH LBS.
- ⑤ 7/8" ϕ H.S. ANCHOR BARS, WRENCH TIGHTEN-TORQUE REQ'T. WAIVED.
- ⑥ FABRICATORS ELECTING LARGER THAN MIN. ARM DIAMETERS MUST ADJUST DETAILS AS REQ'D. TO PERMIT SOLID SEATING OF CAP SCREWS. IN LIEU OF TORQUE REQ'MTS. FOR H.S. BOLTS, CAP SCREWS SHALL BE TIGHTENED BY THE TURN-OF-NUT METHOD 1/6 TURN FROM SNUG TIGHT CONDITION. NO WASHER WILL BE REQ'D.
- ⑦ 4" $\times$ 6 1/2" HANDHOLE REINF. W/#3 GA. RING 1 1/2" WIDE WELDED TO OUTSIDE OF POLE COVER OF 10 GA. P. LOCATE 90° OF MAST ARM UNLESS SHOWN OTHERWISE
- ⑧ UNASSIGNED.
- ⑨ PLATE WASHER
- ⑩ 3-7/8" ϕ H.S. BARS, THREAD 6" & GALV. 10", W/ HEX. HD. NUT, LEVELING NUT & WASHER.
- ⑪ HEX. HD. NUT SHOWN OR AS ALT. DET. ANCHOR P'S MAY BE RETAINED W/5/16" FILLET WELDS ALL ROUND OR FORMED HEADS.
- ⑫ ROUND TAPERED STEEL TUBE W/MAX. TAPER OF 0.15"/FT.
- ⑬ NO. 11 GA. SHT. STEEL OF WELDABLE GRADE ACCEPTABLE IF STEEL AFTER FAB. HAS A MIN. YIELD STRENGTH OF 40,000 PSI.
- ⑭ 28 GA. KEEPER P., PLACE ON TOP OF FLAT WASHER, ASTM A526, 125 COMMERCIAL.
- ⑮ SLIP BASE INSERT DET. ON THIS SHT. APPLICABLE FOR POLE STDs. TALLER THAN 25'-0".

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

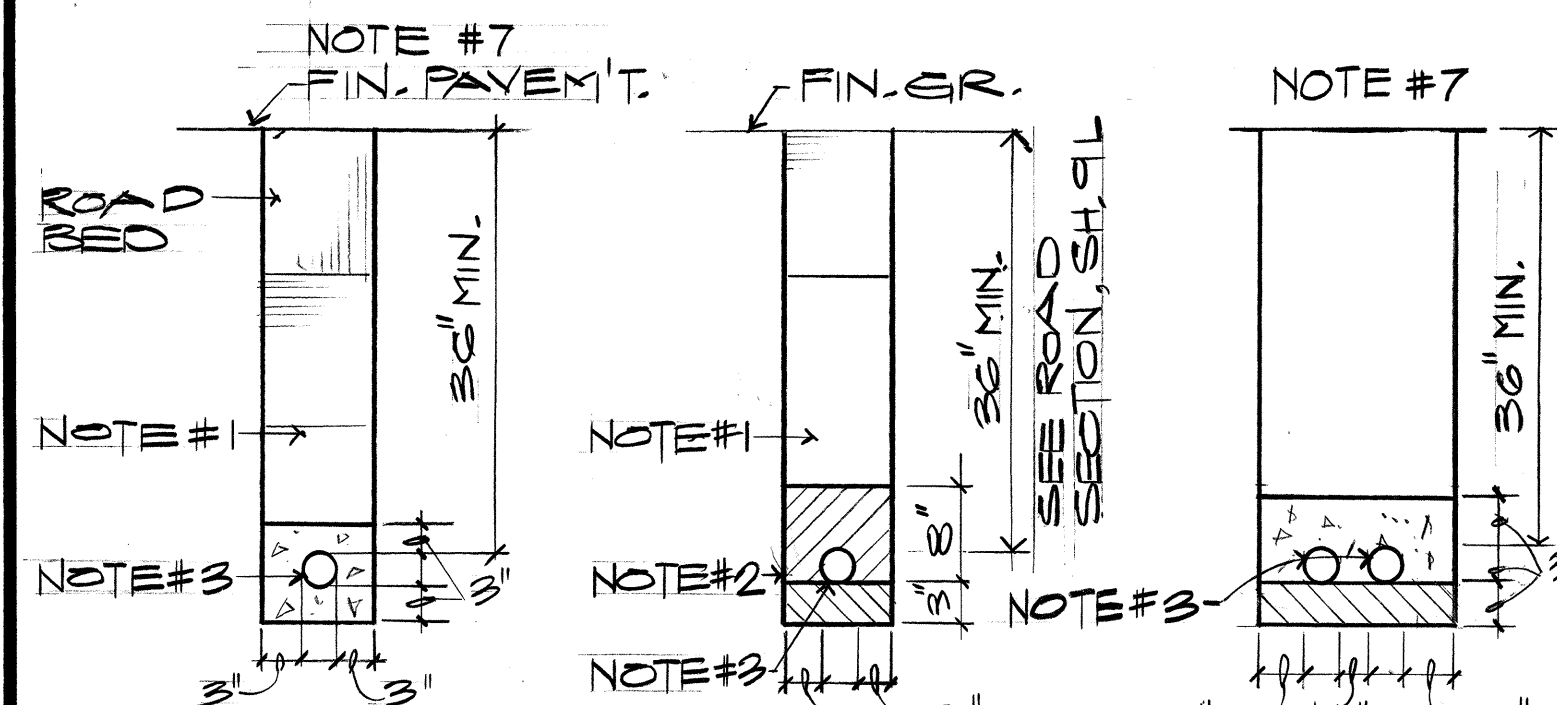
**SLIP BASE INSERT
STANDARD**

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. 1 -HI-1(178)



DATE	_____
DESIGNED BY	_____
TRACED BY	_____
NOTED BY	_____
CHECKED BY	_____
ORIGINAL PLAN	_____
NOTE BOOK	_____
QUANTITIES BY	_____
CHECKED BY	_____

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I -HI-1(178)	1982	113	165

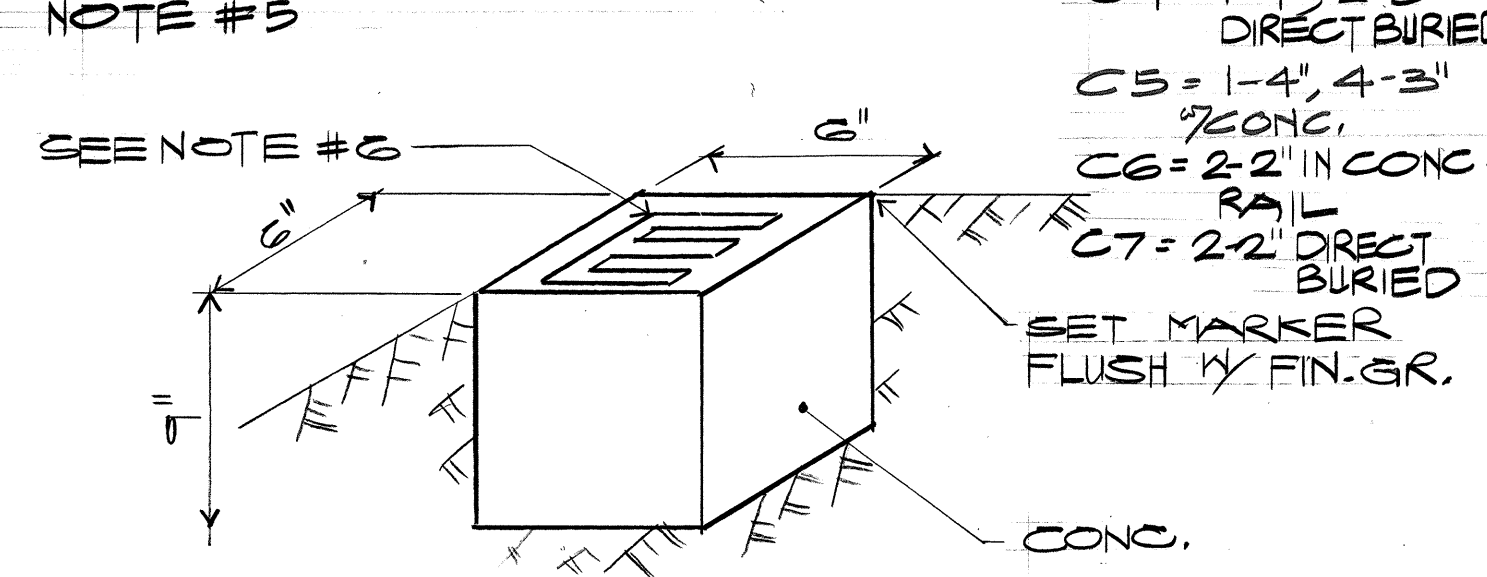


SECT. A
ROAD X-ING

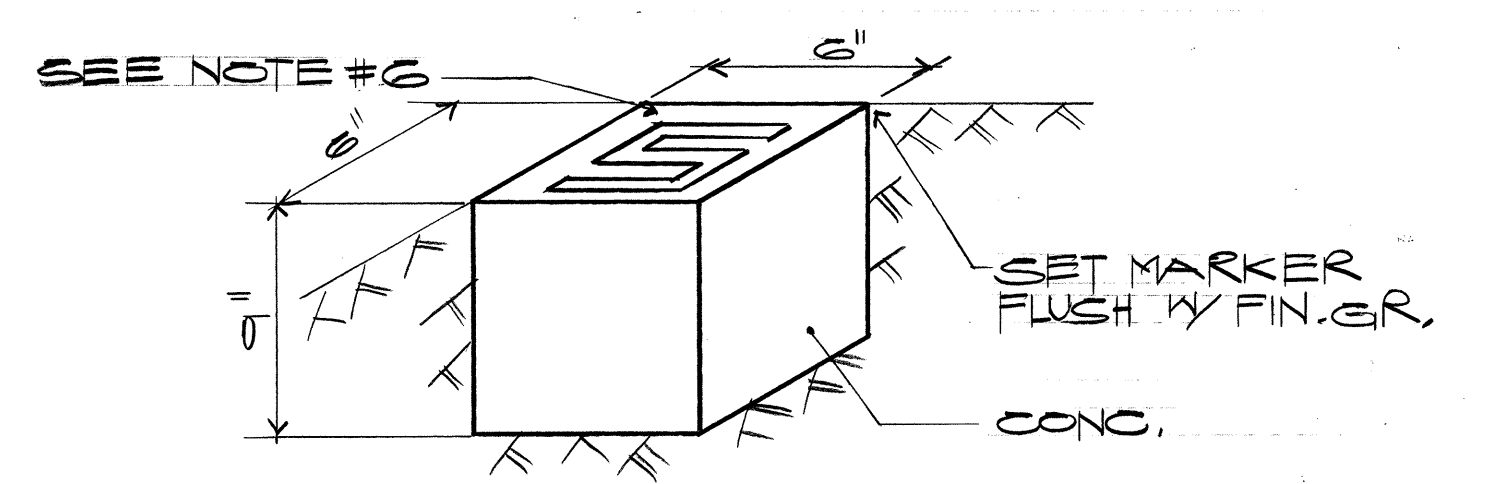
SECT. B
SHOULDERS

SECT. C

TYPICAL DUCT SECTIONS



MARKER FOR STUB-OUT
N.T.S.

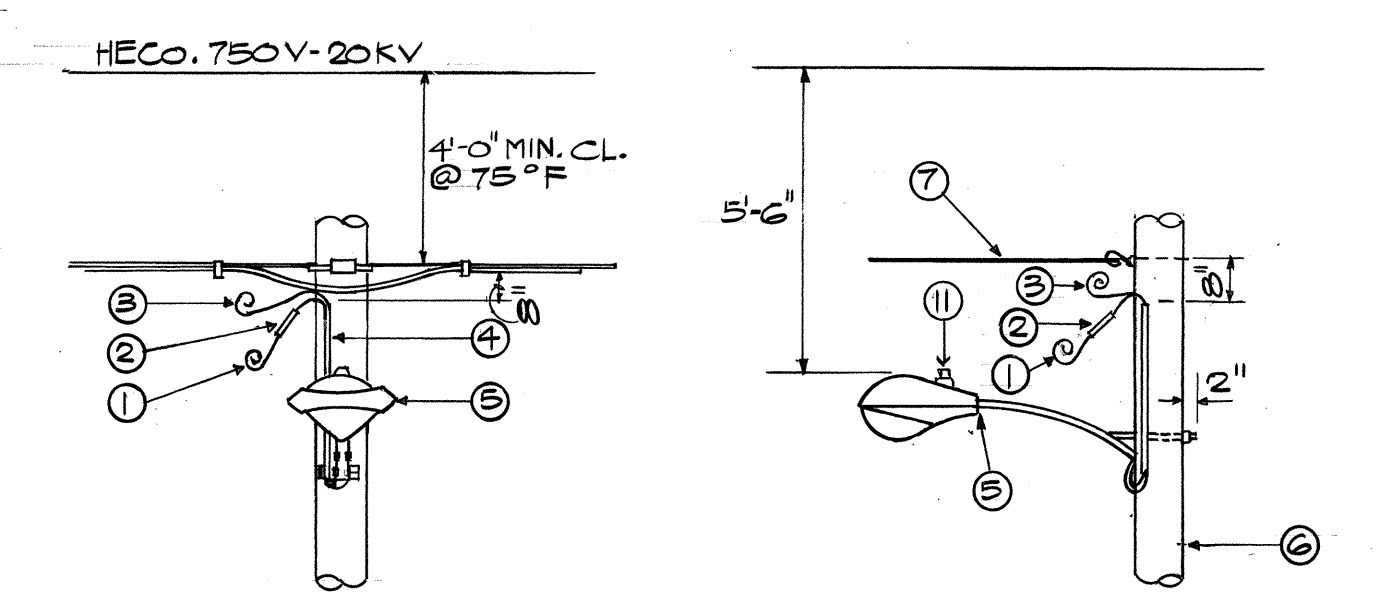


MARKER FOR CABLE SPLICE
N.T.S.

- NOTES:**
1. TYPE "A" BACKFILL, BEACH SAND, EARTH OR EARTH & GRAVEL. IF EARTH & GRAVEL THE MAX. ROCK SIZE SHALL BE 1" & THE MIX. SHALL NOT CONTAIN MORE THAN 50% BY VOL. OF ROCK PARTICLES.
 2. TYPE "B" BACKFILL, BEACH SAND, EARTH OR EARTH & GRAVEL, IF EARTH & GRAVEL THE MIX. MUST PASS A 1/2" MESH SCREEN & CONTAIN NOT MORE THAN 20% BY VOL. OF ROCK PARTICLES
 3. CONDUIT, 2" PVC, SCH. 40
 4. PRIM. CONN. USED ONLY BETWEEN BALLASTS & LUMINAIRE IN POLE SHAFT ACCESSIBLE VIA HANDHOLE
 5. FOR CONDUIT POSITION, SEE SHIT.
 6. 2" HIGH x 1/2" DEEP LETTER ENGRAVED IN MARKER.
 7. SAW CUT PAVEMENT & REPAIR TO MATCH, COMPLY W/ STATE D.O.T. STD. SPEC. FOR ROAD & BRIDGE CONST. & SPECIAL PROVISIONS.

HANDHOLES A, B & C

- NOTE:**
1. PROVIDE 5/8" x 8'-0" LONG COPPERCLAD GROUND ROD w/ BRONZE SQ. HEAD SET SCREW & CLAMP IN ALL PULLBOXES.



