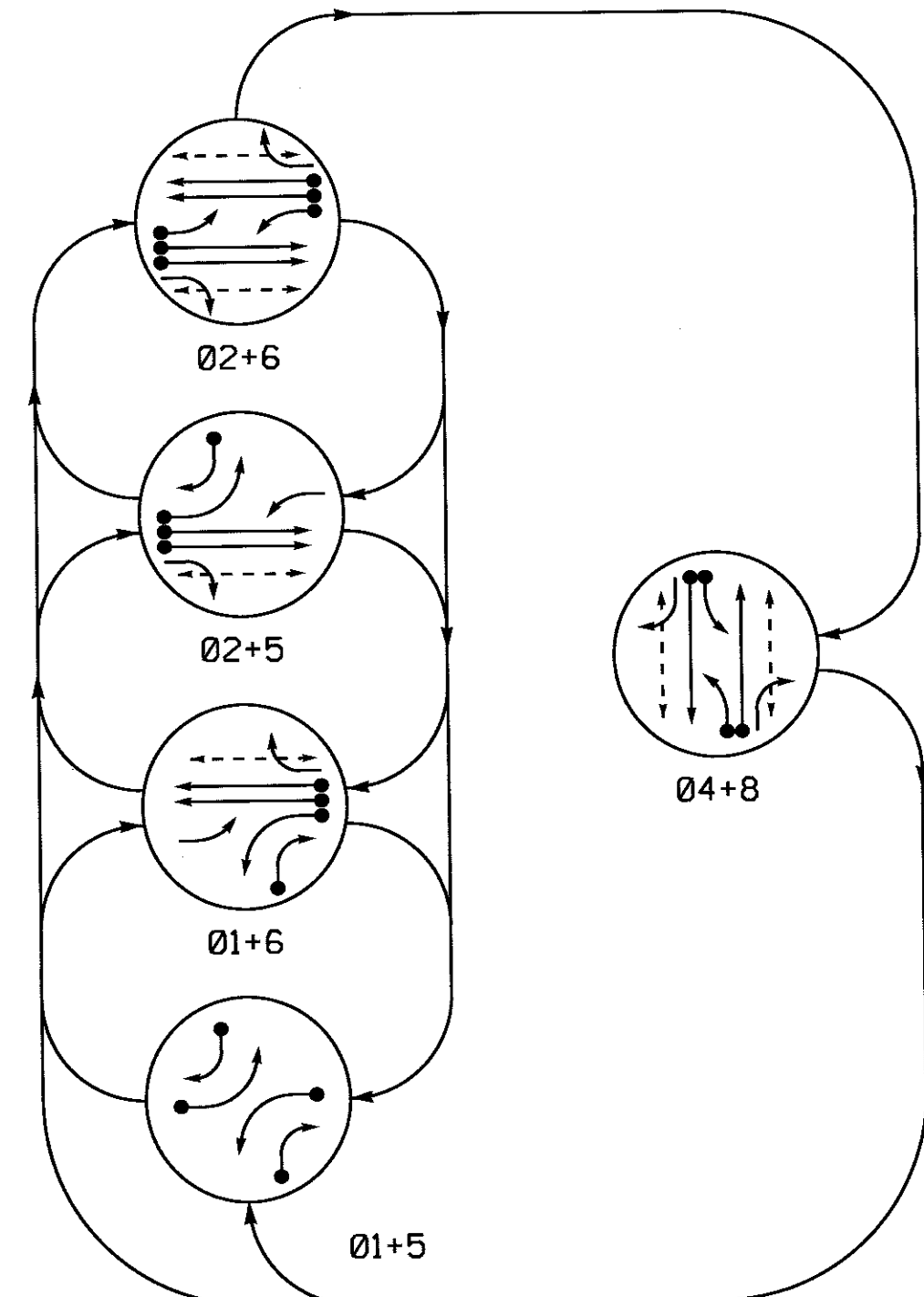


PHASING DIAGRAM



PHASING DIAGRAM DETECTION LEGEND

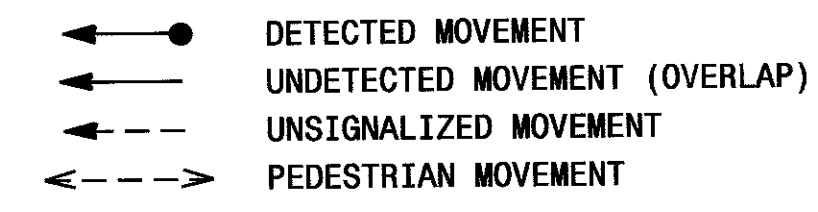
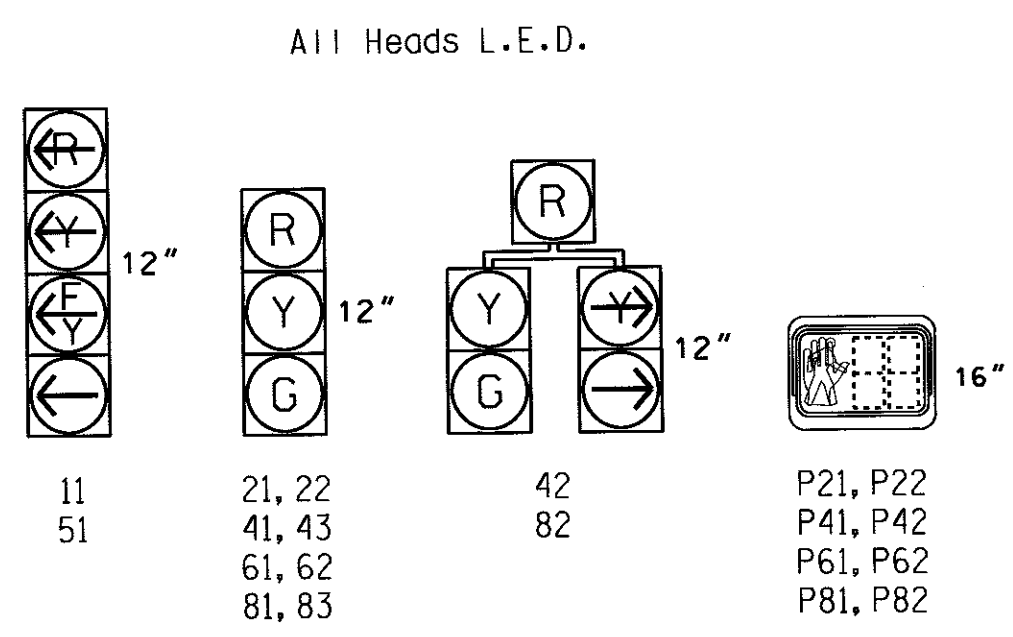


TABLE OF OPERATION

SIGNAL FACE	PHASE					
	Ø1+5	Ø1+6	Ø2+5	Ø2+6	Ø4+8	F
11	←	←	←	←	←	←
21, 22	R	R	G	G	R	Y
41, 43	R	R	R	R	G	R
42	↘	↘	↘	↘	G	R
51	←	←	←	←	←	←
61, 62	R	G	R	G	R	Y
81, 83	R	R	R	R	G	R
82	↘	↘	↘	↘	G	R
P21, P22	DW	DW	W	W	DW	DRK
P41, P42	DW	DW	DW	DW	W	DRK
P61, P62	DW	W	DW	W	DW	DRK
P81, P82	DW	DW	DW	DW	W	DRK

F = Flashing Yellow Arrow
 W - Walk
 DW - Don't Walk
 DRK - Dark

SIGNAL FACE I.D.



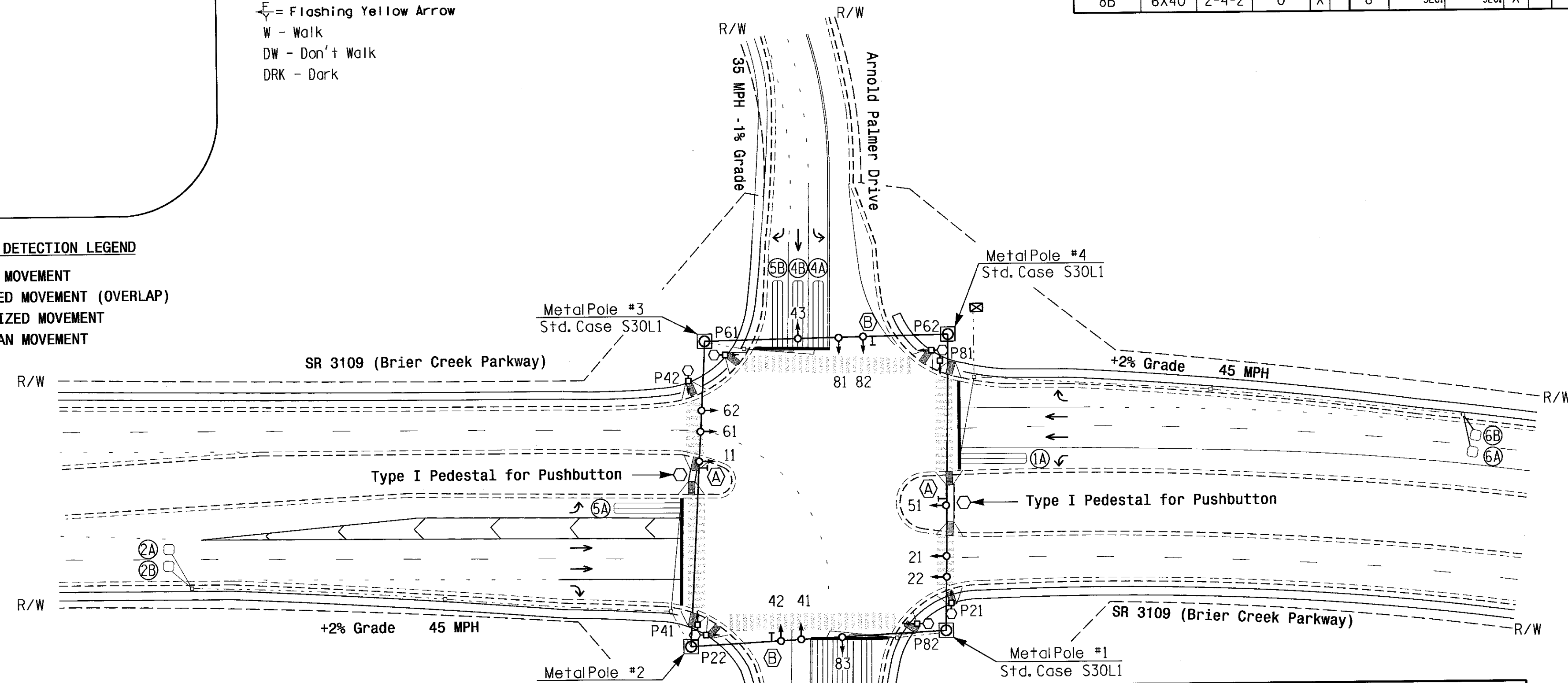
SE-PAC 2070 LOOP & DETECTOR UNIT INSTALLATION CHART

LOOP NO.	SIZE (ft)	TURNS	DIST. FROM STOPBAR (ft)	NEW	EXISTING	DETECTOR PROGRAMMING															
						ASSIGNED PHASE	TIMING		OPERATION MODE							SWITCH	SYSTEM	NEW	EXISTING		
							DELAY	EXTEND (STRETCH)	VEHICLE	PEDESTRIAN	1 CALL	2 STOP A	3 STOP B	4 PROTECTOR	5 PROTECTOR					6 THROUGH	7 THROUGH
1A	6X40	2-4-2	0	X	-	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
1B	6X40	2-4-2	0	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
2A	6X6	6	300	X	-	1	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
2B	6X6	6	300	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
4A	6X40	2-4-2	0	X	-	4	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
4B	6X40	2-4-2	0	X	-	4	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
5A	6X40	2-4-2	0	X	-	5	15 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
5B	6X40	2-4-2	0	X	-	2	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
6A	6X6	4	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
6B	6X6	4	300	X	-	6	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
8A	6X40	2-4-2	0	X	-	8	3 SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-
8B	6X40	2-4-2	0	X	-	8	- SEC.	- SEC.	X	-	-	-	-	-	-	-	-	-	-	X	-

5 Phase Fully Actuated (Raleigh Signal System)

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 and/or phase 5 may be lagged.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.

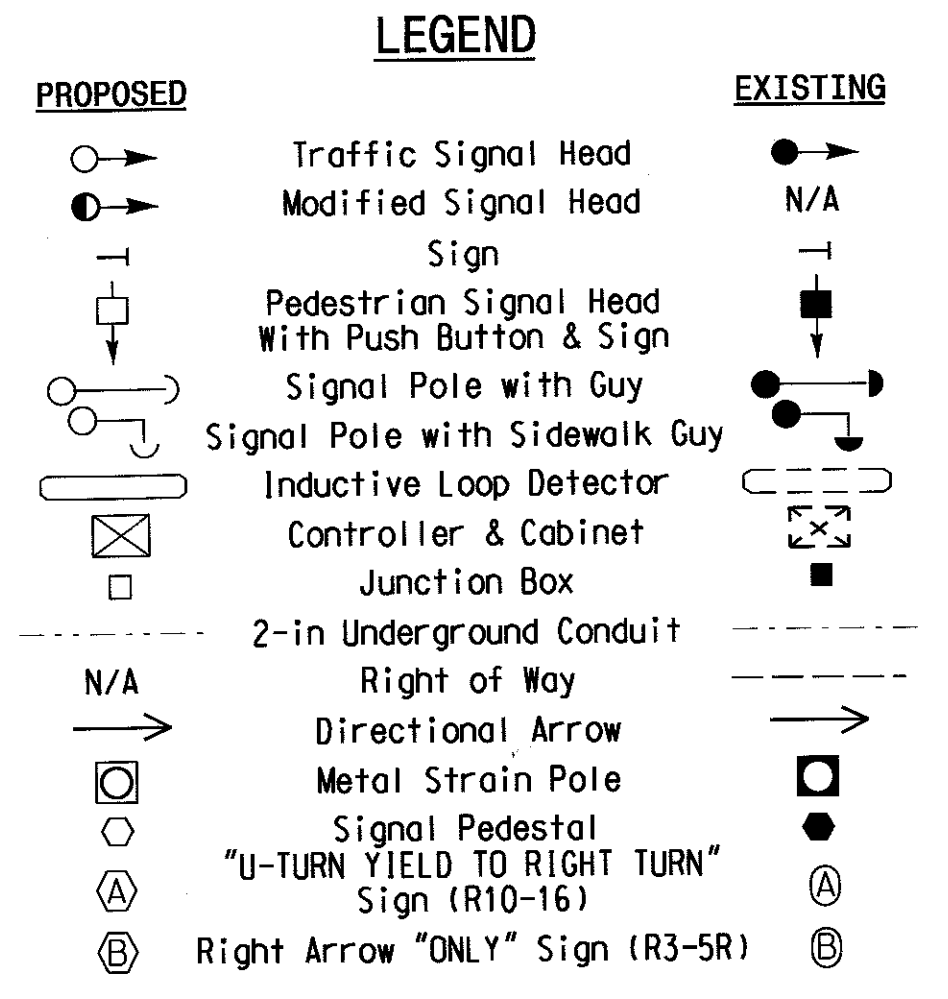
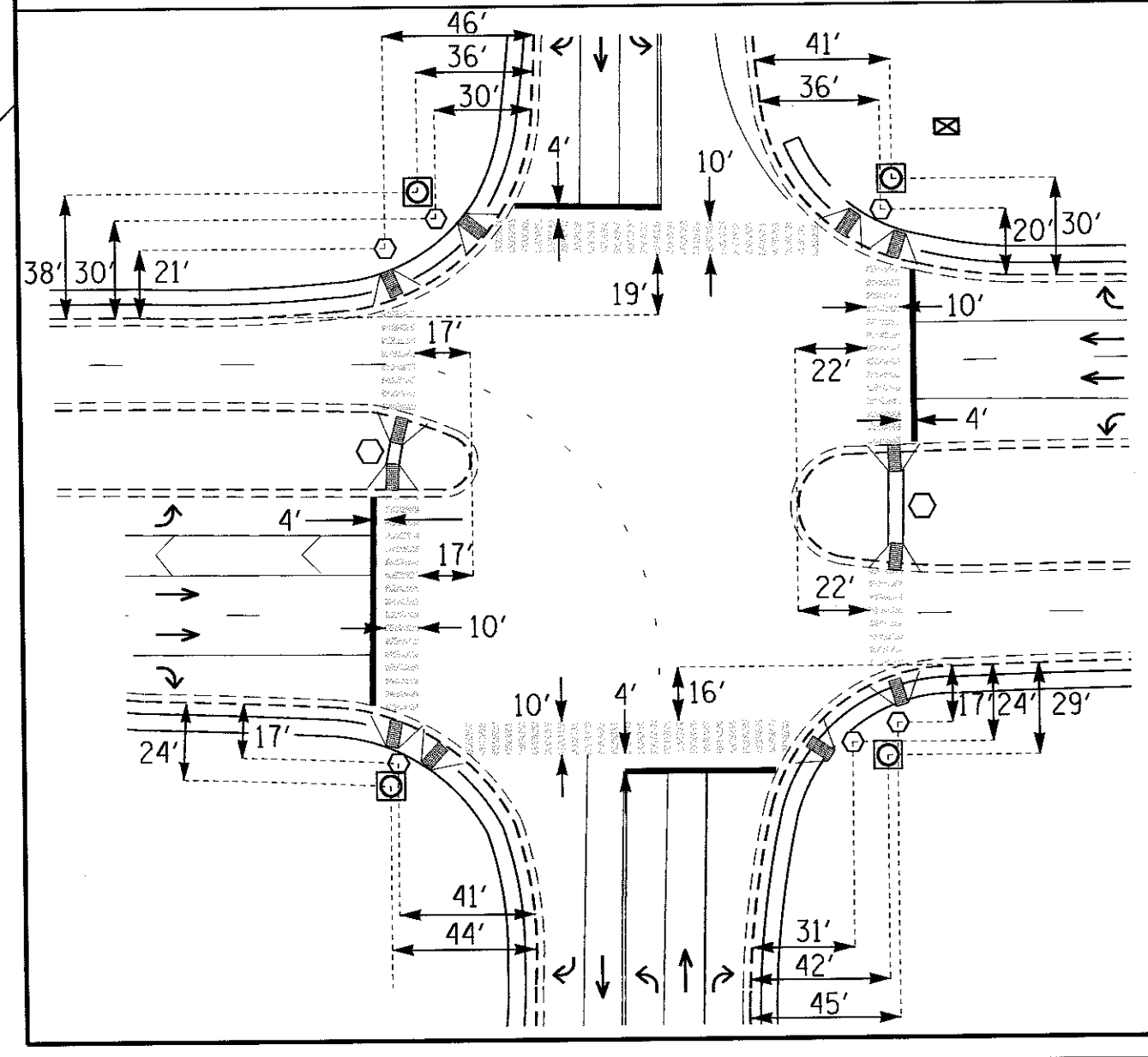


