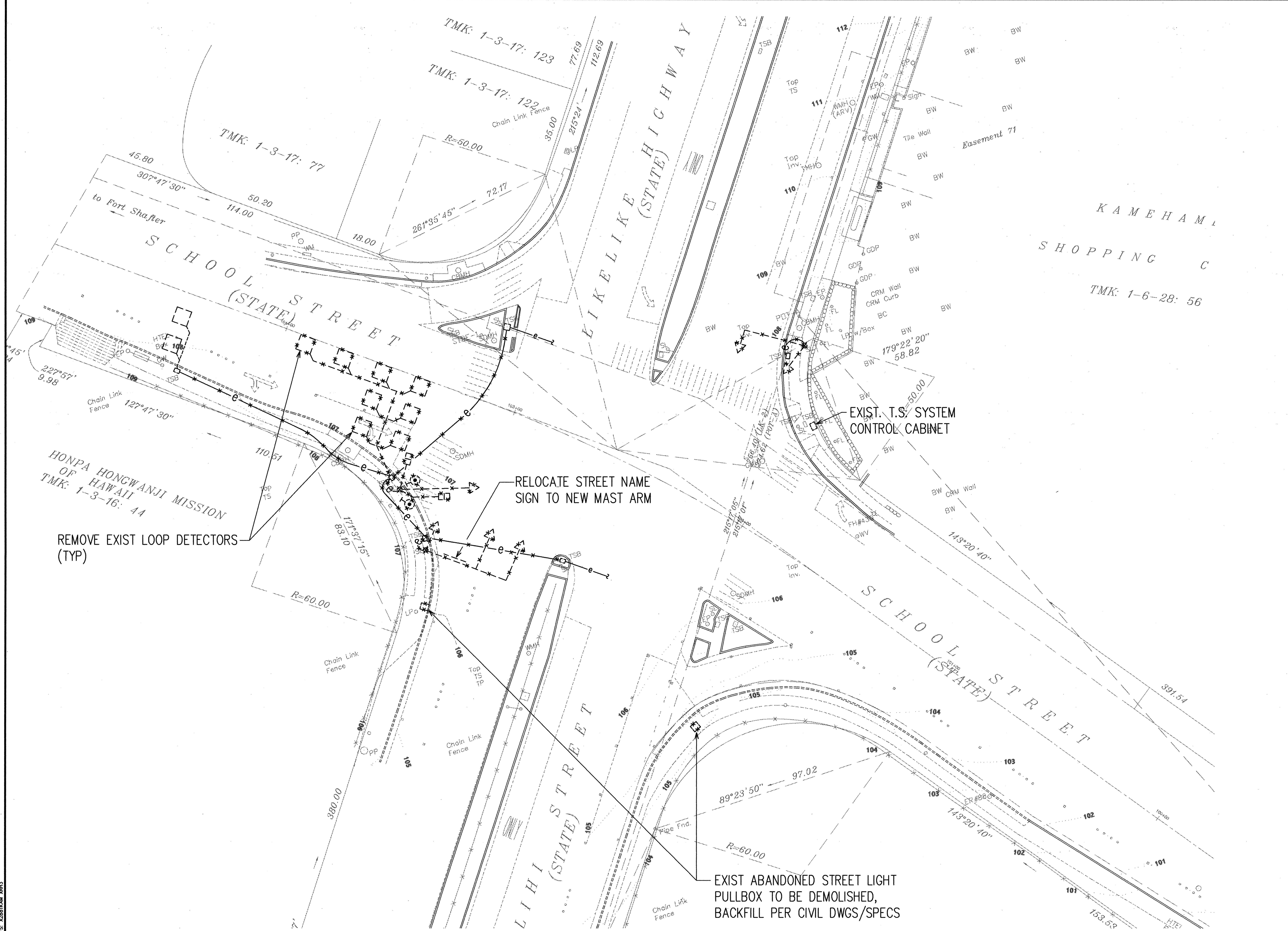
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	40	52



NORTH

TRAFFIC SIGNAL DEMOLITION PLAN IIA – LIKELIKE HWY/SCHOOL ST. INTERSECTION

SCALE: 1"=20'

20' 10' 0 20' 40' 60'

SCALE: 1"=20'

GRAPHIC SCALE

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

6/1/98

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

Andrew I. Miyasato

RONALD N. S. HO & ASSOC., INC. ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DEMOLITION PLAN

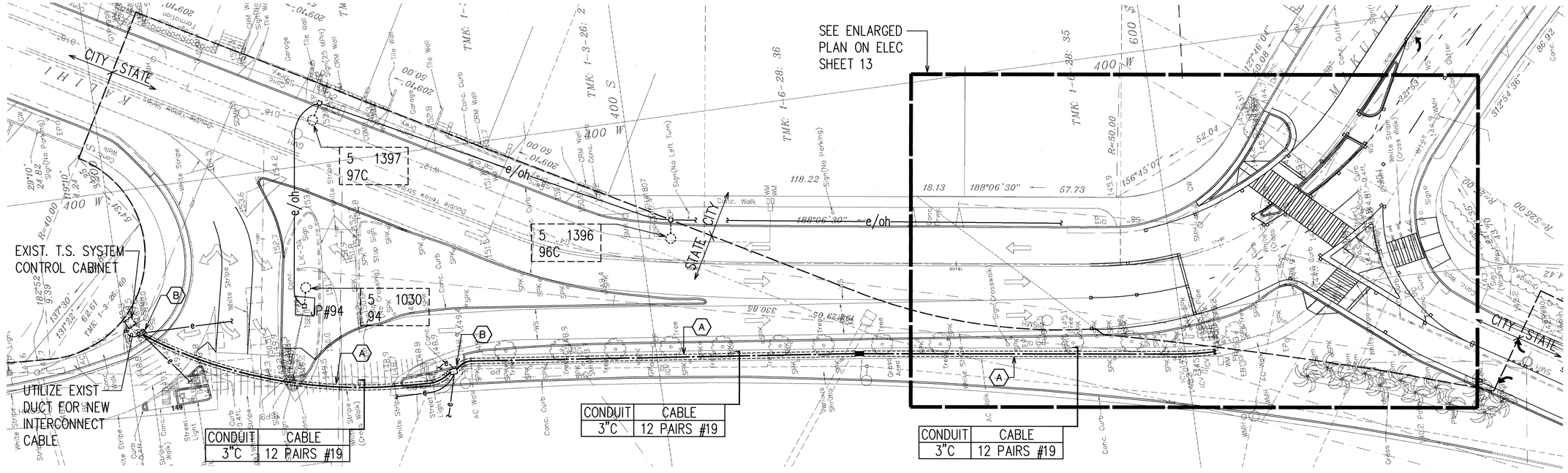
LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1
LIKELIKE HWY/SCHOOL ST INTERSECTION
PROJECT NO. 63A-01-97

SCALE: AS NOTED — DATE: MAY 1998

SHEET No. 11 OF 23 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	41	52



PLAN NOTE(S):

1. "(A)" DENOTES "SAW CUT EXISTING PAVEMENT AND SIDEWALK TO INSTALL DUCTS; RESTORE TO MATCH EXISTING". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF DUCTS.

2. "(B)" DENOTES "BREAK INTO EXISTING TRAFFIC SIGNAL PULLBOX AS REQUIRED TO INSTALL NEW DUCTS; RESTORE TO MATCH EXISTING". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF DUCTS.

NORTH

TRAFFIC SIGNAL PLAN IA
LIKELIKE HWY/MAKUAHINE ST INTERSECTION

SCALE: 1"=20'

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

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

6/1/98
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Andrew I. Miyasato

RONALD N. S. HO & ASSOC., INC.
ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN IA

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1
LIKELIKE HWY/MAKUAHINE ST INTERSECTION
PROJECT NO. 63A-01-97

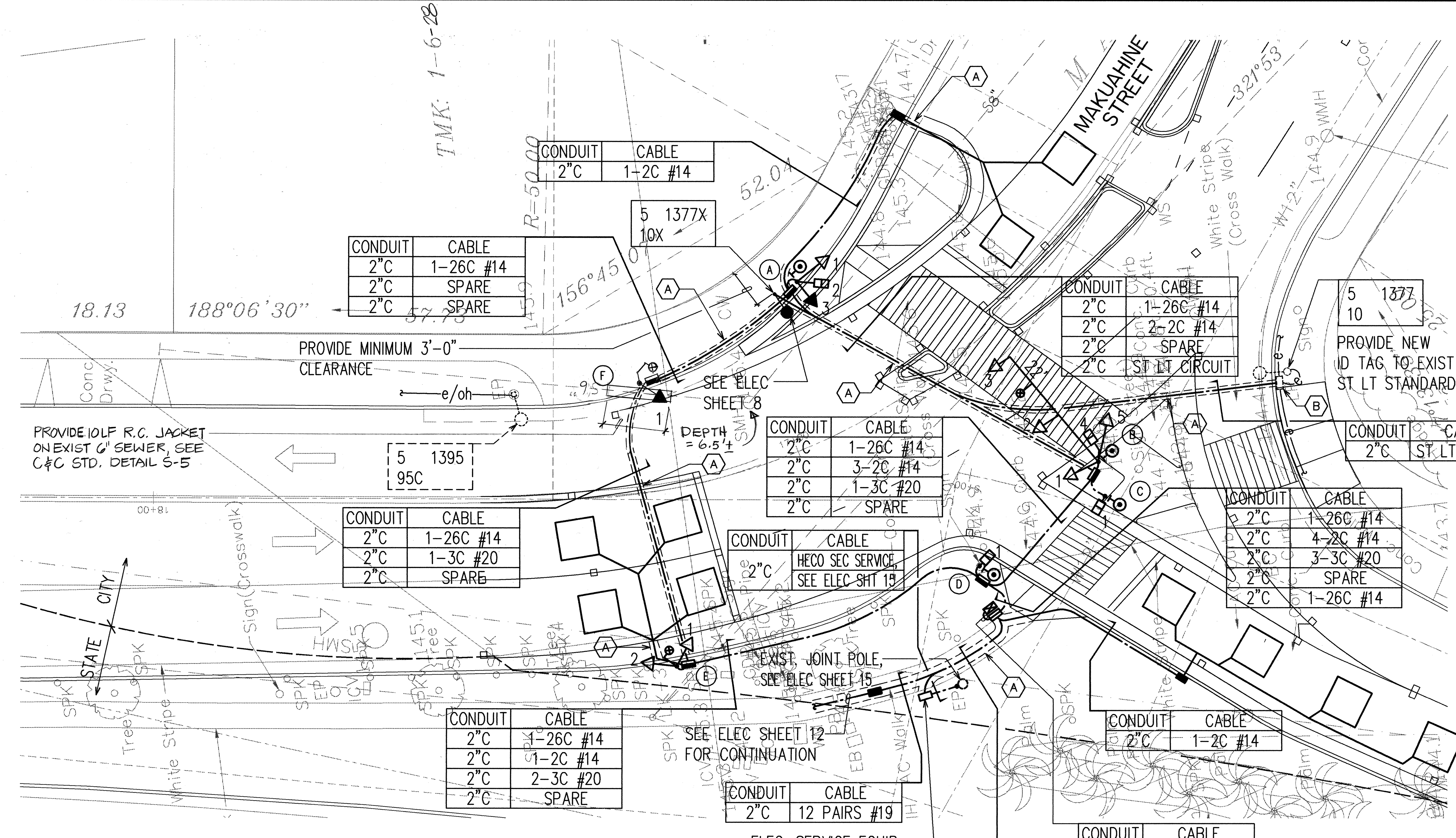
SCALE: AS NOTED DATE: MAY 1998

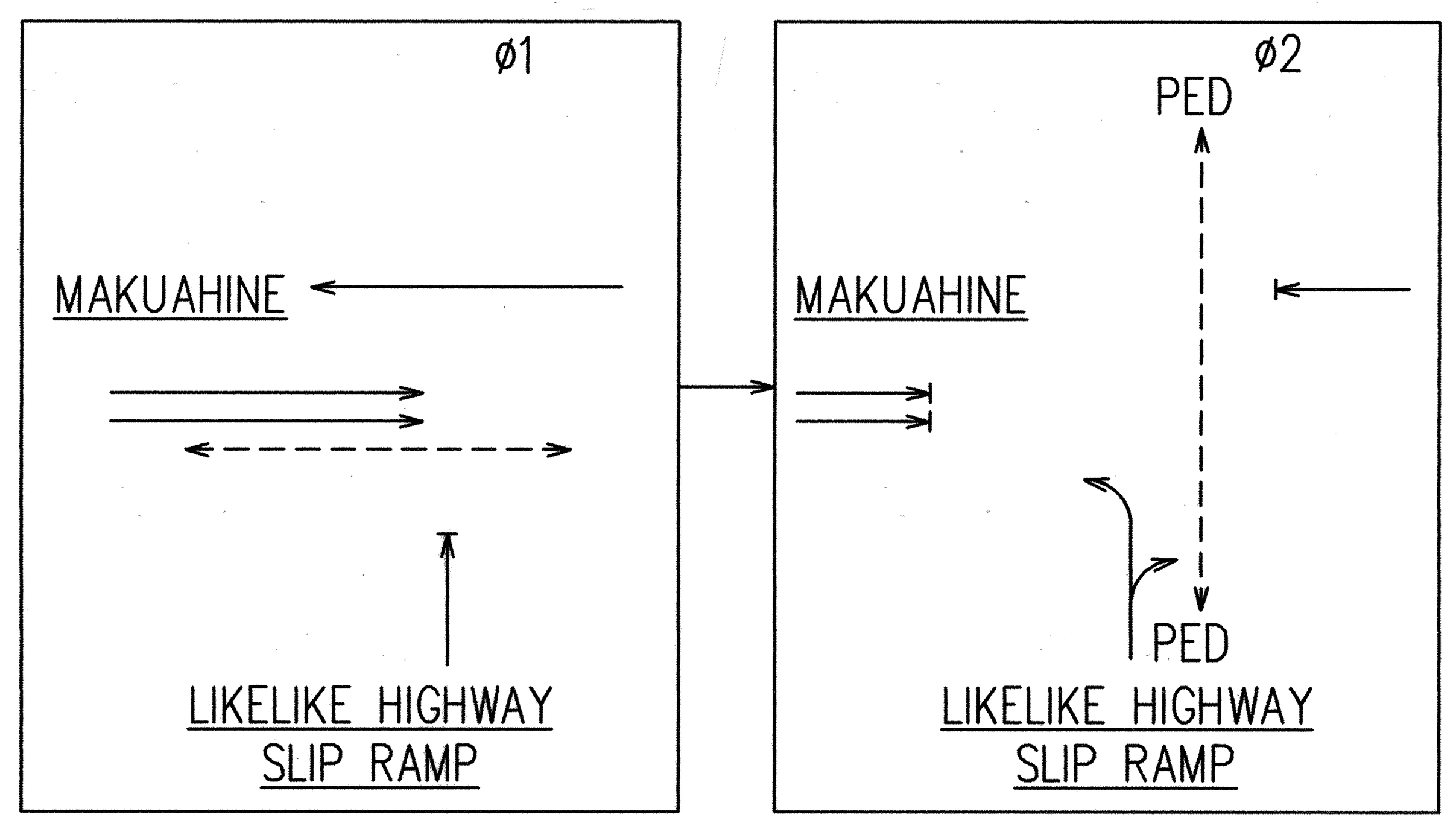
SHEET No. 12 OF 23 SHEETS

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

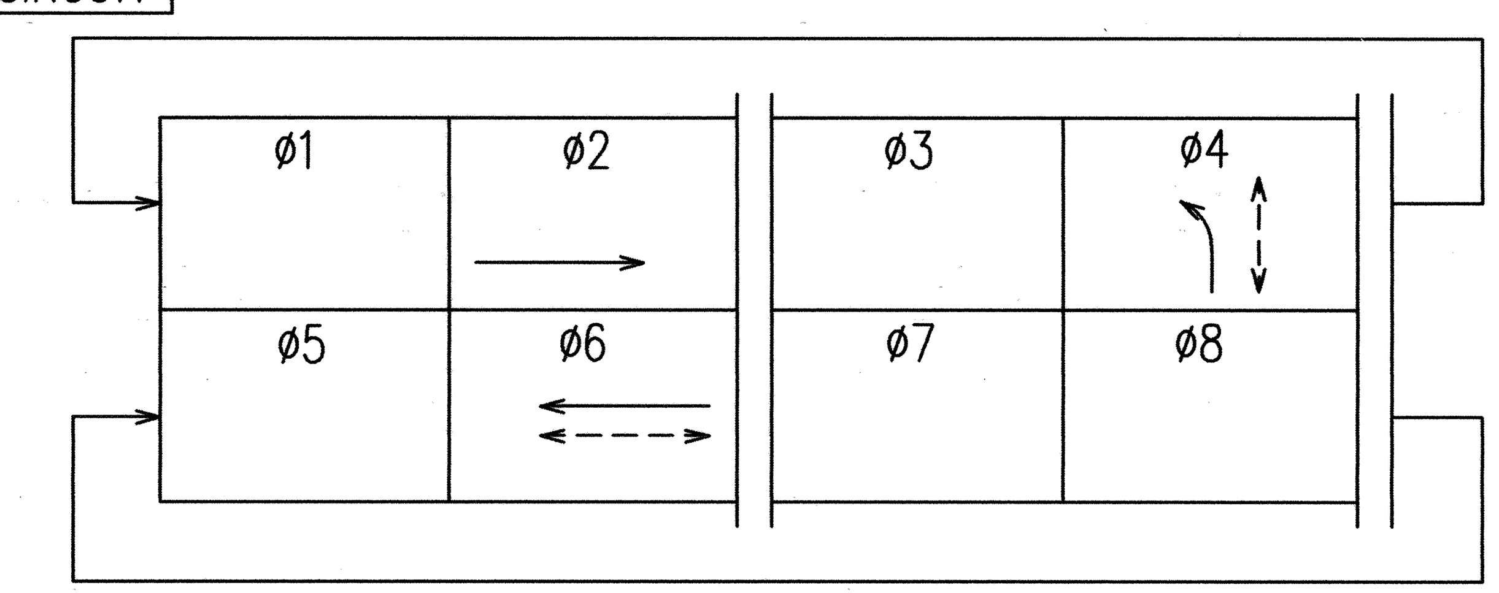
LAST SAVE: 05/27/98 @ 11:46:18 BY: TM PLOT SC 1=20'
Z:\ACAD\PROJECTS\97165\7165TSP2 XREFS: XRH0506B X2881RMK XRHR318A XRH-0506 XRH1

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	C.042	52





PHASE DIAGRAM



PHASE ASSIGNMENT DIAGRAM

DATE	REVISION
9/10/98	SHIFTED T.S. STANDARD "F" & ASSOC. PULLBOX TO CLEAR EXIST. 56" SEWER LINE (EXACT LOCATION TO BE DETERMINED IN FIELD) AND INDICATED R.C. JACKET FOR EXIST SEWER LINE

R / Y / ←	R / Y / G	(hand / walking person)	SIGNAL INDICATION
12" RYGA TRAFFIC SIGNAL HEAD	12" RYG TRAFFIC SIGNAL HEAD	PEDESTRIAN SIGNAL HEAD	DESCRIPTION
A-3 F-1	B-1 B-2 B-3 A-1 E-1 E-2 B-5	B-4 * C-1 A-2 * D-1	POLE LETTER-SIGNAL HEAD NUMBER

SIGNAL HEAD SCHEDULE

"*" DENOTES "MOIUNTED ON I-8 TRAFFIC SIGNAL STANDARD"

PLAN NOTE(S):

1. "(A)" DENOTES "SAW CUT EXISTING PAVEMENT AND SIDEWALK TO INSTALL DUCTS; RESTORE TO MATCH EXISTING". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF DUCTS.
2. "(B)" DENOTES "BREAK INTO EXISTING STREET LIGHT PULLBOX AS REQUIRED TO INSTALL NEW DUCT; RESTORE TO MATCH EXISTING". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF DUCTS.
3. ACTUAL LOCATIONS FOR NEW TRAFFIC SIGNAL STANDARDS AND PULLBOXES SHALL CONFORM TO REQUIREMENTS ON CURB RAMP DETAILS ON CIVIL SHEETS 21 TO 24.

NORTH

TRAFFIC SIGNAL PLAN IB
LIKELIKE HWY/MAKUAHINE ST INTERSECTION

SCALE: 1"=10'

APPROVED BY:

[signature] 8/7/98
CHIEF, CIVIL ENGINEERING BRANCH, D.P.P. — DATE

[signature] 6/22/98
CHIEF, ELECTRICAL ENGINEERING DIVISION, D.T.S. CITY AND COUNTY OF HONOLULU (FOR CONSTRUCTION WITHIN CITY AND COUNTY R.O.W. ONLY) — DATE

Dennis M. Nishimura 10/12/98
CHIEF, WASTEWATER BRANCH, D.P.P. — DATE

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

6/1/98
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Andrew I. Miyasato
RONALD N. S. HO & ASSOC., INC. ELECTRICAL ENGINEERS

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

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL PLAN IB

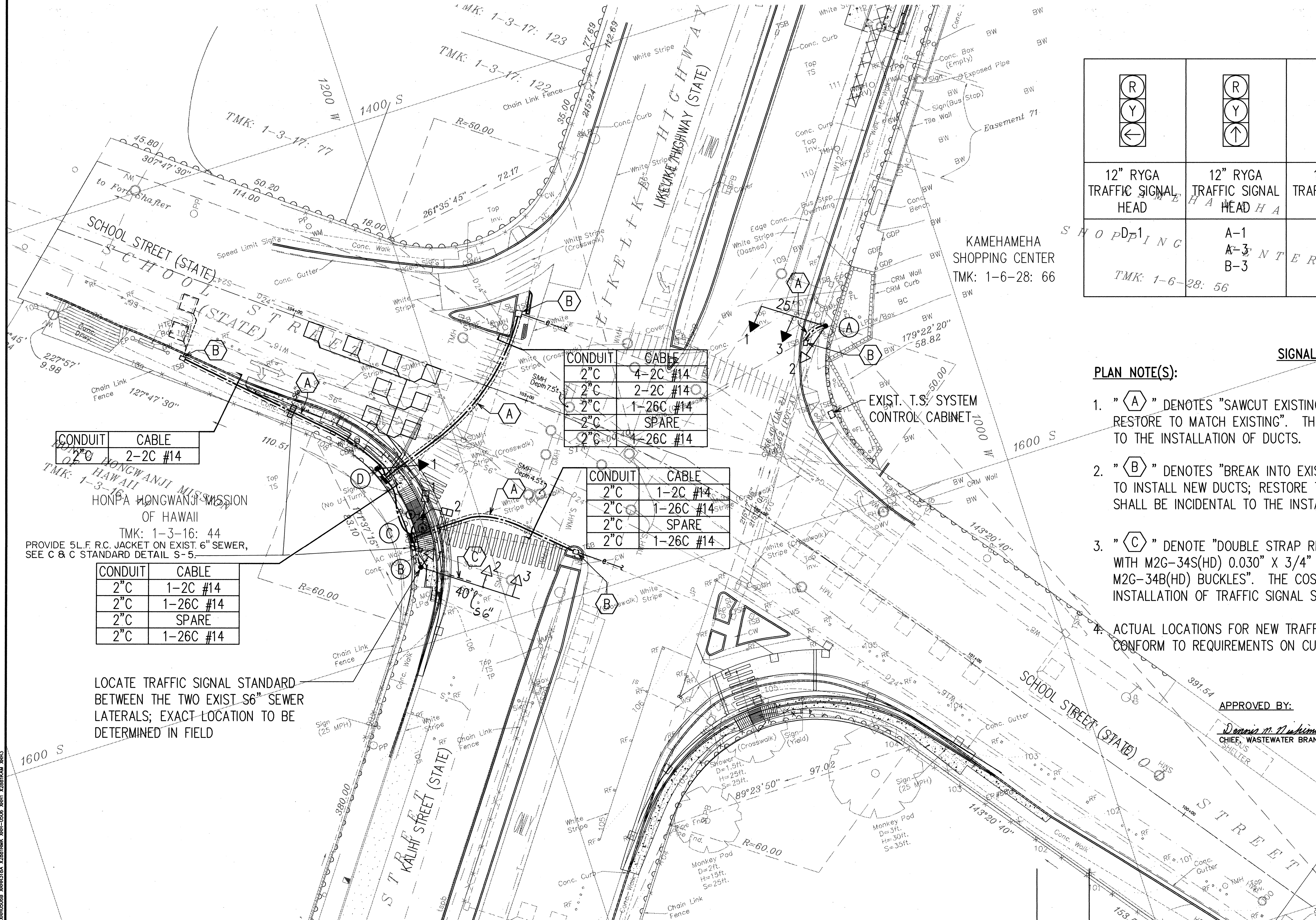
LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1
LIKELIKE HWY/MAKUAHINE ST INTERSECTION
PROJECT NO. 63A-01-97

SCALE: AS NOTED — DATE: MAY 1998

SHEET No. 13 OF 23 SHEETS

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

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	R43	52



CONDUIT	CABLE
2"C	4-2C #14
2"C	2-2C #14
2"C	1-26C #14
2"C	SPARE
2"C	1-26C #14

CONDUIT	CABLE
2"C	2-2C #14

CONDUIT	CABLE
2"C	1-2C #14
2"C	1-26C #14
2"C	SPARE
2"C	1-26C #14

CONDUIT	CABLE
2"C	1-2C #14
2"C	1-26C #14
2"C	SPARE
2"C	1-26C #14

R Y ←	R Y ↑	R Y G	(pedestrian symbol)	SIGNAL INDICATION
12" RYGA TRAFFIC SIGNAL HEAD	12" RYGA TRAFFIC SIGNAL HEAD	12" RYG TRAFFIC SIGNAL HEAD	PEDESTRIAN SIGNAL HEAD	DESCRIPTION
D-1	A-1 ~~A-3~~ B-3	A-2 B-1 B-2	*C-1 *C-2	POLE LETTER-SIGNAL HEAD NUMBER

"*" DENOTES "MOUNTING ON I-8 TRAFFIC SIGNAL STANDARD"

SIGNAL HEAD SCHEDULE

PLAN NOTE(S):

1. "⟨A⟩" DENOTES "SAWCUT EXISTING PAVEMENT AND SIDEWALK TO INSTALL DUCTS; RESTORE TO MATCH EXISTING". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF DUCTS.
2. "⟨B⟩" DENOTES "BREAK INTO EXISTING TRAFFIC SIGNAL PULLBOX AS REQUIRED TO INSTALL NEW DUCTS; RESTORE TO MATCH EXISTING". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF DUCTS.
3. "⟨C⟩" DENOTE "DOUBLE STRAP RELOCATED STREET NAME SIGN TO NEW MAST ARM WITH M2G-34S(HD) 0.030" X 3/4" HEAVY-DUTY STAINLESS STEEL STRAP AND M2G-34B(HD) BUCKLES". THE COST OF THIS WORK SHALL BE INCIDENTAL TO THE INSTALLATION OF TRAFFIC SIGNAL STANDARD AND MAST ARM.
4. ACTUAL LOCATIONS FOR NEW TRAFFIC SIGNAL STANDARDS AND PULLBOXES SHALL CONFORM TO REQUIREMENTS ON CURB RAMP DETAILS ON CIVIL SHEETS 21 TO 24.

