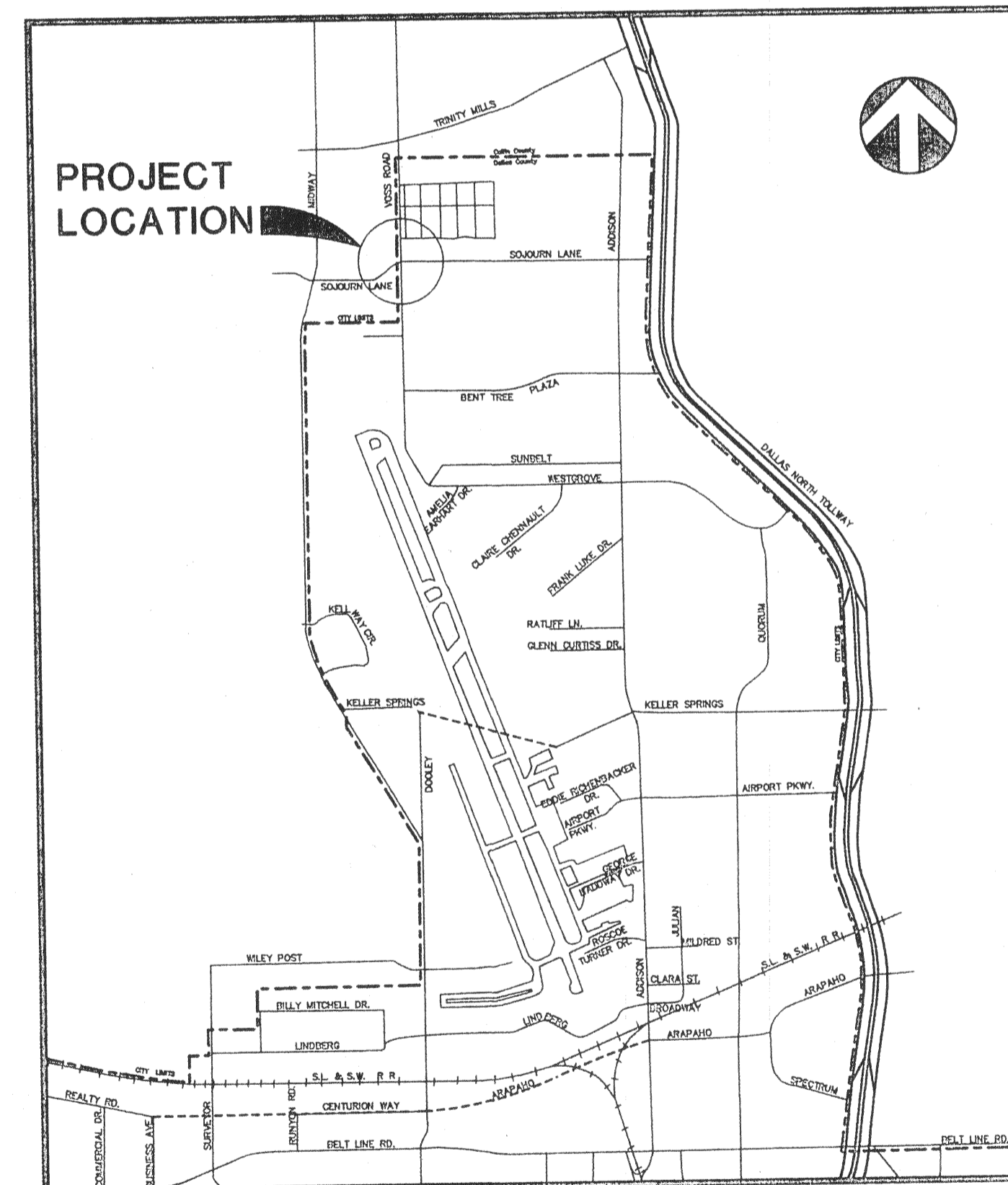
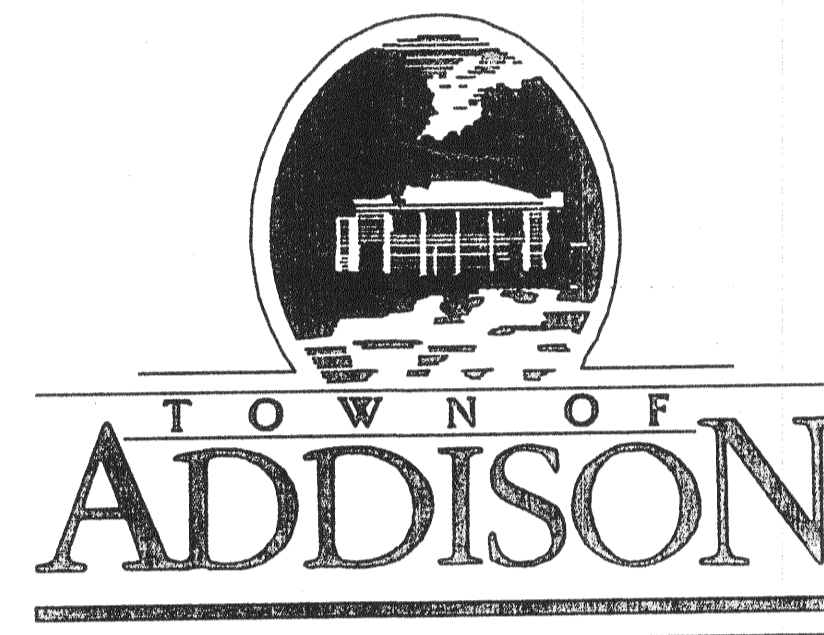


SIGNAL DESIGN PLANS FOR WESTGROVE DRIVE AND SOJOURN LANE



LOCATION MAP

INDEX OF DRAWINGS

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TRAFFIC SIGNAL PLAN DETAILS	3
TRAFFIC SIGNAL HEAD IDENTIFICATION	4
TRAFFIC SIGNAL POLE FOUNDATION	5
FOUNDATION SUMMARY	6
MAST ARM CONNECTIONS	7
SERVICE POLE & GROUNDING DETAILS	8
TRAFFIC CONTROL PLAN DETAILS	9

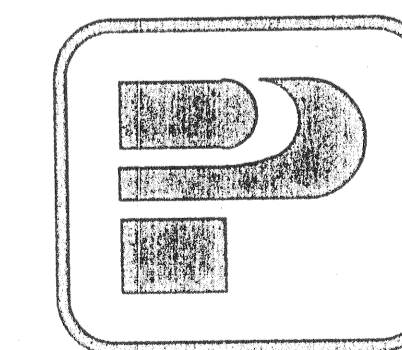
TOWN OF ADDISON ENGINEER

JOHN BAUMGARTNER, P.E.

CONSTRUCTION SET

ISSUED BY
TOWN OF ADDISON
PUBLIC WORKS DEPARTMENT

NAME: *John Baumgartner* DATE: *2/29/05*



**BARTON-ASCHMAN
ASSOCIATES, INC.**

5485 BELT LINE RD. #199 • DALLAS, TEXAS 75240 • (214) 991-1900

PARSONS TRANSPORTATION GROUP

4-4

Sojourn/Westgrove

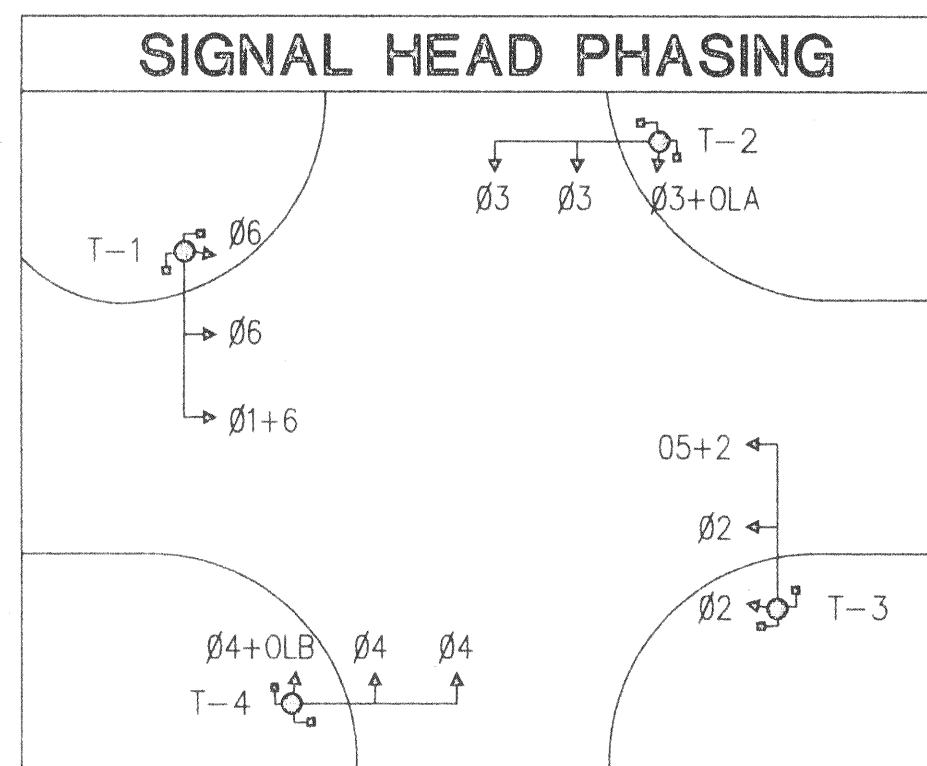
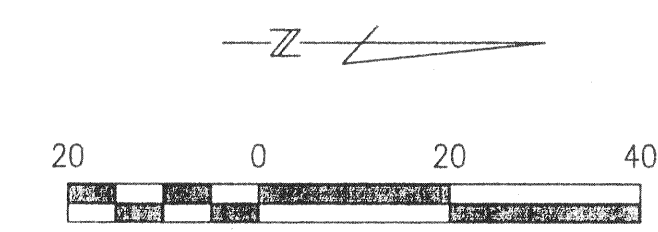
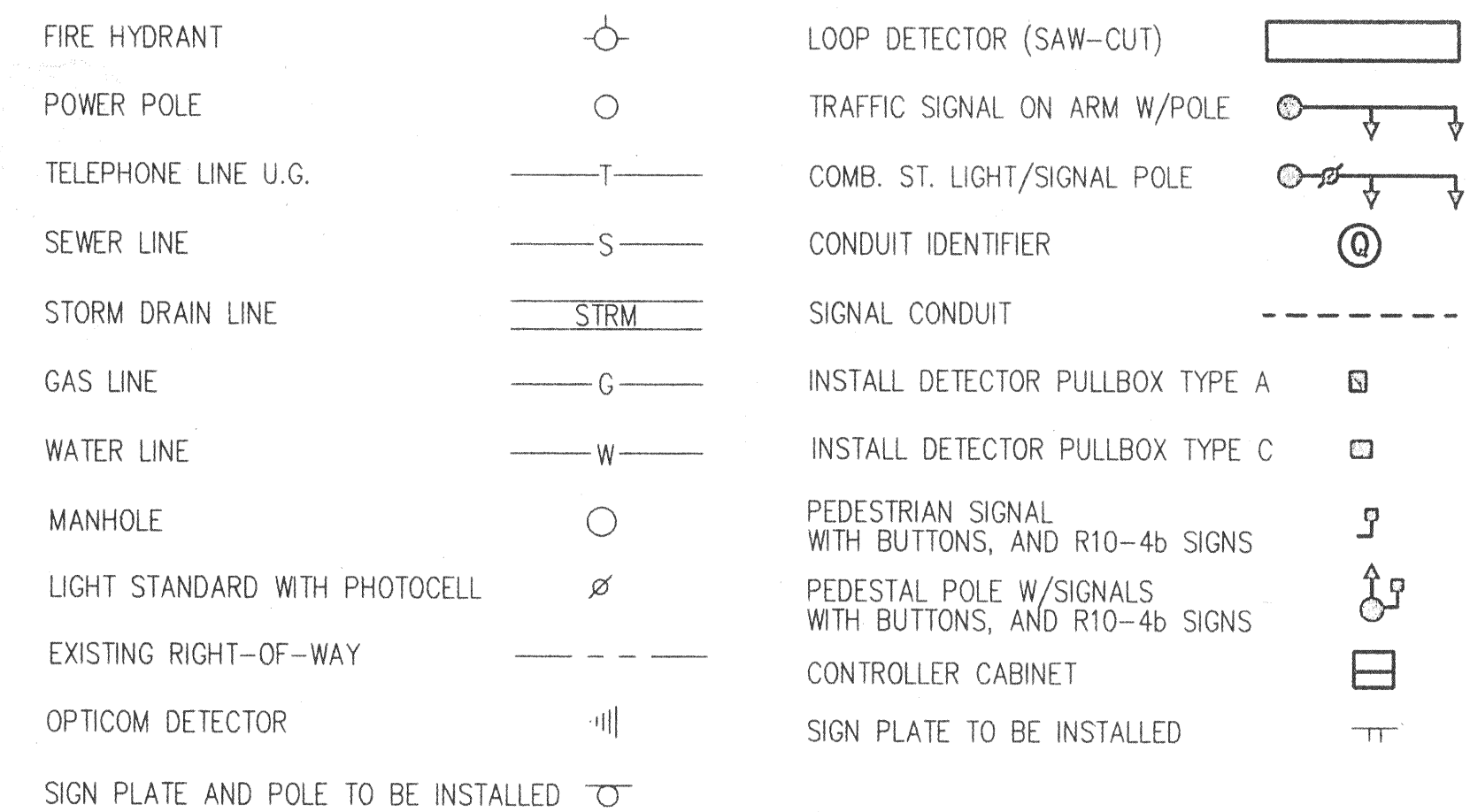
CABLE TERMINATION CHART

CABLE CONDUCTOR	T-1		T-2		T-3		T-4	
	S.H. NO.	INDICATION	S.H. NO.	INDICATION	S.H. NO.	INDICATION	S.H. NO.	INDICATION
BLACK	SPARE		SPARE		SPARE		SPARE	
WHITE	COMMON		COMMON		COMMON		COMMON	
RED	1-3	R	4-6	R	7-9	R	10-12	R
GREEN	1-3	Y	4-6	Y	7-9	Y	10-12	Y
ORANGE	1-3	G	4-6	G	7-9	G	10-12	G
BLUE/BLACK	1	←Y	SPARE		7	←Y	SPARE	
WHITE/BLACK	1	←G	4	←G	7	←G	10	←G
RED/BLACK	13	W	15	W	17	W	19	W
GREEN/BLACK	14	W	16	W	18	W	20	W
ORANGE/BLACK	13	DW	15	DW	17	DW	19	DW
BLUE/BLACK	14	DW	16	DW	18	DW	20	DW
BLACK/WHITE	PB13	Ø4	PB15	Ø6	PB17	Ø3	PB19	Ø2
RED/WHITE	PB14	Ø6	PB16	Ø3	PB18	Ø2	PB20	Ø4
GREEN/WHITE	P.B. COM.		P.B. COM.		P.B. COM.		P.B. COM.	
BLUE/WHITE	SPARE		6	Y→	SPARE		12	Y→
BLACK/RED	SPARE		6	G→	SPARE		12	G→

CONDUIT RUNS

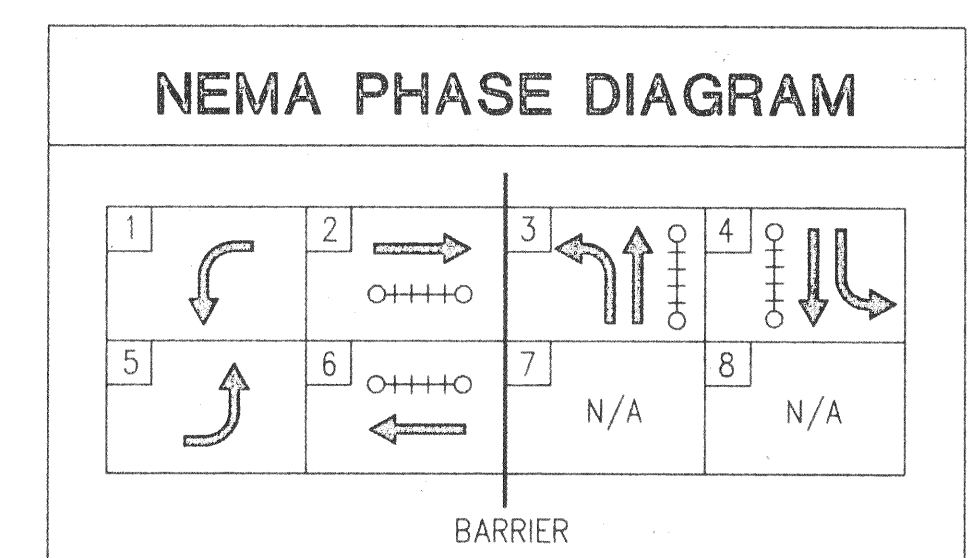
RUN NO.	SIZE/TYPE CONDUIT	CABLE TYPE					LENGTH OF RUN	FINAL
		#6 XHHW WIRE	#6 BARE WIRE	#18 AWG SHLD. PR.	3 CNDR. CABLE	16 CNDR. CABLE		
A	2-3" PVC (Trenched)	1	1	8	3	3	30	
B	2-3" PVC (Trenched)		1	5	2	2	10	
C	3" PVC (Trenched)		1		1	1	15	
D	2-3" PVC (Existing)		1	4	2	2	55	
E	3" PVC (Trenched)		1		1	1	10	
F	2-3" PVC (Existing)		1	3	1	1	85	
G	3" PVC (Trenched)		1		1	1	25	
H	2-3" PVC (Existing)		1				55	
I	3" PVC (Trenched)		1		1	1	10	
J	2" PVC (Trenched)	2	1				10	
K	2" PVC (Trenched)			1			150	
L	2" PVC (Trenched)			1			135	
M	2" PVC (Trenched)			1			150	
N	2" PVC (Trenched)			1			135	
O	2-3" PVC (Boring)		1	1	1	1	85	

LEGEND



PAVEMENT MARKINGS

TYPE	QUANTITY	UNIT
6" X 6" WHITE REFLECTIVE JIGGLE BARS	104	EA.
4" YELLOW BIDIRECTIONAL RETROREFLECTIVE RAISED BUTTONS	280	EA.
4" YELLOW RAISED BUTTONS	910	EA.
24" SOLID WHITE ALKYD THERMOPLASTIC	105	FT.
4" SOLID WHITE ALKYD THERMOPLASTIC	60	FT.
SOLID WHITE ALKYD THERMOPLASTIC LEFT ARROW	2	EA.
SOLID WHITE ALKYD THERMOPLASTIC RIGHT ARROW	2	EA.
SOLID WHITE ALKYD THERMOPLASTIC "ONLY"	4	EA.
SOLID WHITE ALKYD THERMOPLASTIC THROUGH/LEFT ARROW	2	EA.



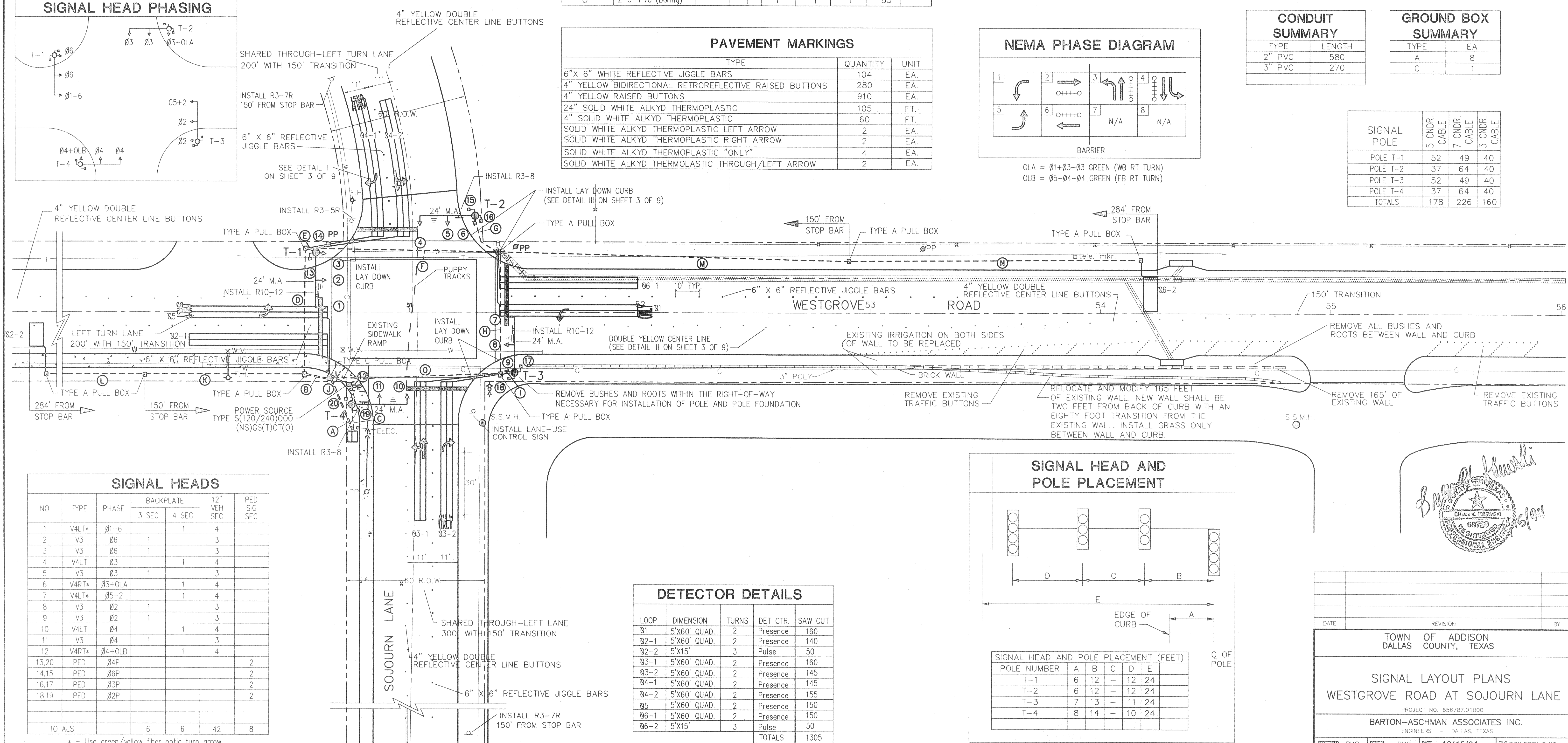
CONDUIT SUMMARY

TYPE	LENGTH
2" PVC	580
3" PVC	270

GROUND BOX SUMMARY

TYPE	EA
A	8
C	1

SIGNAL POLE	5 CNDR. CABLE	7 CNDR. CABLE	3 CNDR. CABLE
POLE T-1	52	49	40
POLE T-2	37	64	40
POLE T-3	52	49	40
POLE T-4	37	64	40
TOTALS	178	226	160



