

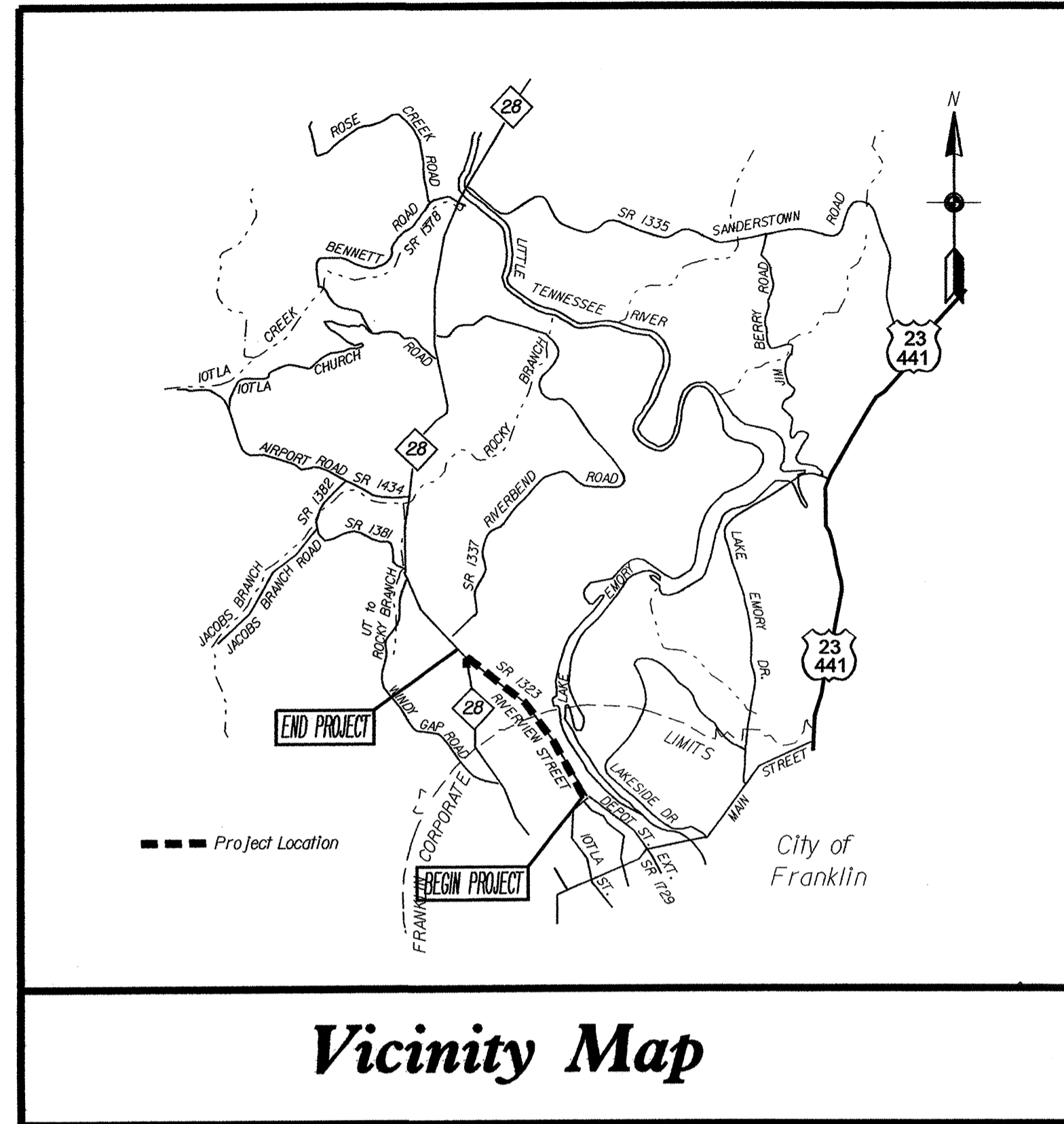
**TIP: R-2408A**

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

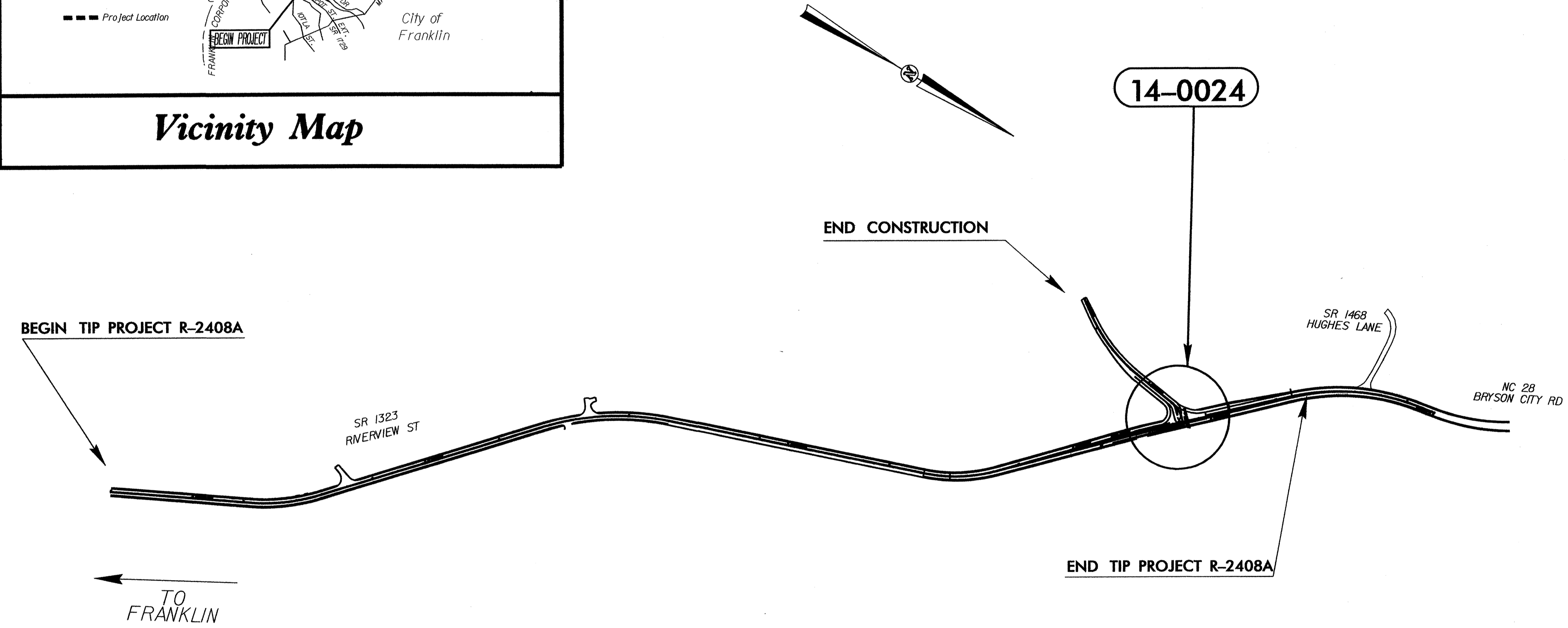
**MACON COUNTY**

**LOCATION: SR 1323 (RIVERVIEW ST.)  
FROM DEPOT ST. EXTENSION TO NC 28**

**TYPE OF WORK: TRAFFIC SIGNAL**



**Vicinity Map**



Refer to "Roadway Standard Drawings  
NCDOT" dated July 2006 and  
"Standard Specifications for Roads  
and Structures" dated July 2006.

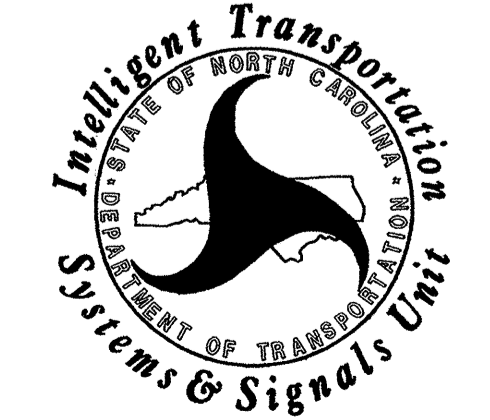
**Index of Plans**

Sheet #	Reference #	Location/Description
Sig. 1		Title Sheet
Sig. 2-5	14-0024	NC 28 (Bryson City Rd.) at SR 1323 (Riverview Street)
Sig. 6-10	N/A	Metal Pole Details
Sig. 11-13	N/A	Inductive Detection Loops Details

**INTELLIGENT TRANSPORTATION SYSTEMS & SIGNALS UNIT**

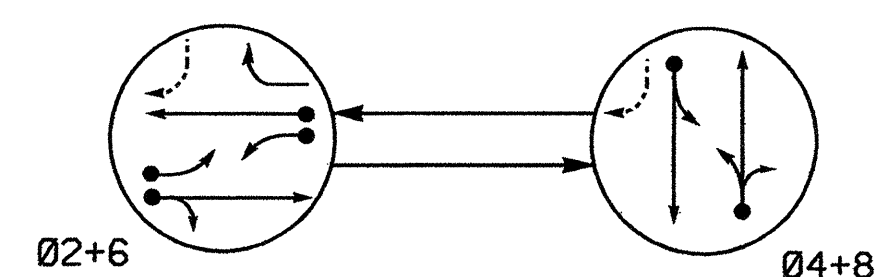
Contacts:  
**Timothy J. Williams, PE - S&G Contracts Engineer**  
**George C. Brown, PE - Signal Equipment Design Engineer**

Prepared In the Office of:  
DIVISION OF HIGHWAYS  
TRAFFIC ENGINEERING AND SAFETY SYSTEMS  
BRANCH



06-NOV-2007 15:47  
s:\ts\signals\workgroups\tip\_projects\r-2408a\signals\design\titlesheet\titlesheet.sig.dsn\_2007mmdd.dgn  
tthompson

**PHASING DIAGRAM**



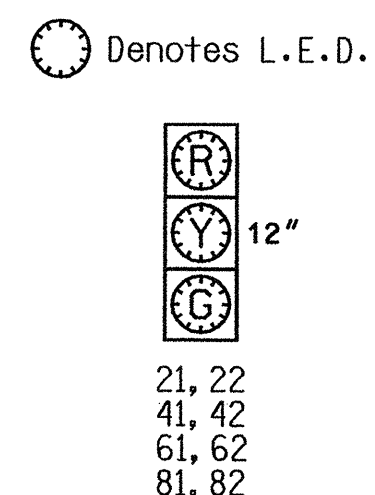
**PHASING DIAGRAM DETECTION LEGEND**

- — DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- UNSIGNALIZED MOVEMENT
- PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø 2+6	Ø 4+8	FLASH
21, 22	G	R	Y
41, 42	R	G	R
61, 62	G	R	Y
81, 82	R	G	R

**SIGNAL FACE I.D.**



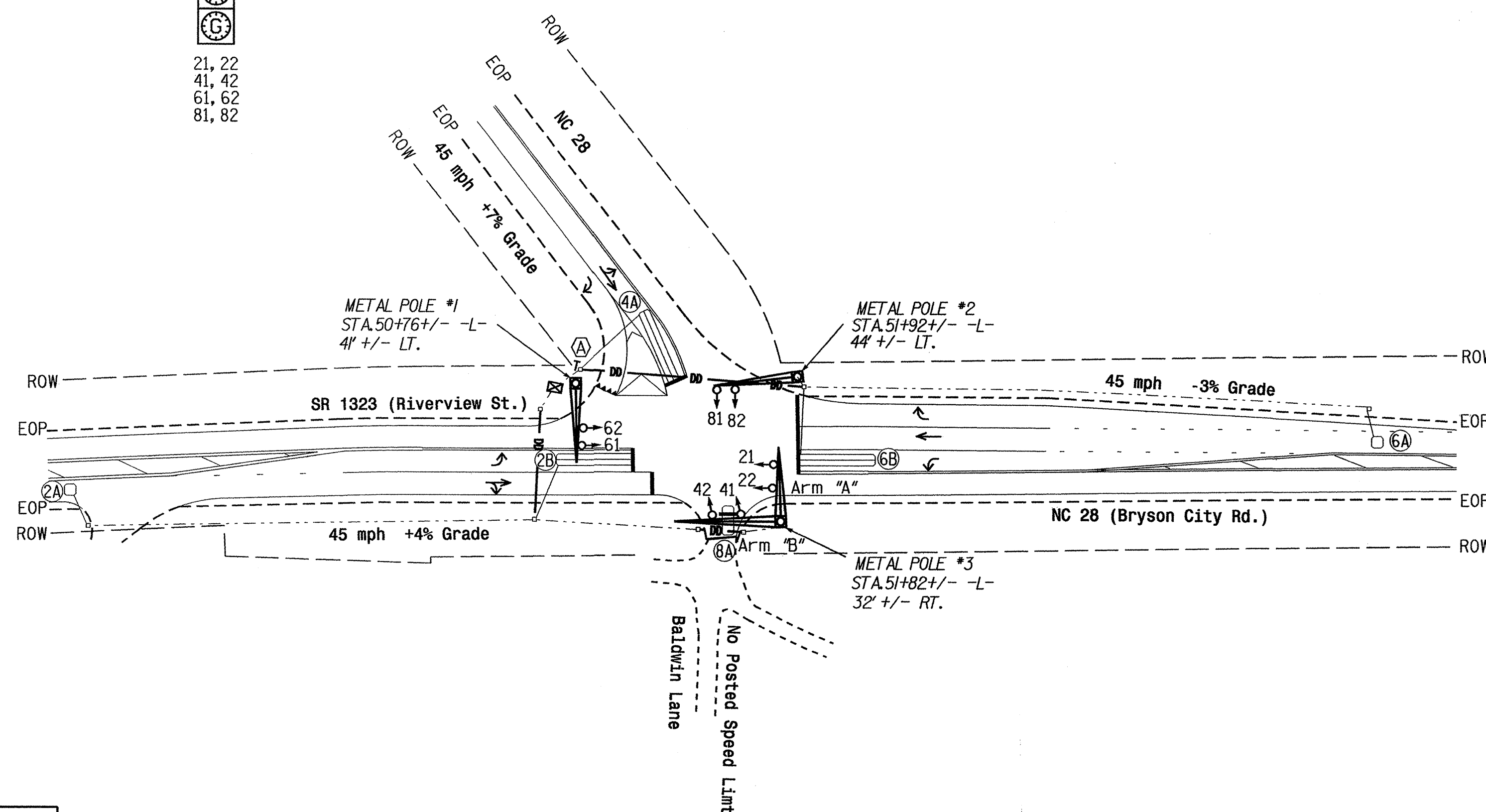
**2070L LOOP & DETECTOR INSTALLATION**

LOOP	INDUCTIVE LOOPS				DETECTOR PROGRAMMING							
	SIZE (FT)	TURNS	DISTANCE FROM STOPBAR (FT)	NEW LOOP	PHASE	CALLING	EXTENSION	FULL TIME DELAY	SYSTEM LOOP	STRETCH TIME	DELAY TIME	NEW CARD
2A	6X6	5	300	Y	2	Y	Y	-	-	-	-	Y
2B	6X40	2-4-2	0	Y	2	Y	Y	Y	-	-	3	Y
4A	6X40	2-4-2	0	Y	4	Y	Y	-	-	-	3	Y
6A	6X6	5	300	Y	6	Y	Y	-	-	-	-	Y
6B	6X40	2-4-2	0	Y	6	Y	Y	Y	-	-	3	Y
8A	6X15	4	+5	Y	8	Y	Y	-	-	-	10	Y

2 Phase Fully Actuated (Isolated)

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated July 2006 and "Standard Specifications for Roads and Structures" dated July 2006.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.



**LEGEND**

- | PROPOSED | EXISTING |
|----------|----------|
|          |          |
|          | N/A      |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
|          |          |
| N/A      |          |
|          |          |
|          |          |
|          | N/A      |
|          |          |

**2070L TIMING CHART**

FEATURE	PHASE			
	2	4	6	8
Min Green 1 *	12	7	12	7
Extension 1 *	6.0	2.0	6.0	2.0
Max Green 1 *	90	20	90	20
Yellow Clearance	4.2	3.5	4.8	3.2
Red Clearance	1.0	1.9	1.1	1.7
Walk 1 *	-	-	-	-
Don't Walk 1	-	-	-	-
Seconds Per Actuation *	2.5	-	2.5	-
Max Variable Initial *	34	-	34	-
Time Before Reduction *	15	-	15	-
Time To Reduce *	30	-	30	-
Minimum Gap	3.0	-	3.0	-
Recall Mode	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	YELLOW	-	YELLOW	-
Dual Entry	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

**New Installation**

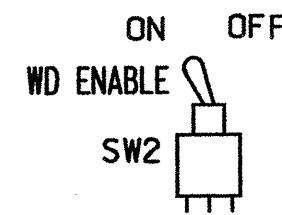
Prepared in the Offices of:  
  
**NC 28 (Bryson City Road) / SR 1323 (Riverview Street)**  
 at  
**NC 28/Baldwin Lane**  
 Division 14 Macon County in Franklin  
 PLAN DATE: September 2007 REVIEWED BY: T. S. Thigpen  
 PREPARED BY: C. E. Pierce REVIEWED BY:  
 SCALE: 1"=50'  
 REVISIONS: \_\_\_\_\_ INIT. DATE \_\_\_\_\_  
 SIGNATURE: *T.J. Williams* DATE: 10/29/07  
 SIG. INVENTORY NO. 14-0024

29-OCT-2007 14:02  
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 14-0024.dgn

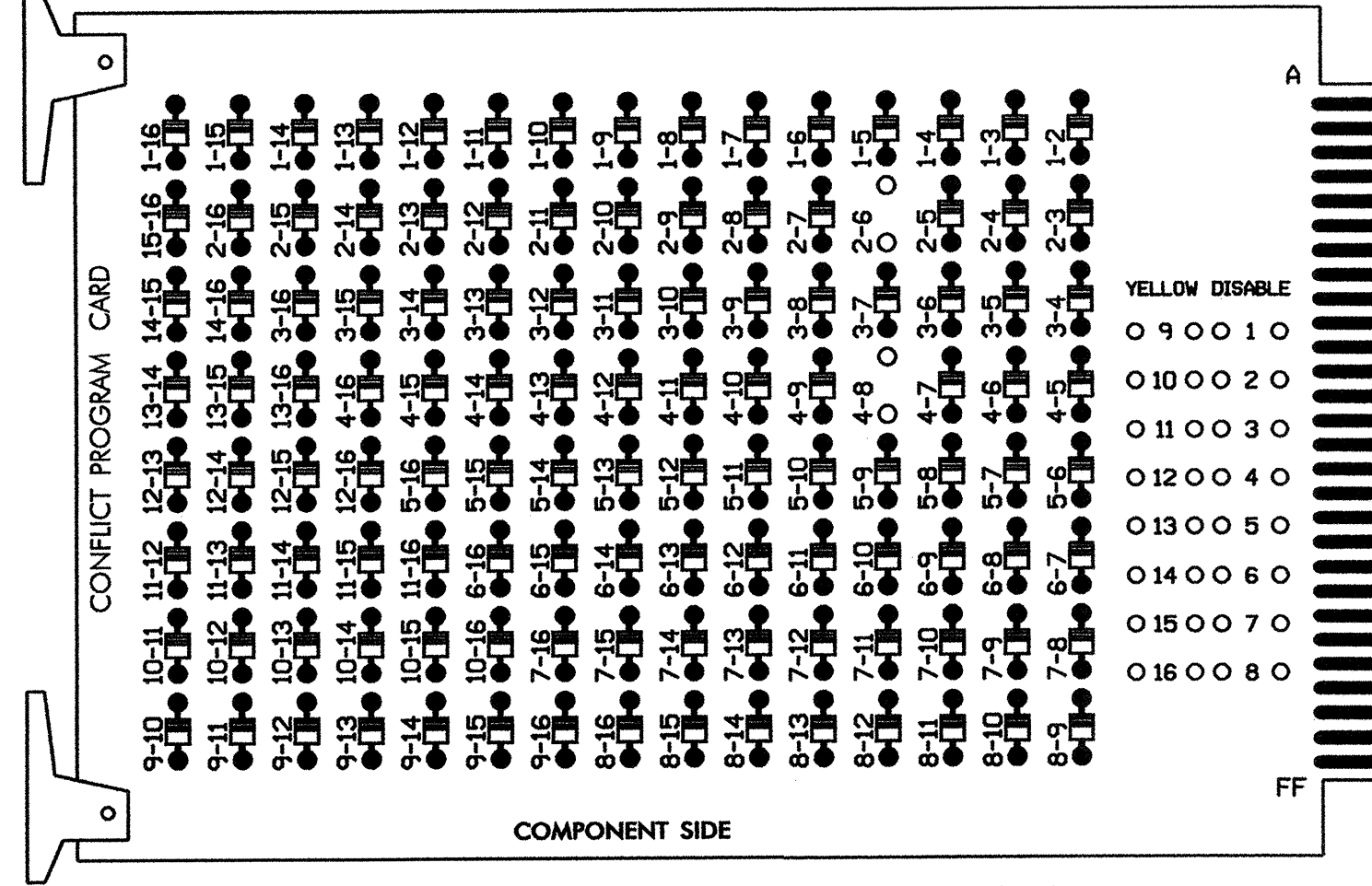


**EDI MODEL 2010ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)



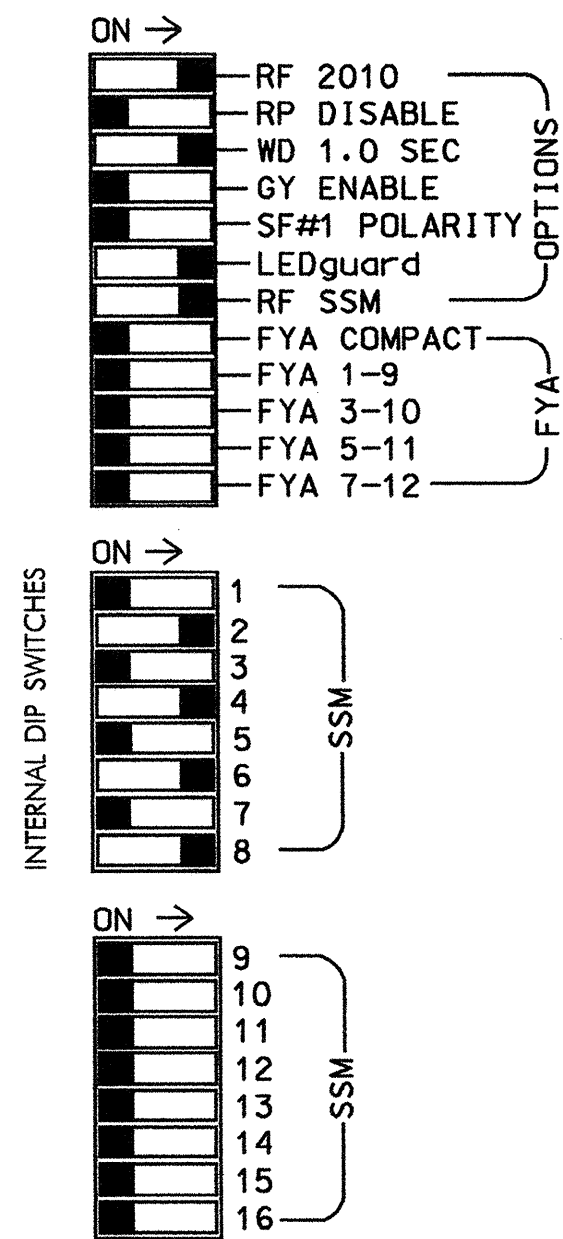
REMOVE DIODE JUMPERS 2-6 and 4-8.



