

PLANS SYMBOLS

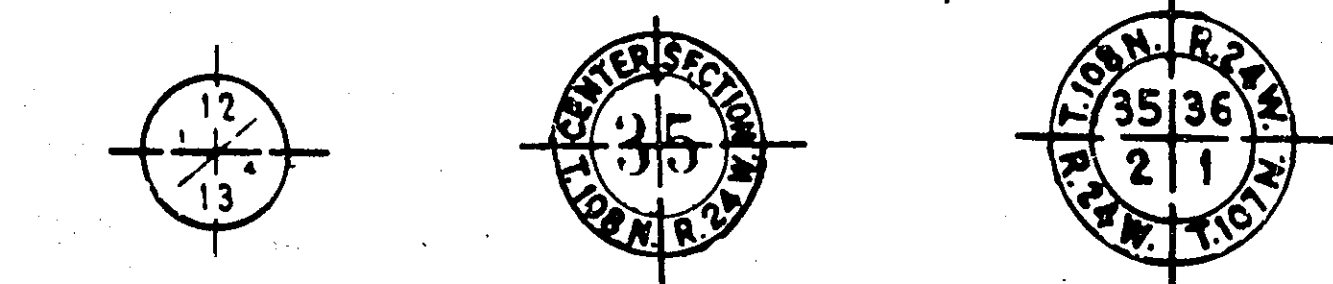
STATE LINE	----
COUNTY LINE	----
TOWNSHIP OR RANGE LINE	----
SECTION LINE	----
QUARTER LINE	----
SIXTEENTH LINE	----
RIGHT-OF-WAY LINE	----
PRESENT RIGHT-OF-WAY LINE	----
CONTROL OF ACCESS LINE	----
PROPERTY LINE (Except Land Lines)	----
VACATED PLATTED PROPERTY	----
CORPORATE OR CITY LIMITS	----
TRUNK HIGHWAY CENTER LINE	----
RETAINING WALL	----
RAILROAD	----
RAILROAD RIGHT-OF-WAY LINE	----
RIVER OR CREEK	----
DRY RUN	----
DRAINAGE DITCH	----
DRAIN TILE	----
CULVERT	----
DROP INLET	----
GUARD RAIL	----
BARBED WIRE FENCE	----
WOVEN WIRE FENCE	----
CHAIN LINK FENCE	----
RAILROAD SNOW FENCE	----
STONE WALL OR FENCE	----
HEDGE	----
RAILROAD CROSSING SIGN	----
RAILROAD CROSSING BELL	----
ELECTRIC WARNING SIGN	----
CROSSING GATE	----
MEANDER CORNER	----

SPRINGS	----
MARSH	----
TIMBER	----
ORCHARD	----
BRUSH	----
NURSERY	----
CATCH BASIN	----
FIRE HYDRANT	----
CATTLE GUARD	----
OVERPASS (Highway Over)	----
UNDERPASS (Highway Under)	----
BRIDGE	----
BUILDING (One Story Frame)	----
F. FRAME	----
S. STONE	----
B. BRICK	----
ST. STUCCO	----
IRON PIPE OR ROD	----
MONUMENT (STONE, CONCRETE, OR METAL)	----
WOODEN HUB	----
GRAVEL PIT	----
SAND PIT	----
BORROW PIT	----
ROCK QUARRY	----

UTILITIES SYMBOLS

POWER POLE LINE	----
TELEPHONE OR TELEGRAPH POLE LINE	----
JOINT TELEPHONE AND POWER OR POWER POLES	----
ON TELEPHONE POLES	----
ANCHOR	----
STEEL TOWER	----
STREET LIGHT	----
PERESTAL (TELEPHONE CABLE TERMINAL)	----
GAS MAIN	----
WATER MAIN	----

CONDUIT	----
TELEPHONE CABLE IN CONDUIT	----
ELECTRIC CABLE IN CONDUIT	----
TELEPHONE-MANHOLE	----
ELECTRIC MANHOLE	----
BURIED TELEPHONE CABLE	----
BURIED ELECTRIC CABLE	----
AERIAL TELEPHONE CABLE	----
SEWER, (SANITARY OR STORM)	----
SEWER MANHOLE	----



NOTE: SECTION NUMBERS READ FROM THE SOUTH.

PIT DATA

PIT NO.	Located in
PIT NO.	Dead Haul
PIT NO.	Located in
PIT NO.	Dead Haul

SPECIFICATIONS

THE STANDARD SPECIFICATIONS DATED JAN. 1, 1968 SHALL APPLY.

OFFICE OF COUNTY ENGINEER

RAMSEY COUNTY

CONSTRUCTION PLAN

FOR TURNING LANES AND TRAFFIC CONTROL SYSTEM
WHITE BEAR AVE. AND FRIST AVE.

GROSS LENGTH	662 FEET	0.125 MILES
BRIDGES-LENGTH	0 FEET	0 MILES
EXCEPTIONS-LENGTH	0 FEET	0 MILES
NET LENGTH	662 FEET	0.125 MILES

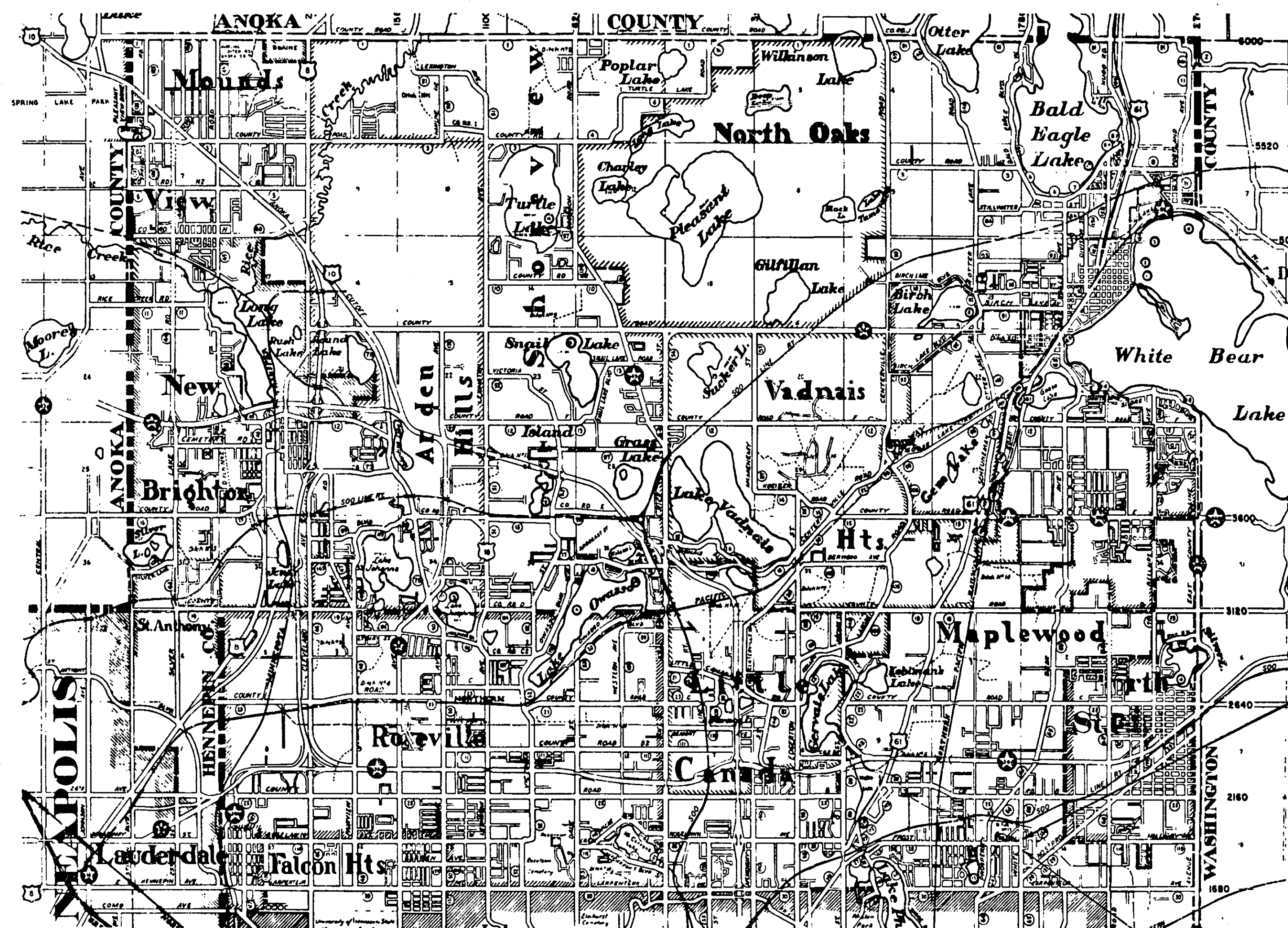
PLAN, 1 inch = 50 Feet
PROFILE, Horiz. 1 inch = 50 Feet Vert. 1 inch = 5 Feet
CROSS-SECTIONS, 1 inch = 10 Feet
LAYOUT, 1 inch = 5280 Feet

DESIGN DESIGNATION

A.D.T. 1967	=
A.D.T. 1965	=
D.H.V.	=
DIRECTIONAL DISTRIBUTION	=
T (HEAVY COMMERCIAL) 1985	=
DESIGN SPEED	=
DESIGN LOAD	=
SOIL FACTOR	=

INDEX

SHEET NO.	DESCRIPTION
1	TITLE SHEET
2	TYPICAL SECTION & ESTIMATED QUANTITIES
3	CONSTRUCTION PLAN
4-6	CROSS-SECTIONS
7-9	SIGNAL DETAILS
10	SIGNAL INTERSECTION LAYOUT
11	SIGNAL WIRING DIAGRAM



END PROJECT
STA. 29+62

BEGIN PROJ.
STA. 23+00

I HEREBY CERTIFY THAT THIS PLAN WAS PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND THAT I AM A DULY REGISTERED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF MINNESOTA.

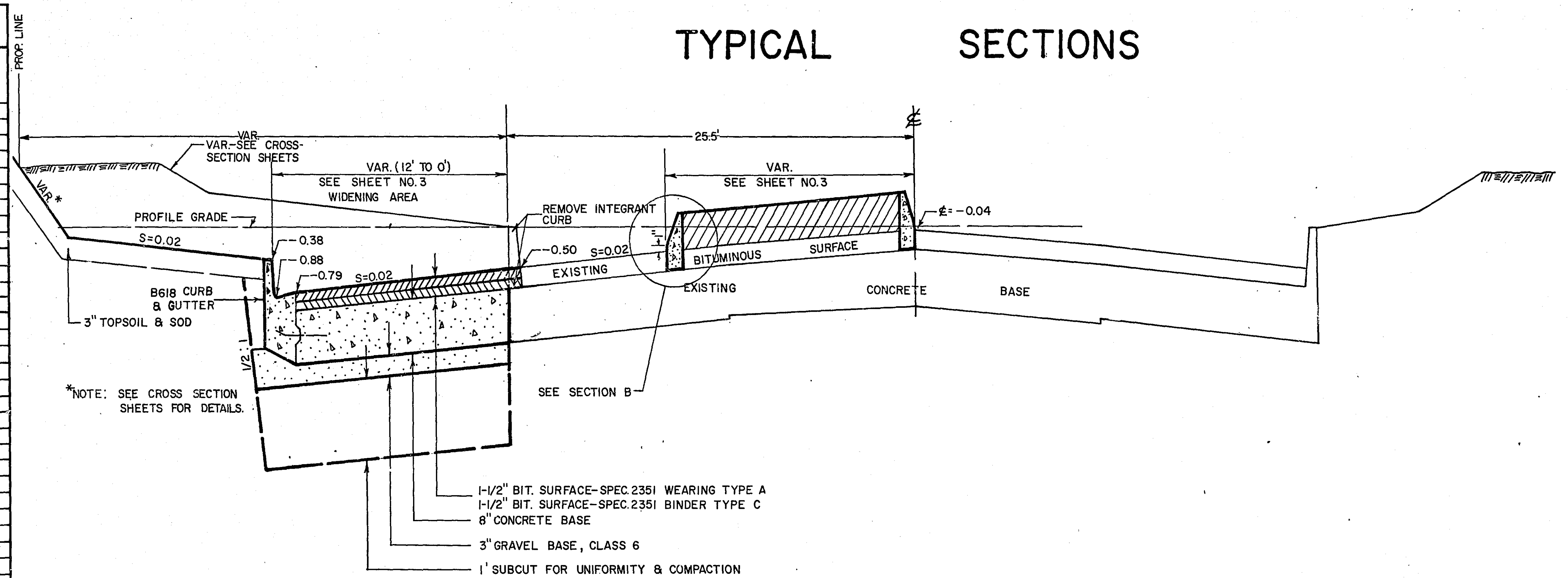
ENGINEER Wm. V. Chisworth REG. NO. 2042 DATE 9-30-68
SIGNAL DESIGN Wm. V. Chisworth DATE 9-27-68
DIRECTOR OF SAFETY
RECOMMENDED FOR APPROVAL Dean R. Umba DATE 9-30-68
COUNTY ENGINEER
APPROVED John H. Daubman DATE 9-30-68
CHAIRMAN OF THE RAMSEY COUNTY BOARD
APPROVED Steve H. Heston DATE 9-19-68
MAYOR, VILLAGE OF MAPLEWOOD

APPROVED _____ DATE _____
MINNESOTA STATE HIGHWAY DEPARTMENT
RECOMMENDED FOR APPROVAL _____ DATE _____
RECOMMENDED FOR APPROVAL _____ DATE _____
DISTRICT STATE AID ENGINEER
APPROVAL _____ DATE _____
STATE AID ENGINEER

STATEMENT OF ESTIMATED QUANTITIES

ITEM NO.	ITEM	UNIT	TOTAL ESTIMATED QUANTITIES
2101.513	CLEAR & GRUB RIGHT OF WAY	LUMP SUM	1
2104.502	REMOVE PAVEMENT	S.Y.	50
2104.503	REMOVE CURB & GUTTER	L.F.	162
2104.510	REMOVE CHAIN LINK FENCE, STEEL POSTS	L.F.	161
2104.515	REMOVE INTERGRANT CURB	L.F.	484
2104.520	REMOVE DRY WALL	STRUCTURE	2
2105.501	COMMON EXCAVATION	C.Y.	1589
2104.510	REMOVE WOOD RAIL FENCE, WOOD POSTS	L.F.	60
2211.501	AGGREGATE BASE, CLASS 6	TON	125
2104.510	REMOVE WOVEN WIRE FENCE, STEEL POSTS	L.F.	80
2201.501	CONCRETE BASE	S.Y.	650
2201.511	STRUCTURAL CONCRETE	C.Y.	145
2201.529	REINFORCEMENT BARS	POUND	789
2201.531	STANDARD JOINTS, DESIGN L7B	L.F.	639
2331.504	BITUMINOUS MATERIAL FOR MIXTURE	TON	4
2331.508	WEARING COURSE MIXTURE	TON	66
2351.504	ASPHALT CEMENT	TON	6.2
2351.509	ASPHALT CONCRETE WEARING COURSE & FILLER	TON	57
2351.510	ASPHALT CONCRETE BINDER COURSE	TON	54
2357.502	BITUMINOUS MATERIAL FOR TACK COAT	GALLON	33
2521.501	4" CONCRETE WALK	S.F.	275
2531.501	CONCRETE CURB & GUTTER, DESIGN B618	L.F.	639
2531.502	CONCRETE CURB DESIGN S-5	L.F.	291
2531.503	CONCRETE MEDIAN	S.Y.	225
2531.507	7" CONCRETE DRIVEWAY PAVEMENT	S.Y.	50
2575.505	SODDING	S.Y.	1000
2575.551	TOPSOIL	C.Y.	110
504.685	ADJUST WATER GATE HOUSING	HOUSING	1
557.621	RESET CHAIN LINK FENCE, STEEL POSTS	L.F.	141
557.621	RESET WOOD RAIL FENCE, WOOD POSTS	L.F.	40
557.621	RESET WOVEN WIRE FENCE, STEEL POSTS	L.F.	57

