

## ELECTRICAL NOTES:

- ① NEW 12PR # 19 OVERHEAD INTERCONNECT CABLE WITH 1/4" # GALVANIZED STEEL MESSANGER CABLE, INSTALL ON EXISTING JOINT POLES. SEE

3  
E-2

NEW 2" PVC RISER UP POLE WITH 12PR # 19 INTERCONNECT CABLE.

CONNECT NEW 12PR # 19 INTERCONNECT CABLE TO EXISTING TRAFFIC SIGNAL CONTROLLER

PENETRATE EXISTING FULLBOX TO INSTALL NEW RACEWAY. PATCH TO MATCH EXISTING CONDITION.

DATE	REVISION
6/3/98	REVISED DTS PHONE NUMBER

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-03-97	1998	12	18

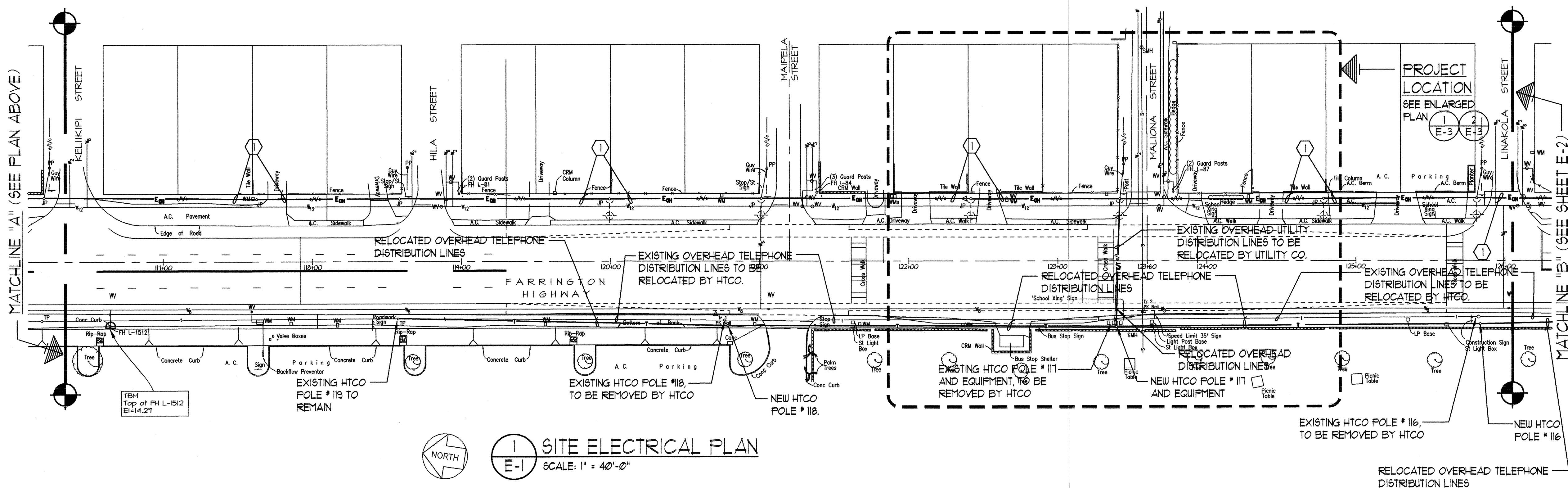
## ELECTRICAL SYMBOL LIST

EXISTING	NEW	DESCRIPTION
	☐	TRAFFIC SIGNAL FULL BOX, TYPE "C".
	☐	TRAFFIC SIGNAL FULLBOX, TYPE "A".
	☐	TRAFFIC SIGNAL FULLBOX, TYPE "B".
	◀	TRAFFIC SIGNAL STANDARD, WITH 12" LENS ASSEMBLY.
	◀	TRAFFIC SIGNAL STANDARD WITH MAST ARM AND 12" LENS ASSEMBLY.
	◻	PEDESTRIAN SIGNAL HEADS (HAND/MAN).
	⊗	EVP DETECTOR
	⊙	TRAFFIC SIGNAL PEDESTRIAN PUSHBUTTON STATION.
---	---	RACEWAY, CONCEALED BELOW FINISH FLOOR. NUMBER OF HASHMARKS INDICATE UPPER HALF, DETAIL NUMBER. LOWER HALF, SHEET NUMBER, DETAIL LOCATION.
---	---	OVERHEAD ELECTRIC CABLE.
---	---	OVERHEAD ELEC./TEL./CATV. CABLES.
---	---	STREET LIGHT BRACKET ARM LUMINAIRE.
○	○	WOOD POLE.
⊞	⊞	ELECTRIC EQUIPMENT.
---	---	OVERHEAD TELEPHONE CABLE.
---	---	OVERHEAD INTERCONNECT CABLES.

## TRAFFIC SIGNAL NOTES:

- LOCATIONS OF UNDERGROUND STRUCTURES SUCH AS PIPE LINES, CONDUITS, CABLES, ETC., AS SHOWN ON THE PLAN, ARE ONLY APPROXIMATE IN LOCATION. IT IS NOT THE INTENT OF THIS PLAN TO SHOW THE EXACT LOCATION OF ALL UNDERGROUND UTILITIES AND STRUCTURES. IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO VERIFY ALL EXISTING UTILITIES WITH THE RESPECTIVE OWNERS. EXISTING UTILITIES DAMAGED BY THE CONTRACTOR SHALL BE REPAIRED AT NO ADDITIONAL COST TO THE OWNERS.
- THE LOCATIONS OF THE TRAFFIC SIGNAL STANDARDS, TRAFFIC CONTROLLER FULLBOXES, AND CONDUITS SHALL BE STAKED OUT IN THE FIELD AND APPROVAL OF THE LOCATIONS OBTAINED FROM THE ENGINEER PRIOR TO CONSTRUCTING THEM IN THE FIELD.
- REGULATORY SIGNS:
  - ALL SIGN PANELS SHALL CONFORM TO SECTION 621 OF SPECIAL PROVISIONS AND THE LATEST EDITIONS AND AMENDMENTS OF THE FOLLOWING FHWA PUBLICATIONS:
    - "MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES FOR STREET AND HIGHWAYS" (MUTCD).
    - "STANDARD HIGHWAY SIGNS".
    - "STANDARD ALPHABETS FOR HIGHWAY SIGNS".
    - PEDESTRIAN PUSH BUTTON SHALL BE PROVIDED WITH TYPE R10-4 SIGN.
- ALL CONSTRUCTION SHALL BE IN ACCORDANCE WITH THE DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII AND THE DEPARTMENT OF TRANSPORTATION SERVICES, CITY AND COUNTY OF HONOLULU.
- FINAL ADJUSTMENT OF TRAFFIC SIGNAL CONTROL EQUIPMENT SHALL BE MADE BY DEPARTMENT OF TRANSPORTATION SERVICES, CITY AND COUNTY OF HONOLULU.

MATCHLINE "A" (SEE PLAN ABOVE)



MATCHLINE "B" (SEE SHEET E-2)

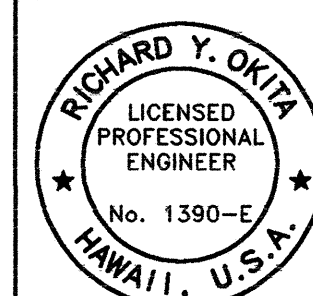
## ELECTRICAL &amp; MAINTENANCE SERVICES DIVISION NOTES:

- THE CONTRACTOR SHALL NOTIFY THE ELECTRICAL AND MAINTENANCE SERVICES DIVISION, DEPARTMENT OF TRANSPORTATION SERVICES, THREE (3) WORKING DAYS PRIOR TO COMMENCING WORK ON THE TRAFFIC SIGNAL SYSTEM (PHONE NO. 523-4589).
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO EXISTING TRAFFIC SIGNAL FACILITIES INCLUDING THE TRAFFIC SIGNAL INTERCONNECT SYSTEM. ANY AND ALL DAMAGES TO THESE FACILITIES SHALL BE REPAIRED BY THE CONTRACTOR AT HIS COST IN ACCORDANCE WITH THE REQUIREMENTS OF THE CITY AND COUNTY OF HONOLULU.

## GENERAL NOTES:

- ALL WORK SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE FOLLOWING CONSTRUCTION STANDARDS AND SPECIFICATIONS:
  - GENERAL ORDER NO. 6 AND NO. 10 PUBLIC UTILITIES COMMISSION, STATE OF HAWAII, CURRENT EDITION.
  - CONSTRUCTION STANDARDS OF DEPARTMENT OF TRANSPORTATION, STATE OF HAWAII.
  - CURRENT STANDARD SPECIFICATIONS FOR ROAD AND BRIDGE CONSTRUCTION, STATE OF HAWAII.
  - STANDARD DETAILS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU.
  - CURRENT STANDARD SPECIFICATIONS FOR PUBLIC WORKS CONSTRUCTION, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU.
  - CONSTRUCTION STANDARDS OF THE DEPARTMENT OF TRANSPORTATION SERVICES, CITY AND COUNTY OF HONOLULU.
  - CONSTRUCTION STANDARD AND SPECIFICATIONS OF GTE. HAWAIIAN TELEPHONE COMPANY, INC.
  - CONSTRUCTION STANDARDS AND SPECIFICATIONS OF THE HAWAIIAN ELECTRIC COMPANY.
- IT IS NOT THE INTENT OF THESE PLANS AND SPECIFICATIONS TO INDICATE THAT ALL EXISTING UTILITIES ARE SHOWN ON THE PLANS. THE INFORMATION ON THE EXISTING UTILITIES ARE BASED ON AVAILABLE PLANS. THE LOCATIONS ARE APPROXIMATE ONLY AND THE CONTRACTOR SHALL VERIFY THE LOCATION AND DEPTH OF THE FACILITIES AND EXERCISE PROPER CARE IN EXCAVATING IN THIS AREA. ALL EXISTING UTILITIES WHETHER OR NOT SHOWN ON THE PLANS SHALL BE PROTECTED AT ALL TIME BY THE CONTRACTOR UNLESS SPECIFIED ON THE PLANS TO BE ABANDONED OR DEMOLISHED. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ANY DAMAGES TO THE FACILITIES WHETHER SHOWN OR NOT SHOWN ON PLANS. ANY REPAIR WORK SHALL BE PROVIDED AT NO ADDITIONAL COST TO THIS PROJECT.
- THE CONTRACTOR SHALL EXERCISE PROPER CARE WHEN EXCAVATING IN AREAS WITH EXISTING UNDERGROUND FACILITIES. DAMAGES TO THE EXISTING FACILITIES SHALL BE IMMEDIATELY REPORTED TO THE RESPECTIVE UTILITY COMPANIES, CITY AND COUNTY OR STATE AGENCY. THE REPAIR WORK SHALL BE PROVIDED AT NO ADDITIONAL COST TO THIS PROJECT.
- CONTRACTOR SHALL INSTALL 3/16" POLYOLEFIN FISH TAPE IN ALL DUCTS. PLUG ALL DUCTS WITH NON-CORRODIBLE PLUGS MANUFACTURED FOR THIS PURPOSE.
- CONTRACTOR SHALL SUBMIT ALL TRAFFIC SIGNAL EQUIPMENT TO ENGINEER, STATE OF HAWAII DOT, AND CITY & COUNTY DTS FOR APPROVAL PRIOR TO ORDERING EQUIPMENT.