REMOVE JUMPERS AS SHOWN

**NOTES:**

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Make sure jumpers SEL2-SEL5 are present on the monitor board.



■ = DENOTES POSITION OF SWITCH

**NOTES**

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Ensure that Red Enable is active at all times during normal operation. To prevent Red Failures on unused monitor channels, tie unused red monitor inputs 1,3,5,7,9,10,11,12,13,14,15 & 16 to load switch AC+ per the cabinet manufacturer's instructions.
- Program phases 2 and 6, on the controller unit, for Start Up In Green.
- Enable Simultaneous Gap-Out, on the controller unit, for all phases.
- Program phases 4 and 8, on the controller unit, for Dual Entry.
- Program phases 2 and 6, on the controller unit, for Variable Initial and Gap Reduction.

**EQUIPMENT INFORMATION**

CONTROLLER.....CONTRACTOR SUPPLIED 2070L  
 CABINET.....CONTRACTOR SUPPLIED 332  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...12  
 LOAD SWITCHES USED.....S2,S4,S6,S8  
 PHASES USED.....2,4,6,8  
 OVERLAPS.....NONE

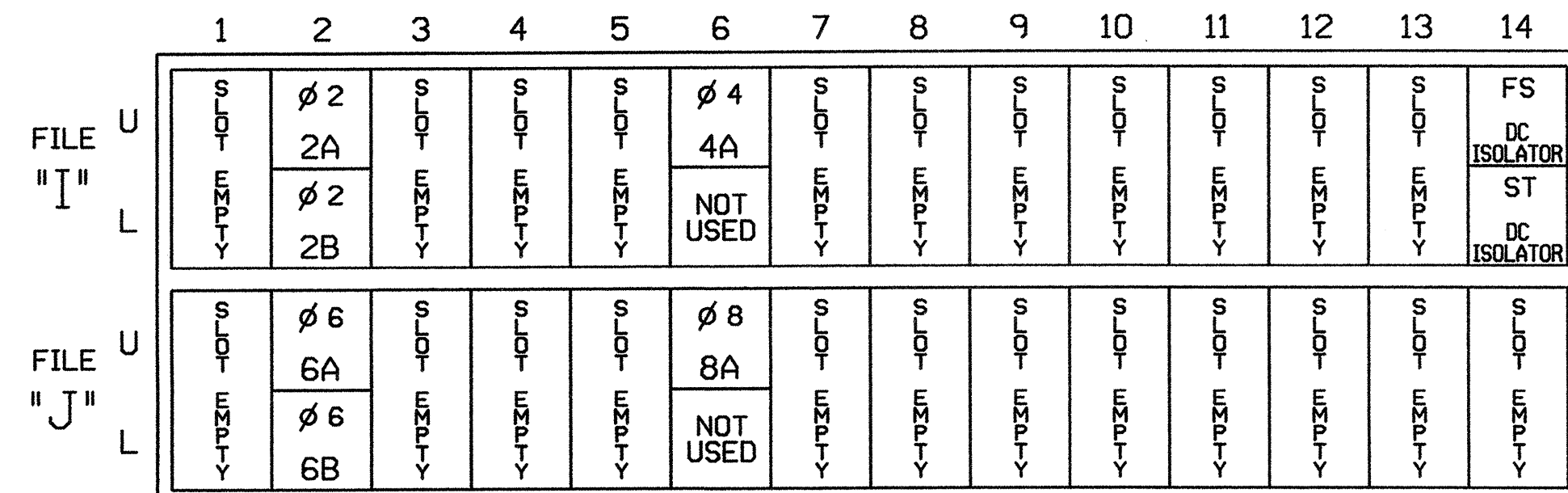
**SIGNAL HEAD HOOK-UP CHART**

LOAD SWITCH NO.	S1	S2	S2P	S3	S4	S4P	S5	S6	S6P	S7	S8	S8P
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED
SIGNAL HEAD NO.	NU	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU
RED		128			101			134			107	
YELLOW		129			102			135			108	
GREEN		130			103			136			109	
RED ARROW												
YELLOW ARROW												
GREEN ARROW												

NU = Not Used

**INPUT FILE POSITION LAYOUT**

(front view)



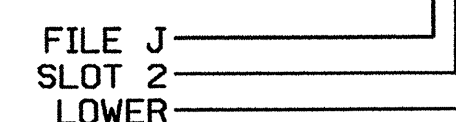
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

**INPUT FILE CONNECTION & PROGRAMMING CHART**

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y	Y		3
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			10

INPUT FILE POSITION LEGEND: J2L



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 14-0024  
 DESIGNED: September 2007  
 SEALED: 10-29-07  
 REVISED: N/A

**New Installation**

Electrical and Programming Details For: **NC 28 (Bryson City Road) / SR 1323 (Riverview Street) at NC 28/Baldwin Lane**

Division 14, Wacon County, in Franklin

Prepared in the Offices of: **James Peterson** (Signature)

PLAN DATE: **October 2007** REVIEWED BY: **JTP**

PREPARED BY: **James Peterson** REVIEWED BY:

SEAL: **James T. Rowe, Jr.** (Professional Engineer Seal)

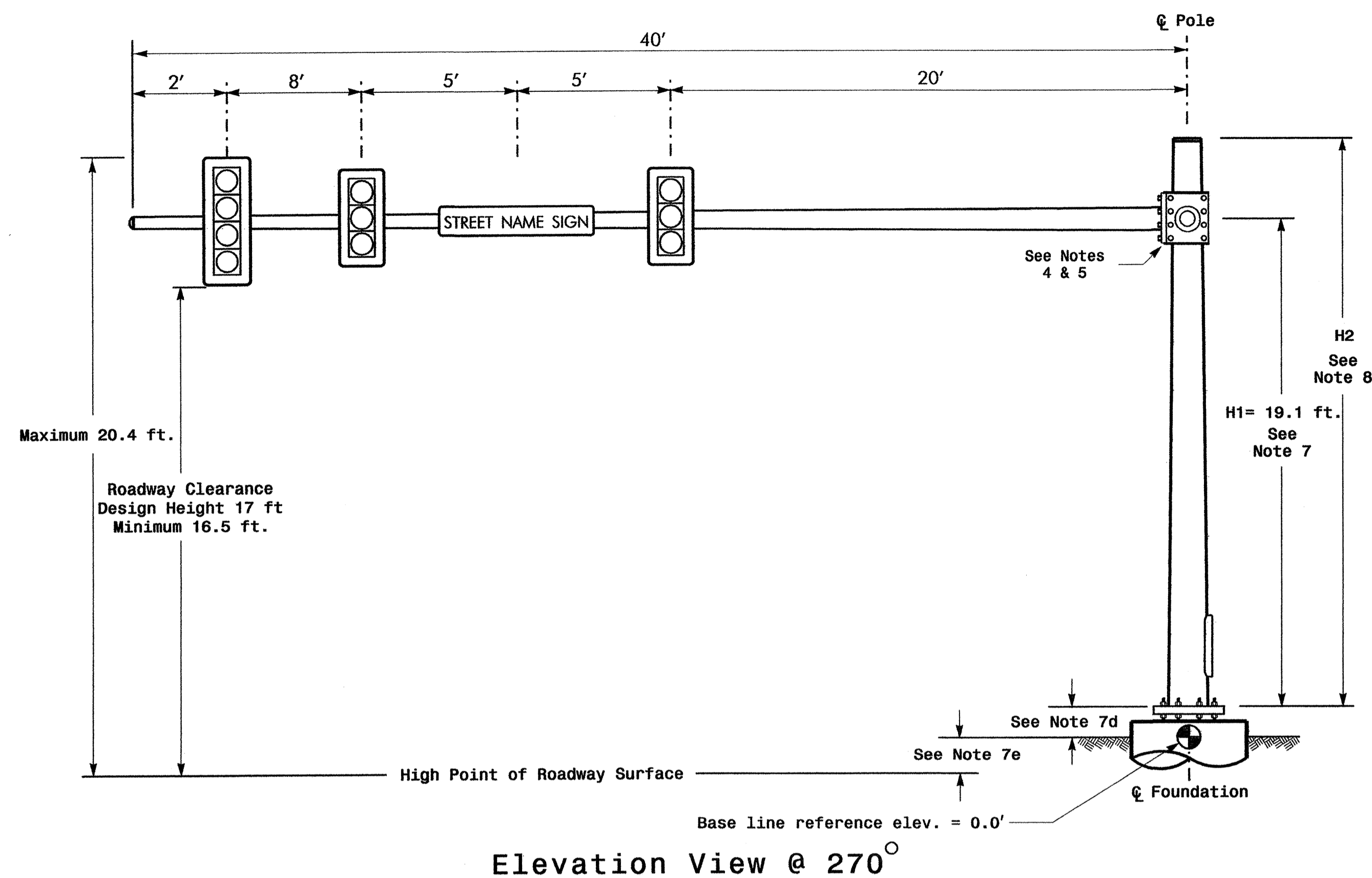
Signature: **John Thomas** (Signature) DATE: **10-30-07**

SIG. INVENTORY NO. **14-0024**



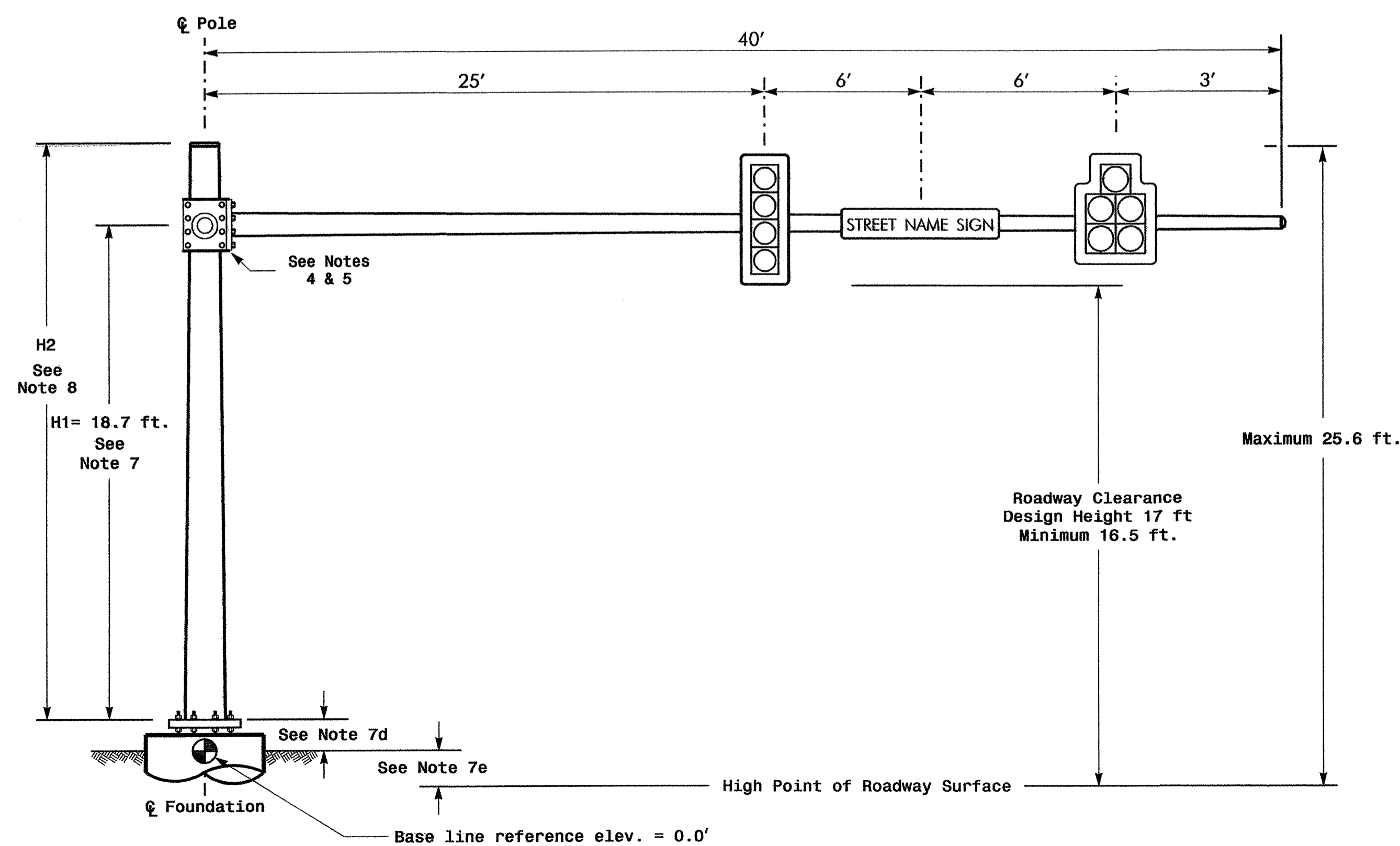


Design Loading for METAL POLE NO. 3, MAST ARM A



Elevation View @ 270°

Design Loading for METAL POLE NO. 3, MAST ARM B

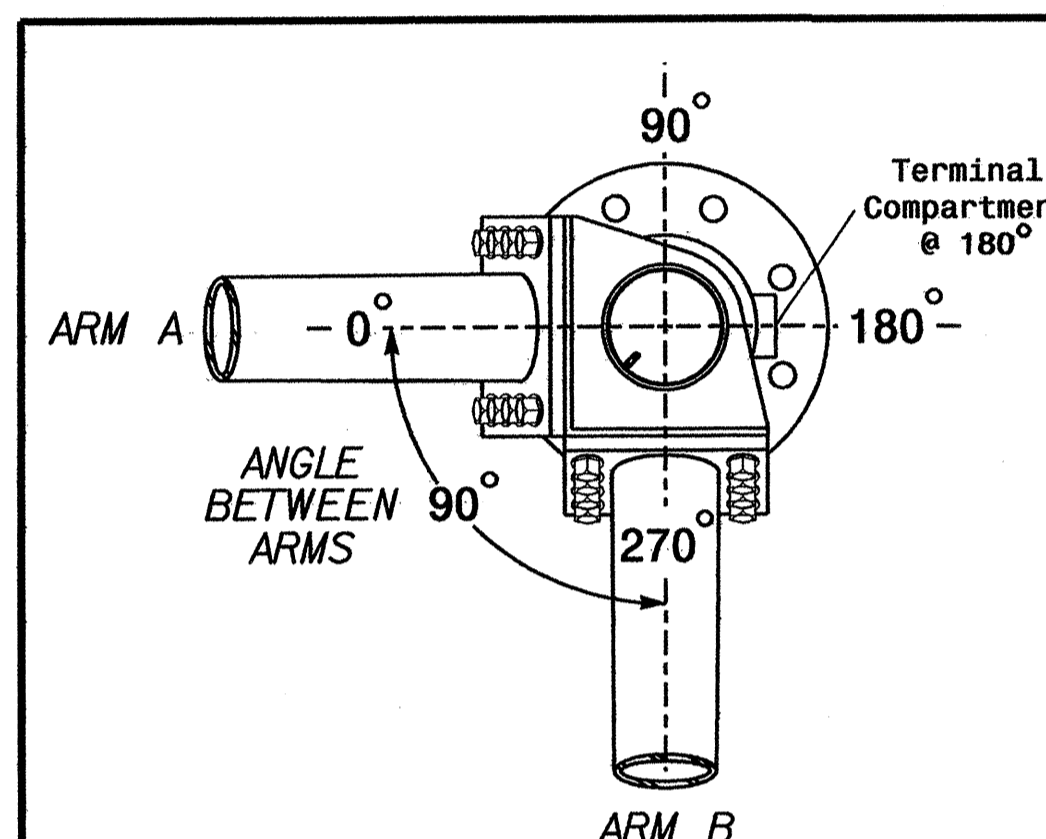


Elevation View @ 0°

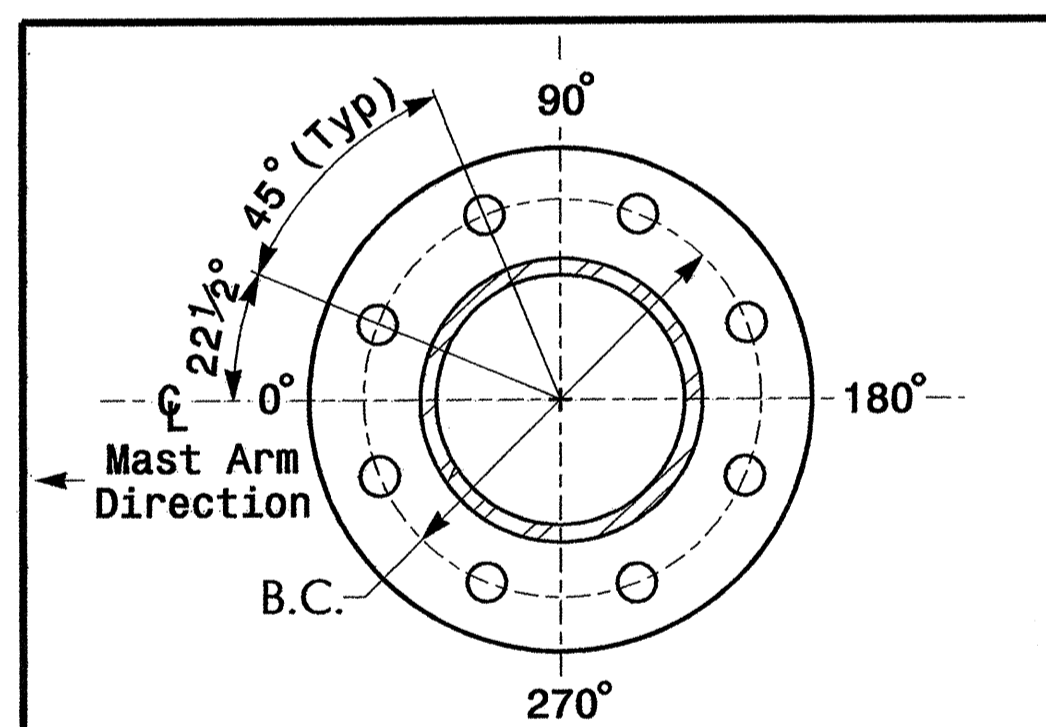
**SPECIAL NOTE**  
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

Elevation Data for Mast Arm Attachment (H1)

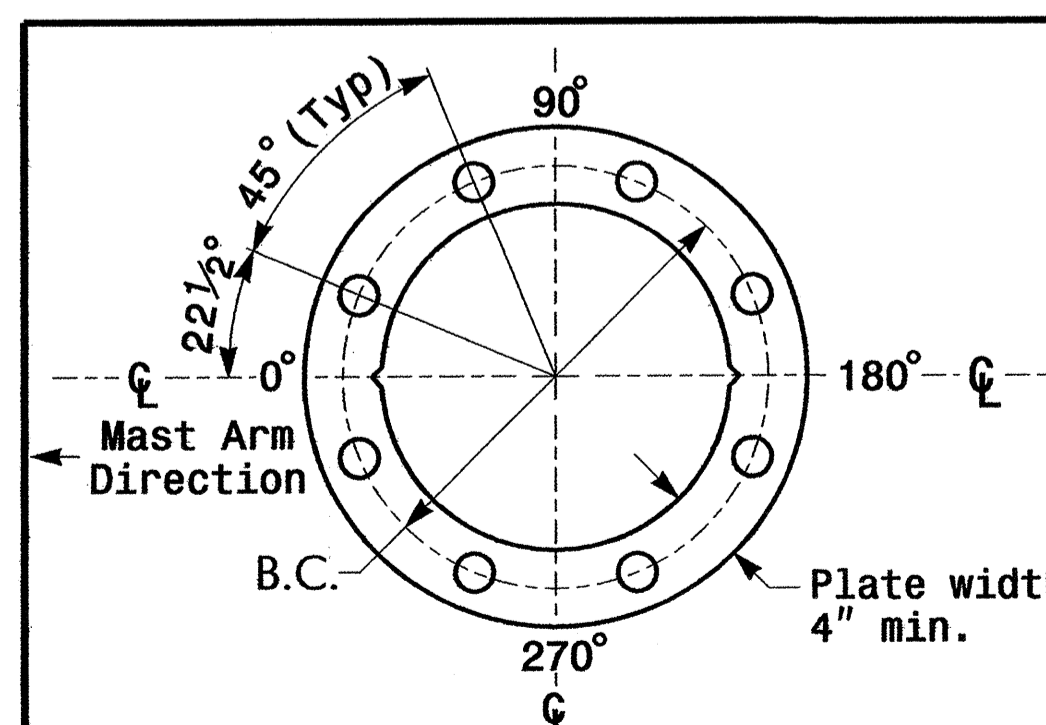
Elevation Differences for:	Arm "A"	Arm "B"
Baseline reference point at $\phi$ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+1.1 ft.	0.0 ft.
Elevation difference at Edge of travelway or face of curb	NA	NA



POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL  
See Note 6



BASE PLATE TEMPLATE & ANCHOR BOLT LOCK PLATE DETAIL  
For 8 Bolt Base Plate

MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	SIGNAL HEAD 12"-5 SECTION-WITH BACKPLATE AND ASTRO-BRAC	16.3 S.F.	42.0" W X 56.0" L	103 LBS
	POLYCARBONATE SIGNAL HEAD 12"-4 SECTION-WITHOUT BACKPLATE	5.6 S.F.	14.0" W X 56.0" L	62.5 LBS
	SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE AND ASTRO-BRAC	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	STREET NAME SIGN RIGID MOUNTED WITH ASTRO-SIGN-BRAC	12.0 S.F.	18.0" W X 96.0" L	27 LBS

NOTES

Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
  - The 4th Edition 2001 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals, including all of the latest interim revisions.
  - The 2006 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
  - The 2006 NCDOT Roadway Standard Drawings.
  - The traffic signal project plans and special provisions.

