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**Project: TIP PROJECT: U-4910A**

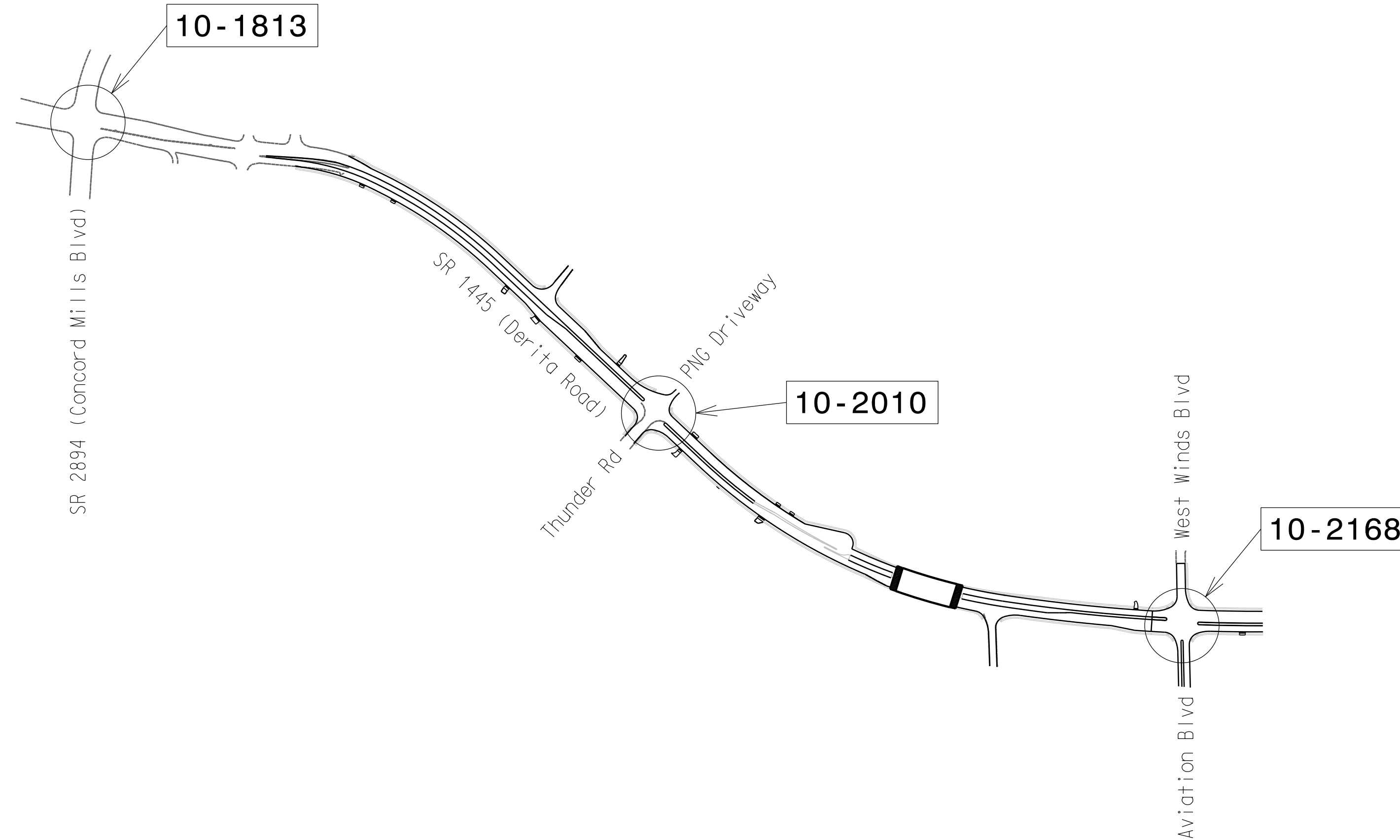
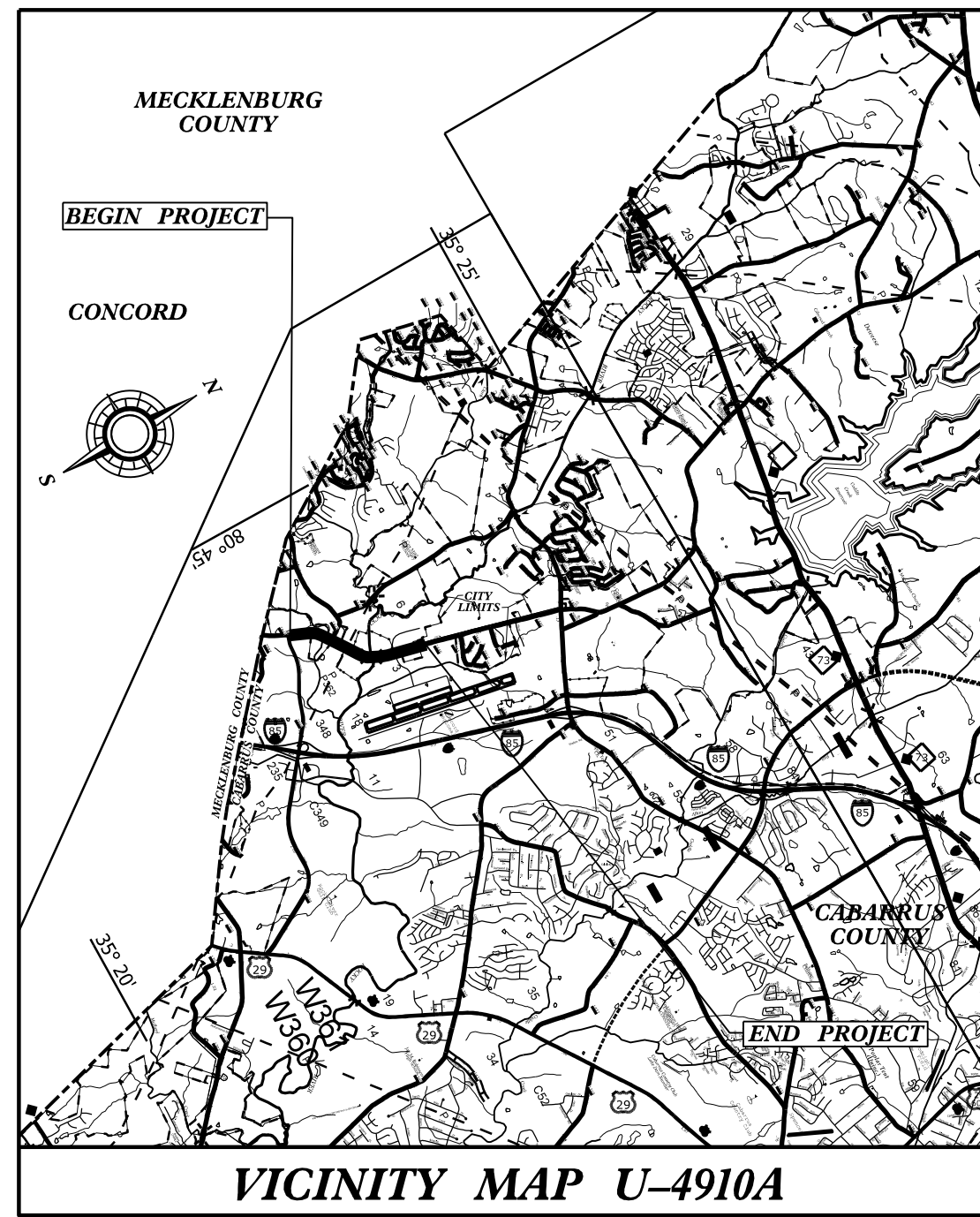
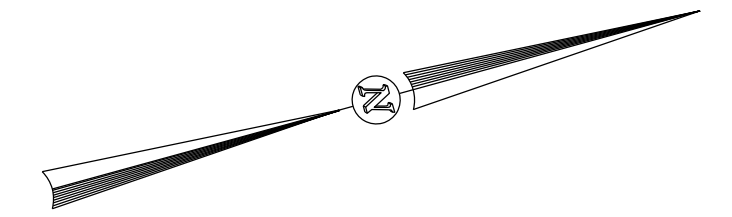
Project No.	Sheet No.
<b>U-4910A</b>	<b>Fig. 1.0</b>

STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

**CABARRUS COUNTY**

**LOCATION: SR 1445 (DERITA ROAD)  
FROM SR 2894 (CONCORD MILLS BOULEVARD)  
TO AVIATION BOULEVARD / WEST WINDS BOULEVARD**

**TYPE OF WORK: TRAFFIC SIGNALS AND COMMUNICATIONS CABLE**



**AECOM**  
NC Firm License No.: F-0342  
701 Corporate Center Drive  
Suite 475 Raleigh, NC 27607  
Phone: 919-854-6200

**Index of Plans**  
*Location/Description*

Sheet #	Reference #	Title
Fig. 1.0	N/A	Title Sheet
Fig. 2.0-2.1	10-2010T1	SR 1445 (Derita Road) at Thunder Road /PNG Driveway - Temp 1 - TCP Phase I
Fig. 3.0-3.1	10-2010T2	SR 1445 (Derita Road) at Thunder Road /PNG Driveway - Temp 2 - TCP Phase II
Fig. 4.0-4.1	10-2010T3	SR 1445 (Derita Road) at Thunder Road /PNG Driveway - Temp 3 - TCP Phase III
Fig. 5.0-5.4	10-2010	SR 1445 (Derita Road) at Thunder Road /PNG Driveway - Final
Fig. M1-M8	N/A	Metal Pole Standard Drawings
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SCP-1	N/A	ITS Legend
SCP-2-6	N/A	Communications Cable and Conduit Routing Plans
SCP-7-8	N/A	Splice Details

**INTELLIGENT TRANSPORTATION AND SIGNALS UNIT**

Contacts:

**Timothy J. Williams, PE - Western Region Signals Engineer**  
**D. Todd Joyce, PE - Signal Equipment Design Review Engineer**  
**I. Neil Avery - Signal Communications Project Engineer**

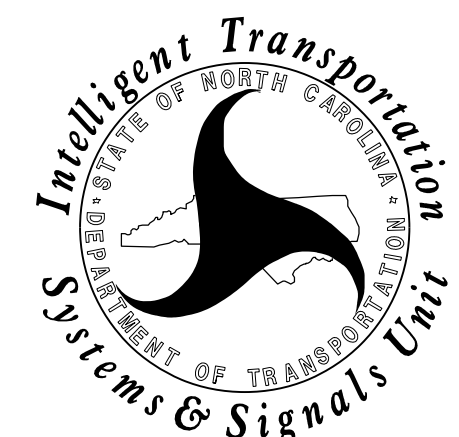
**CITY OF CONCORD**

Contacts:

**Joe Wilson III, PE - Transportation Director**

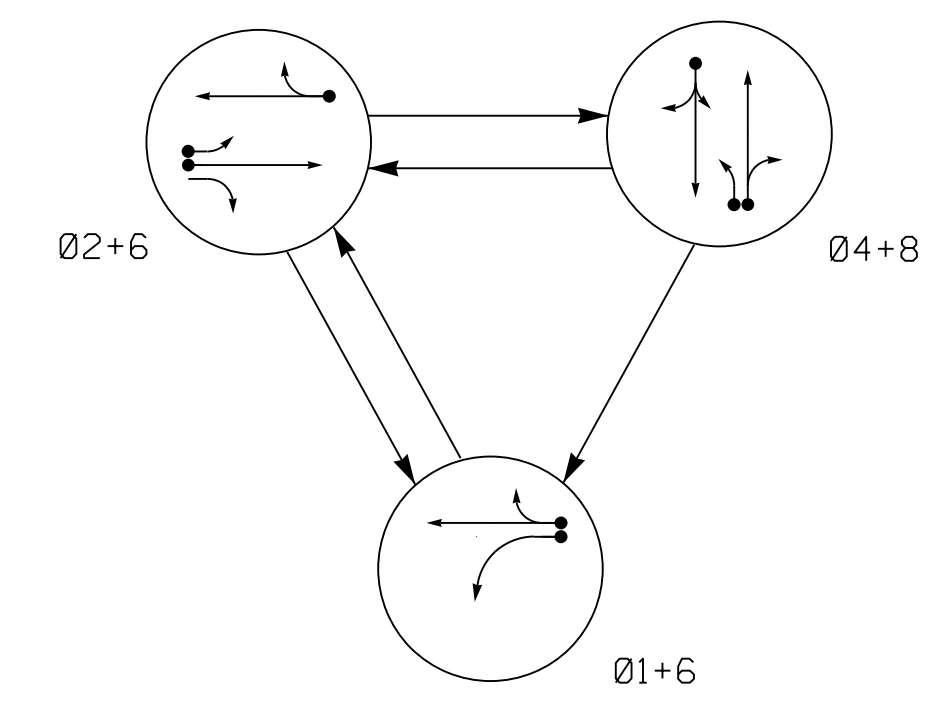
Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

Prepared in the Office of:  
**DIVISION OF HIGHWAYS**  
**TRANSPORTATION MOBILITY AND SAFETY**  
**DIVISION**



750 N. Greenfield Parkway, Garner, NC 27529

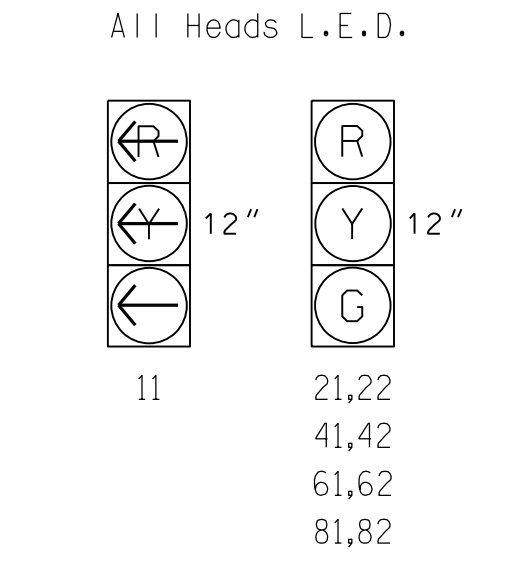
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	01+6	02+6	04+8	01+6
11	←	←	←	←
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
81,82	R	R	G	R

**SIGNAL FACE I.D.**



**OASIS 2070 DETECTOR INSTALLATION CHART**

ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING								
			NEW ZONE	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM	NEW CARD	
1A	6X40	0	Y	1	Y	Y	-	-	3	-	-
2A	6X6	300	Y	2	Y	Y	-	1.6	-	-	-
2B	6X6	90	Y	2	Y	Y	-	-	-	-	-
2C	6X40	0	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	Y	4	Y	Y	-	-	10	-	-
6A	6X6	300	Y	6	Y	Y	-	1.6	-	-	-
6B	6X6	90	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	Y	8	Y	Y	-	-	3	-	-
8B	6X40	0	Y	8	Y	Y	-	-	-	-	-

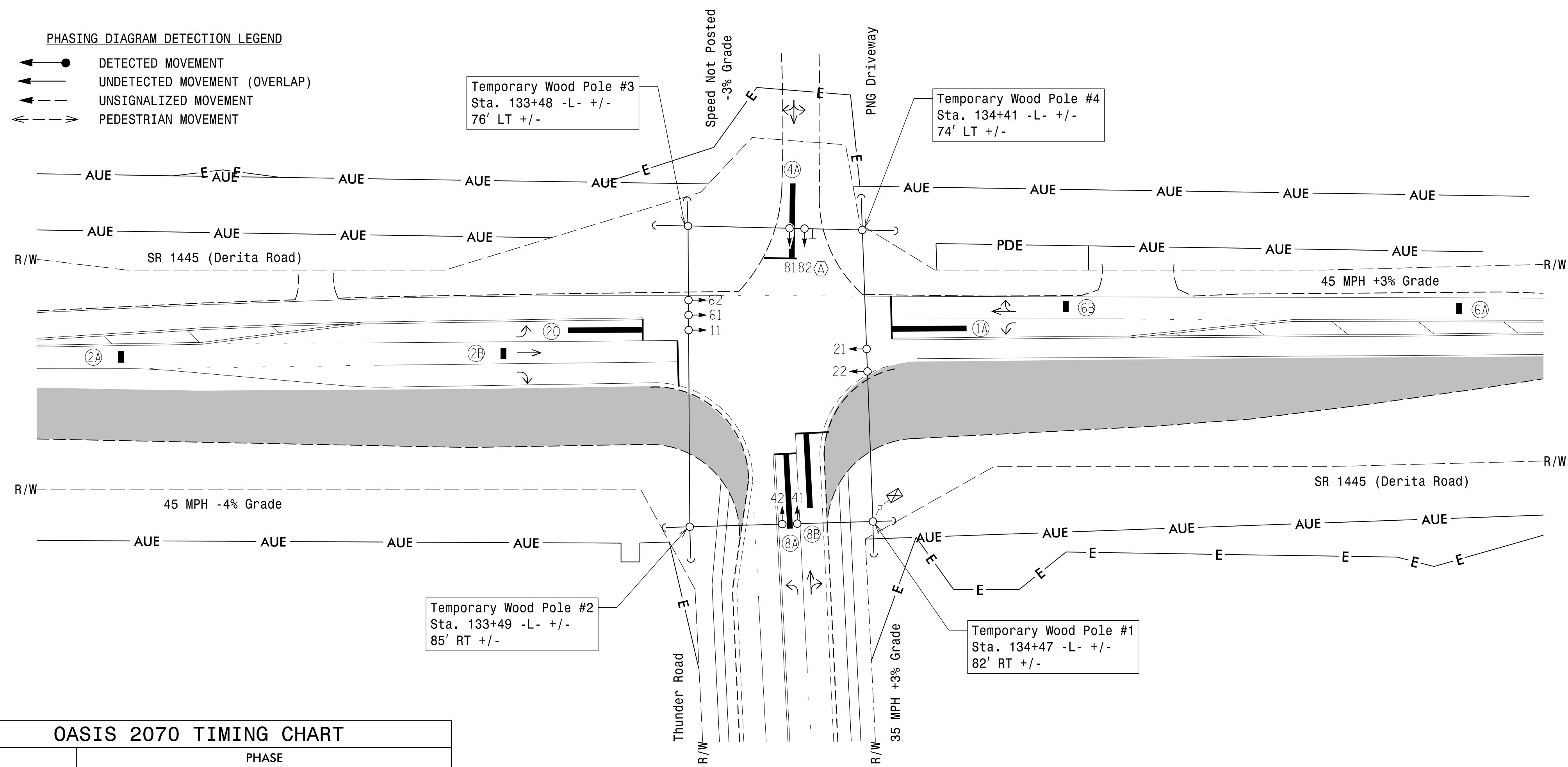
**3 Phase Fully Actuated Concord City Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
- Install backplates for all signal heads.
- Set all detector units to presence mode.
- Pavement markings are existing.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #2010.
- Reuse existing video detection system for temporary signals. Relocate equipment as necessary.
- Remove existing metal signal poles and foundations.
- Remove existing wireless communication equipment and return to the City of Concord.

**PHASING DIAGRAM DETECTION LEGEND**

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← - - UNSIGNALIZED MOVEMENT
- ← - - - PEDESTRIAN MOVEMENT



**OASIS 2070 TIMING CHART**

FEATURE	PHASE				
	1	2	4	6	8
Min Green 1 *	7	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	90	30
Yellow Clearance	3.0	4.9	3.3	4.3	3.7
Red Clearance	2.6	1.3	2.0	1.3	2.1
Red Revert	2.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	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.

**LEGEND**

- | PROPOSED   | EXISTING                            |
|--|-------------------------------------|
| ○ → Traffic Signal Head                            | ● → Traffic Signal Head             |
| ○ → Modified Signal Head                           | N/A                                 |
| ○ → Pedestrian Signal Head With Push Button & Sign | N/A                                 |
| ○ → Signal Pole with Guy                           | ● → Signal Pole with Sidewalk Guy   |
| ⊠ → Video Detection Zone                           | ⊠ → Video Detection Zone            |
| ⊠ → Controller & Cabinet                           | ⊠ → Junction Box                    |
| □ → 2-in Underground Conduit                       | □ → 2-in Underground Conduit        |
| N/A → Right of Way                                 | N/A → Right of Way                  |
| → → Directional Arrow                              | → → Directional Arrow               |
| ⊠ → "NO TURN ON RED" Sign (R10-11a)                | ⊠ → "NO TURN ON RED" Sign (R10-11a) |
| ■ → Construction Zone                              | N/A                                 |
| E → Construction Easement                          | N/A                                 |
| AUE → Aerial Utility Easement                      | N/A                                 |
| PDE → Permanent Drainage Easement                  | N/A                                 |

**Signal Upgrade-Temporary Design 1-TCP Phase I** DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

NC Firm License No.: F-0342  
701 Corporate Center Drive  
Suite 475 Raleigh, NC 27607  
Phone: 919-854-6200

**SR 1445 (Derita Road) at Thunder Road / PNG Driveway**

Division 10 Cabarrus County Concord

PLAN DATE: March 2016 REVIEWED BY: C.L. Kalencik

PREPARED BY: S W Cox REVIEWED BY:

7/7/2016

750 N. Greenfield Pkwy, Garner, NC 27529

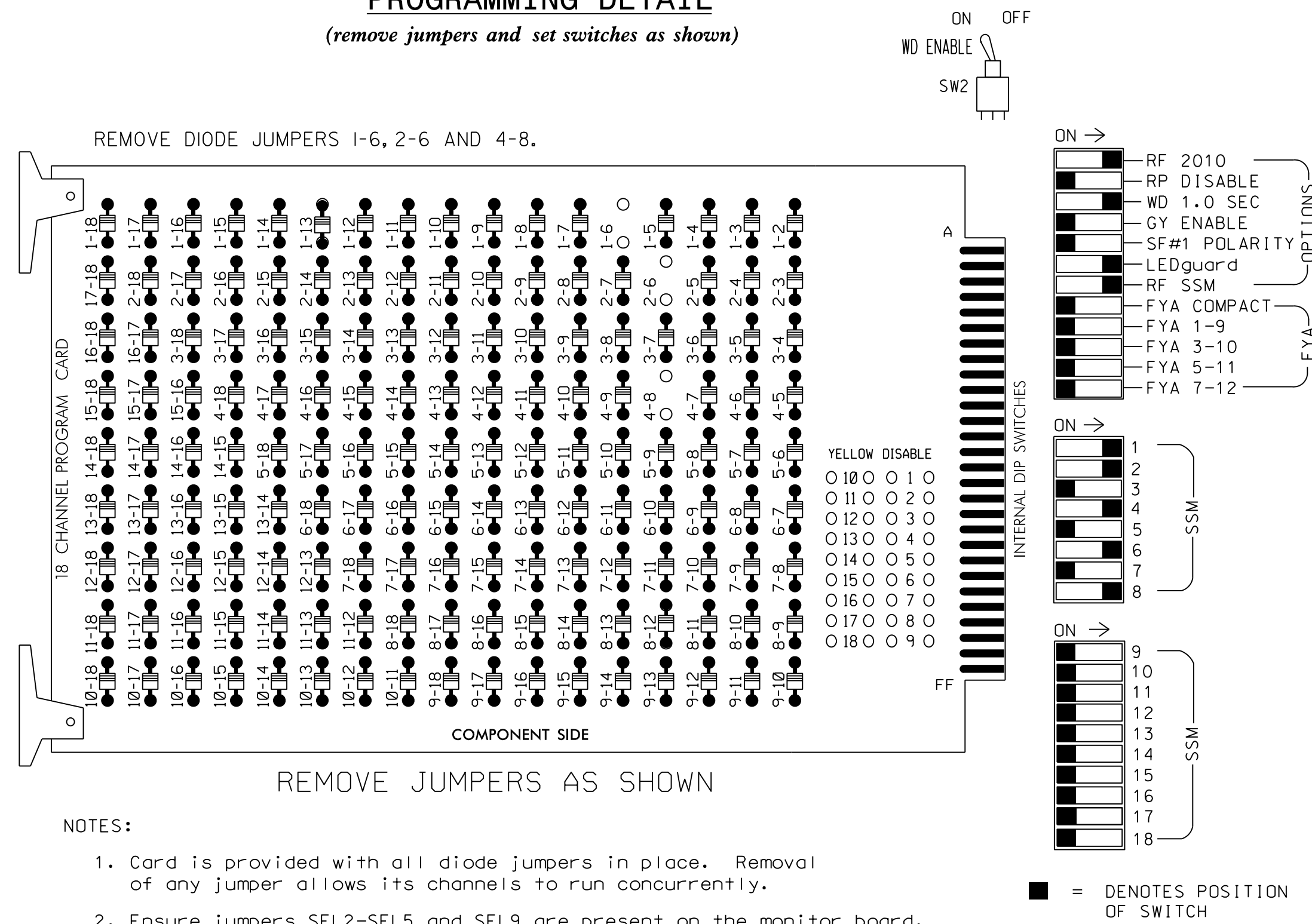
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### EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



### 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 phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Concord City Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 (12-STD; 6 AUX)  
 \* LOAD SWITCHES USED.....S1,S2,S5,S8,S11  
 PHASES USED.....1,2,4,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* Auxiliary Output File required for final configuration

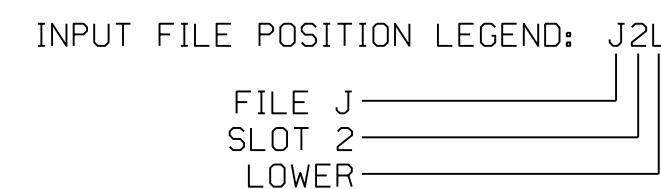
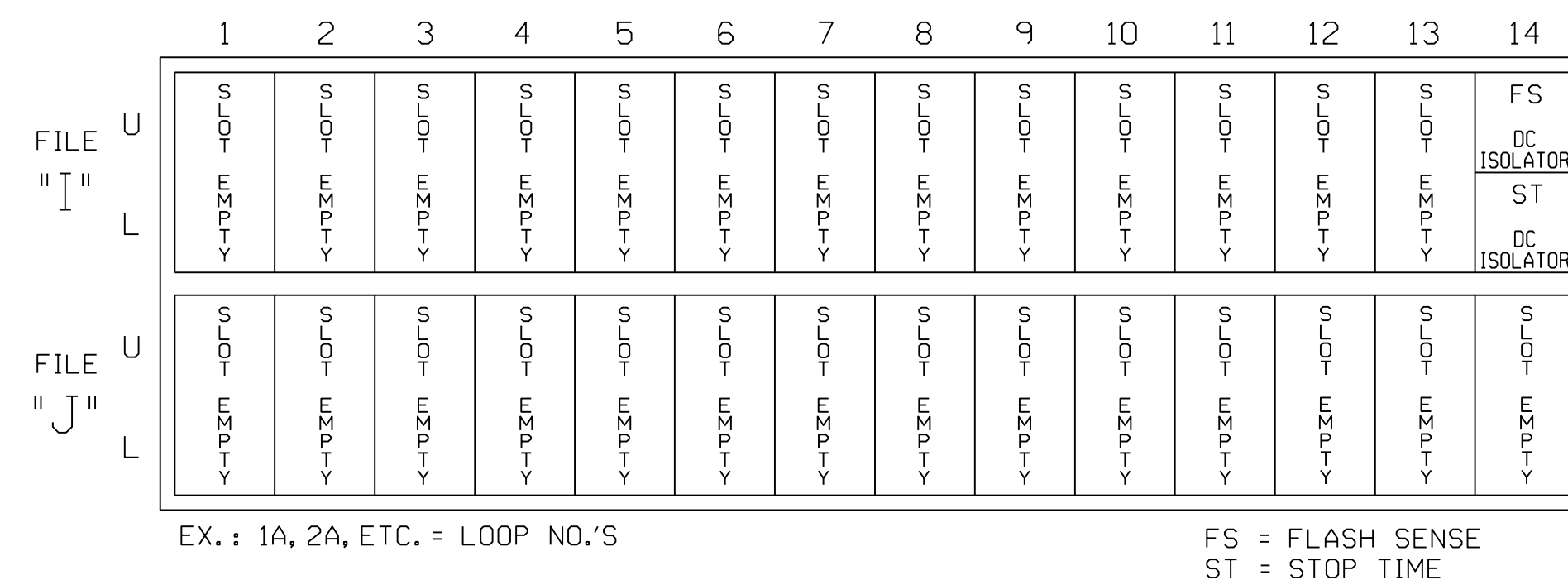
### SIGNAL HEAD HOOK-UP CHART

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	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125																	
YELLOW ARROW	126																	
FLASHING YELLOW ARROW																		
GREEN ARROW	127																	

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



### SPECIAL DETECTOR NOTE

Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

### BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-2010T1  
 DESIGNED: March 2016  
 SEALED: July 7, 2016  
 REVISED:

Signal Upgrade - Temporary Design 1 - TCP Phase 1  
 Electrical Detail Sheet 1 of 1

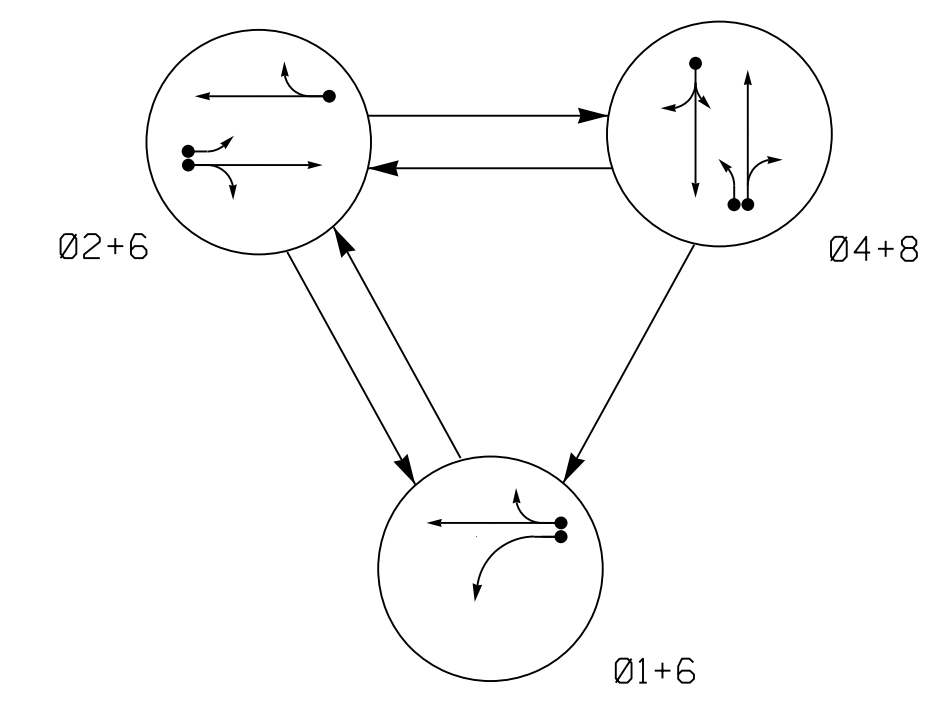
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of:  750 N. Greenfield Pkwy, Garner, NC 27529	<b>SR 1445 (Derita Road) at Thunder Road / PNG Driveway</b>		 James O. Deaton 7/11/2016
	Division 10 Cabarrus County Concord PLAN DATE: March 2016 REVIEWED BY: J O Deaton PREPARED BY: M W Yalch REVIEWED BY:	REVISIONS INIT. DATE	

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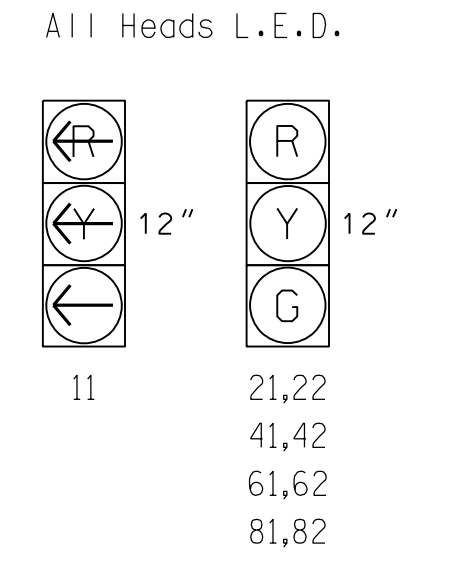
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	01+6	02+6	04+8	01+6
11	←	←	←	←
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
81,82	R	R	G	R

**SIGNAL FACE I.D.**



**OASIS 2070 DETECTOR INSTALLATION CHART**

ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING							
			PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM ZONE	NEW CARD	
1A	6X40	0	Y	1	Y	Y	-	3	-	-
2A	6X6	300	Y	2	Y	Y	-	1.6	-	-
2B	6X6	90	Y	2	Y	Y	-	-	-	-
2C	6X40	0	Y	2	Y	Y	-	-	-	-
4A	6X40	0	Y	4	Y	Y	-	10	-	-
6A	6X6	300	Y	6	Y	Y	-	1.6	-	-
6B	6X6	90	Y	6	Y	Y	-	-	-	-
8A	6X40	0	Y	8	Y	Y	-	3	-	-
8B	6X40	0	Y	8	Y	Y	-	-	-	-

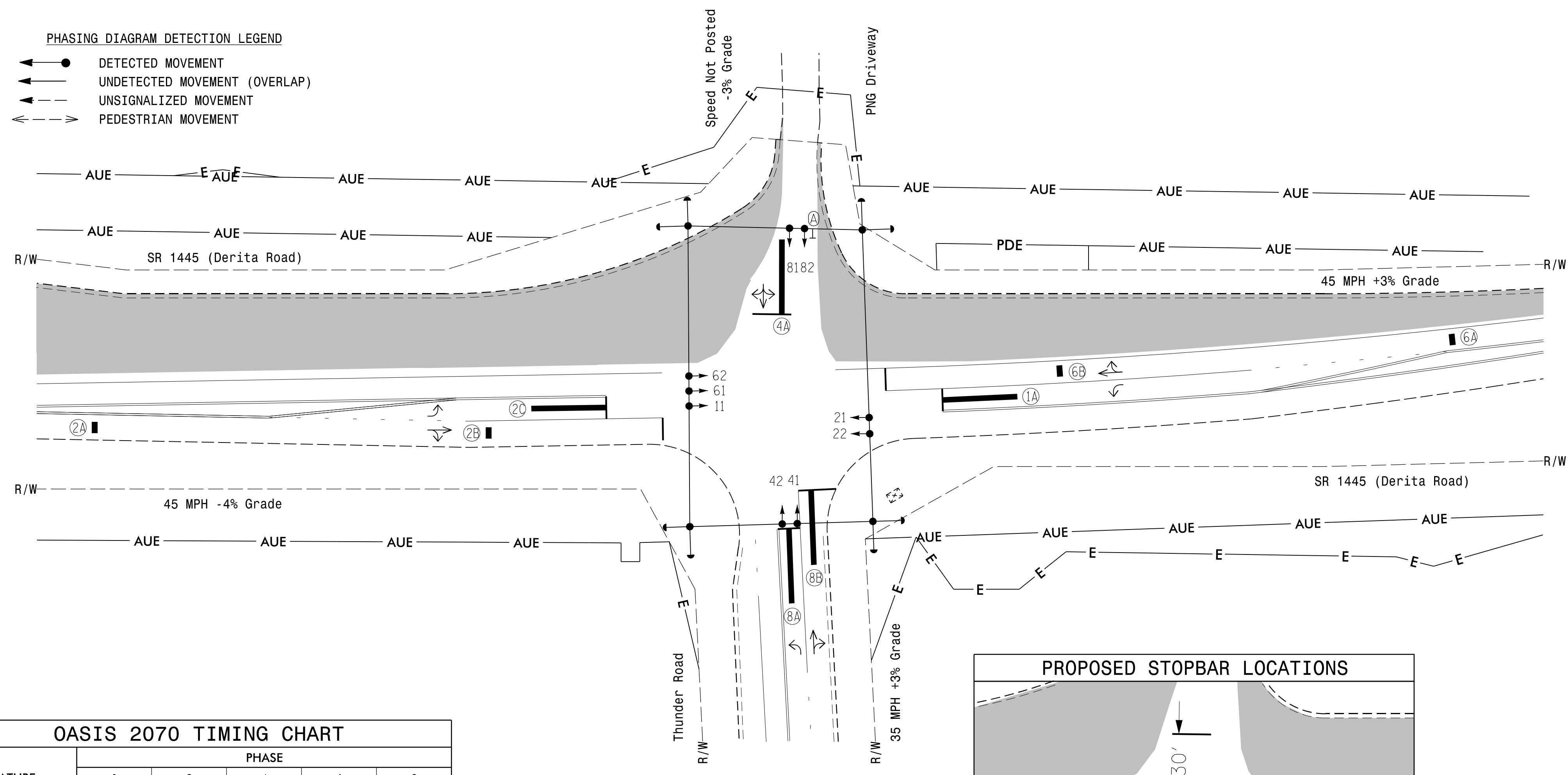
**3 Phase Fully Actuated Concord City Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
- Reposition existing signal heads numbered 11, 21, 22, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #2010.