APPROVED BY:

Dennis M. Nakimura 10/12/98
CHIEF, WASTEWATER BRANCH D.P.P. DATE

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

9/10/98
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Andrew I. Miyasato
RONALD N. S. HO & ASSOC., INC.
ELECTRICAL ENGINEERS

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

LAST SAVE: 09/10/98 @ 14:26:39 BY: RN PLOT SC 1=20'
Z:\ACAD\PROJECTS\97163\TSP3 XREFS: ...

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

TRAFFIC SIGNAL PLAN
LIKELIKE HWY/SCHOOL ST. INTERSECTION
SCALE: 1"=20'

DATE	REVISIONS
9/10/98	INDICATED ADDITIONAL SEWER LATERALS AND ADDED NOTE TO T.S. STANDARD "B"

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

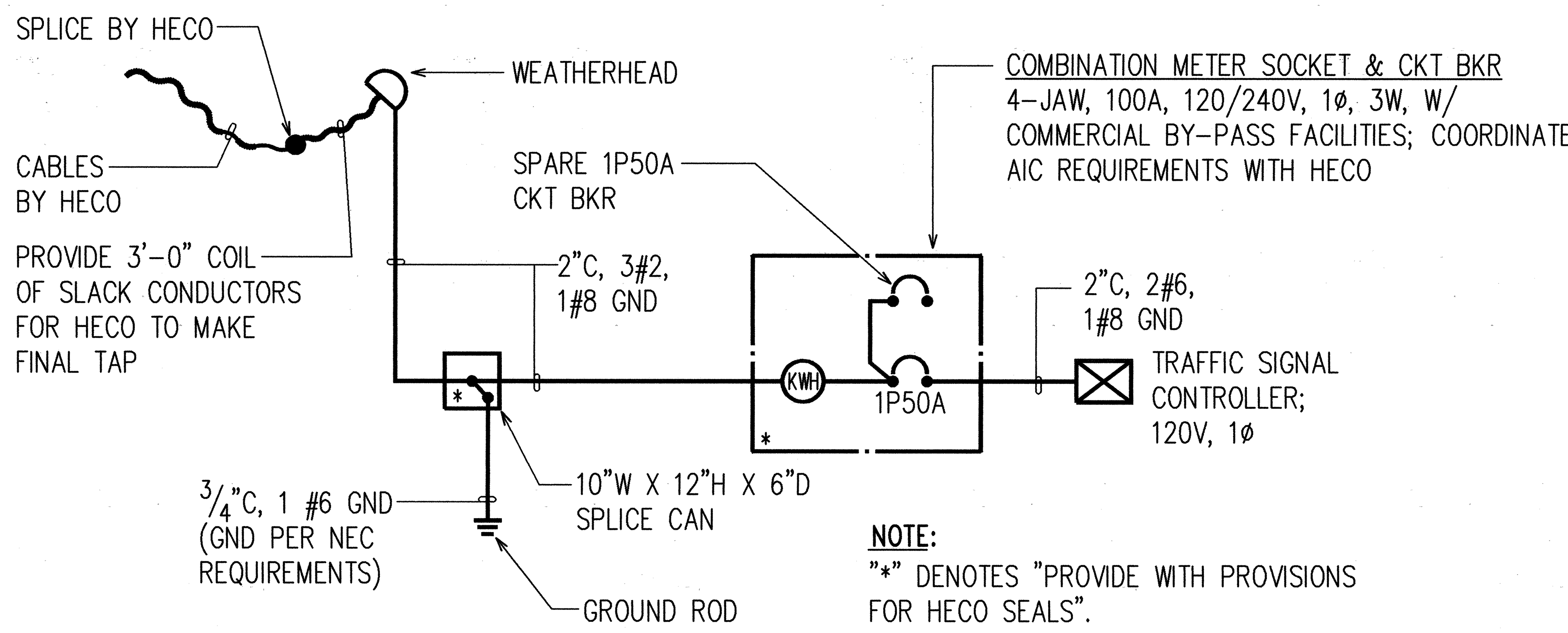
TRAFFIC SIGNAL PLAN

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1
LIKELIKE HWY/SCHOOL ST. INTERSECTION
PROJECT NO. 63A-01-97

SCALE: AS NOTED DATE: MAY 1998

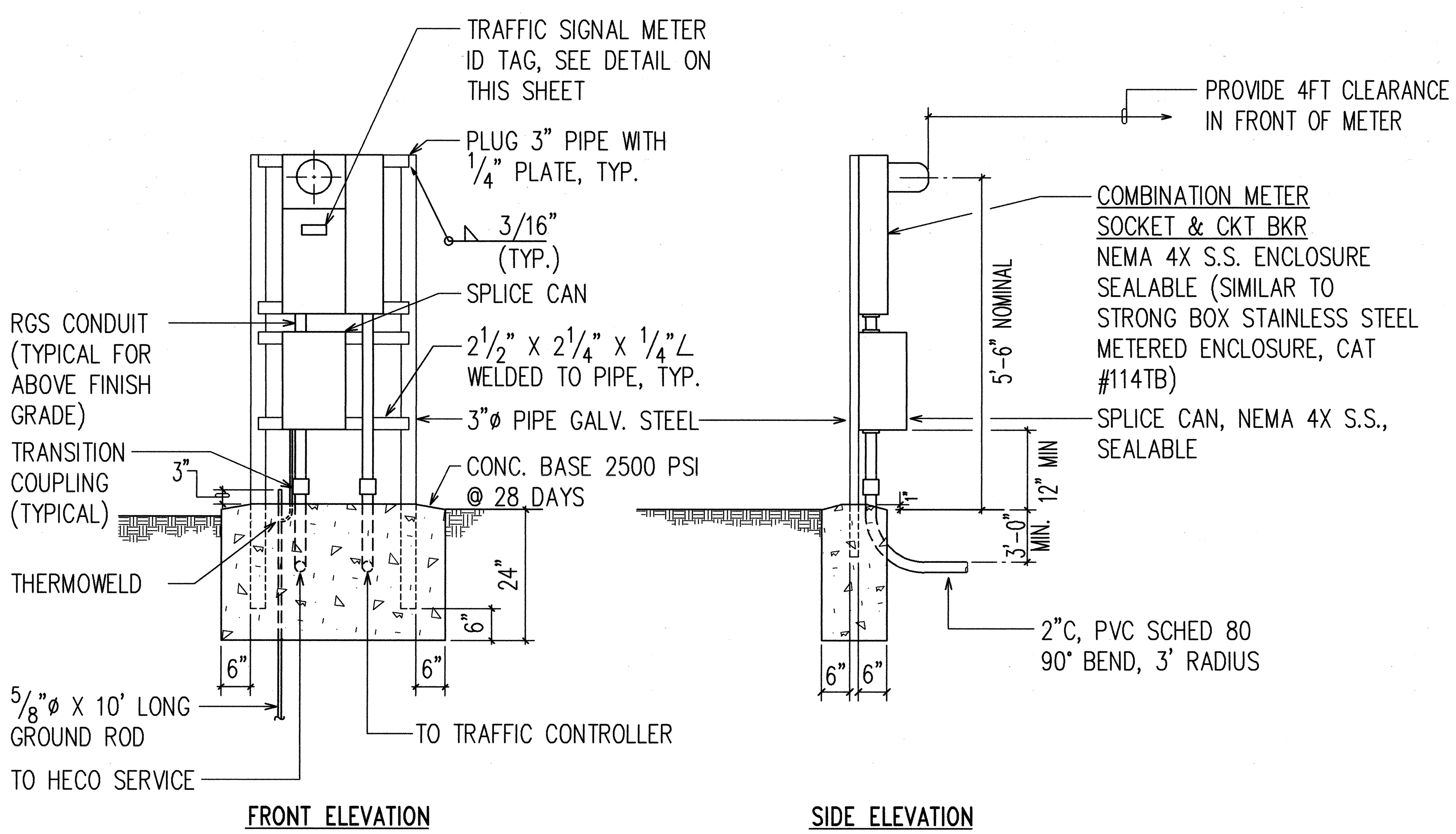
SHEET No. 14 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	44	52



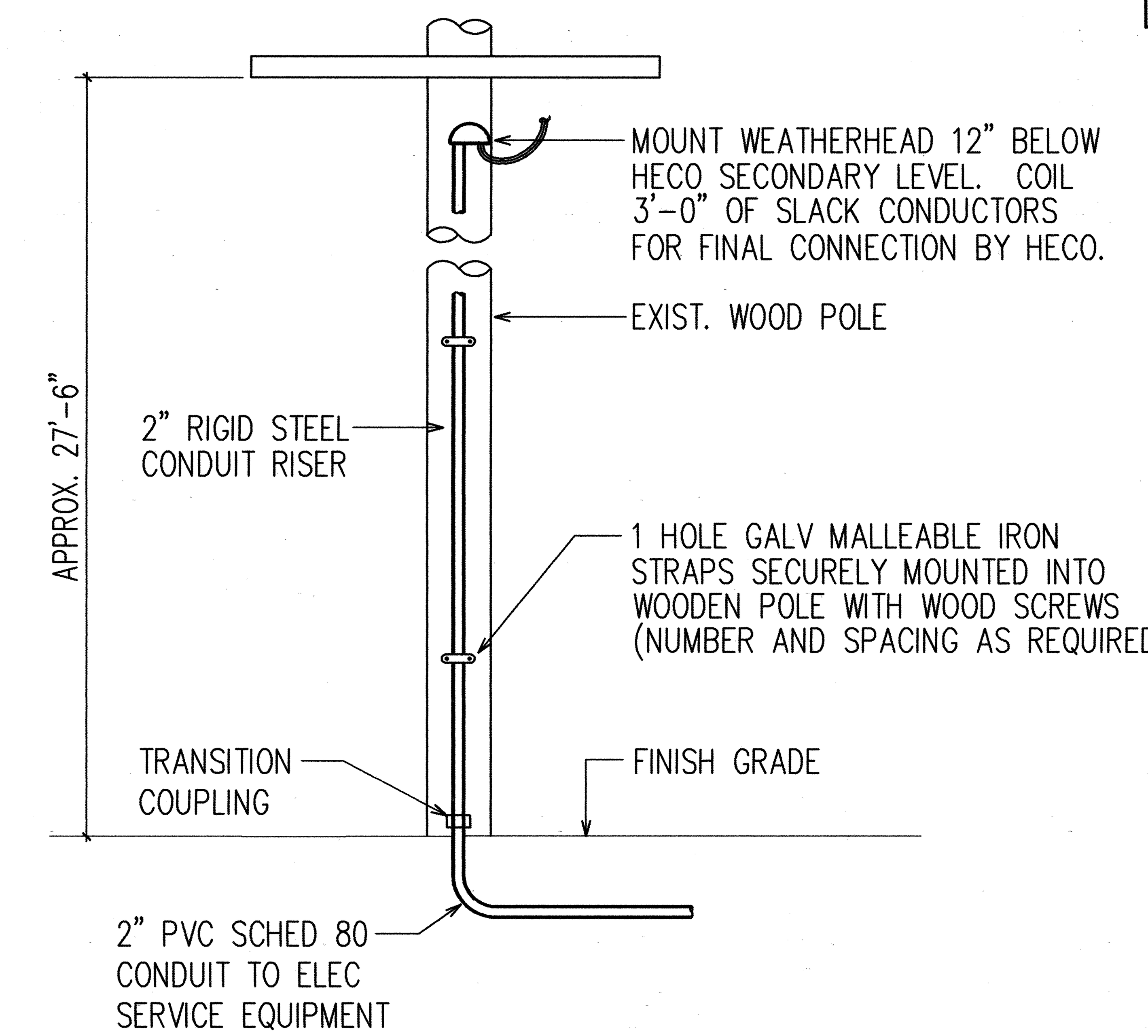
NOTE:
"*" DENOTES "PROVIDE WITH PROVISIONS FOR HECO SEALS".

ONE-LINE DIAGRAM

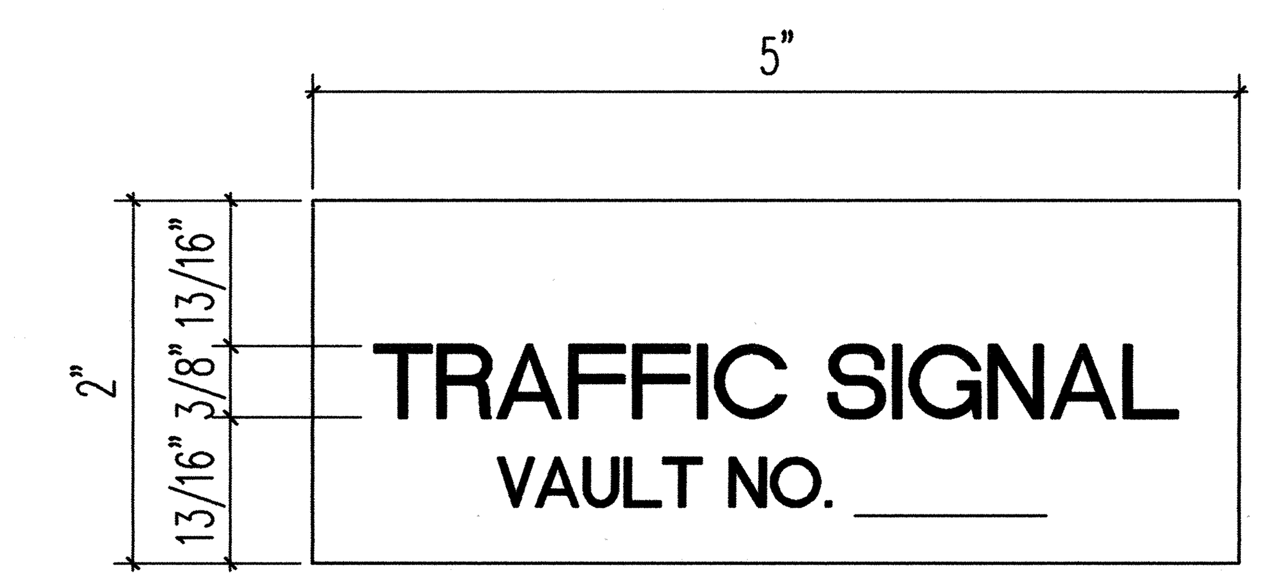


NOTES:
1. ALL CONDUITS TO CONTAIN A POLYOLEFIN PULL LINE (JET LINE CAT #232 OR EQUIV)
2. THE INSTALLATION OF THE METER PEDESTAL FOR UNDERGROUND SERVICE WILL NOT BE PAID FOR SEPARATELY BUT CONSIDERED INCIDENTAL TO THE METER SOCKET AND BREAKER.
3. PEDESTAL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
4. ALL FASTENING BOLTS, NUTS & WASHERS SHALL BE STAINLESS STEEL.
5. MATERIAL CONSTRUCTION/INSTALLATION OF ALL METERING FACILITIES AND ASSOCIATED EQUIPMENT SHALL MEET REQUIREMENTS OF HECO'S ESIM (LATEST REVISION), NEC AND EUSERC.

ELECTRICAL SERVICE EQUIPMENT DETAIL
NOT TO SCALE



NEW CONDUIT RISER ON EXIST WOOD POLE
NOT TO SCALE



NOTES:
1. USE 3-PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK THICKNESS: BLACK CAP SHEET - 0.010", WHITE BASE SHEET - 0.052", BLACK BASE SHEET - 0.010".
2. ATTACH TO METER SOCKET USING SCOTCH 3M BRAND VERY HIGH BOND (VHB) DOUBLE COATED ACRYLIC FOAM TAPE OR EQUIVALENT.
3. LETTERS/NUMBERS SHALL BE 3/8" HIGH, 1/16" STROKE (WHITE IN COLOR).
4. LETTERS/NUMBERS AREA INSCRIBED BY CUTTING THROUGH "BLACK CAP SHEET" TO EXPOSE WHITE LETTERS/NUMBERS.

TRAFFIC SIGNAL METER ID TAG DETAIL
NOT TO SCALE

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

6/1/98
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
Andrew I. Miyasato
RONALD N. S. HO & ASSOC., INC.
ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

ONE-LINE DIAGRAM, SERVICE EQUIPMENT DETAIL

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97

SCALE: AS NOTED — DATE: MAY 1998

SHEET No. 15 OF 23 SHEETS

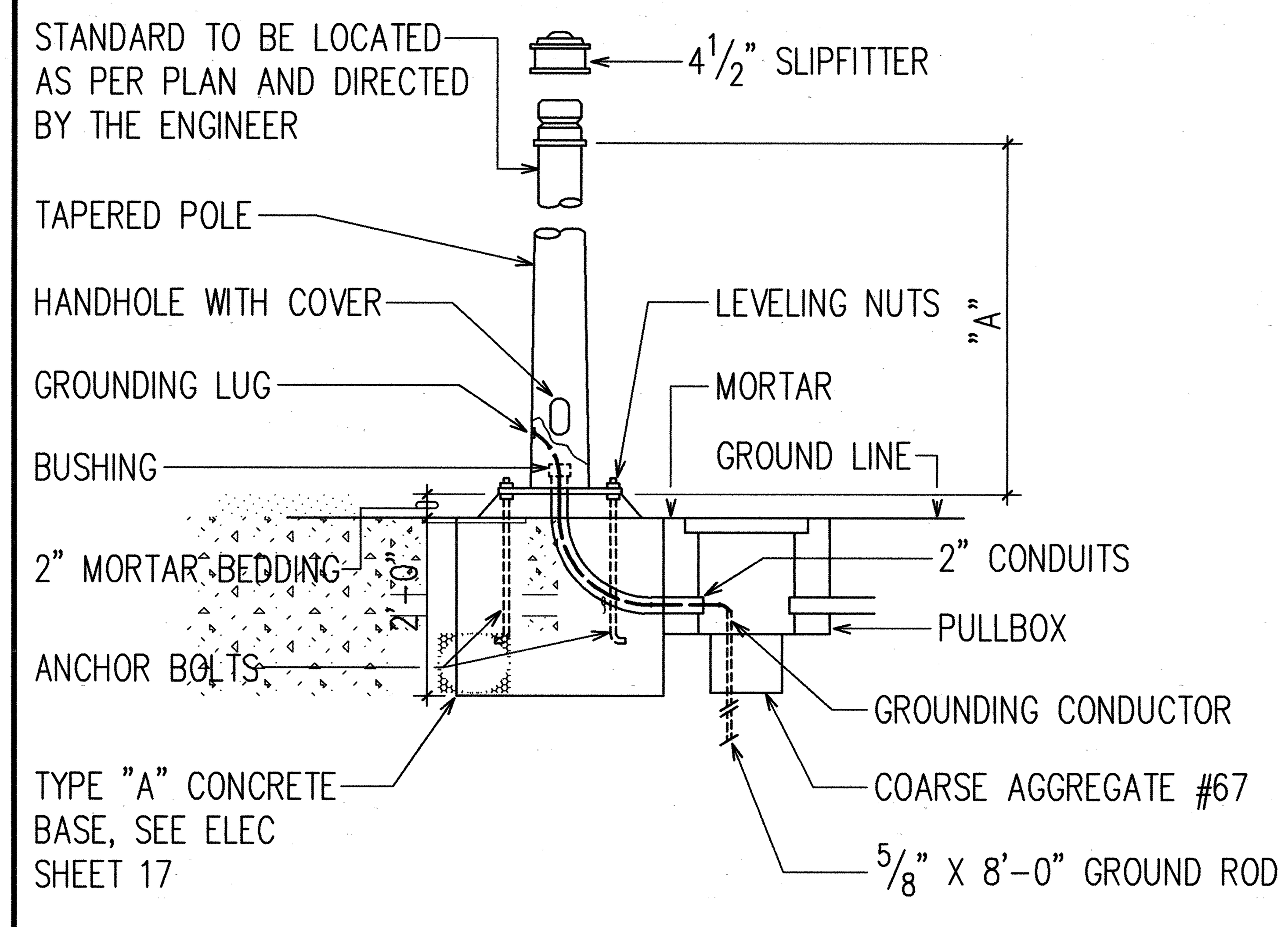
ORIGINAL PLAN / NOTE BOOK No. — SURVEY PLOTTED BY / DRAWN BY / TRACED BY / DESIGNED BY / QUANTITIES BY / CHECKED BY — DATE

LAST SAVE: 05/27/98 @ 09:49:60 BY: TM PLOT SC: 1"=2'=1
Z:\ACAD\PROJECTS\97165\716501

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	45	52

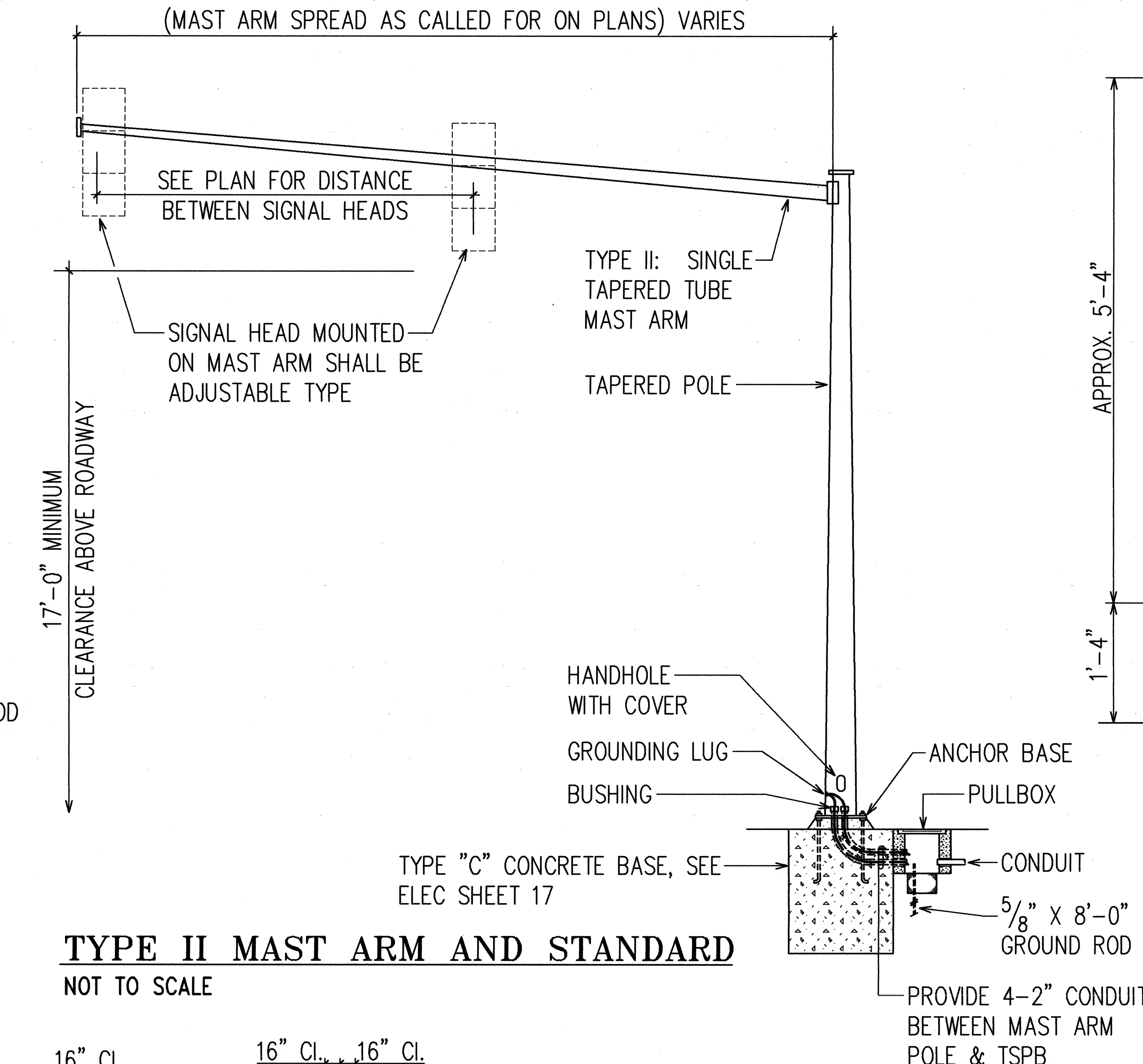
	TYPE OF STANDARD	"A"
*	I-8	8'-0"
	I-10	10'-0"

"*" DENOTES "APPLICABLE ONLY WHERE INDICATED ON PLANS".

