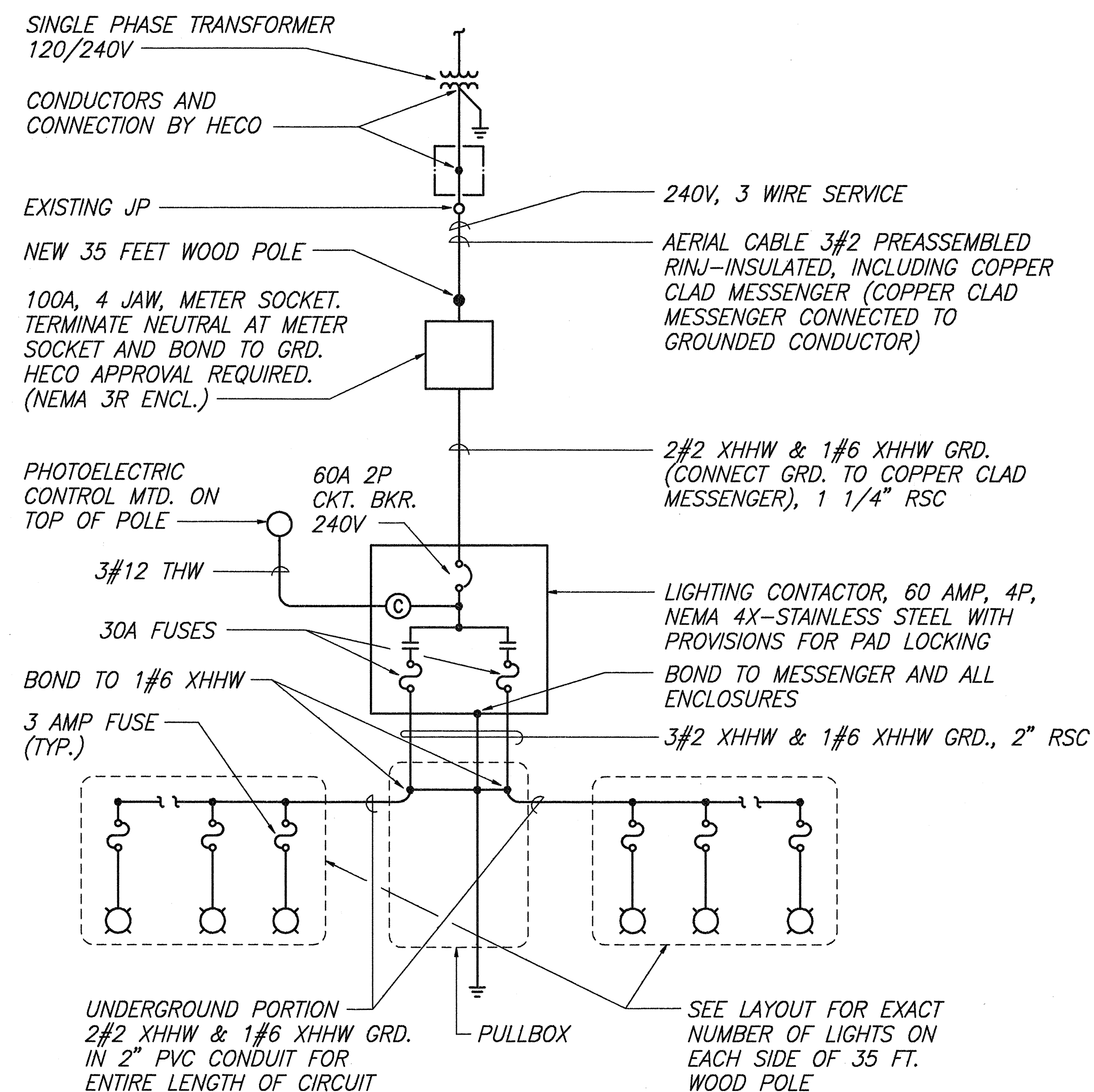
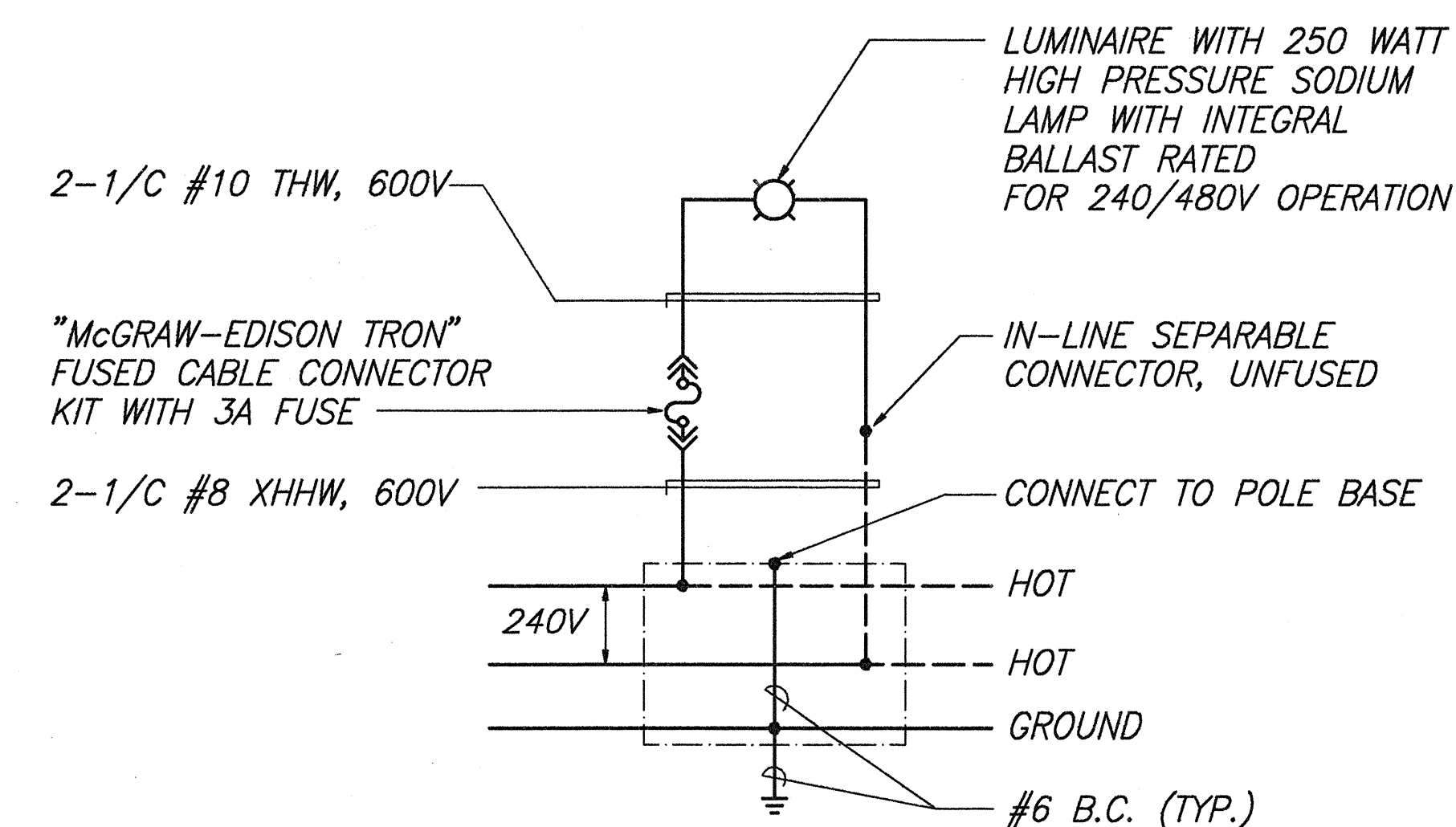


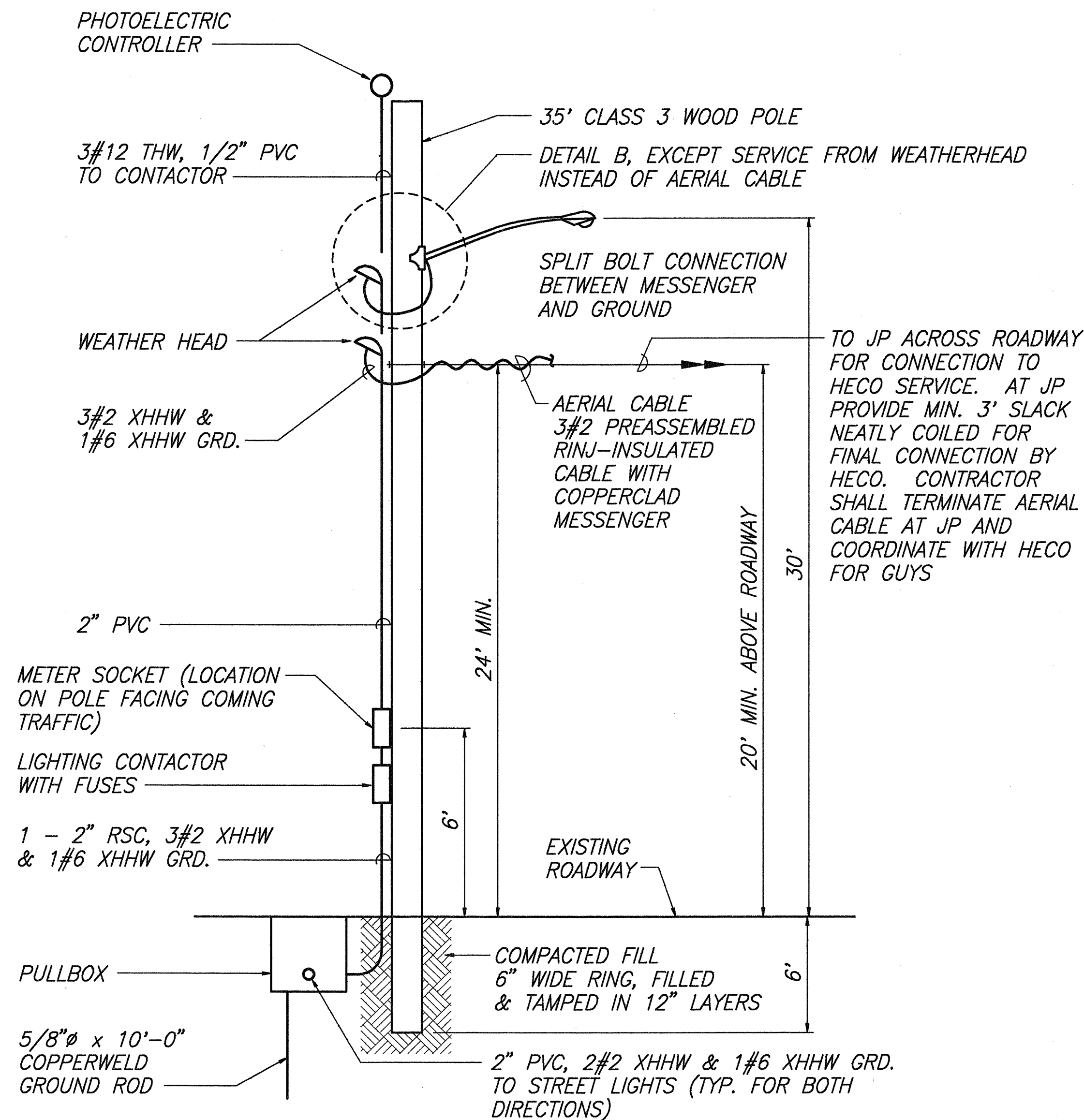
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HAWAII	HAW.	93A-02-95	1996	10	13