SE-PAC 2070 TIMING CHART

FEATURE	PHASE					
	1	2	4	5	6	8
Min Green *	7	12	7	7	12	7
Passage Gap *	2.0	6.0	2.0	2.0	6.0	2.0
Maximum Green *	15	90	25	15	90	25
Yellow Change	3.0	4.3	3.9	3.0	4.3	3.9
Red Clear	4.0	2.7	3.2	3.9	2.7	3.1
Walk *	-	7	7	-	7	7
Pedestrian Clear	-	27	33	-	26	33
Added Initial *	-	1.5	-	-	1.5	-
Maximum 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	NON-LOCK	LOCK	NON-LOCK	NON-LOCK	LOCK	NON-LOCK
Dual Entry	-	-	ON	-	-	ON
Simultaneous Gap	ON	ON	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.

Proposed Stop Bar, Crosswalk and Metal Pole Locations



New Installation

Prepared in the Offices of:
 TRANSPORTATION MOBILITY AND SAFETY DIVISION
 NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529

SR 3109 (Brier Creek Parkway) at Arnold Palmer Drive/Vogel Street

Division 5 Wake County Raleigh

PLAN DATE: July 2013 REVIEWED BY: L. Blount

PREPARED BY: L. Blount REVIEWED BY: [Signature]

REVISIONS: [Table with columns for REVISIONS, INIT., DATE]

SCALE: 1" = 50'

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 026486 ROBERT J. ZEJMA

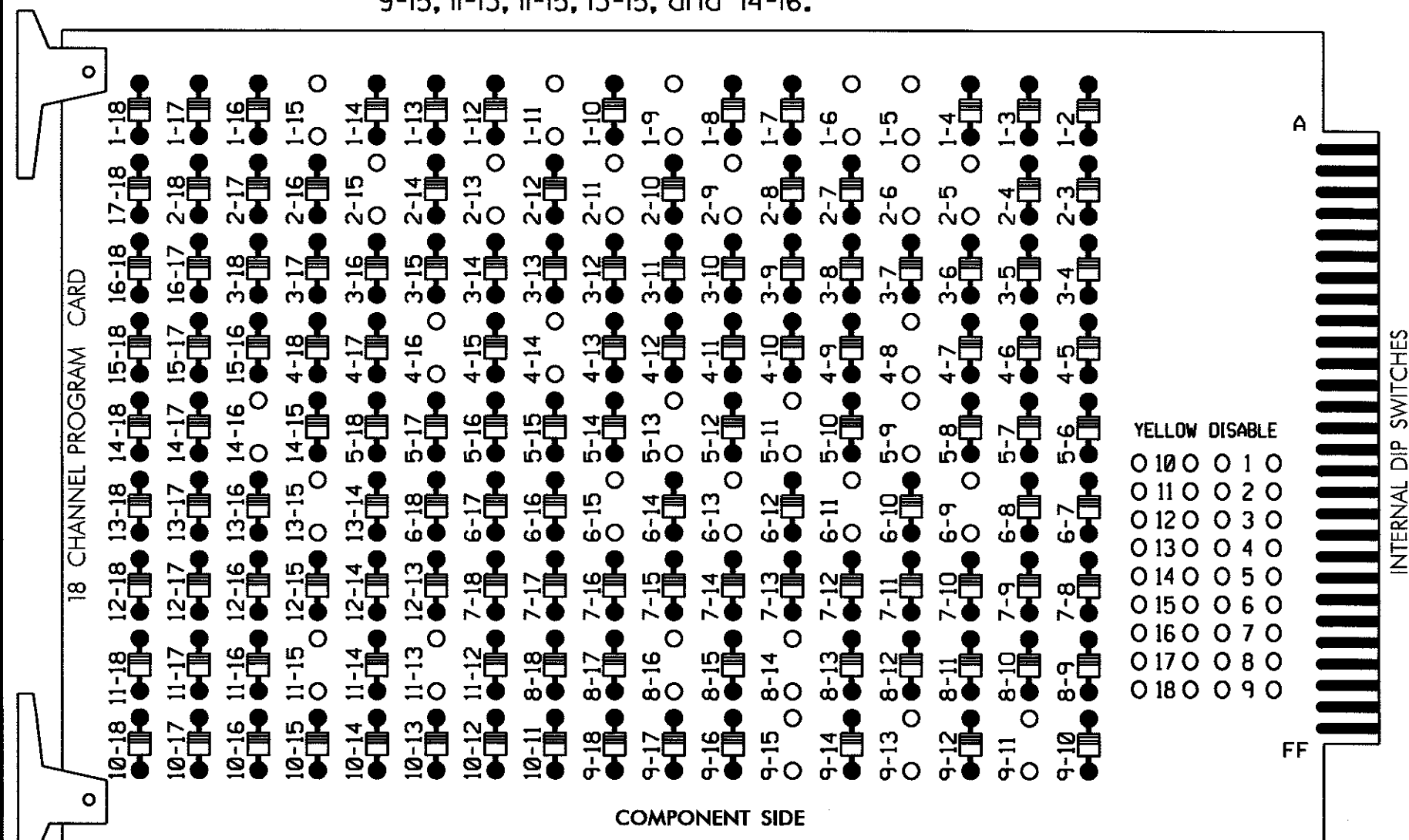
SIG. INVENTORY NO. 05-1864

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**EDI MODEL 2018ECL-NC CONFLICT MONITOR
PROGRAMMING DETAIL**

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-5, 1-6, 1-9, 1-11, 1-15, 2-5, 2-6, 2-9, 2-11, 2-13, 2-15, 4-8, 4-14, 4-16, 5-9, 5-11, 5-13, 6-9, 6-11, 6-13, 6-15, 8-14, 8-16, 9-11, 9-13, 9-15, 11-13, 11-15, 13-15, and 14-16.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- Connect serial cable from conflict monitor to comm. port 1 of 2070 controller. Ensure conflict monitor communicates with 2070.

■ = 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.
- Program controller to start up in phases 2 and 6 green.
- Enable simultaneous gap-out feature, on controller unit, for all phases.
- Program phases 4 and 8, on controller unit, for dual entry.
- Program phases 2 and 6, on controller unit, for volume density operation.
- The cabinet and controller are part of the Raleigh Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070L
 CABINET.....332 W/ AUX
 SOFTWARE.....SE-PAC2070
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX FILE
 LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S7,S8,S9,
 S11,S12,AUX S1,AUX S4
 PHASES USED.....1,2,2PED,4,4PED,5,6,6PED,8,8PED
 OVERLAP A.....*
 OVERLAP B.....NOT USED
 OVERLAP C.....*
 OVERLAP D.....NOT USED
 * See sheet 2 for overlap programming details.

PROJECT REFERENCE NO.	SHEET NO.
SR-5001BX	Sig. 2

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	82	21,22	P21, P22	NU	41,42 P41, P42	42	51	61,62	P61, P62	NU	81,82 P81, P82	11	NU	NU	51	NU	NU
RED		*	128		101		*		134			107						
YELLOW			129		102				135			108						
GREEN			130		103				136			109						
RED ARROW													A121				A114	
YELLOW ARROW			126					132					A122				A115	
FLASHING YELLOW ARROW													A123				A116	
GREEN ARROW	127	127					133	133										
Hand				113		104			119			110						
Foot				115		106			121			112						

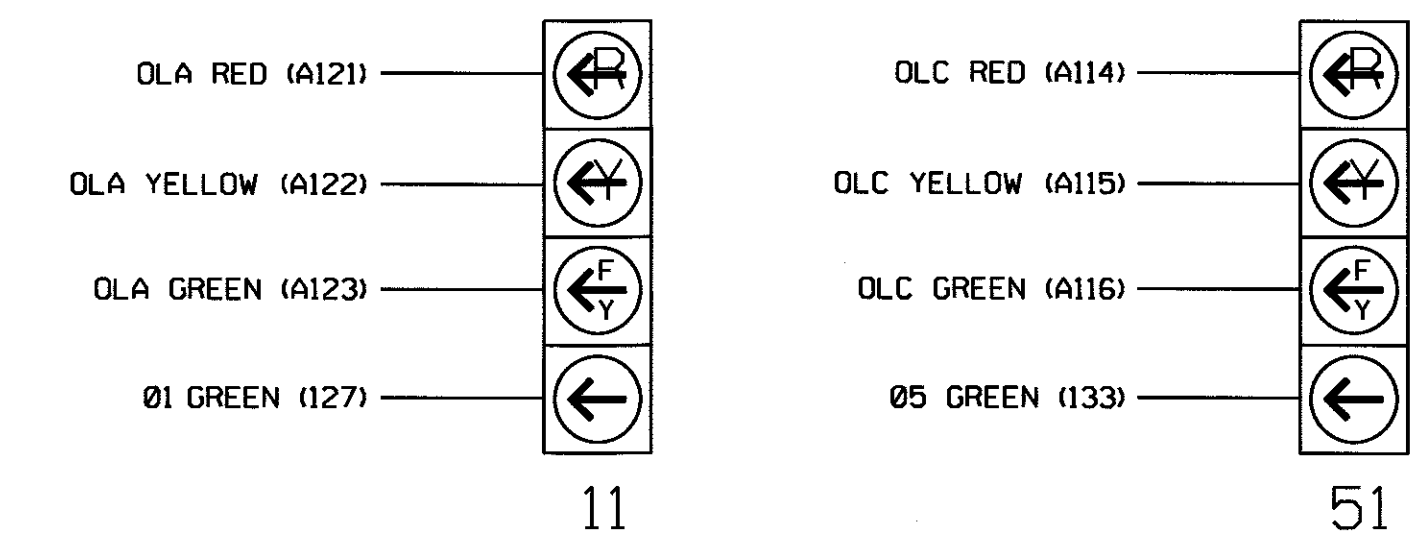
NU = Not Used

* Denotes install load resistor. See load resistor installation detail this sheet.

* See pictorial of head wiring in detail below.

FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



NOTE

The sequence display for signal heads 11 and 51 requires special logic programming. See sheet 2 for programming instructions.

INPUT FILE POSITION LAYOUT

(front view)

FILE "I"	1	2	3	4	5	6	7	8	9	10	11	12	13	14
U	∅ 1	∅ 1	∅ 2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	1A	1B	2A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A	4A
U	NOT USED	NOT USED	∅ 2	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4	∅ 4
L	2B	2B	2B	4B	4B	4B	4B	4B	4B	4B	4B	4B	4B	4B

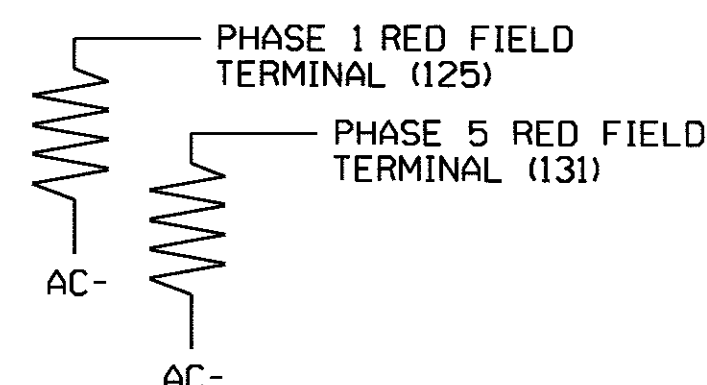
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE
 ST = STOP TIME

* Wired Input - Do not populate slot with detector card

**LOAD RESISTOR
INSTALLATION DETAIL**

VALUE (ohms)	WATTAGE
1.5K - 1.9K	25W (min)
2.0K - 3.0K	10W (min)



INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	DETECTOR NO.	NEMA PHASE	DELAY TIME	EXTEND (STRETCH) TIME
1A ¹	TB2-1,2	I1U	56	1	1	15	
	-	J4U	48	25	6		
1B	TB2-5,6	I2U	39	3	1	15	
	TB2-11,12	I3L	76	6	2		
2A	TB2-9,10	I3U	63	5	2		
	TB4-9,10	I6U	41	11	4	3	
4A	TB4-11,12	I6L	45	12	4		
	TB3-1,2	J1U	55	19	5	15	
5A ²	-	I4U	47	7	2		
	TB3-5,6	J2U	40	21	5	15	
5B	TB3-9,10	J3U	64	23	6		
	TB3-11,12	J3L	77	24	6		
6A	TB5-9,10	J6U	42	31	8	3	
	TB5-11,12	J6L	46	32	8		
PED PUSH BUTTONS							
P21,P22	TB8-4,6	I12U	67	PED 2	2 PED		
P41,P42	TB8-5,6	I12L	69	PED 4	4 PED		
P61,P62	TB8-7,9	I13U	68	PED 6	6 PED		
P81,P82	TB8-8,9	I13L	70	PED 8	8 PED		

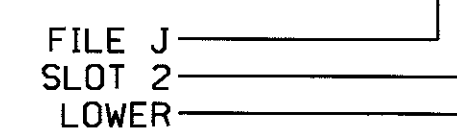
NOTE:

INSTALL DC ISOLATORS IN INPUT FILE SLOTS 112 AND 113.

¹Add jumper from I1-W to J4-W, on rear of input file.