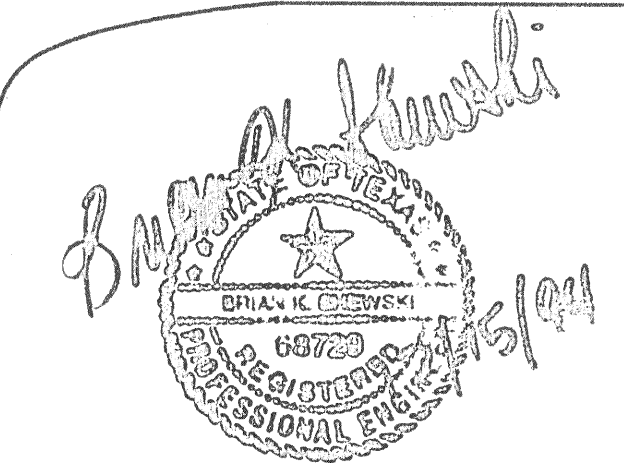
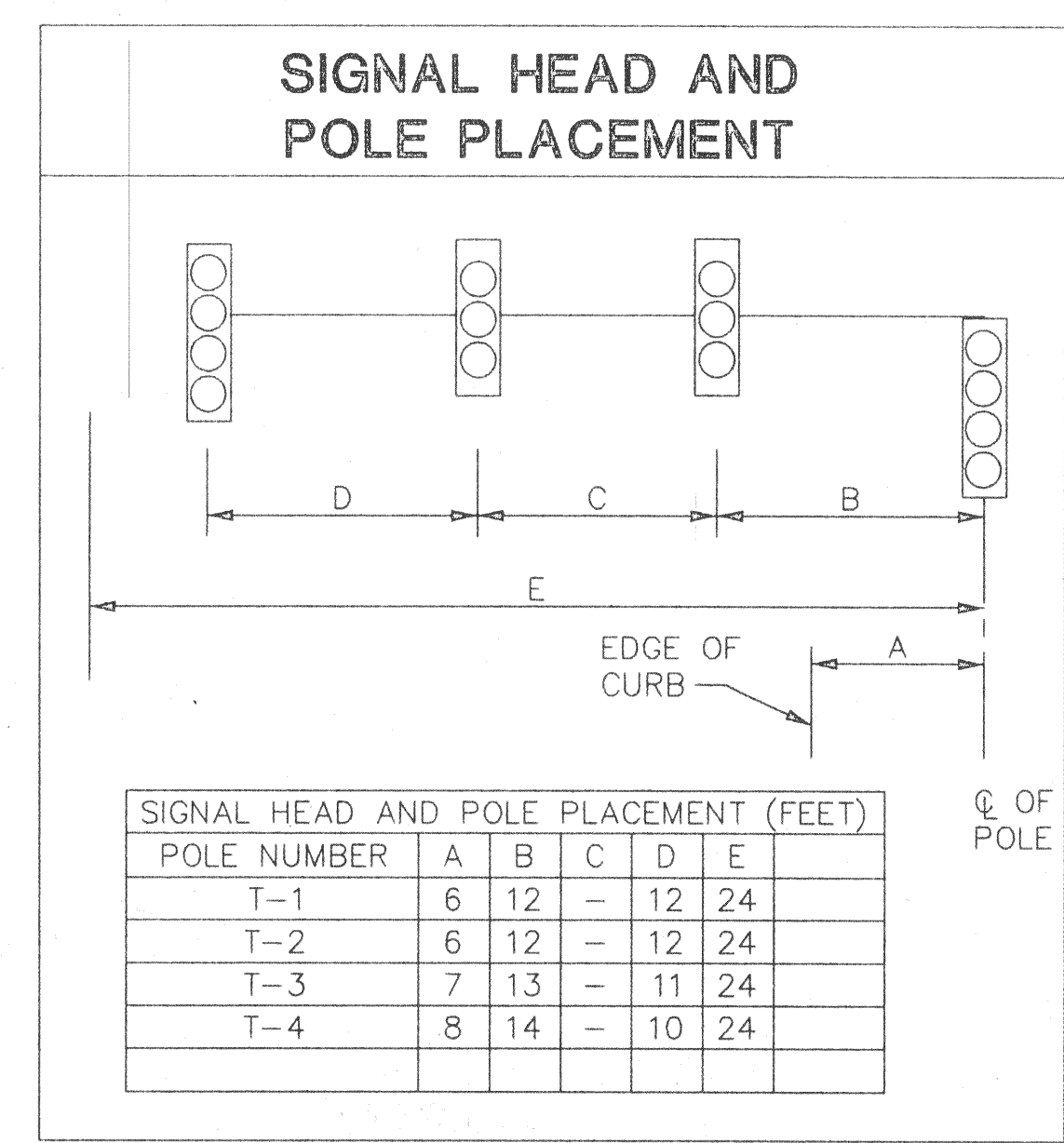
SIGNAL HEADS

NO	TYPE	PHASE	BACKPLATE		12" VEH SEC	PED SIG SEC
			3 SEC	4 SEC		
1	V4LT*	Ø1+6		1	4	
2	V3	Ø6	1		3	
3	V3	Ø6	1		3	
4	V4LT	Ø3		1	4	
5	V3	Ø3	1		3	
6	V4RT*	Ø3+OLA		1	4	
7	V4LT*	Ø5+2		1	4	
8	V3	Ø2	1		3	
9	V3	Ø2	1		3	
10	V4LT	Ø4		1	4	
11	V3	Ø4	1		3	
12	V4RT*	Ø4+OLB		1	4	
13,20	PED	Ø4P				2
14,15	PED	Ø6P				2
16,17	PED	Ø3P				2
18,19	PED	Ø2P				2
TOTALS			6	6	42	8

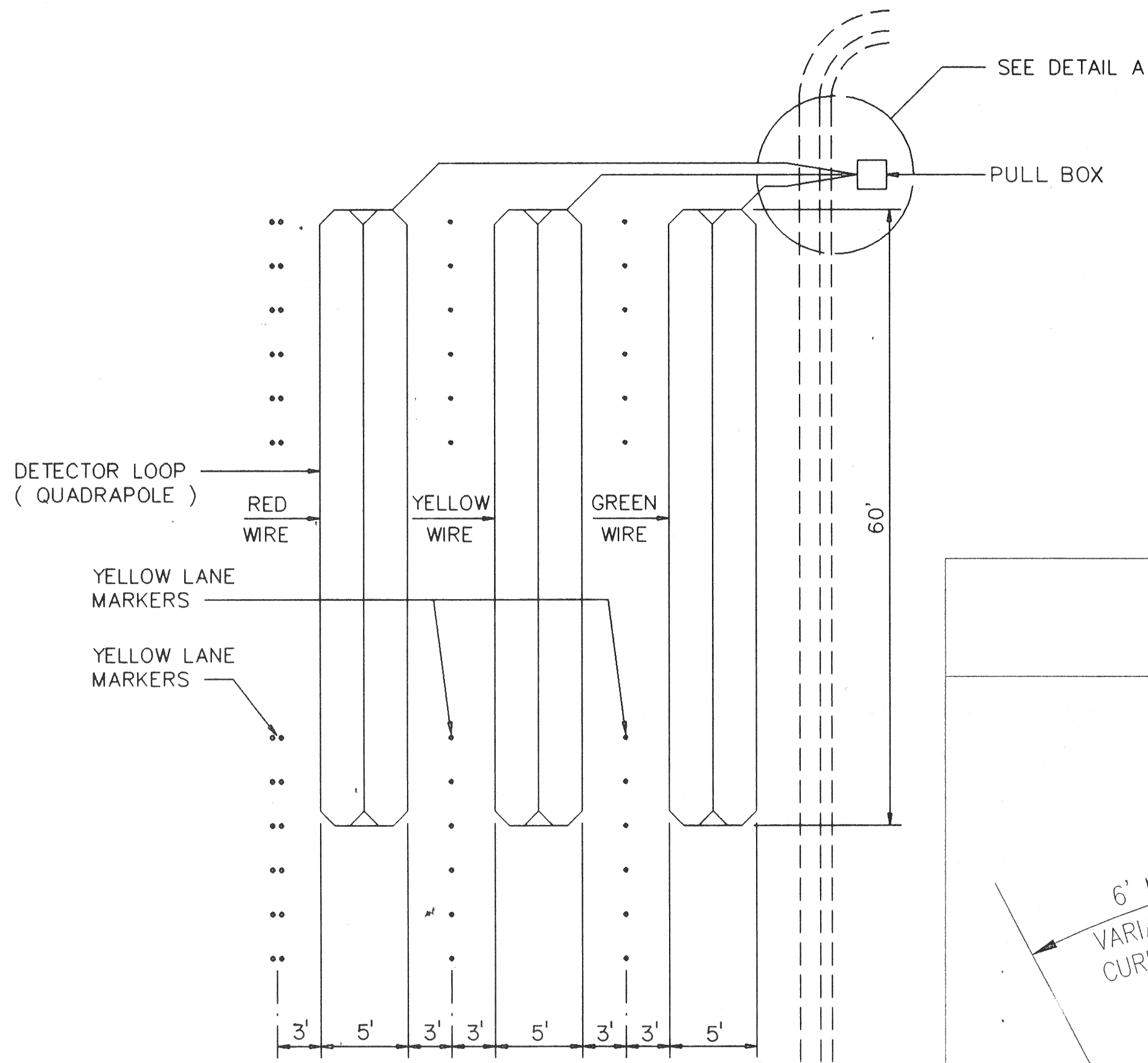
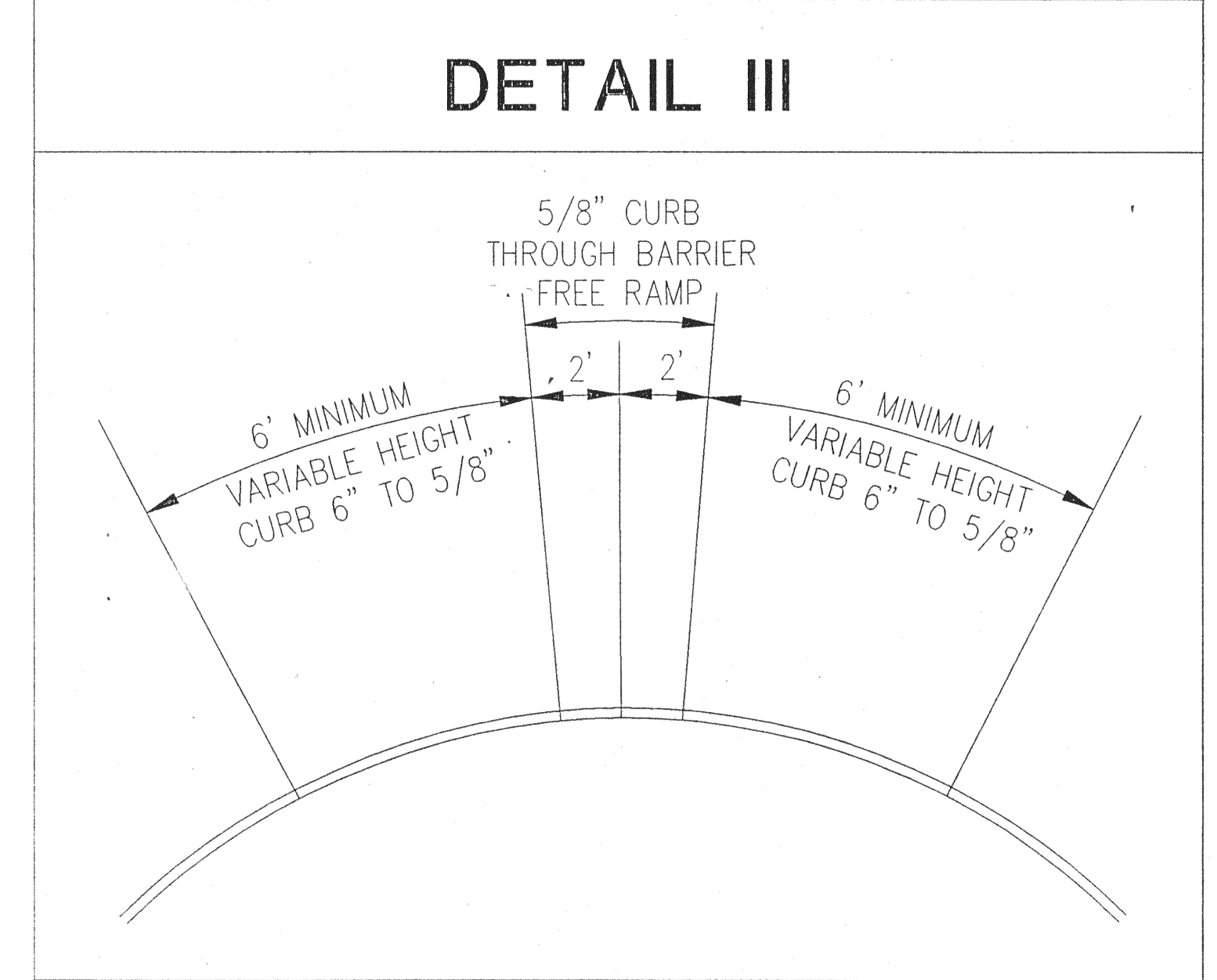
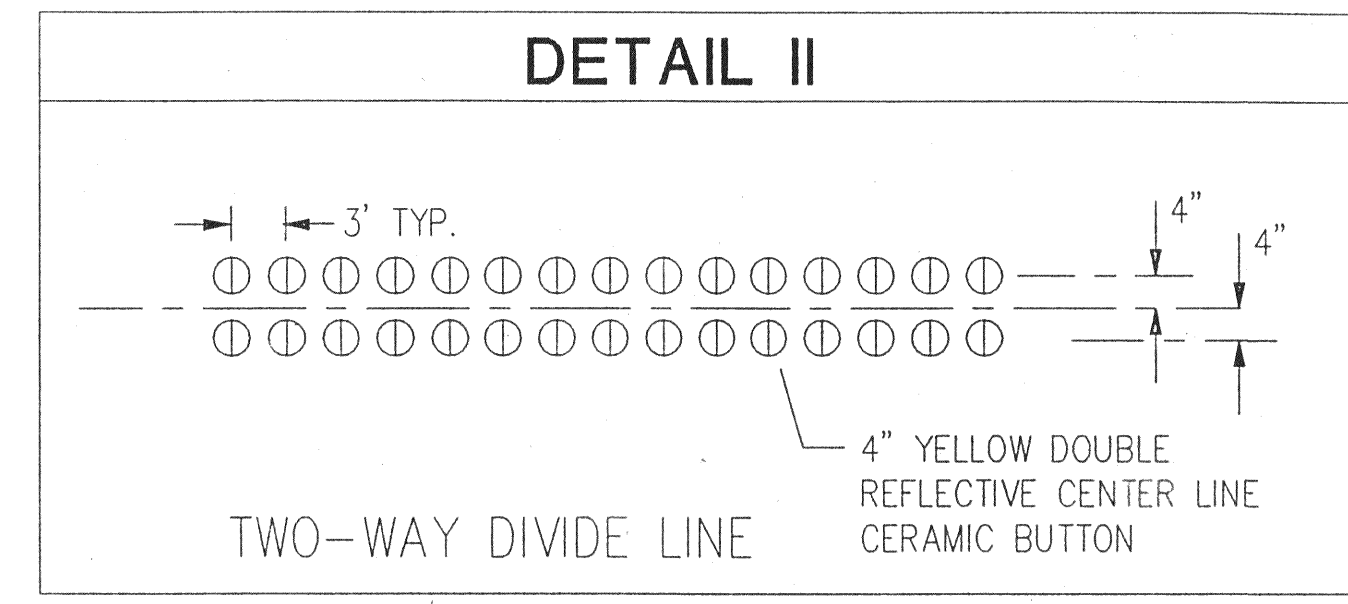
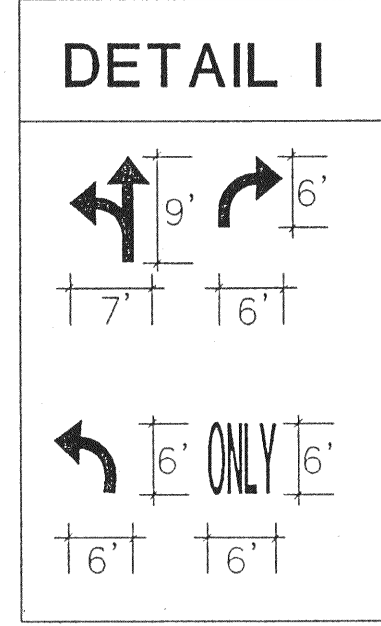
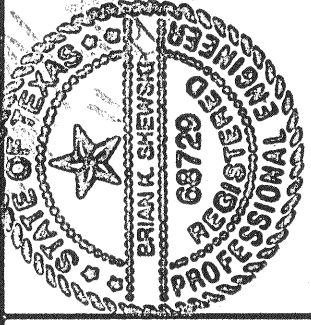
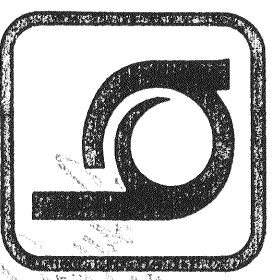
* - Use green/yellow fiber optic turn arrow.

DETECTOR DETAILS

LOOP	DIMENSION	TURNS	DET. CTR.	SAW CUT
Ø1	5'X60' QUAD.	2	Presence	160
Ø2-1	5'X60' QUAD.	2	Presence	140
Ø2-2	5'X15'	3	Pulse	50
Ø3-1	5'X60' QUAD.	2	Presence	160
Ø3-2	5'X60' QUAD.	2	Presence	145
Ø4-1	5'X60' QUAD.	2	Presence	145
Ø4-2	5'X60' QUAD.	2	Presence	155
Ø5	5'X60' QUAD.	2	Presence	150
Ø6-1	5'X60' QUAD.	2	Presence	150
Ø6-2	5'X15'	3	Pulse	50
TOTALS				1305

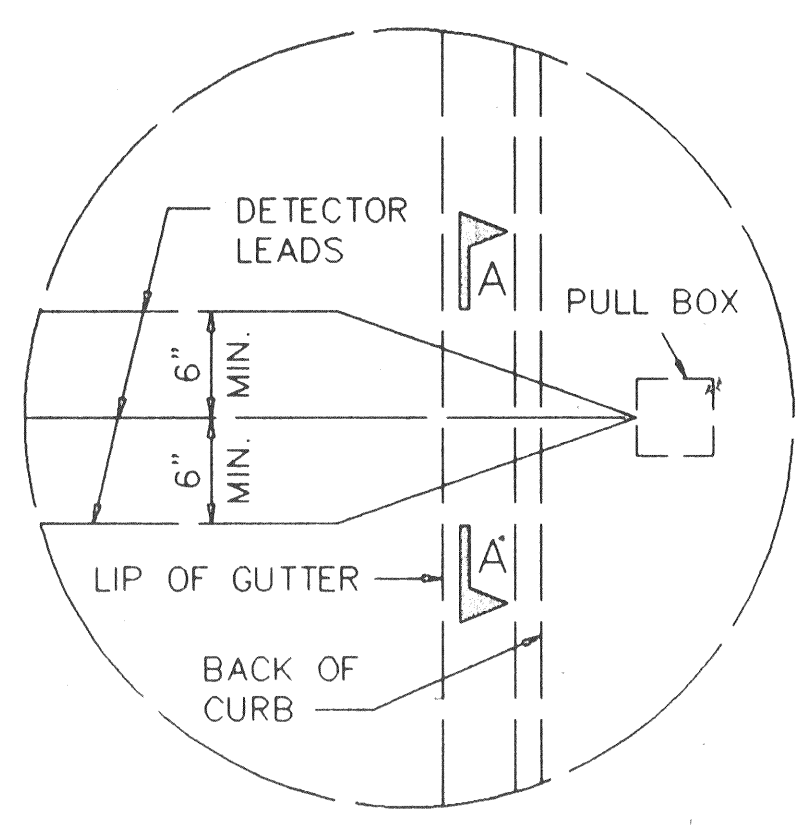


DATE	REVISION	BY
TOWN OF ADDISON DALLAS COUNTY, TEXAS		
SIGNAL LAYOUT PLANS WESTGROVE ROAD AT SOJOURN LANE		
PROJECT NO. 656787.01.000		
BARTON-ASCHMAN ASSOCIATES INC. ENGINEERS - DALLAS, TEXAS		
DESIGNED BKS	DRAWN BKS	DATE 12/15/94
APPROVED GDJ	CHECKED KDM	SCALE 1" = 20'
		FILE SOWESTA.DWG
		SHEET 2 OF 9

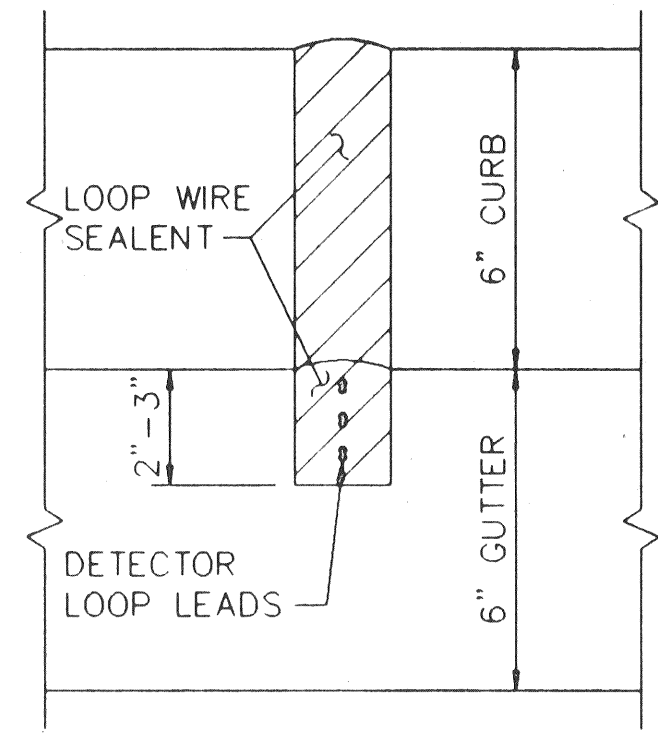


- NOTES:**
1. CONTRACTOR TO PROVIDE INDIVIDUAL SAWED CHANNELS THRU CURB & GUTTER FOR EACH WIRE LOOP.
 2. SPLICE IN PULL BOXES SHALL BE SOLDERED AND WEATHER SEALED.