TANGENT DEAD-END

- ITEM DESCRIPTION**
1. 1/2 NO. 8 AWG RHW - USE BLACK, STRANDED WIRE.
 2. IN-LINE FUSE HOLDER & SA FUSE FOR NO. 8 AWG COPPER WIRE.
 3. 1/2 NO. 8 AWG RHW - USE WHITE STRANDED WIRE.
 4. 3/4" PVC SCH. 40 W/ NO. 10 AWG CU. WIRE.
 5. REPLACE FIXTURE LUMINAIRE & REUSE BRACKET.
 6. EXST. WOOD POLE.
 7. SEE PLAN.

MULTIPLE STREET LIGHT ON WOOD POLE

N.T.S.

OMIT

NOTES:

1. USE 3-PLY PLASTIC BLK-WHITE-BLK.
2. ENGRAVE NOMENCLATURE NUMBER 1/4" HIGH & 1/32" WIDE. COMMERCIAL GOTHIC FONT. (WATTAGE, IES DISTRIB., VOLTAGE OR SYSTEM TYPE)
3. IF MULTIPLE - CKT. FROM HECO, ENGRAVE CONTRACT NO.
4. ATTACH TO POLE W/ NO. 7 CADMIUM PLATED DRIVE SCREWS
5. USE "H" FOR HIGH PRESSURE SODIUM
6. LEGEND:

REMARKS:

B. LIGHT NO. DO NOT COPY PLAN NUMBERS

C. LAMP DATA

D. REFRACTOR DATA

E. POST NO. DO NOT COPY PLAN NUMBERS

7. ATTACH ON POLE 15'-0"

8. SUBMIT LIST OF TAGS SCH'D. FOR APPROVAL BEFORE ENGRAVING

IDENTIFICATION TAG

N.T.S.

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

NAKAMURA, KAWABATA & ASSOC., INC.
One Kapiolani Bldg., Suite 405
830 Kapiolani Boulevard
Honolulu, Hawaii 96813



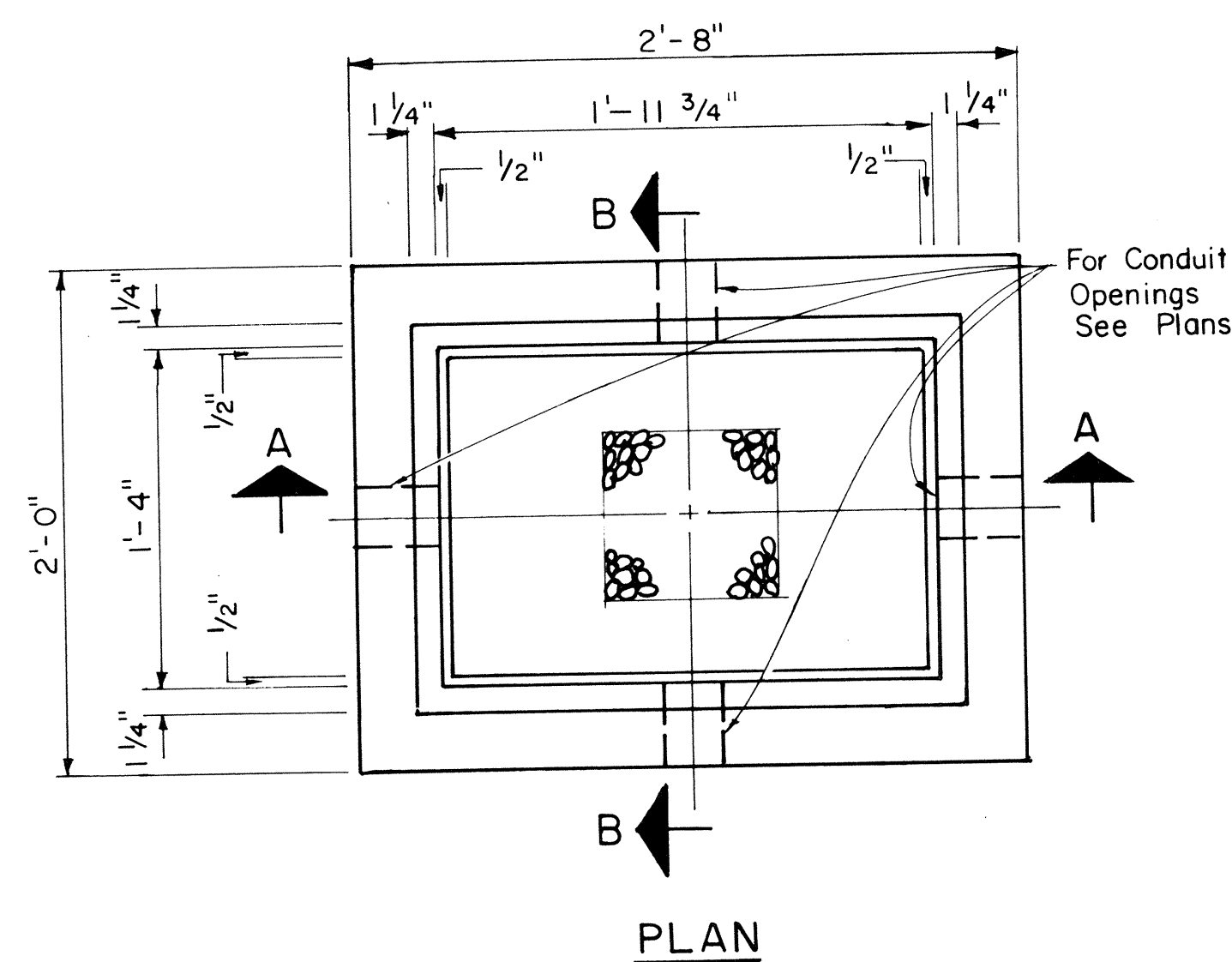
THIS WORK WAS PREPARED BY
Wynn M. Nakamura
Professional Engineer