²Add jumper from J1-W to I4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



COUNTDOWN PEDESTRIAN SIGNAL OPERATION

Countdown Ped Signals are required to display timing only during Ped Clearance Interval. Consult Ped Signal Module user's manual for instructions on selecting this feature.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 05-1864
 DESIGNED: July 2013
 SEALED: 8/12/13
 REVISED: N/A

New Installation - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared in the Offices of: Signal Management Group, Inc. 750 Greenfield Parkway, Garner, NC 27529	SR 3109 (Brier Creek Parkway) at Arnold Palmer Drive/ Vogel Street		SEAL JOHN T. ROWE, INC. ENGINEER 008453
	Division 5 PLAN DATE: August 2013 PREPARED BY: S. Armstrong	Wake County REVIEWED BY: JTR REVIEWED BY:	

FLASHING YELLOW ARROW PROTECTED/PERMISSIVE SEQUENCE FOR OVERLAPS A & C

(program controller as shown below)
FROM MAIN MENU PRESS 4 (UNIT DATA)

SE-PAC UNIT DATA	PRESS # DESIRED
1-STARTUP & MISC	6-ALT SEQUENCES
2-REMOTE FLASH	7-PORT 1 DATA
3-OVERLAP STANDARD	8-I/O MISC
4-OVERLAP SPECIAL	9-SIG DRV OUT
5-RING STRUCTURE	
F-PRIOR MENU	

DO NOT enter any OVL PHASES! →

SE-PAC OVERLAP - A	(0-NO/1-YES)
OVL PHASES: 00000000 0000000	
PHS/CHN: 123456789 0123456789 01234	
OVL CHN(S): 000000000 000100000 00000	
A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU	

PRESS "B" TWICE

DO NOT enter any OVL PHASES! →

SE-PAC OVERLAP - C	(0-NO/1-YES)
OVL PHASES: 000000000 0000000	
PHS/CHN: 123456789 0123456789 01234	
OVL CHN(S): 000000000 000001000 00000	
A-UP B-DN D-DspChn E-EDIT F-PRIOR MENU	

OVERLAP PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

PROTECTED AND PERMISSIVE PHASES FOR FLASHING YELLOW ARROW

(program controller as shown below)
FROM MAIN MENU PRESS 4 (UNIT DATA)

SE-PAC UNIT DATA	PRESS # DESIRED
1-STARTUP & MISC	6-ALT SEQUENCES
2-REMOTE FLASH	7-PORT 1 DATA
3-OVERLAP STANDARD	8-I/O MISC
4-OVERLAP SPECIAL	9-SIG DRV OUT
5-RING STRUCTURE	
F-PRIOR MENU	

PROTECTED PHASES →
PERMISSIVE PHASES →

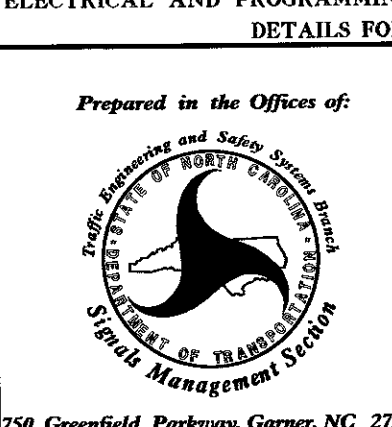
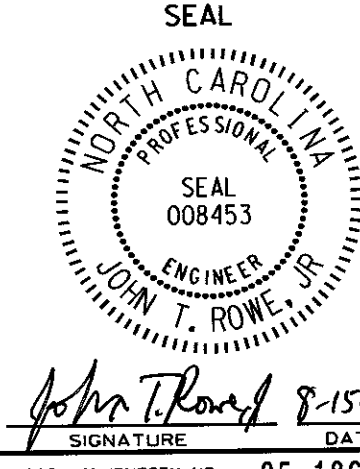
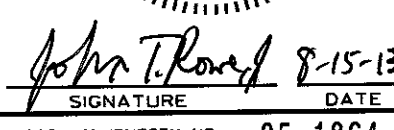
SE-PAC OVLP. A...B...C...D...E...F...G...H.	
TR GRN	0 0 0 0 0 0 0 0
YEL/10	40 40 40 40 40 40 40 40
RED/10	20 20 20 20 20 20 20 20
-G/Y	1 0 5 0 0 0 0 0
+GRN	2 0 6 0 0 0 0 0
(-) #-PH G/Y KILLS OVL= (+) #-PH G STRT	
A-UP B-DN C-LT D-RT E-ENTER F-PRIOR MENU	

PPLT DEFINITION PROGRAMMING COMPLETE
PRESS 'F' TO RETURN TO UNIT DATA

NOTE: THIS PROGRAMMING IS REQUIRED FOR SIGNAL HEADS 11 AND 51 SO THAT THE SOLID GREEN ARROWS TURN ON EXCLUSIVELY DURING PROTECTED GREEN PHASES 1 & 5, AND THE FLASHING YELLOW ARROWS TURN ON EXCLUSIVELY DURING PERMITTED GREEN PHASES 2 AND 6.

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 05-1864
DESIGNED: July 2013
SEALED: 8/12/13
REVISED: N/A

New Installation - Sheet 2 of 2

	<p>ELECTRICAL AND PROGRAMMING DETAILS FOR:</p> <p>SR 3109 (Brier Creek Parkway) at Arnold Palmer Drive/ Vogel Street</p>	<p>SEAL</p> 						
<p>Division 5 Wake County Raleigh</p> <p>PLAN DATE: August 2013 REVIEWED BY: JTR</p> <p>PREPARED BY: S. Armstrong</p>		<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>NO.</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	INIT.	DATE			
NO.	INIT.		DATE					
<p>750 Greenfield Parkway, Garner, NC 27529</p>		<p style="text-align: right;">  SIGNATURE DATE 8-15-13 SIG. INVENTORY NO. 05-1864 </p>						

13-AUG-2013 07:00
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- 1 INSTALL REA, PE - 22, SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 2 INSTALL REA, PE - 38, (FIGURE 8) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 3 INSTALL REA, PE - 39, (UNDERGROUND) SHIELDED, TWISTED PAIR COMMUNICATIONS CABLE
- 4 INSTALL SMFO CABLE
- 5 INSTALL MMFO CABLE
- 6 INSTALL FIBER OPTIC DROP CABLE
- 7 INSTALL TRACER WIRE
- 8 TRENCH
- 9 INSTALL PVC CONDUIT
- 10 INSTALL RIGID, GALVANIZED STEEL CONDUIT
- 11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- 12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
- 13 INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
- 14 INSTALL POLYETHYLENE CONDUIT
- 15 DIRECTIONAL DRILL CONDUIT
- 16 BORE AND JACK CONDUIT
- 17 INSTALL CABLE(S) IN EXISTING CONDUIT
- 18 INSTALL CABLE(S) IN NEW CONDUIT
- 19 INSTALL CABLE(S) IN EXISTING RISER
- 20 INSTALL CABLE(S) IN NEW RISER
- 21 INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
- 22 INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 23 INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 24 INSTALL NEW CONDUIT INTO EXISTING POLE MOUNTED CABINET
- 25 INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
- 26 TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
- 27 INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
- 28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPlice CABLE IN CABINET
- 29 INSTALL UNDERGROUND SPlice ENCLOSURE
- 30 INSTALL AERIAL SPlice ENCLOSURE
- 31 INSTALL POLE MOUNTED SPlice CABINET
- 32 INSTALL BASE MOUNTED SPlice CABINET
- 33 REMOVE EXISTING SPlice CABINET

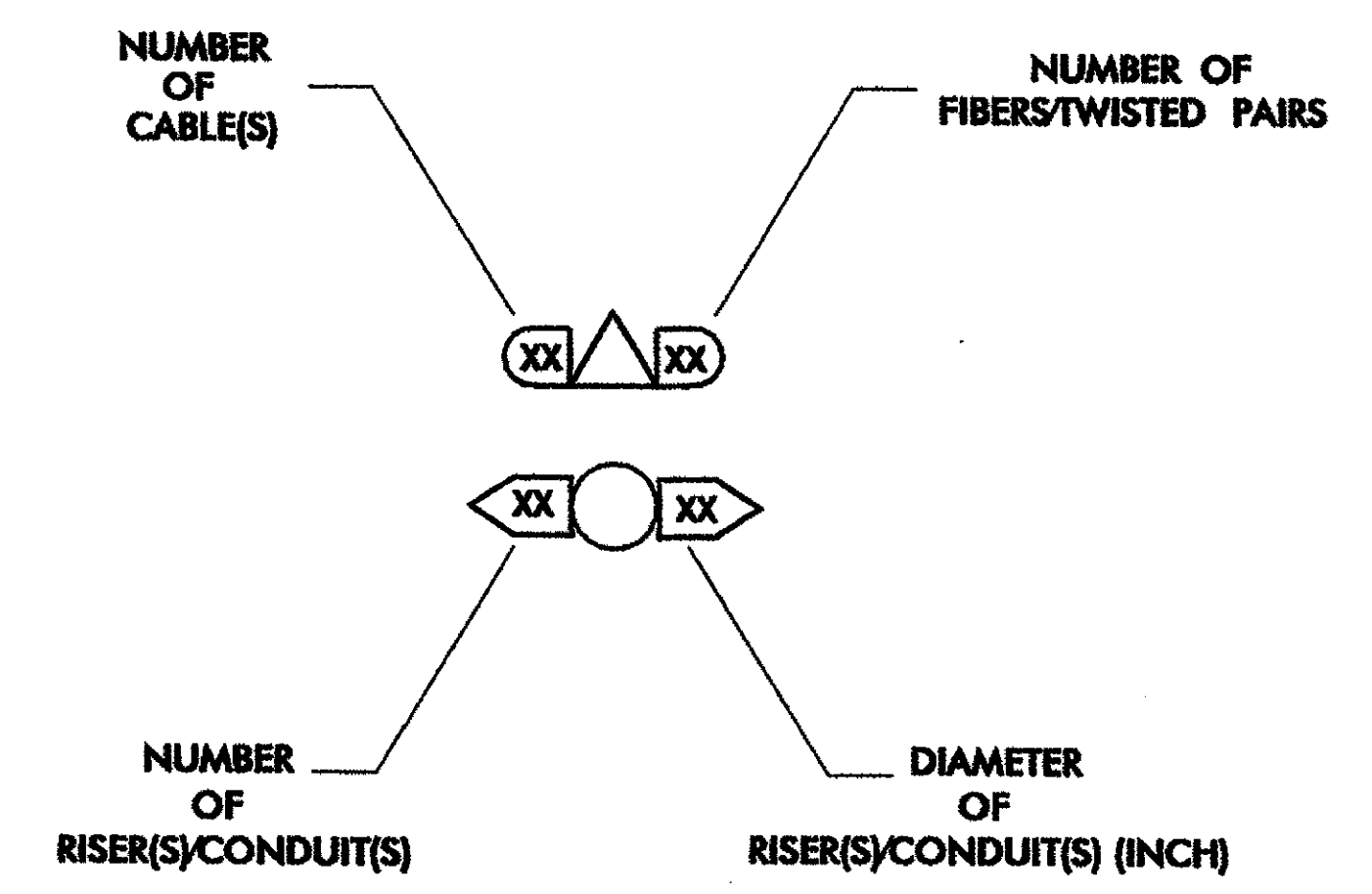
- 34 INSTALL CABINET FOUNDATION
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL WOOD POLE
- 43 REMOVE EXISTING WOOD POLE
- 44 INSTALL AERIAL GUY ASSEMBLY
- 45 INSTALL STANDARD GUY ASSEMBLY
- 46 INSTALL SIDEWALK GUY ASSEMBLY
- 47 INSTALL MESSENGER CABLE
- 48 REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
- 49 REMOVE EXISTING MESSENGER CABLE
- 50 INSTALL TELEPHONE SERVICE
- 51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- 52 INSTALL DELINEATOR MARKER
- 53 STORE 20 FEET OF COMMUNICATIONS CABLE
- 54 LASH CABLE(S) TO EXISTING SIGNAL/COMMUNICATIONS CABLE
- 55 LASH CABLE(S) TO EXISTING MESSENGER CABLE
- 56 LASH CABLE(S) TO NEW MESSENGER CABLE
- 57 MODIFY EXISTING ELECTRICAL SERVICE
- 58 INSTALL NEW ELECTRICAL SERVICE

LEGEND

- FO NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI EXISTING COMMUNICATIONS CABLE
- REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD NEW DIRECTIONAL DRILLED CONDUIT
- B&J NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- AERIAL SPlice ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW SIDEWALK GUY ASSEMBLY
- NEW CABLE STORAGE RACKS (SNOW SHOES)
- EXISTING CONTROLLER AND CABINET
- EXISTING SPlice CABINET
- NEW SPlice CABINET
- SP SIGNAL POLE
- XX-XXXX SIGNAL INVENTORY NUMBER

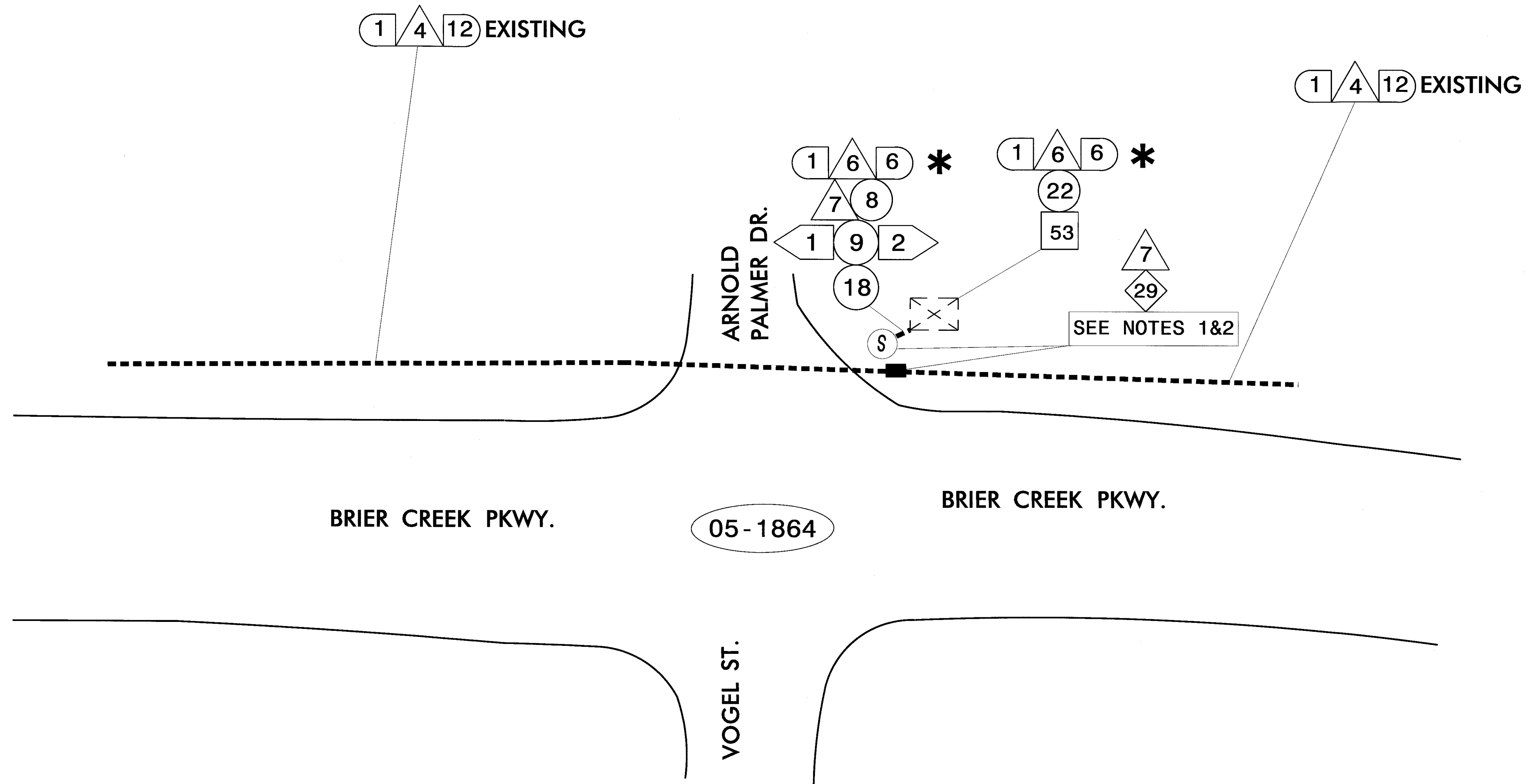
CONSTRUCTION NOTE SYMBOLOGY KEY

- XX INDICATES NUMBER OF CABLES, LOOPS, ETC.
- XX INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- XX INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- XX INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