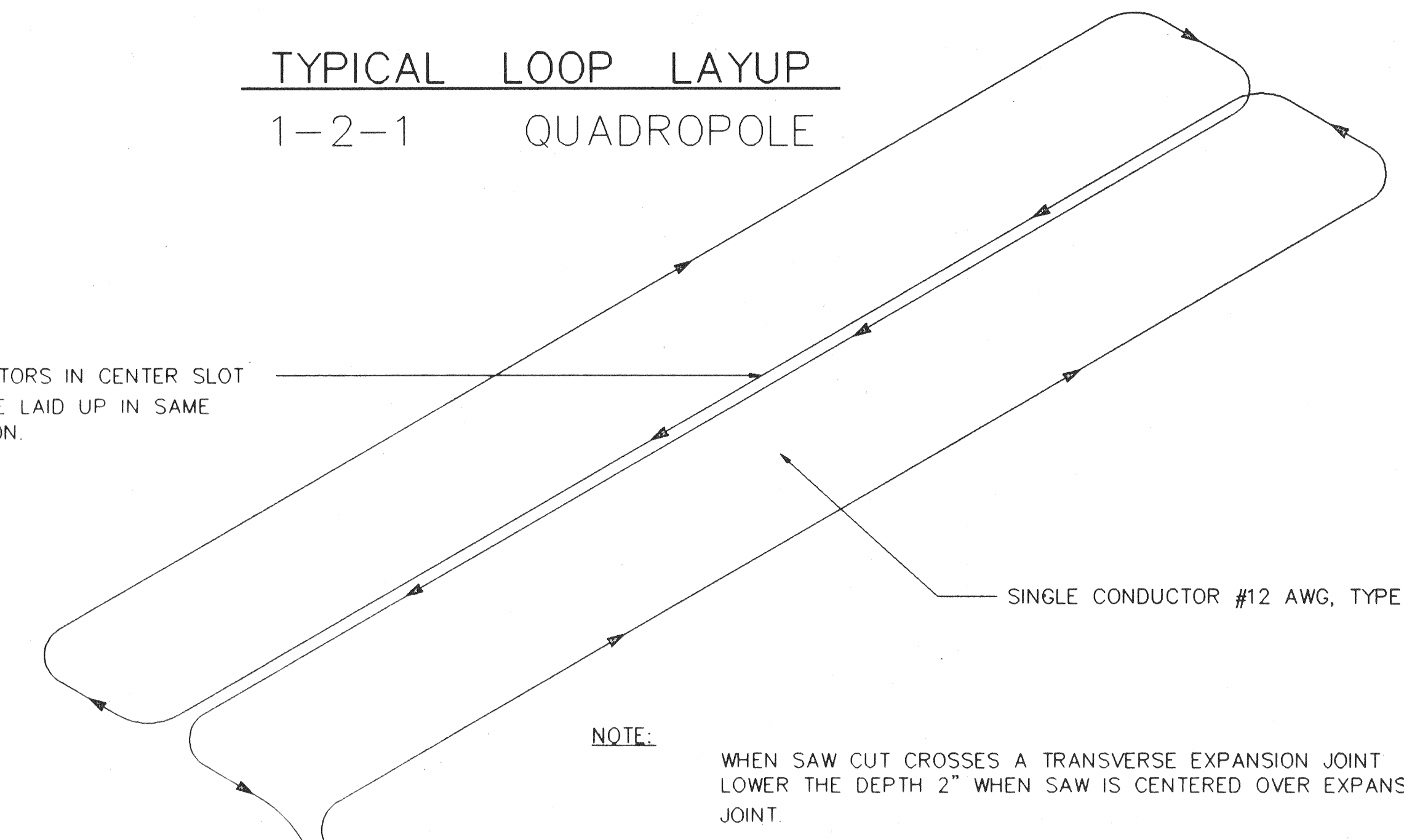
PLAN



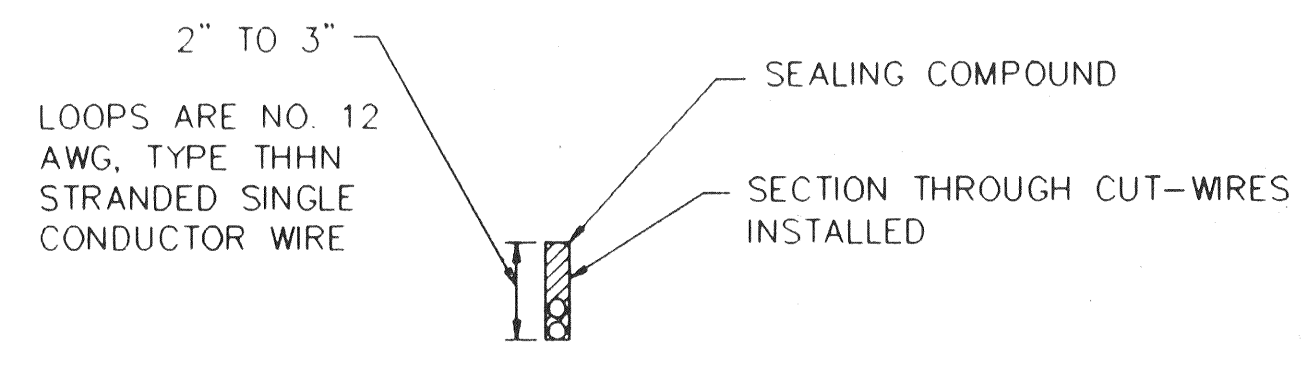
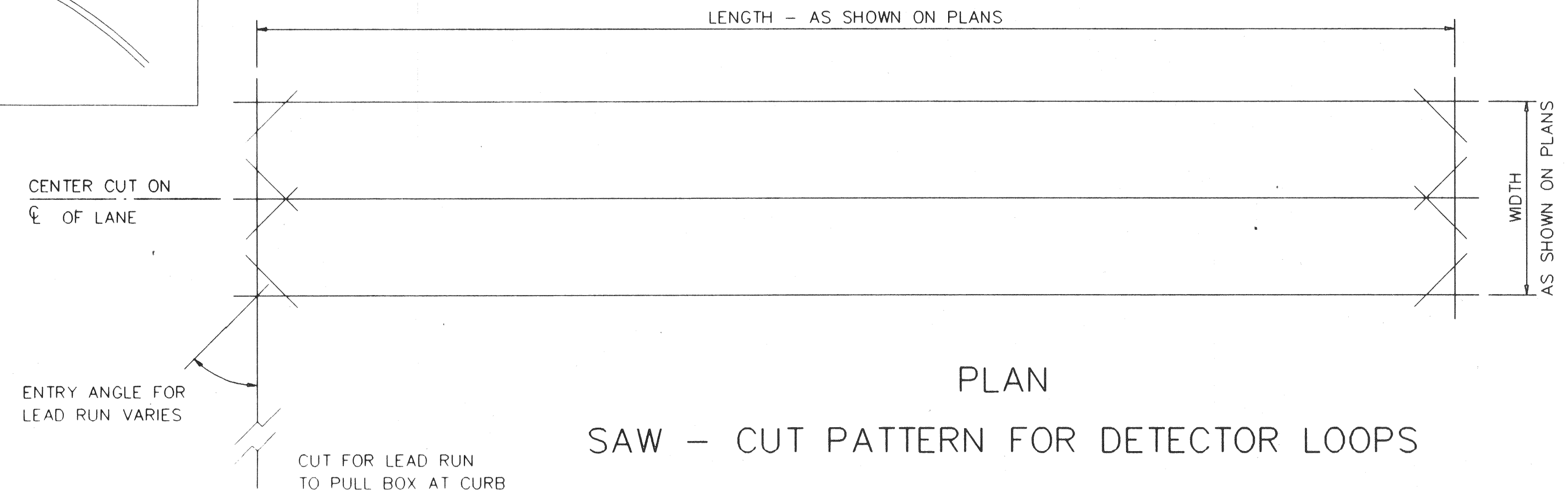
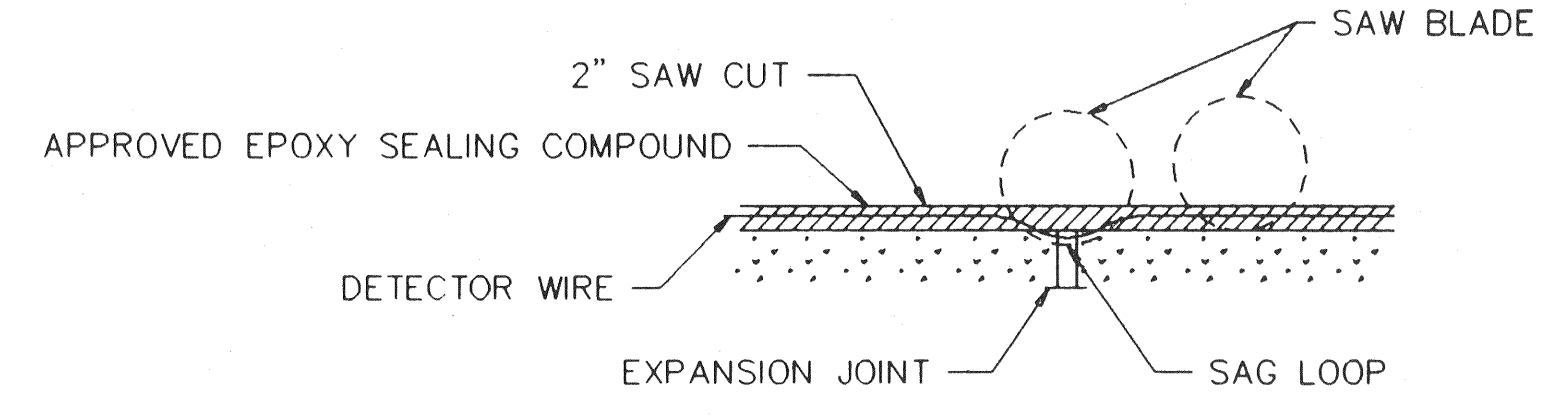
VEHICLE LOOP DETECTOR LAYOUT

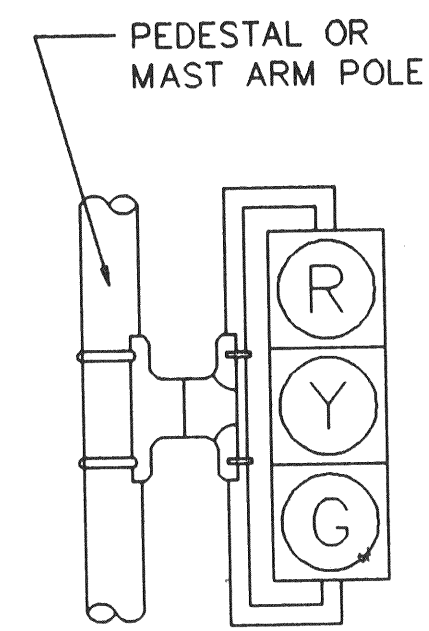


1. INSTALLATION OF WIRE LOOPS IS TO BE MADE IN THE SHORTEST TIME PRACTICAL, NOT TO EXCEED A 4 HR. MAX. AND SCHEDULED DURING OFF PEAK HOURS TO MINIMIZE DELAY TO VEHICLE TRAFFIC.
2. THE PAVEMENT CUT IS TO BE CUT WITH A CONCRETE SAW TO NEAT LINES AND LOOSE MATERIAL REMOVED. THE CUT SHOULD BE CLEAN AND DRY WHEN THE SEALING COMPOUND IS PLACED.
3. THE LEAD-IN WIRES ARE TO BE TWISTED A MINIMUM OF TWO TURNS PER FOOT AND REMAIN UNDISTURBED AFTER THE LOOP HAS BEEN TUNED.
4. EACH LOOP IS TO BE RETURNED TO CONTROLLER VIA ONE PAIR OF UNSPLICED SHIELDED LEAD-IN WIRES. MULTIPLE, TWISTED LEADS TO MORE THAN ONE LOOP IN SINGLE LEAD RUN SAW SLOT ARE NOT PERMISSIBLE.
5. ALL LOOPS TO PENETRATE CURB IN A SEPERATE CONDUIT

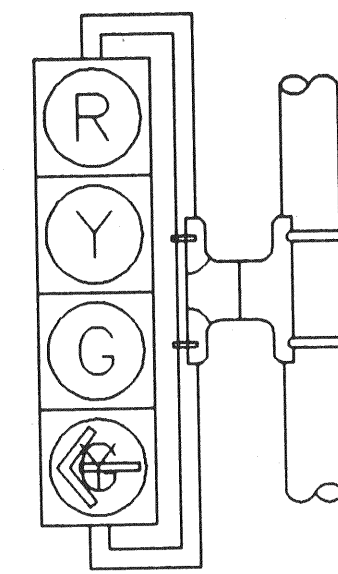


WIRES TWISTED IN LEAD RUN CUT AT LEAST, 2 TURNS PER FOOT

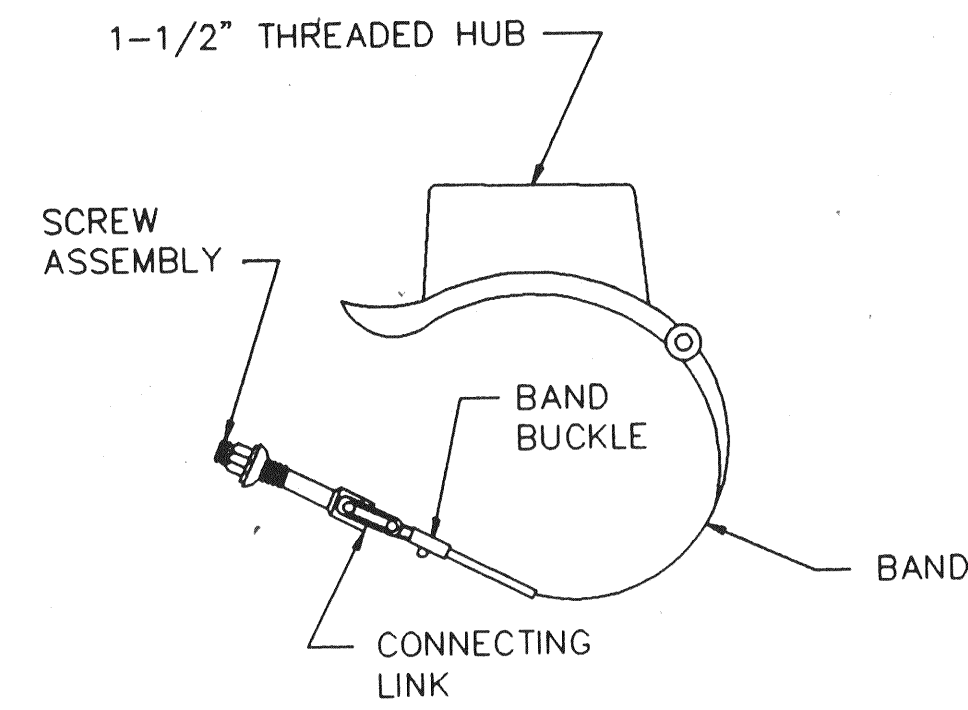




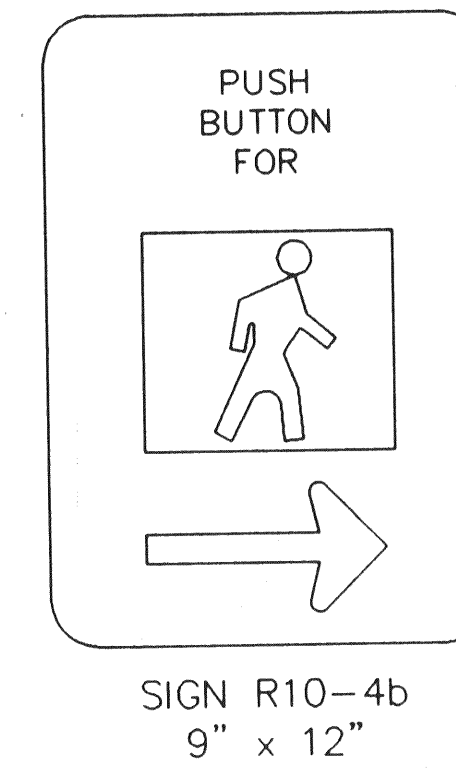
V3



V4LT (RT)



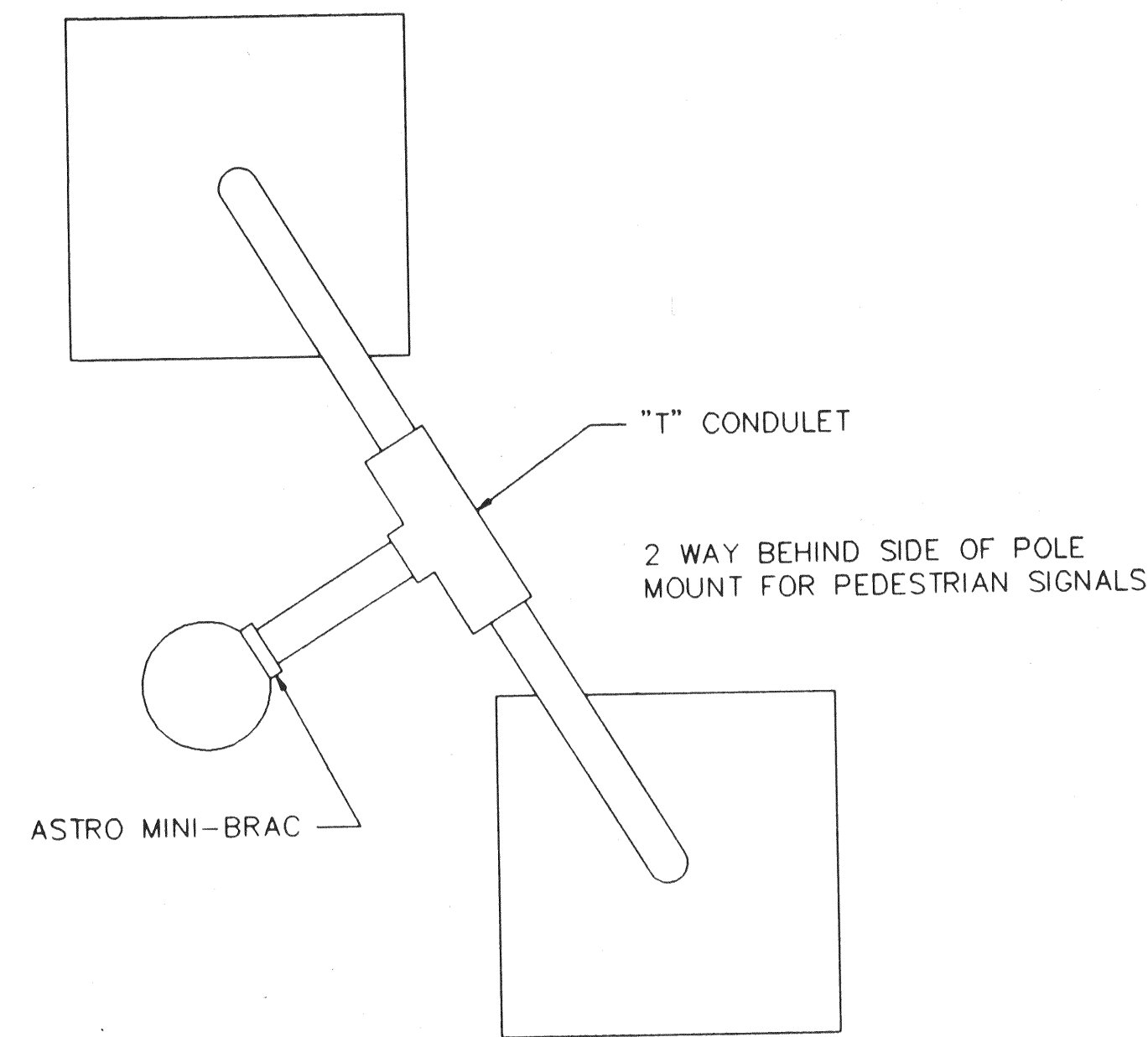
ASTRO MINI-BRAC



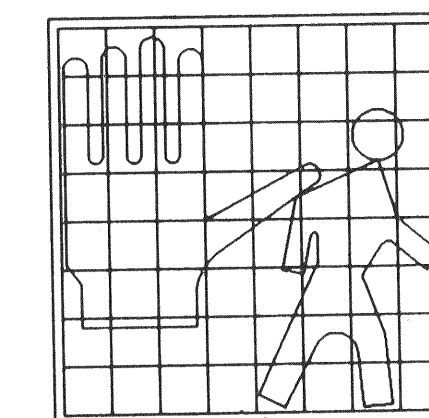
SIGN R10-4b
9" x 12"
PEDESTRIAN PUSH BUTTON
SIGN DETAILS

NOTES :

1. ALL SIGNAL HEAD LENSES SHALL BE 12" IN DIAMETER.
2. VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL BE MOUNTED WITH "ASTRO-BRACS" AND APPROPRIATE TUBING, PAINTED BLACK. ALL SIGNALS TO BE BLACK, ALL LENSES TO BE GLASS.
3. ALL VISORS SHALL BE TUNNEL VISORS.
4. ALL POLE MOUNTED VEHICLE AND PEDESTRIAN SIGNAL HEADS SHALL BE INSTALLED ON THE AWAY-FROM-TRAFFIC SIDE OF THE PEDESTAL OR MAST ARM POLE.
5. ALL SIGNAL HEADS WILL BE PROVIDED WITH BLACK 5" POLYCARBONATE VACUUM FORMED BACKPLATES.
6. ALL WIRING FOR VEHICLE AND PEDESTRIAN SIGNALS SHALL BE TOTALLY ENCLOSED WITHIN THE SIGNAL MOUNTING HARDWARE.
7. ALL DAMPING DEVICES SHALL BE 18" TO 2' WIDE BY 4' IN LENGTH.
8. ALL PEDESTRIAN SIGNAL HEADS AND PUSH BUTTON SIGNS SHALL DISPLAY THE SYMBOLIZED MESSAGES SHOWN ON THIS SHEET.
9. SYMBOLIZED MESSAGE HEIGHT SHALL BE 10 INCHES MINIMUM.
10. PROVIDE DURO TEST 135 WATT SAVER LAMPS IN VEHICLE SIGNALS.
11. PROVIDE DURO TEST 60 WATT SAVER LAMPS IN PEDESTRIAN SIGNALS.

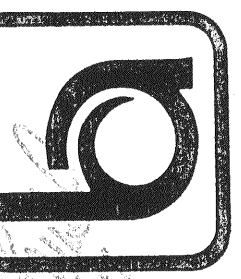


UPPER & LOWER ARMS
IDENTICAL
PEDESTRIAN SIGNAL HEAD MOUNTING
FOR TWO PEDESTRIAN SIGNAL HEADS

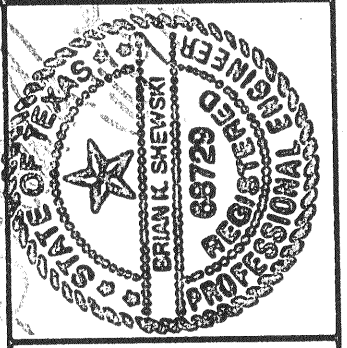


PEDESTRIAN SIGNAL HEAD IDENTIFICATION

No.	Date	Revisions	App.

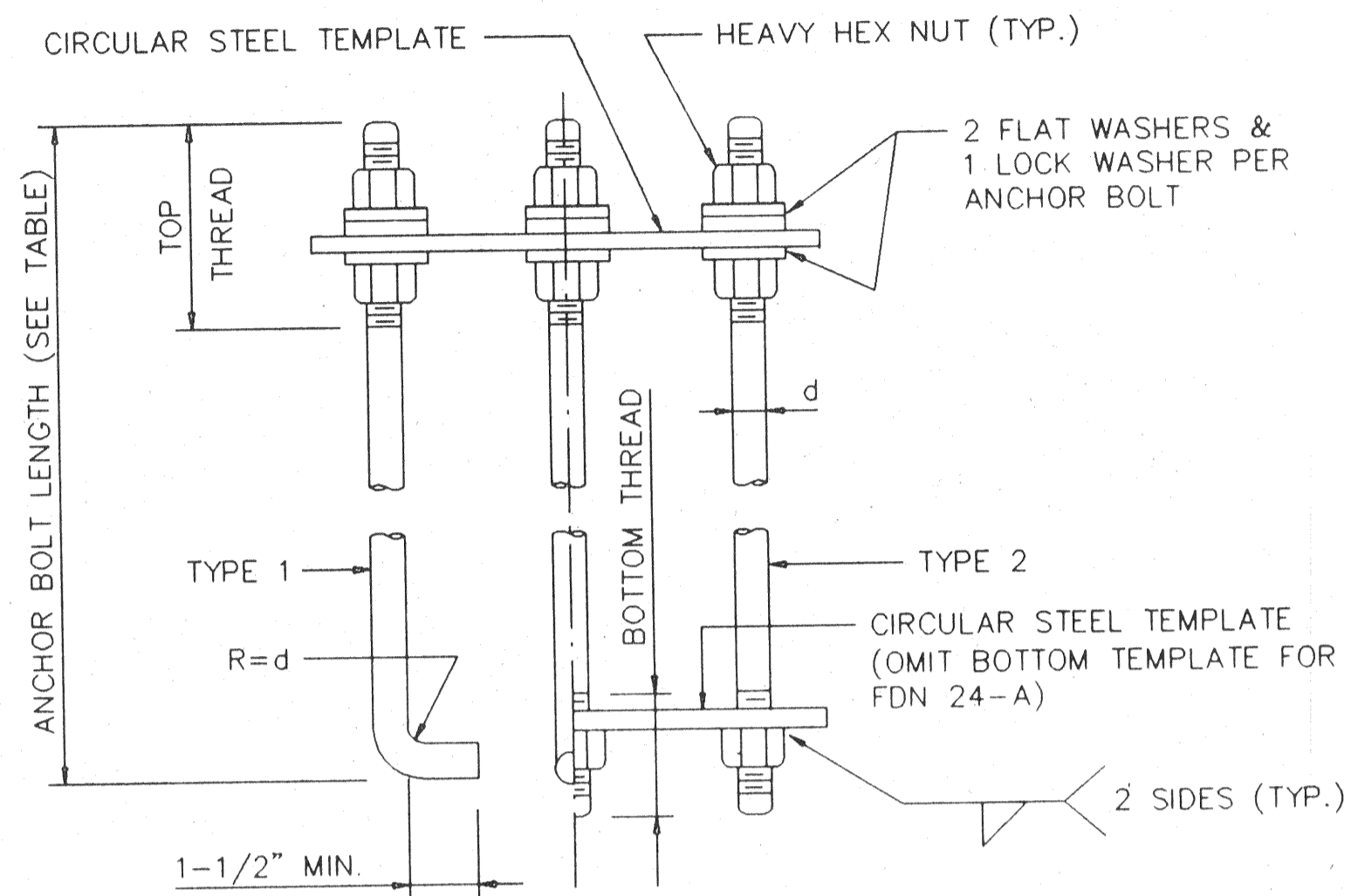
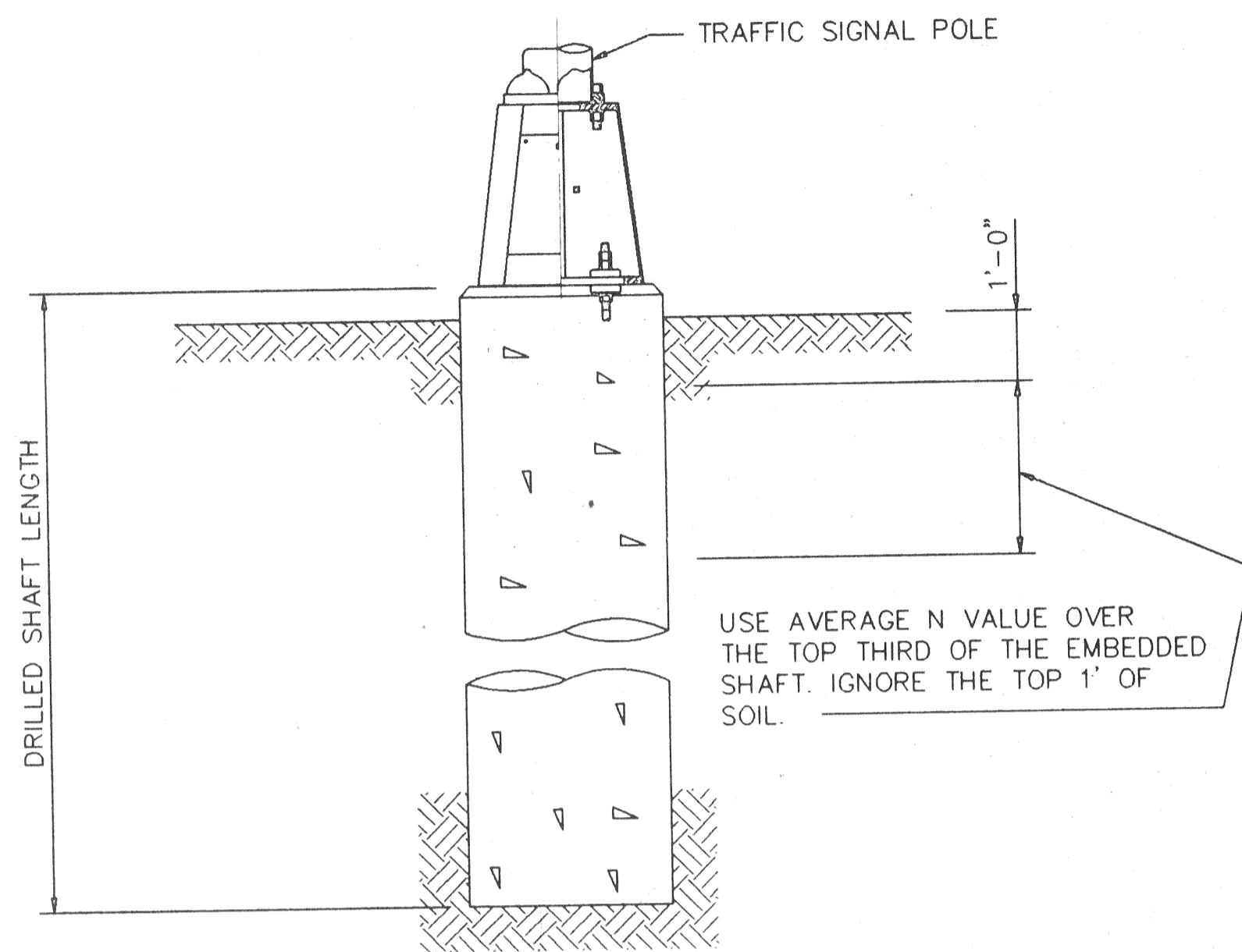


Barton-Aschman
Associates, Inc.