**PHASING DIAGRAM DETECTION LEGEND**

- ← ● DETECTED MOVEMENT
- ← ○ UNDETECTED MOVEMENT (OVERLAP)
- ← - - UNSIGNALIZED MOVEMENT
- ← - - - PEDESTRIAN MOVEMENT



**LEGEND**

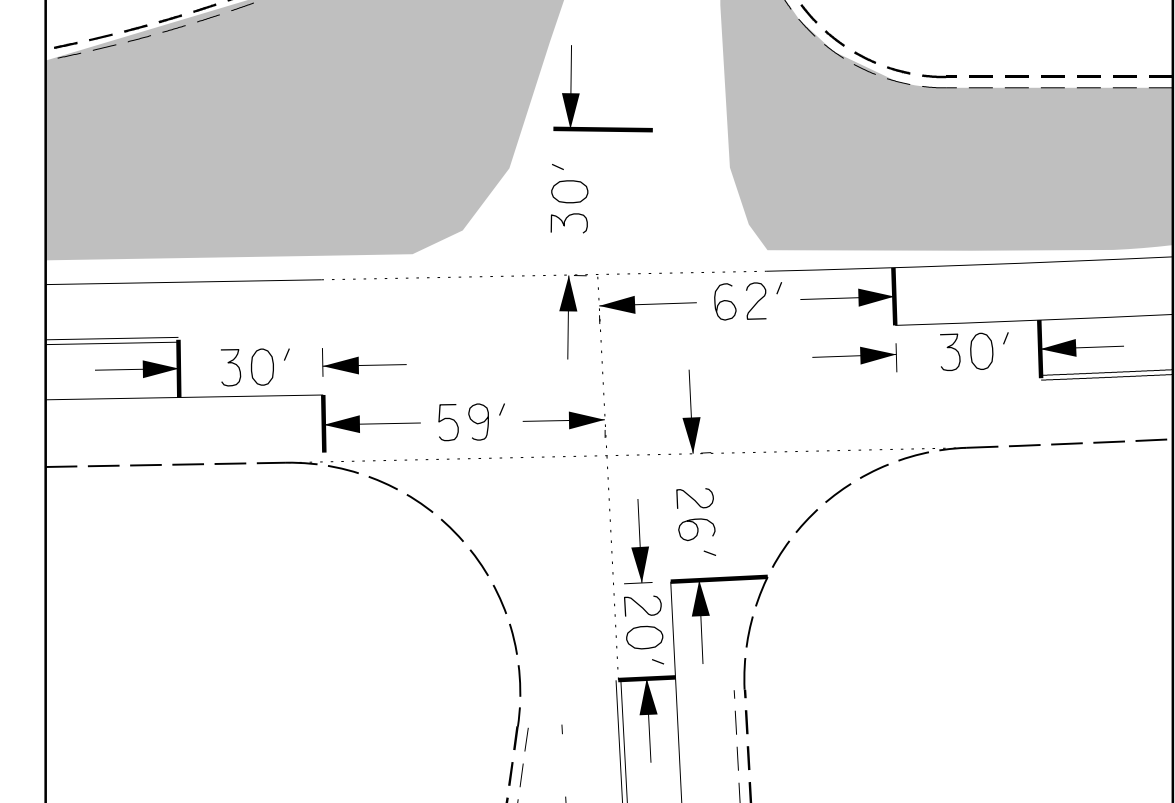
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|--|-----------------|
| <b>PROPOSED</b>                                      | <b>EXISTING</b> |
| ○ → Traffic Signal Head                              | ● → N/A         |
| ● → Modified Signal Head                             | ○ → N/A         |
| —   — Sign   | —   — N/A       |
| —   — Pedestrian Signal Head With Push Button & Sign | —   — N/A       |
| —   — Signal Pole with Guy                           | —   — N/A       |
| —   — Signal Pole with Sidewalk Guy                  | —   — N/A       |
| —   — Video Detection Zone                           | —   — N/A       |
| —   — Controller & Cabinet                           | —   — N/A       |
| —   — Junction Box                                   | —   — N/A       |
| —   — 2-in Underground Conduit                       | —   — N/A       |
| N/A → Right of Way                                   | N/A → N/A       |
| → Directional Arrow                                  | → N/A           |
| ⓐ "NO TURN ON RED" Sign (R10-11a)                    | ⓐ N/A           |
| Construction Zone                                    | N/A             |
| E Construction Easement                              | N/A             |
| AUE Aerial Utility Easement                          | N/A             |
| PDE Permanent Drainage Easement                      | N/A             |

**OASIS 2070 TIMING CHART**

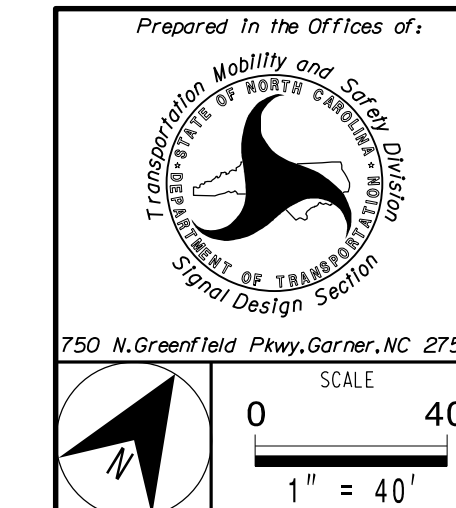
FEATURE	PHASE				
	1	2	4	6	8
Min Green 1 *	7	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	90	30
Yellow Clearance	3.0	4.9	3.3	4.3	3.7
Red Clearance	3.3	1.4	2.0	1.3	2.2
Red Revert	2.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	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 STOPBAR LOCATIONS**



Signal Upgrade-Temporary Design 2-TCP Phase II **DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



**SR 1445 (Derita Road) at Thunder Road / PNG Driveway**

Division 10 Cabarrus County Concord

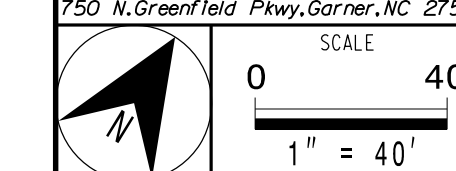
PLAN DATE: March 2016 REVIEWED BY: C.L. Kalencik

PREPARED BY: S W COX REVIEWED BY:

REVISIONS	INIT.	DATE



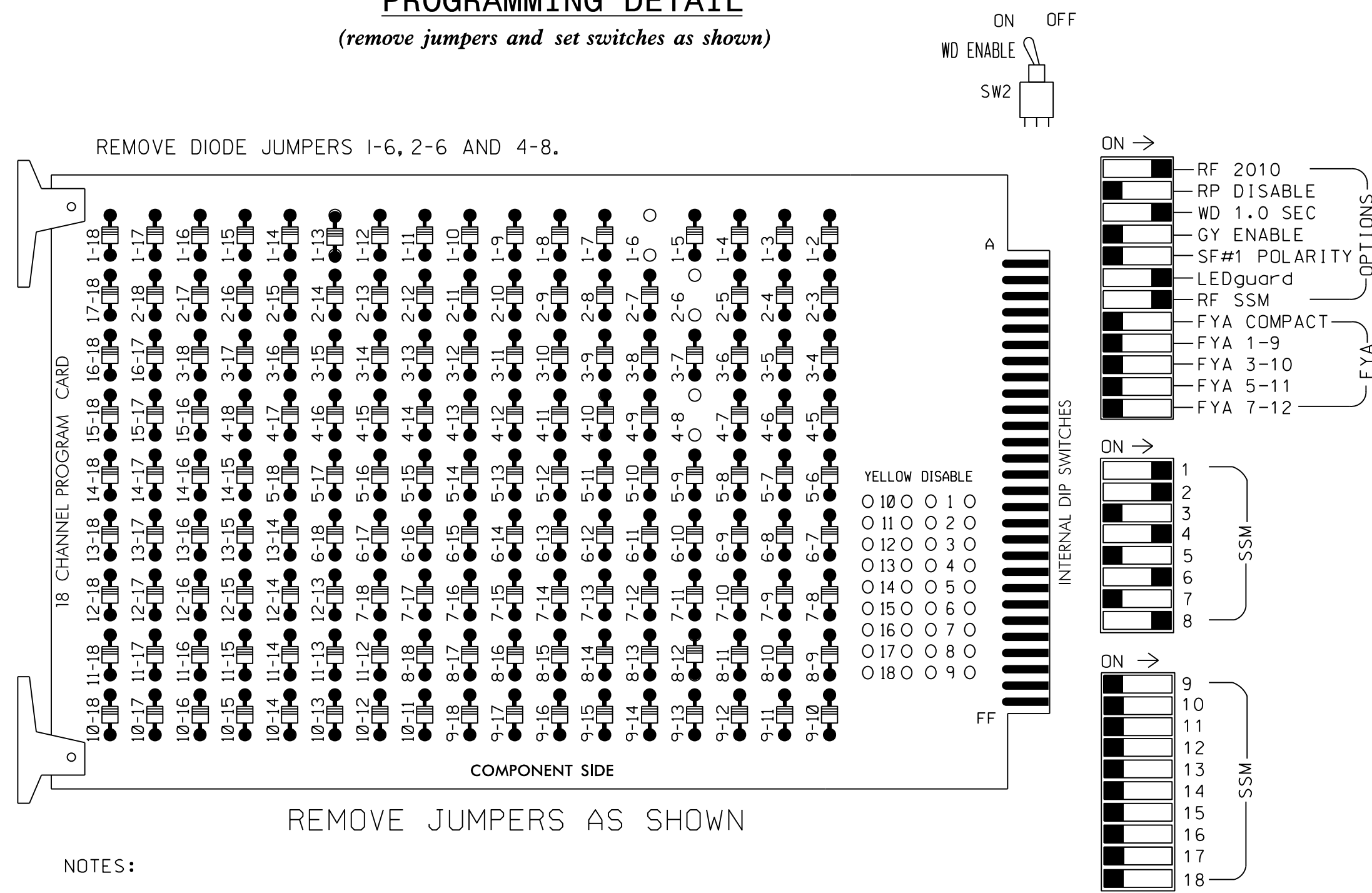
**AECOM**  
 NC Firm License No.: F-0342  
 701 Corporate Center Drive  
 Suite 475 Raleigh, NC 27607  
 Phone: 919-854-6200



7/7/2016 02:46:30 0471:4900:WorK:In:Q:cs:CAD:07\_NCDOT:Traffic:cas:Signal:10201012:sl:q:dsn...:cgm

### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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.
- Integrate monitor with Ethernet network in cabinet.

### 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 phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash.
- The cabinet and controller are part of the Concord City Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 \* OUTPUT FILE POSITIONS...18 (12-STD; 6 AUX)  
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11  
 PHASES USED.....1,2,4,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* Auxiliary Output File required for final configuration

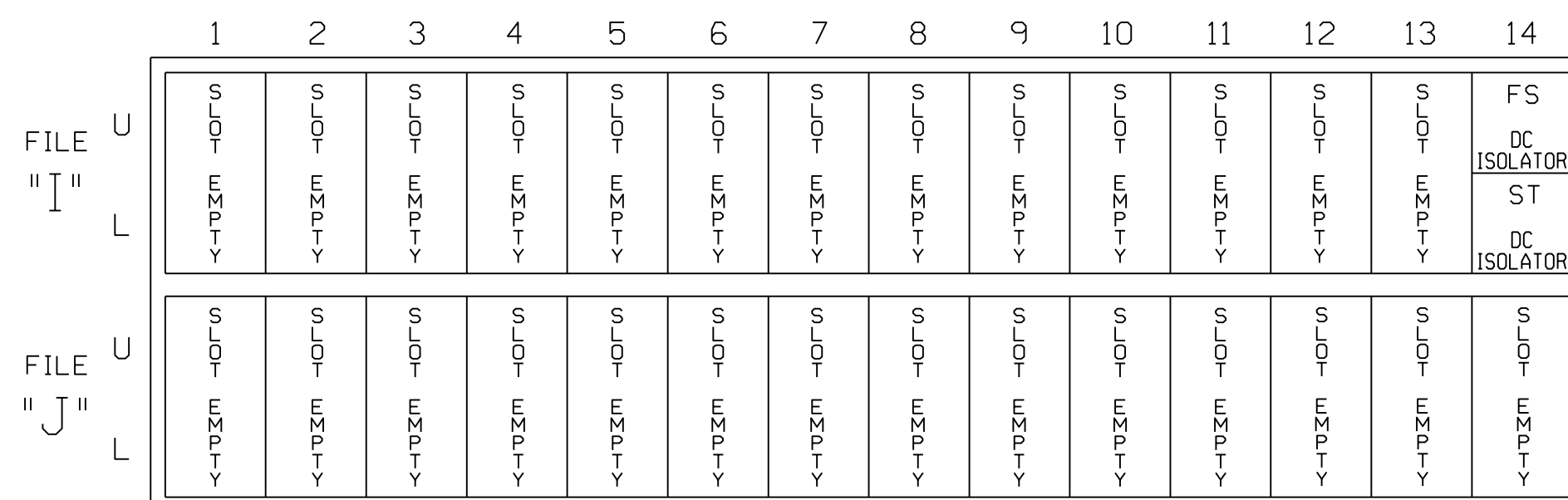
### SIGNAL HEAD HOOK-UP CHART

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	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125																	
YELLOW ARROW	126																	
FLASHING YELLOW ARROW																		
GREEN ARROW	127																	

NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE  
 ST = STOP TIME

INPUT FILE POSITION LEGEND: J2L  
 FILE J  
 SLOTTED LOWER

### SPECIAL DETECTOR NOTE

Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

### BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-2010T2  
 DESIGNED: March 2016  
 SEALED: July 7, 2016  
 REVISED:

Signal Upgrade - Temporary Design 2 - TCP Phase 2  
 Electrical Detail Sheet 1 of 1

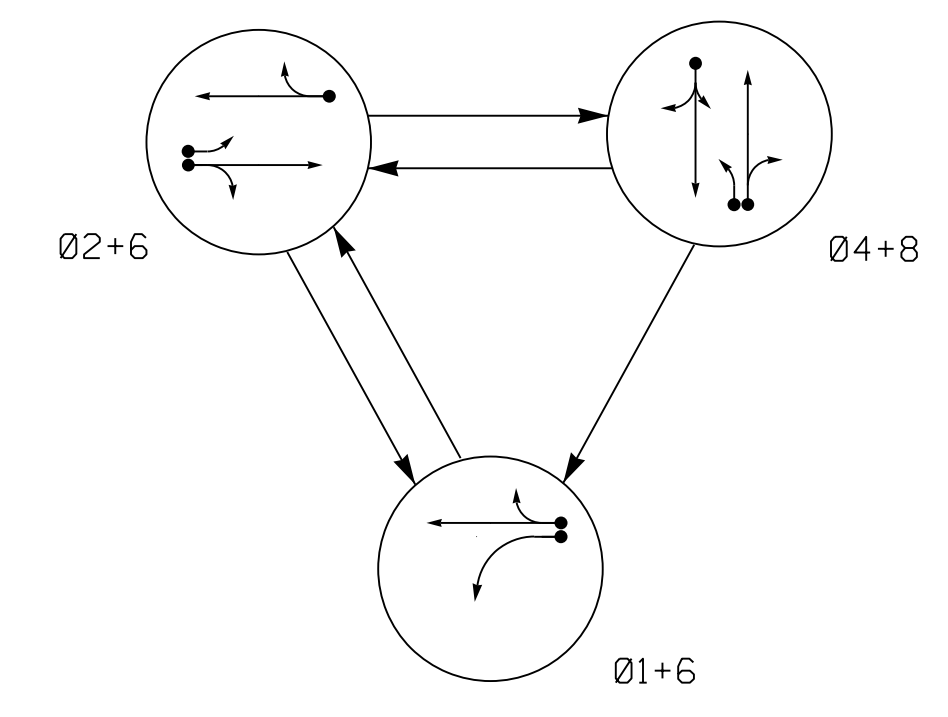
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 	<b>SR 1445 (Derita Road)                  at                  Thunder Road / PNG Driveway</b>		
	Division 10 Cabarrus County Concord		
PLAN DATE: March 2016	REVIEWED BY: J O Deaton		
PREPARED BY: M W Yalch	REVIEWED BY:		
REVISIONS	INIT.	DATE	
DocuSigned by: James O. Deaton			7/11/2016
SIG. INVENTORY NO. 10-2010T2			

**AECOM**  
 NC Firm License No.: F-0342  
 701 Corporate Center Drive  
 Suite 475 Raleigh, NC 27607  
 Phone: 919-854-6200



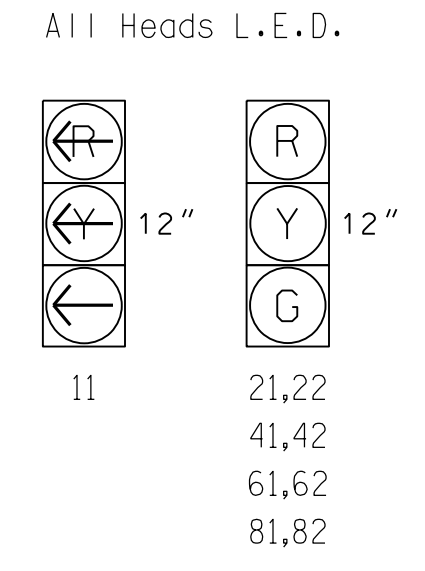
**PHASING DIAGRAM**



**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	01+6	02+6	04+8	01+6
11	←	→	←	→
21,22	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
81,82	R	R	G	R

**SIGNAL FACE I.D.**



**OASIS 2070 DETECTOR INSTALLATION CHART**

ZONE	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	DETECTOR PROGRAMMING								
			NEW ZONE	PHASE	CALLING	EXTENSION	STRETCH TIME	DELAY TIME	SYSTEM ZONE	NEW CARD	
1A	6X40	0	Y	1	Y	Y	-	-	3	-	-
2A	6X6	300	Y	2	Y	Y	-	1.6	-	-	-
2B	6X6	90	Y	2	Y	Y	-	-	-	-	-
2C	6X40	0	Y	2	Y	Y	-	-	-	-	-
4A	6X40	0	Y	4	Y	Y	-	-	10	-	-
6A	6X6	300	Y	6	Y	Y	-	1.6	-	-	-
6B	6X6	90	Y	6	Y	Y	-	-	-	-	-
8A	6X40	0	Y	8	Y	Y	-	-	3	-	-
8B	6X40	0	Y	8	Y	Y	-	-	-	-	-

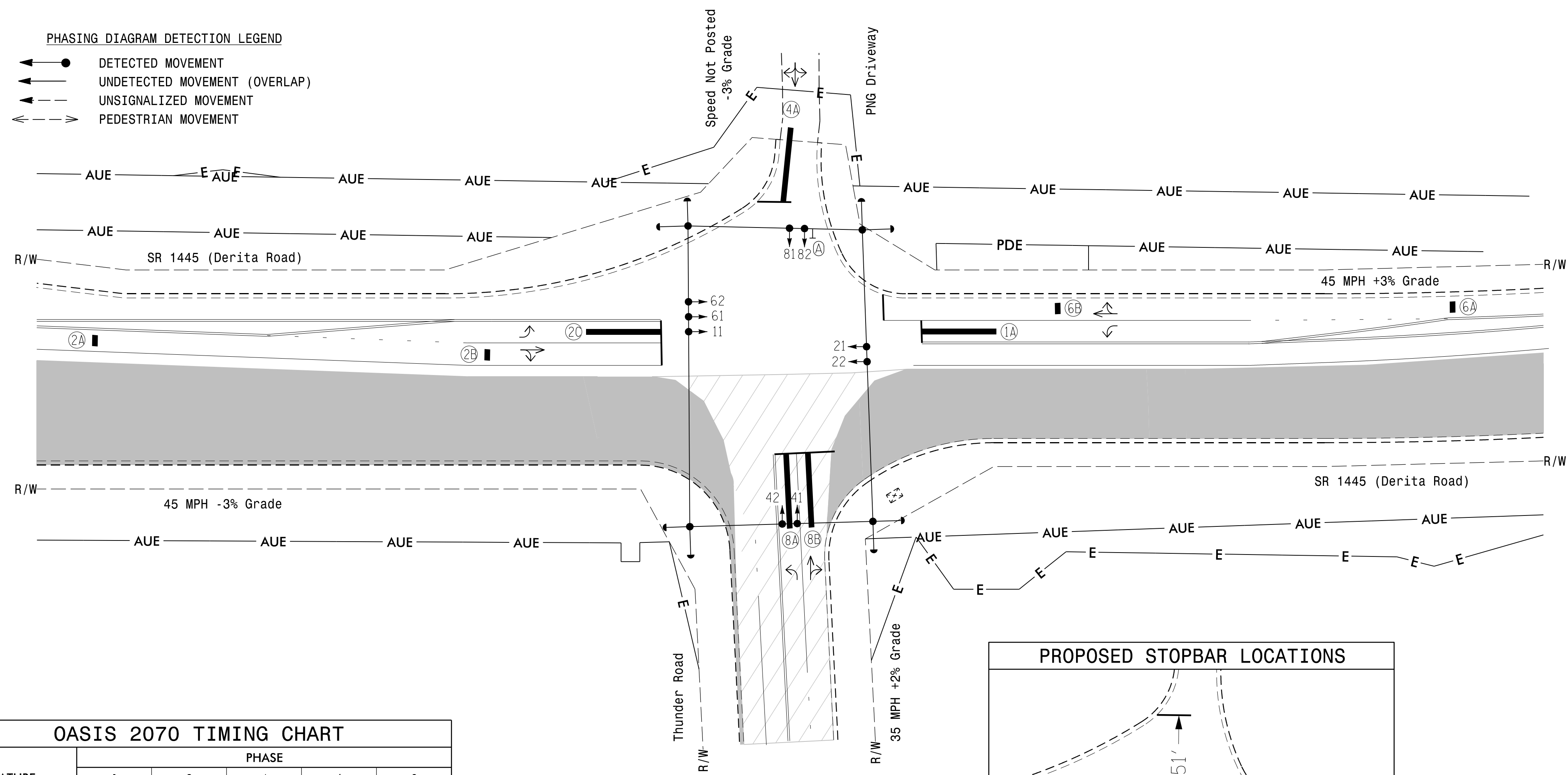
**3 Phase Fully Actuated Concord City Signal System**

**NOTES**

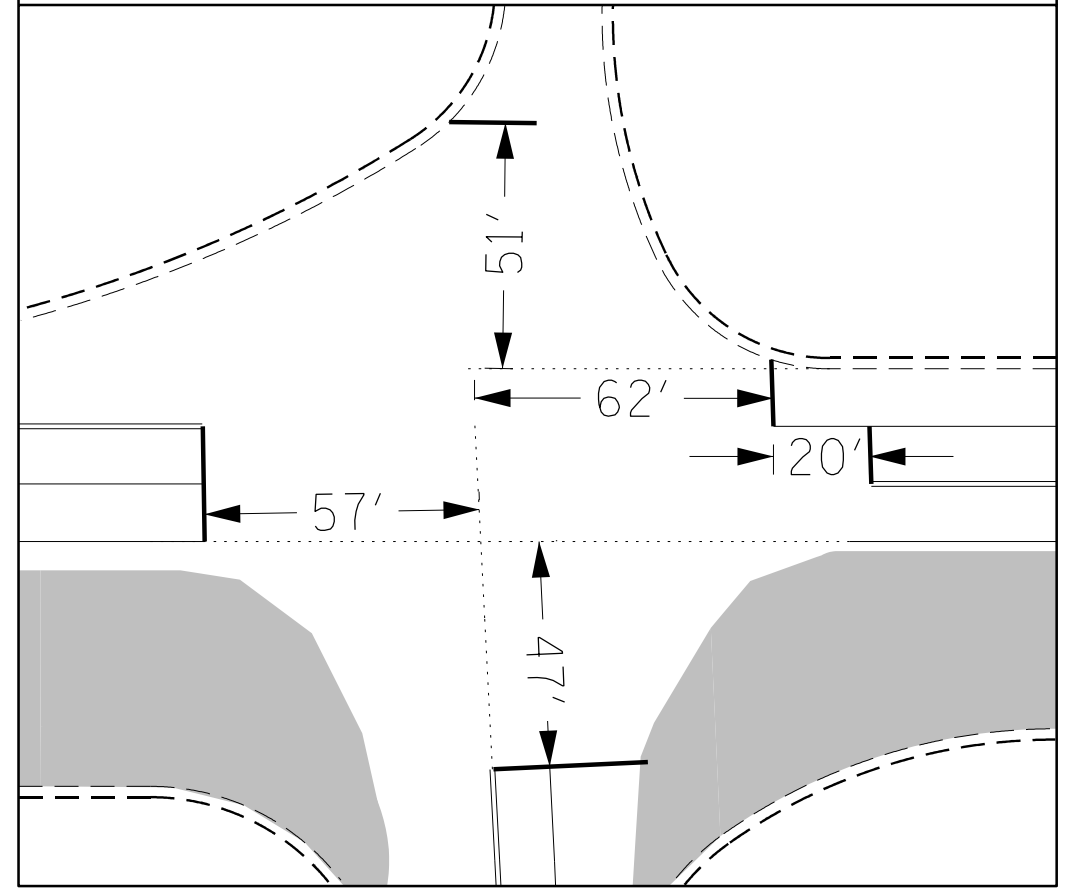
- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Enable Backup Protect for phase 6 to allow the controller to clear from phase 2+6 to phase 1+6 by progressing through an all red display.
- Reposition existing signal heads numbered 11, 21, 22, 61, and 62.
- Set all detector units to presence mode.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #2010.

**PHASING DIAGRAM DETECTION LEGEND**

- ← ● → DETECTED MOVEMENT
- ← ○ → UNDETECTED MOVEMENT (OVERLAP)
- ← ○ → UNSIGNALIZED MOVEMENT
- ← ○ → PEDESTRIAN MOVEMENT



**PROPOSED STOPBAR LOCATIONS**



**OASIS 2070 TIMING CHART**

FEATURE	PHASE				
	1	2	4	6	8
Min Green 1 *	7	12	7	12	7
Extension 1 *	2.0	2.0	2.0	2.0	2.0
Max Green 1 *	20	90	30	90	30
Yellow Clearance	3.0	4.8	3.3	4.3	3.7
Red Clearance	2.9	1.3	2.5	1.3	2.1
Red Revert	2.0	2.0	2.0	5.0	2.0
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	-	-	-	-
Max Variable Initial *	-	-	-	-	-
Time Before Reduction *	-	-	-	-	-
Time To Reduce *	-	-	-	-	-
Minimum Gap	-	-	-	-	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	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.

**LEGEND**

- |  |   |
|--|---|
| <b>PROPOSED</b>                                    | <b>EXISTING</b>                             |
| ○ → Traffic Signal Head                            | ● → N/A                                     |
| ● → Modified Signal Head                           | ○ → N/A                                     |
| ○ → Sign   | ○ → N/A                                     |
| ○ → Pedestrian Signal Head With Push Button & Sign | ○ → N/A                                     |
| ○ → Signal Pole with Guy                           | ○ → N/A                                     |
| ○ → Signal Pole with Sidewalk Guy                  | ○ → N/A                                     |
| □ → Video Detection Zone                           | □ → N/A                                     |
| □ → Controller & Cabinet                           | □ → N/A                                     |
| □ → Junction Box                                   | □ → N/A                                     |
| --- 2-in Underground Conduit                       | --- 2-in Underground Conduit                |
| N/A → Right of Way                                 | N/A → Right of Way                          |
| → Directional Arrow                                | → Directional Arrow                         |
| ⊠ "NO TURN ON RED" Sign (R10-11a)                  | ⊠ "NO TURN ON RED" Sign (R10-11a)           |
| ▨ Construction Zone                                | ▨ Construction Zone (N/A)                   |
| ▨ Construction Zone (Open to Traffic)              | ▨ Construction Zone (Open to Traffic) (N/A) |
| E Construction Easement                            | E Construction Easement (N/A)               |
| AUE Aerial Utility Easement                        | AUE Aerial Utility Easement (N/A)           |
| PDE Permanent Drainage Easement                    | PDE Permanent Drainage Easement (N/A)       |

**Signal Upgrade-Temporary Design 3-TCP Phase III**

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

**SR 1445 (Derita Road) at Thunder Road / PNG Driveway**

Division 10 Cabarrus County Concord

PLAN DATE: May 2014 REVIEWED BY: C.L. Kalencik

PREPARED BY: S W COX REVIEWED BY:

REVISIONS: INIT. DATE

7/7/2016

DocuSign by Corynne L. Kalencik 7/7/2016

SIG. INVENTORY NO. 10-2010T3

**AECOM**

NC Firm License No.: F-0342  
701 Corporate Center Drive  
Suite 475 Raleigh, NC 27607  
Phone: 919-854-6200

750 N. Greenfield Pkwy, Garner, NC 27529

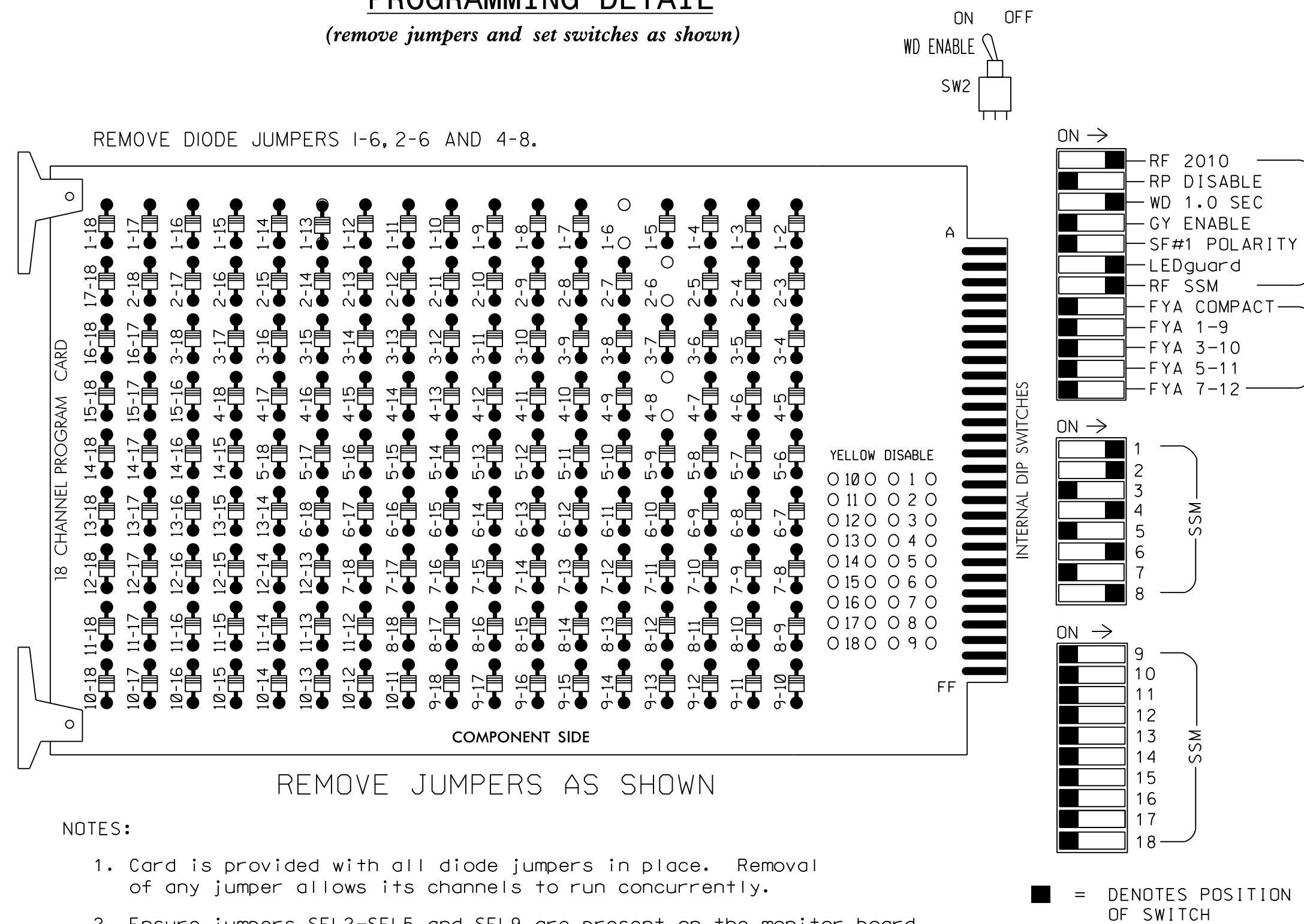
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### EDI MODEL 2018ECLip-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



**NOTES:**

1. Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
2. Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
3. Ensure that Red Enable is active at all times during normal operation.
4. Integrate monitor with Ethernet network in cabinet.

### NOTES

1. 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.
2. Program phases 4 and 8 for Dual Entry.
3. Enable Simultaneous Gap-Out for all phases.
4. Program phases 2 and 6 for Start Up In Green.
5. Program phases 2 and 6 for Yellow Flash.
6. The cabinet and controller are part of the Concord City Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 /W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 \* OUTPUT FILE POSITIONS...18 (12-STD; 6 AUX)  
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11  
 PHASES USED.....1,2,4,6,8  
 OVERLAP "A".....NOT USED  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....NOT USED  
 OVERLAP "D".....NOT USED

\* Auxiliary Output File required for final configuration

PROJECT REFERENCE NO.	SHEET NO.
U-4910A	Sig. 4.1

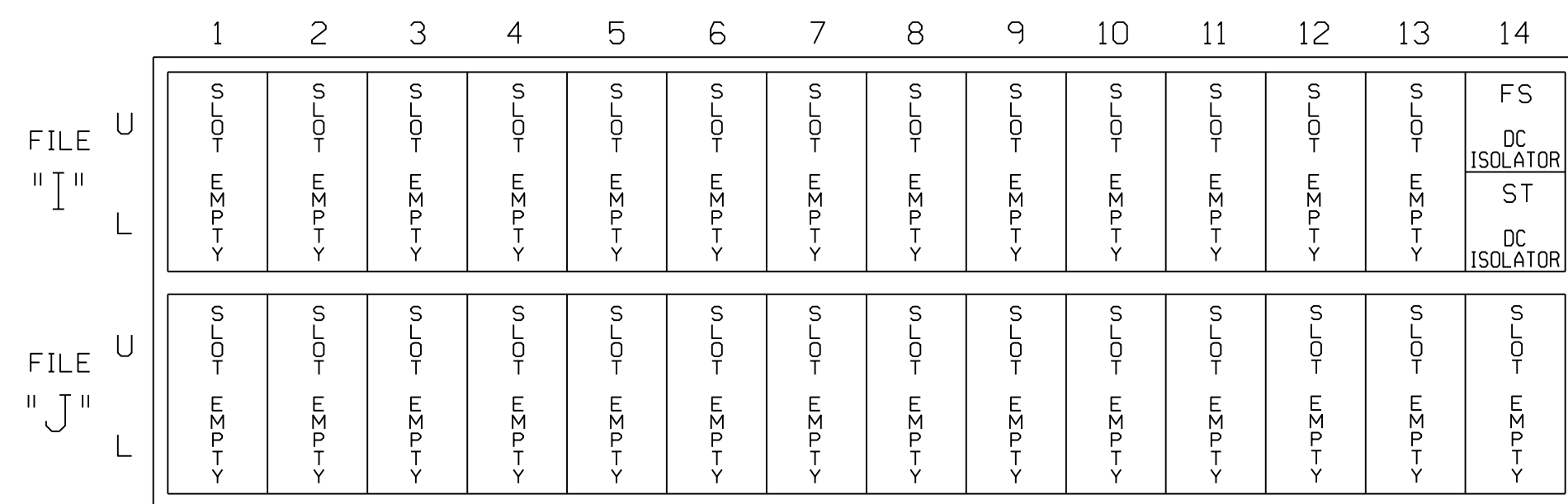
### SIGNAL HEAD HOOK-UP CHART

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	21,22	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82	NU	NU	NU	NU	NU	NU	NU
RED		128			101			134			107							
YELLOW		129			102			135			108							
GREEN		130			103			136			109							
RED ARROW	125																	
YELLOW ARROW	126																	
FLASHING YELLOW ARROW																		
GREEN ARROW	127																	

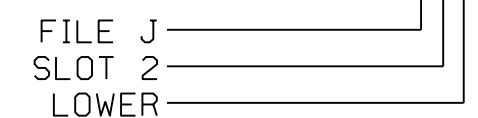
NU = Not Used

### INPUT FILE POSITION LAYOUT

(front view)



INPUT FILE POSITION LEGEND: J2L



### SPECIAL DETECTOR NOTE

Install a loop emulation detection system for vehicle detection. Perform installation according to manufacturer's directions and NCDOT engineer-approved mounting locations to accomplish the detection schemes shown on the Signal Design Plans.