E-1



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**SITE ELECTRICAL PLAN  
AND ELECTRICAL SYMBOL LIST**

**FARRINGTON HIGHWAY  
Intersection Improvements at Malakia St.  
Project No. 93A-03-97**

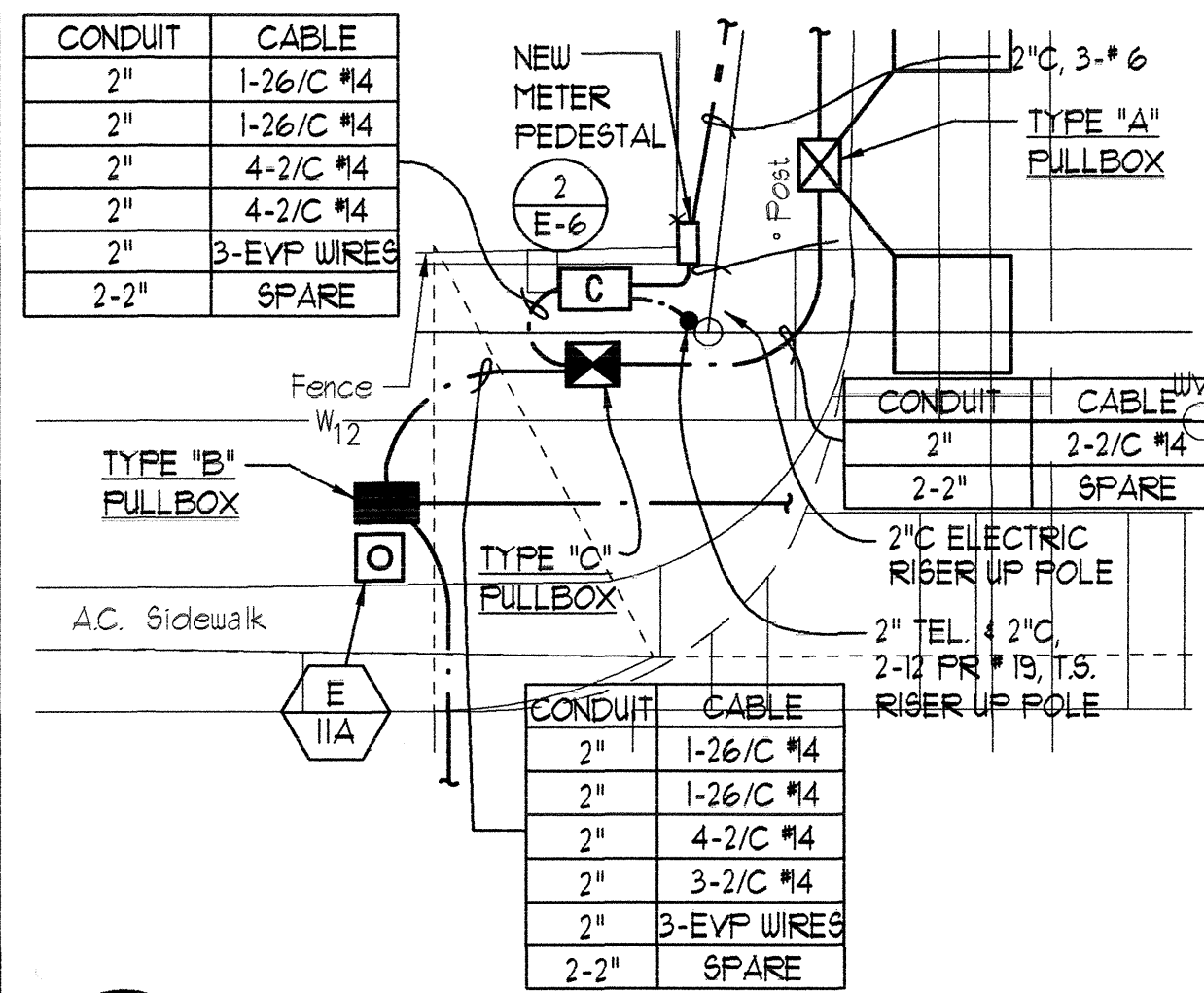
SCALE: AS SHOWN DATE: MAY 1998  
SHEET No. 1 OF 7 SHEETS

ADD. 12

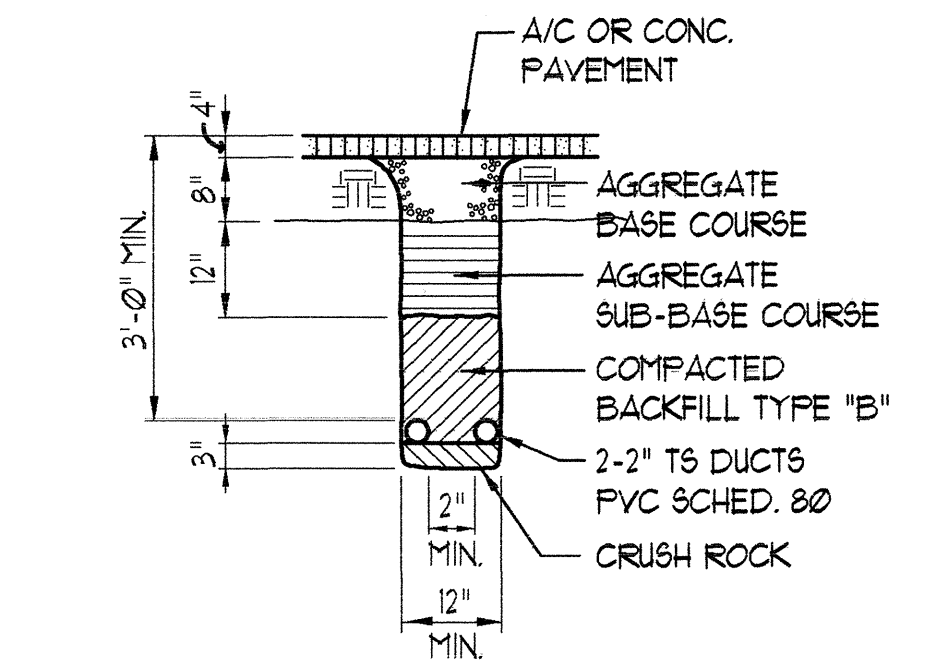








3 PARTIAL ENLARGED ELEC. PLAN  
E-3 SCALE: 1" = 10' - 0"

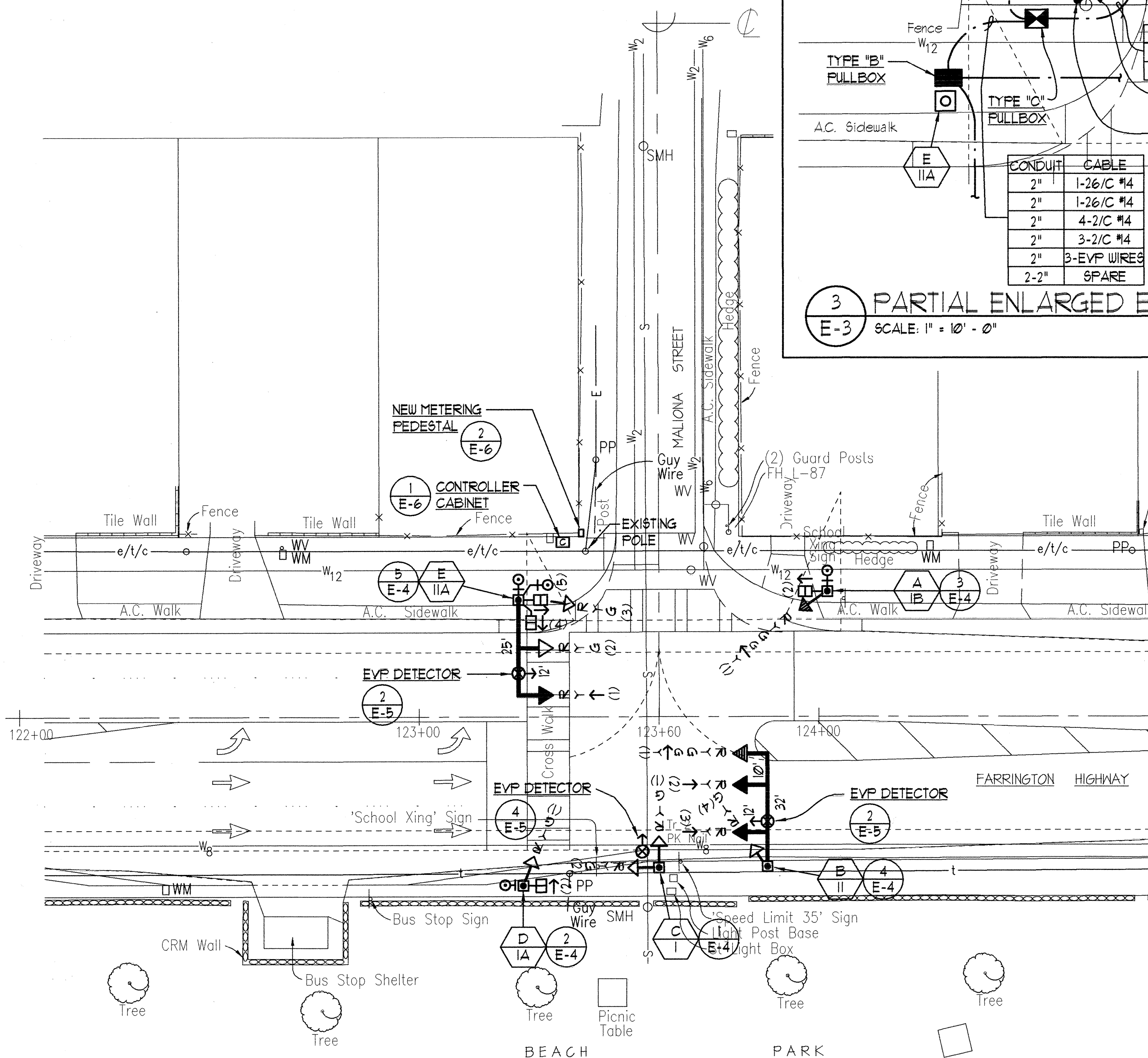


5 TYPICAL DUCT SECTIONS  
E-3 NOT TO SCALE

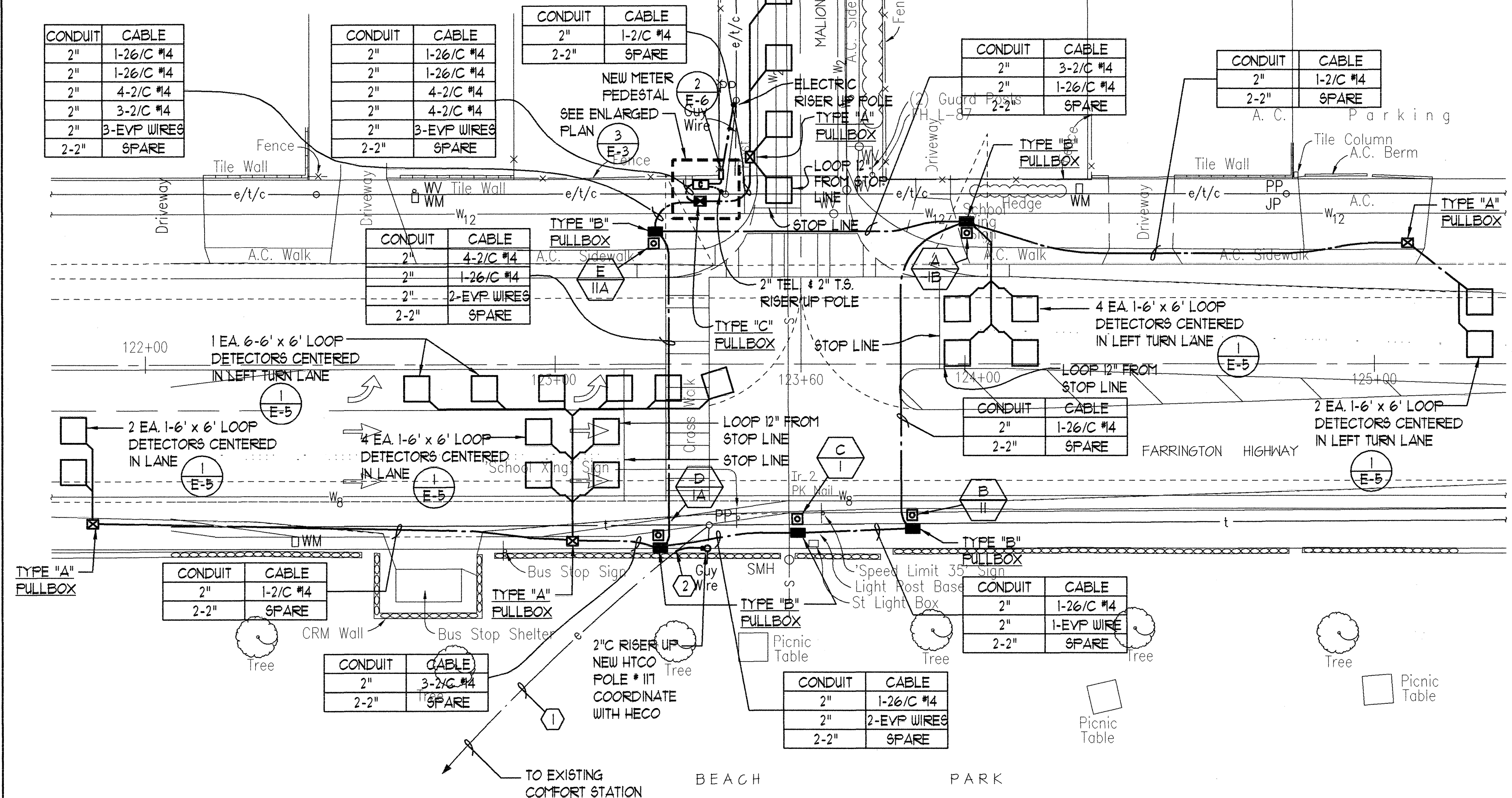
DATE	REVISION
6/9/98	REVISED SIGNAL ASSEMBLY INDICATIONS.

FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-03-97	1998	14	18

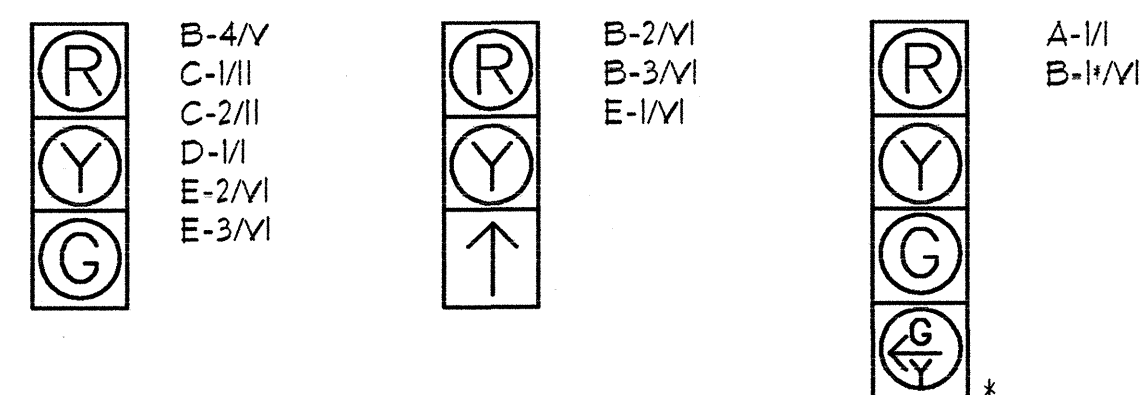
- ELECTRICAL NOTES:
- EXISTING UNDERGROUND SERVICE.
  - INTERCEPT EXISTING 2" C WITH NEW 2" C.