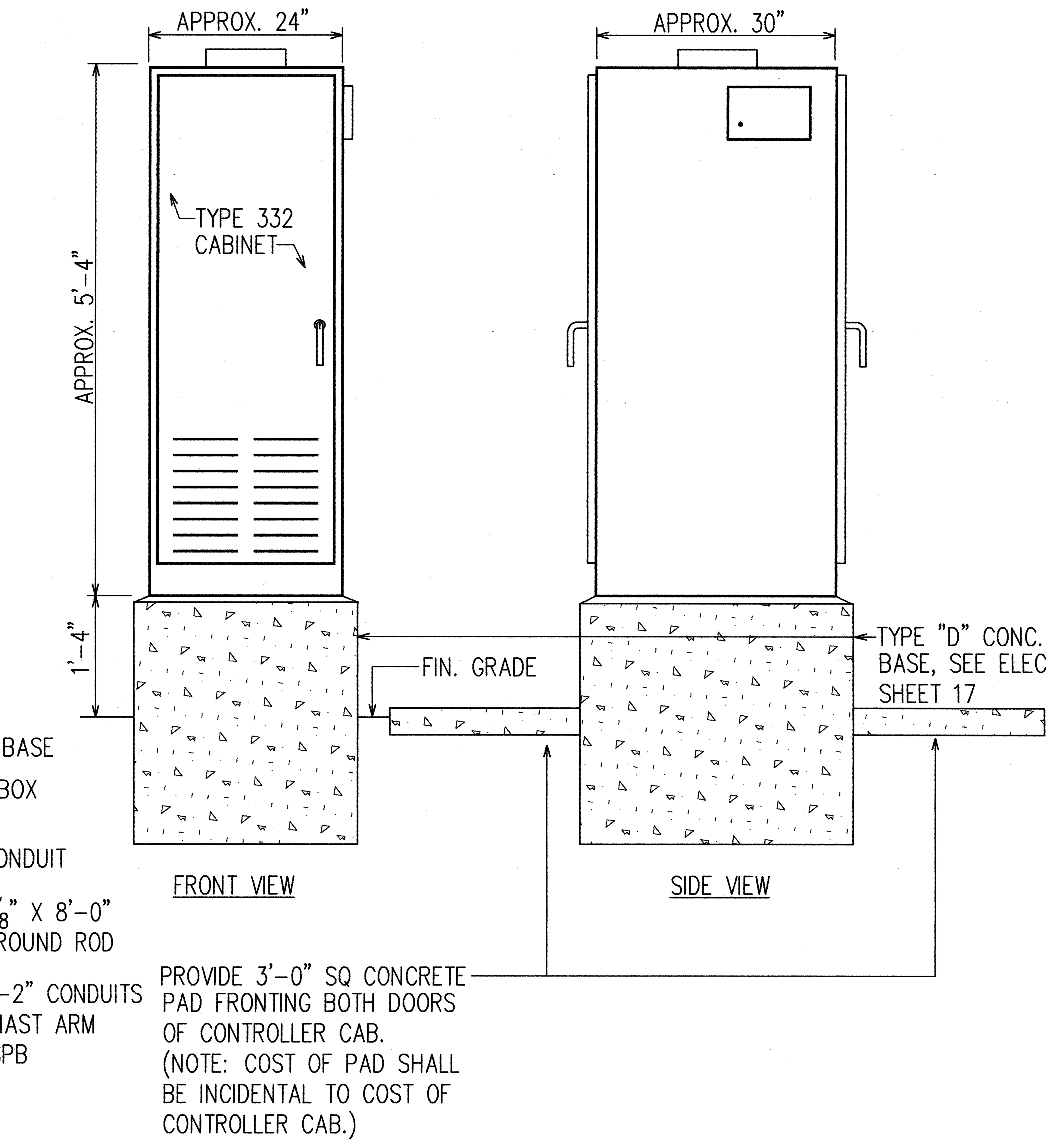


NOTE:
FOOTINGS IN SIDEWALK AREAS SHALL BE FLUSH WITH SIDEWALK.

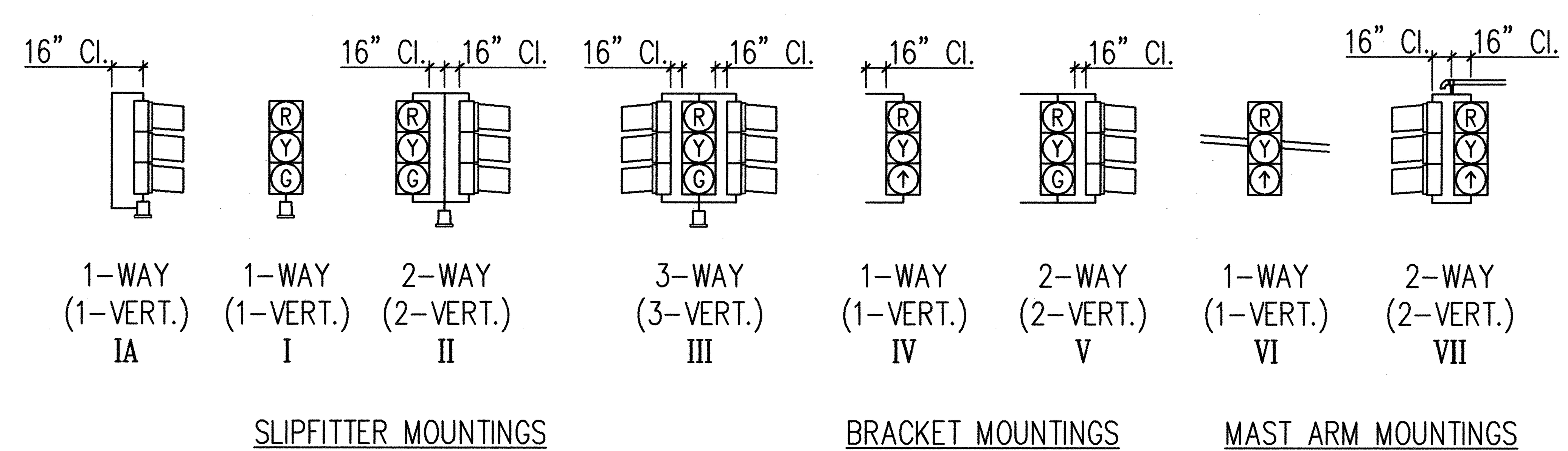
TYPE I SIGNAL STANDARD
NOT TO SCALE



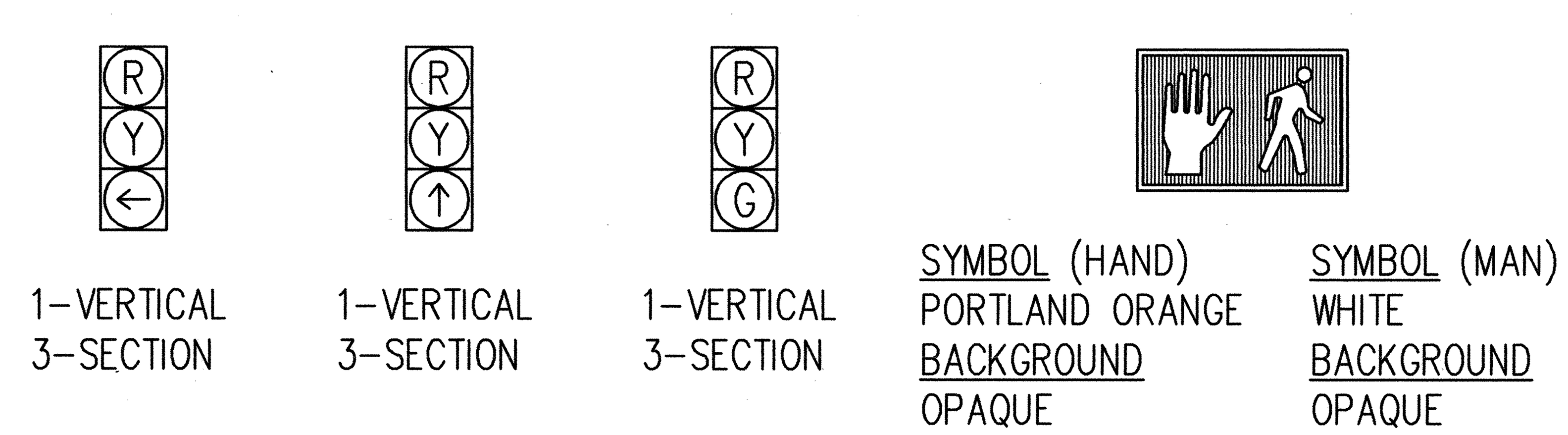
TYPE II MAST ARM AND STANDARD
NOT TO SCALE



CONTROLLER CABINET – TYPE 332
NOT TO SCALE



TYPICAL VEHICULAR AND PEDESTRIAN SIGNAL MOUNTINGS



TYPICAL SIGNAL ARRANGEMENTS

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
6/1/98
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.
RONALD N. S. HO & ASSOC., INC. ELECTRICAL ENGINEERS

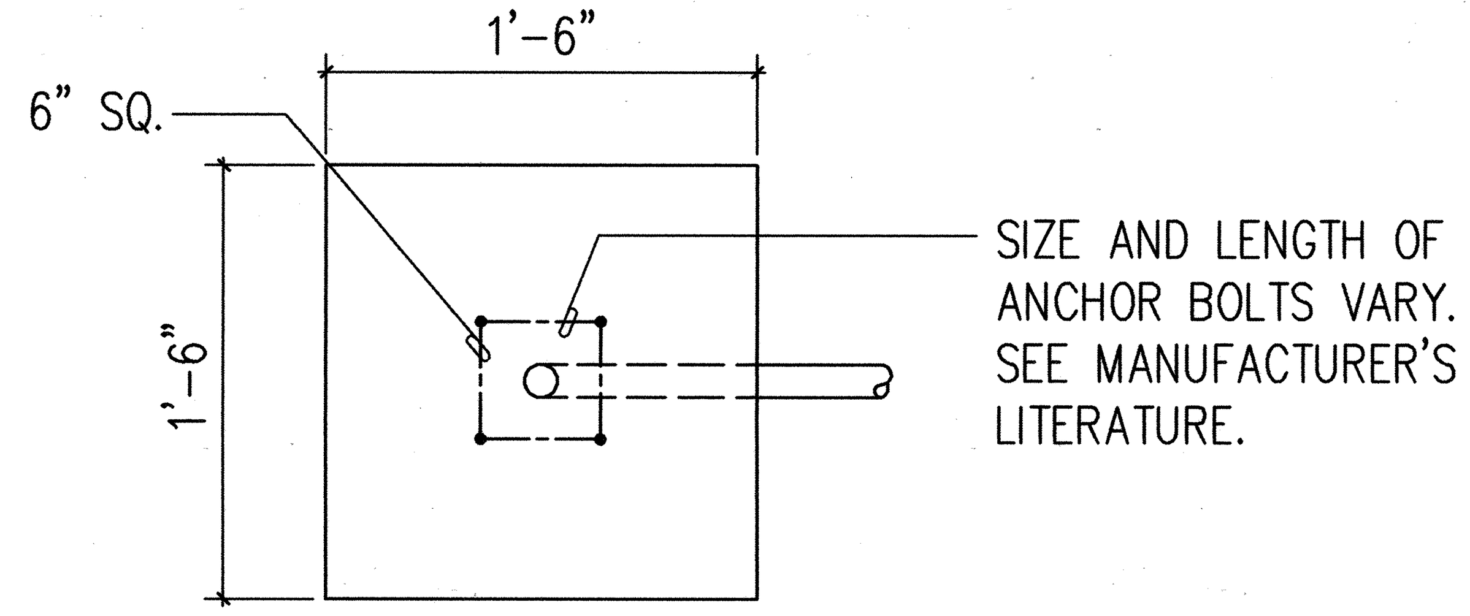
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS I

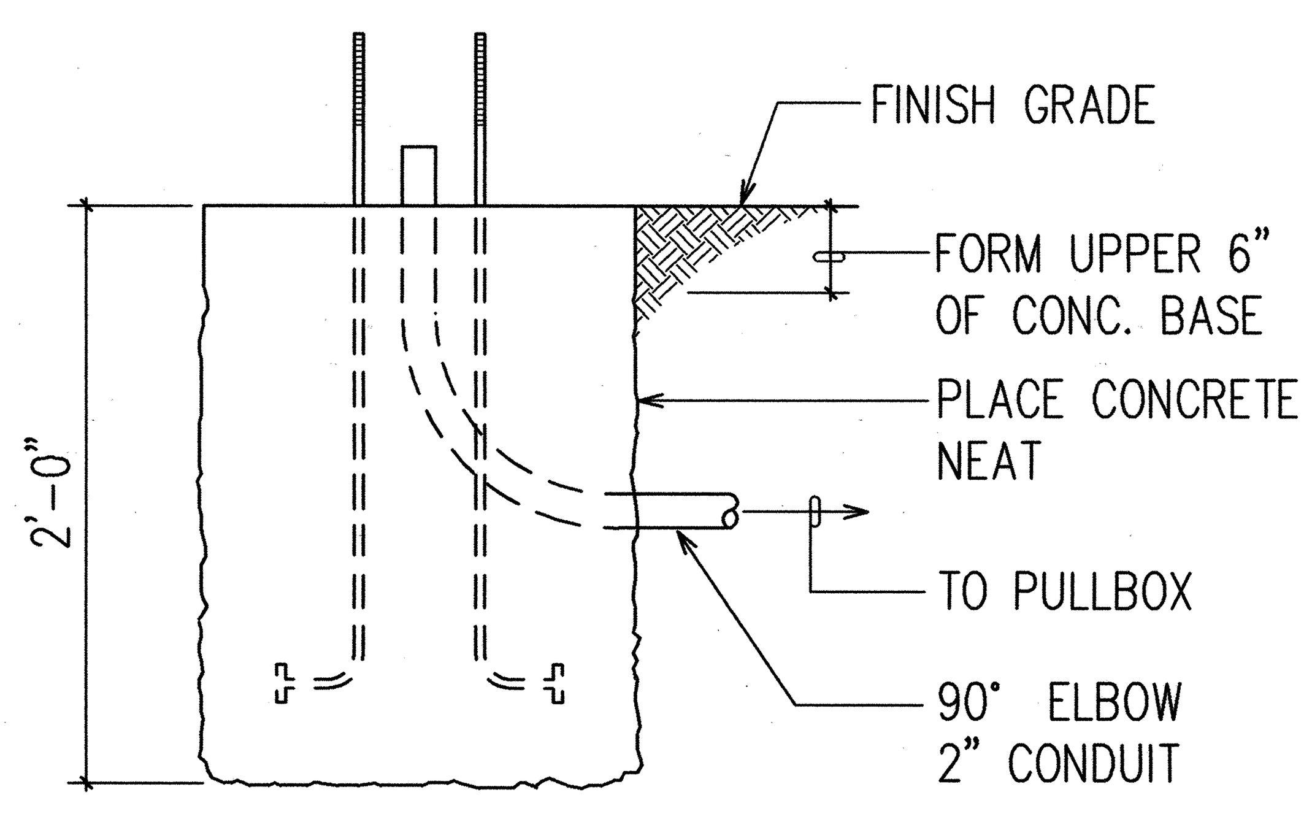
LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97
SCALE: AS NOTED DATE: MAY 1998
SHEET No. 16 OF 23 SHEETS

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	46	52



PLAN



SECTION

NOTES:

1. CONCRETE SHALL BE CLASS "B".
2. TYPE "A" CONCRETE BASE SHALL BE USED FOR TYPE I-10 AND I-8 STANDARDS.
3. CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE CONSTRUCTION.

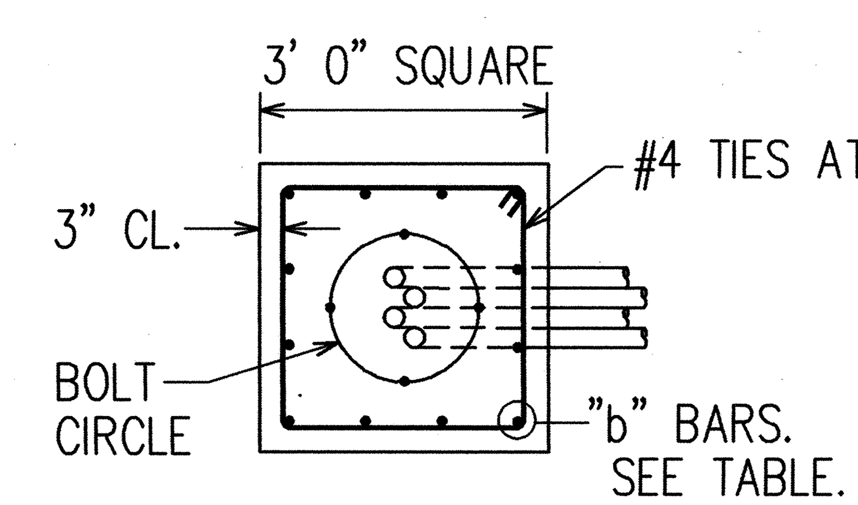
TYPE "A" CONCRETE BASE

NOT TO SCALE

TYPE "C" CONCRETE BASE		
TYPE OF STANDARD	"a"	"b" BARS
II - 18	5' - 0"	12 - #6
II - 20	5' - 6"	12 - #6
* II - 25	6' - 0"	12 - #6
II - 30	6' - 6"	12 - #8
II - 35	7' - 0"	12 - #8
* II - 40	8' - 0"	12 - #8
III - 18	5' - 6"	12 - #6
III - 20	6' - 0"	12 - #6
III - 25	6' - 6"	12 - #8
III - 30	7' - 0"	12 - #8
III - 35	7' - 6"	12 - #8
III - 40	8' - 0"	12 - #8

TYPICAL STANDARD DESIGNATION: II - 25 (TYPE: II; MAST ARM LENGTH: 25)

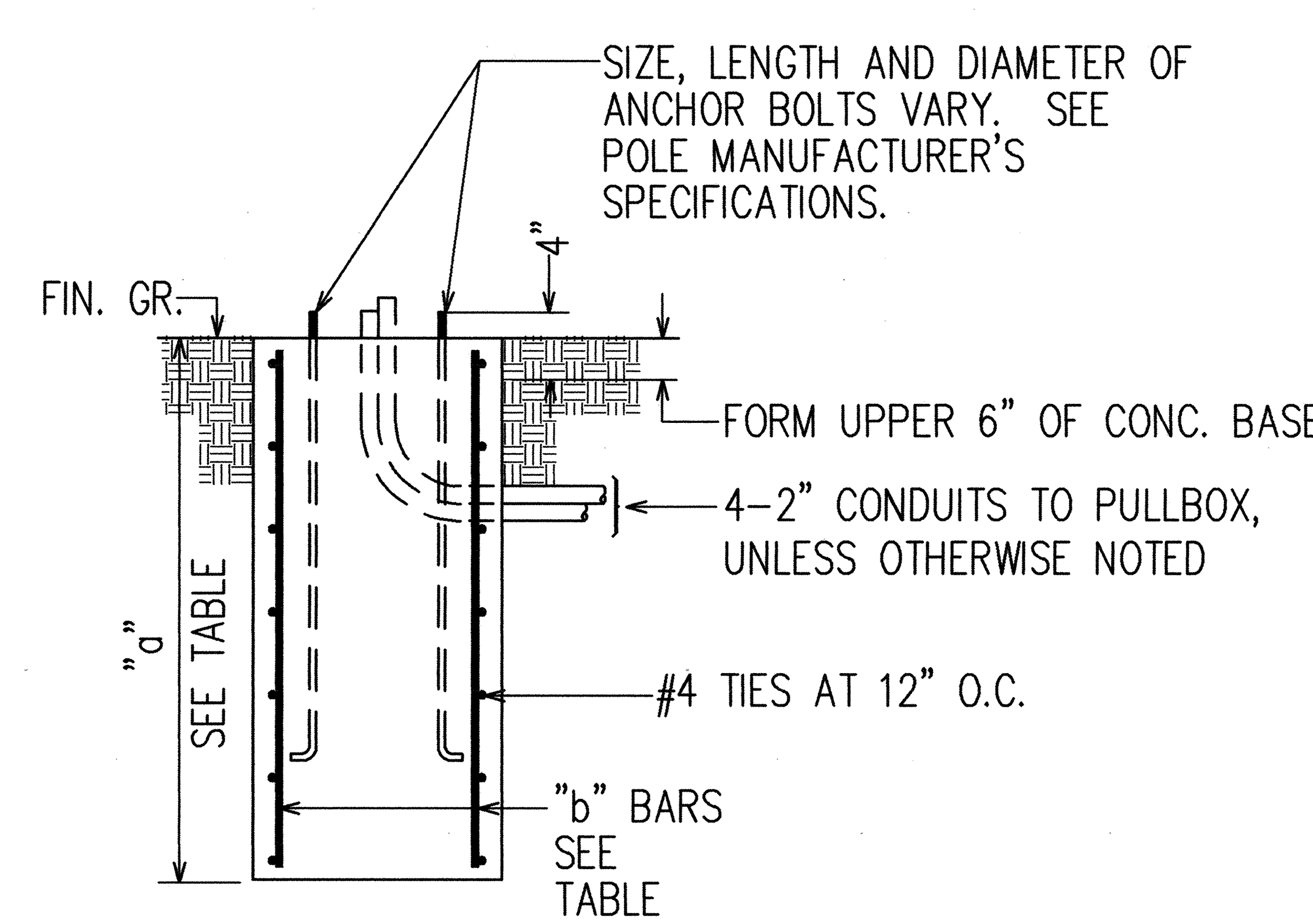
"*" DENOTES SIZE OF STANDARD APPLICABLE TO THIS PROJECT



PLAN - SECTION

NOTES:

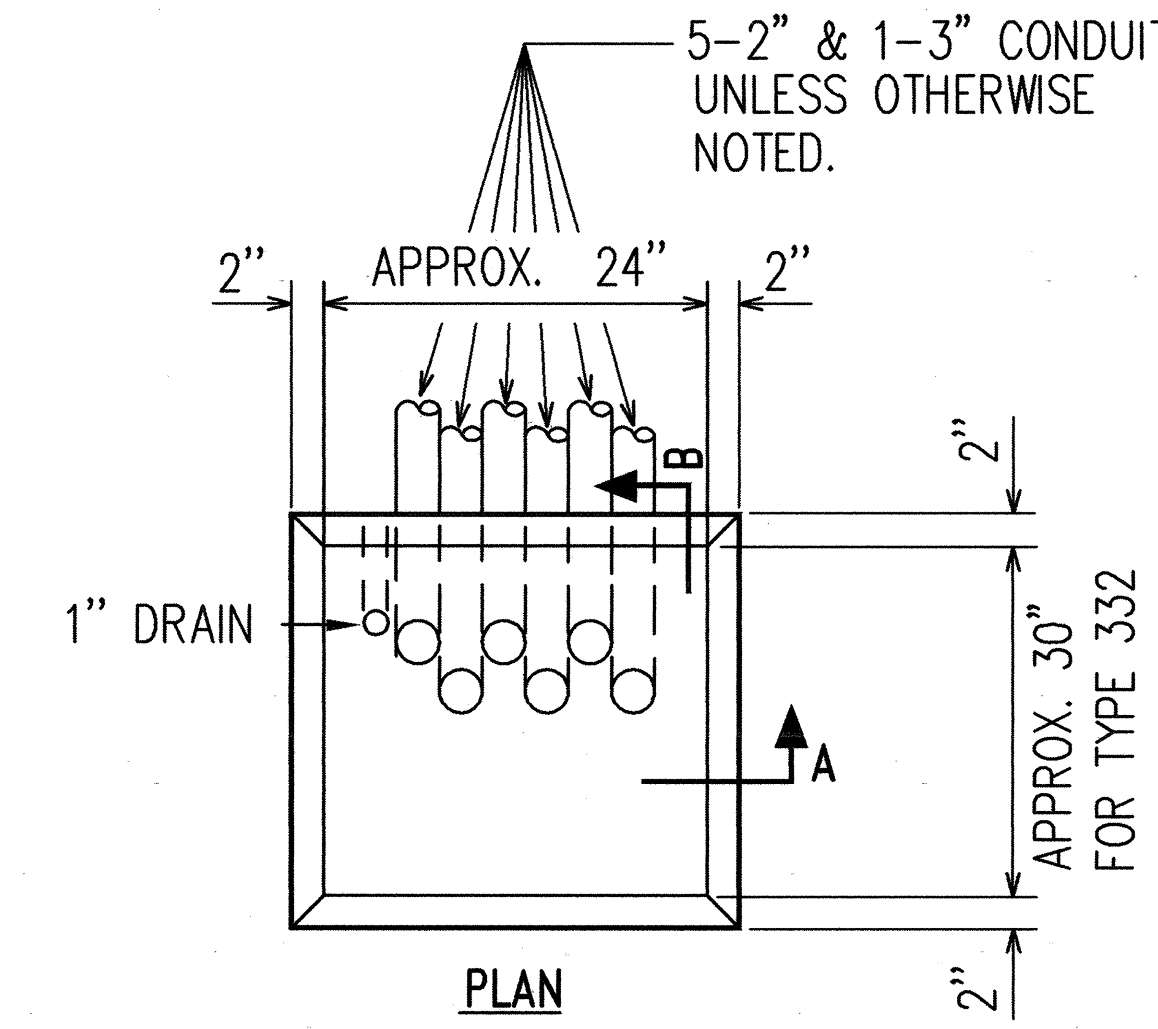
1. CONCRETE SHALL BE CLASS "B".
2. TYPE "C" CONCRETE BASE SHALL BE USED FOR TYPE II AND III TRAFFIC SIGNAL STANDARDS.
3. DESIGN LATERAL PRESSURE: 1,500 PSF.
4. CONDUIT BEND IS INCIDENTAL TO CONCRETE BASE.



VERTICAL SECTION

TYPE "C" CONCRETE BASE

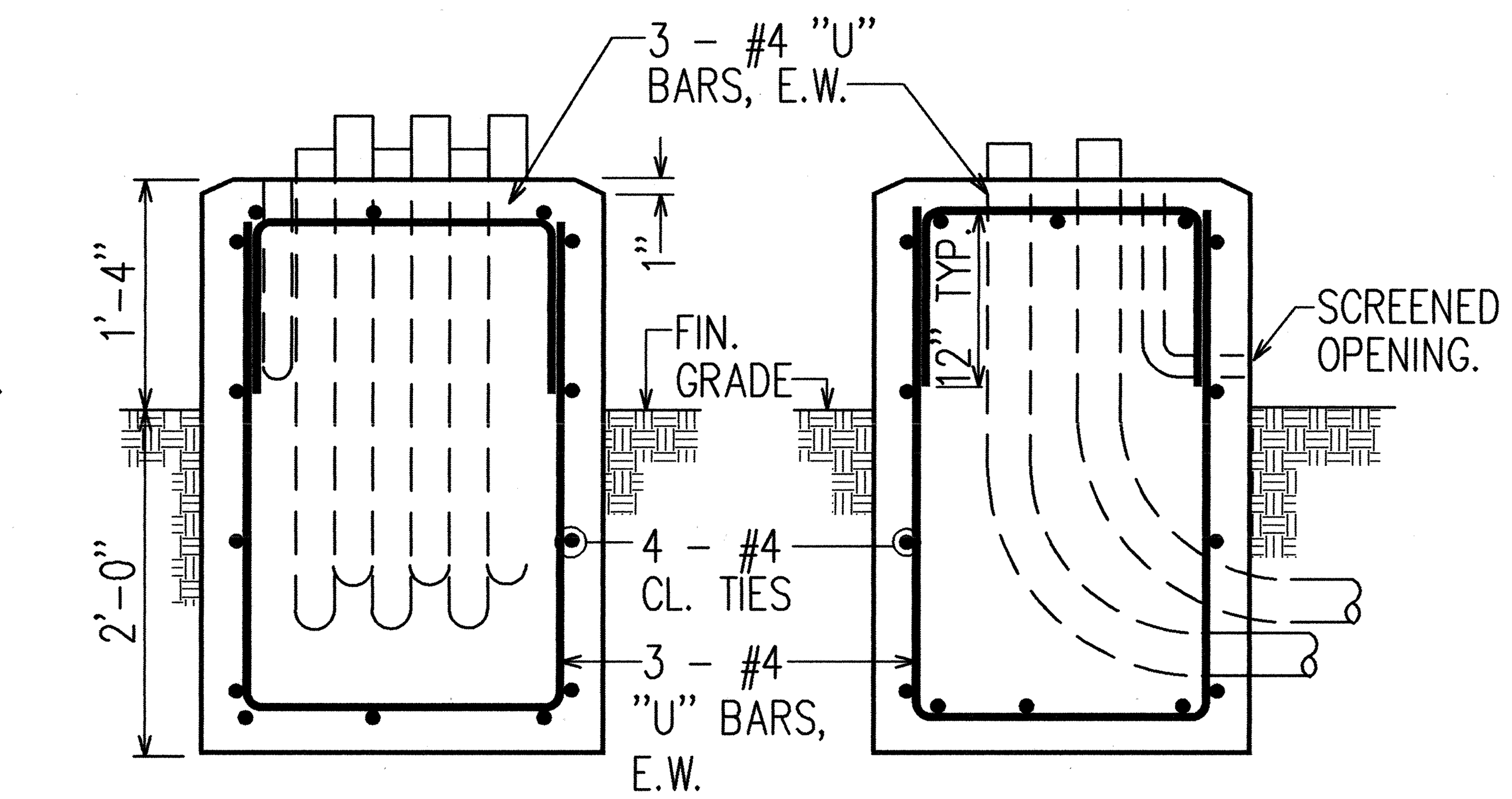
NOT TO SCALE



PLAN

NOTES:

1. CONCRETE SHALL BE CLASS "B".
2. DIMENSIONS SHALL BE ALTERED TO SUIT CONTROLLER CABINET ACTUALLY FURNISHED.
3. CONDUIT BENDS AND DRAIN ARE INCIDENTAL TO CONCRETE BASE.
4. REFER TO CABINET MANUFACTURER'S SPECIFICATIONS FOR DETAILS OF ANCHOR BOLTS AND BASE SETTING.
5. ALL EXPOSED SURFACES OF CONCRETE BASE SHALL BE GIVEN A CLASS 2, RUBBED FINISH.



SECTION "A" SECTION "B"

TYPE "D" CONC. BASE FOR CONTROLLER CABINET

NOT TO SCALE

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4940-E HAWAII, U.S.A.
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RONALD N. S. HO & ASSOC., INC. ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

CONCRETE BASE DETAILS II

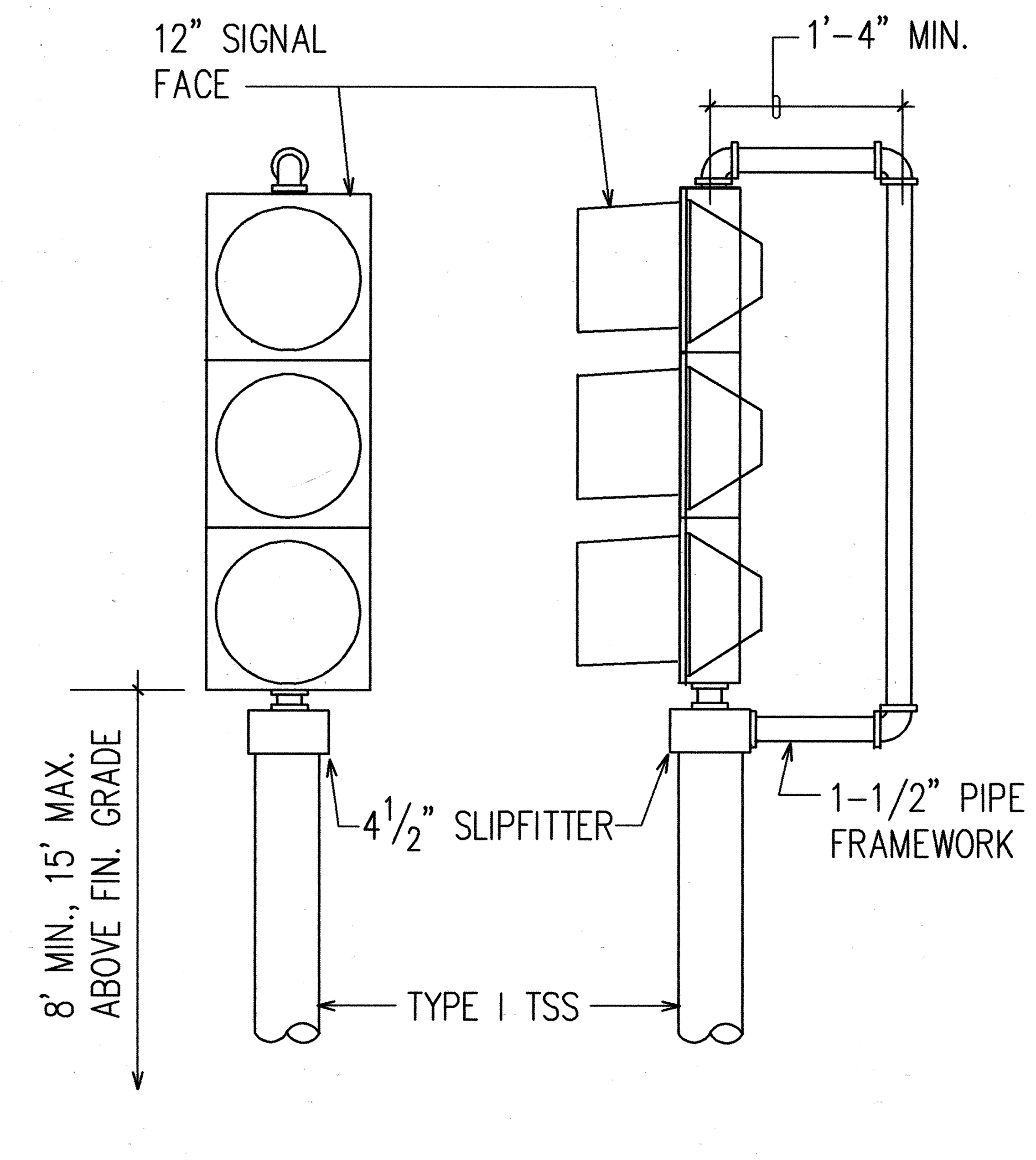
LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97

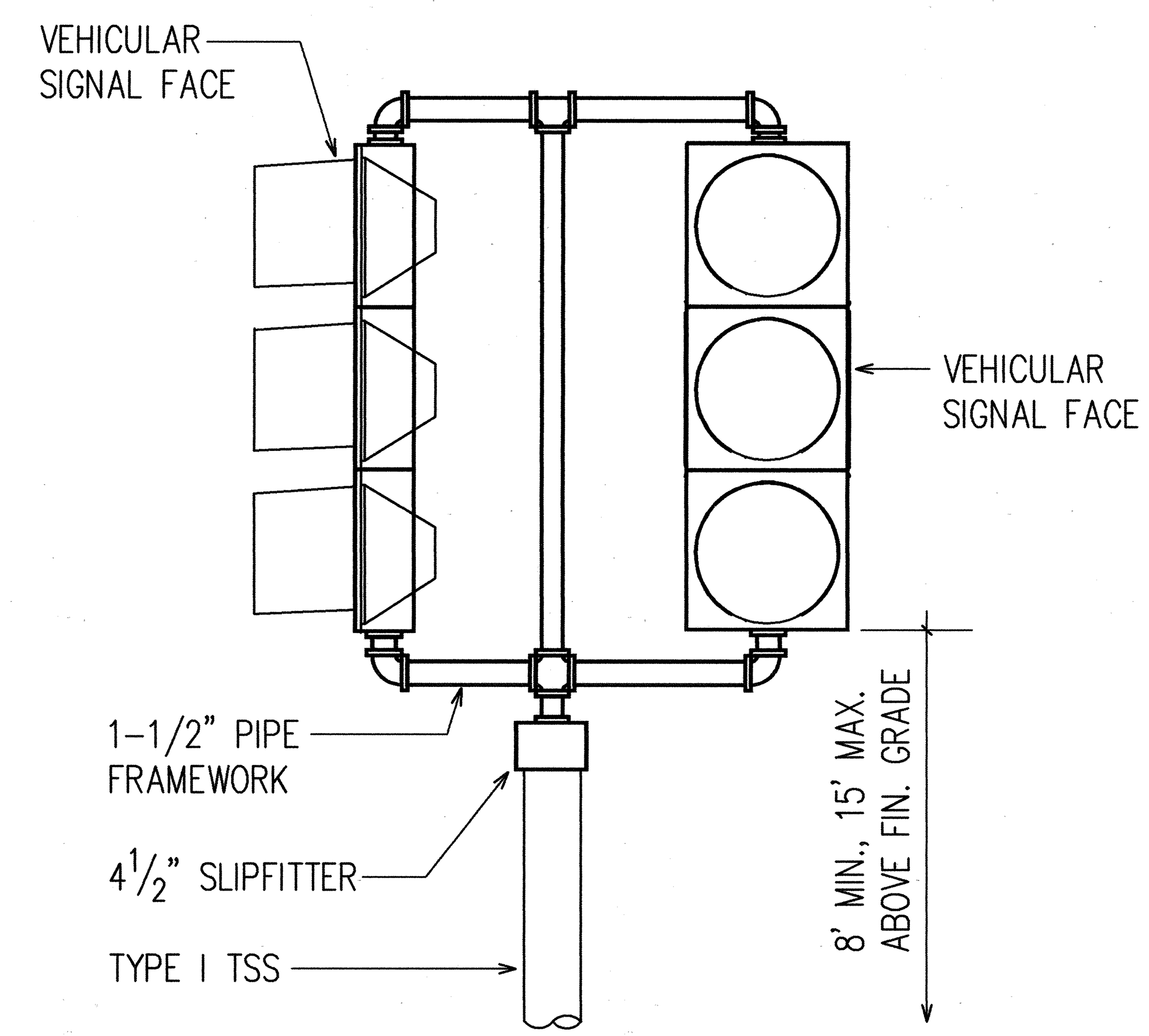
SCALE: AS NOTED DATE: MAY 1998

SHEET No. 17 OF 23 SHEETS

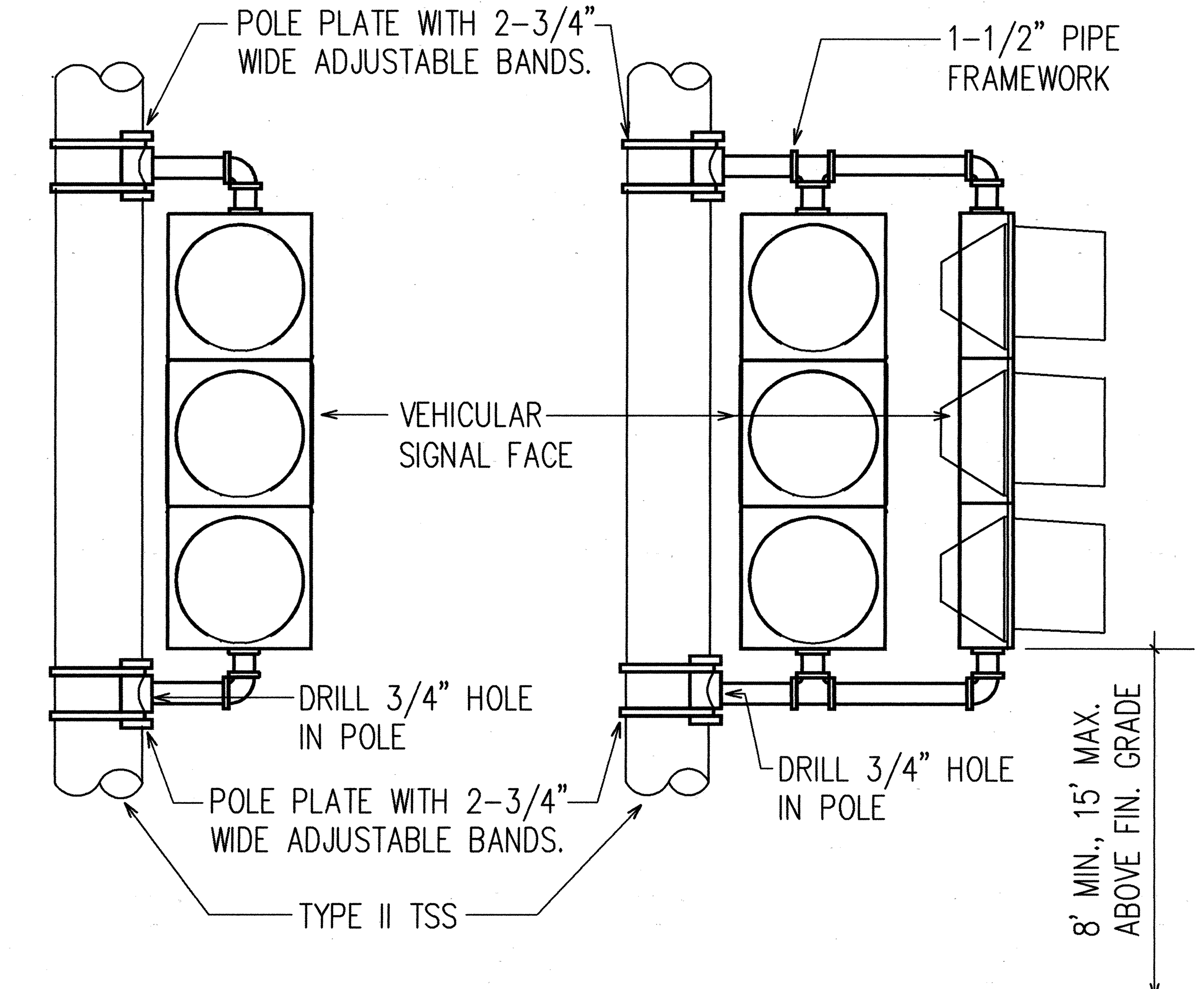
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	47	52