### BACKUP PROTECTION NOTE

(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Program phase 6 for 'Backup Protect'. Make sure the Red Revert times shown on the Signal Design Plans are programmed in the 'Phase Timing' menu.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-2010T3  
 DESIGNED: May 2014  
 SEALED: July 7, 2016  
 REVISED:

Signal Upgrade - Temporary Design 3 - TCP Phase 3  
 Electrical Detail Sheet 1 of 1

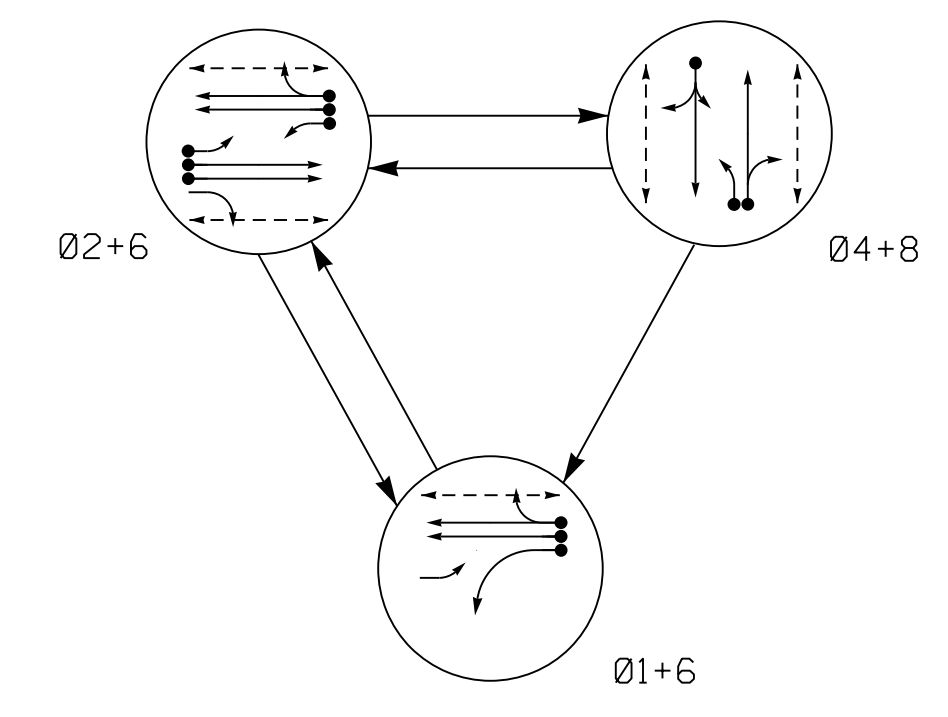
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

ELECTRICAL AND PROGRAMMING DETAILS FOR: Prepared for the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	<b>SR 1445 (Derita Road) at Thunder Road / PNG Driveway</b>		
	Division 10 Cabarrus County PLAN DATE: March 2016 PREPARED BY: M W Yalch	REVIEWED BY: J O Deaton REVIEWED BY:	

DocuSigned by:  
James O. Deaton  
40FFRAC438B0AF... 7/11/2016  
SIG. INVENTORY NO. 10-2010T3

**AECOM**  
 NC Firm License No.: F-0342  
 701 Corporate Center Drive  
 Suite 475 Raleigh, NC 27607  
 Phone: 919-854-6200

**PHASING DIAGRAM**



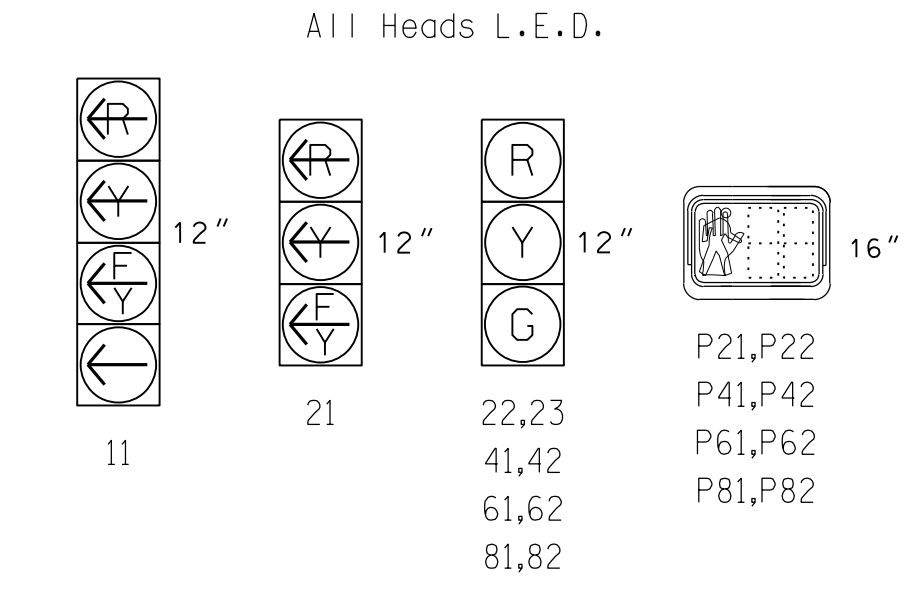
**PHASING DIAGRAM DETECTION LEGEND**

- ◄●► DETECTED MOVEMENT
- ◄◄◄ UNDETECTED MOVEMENT (OVERLAP)
- ◄◄◄ UNSIGNALIZED MOVEMENT
- ◄◄◄ PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE			
	01+6	02+6	04+8	01+6
11	←	←	←	←
21	←	←	←	←
22,23	R	G	R	Y
41,42	R	R	G	R
61,62	G	G	R	Y
81,82	R	R	G	R
P21,P22	DW	W	DW	DRK
P41,P42	DW	DW	W	DRK
P61,P62	W	W	DW	DRK
P81,P82	DW	DW	W	DRK

**SIGNAL FACE I.D.**



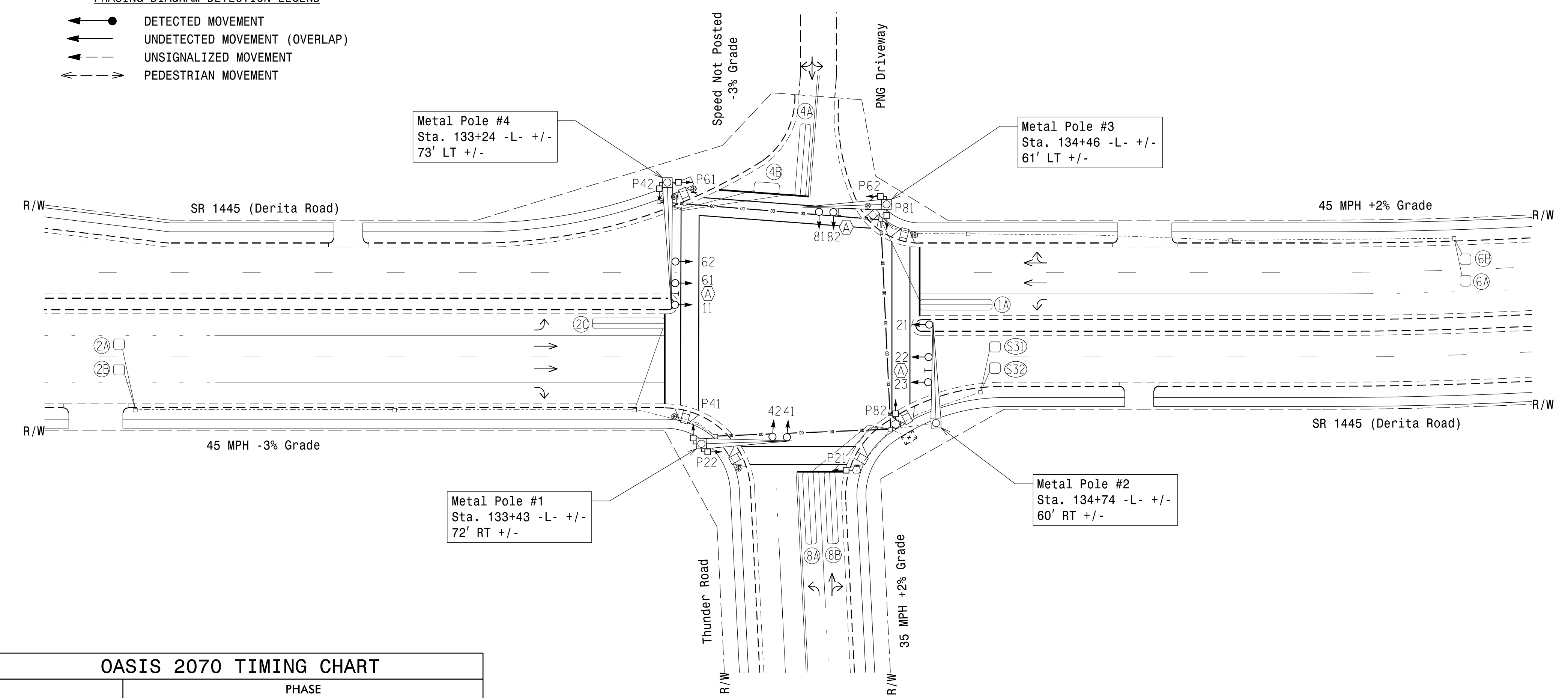
**OASIS 2070 LOOP & DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	DETECTOR PROGRAMMING				SYSTEM LOOP	NEW CARD	
					PHASE	CALLING	EXTENSION	FULL TIME DELAY			
1A	6X40	0	2-4-2	Y	1	Y	Y	-	15	-	Y
2A	6X6	300	5	Y	2	Y	Y	-	-	-	Y
2B	6X6	300	5	Y	2	Y	Y	-	-	-	Y
2C	6X40	0	2-4-2	Y	2	Y	Y	-	3	-	Y
4A	6X40	0	2-4-2	Y	4	Y	Y	-	10	-	Y
4B	6X15	0	3	Y	4	Y	Y	-	15	-	Y
6A	6X6	300	5	Y	6	Y	Y	-	-	-	Y
6B	6X6	300	5	Y	6	Y	Y	-	-	-	Y
8A	6X40	0	2-4-2	Y	8	Y	Y	-	3	-	Y
8B	6X40	0	2-4-2	Y	8	Y	Y	-	10	-	Y
S31	6X6	+180	3	Y	-	-	-	-	-	-	Y
S32	6X6	+180	3	Y	-	-	-	-	-	-	Y

**3 Phase Fully Actuated Concord City Signal System**

**NOTES**

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012, "Standard Specifications for Roads and Structures" dated January 2012, and all applicable sections of the latest version of the generic Project Special Provisions.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Disable Backup Protect for phase 6.
- Phase 1 may be lagged.
- Install backplates for all signal heads.
- Set all detector units to presence mode.
- Omit "WALK" and flashing "DON'T WALK" with no pedestrian calls.
- Program pedestrian heads to countdown the flashing "Don't Walk" time only.
- Pedestrian pedestals are conceptual and shown for reference only. See sheets P1-P3 for pushbutton location details.
- All pedestrian pushbuttons shall be located in the field by the Division Traffic Engineer before installation.
- Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
- Closed loop system data: Controller Asset #2010.
- Remove existing video detection system and return to the City of Concord.



**OASIS 2070 TIMING CHART**

FEATURE	PHASE				
	1	2	4	6	8
Min Green 1 *	7	12	7	12	7
Extension 1 *	2.0	6.0	2.0	6.0	2.0
Max Green 1 *	20	90	30	90	30
Yellow Clearance	3.0	4.8	3.3	4.8	3.7
Red Clearance	3.4	2.1	3.5	2.1	2.9
Red Revert	2.0	2.0	2.0	2.0	2.0
Walk 1 *	-	7	7	7	7
Don't Walk 1	-	13	30	25	23
Seconds Per Actuation *	-	1.5	-	1.5	-
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	ON

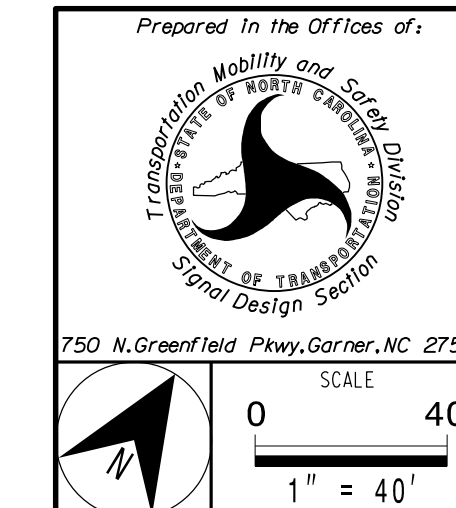
\* These values may be field adjusted. Do not adjust Min Green and Extension times for phases 2 and 6 lower than what is shown. Min Green for all other phases should not be lower than 4 seconds.

**LEGEND**

PROPOSED	EXISTING
○ → Traffic Signal Head	● → N/A
◐ → Modified Signal Head	■ → N/A
◑ → Pedestrian Signal Head	◑ → Metal Pole with Mastarm
◒ → Inductive Loop Detector	◒ → Junction Box
⊠ → Controller & Cabinet	⊠ → 2-in Underground Conduit
□ → Junction Box	□ → Right of Way
N/A → Directional Arrow	→ → Type I Pushbutton Post
⊕ → Type II Signal Pedestal	⊕ → Pushbutton & Sign
⊖ → Sign	⊖ → Sign
⊗ → Street Name Sign (D3-1)	⊗ → Street Name Sign (D3-1)

**Signal Upgrade - Final Design**

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**



**SR 1445 (Derita Road) at Thunder Road / PNG Driveway**

Division 10 Cabarrus County Concord

PLAN DATE: March 2016 REVIEWED BY: C.L. Kalencik

PREPARED BY: S W COX REVIEWED BY:

REVISIONS: \_\_\_\_\_ INIT. DATE

SCALE: 0 40  
1" = 40'

**SEAL 040715**

CORYNNE L. KALENCIK  
PROFESSIONAL ENGINEER

DocuSign Envelope ID: 0FE198CE2884FE  
7/7/2016

SIG. INVENTORY NO. 10-2010

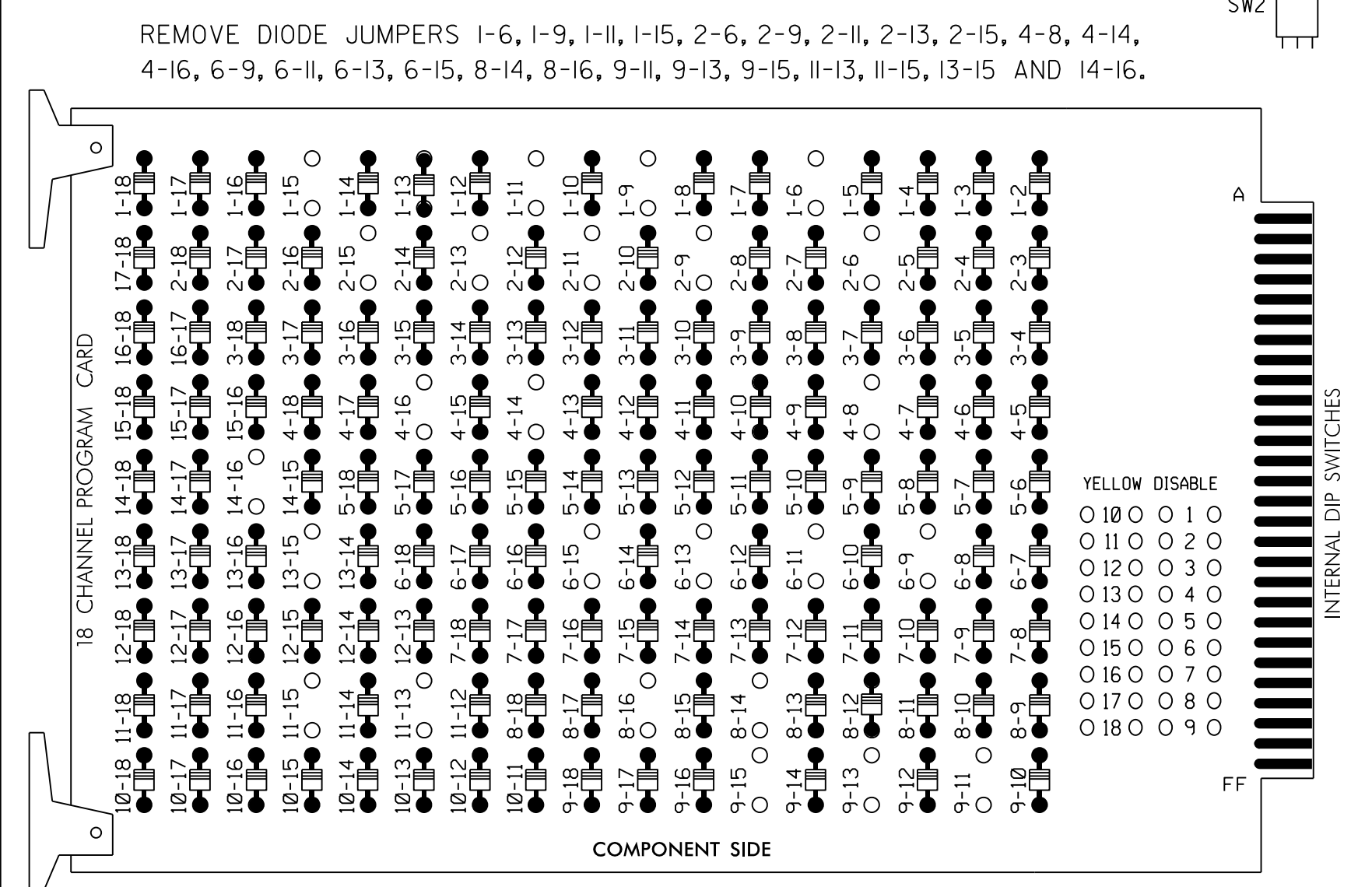
**AECOM**  
NC Firm License No.: F-0342  
701 Corporate Center Drive  
Suite 475 Raleigh, NC 27607  
Phone: 919-854-6200

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### EDI MODEL 2018ECLIP-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches 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.
- Integrate monitor with Ethernet network in cabinet.

### 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 phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2, 4, 6 and 8 for 'STARTUP PED CALL'.
- Program phases 2 and 6 for Yellow Flash and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Concord City Signal System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070  
 CABINET.....332 W/ AUX  
 SOFTWARE.....ECONOLITE OASIS  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 (12-STD; 6 AUX)  
 LOAD SWITCHES USED.....S1,S2,S3,S5,S6,S8,S9,S11,S12,  
 AUX S1,AUX S4  
 PHASES USED.....1,2,4,6,8,2PED,4PED,6PED,8PED  
 OVERLAP "A".....1+2  
 OVERLAP "B".....NOT USED  
 OVERLAP "C".....6  
 OVERLAP "D".....NOT USED

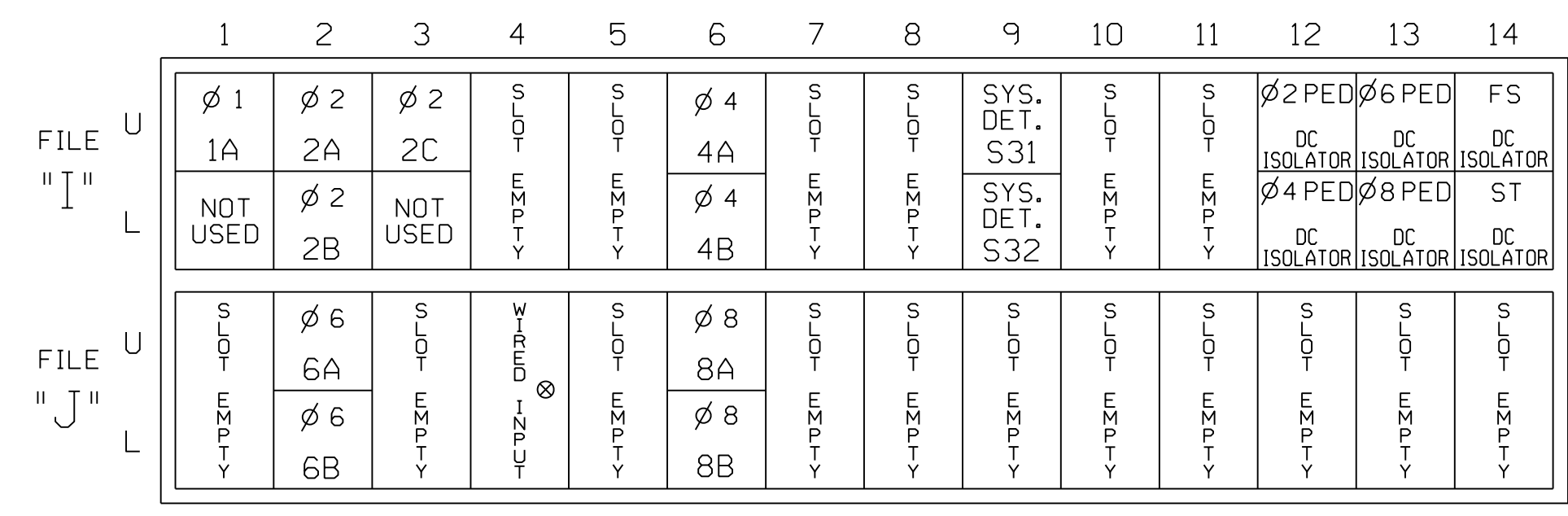
### SIGNAL HEAD HOOK-UP CHART

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
GMU 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	22,23	P21, P22	NU	41,42	P41, P42	NU	61,62	P61, P62	NU	81,82	P81, P82	11	NU	NU	21	NU	NU
RED	128			101				134			107							
YELLOW	*	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW																A121		A114
YELLOW ARROW																A122		A115
FLASHING YELLOW ARROW																A123		A116
GREEN ARROW	127																	
Hand icon			113			104			119				110					
Person icon			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.

### INPUT FILE POSITION LAYOUT

(front view)



EX.: 1A, 2A, ETC. = LOOP NO.'S  
 FS = FLASH SENSE  
 ST = STOP TIME  
 ⊗ Wired Input - Do not populate slot with detector card

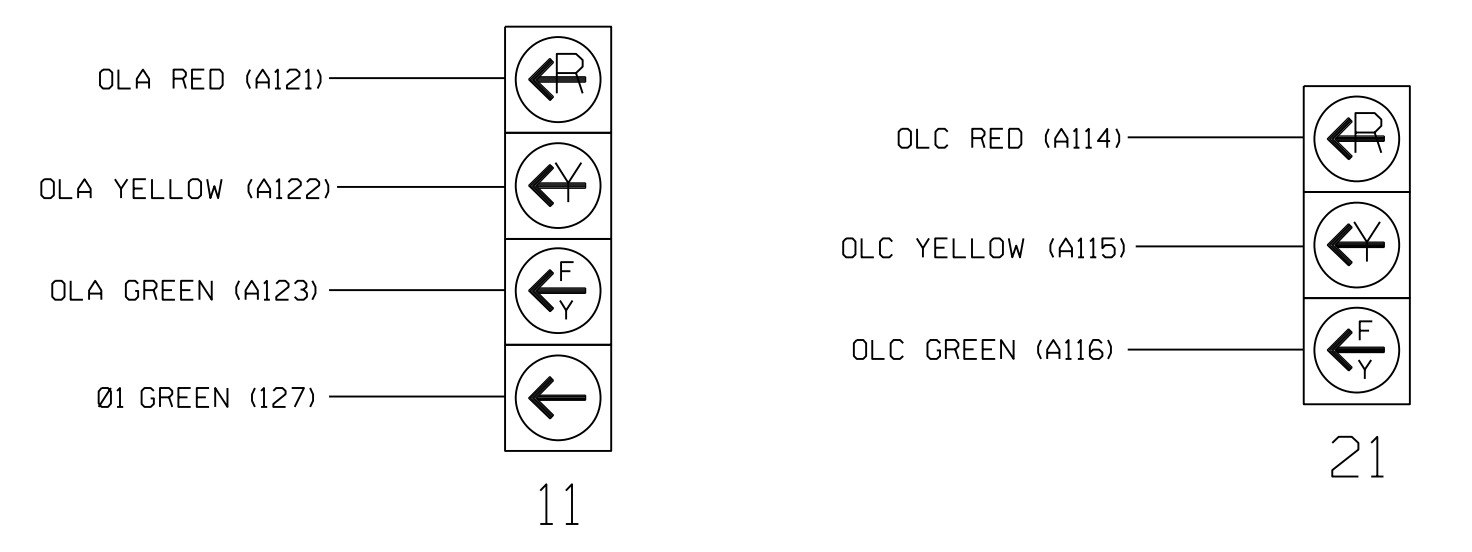
### INPUT FILE CONNECTION & PROGRAMMING CHART

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
1A <sup>1</sup>	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
2A	TB2-5,6	I2U	39	1	2	2	Y	Y			
2B	TB2-7,8	I2L	43	5	12	2	Y	Y			
2C	TB2-9,10	I3U	63	25	32	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			10
4B	TB4-11,12	I6L	45	7	14	4	Y	Y			15
*S31	TB6-9,10	I9U	60	22	11	SYS					
*S32	TB6-11,12	I9L	62	24	13	SYS					
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			10
PED PUSH BUTTONS											
P21,P22	TB8-4,6	I12U	67	29	PED 2	2 PED					
P41,P42	TB8-5,6	I12L	69	31	PED 4	4 PED					
P61,P62	TB8-7,9	I13U	68	30	PED 6	6 PED					
P81,P82	TB8-8,9	I13L	70	32	PED 8	8 PED					

<sup>1</sup>Add jumper from I1-W to J4-W, on rear of input file.  
 \* System detector only. Remove the vehicle phase assigned to this detector in the default programming.

### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



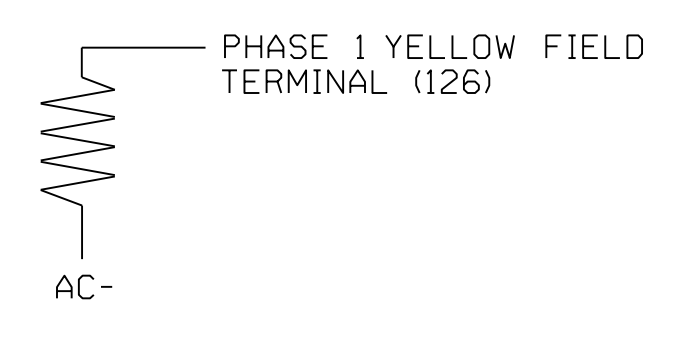
**NOTE**

- The sequence display for Signal Head 11 requires special logic programming. See sheet 2 of 2 for programming instructions.

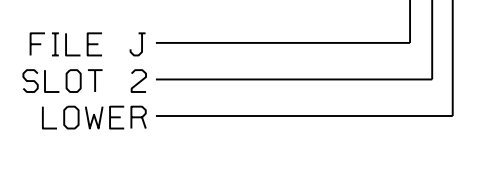
### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



### INPUT FILE POSITION LEGEND: J2L



Signal Upgrade - Final Design  
 Electrical Detail Sheet 1 of 2

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

DETAILS FOR: SR 1445 (Derita Road) at Thunder Road / PNG Driveway

Division 10 Cabarrus County Concord

PLAN DATE: March 2016 REVIEWED BY: J O Deaton

PREPARED BY: M W Yalch REVIEWED BY:

REVISIONS: INIT. DATE

DocuSigned by: James O. Deaton  
 48FFBAC8BDD6F... 7/11/2016

SIG. INVENTORY NO. 10-2010

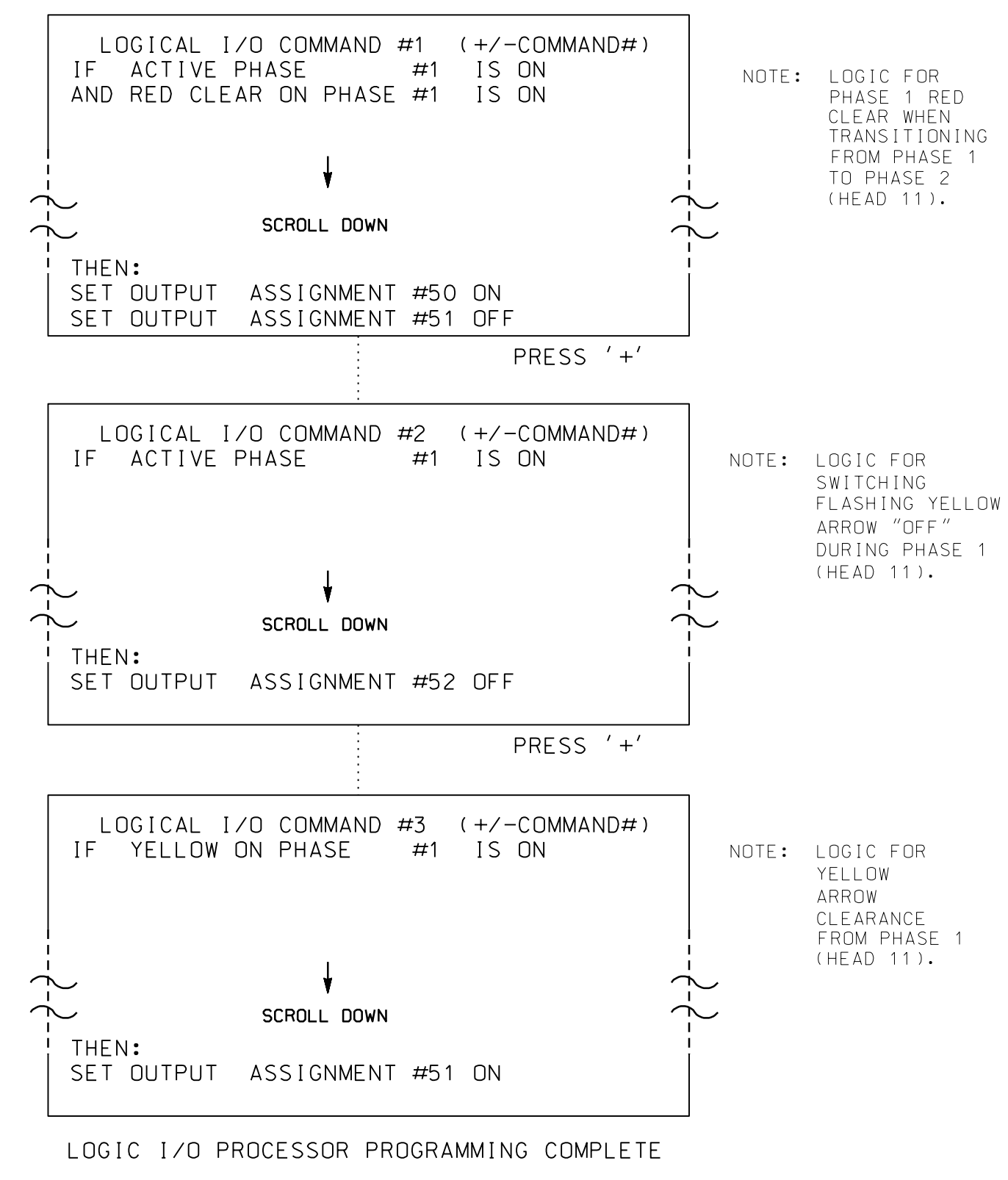
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### LOGICAL I/O PROCESSOR PROGRAMMING DETAIL TO PRODUCE SPECIAL FYA-PPLT SIGNAL SEQUENCE

(program controller as shown below)

- FROM MAIN MENU PRESS '2' (PHASE CONTROL), THEN '1' (PHASE CONTROL FUNCTIONS). SCROLL TO THE BOTTOM OF THE MENU AND ENABLE ACT LOGIC COMMANDS 1, 2 AND 3.
- FROM MAIN MENU PRESS '6' (OUTPUTS), THEN '3' (LOGICAL I/O PROCESSOR).



OUTPUT REFERENCE SCHEDULE	
USE TO INTERPRET LOGIC PROCESSOR	
OUTPUT 50	= Overlap A Red
OUTPUT 51	= Overlap A Yellow
OUTPUT 52	= Overlap A Green

### OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

FROM MAIN MENU PRESS '8' (OVERLAPS), THEN '1' (VEHICLE OVERLAP SETTINGS).

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS  
 PHASE: ;12345678910111213141516  
 VEH OVL PARENTS: ;XX  
 VEH OVL NOT VEH: ;  
 VEH OVL NOT PED: ;  
 VEH OVL GRN EXT: ;  
 STARTUP COLOR: - RED - YELLOW - GREEN  
 FLASH COLORS: - RED - YELLOW X GREEN ← NOTICE GREEN FLASH  
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)  
 FLASH YELLOW IN CONTROLLER FLASH?...Y  
 GREEN EXTENSION (0-255 SEC)...0.0  
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0  
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0  
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS  
 PHASE: ;12345678910111213141516  
 VEH OVL PARENTS: ; X  
 VEH OVL NOT VEH: ;  
 VEH OVL NOT PED: ;  
 VEH OVL GRN EXT: ;  
 STARTUP COLOR: - RED - YELLOW - GREEN  
 FLASH COLORS: - RED - YELLOW X GREEN ← NOTICE GREEN FLASH  
 SELECT VEHICLE OVERLAP OPTIONS: (Y/N)  
 FLASH YELLOW IN CONTROLLER FLASH?...Y  
 GREEN EXTENSION (0-255 SEC)...0.0  
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0  
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0  
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

OVERLAP PROGRAMMING COMPLETE

### 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.

### BACKUP PROTECTION NOTE

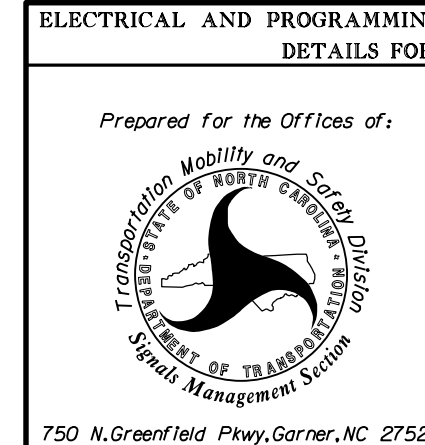
(program controller as shown below)

From Main Menu press '2' (Phase Control), then '1' (Phase Control Functions). Deselect phase 6 for 'Backup Protect'.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 10-2010  
 DESIGNED: March 2016  
 SEALED: July 7, 2016  
 REVISED:

Signal Upgrade - Final Design  
 Electrical Detail Sheet 2 of 2

DOCUMENT NOT CONSIDERED FINAL  
 UNLESS ALL SIGNATURES COMPLETED

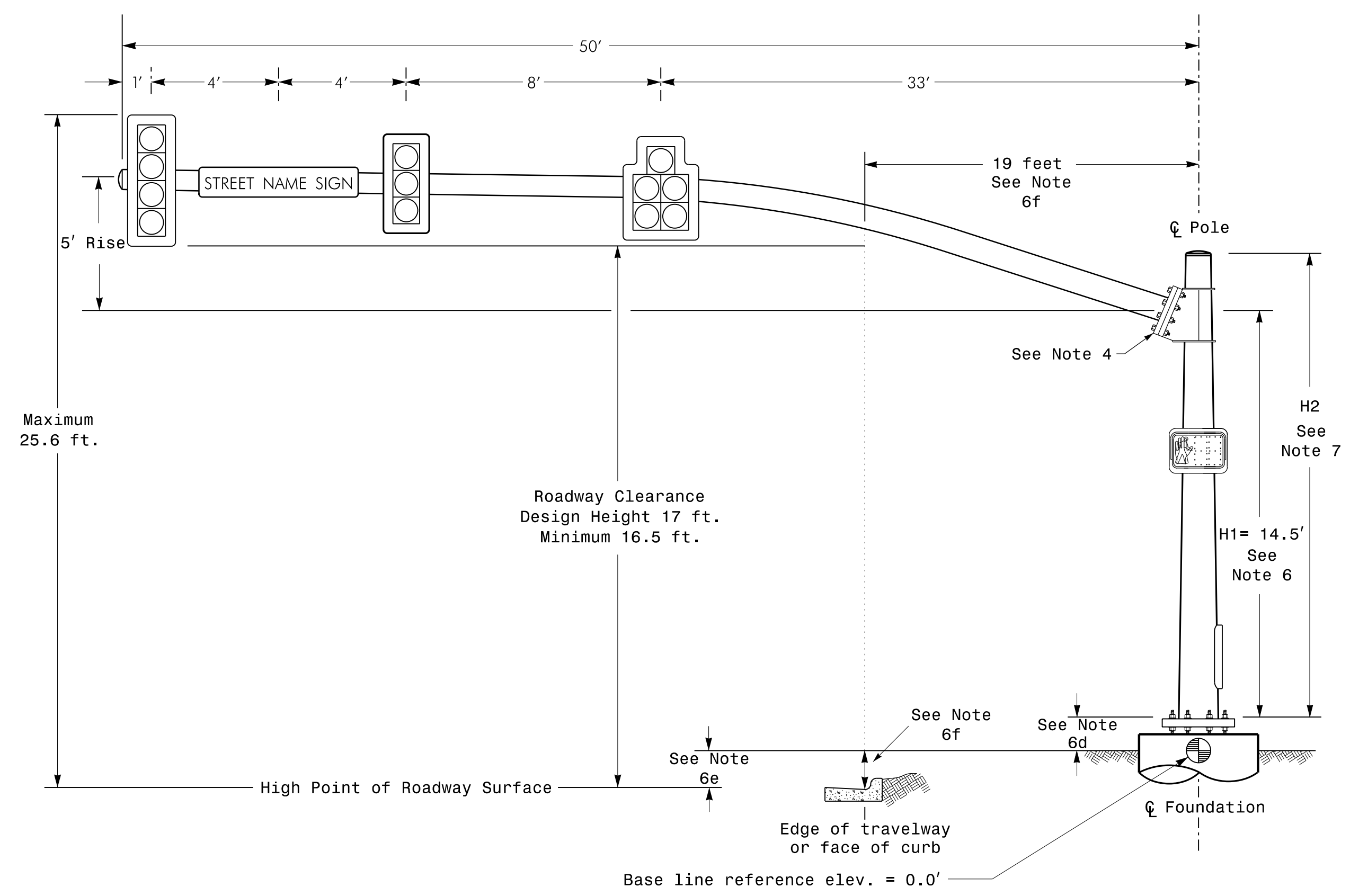


SR 1445 (Derita Road) at Thunder Road / PNG Driveway	
Division 10	Cabarrus County
PLAN DATE: March 2016	REVIEWED BY: J O Deaton
PREPARED BY: M W Yalch	REVIEWED BY:
REVISIONS	INIT. DATE

DocuSigned by:  
 James O. Deaton  
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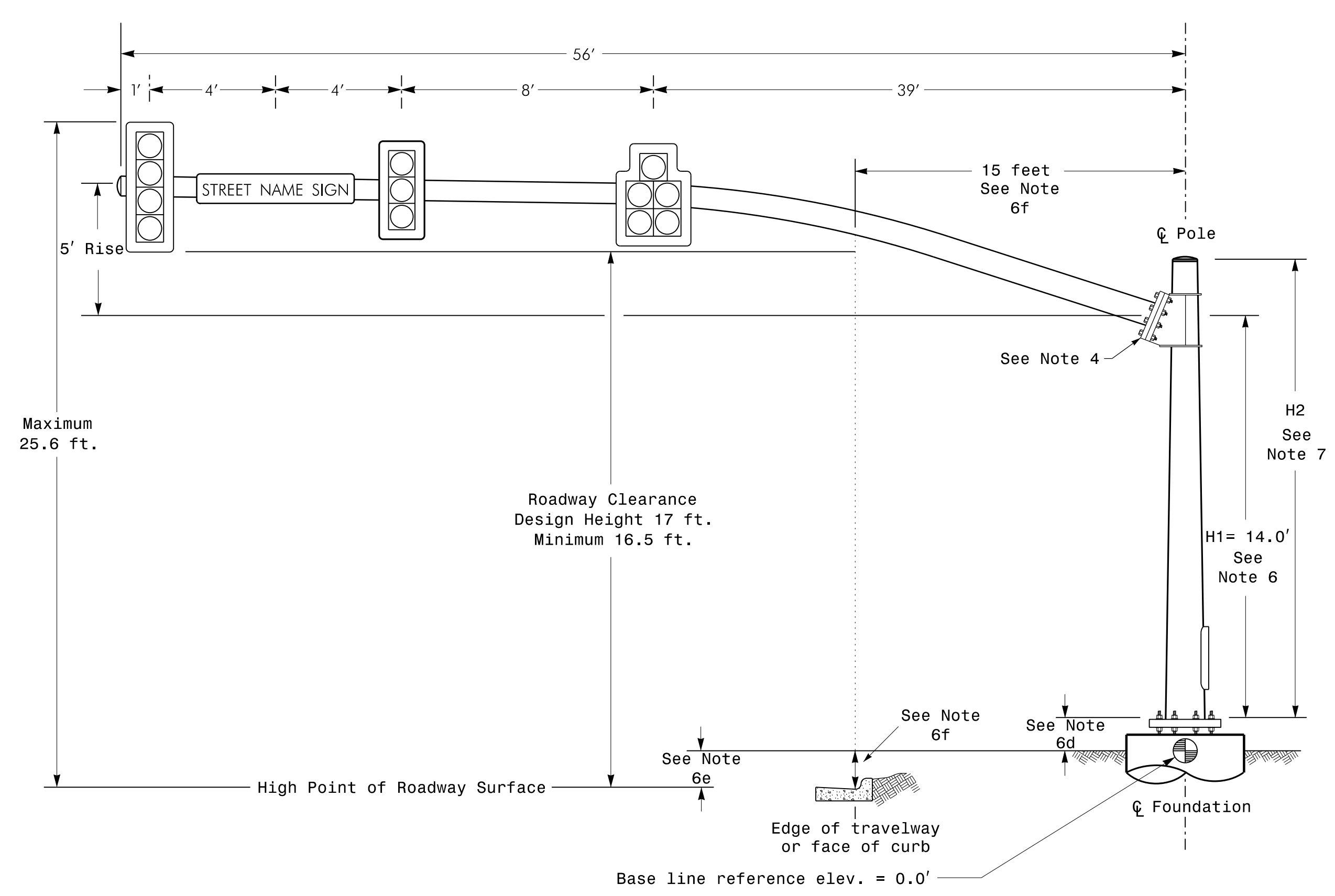
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**Design Loading for METAL POLE NO. 1**