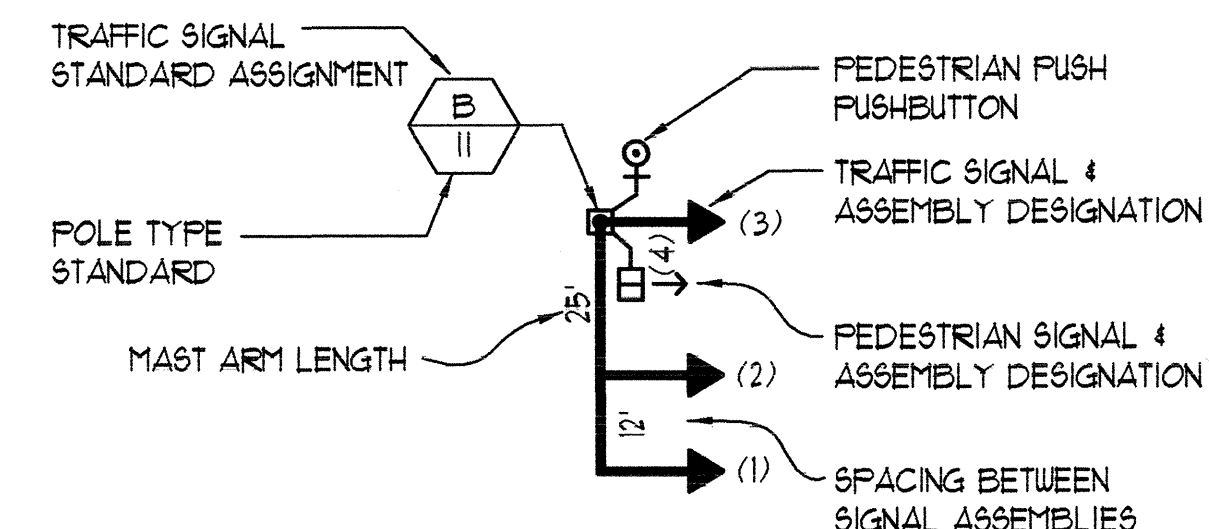
1 ELECTRICAL PLAN - TRAFFIC SIGNAL EQUIPMENT  
E-3 SCALE: 1" = 20' - 0"



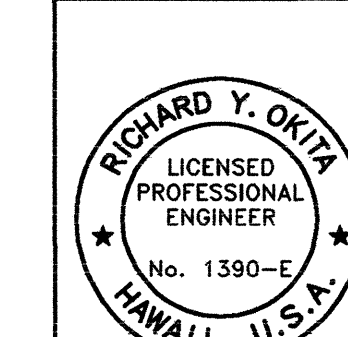
2 ELECTRICAL PLAN - HANDHOLE/DUCTLINES  
E-3 SCALE: 1" = 20' - 0"



4 SIGNAL ASSEMBLY ARRANGEMENT/  
E-3 TYPE OF MOUNTING  
NOT TO SCALE



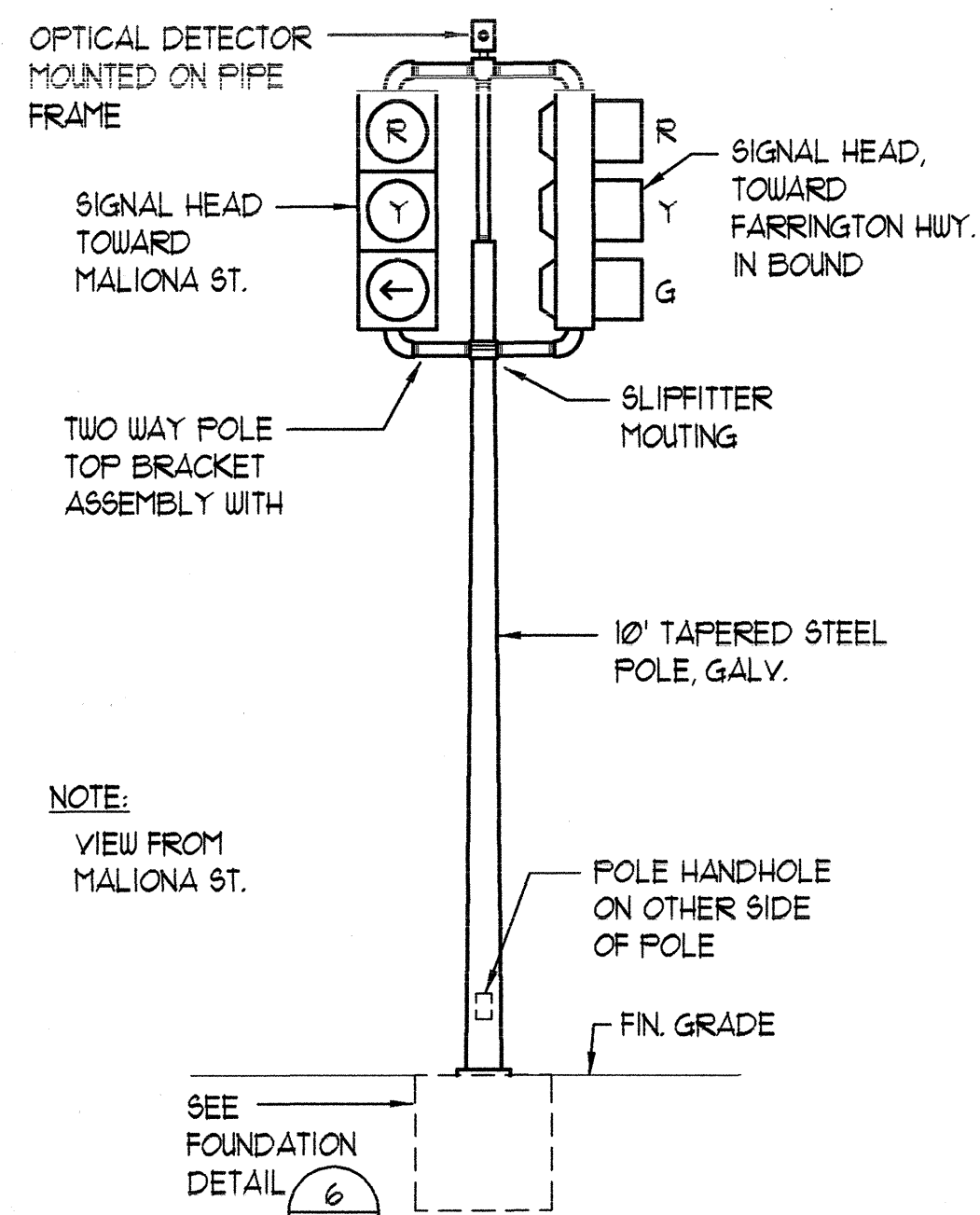
PLAN - SYMBOL LEGEND



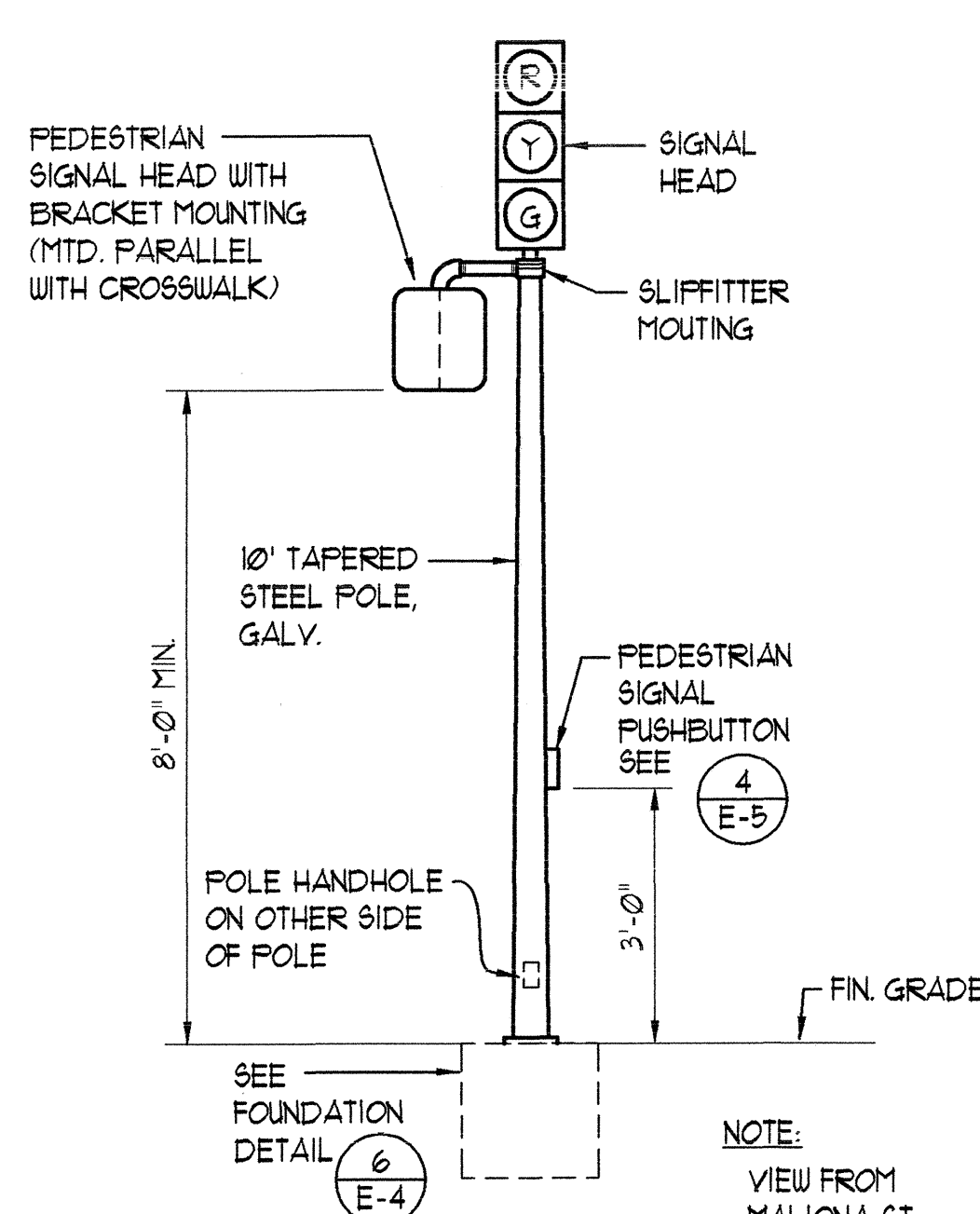
STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION  
ELEC. PLAN-TRAFFIC SIGNAL EQUIP.  
AND HANDHOLE/DUCTLINES  
FARRINGTON HIGHWAY  
Intersection Improvements at Malona St.  
Project No. 93A-03-97