TRAFFIC SIGNAL HEAD IDENTIFICATION

Scale: H=	Date: 11/29/04
Designed by:	
Drawn by:	
Checked by: BKS	
Approved by: BKS	
Project No. - 663787-01000	



HOOKED ANCHOR (TYPE 1) NUT ANCHOR (TYPE 2)

ANCHOR BOLT ASSEMBLY

INSTALLATION PROCEDURE :

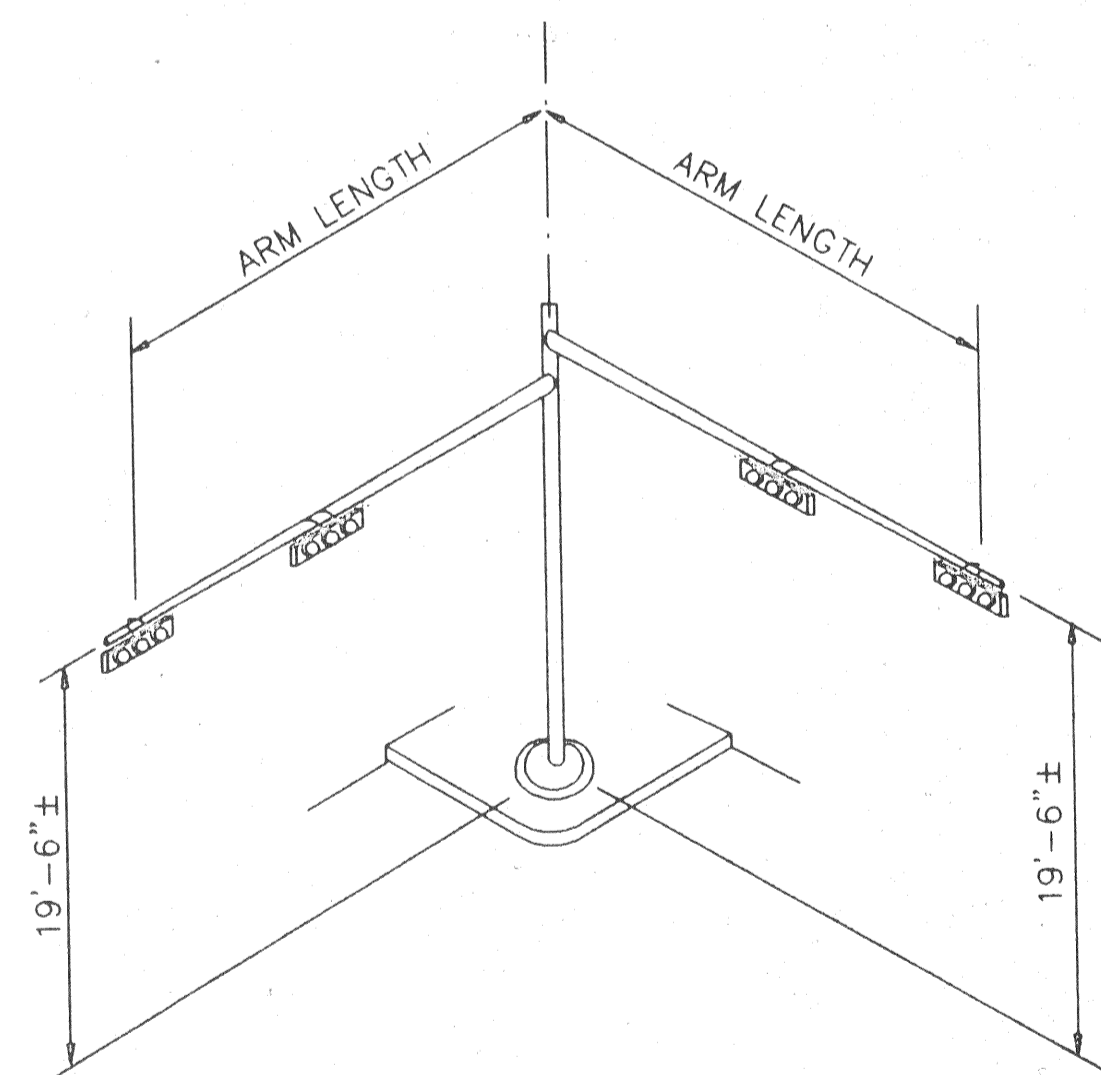
THREADS OF ANCHOR BOLTS SHALL BE COATED WITH PIPE JOINT COMPOUND PRIOR TO INSTALLATION OF UPPER NUTS WHEN ERECTING POLE AFTER POLE IS PLUMBED AND IN PERMANENT ALIGNMENT, THE EXPOSED THREADS OF PAINTED BOLTS SHALL BE CLEANED AND AN ADDITIONAL COATING OF ZINC-RICH PAINT APPLIED TO SEAL THE BOLT THREAD-NUT JOINT.

NOTES :

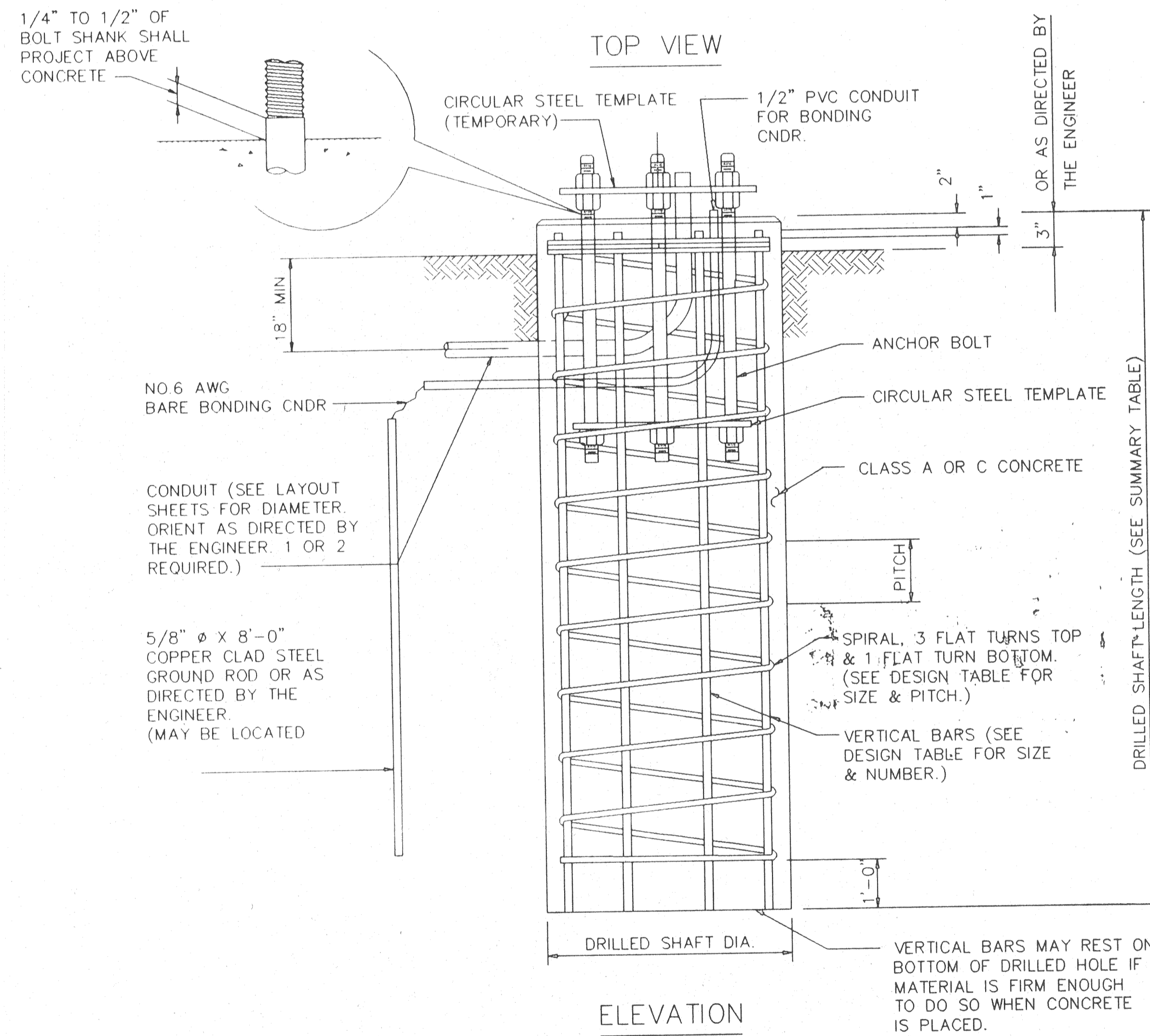
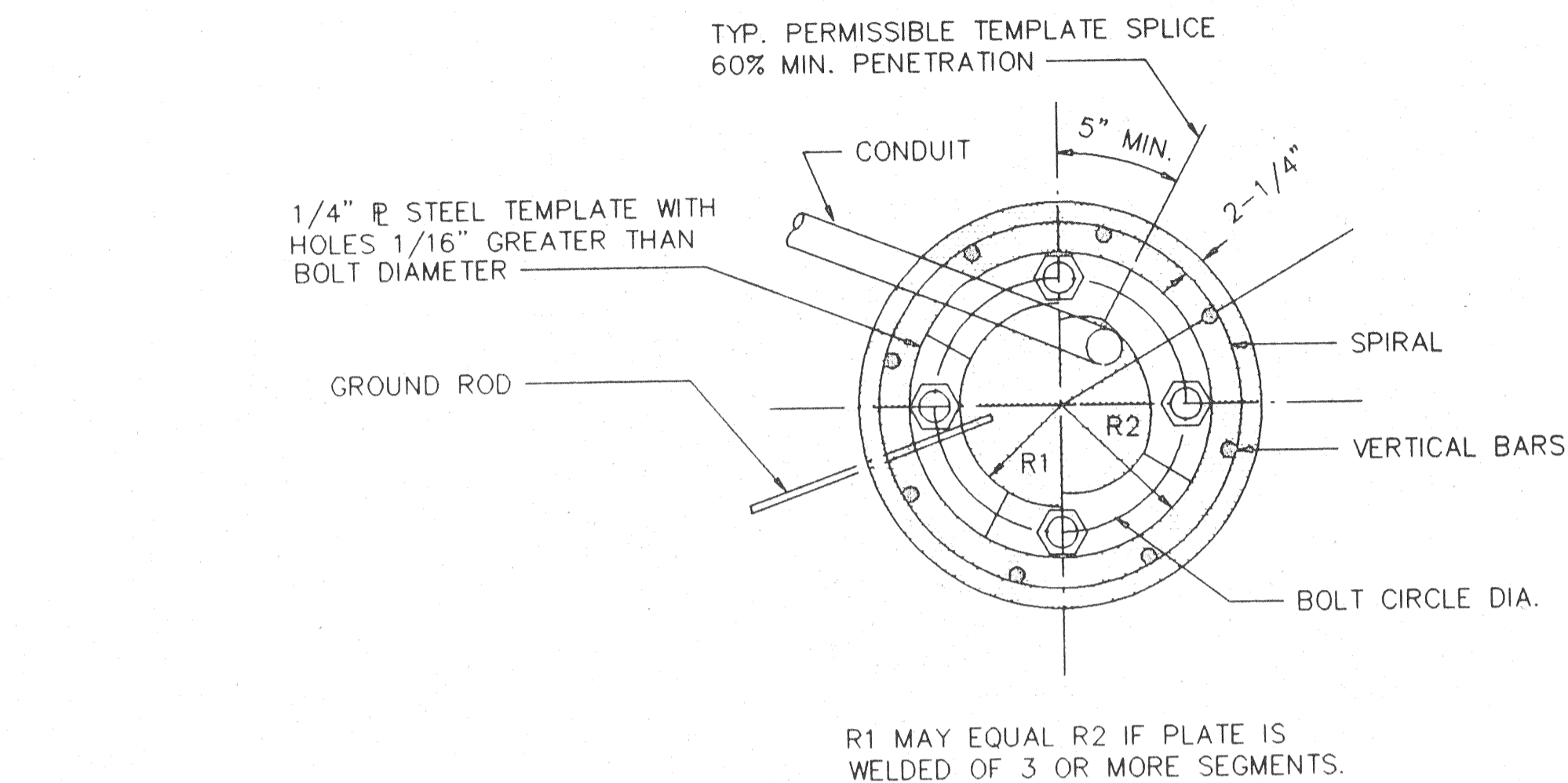
- (1) ANCHOR BOLT DESIGN DEVELOPS THE FOUNDATION CAPACITY GIVEN UNDER FOUNDATION DESIGN LOADS.
- (2) FOUNDATION DESIGN LOADS ARE THE ALLOWABLE MOMENTS AND SHEARS AT THE BASE OF THE STRUCTURE.
- (3) FOUNDATIONS MAY BE LISTED SEPARATELY OR GROUPED ACCORDING TO SIMILARITY OF LOCATION AND TYPE. QUANTITIES ARE FOR THE CONTRACTOR'S INFORMATION ONLY.
- (4) FIELD PENETROMETER READINGS AT A DEPTH OF APPROXIMATELY 3 TO 5 FEET MAY BE USED TO ADJUST SHAFT LENGTHS.
- (5) IF ROCK IS ENCOUNTERED, THE DRILLED SHAFT SHALL EXTEND A MINIMUM OF TWO DIAMETERS INTO SOLID ROCK.
- (6) DECIMAL LENGTHS IN DESIGN TABLE ARE TO ALLOW INTERPOLATION FOR OTHER PENETROMETER VALUES. ROUND TO NEAREST FOOT FOR ENTRY INTO SUMMARY TABLE.

ANCHOR BOLT & TEMPLATE SIZES						
BOLT DIAMETER	*BOLT LENGTH	TOP THREAD	BOTTOM THREAD	BOLT CIRCLE	R2	R1
3/4"	1'-6"	3"	-	12-3/4"	7-1/8"	5-5/8"
1-1/2"	3'-4"	6"	2"	17"	10"	7"
1-3/4"	3'-10"	7"	2-1/4"	19"	11-1/8"	7-3/4"
2"	4'-3"	8"	2-1/2"	21"	12-1/2"	8-1/2"

* MINIMUM DIMENSIONS GIVEN, LONGER BOLTS ARE ACCEPTABLE.



TYPICAL MAST ARM ASSEMBLY



ELEVATION FOUNDATION DETAILS

App.	
Revisions	
No.	Date

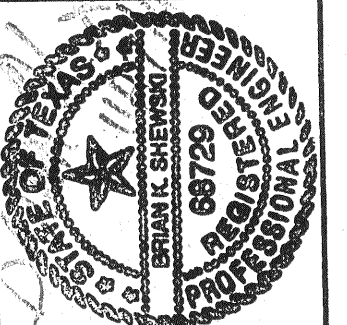
Barton-Aschman Associates, Inc.

TRAFFIC SIGNAL POLE FOUNDATIONS

Date: 11/29/84
Scale: H-V
Designed by:
Drawn by:
Checked by: BKS
Approved by: BKS
Project No. 653787-01000

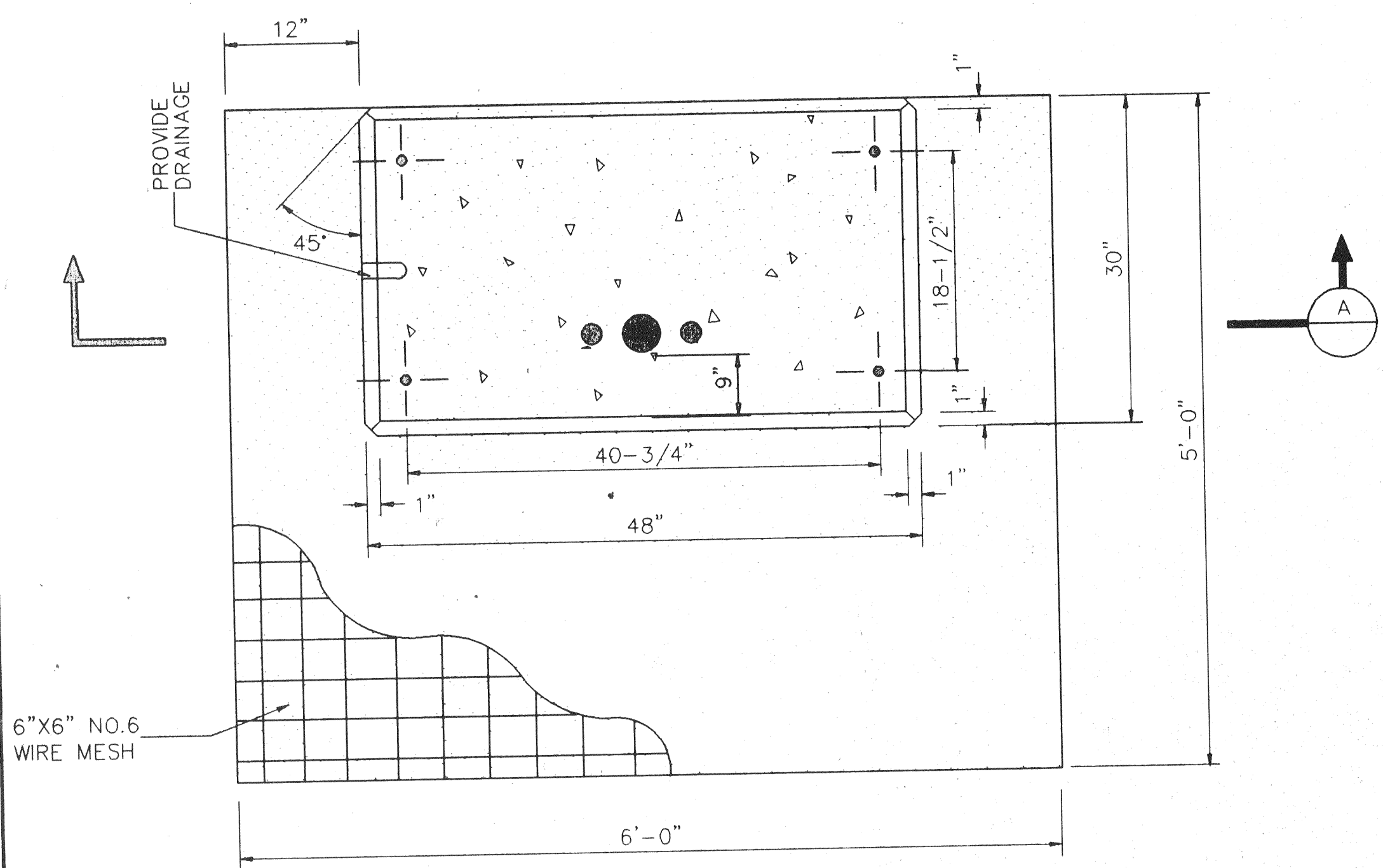
SHEET 5

OF 9



FOUNDATION DESIGN TABLE

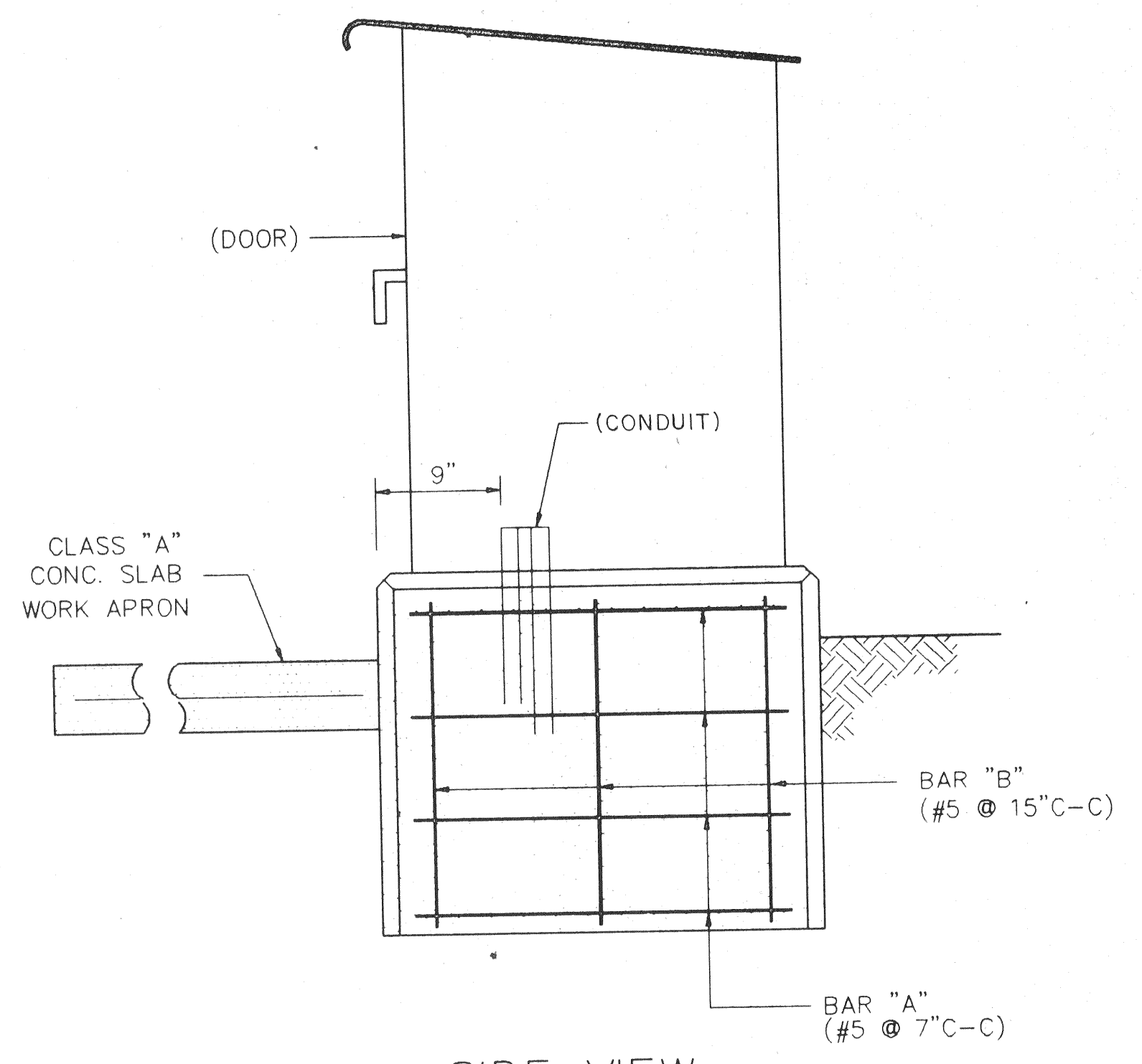
FDN. TYPE	DRILLED SHAFT DIA.	REINFORCING STEEL		DRILLED SHAFT LENGTH - feet			ANCHOR BOLT DESIGN			FOUNDATION DESIGN LOAD		TYPICAL APPLICATION	
		VERT. BARS	SPIRAL & PITCH	TEXAS	CONE	PENETROMETER, N blows/ft	ANCHOR BOLT DIA.	F _y (ksi)	BOLT CIRCLE DIA.	ANCHOR TYPE	MOMENT K-ft		SHEAR Kips
24-A	24"	4-#5	#2at12"	5.7	5.3	4.5	3/4"	36	12-3/4"	1	10	1	PEDESTAL POLE, PEDESTAL MOUNTED CONTROLLER.
30-A	30"	8-#7	#3at9"	11.3	10.3	8.0	1-1/2"	55	17"	2	87	3	MAST ARM ASSEMBLY (SEE SELECTION TABLE)
30-B	30"	8-#9	#3at9"	13.2	11.9	9.0	1-3/4"	55	19"	2	131	5	MAST ARM ASSEMBLY (SEE SELECTION TABLE) 30' STRAIN POLE WITH OR WITHOUT LUMINAIRE.
36-A	36"	12-#9	#3at9"	15.2	13.6	10.4	2"	55	21"	2	190	7	MAST ARM ASSEMBLY (SEE SELECTION TABLE) STRAIN POLE TALLER THAN 30' & STRAIN POLE WITH MAST ARM.