Design Requirements

- Design the traffic signal structure using the loading conditions shown in the elevation views. These are anticipated worst case "Design loads" and may not represent the actual loads that will be applied at the time of the installation. The contractor should refer to the traffic signal plans for the actual loads that will be applied at the time of the installation.
- Design all signal supports using stress ratios that do not exceed 0.9.
- The camber design for mast arm deflection should provide an appearance of a low pitched arch where the tip or the free end of the mast arm does not deflect below horizontal when fully loaded.
- A clamp-type bolted mast arm-to-pole connection may be used instead of the welded ring stiffened box connection shown as long as the connection meets all of the design requirements. This requires staggering the connections. Use elevation data for each arm to determine appropriate arm connection points.
- Design base plate with 8 anchor bolt holes. Provide 2 inch x 60 inch anchor bolts.
- The mast arm attachment height (H1) shown is based on the following design assumptions:
  - Mast arm slope and deflection are not considered in determining the arm attachment height as they are assumed to offset each other.
  - Signal heads attached to the mast arm are rigid mounted and vertically centered on the arm.
  - The roadway clearance height for design is as shown in the elevation views.
  - The top of the pole base plate is .75 feet above the ground elevation.
  - Refer to the Elevation Data chart for elevation differences between the proposed foundation ground level and the high point on the roadway.
- The pole manufacturer will determine the total height (H2) of the pole using the greater of the following:
  - Mast arm attachment height (H1) plus 2 feet, or
  - H1 plus 1/2 of the total height of the mast arm attachment assembly plus 1 foot.
- If pole location adjustments are required, the contractor must gain approval from the engineer as this may affect the mast arm lengths and arm attachment heights. The contractor may contact the Signals & Geometrics Structural Engineer for assistance at (919) 773-2800.
- The contractor is responsible for verifying that the mast arm lengths shown will allow proper positioning of the signal heads over the roadway.
- The contractor is responsible for providing soil penetration testing data (SPT) to the pole manufacturer so site specific foundations can be designed.

NCDOT Wind Zone 4 (90 mph)

Prepared in the Office of:  
  
 STATE OF NORTH CAROLINA  
 DEPARTMENT OF TRANSPORTATION  
 Signals and Geometrics Section  
 750 N. Greenfield Place, Garner, NC 27529

NC 28 (Bryson City Road) /  
 SR 1323 (Riverview Street)  
 at  
 NC 28/Baldwin Lane  
 Division 14 Macon County in Franklin  
 PLAN DATE: September 2007 REVIEWED BY: T. S. Thigpen  
 PREPARED BY: C. E. Pierce REVIEWED BY:

SEAL  
  
 T. S. Thigpen  
 ENGINEER  
 11/16/07  
 DATE  
 SIG. INVENTORY NO. 14-0024

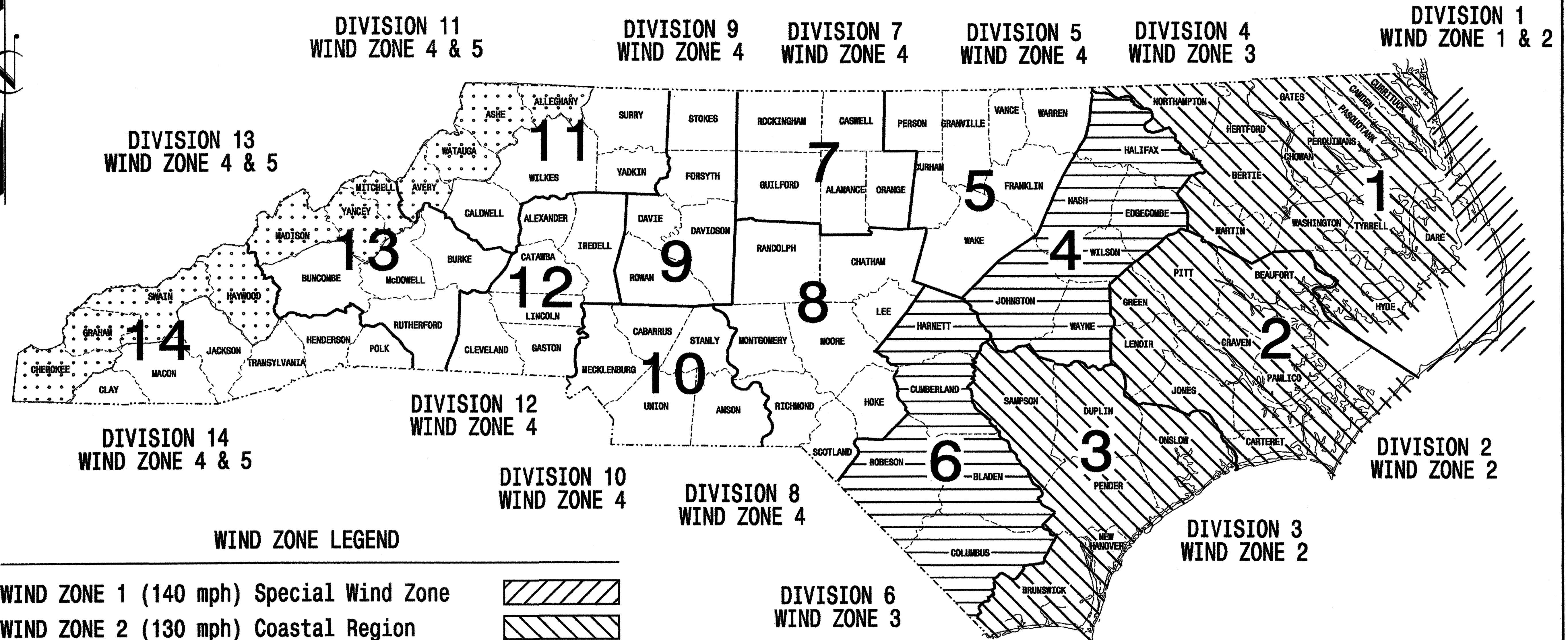
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# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	R-2408A	Sig. 6
F. A. PROJ. NO.	M 1	
PROJECT ID. NO.		

## STANDARD DRAWINGS FOR METAL POLES



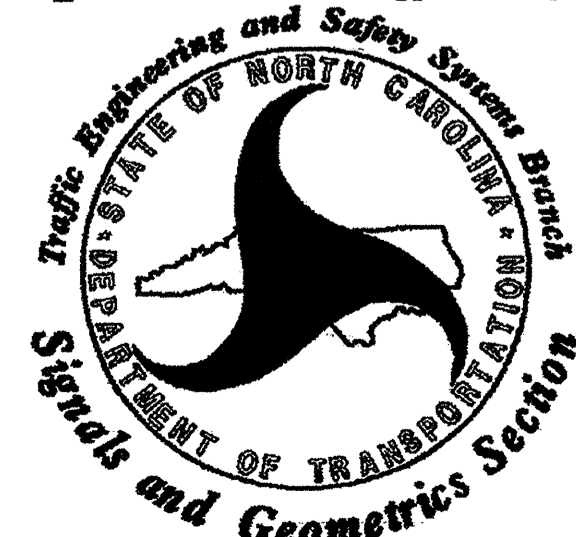
### WIND ZONE LEGEND

WIND ZONE 1 (140 mph) Special Wind Zone		
WIND ZONE 2 (130 mph) Coastal Region		
WIND ZONE 3 (110 mph) Eastern Region		
WIND ZONE 4 (90 mph) Central & Mtn. Region		
WIND ZONE 5 (120 mph) Special Wind Zone		

<http://www.ncdot.org/doh/preconstruct/traffic/tmssu/ws/default.htm>

NCDOT METAL POLE STANDARDS

Prepared in the Offices of:



122 N. McDowell St., Raleigh, NC 27603

Designed in conformance with the 2002 Interim to the 4th Edition 2001

AASHTO

Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals

### INDEX OF PLANS

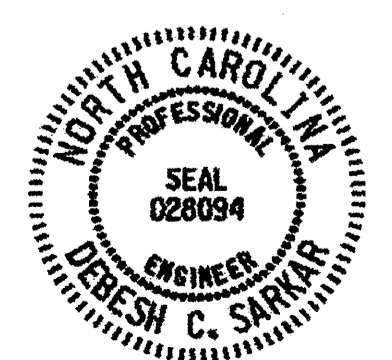
DRAWING NUMBER	DESCRIPTION
M 1	Title Sheet
M 2	Fabrication Details - All Poles
M 3	Fabrication Details - Strain Poles
M 4,5	Fabrication Details - Mast Arm Poles
M 6	Construction Details - Strain Poles
M 7	Construction Details - Foundations
M 8	Standard Strain Poles

### NCDOT CONTACTS:

#### TRAFFIC ENGINEERING AND SAFETY SYSTEMS BRANCH

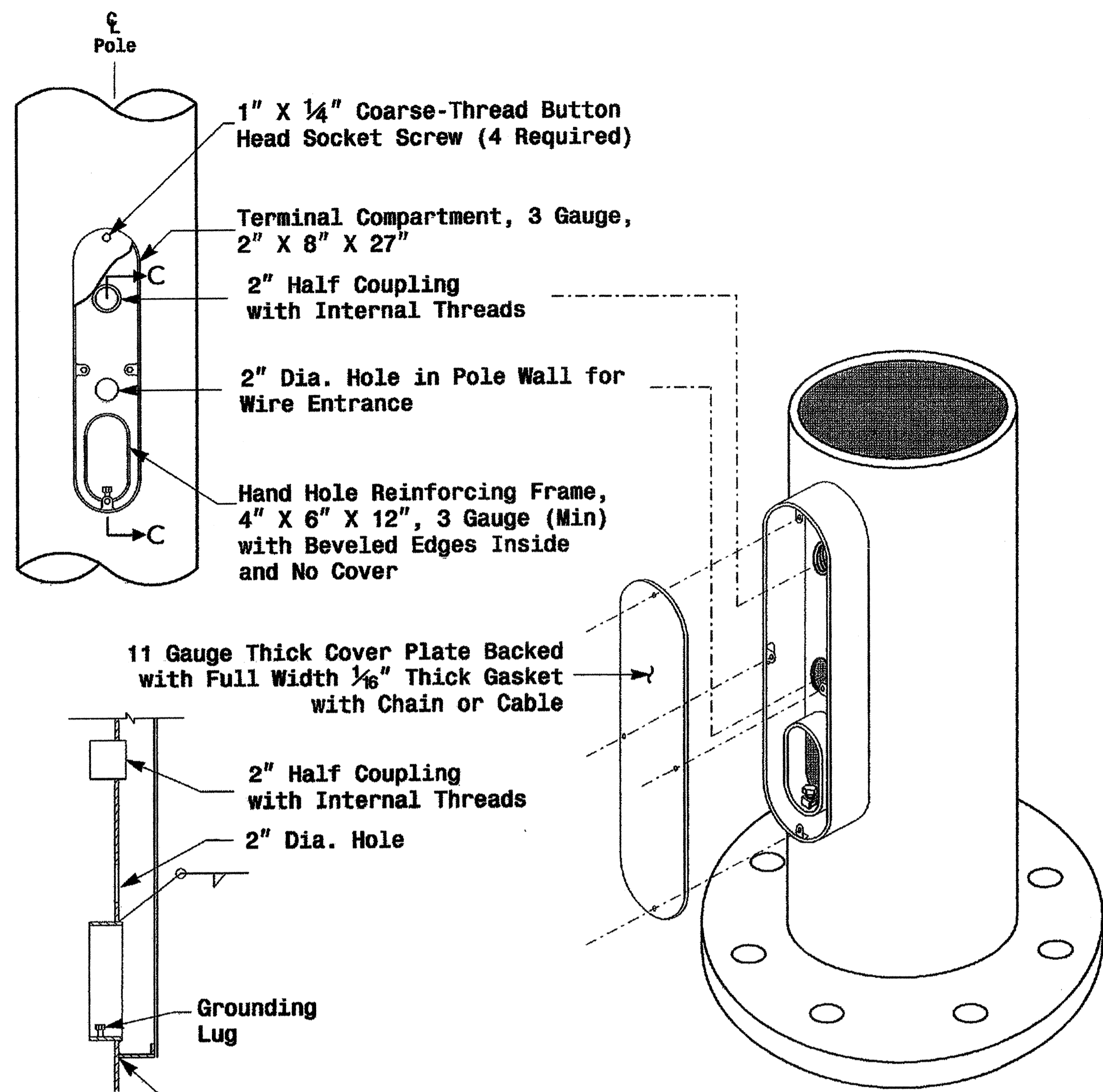
- G. A. Fuller, P.E. - State ITS and Signals Engineer
- R. E. Mullinax, P.E. - Signals and Geometrics Engineer
- P. L. Alexander, P.E. - Signals and Geometrics Special Projects Engineer
- D. C. Sarkar, P.E. - Signals and Geometrics Structural Engineer
- A. M. Esposito, P.E. - Signals and Geometrics Project Engineer
- C. F. Andrews, Jr. - Signals and Geometrics Project Engineer

SEAL



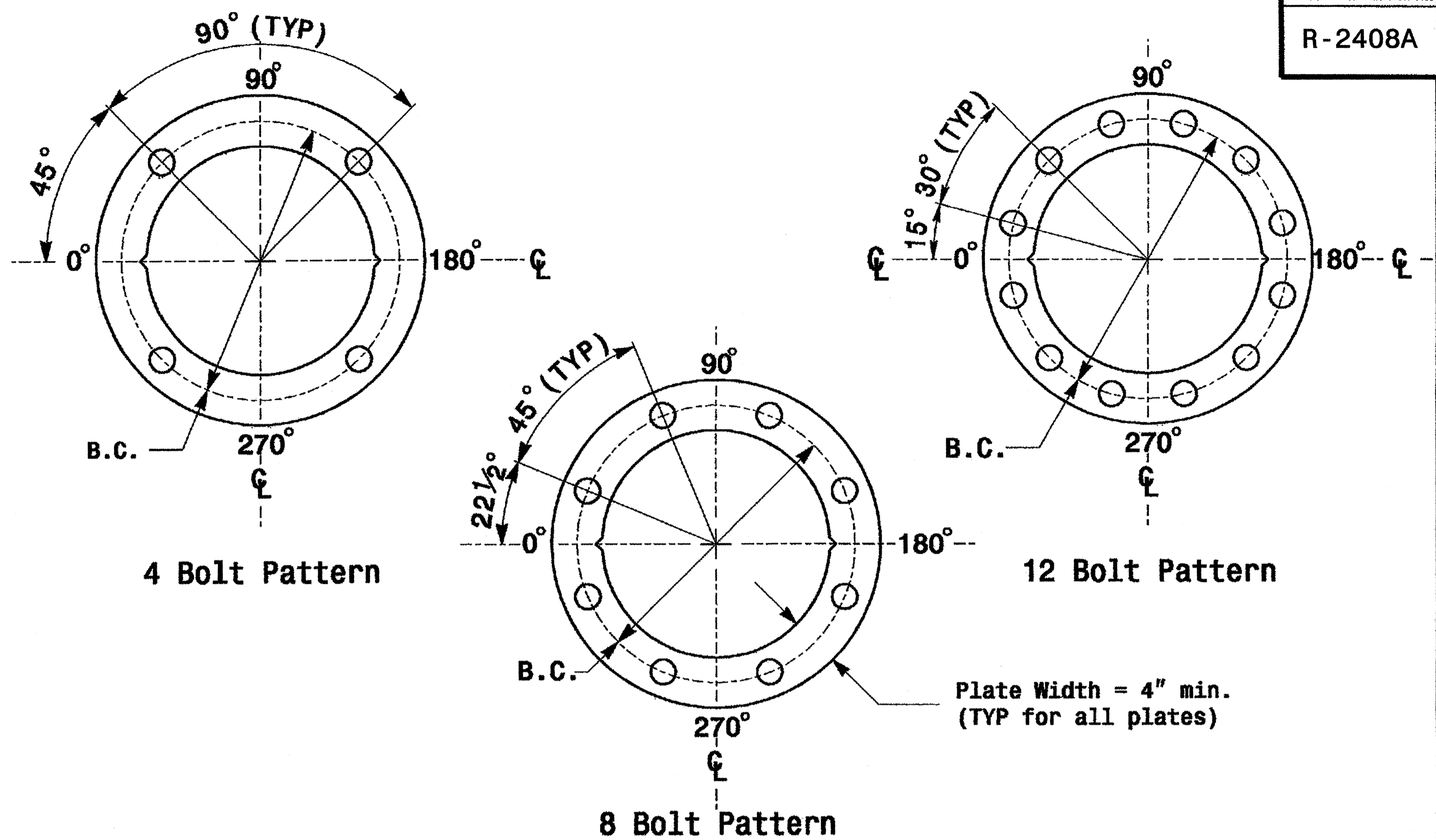
*D. Sarkar* 9.2.2005  
SIGNATURE DATE



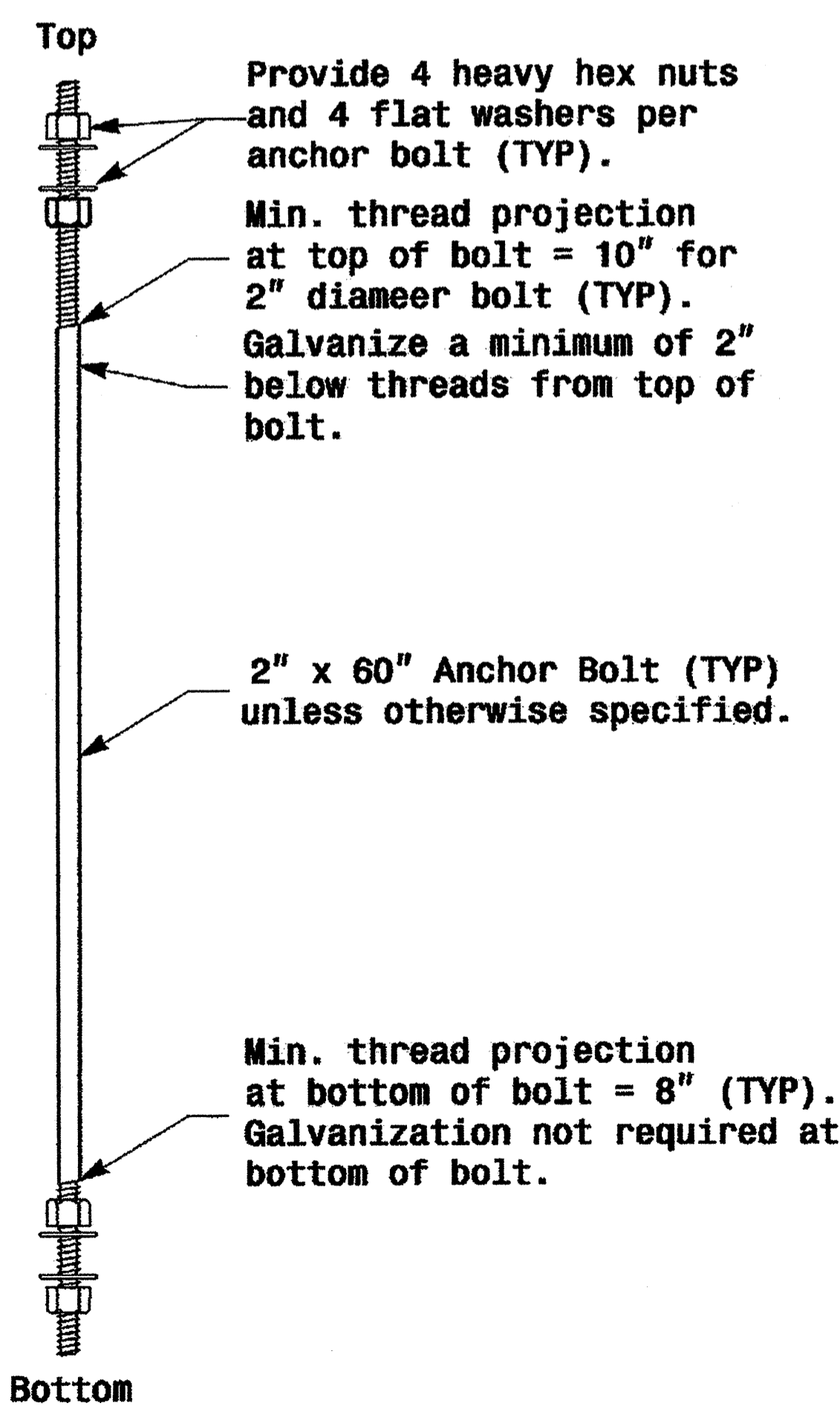


Section C-C Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

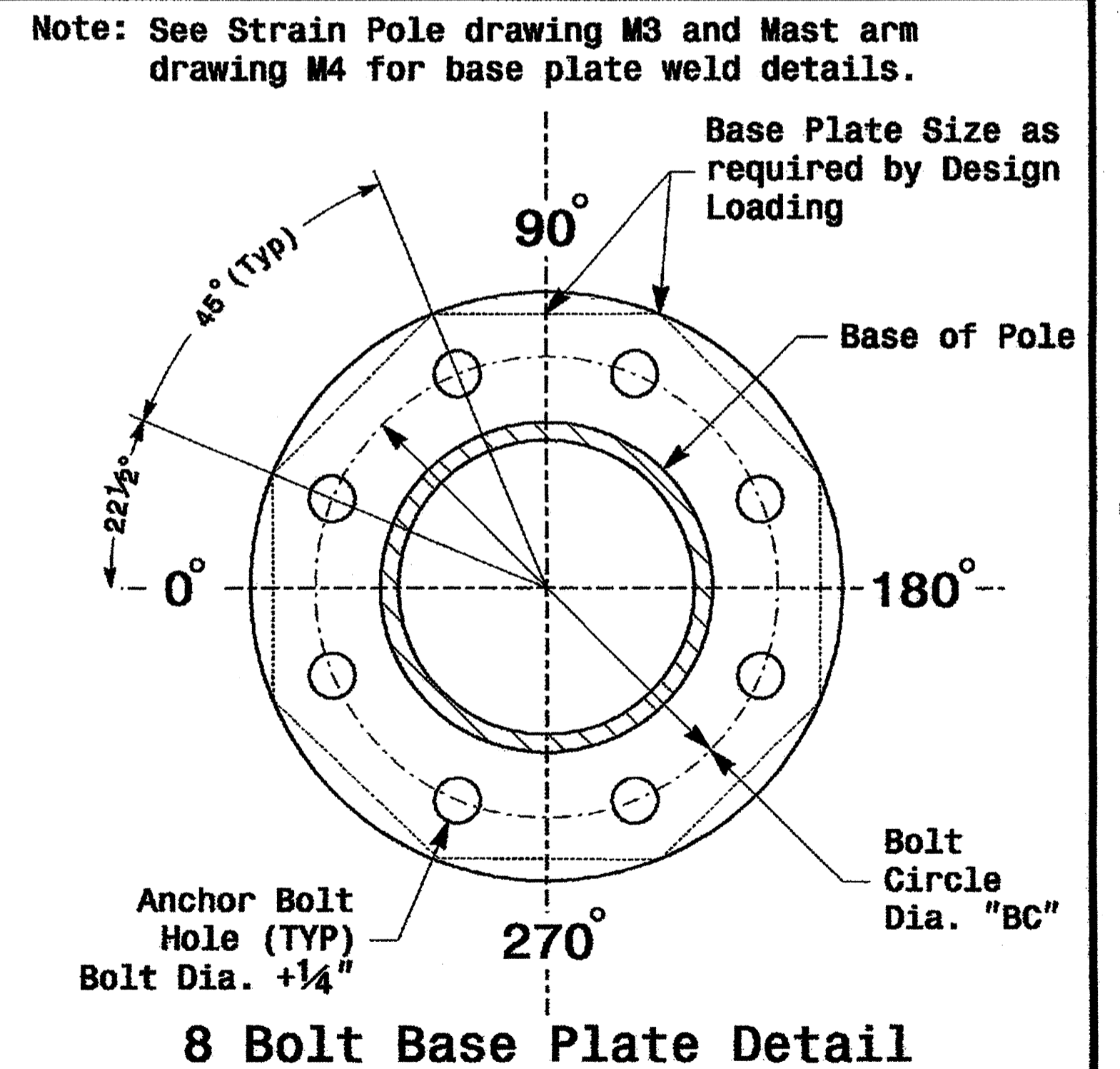
**Terminal Compartment Detail**



Construct Templates and Plates from 1/4" min. thick Steel. Galvanizing is not required.  
**Base Plate Template and Anchor Bolt Lock Plate Details**



**Anchor Bolt Detail**



Shaft I.D. Tag (Provide on Strain Poles and Mast Arm Poles)

MFG	MFG. DATE: MM/YY
SHAFT D/T/L/Y	_____
ARM-A D/T/L/Y	_____
ARM-B D/T/L/Y	_____
A.B. DIA./B.C./L/Y	_____
NCDOT STANDARD	_____

Arm I.D. Tag (Provide on each section of a multi-section mast arm)

MFG	MFG. DATE: MM/YY
SECTION D/T/L/Y	_____
NCDOT STANDARD	_____

- Notes:
- 1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
  - 2) A.B. = Anchor Bolt
  - 3) B.C. = Bolt Circle of Anchor Bolts
  - 4) If Custom Design, use "NCDOT STANDARD" line for plan pole I.D.
  - 5) See drawing M4 for mounting positions of I.D. tags.