**ELEVATION VIEW**

**Design Loading for METAL POLE NO. 2**

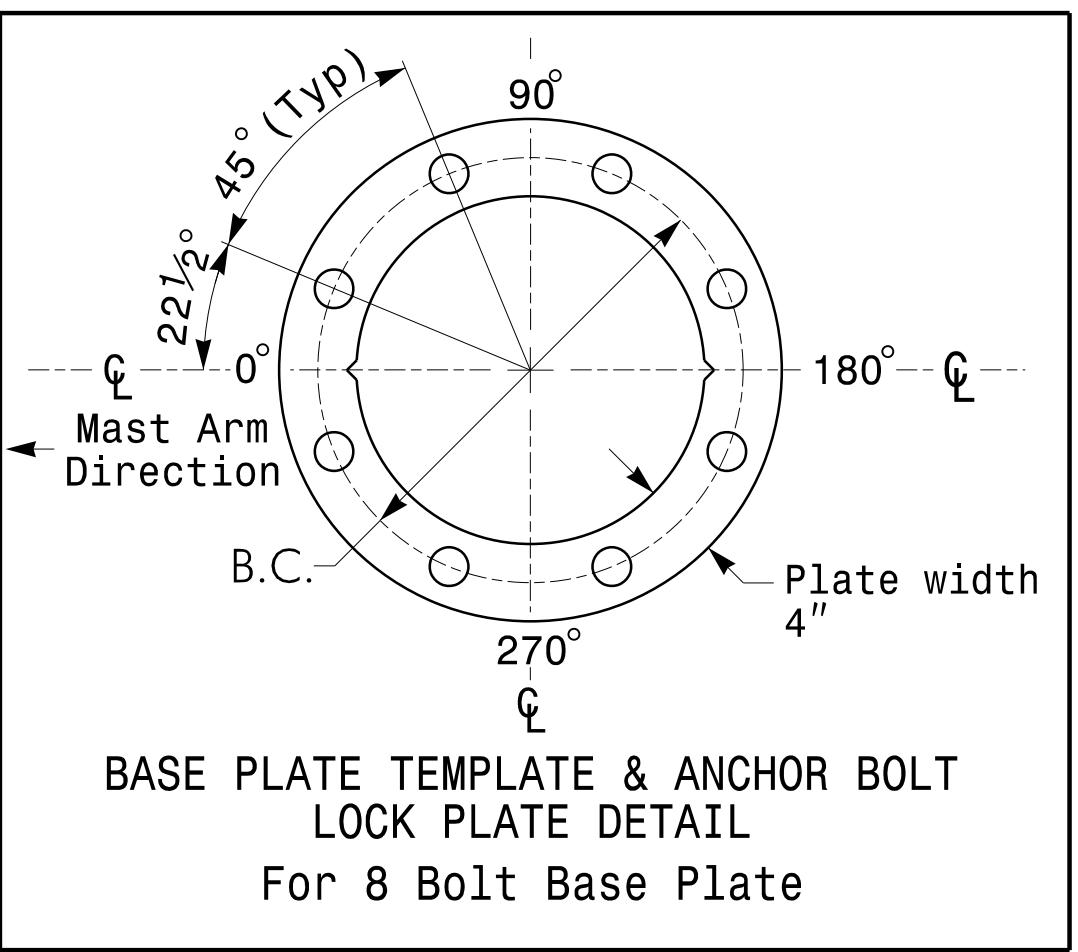
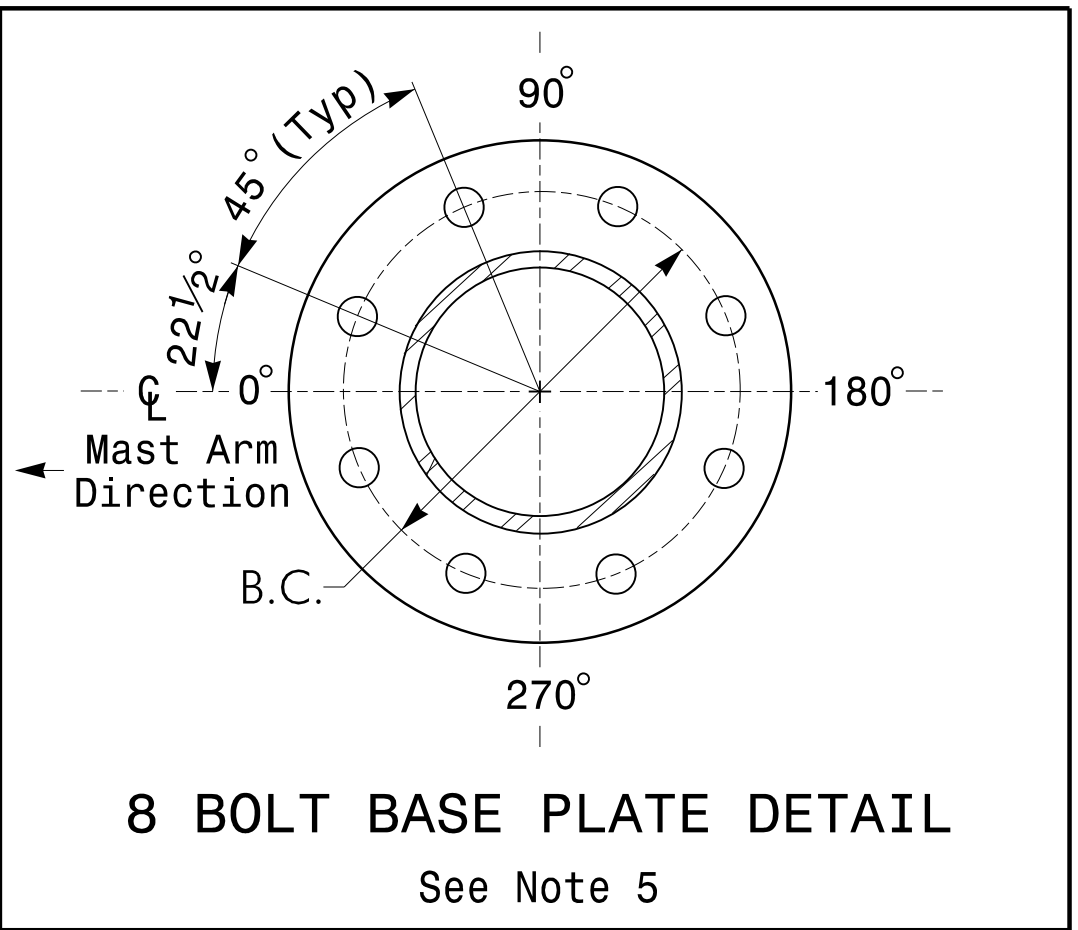
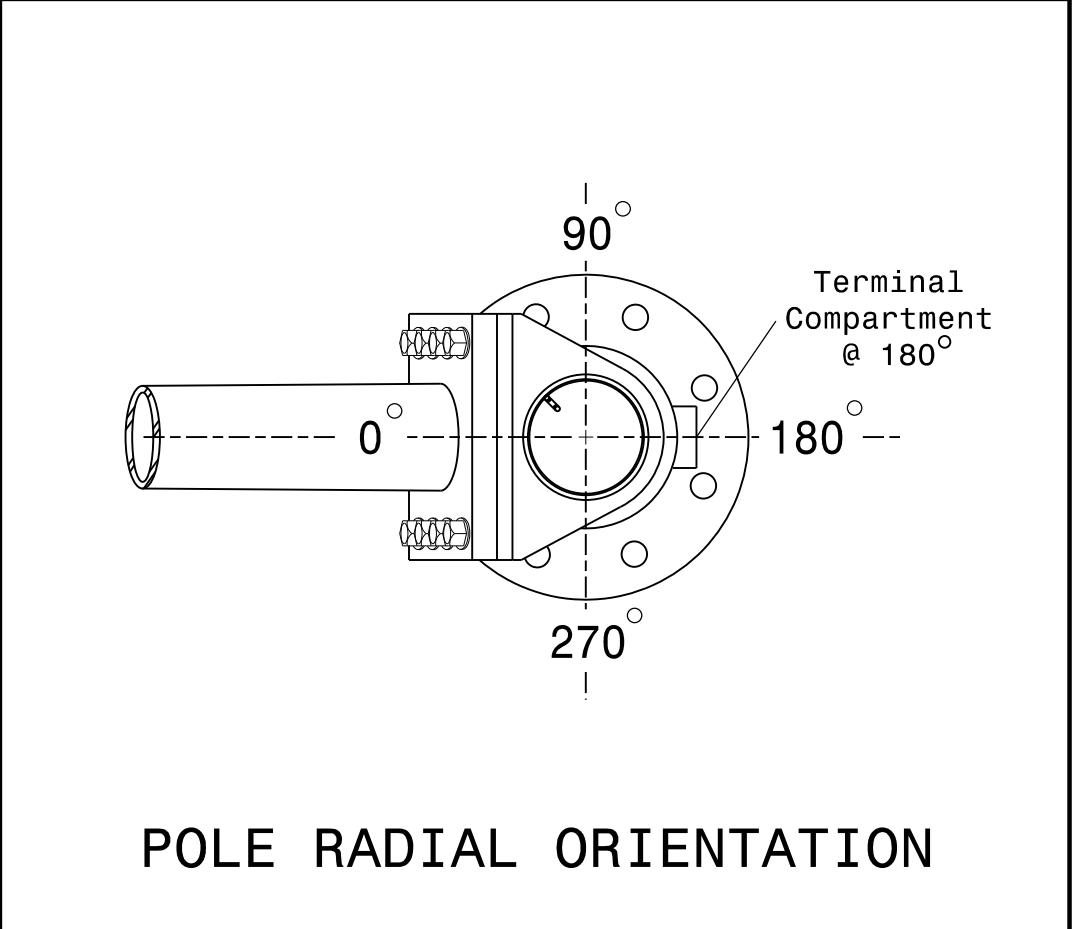


**Elevation View**

**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:	Pole 1	Pole 2
Baseline reference point at $\phi$ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	+0.4 ft.	-0.1 ft.
Elevation difference at Edge of travelway or face of curb	-0.7 ft.	-0.7 ft.



**METAL POLE No. 1 and 2**

**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
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 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
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5" W X 17.0" L	21 LBS

**NOTES**

- Design Reference Material**
- Design the traffic signal structure and foundation in accordance with:
    - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", including all of the latest interim revisions.
    - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
    - The 2012 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.
  - 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.
  - 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:
    - Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
    - 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.
    - Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
  - The pole manufacturer will determine the total height (H2) of each 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 & Design Structural Engineer for assistance at (919) 773-2800.
  - The contractor is responsible for verifying that the mast arm length 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)

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

	SR 1445 (Derita Road) at Thunder Road / PNG Driveway		
	Division 10 Cabarrus County Concord	REVIEWED BY: C.L. Kalencik	
PLAN DATE: March 2016	PREPARED BY: S W COX	REVIEWED BY:	DATE:
SCALE: N/A	REVISIONS:	INIT.:	DATE:
750 N. Greenfield Pkwy, Garner, NC 27529	DocuSign by:	7/7/2016	SIG. INVENTORY NO. 10-2010

**AECOM**  
NC Firm License No.: F-0342  
701 Corporate Center Drive  
Suite 475 Raleigh, NC 27607  
Phone: 919-854-6200

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### METAL POLE No. 3 and 4

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
	SIGNAL HEAD 12"-4 SECTION-WITH BACKPLATE AND ASTRO-BRAC	11.5 S.F.	25.5" W X 66.0" L	74 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
	PEDESTRIAN SIGNAL HEAD WITH MOUNTING HARDWARE	2.2 S.F.	18.5" W X 17.0" L	21 LBS

#### NOTES

#### Design Reference Material

- Design the traffic signal structure and foundation in accordance with:
  - The 6th Edition 2013 AASHTO "Standard Specifications for Structural Supports for Highway Signs, Luminaires, and Traffic Signals", including all of the latest interim revisions.
  - The 2012 NCDOT "Standard Specifications for Roads and Structures". The latest addenda to these specifications can be found in the traffic signal project special provisions.
  - The 2012 NCDOT Roadway Standard Drawings.
  - The traffic signal project plans and special provisions.

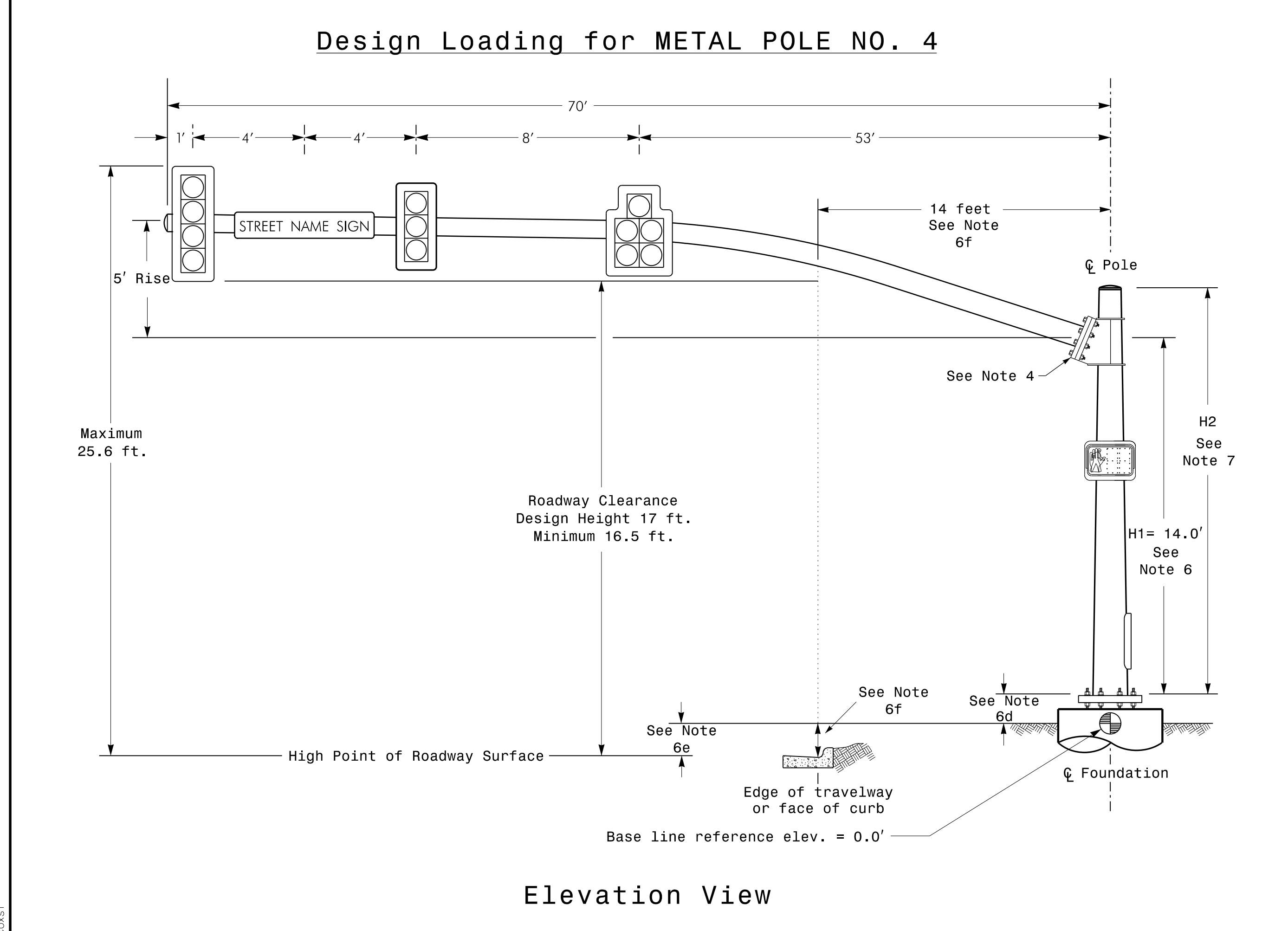
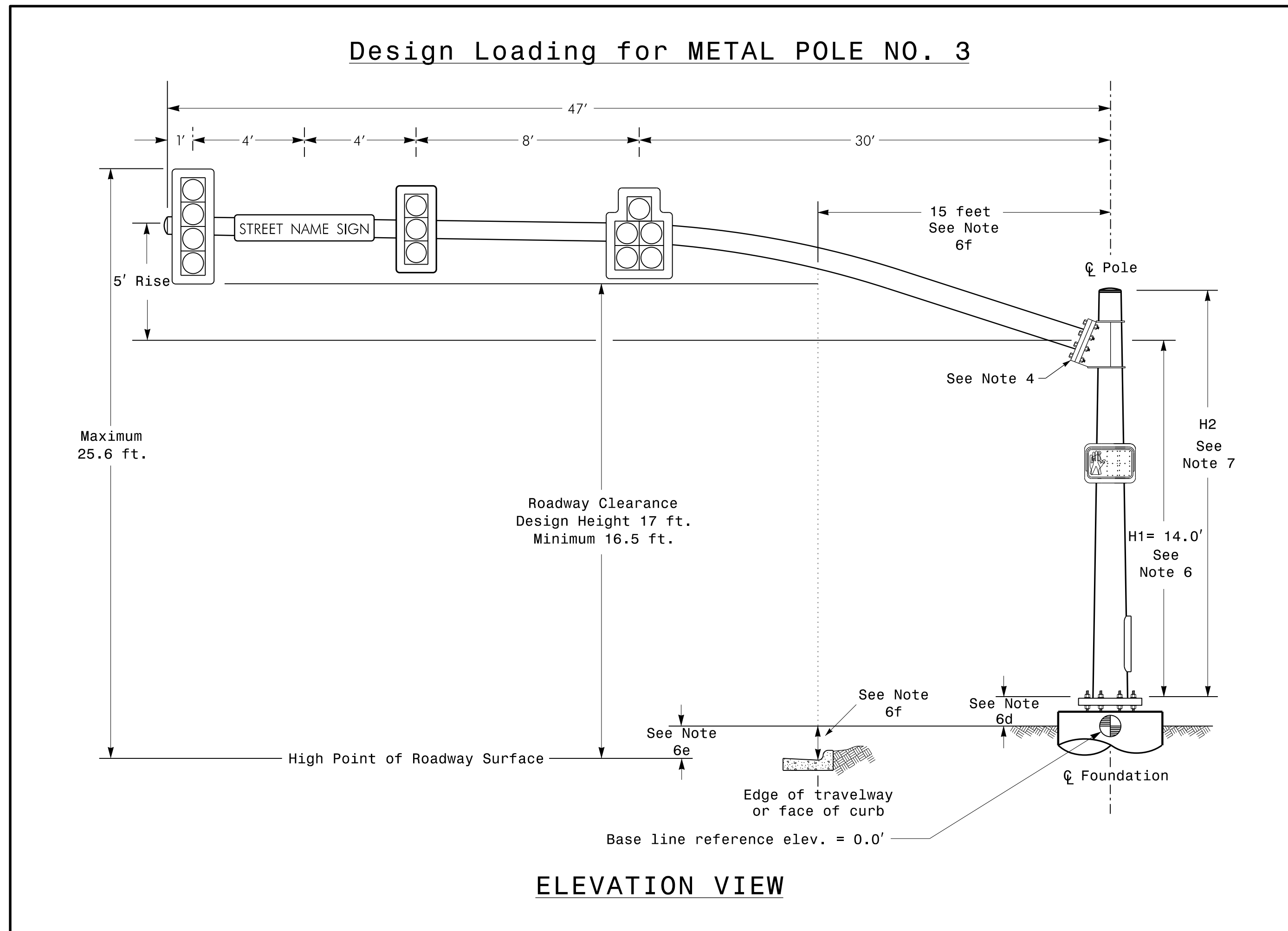
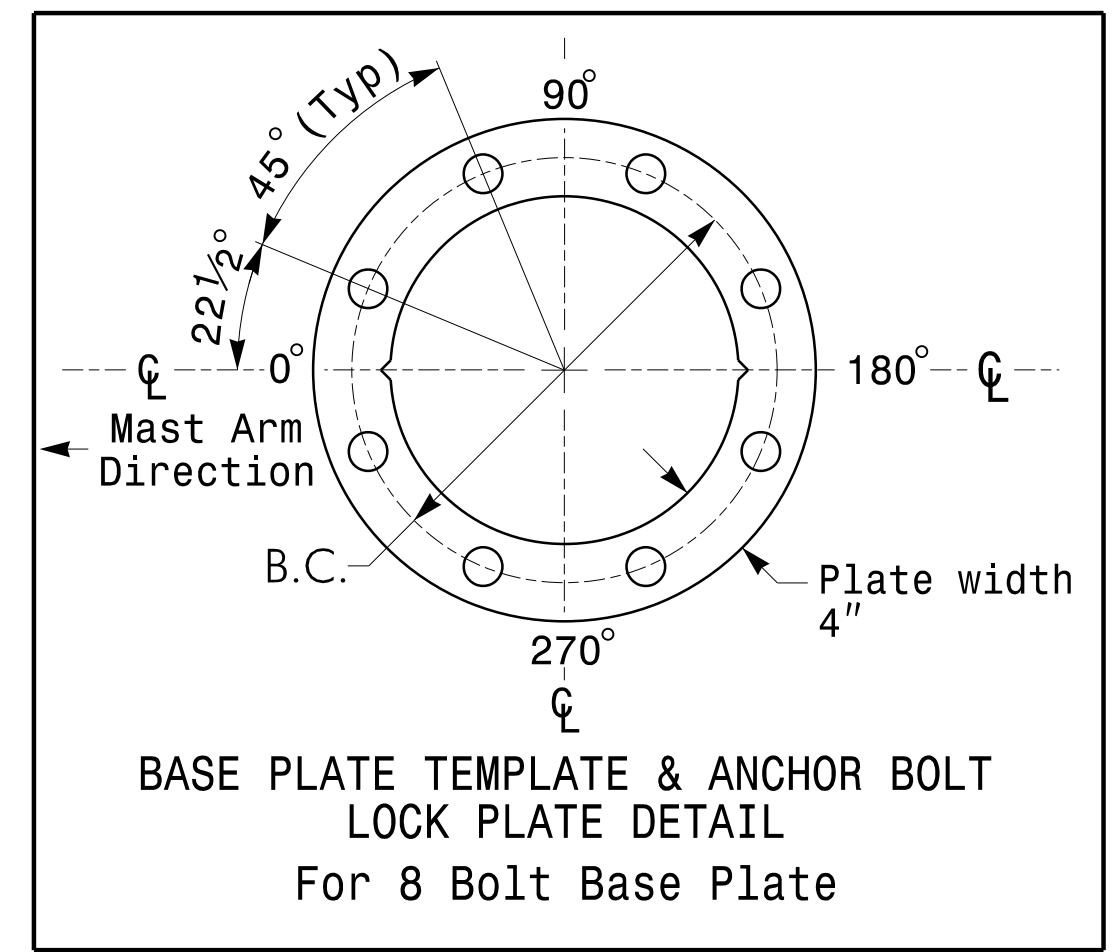
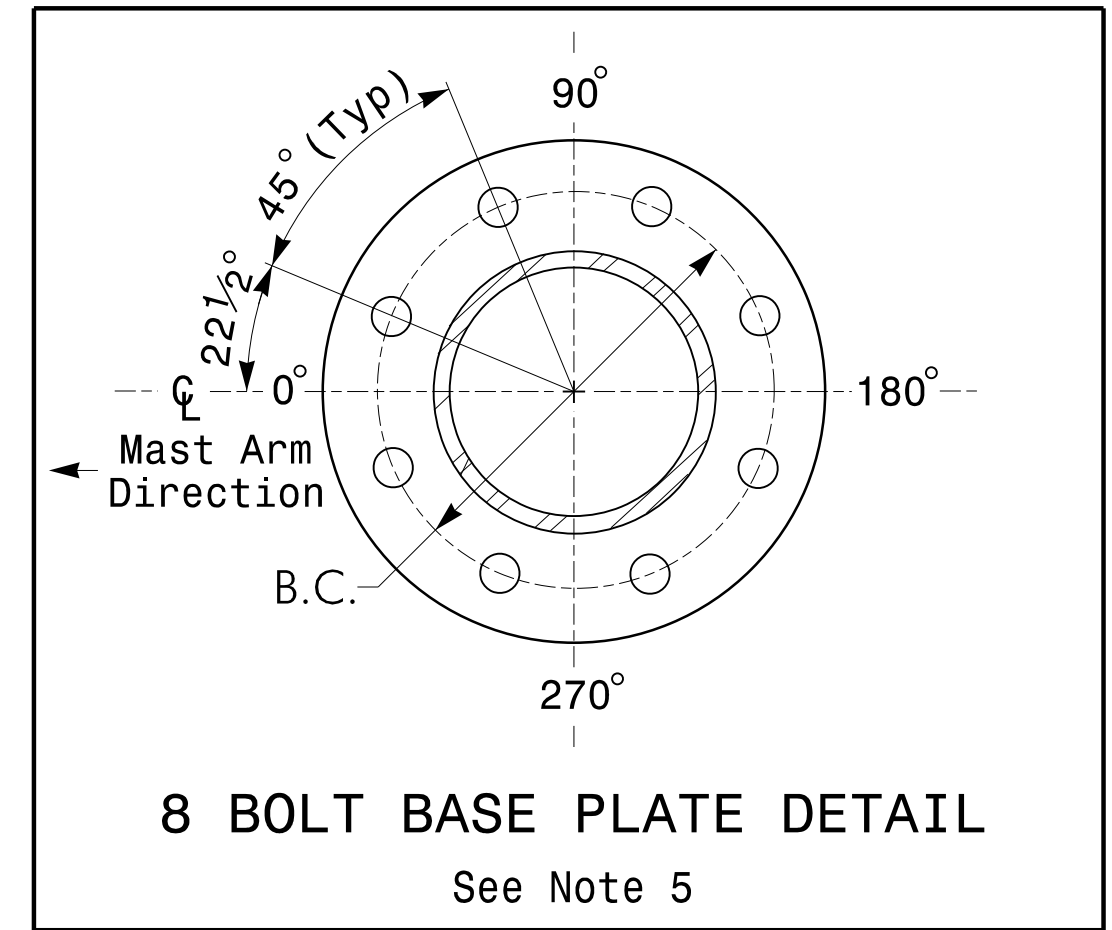
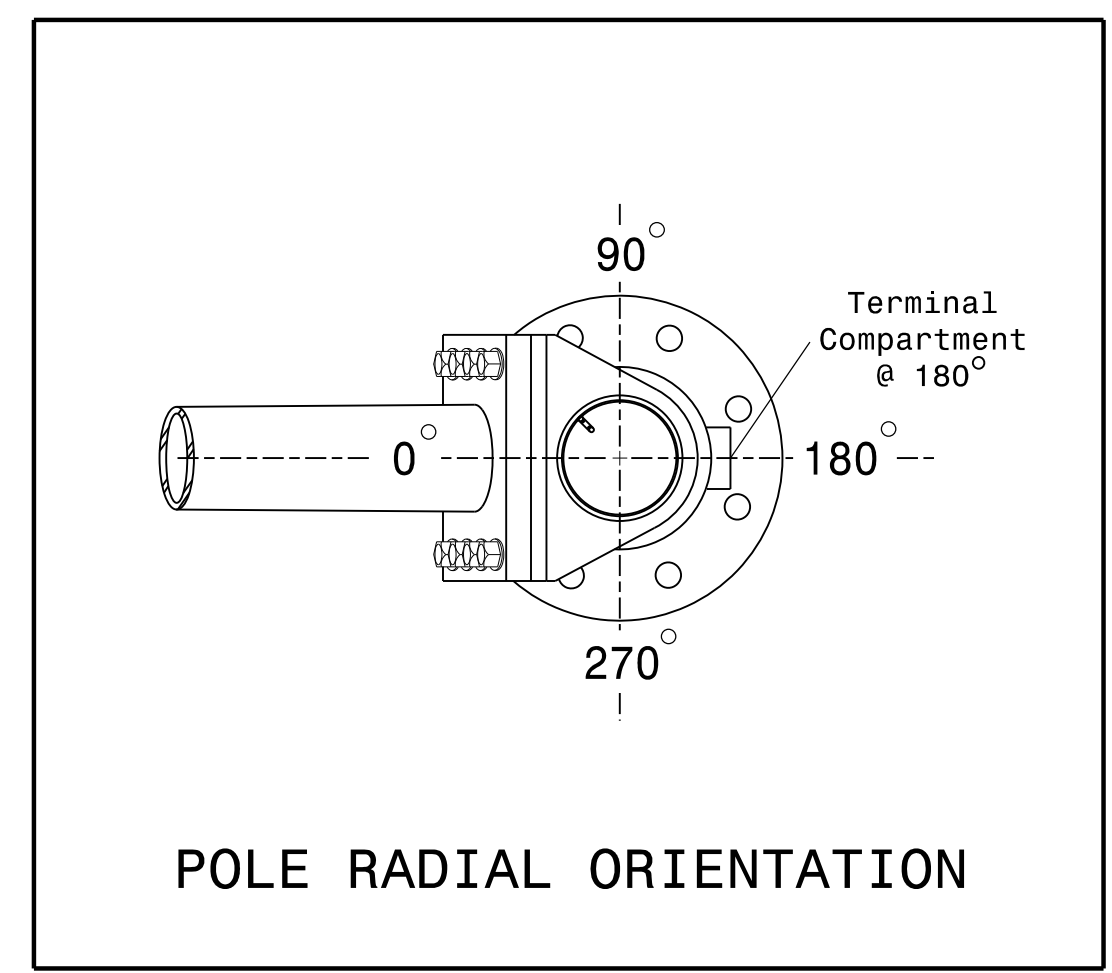
#### Design Requirements

- 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.
- 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.
- 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:
  - Nominal vertical rise in mast arm is 5 feet as measured from the centerline of the arm base to the centerline of the free end of the arm.
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  - 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.
  - Provide horizontal distance from proposed centerline of foundation to edge of travelway. Refer to the Elevation Data chart above for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary when arched arms are specified to ensure that the roadway clearance is maintained at the edge of the travelway and to assist in the camber design of the mast arm.
- The pole manufacturer will determine the total height (H2) of each 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 & Design Structural Engineer for assistance at (919) 773-2800.
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**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:	Pole 3	Pole 4
Baseline reference point at $\phi$ Foundation @ ground level	0.0 ft.	0.0 ft.
Elevation difference at High point of roadway surface	-0.1 ft.	-0.6 ft.
Elevation difference at Edge of travelway or face of curb	-0.8 ft.	-1.1 ft.



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NCDOT Wind Zone 4 (90 mph)

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

	SR 1445 (Derita Road) at Thunder Road / PNG Driveway		
	Division 10 Cabarrus County Concord	Prepared by: S W COX	
750 N. Greenfield Pkwy, Garner, NC 27529	SCALE: 0 N/A	REVISIONS:	INIT. DATE

DocuSigned by: Corynne L. Kalencik 7/7/2016

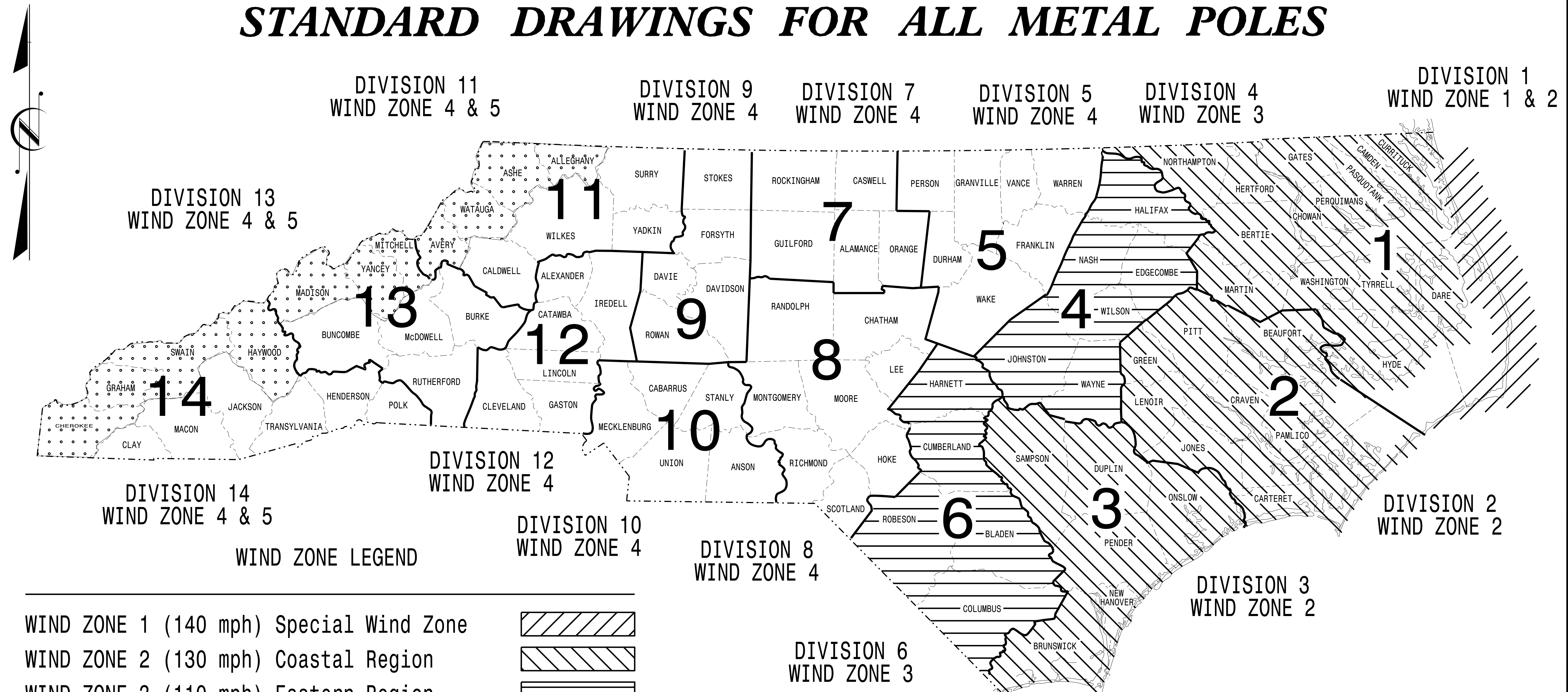
SIG. INVENTORY NO. 10-2010



# STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT I.D. NO. <b>U-4910A</b>	SHEET NO. <b>Sig.M1</b>
------------------------------------	----------------------------

## STANDARD DRAWINGS FOR ALL 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  
2015 Interim to the  
6th Edition 2013  
**AASHTO**  
Standard Specifications for  
Structural Supports for  
Highway Signs, Luminaires,  
and Traffic Signals

DRAWING NUMBER	DESCRIPTION
Sig. M 1	Statewide Wind Zone Map
Sig. M 2	Typical Fabrication Details-All Metal Poles
Sig. M 3	Typical Fabrication Details-Strain Poles
Sig. M 4	Typical Fabrication Details-Mast Arm Poles
Sig. M 5	Typical Fabrication Details-Mast Arm Connection
Sig. M 6	Typical Fabrication Details-Strain Pole Attachments
Sig. M 7	Construction Details-Foundations
Sig. M 8	Standard Strain Pole Foundation-All Soil Conditions