TOP VIEW

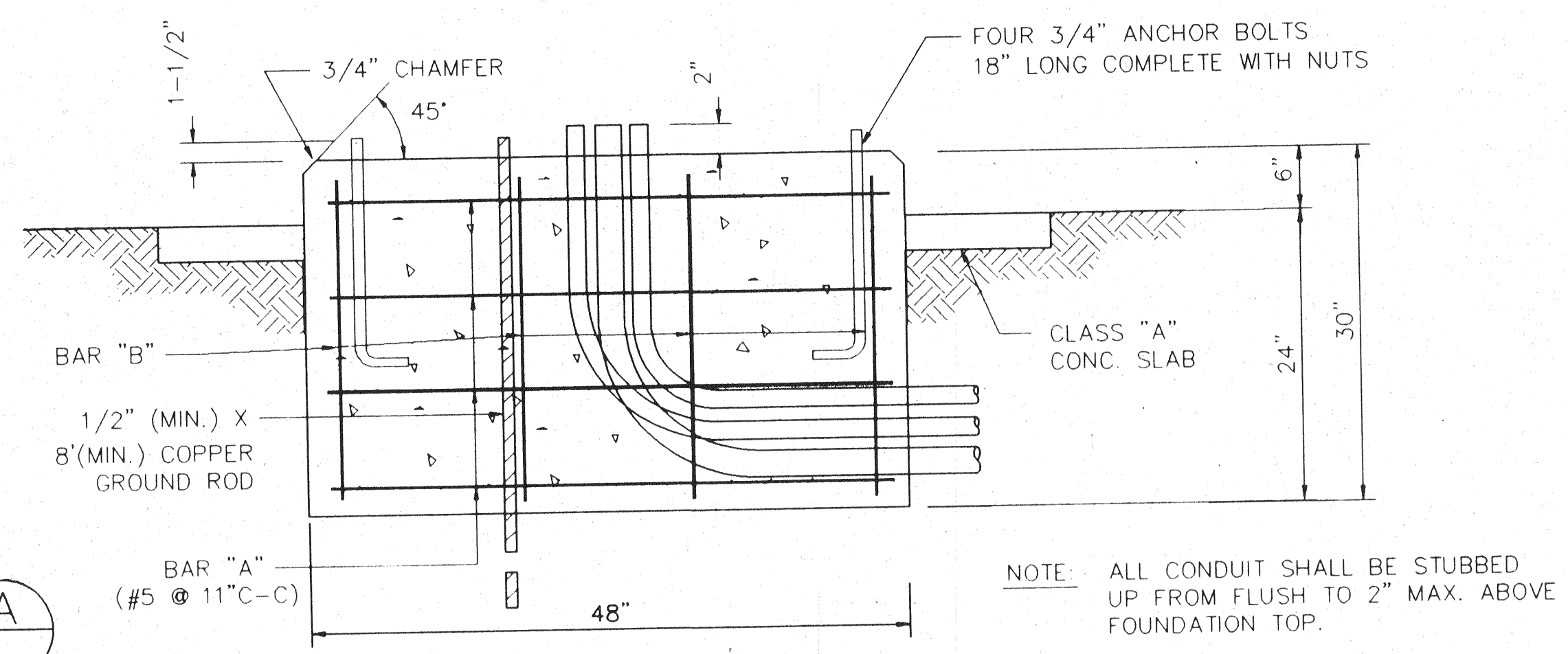
CONTROLLER FOUNDATION

DETAIL 1



SIDE VIEW

ELEVATION SECTION A



FOUNDATION SUMMARY TABLE

LOCATION / IDENTIFICATION	AVG. N blows/ft	FDN TYPE	NO. (ea.)	DRILLED SHAFT LENGTH (FEET)			
				24-A	30-A	30-B	36-A
POLE T-1	-	-	-		11'		
POLE T-2	-	-	-		11'		
POLE T-3	-	-	-		11'		
POLE T-4	-	-	-		11'		
TOTAL DRILLED SHAFT LENGTHS					44'		

FOUNDATION SELECTION TABLE FOR STANDARD MAST ARM ASSEMBLIES

DESIGN WIND SPEED	MAXIMUM SINGLE ARM LENGTH	FDN 30-A	FDN 30-B	FDN 36-A
		80 MPH	36'	48'
100 MPH	MAXIMUM DOUBLE ARM LENGTH COMBINATIONS	24' x 24'		
		28' x 28'		
		32' x 28'	32' x 32'	
			36' x 36'	
		40' x 36'		
		44' x 28'	44' x 36'	
			44'	