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION

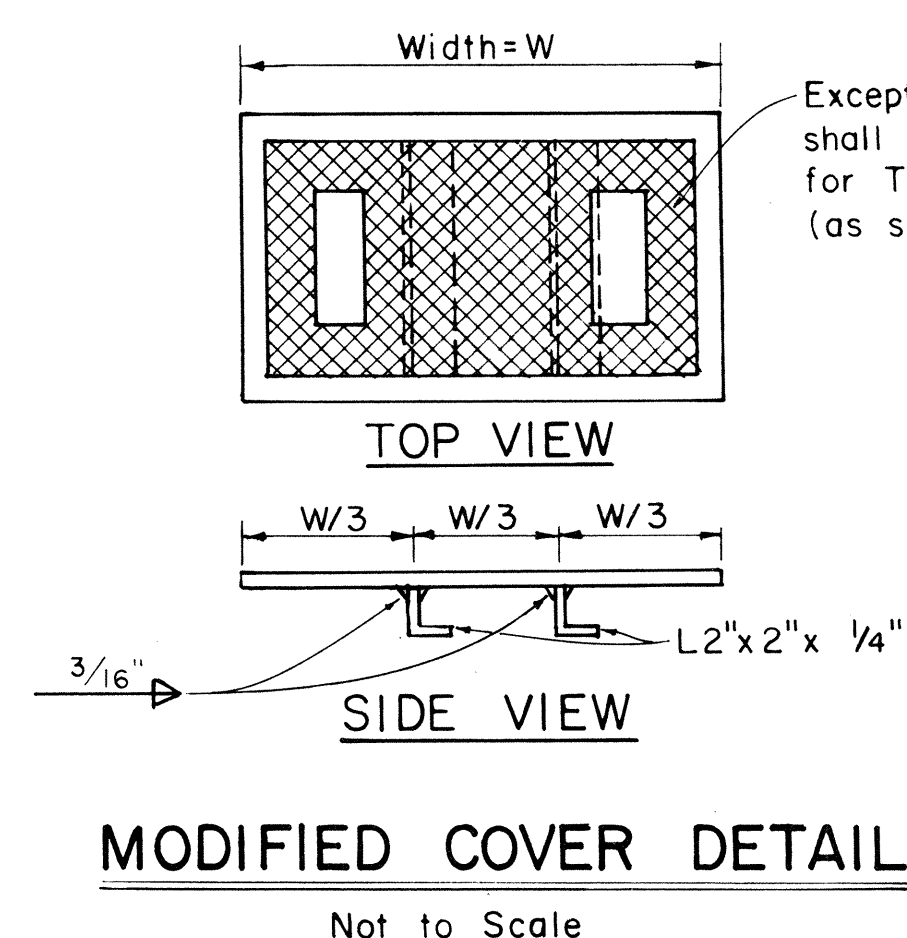
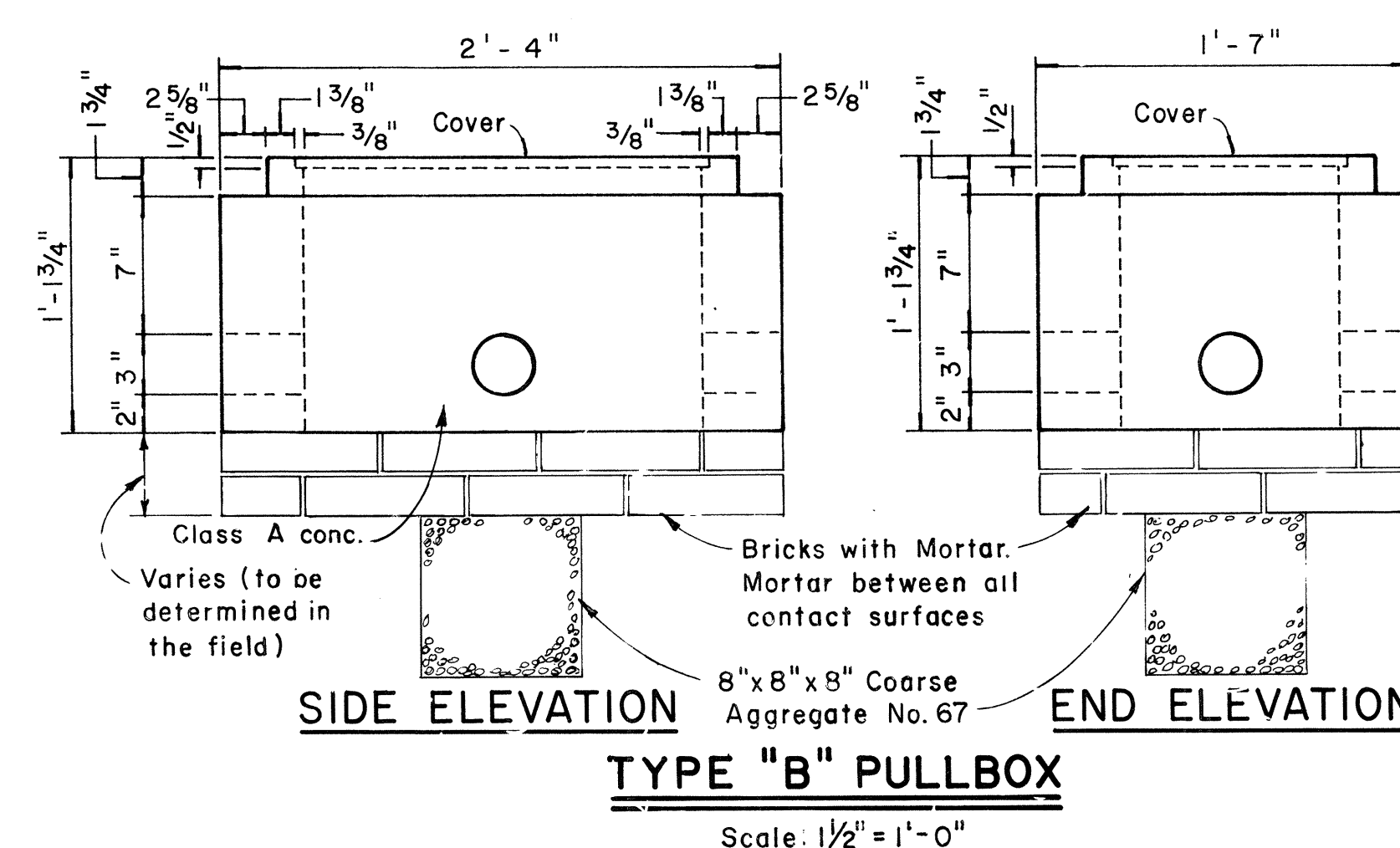
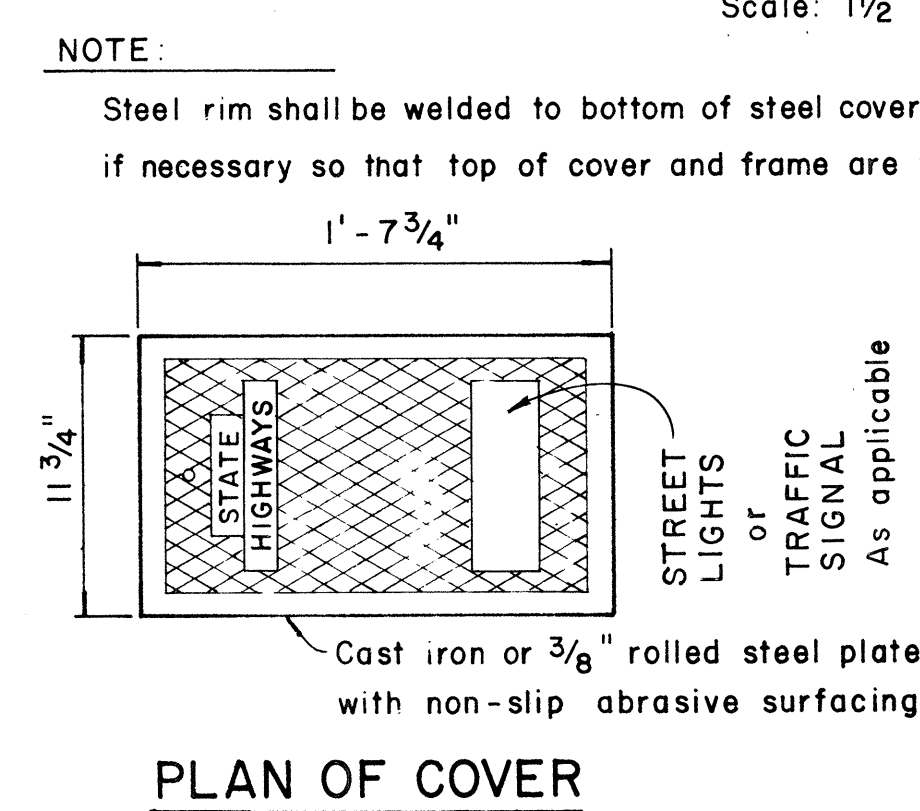
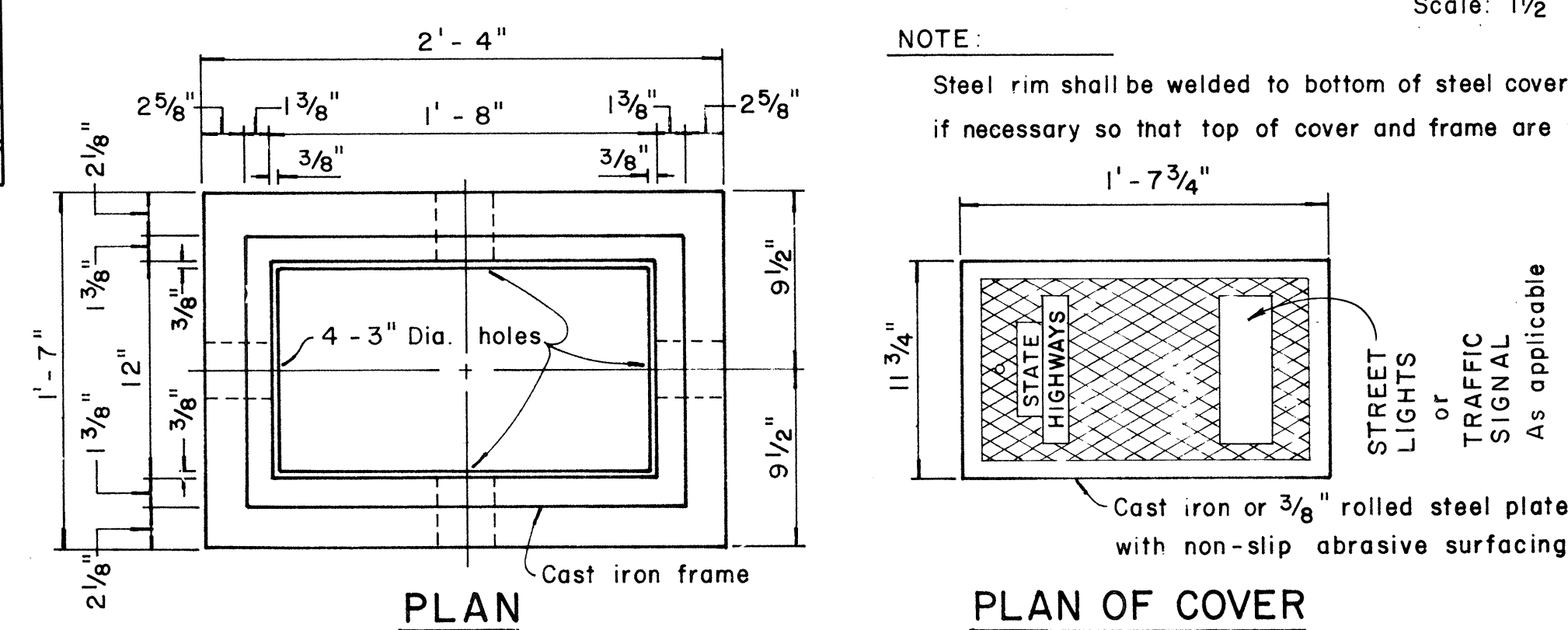
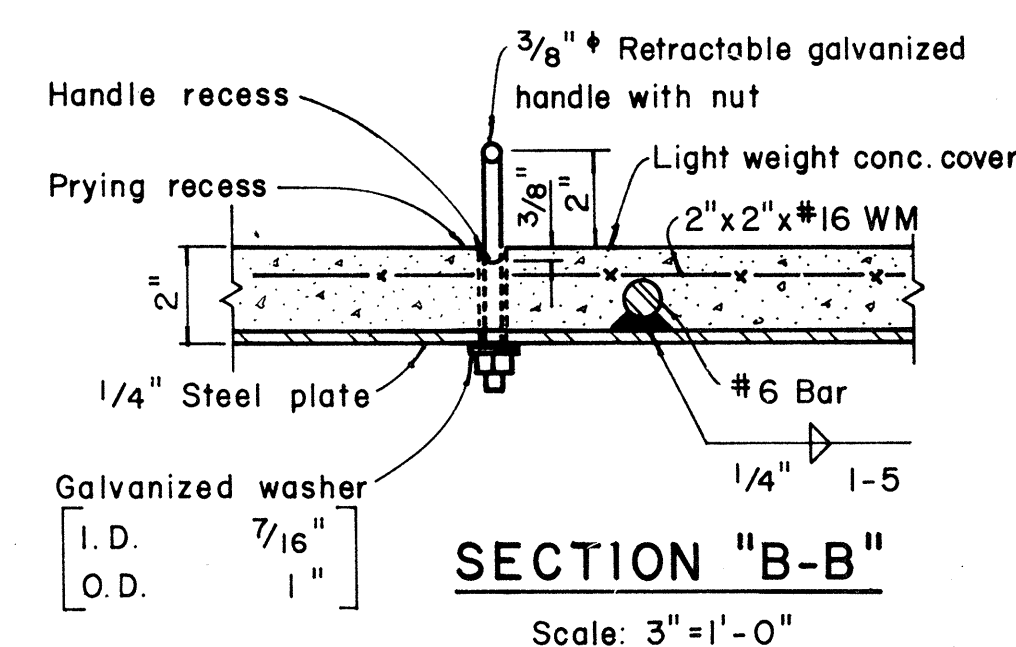
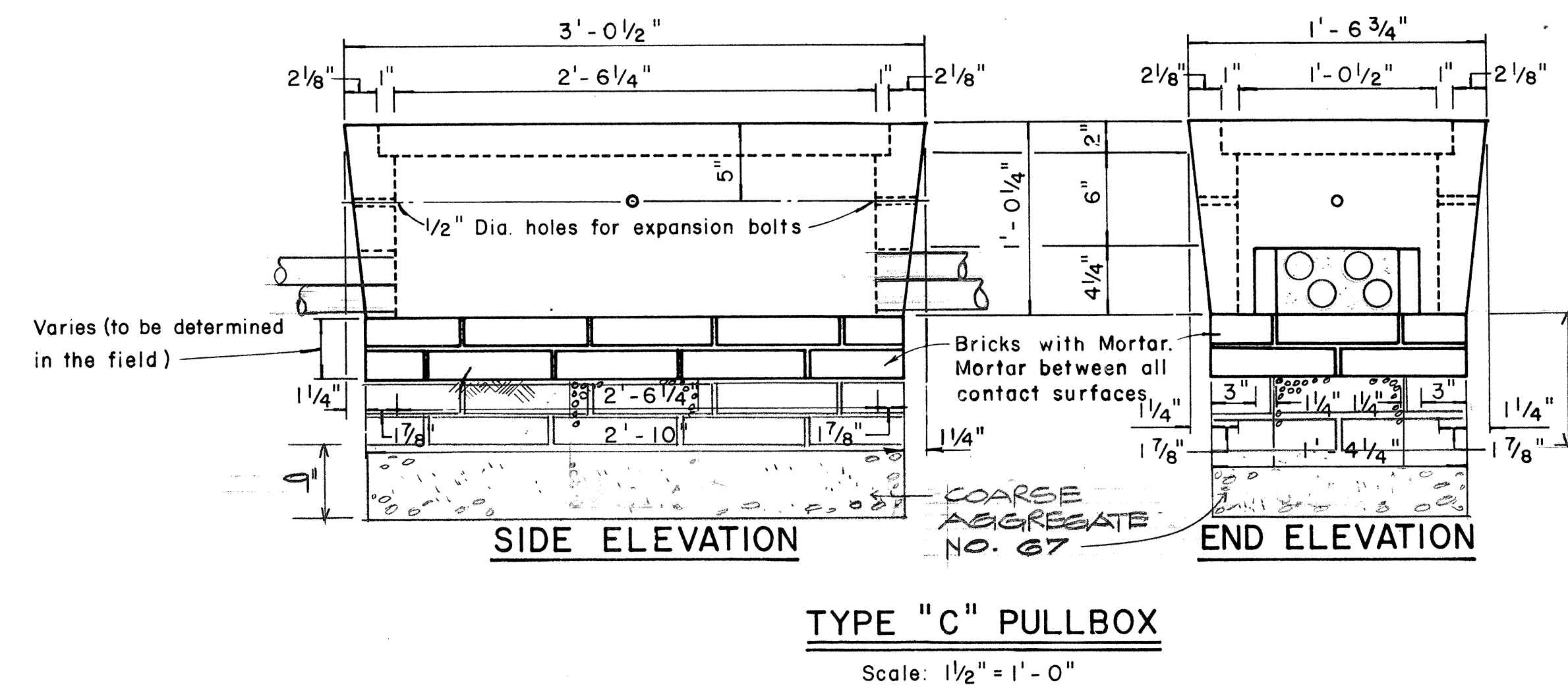
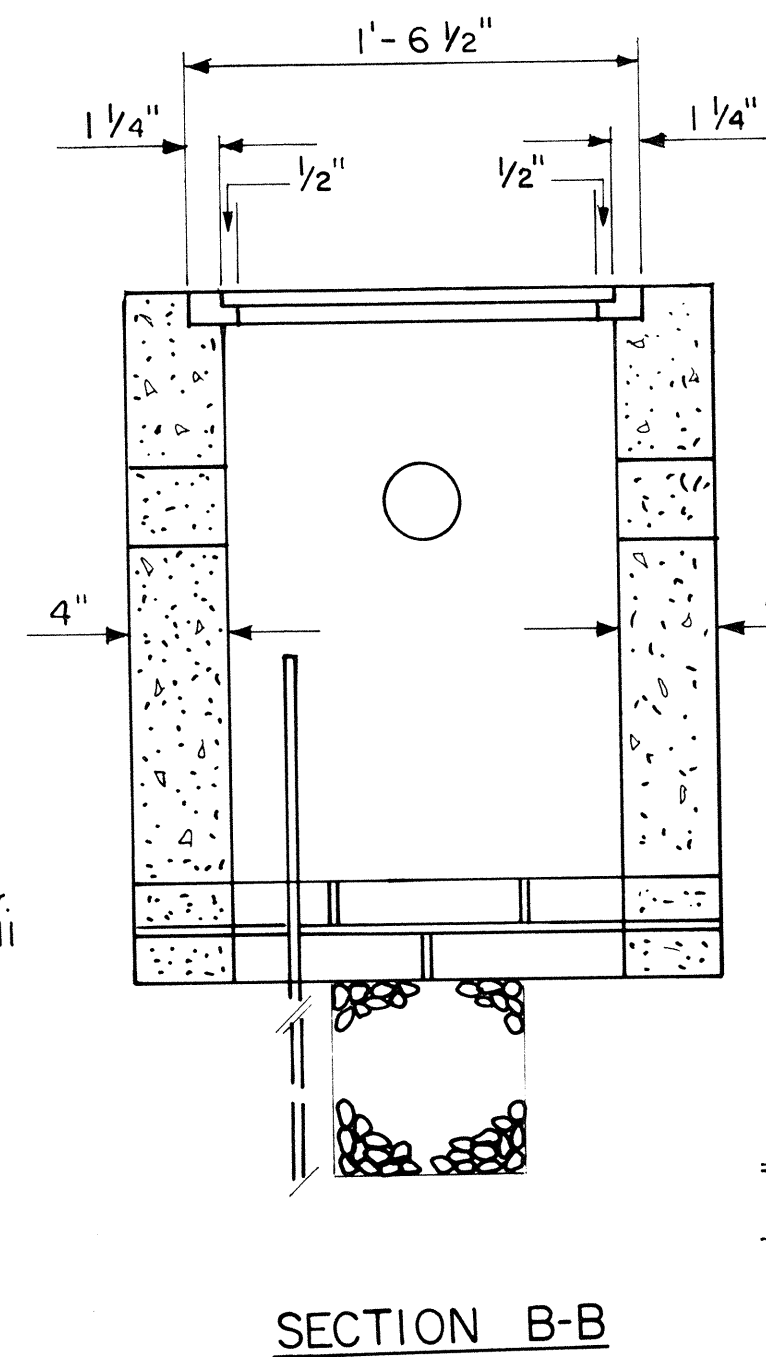
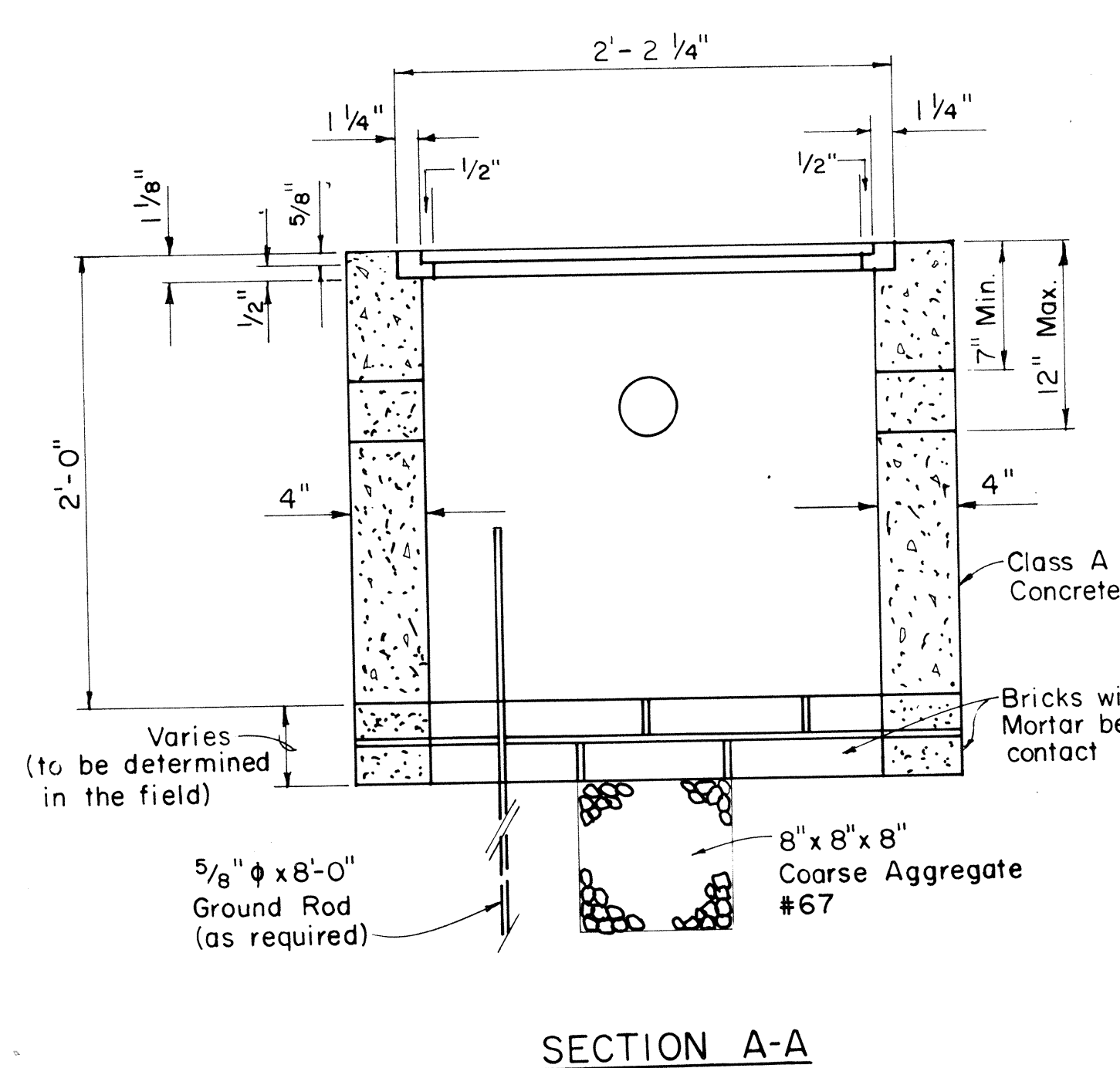
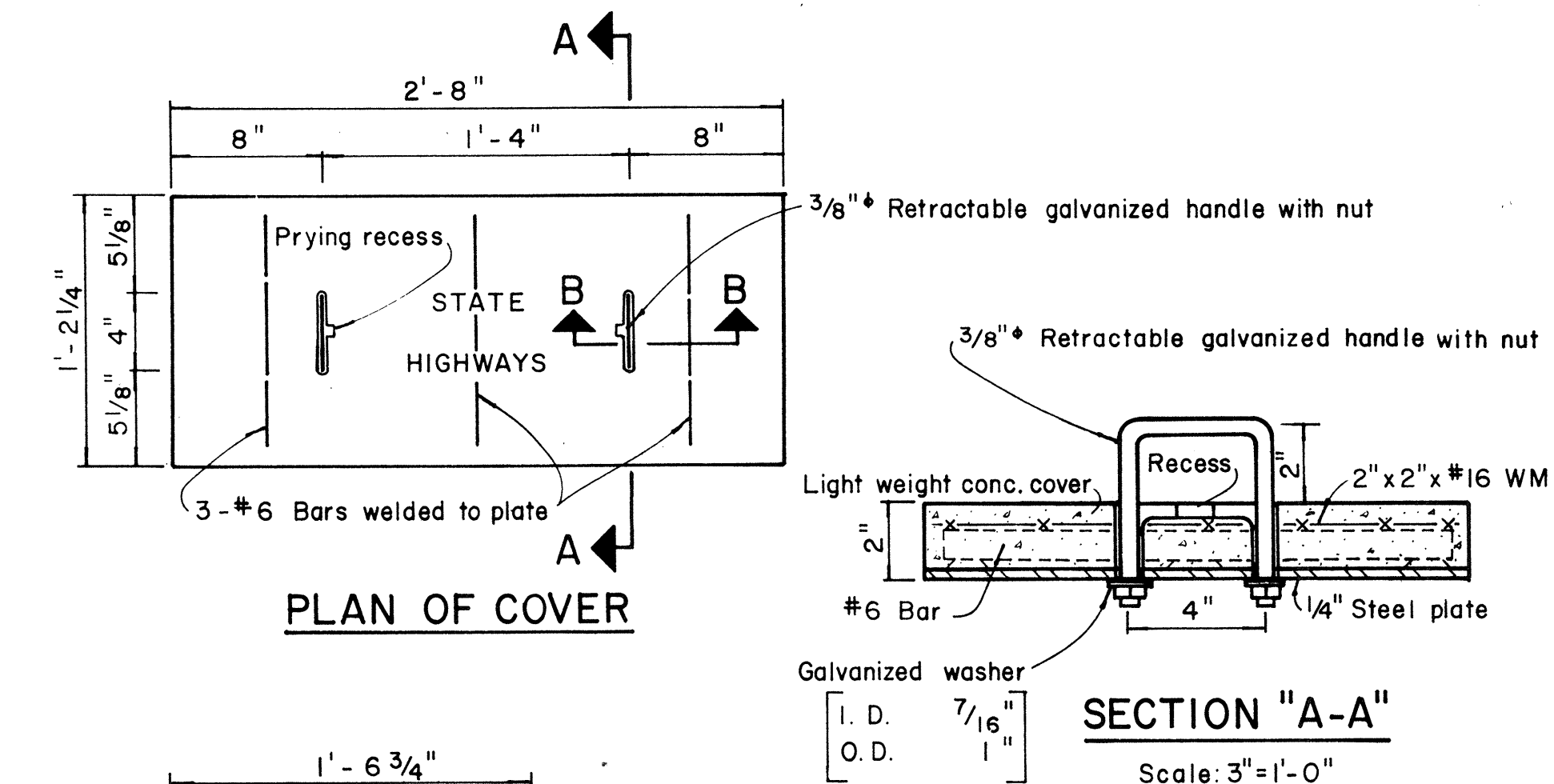
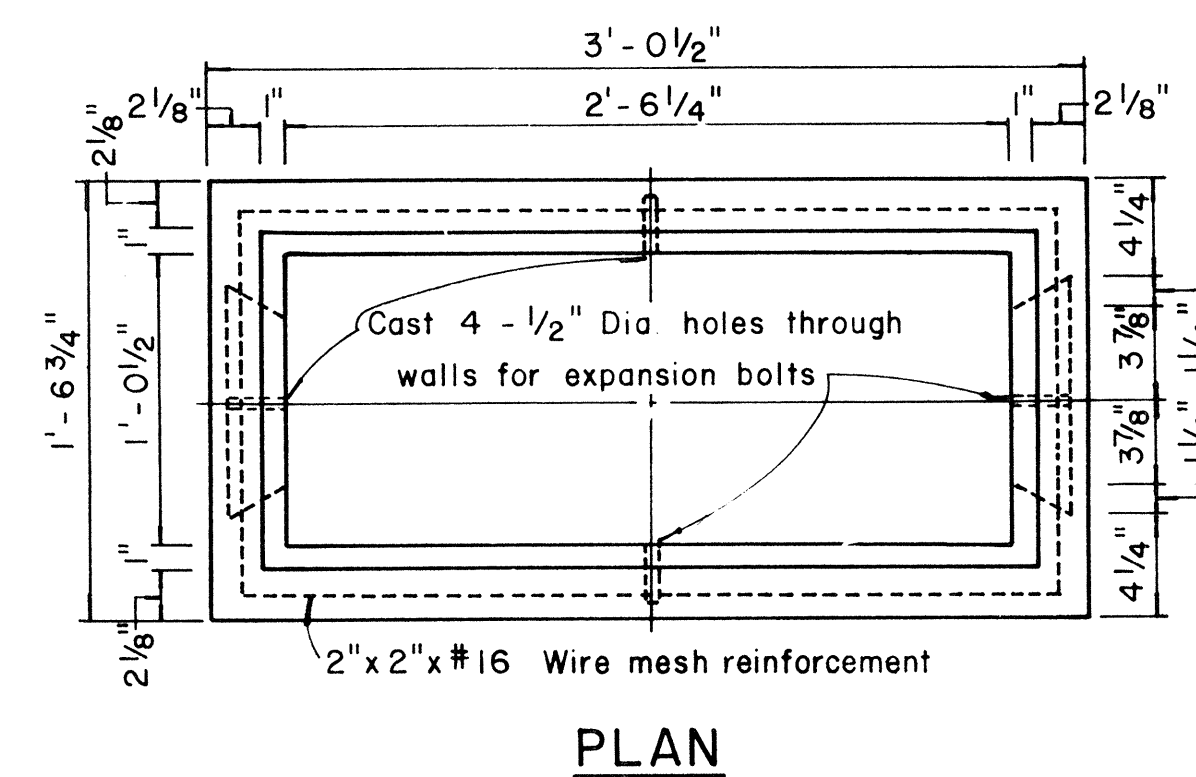
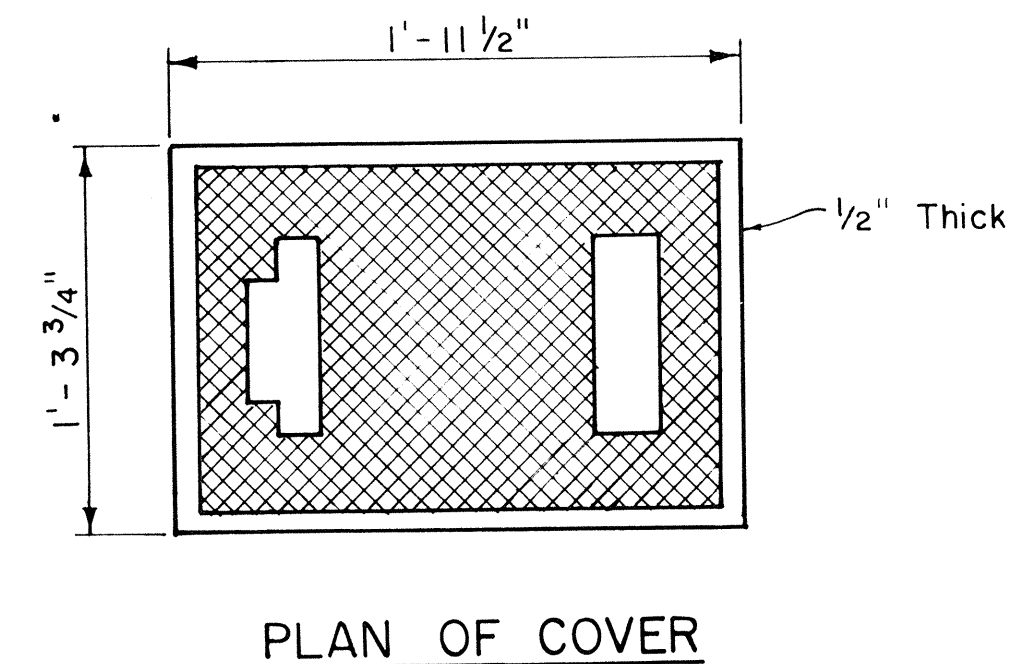
MISCELLANEOUS ELECTRICAL DETAILS

INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I -HI-1 (178)

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I - HH(78)	1982	114	165



NOTE:
Except as noted, Cover Details shall
conform to Type "B" Pullbox
Cover.



NOTE:
Hot dip galvanize after fabrication.
Modified cover shall be furnished
when called for on plans.

NOTE:

Steel rim shall be welded to bottom of steel cover
if necessary so that top of cover and frame are flush

TYPE "C" PULLBOX
Scale: 1½" = 1' - 0"

SECTION "B-B"
Scale: 3" = 1' - 0"

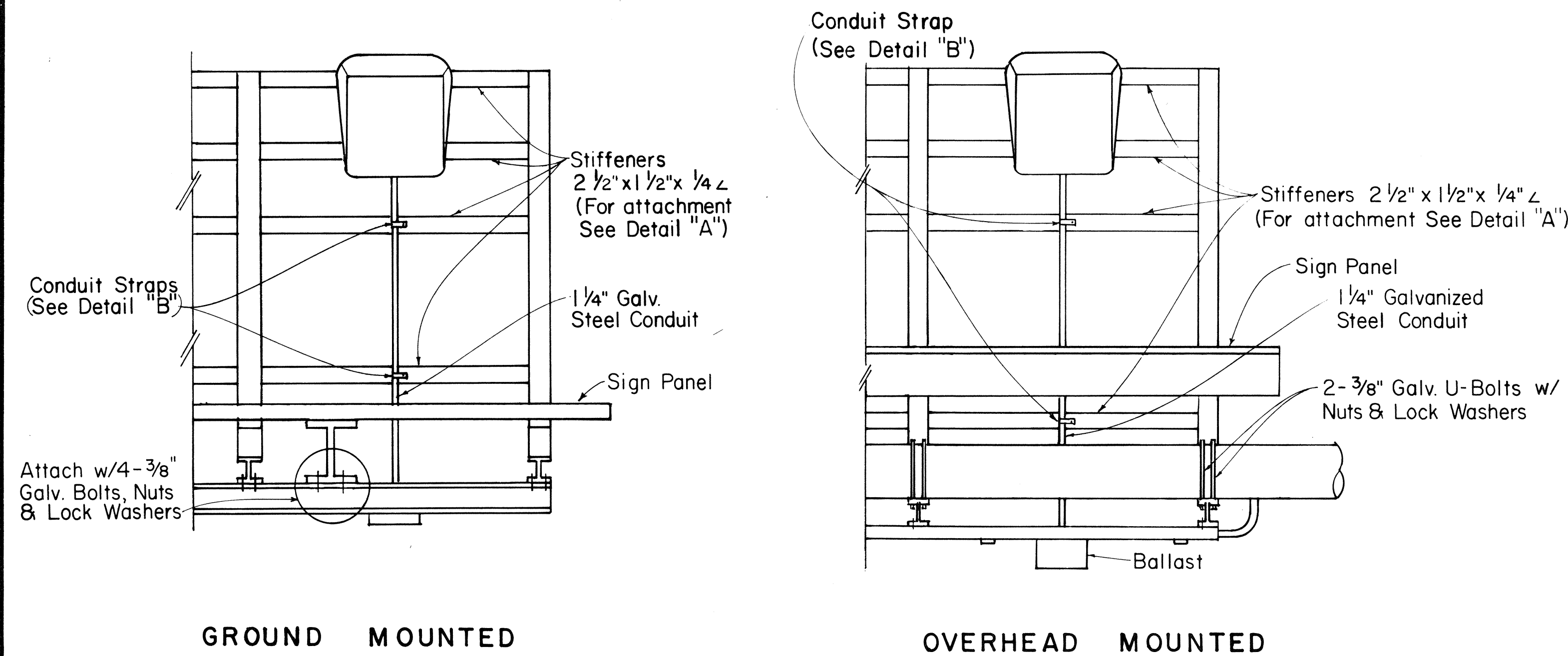
APPROVAL RECOMMENDED: *E. J. ...* 12/29/69
TRAFFIC ENGINEER DATE

APPROVED: *E. J. ...* 12-30-69
ASSISTANT CHIEF, ENGINEERING DATE

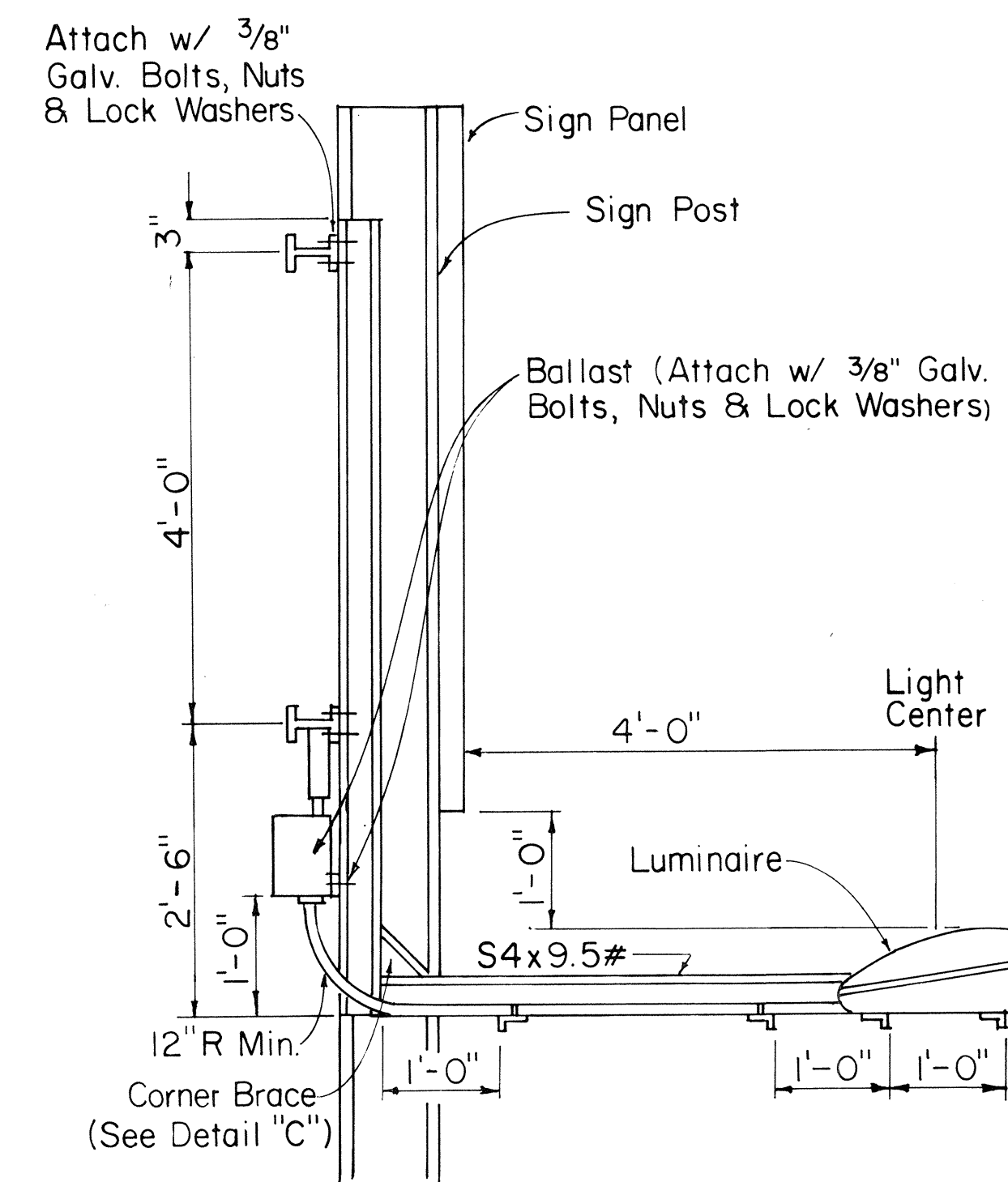
NO.	REVISION	APPROVED BY	DATE
1	Revised Type B & C Pullbox details	H.T.	3-5-1
2	Revised Type "A" Pullbox & Added Modified Cover.	H.T.	1-31-8