**NC DOT 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**

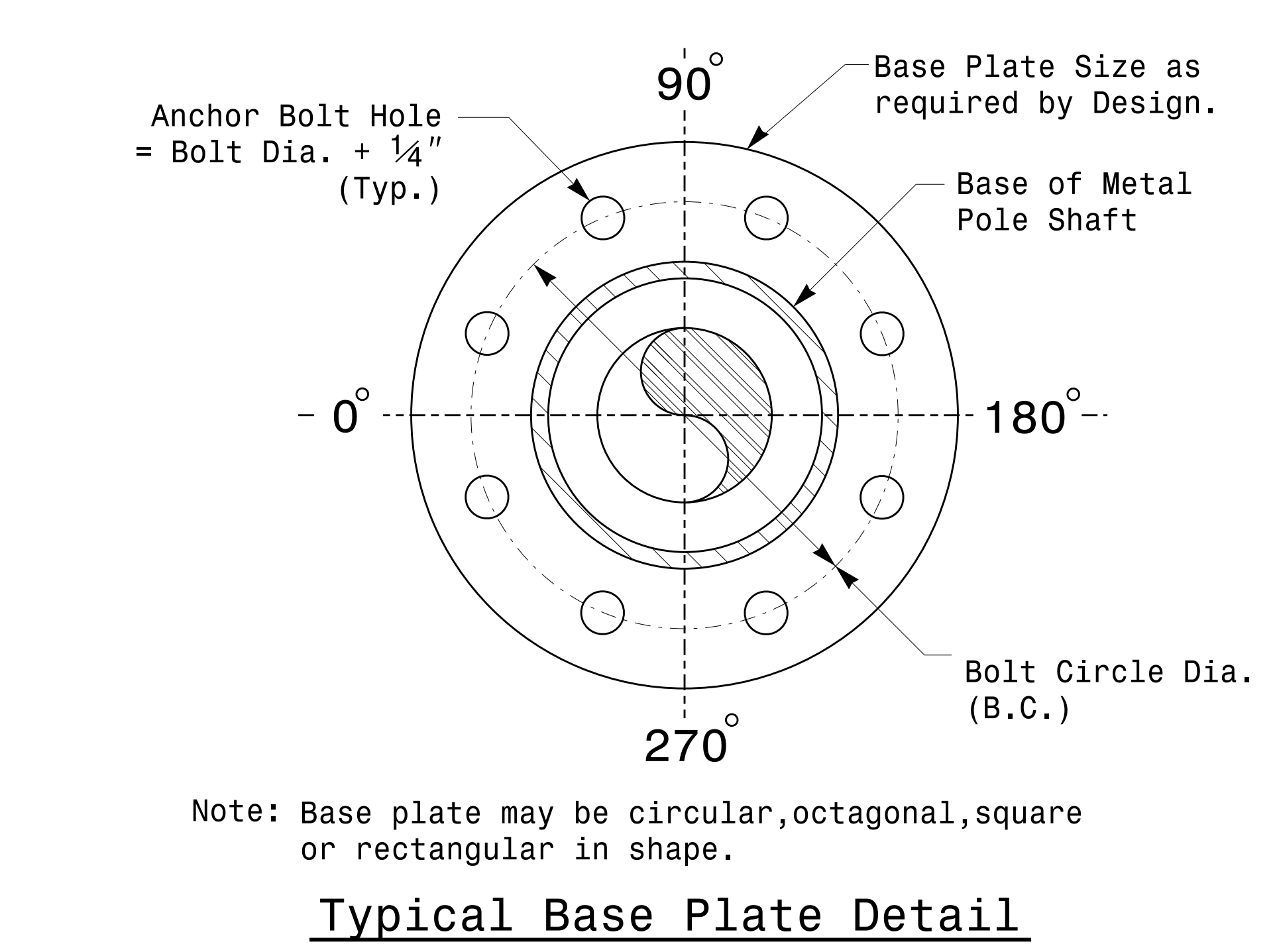
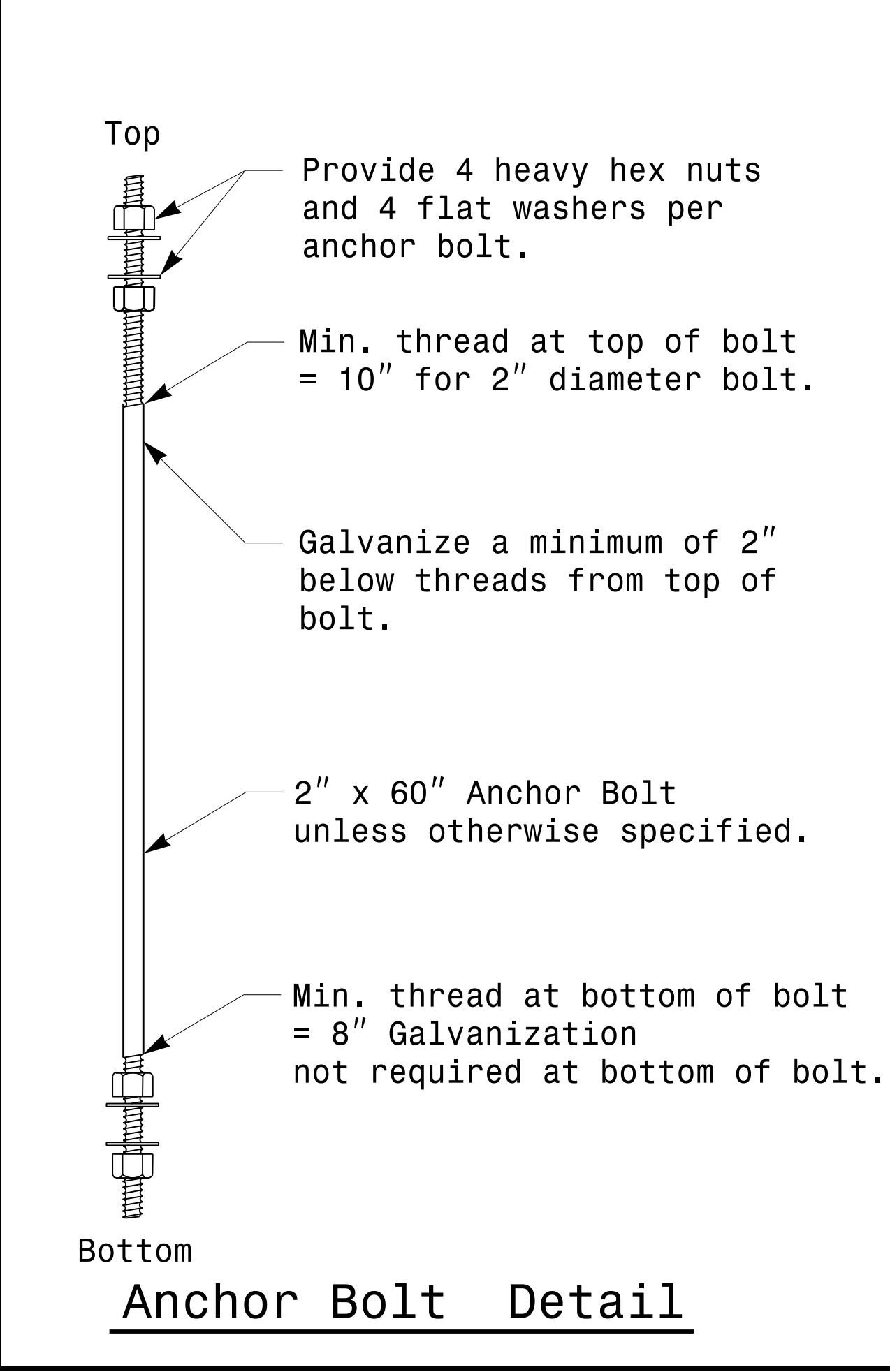
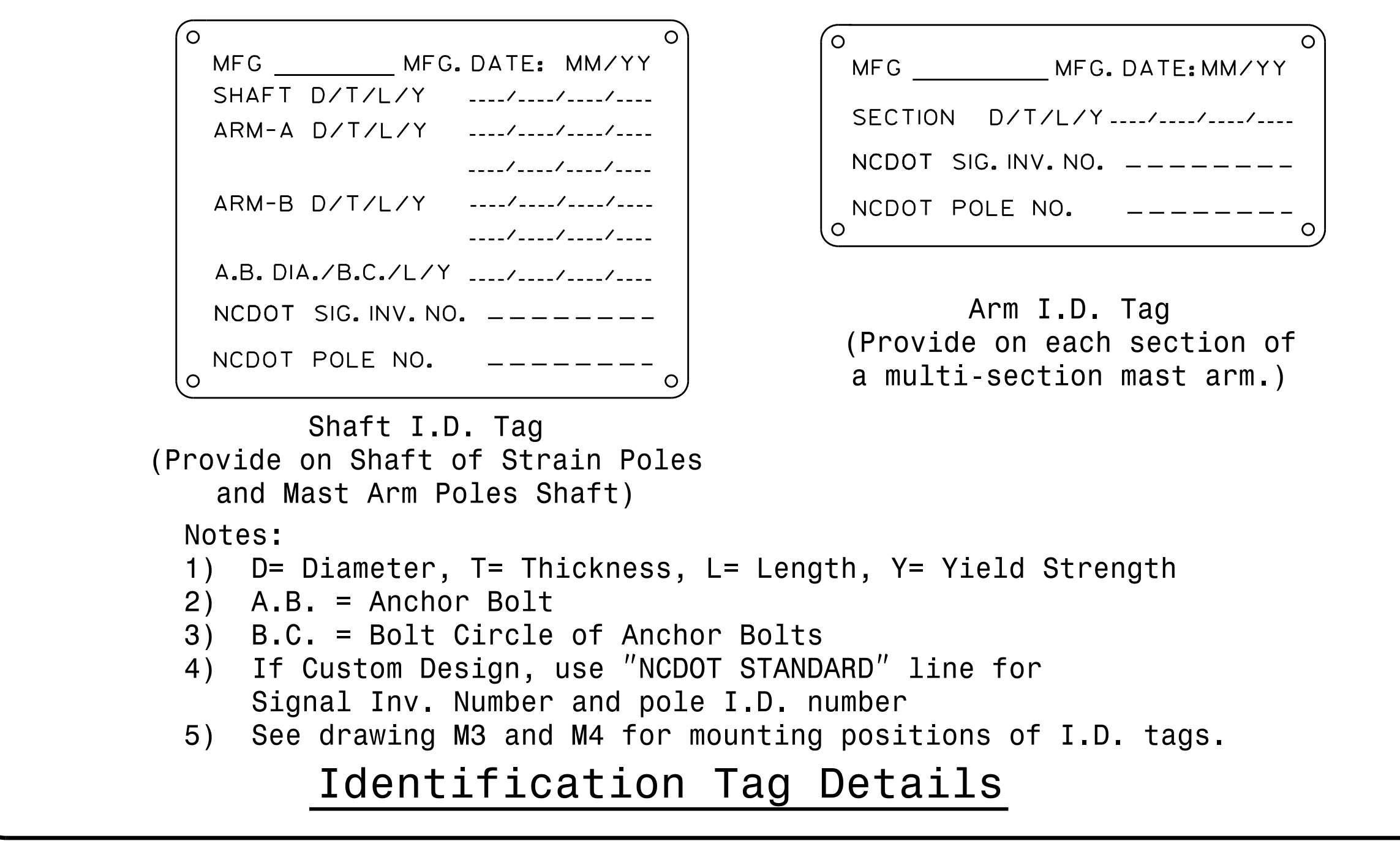
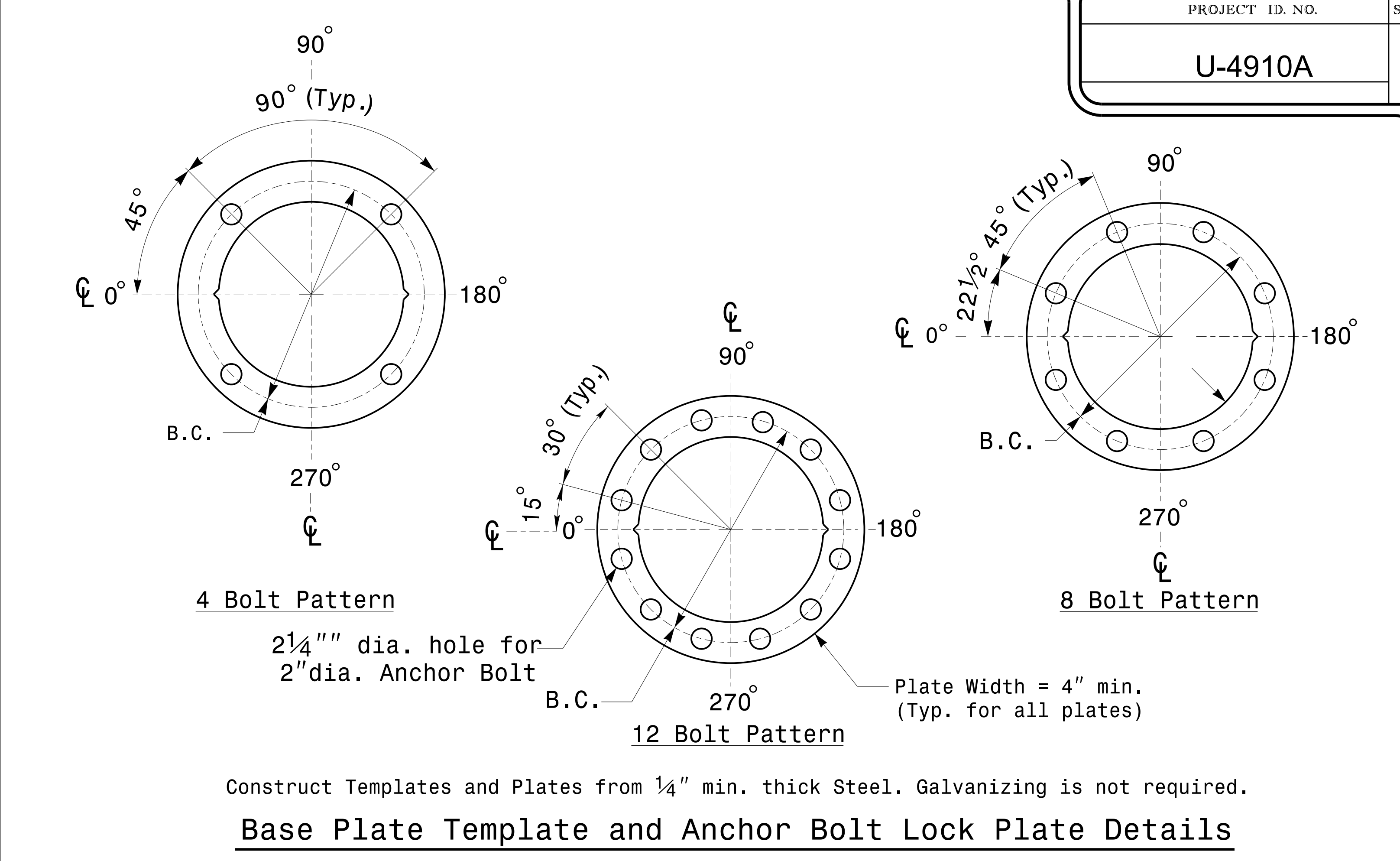
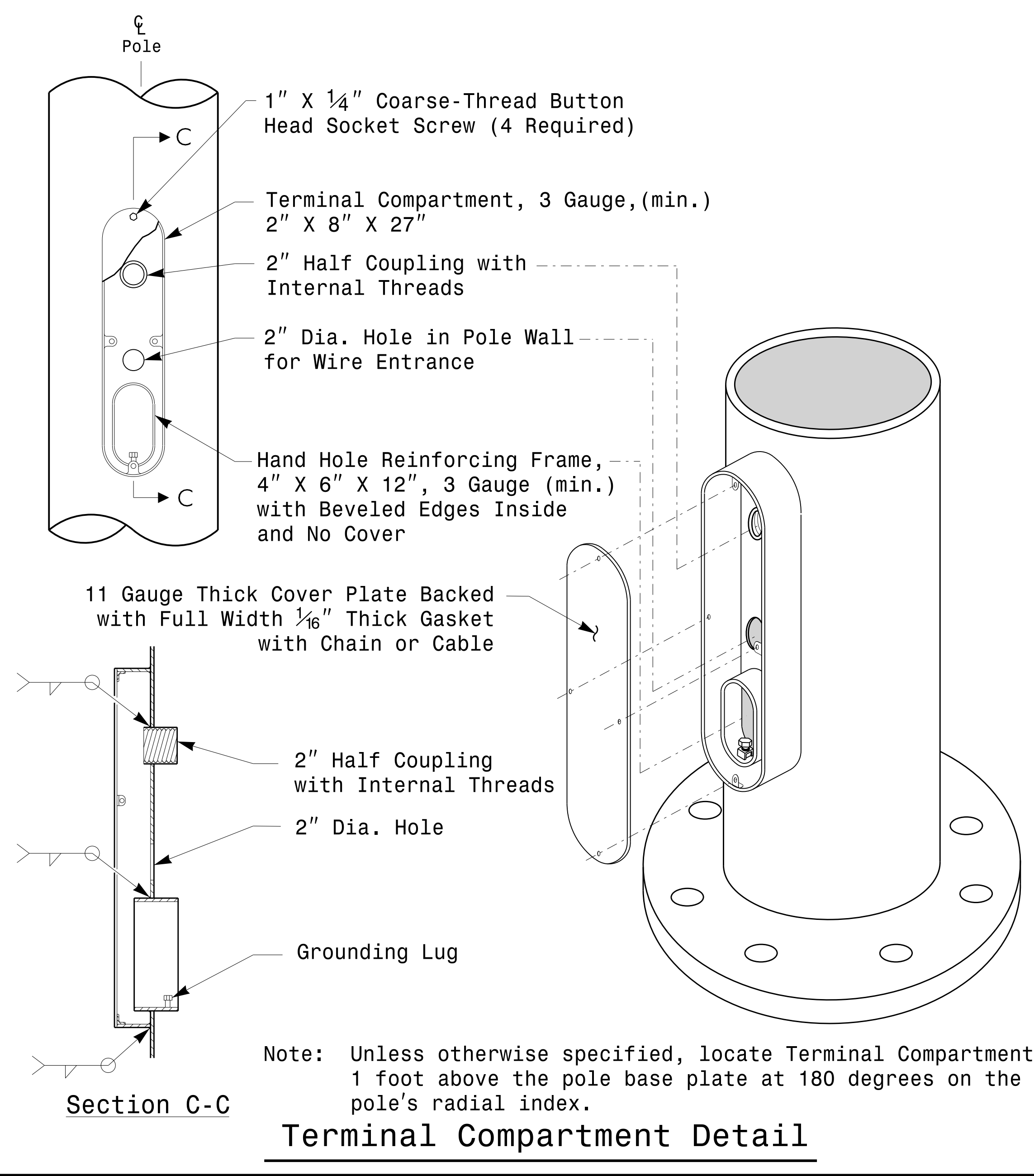
**C.F. ANDREWS - ITS AND SIGNALS JOURNEY STRUCTURAL ENGINEER**

SEAL

DocuSigned by:  
*Debesh C. Sarkar*

2/17/2016  
DATE

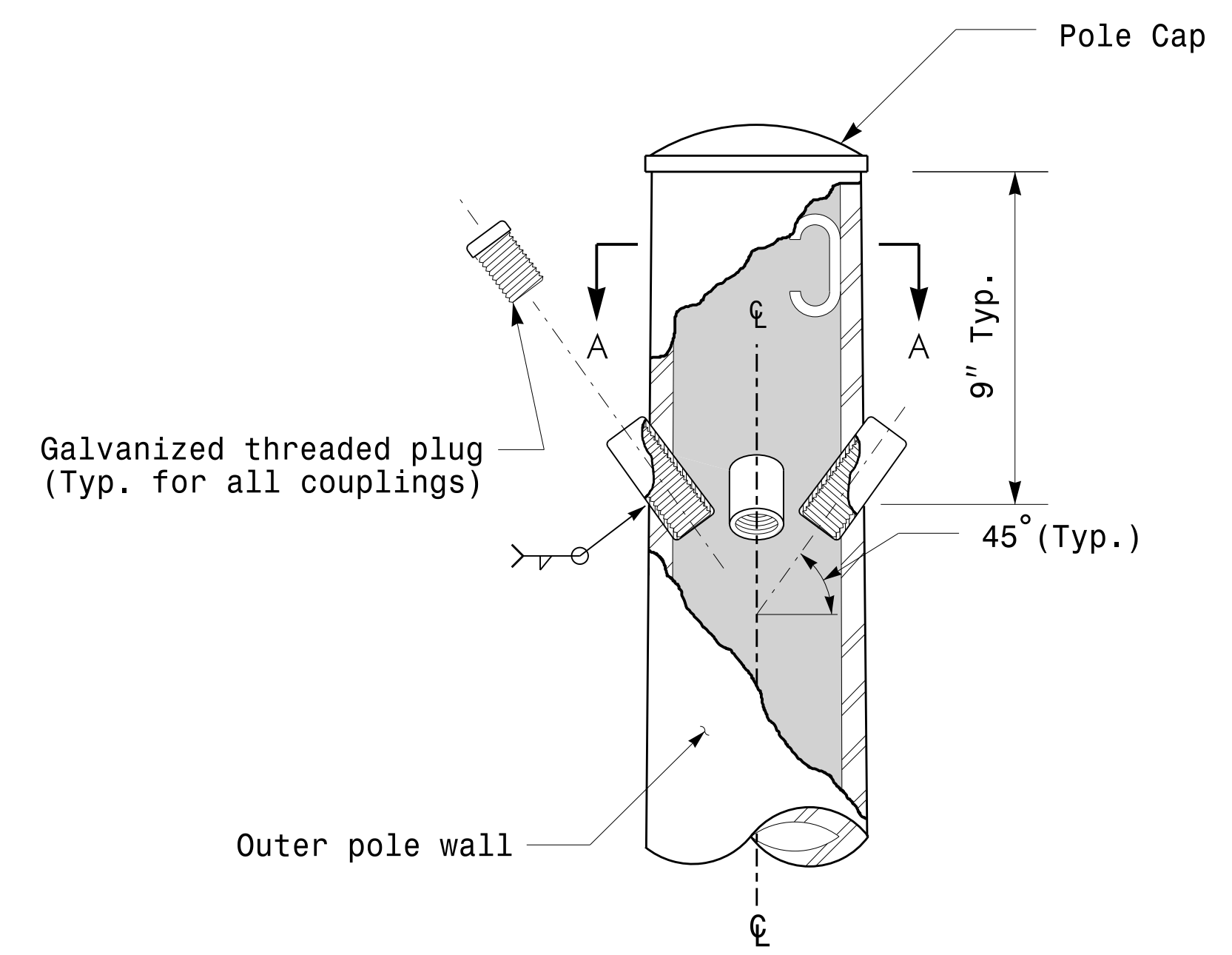




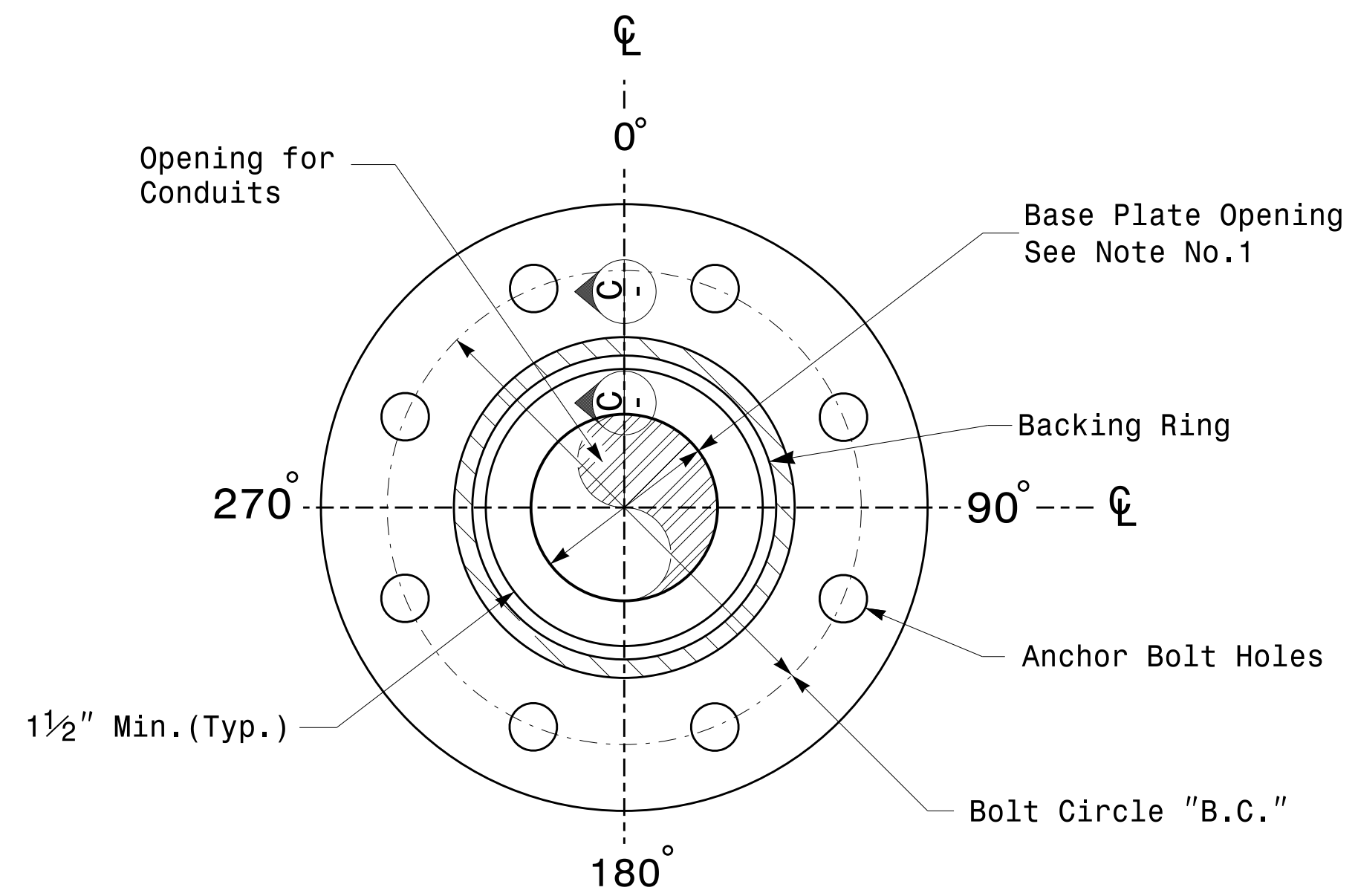
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SCALE: 0 NONE		DocuSigned by: <i>Debesh C. Sarkar</i> 2/17/2016 DATE	

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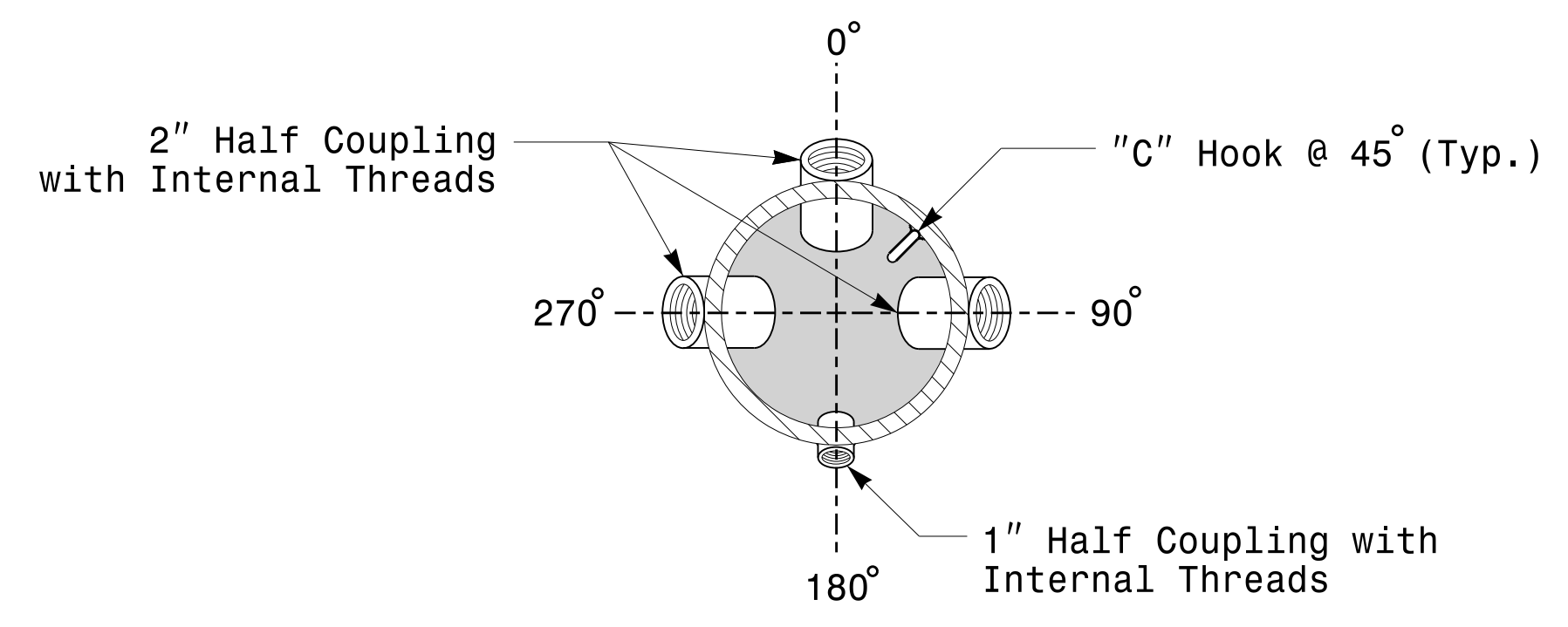
Note:  
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



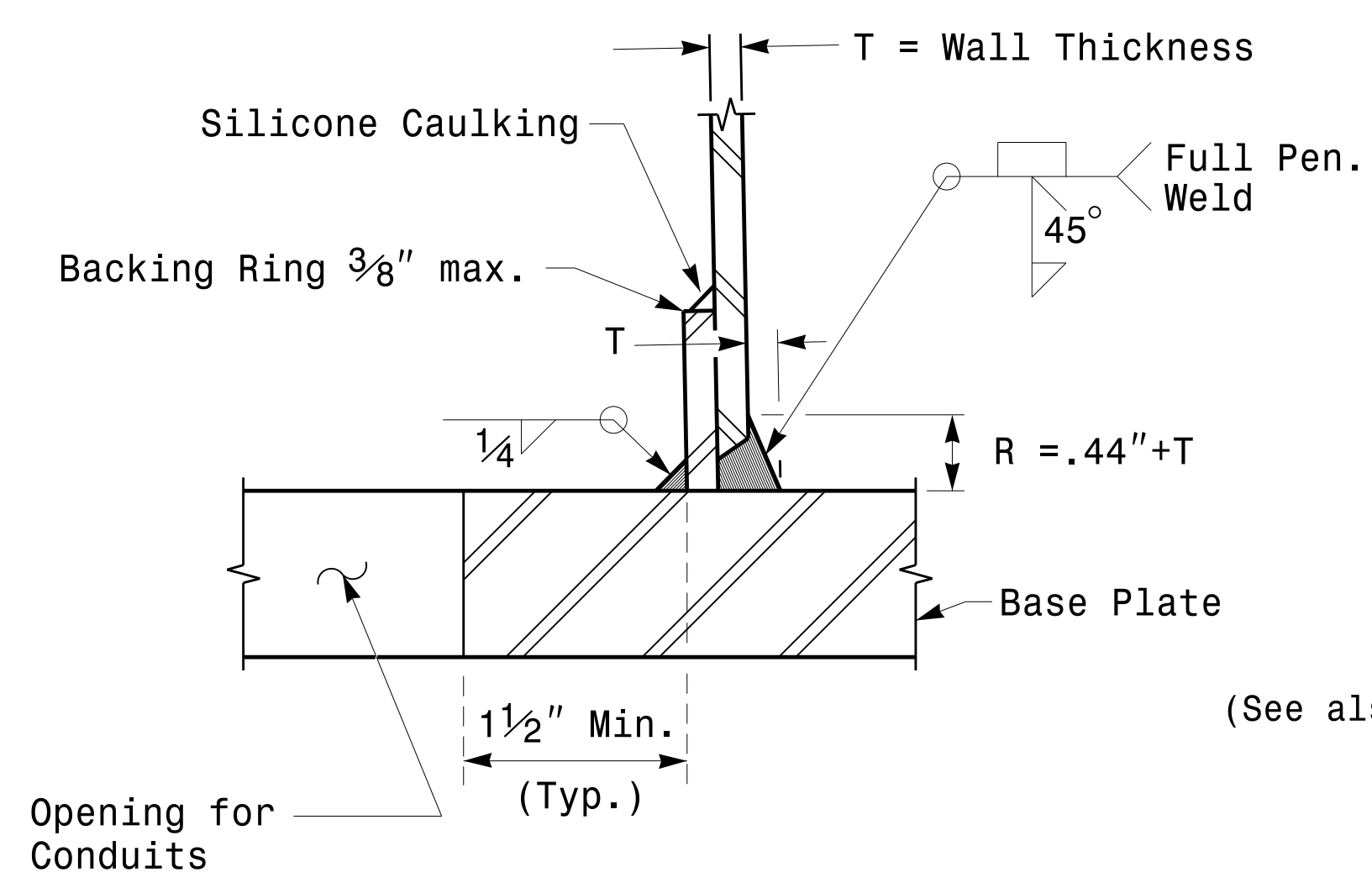
Cable Entrances at Top of Pole



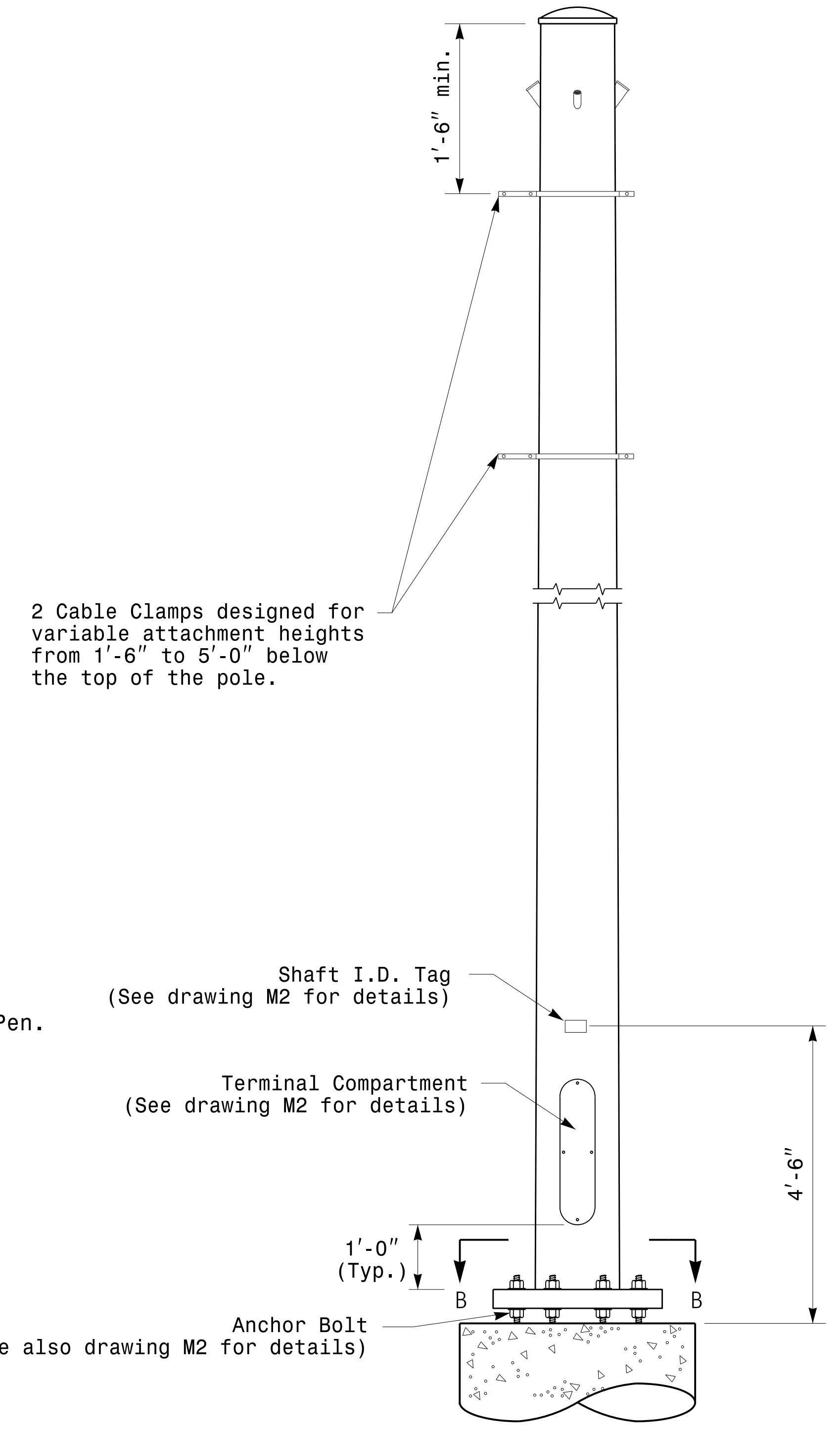
Section B-B  
Pole Base Plate Details  
(8 and 12 Bolt Pattern)



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



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



Monotube Strain Pole

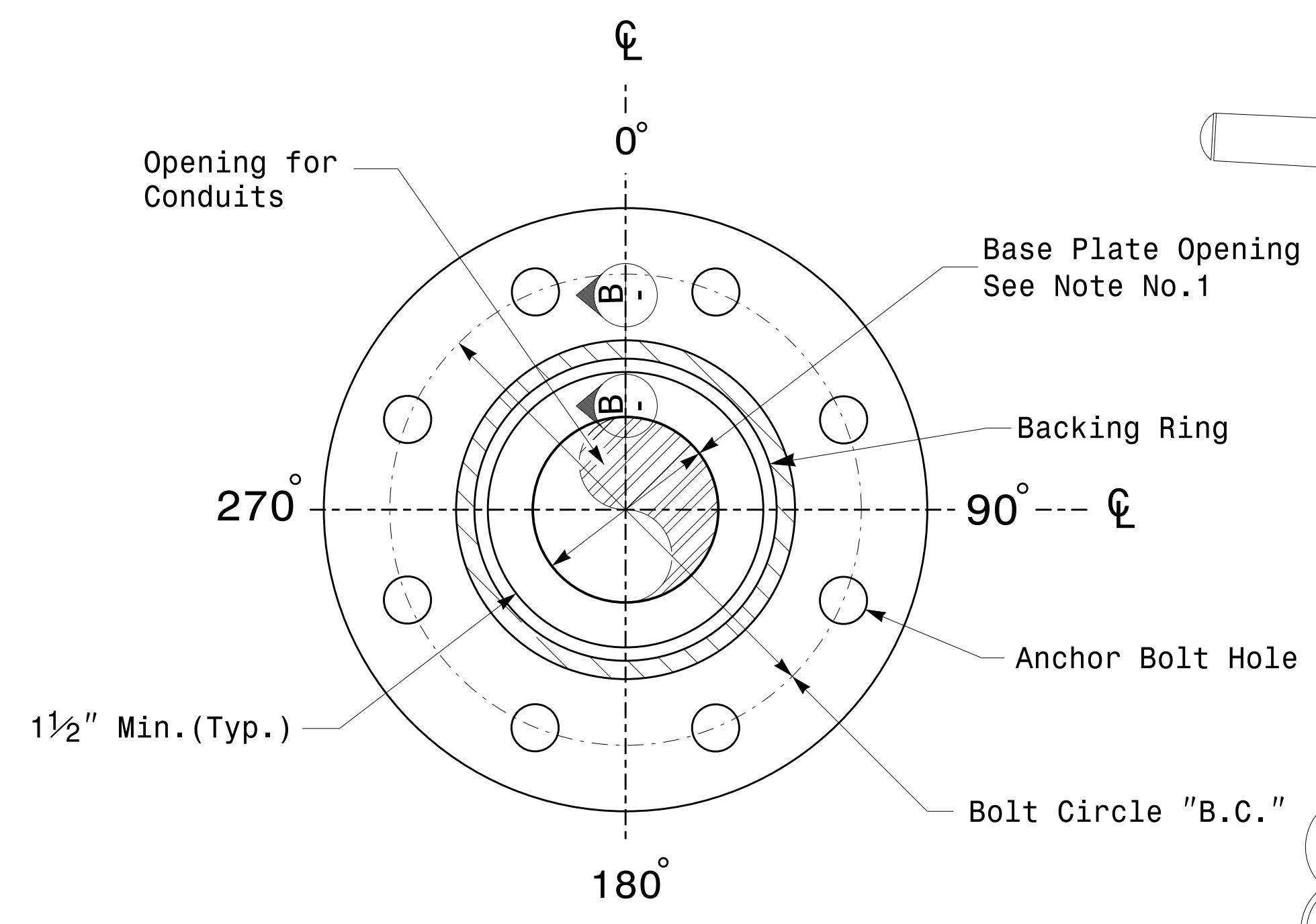
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<p>SCALE: NONE</p>	<p>PREPARED BY: N. BITTING</p>	<p>REVIEWED BY: D.C. SARKAR</p>	<p>DATE: 2/17/2016</p>