SCALE: AS SHOWN DATE: MAY 1998  
SHEET No. 3 OF 7 SHEETS

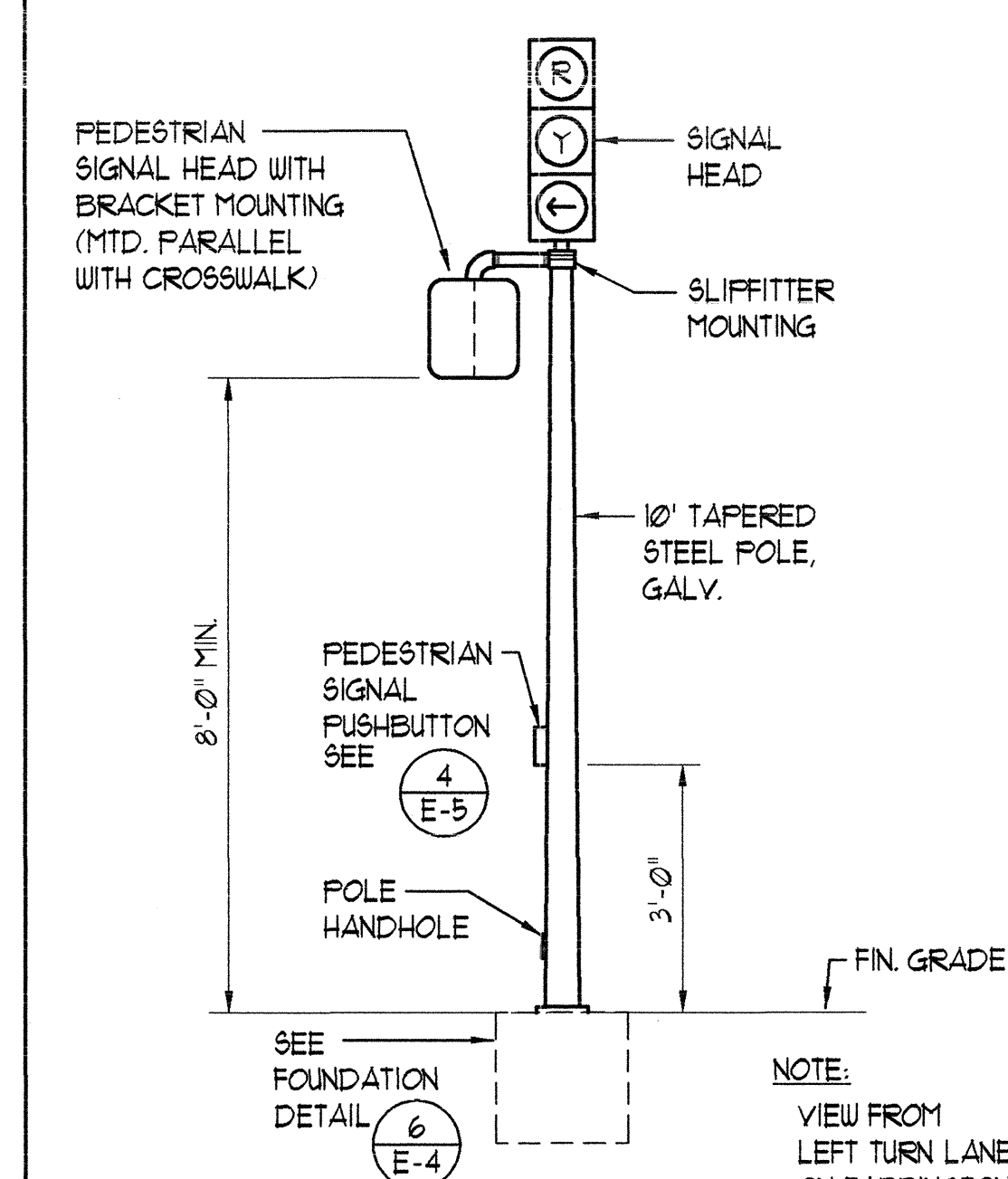




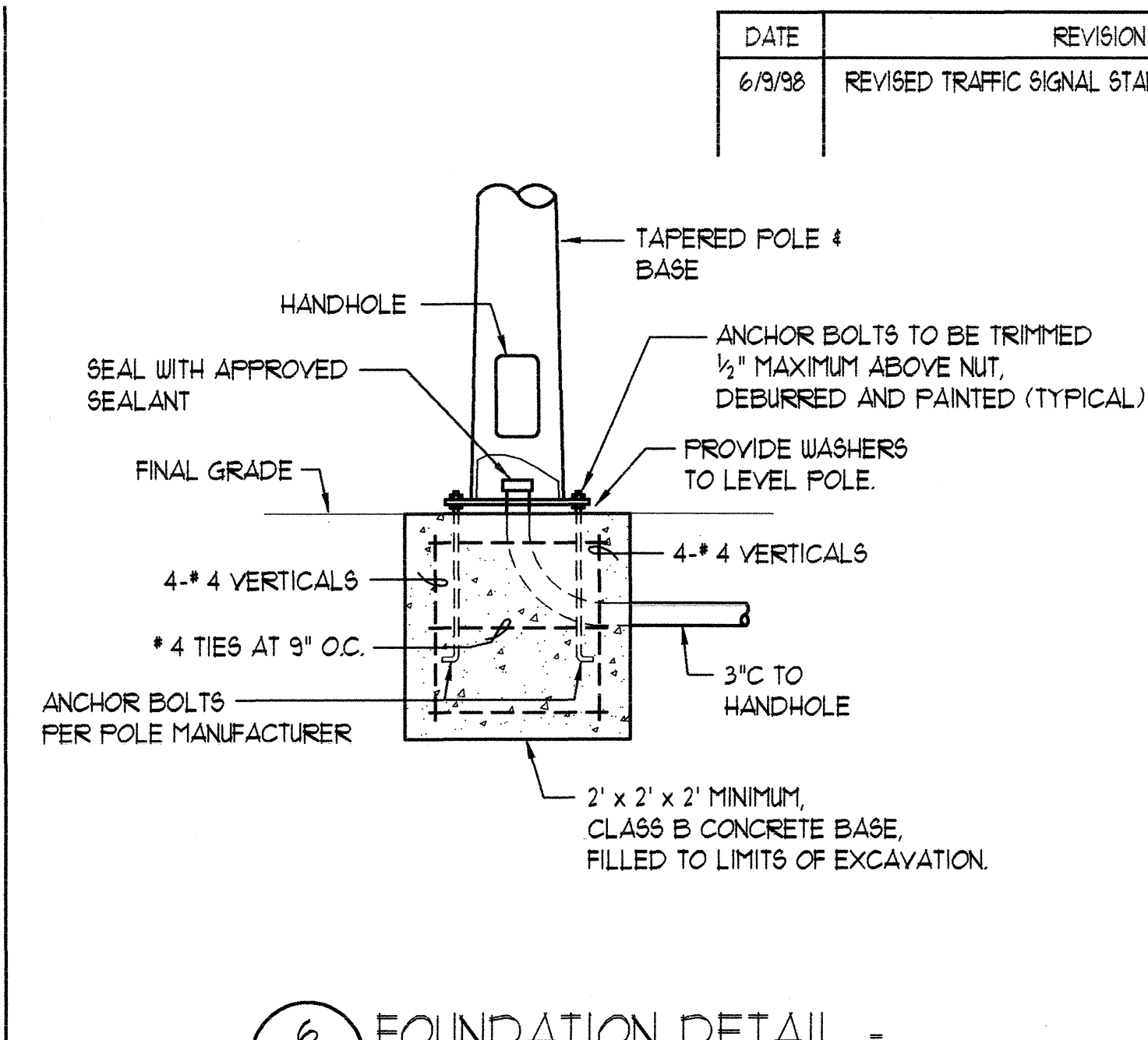
**1 TYPE I**  
**E-4 TRAFFIC SIGNAL STANDARD**  
NOT TO SCALE



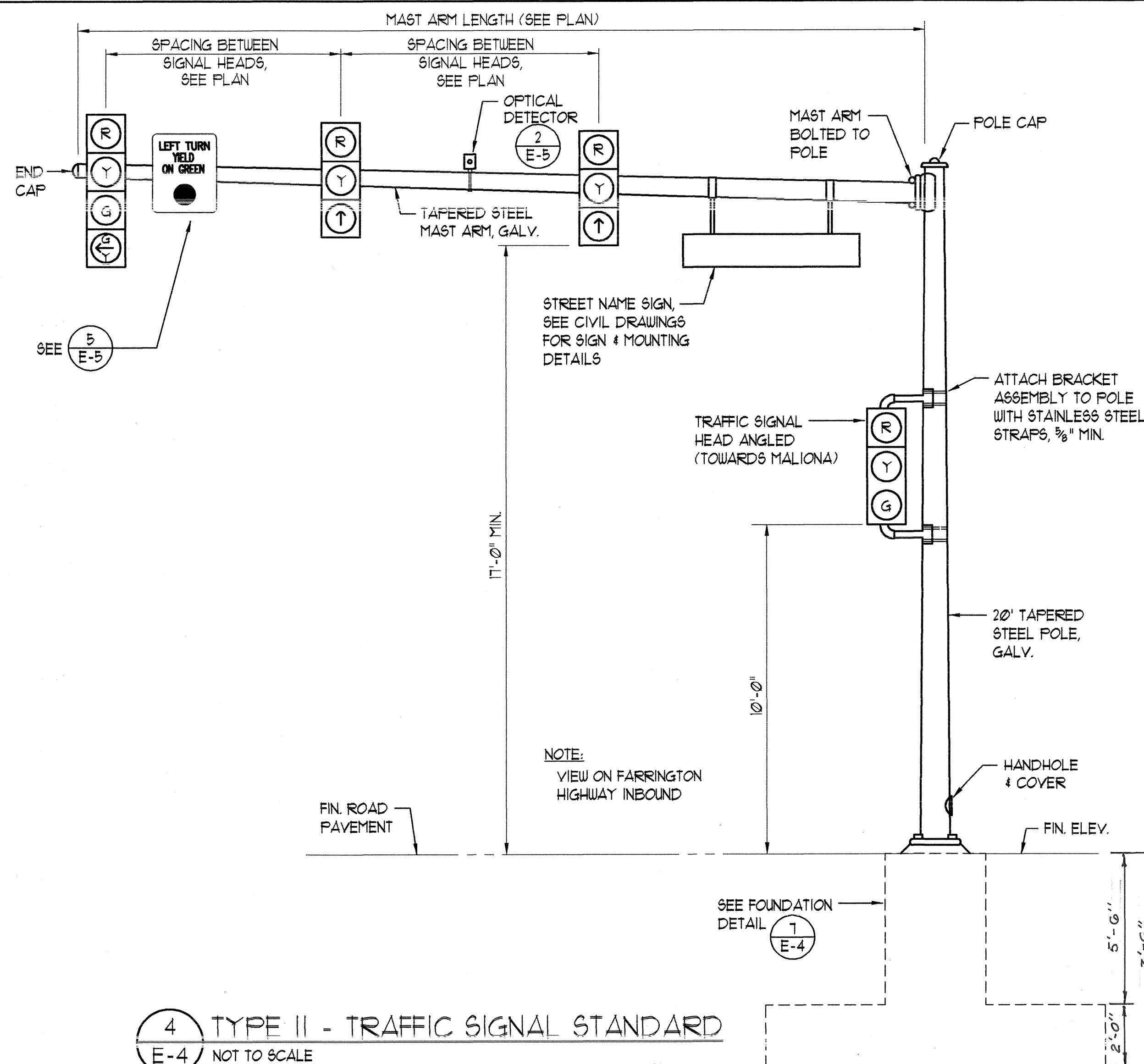
**2 TYPE IA**  
**E-4 TRAFFIC SIGNAL STANDARD**  
NOT TO SCALE



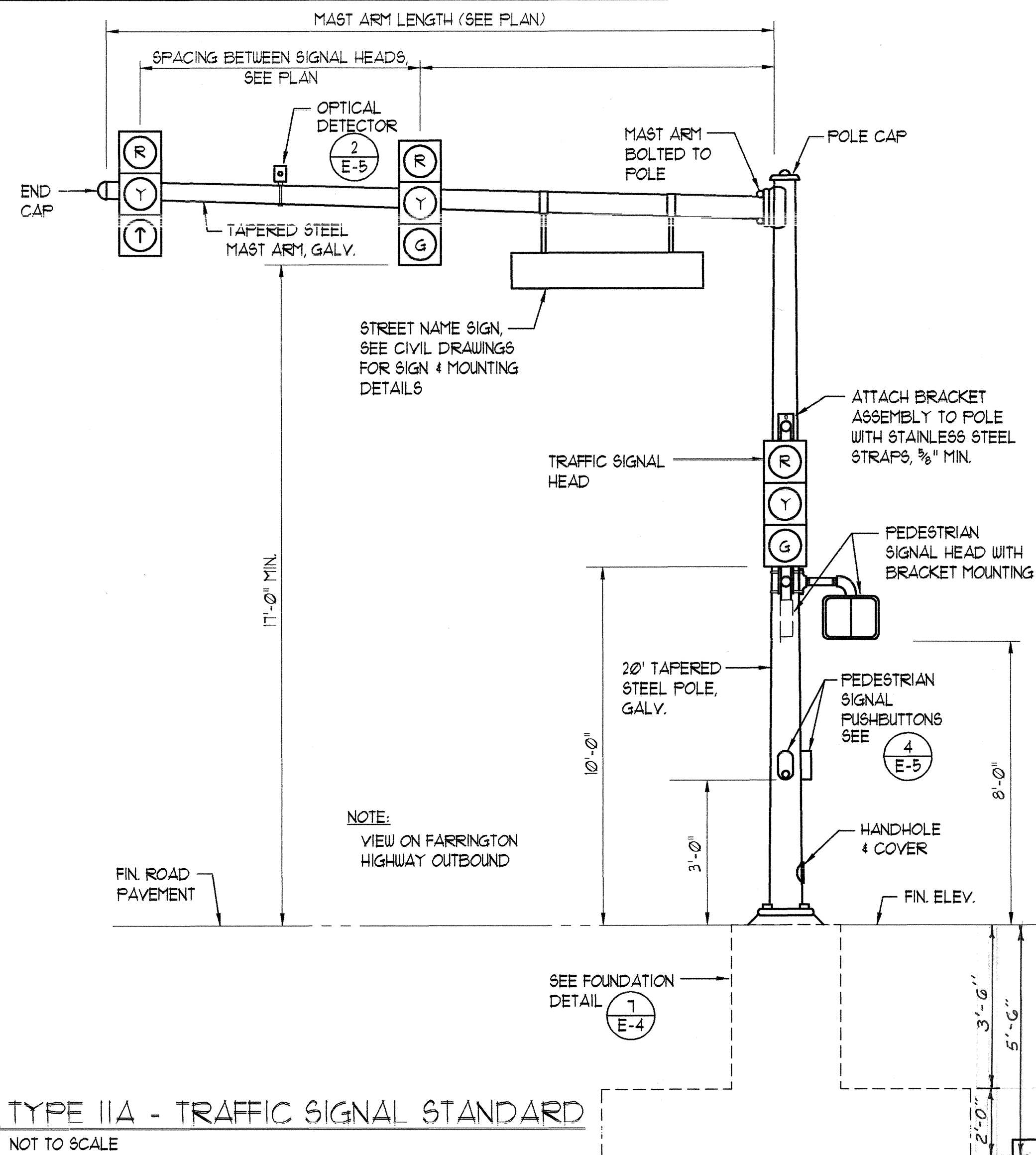
**3 TYPE IB**  
**E-4 TRAFFIC SIGNAL STANDARD**  
NOT TO SCALE



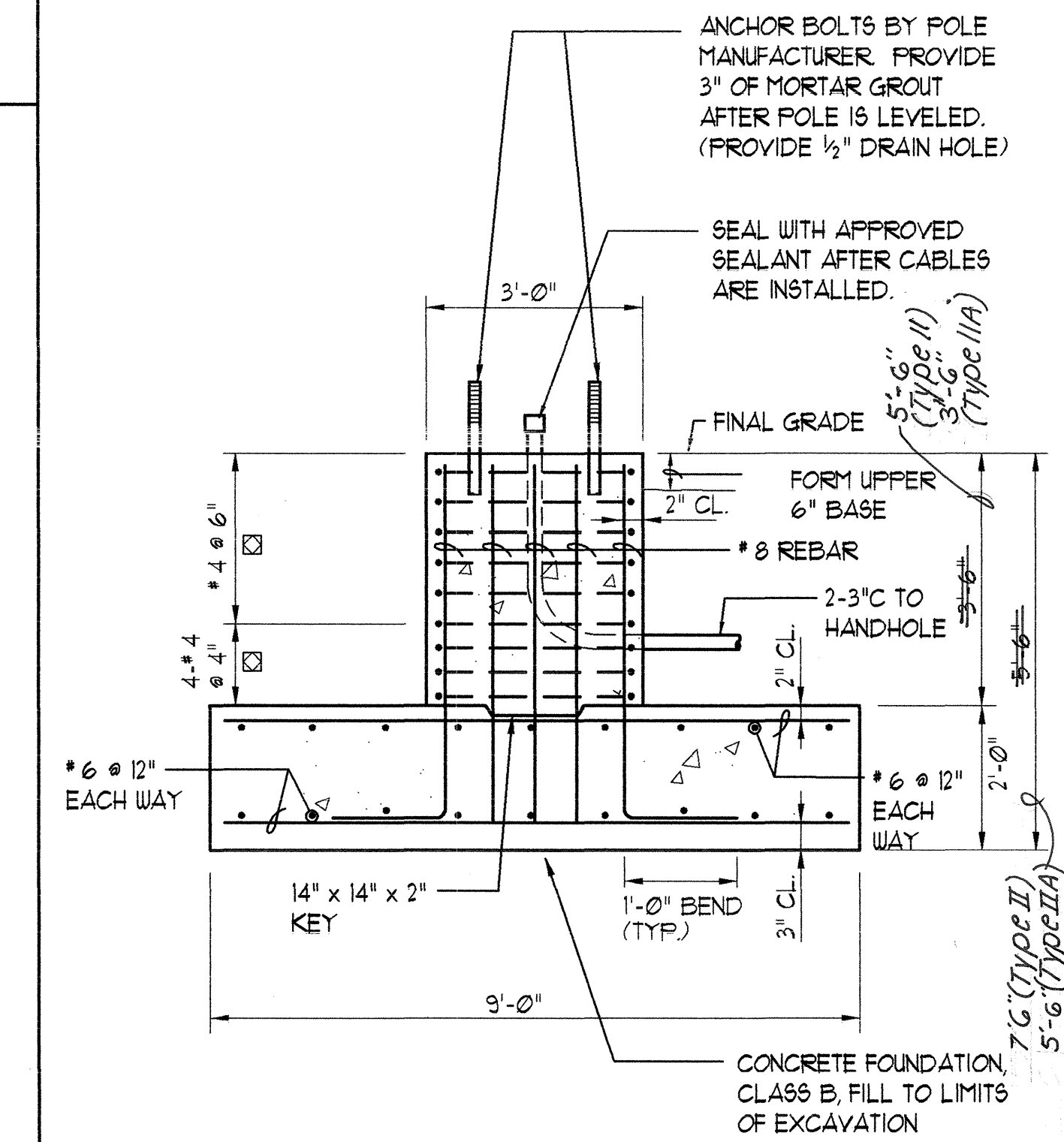
**6 FOUNDATION DETAIL -**  
**E-4 TYPE I, TYPE IA, TYPE IB**  
NOT TO SCALE  
NOTE: FOUNDATIONS IN OR ADJOINING SIDEWALK SHALL BE FLUSH WITH SIDEWALK.



**4 TYPE II - TRAFFIC SIGNAL STANDARD**  
**E-4** NOT TO SCALE



**5 TYPE IIA - TRAFFIC SIGNAL STANDARD**  
**E-4** NOT TO SCALE



**7 FOUNDATION DETAIL - TYPE II & TYPE IIA**  
**E-4** NOT TO SCALE  
NOTE: FOUNDATIONS IN SIDEWALK AREA SHALL BE FLUSH WITH SIDEWALK.