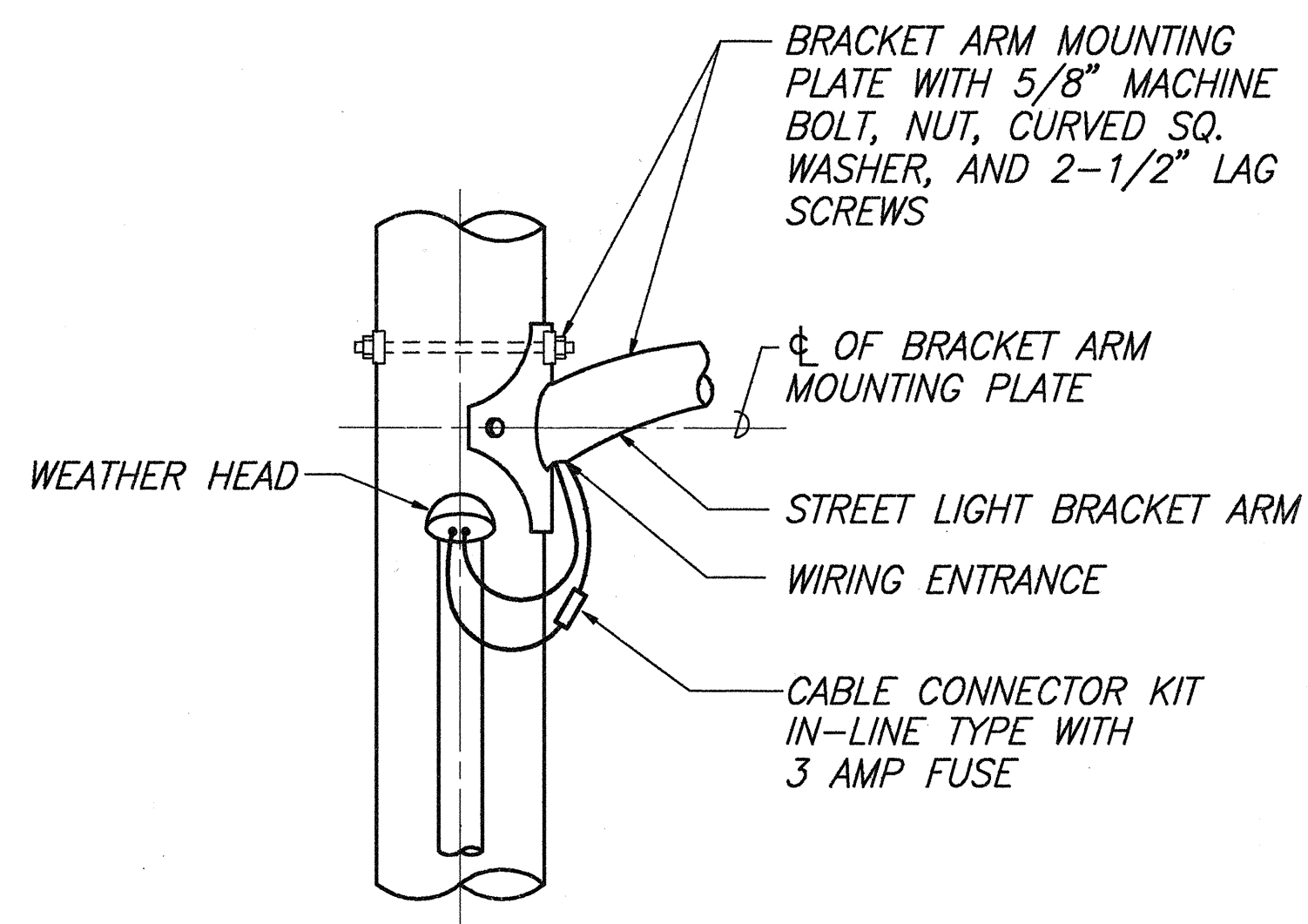
TYPICAL ONE-LINE DIAGRAM



TYPICAL LUMINAIRE CONNECTION DIAGRAM



WOOD POLE FOR HECO SERVICE



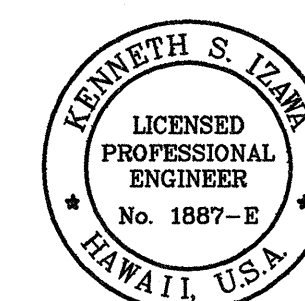
STREET LIGHT MAST ARM MOUNTING

STREET LIGHT ON WOOD POLE DETAIL B

ONE-LINE DIAGRAM LEGEND:

- STREET LIGHT AND POLE NUMBER
- FUSE ELEMENT
- CONNECTION
- CONNECTION TO HECO TRANSFORMER SECONDARY BY HECO
- GROUND ROD

DRAWING REVIEW:
Reviewed for HECO's Facilities Only
Date 5/10/96 By [Signature]
Distribution Engineering Department
Hawaiian Electric Company, Inc.
HECO's review of these drawings shall in no way relieve the Customer, its Consultant, its Contractor or anyone acting on Customers behalf from the responsibility for engineering, design, materials and any liability associated with this project.



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

[Signature]

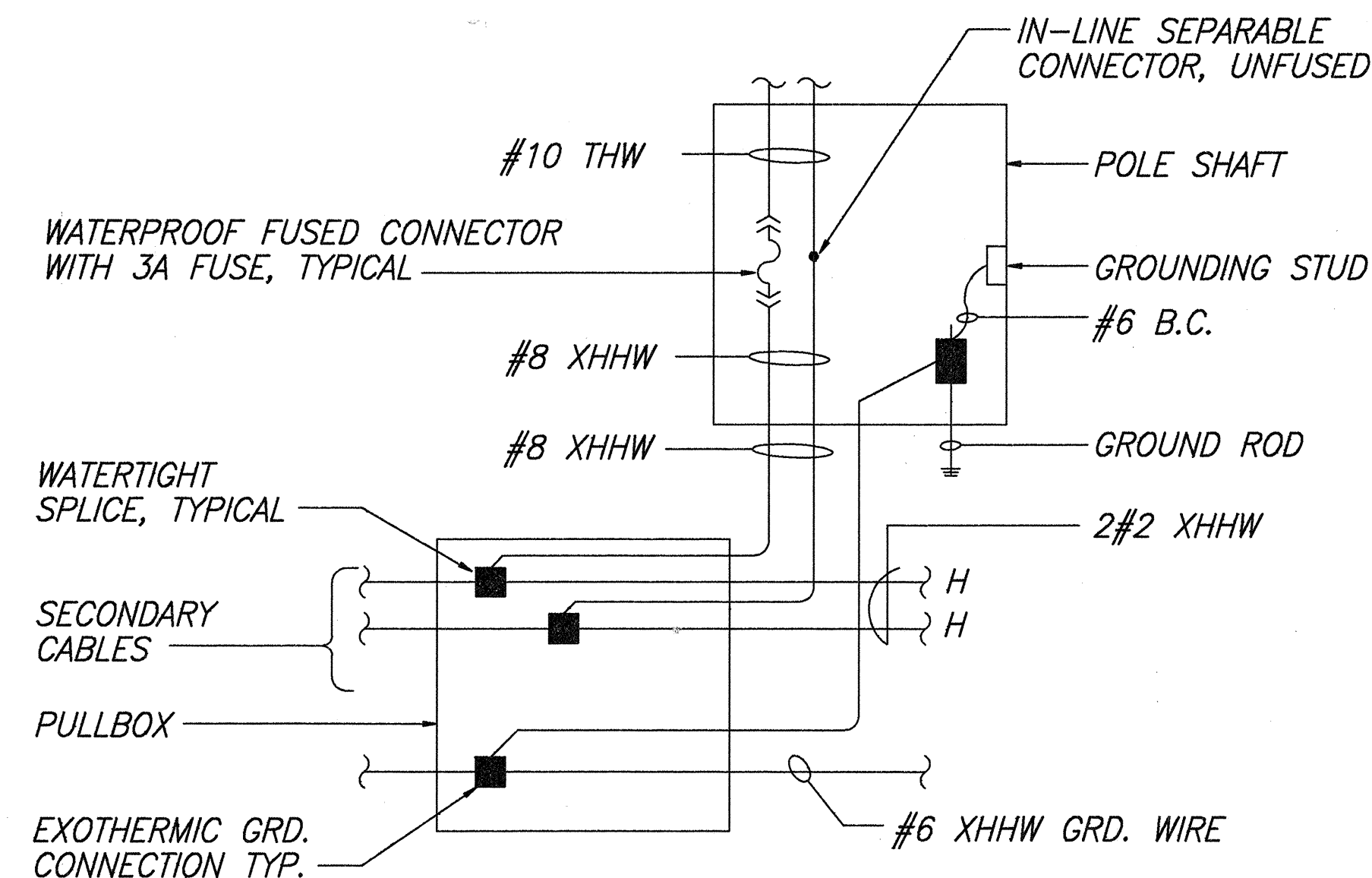
APPROVED:
HAWAIIAN ELECTRIC COMPANY, DATE

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
**HIGHWAY LIGHTING DETAILS
& ONE-LINE DIAGRAM**
FARRINGTON HIGHWAY LIGHTING IMPROVEMENTS
MAIPELA ST. TO LUALEI PLACE
PROJECT NO. 93A - 02 - 95
SCALE: As Noted May, 1996
SHEET No. 10 OF 13 SHEETS

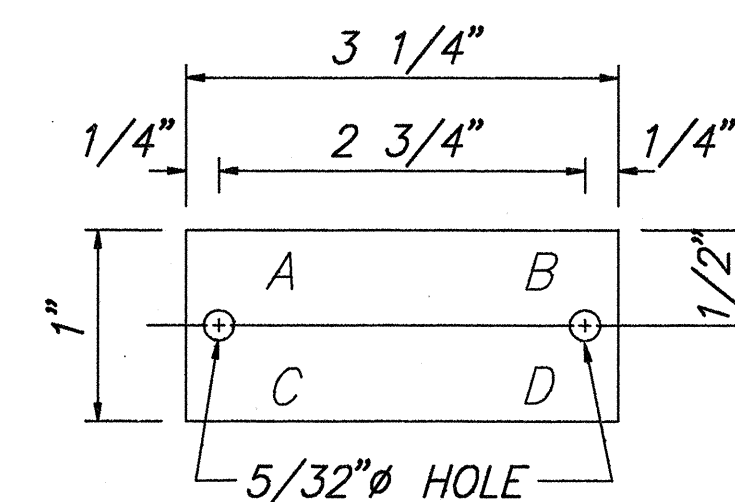
FED. ROAD DIST. NO.	STATE	PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	93A-02-95	1996	11	13

NOTES:

- ALL STEEL SHAFTS, PLATES, MAST ARMS, BOLTS, SCREWS, NUTS AND WASHERS TO BE GALV. AFTER FABRICATION OR MODIFICATION.
- 4" X 6 1/2" HANDHOLE REINFORCED W/#3 GA. RING 1 1/2" WIDE WELDED TO OUTSIDE OF POLE COVER OF 10 GA. PLATE LOCATE 90 DEGREES OF MAST ARM UNLESS SHOWN OTHERWISE.
- ROUND TAPERED STEEL TUBE W/MAX. TAPER OF 0.15"/FOOT.
- NO. 11 GAGE SHEET STEEL OF WELDABLE GRADE ACCEPTABLE IF STEEL AFTER FABRICATION HAS A MIN. YIELD STRENGTH OF 40,000 PSI.