Fabrication Details – Strain Poles

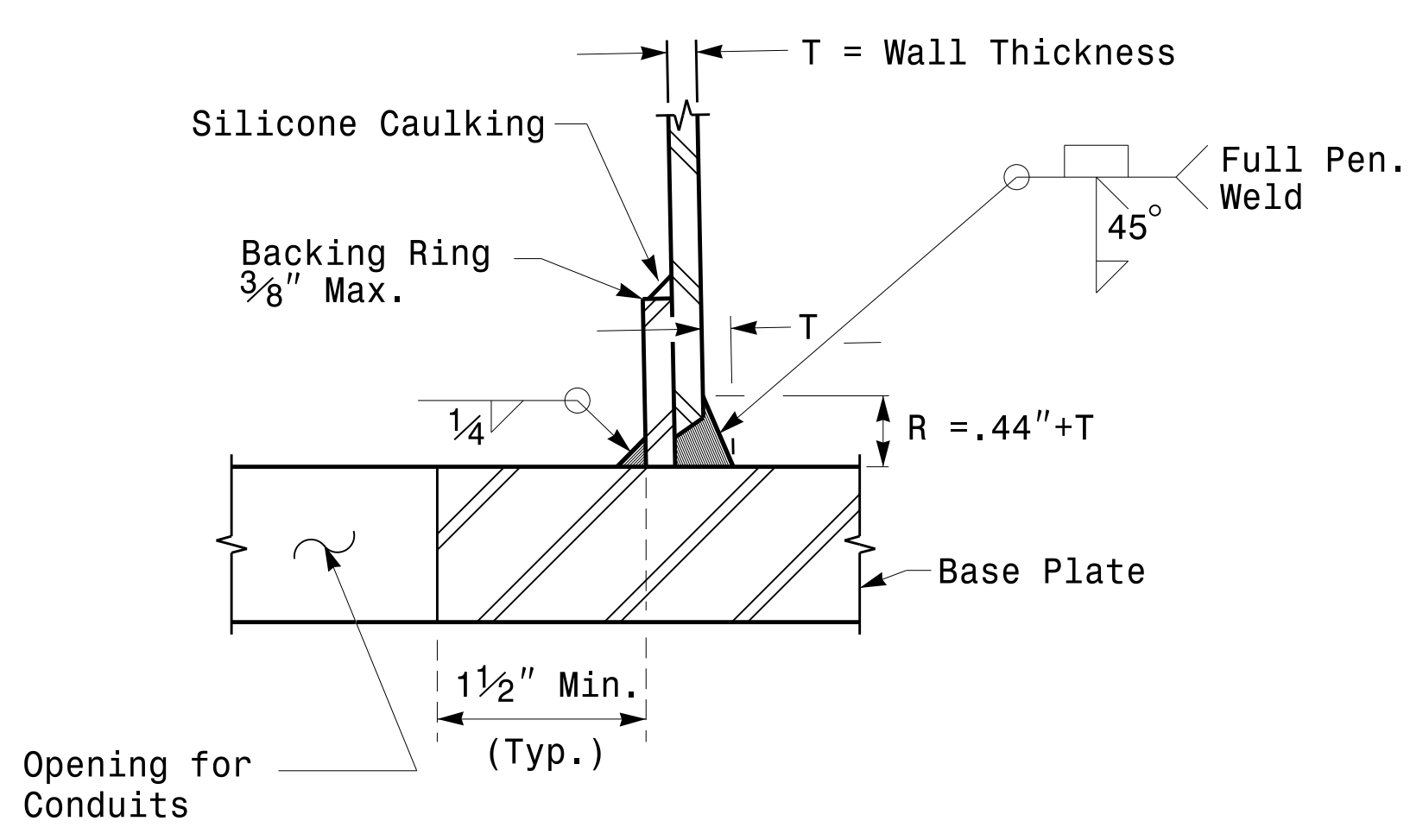
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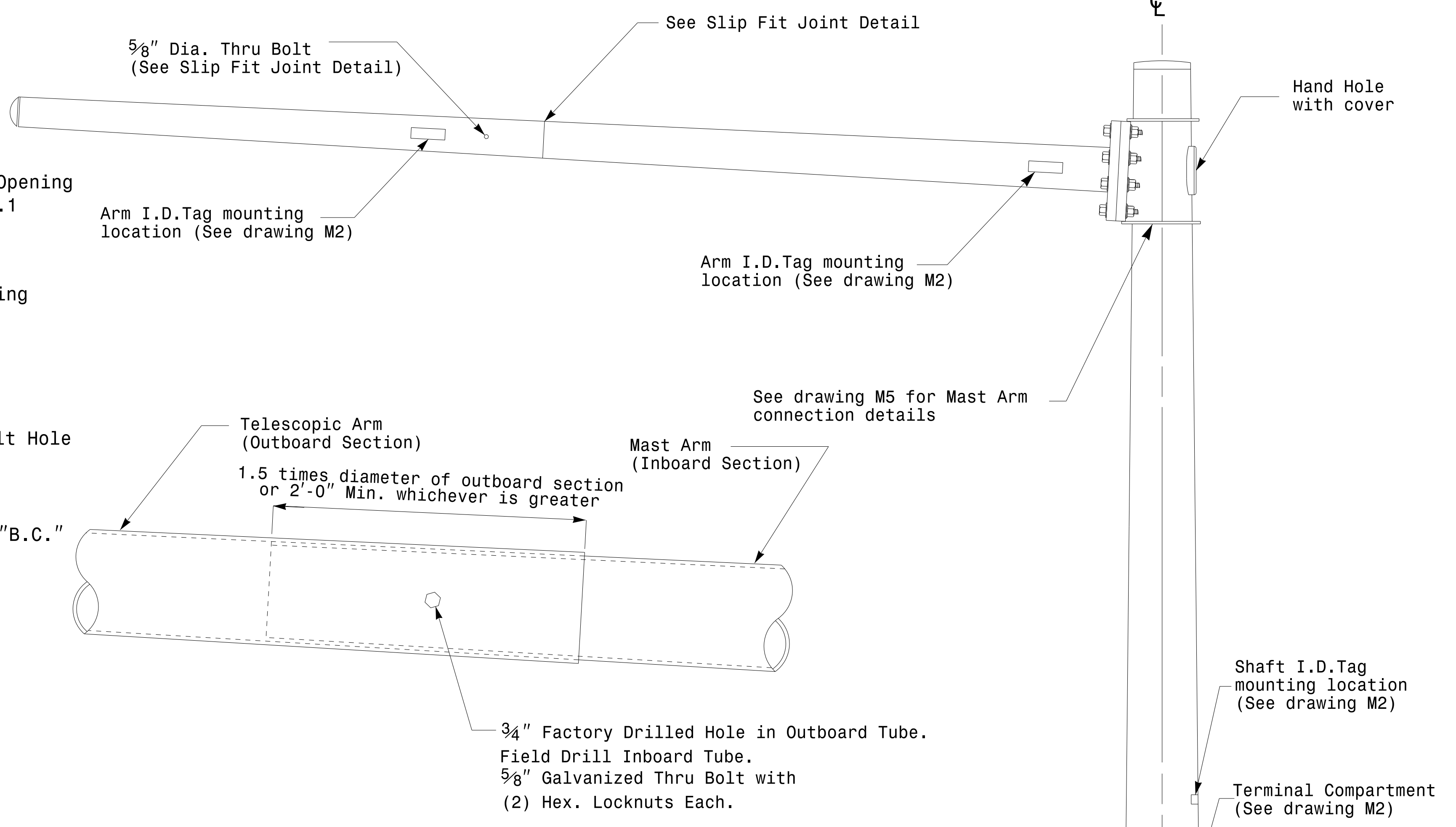
Note:  
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



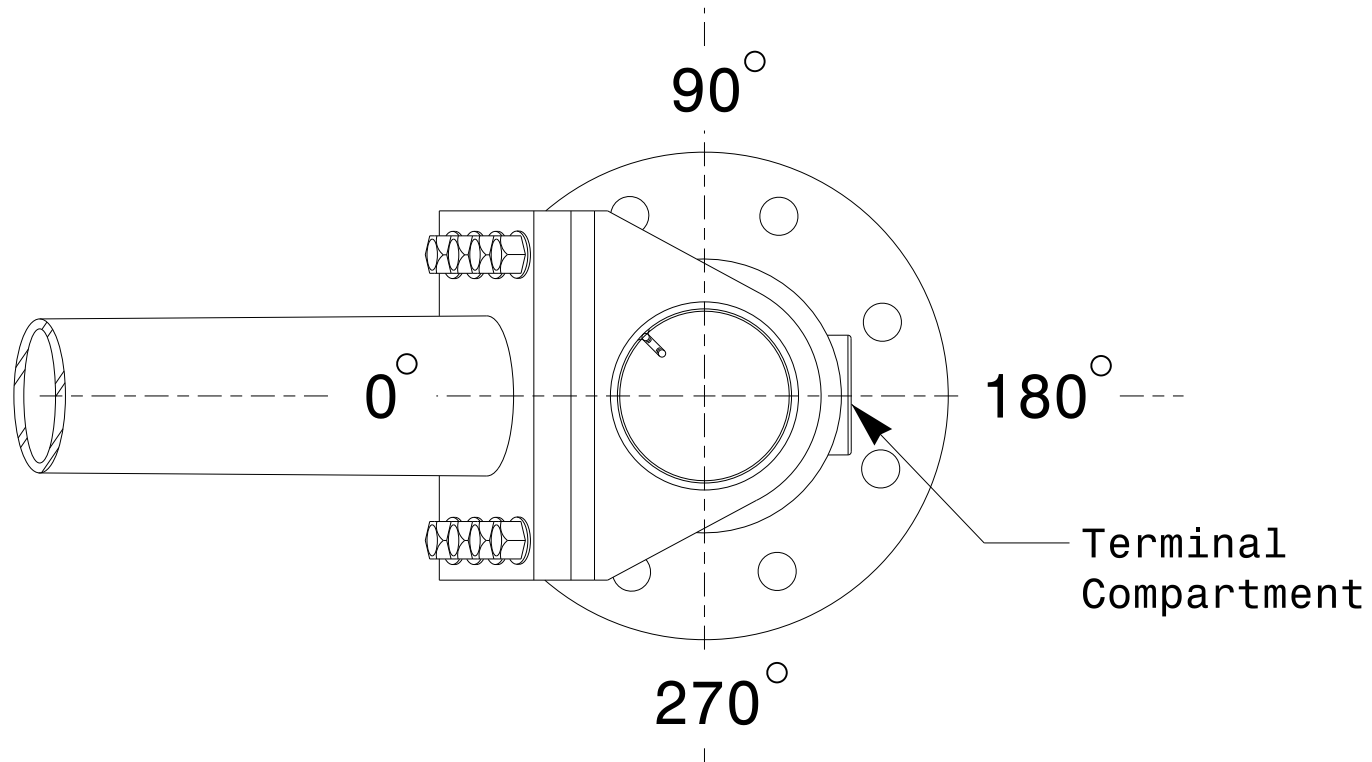
**Section A-A**  
**Pole Base Plate Details**



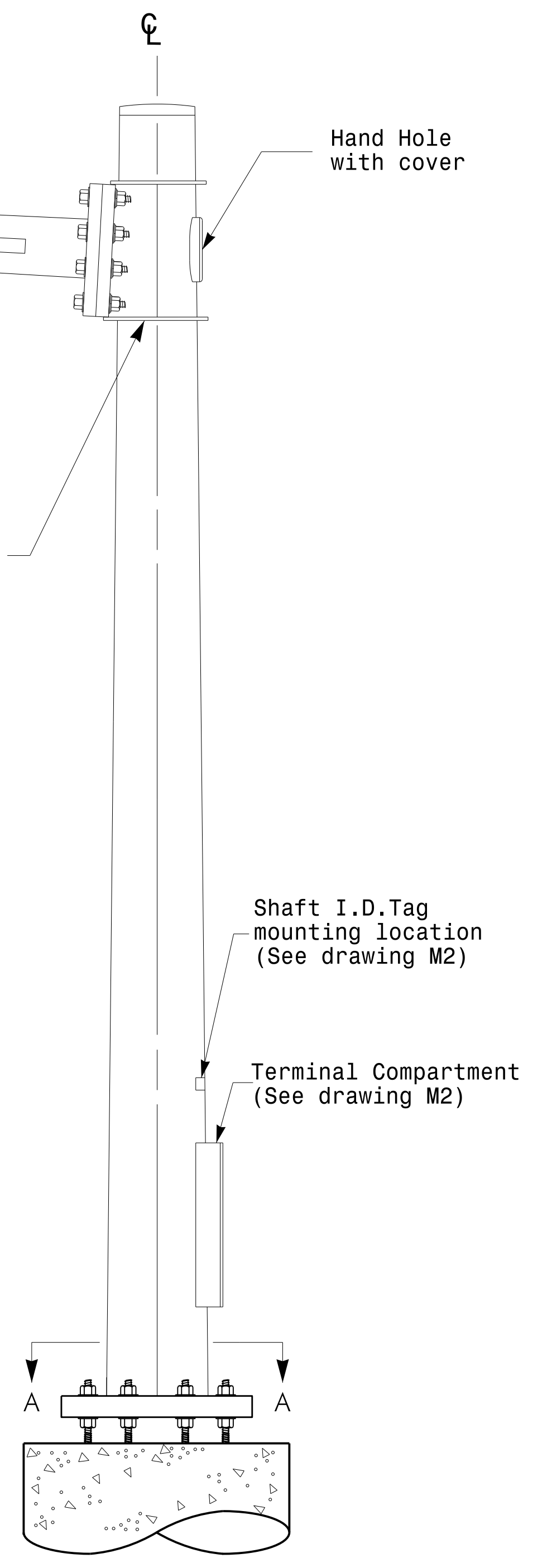
**Section B-B**  
 (Pole Attachment to Base Plate)  
**Full-Penetration Groove Weld Detail**



**Slip Fit Joint Detail for Mast Arm**



**Mast Arm Radial Orientation**



**Mast Arm Pole**

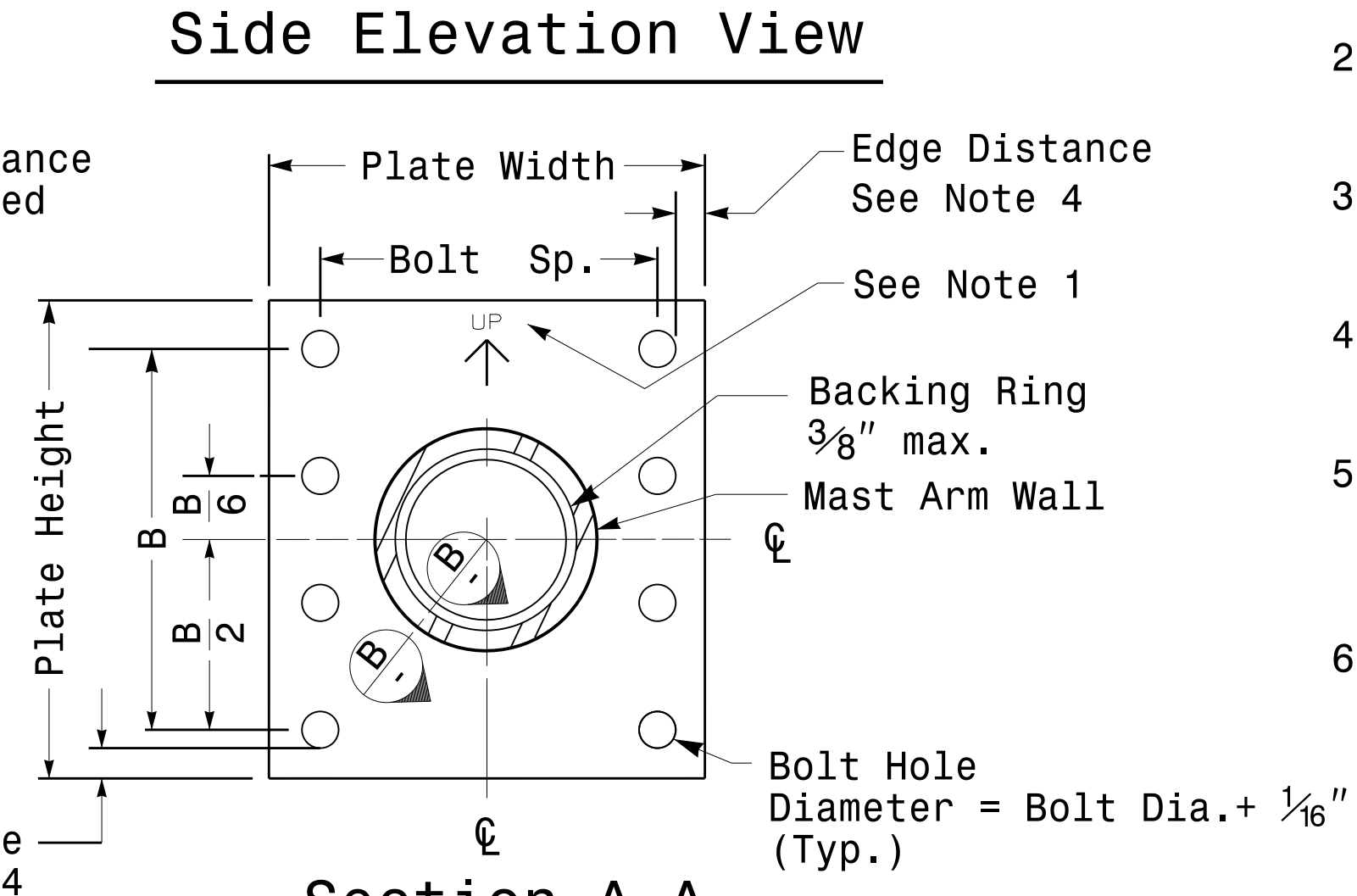
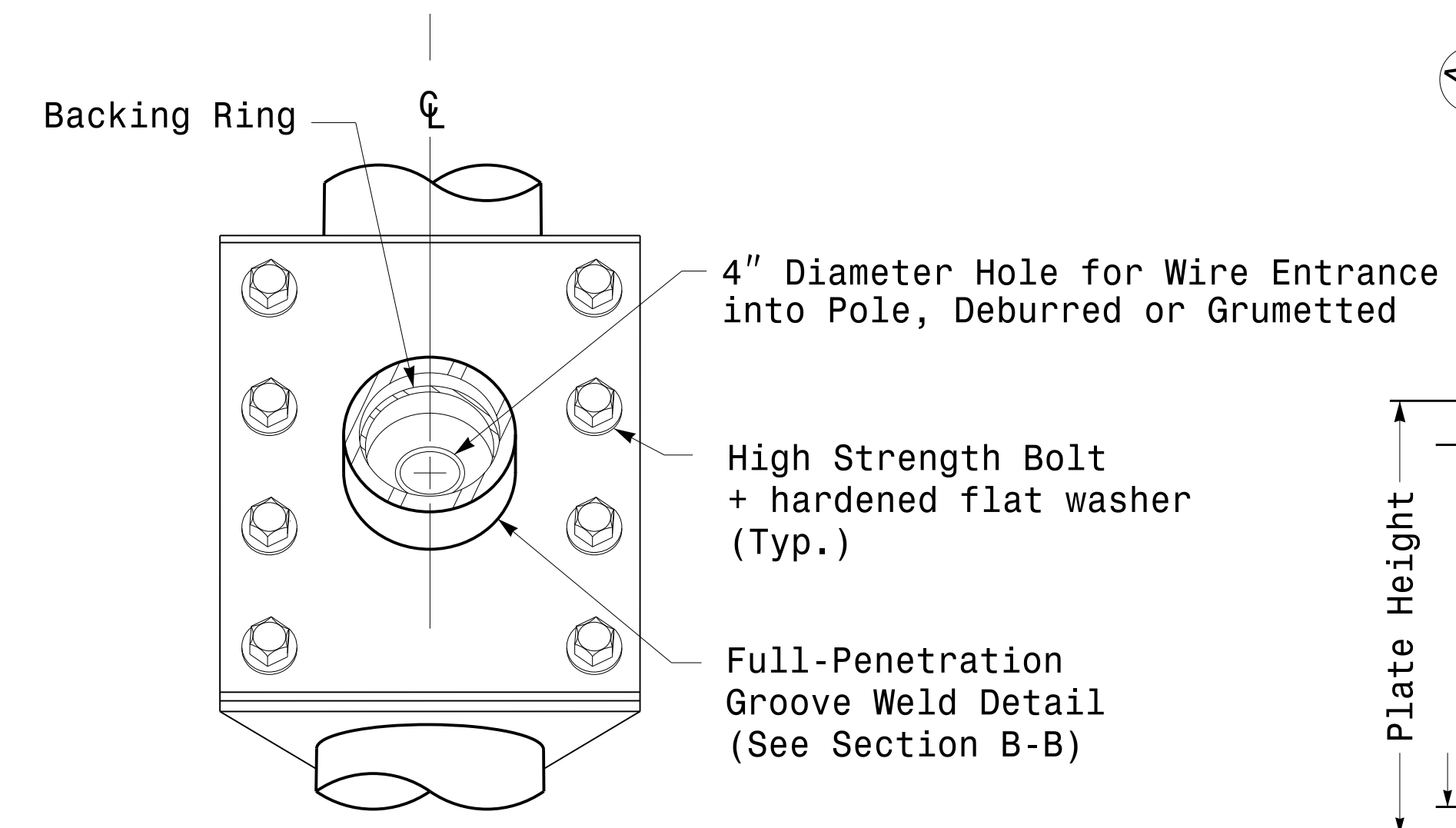
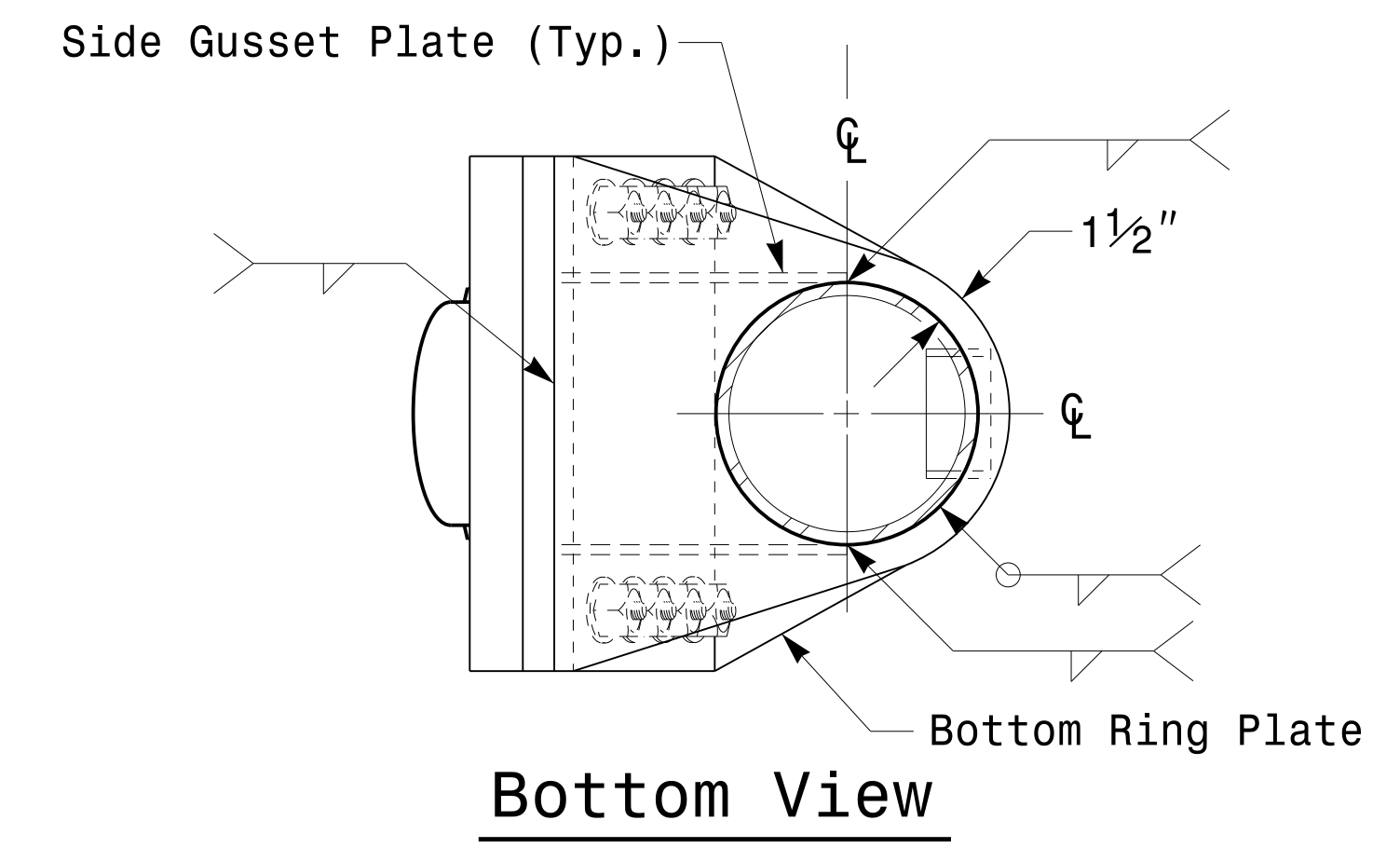
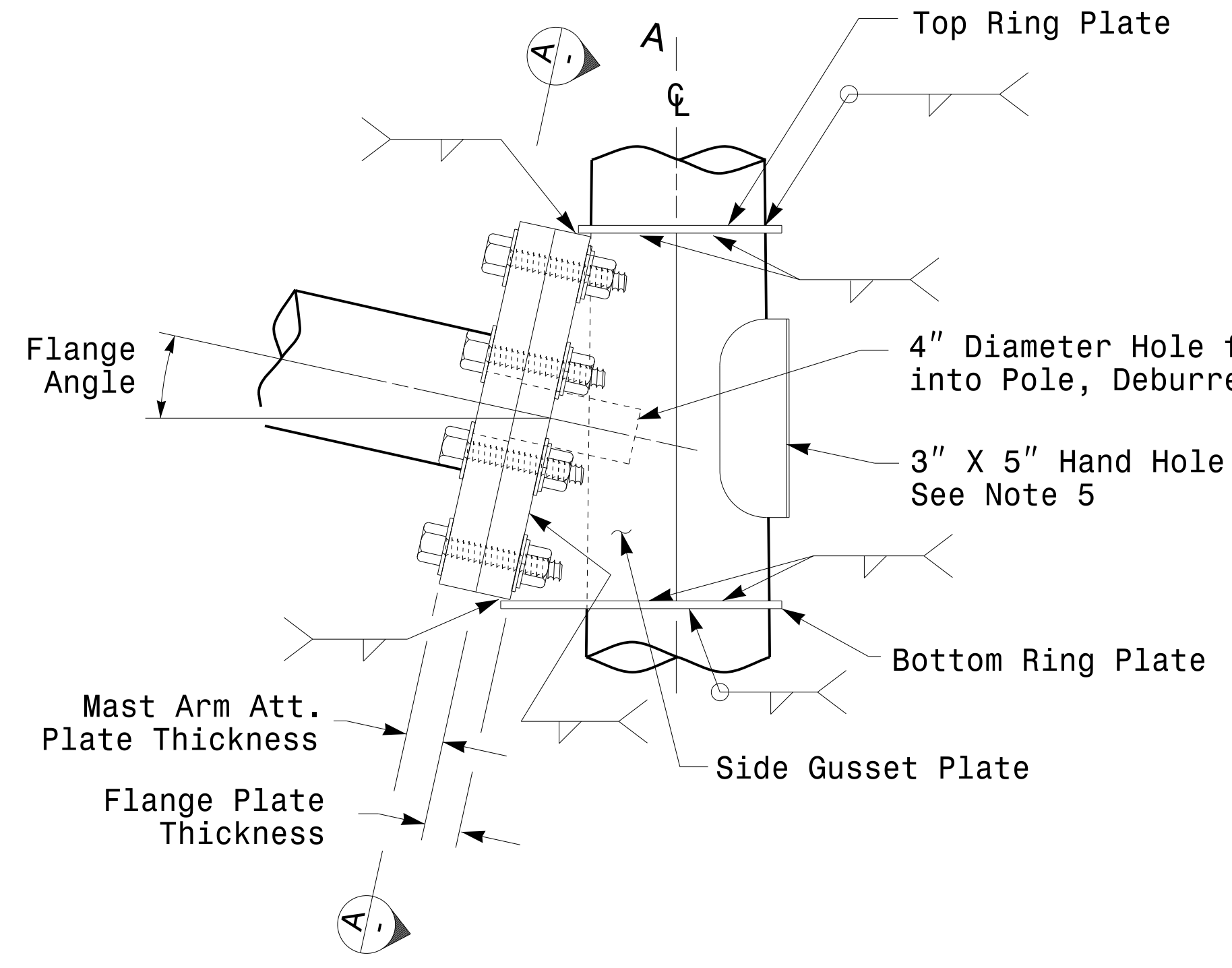
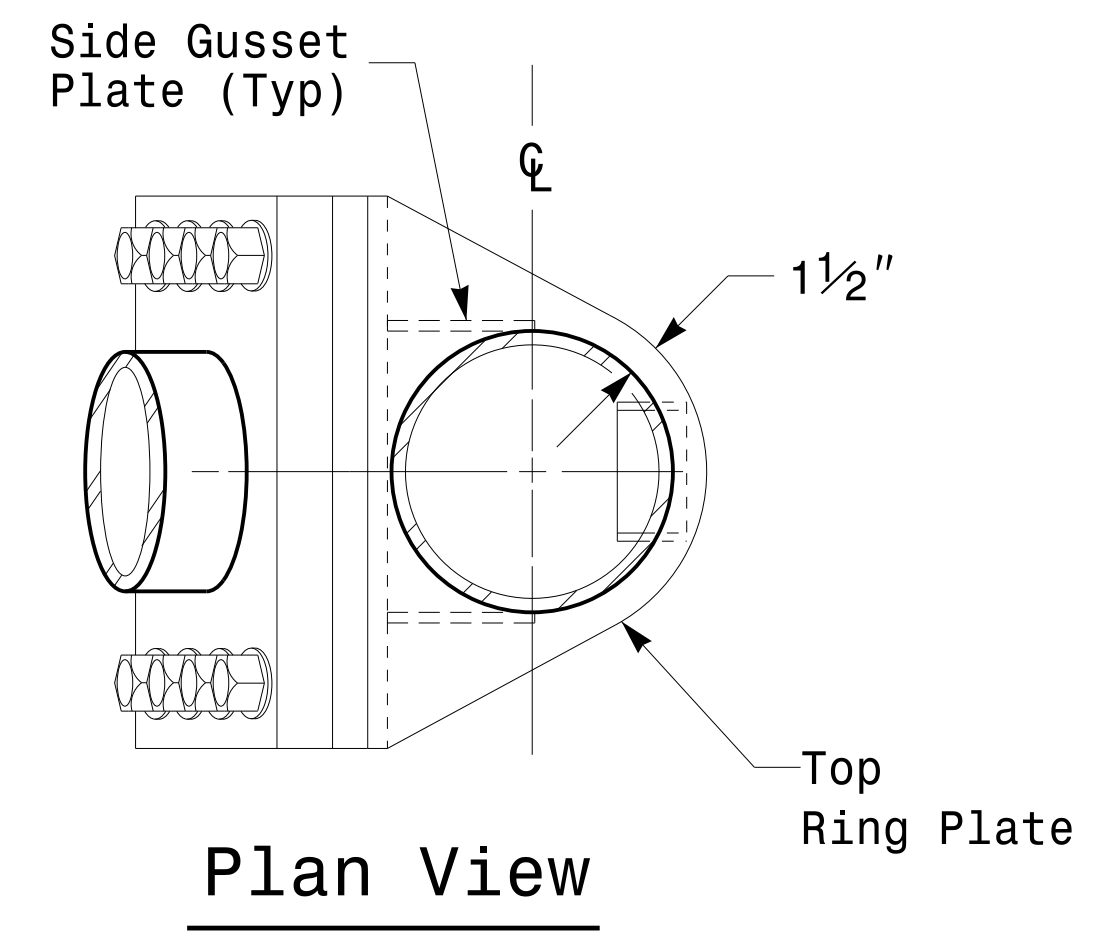
**Fabrication Details – Mast Arm Poles**

17-FEB-2016 16:05:13 TSC04115 S:\projects\6151\Signal\sig\Design Section\Eastern Region\M4 Sheets\2016\2014\_Sig\_M4\_Std\_Fabrication\_Details\Mast\_Arm\_Poles.dgn

	Typical Fabrication Details For Mast Arm Poles		SEAL  DocuSigned by D. Sarkar 44E8E32E147E4C4...
	PLAN DATE: FEBRUARY 2016 PREPARED BY: N. BITTING	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR	
SCALE: 0 NA NONE			DATE: 2/17/2016

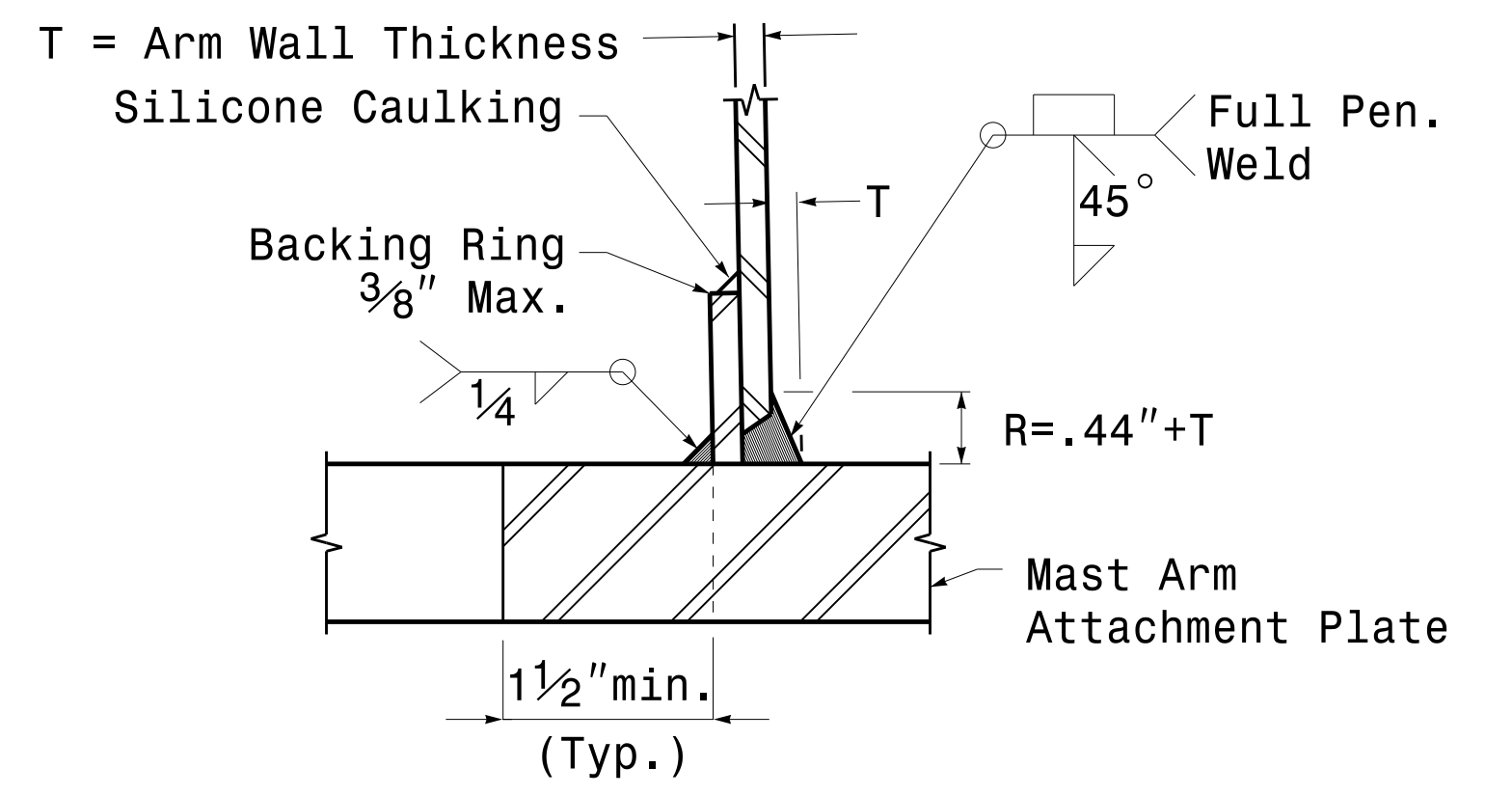
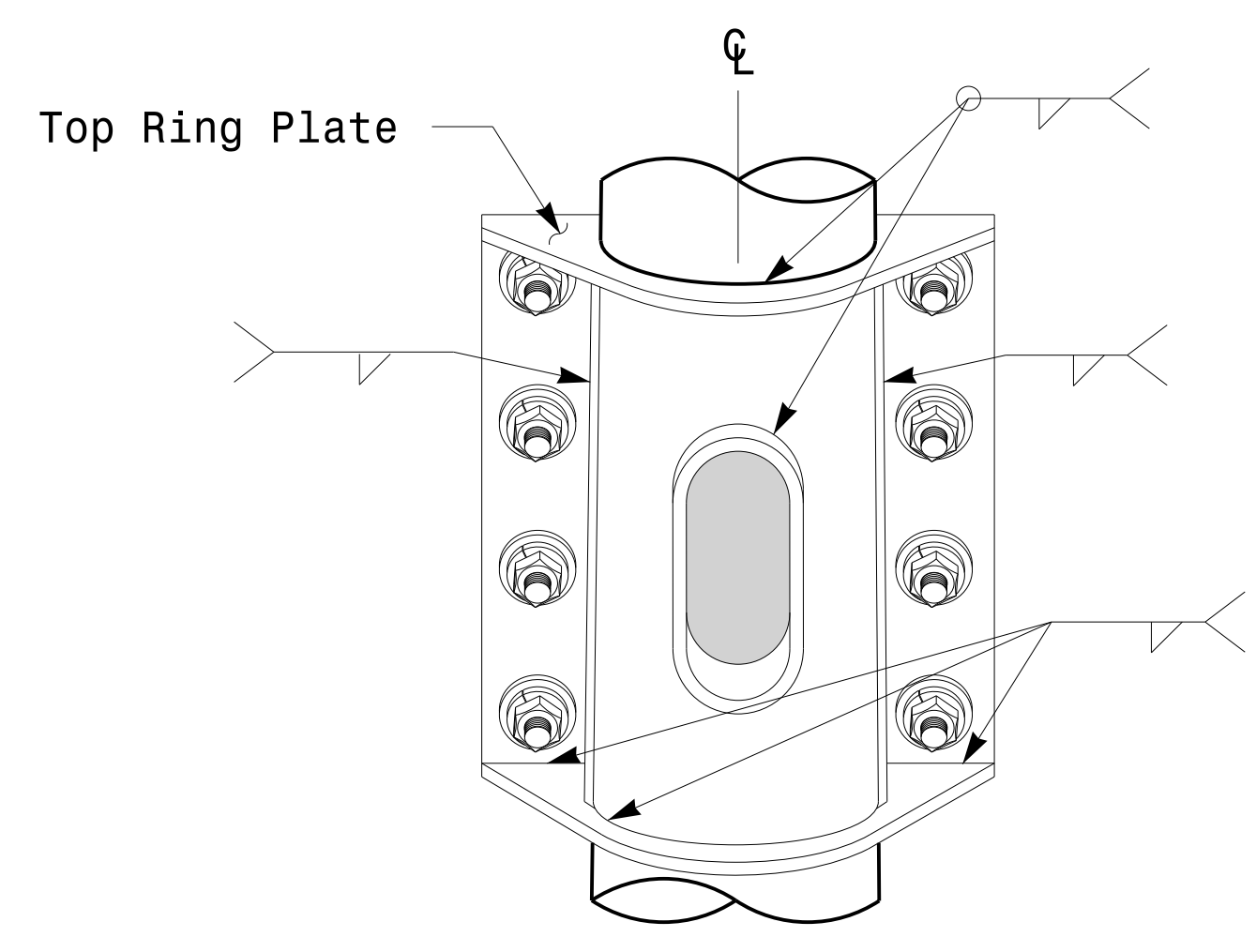
# Welded Ring Stiffened Mast Arm Connection

PROJECT ID. NO.	SHEET NO.
U-4910A	Sig.M5



**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. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are required for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.



Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Fabrication Details For Mast Arm Connection To Pole

PLAN DATE: FEBRUARY 2016	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

DocuSigned by:

*Debesh C. Sarkar*

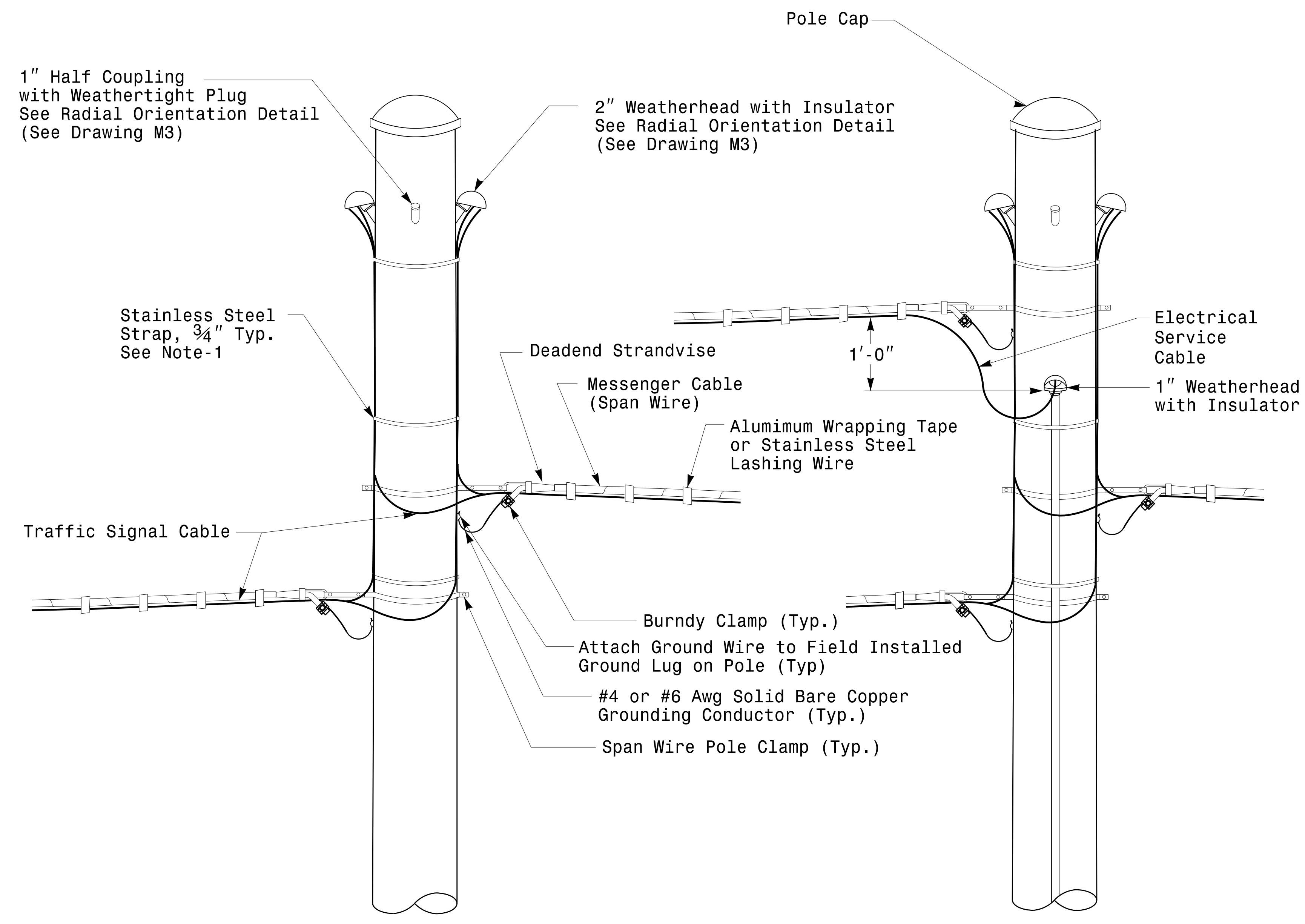
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Fabrication Details - Mast Arm Connection

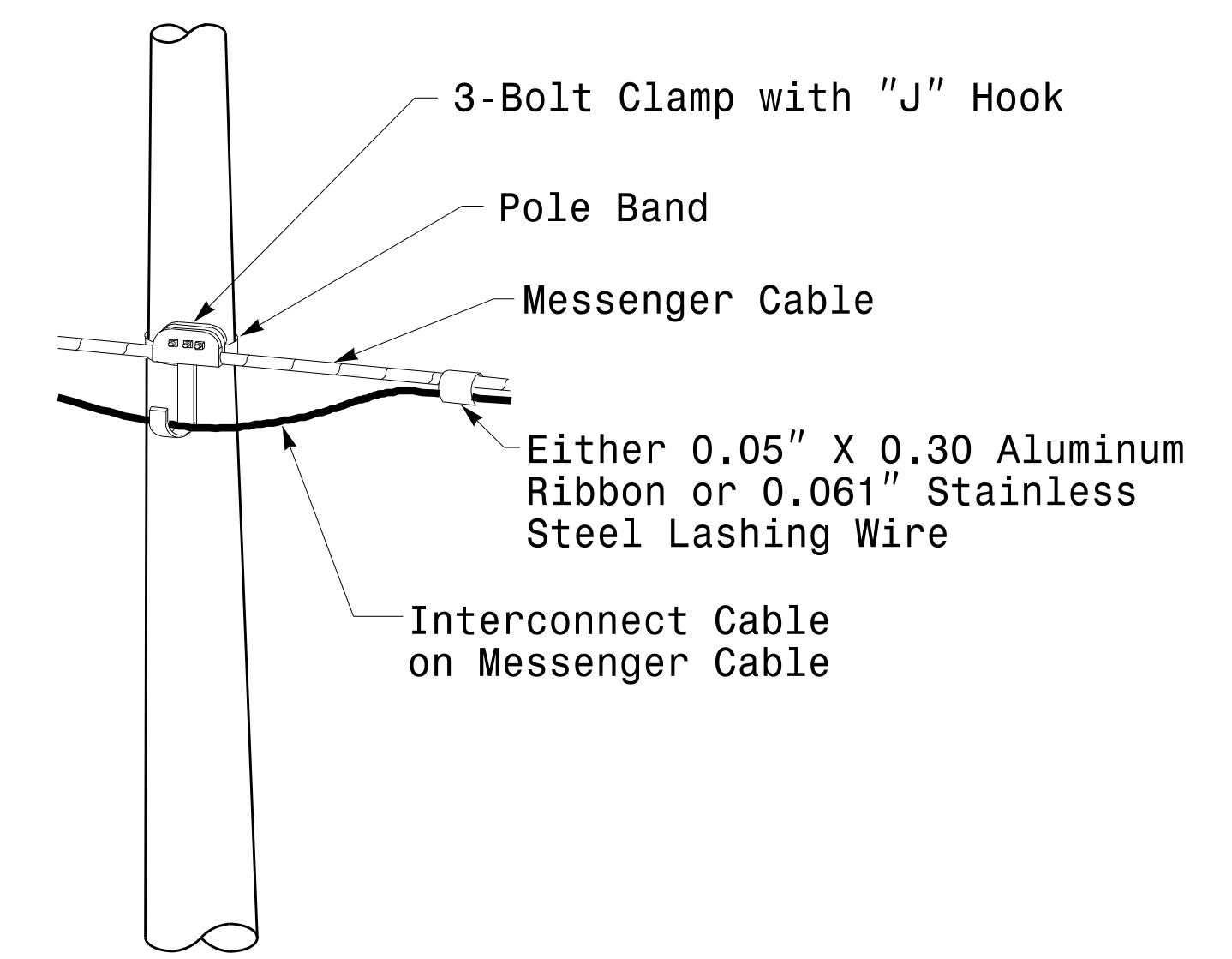




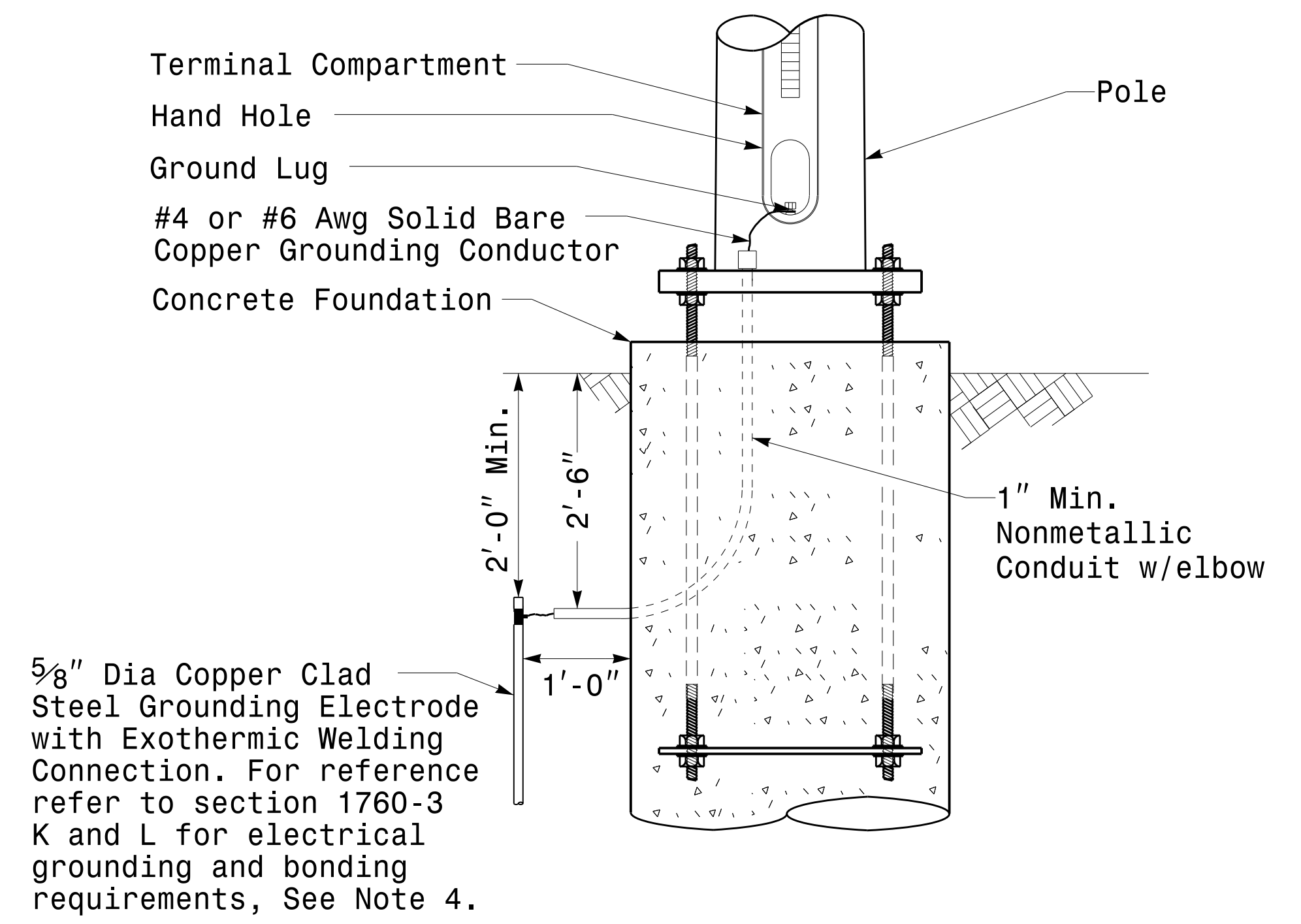
**Strain Pole Attachments**

**NOTE:**

1. 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 3'-0".
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2012.



**Attachment of Cable to Intermediate Metal Pole**

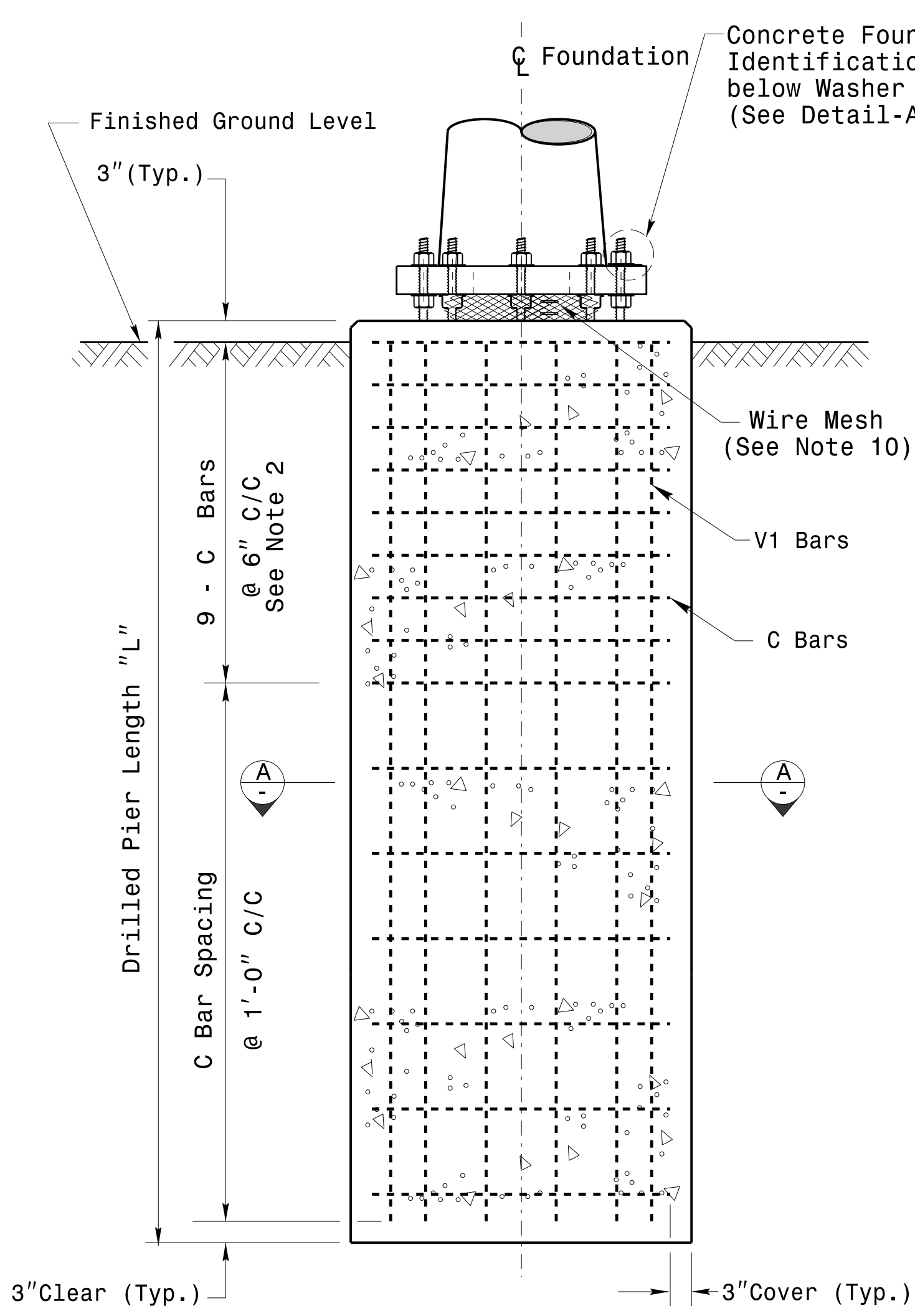


**Metal Pole Grounding Detail For Strain Pole and Mast Arm**

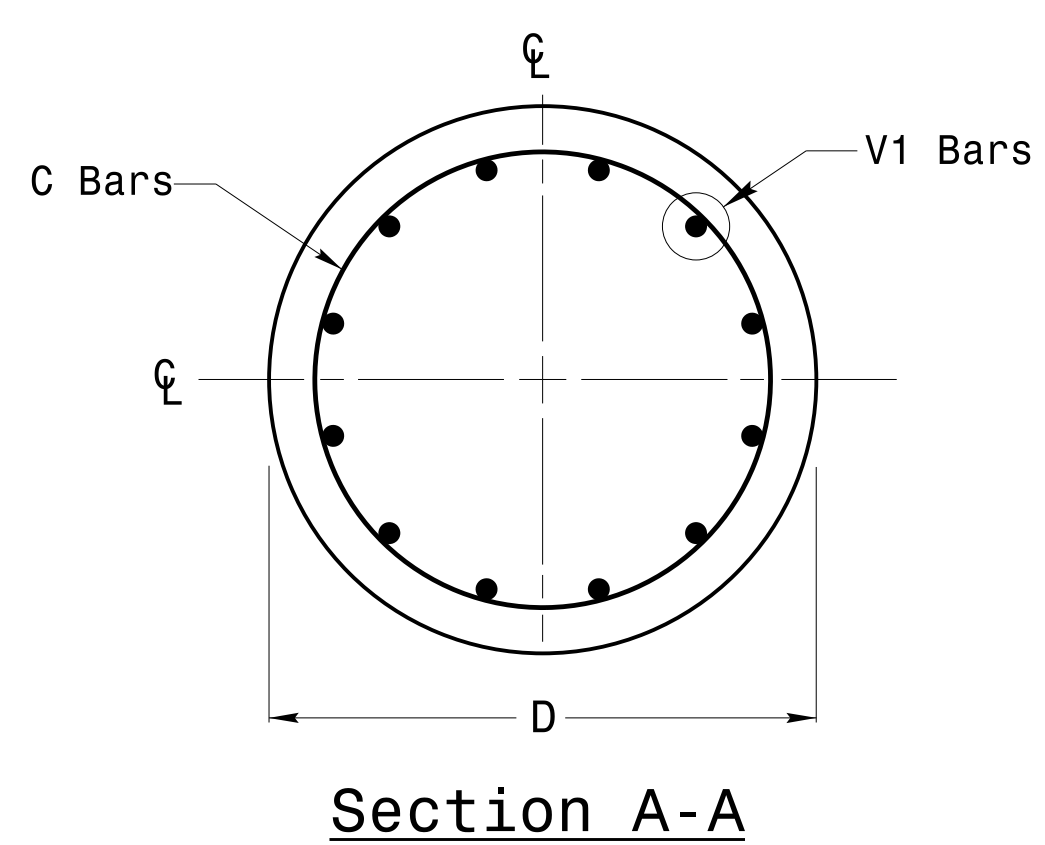
<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Strain Pole Attachments</p>		<p>SEAL</p> <p>DocuSigned By: <i>Devesh C. Sarkar</i></p> <p>44E8E32E147E4C4...</p>					
	<p>PLAN DATE: FEBRUARY 2016</p> <p>DESIGNED BY: C.F. ANDREWS</p> <p>PREPARED BY: N. BITTING</p> <p>REVIEWED BY: D.C. SARKAR</p>	<table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>		REVISIONS	INIT.	DATE		
REVISIONS	INIT.	DATE						

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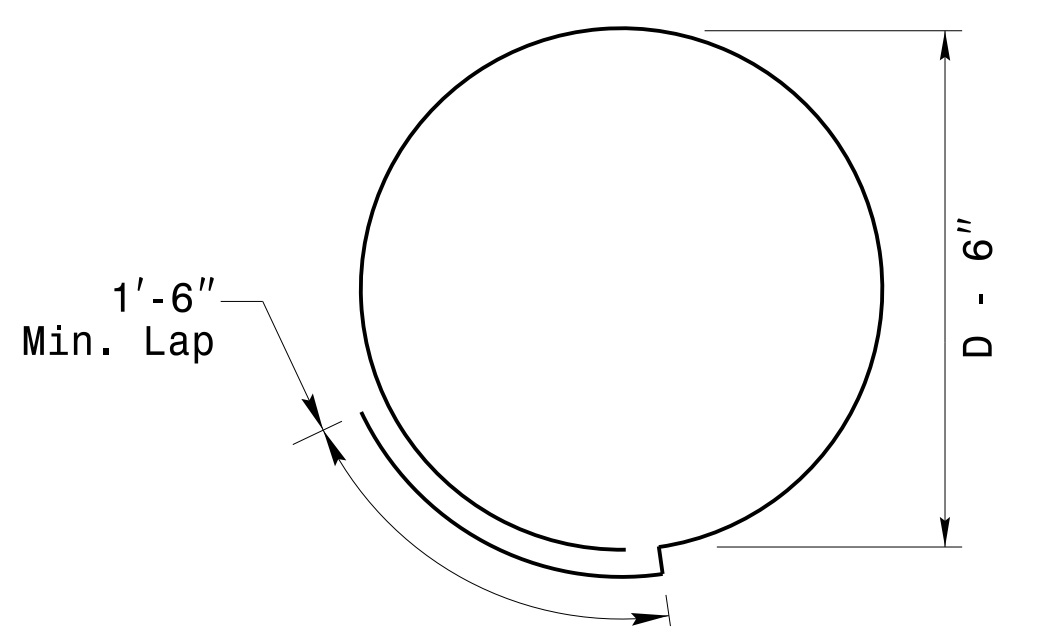




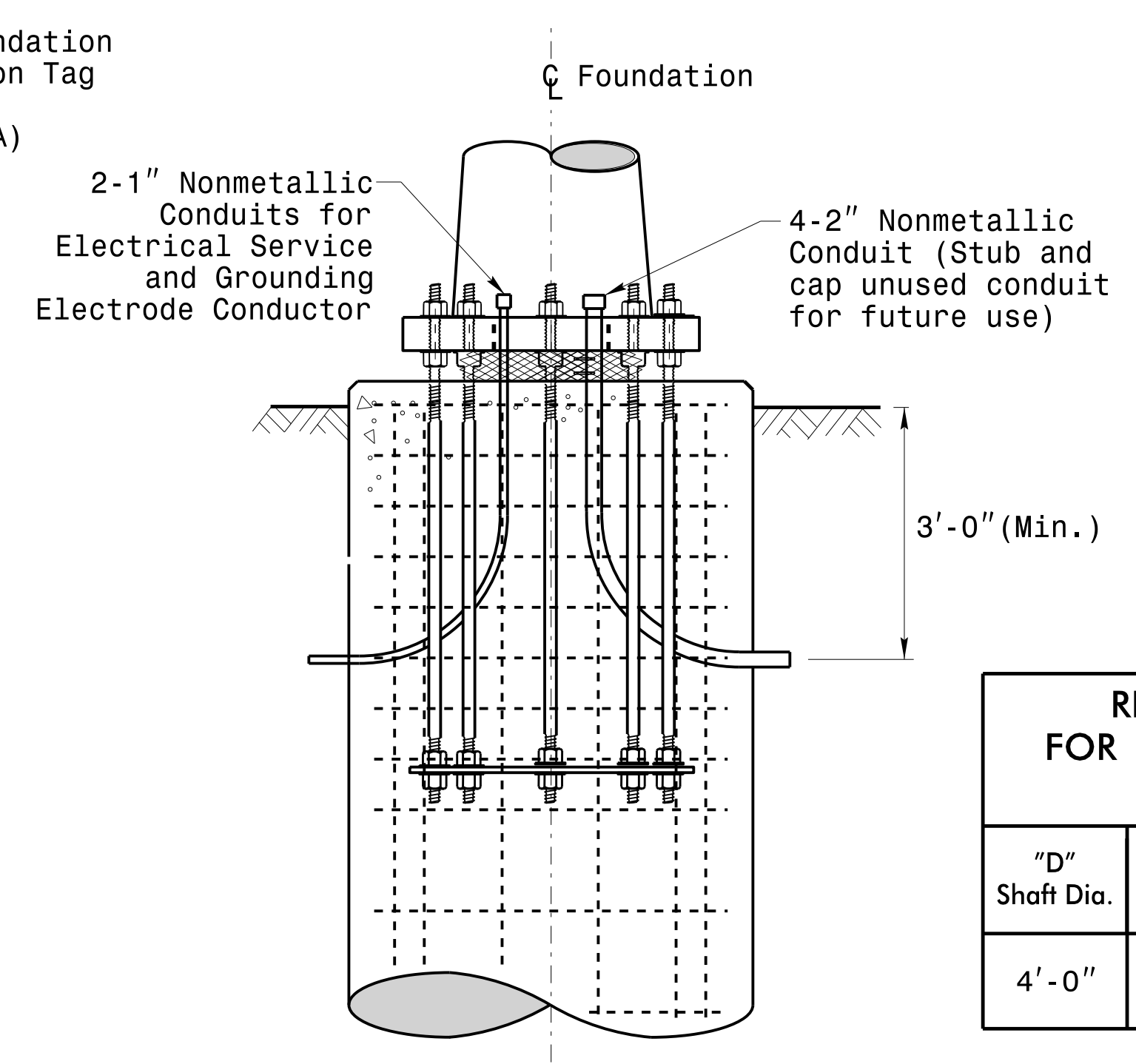
Concrete Shaft Elevation



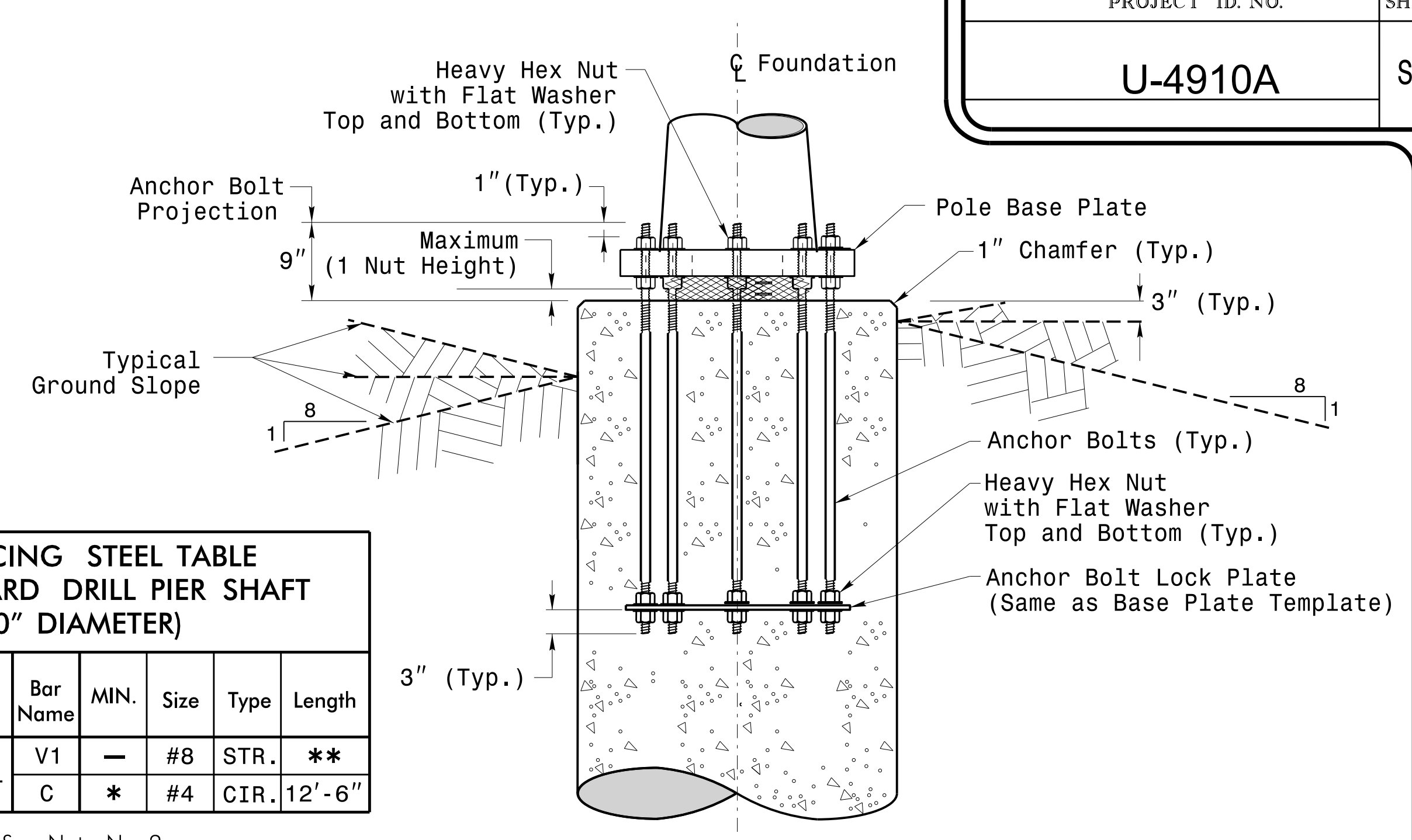
Section A-A



Typical "C" Bar Detail



Typical Foundation Conduit Details



Typical Foundation Anchor Bolt Details

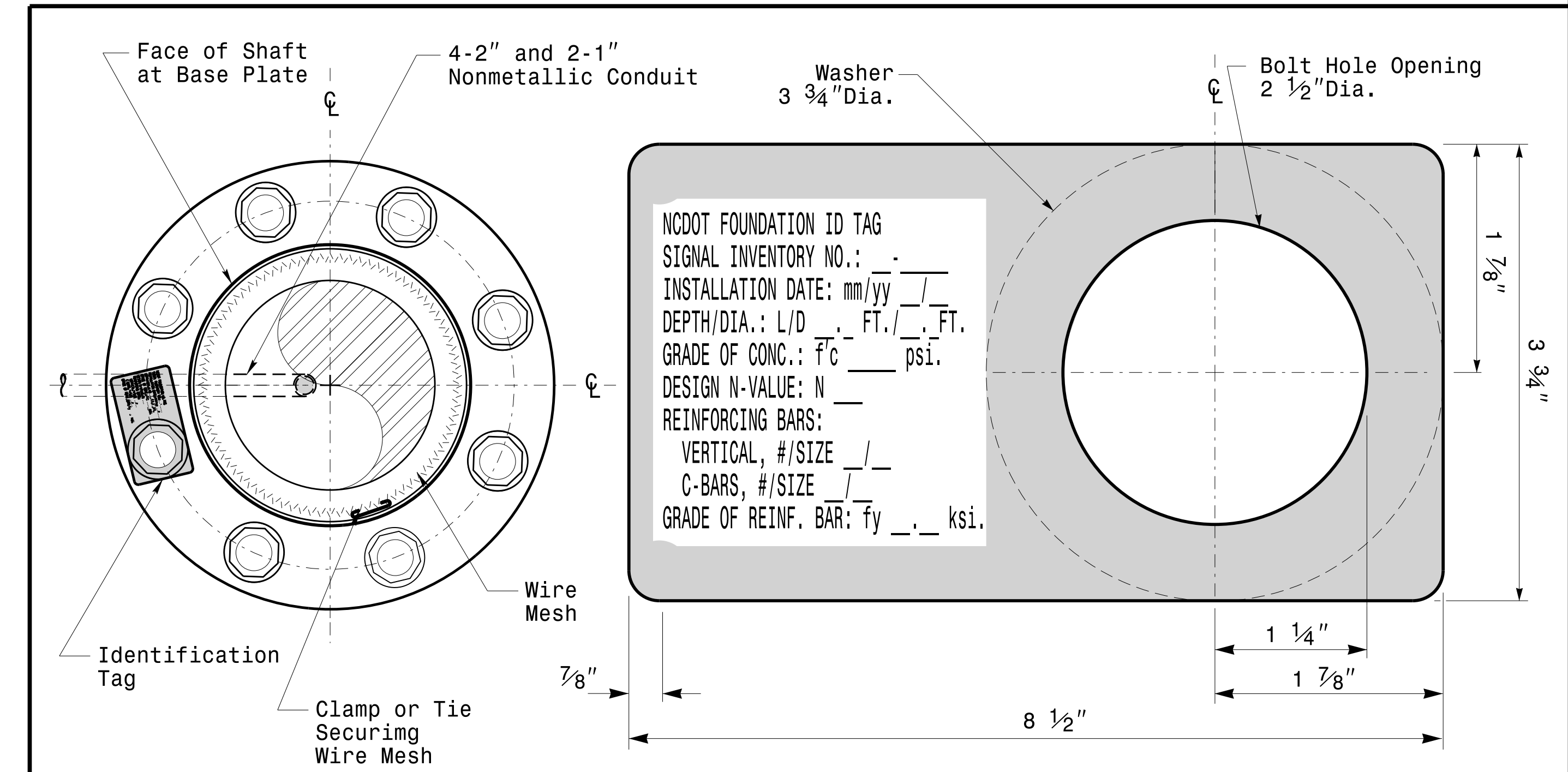
(Reinforcing Cage Not Shown for Clarity)

"D" Shaft Dia.	Conc. Volume (cu. yds.)	Bar Name	MIN. Size	Type	Length
4'-0"	.465 x L	V1	#8	STR.	**
		C	#4	CIR.	12'-6"

\* See Note No. 2  
 \*\* See Note No. 3

General Notes:

1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. 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.
3. For standard foundations, see sheet Sig. M8 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/- 3" to facilitate the installation of electrical conduit entering into the cage.
4. Provide 2" to 5" foundation projection above ground level depending on the ground slope.
5. Unless otherwise shown, foundation designs are based on non-sloping level ground surfaces with slope ratios of 8:1 (H:V) or flatter. If actual ground line slopes are steeper contact the Engineer before excavating or placing concrete.
6. Construct foundations in accordance with NCDOT Standard Provisions SP09 R005- Foundations and Anchor Rod Assemblies for Metal Poles. All applicable 2012 NCDOT Standard Specifications are referenced in this provision. Refer to the NCDOT Resources/Specifications page located on the Connect NCDOT website.  
<https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx>
7. Use air entrained AA concrete mix with a compression strength of f'c=4500 psi.(min.) after 28 days.
8. Use ASTM A615 grade 60 deformed bars for all reinforcing steel. Maintain at least 3" cover on all reinforcement.
9. Locate the Identification Tag on the top of the base plate, directly above the conduit's entry point.
10. Provide two layers of galvanized welded 23 gauge (0.25) 6" wide 4 mesh wire around pipes under the base plate and secure it with ties if necessary.
11. Preferred location for the I.D. Tag is as shown in Detail-A; directly above the conduit entering the foundation.



Concrete Foundation Identification Tag Details

Detail-A

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Construction Details For Foundations</p>		
	<p>PLAN DATE: FEBRUARY 2016</p> <p>DESIGNED BY: C.B. COGDILL</p> <p>PREPARED BY: N. BITTING</p> <p>REVIEWED BY: D.C. SARKAR</p>	<p>SCALE: NONE</p>	

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Construction Details - Foundations



# SOIL CONDITION

PROJECT ID. NO.	SHEET NO.
U-4910A	Sig.M8

		STANDARD STRAIN POLES					STANDARD FOUNDATIONS 48" Diameter Drilled Pier Length (L) - Feet							Reinforcement				
Case No.	Pole Height (Ft.)	Base Plate BC (In.)	Reactions at the Pole Base			Clay				Sand			Longitudinal		Stirrups			
			Axial (kip)	Shear (kip)	Moment (ft-kip)	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	Bar Size (#)	Quantity (ea.)	Bar Size (#)	Spacing (in.)		
WIND ZONE 1	LIGHT	S26L3	26	25	2	11	270	19	13	10	8	17	14.5	12.5	8	12	4	12
		S30L3	30	25	2	11	300	19.5	13.5	10	8	17.5	15	13	8	14	4	12
		S35L3	35	25	3	11	320	20	13.5	10.5	8	17.5	15	13	8	14	4	12
	HEAVY	S30H3	30	29	3	16	450	24.5	16	12	9	21	17.5	15	8	16	4	6
		S35H3	35	29	4	16	515	26	17	12.5	9.5	22	18.5	16	8	16	4	6
WIND ZONE 2	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 3	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
		S30L2	30	23	2	10	270	18.5	12.5	10	8	16.5	14	12.5	8	12	4	12
		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6
WIND ZONE 4	LIGHT	S26L1	26	22	2	8	190	16	11.5	8.5	8	15	12.5	11	8	12	4	12
		S30L1	30	22	2	8	205	16.5	11.5	9	8	15	13	11.5	8	12	4	12
		S35L1	35	22	3	8	230	17	12	9	8	15.5	13.5	11.5	8	12	4	12
	HEAVY	S30H1	30	25	3	12	320	20.5	13.5	10.5	8	18	15	13.5	8	16	4	6
		S35H1	35	25	4	12	350	21	14	10.5	8.5	18.5	15.5	13.5	8	16	4	6
WIND ZONE 5	LIGHT	S26L2	26	23	2	10	245	18	12.5	9.5	8	16.5	14	12	8	12	4	12
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		S35L2	35	23	3	10	300	19.5	13	10	8	17	14.5	13	8	12	4	12
	HEAVY	S30H2	30	29	3	15	415	23	15.5	11.5	9	20	17	14.5	8	16	4	6
		S35H2	35	29	4	15	475	25	16.5	12	9.5	21	17.5	15.5	8	16	4	6

**General Notes:**

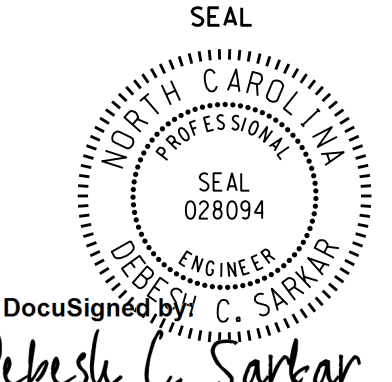
1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

**Foundation Selection:**

1. Perform a standard penetration test at each proposed foundation site to determine "N" value.
2. Select the appropriate wind zone from M 1 drawing.
3. Select the soil type (Clay or Sand) that best describes the soil characteristics.
4. Get the appropriate standard pole case number from the plans or from the Engineer.
5. Select the appropriate column under "Standard Foundations" based on soil type and "N" value. Select the appropriate row based on the pole load case.
6. The foundation depth is the value shown in the "Standard Foundations" category where the column and the row intersect.
7. Use Construction Procedures and Design Methods prescribed by FHWA-NHI-10-016 for Reference Drilled Shafts.