TOP OF POLE - ONE WAY MOUNTING



TOP OF POLE - TWO WAY MOUNTING

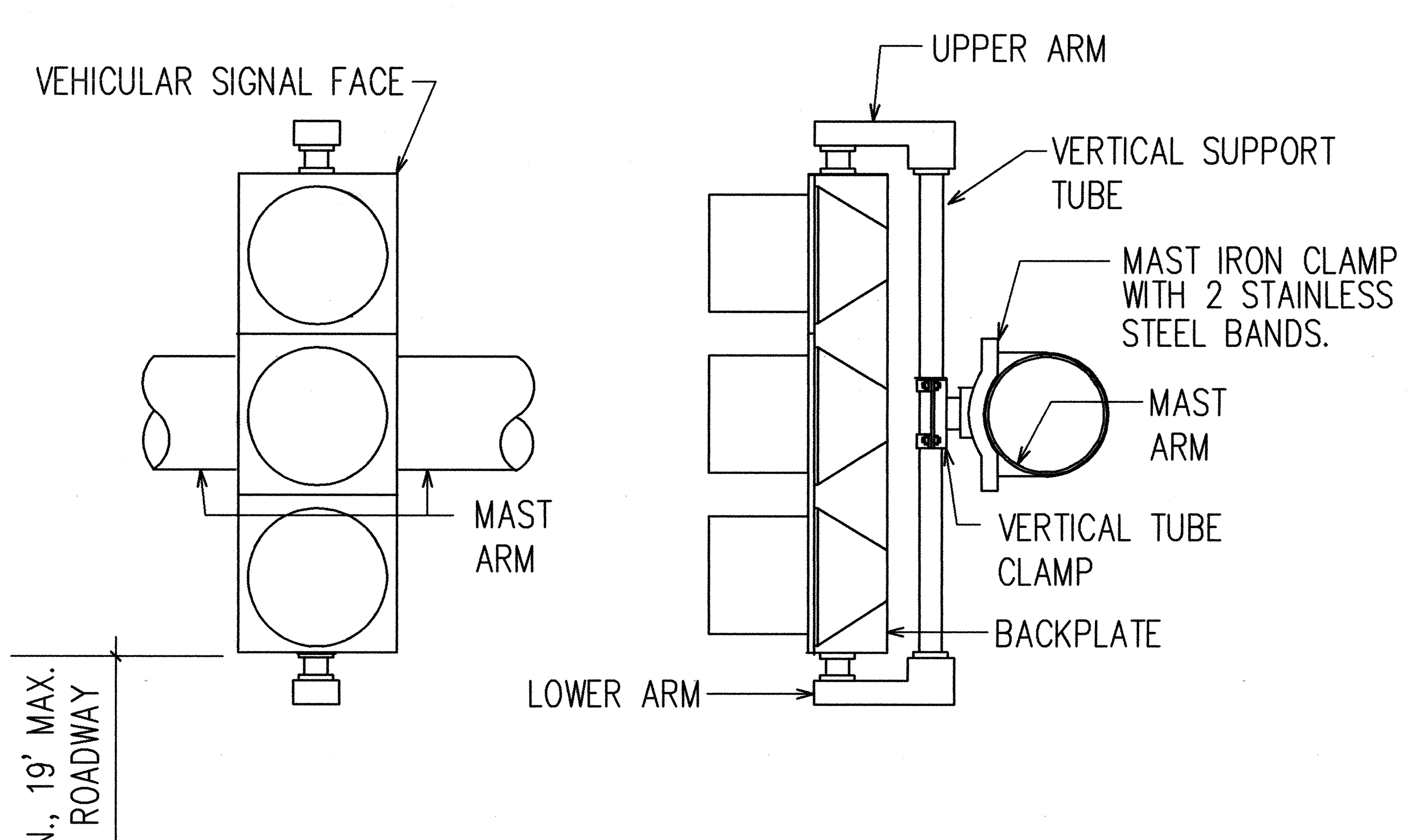


BRACKET MOUNT - ONE WAY

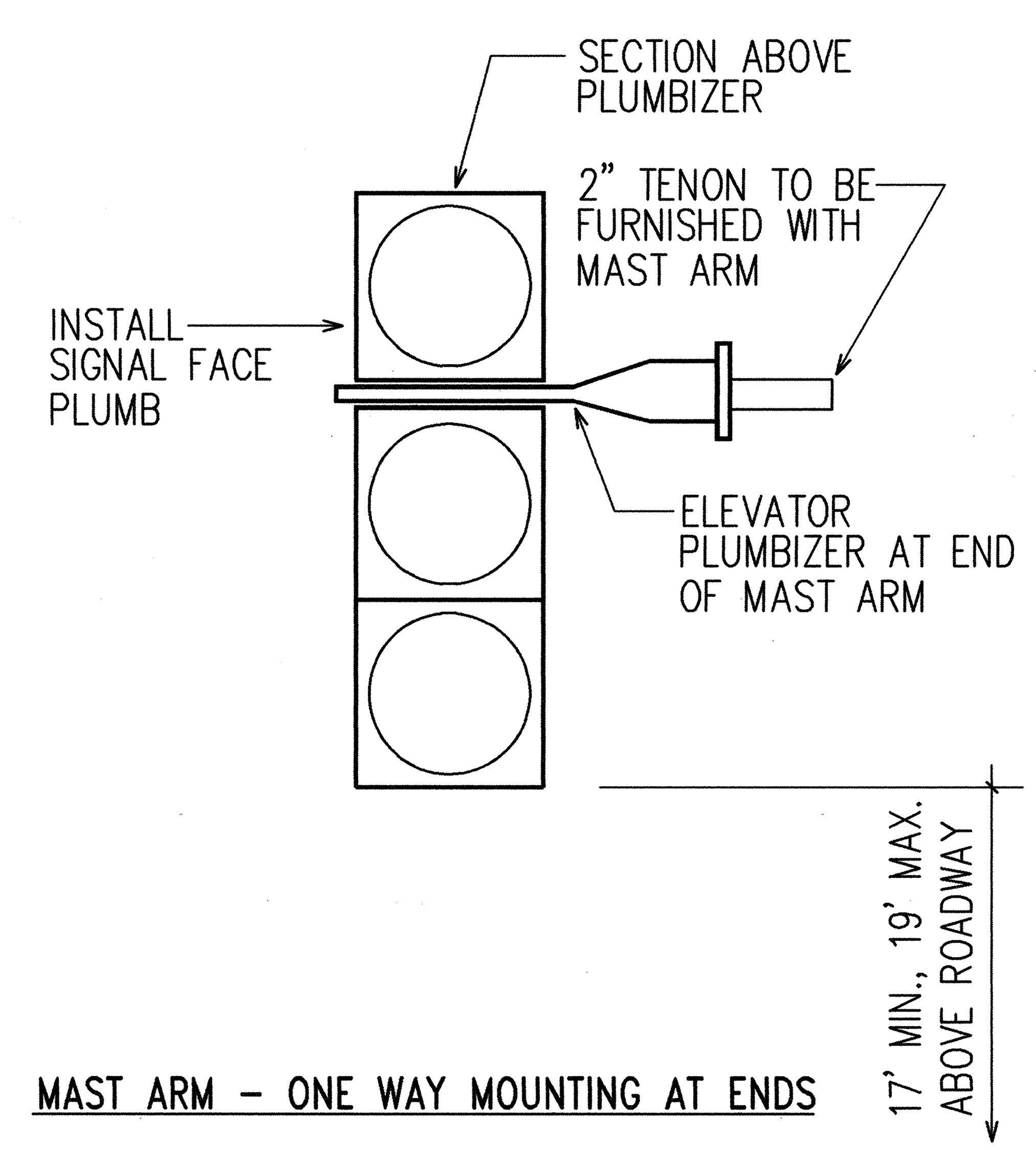
BRACKET MOUNT - TWO WAY

NOTES:

1. STAINLESS STEEL BANDS SHALL BE 1/2" WIDE X .050" THICK, MINIMUM. TENSILE STRENGTH SHALL BE 100,000 PSI MINIMUM.
2. UPPER ARM, LOWER ARM AND VERTICAL SUPPORT TUBE SHALL BE OF 356 CAST ALUMINUM.
3. ALL WIRING SHALL BE CONCEALED.
4. VERTICAL TUBE CLAMP SHALL BE OF MALLEABLE IRON, GRADE 32510.
5. ALL ALUMINUM PARTS SHALL HAVE AN ALODINE 1200 FINISH.
6. SIGNAL AS NOTED ON PLANS.
7. MAINTAIN 16" MIN. CLEARANCE AT REAR OF ALL PROGRAMMED FACES.



ADJUSTABLE MAST ARM ONE WAY MOUNTING AT INTERMEDIATE POINT



MAST ARM - ONE WAY MOUNTING AT ENDS

ANDREW I. MIYASATO LICENSED PROFESSIONAL ENGINEER No. 4340-E HAWAII, U.S.A.
6/1/98
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RONALD N. S. HO & ASSOC., INC. ELECTRICAL ENGINEERS

VEHICULAR SIGNAL MOUNTING DETAILS

NOT TO SCALE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS III

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

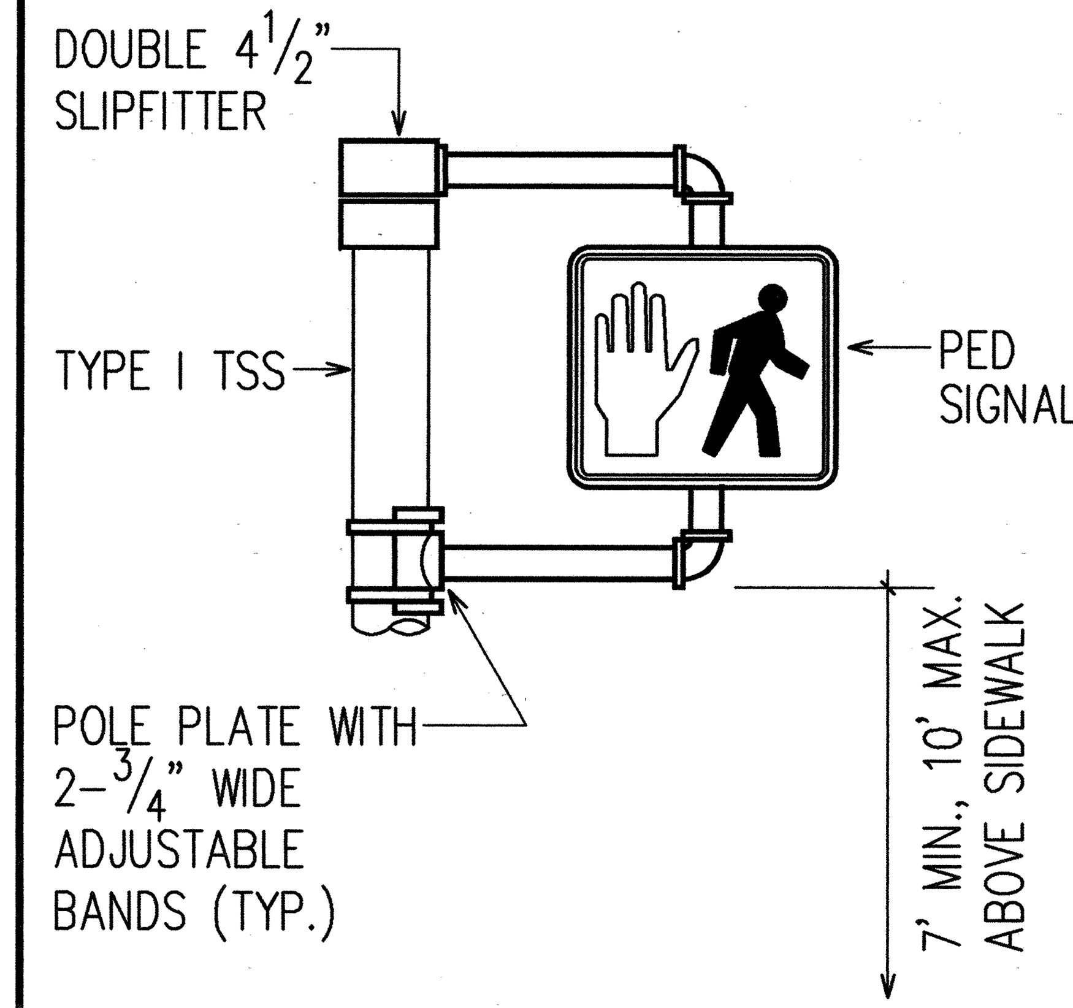
PROJECT NO. 63A-01-97

SCALE: AS NOTED DATE: MAY 1998

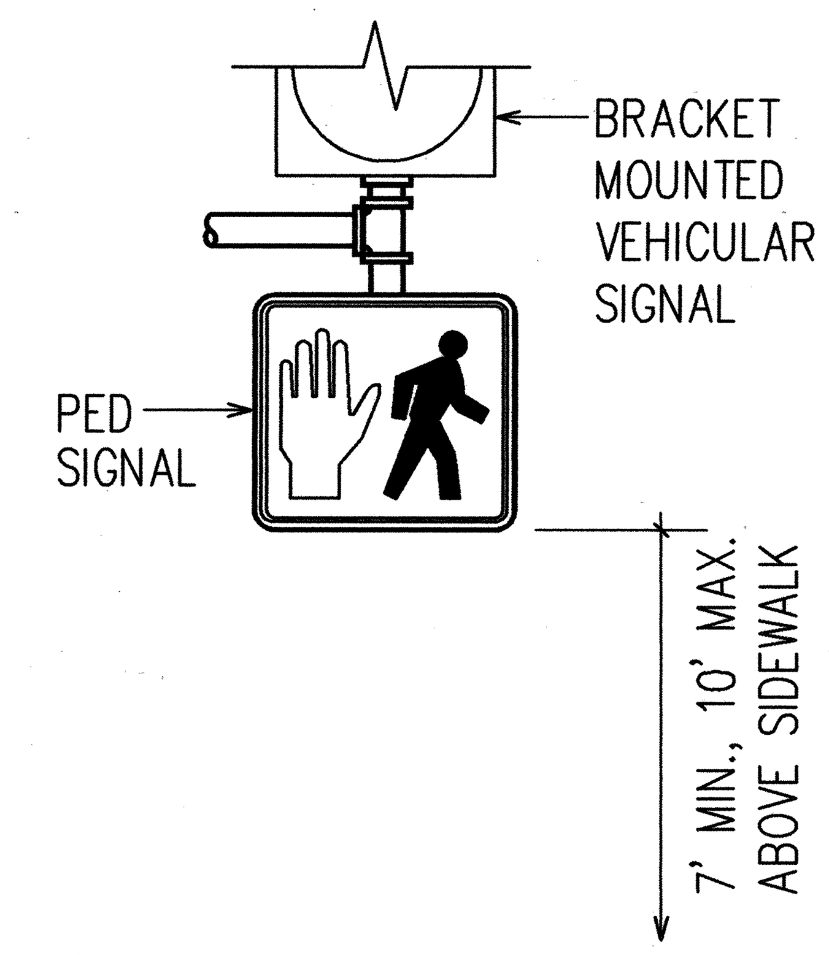
SHEET No. 18 OF 23 SHEETS

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

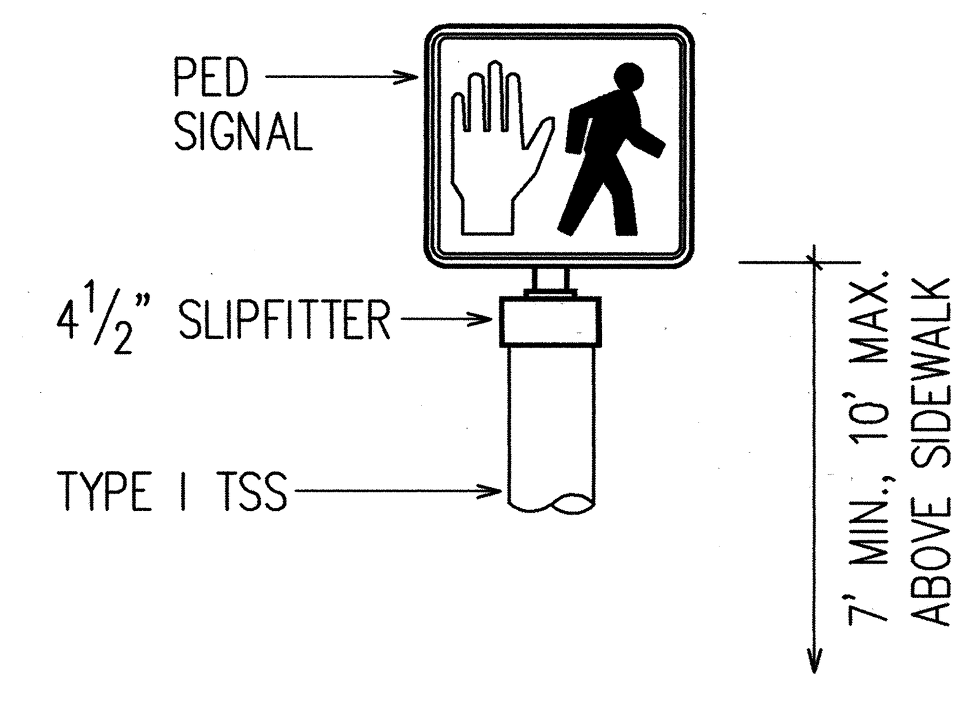
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	48	52