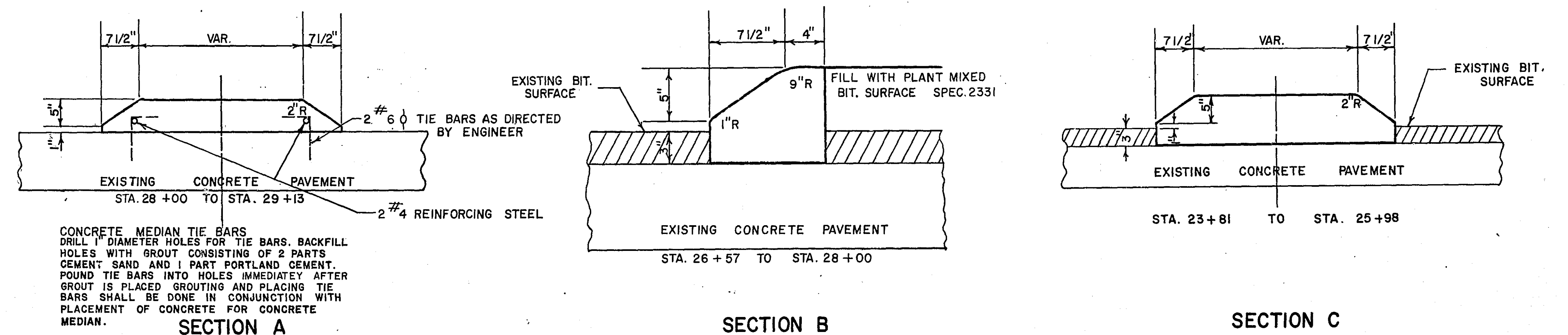
TYPICAL SECTIONS

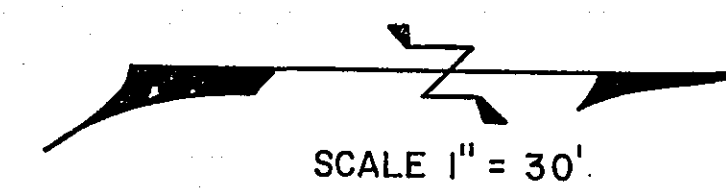


STANDARD DETAIL PLATES

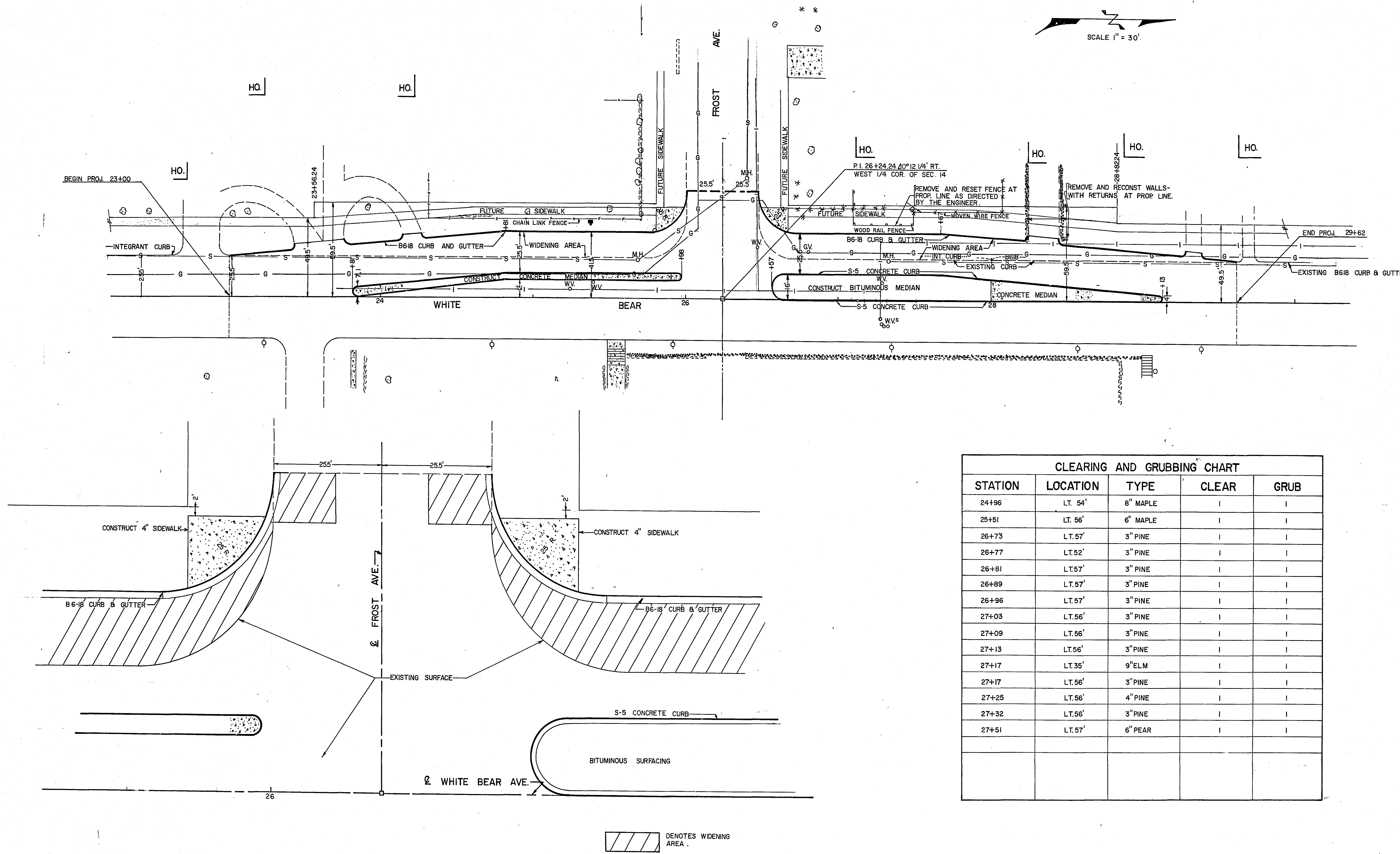
1140 I	LONGITUDINAL JOINTS, DESIGN L7B
1141 B	PAVEMENT KEYWAY FOR KEYED JOINT CONSTRUCTION
7020 D	CONCRETE CURB, DESIGN S-5
7035 E	CONCRETE WALK & CURB RETURNS AT ENTRANCES
7100 D	CONCRETE CURB & GUTTER, DESIGN B618
7105 C	CONCRETE MEDIAN
8000 C	STANDARD BARRICADES
8008 C	CONTRACTORS SIGN

MEDIAN SECTIONS



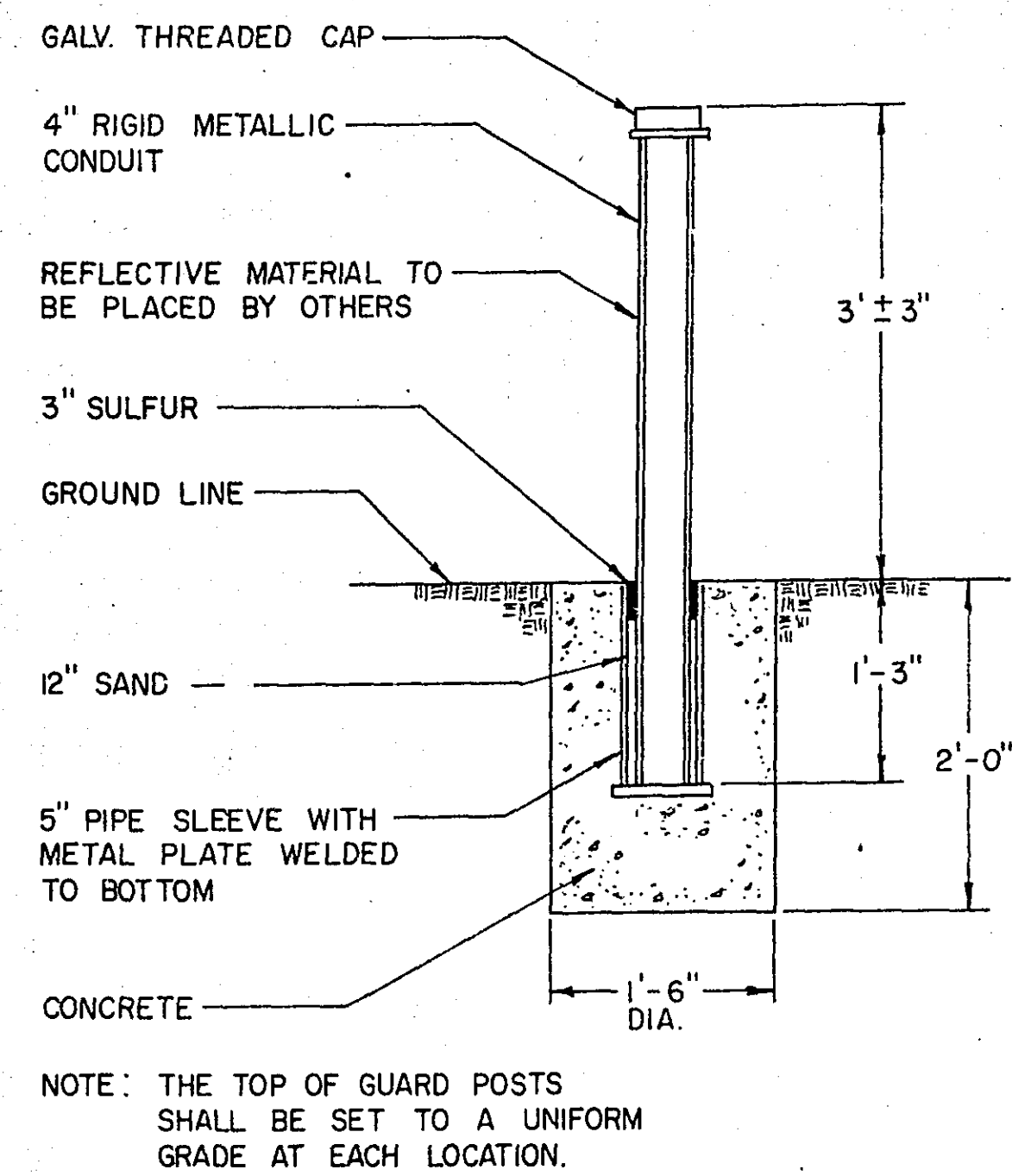


SCALE 1" = 30'

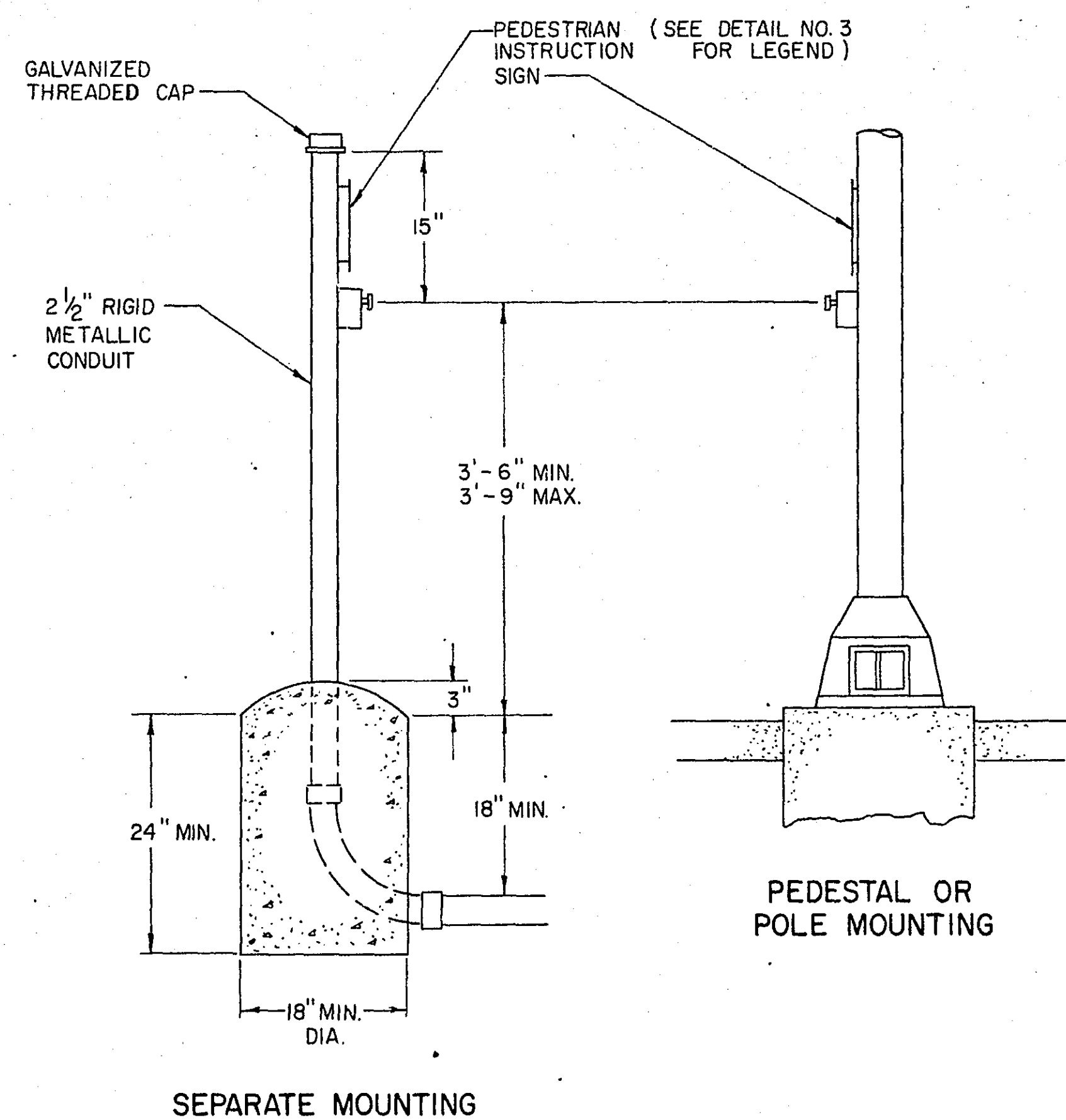


CLEARING AND GRUBBING CHART				
STATION	LOCATION	TYPE	CLEAR	GRUB
24+96	LT. 54'	8" MAPLE	I	I
25+51	LT. 56'	6" MAPLE	I	I
26+73	LT. 57'	3" PINE	I	I
26+77	LT. 52'	3" PINE	I	I
26+81	LT. 57'	3" PINE	I	I
26+89	LT. 57'	3" PINE	I	I
26+96	LT. 57'	3" PINE	I	I
27+03	LT. 56'	3" PINE	I	I
27+09	LT. 56'	3" PINE	I	I
27+13	LT. 56'	3" PINE	I	I
27+17	LT. 35'	9" ELM	I	I
27+17	LT. 56'	3" PINE	I	I
27+25	LT. 56'	4" PINE	I	I
27+32	LT. 56'	3" PINE	I	I
27+51	LT. 57'	6" PEAR	I	I