WIRING CONNECTION DIAGRAM
SLIP BASE

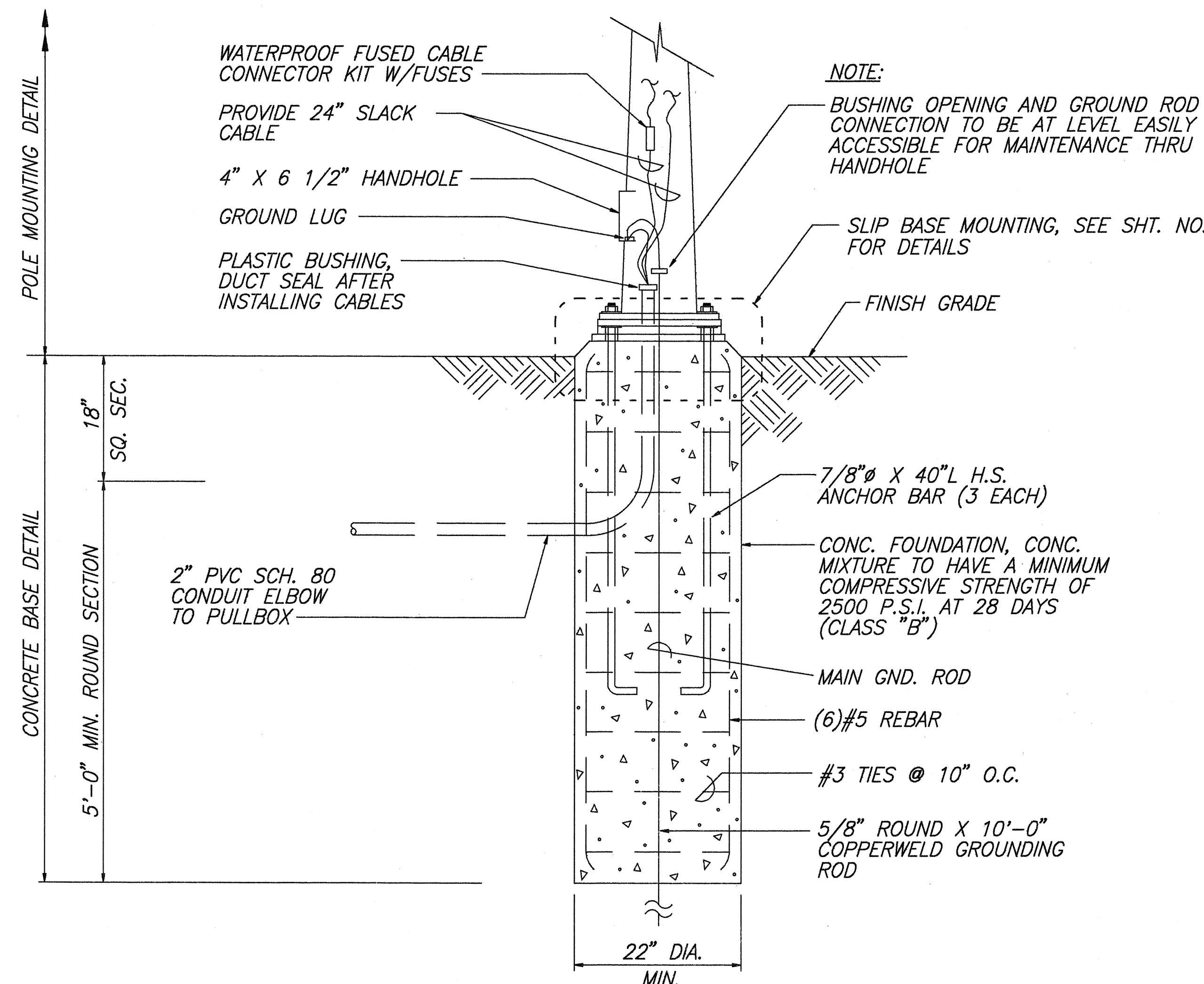


- LEGEND
- A- METER NUMBER
 - B- LIGHT POLE NUMBER
 - C- LAMP DATA, N FOR H.P.S.
 - D- REFRACTOR DATA

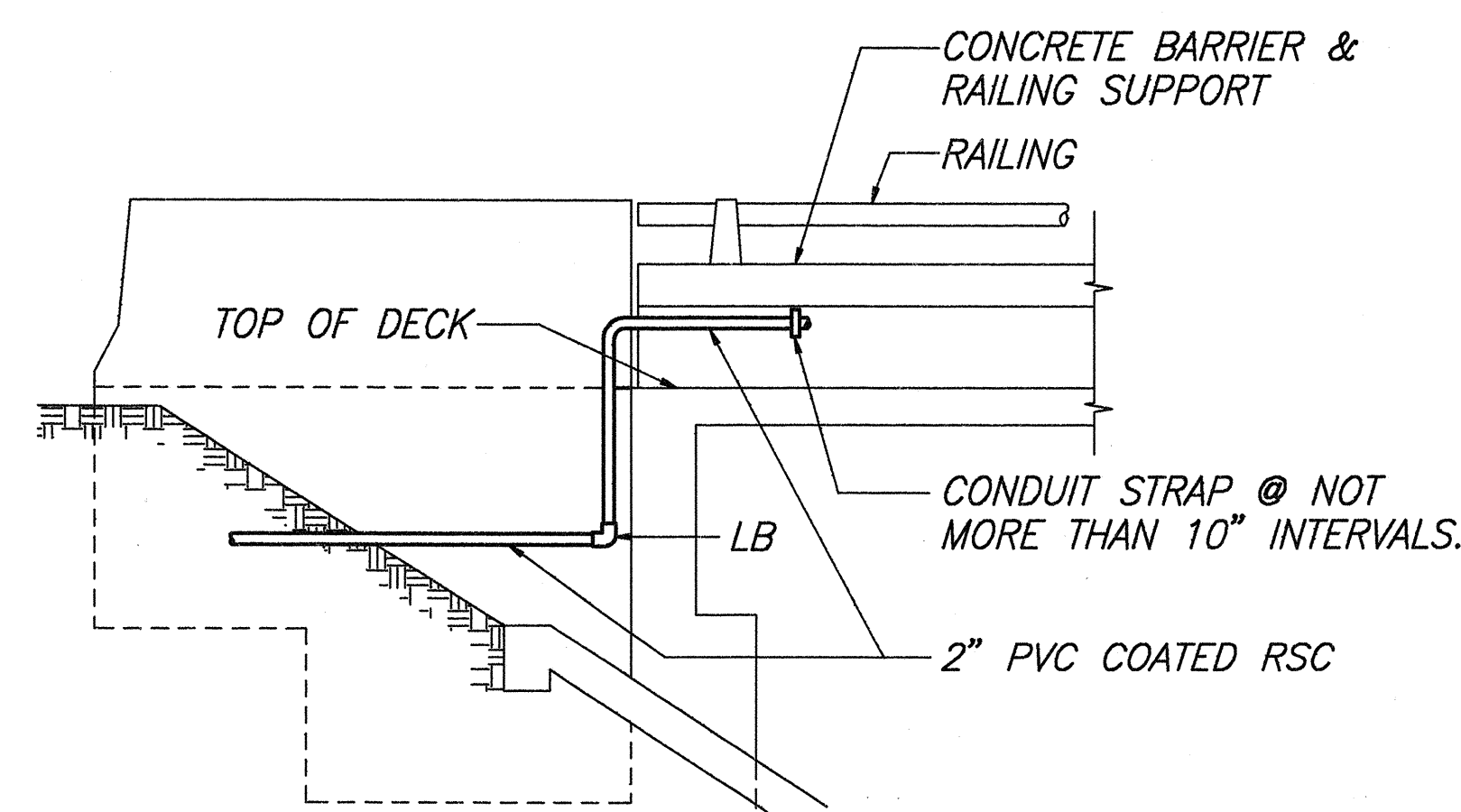
NOTES:

- TAG SHALL BE MADE FROM 3 PLY BLACK-WHITE-BLACK LAMINATED PLASTIC.
- ATTACH TO STEEL POLE WITH NO. 7 CADMIUM PLATED DRIVE SCREWS NO. 29 DRILL HOLES IN POLE.
- ATTACHED ACCORDING TO POLE MANUFACTURER'S RECOMMENDATION.
- LETTERS, NO. 5 REDUCTION 1/64" ENGRAVED.

HIGHWAY LIGHT ID TAG DETAIL

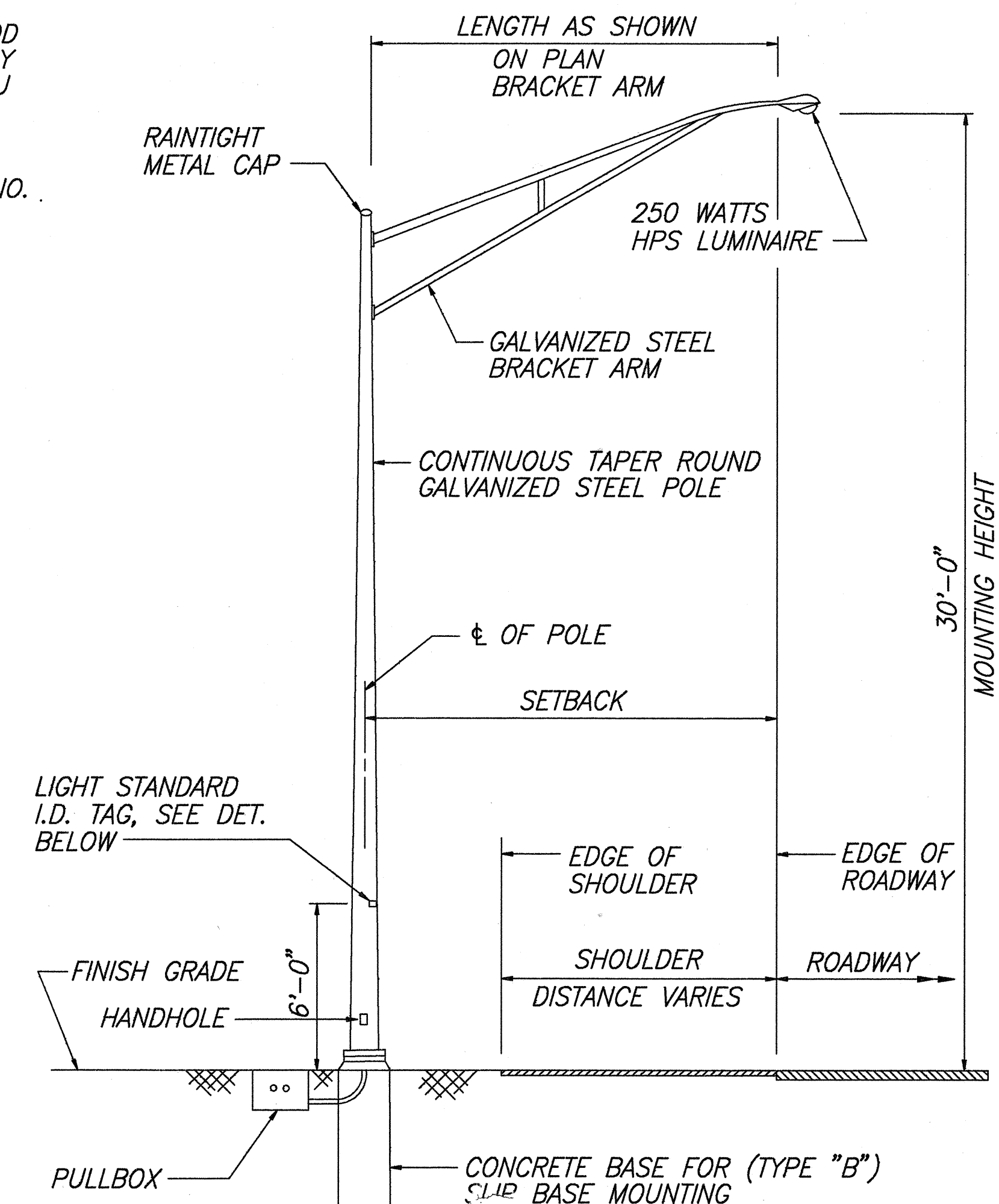


CONCRETE BASE AND POLE MOUNTING DETAIL
SLIP BASE (TYPE "B")