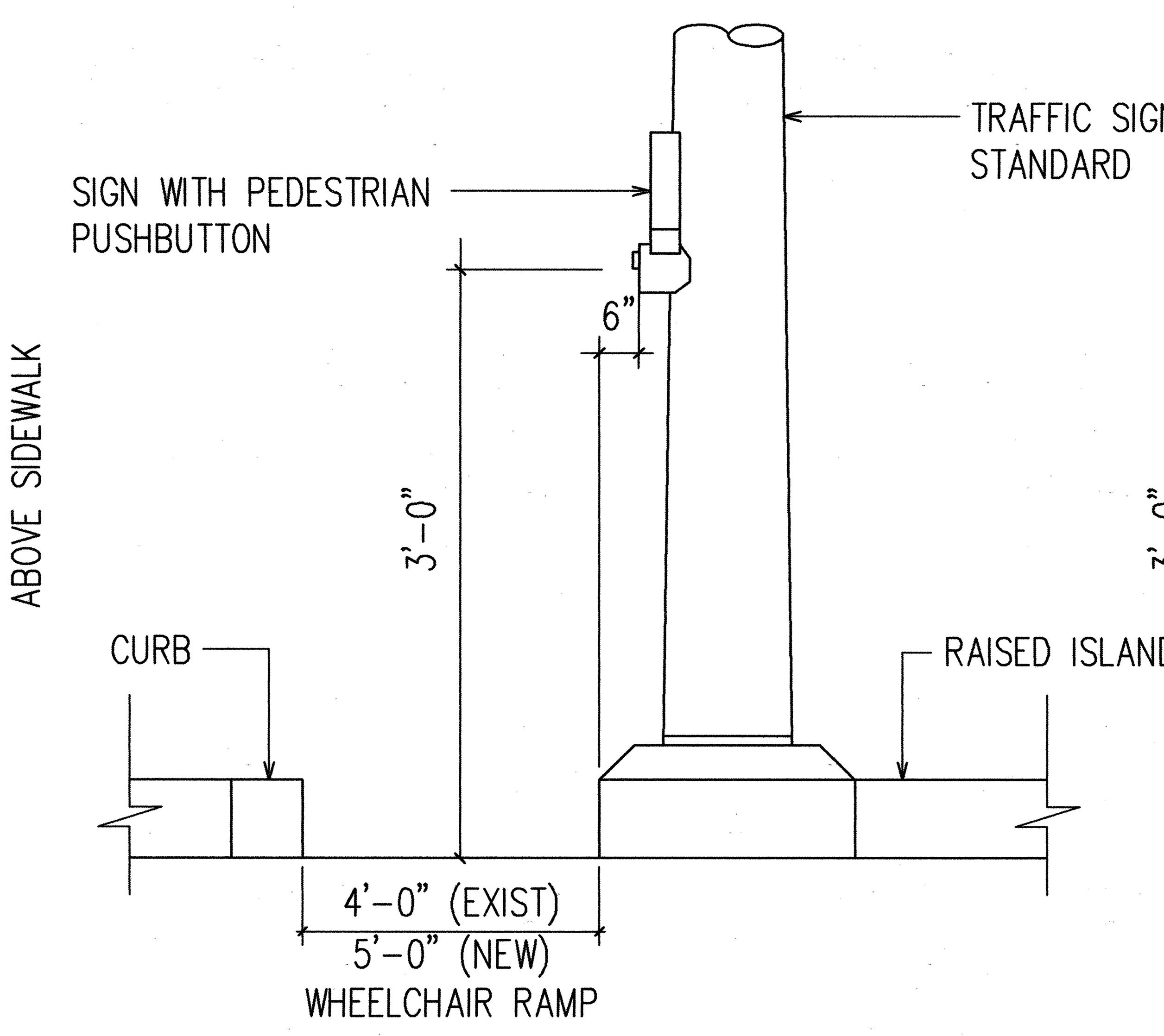
CANTILEVER - ONE WAY



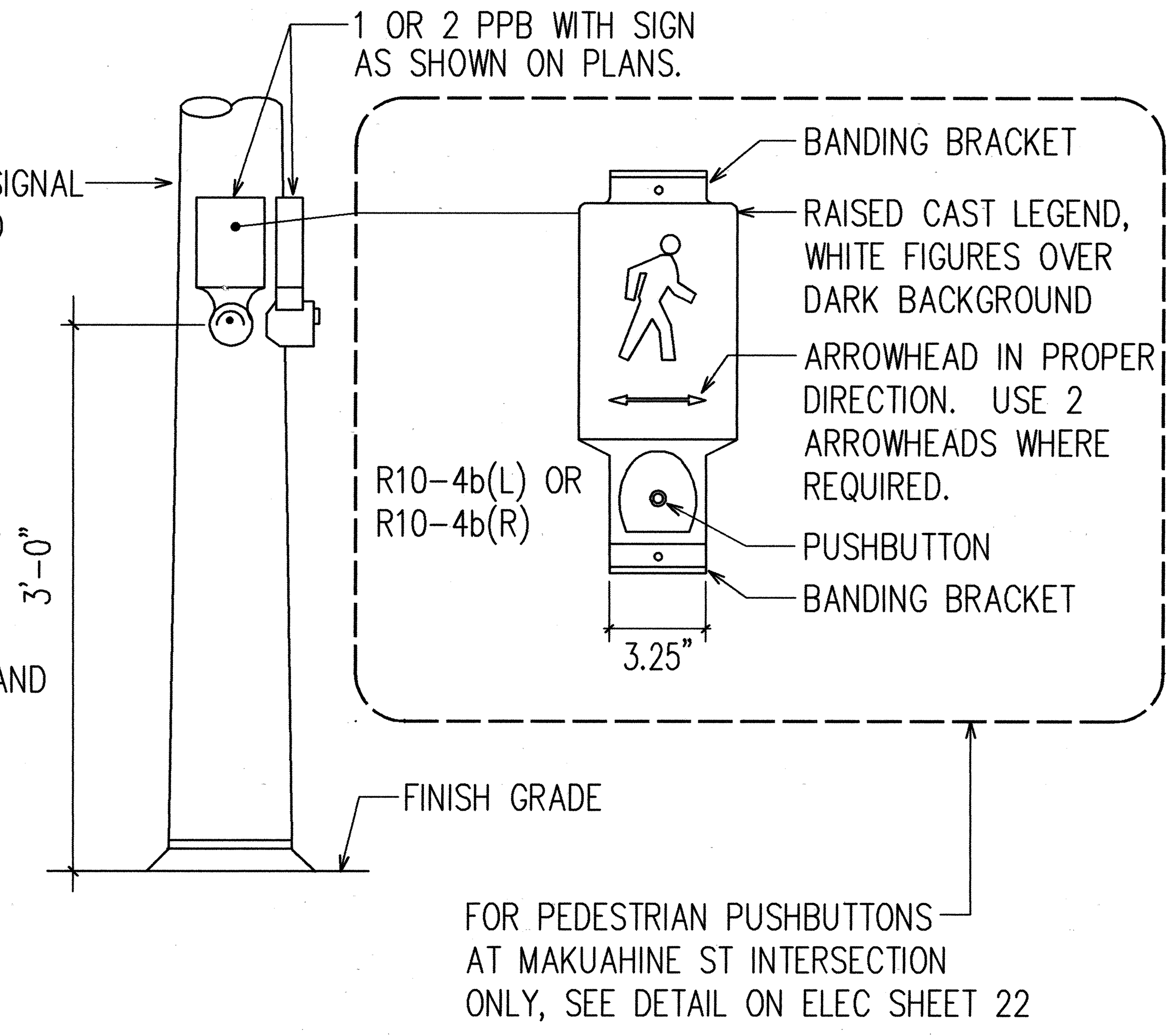
UNDERSLUNG - ONE WAY



TOP OF POLE - ONE WAY



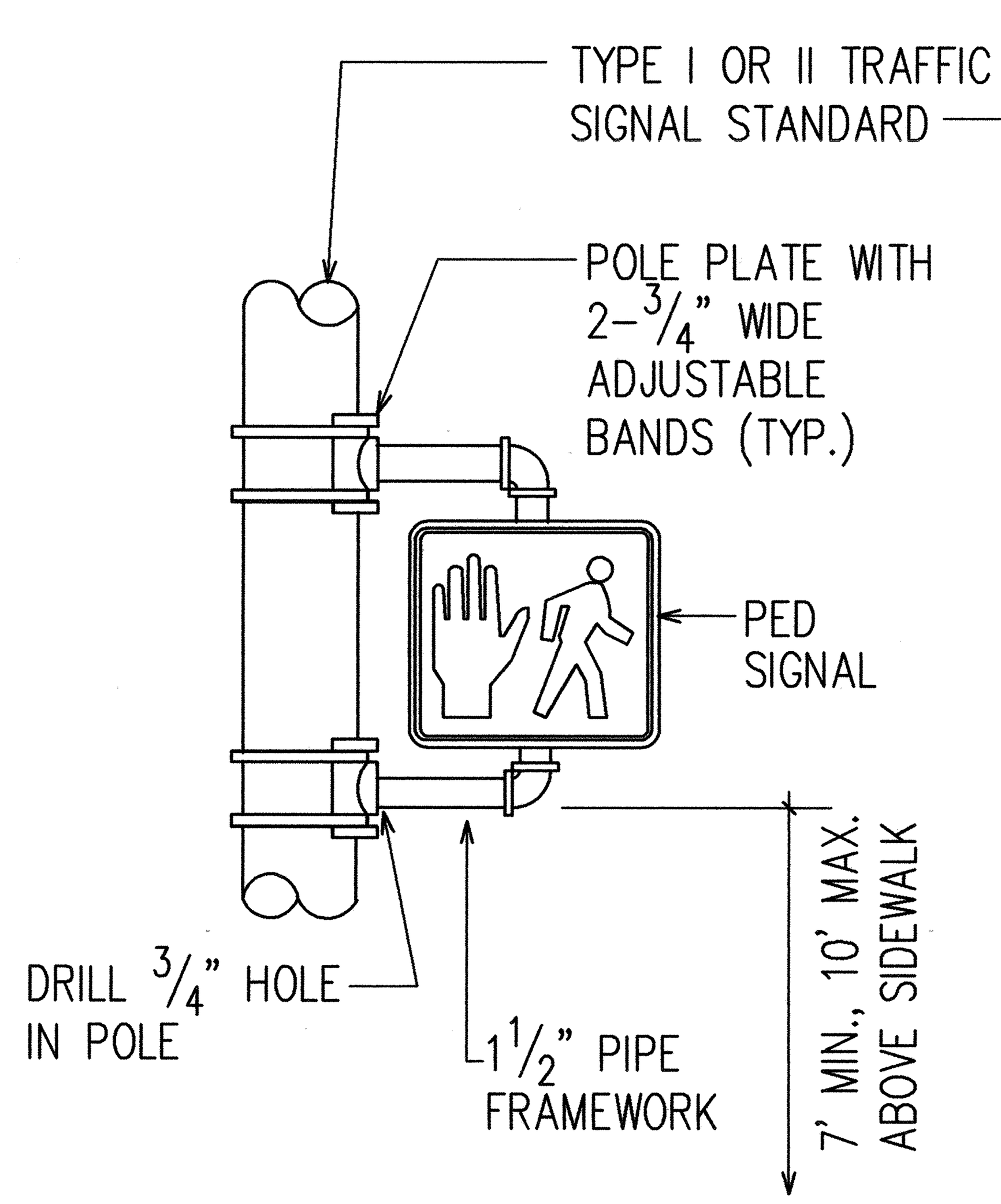
AT RAISED CONCRETE ISLAND



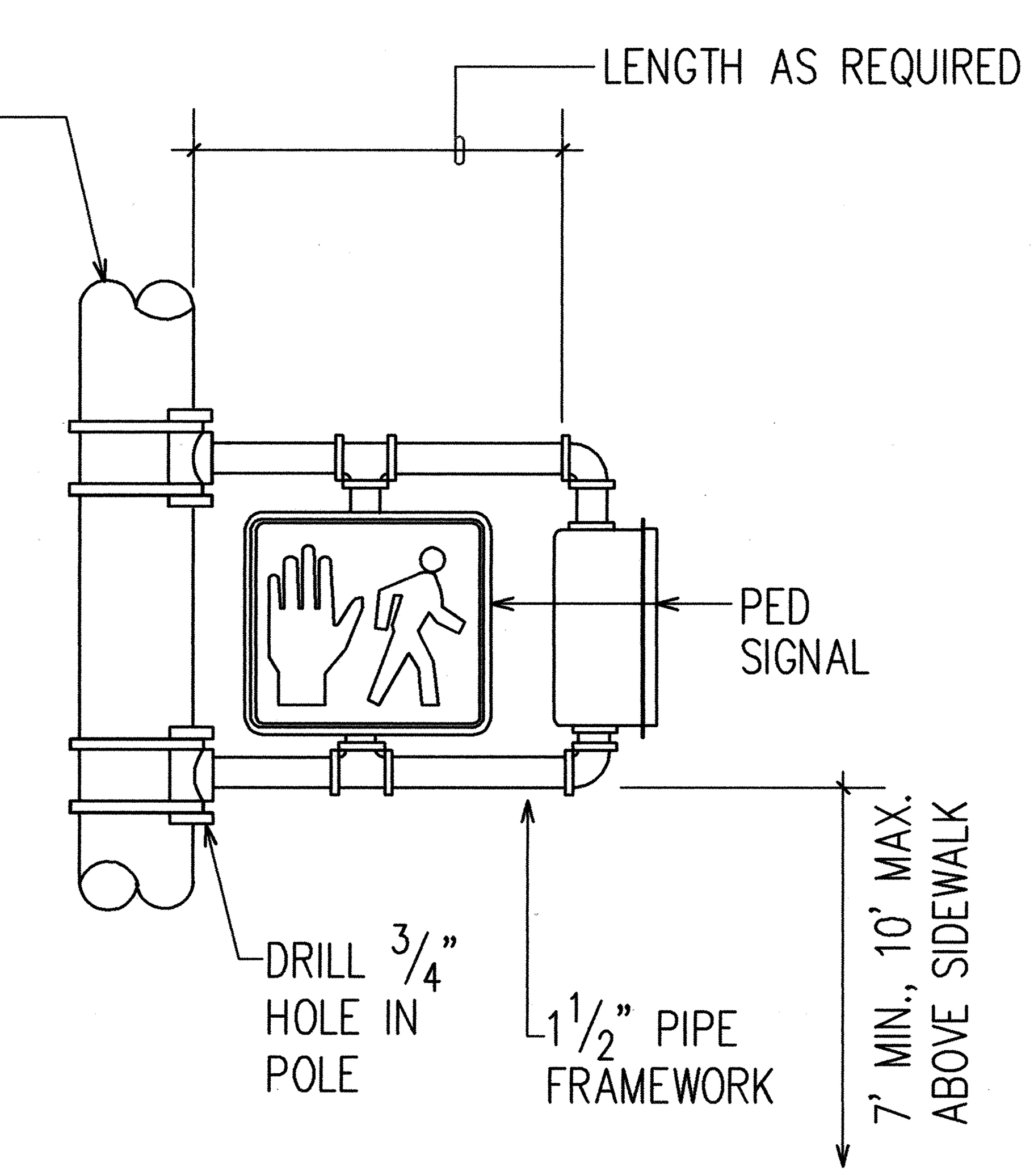
AT SHOULDER

PEDESTRIAN PUSHBUTTON DETAILS

NOT TO SCALE



BRACKET MOUNT - ONE WAY



BRACKET MOUNT - TWO WAY

NOTES:

1. STAINLESS STEEL BANDS SHALL BE 1/2" WIDE X .050" THICK, MINIMUM. TENSILE STRENGTH SHALL BE 100,000 PSI MINIMUM.
2. UPPER ARM, LOWER ARM AND VERTICAL SUPPORT TUBE SHALL BE OF 356 CAST ALUMINUM.
3. ALL WIRING SHALL BE CONCEALED.
4. VERTICAL TUBE CLAMP SHALL BE OF MALLEABLE IRON, GRADE 32510.
5. ALL ALUMINUM PARTS SHALL HAVE AN ALODINE 1200 FINISH.
6. SIGNAL AS NOTED ON PLANS.
7. MAINTAIN 16" MIN. CLEARANCE AT REAR OF ALL PROGRAMMED FACES.

PEDESTRIAN SIGNAL MOUNTING DETAILS

NOT TO SCALE

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6/1/98
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Andrew I. Miyasato

RONALD N. S. HO & ASSOC., INC. ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS IV

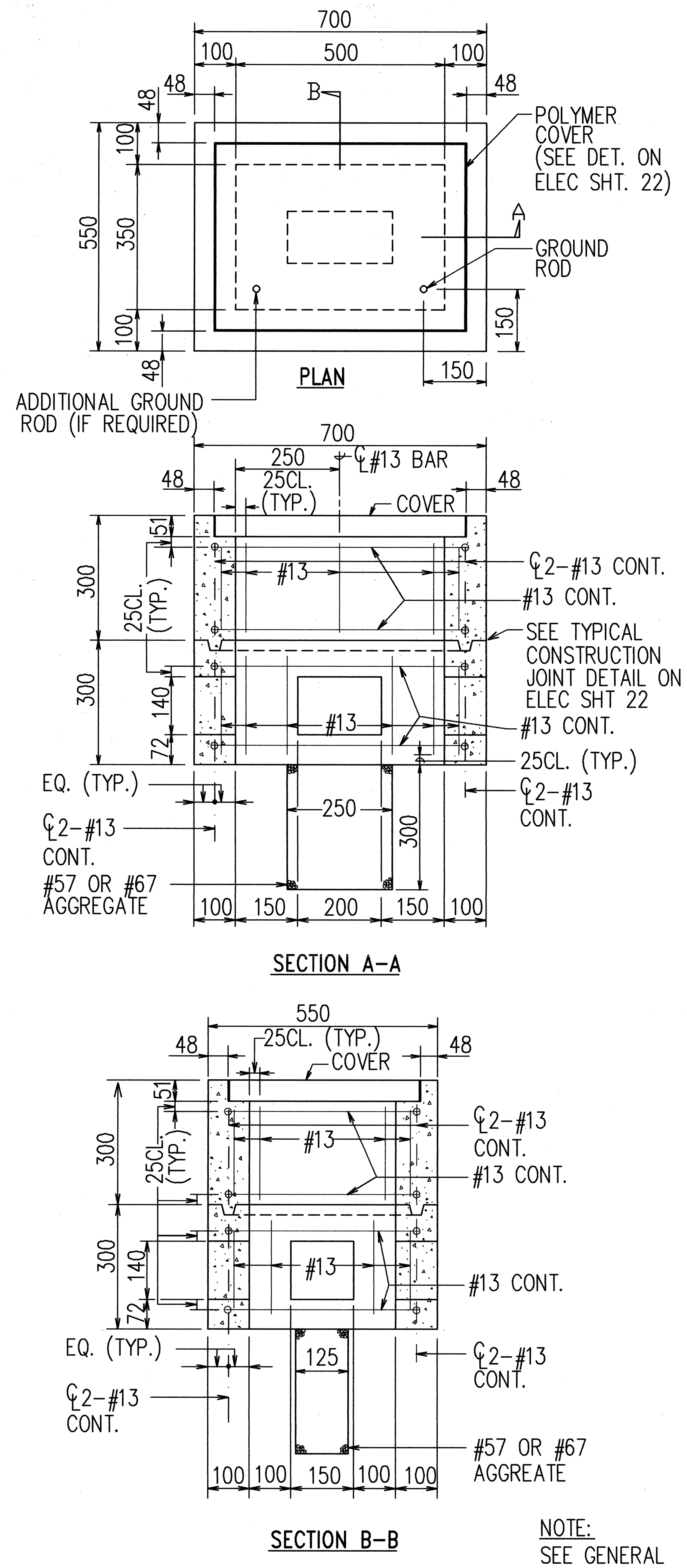
LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97

SCALE: AS NOTED   DATE: MAY 1998

SHEET No. 19 OF 23 SHEETS

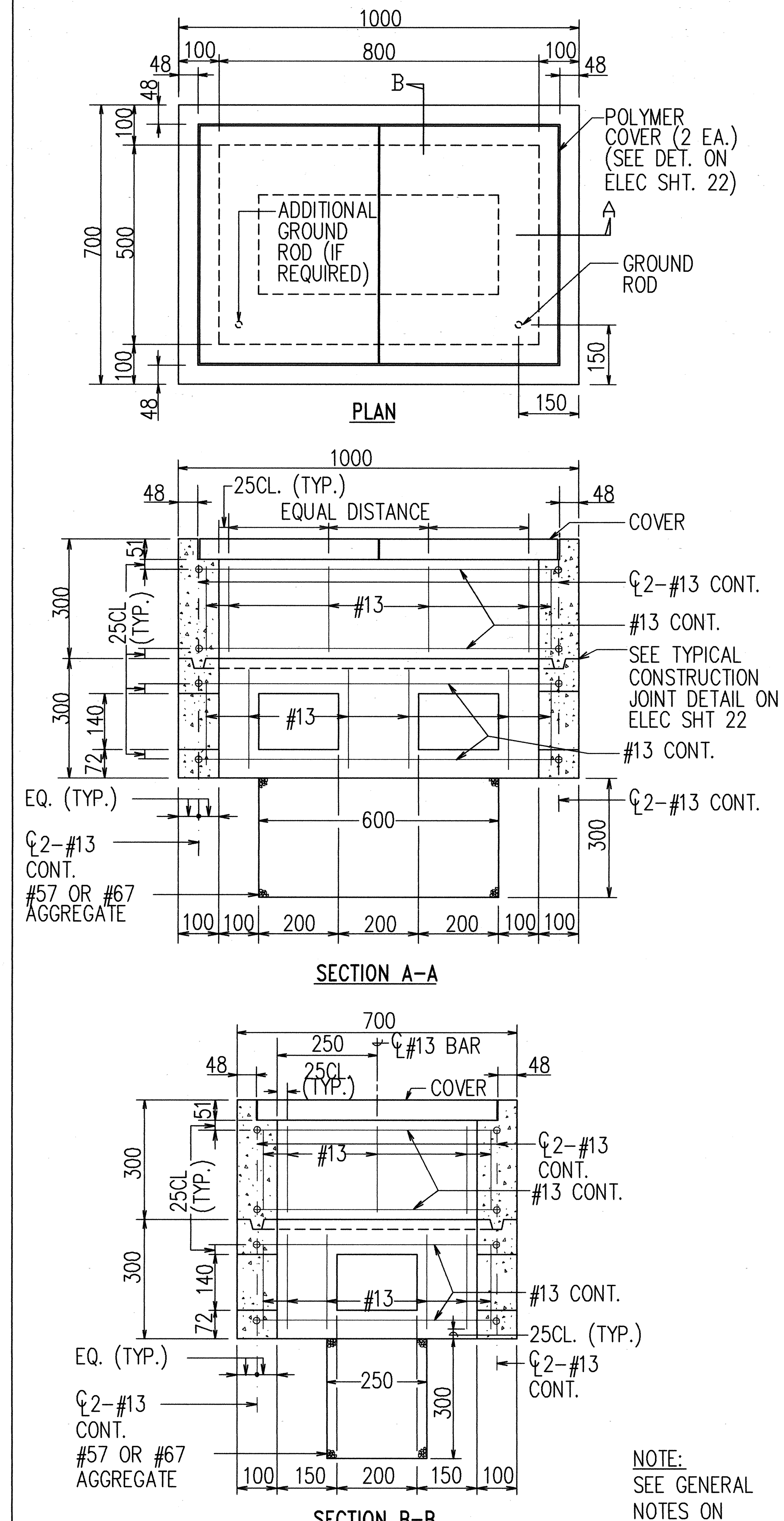
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	49	52



NOTE:
SEE GENERAL NOTES ON ELEC SHT 22

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

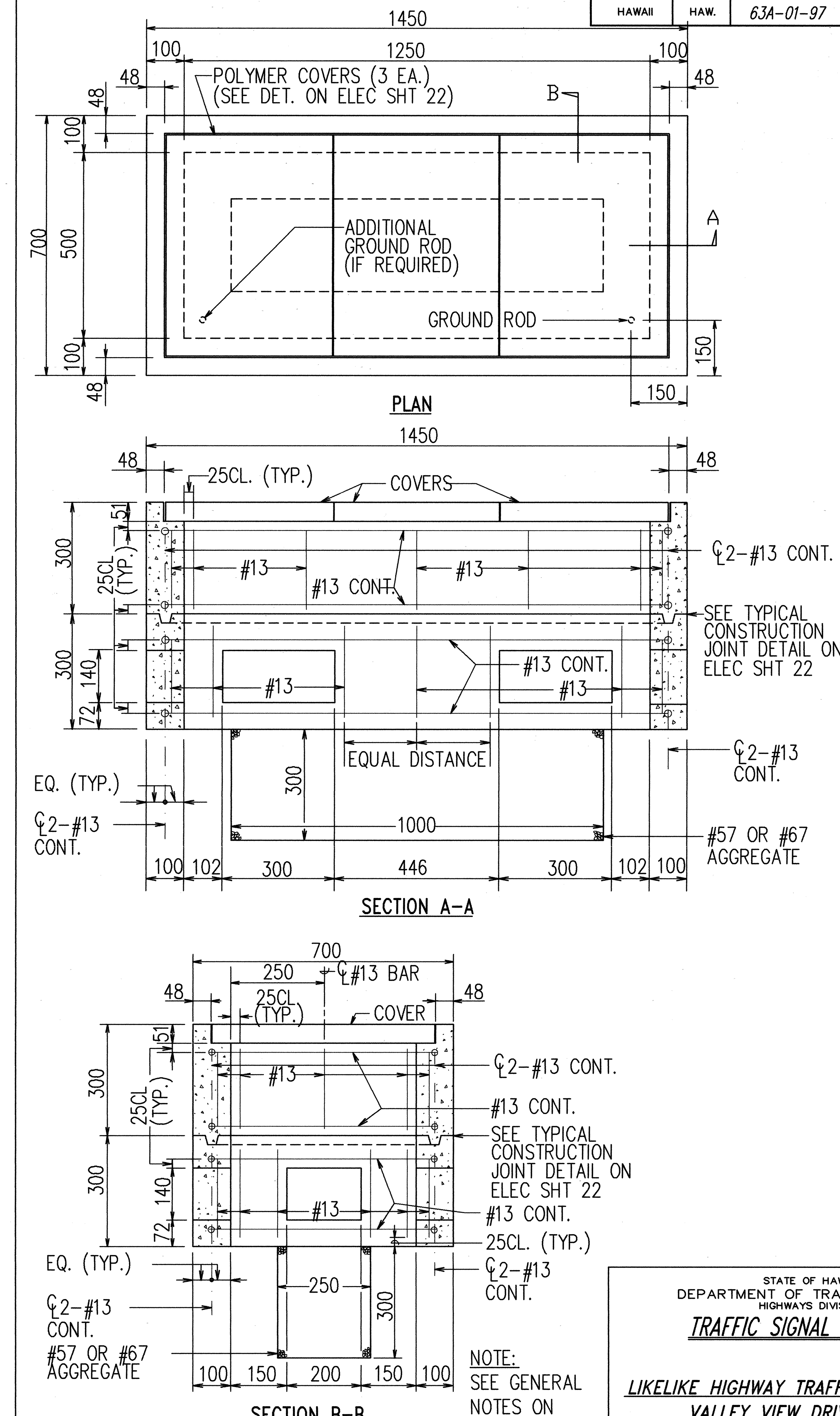
NOT TO SCALE



NOTE:
SEE GENERAL NOTES ON ELEC SHT 22

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

NOT TO SCALE



NOTE:
SEE GENERAL NOTES ON ELEC SHT 22

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

NOT TO SCALE

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ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS V

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

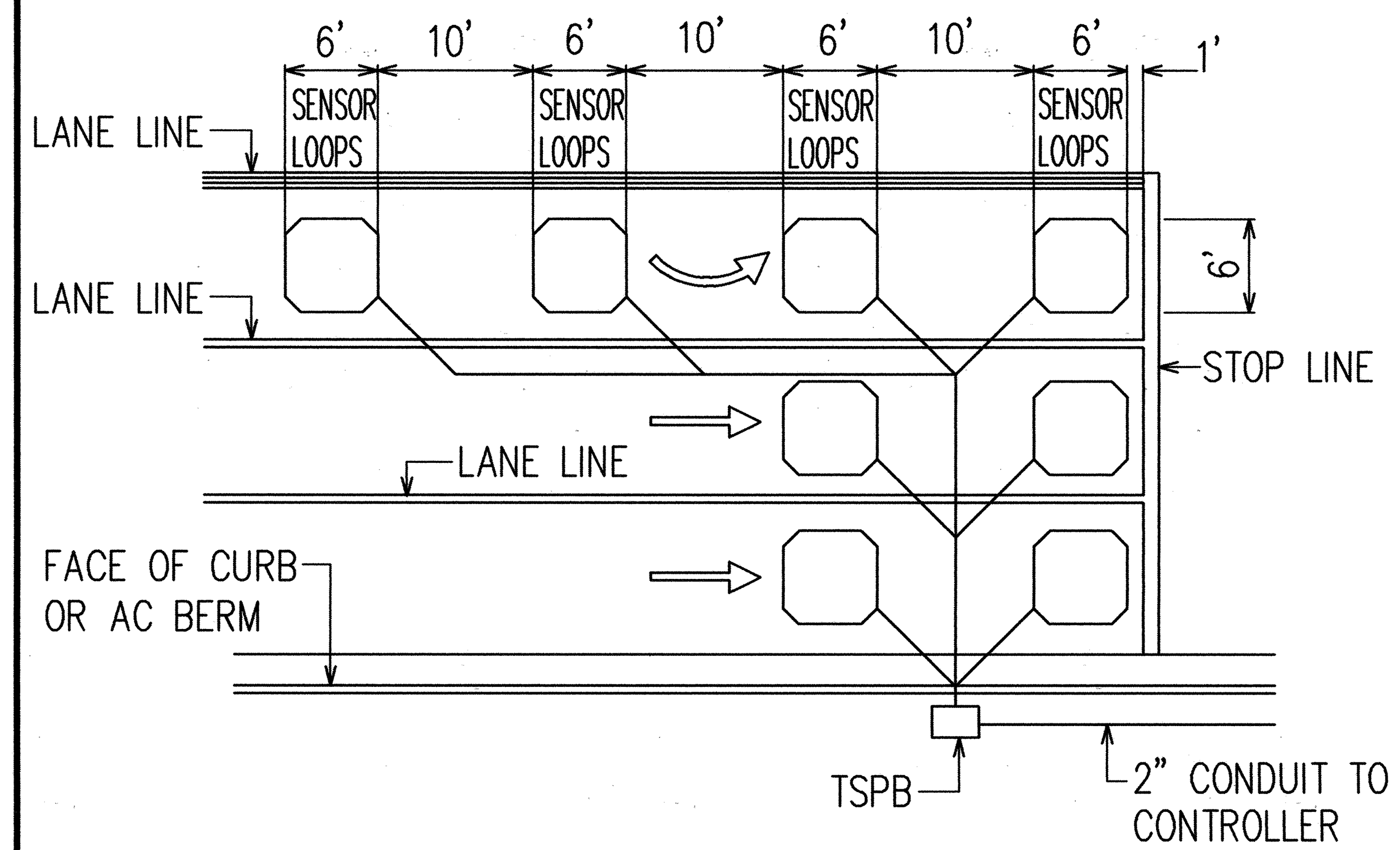
PROJECT NO. 63A-01-97

SCALE: AS NOTED | DATE: MAY 1998

SHEET No. 20 OF 23 SHEETS

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

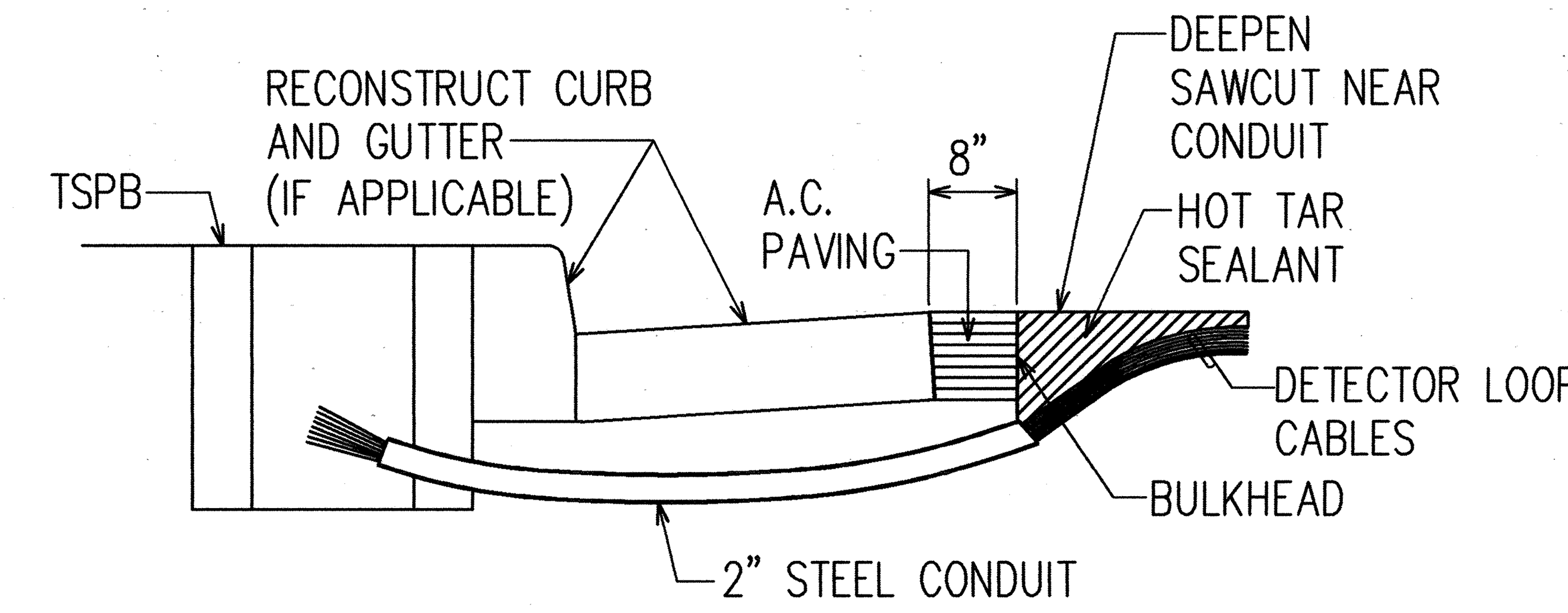
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	50	52



NOTES:

1. CENTER SENSOR LOOPS IN LANES.
2. COLLECTOR CABLES SHALL BE TWISTED 2 TURNS PER FOOT.
3. NUMBER OF LOOPS AND LOCATIONS VARY. SEE PROJECT PLANS.
4. NUMBER AND LOCATIONS OF COLLECTOR SAWCUTS MAY BE VARIED IN THE FIELD TO SUIT.