**Identification Tag Details**

Prepared in the Office of: **North Carolina Department of Transportation**

222 N. McDowell St., Raleigh, NC 27603

SCALE: 0 MA NONE

Typical Fabrication Details Common To All Metal Poles

PLAN DATE: May 2005 REVISIONS: \_\_\_\_\_

PREPARED BY: P.L. Alexander REVIEWED BY: C.F. Andrews

REVIEWED BY: A.M. Esposito

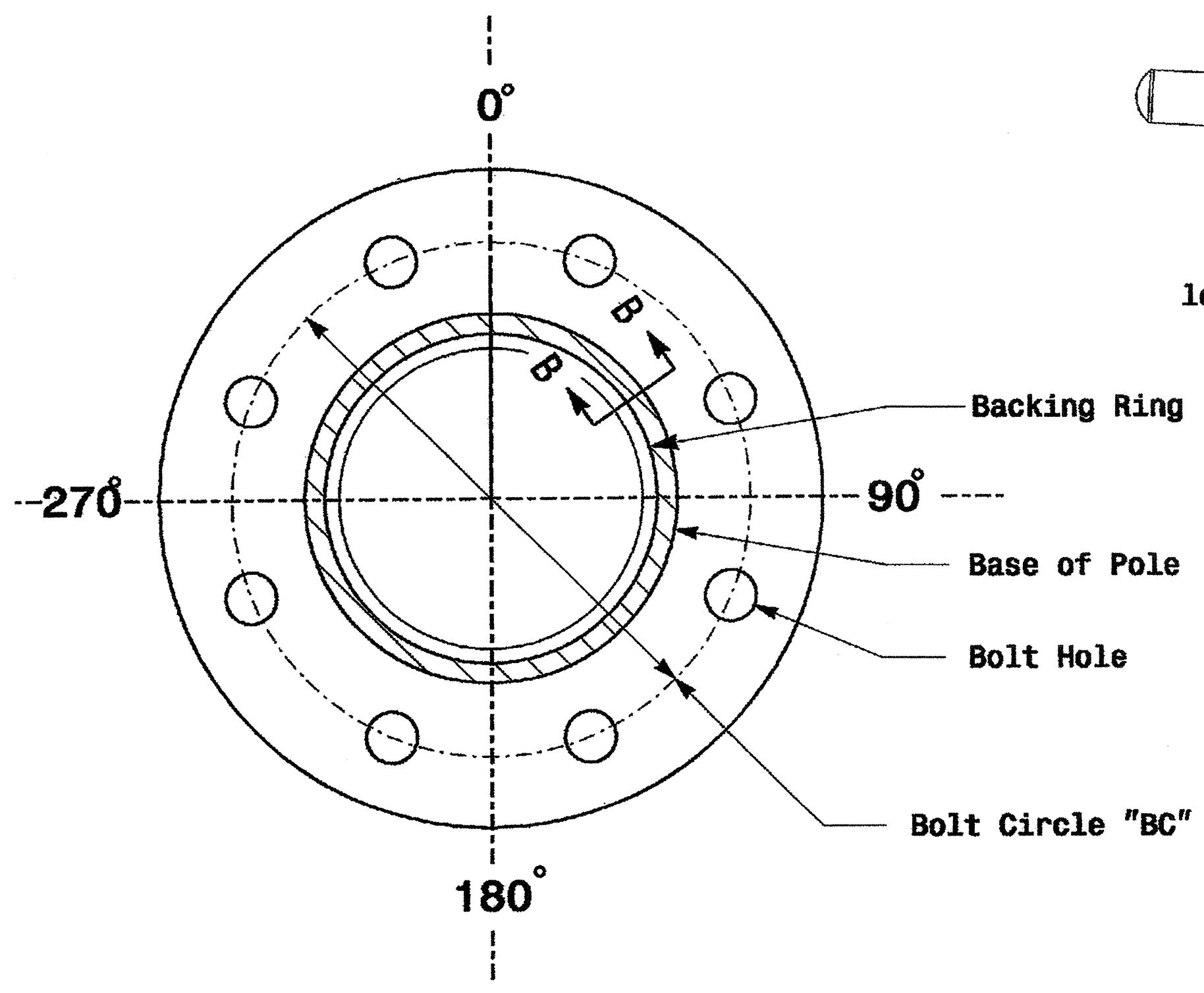
INIT. DATE

Signature: *D. Sarker* 9/2/2005

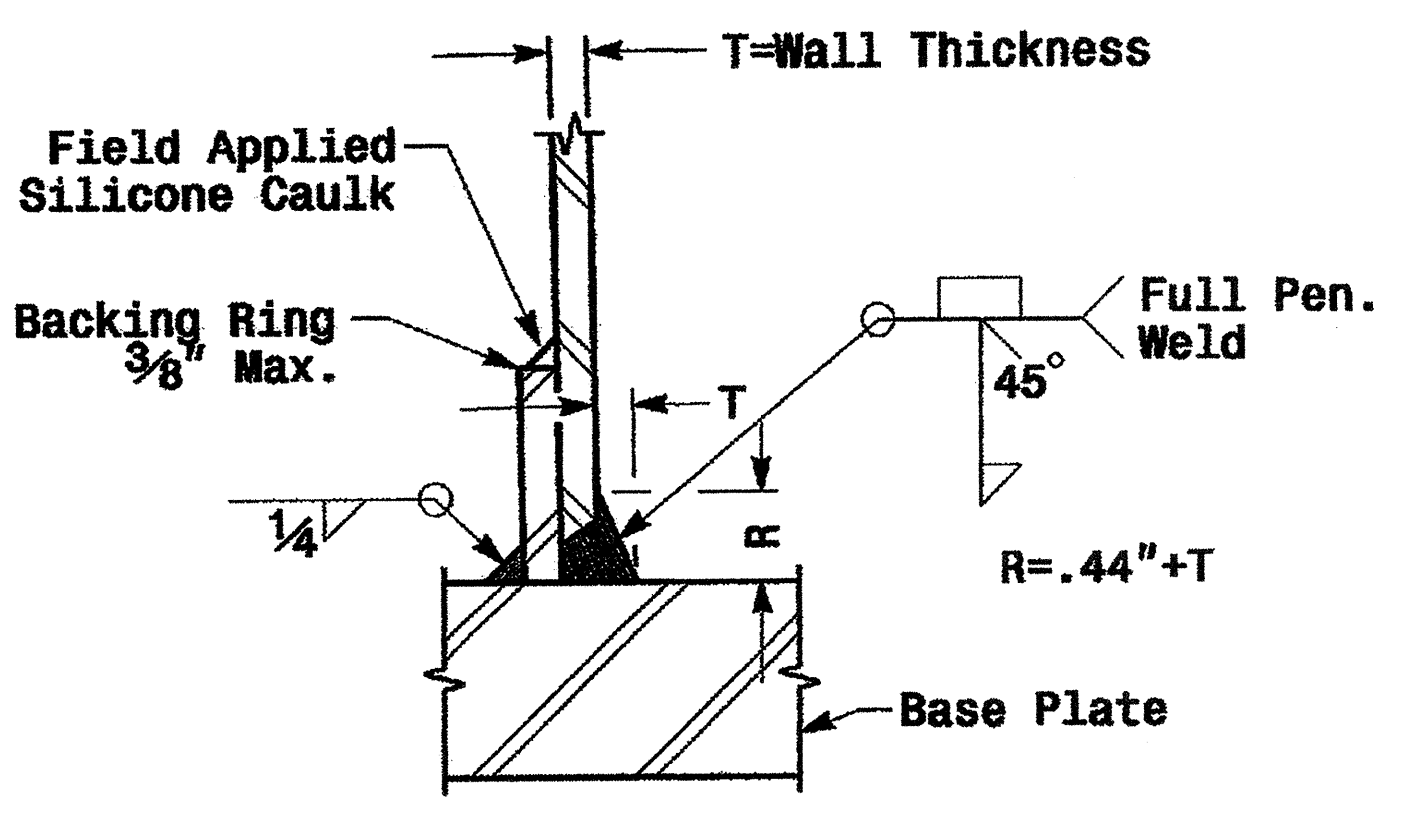
SEAL: NORTH CAROLINA DEPARTMENT OF TRANSPORTATION SEAL 028094 ENGINEER DEBESH C. SARKAR

SIG. INVENTORY NO.

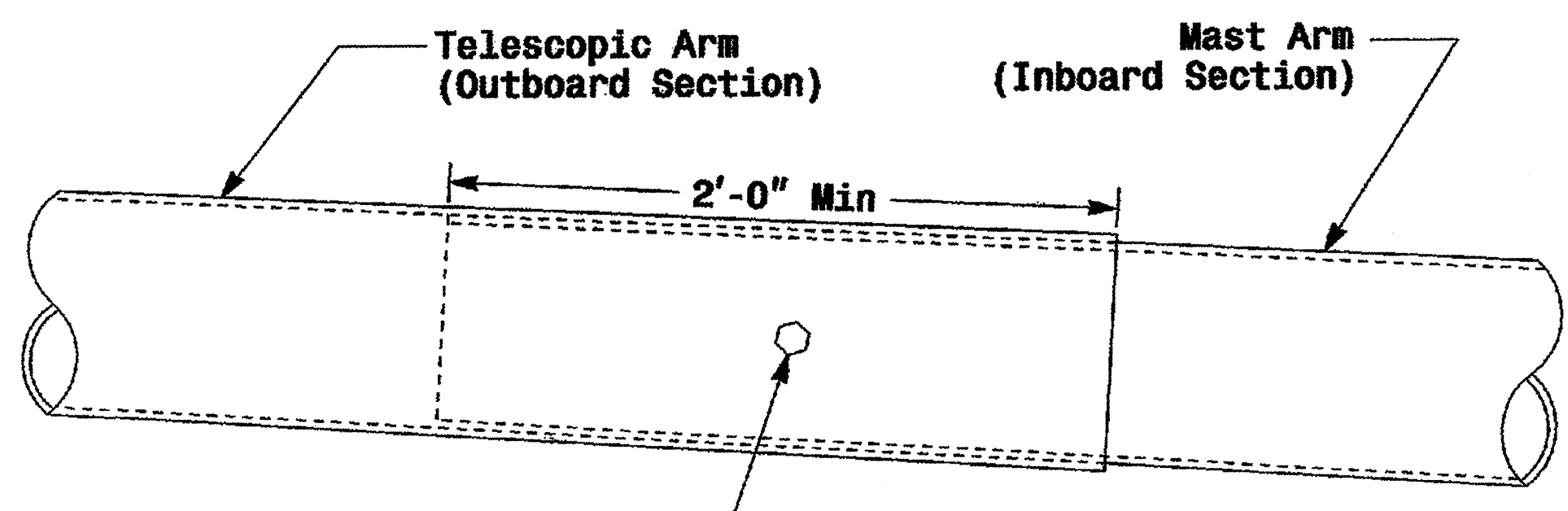
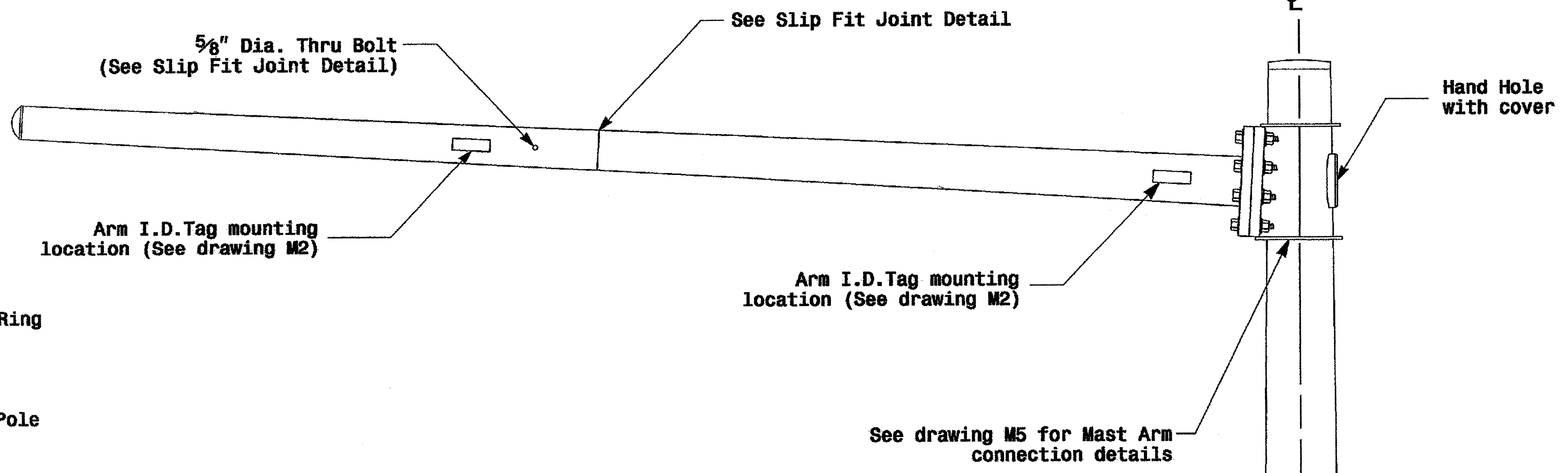
**Fabrication Details - All Poles**



Section A-A  
(See drawing M 2)  
**Pole Base Plate**

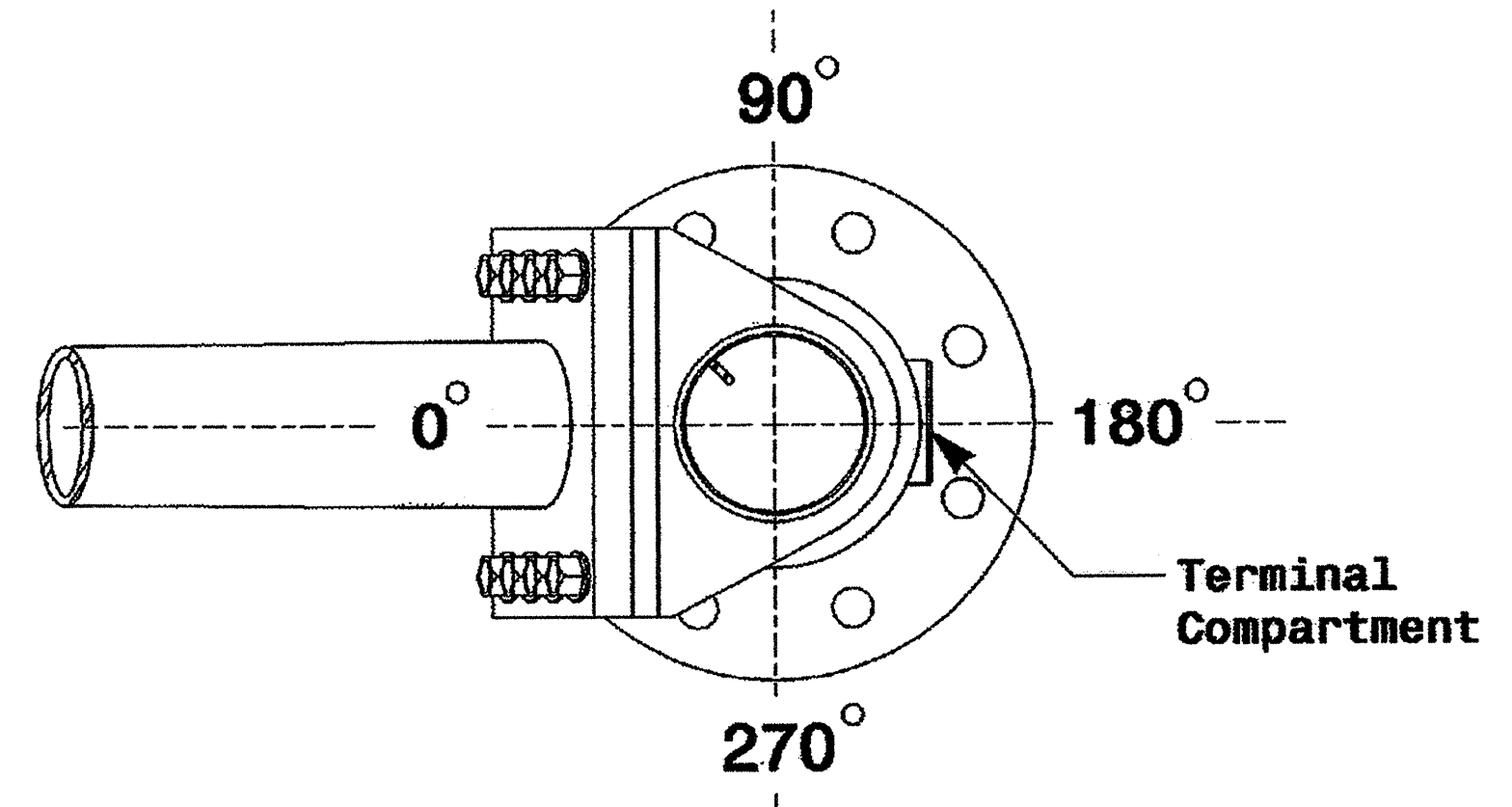


Section B-B  
(Pole Attachment to Base Plate)  
**Full-Penetration Groove Weld Detail**



3/4" Factory Drilled Hole in Outboard Tube.  
Field Drill Inboard Tube.  
5/8" Galvanized Thru Stud with (2) Hex. Locknuts Ea.