GUARD POST

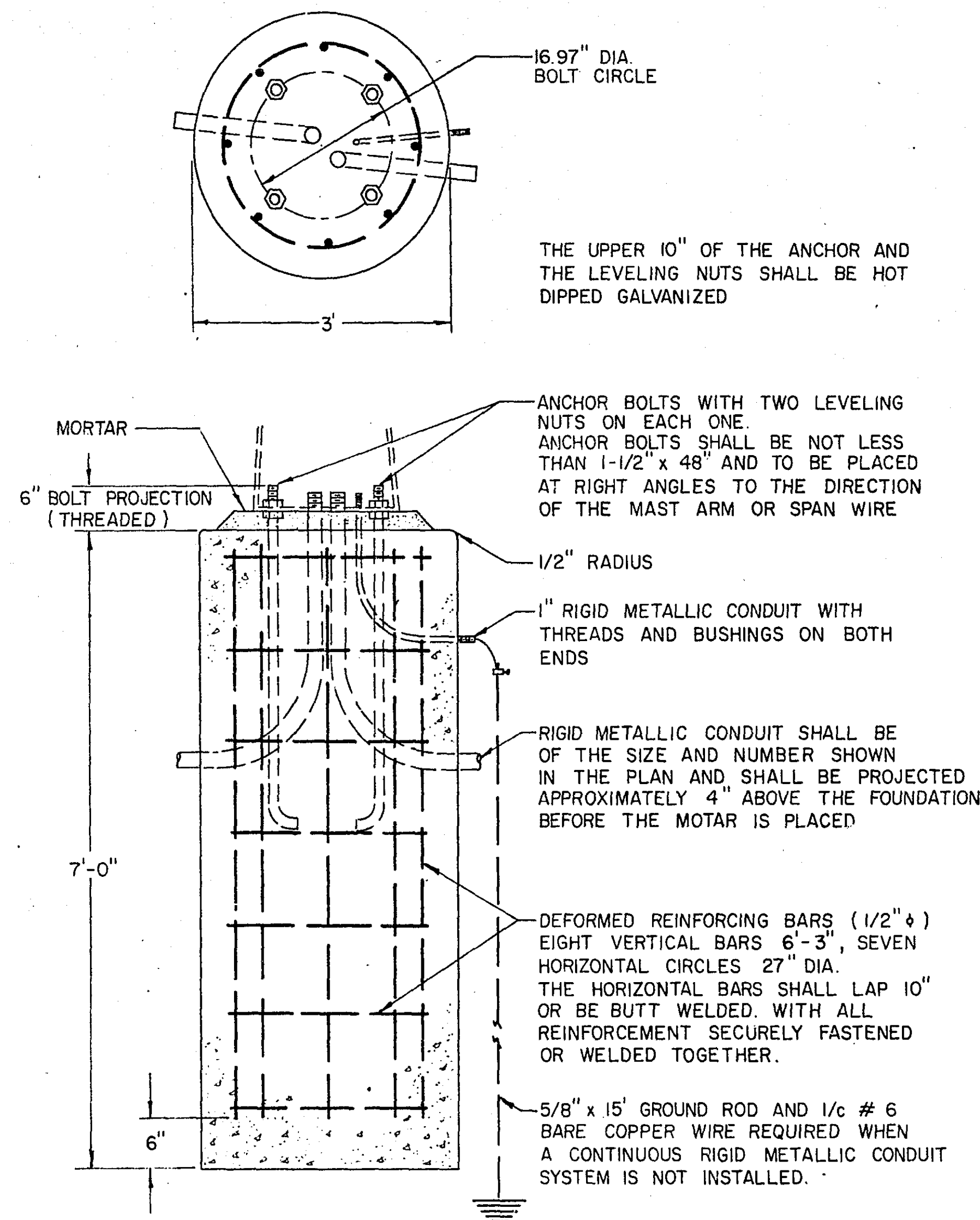


PEDESTRIAN PUSH BUTTON DETAIL NO. 1

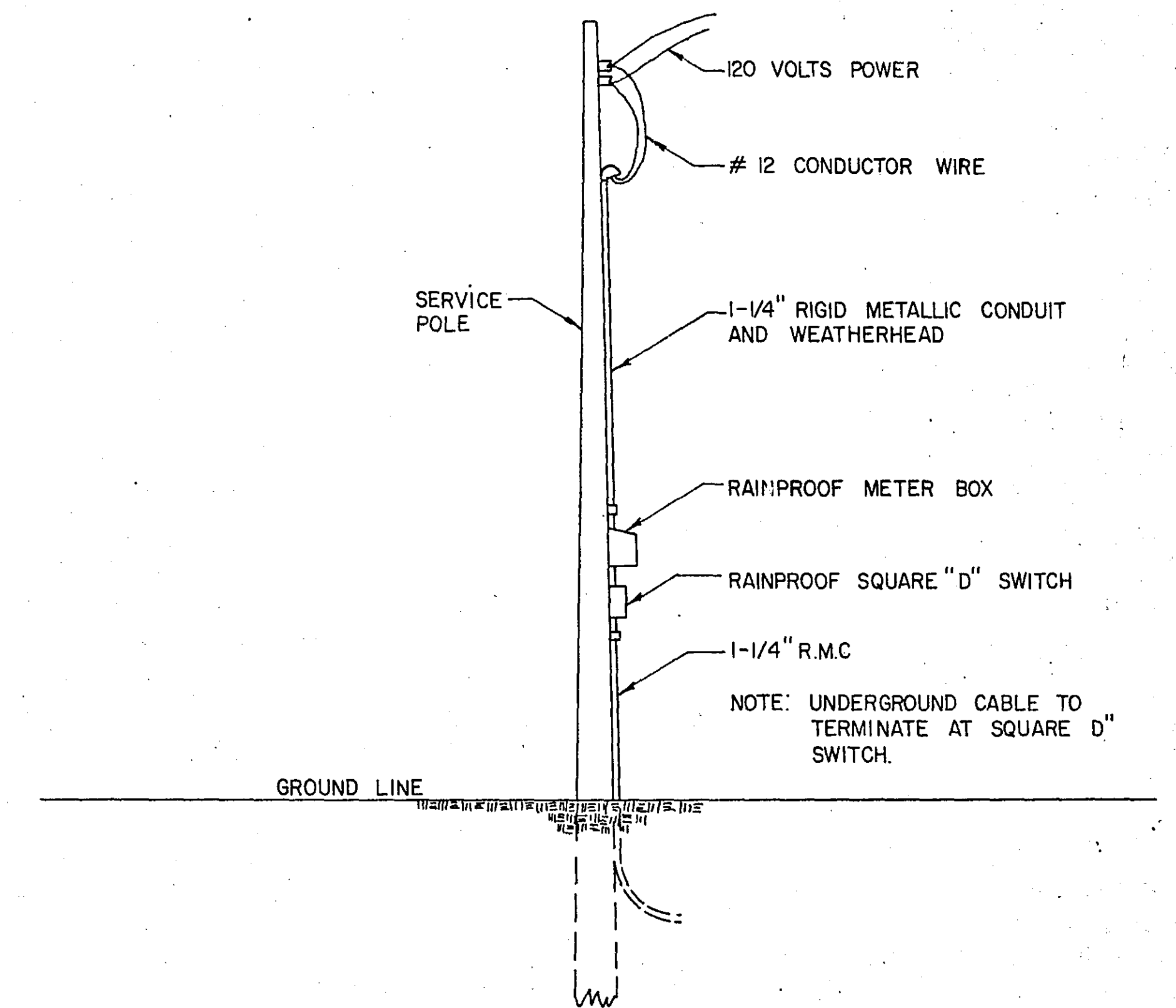


CONCRETE FOUNDATION

FOR MAST ARM TRAFFIC SIGNAL POLE

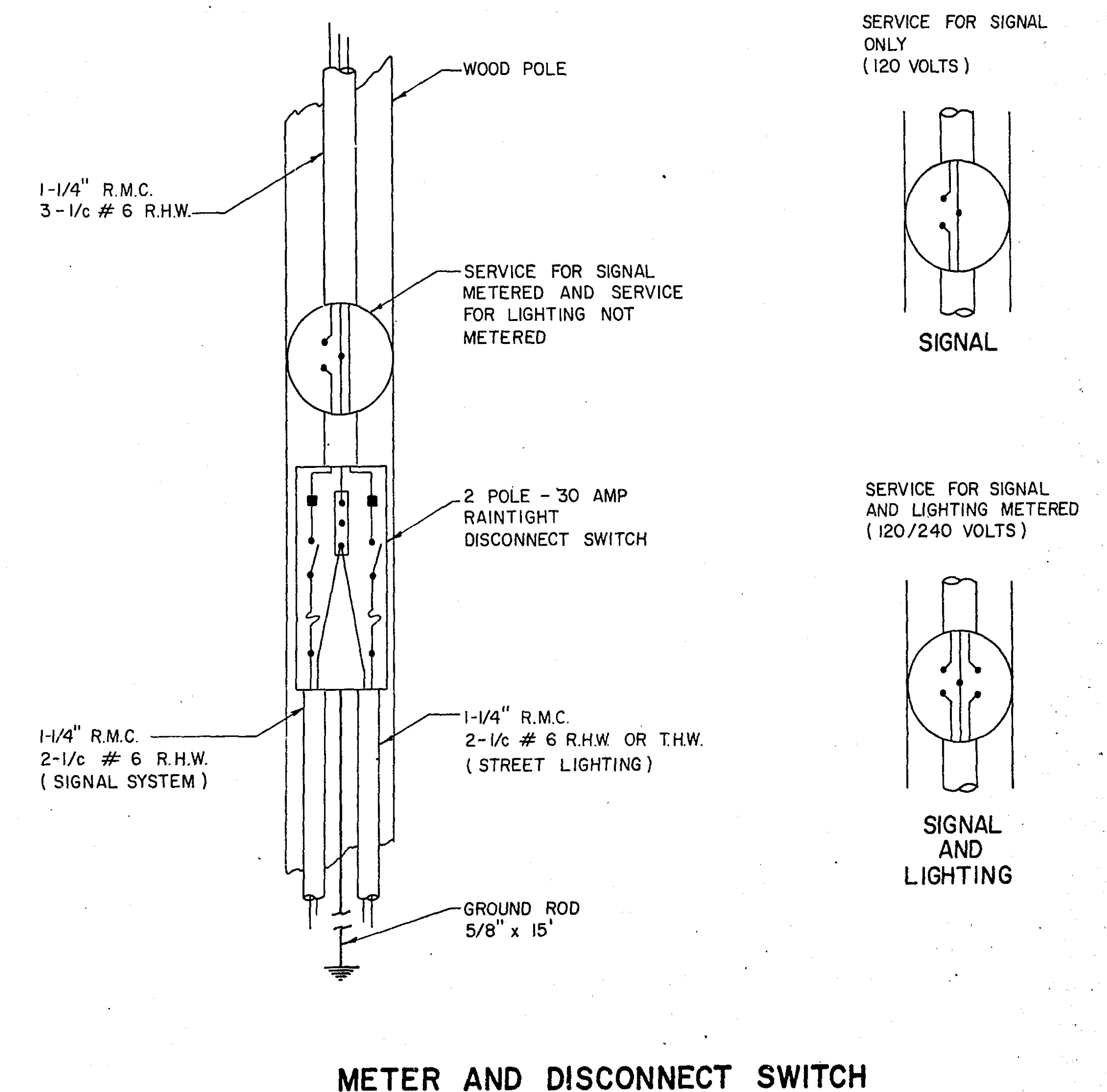
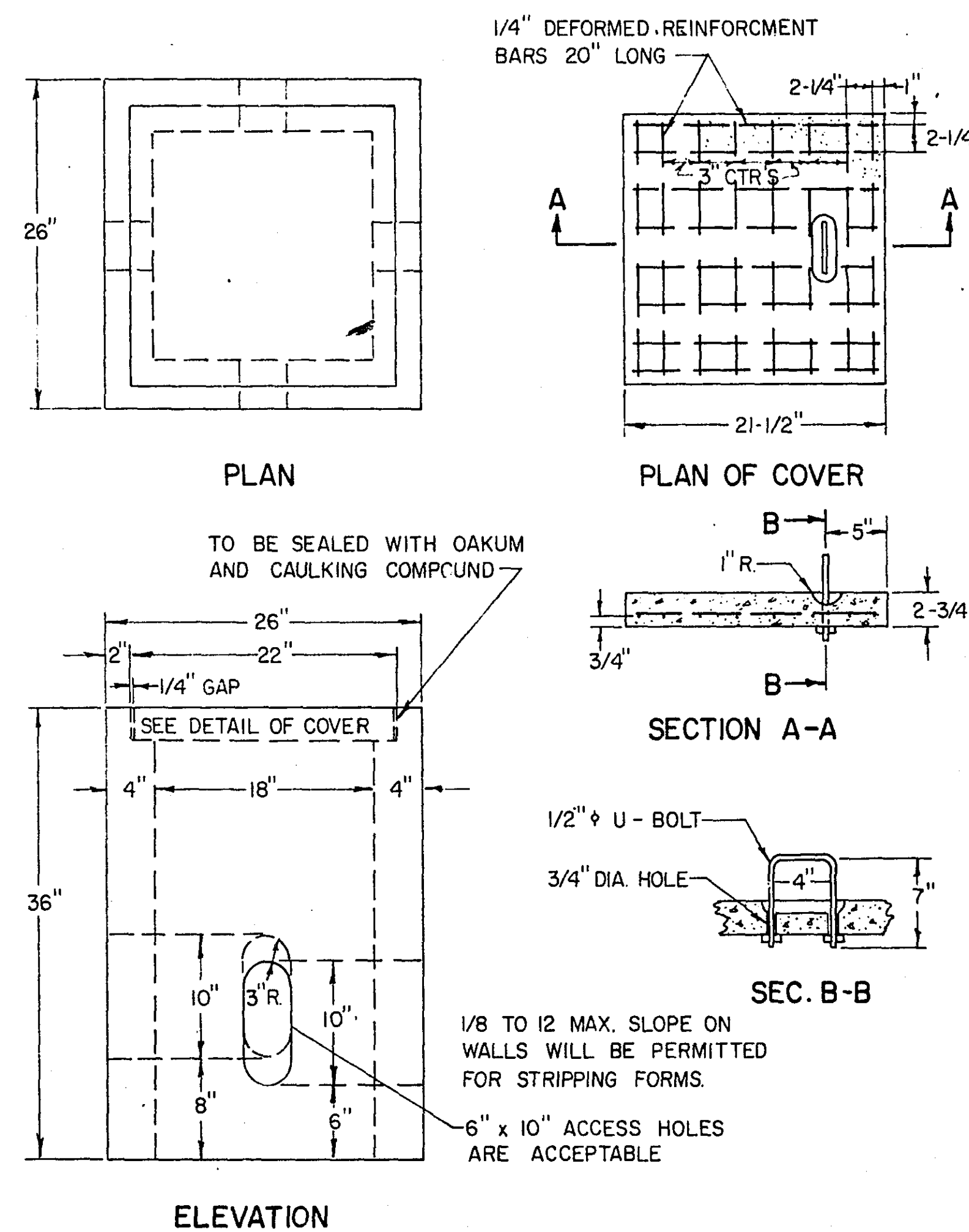
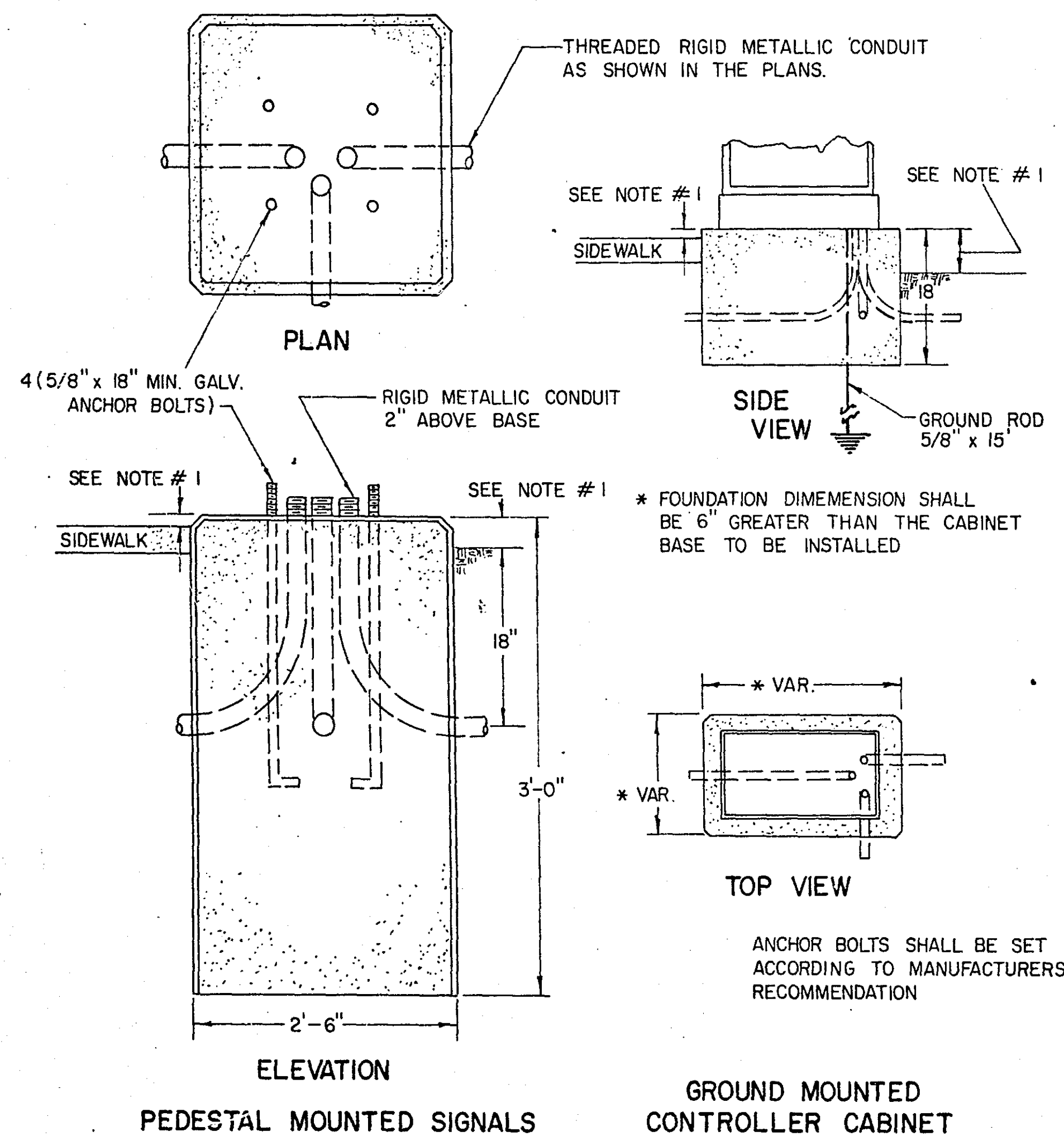


POLE FOR POWER CONNECTION



NOTE # 1

DISTANCE FROM GROUND LINE VARIABLE FROM 1/4" IN THE SIDEWALK AREA TO 2" IN THE SHOULDER OR BLVD. AREA.