	CONSTRUCTION NOTES		
	PLAN DATE: _____ PREPARED BY: _____ SCALE: _____ 	REVIEWED BY: _____ REVIEWED BY: G. A. FULLER REVISIONS: _____ INIT. DATE: _____	

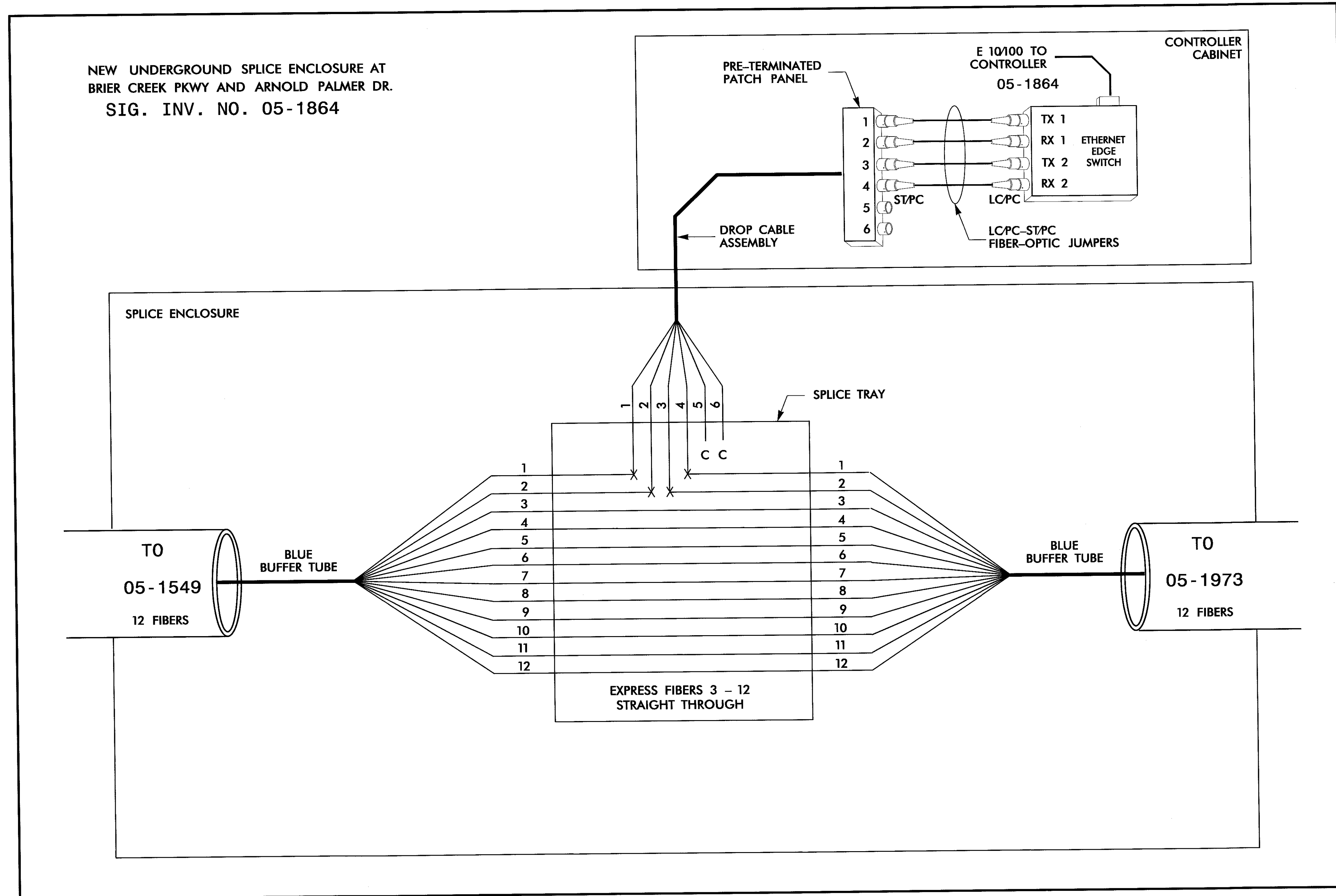
***DROP CABLE ASSEMBLY (PRE-ASSEMBLED)**



- NOTE 1. STORE 30 FT. OF DROP CABLE ASSEMBLY (PRE-ASSEMBLED)
- 2. USE EXISTING FIBER IN JUNCTION BOX TO SPLICE IN UNDERGROUND SPLICE ENCLOSURE.

	BRIER CREEK PKWY AT ARNOLD PALMER DR.		
	DIVISION 05 WAKE COUNTY RALEIGH PLAN DATE: JULY 2013 REVIEWED BY: I. N. AVERY	PREPARED BY: P. C. LOUDER REVIEWED BY: G.A. FULLER, PE	
750 N. Greenfield Pkwy., Garner, NC 27529 SCALE: 0'	REVISIONS:	INIT. DATE	SIGNATURE: <i>Gregory A. Fuller</i> 7/30/13 DATE: 7/30/13 CADD: F. Terrence

*DROP CABLE ASSEMBLY (PRE-ASSEMBLED)



NOTES:

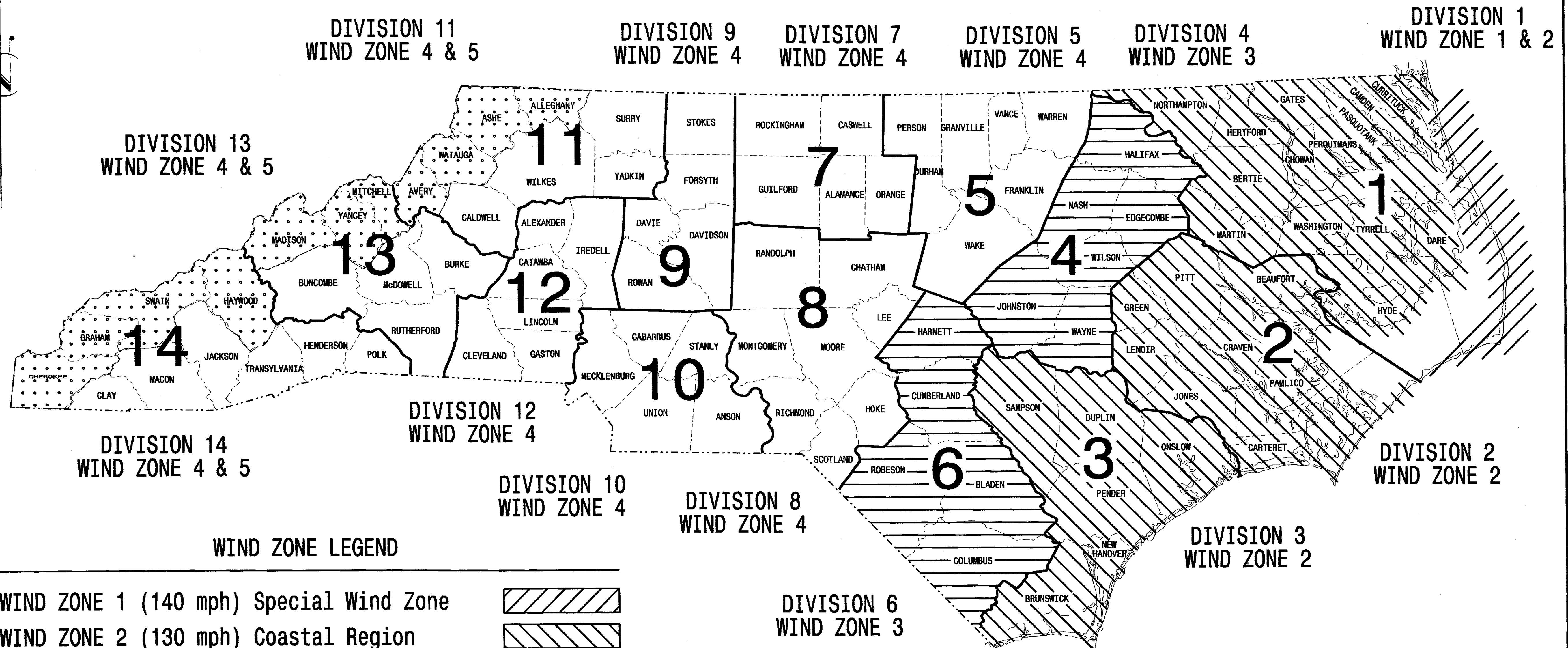
- 1) ETHERNET EDGE SWITCH TO BE PROVIDED BY THE CITY OF RALEIGH. CONTACT JED NIFFENEGGER, SENIOR TRANSPORTATION ENGINEER, AT 919-996-4039 TO OBTAIN EDGE SWITCH. PROVIDE 5 WORKING DAYS NOTICE.
- 2) THE CITY WILL PROVIDE THE ETHERNET EDGE SWITCH PRE-PROGRAMMED WITH REQUIRED NETWORK CONFIGURATION DATA (INCLUDING BUT NOT LIMITED TO PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION).

	SPLICE PLAN		
	DIVISION 05 WAKE COUNTY RALEIGH		
PLAN DATE: JULY 2013	REVIEWED BY: I. N. AVERY		Signature: <i>Gregory A. Fuller</i> 7/30/13 DATE
PREPARED BY: P. C. LOUDER	REVIEWED BY: G. A. FULLER, PE		
SCALE: 0	REVISIONS	INIT.	DATE
CADD Filename:			

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

STATE	PROJECT NO.	SHEET NO.
N.C.	SR-5001BX	Sig. 7
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		

<https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Designed in conformance with the latest 2012 Interim to the 5th Edition 2009

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:

MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT

G. A. FULLER, P.E. - STATE ITS AND SIGNALS ENGINEER

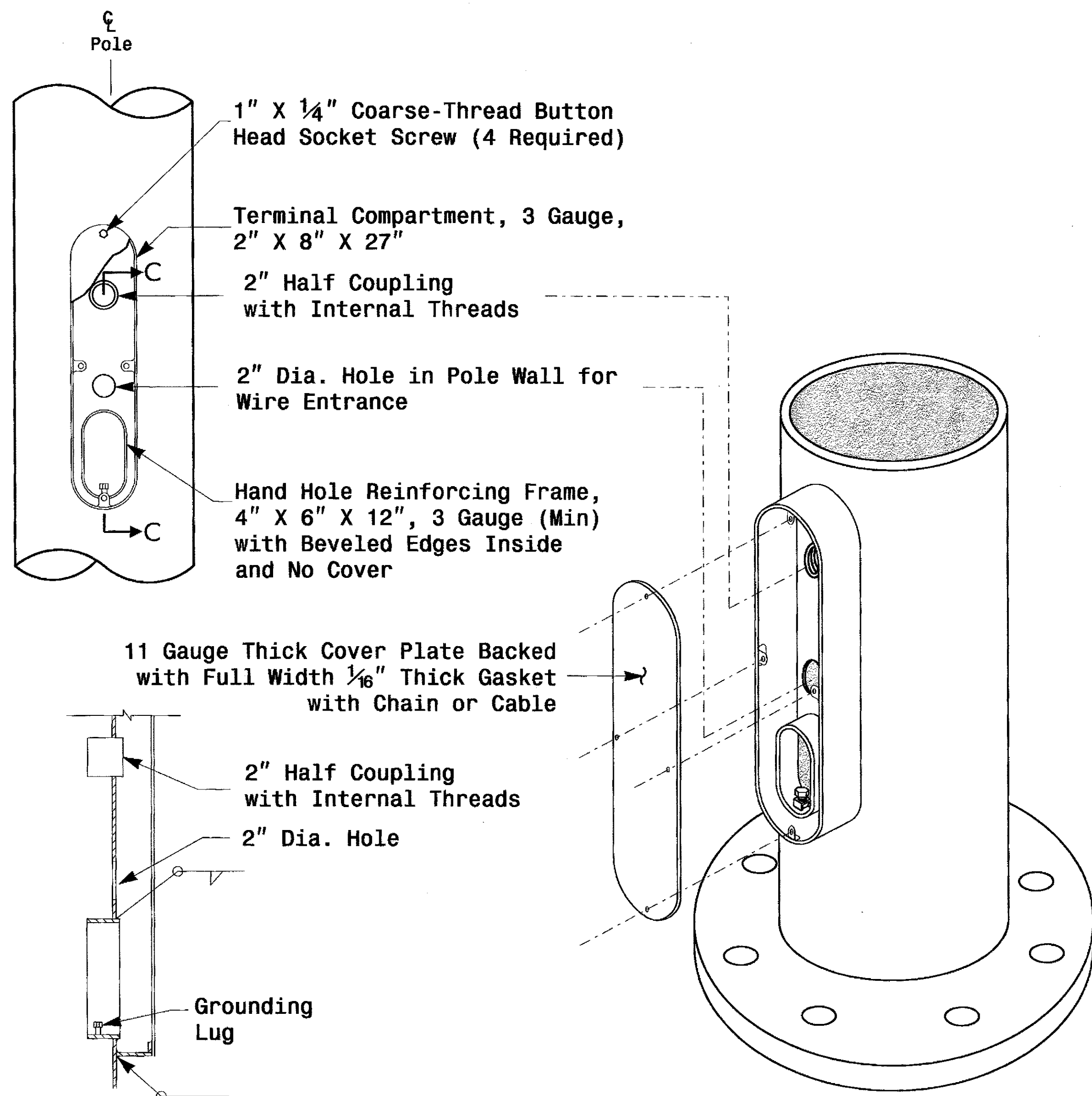
G. G. MURR, JR., P.E. - STATE SIGNALS ENGINEER

D. C. SARKAR, P.E. - ITS AND SIGNALS SENIOR STRUCTURAL ENGINEER

C. F. ANDREWS - ITS AND SIGNALS JOURNEY STRUCTURAL ENGINEER

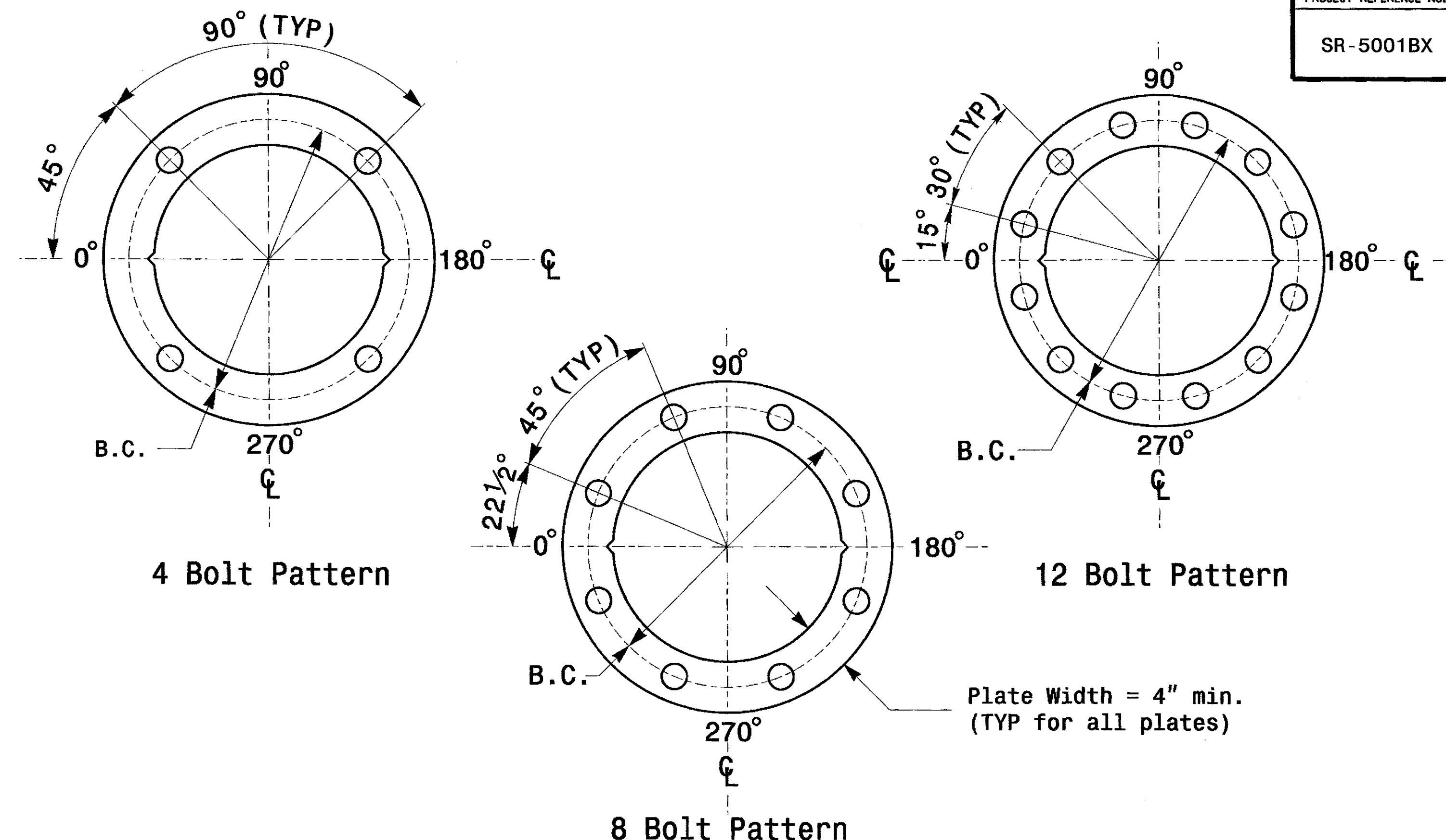
SEAL

D. Sarkar 8.7.2013
 SIGNATURE DATE



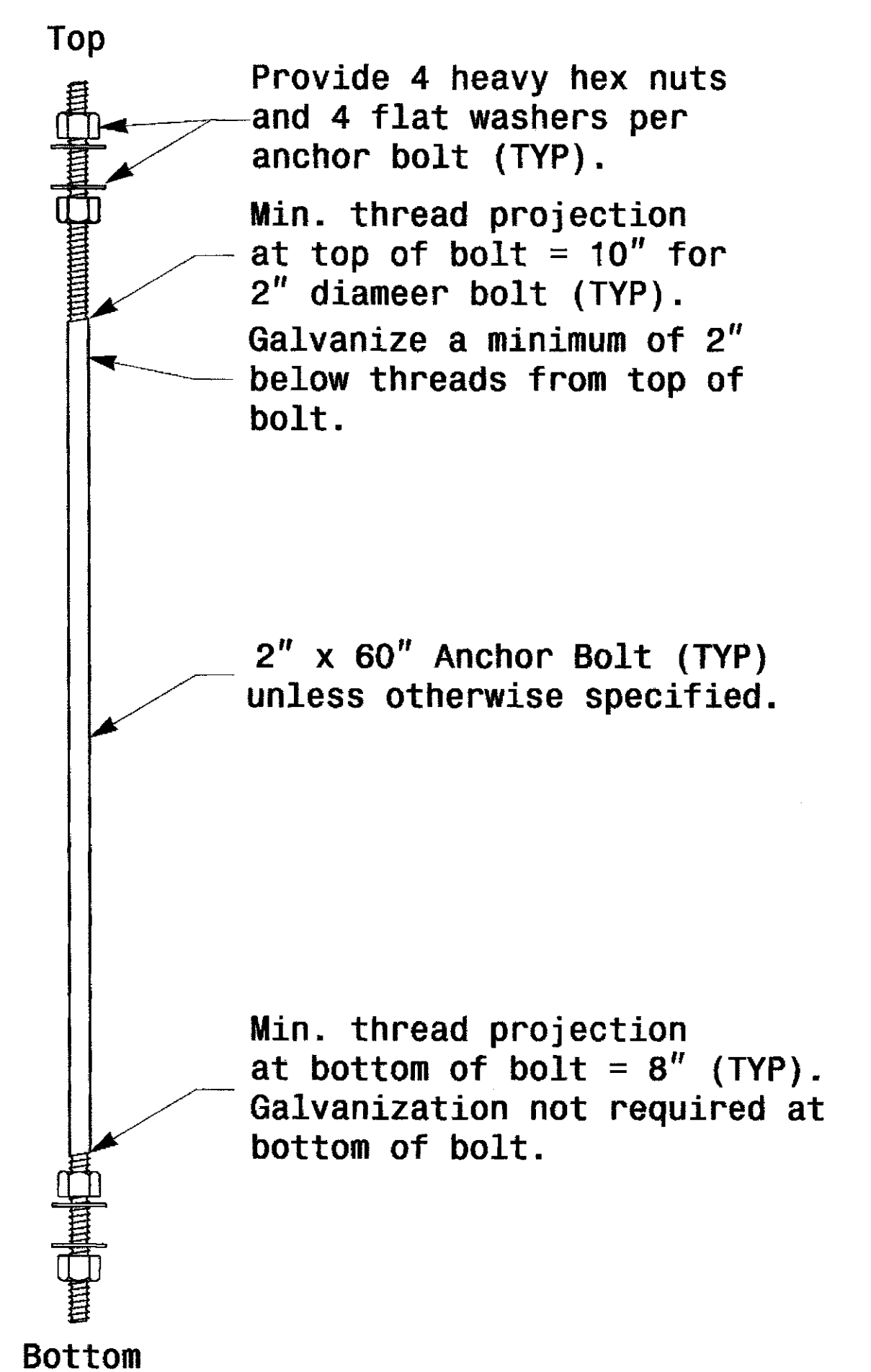
Section C-C Note: Unless otherwise specified, locate Terminal Compartment 1 foot above the pole base plate at 180 degrees on the pole's radial index.

Terminal Compartment Detail

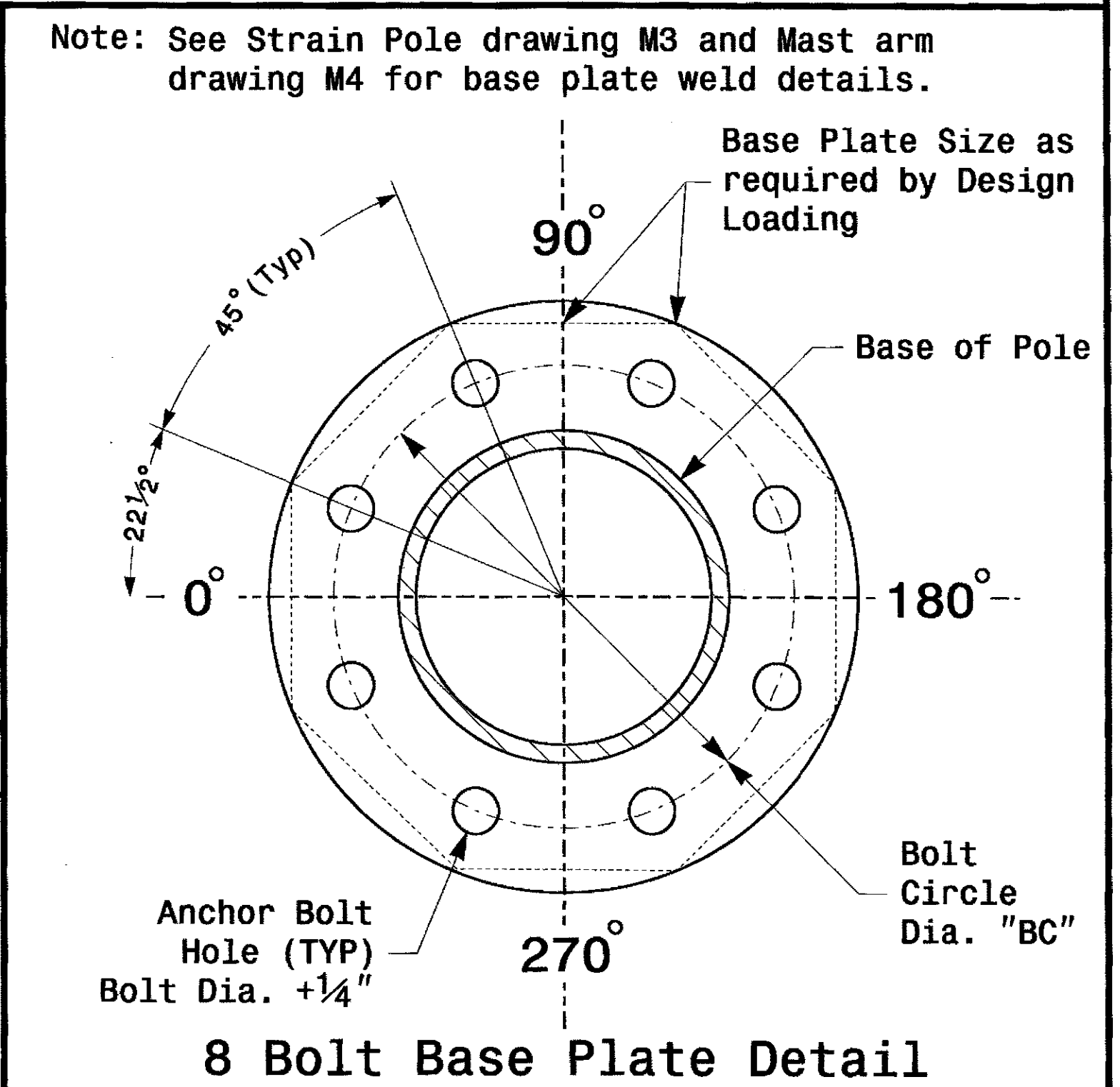


Construct Templates and Plates from 1/4" min. thick Steel. Galvanizing is not required.

Base Plate Template and Anchor Bolt Lock Plate Details



Anchor Bolt Detail



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 _____

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

MFG _____ MFG. DATE:MM/YY

SECTION D/T/L/Y _____

NCDOT STANDARD _____

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

- 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 pole I.D. number and Signal Inv. Number.
 - 5) See drawing M4 for mounting positions of I.D. tags.

Identification Tag Details

Prepared in the Office of:

Typical Fabrication Details Common To All Metal Poles

PLAN DATE: AUGUST 2013 DESIGNED BY: C.F. ANDREWS

PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR

SCALE: 0 NA NONE

REVISIONS: _____

INIT. DATE

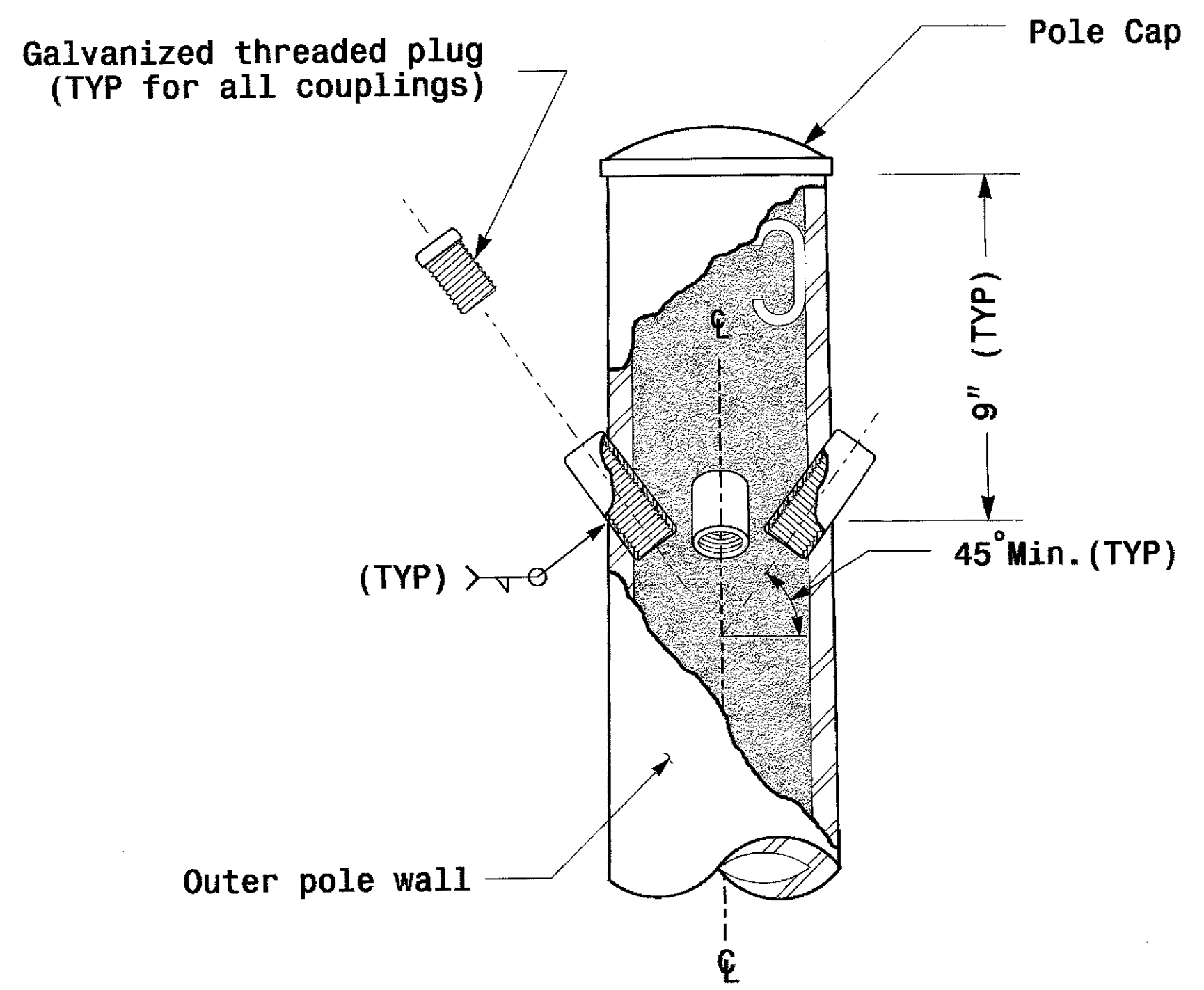
SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 ENGINEER DEBESH C. SARKAR