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**TRAFFIC SIGNAL STANDARD  
AND FOUNDATION DETAILS**

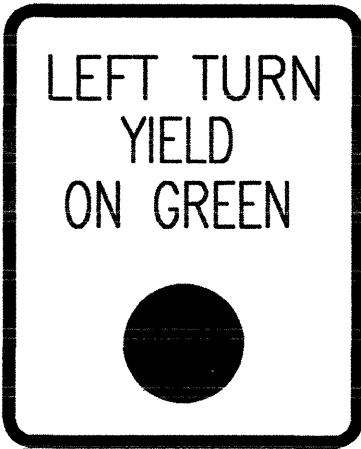
FARRINGTON HIGHWAY  
Intersection Improvements at Maliona St.  
Project No. 93A-03-97

SCALE: AS SHOWN  
DATE: MAY 1998

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SHEET No. 4 OF 7 SHEETS

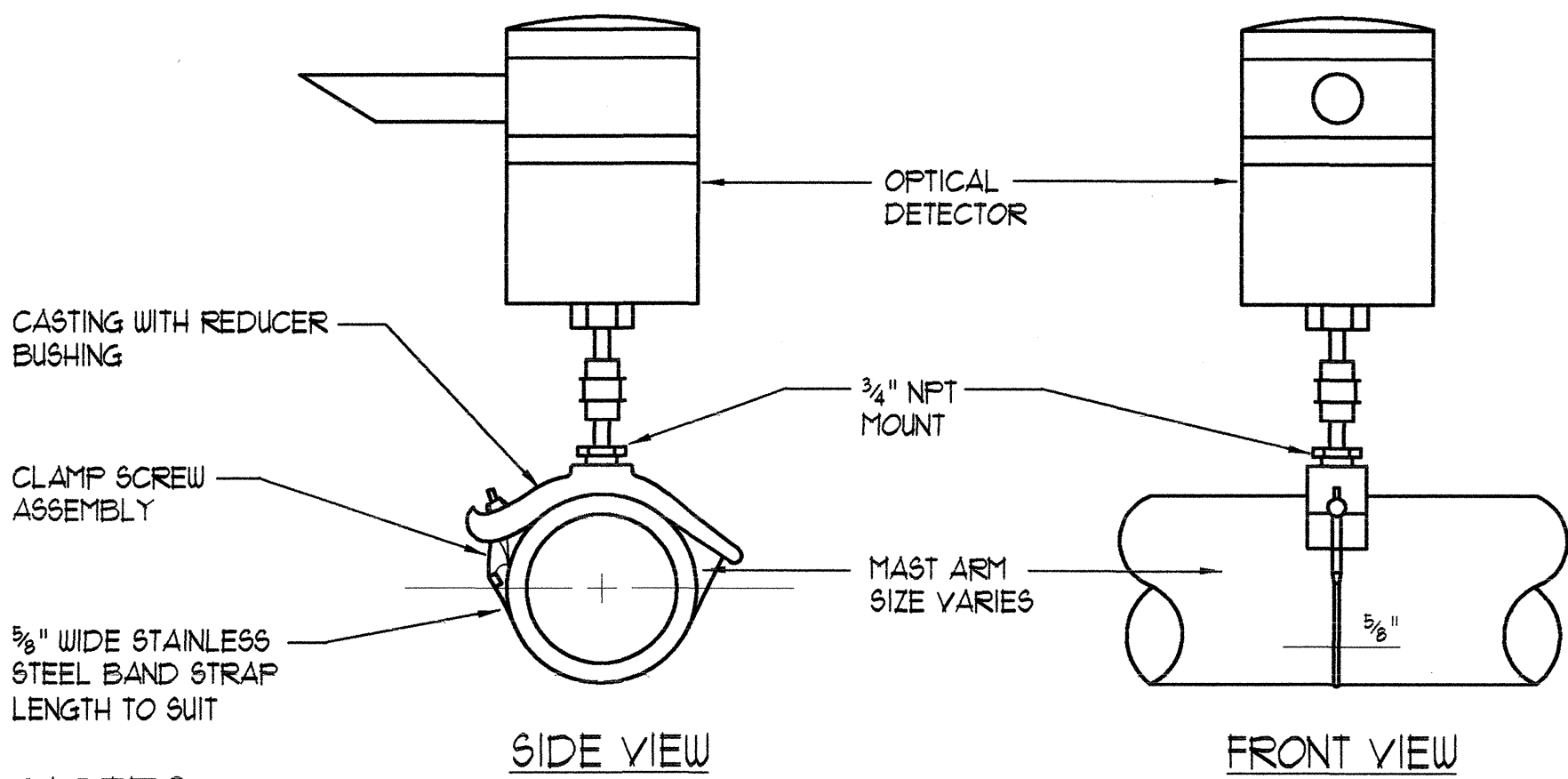
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-03-97	1998	16	18



24" x 30"

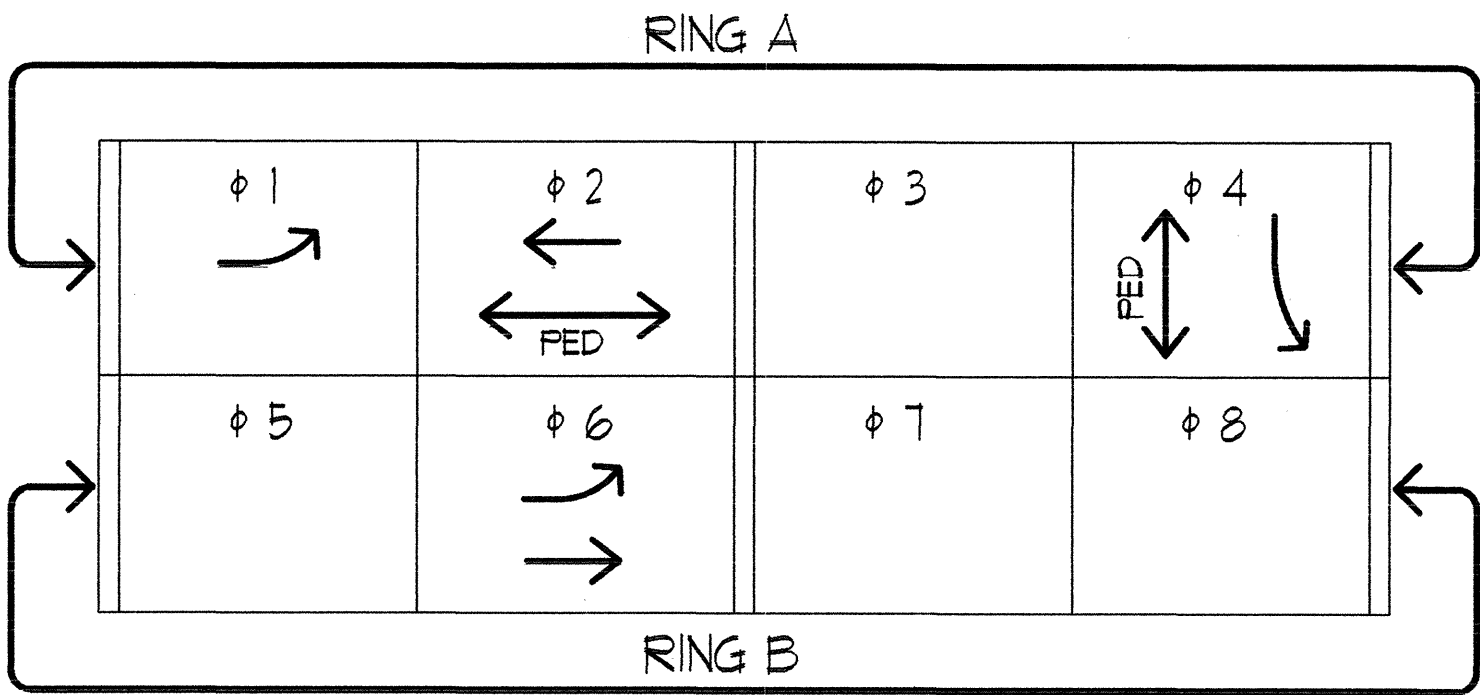
R10-12

5  
E-5  
TRAFFIC SIGNAL SIGN  
NOT TO SCALE

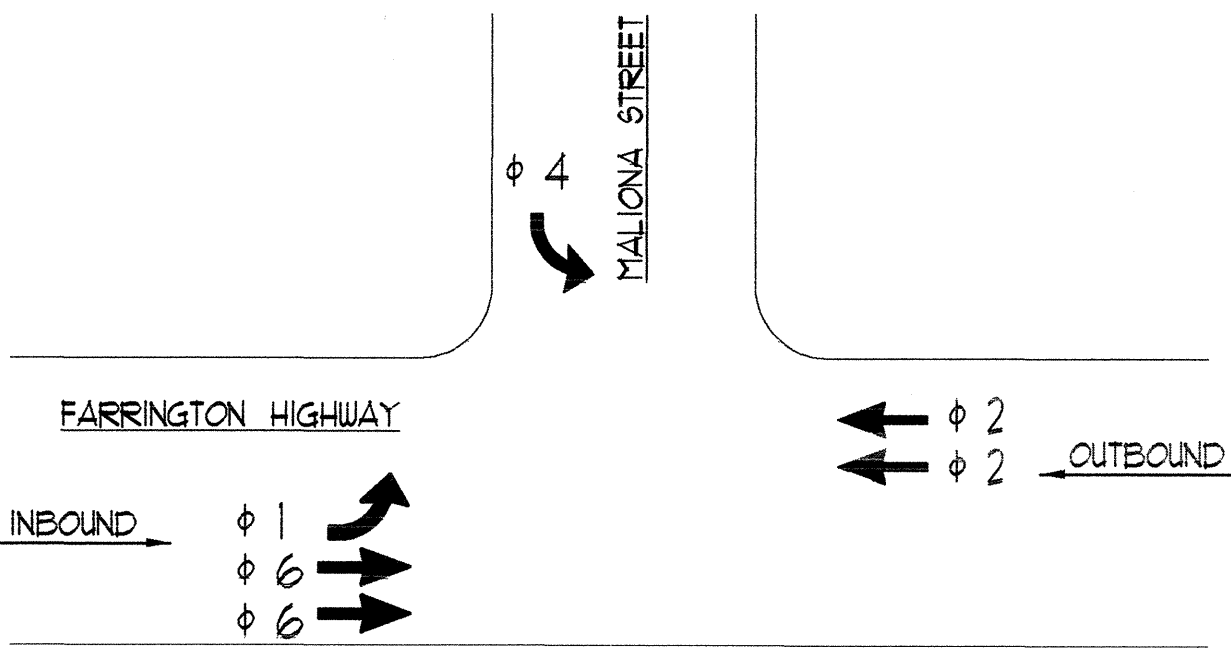


- NOTES:
- OPTICAL DETECTOR SHALL BE "OPTICOM M511 OPTICAL DETECTOR", OR APPROVED EQUAL, UNLESS NOTED OTHERWISE IN THE SPECIAL PROVISION.
  - SUPPORT SADDLE ASSEMBLY SHALL BE "ASTRO MINI-BRAC, AB-0132-29", OR APPROVED EQUAL, UNLESS NOTED OTHERWISE IN THE SPECIAL PROVISION.