**Slip Fit Joint Detail for Mast Arm**



**Mast Arm Radial Orientation**

Shaft I.D.Tag mounting location (See drawing M2)  
Terminal Compartment (See drawing M2)

Monotube Mast Arm Pole  
(.14in./ft. taper)

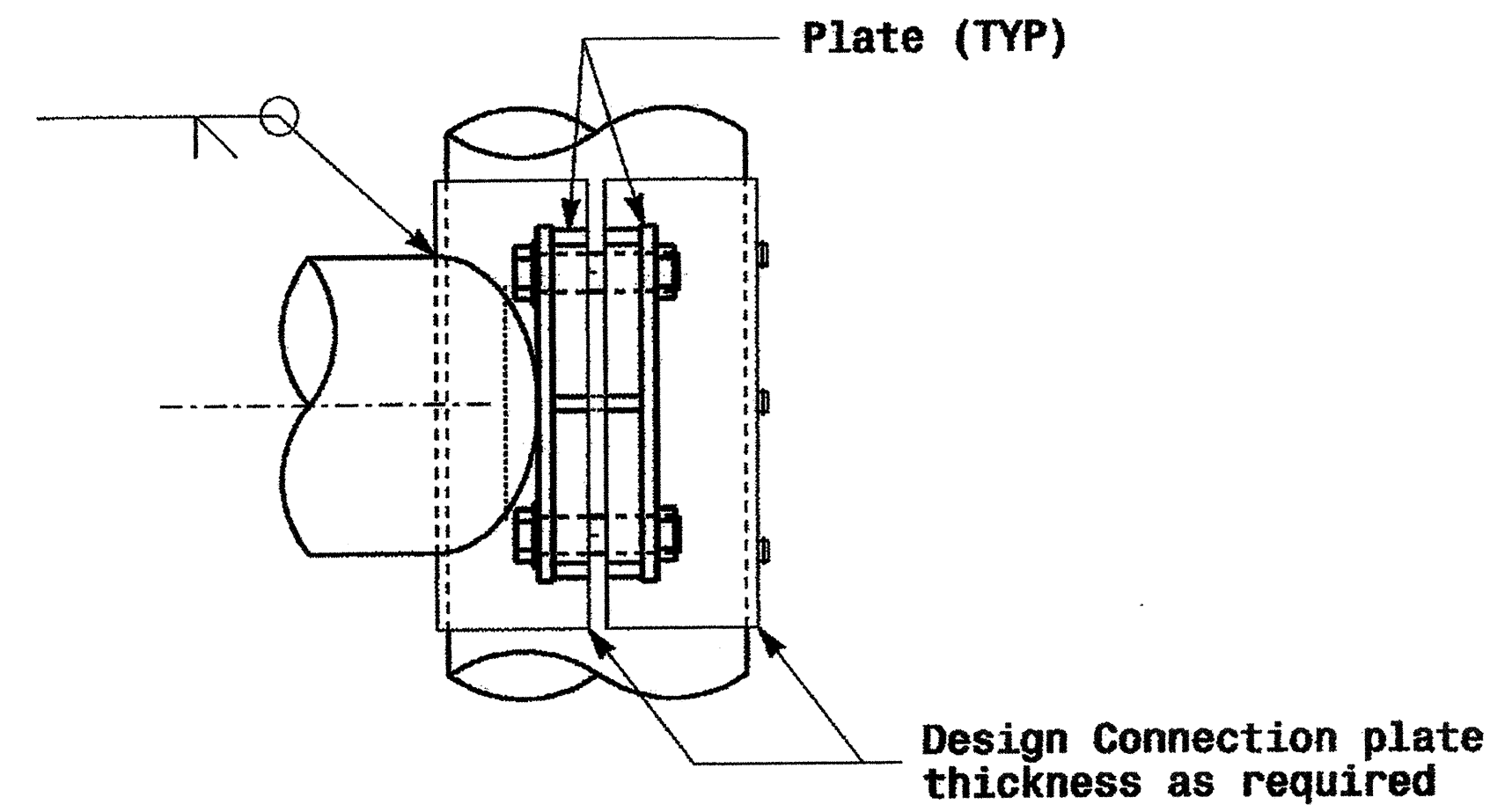
**Fabrication Details - Mast Arm Poles**

01-SEP-2005 14:08 w:\proj\res-un\1\work\kg\cupss\2004 mast\pole standard\dsae2004 m4.dgn p01.evgnr

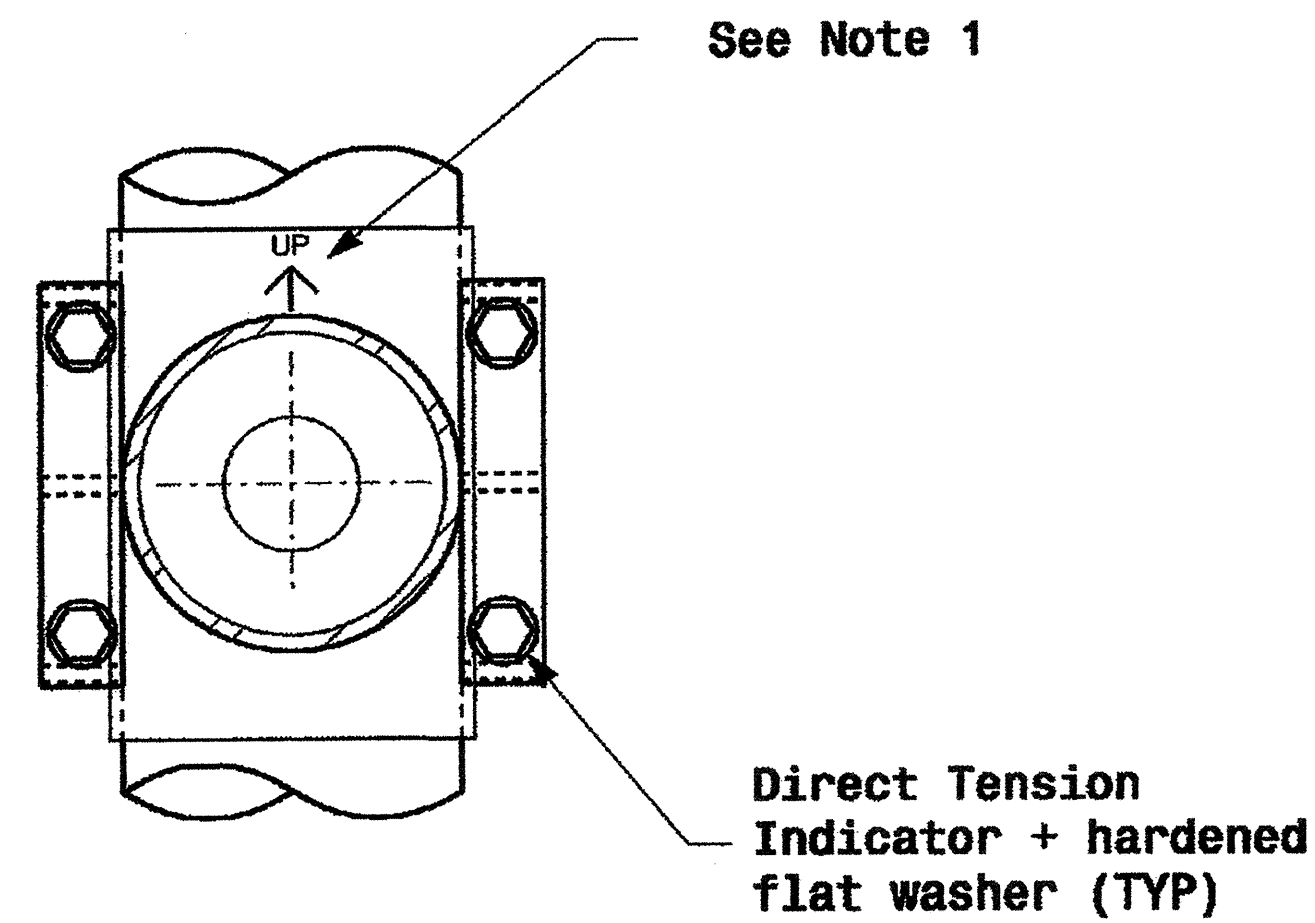
	<b>Typical Fabrication Details for Mast Arm Poles</b>		
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito	
222 N. McDowell St., Raleigh, NC 27603		REVISIONS: _____ INIT: _____ DATE: _____	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DATE: 9.2.2005 SIGNATURE: D. Sacker SIG. INVENTORY NO.



# Adjustable Clamp Type Bolted Mast Arm Connection

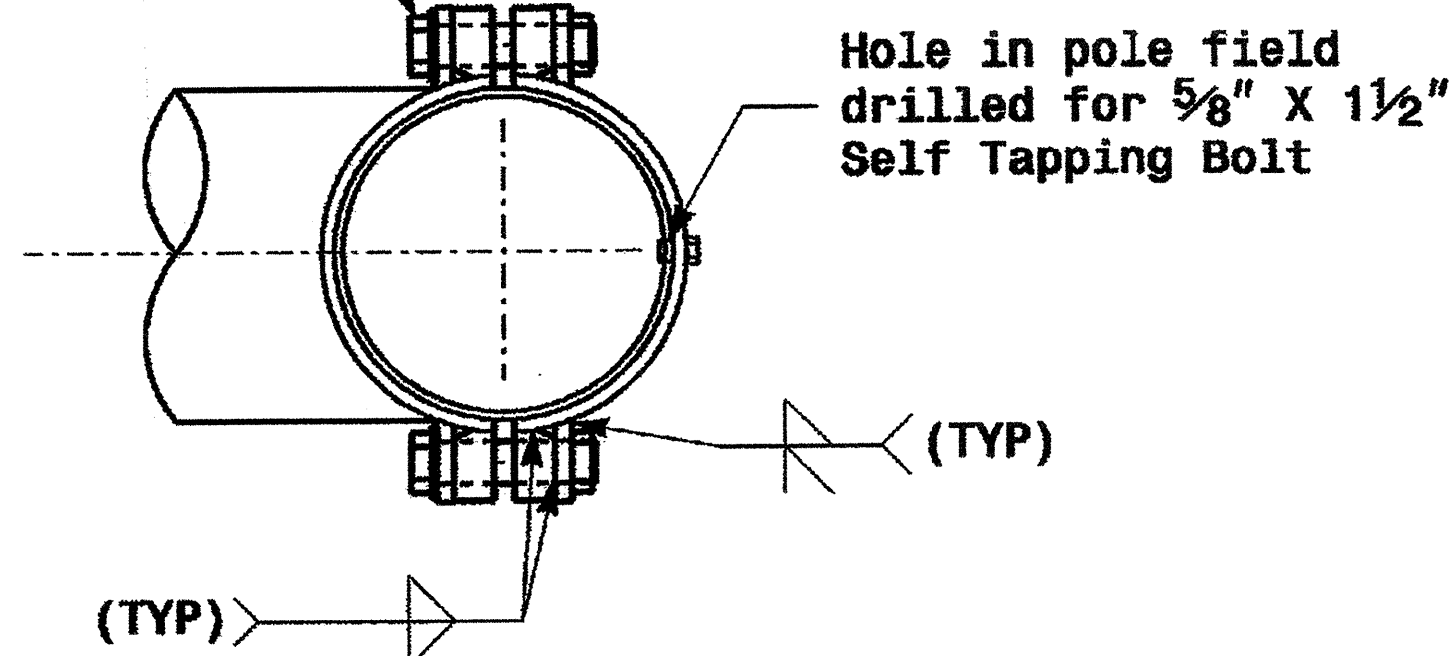


Side Elevation View



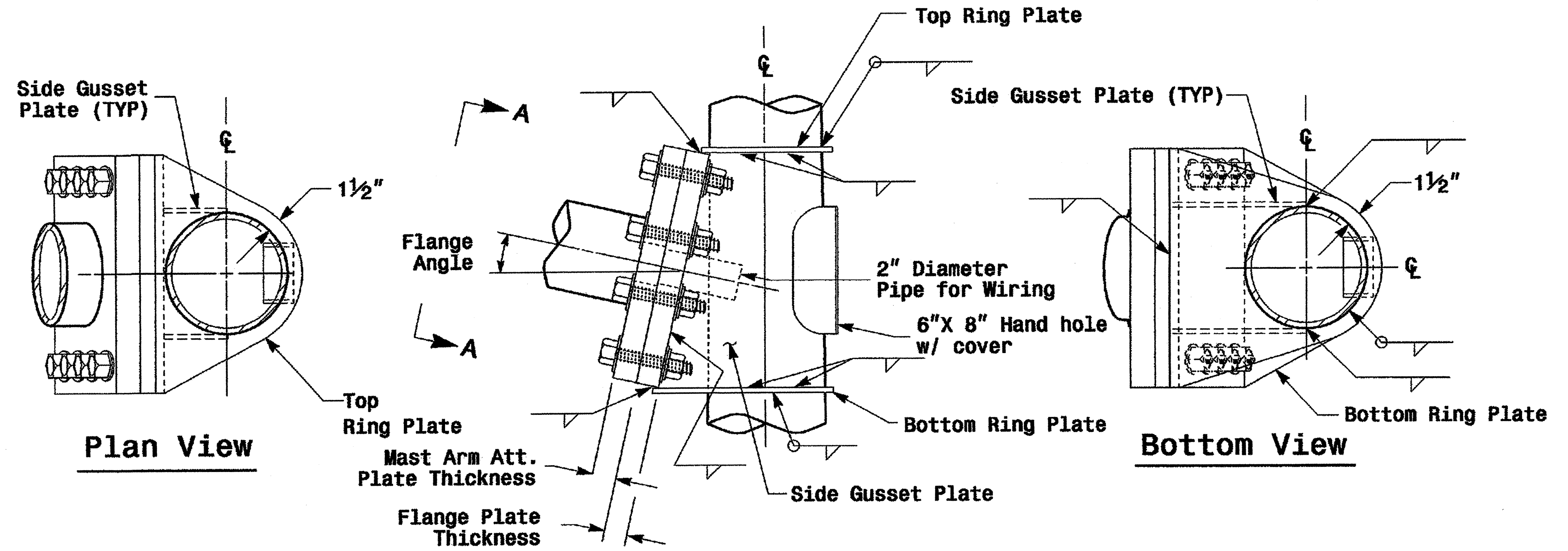
Front Elevation View

(4) - Size "E" Hex Head Bolts with (1) Hex Nuts & Washers

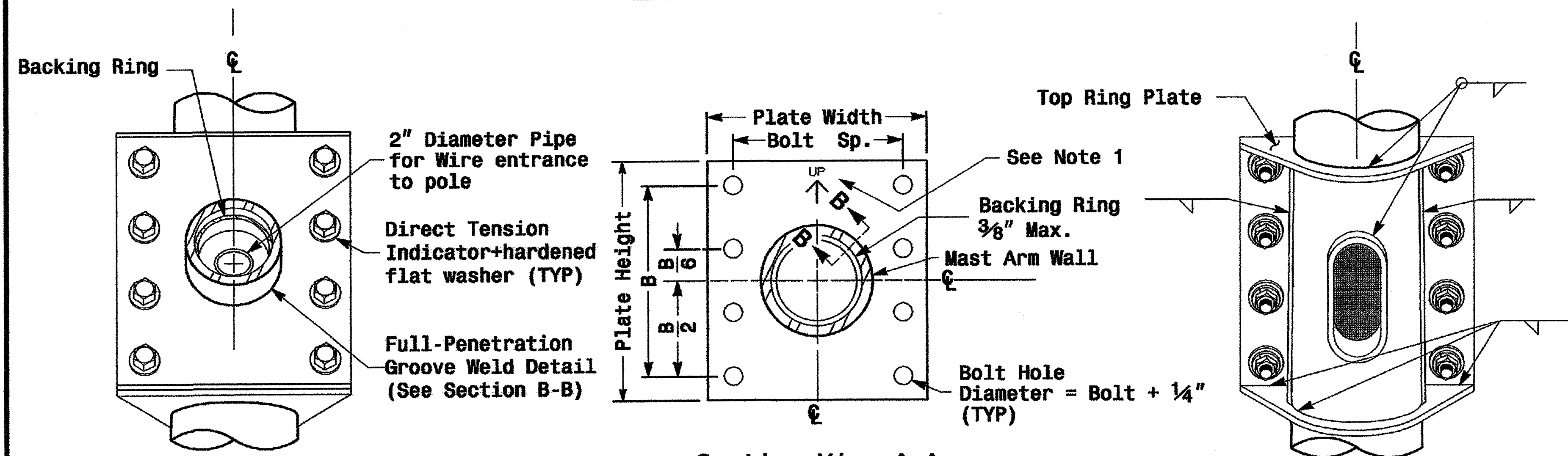


Plan View

# Welded Ring Stiffened Mast Arm Connection



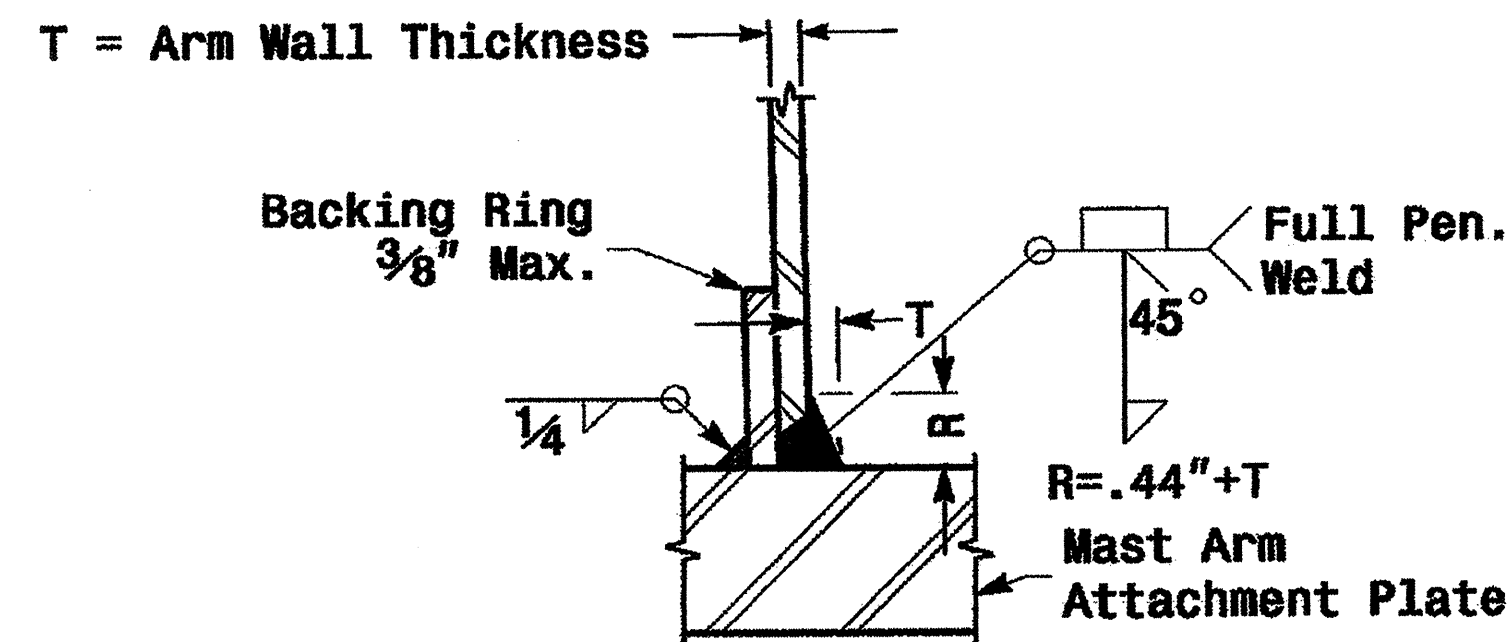
Side Elevation View



Front Elevation View

Mast Arm Attachment Plate

Back Elevation View



Full-Penetration Groove Weld Detail

Notes:

1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Designer is responsible for providing appropriate drainage points.