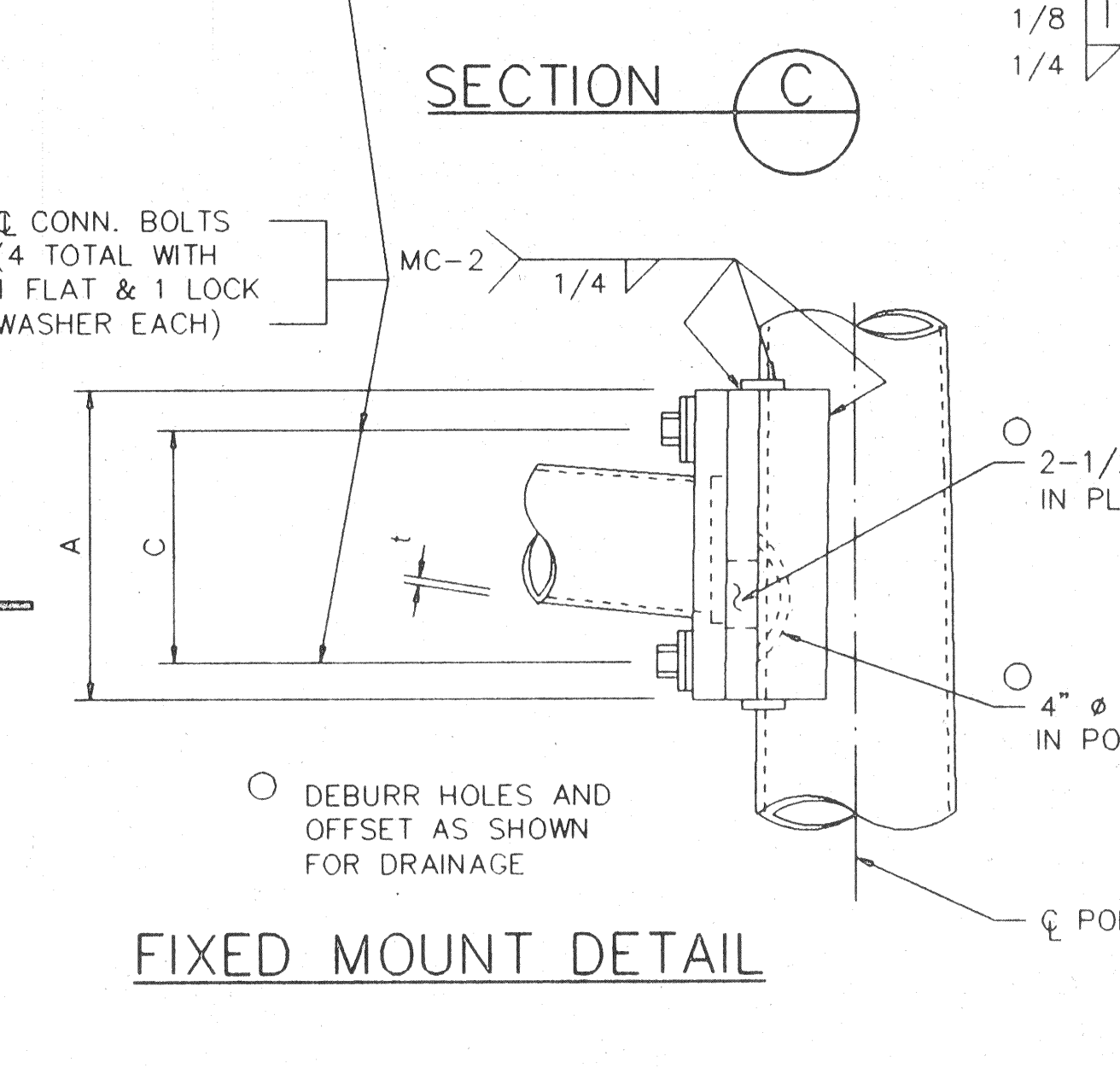
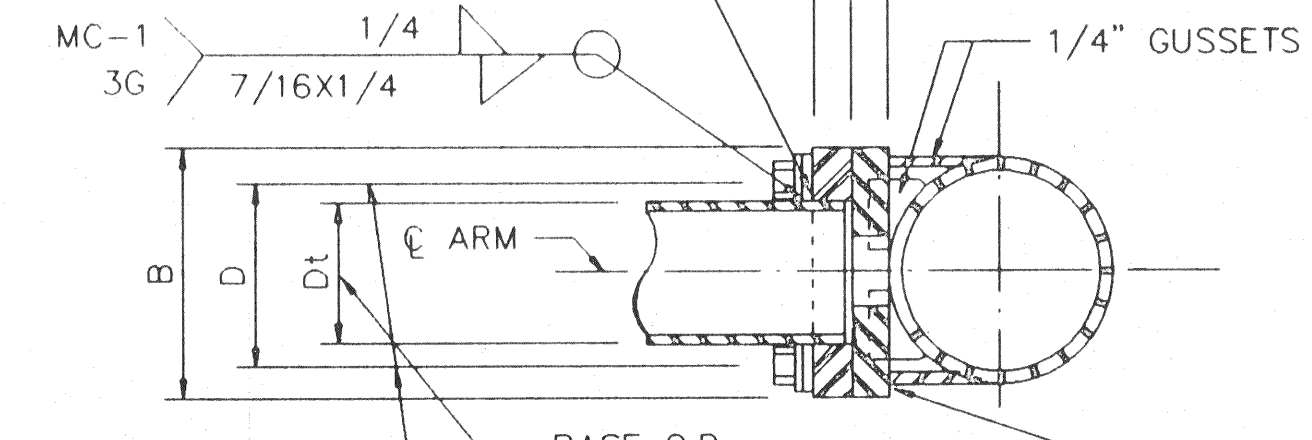
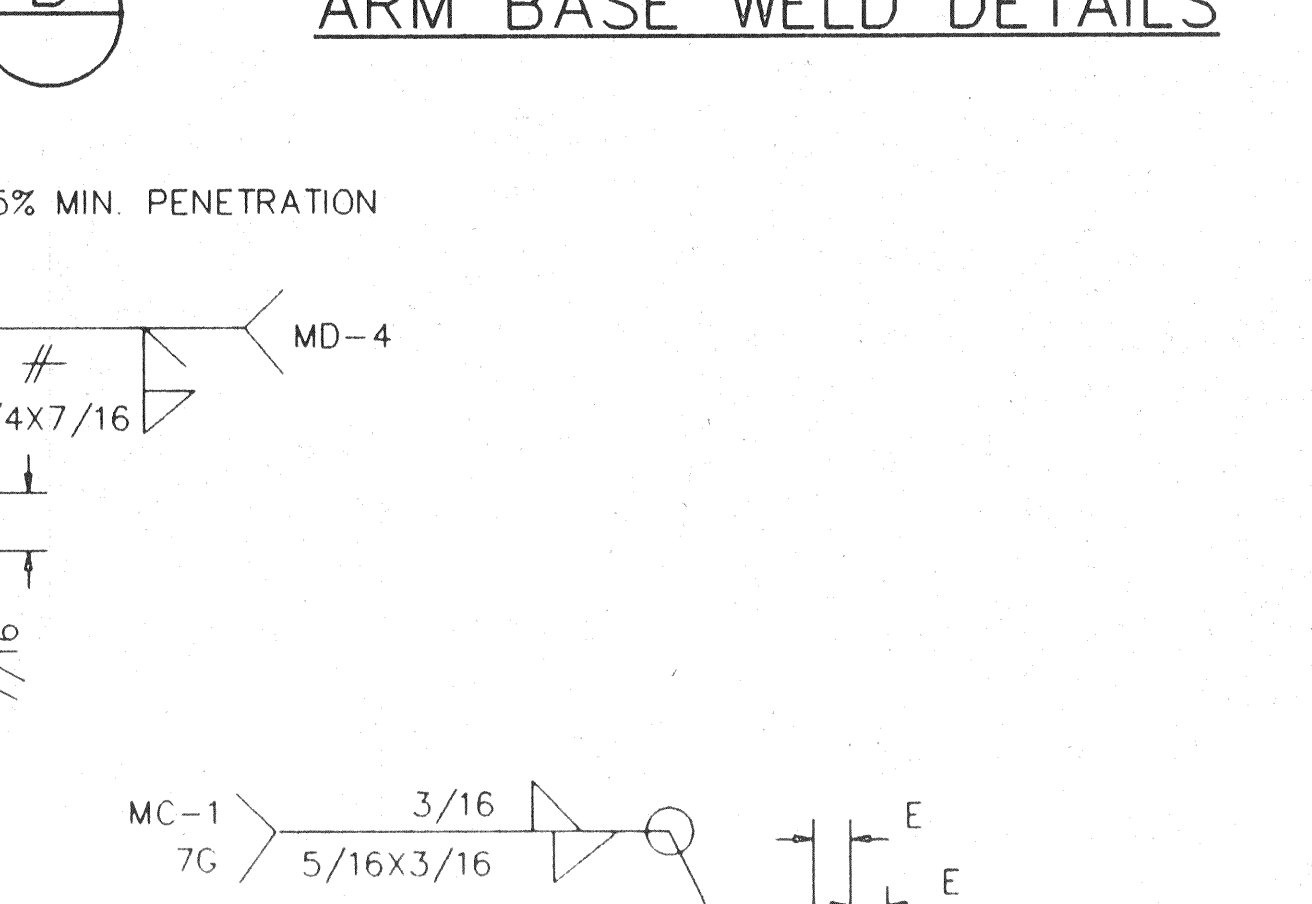
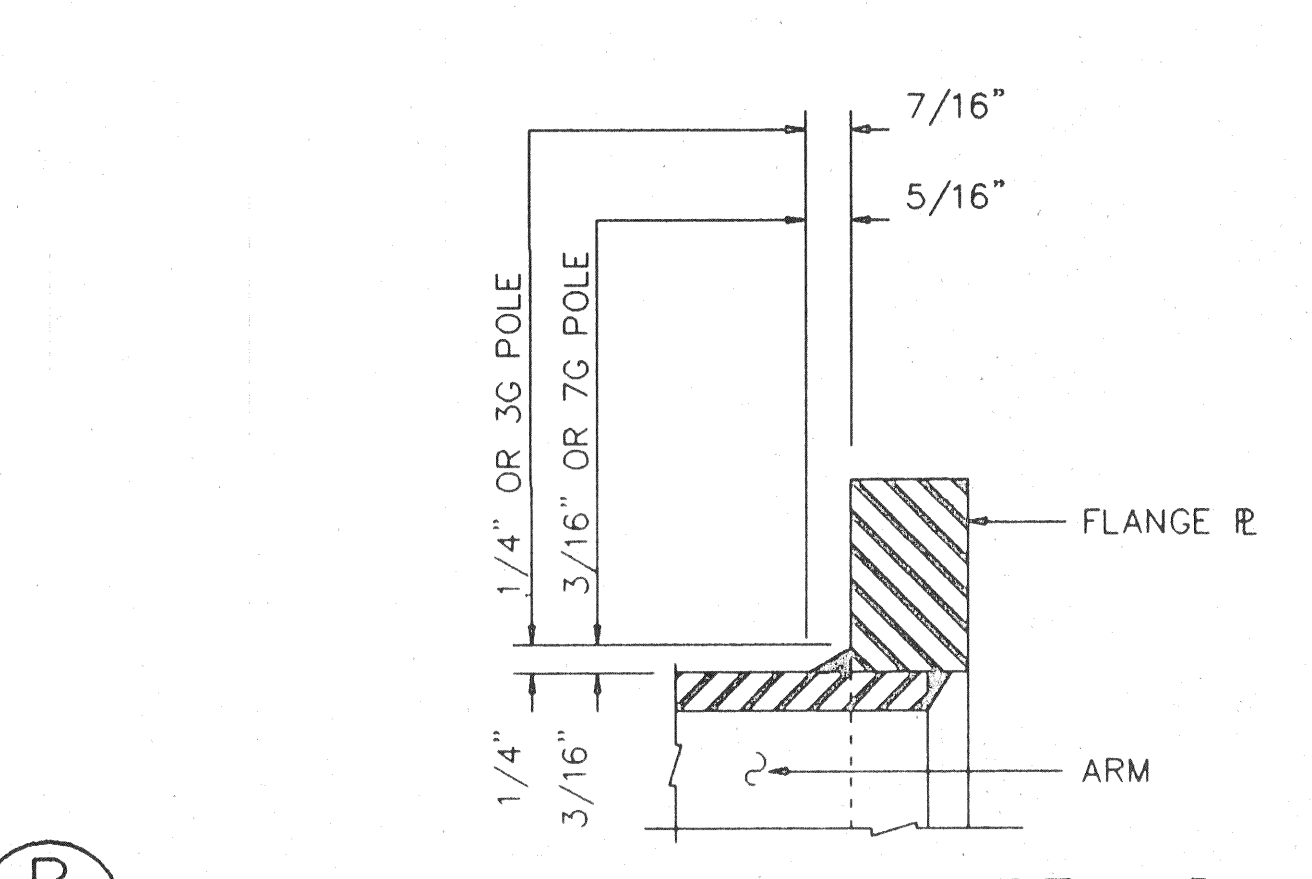
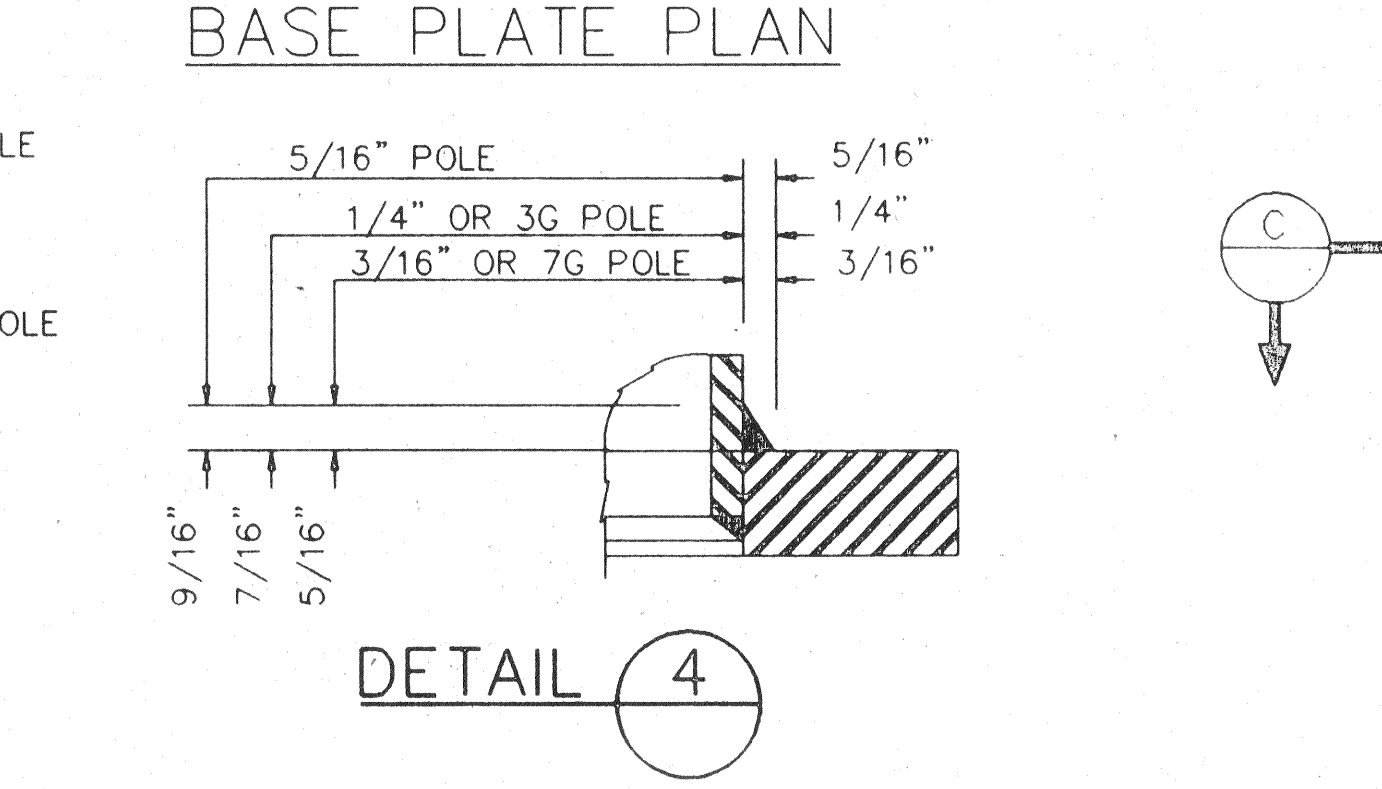
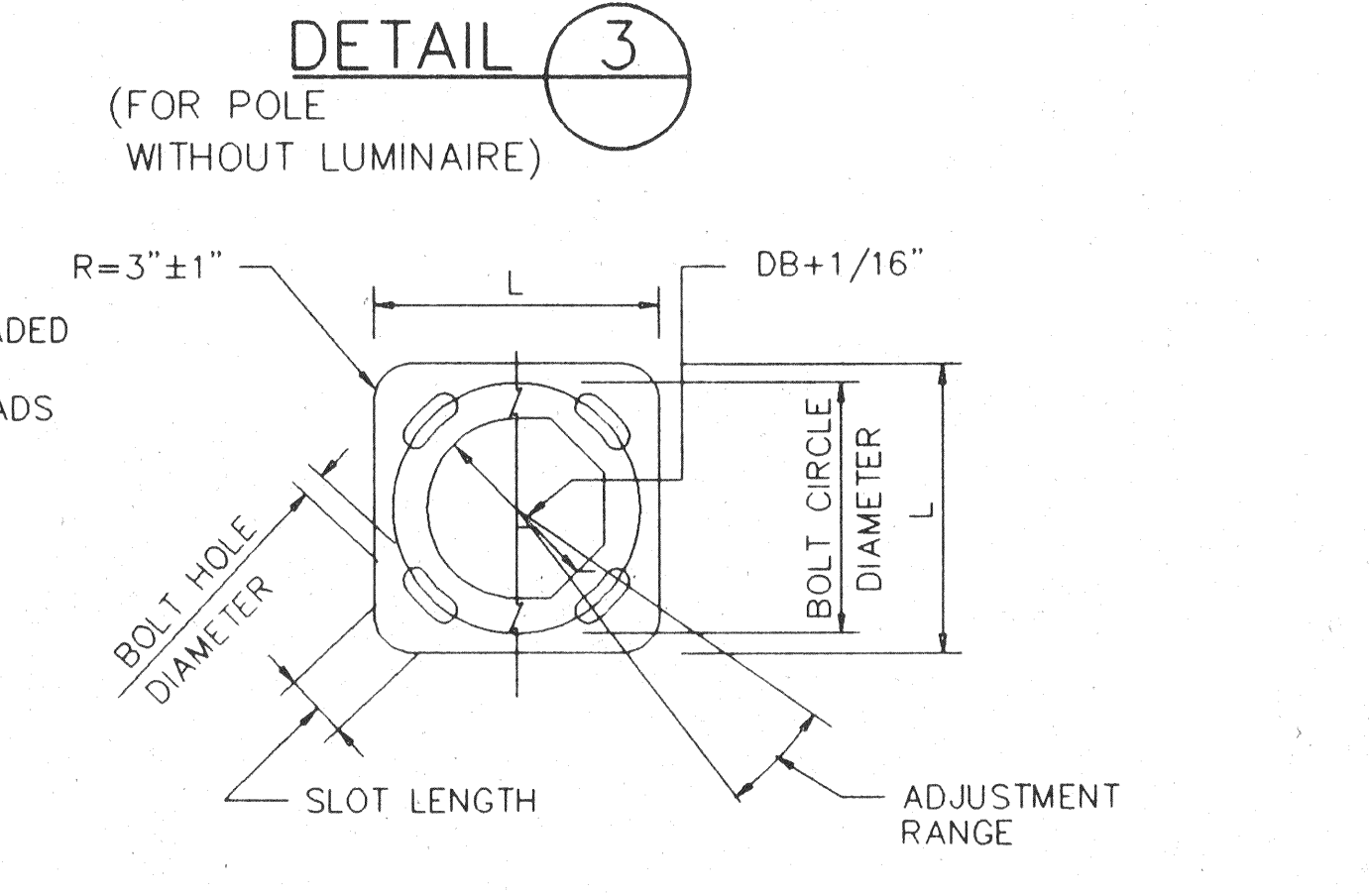
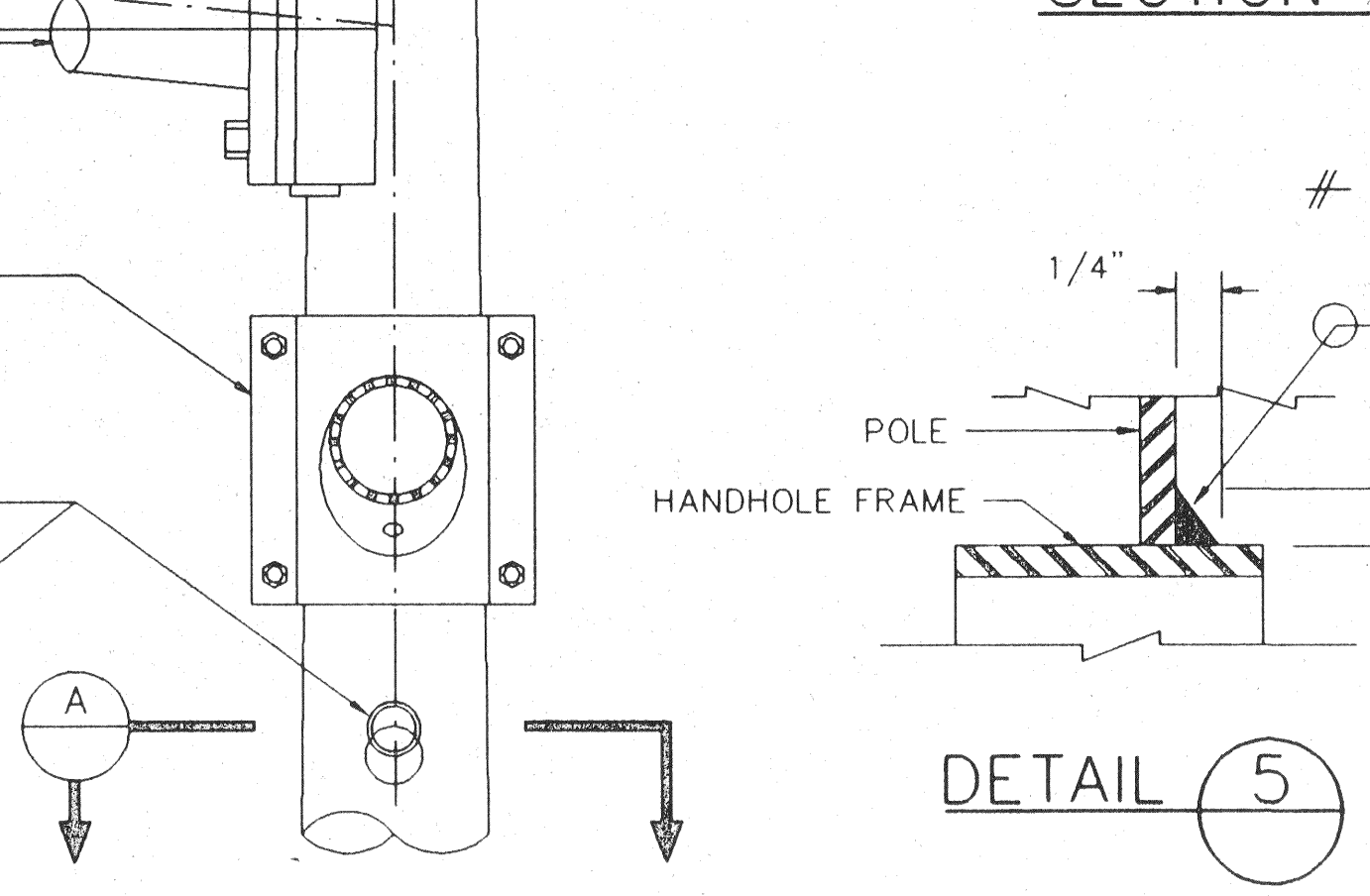
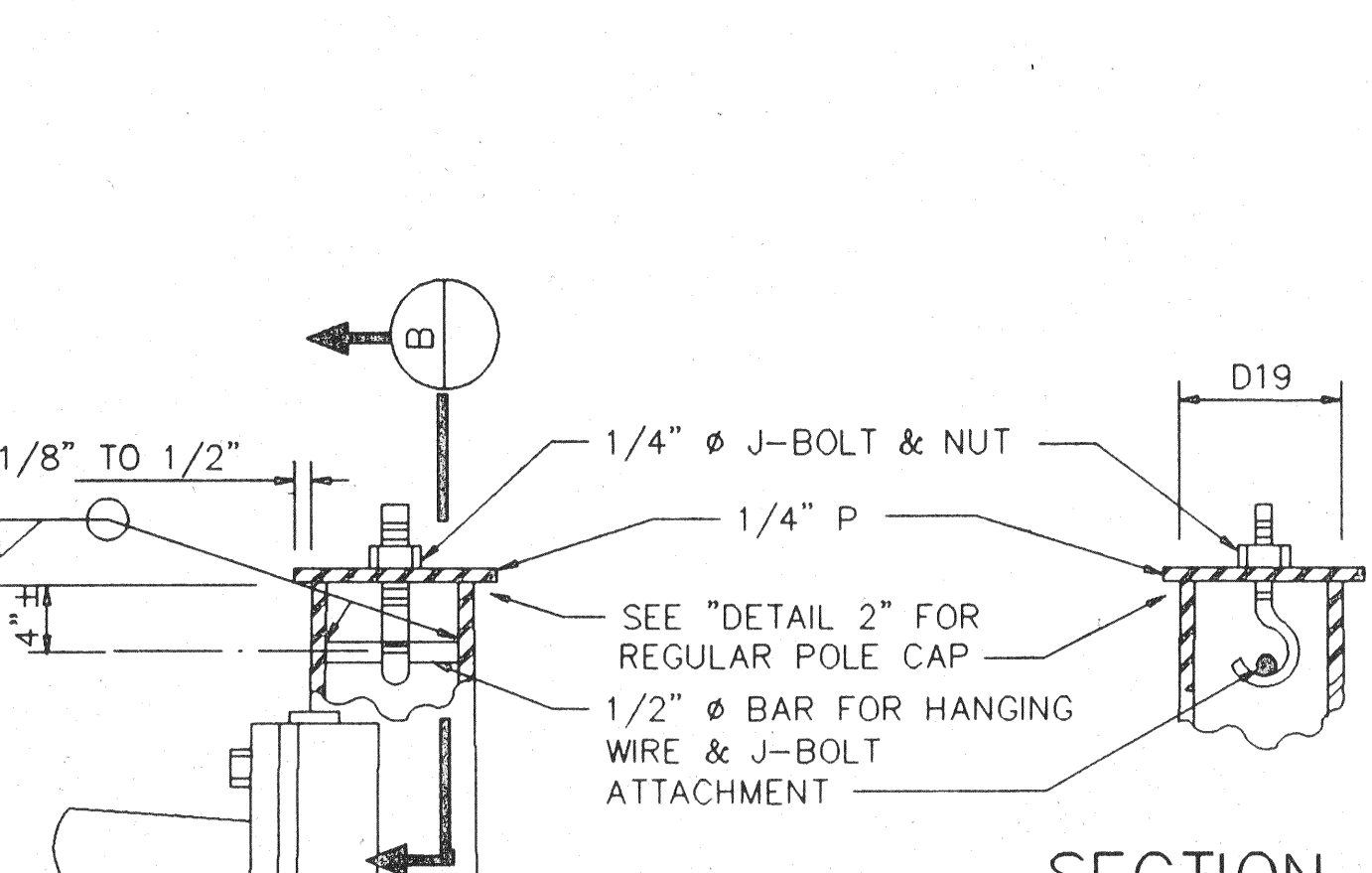
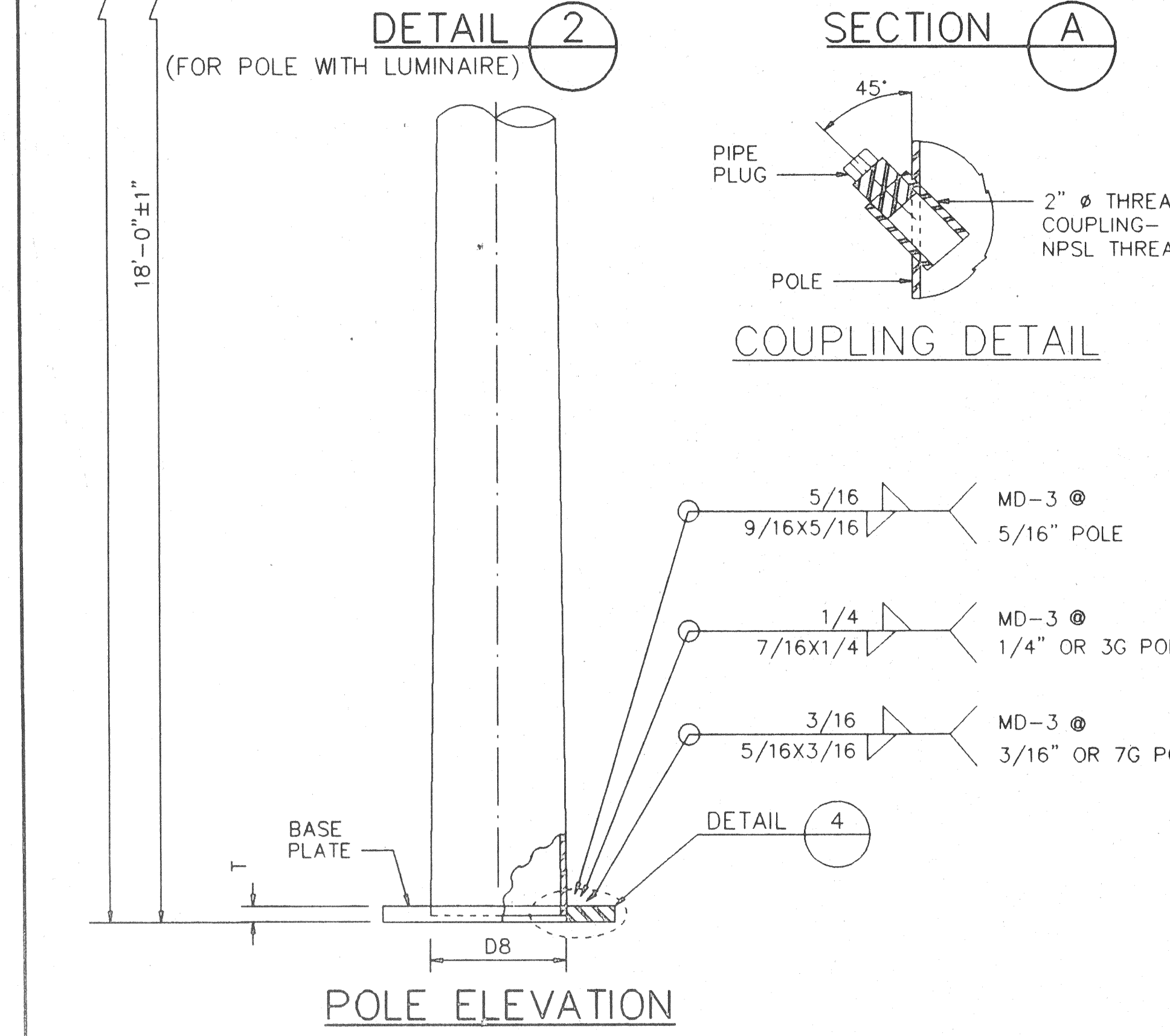
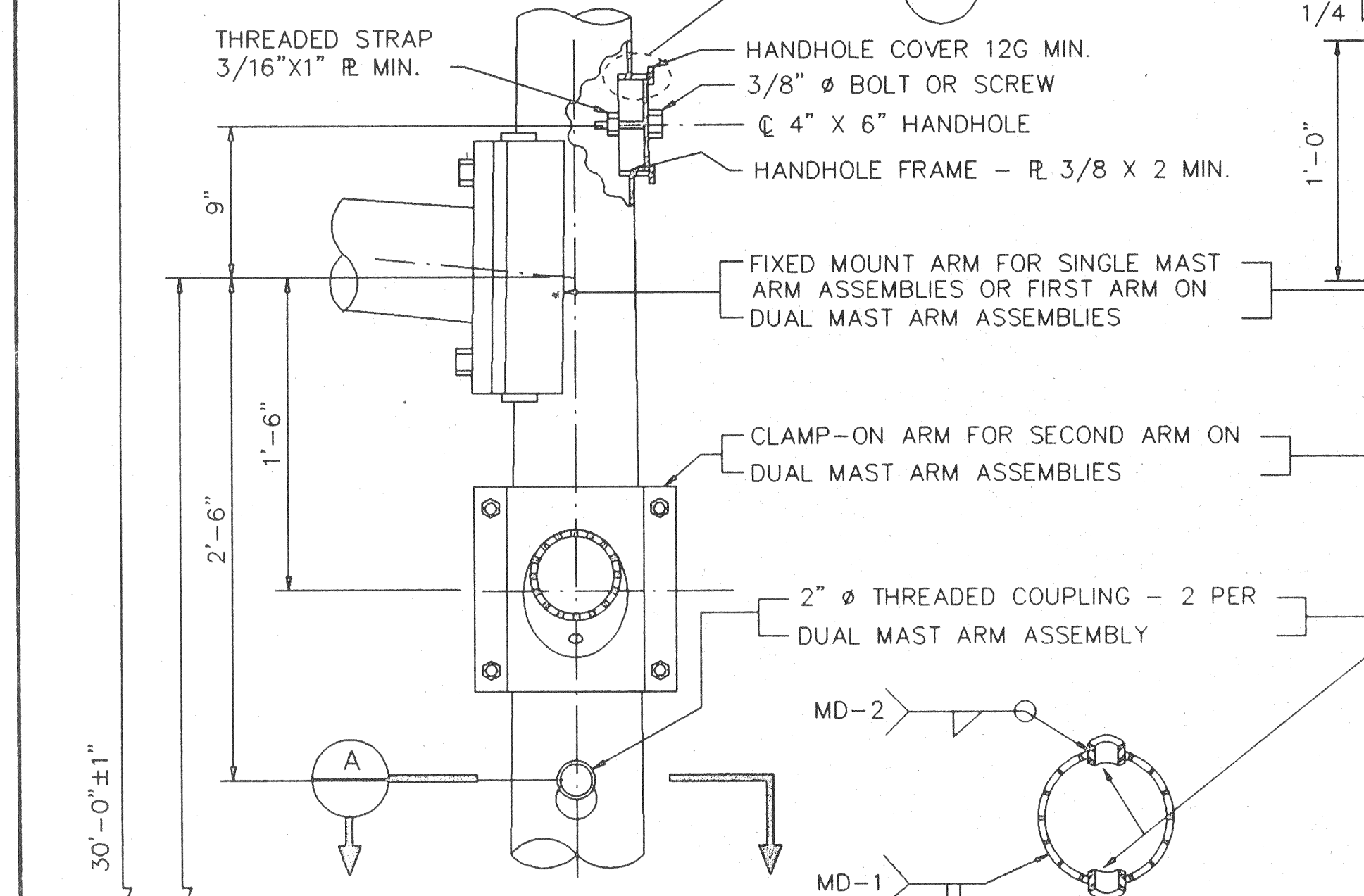
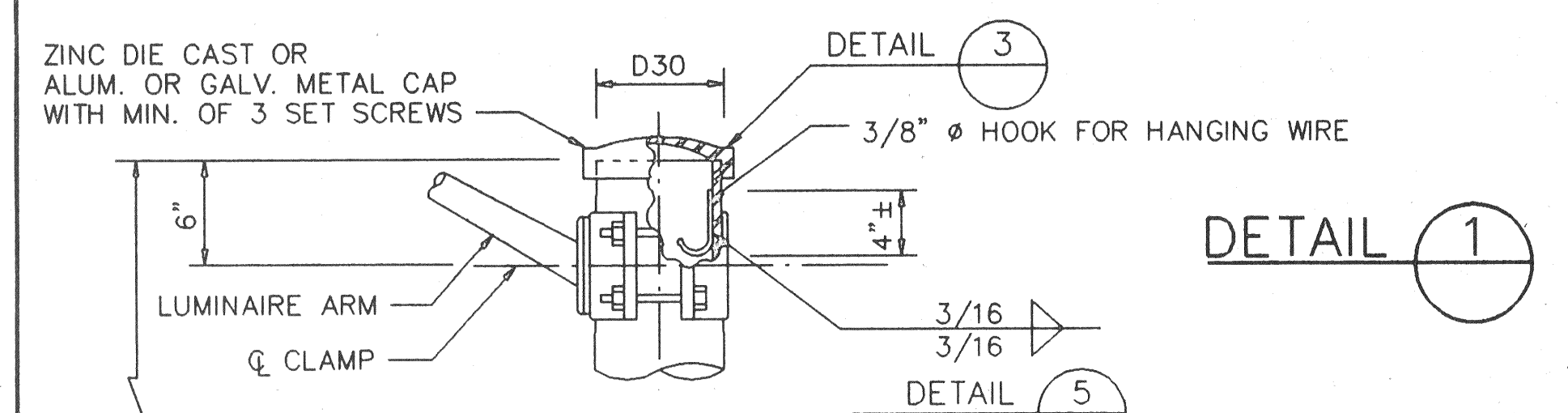
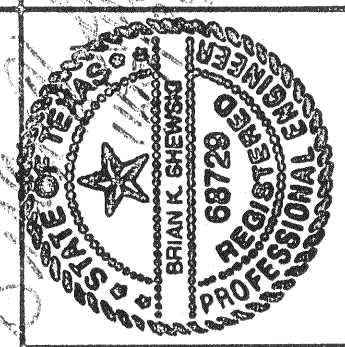
EXAMPLES :

- FOR 80MPH DESIGN WIND SPEED, FOUNDATION 30-A CAN SUPPORT UP TO A 32' ARM WITH ANOTHER ARM UP TO 28'.
- FOR 100MPH DESIGN WIND SPEED, FOUNDATION 30-B CAN SUPPORT A SINGLE 36' MAST ARM.

GENERAL NOTES :

DESIGN CONFORMS TO 1975 AASHTO STANDARD SPECIFICATIONS FOR STRUCTURAL SUPPORTS FOR HIGHWAY SIGNS, LUMINAIRES AND TRAFFIC SIGNALS AND INTERIM REVISIONS THERETO.

CONCRETE SHALL BE CLASS C.
 THREADS FOR ANCHOR BOLTS AND NUTS SHALL BE ROLLED OR CUT THREADS OF UNIFIED NATIONAL COARSE THREAD SERIES EXCEPT FOR A19387 BOLTS WHICH SHALL HAVE 8 PITCH THREAD SERIES. BOLTS AND NUTS SHALL HAVE CLASS 2A AND 2B FIT TOLERANCES. GALVANIZED NUTS SHALL BE TAPPED AFTER GALVANIZING. ANCHOR BOLTS THAT ARE 1" IN DIAMETER OR LESS SHALL CONFORM TO ASTM A36. ANCHOR BOLTS LARGER THAN 1" IN DIAMETER SHALL CONFORM TO SPECIAL SPECIFICATION A36M55 OR ASTM A19387 OR A687. GALVANIZE OR COAT WITH ZINC-RICH PAINT A MINIMUM OF THE UPPER 14 INCHES OF ALL ANCHOR BOLTS UNLESS OTHERWISE NOTED. NUTS FOR ANCHOR BOLTS SHALL CONFORM TO ASTM A563 Gr A OR BETTER HEAVY HEX. EXPOSED NUTS SHALL BE GALVANIZED OR COATED WITH ZINC-RICH PAINT. WASHERS SHALL BE GALVANIZED. TEMPLATES AND EMBEDDED NUTS NEED NOT BE GALVANIZED.