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
STANDARD DETAILS
PULLBOXES

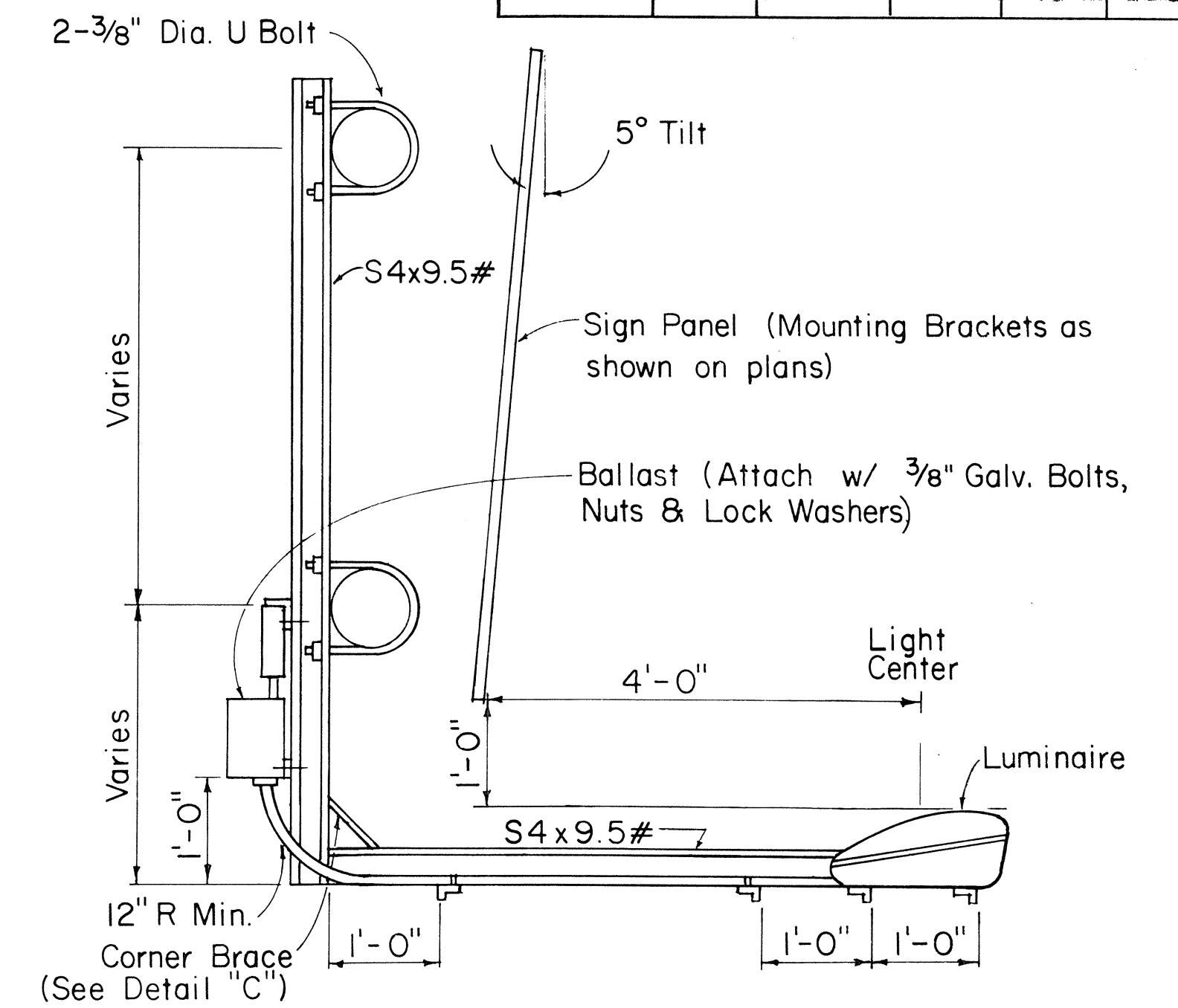
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HH(178)	1982	116	165



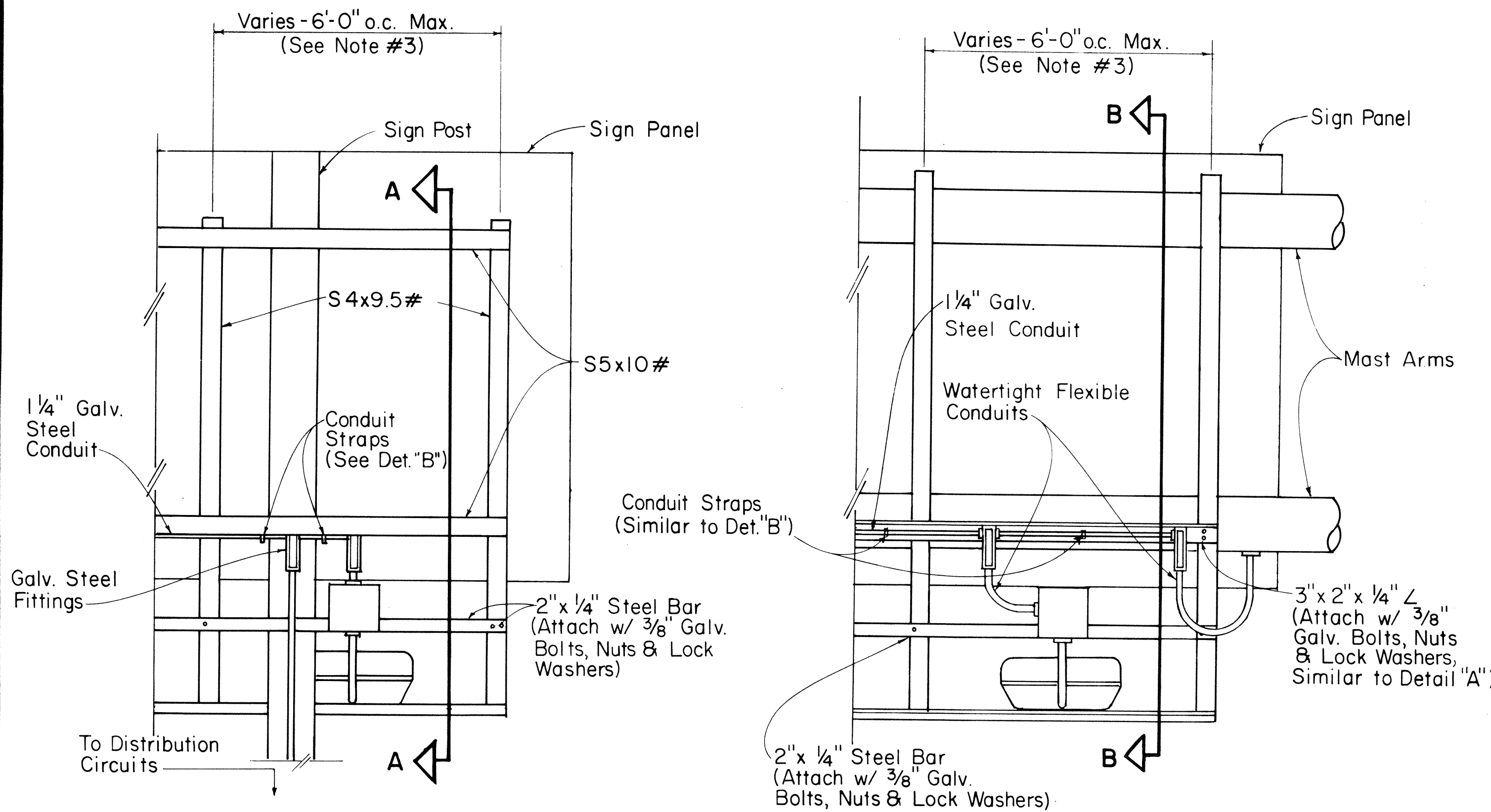
TOP VIEW



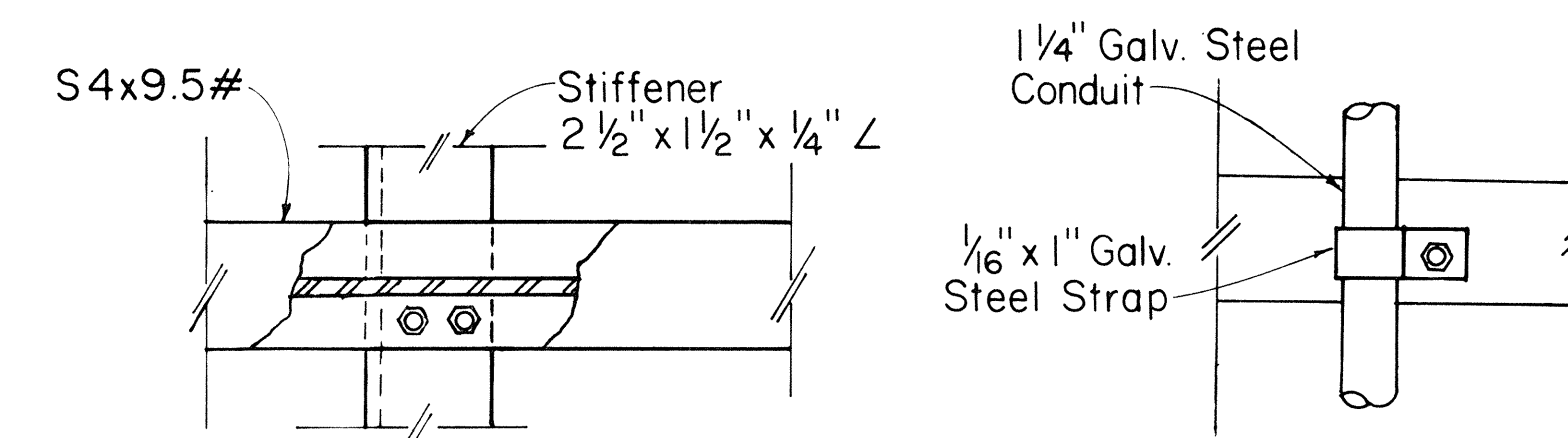
SECTION A-A
Scale: 3/4" = 1'-0"



SECTION B-B
Scale: 3/4" = 1'-0"

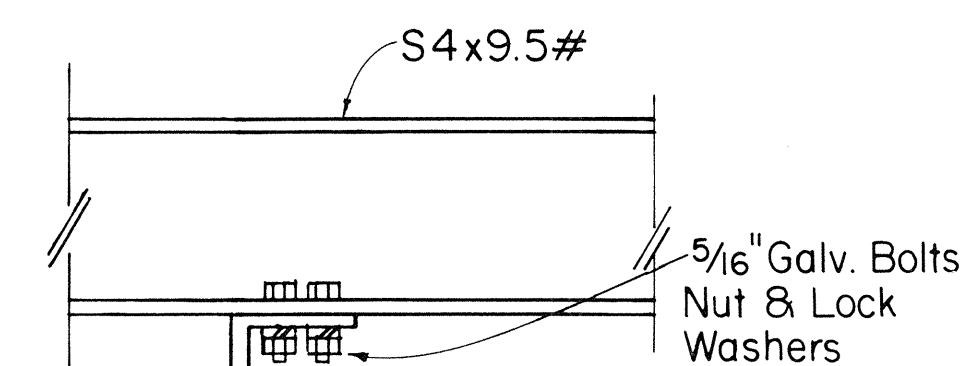


REAR VIEW

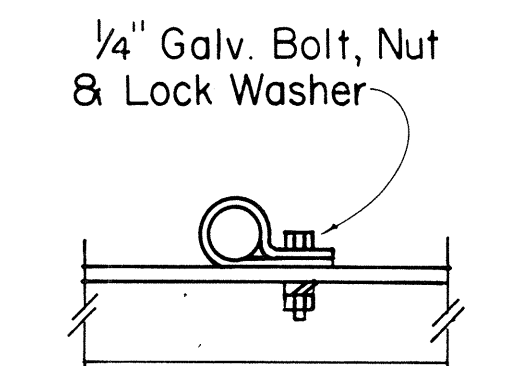


TOP VIEW

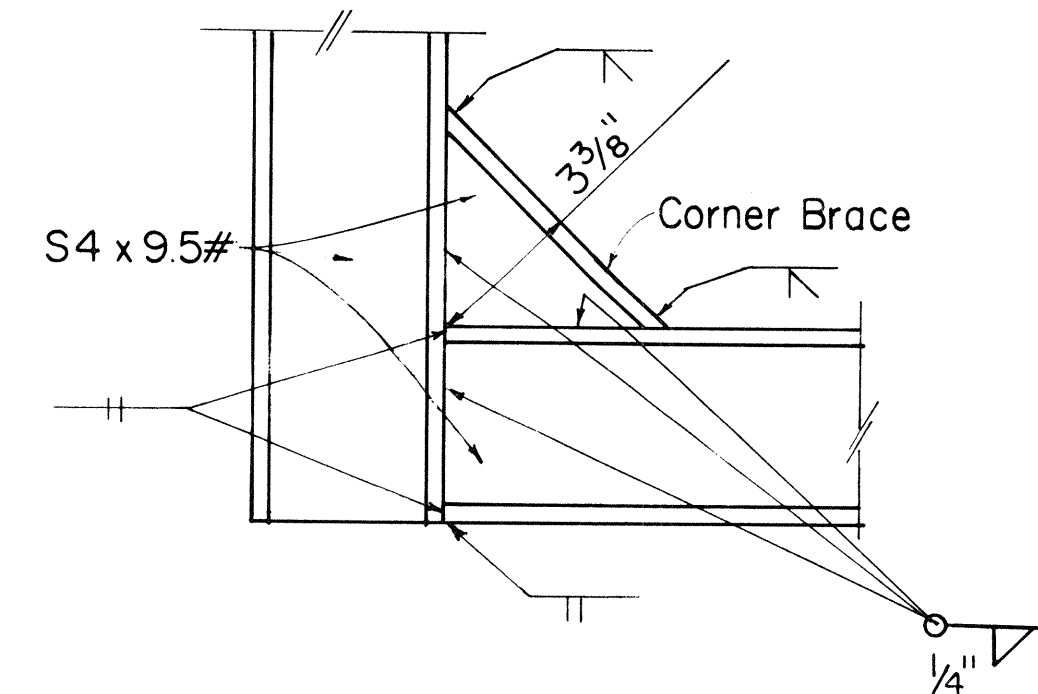
TOP VIEW



SIDE VIEW
DETAIL "A"
Scale: 3" = 1'-0"



SIDE VIEW
DETAIL "B"
Scale: 3" = 1'-0"



DETAIL "C"
Scale: 3" = 1'-0"

GENERAL NOTES:

- All parts of the Luminaire Mounting shall be Hot-Dip Galv., Prime Coated with a suitable Primer and Painted with Three Coats of Dark Green Enamel.
- Luminaire Mounting shall be adjusted as recommended by the manufacturer to provide optimum sign illumination.
- The Contractor shall insure that the luminaire supports do not conflict with the sign supports (see support spacing tables on sheets DT 205 and DT 206). Final spacing shall be approved by the Engineer.
- The Contractor shall determine the amount and spacing of luminaires per sign in accordance with the luminaire manufacturer's instructions, subject to approval by the Engineer. The maximum spacing shall be 10 feet on centers and the maximum height and width illuminated by a single luminaire shall be 10 feet, respectively.