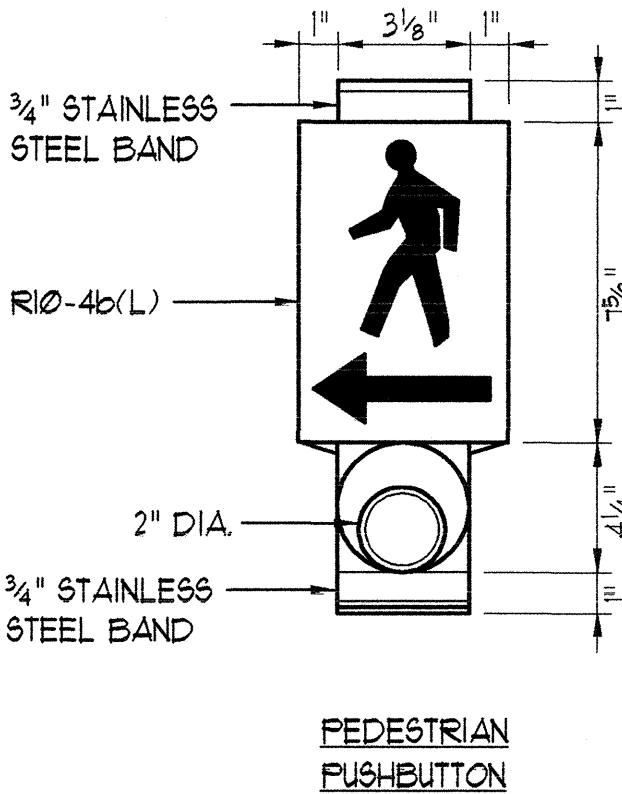
2  
E-5  
DETAIL - MAST ARM OPTICAL DETECTOR MOUNTING  
NOT TO SCALE



6  
E-5  
CONTROLLER PHASE ASSIGNMENT  
NOT TO SCALE



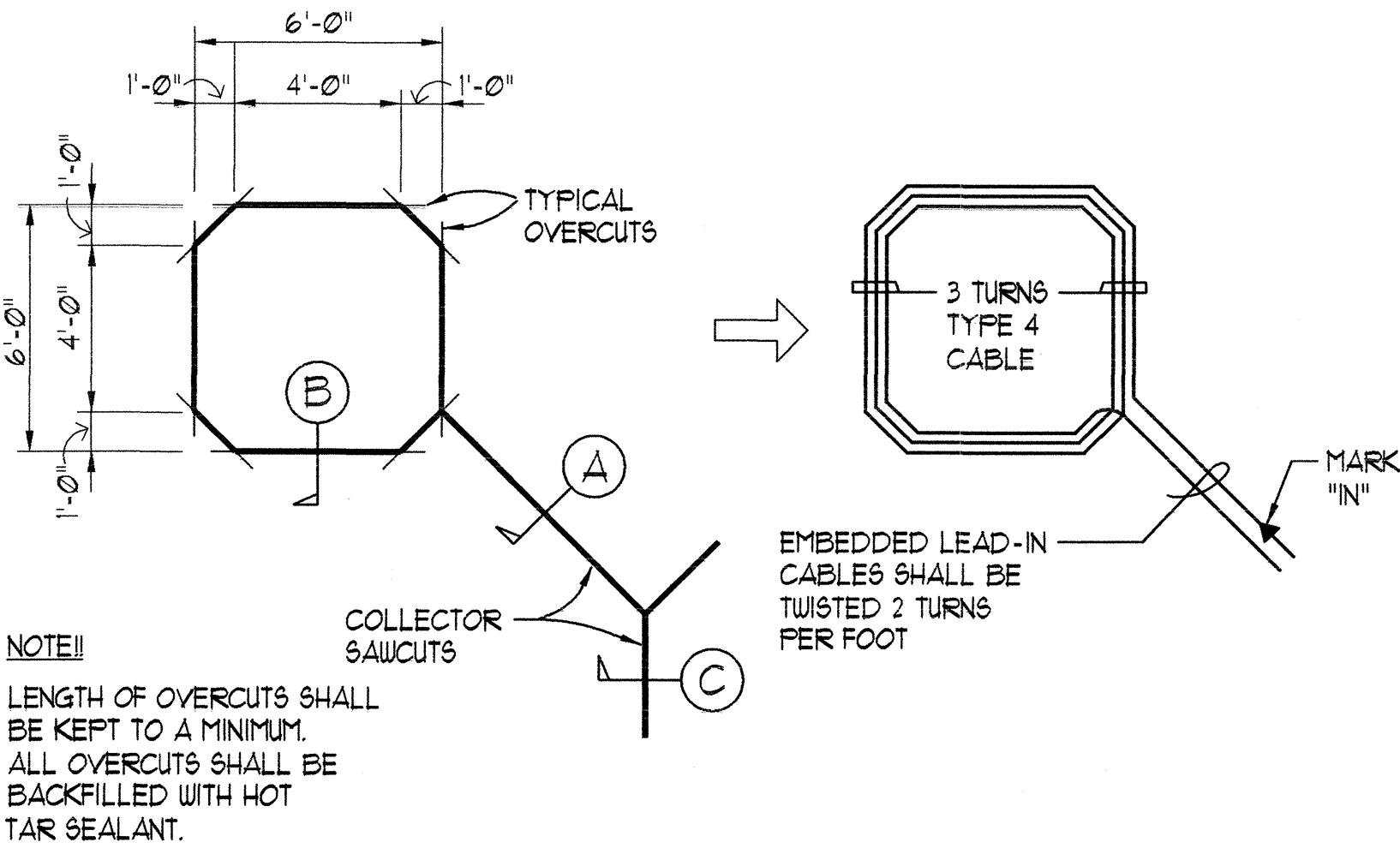
7  
E-5  
PHASE PLAN  
NOT TO SCALE



4  
E-5  
DETAIL - PEDESTRIAN  
SIGNAL PUSHBUTTON

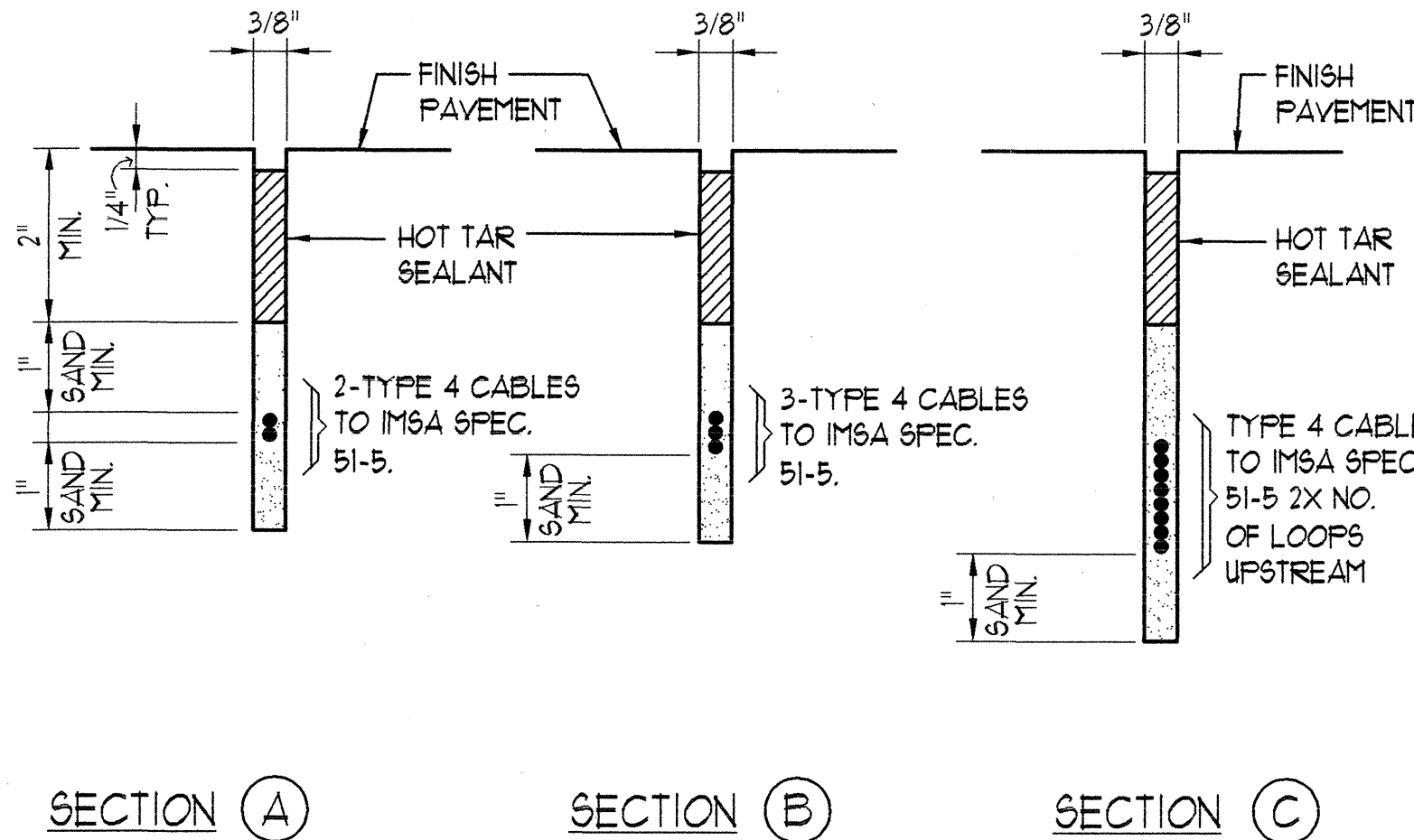
- GENERAL NOTES:
- THE PEDESTRIAN PUSHBUTTON UNIT SHALL CONSIST OF A ONE PIECE ASSEMBLY WITH A RAISED WALKING MAN, ARROW INDICATION AND PUSH BUTTON.
  - THE PUSHBUTTON ACTIVATOR SHALL BE OF THE MUSHROOM PLUNGER TYPE, ADA ACCEPTABLE, 2-INCHES IN DIAMETER THAT REQUIRES LESS THAN 5 LBS. OF PRESSURE TO ACTIVATE.
  - THE RAISED MAN AND ARROWS SHALL BE DIRECTIONAL AND MATCH THE DIRECTIONAL INDICATION AS SHOWN ON THE PLANS.
  - THE PUSHBUTTON SHALL BE TAMPERPROOF, WEATHERPROOF AND CONSTRUCTED SO THAT ELECTRICAL SHOCKS ARE IMPOSSIBLE.
  - THE COLOR SCHEME SHALL BE:  
WHITE - MAN, ARROW AND PUSH BUTTON  
BLACK - BACKGROUND