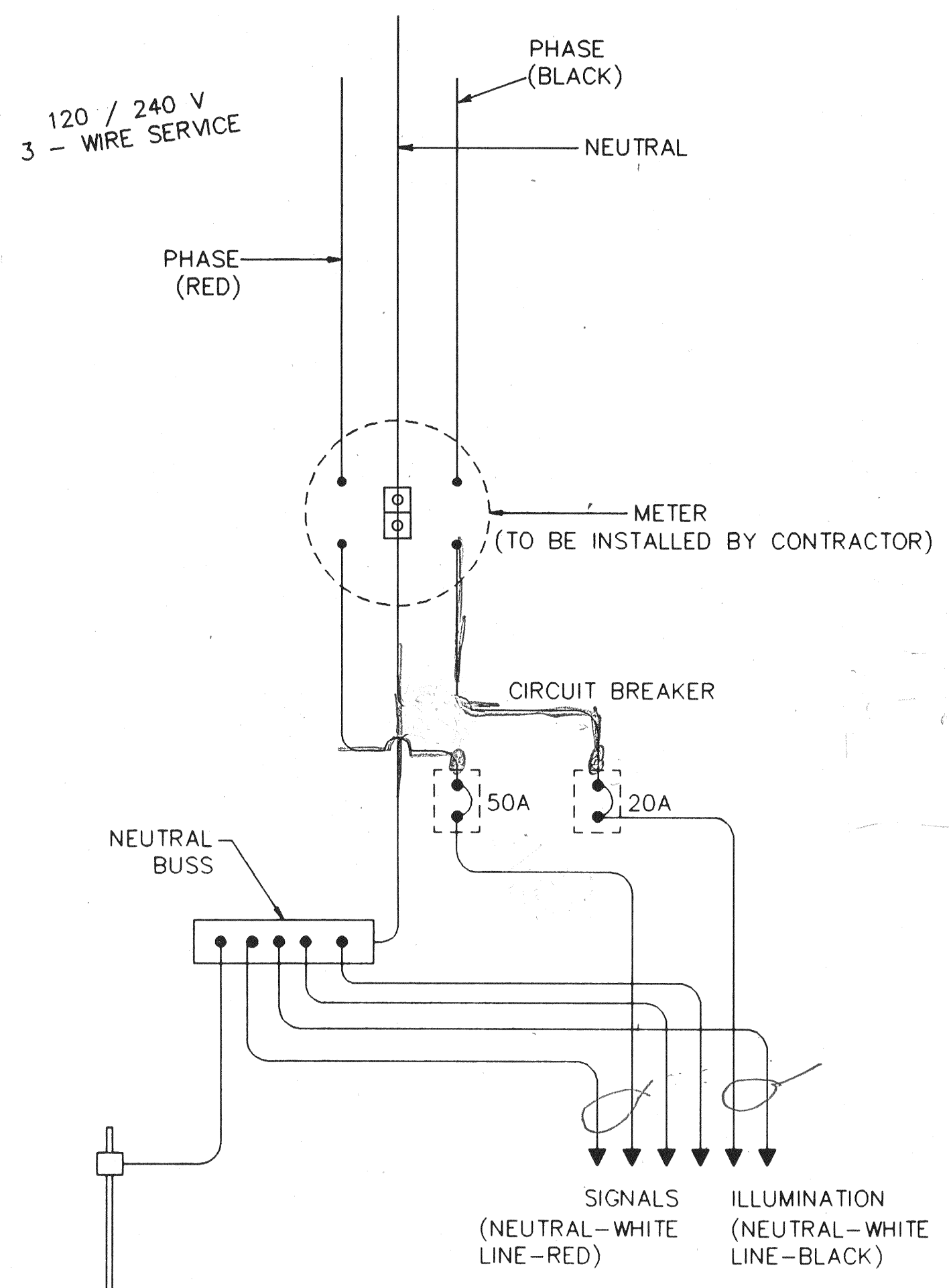
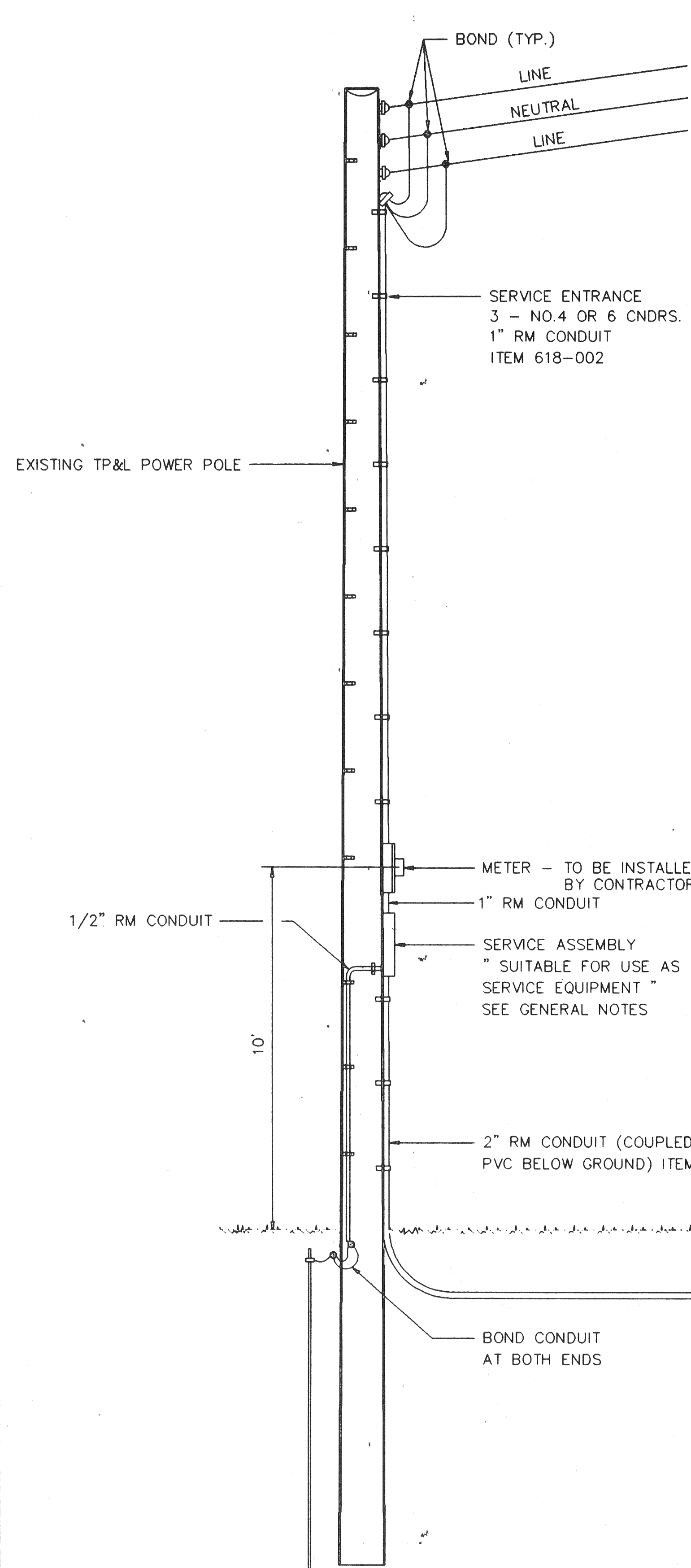


MATERIALS	
ROUND SHAFTS	ASTM A595 GRA, ASTM A570 GR50
PLATES (1)	ASTM A36 OR A572 GR50 OR A595 (2) OR A36M50
CONNECTION BOLTS	ASTM A325 EXCEPT WHERE NOTED
PIN BOLTS	ASTM A325
PIPE	ASTM A53 GR A OR B, OR A501
MISC. HARDWARE	GALVANIZED STEEL OR STAINLESS OR AS NOTED

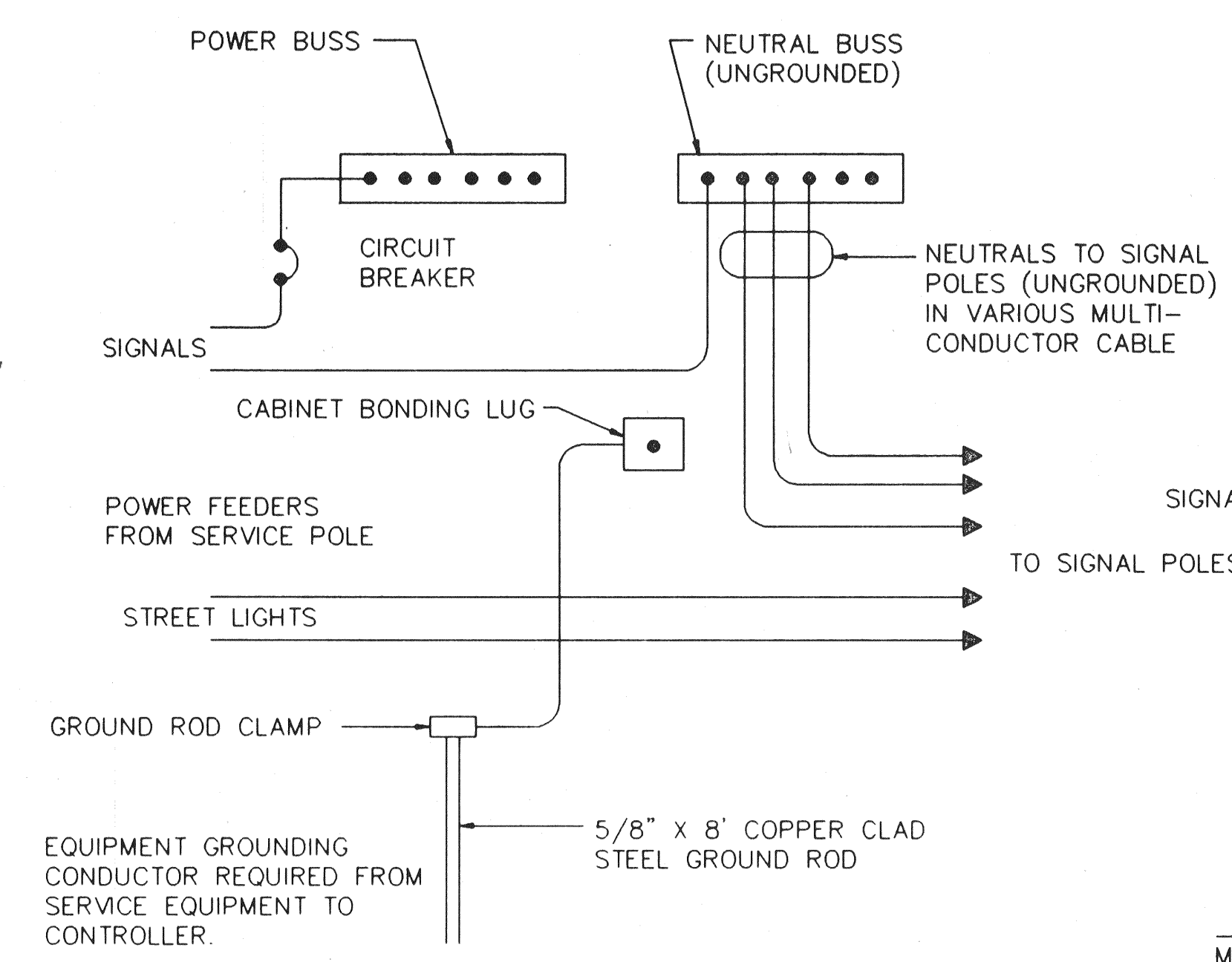
- ANY OF THE MATERIALS LISTED FOR PLATES MAY BE USED WHERE THE DRAWINGS DO NOT SPECIFY A PARTICULAR GRADE DESIGNATION.
- IF A595 MATERIAL IS USED, IT NEED NOT BE COLD WORKED TO A595 REQUIREMENTS, BUT MATERIALS MUST HAVE 40 KSI MINIMUM YIELD PRIOR TO FABRICATION.

ARM SIZE		A	B	C	D	E	CONN. BOLT DIAM.
Dt	t	in	in	in	in	in	in
6.5	.179	12	9	9	6	1	1
7.5	.179	13	9	10	6	1	1
8.0	.179	14	10	11	7	1-1/4	1-1/4
9.0	.179	16	11	13	8	1-1/4	1-1/4
9.5	.179	17	12	14	9	1-1/4	1-1/4
9.5	.239	18	12	15	9	1-1/4	1-1/4
10.0	.239	18	12	15	9	1-1/4	1-1/4
10.5	.239	18	13	15	10	1-1/2	1-1/2
11.0	.239	18	13	15	10	1-1/2	1-1/2

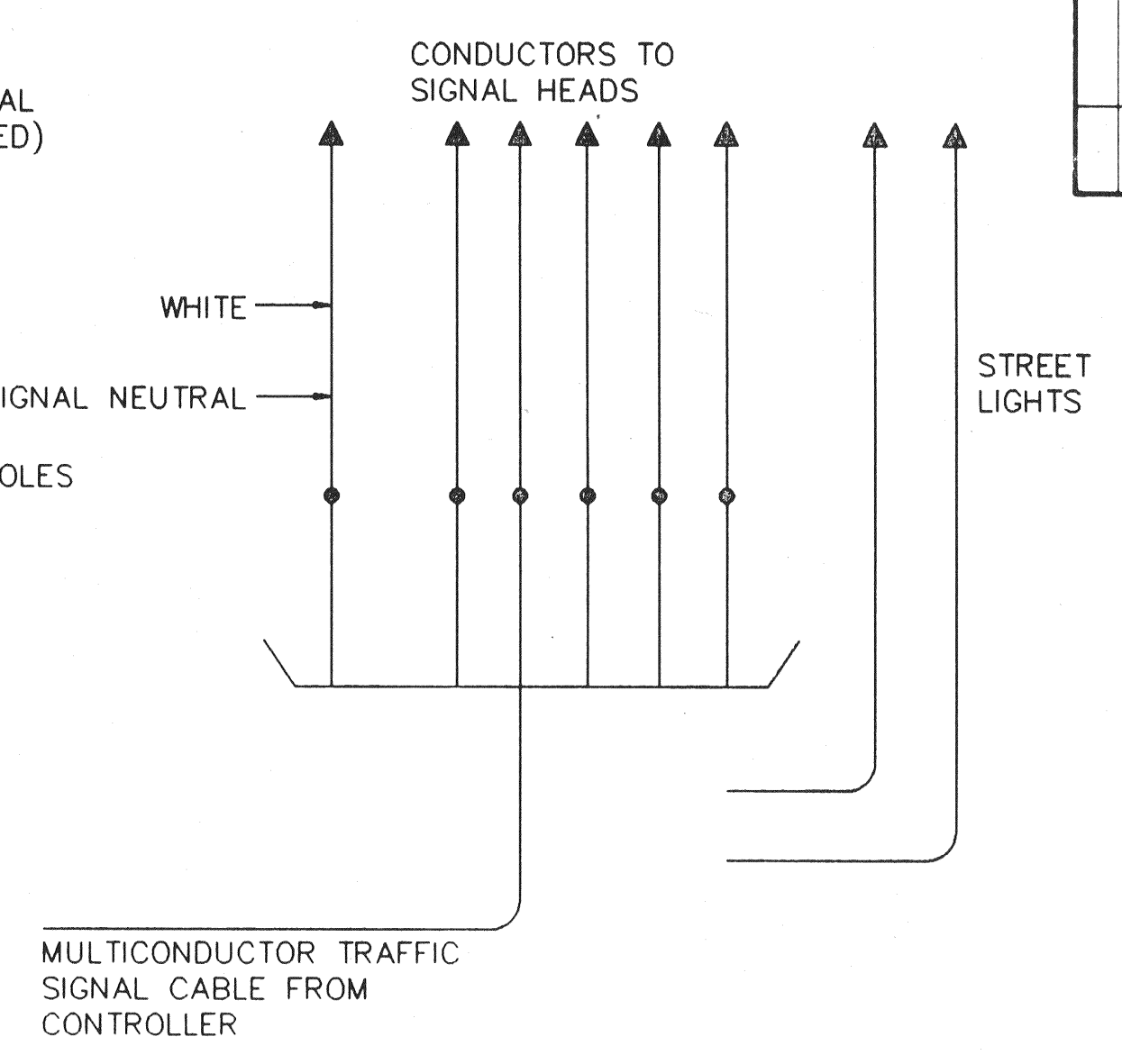
GENERAL NOTES:
 CLAMP-ON DETAILS ARE USED FOR THE SECOND ARM ON DUAL MAST ARM ASSEMBLIES. A MAXIMUM 1-1/2" WIDE VERTICAL SLOTTED HOLE MAY BE CUT IN THE FRONT CLAMP PLATE TO FACILITATE DRAINAGE DURING GALVANIZING. THE SLOT SHALL BE CENTERED BEHIND THE ARM AND SHALL BE NO LONGER THAN THE ARM DIAMETER MINUS 1".
 FIXED MOUNT DETAILS ARE USED FOR SINGLE MAST ARM ASSEMBLIES AND FOR THE FIRST ARM ON DUAL MAST ARM ASSEMBLIES.
 WHERE DUPLICATE PARTS OCCUR ON DETAIL, WELDS SHOWN FOR ONE PART SHALL APPLY TO ALL SIMILAR PARTS ON THE DETAIL.
 PIN BOLTS ARE REQUIRED TO PREVENT ROTATION OF CLAMP-ON ARMS UNDER DESIGN WIND FORCES.
 ALL POLES ARMS & METAL HARDWARE TO BE PAINTED "BRUSHING BROWN".



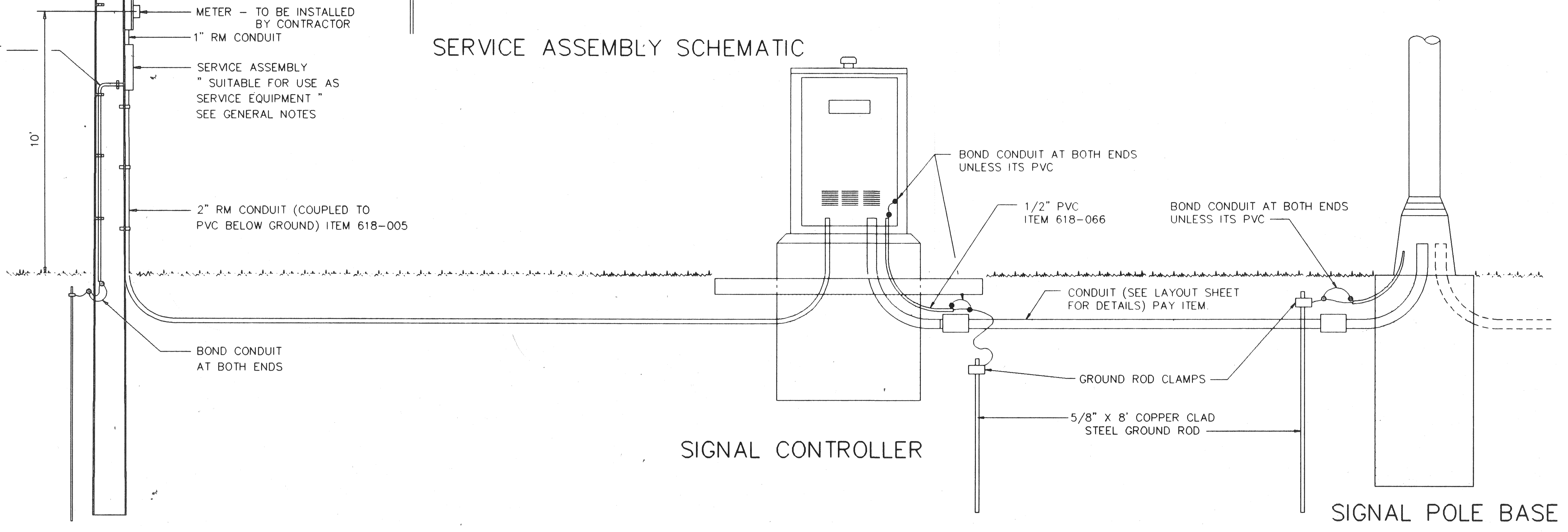
SERVICE ASSEMBLY SCHEMATIC



CONNECTIONS AT SIGNAL CONTROLLERS



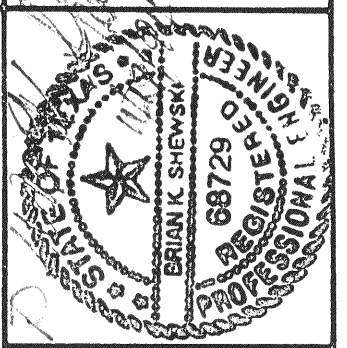
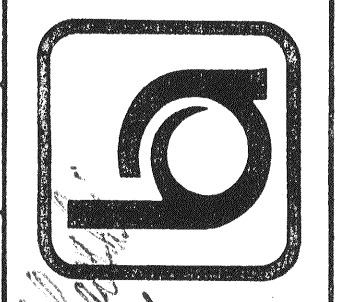
CONNECTIONS AT POLE BASE



SIGNAL CONTROLLER

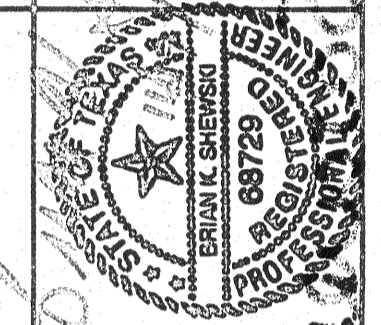
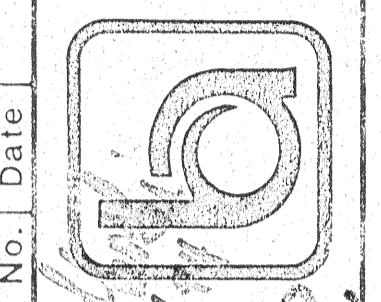
SIGNAL POLE BASE

No.	Date	Revisions	App.



SERVICE POLE AND GROUNDING DETAILS

Scale: H=, V=
 Date: 11/29/94
 Designed by:
 Drawn by:
 Checked by: BKS
 Approved by: BKS
 Project No. 663787-01000



GENERAL NOTES
 ReflectORIZED signs shall be constructed of retro-reflective sheeting in conformance with project specifications and shall be maintained to meet the appearance, color and reflectivity requirements of those specifications. Paints and coloration of signs shall be equal to the Department's standards. Signs shall comply with the general requirements specified in the "Standard Specifications for Construction of Highways, Streets and Bridges" in effect at the time of contract award.
 All traffic control devices shall conform with the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways." Contractors shall furnish a copy of a certification from the manufacturer of the lights that the warning lights meet the requirements of the ITE Standard for Flashing and Steady Burn Warning Lights as contained in the latest edition of the "Texas Manual on Uniform Traffic Control Devices for Streets and Highways."
 All signs shown have black letters and borders on a reflective orange background except the R20-3, R4-7b, R4-8b, and G20-6 signs which have a reflective white background.
 Signs erected on portable supports for use on construction projects normally mean signs which are used during the day to warn or guide traffic through and/or around the actual construction area, but at the end of the workday such signs are either removed or turned away from the view of traffic. Portable supports shall be as shown on this sheet or as approved by the Engineer. The bottom of the sign shall be a minimum of one (1) foot above the pavement sign. Signs required for nighttime usage should not normally be mounted on temporary supports, except when approved by the Engineer. Signs erected on fixed supports for use on construction projects normally mean signs that are to remain in place for both day and night usage to regulate, warn and guide traffic in advance of and within the limits of the project including the crossroad approaches. However, under certain conditions, such as where a sign may be required for a few days' duration and then is no longer needed or where a sign is moved from location to location every few days or where it is not practical or desirable to provide a fixed mounting, such signs may be erected on a temporary type of support. Temporary supports shall be as shown on this sheet or as approved by the Engineer. Signs erected on temporary supports should be at a minimum height of three (3) feet. Signs erected on fixed supports should be at a minimum height of five (5) feet in rural areas and seven (7) feet in urban areas and other rural locations where sight distance obstructions are present. Regardless of the type of support used, regulatory signs should not be erected at height less than the 5- or 7-foot minimum specified above unless a lower height is approved by the Engineer. Posts for fixed supports should be set in the ground without concrete footings.
 Where portable or temporary supports require the use of weights to keep a sign or barricade from turning over, the use of some type of sandbag is recommended. The use of pieces of concrete, rocks, iron, steel or other solid objects will not be permitted.

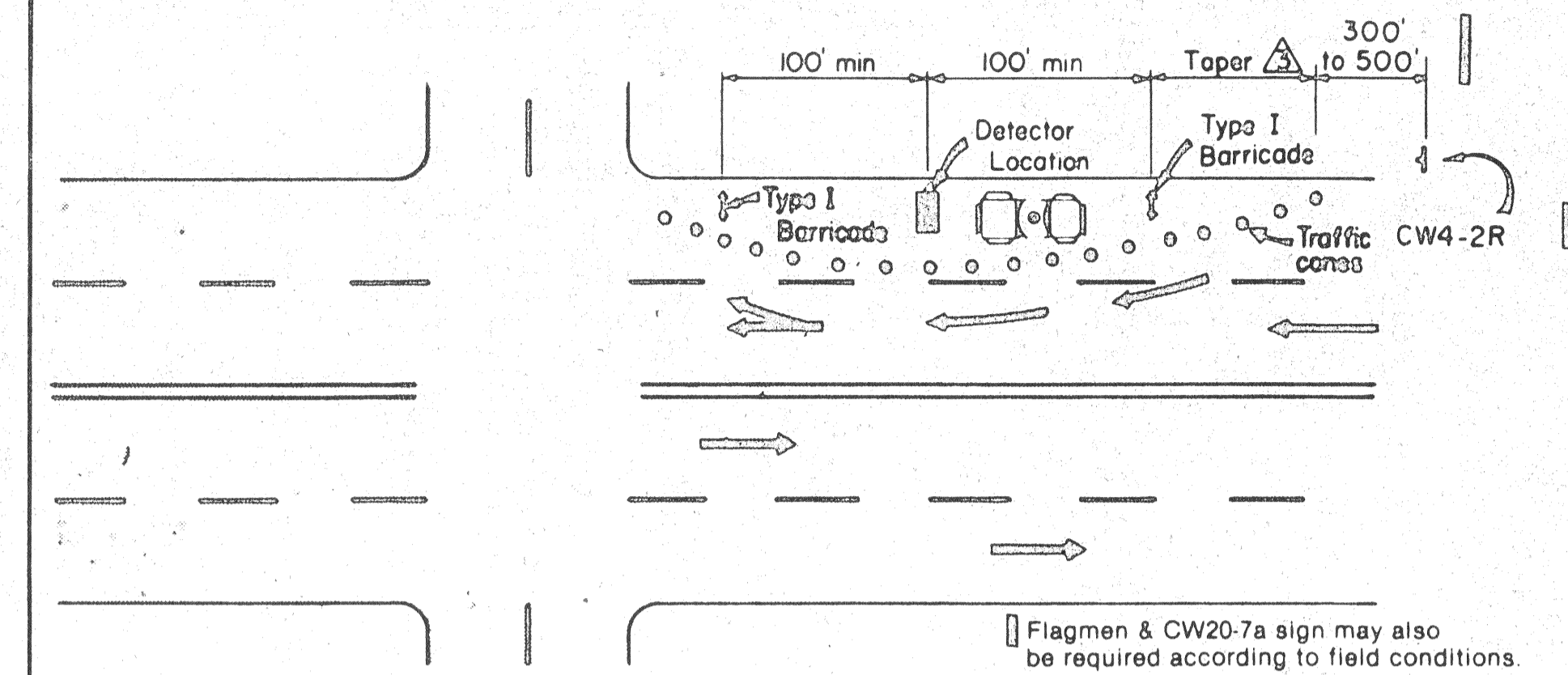
For additional information and guidelines on barricades and construction signs see the Texas Manual on Uniform Traffic Control Devices.
 Signing shown is typical and may be adjusted to fit field conditions by the Engineer.
 No more than two signs should be placed on a barricade.