CONCRETE FOUNDATIONS

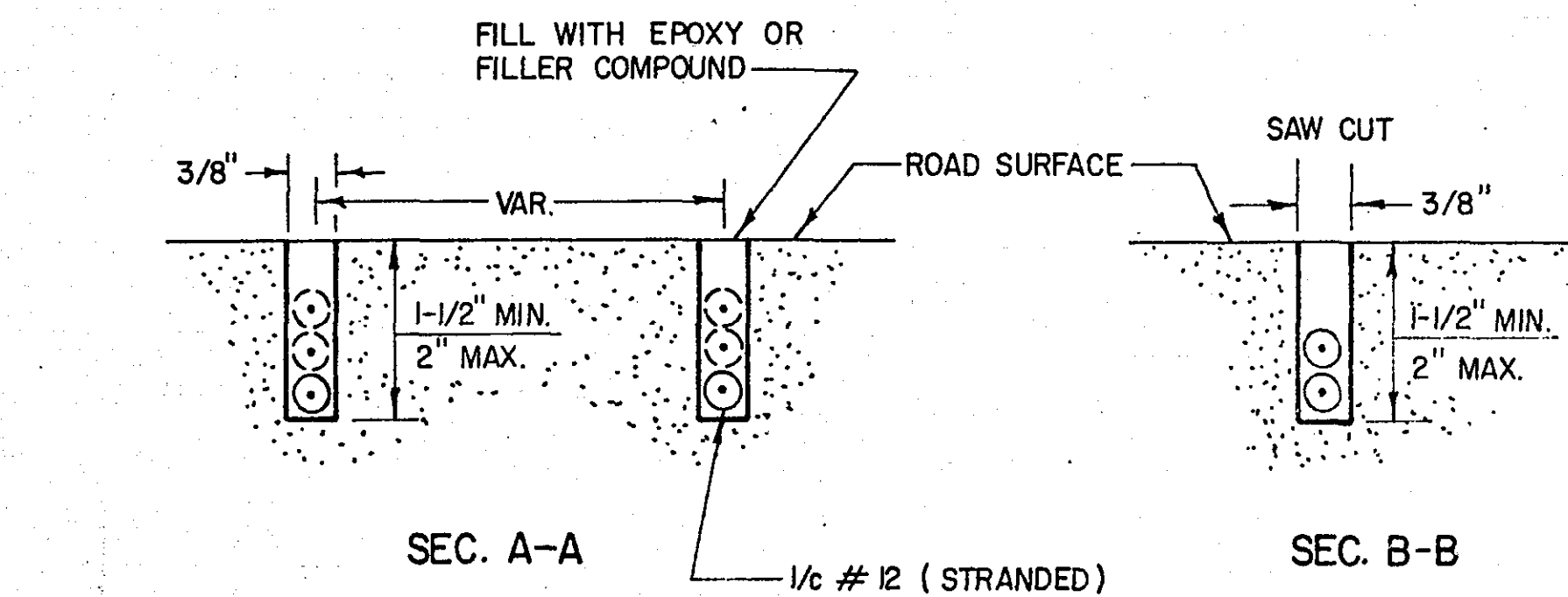
PRECAST CONCRETE HANDHOLE OR PULLBOX

CO. PROJ. NO. 68-65

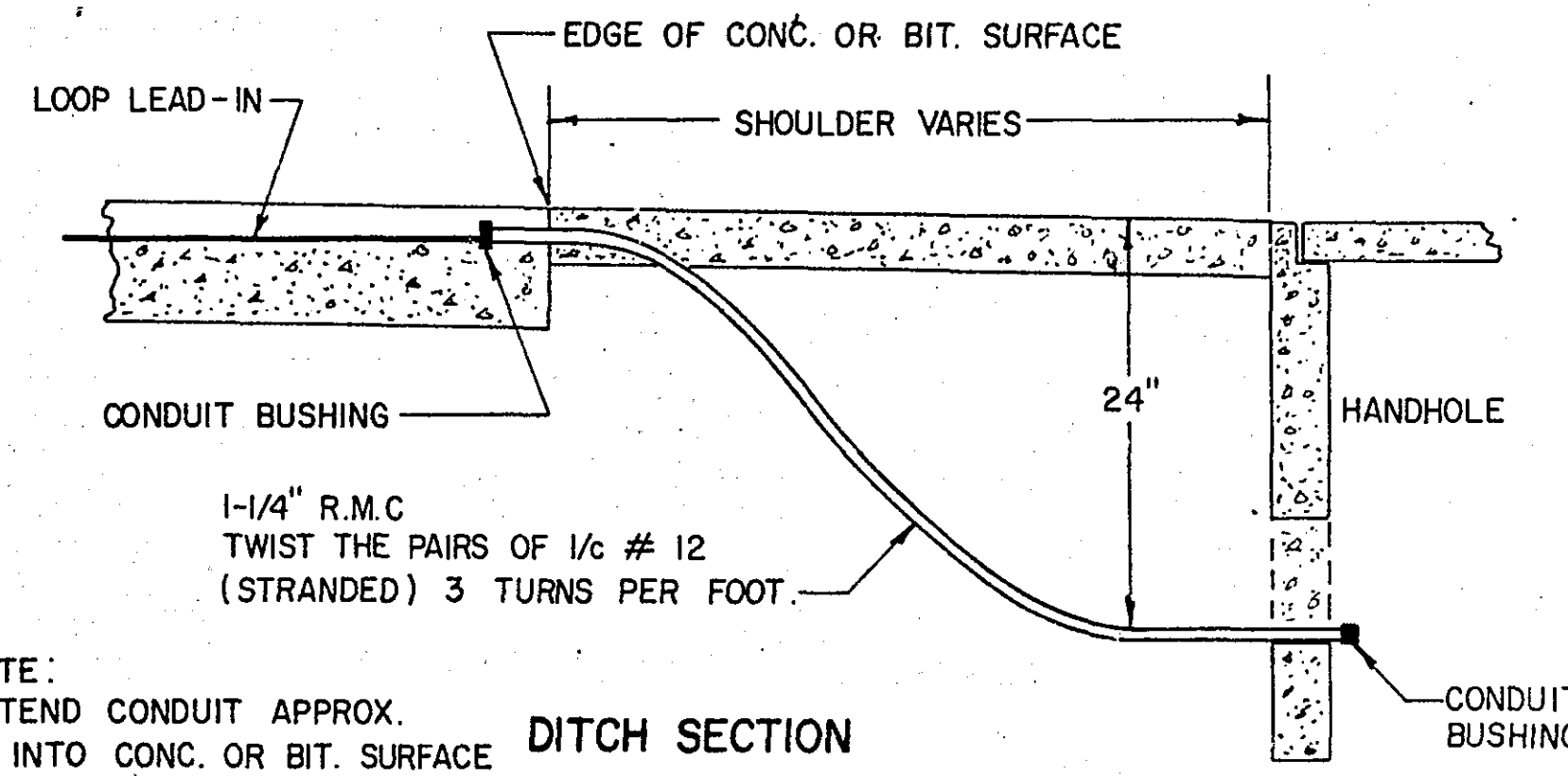
MICROFILMED
RAMSEY CO. ENGRSHEET NO. 7 OF 11 SHEETS

19-100

NOTE: NUMBER OF TURNS &
SIZE OF LOOP SHALL BE DETERMINED
IN THE FIELD BY THE ENGINEER.

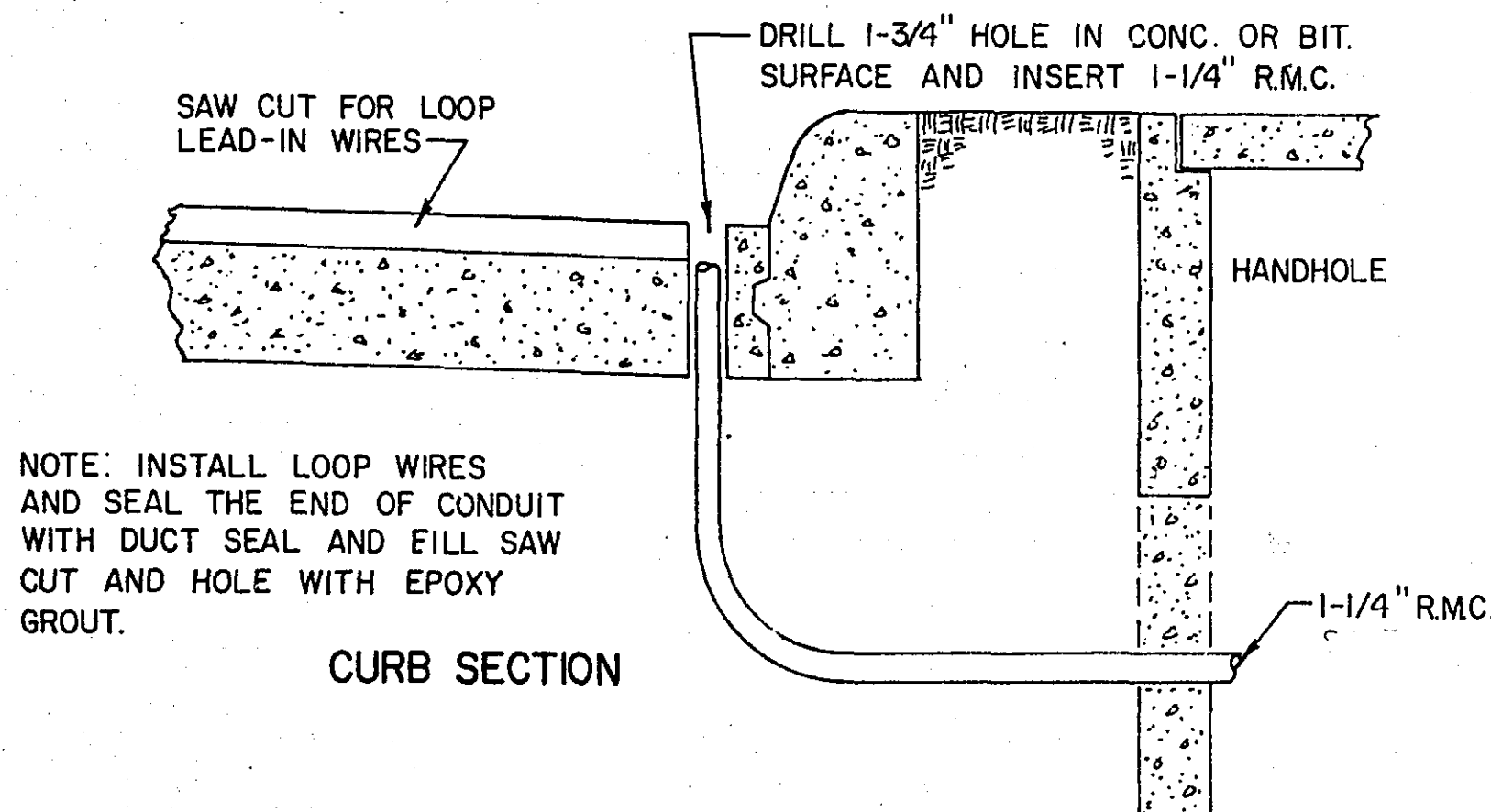


NOTE:
THE CONDUCTORS SHALL BE SINGLE-CONDUCTOR
12 (STRANDED) INSULATED WITH FILLED
CHEMICALLY CROSS-LINKED POLYETHYLENE AND
SHALL BEAR THE U.L. LISTING LABELS FOR
TYPE R.H.W. AND TYPE R.H.H.



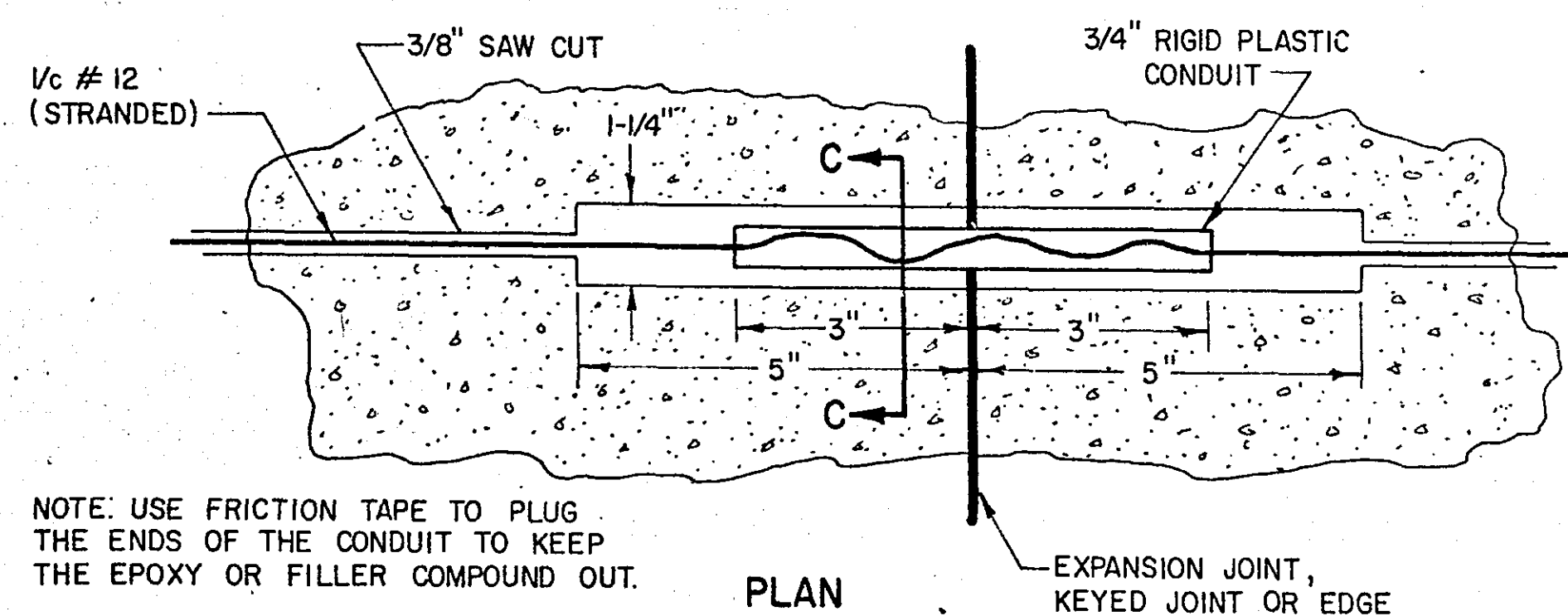
NOTE:
EXTEND CONDUIT APPROX.
2" INTO CONC. OR BIT. SURF.

DITCH SECTION



NOTE: INSTALL LOOP WIRES
AND SEAL THE END OF CONDUIT
WITH DUCT SEAL AND FILL SAW
CUT AND HOLE WITH EPOXY
GROUT.

CURB SECTION



NOTE: USE FRICTION TAPE TO PLUG THE ENDS OF THE CONDUIT TO KEEP THE EPOXY OR FILLER COMPOUND OUT.

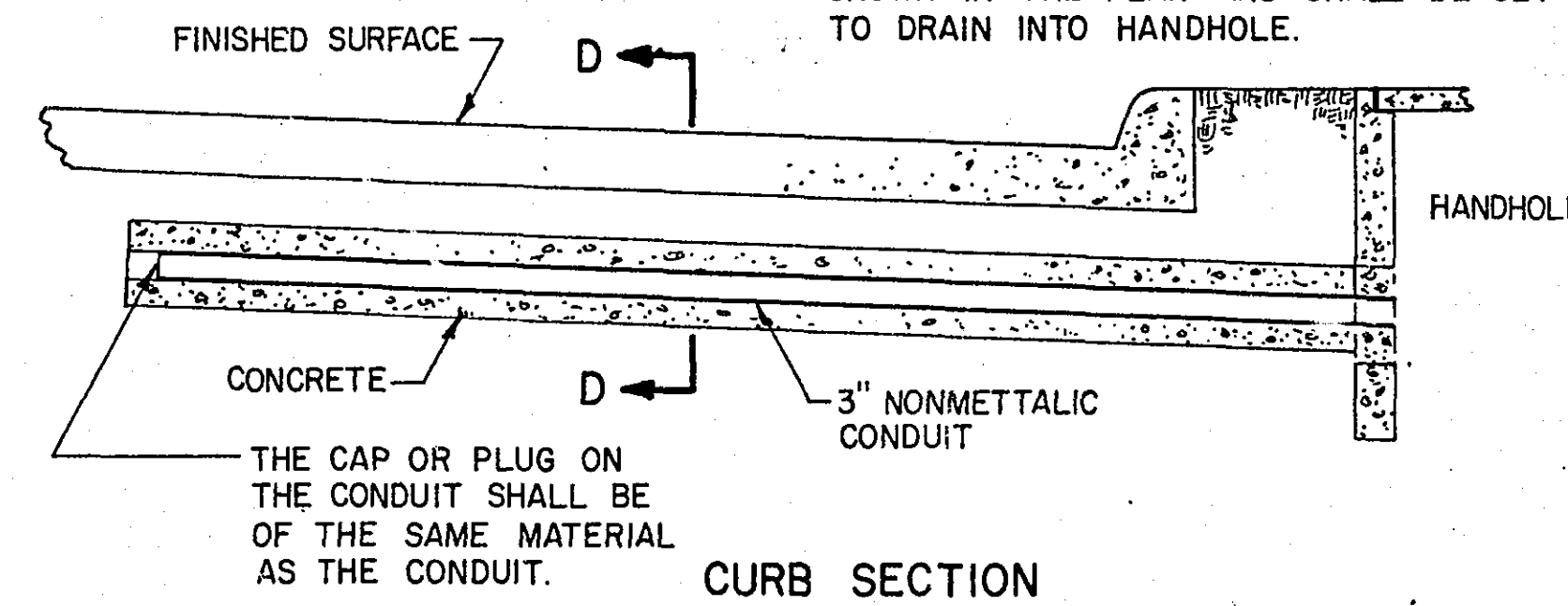
PLAN

Diagram illustrating a repair method for a pavement surface using a rigid plastic conduit and epoxy. The diagram shows a cross-section of the pavement surface and the repair area.