APPROVAL RECOMMENDED:

Eichi Tanaka 5/19/81
TRAFFIC ENGINEER DATE

APPROVED:

Robert Sakai 5/20/81
ASSISTANT CHIEF, ENGINEERING DATE

NO	REVISION	APPROVED BY	DATE
1	Supersedes DT 208 Approved 12/30/69.	H.F.	5/20/81

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

STANDARD DETAILS
GUIDE SIGNS
LUMINAIRE MOUNTINGS

Scale: As Shown

SHEET No. 25 OF SHEETS DT 208

DATE	DESIGNED BY	CHECKED BY
5/19/81	Eichi Tanaka	Robert Sakai
5/20/81	Robert Sakai	

ORIGINAL PLAN	NOTE BOOK
DESIGNED BY	CHECKED BY
QUANTITIES BY	

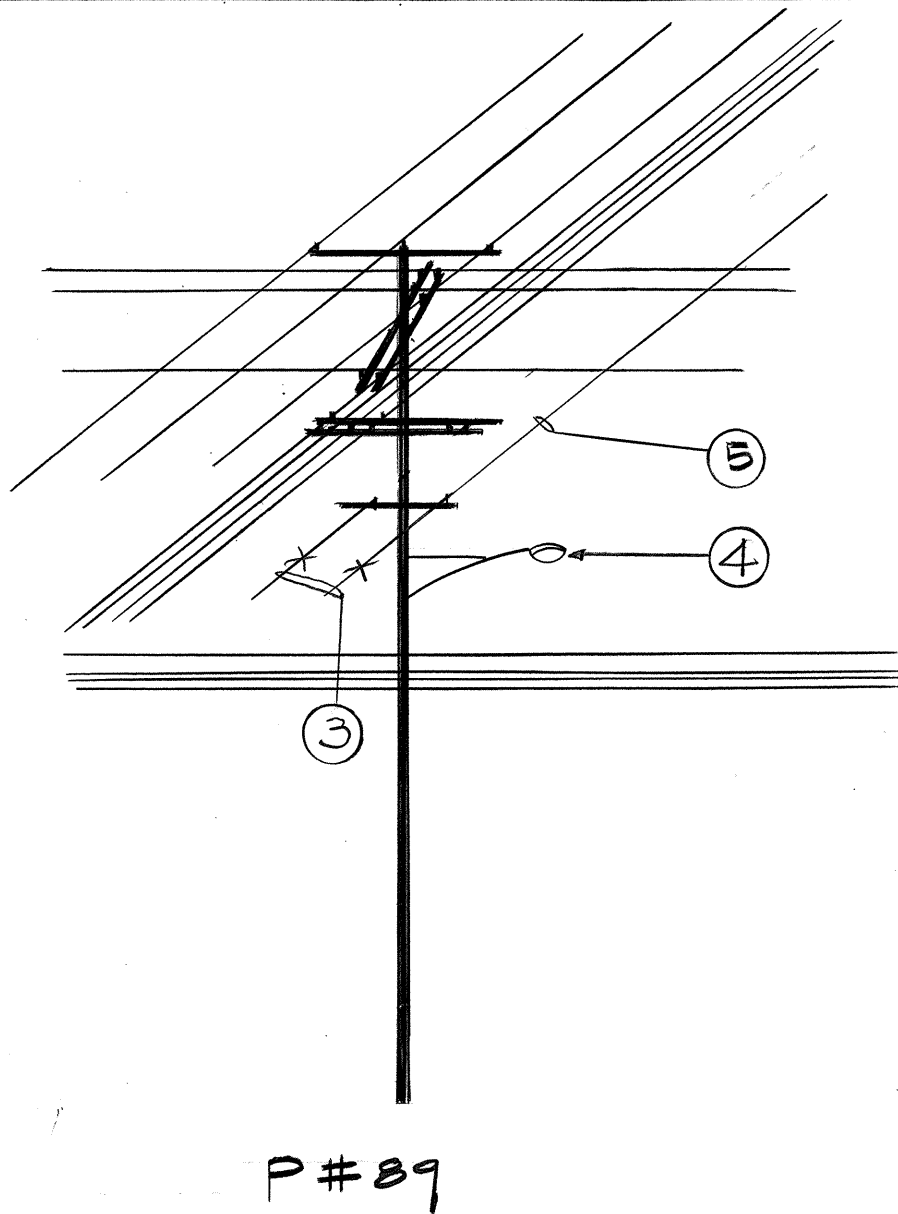