6/9/98	DELETED PEDESTRIAN SIGNAL DETAIL.
DATE	REVISION

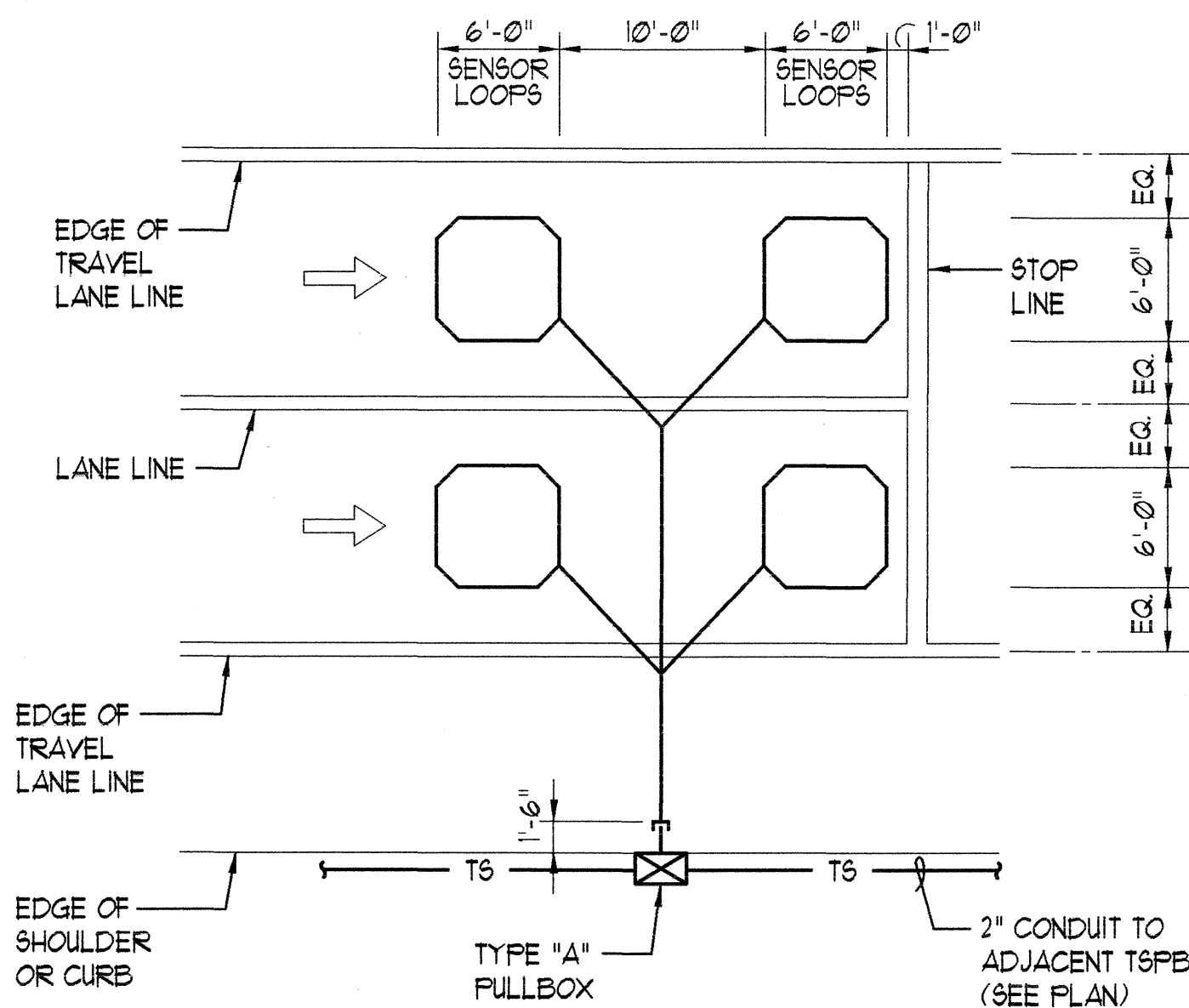


TYPICAL DETECTOR LOOP  
SAWCUT PLAN

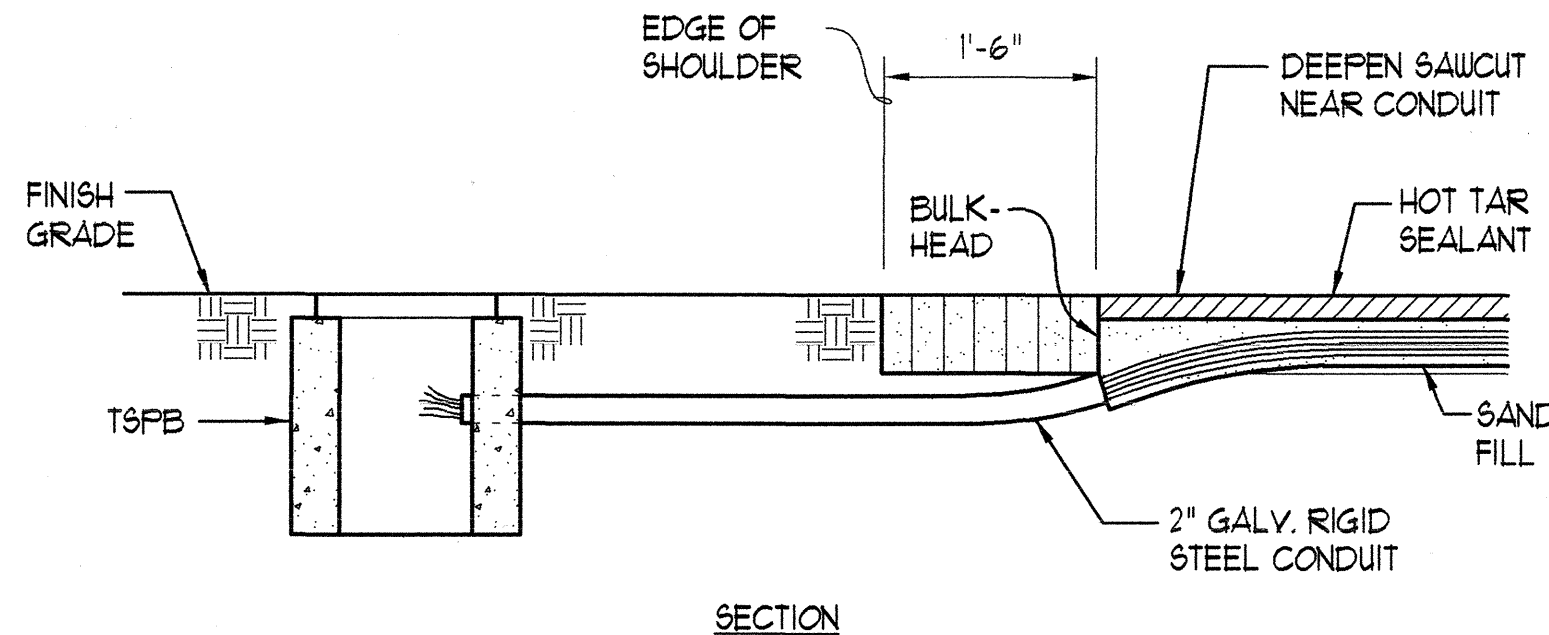
TYPICAL DETECTOR LOOP  
WIRING DIAGRAM



TYPICAL DETECTOR LOOP SAWCUT SECTIONS

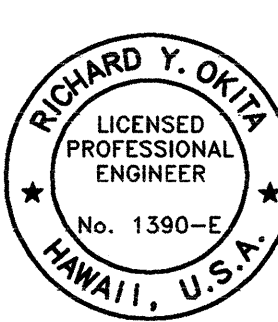


TYPICAL DETECTOR LOOP LAYOUT PLAN



TYPICAL CONDUIT STUBOUT  
INSTALLATION AT ROAD SHOULDER

1  
E-5  
TYPICAL 6' x 6' DETECTOR LOOP DETAILS  
NOT TO SCALE



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

MISCELLANEOUS DETAILS

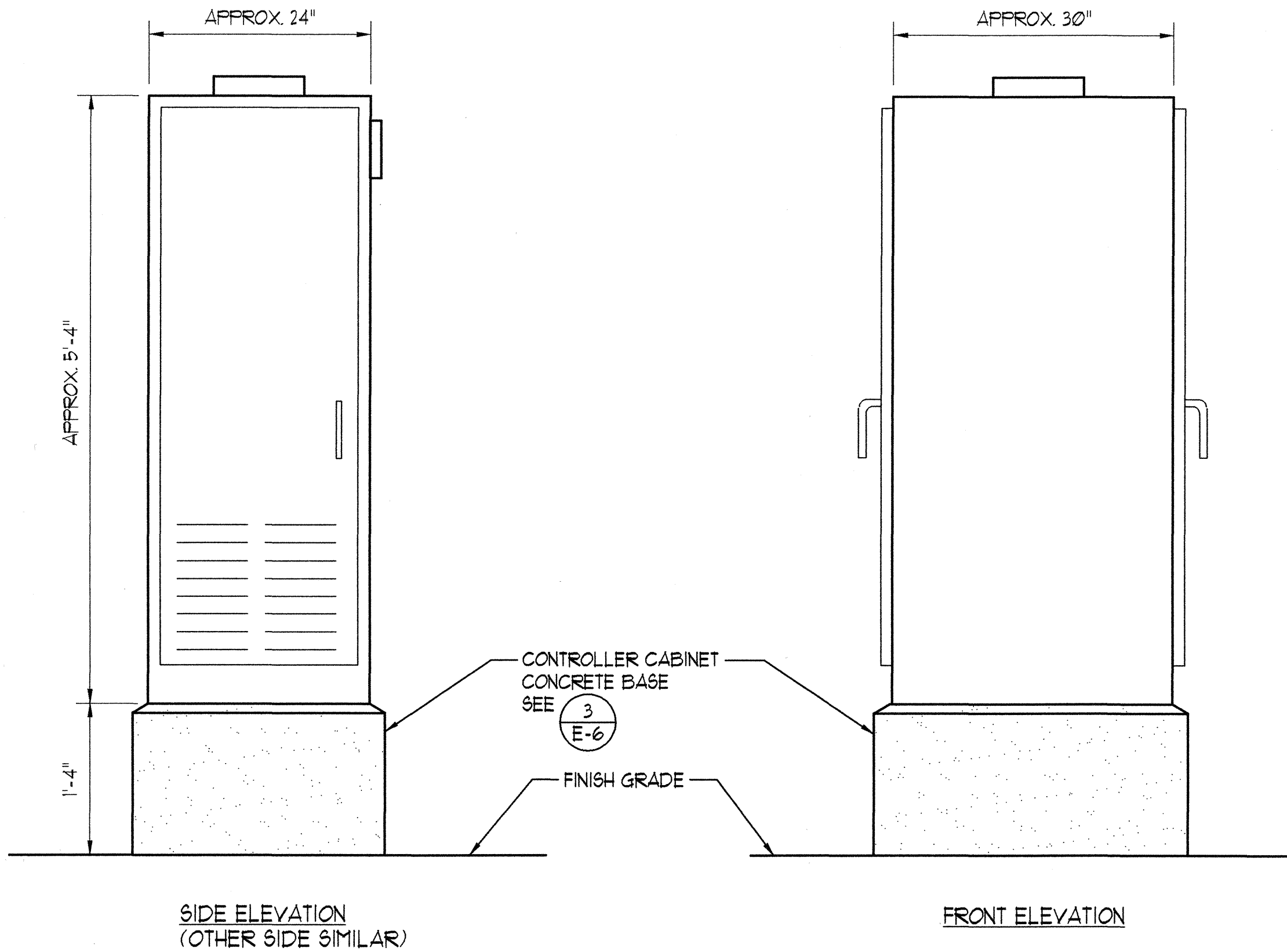
FARRINGTON HIGHWAY  
Intersection Improvements at Malona St.  
Project No. 93A-03-97

SCALE: AS SHOWN  
DATE: MAY 1998  
SHEET NO. 5 OF 7 SHEETS

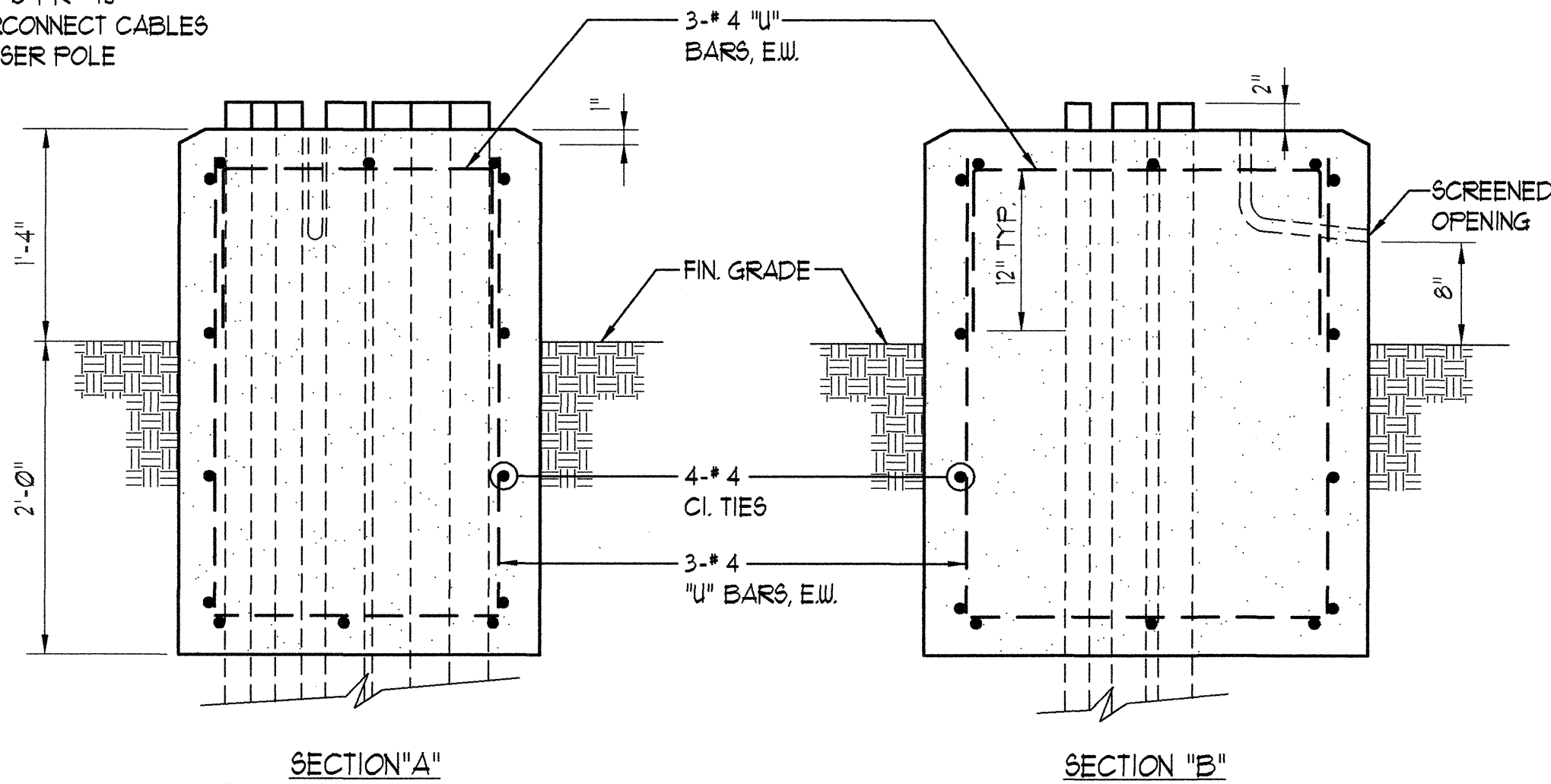
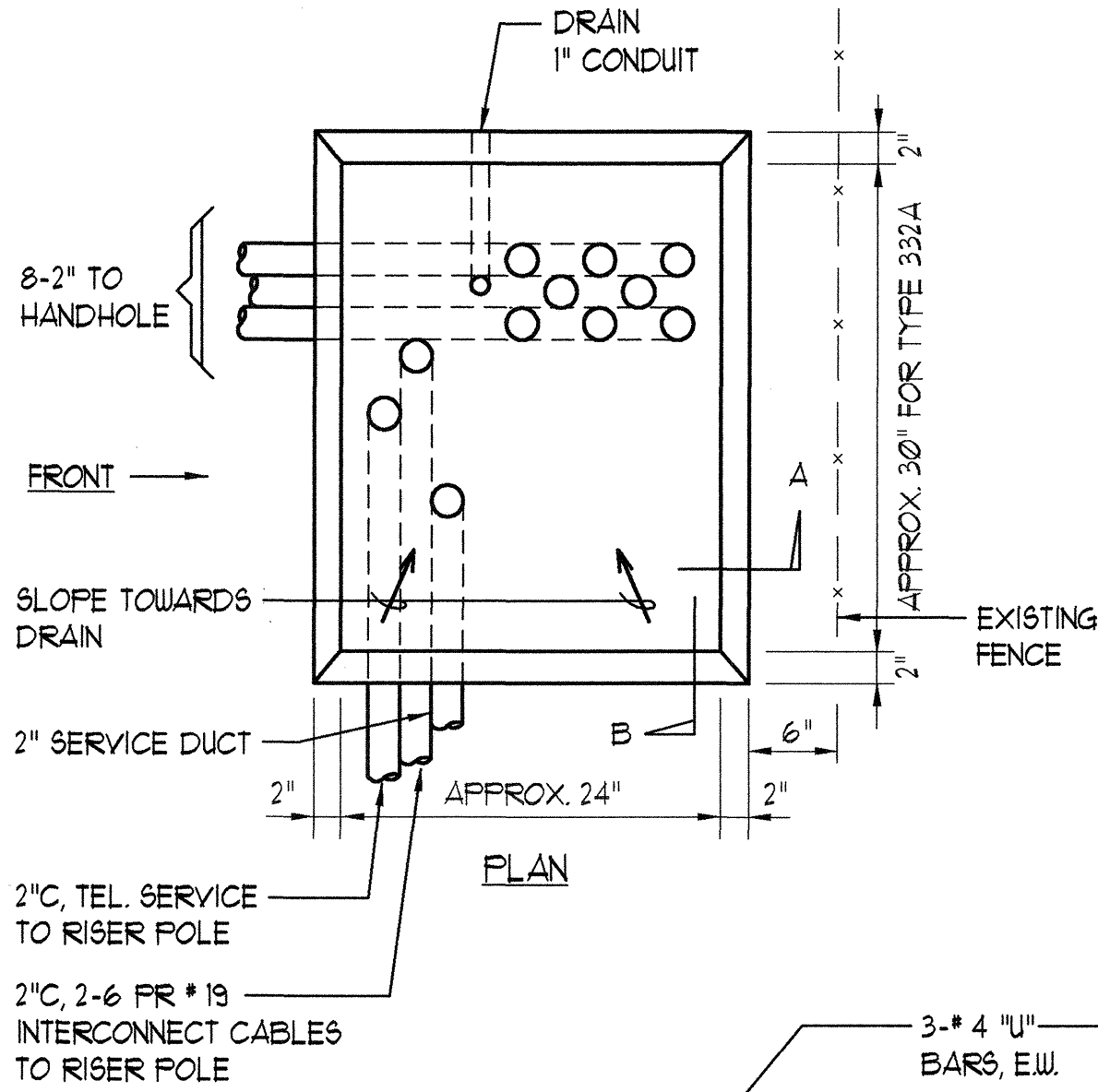
E-5