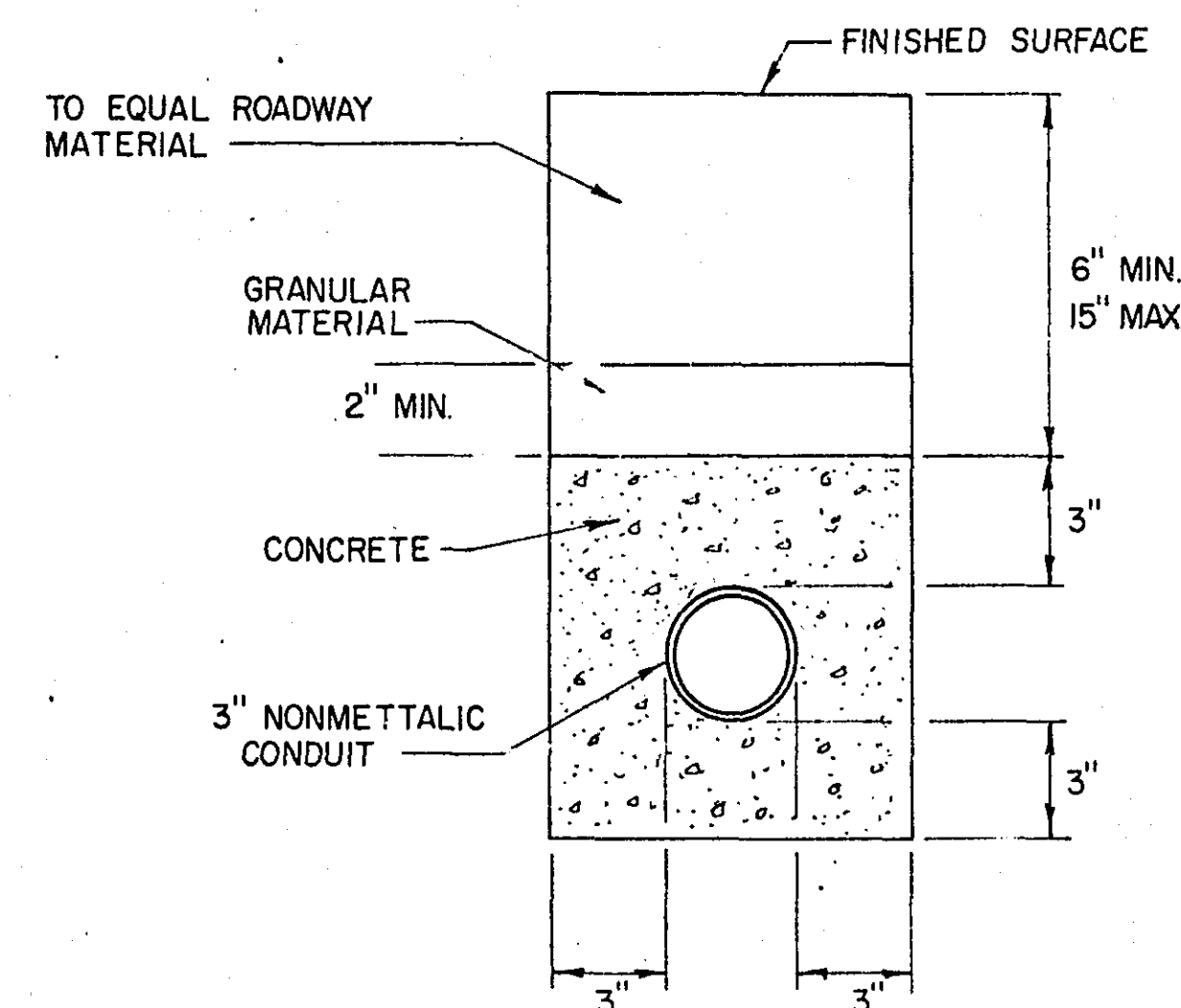
- PAVEMENT SURFACE**: The top layer of the pavement.
- 3/4" RIGID PLASTIC CONDUIT**: A conduit embedded in the pavement, containing three wires.
- FILL WITH EPOXY OR FILLER COMPOUND**: The material used to fill the hole around the conduit.
- 1/c # 12 (STRANDED)**: The size and type of the wires inside the conduit.
- 1-1/2" TO 2"**: The depth of the hole drilled into the pavement.
- 1-1/4"**: The diameter of the hole.

SECTION C-C

NOTE: CONDUIT LENGTH SHALL BE AS SHOWN IN THE PLAN AND SHALL BE SET TO DRAIN INTO HANDHOLE.



CURB SECTION



SECTION D-D

8"

5"

TO CROSS
FROST AVE.

➔

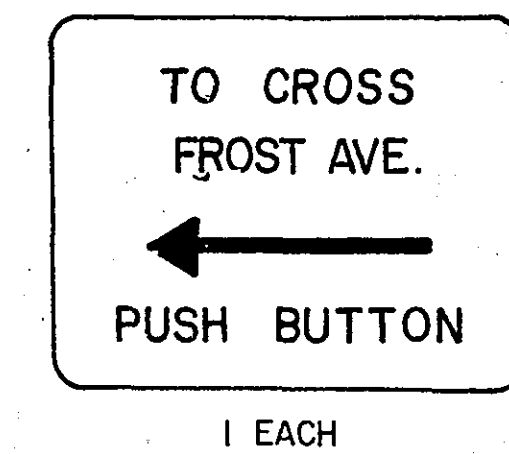
PUSH BUTTON

1 EACH

TO CROSS
FROST AVE.

PUSH BUTTON

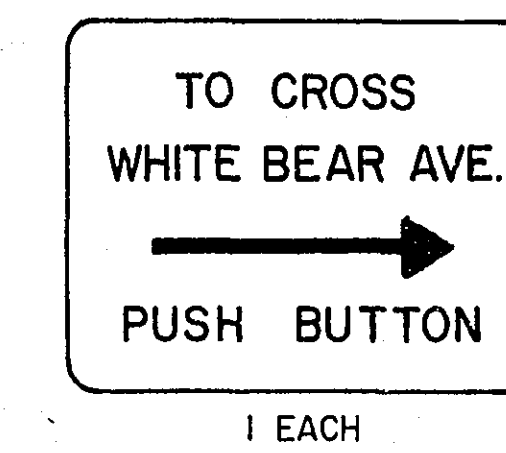
1 EACH



TO CROSS
FROST AVE.

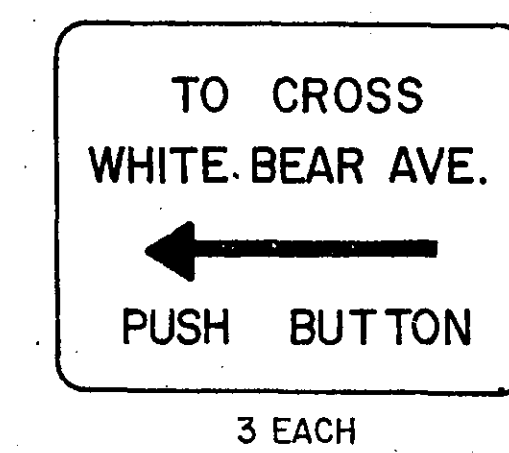
PUSH BUTTON

1 EACH



TO CROSS
WHITE BEAR AVE.

(F U S I O N)



TO CROSS
WHITE BEAR AVE.

PUSH BUTTON

3 EACH

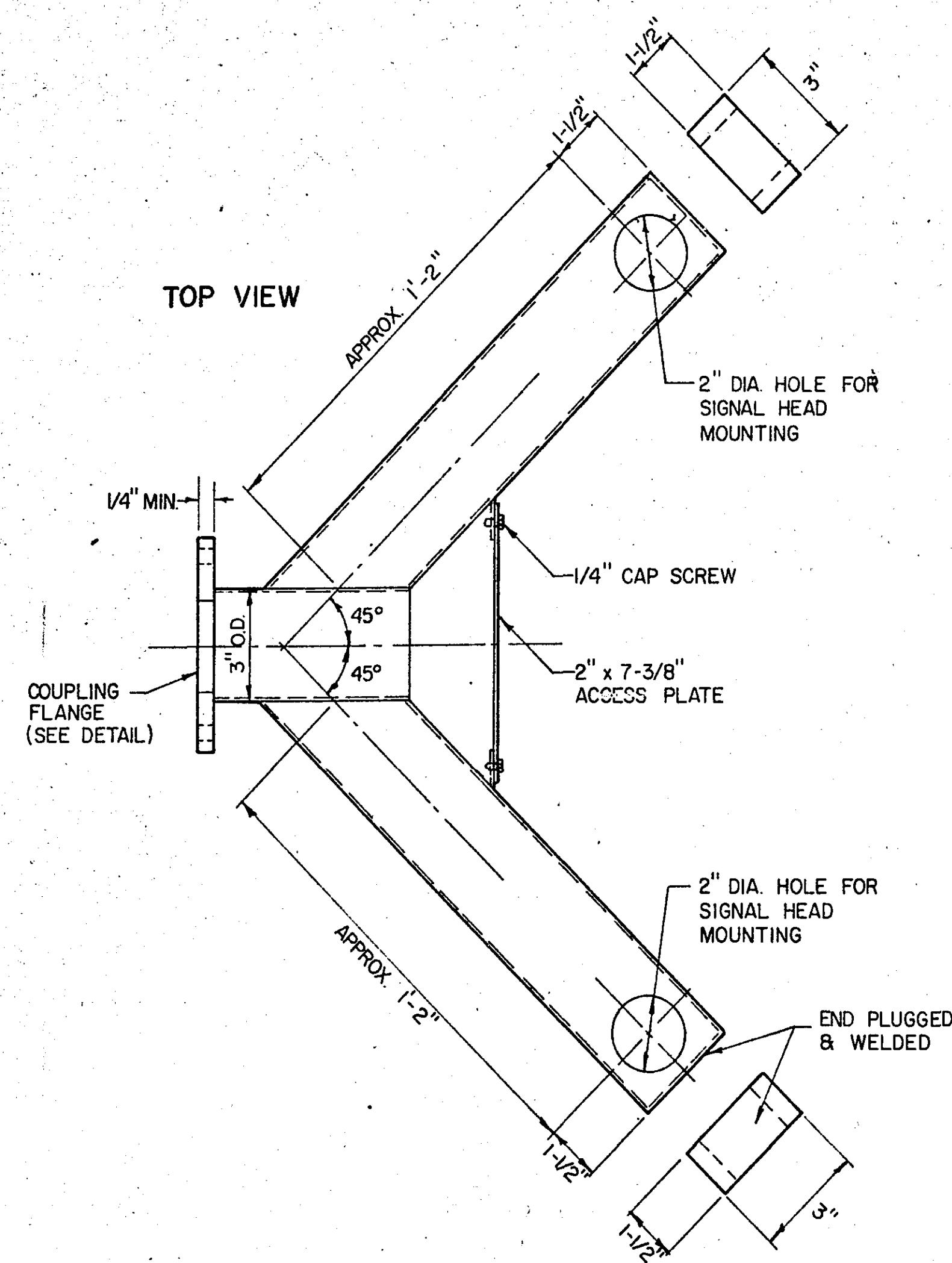
EQUIPMENT & INDICATIONS

RED - RED
YEL - YELLOW
GRN - GREEN
LTA - LEFT TURN ARROW
RTA - THRU ARROW
TRA - RIGHT TURN ARROW
TRA - THRU AND RIGHT ARROW
WLK - WALK
NEU - NEUTRAL
DWK - DON'T WALK
SW - SWITCH
SWD - SWITCHED
LUM - LUMINAIRE
PA1(eg)- PEDESTRIAN INDICATION - "A" PHASE
PB2(eg)- PUSH BUTTON - "B" PHASE
CB1(eg)- SIGNAL HEAD - "C" PHASE
DA4(eg)- DETECTOR - "A" PHASE
H.H. - HANDHOLE
GR.R - GROUND ROD
SERV. - SERVICE

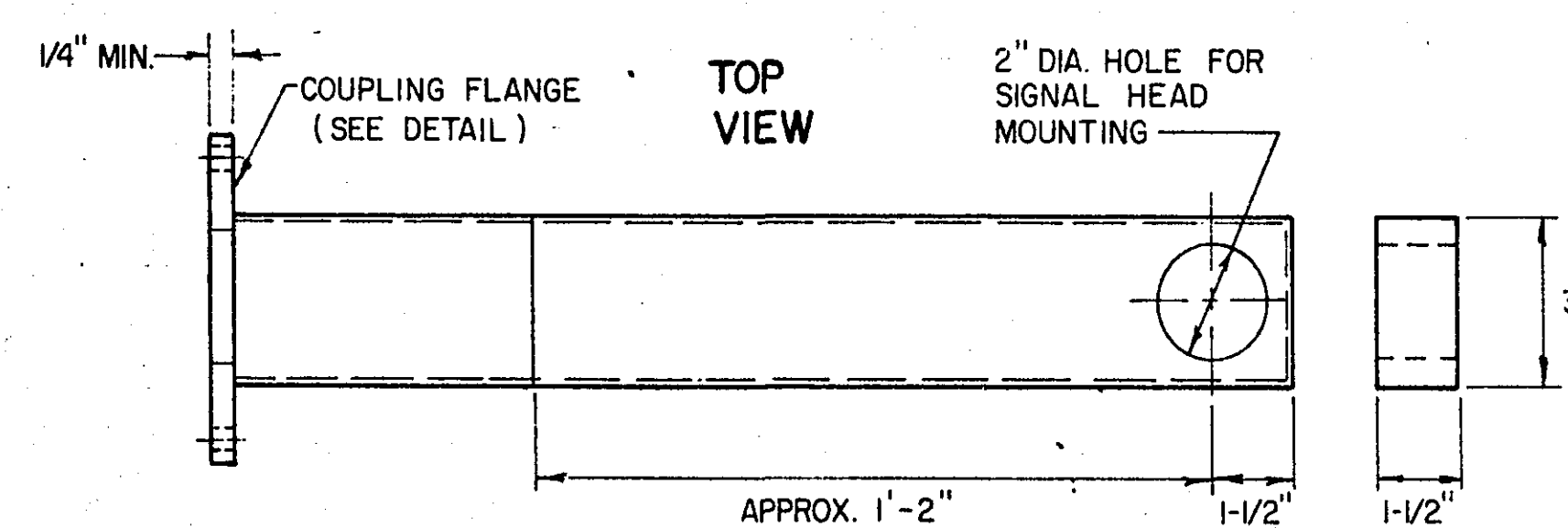
DNL - DOWNLIGHT
P.E.C. - PHOTOELECTRIC CELL
ST. LHT. - STREET LIGHT
CH - CHECK
S.O.P. - SOURCE OF POWER
EQ.G. - EQUIPMENT GROUND
SPR - SPARE CONDUCTOR

COLOR CODING OF CONDUCTORS

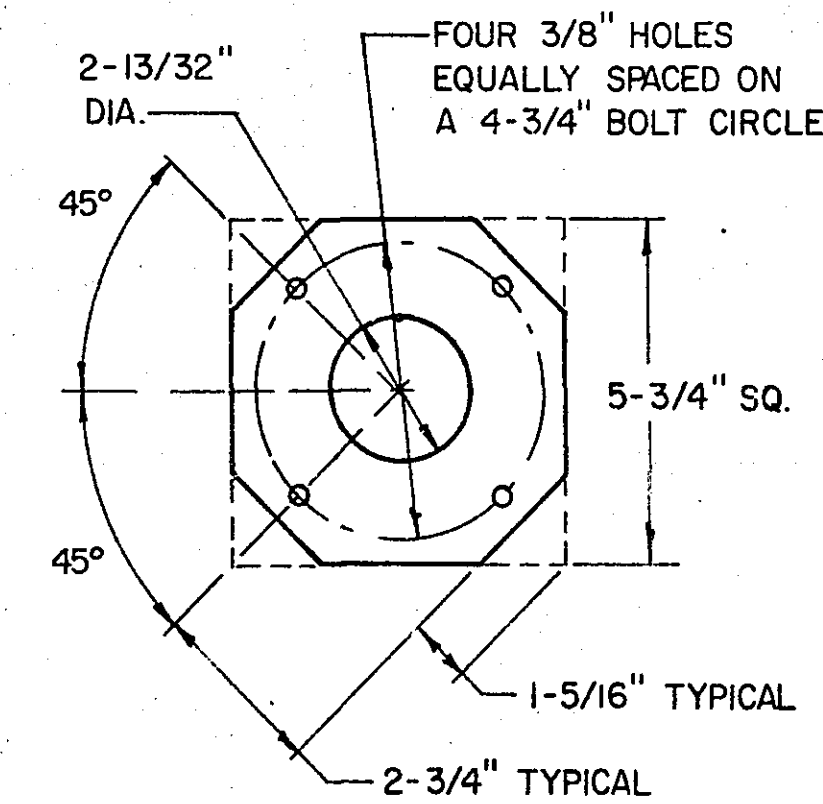
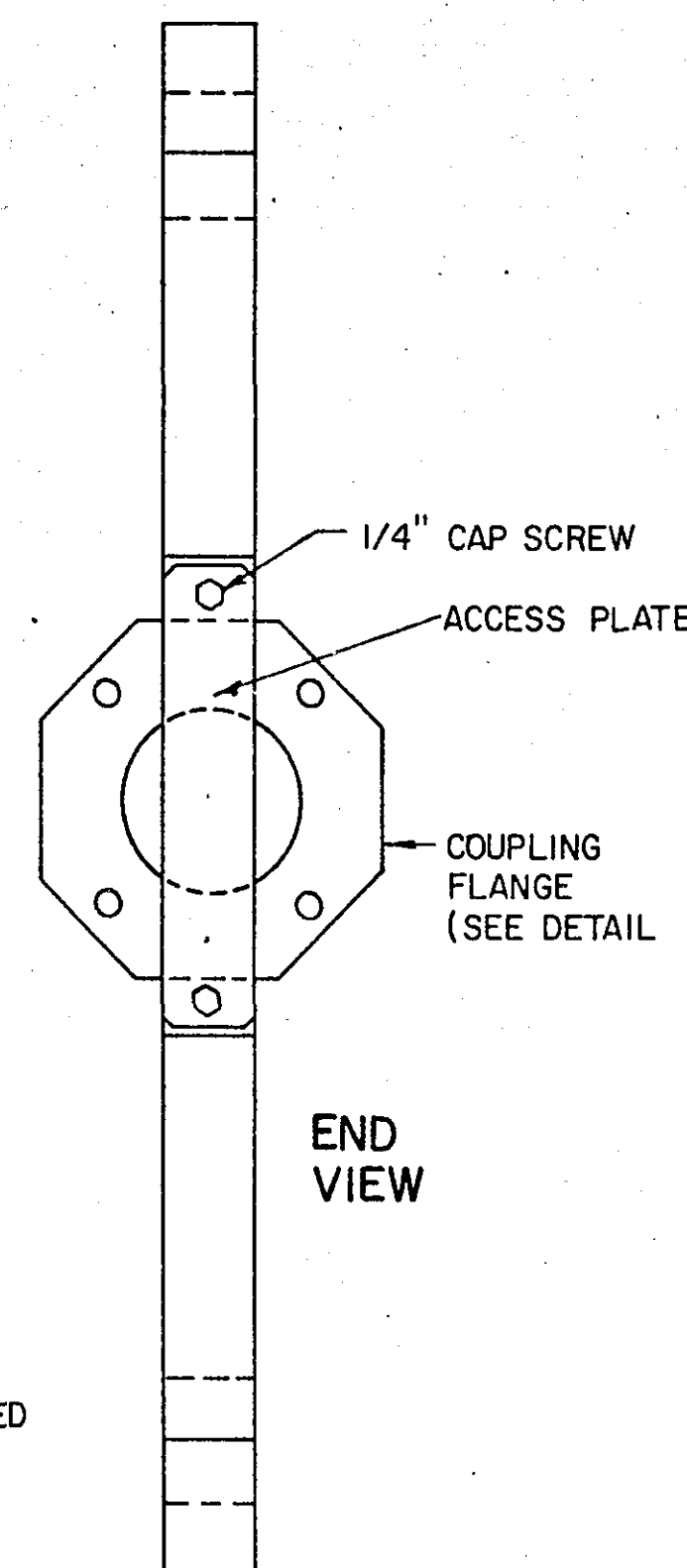
R - RED
O - ORANGE
BL - BLUE
WH - WHITE
R/BLK - RED WITH BLACK TRACER
O/BLK - ORANGE WITH BLACK TRACER
BL/BLK - BLUE WITH BLACK TRACER
WH/BLK - WHITE WITH BLACK TRACER
BLK - BLACK
BLK/WH - BLACK WITH WHITE TRACER
G/BLK - GREEN WITH BLACK TRACER
G - GREEN