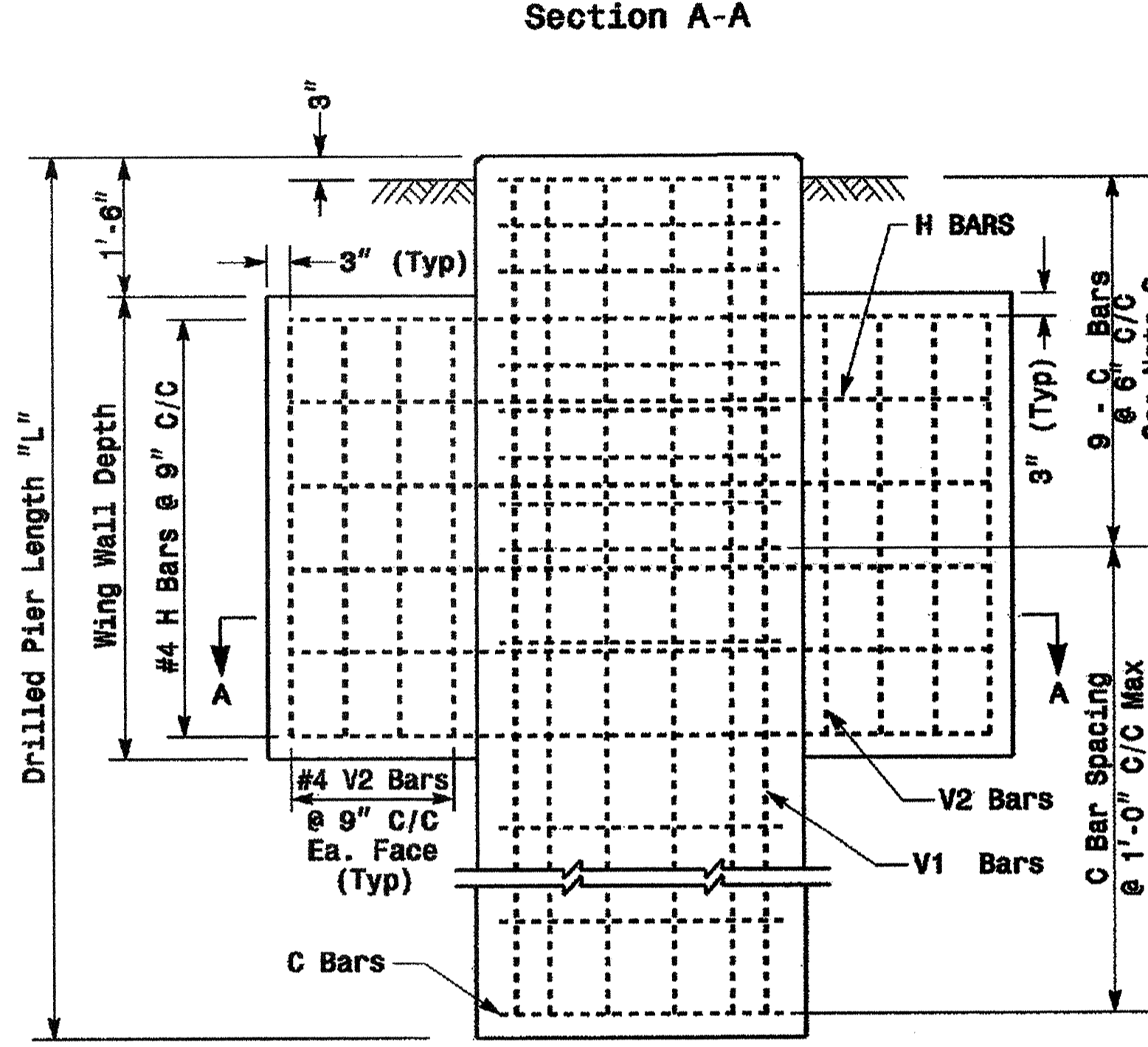
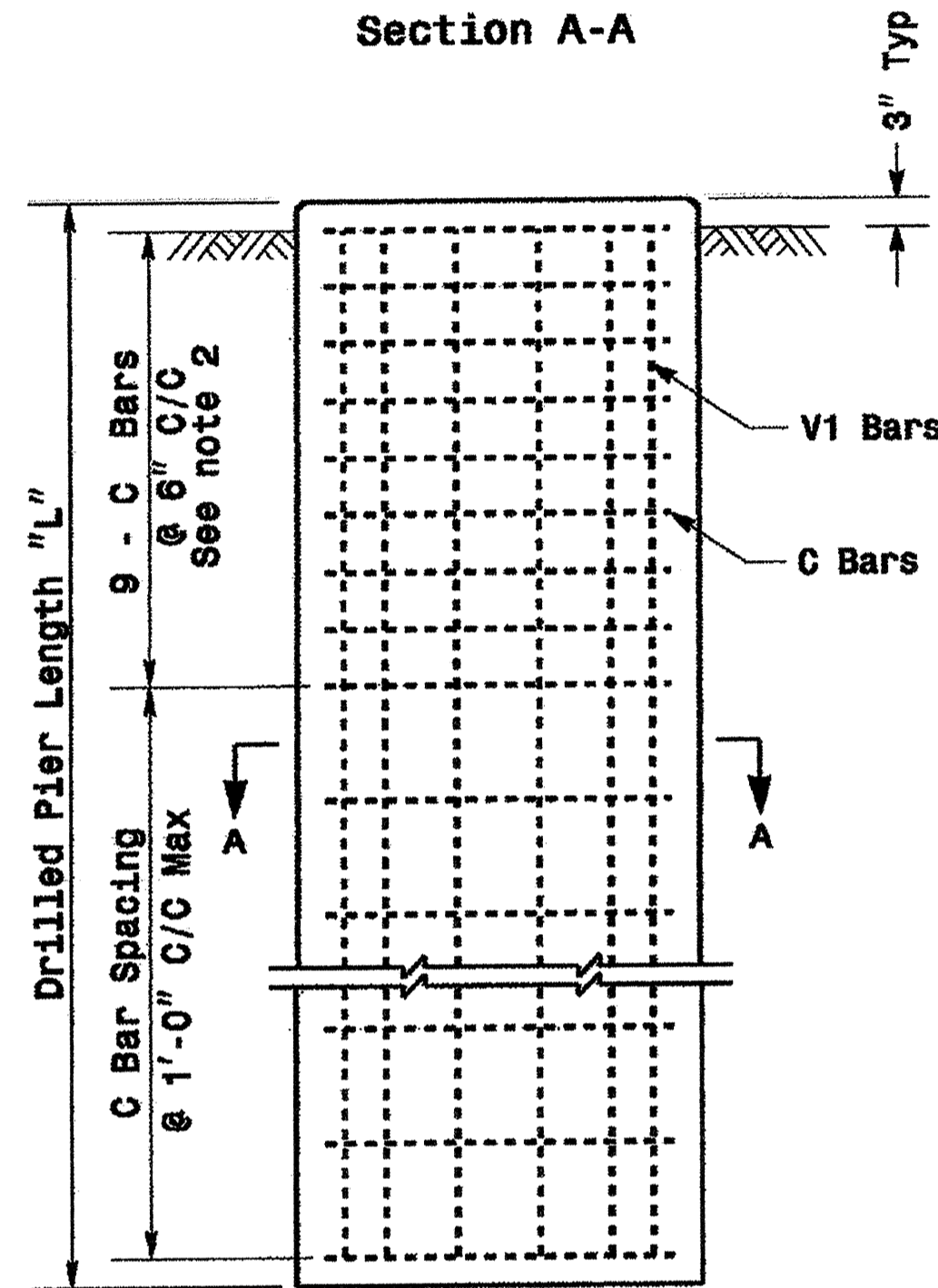
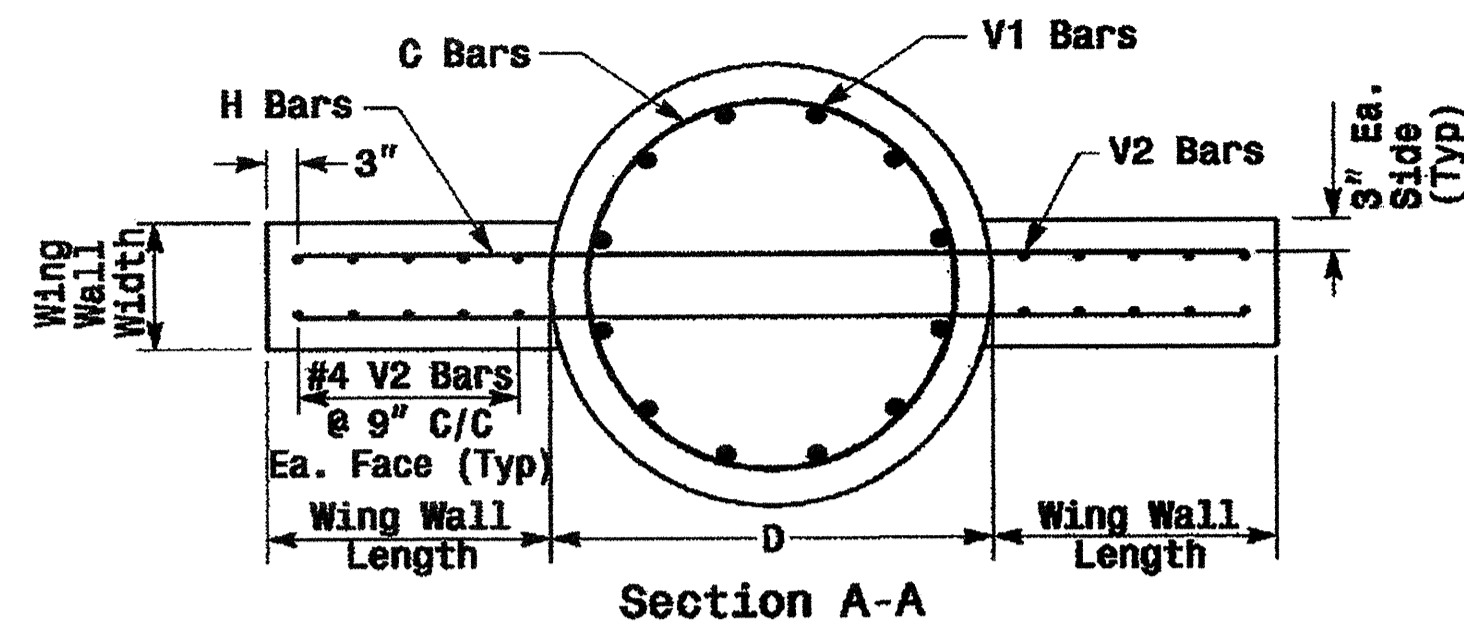
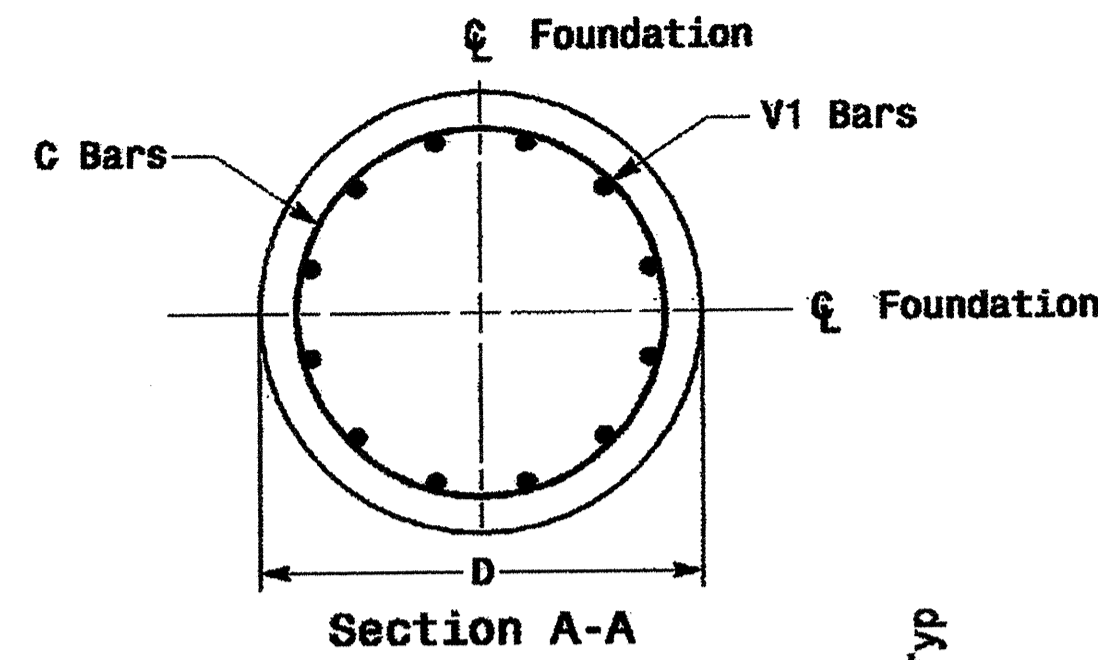
Fabrication Details - Mast Arm Poles

01-SEP-2005 14:11 w:\pca\les-unit\margr\cass\2004 metal pole standard\2004\_m5.dgn p.l.alexander

	<b>Fabrication Details For Mast Arm Connection To Pole</b>		
	PLAN DATE: <b>May 2005</b> PREPARED BY: <b>P.L. Alexander</b>	REVIEWED BY: <b>C.F. Andrews</b> REVIEWED BY: <b>A.M. Esposito</b>	
REVISIONS:		INIT. DATE	SIGNATURE: <b>D. Sarker</b> 9.2.2005 DATE
SIG. INVENTORY NO.			SEAL



# Reinforcing Steel Bars



Shaft Dia (in.)	Conc. Volume (cu. yds.)	Bar Name	No.	Size	Type	Length
42"	.356 x L	V1	9	#8	STR.	**
		C	*	#4	CIR.	10'-9"
48"	.465 x L	V1	12	#8	STR.	**
		C	*	#4	CIR.	12'-6"

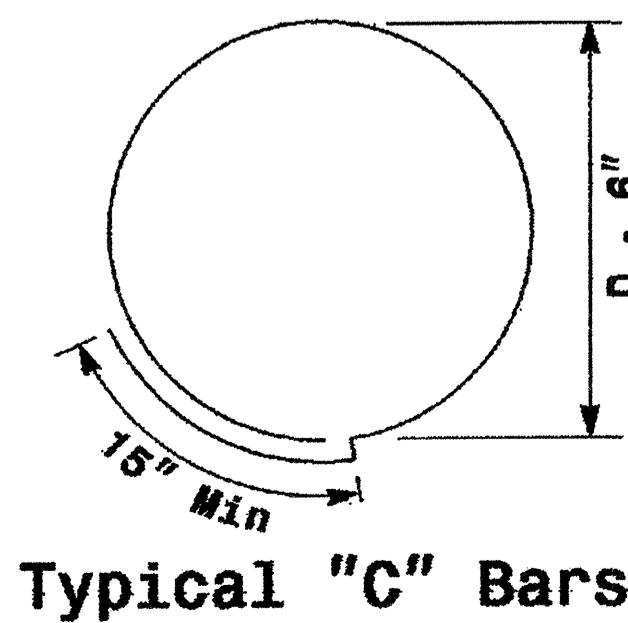
\* See Note No. 1  
\*\* See Note No. 3

Wing Wall Type	Drill Pier Shaft Dia. (in.)	Reinforcing Steel					
		Bar Name	No.	Size	Type	Length	
TYPE 1	42"	V1	9	#8	STR.	**	
		V2	12	#4	STR.	2'-6"	
		H	8	#4	STR.	6'-0"	
		C	*	#4	CIR.	10'-9"	
TYPE 2	42"	V1	9	#8	STR.	**	
		V2	16	#4	STR.	4'-6"	
		H	12	#4	STR.	9'-0"	
TYPE 2	48"	V1	12	#8	STR.	**	
		V2	16	#4	STR.	4'-6"	
		H	12	#4	STR.	9'-6"	
		C	*	#4	CIR.	12'-6"	

\* See Note No. 1  
\*\* See Note No. 3

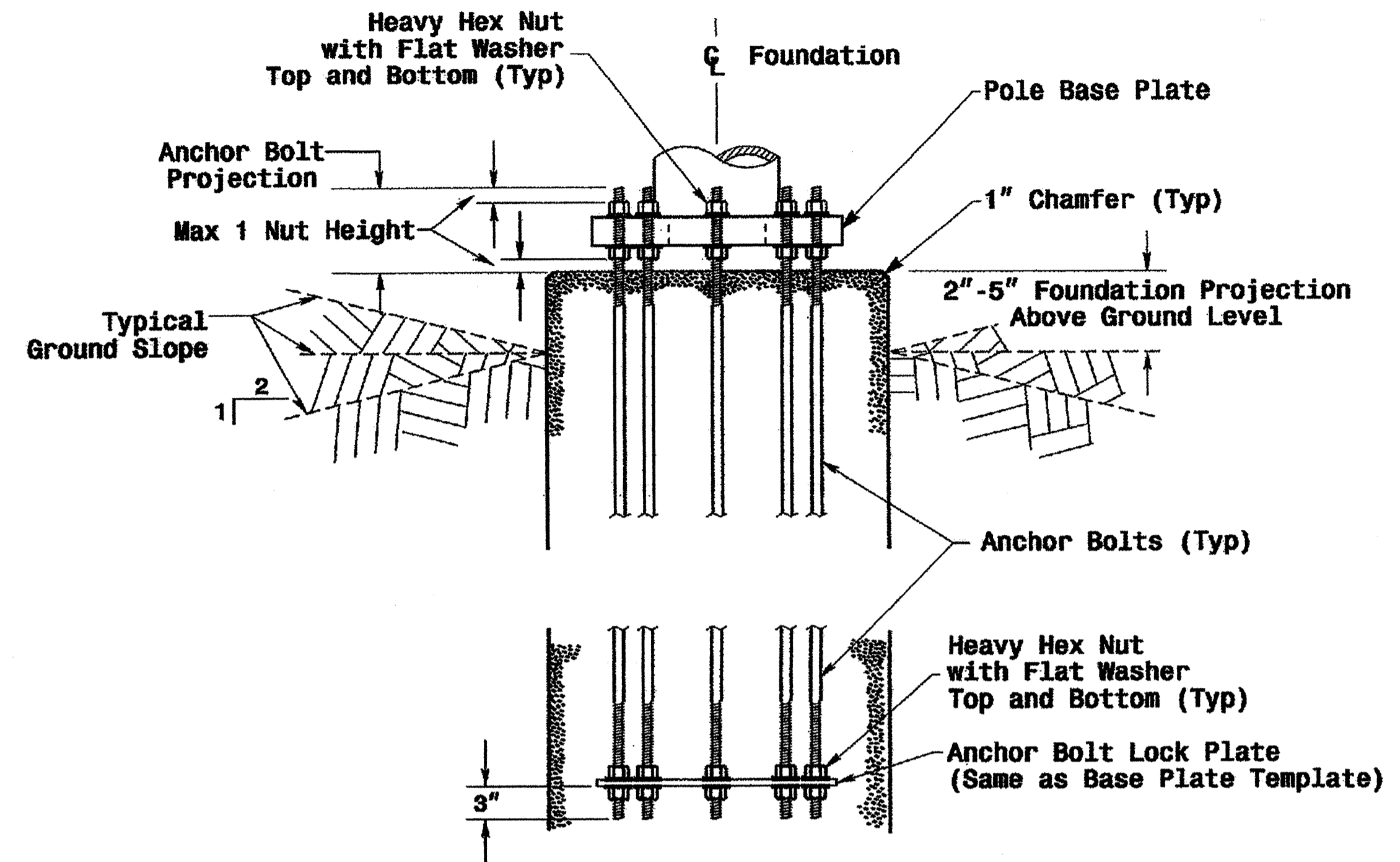
Wing Wall Type	Wing Wall Length (Ft.)	Wing Wall Width (Ft.)	Wing Wall Depth (Ft.)	Concrete Volume (Cu. Yds.)
TYPE 1	1'-6"	1'-0"	3'-0"	.4
TYPE 2	3'-0"	1'-0"	5'-0"	1.2

See Note No. 4

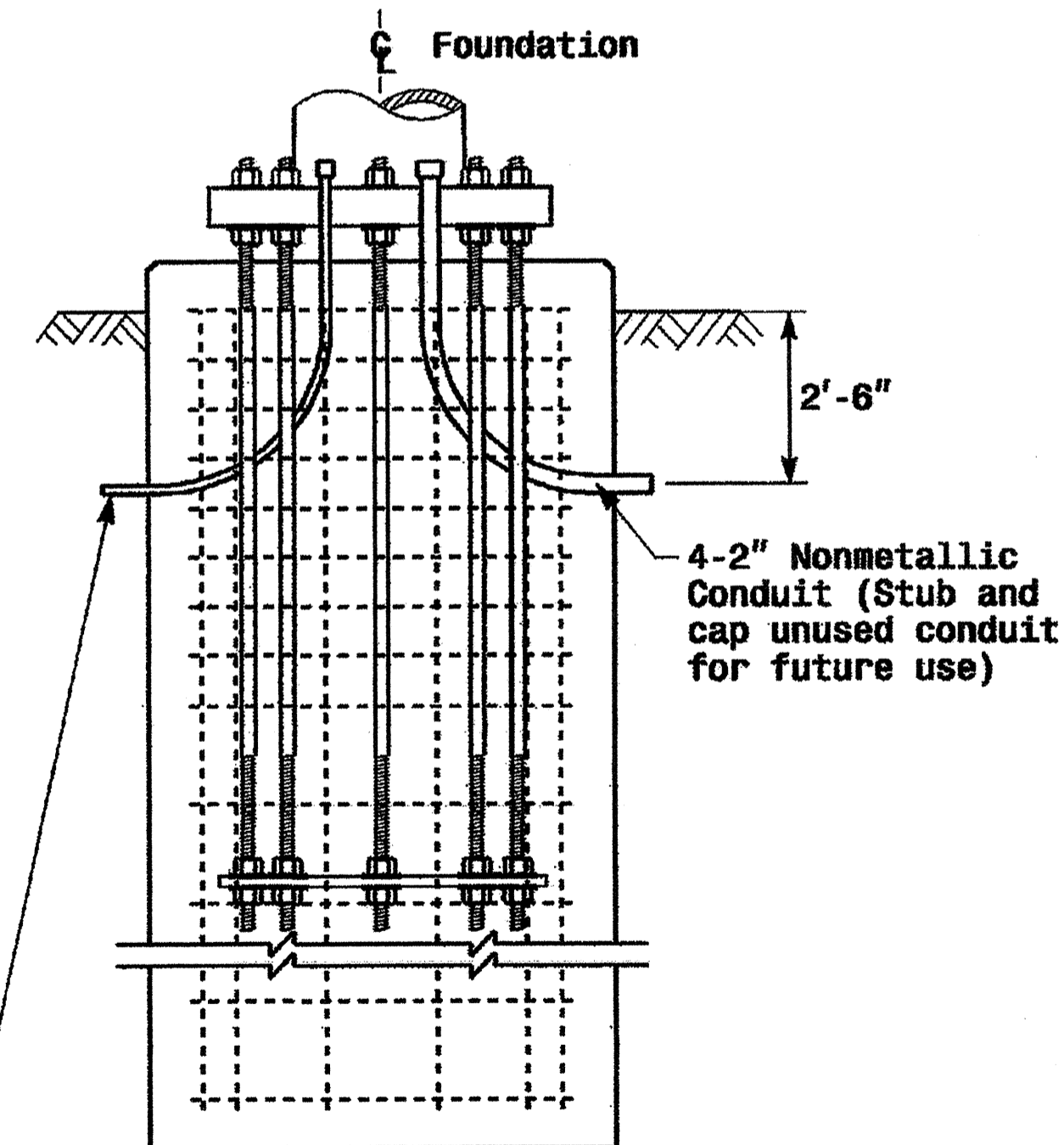


# Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



# Typical Foundation Conduit Details



2-1" Nonmetallic Conduits for Electrical Service and Grounding Electrode Conductor

## Notes

- The number of C-bars is based on foundation depth. For standard foundations, see sheet M 8.
- Circular tie reinforcing rings may be vertically adjusted by +/- 3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
- The length of V1-bars is based on foundation depth. For standard foundations, see sheet M 8.
- The quantities for steel and concrete shown in the Wing Wall Details Chart reflect the amount of material for 1 pair of wing walls (2 wing walls per drilled pier shaft.)

Construction Details - Foundations

	<b>Construction Details Foundations</b>		
	PLAN DATE: May 2005 PREPARED BY: G.F. ANDREWS SCALE: 0 NA NONE	REVIEWED BY: P.L. ALEXANDER REVIEWED BY: A.M. ESPOSITO REVISIONS: _____ INIT. DATE _____	

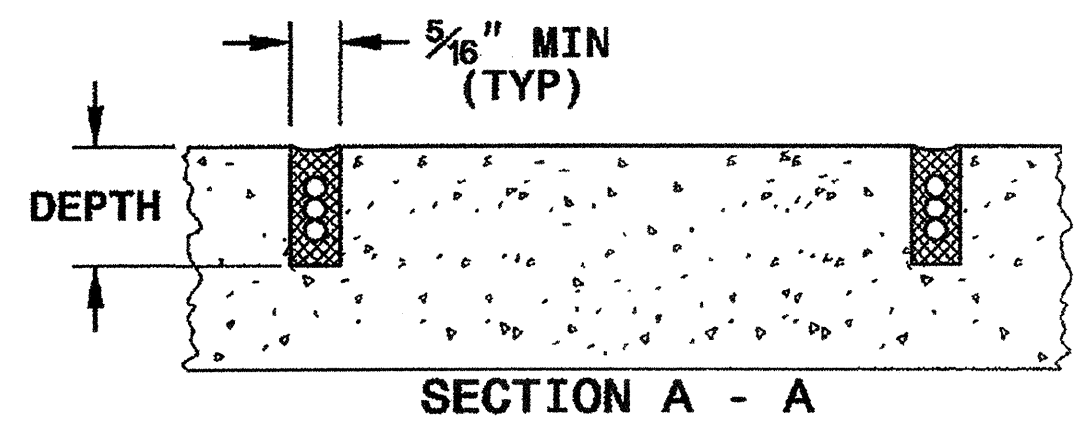


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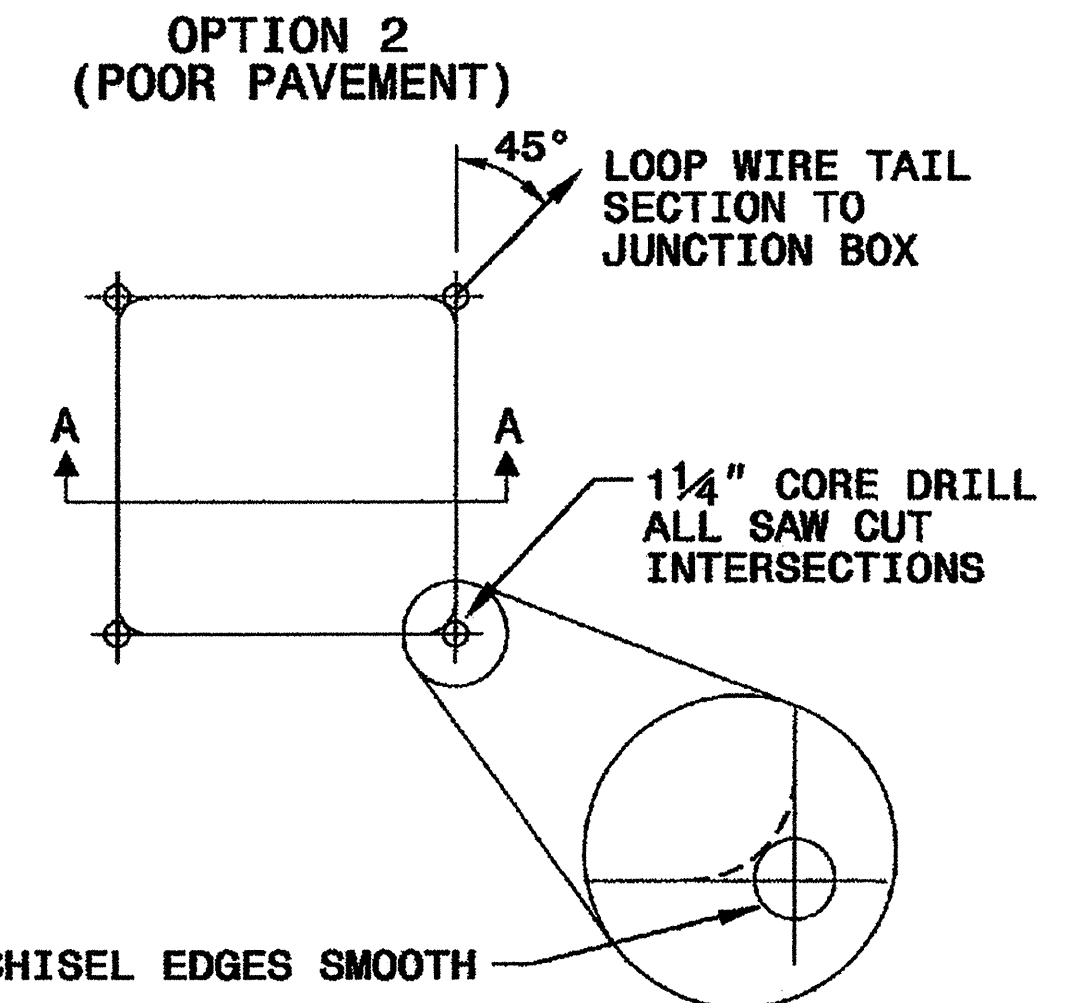
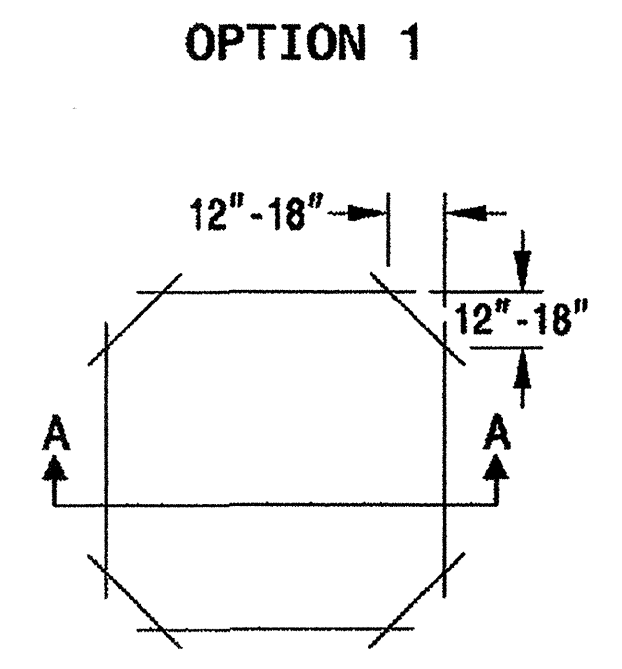
**SAW SLOT DEPTH CHART**