Signature: D. Sarkar 8.7.2013

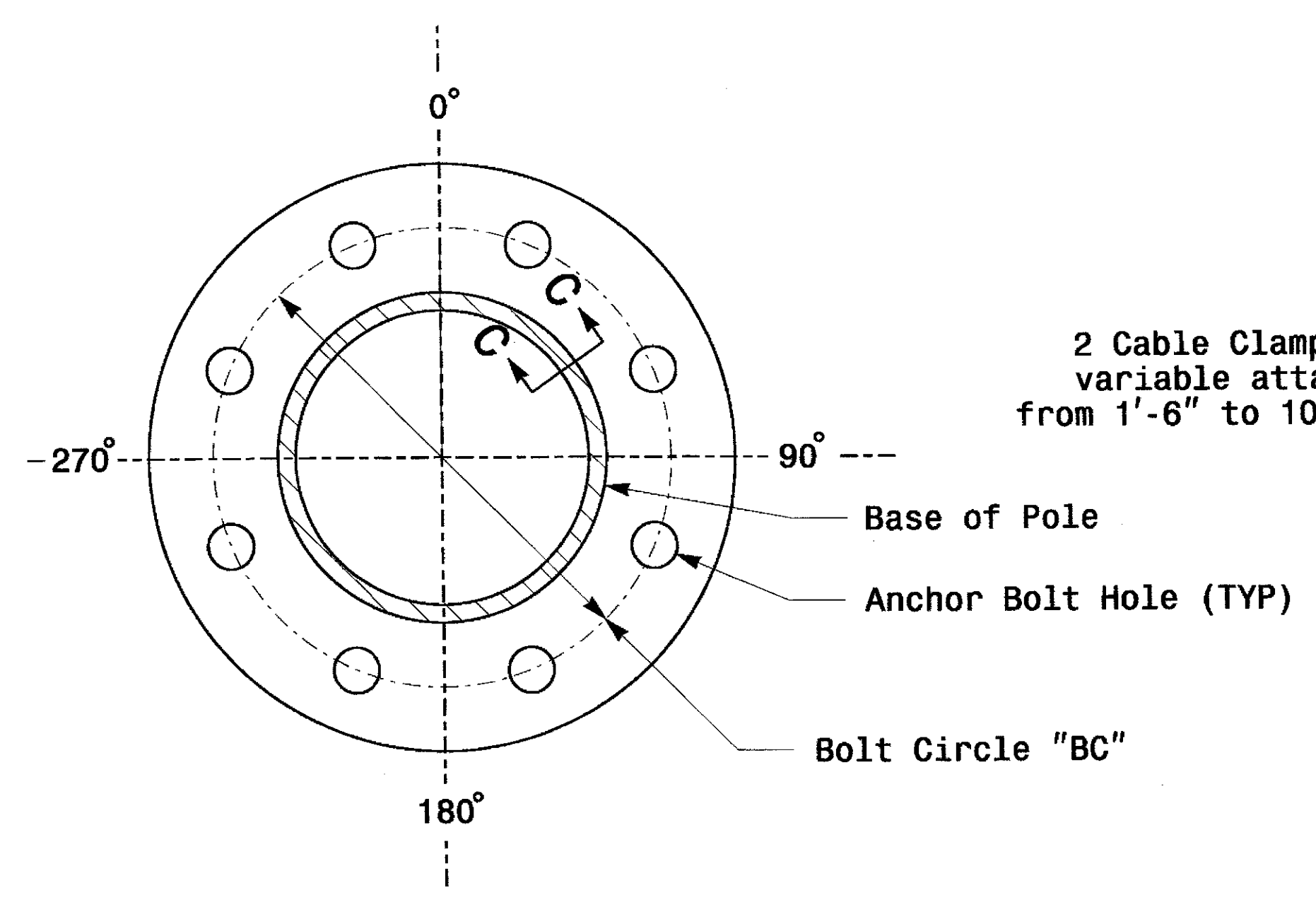
SIG. INVENTORY NO. _____

Fabrication Details - All Poles

07-AUG-2013 13:15 C:\Users\jgarcia\Documents\Drawings\2012 Standard Strain Pole Design\02.mxd

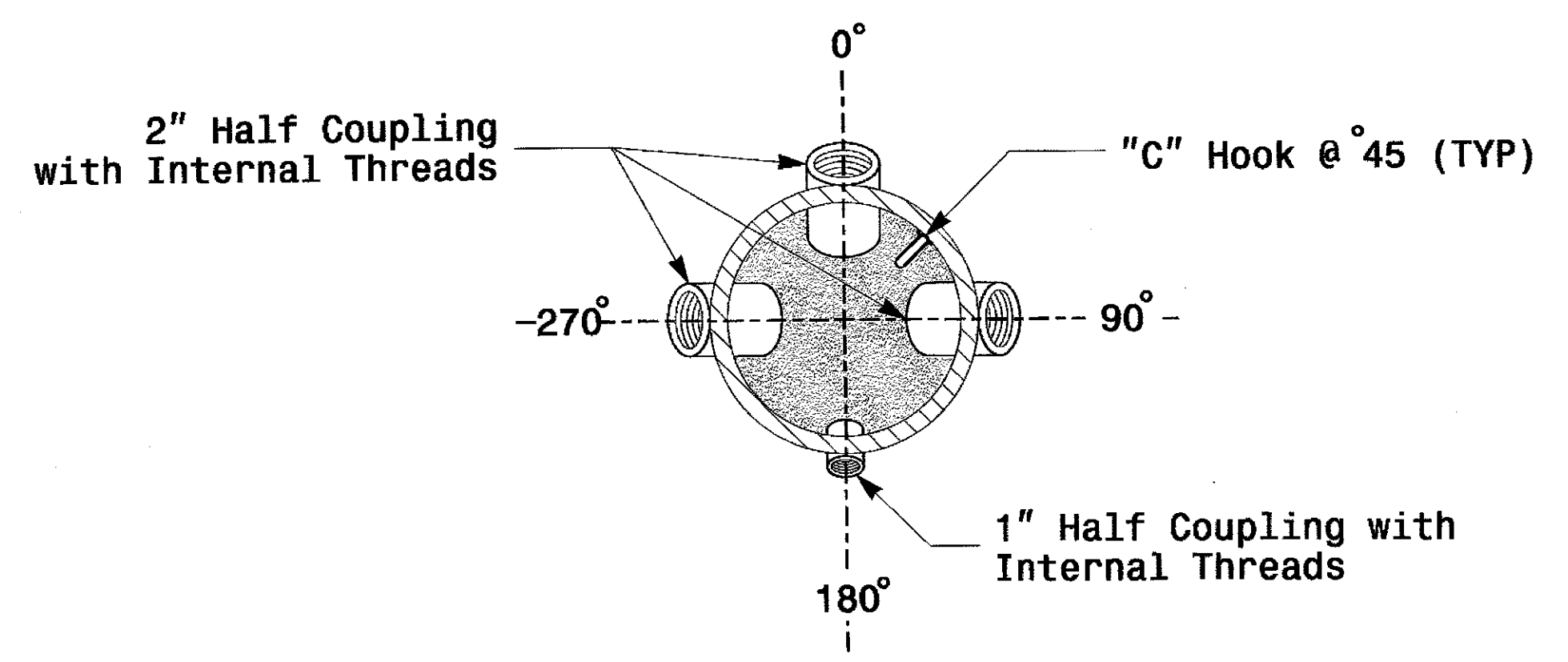
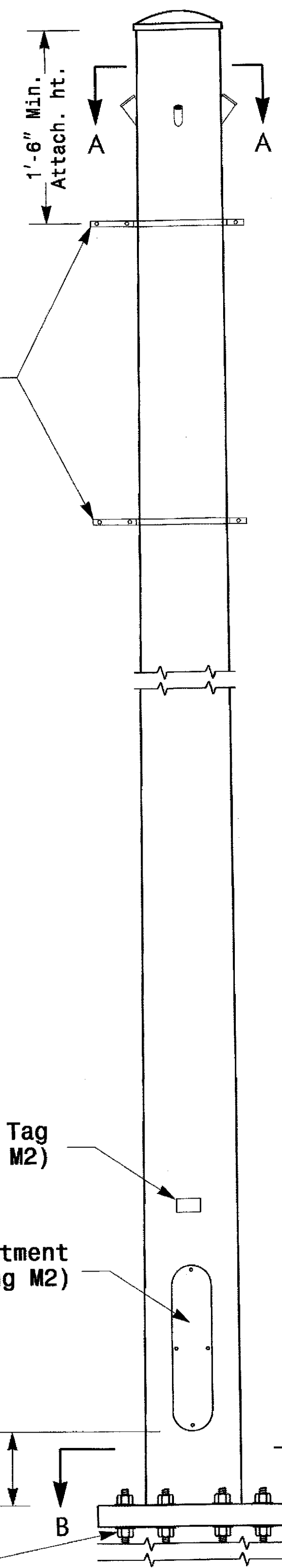


Cable Entrances at Top of Pole

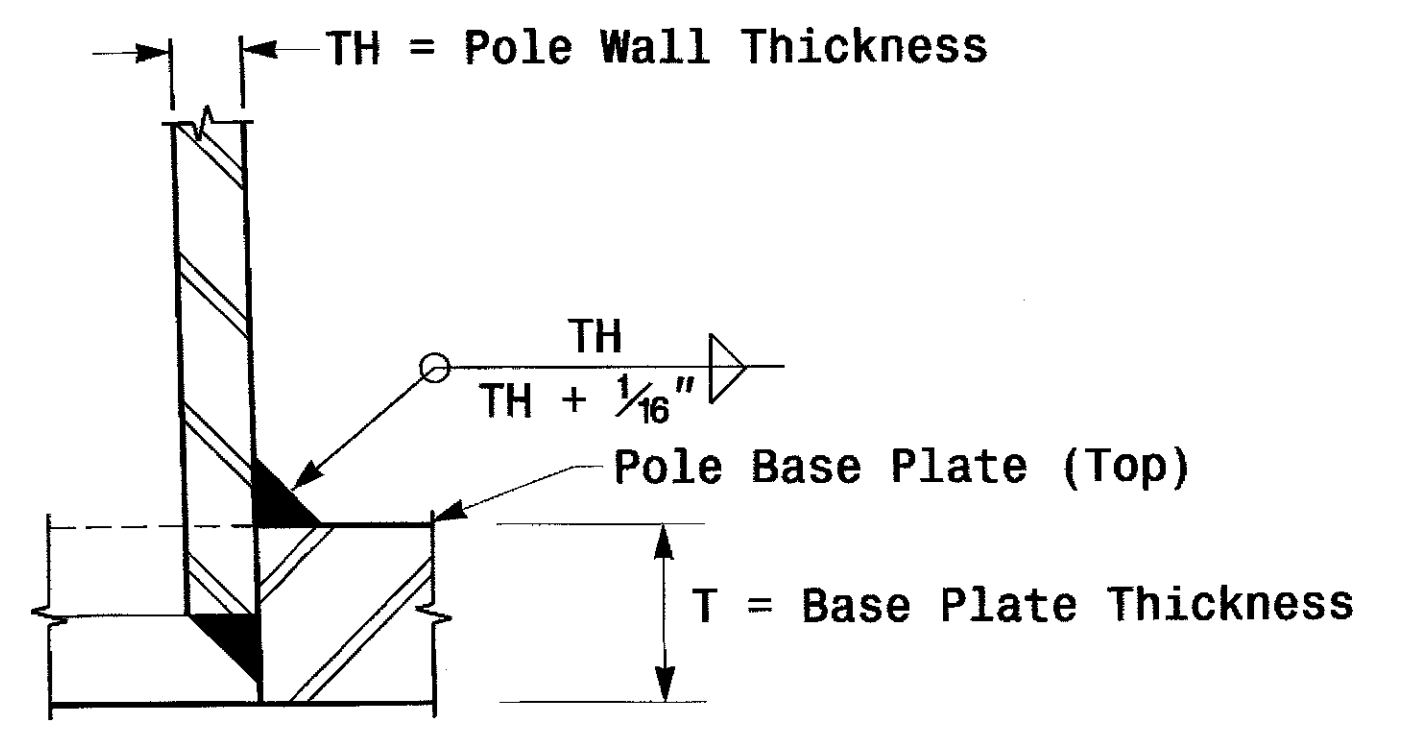


Section B-B
(See drawing M2)
Pole Base Plate

2 Cable Clamps designed for variable attachment heights from 1'-6" to 10' below the top of the pole.



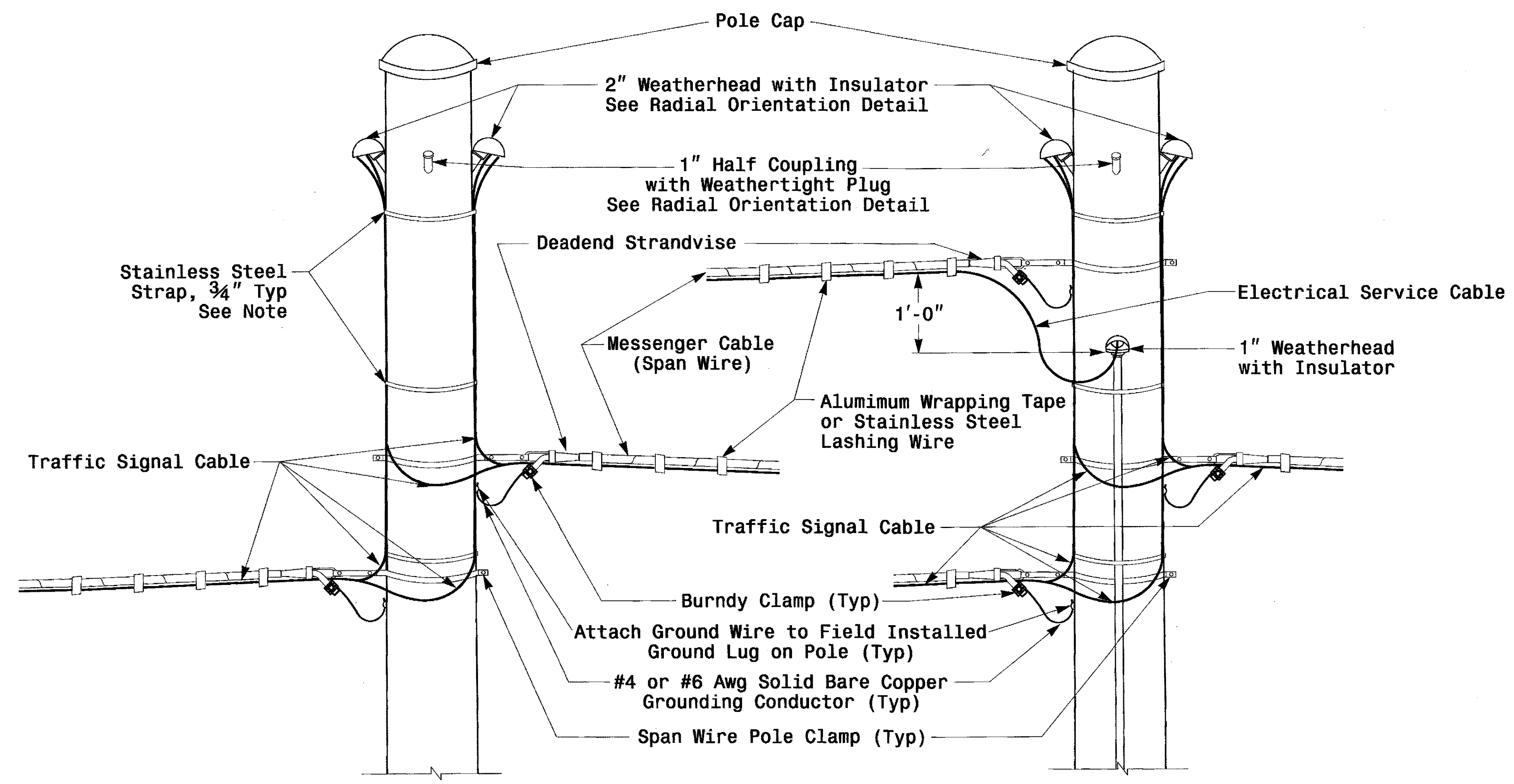
Section A-A
Radial Orientation for Factory Installed Accessories at Top of Pole