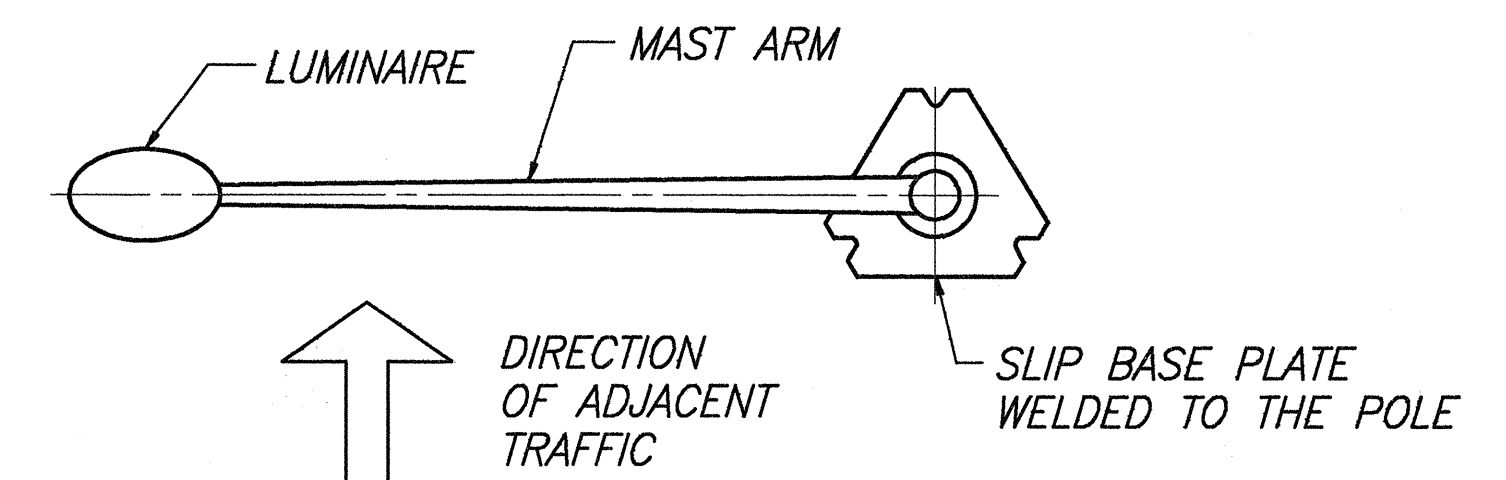


@ ABUTMENT JOINT

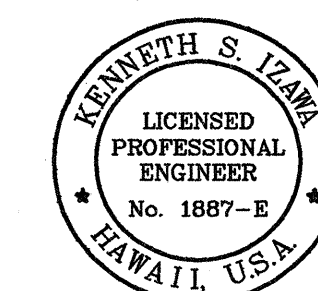
CONDUIT MOUNTING AT MAIPALAOA BRIDGE
(SIMILAR DETAIL @ OPPOSITE END)



TYPICAL LIGHT STANDARD INSTALLATION
SLIP BASE (TYPE "B")



LUMINAIRE SLIP BASE ORIENTATION




THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

May 1996

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION
HIGHWAY LIGHTING
SLIP BASE POLE
FARRINGTON HIGHWAY LIGHTING IMPROVEMENTS
MAIPELA ST. TO LUALAI PLACE
PROJECT NO. 93A - 02 - 95
SCALE: None
SHEET No. 11 OF 13 SHEETS

NOTES

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Annex 5.4

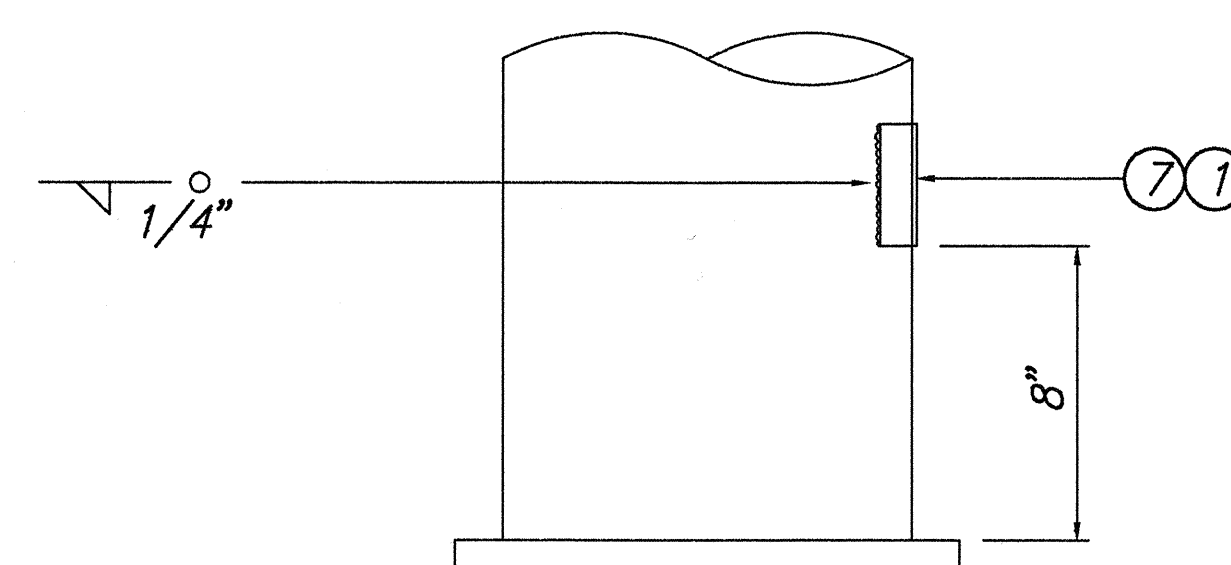
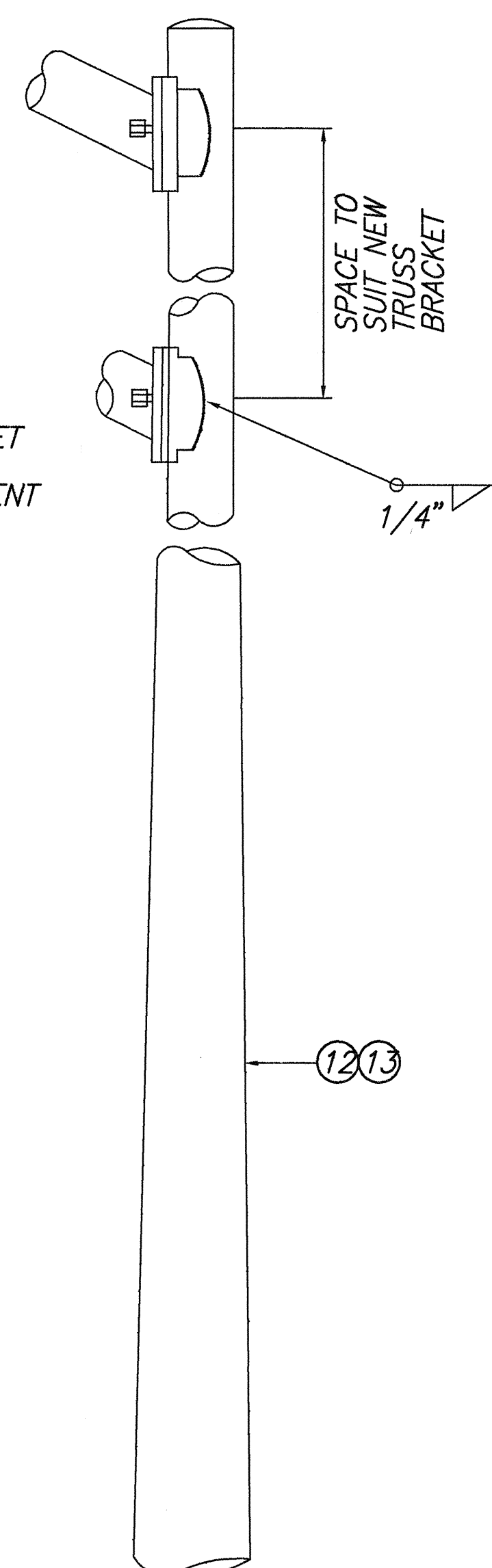
STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