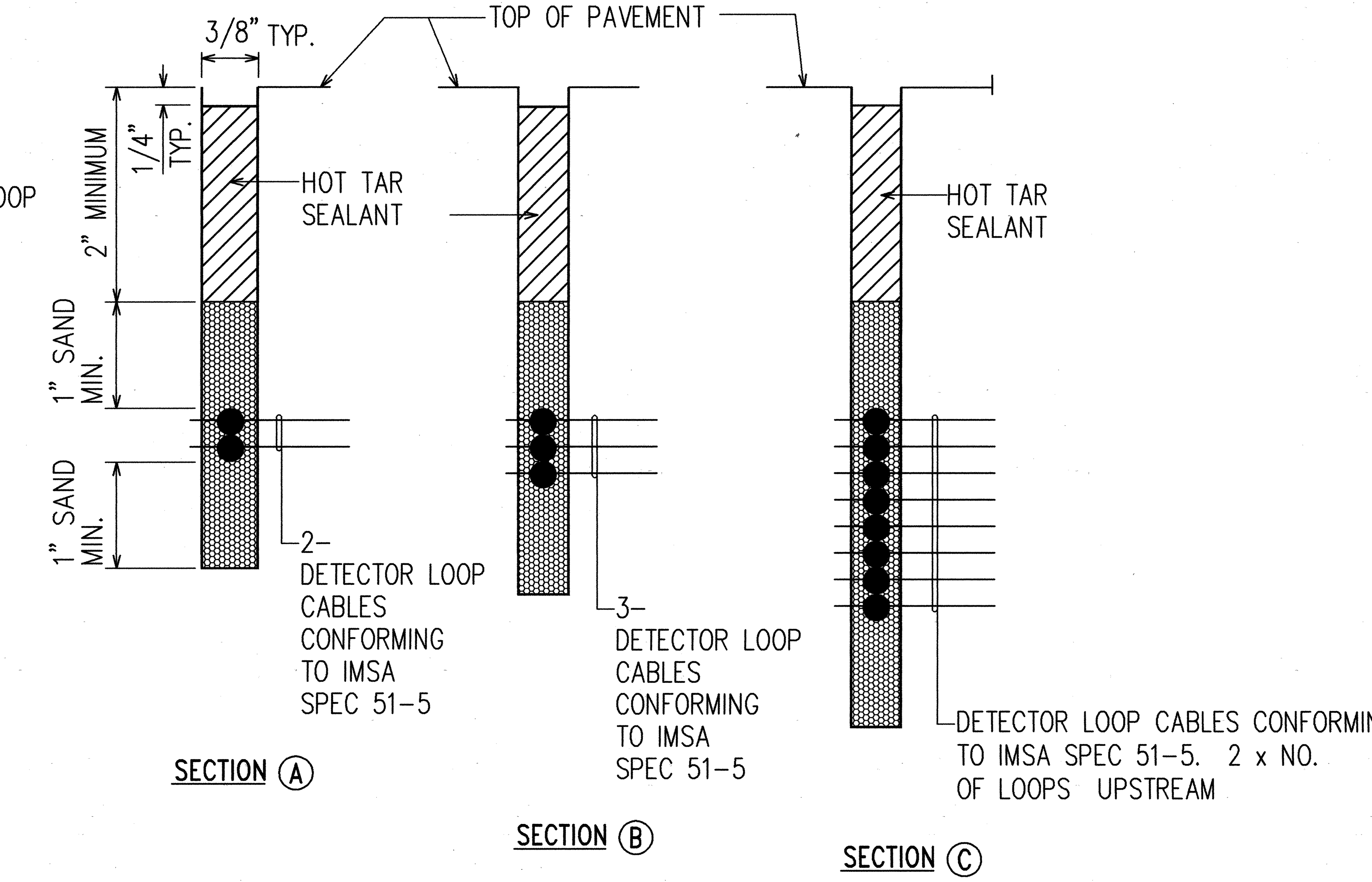
TYPICAL SENSOR LOOP LAYOUT

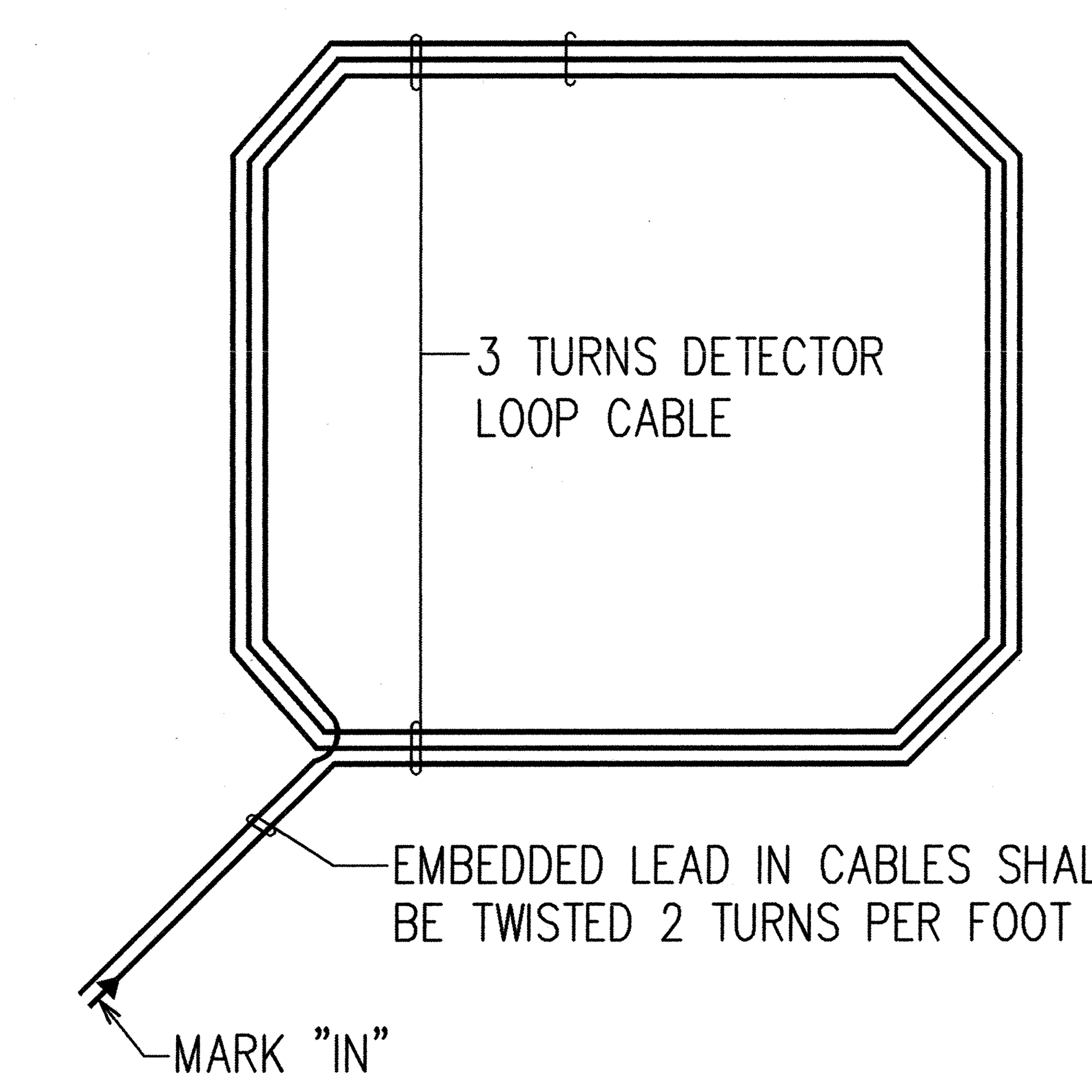


NOTES ON CONSTRUCTION AT END OF SAWCUT

1. SEAL ROADWAY END OF CONDUIT AFTER INSTALLATION OF CONDUCTORS
2. INSTALL BULKHEAD ACROSS CONDUIT TRENCH.
3. PLACE HOT TAR IN SAWCUT.
4. BACKFILL OVER CONDUIT WITH NEW A.C.
5. RECONSTRUCT CURB AND GUTTER AS REQUIRED.

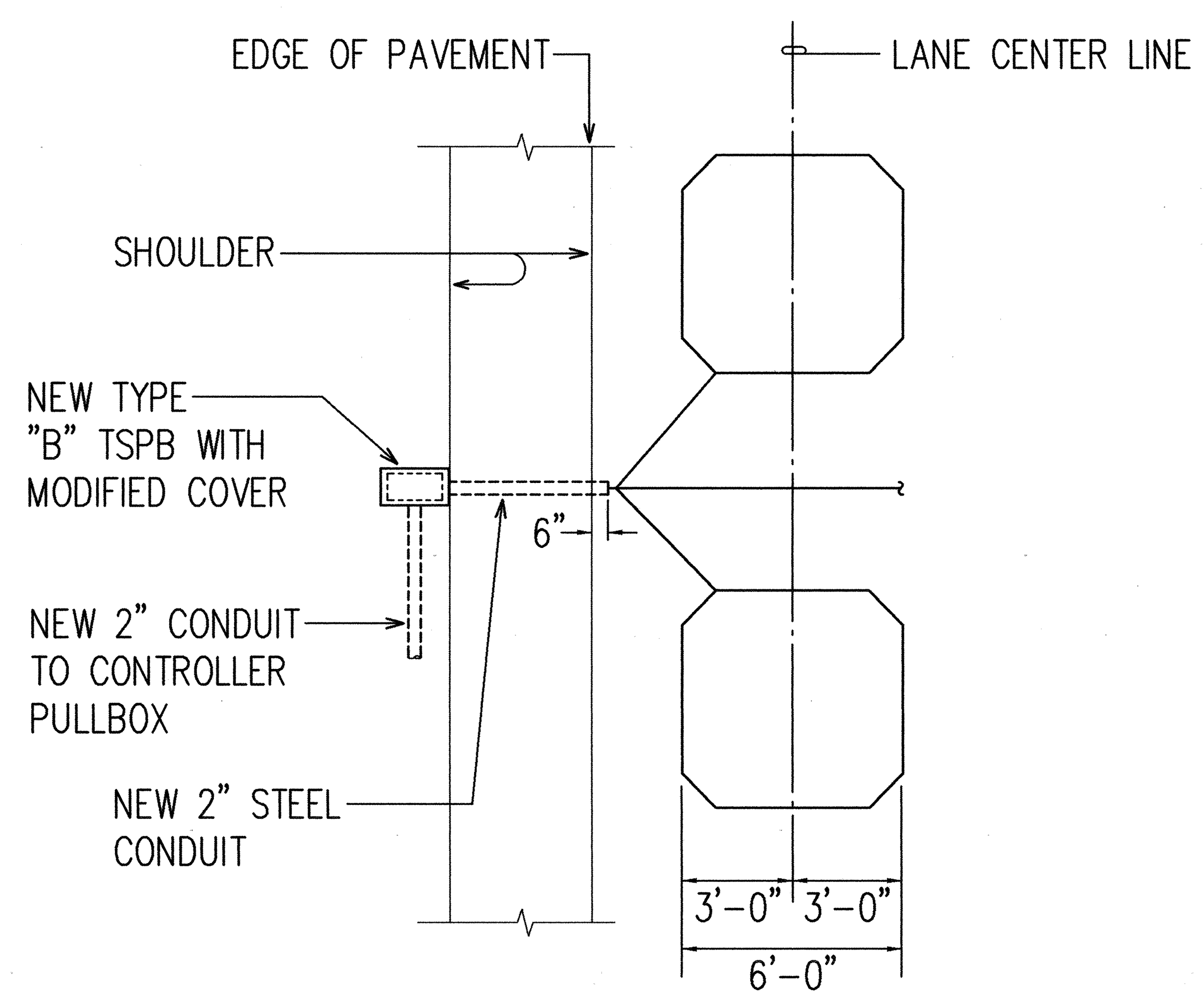
DETAIL OF SENSOR LOOP INSTALLATION AT EDGE OF ROADWAY



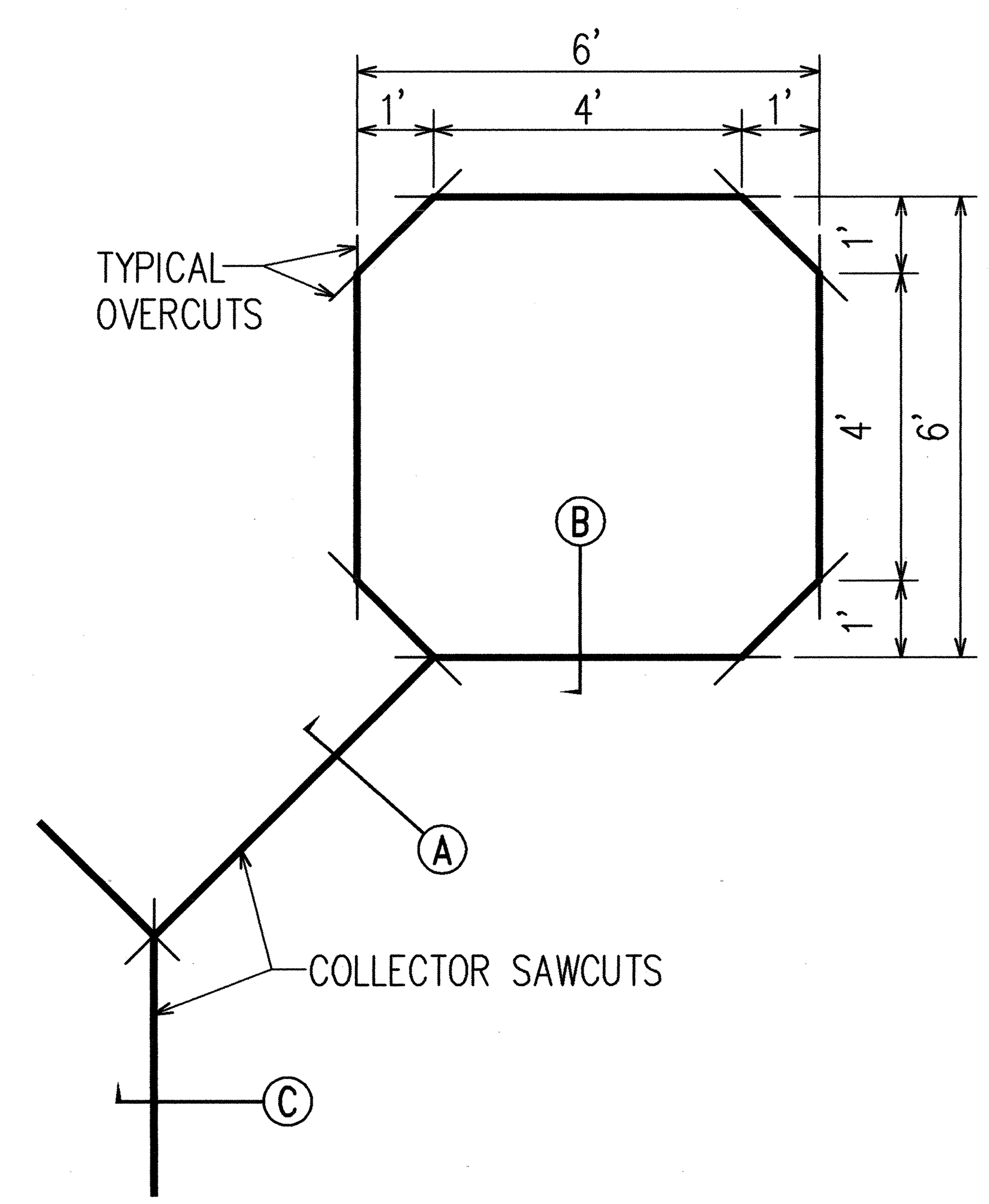


PLAN

TYPICAL SENSOR LOOP WIRING DIAGRAM



TYPICAL LAYOUT AT SHOULDER AREAS



NOTE: LENGTH OF OVERCUTS SHALL BE KEPT TO A MINIMUM. ALL OVERCUTS SHALL BE BACKFILLED WITH HOT TAR.

TYPICAL SENSOR LOOP SAWCUT DETAIL

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6/1/98

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ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS VI

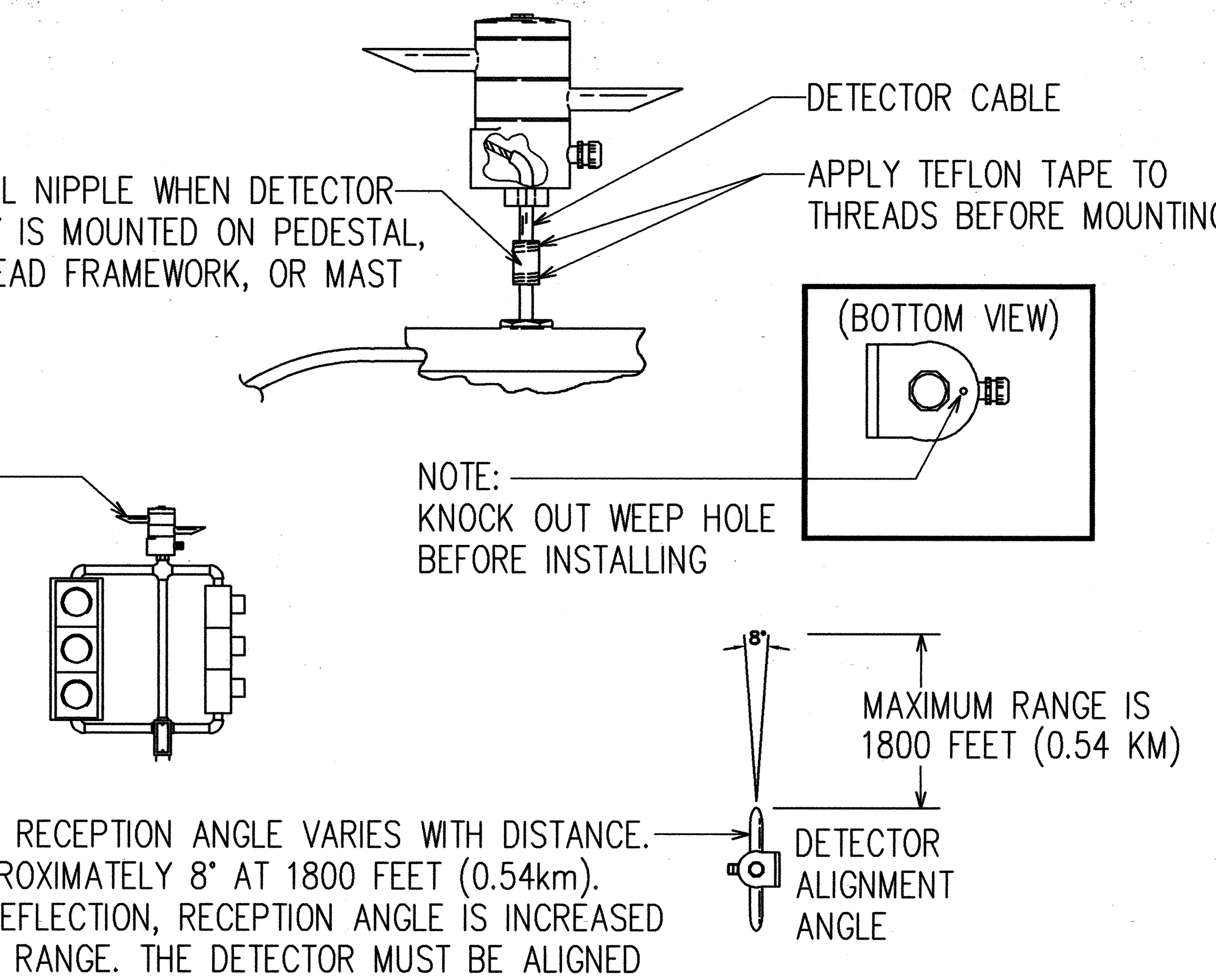
LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97

SCALE: AS NOTED DATE: MAY 1998

SHEET No. 21 OF 23 SHEETS

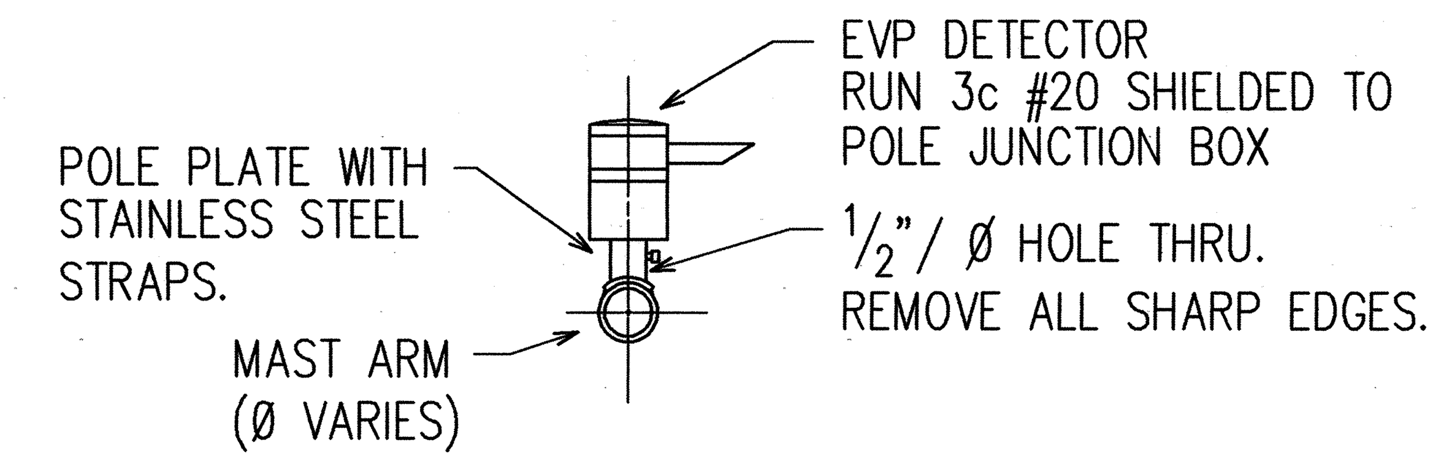
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	51	52



NOTE:
DETECTOR RECEPTION ANGLE VARIES WITH DISTANCE. IT IS APPROXIMATELY 8° AT 1800 FEET (0.54km). DUE TO REFLECTION, RECEPTION ANGLE IS INCREASED AT CLOSE RANGE. THE DETECTOR MUST BE ALIGNED WITHIN 8° OF THE FARTHEST POINT WHERE PRIORITY VEHICLE IS TO BE SENSED.