Section C-C
Socket Connection Weld Detail

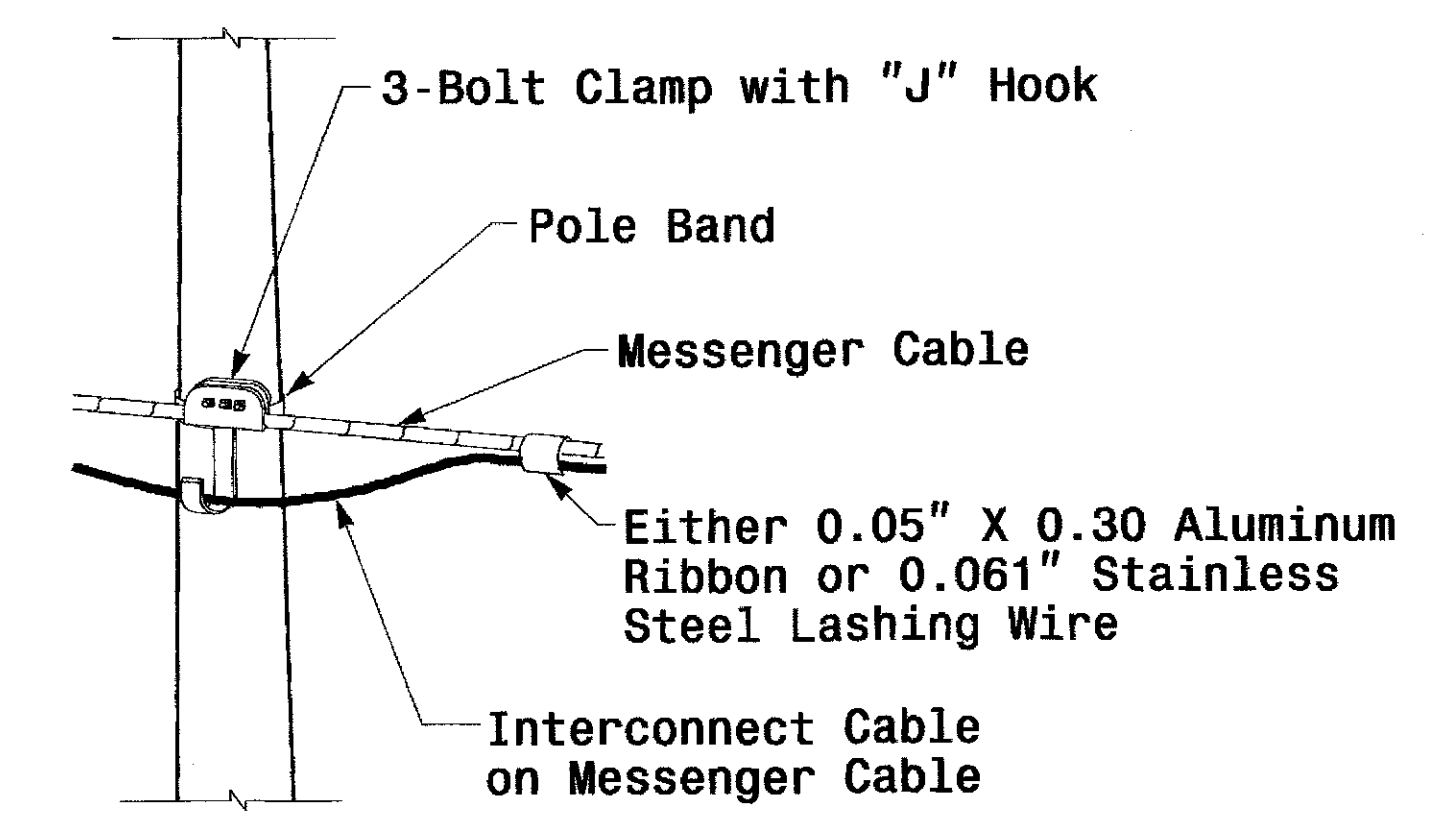
	Typical Fabrication Details For Strain Poles		
	PLAN DATE: AUGUST 2013 DESIGNED BY: C.F. ANDREWS PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR	REVISIONS INJT. DATE	

07-AUG-2013 13:11 S:\ITS&S\WITS 5\Signal\work\p\sub\structures\Drawings\02 Standard Strain Pole Dwg\0212 m3.dgn

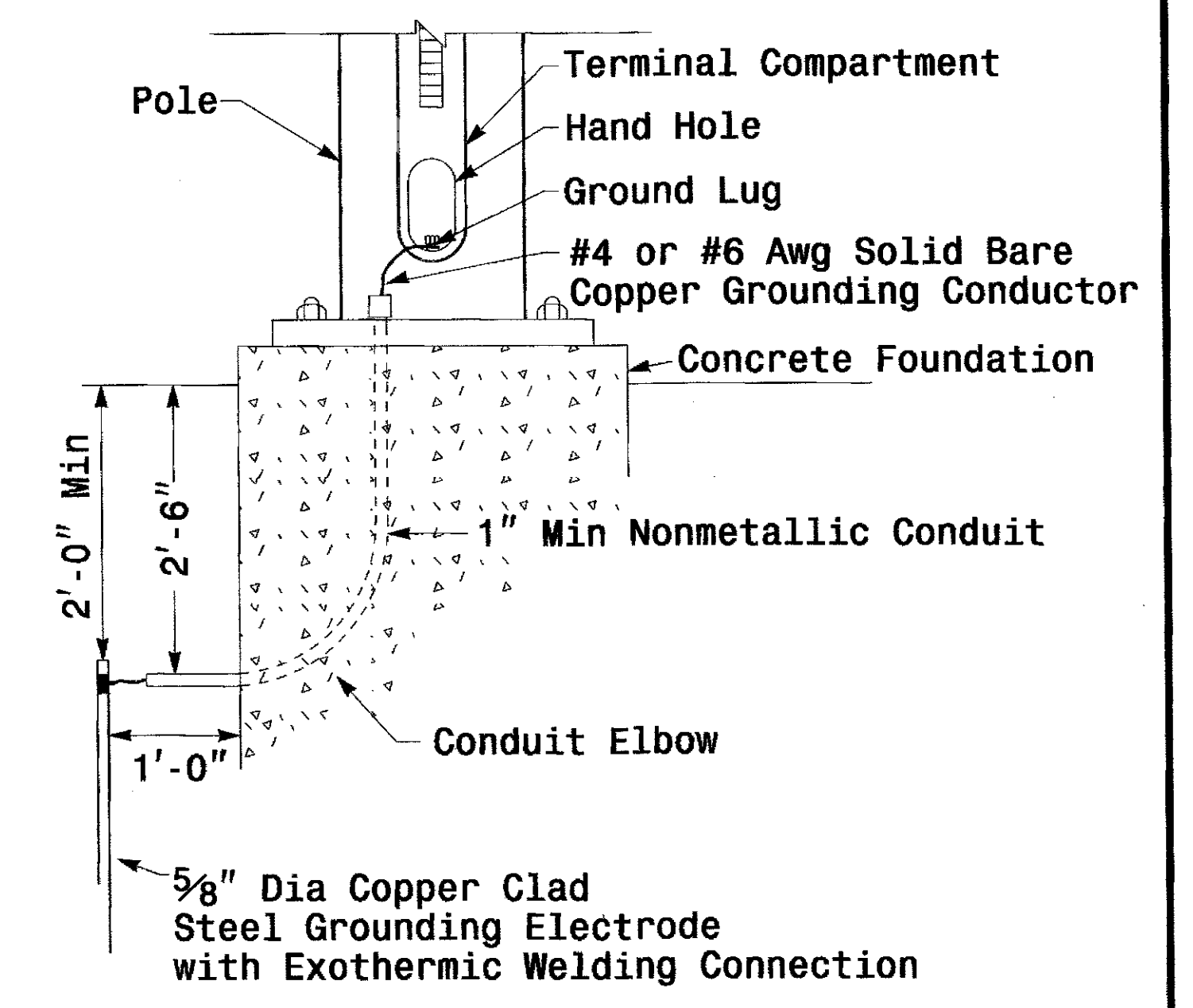


Strain Pole Attachments

Note: Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 36"



Attachment of Cable to Intermediate Metal Pole



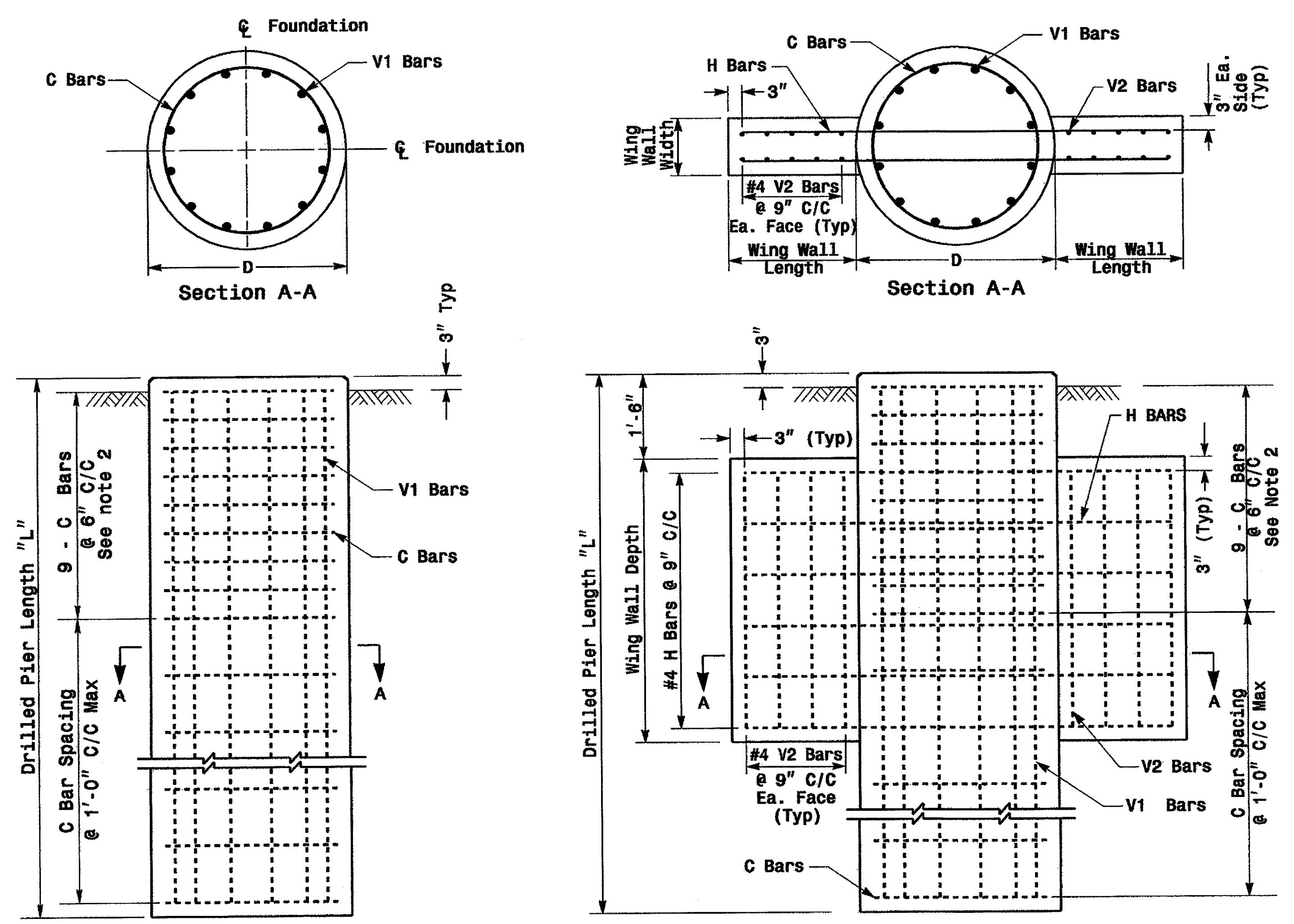
Metal Pole Grounding Detail

Construction Details - Strain Poles

07 AUG 2013 11:59 C:\Users\jg\Documents\Structure\Drawings\2012 Standard Strain Pole Drawings\2012_m6.dgn

	<p>Construction Details Strain Poles</p>		
	<p>PLAN DATE: AUGUST 2013</p> <p>PREPARED BY: N. BITTING</p>	<p>REVIEWED BY: C.F. ANDREWS</p> <p>REVIEWED BY: D.C. SARKAR</p>	
<p>SCALE: NONE</p>		<p>SIGNATURE: <i>D. Sarker</i> 8.7.2013</p>	

Reinforcing Steel Bars



REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (42" & 48" DIAMETER)

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

REINFORCING STEEL TABLE FOR STANDARD 42" and 48" DRILL PIER SHAFT WITH TYPE 1 AND TYPE 2 WING WALLS

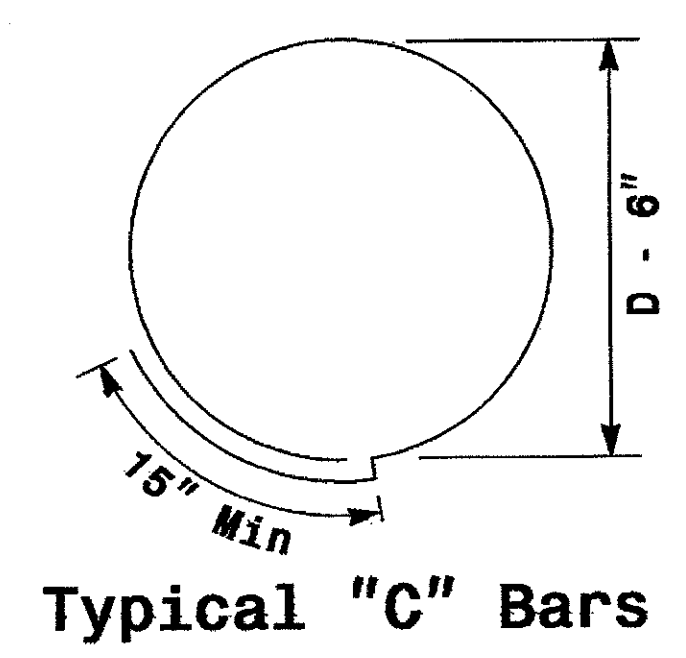
Wing Wall Type	Drill Pier Shaft Dia. (in.)	Reinforcing Steel				
		Bar Name	No.	Size	Type	Length
TYPE 1	42"	V1	9	#8	STR.	**
		V2	12	#4	STR.	2'-6"
		H	8	#4	STR.	6'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	42"	V1	9	#8	STR.	**
		V2	16	#4	STR.	4'-6"
		H	12	#4	STR.	9'-0"
		C	*	#4	CIR.	10'-9"
TYPE 2	48"	V1	12	#8	STR.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

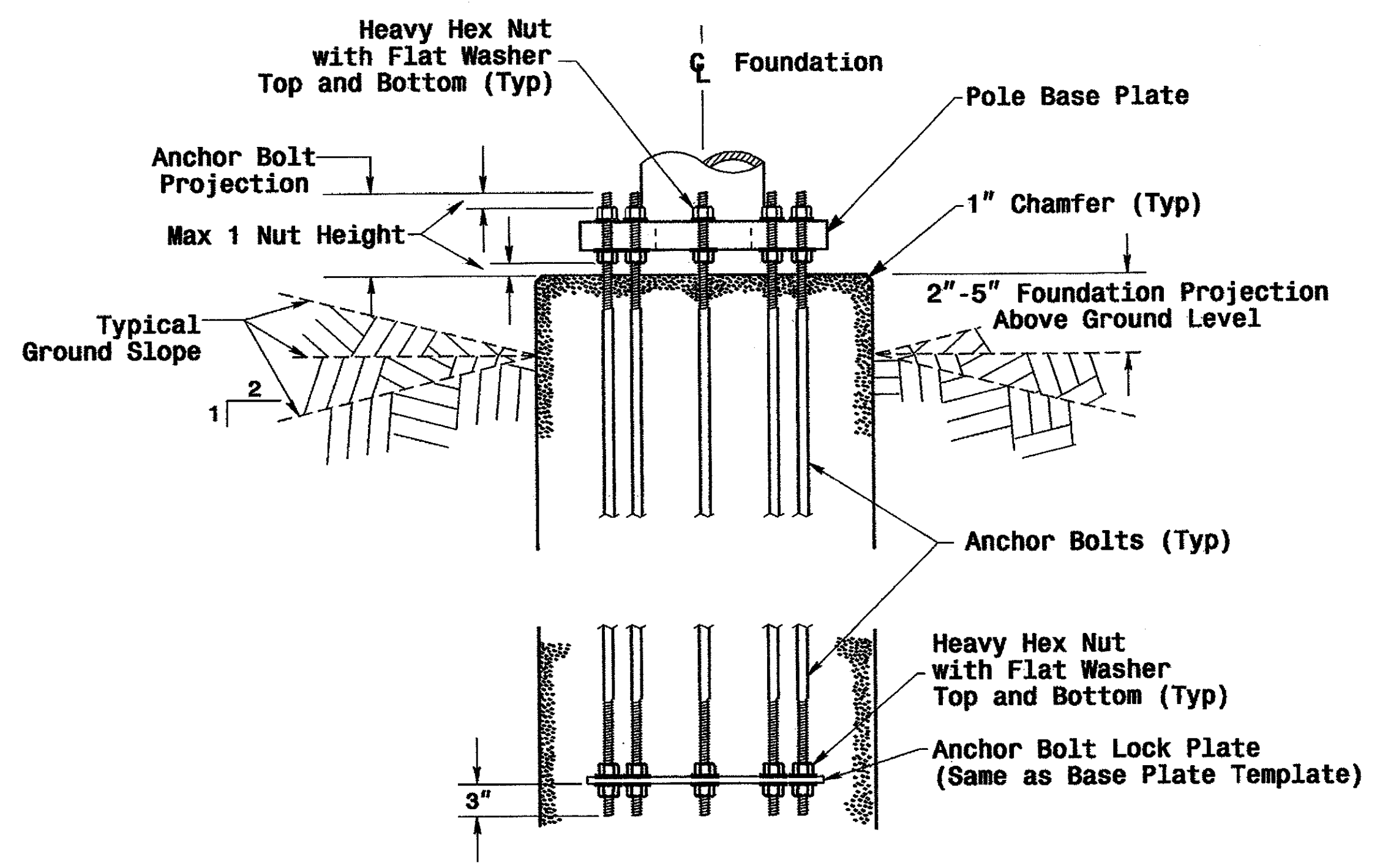
Wing Wall Type	Wing Wall Length (Ft.)	Wing Wall Width (Ft.)	Wing Wall Depth (Ft.)	Concrete Volume (Cu. Yds.)
TYPE 1	1'-6"	1'-0"	3'-0"	.4
TYPE 2	3'-0"	1'-0"	5'-0"	1.2