HIGHWAY LIGHTING
SLIP BASE POLE

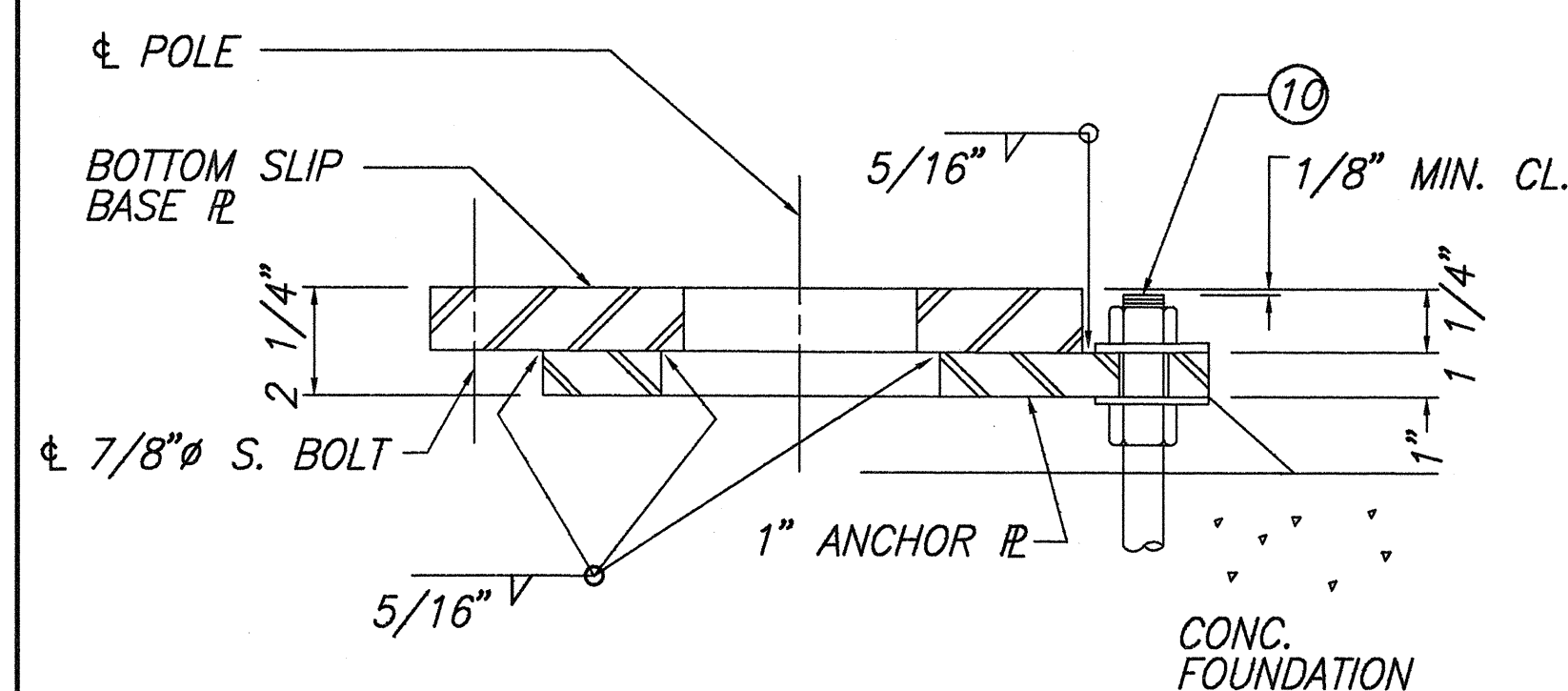
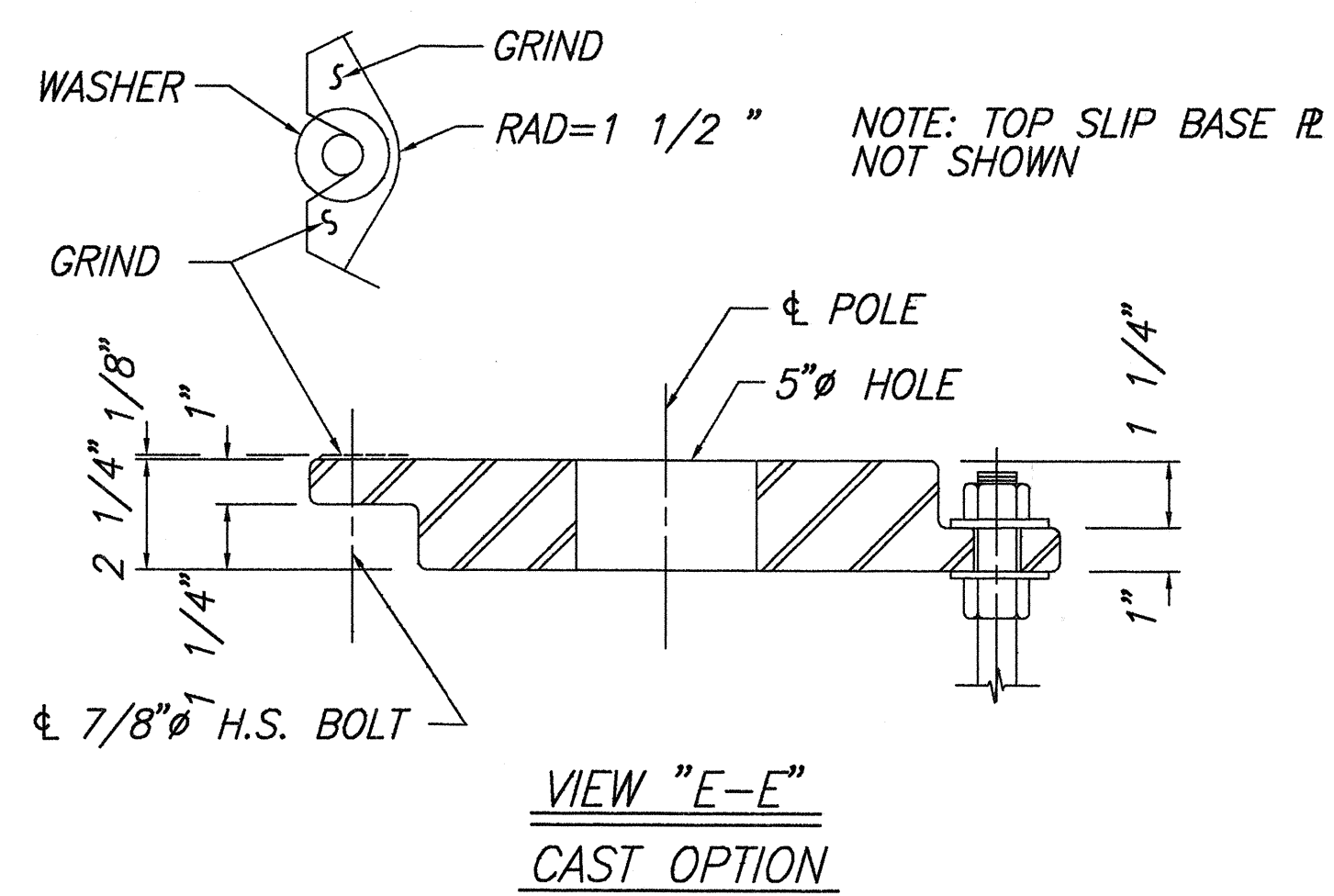
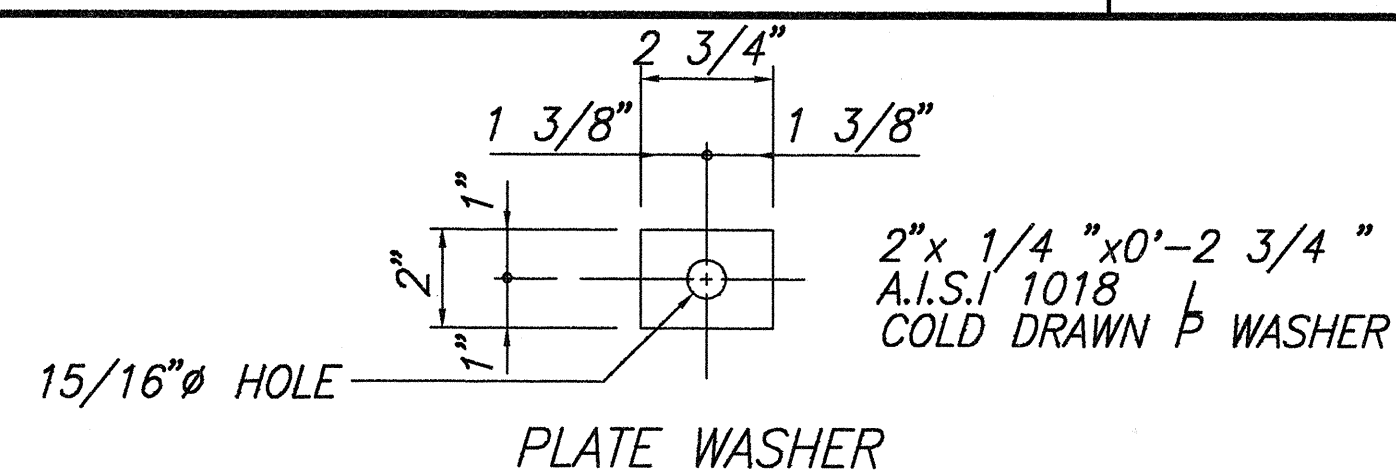
FARRINGTON HIGHWAY LIGHTING IMPROVEMENTS
MAIPELA ST. TO LUALEI PLACE
PROJECT NO. 93A - 02 - 95