TYPICAL PEDESTAL/MAST ARM INSTALLATION OF EVP DETECTOR

NOT TO SCALE

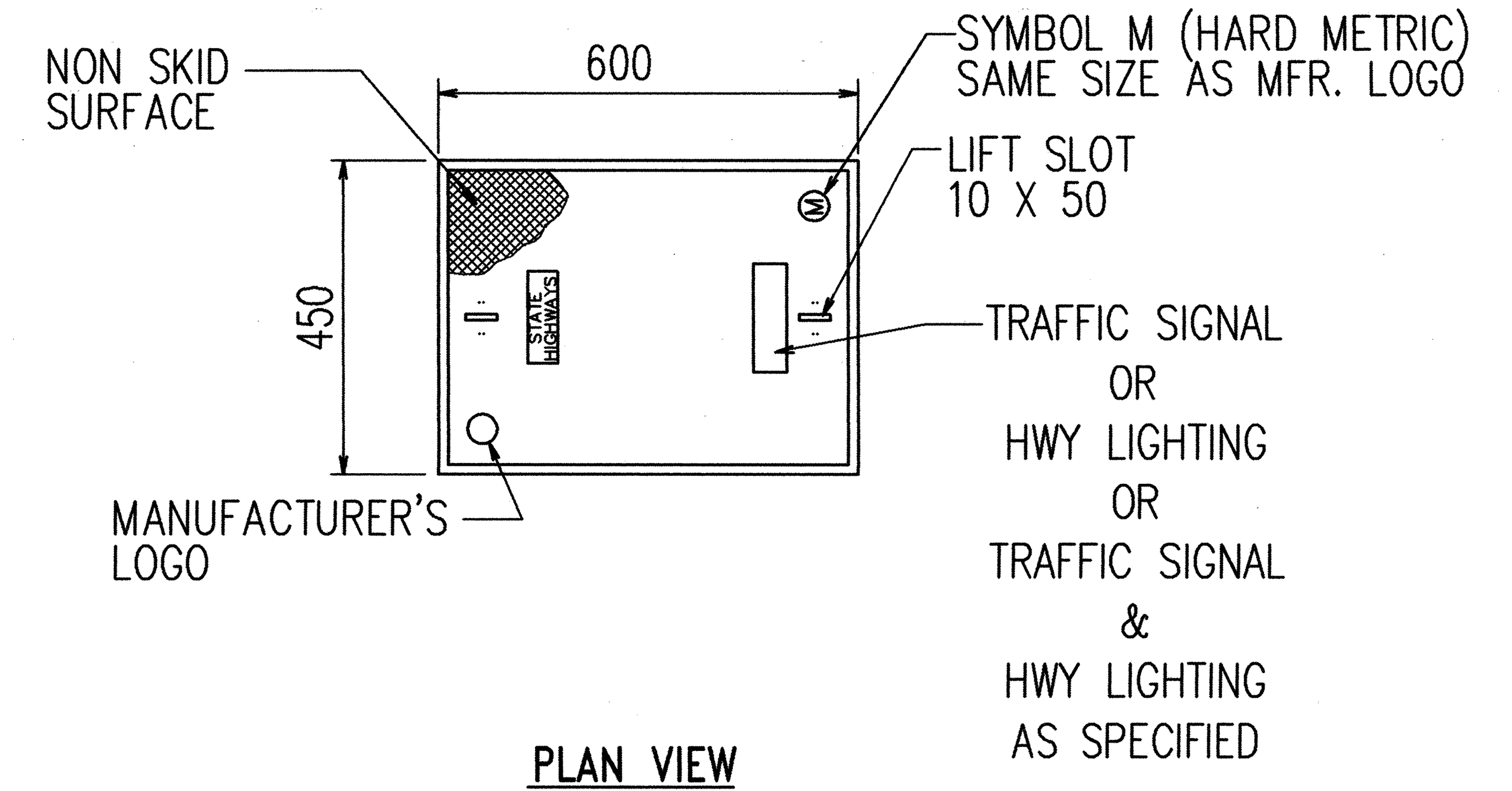


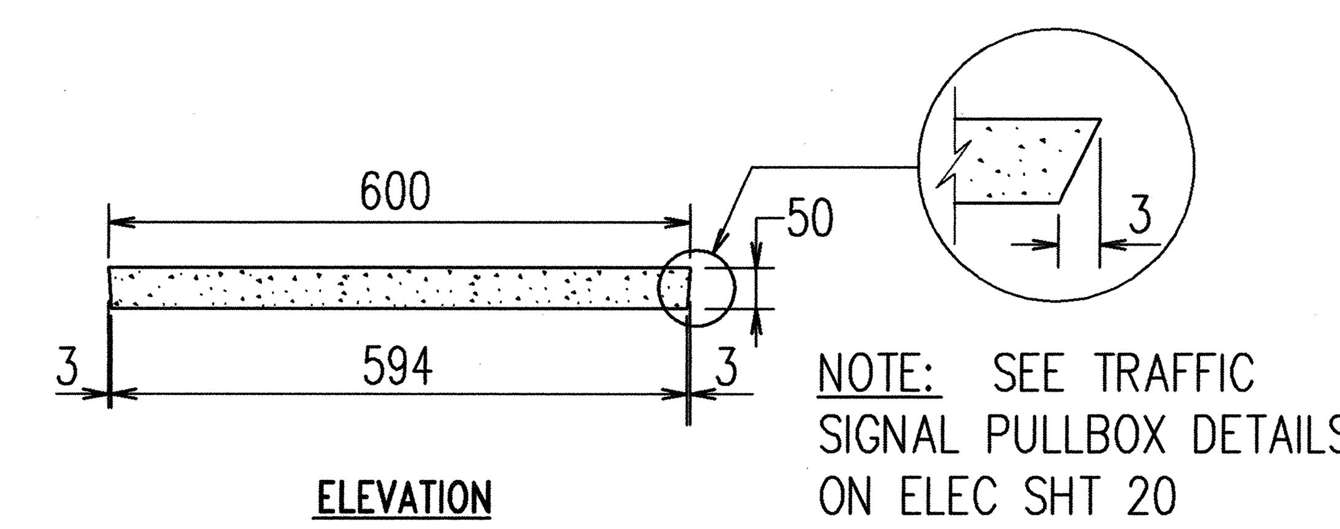
EVP DETECTOR HORIZONTAL MOUNTING DETAIL

NOT TO SCALE

GENERAL NOTES FOR TRAFFIC SIGNAL PULLBOX DETAILS ON ELEC SHEET 20

1. PROVIDE A MINIMUM OF ONE 16 X 2.5M COPPERWELD GROUND ROD IN EACH PULLBOX. WHEN DIRECTED BY THE TRAFFIC SIGNAL INSPECTOR/ENGINEER, INSTALL ADDITIONAL GROUND RODS. COST OF GROUND RODS SHALL BE INCIDENTAL TO THE PULLBOXES.
2. ALL PRE-CAST CONCRETE PULLBOXES SHALL BE MANUFACTURED IN TWO PIECES.
3. THE PULLBOX WITH COVER SHALL BE CAPABLE OF SUPPORTING AN MS 18 LOADING.
4. THE MAXIMUM WEIGHT OF THE PULLBOX COVER SHALL NOT EXCEED 27 KILOGRAMS.
5. THE OPENINGS FOR THE CONDUITS ON ALL PULLBOXES SHALL BE PRE-CAST CONCRETE KNOCKOUTS.
6. AFTER INSTALLING THE CONDUITS IN THE OPENINGS OF THE PULLBOXES, THE CONTRACTOR SHALL FILL THE EXCESS OPENING IN THE PRE-CAST KNOCKOUTS WITH CONCRETE MORTAR.
7. PRIOR TO INSTALLING THE PULLBOXES, THE CONTRACTOR SHALL LEVEL THE BOTTOM OF THE TRENCH AND ACHIEVE A MINIMUM OF 95% RELATIVE COMPACTION OF THE BOTTOM OF THE TRENCH.
8. ALL CONCRETE SHALL BE CLASS A (25MPA, MIN.)
9. REBARS SHALL BE GRADE 300 AND ALL LAPPED SPLICES SHALL BE 360MM MINIMUM.
10. THE #57 OR #67 SIZE AGGREGATE SHALL CONFORM TO LATEST VERSION OF AASHTO M43 (ASTM D 448).
11. TYPE "C" PULLBOX SHALL BE INSTALLED IN A LOCATION PROTECTED FROM VEHICULAR TRAFFIC (I.E. RAISED SIDEWALK, BEHIND A.C. CURBS, TRAFFIC SIGNAL STANDARD OR PIPE GUARDS).

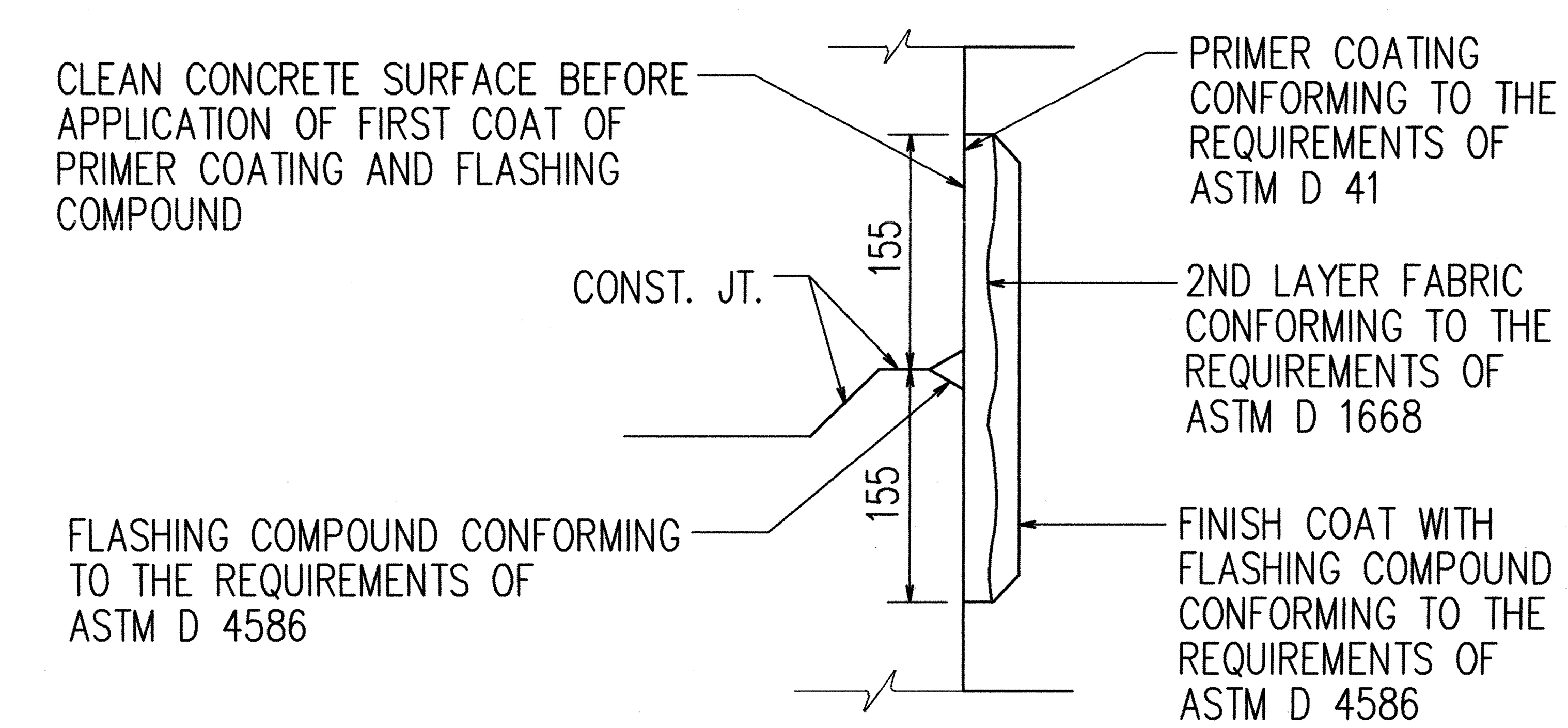




NOTE: SEE TRAFFIC SIGNAL PULLBOX DETAILS ON ELEC SHT 20

POLYMER CONCRETE COVER

NOT TO SCALE

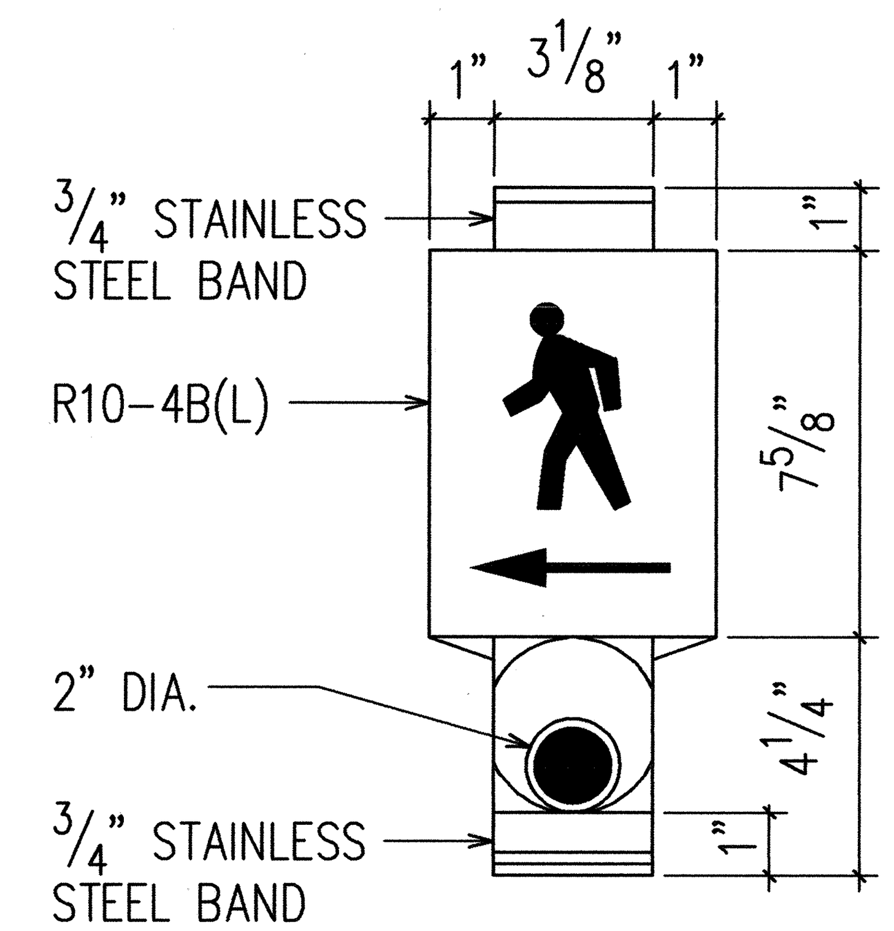


TYPICAL FLASHING COMPOUND WATERPROOFING DETAILS

NOT TO SCALE

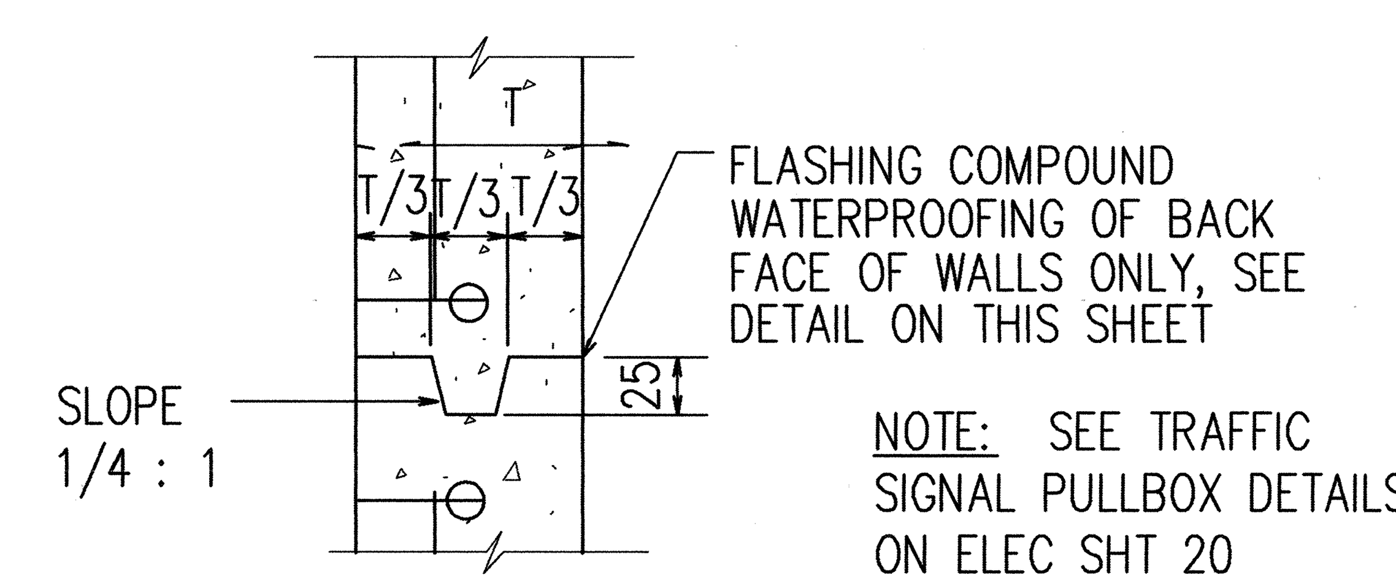
DETAIL NOTES:

1. THE PEDESTRIAN PUSHBUTTON UNIT SHALL CONSIST OF A ONE PIECE ASSEMBLY WITH A RAISE WALKING MAN, ARROW INDICATION AND PUSH BUTTON.
2. THE PUSHBUTTON ACTIVATOR SHALL BE OF THE MUSHROOM PLUNGER TYPE, ADA ACCEPTABLE, 2 INCHES IN DIAMETER THAT REQUIRES LESS THAN 5 LBS. OF PRESSURE TO ACTIVATE.
3. THE RAISED MAN AND ARROWS SHALL BE DIRECTIONAL AND MATCH THE DIRECTIONAL INDICATION AS SHOWN ON THE PLANS.
4. THE PUSHBUTTON SHALL BE TAMPER PROOF, WEATHERPROOF AND CONSTRUCTED SO THAT ELECTRICAL SHOCKS ARE IMPOSSIBLE.
5. THE COLOR SCHEME SHALL BE:
   WHITE - MAN, ARROW AND PUSHBUTTON
   BLACK - BACKGROUND
6. FOR ADDITIONAL DETAILS, SEE PEDESTRIAN PUSHBUTTON DETAILS ON ELEC SHEET 19.



PEDESTRIAN PUSHBUTTON DETAIL

NOT TO SCALE (MAKUAHINE ST. INTERSECTION ONLY)



NOTE: SEE TRAFFIC SIGNAL PULLBOX DETAILS ON ELEC SHT 20

TYPICAL CONSTRUCTION JOINT DETAIL

NOT TO SCALE

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

6/1/98
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STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL DETAILS VII

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97

SCALE: AS NOTED DATE: MAY 1998

SHEET No. 22 OF 23 SHEETS

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

LAST SAVE: 05/05/98 @ 14:52:12 BY: TM PLOT SC 1"=0'=1"
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FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	63A-01-97	1998	52	52

GENERAL NOTES - TRAFFIC SIGNAL SYSTEM

1. ALL TRAFFIC SIGNAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREETS AND HIGHWAYS", FEDERAL HIGHWAY ADMINISTRATION, LATEST EDITION, AND AMENDMENTS.

2. THE LOCATIONS OF THE TRAFFIC SIGNAL STANDARDS, TRAFFIC SIGNAL STANDARDS WITH MAST-ARM, PEDESTRIAN PUSH BUTTONS, TRAFFIC CONTROLLER, PULLBOXES, CONDUITS, BARRIERS & LOOP DETECTORS SHALL BE STAKED OUT IN THE FIELD BY CONTRACTOR & APPROVAL OF THE LOCATIONS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTION & INSTALLATION. LOCATIONS SHOWN ON THE PLANS SHALL BE ADJUSTED AS NECESSARY TO PREVENT CONFLICTS WITH EXISTING OR NEW FACILITIES.

3. ALL NEW CONDUITS UNDER ROADWAY SHALL BE PVC SCHEDULE 80.

4. A SOLID #8 BARE COPPER WIRE SHALL BE INSTALLED IN THE ENTIRE TRAFFIC SIGNAL CONDUIT SYSTEM FOR USE AS A SYSTEM GROUND.

5. LEAD-IN WIRES IN PULLBOX NEAR LOOPS SHALL BE TAGGED WITH LOOP NUMBER(S).

6. DEPARTMENT OF TRANSPORTATION SERVICES, CITY & COUNTY OF HONOLULU WILL ASSIST THE ENGINEER IN CONSTRUCTION INSPECTION FOR THE TRAFFIC SIGNAL SYSTEM.
   WORK BY THE DEPARTMENT OF TRANSPORTATION SERVICES, C & C OF HONOLULU:
   (a) MAKE ALL ELECTRICAL EQUIPMENT CONNECTIONS IN THE FIELD FOR SIGNAL SYSTEM AFTER THE SYSTEM HAS BEEN INSTALLED IN PLACE BY THE CONTRACTOR.
   (b) FINAL ADJUSTMENT OF TRAFFIC SIGNAL CONTROL EQUIPMENT.

7. LOCATIONS OF TRAFFIC MARKINGS AND MARKERS (LANE LINES, STOP LINES, CROSS-WALK, ETC.) SHOWN ON THE PLANS SHALL BE VERIFIED WITH THE ENGINEER PRIOR TO THE INSTALLATION OF THE TRAFFIC SIGNAL SYSTEM.

8. ALL TRAFFIC SIGNAL CONTROLLER EQUIPMENT SHALL BE COMPLETELY WIRED IN THE CABINET AND SHALL CONTROL THE TRAFFIC SIGNALS AS CALLED FOR IN THE PLANS.

9. SIGNAL INDICATIONS DURING CLEARANCE INTERVAL:
   A. IF A SIGNAL IS G OR ~~G~~ AND WILL REMAIN G OR ~~G~~ DURING THE NEXT PHASE, IT SHALL BE G OR ~~G~~ DURING THE CLEARANCE INTERVAL.
   B. IF A SIGNAL IS G OR ~~G~~ AND WILL BECOME R OR EXTINGUISHED DURING THE NEXT PHASE, IT SHALL BE Y OR ~~Y~~ DURING THE CLEARANCE INTERVAL.
   C. IF THE SIGNAL IS R AND WILL REMAIN R OR BECOMES G DURING THE NEXT PHASE, IT SHALL REMAIN R DURING THE CLEARANCE INTERVAL.

DEPARTMENT OF TRANSPORTATION SERVICES- ELECTRICAL & MAINTENANCE SERVICES DIVISION NOTES:

1. ALL WORK SHALL BE DONE IN ACCORDANCE WITH THE "STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION", SEPTEMBER, 1986, OF THE DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, EXCEPT AS MODIFIED HEREIN OR IN THE SPECIAL PROVISIONS.

2. THE LOCATIONS OF ALL NEW TRAFFIC SIGNAL STANDARDS AND CONTROLLERS ON THE DRAWINGS ARE APPROXIMATE. EXACT LOCATION WILL BE DETERMINED IN THE FIELD BY THE ENGINEER. CONFLICTS BETWEEN STANDARDS AND CROSSWALK LOCATIONS SHALL BE AVOIDED WHEREVER POSSIBLE. THE LOCATIONS OF TRAFFIC SIGNAL STANDARDS, CONTROLLERS, PULLBOXES, AND CONDUITS SHALL BE STAKED OUT BY THE CONTRACTOR AND APPROVED BY THE ENGINEER PRIOR TO ANY EXCAVATION.

3. THE CONTRACTOR SHALL NOTIFY ALL AFFECTED UTILITY COMPANIES AND GOVERNMENT AGENCIES OF THEIR INTENT TO BEGIN CONSTRUCTION ON ANY INTERSECTION OR STREET AT LEAST TWO (2) WEEKS PRIOR TO THE START OF SUCH CONSTRUCTION.

4. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE 523-4589).

5. THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE FIBER OPTIC SYSTEM (PHONE: 523-4589).

6. THE CONTRACTOR SHALL NOTIFY THE JOINT POLE COMMITTEE TWO (2) WEEKS IN ADVANCE OF ANY RELOCATION OF UTILITY POLE(S) THAT MAY BE NECESSARY.

7. THE TRAFFIC SIGNAL AND FIBER OPTIC SYSTEM SHALL BE KEPT OPERATIONAL DURING CONSTRUCTION. ANY RELOCATION OR CHANGEOVER REQUIRED SHALL BE APPROVED BY THE ELECTRICAL & MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, AND PERFORMEDAND PAID FOR BY THE CONTRACTOR.

8. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING TRAFFIC SIGNAL AND FIBER OPTIC FACILITIES, INCLUDING THE TRAFFIC SIGNAL INTERCONNECT SYSTEM AND ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.

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ELECTRICAL ENGINEERS

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

TRAFFIC SIGNAL NOTES

LIKELIKE HIGHWAY TRAFFIC IMPROVEMENTS
VALLEY VIEW DRIVE TO H-1

PROJECT NO. 63A-01-97

SCALE: AS NOTED DATE: MAY 1998

SHEET No. 23 OF 23 SHEETS

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