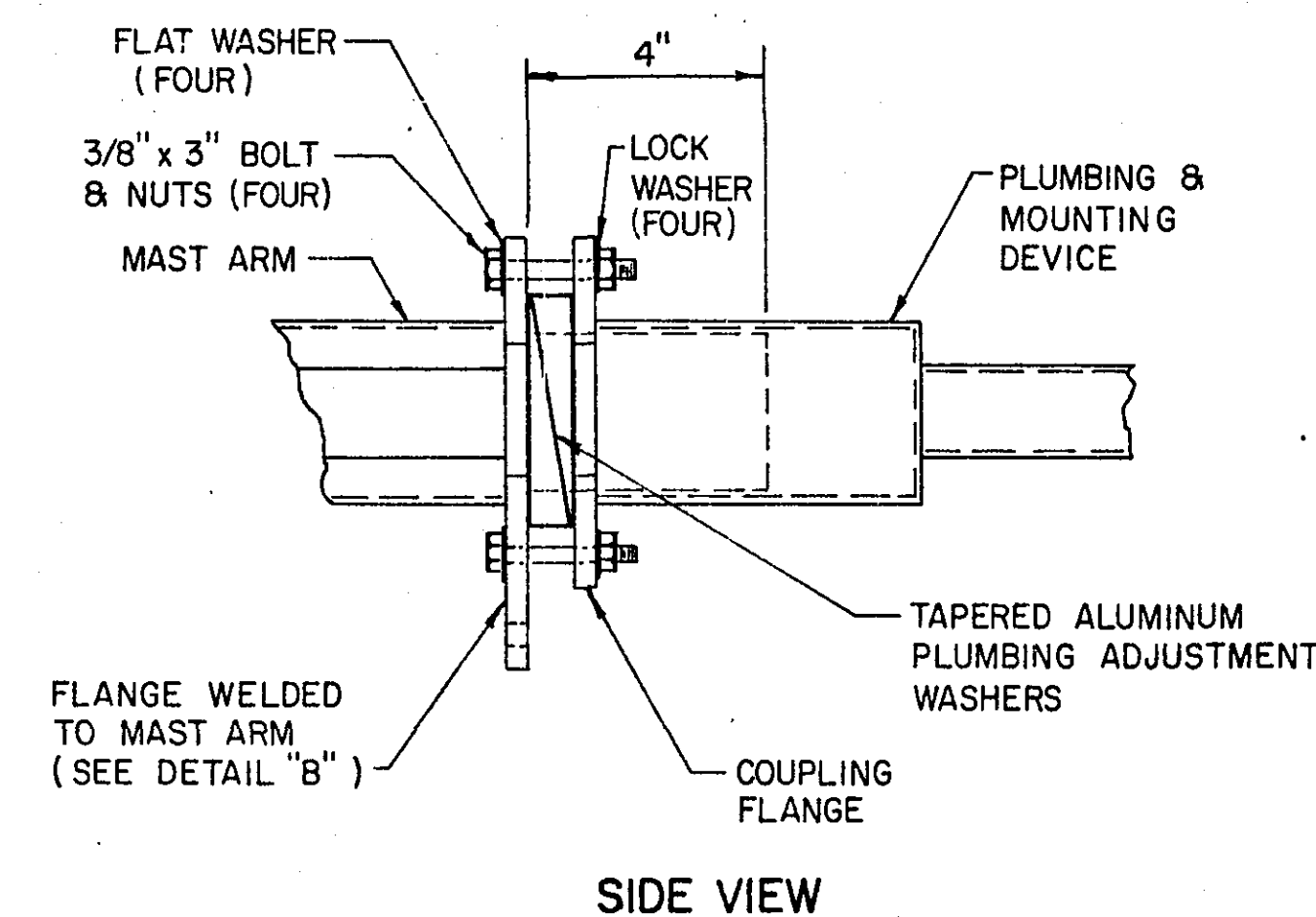
**TWO-WAY TRAFFIC SIGNAL
PLUMBING AND MOUNTING DEVICE**
SPECIFICATION REFERENCE M.H.D. 1703



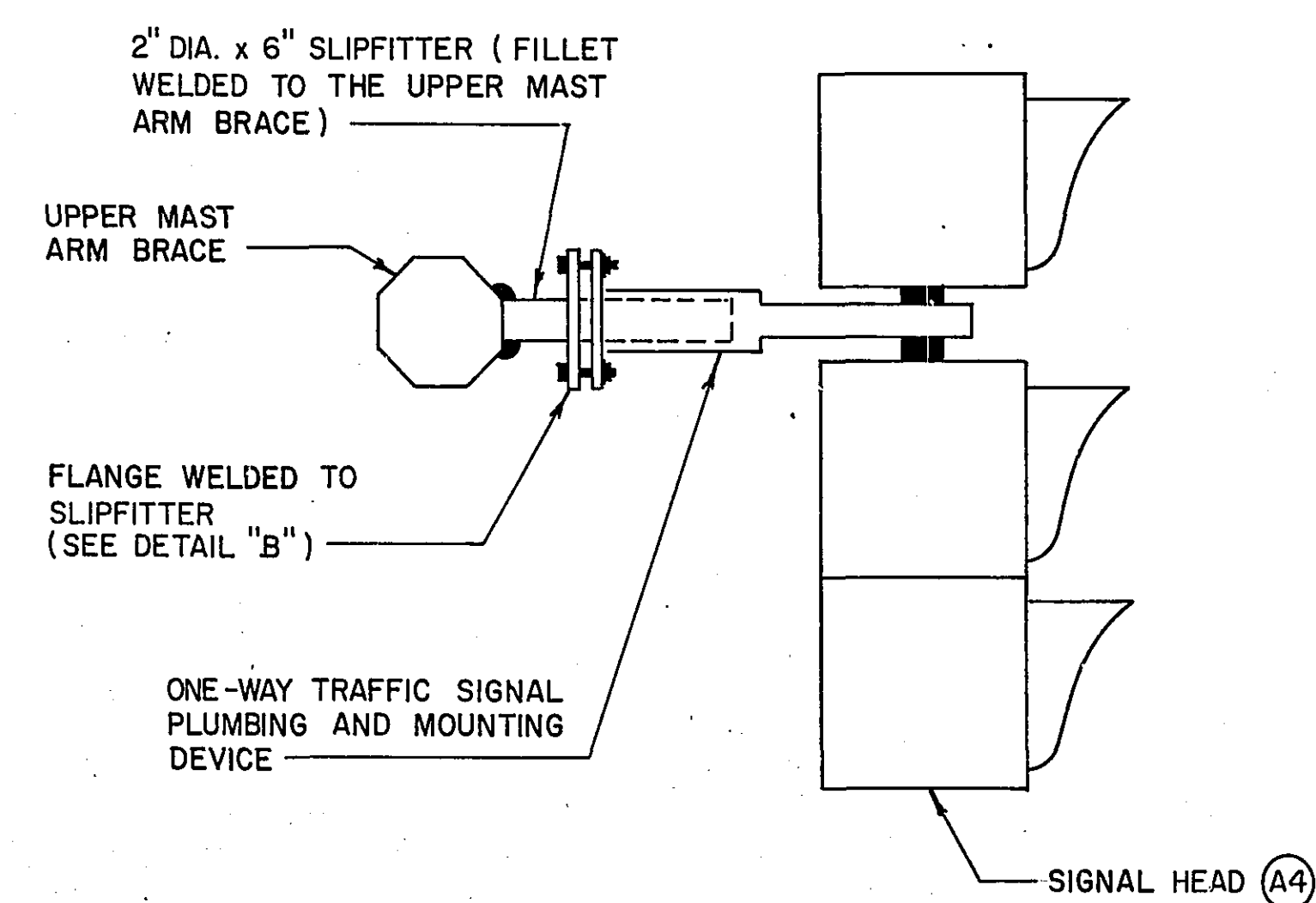
**ONE-WAY TRAFFIC SIGNAL
PLUMBING AND MOUNTING DEVICE**
SPECIFICATION REFERENCE M.H.D. 1703



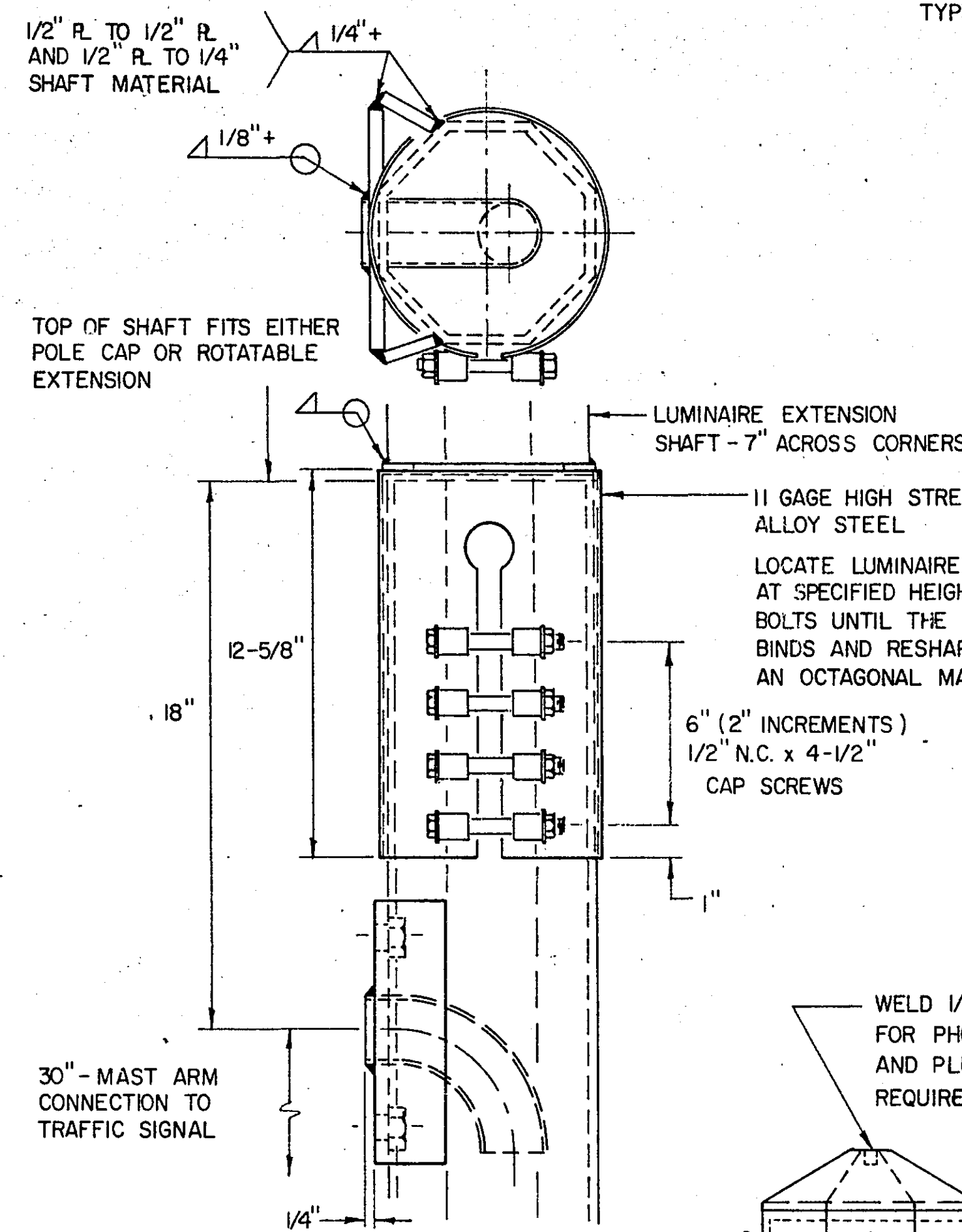
**COUPLING FLANGE
DETAIL**
(ONE-WAY AND TWO-WAY SIGNAL)



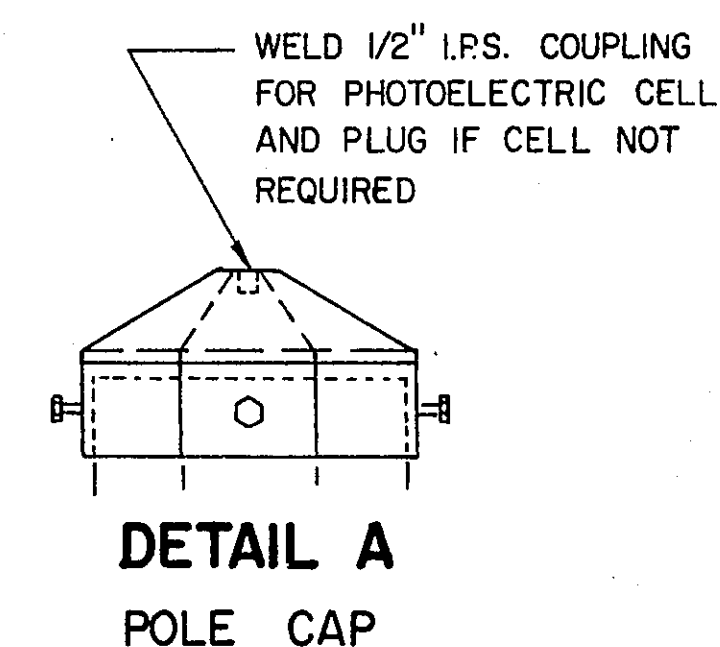
ASSEMBLY DETAIL
(ONE-WAY AND TWO-WAY SIGNAL)
SPECIFICATION REFERENCE M.H.D. 1703