SCALE: None May, 1996

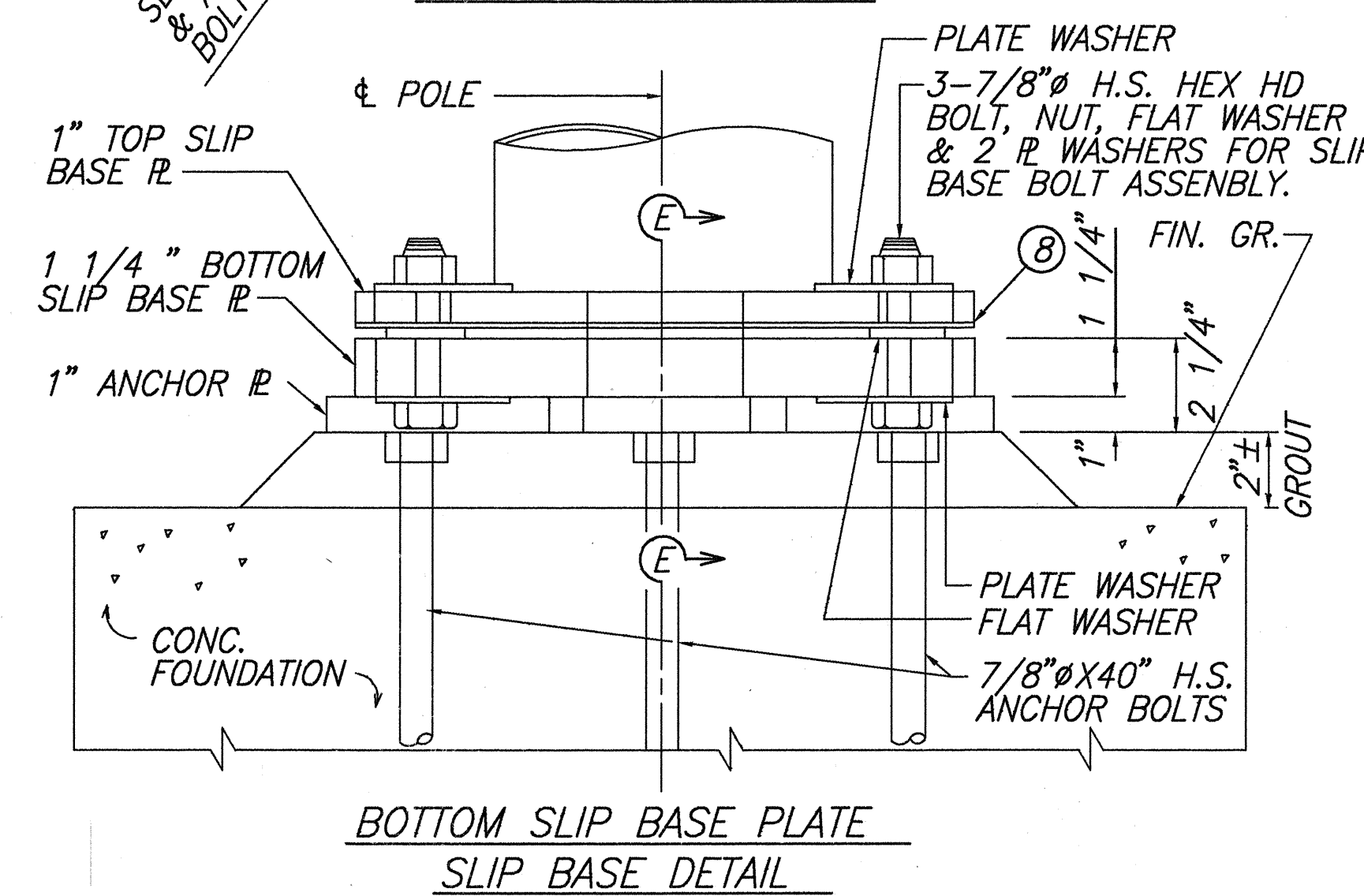
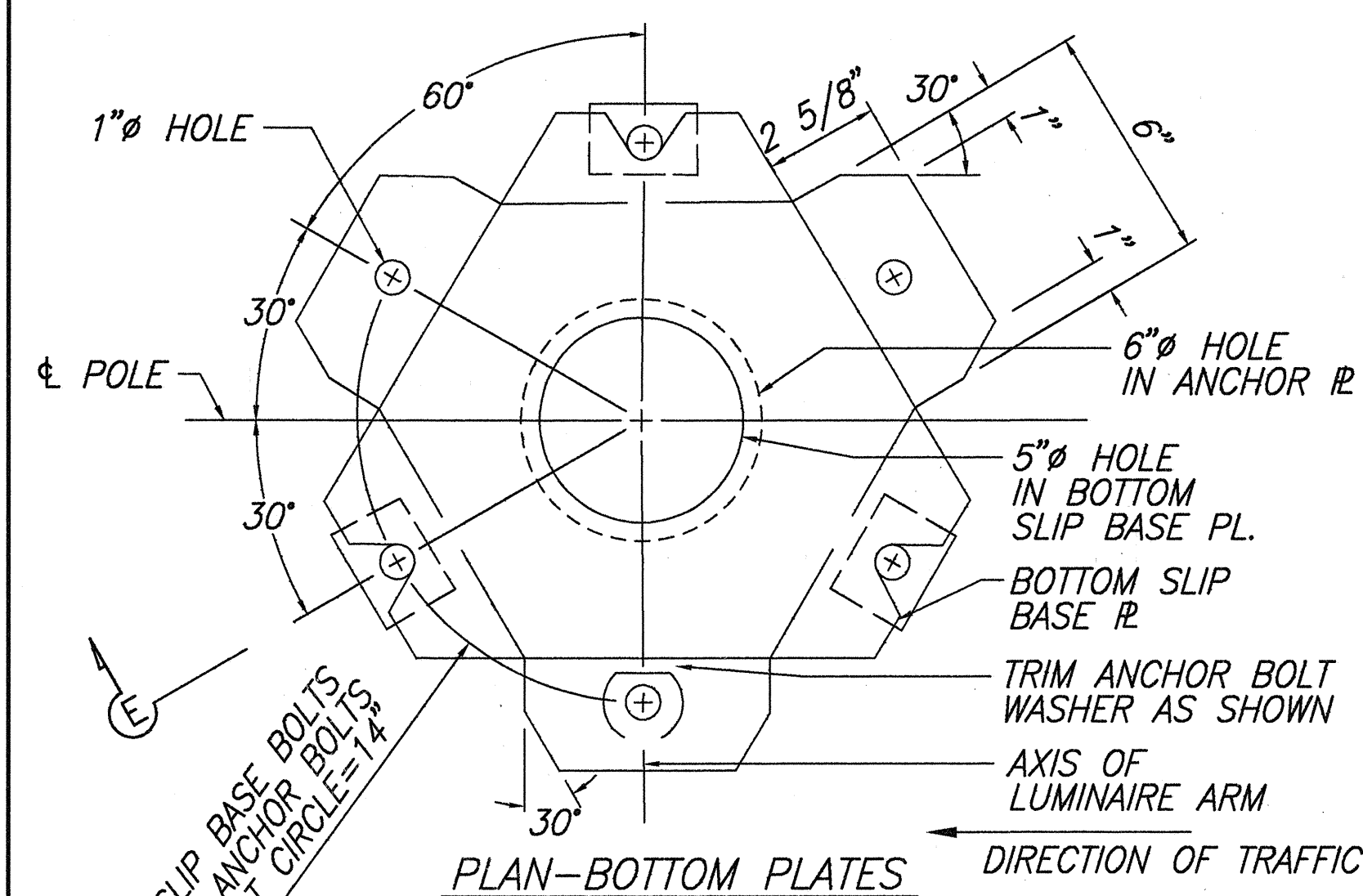
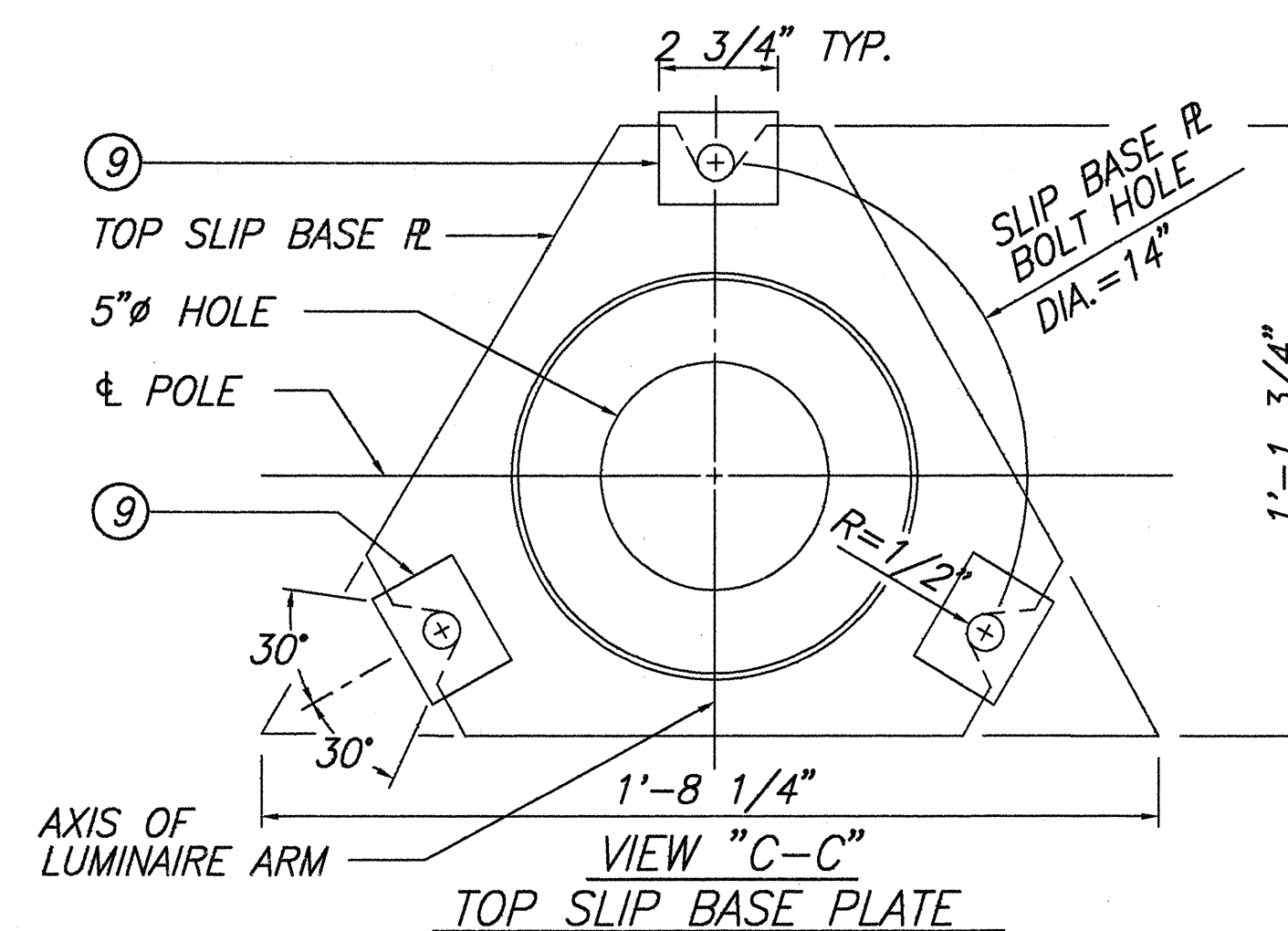
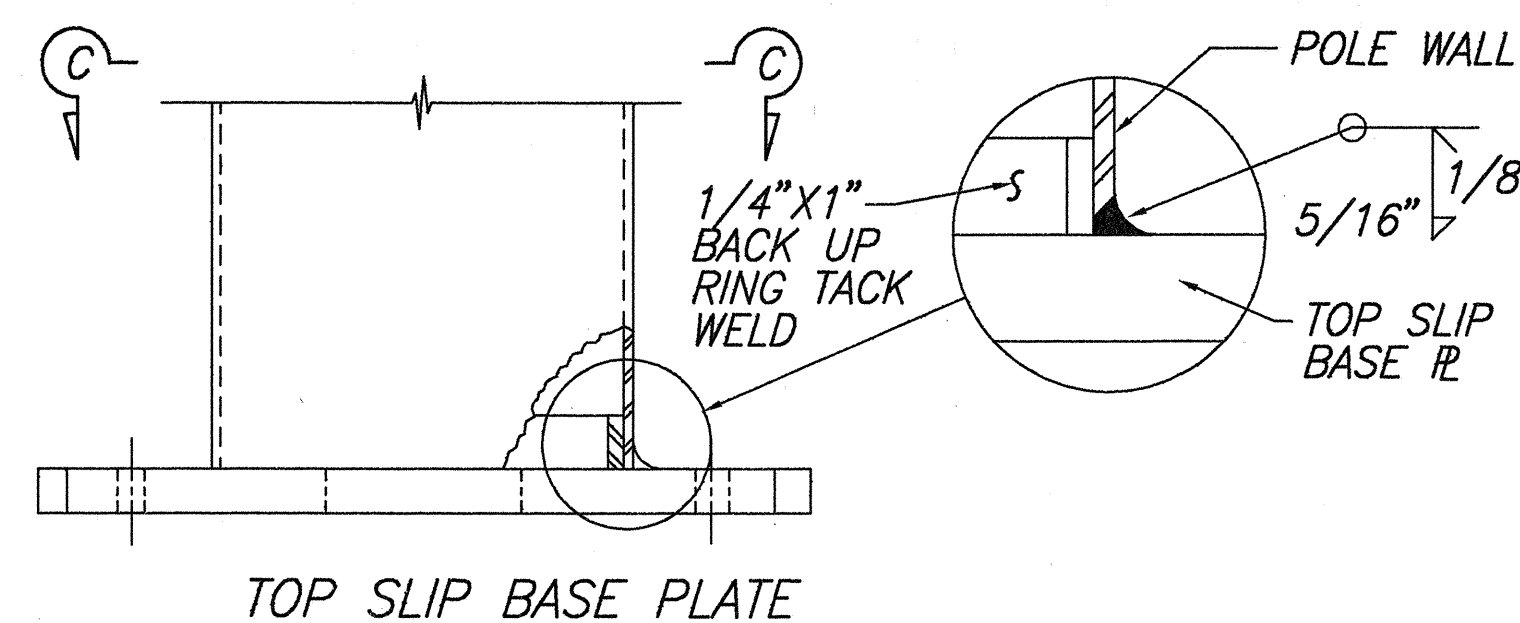
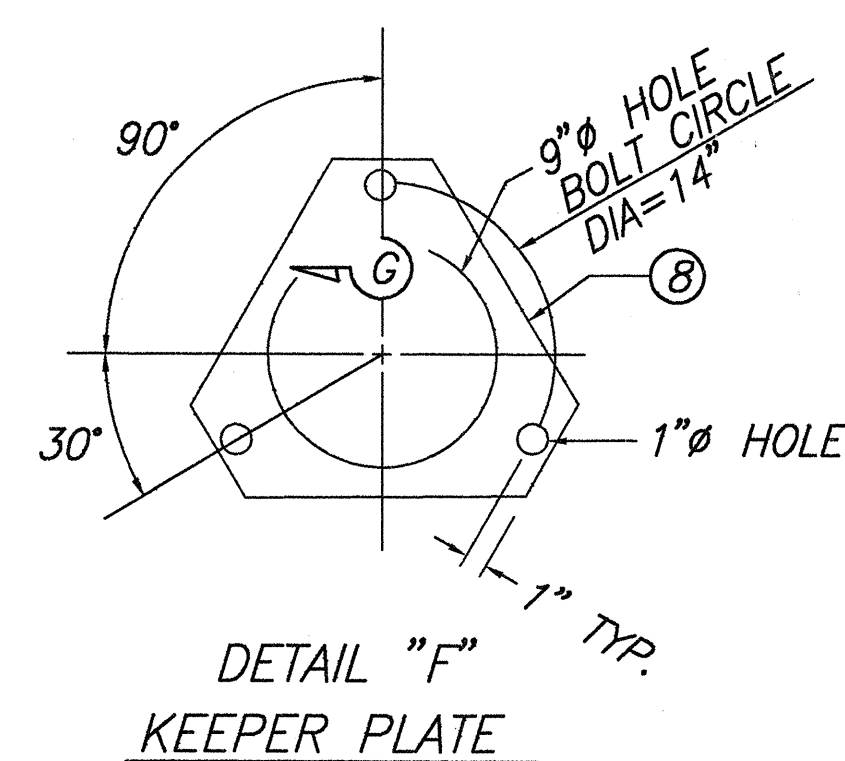
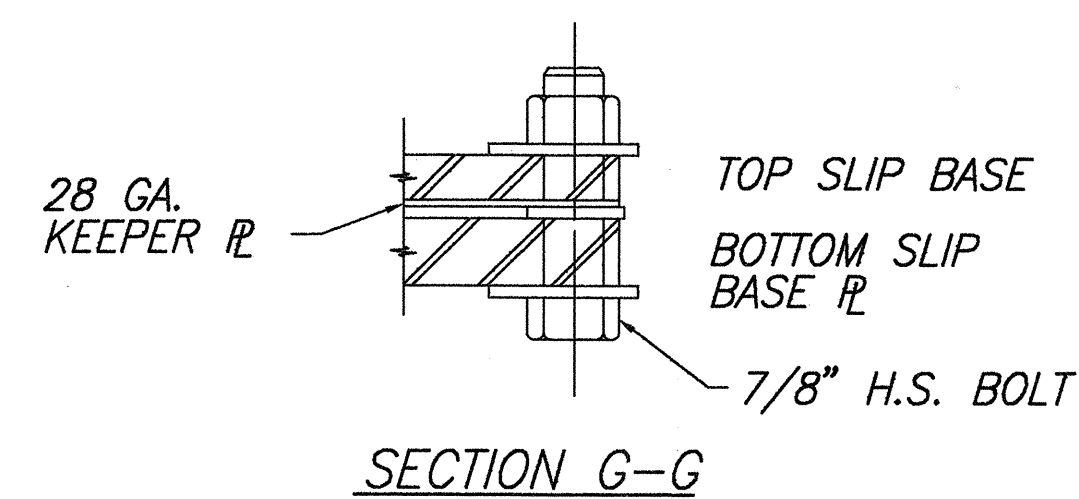
SHEET No. 12 OF 13 SHEETS