See Note No. 4

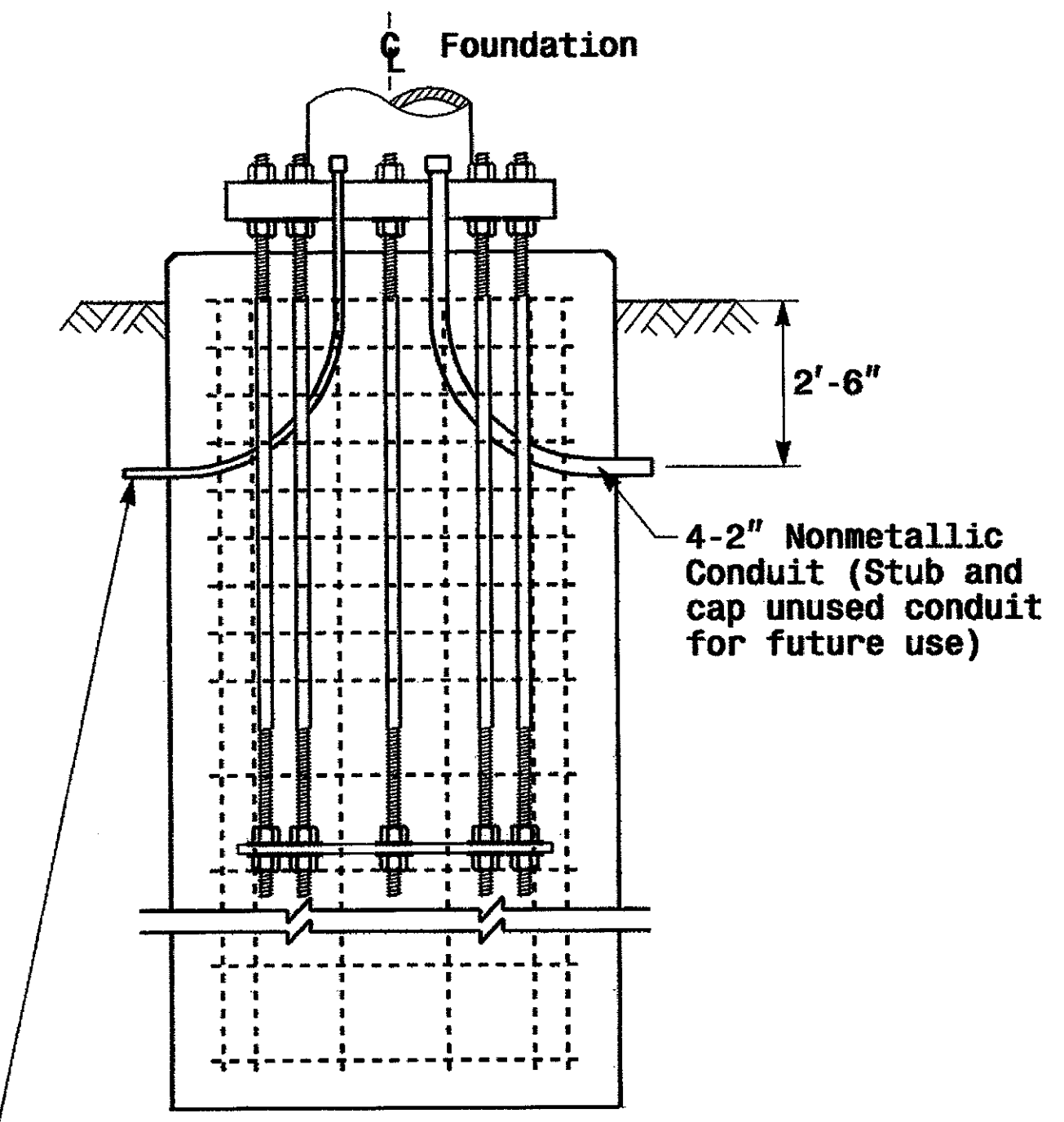


Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Typical Foundation Conduit Details



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

01-SEP-2005 11:48 ...\\nt\workgroups\2004\metal pole standards\2004_mf.dgn

Prepared in the Office of:

Construction Details Foundations

PLAN DATE: May 2005 REVIEWED BY: P.L. ALEXANDER
 PREPARED BY: C.F. ANDREWS REVIEWED BY: A.W. ESPOSITO

SCALE: 0 NA NONE

REVISIONS: _____ INIT. DATE _____

SIGNATURE: *D. Sarker* 9.2.2005 DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 JUDESH C. SARKAR

STG. INVENTORY NO. _____

WIND ZONE	LIGHT / HEAVY	STANDARD STRAIN POLES				STANDARD FOUNDATIONS 42" Diameter Drilled Pier Length (L) - Feet						
		Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Moment at the Pole Base (ft-kp)	Clay				Sand		
						Medium N-Value 4-8	Stiff N-Value 9-15	Very Stiff N-Value 16-30	Hard N-Value >30	Loose N-Value 4-10	Medium N-Value 11-30	Dense N-Value >30
WIND ZONE 1	LIGHT	S26L3	26	25	280	20.5	14.0	11.5	9.5	18.0	16.0	14.0
		S30L3	30	25	310	21.0	14.5	11.5	9.5	18.5	16.5	14.5
		S35L3	35	25	350	22.5	15.0	12.0	10.0	19.5	17.5	15.5
	HEAVY	S30H3	30	29	450	25.5	16.5	13.0	11.0	21.0	18.5	16.5
		S35H3	35	29	540	26.0	17.0	13.5	11.5	22.0	19.5	17.0
		S26L2	26	23	250	19.5	13.5	11.0	9.0	18.0	15.5	14.0
WIND ZONE 2	LIGHT	S30L2	30	23	290	20.0	14.0	11.5	9.5	18.5	16.0	14.0
		S35L2	35	23	315	21.0	14.5	11.5	9.5	19.0	16.5	14.5
		S30H2	30	29	415	24.5	16.0	13.0	10.5	21.0	18.5	16.0
	HEAVY	S35H2	35	29	485	25.5	16.5	13.5	11.0	21.5	19.0	16.5
		S26L2	26	23	250	18.5	13.0	10.5	9.0	17.5	15.0	13.5
		S30L2	30	23	290	19.5	13.5	11.0	9.0	18.0	15.5	14.0
WIND ZONE 3	LIGHT	S35L2	35	23	315	20.0	14.0	11.5	9.5	18.5	16.0	14.5
		S30H2	30	29	415	23.0	15.5	12.5	10.0	20.5	17.5	16.0
		S35H2	35	29	485	24.0	16.0	13.0	10.5	21.0	18.0	16.5
	HEAVY	S26L1	26	22	195	18.0	13.0	10.5	9.0	16.5	14.5	13.0
		S30L1	30	22	225	18.5	13.0	10.5	9.0	17.0	15.0	13.5
		S35L1	35	22	255	19.0	13.5	11.0	9.0	17.5	15.5	14.0
WIND ZONE 4	LIGHT	S30H1	30	25	330	22.0	15.0	12.0	9.5	19.5	17.0	15.0
		S35H1	35	25	385	23.0	15.5	12.5	10.0	20.0	17.5	15.5
		S26L2	26	23	250	19.0	13.5	10.5	9.0	17.5	15.5	13.5
	HEAVY	S30L2	30	23	290	20.0	14.0	11.0	9.5	18.0	16.0	14.0
		S35L2	35	23	315	21.0	14.5	11.5	10.0	19.0	16.5	14.5
		S30H2	30	29	415	23.5	15.5	12.5	10.5	21.0	18.0	16.0
WIND ZONE 5	LIGHT	S35H2	35	29	485	25.0	16.5	13.0	11.0	21.5	18.5	16.5
		S26L2	26	23	250	19.0	13.5	10.5	9.0	17.5	15.5	13.5
		S30L2	30	23	290	20.0	14.0	11.0	9.5	18.0	16.0	14.0
	HEAVY	S35L2	35	23	315	21.0	14.5	11.5	10.0	19.0	16.5	14.5
		S30H2	30	29	415	23.5	15.5	12.5	10.5	21.0	18.0	16.0
		S35H2	35	29	485	25.0	16.5	13.0	11.0	21.5	18.5	16.5

Concrete Volume (cubic yards)=.356 X L

Fabrication Design Notes:

1. Values shown in "Moment at the Pole Base" column represents the minimum acceptable capacity allowable for design using a design CSR of 1.


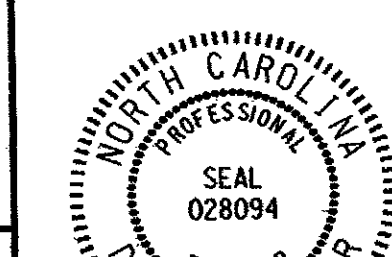
2. Base plate thickness (T) is 2.0 inches.

Foundation Selection:

- Perform a standard penetration test at each proposed foundation site to determine "N" value.
- Select the appropriate wind zone from sheet M 1.
- Select the soil type (Clay or Sand) that best describes the soil characteristics.
- Get the appropriate pole case load number from the plans or from the Engineer.
- Select the appropriate column in the chart based on soil type and "N" value. Select the appropriate row based on the pole load case. The foundation depth is the value where the column and the row intersect.

Standard Strain Poles

02-SEP-2005 12:42
v:\p\p\lee\ee-unit1\@corporate004.metal.pole.standard.dwg004.mdb std str-pole.dgn

 Prepared in the Office of: STANDARD STRAIN POLES SPECIALTY ENGINEERING	Standard Strain Poles and Standard Foundations		SEAL 
	PLAN DATE: May 2005 PREPARED BY: P.L. Alexander SCALE: 0 NA None	REVISIONS: _____ INIT.: _____ DATE: _____	REVIEWED BY: C.F. Andrews REVIEWED BY: A.M. Esposito SIGNATURE: <i>D. Sarkar</i> DATE: 9.2.2005

SR-500IBX SR 3109 (Brier Creek Parkway) at Arnold Palmer Dr/Vogel St



Remove Existing 24" Thermo Stop Bar, 8" Thermo Pedestrian Crosswalk, 4"/8" Thermo Island and 4" Lane Lines as Directed by the Engineer to Accomodate New Pavement Marking Plan

Proposed 24" x 120 mil White Thermoplastic Stop Bar and High Visibility Crosswalk as Directed by the Engineer

Proposed 90 mil Thermo Right Arrow Adjacent to Existing Symbols

SR 3109 (Brier Creek Parkway)

+2% Grade 45 MPH

Type I Pedestal for Pushbutton

Type I Pedestal for Pushbutton

+2% Grade 45 MPH

SR 3109 (Brier Creek Parkway)

Proposed 24" x 120 mil White Thermoplastic Stop Bar and High Visibility Crosswalk as Directed by the Engineer

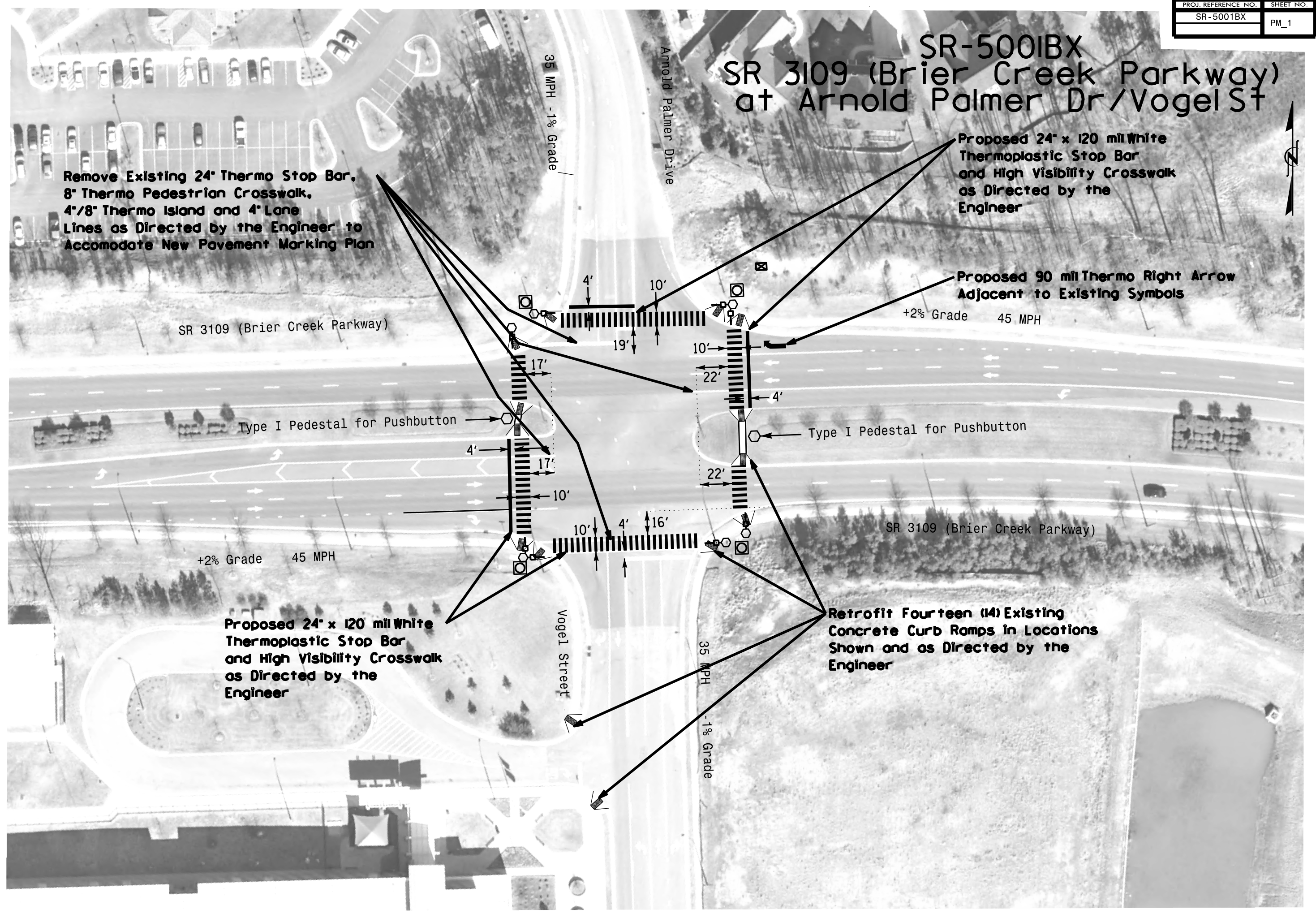
Retrofit Fourteen (14) Existing Concrete Curb Ramps in Locations Shown and as Directed by the Engineer

35 MPH -1% Grade

Arnold Palmer Drive

Vogel Street

35 MPH -1% Grade



SR-5001BX SR 3109 (Brier Creek Parkway) at Arnold Palmer Dr/Vogel St

NOT TO
SCALE

**30" Signal Ahead Sign
350'+/- Back from
Intersection or as
Directed by the Engineer**

**36" Signal Ahead Signs (2)
500'+/- Back from Intersection
or as Directed by the Engineer**

**36" Signal Ahead Signs (2)
500'+/- Back from
Intersection or as
Directed by the Engineer**

**Existing Sign System to be
Removed and Disposed
of by Contractor**

**30" Signal Ahead Sign
350'+/- Back from Intersection
or as Directed by the Engineer**