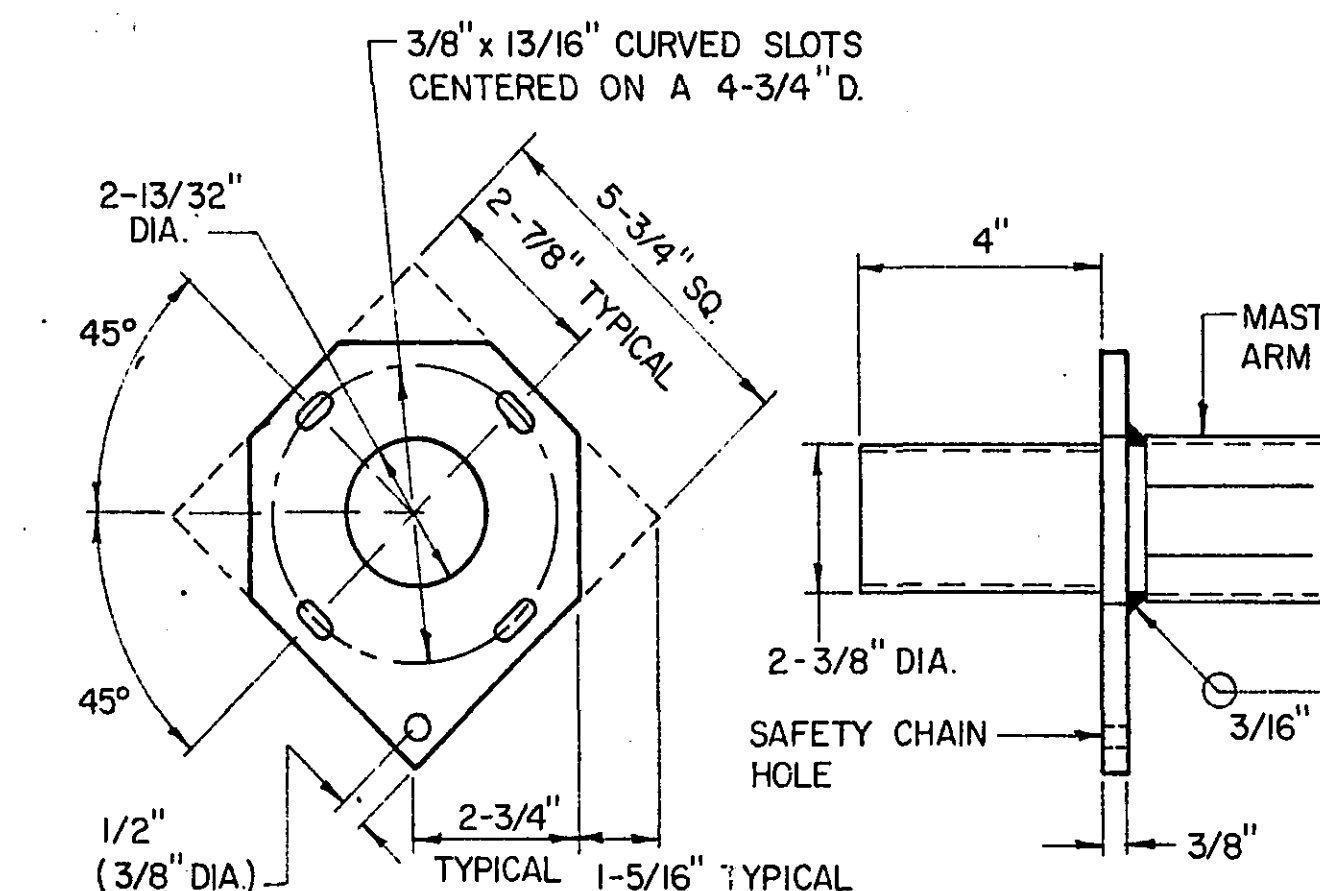
DETAIL G



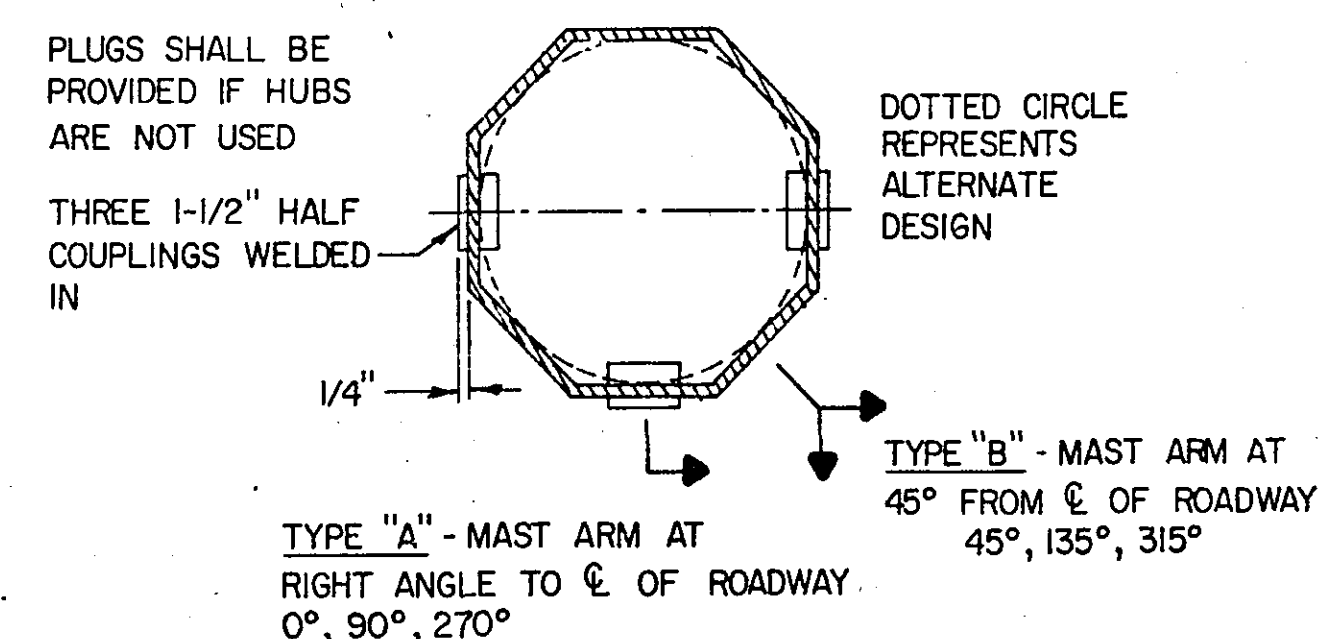
DETAIL C
ROTATABLE LUMINAIRE
EXTENSION AND MAST
ARM CONNECTION



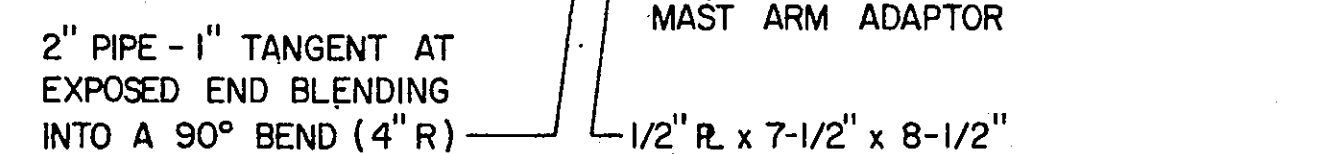
DETAIL A
POLE CAP



DETAIL B
FLANGE

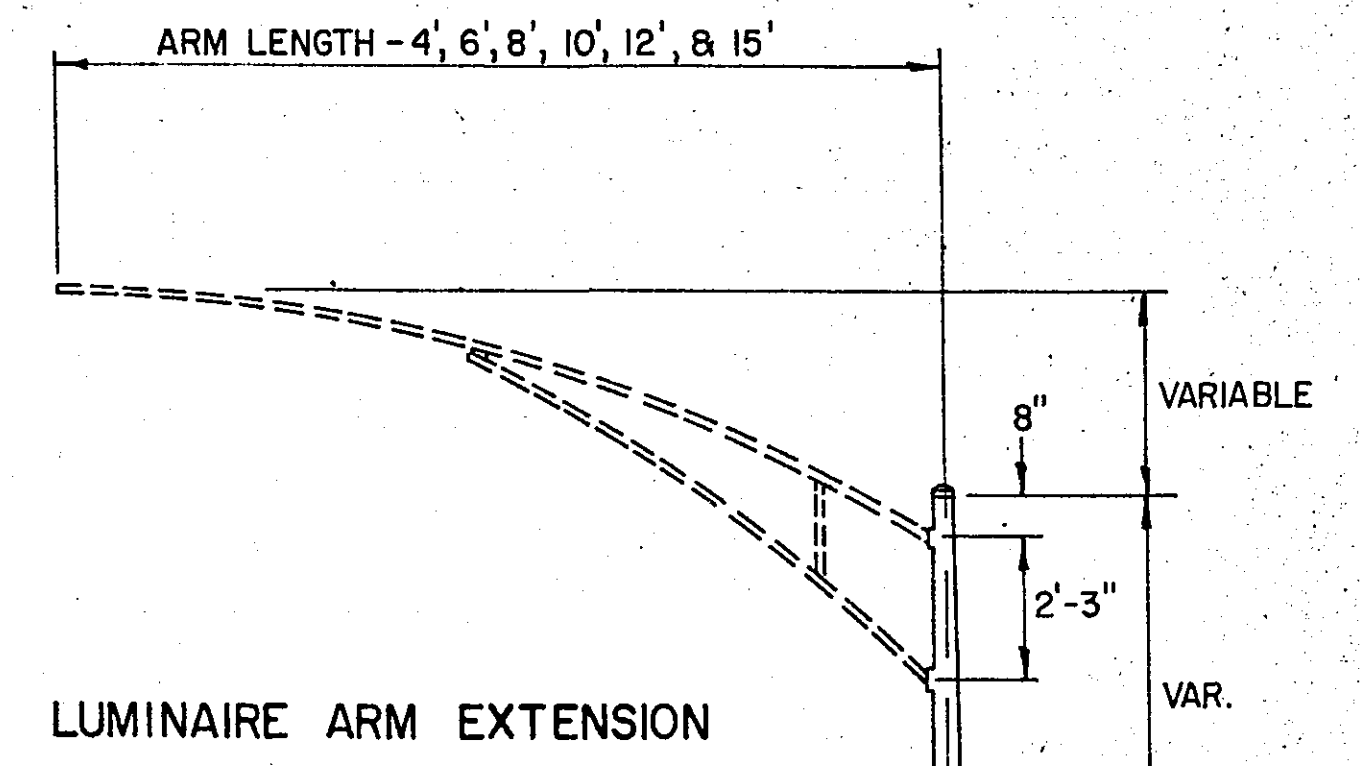


SECTION E-E
POLE-MOUNTED SIGNAL HUB

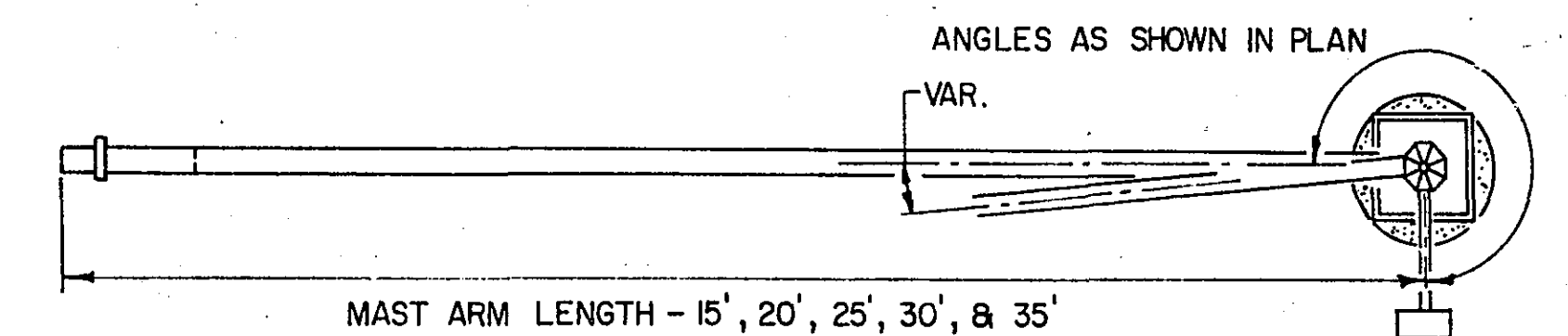


DETAIL D
MAST ARM ADAPTOR

- NOTES:
TYPE A-20-D30 OR 40-12 TYPE A-20-T30 OR 40-20
(1) (2) (3) (4) (1) (2) (3) (4)
1. LETTER TYPE INDICATES POLE MAST ARM POSITION WITH RESPECT TO THE ϕ OF ROADWAY.
 2. NUMBER FOLLOWING TYPE LETTER INDICATES SIGNAL MAST ARM LENGTH.
 3. SECOND LETTER INDICATES LUMINAIRE TRUSS-TYPE ARM EXTENSION OR DAVIT-TYPE ARM EXTENSION. SECOND LETTER FOLLOWED BY NUMBERS INDICATES LUMINAIRE MOUNTING HEIGHT.
 4. NUMBER FOLLOWING INDICATES LENGTH OF LUMINAIRE TRUSS ARM OR DAVIT ARM.



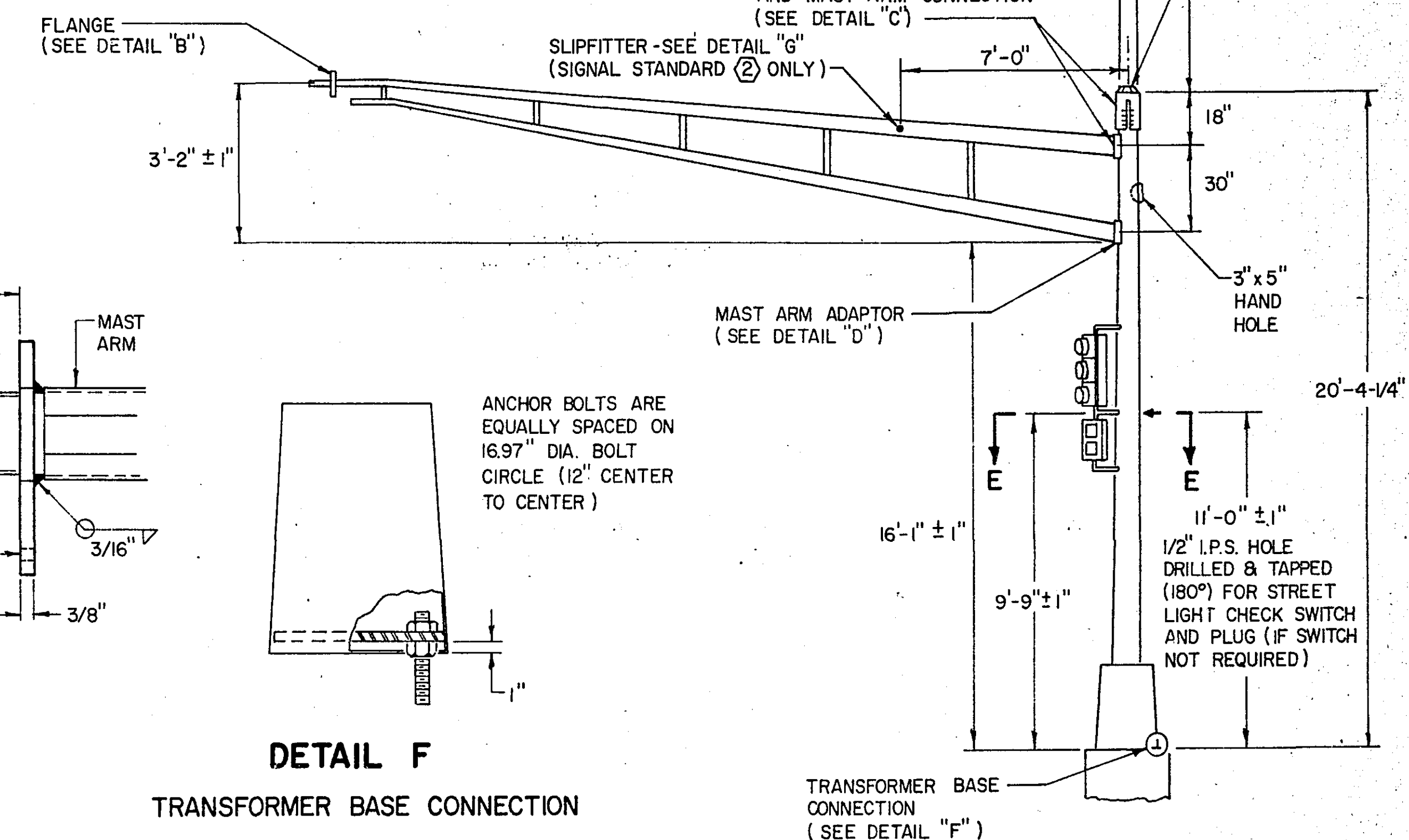
LUMINAIRE ARM EXTENSION



PLAN

(1) DIMENSIONS SHOWN SHOULD PROVIDE FOR A DISTANCE OF 30' OR 40' FROM TRANSFORMER BASE BOTTOM TO TOP OF LUMINAIRE. DIMENSIONS MAY VARY AS SPECIFIED BY THE RAMSEY COUNTY HIGHWAY DEPT.

FOR LUMINAIRE, USE TRUSS-TYPE ARM OR DAVIT-TYPE ARM SHAFT EXTENSION AS SPECIFIED



ELEVATION

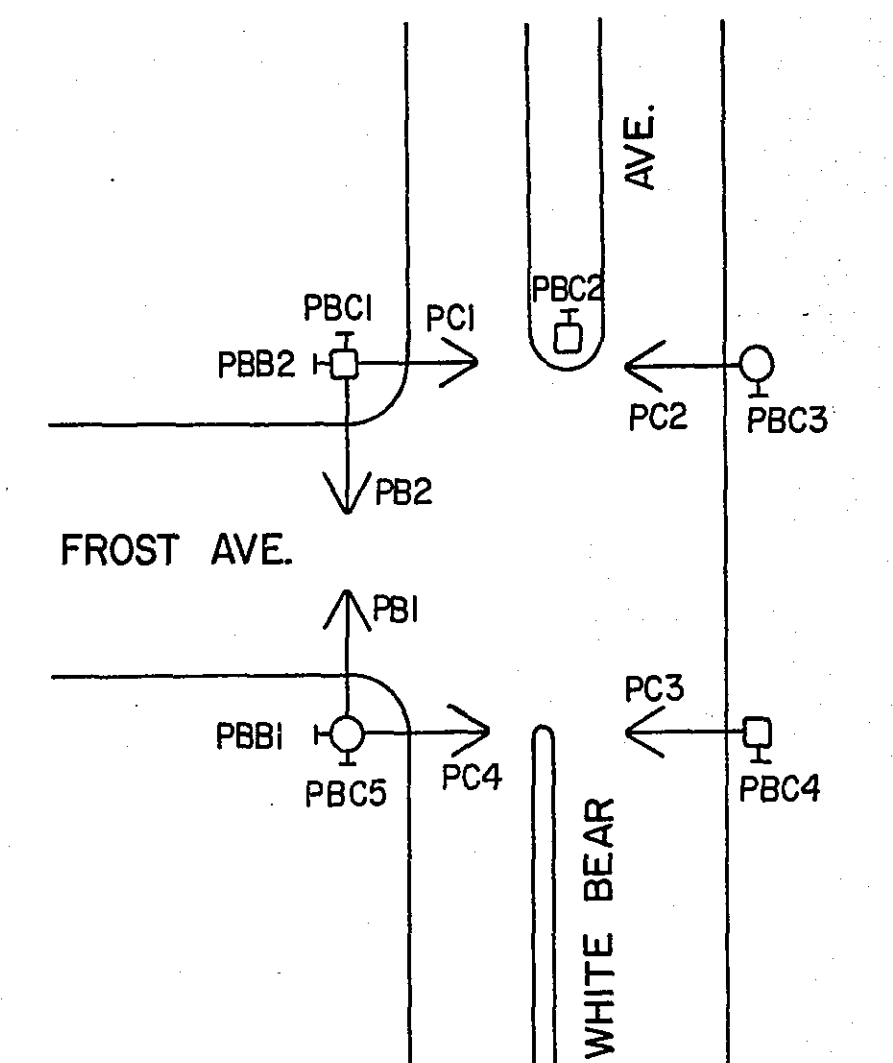
POLE AND MAST ARM

PHASING DIAGRAM

The diagram shows the intersection of Frost Ave. and White Bear Ave. Frost Ave. runs horizontally, and White Bear Ave. runs vertically. Traffic flow is indicated by arrows:

- On Frost Ave., traffic flows from left to right. An arrow labeled 'C' is shown at the intersection.
- On White Bear Ave., traffic flows from bottom to top. An arrow labeled 'A' is shown at the intersection.
- At the intersection, there are two arrows pointing diagonally up and to the right, labeled 'B' and 'A+B'.
- At the top of White Bear Ave., there is an arrow pointing straight up, labeled 'A+B'.