DETAIL "B"



VIEW "E-E"
WELDED OPTION



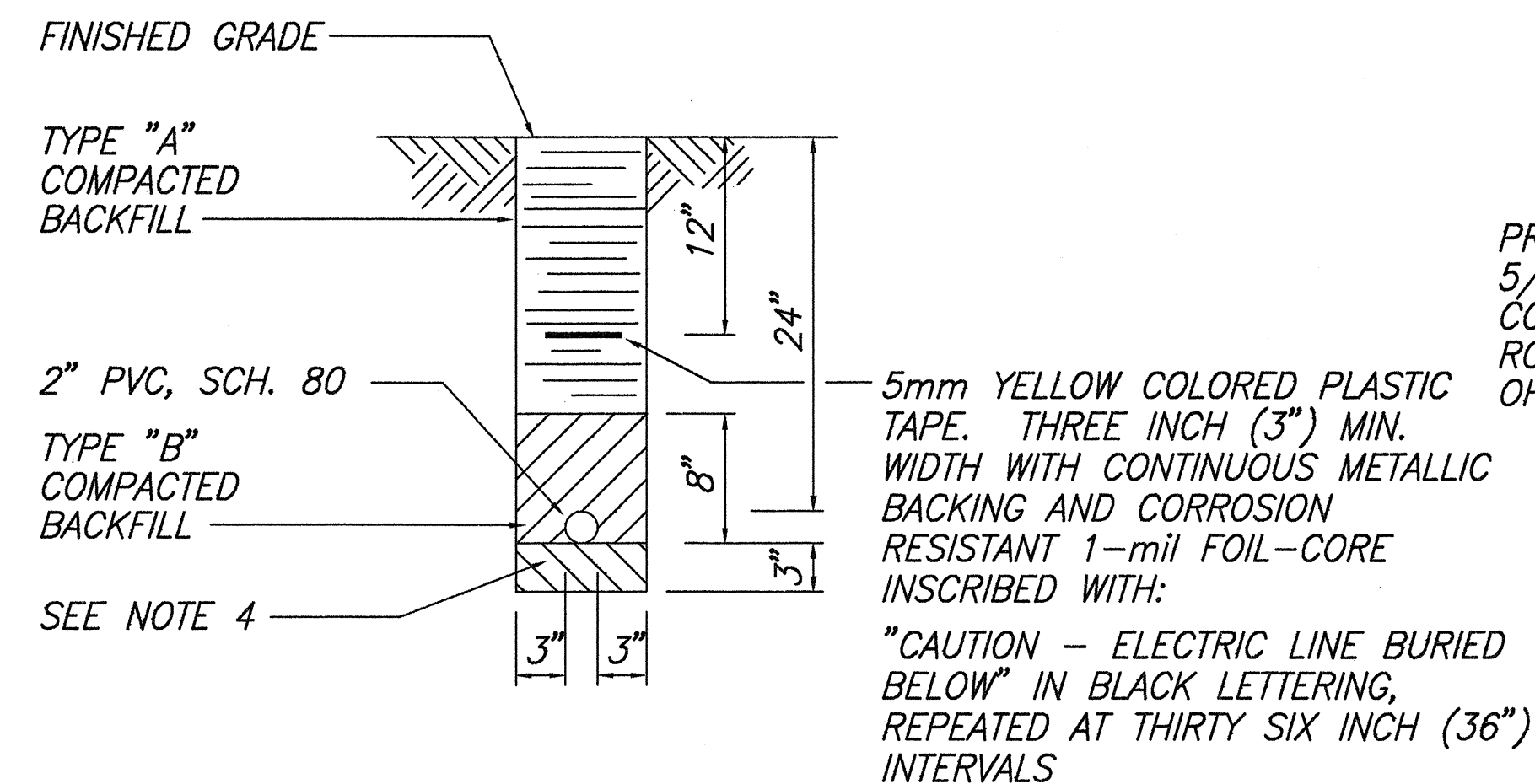
NOTES:

- ALL CONDUIT SHALL BE "PVC" SCHED. 80 FOR DIRECT BURIED OR CONCRETE ENCASEMENT, U.O.N.
- BACKFILL OVER CONCRETE DUCT SECTIONS SHALL BE TYPE "A"
- BACKFILL OVER DIRECT BURIED CONDUITS SHALL BE TYPE "B"
- IF THE NORMAL MATERIAL IN THE BOTTOM OF A TRENCH CONTAINING A DIRECT BURIAL CONDUIT IS NOT TYPE "B" AN ADDITIONAL 3" SHALL BE EXCAVATED AND TYPE "B" BACKFILL PROVIDED.
- CONCRETE FOR DUCTS TO BE 2500 P.S.I. IN 28 DAYS.

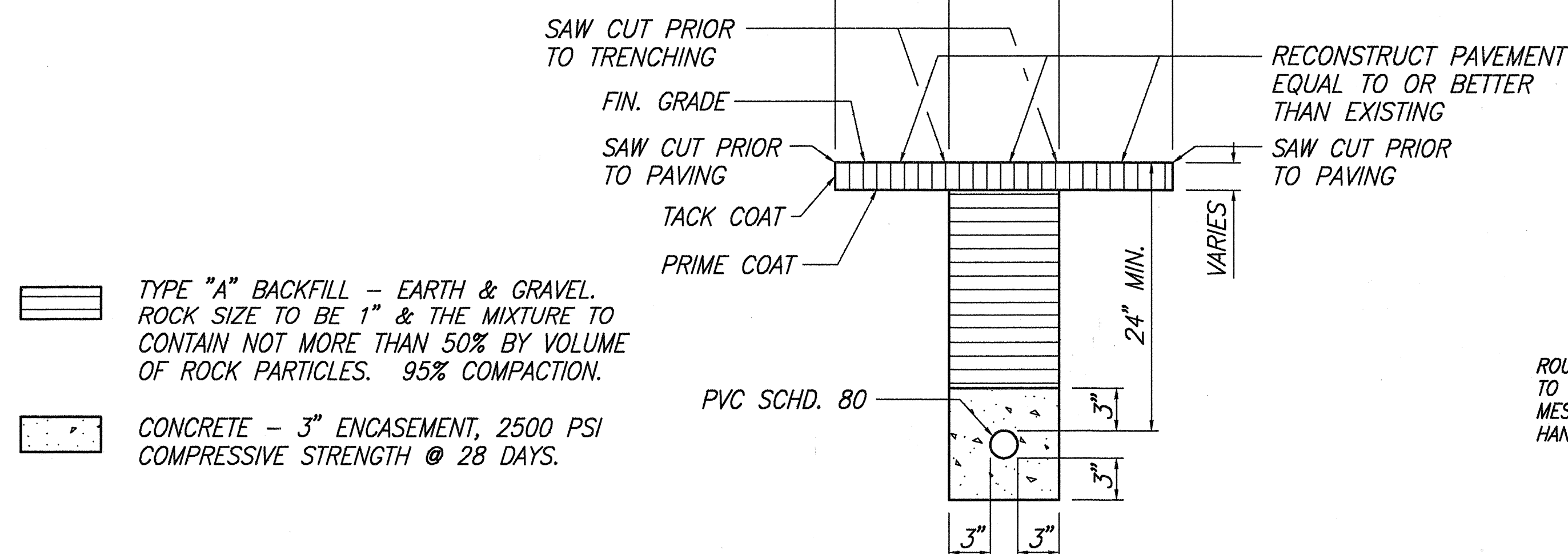
BACKFILL TYPES ARE:

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

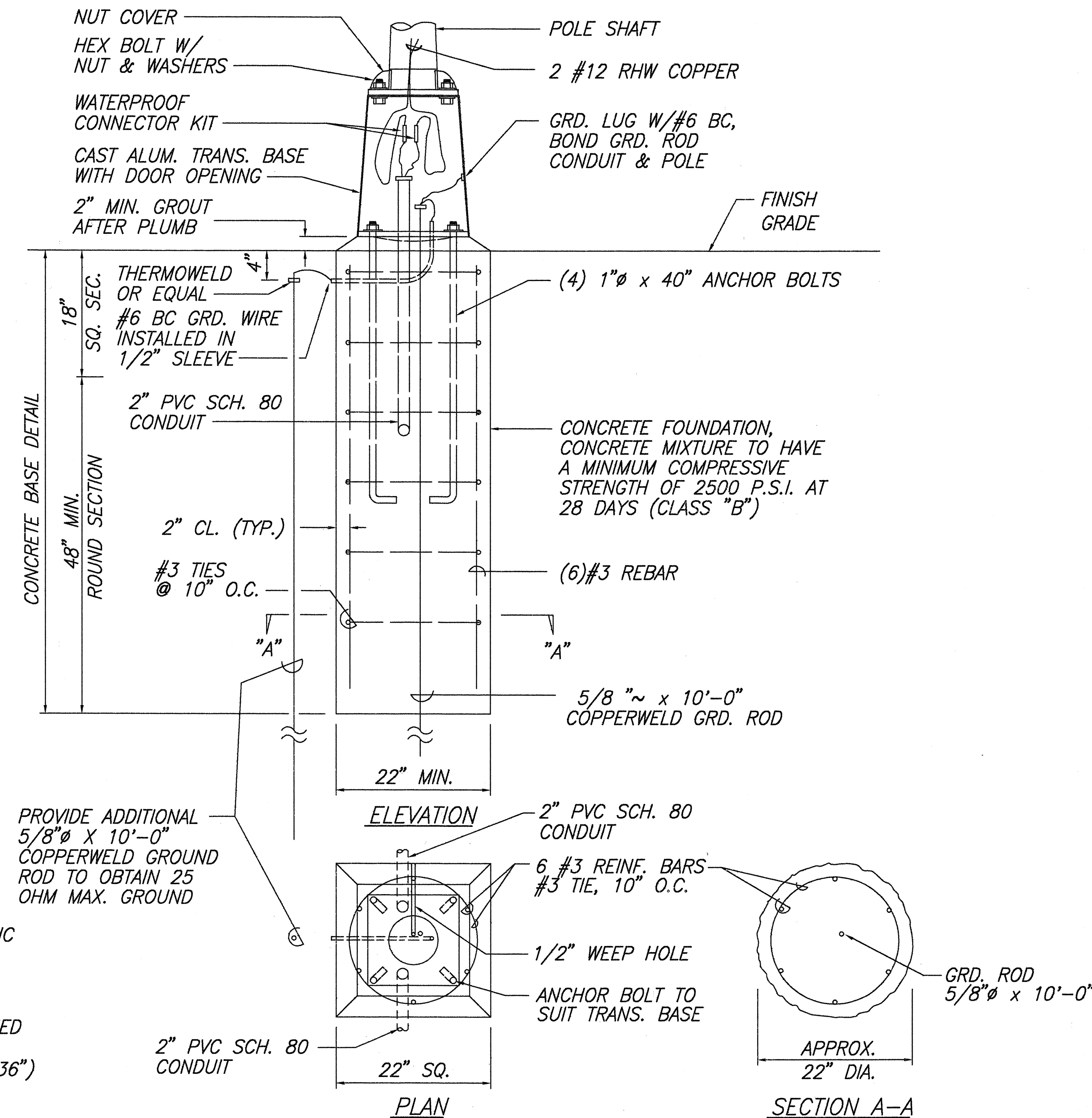
TYPE "B": BEACH SAND, EARTH, OR EARTH AND GRAVEL. IF EARTH AND GRAVEL USED, MIXTURE MUST PASS A 1/2" MESH SCREEN AND CONTAIN NOT MORE THAN 20% BY VOLUME OF ROCK PARTICLES.