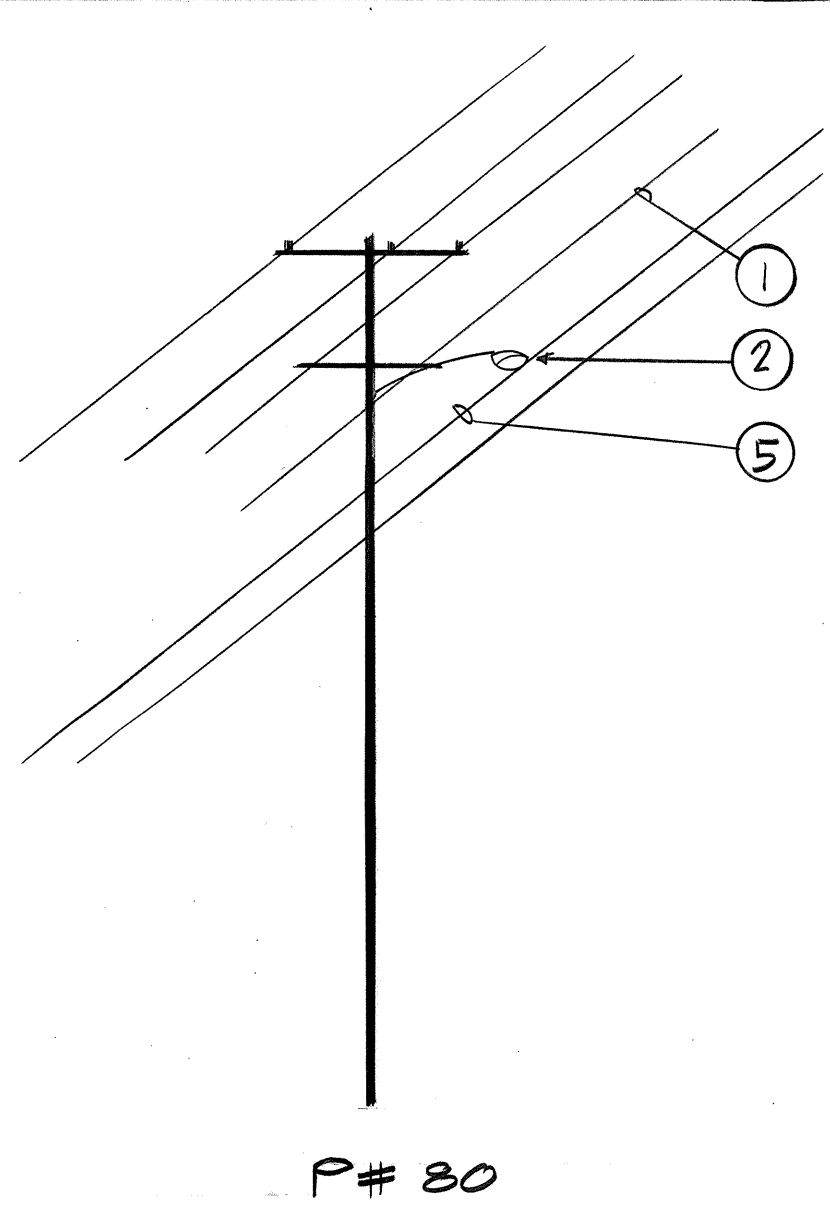
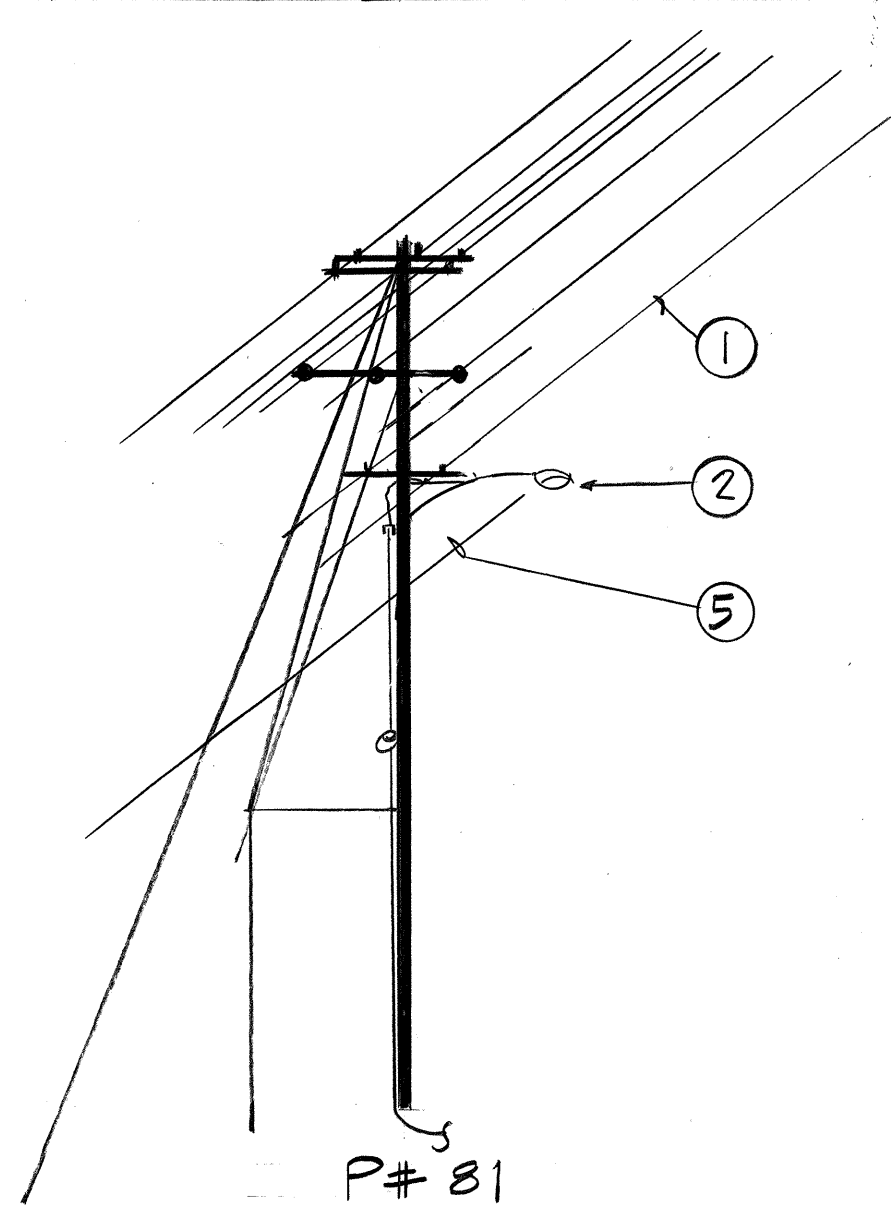
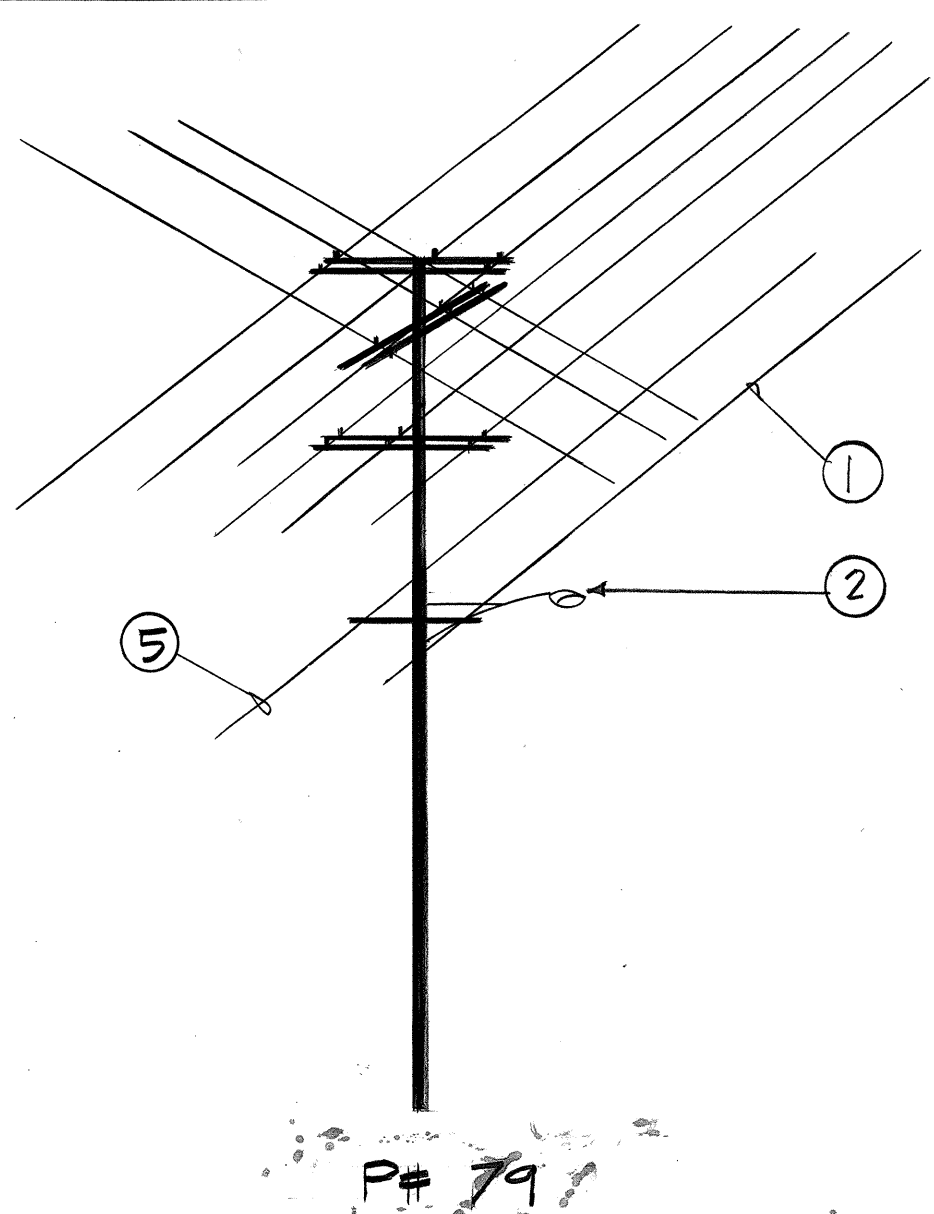
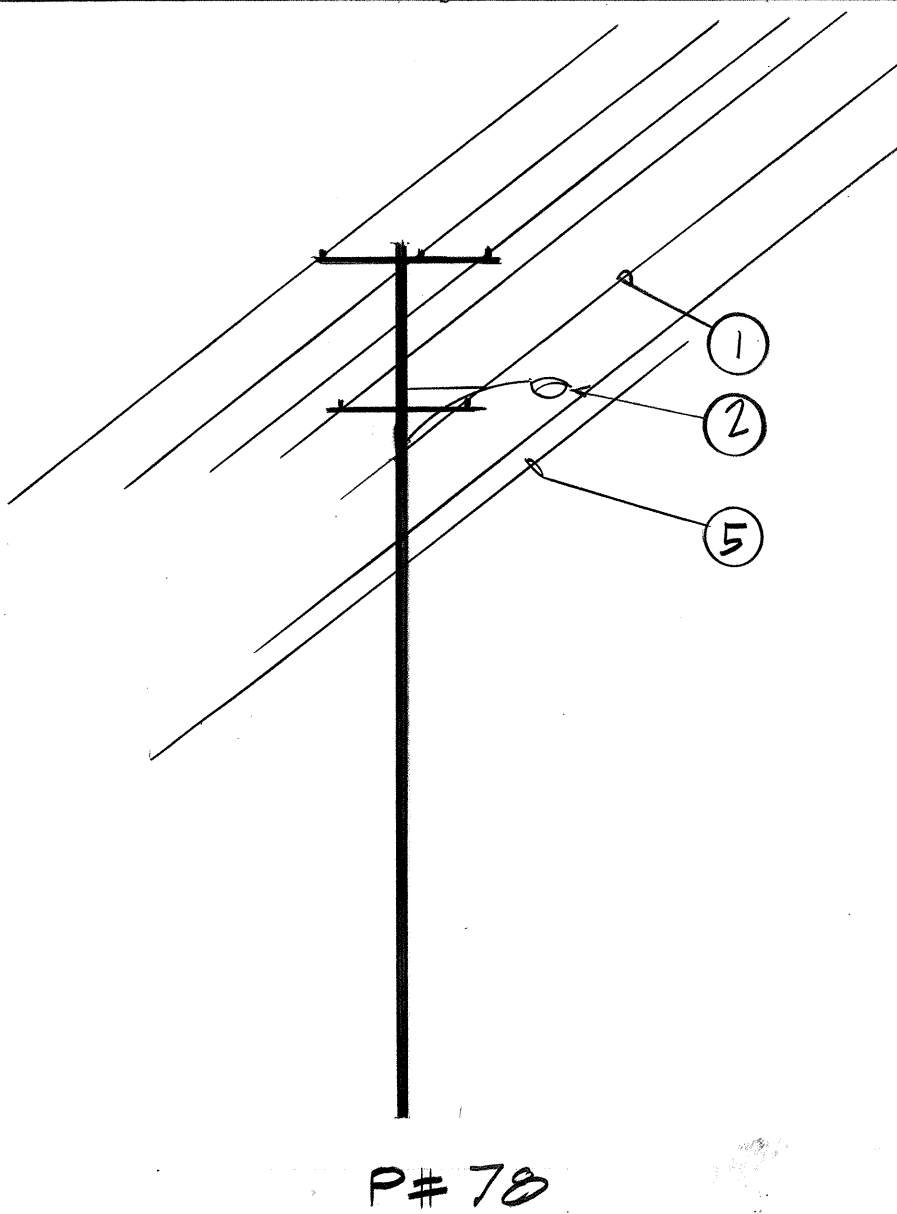
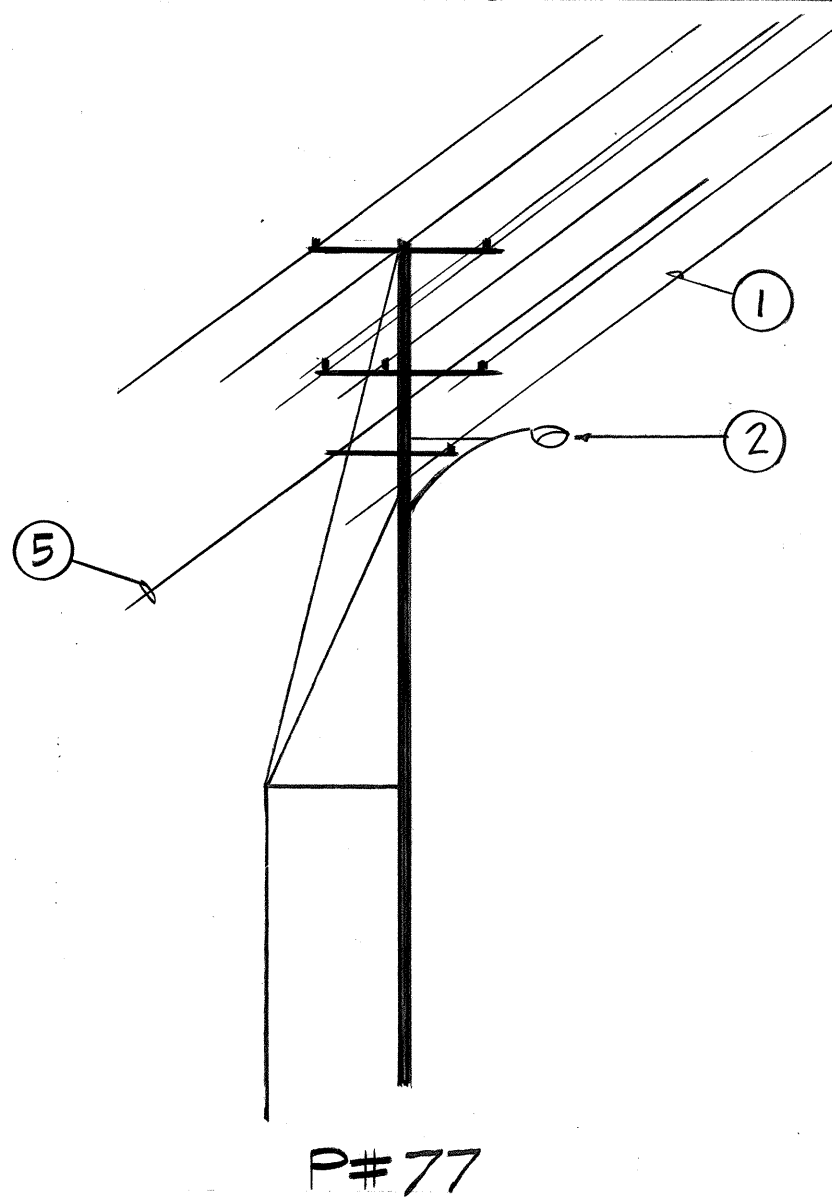
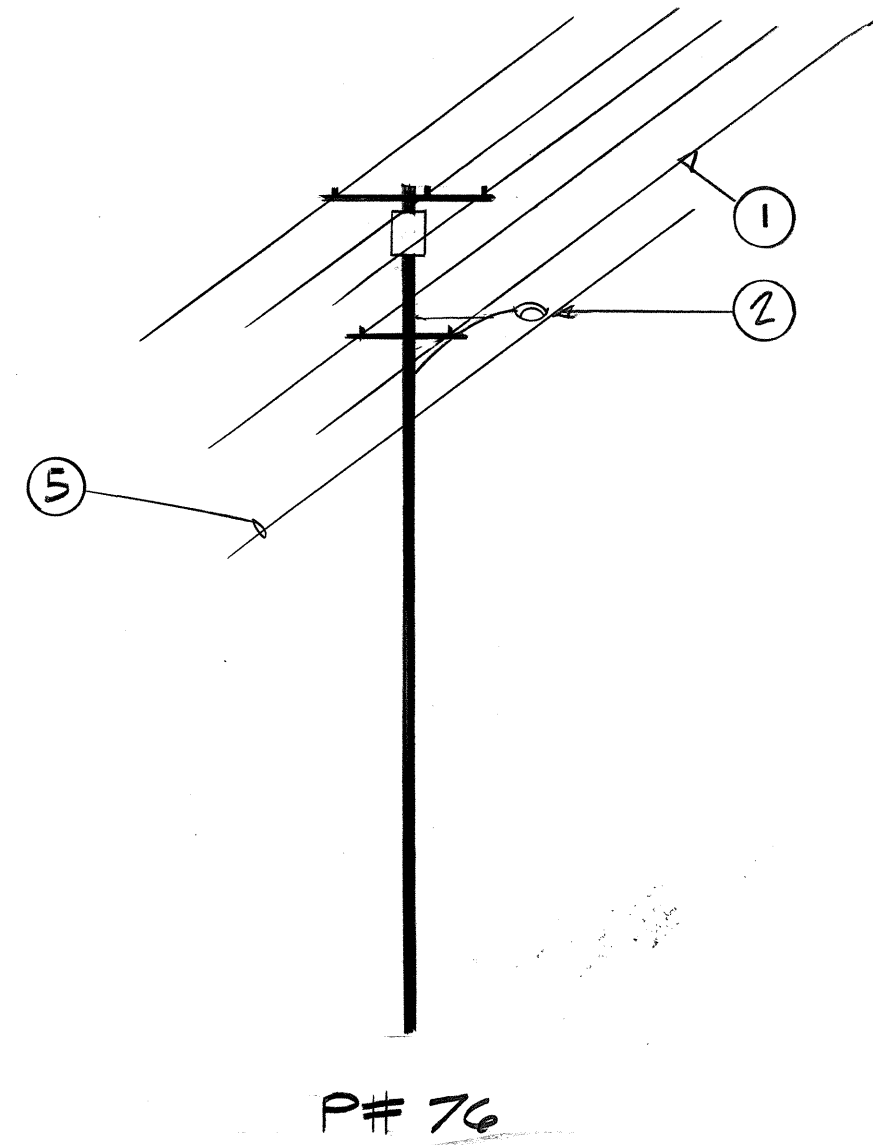
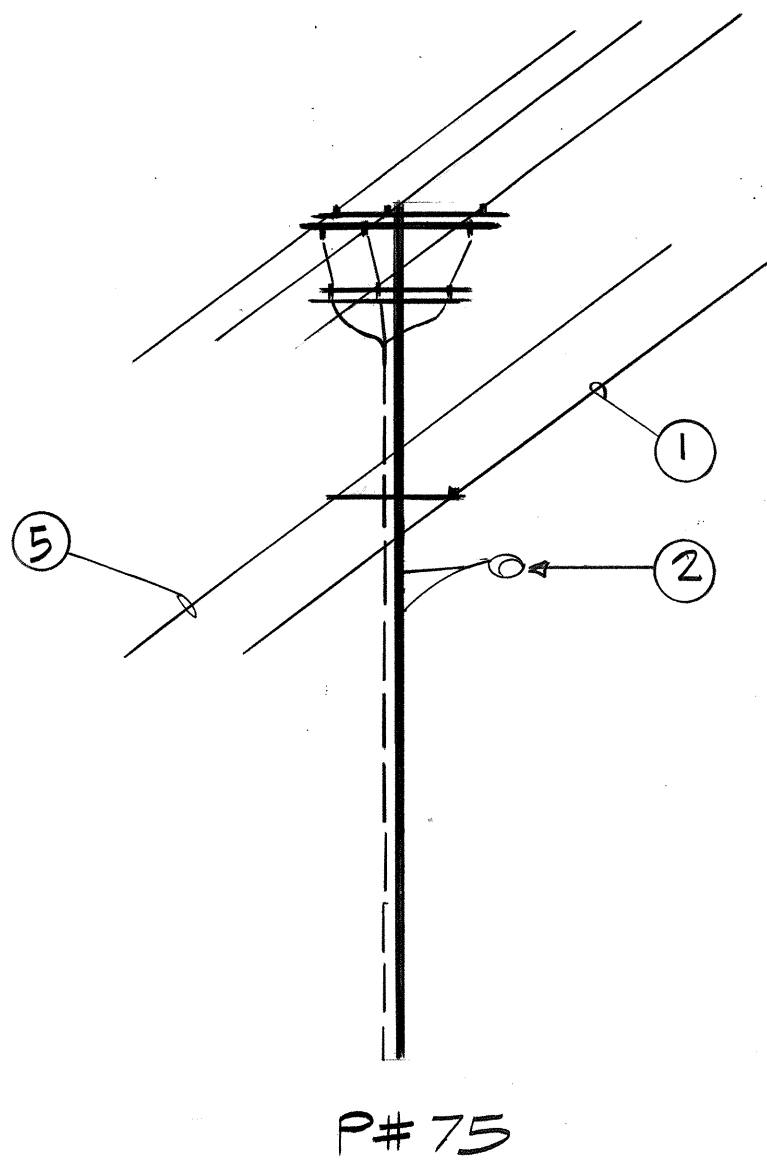
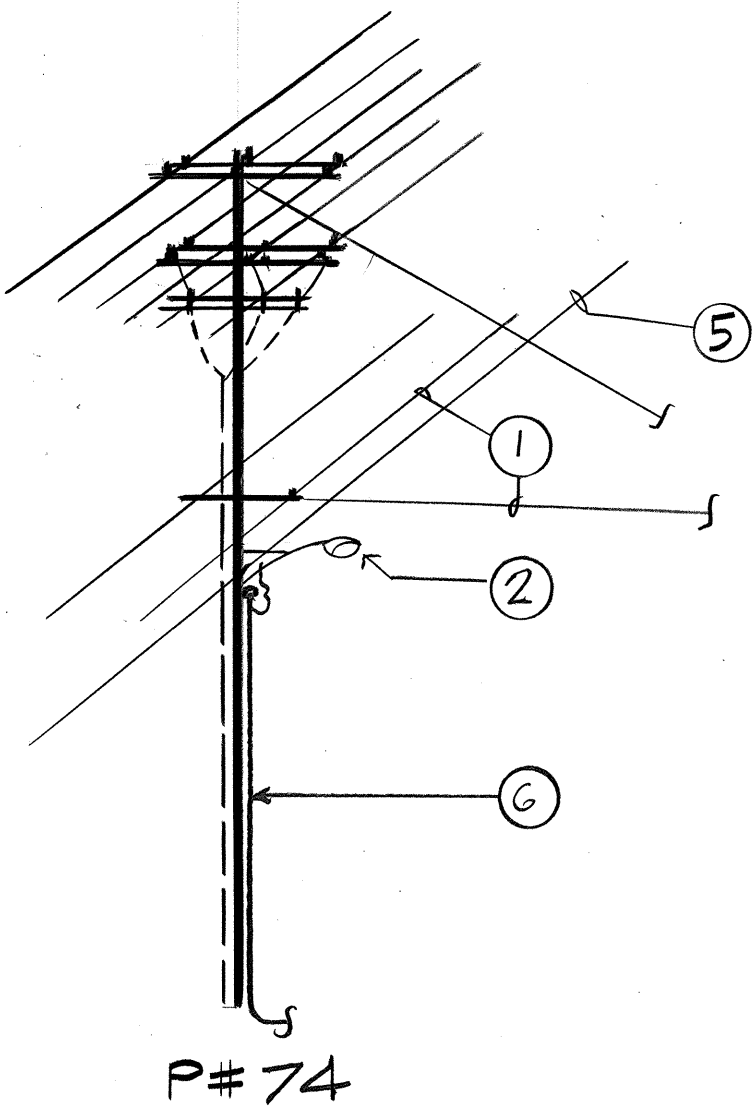
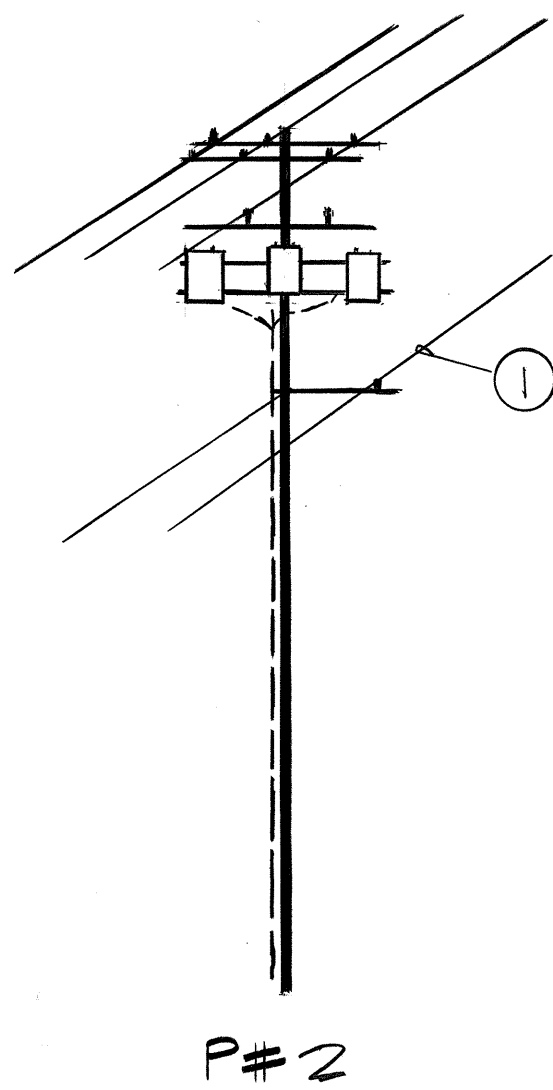
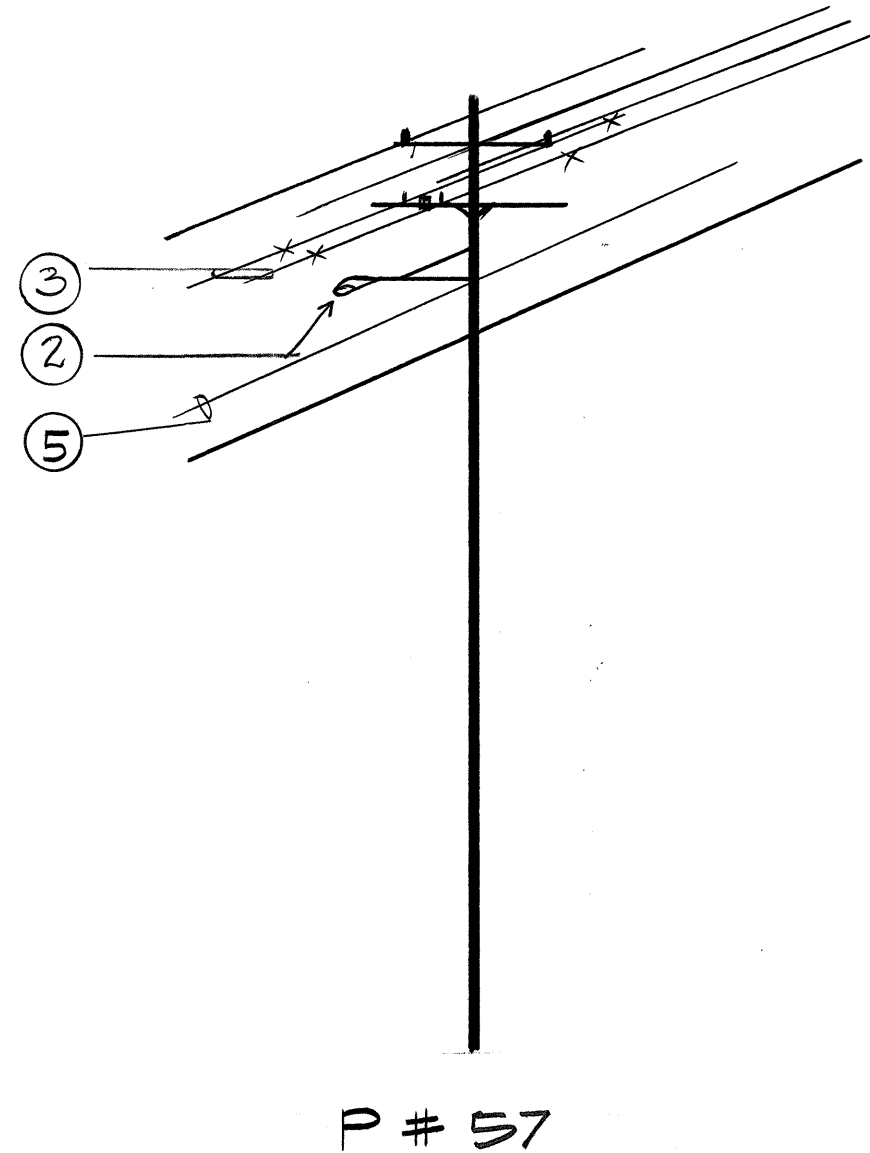
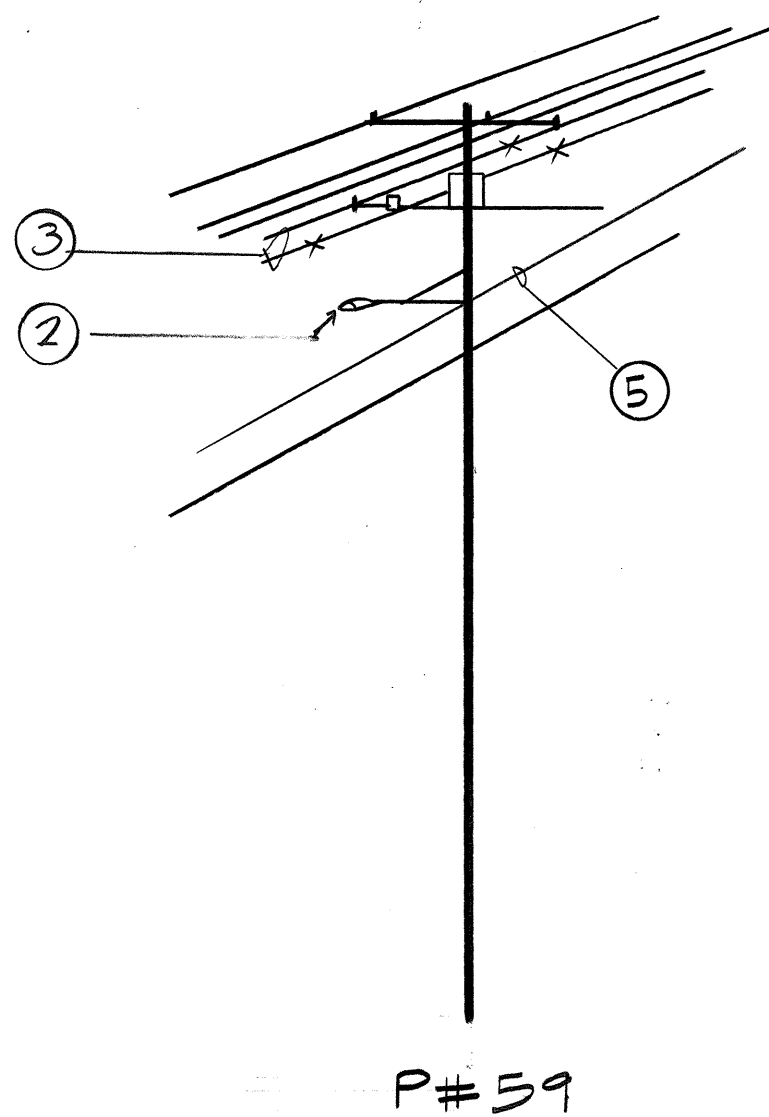
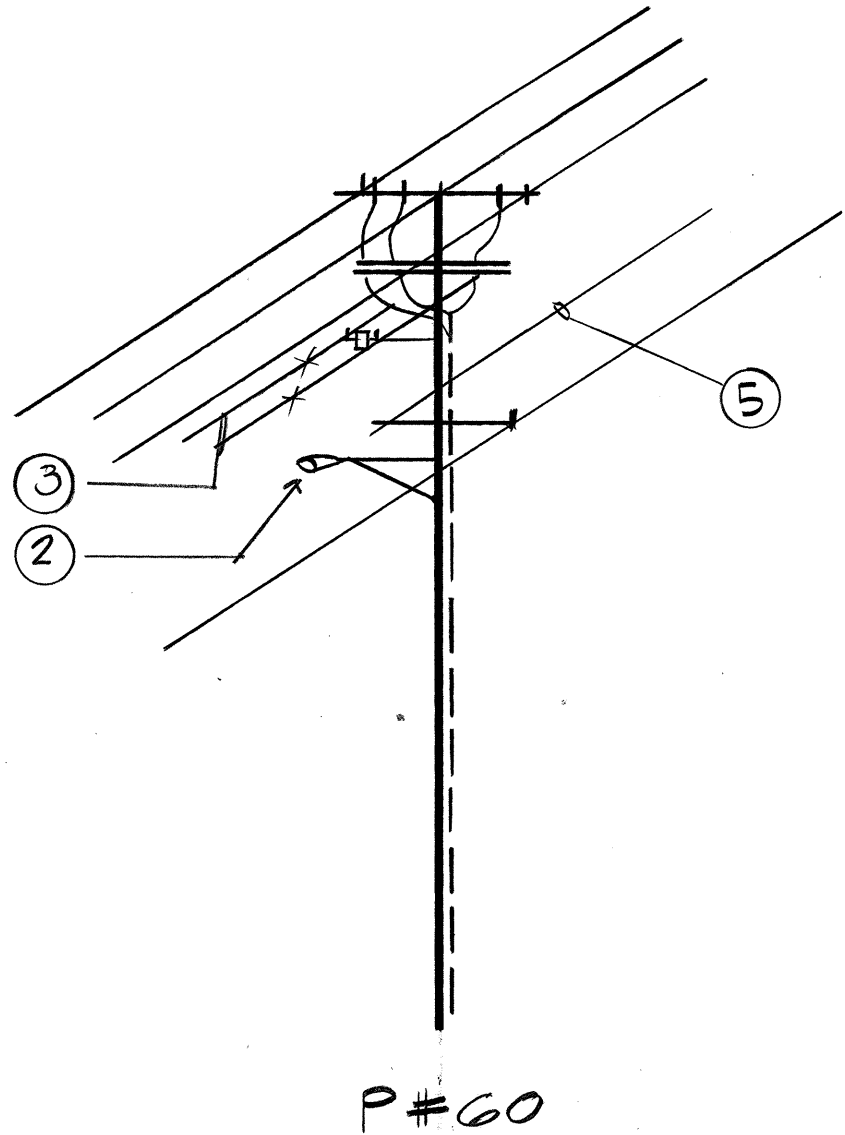
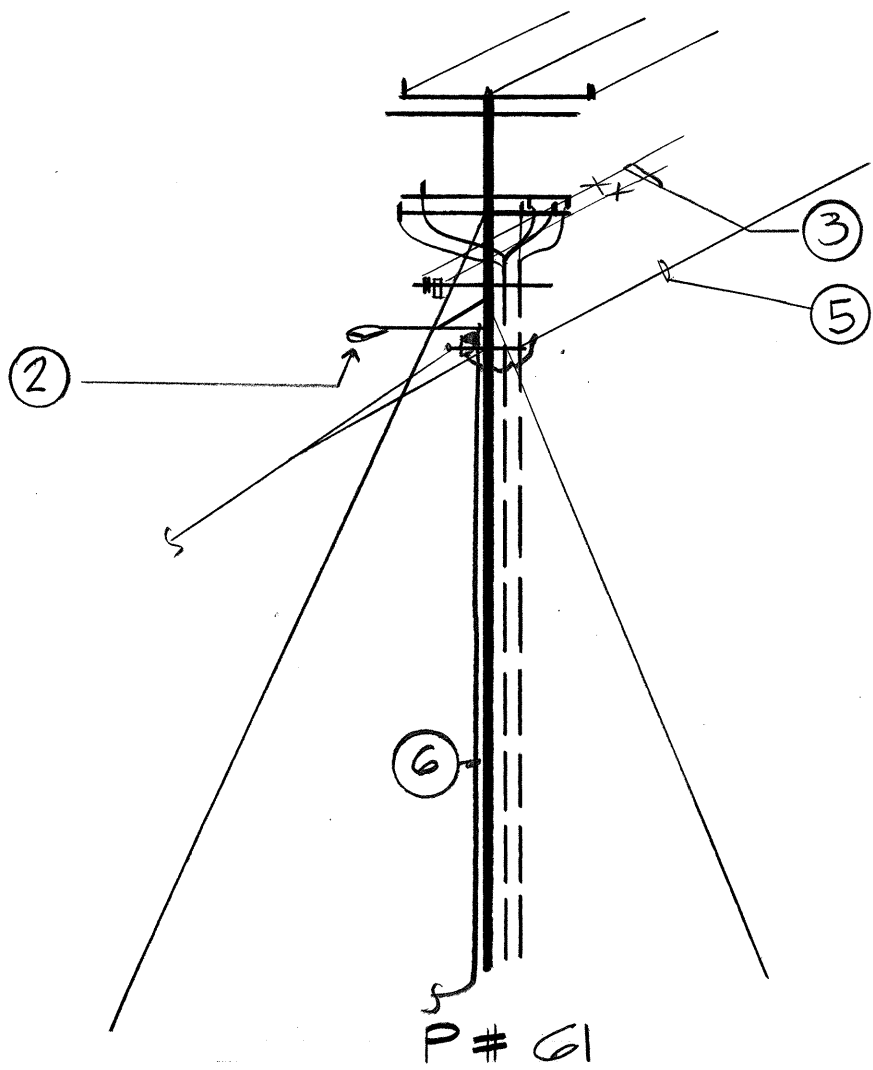
LUMINAIRE MOUNTING