Where a sign is to be mounted on a barricade, the barricade length should not be less than the horizontal dimension of the sign. If lights are also to be mounted on the barricade, the barricade should not be less than the sign width plus about 12" for each light to be attached. Barricades of a greater length than the above will be satisfactory.
 The advance signs and barricades shall be in place when signal construction operations are in progress. The contractor may remove the advance signs and barricades when there are no construction operations underway if permitted elsewhere in the plans. Any obstructions or hazards at the work area shall be clearly marked and delineated at all times.

NOTE: For several closely adjoining intersections on the same project, advance signing may not be required in advance of each intersection, but only in advance of the intersections at the project limits. If this is the case, see details elsewhere in the plans for advance signing requirements.

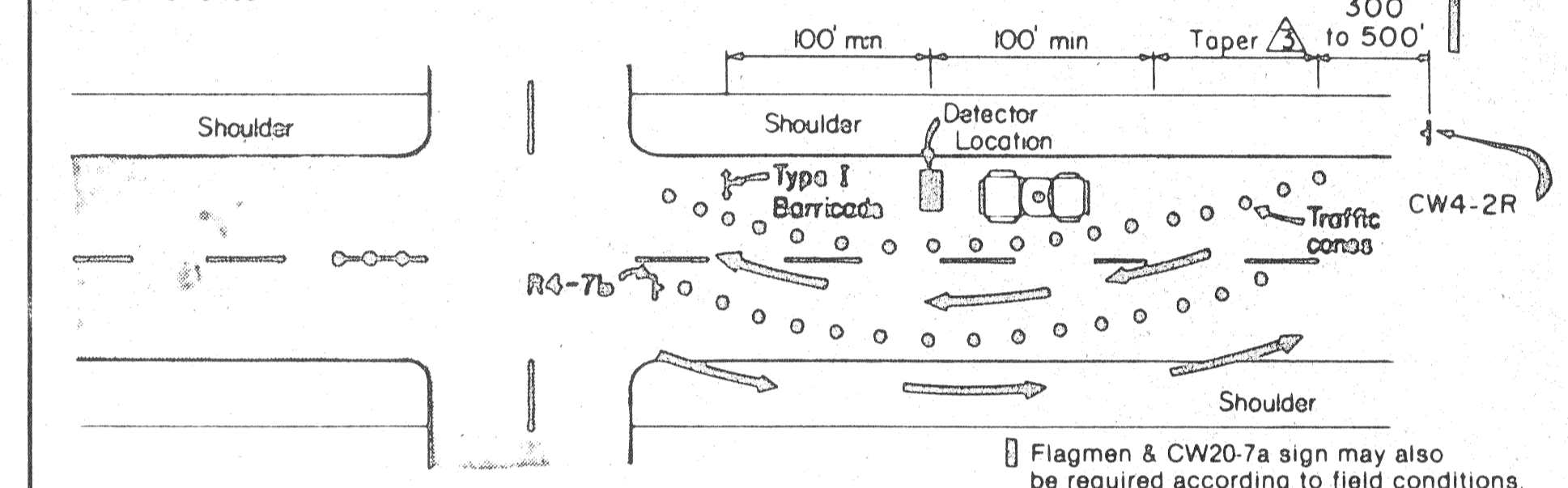
^a Distance varies with speed of traffic. Distance can be less than shown in urban areas.

^{**} Change to Type I Barricades with arrows at night.



S = Speed (Numerical value)
 W = Width of offset

Daytime - Four Lane Roadway

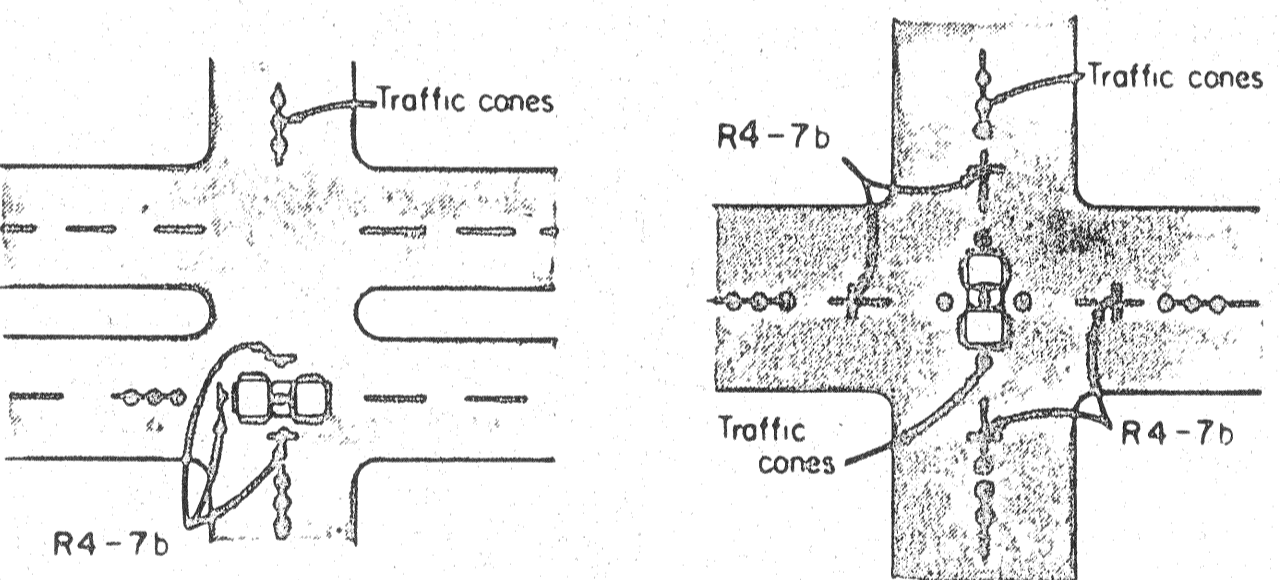


Daytime - Two Lane Roadway

TYPICAL TAPER LENGTH (L)

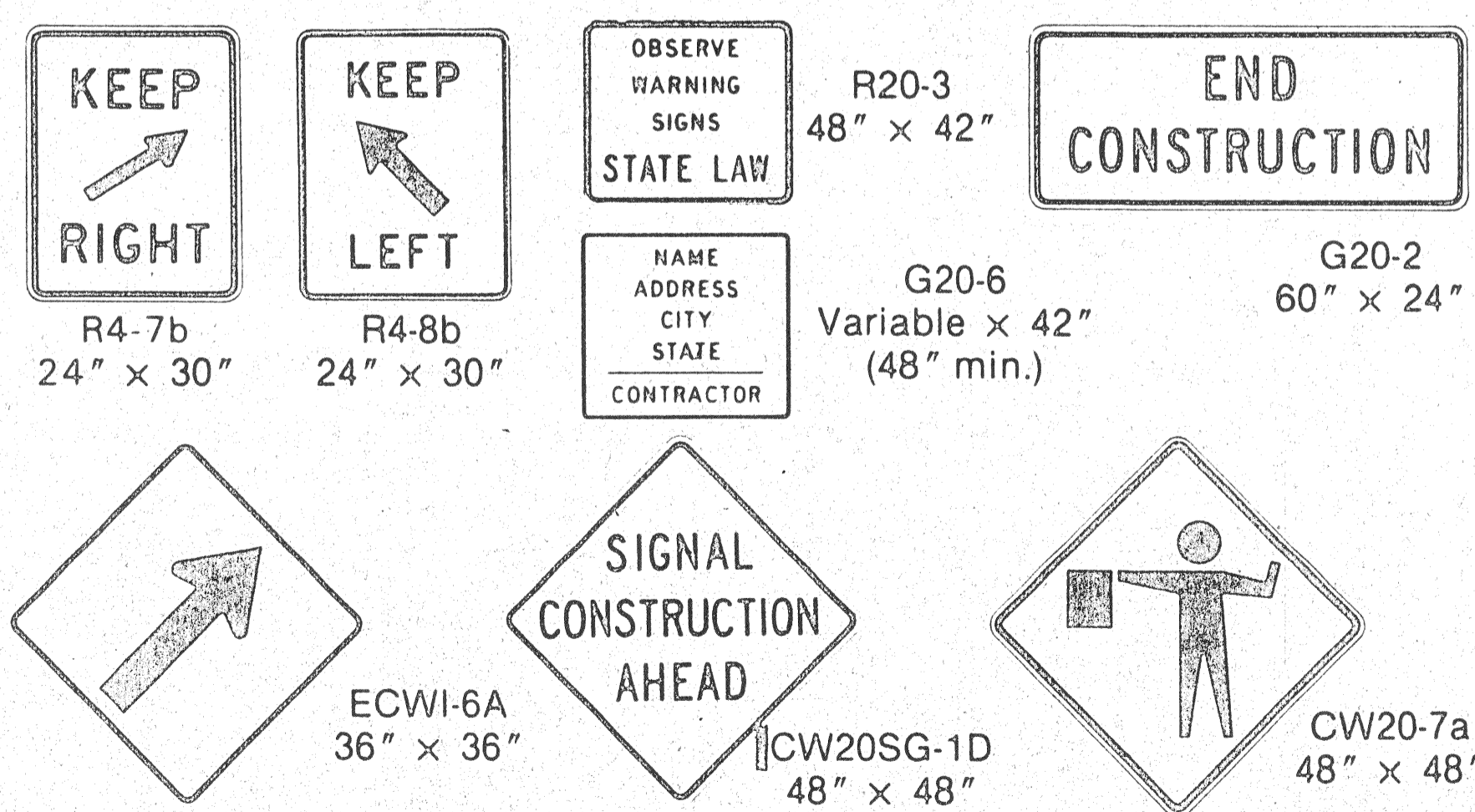
Posted Speed	Formula	Minimum Desirable Taper Lengths **		
		10'	11'	12'
30	L = WS ² /80	150	165	180
35		205	225	245
40		265	295	320
45	L = WS	450	495	540
50		500	550	600
55		550	605	660
60		600	660	720

⁶⁵TH PERCENTILE SPEED MAY BE USED ON ROADS WHERE TRAFFIC SPEEDS NORMALLY EXCEED THE POSTED SPEED LIMIT.
^{**} TAPER LENGTHS HAVE BEEN ROUNDED OFF.
 L = TAPER LENGTH IN FEET
 W = OFFSET IN FEET
 S = SPEED IN MPH



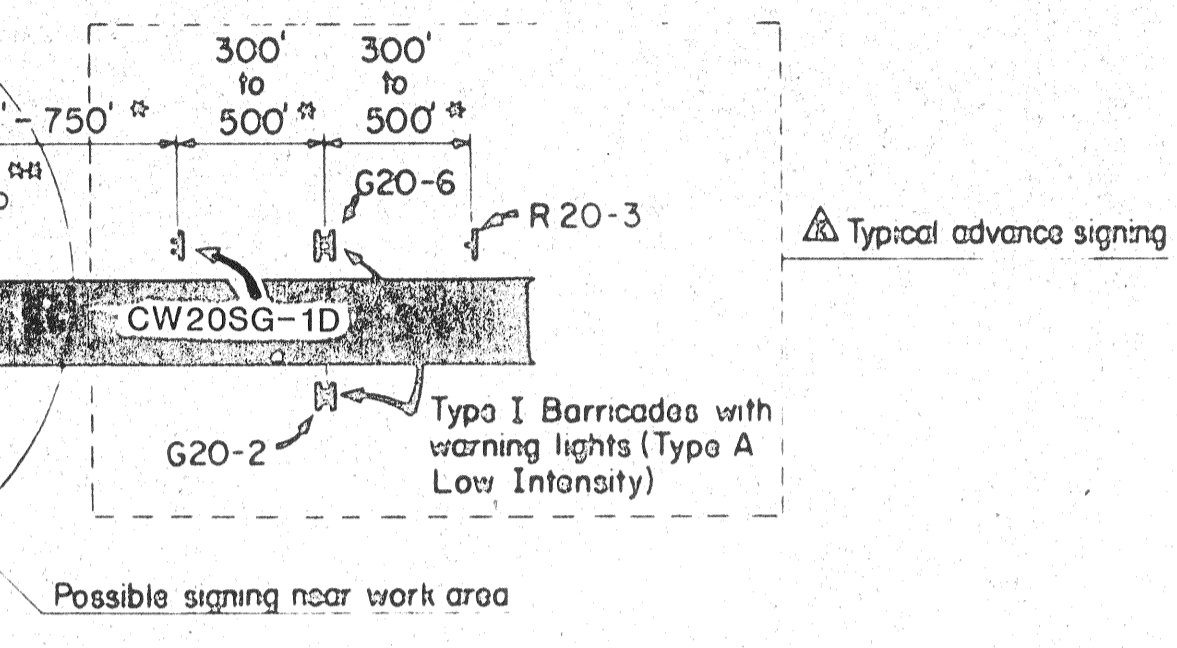
TYPICAL HANGING SIGNAL INSTALLATIONS

- NOTES**
1. Flagmen & CW20-7a sign may also be required according to field conditions.
 2. Use vehicle equipped with yellow rotating beacon or strobe.

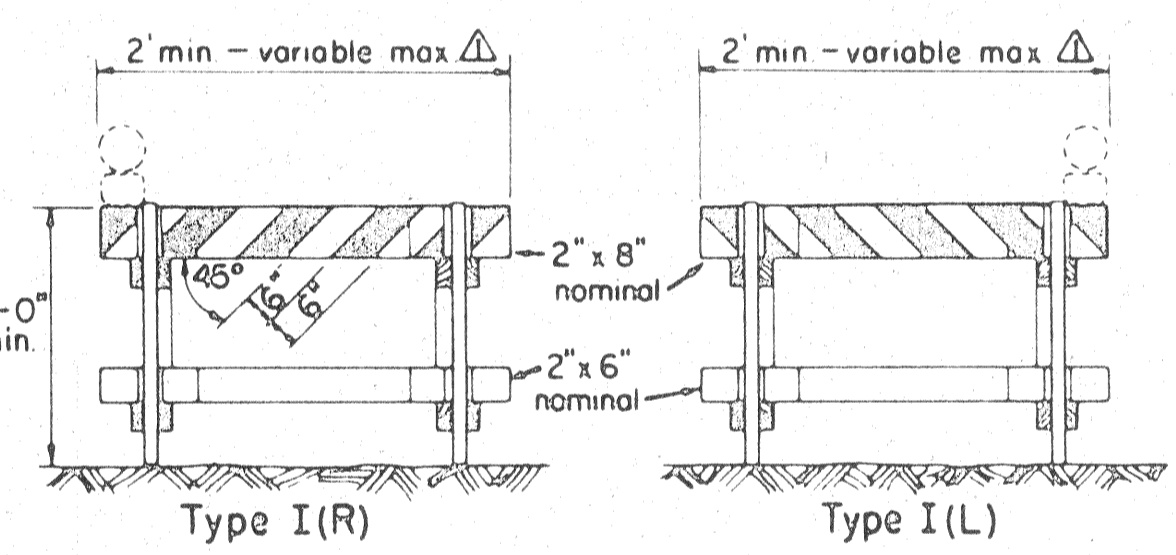


TYPICAL SIGNS USED IN TRAFFIC SIGNAL CONSTRUCTION AREAS

SIGNING IN ADVANCE OF CONSTRUCTION AND POSSIBLE SIGNING NEAR WORK AREA



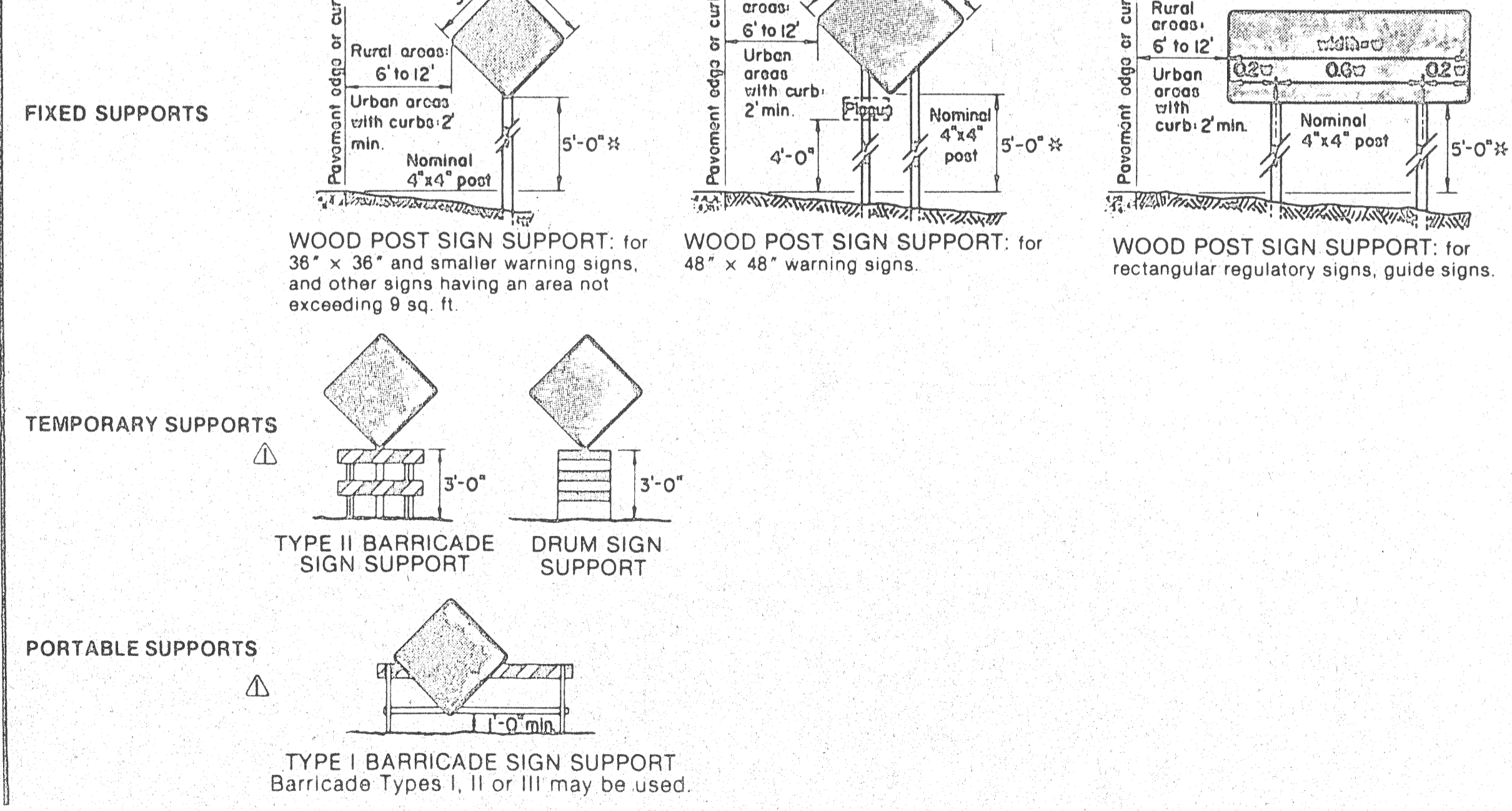
For Type I Barricades, both sides of the top rail shall have reflective orange and reflective white striping.



TYPE I BARRICADES

TYPICAL SIGN SUPPORTS

Other type of portable or temporary sign supports may be used with approval of the ENGINEER.



Where sight distance obstructions are present, or where signs are erected in urban areas, the 5'-0" height should be increased to 7'-0".

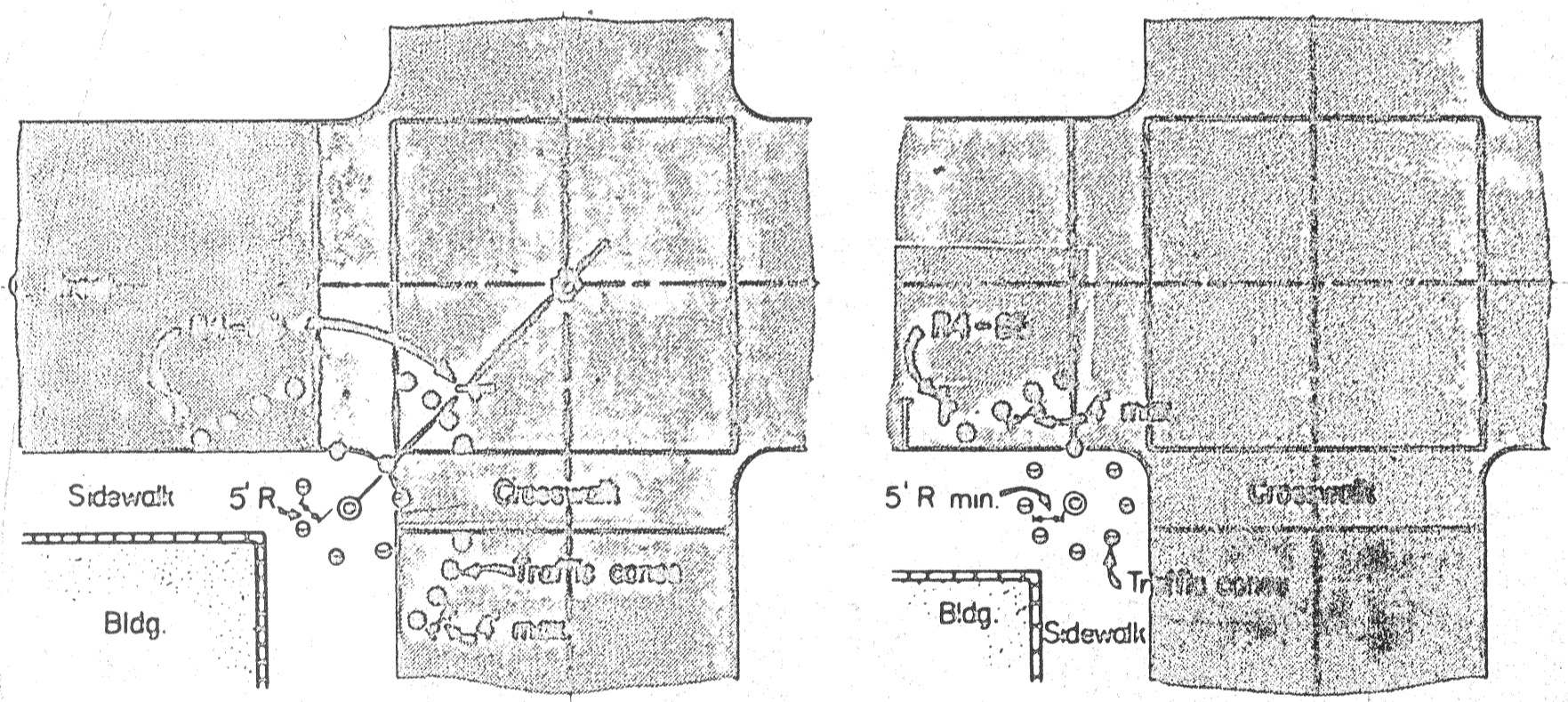
WOOD POST SIGN SUPPORT: for 36" x 36" and smaller warning signs, and other signs having an area not exceeding 9 sq. ft.

WOOD POST SIGN SUPPORT: for 48" x 48" warning signs.

WOOD POST SIGN SUPPORT: for rectangular regulatory signs, guide signs.

TYPICAL DETECTOR INSTALLATION

- At Night—1. Steady burn lamps for delineation instead of cones.
 2. Flashers on barricades.



TYPICAL RESTRICTED PEDESTRIAN MOVEMENTS

Where pedestrian movements are anticipated at night, all holes, trenches or other hazardous areas shall be adequately protected by use of barricades, lights or other protective devices.