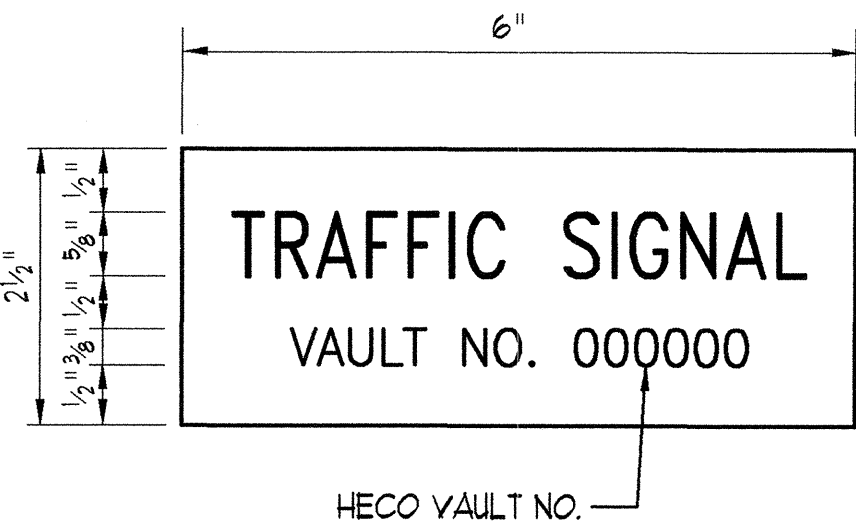
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-03-97	1998	17	18



1 TYPE 332A TRAFFIC SIGNAL  
E-6 CONTROLLER CABINET DETAIL  
NOT TO SCALE

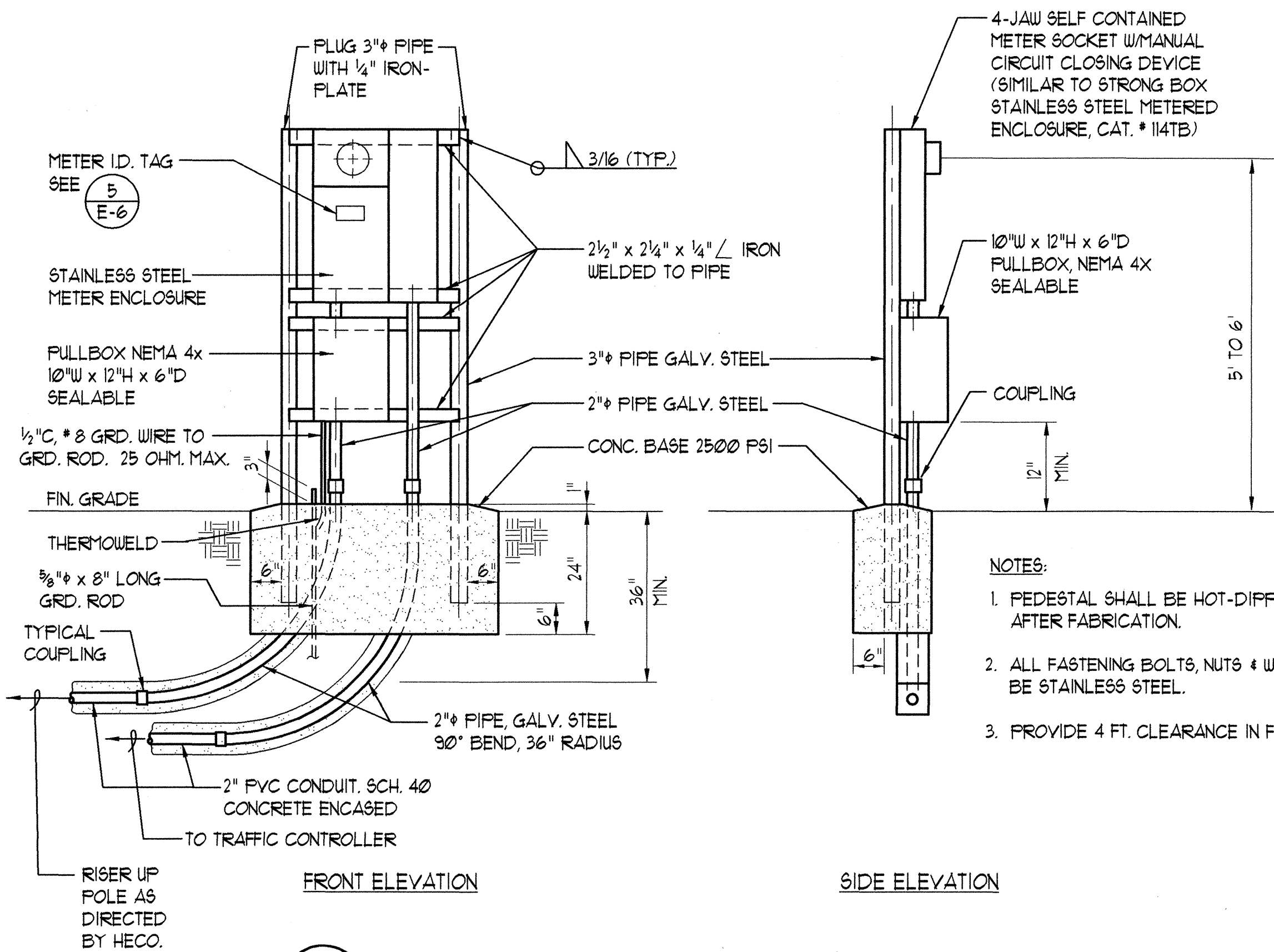


3 CONTROLLER CABINET CONCRETE BASE  
E-6 NOT TO SCALE



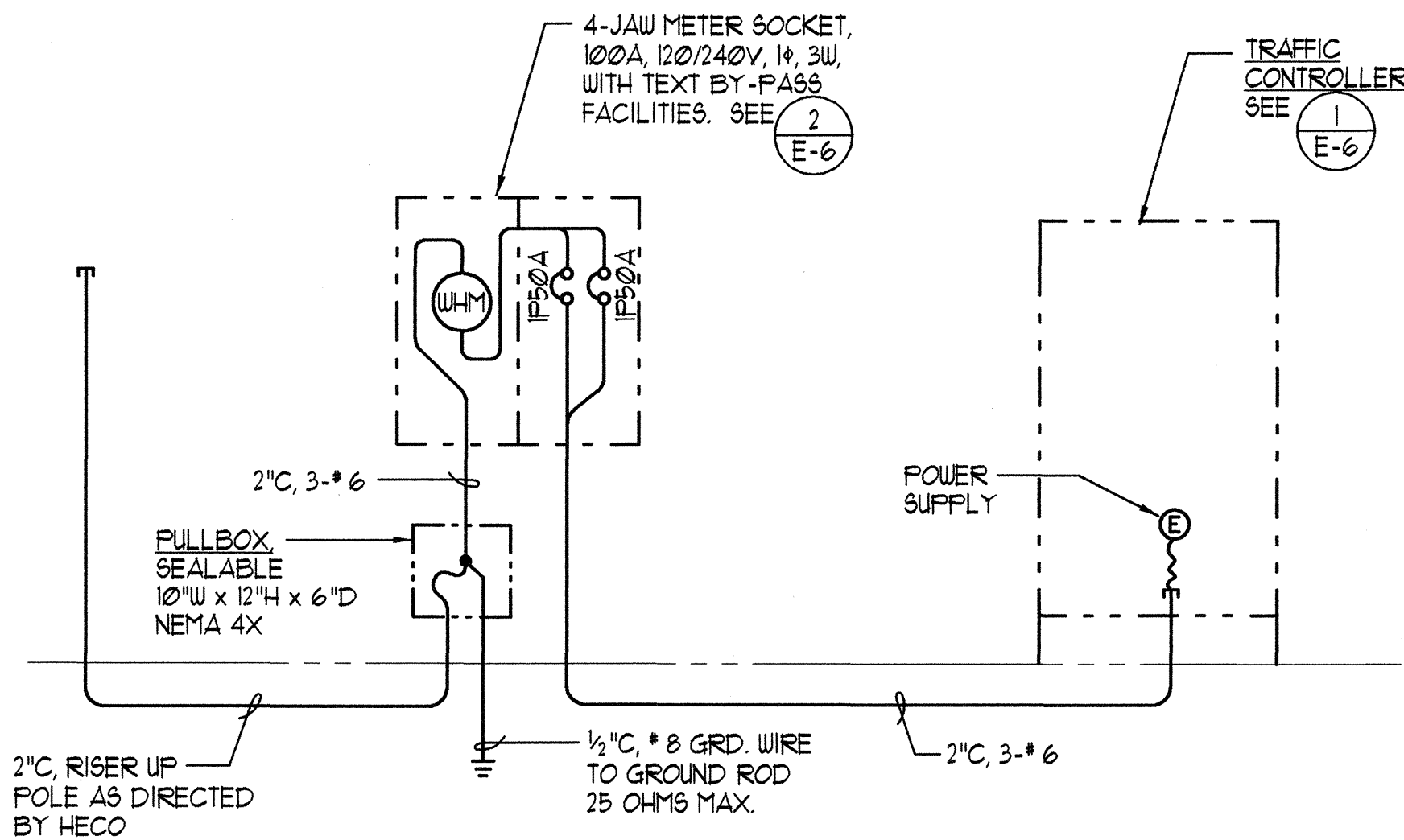
- NOTES:
- USE 3-PLY LAMINATED FLEXIBLE PLASTIC, BLACK-WHITE-BLACK. THICKNESS: 0.010" - BLACK CAP SHEET 0.052" - WHITE BASE SHEET 0.010" - BLACK BASE SHEET
  - ATTACH TO METER SOCKET USING SCOTCH 3M BRAND VERY HIGH BOND (VHB) DOUBLE COATED ACRYLIC FOAM TAPE OR EQUIVALENT.
  - LETTERS/NUMBERS SHALL BE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

5 METER IDTAG DETAIL  
E-6 NOT TO SCALE

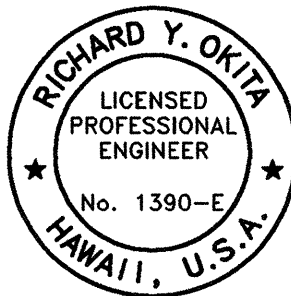


- NOTES:
- PEDESTAL SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
  - ALL FASTENING BOLTS, NUTS & WASHERS SHALL BE STAINLESS STEEL.
  - PROVIDE 4 FT. CLEARANCE IN FRONT OF METER.

2 METER PEDESTAL FOR UNDERGROUND SERVICE  
E-6 NOT TO SCALE



4 ONE LINE DIAGRAM  
E-6



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

### TRAFFIC SIGNAL DETAILS

FARRINGTON HIGHWAY  
Intersection Improvements at Maliona St.  
Project No. 93A-03-97

SCALE: AS SHOWN DATE: MAY 1998  
SHEET No. 6 OF 7 SHEETS

E-6