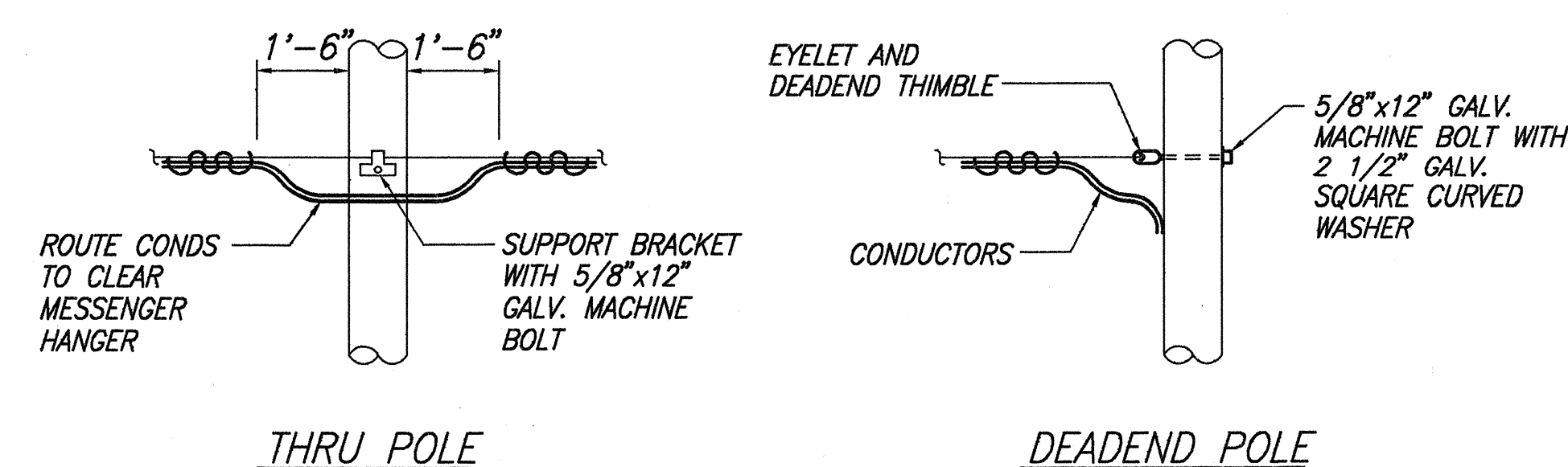
TYPICAL DUCT SECTION
(DIRECT BURIED)



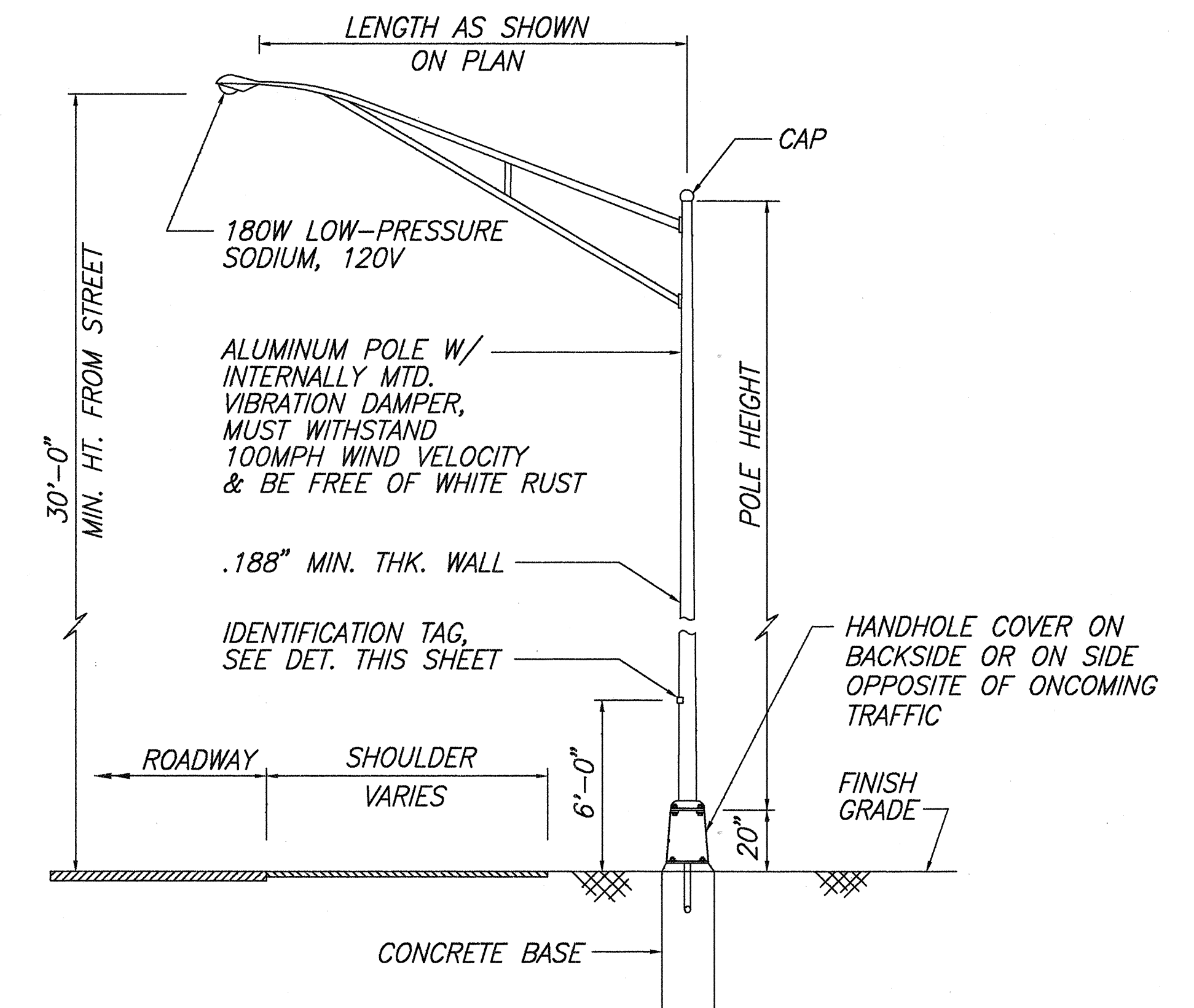
TYPICAL TRENCH DETAIL - STREET LIGHT
NOT TO SCALE



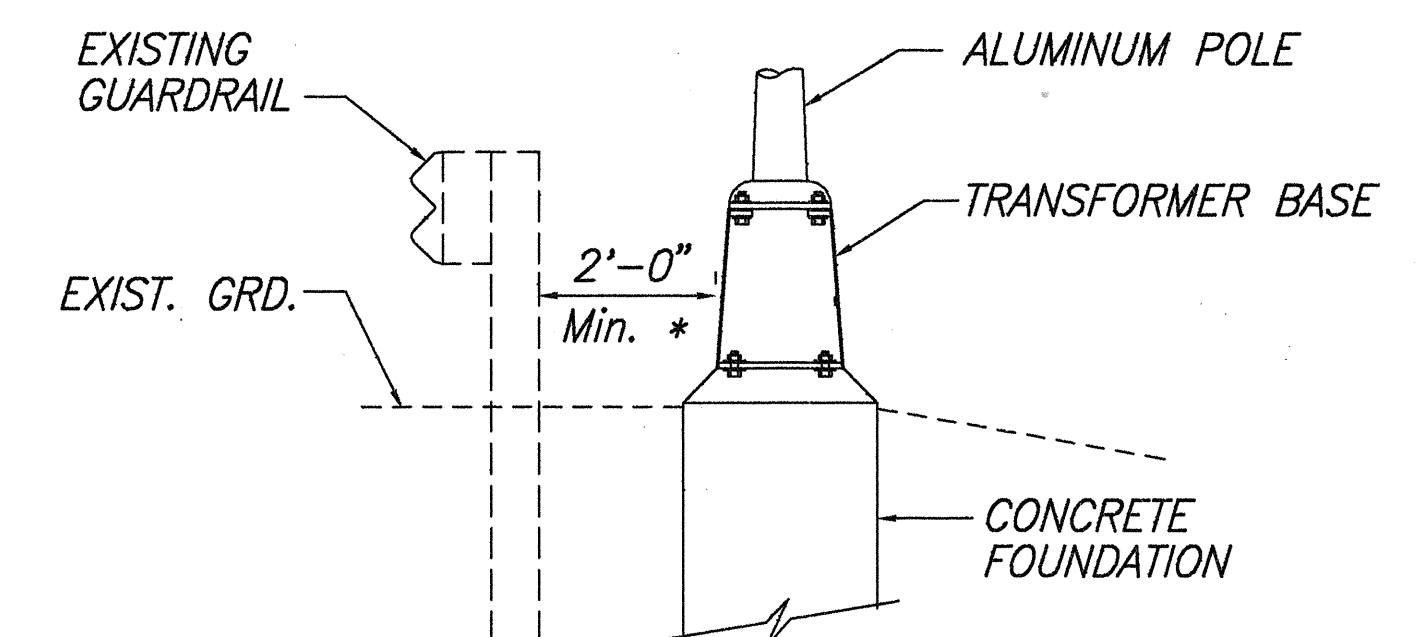
CONCRETE FOUNDATION AND TRANSFORMER BASE DETAIL



AERIAL CABLE TERMINATION DETAILS
NOT TO SCALE

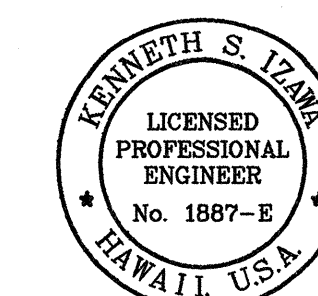


TYPICAL LIGHT STANDARD INSTALLATION
WITH TRANSFORMER BASE



* - IF 2'-0" MIN. CAN NOT BE MAINTAINED DUE TO CONFLICT WITH OTHER UTILITIES, COORDINATE FIELD ADJUSTMENTS WITH ENGINEER.

HIGHWAY LIGHTING DETAIL



THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION

Kenneth S. Izumi

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
HIGHWAYS DIVISION

**HIGHWAY LIGHTING
TRANSFORMER BASE POLE**

FARRINGTON HIGHWAY LIGHTING IMPROVEMENTS
MAIPELA ST. TO LUALEI PLACE
PROJECT NO. 93A - 02 - 95

SCALE: None May, 1996

SHEET No. 13 OF 13 SHEETS