DEPTH (IN)	NO. OF WIRE TURNS				
	2	3	4	5	6
CONCRETE	2.0	2.0	2.5	2.5	3.0
ASPHALT	2.0	2.5	3.0	3.0	3.0

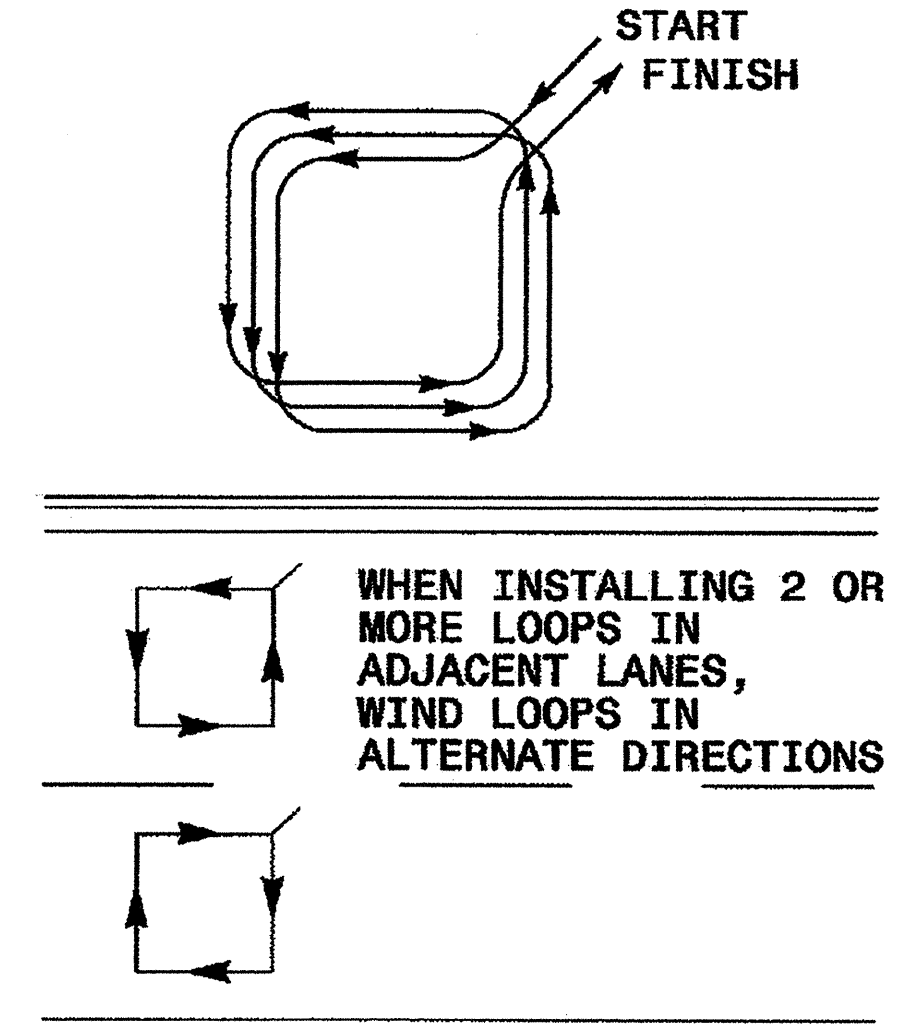


**CONVENTIONAL 4-SIDED LOOP**

**SAW CUT OPTIONS**

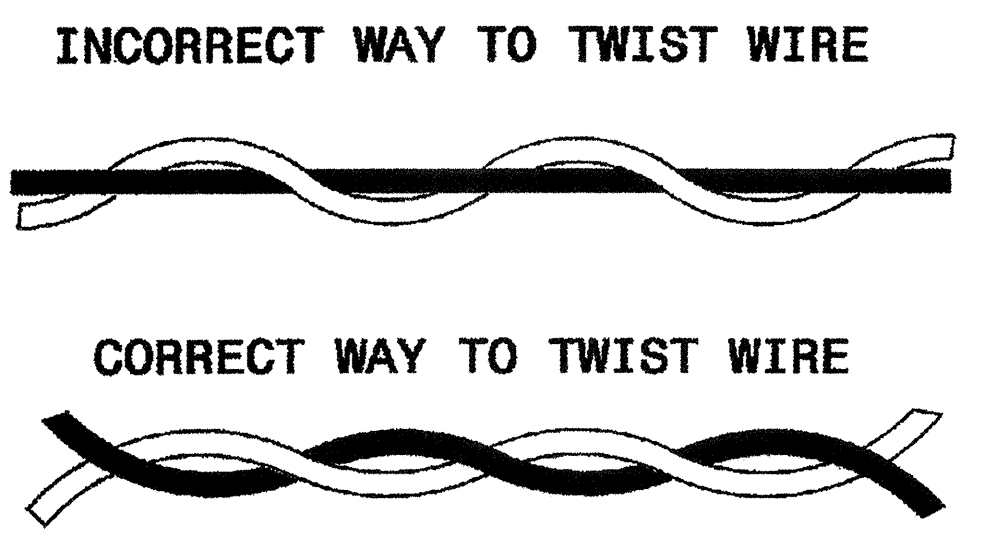


**LOOP WINDING METHOD**



ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**

**LOOP WIRE TWISTING METHOD**

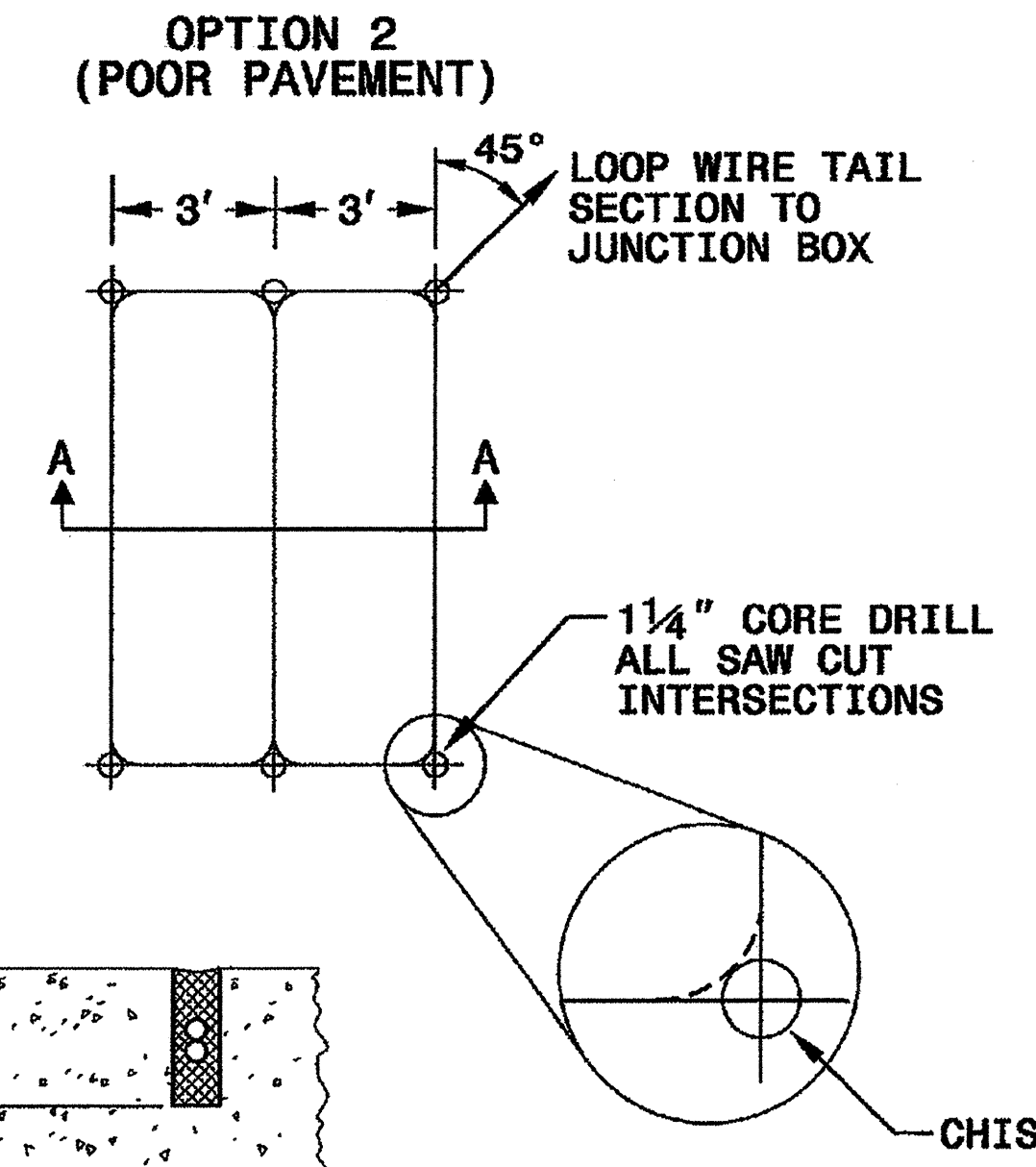
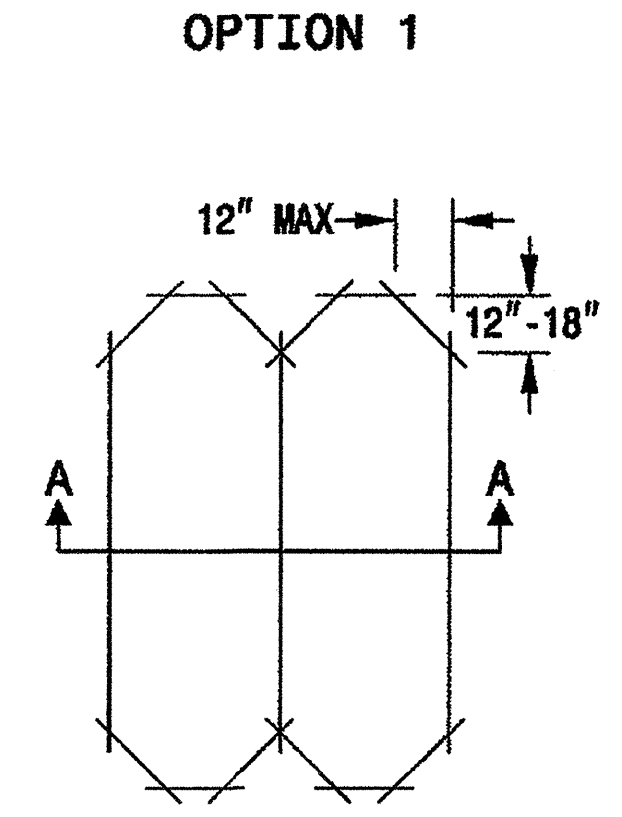


**NOTES**

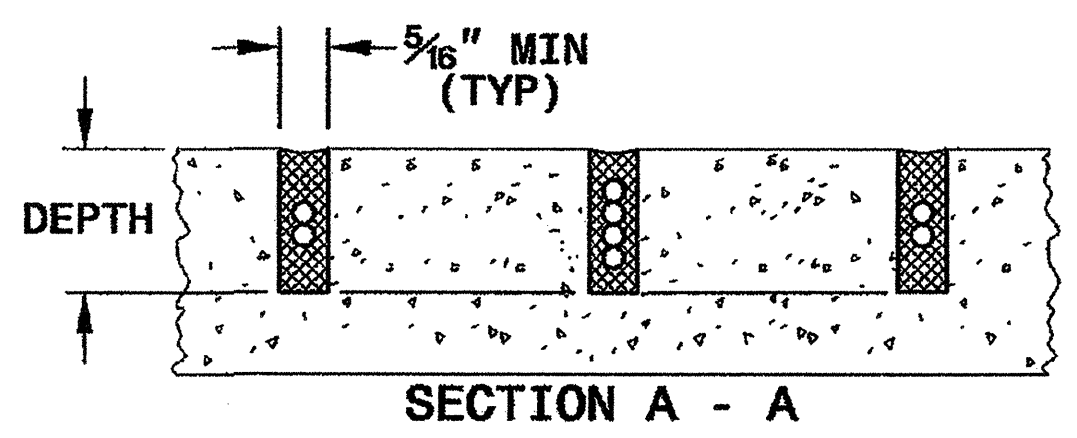
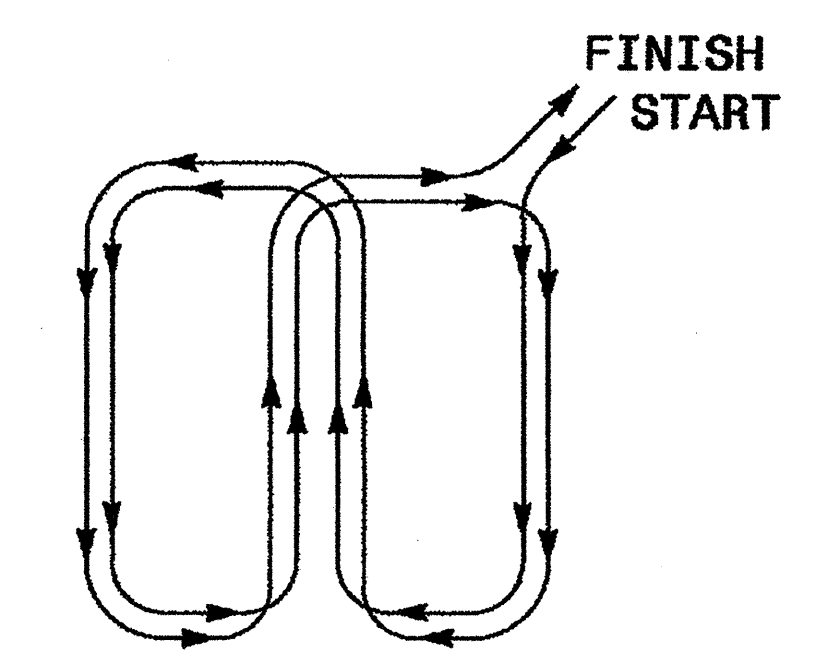
- OVERLAP SAW CUTS AT CORNERS AND INTERSECTION POINTS TO ENSURE UNIFORM SAW SLOT DEPTH.
- MAINTAIN 12" SPACING BETWEEN LOOP WIRE TAIL SECTIONS.
- WIRE LOOPS CONNECTED TO THE SAME DETECTOR CHANNEL IN SERIES.
- LOCATE LOOPS IN CENTER OF LANES UNLESS OTHERWISE SHOWN ON PLANS OR APPROVED BY ENGINEER.

**QUADRUPOLE LOOP**

**SAW CUT OPTIONS**



**LOOP WINDING METHOD**



DEPTH IS 2.5" FOR CONCRETE AND 3.0" FOR ASPHALT

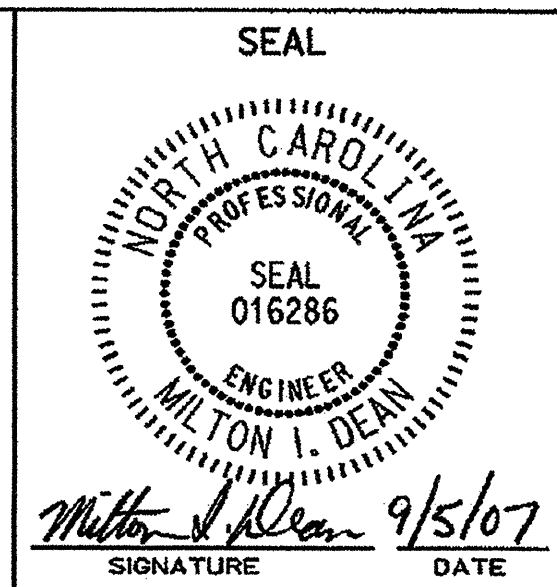
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5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**

SHEET 1 OF 3  
**1725D01**

See Plate for Title



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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