* SEE SPECIAL PROVISIONS (S-12.25)

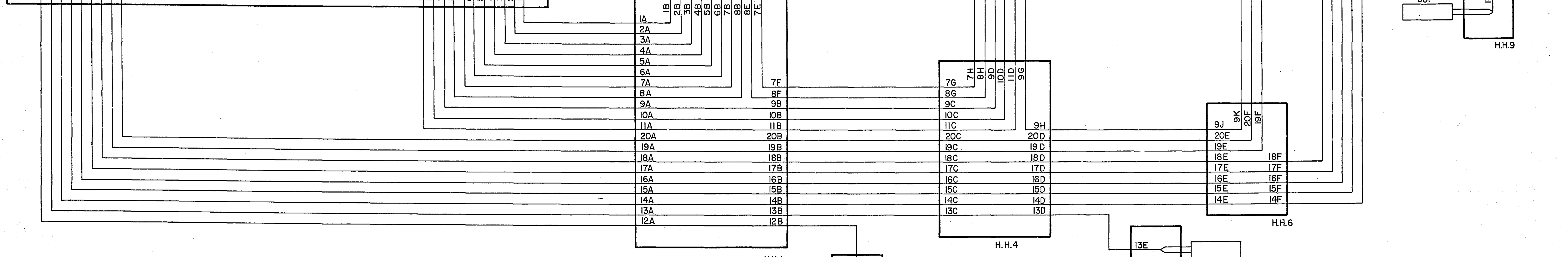
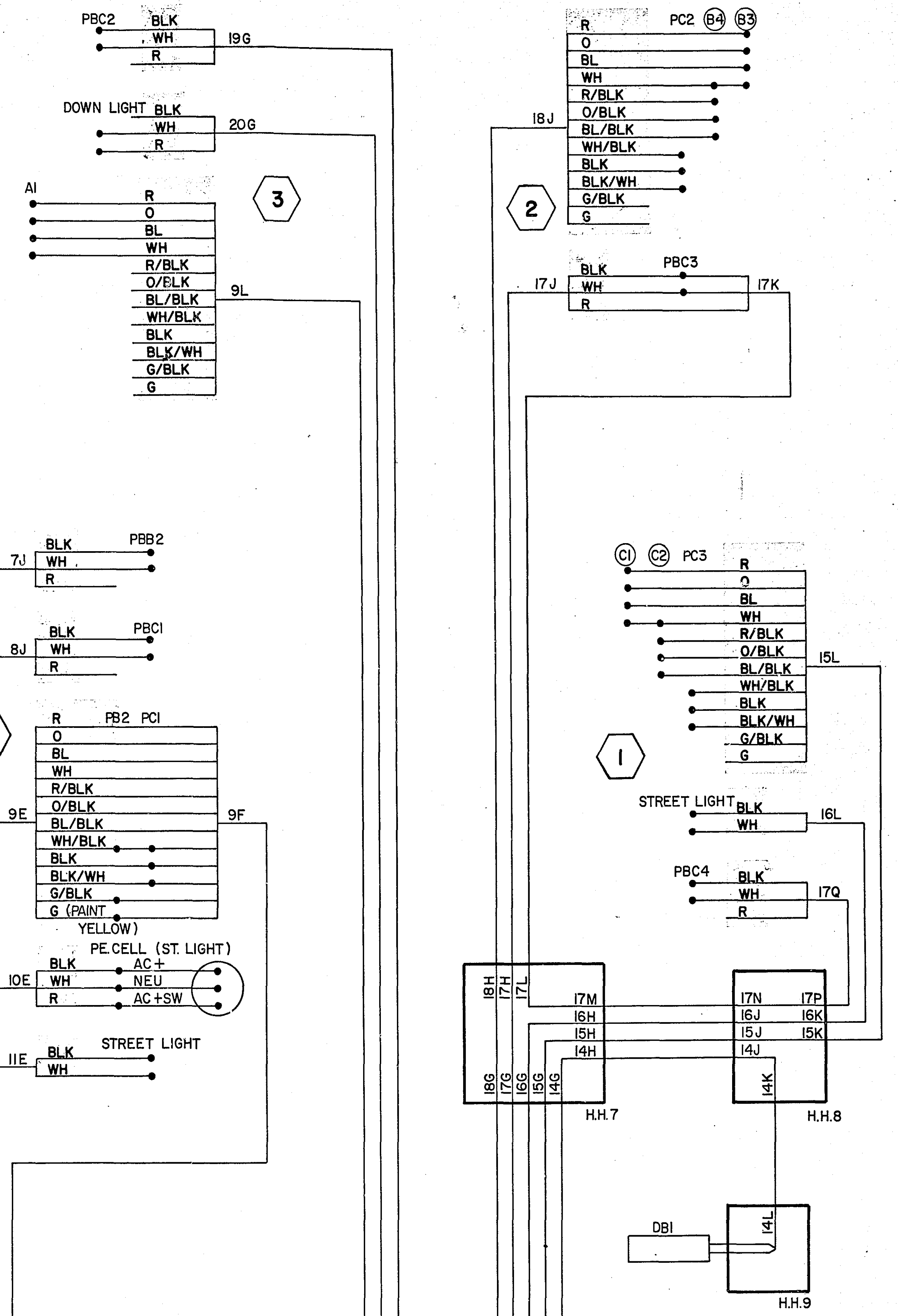
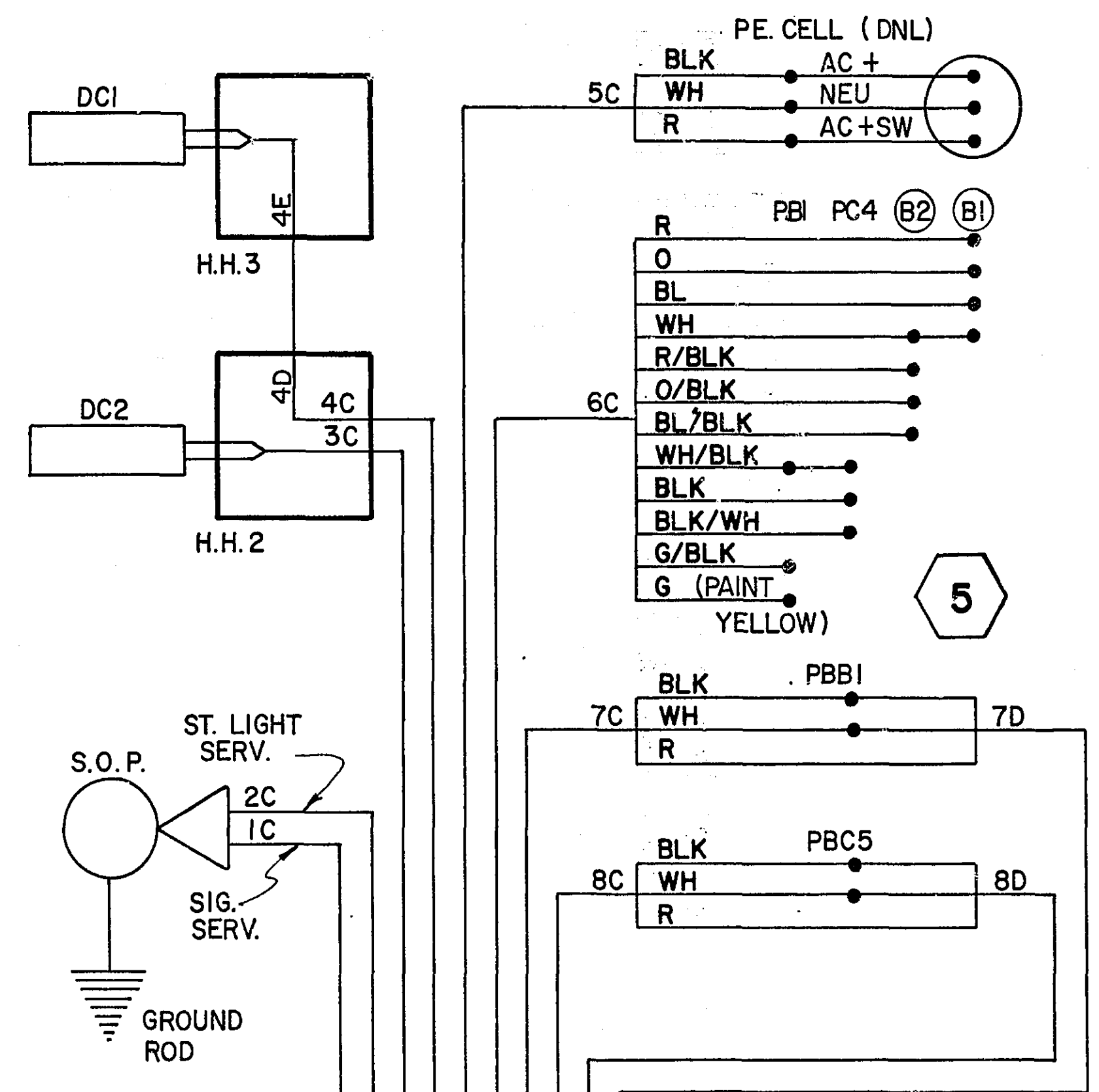
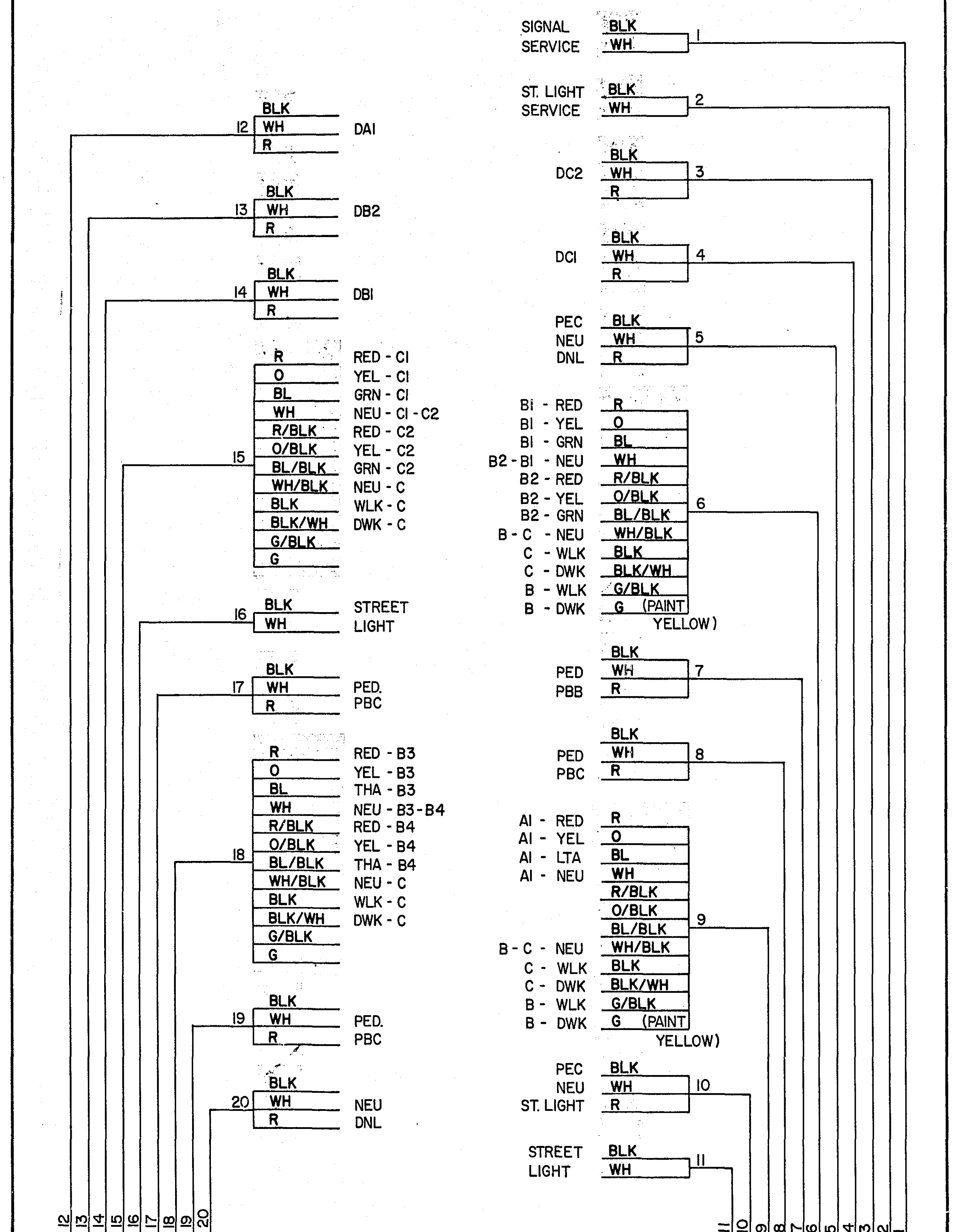
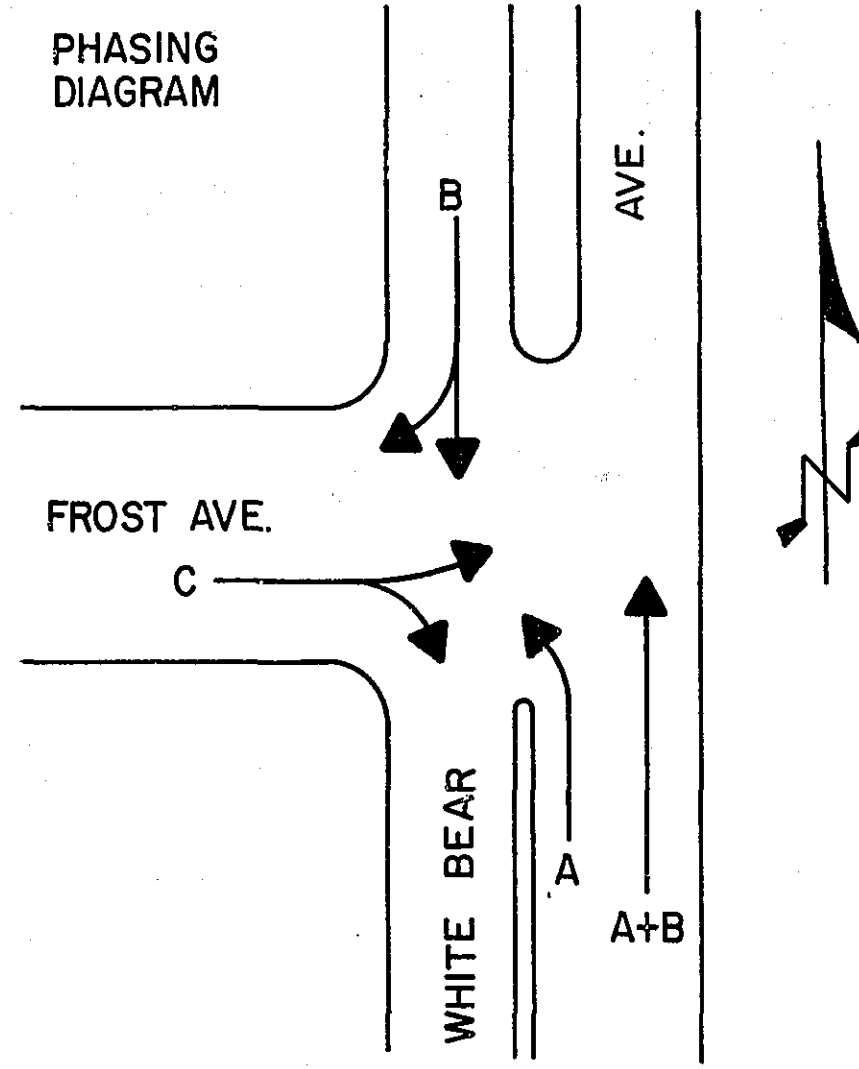


NOTE: LEFT TURN SIGN
TO BE PLACED BY
OTHERS.

PLAN

CONTROLLER CABINET

PHASING DIAGRAM



WIRING DIAGRAM