Not to Scale

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	I-HI-1(178)	1982	117	165

NOTES:

- ① SERIES CKT. TO REMAIN
- ② REPLACE W/ 150W HPS FIXTURE & CONN. TO MULTIPLE CKT.
- ③ REMOVE SERIES CKT.
- ④ REPLACE W/ 250W HPS FIXTURE & CONN. TO MULTIPLE CKT.
- ⑤ PROVIDE MULTIPLE CKT AERIAL TRIPLEX 4#4 RING W/ MESSENGER & HARDWARE. COMPLY W/ CITY DOTS DWG. NO. B401. APPLICABLE REQUIREMENTS. SEE SHT. 22L.
- ⑥ 2" C. RISER W/ SVC HEAD.



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800 Kapiolani Boulevard
Honolulu, Hawaii 96813



W. H. M. Nakamura
REGISTERED PROFESSIONAL ENGINEER
No. 573
HAWAII, U.S.A.

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
LAND TRANSPORTATION FACILITIES DIVISION
**KALIHI ST. EXTENSION
& KALIHI ST. LIGHTING**
INTERSTATE H-1 IMPROVEMENTS
MIDDLE STREET TO KALIHI INTERCHANGE
EASTBOUND LANES
F.A.I. PROJECT NO. I-HI-1 (178)

SHEET No. 26 OF SHEETS

ORIGINAL PLAN	SURVEY PLOTTED BY	DATE
NOTE BOOK	DRAWN BY	
	TRACED BY	
	DESIGNED BY	
	QUANTITY BY	
	CHECKED BY	