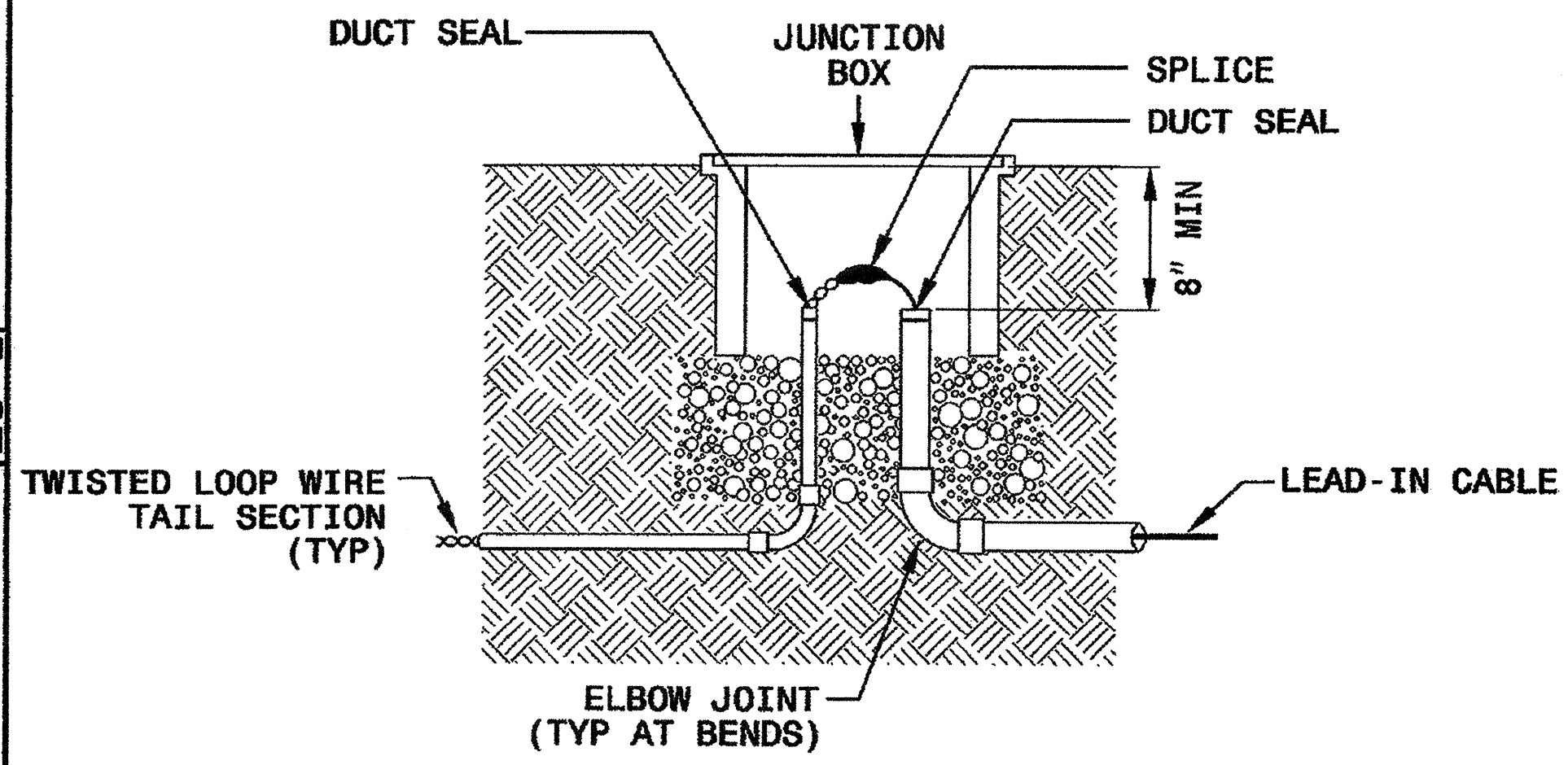
5-07

ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
LOOP WIRE DETAILS

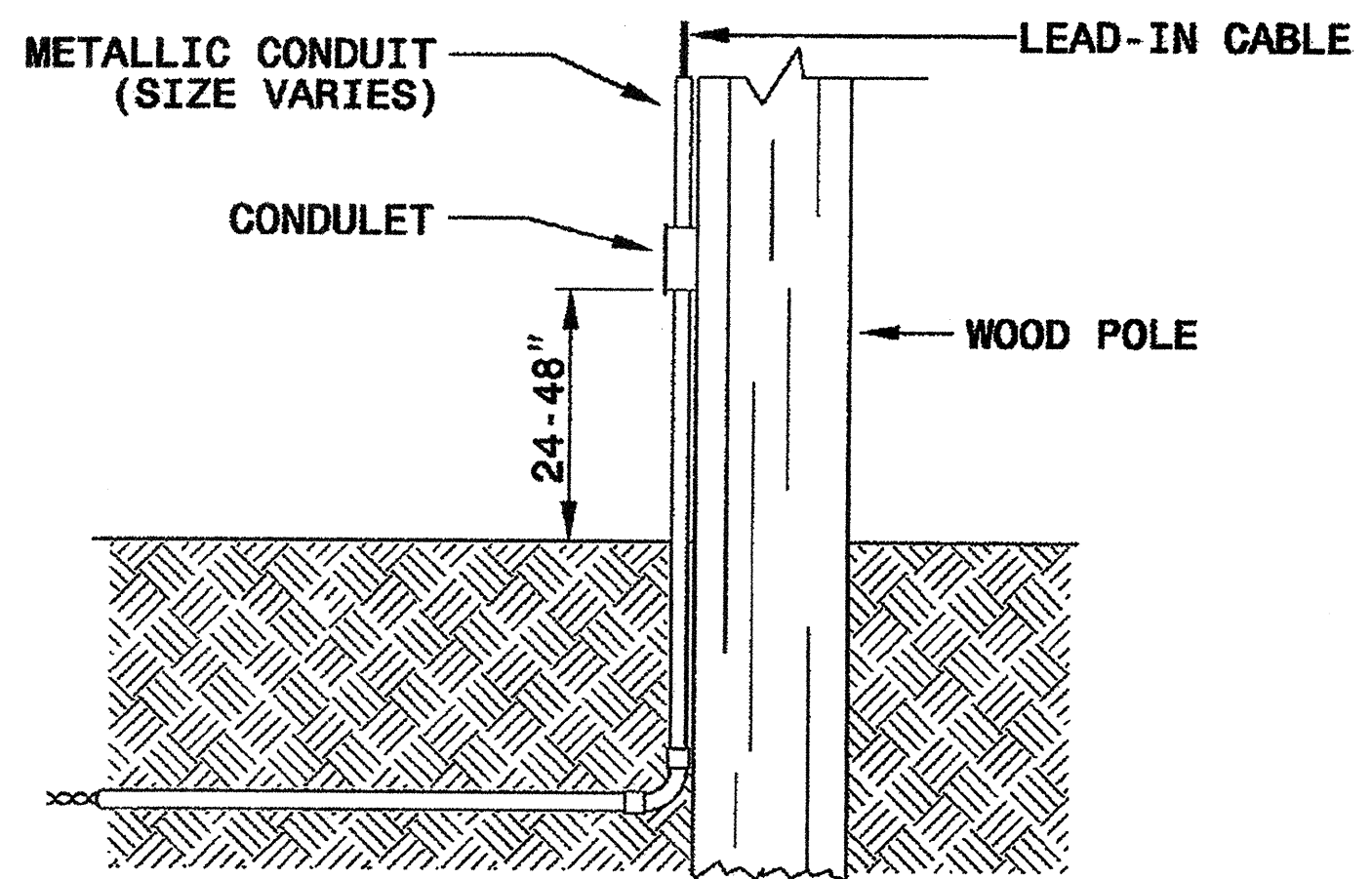
SHEET 2 OF 3  
**1725D01**

**LOOP WIRE SPLICE POINT DETAILS**

**LOOP WIRE AT JUNCTION BOX**



**LOOP WIRE AT POLE**

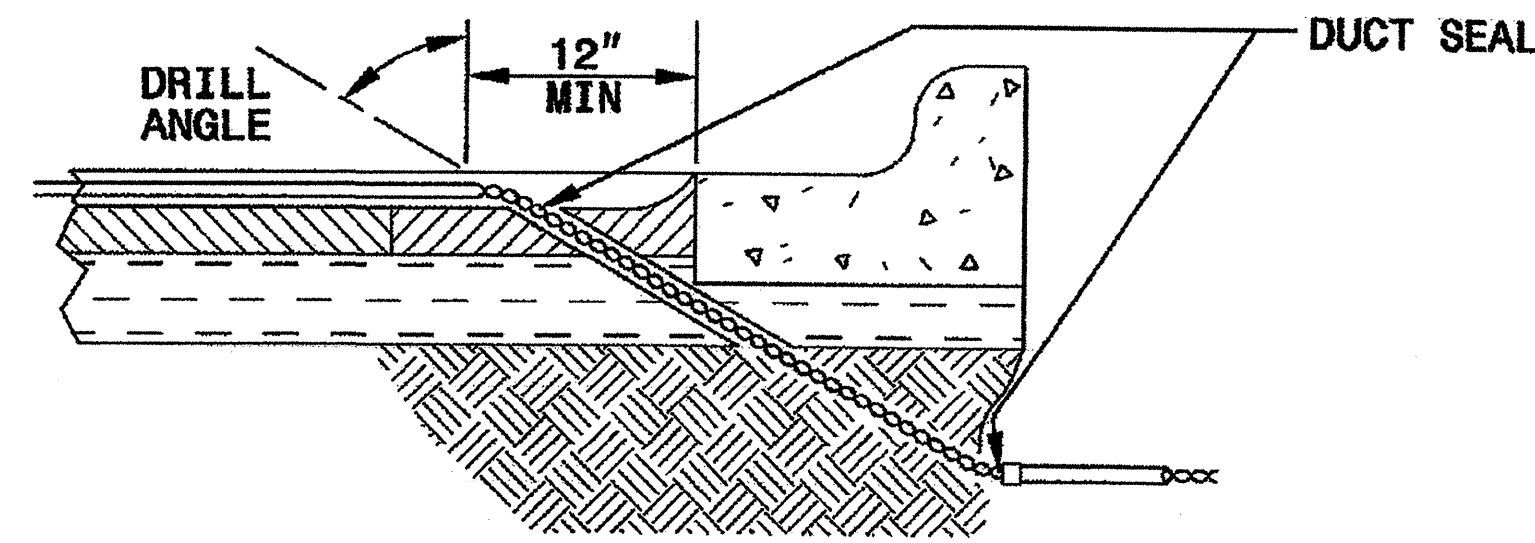


**NOTE**

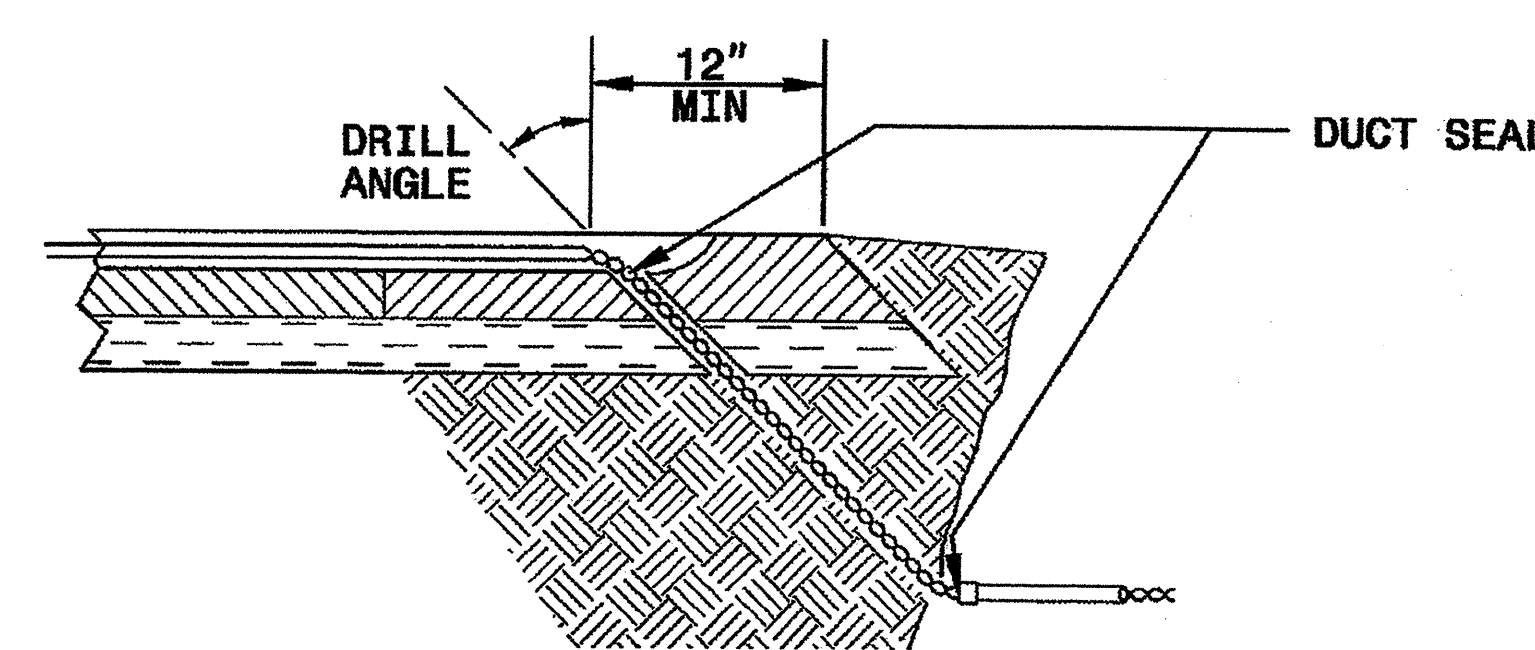
SPLICE ALL LOOP WIRE TAIL SECTIONS/LEAD-IN CABLE IN JUNCTION BOXES OR APPROVED CONDULETS.

**LOOP WIRE PAVEMENT EDGE DETAILS**

**LOOP WIRE AT CURB & GUTTER SECTION**



**LOOP WIRE AT PAVEMENT SECTION**



**NOTES**

- DO NOT EXCAVATE UNDER CURB AND GUTTER SECTIONS FOR CONDUIT INSTALLATION.
- TWIST LOOP WIRE TAIL SECTIONS FROM WHERE LOOP WIRE TAIL LEAVES SAW CUT TO JUNCTION BOX, INCLUDING THROUGH CONDUIT.
- BEFORE SEALING LOOPS, INSTALL DUCT SEAL WHERE LOOP WIRE TAIL SECTION LEAVES SAW CUT IN PAVEMENT AND AT ENTRANCE OF CONDUIT TO JUNCTION BOX.

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ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
LOOP WIRE DETAILS

SHEET 2 OF 3  
**1725D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

Milton I. Dean  
ENGINEER  
MILTON I. DEAN  
DATE: 9/5/07



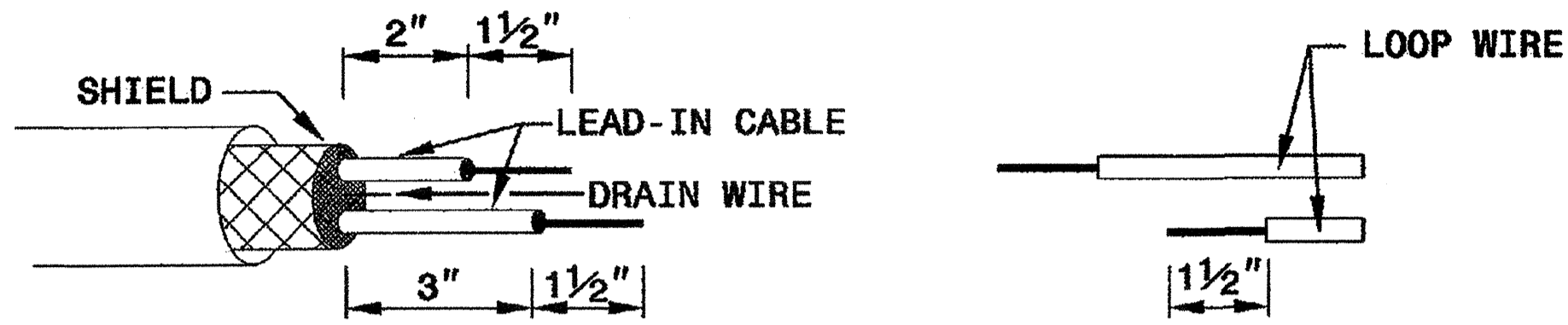
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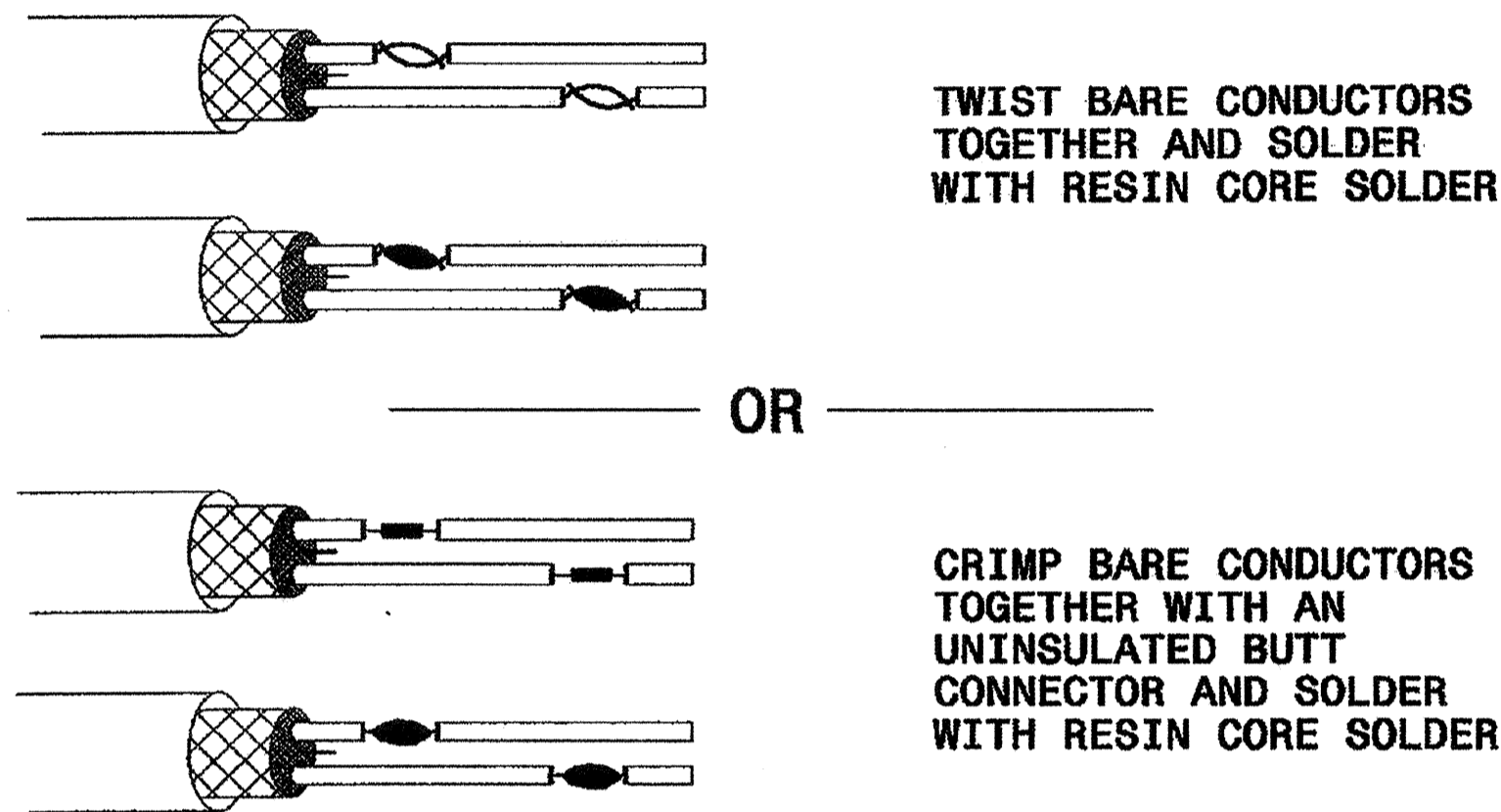
ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

**STEP 1. STRIP LOOP WIRE AND LEAD-IN CABLE**

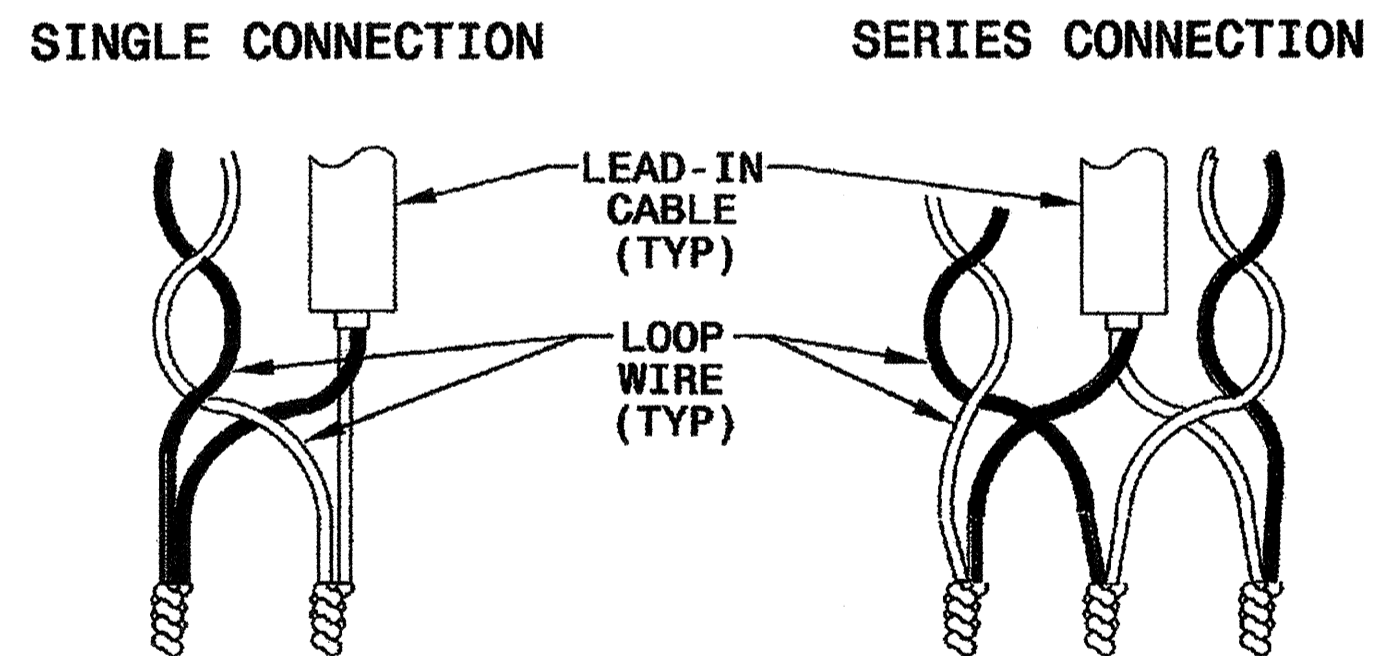


**STEP 2. CONNECT AND SOLDER**

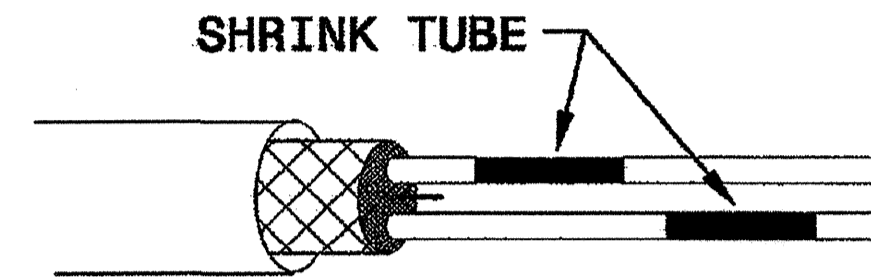


BOND SHIELD DRAIN WIRE AT SPLICE SECTIONS (DO NOT GROUND)

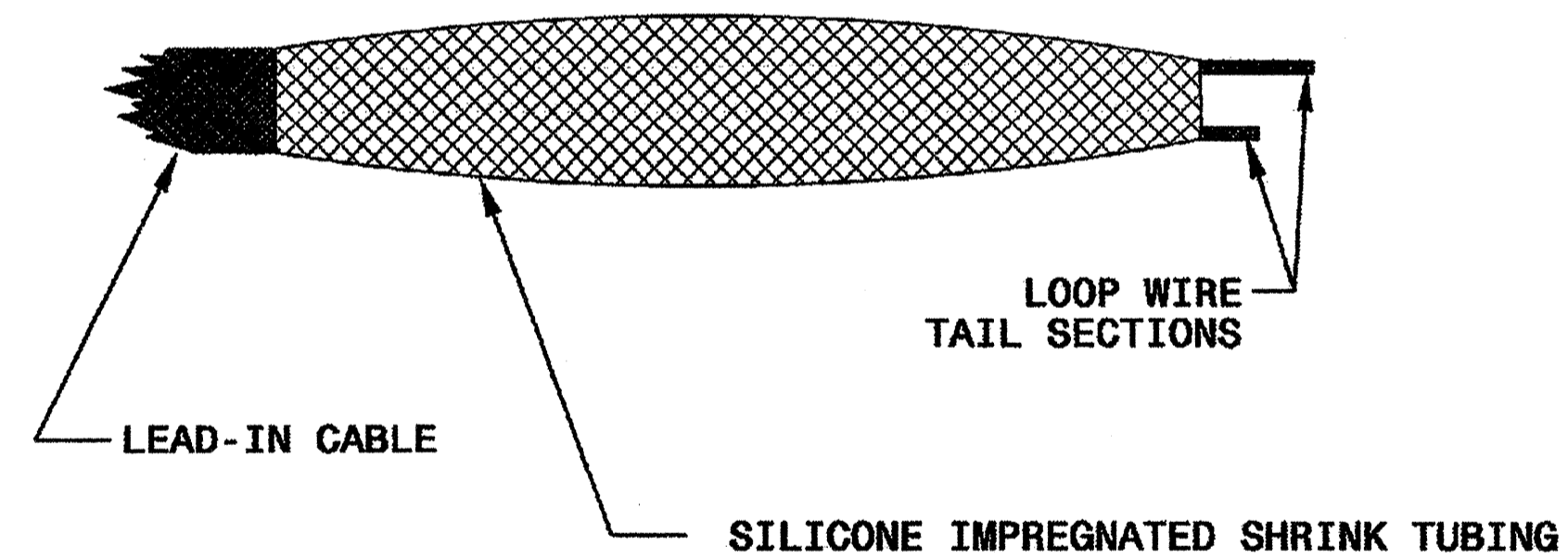
**LOOP WIRE AND LEAD-IN CABLE CONNECTION DETAILS**



**STEP 3. INSULATE EACH SOLDER JOINT SEPARATELY**



**STEP 4. ENVIRONMENTALLY PROTECT SPLICE**



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ENGLISH DETAIL DRAWING FOR  
**INDUCTIVE DETECTION LOOPS**  
SPlicing FOR LEAD-IN CABLE AND LOOP WIRE

SHEET 3 OF 3  
**1725D01**

See Plate for Title