Standard Strain Pole Foundation-All Soil Condition

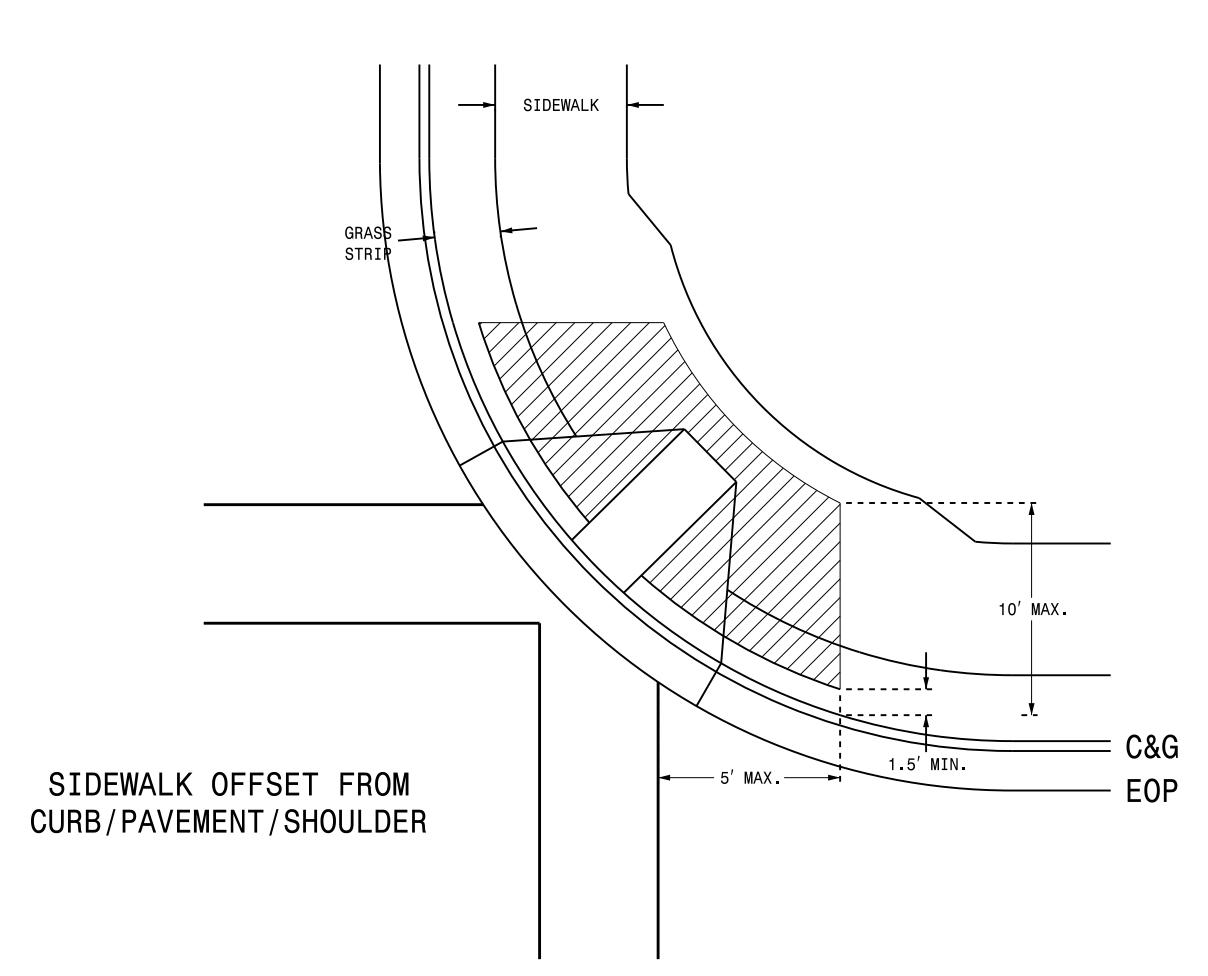
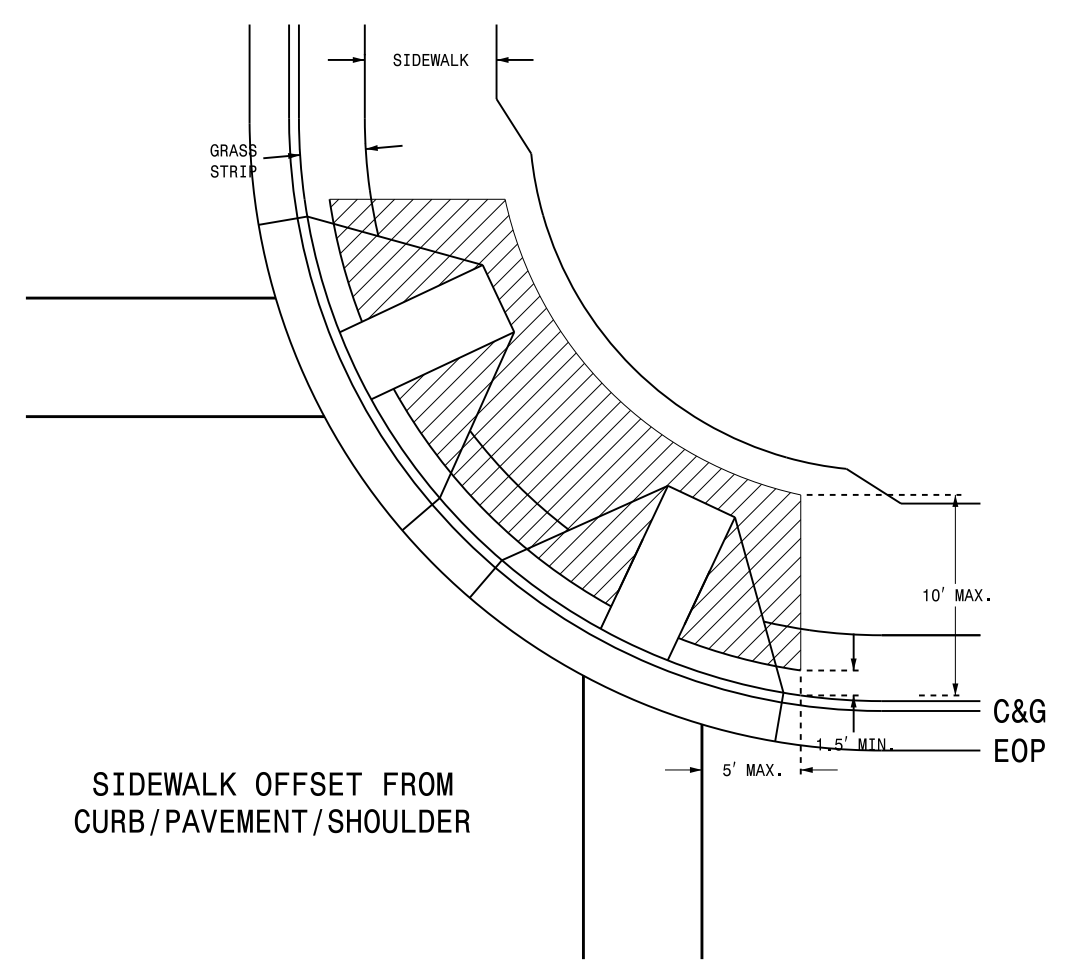
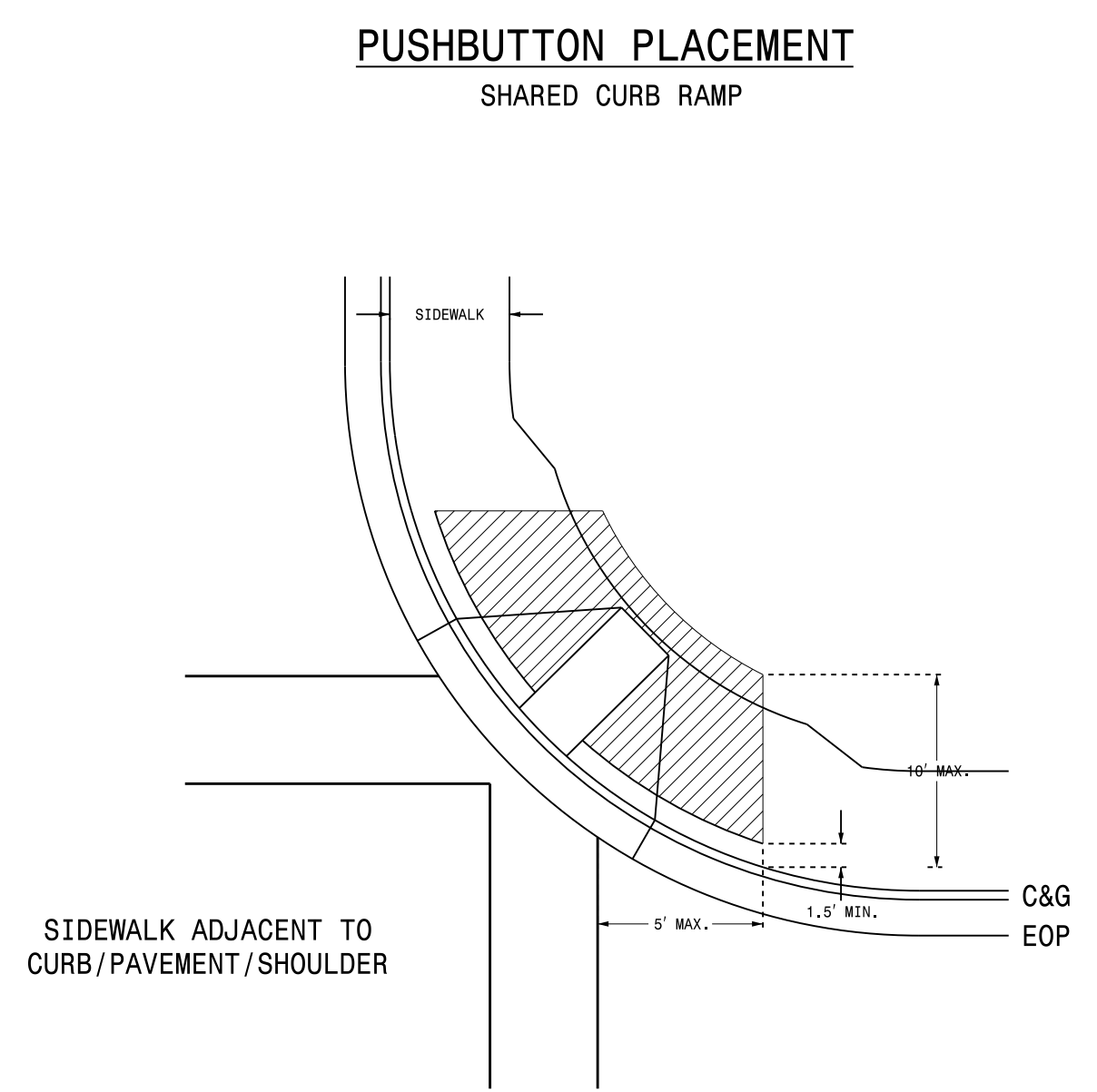
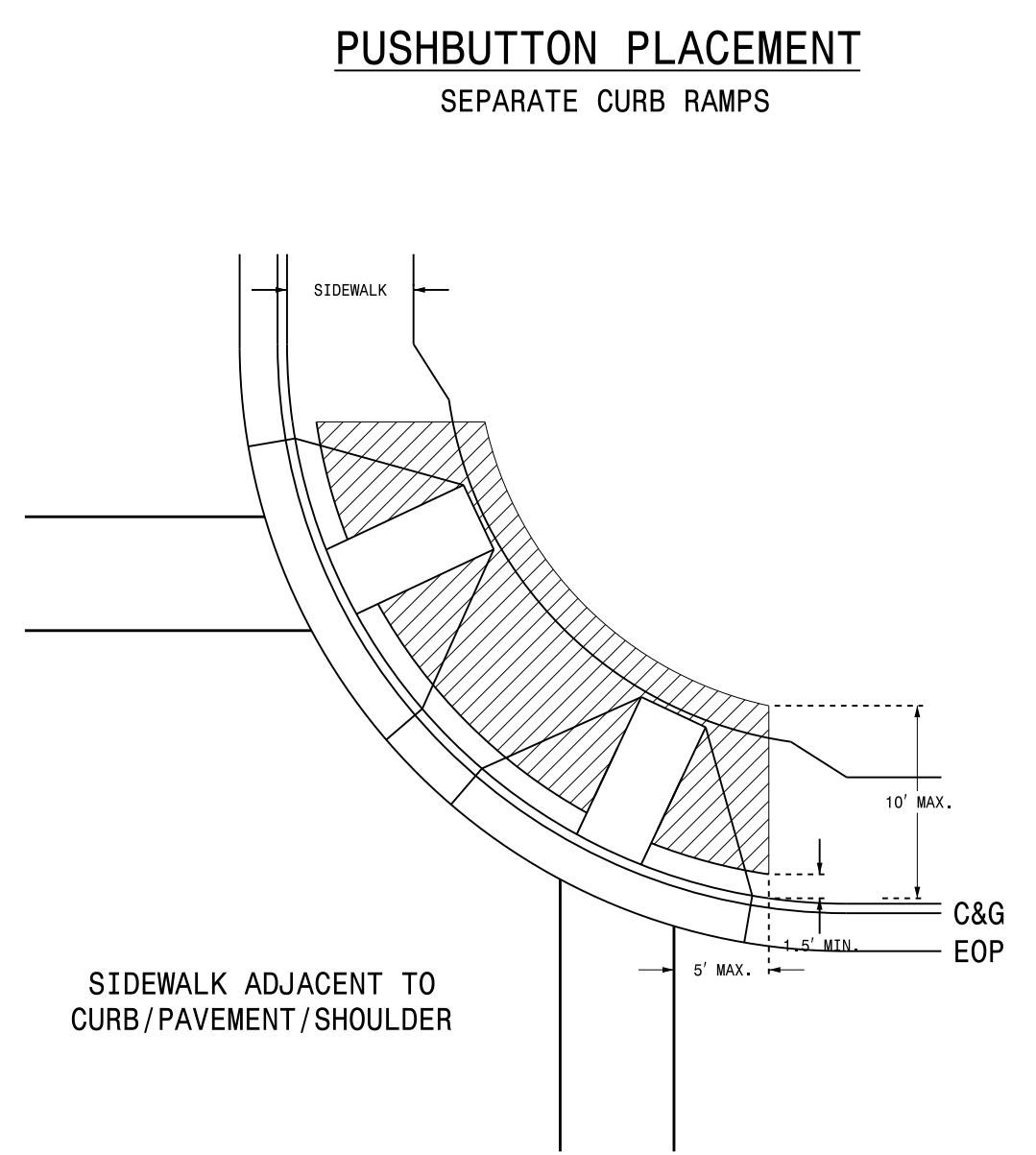
48" Dia. Foundations Concrete Volume (cubic yards) = (0.465) x Drilled Pier Length

	Standard Strain Pole Foundation for All Soil Conditions	
	PLAN DATE: FEBRUARY 2016 PREPARED BY: N. BITTING REVISIONS: Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn.	DESIGNED BY: C.B. COGDILL REVIEWED BY: D.C. SARKAR DATE: 7/12/2015
SCALE: 0 NA NONE	DocuSigned by: <i>Debash C. Sarkar</i> 44E8E32E147E4C4...	2/17/2016 DATE

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

06-14  
ENGLISH DETAIL DRAWING FOR  
**PEDESTRIAN PUSHBUTTON LOCATIONS**  
PLACEMENT DETAIL

SHEET 1 OF 3  
**1705D01**



- NOTES**
1. Pushbutton pedestals should not be located further than 10 feet from the edge of curb, shoulder, or pavement.
  2. The face of the pushbutton should be parallel to the applicable crosswalk.
  3. Separate pushbuttons used on the same corner should be separated by a distance of at least 10 feet.
  4. Pushbuttons shall be installed adjacent to a level surface with a maximum reach distance of 10 inches.
  5. Maintain 4 feet of clearance around pedestal if located in sidewalk.
  6. Refer to section 1705 of the 2012 NCDOT Roadway Standard Drawings for Pushbutton Assembly details.
  7. Refer to section 1743 of the 2012 NCDOT Roadway Standard Drawings for Pedestal details.
  8. Contact Division Traffic Engineer for pushbutton location approval prior to installation.
  9. Curb ramps are for symbolic use only and may not reflect actual design or field conditions.

**PROPOSED**

	Signal Pole
	Type I Pushbutton Post
	Type II Signal Pedestal
	Pushbutton & Sign
	Pedestrian Signal Head
	Curb Ramp
	Pushbutton Location Area

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DIVISION OF HIGHWAYS  
RALEIGH, N.C.

06-14  
ENGLISH DETAIL DRAWING FOR  
**PEDESTRIAN PUSHBUTTON LOCATIONS**  
PLACEMENT DETAIL

SHEET 1 OF 3  
**1705D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

DocuSigned by:  
*Robert J. Ziemba*  
10084582746404

SIGNATURE DATE

6/17/2014

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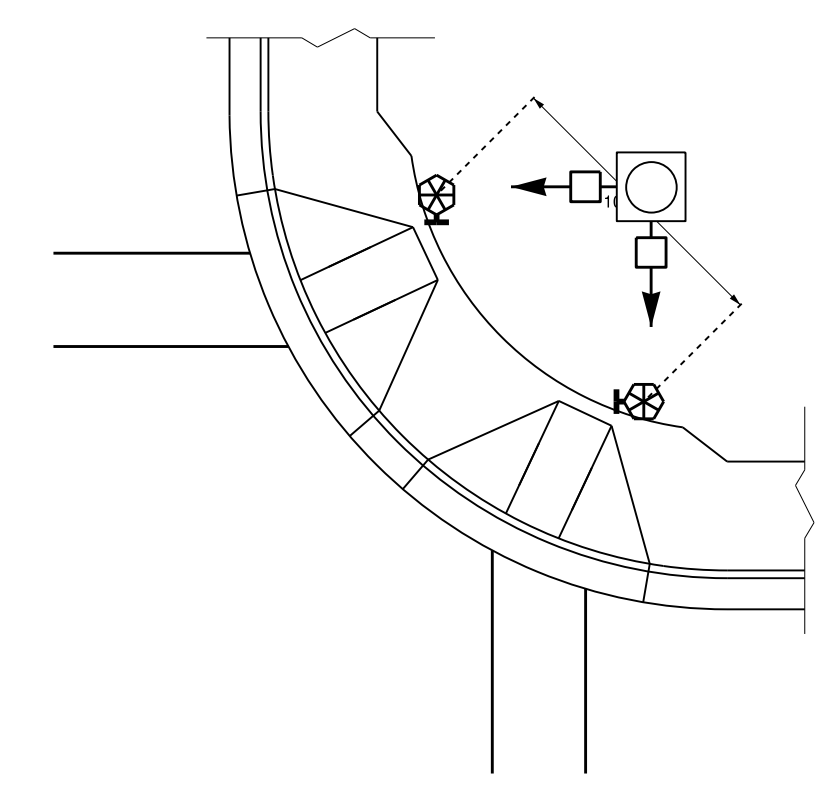
STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

06-14

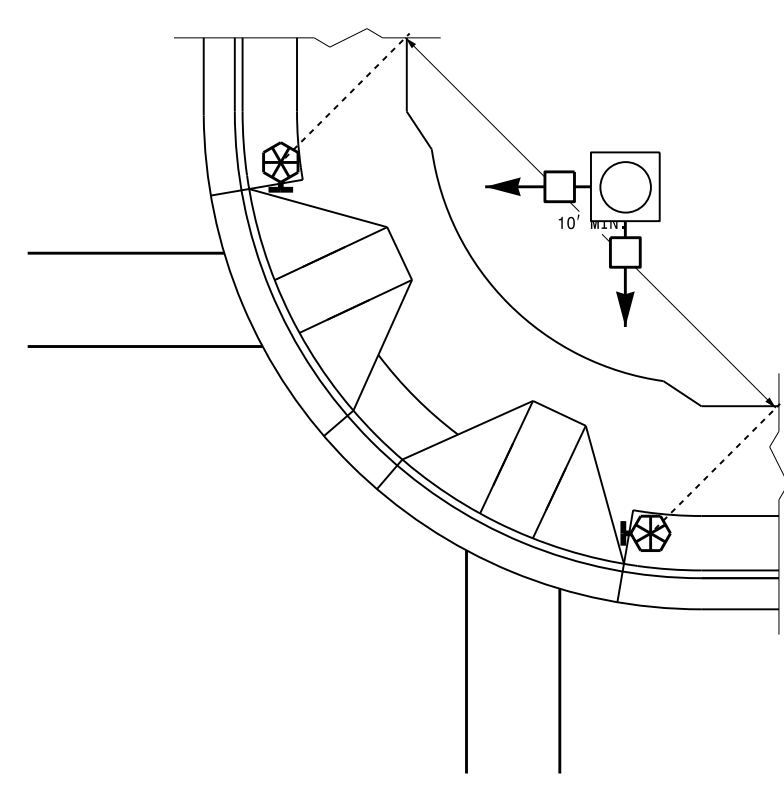
ENGLISH DETAIL DRAWING FOR  
**PEDESTRIAN PUSHBUTTON LOCATIONS**  
PLACEMENT DETAIL

SHEET 2 OF 3  
**1705D01**

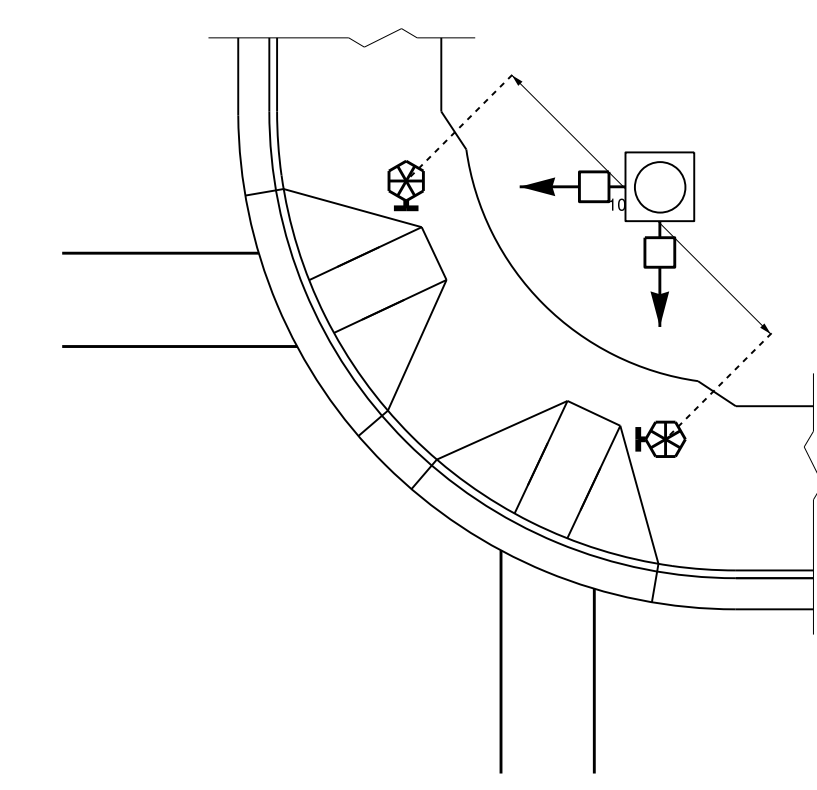
TYPICAL PUSHBUTTON LOCATIONS (CASE I)  
SEPARATE CURB RAMPS W/ TYPE I PEDESTALS



BACK OF SIDEWALK IS WITHIN 10'  
OF CURB OR PAVEMENT/SHOULDER



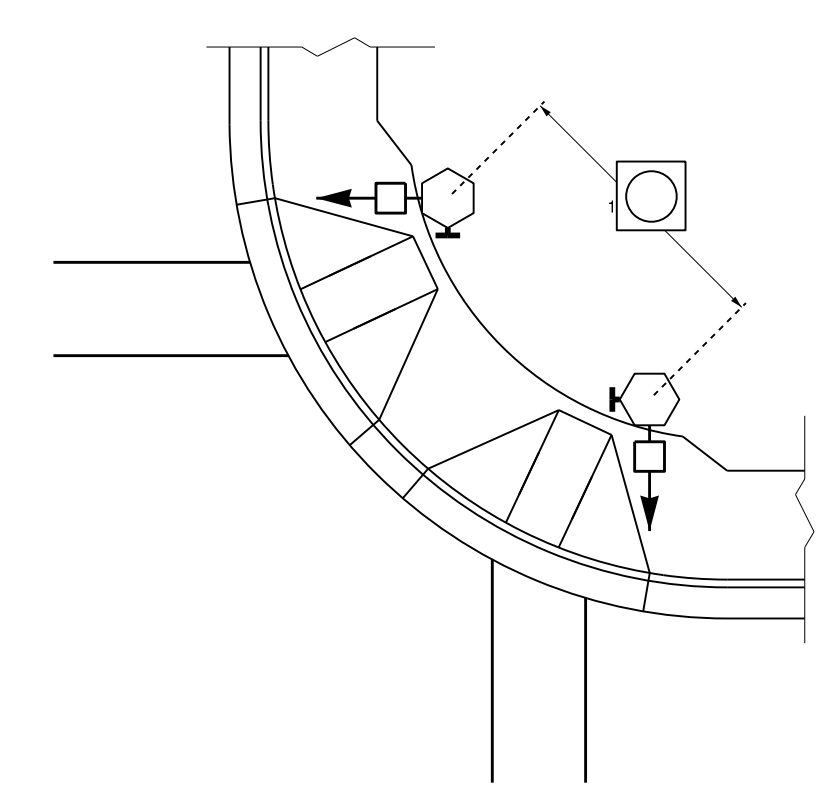
GRASS STRIP PLACEMENT IF BACK  
OF SIDEWALK EXCEEDS 10' FROM  
CURB OR PAVEMENT/SHOULDER



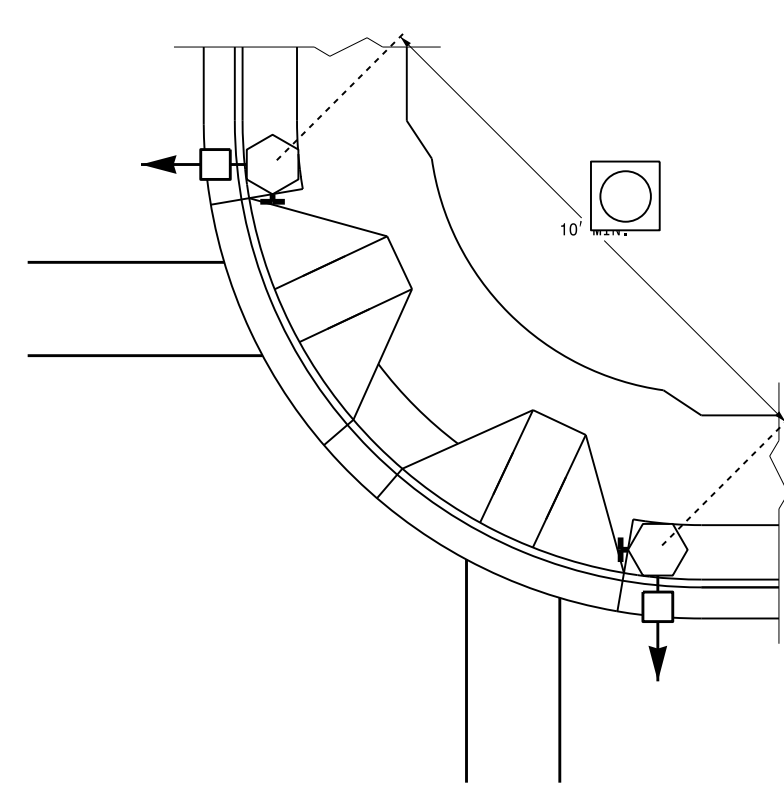
PUSHBUTTON PLACEMENT  
IN WIDE SIDEWALK

- PROPOSED**
- Signal Pole
  - Type I Pushbutton Post
  - Type II Signal Pedestal
  - Pushbutton & Sign
  - Pedestrian Signal Head
  - Curb Ramp
  - Pushbutton Location Area

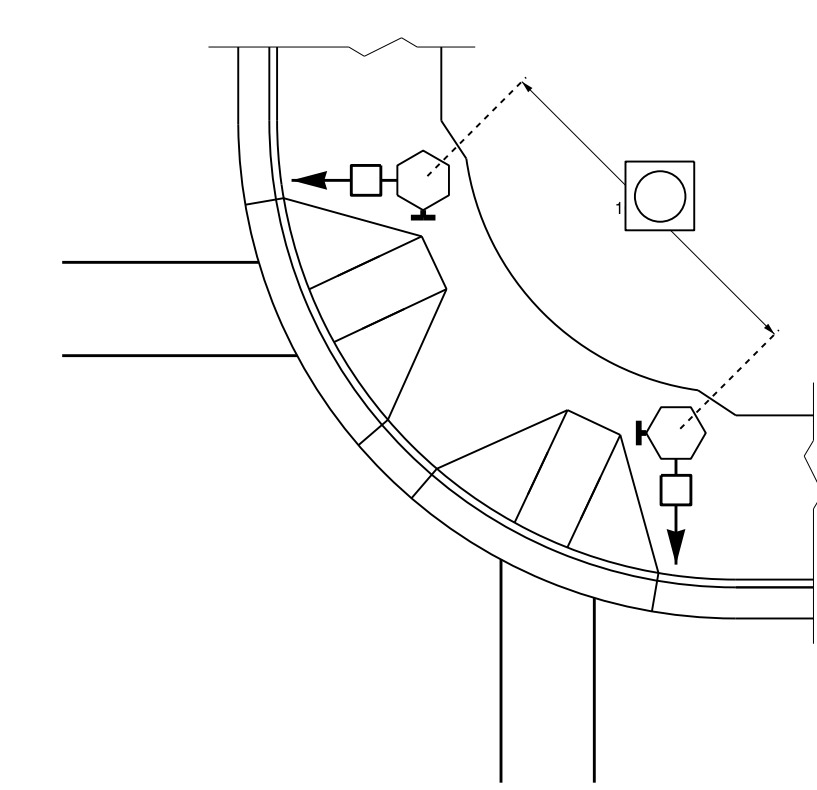
TYPICAL PUSHBUTTON LOCATIONS (CASE II)  
SEPARATE CURB RAMPS W/ TYPE II PEDESTALS



BACK OF SIDEWALK IS WITHIN 10'  
OF CURB OR PAVEMENT/SHOULDER

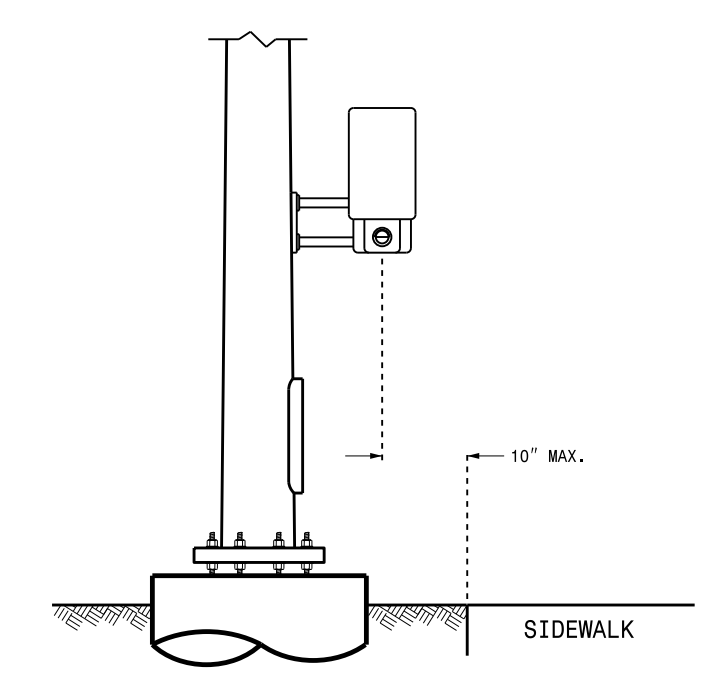


GRASS STRIP PLACEMENT IF BACK  
OF SIDEWALK EXCEEDS 10' FROM  
CURB OR PAVEMENT/SHOULDER



PUSHBUTTON PLACEMENT  
IN WIDE SIDEWALK

OPTIONAL PUSHBUTTON EXTENSION  
FACE OF PUSHBUTTON PARALLEL TO  
APPLICABLE CROSSWALK



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06-14

ENGLISH DETAIL DRAWING FOR  
**PEDESTRIAN PUSHBUTTON LOCATIONS**  
PLACEMENT DETAIL

SHEET 2 OF 3  
**1705D01**

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

DocuSigned by:  
*Robert J. Ziemba*  
1884828274464

SIGNATURE

6/17/2014  
DATE

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STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

06-14

ENGLISH DETAIL DRAWING FOR  
**PEDESTRIAN PUSHBUTTON LOCATIONS**  
PLACEMENT DETAIL

SHEET 3 OF 3  
**1705D01**

STATE OF NORTH CAROLINA  
DEPT. OF TRANSPORTATION  
DIVISION OF HIGHWAYS  
RALEIGH, N.C.

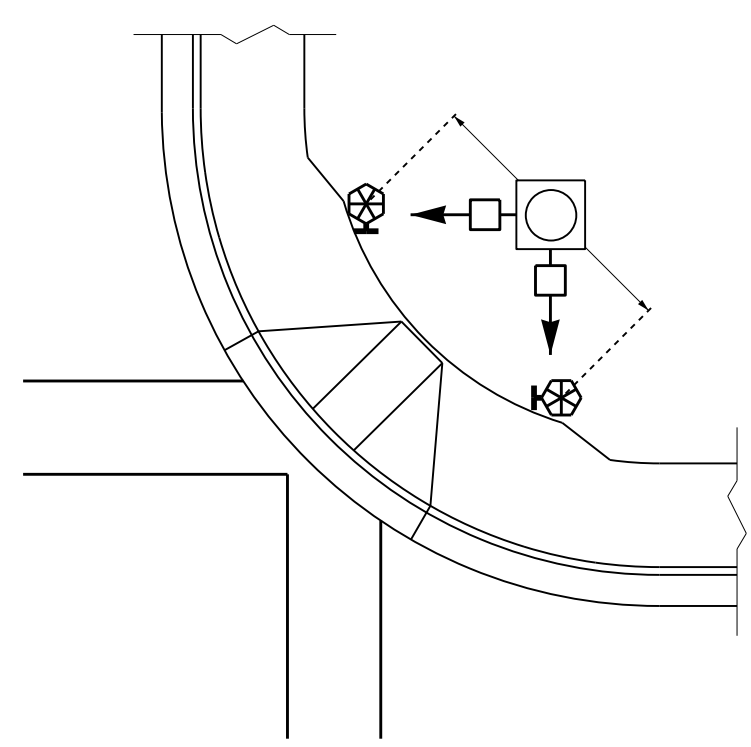
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ENGLISH DETAIL DRAWING FOR  
**PEDESTRIAN PUSHBUTTON LOCATIONS**  
PLACEMENT DETAIL

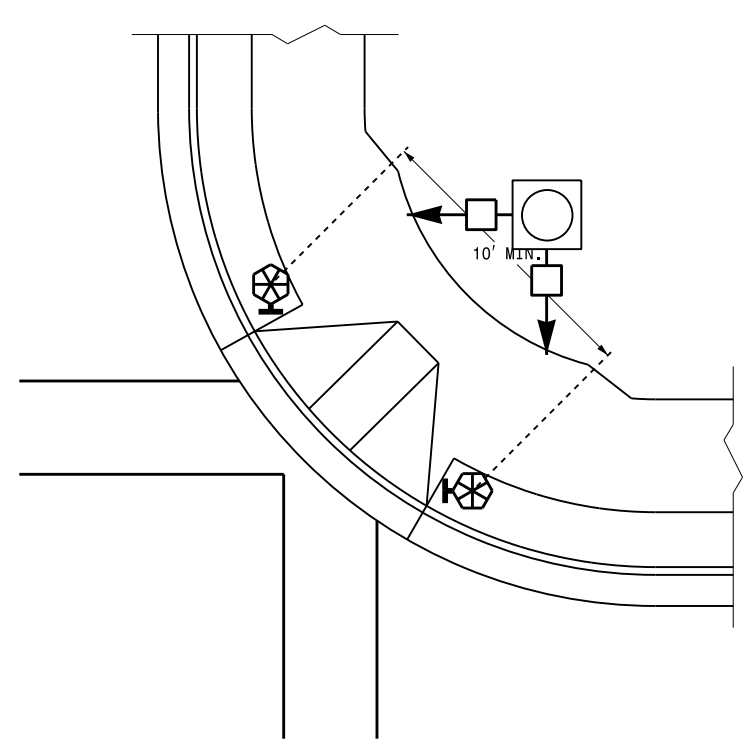
SHEET 3 OF 3  
**1705D01**

**TYPICAL PUSHBUTTON LOCATIONS (CASE III)**

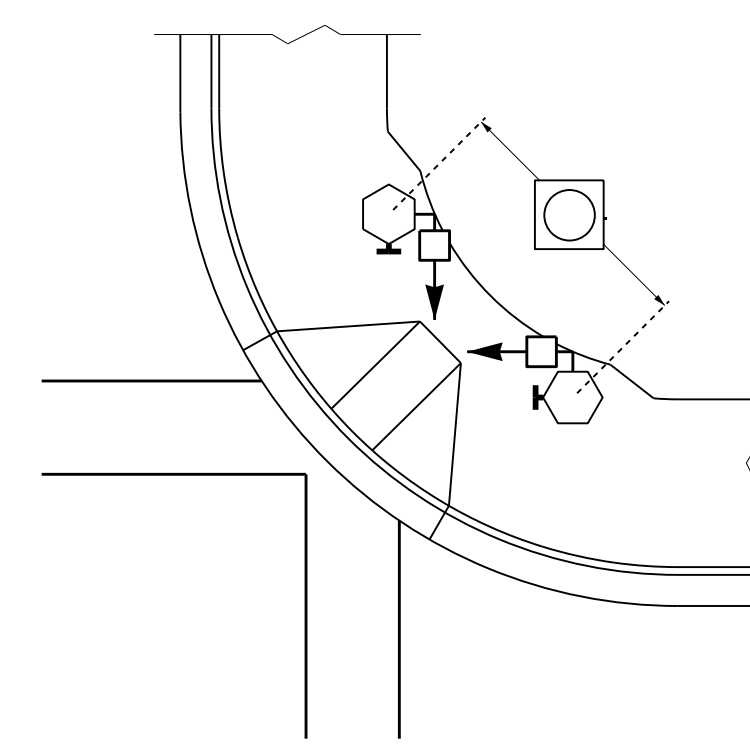
SHARED CURB RAMPS



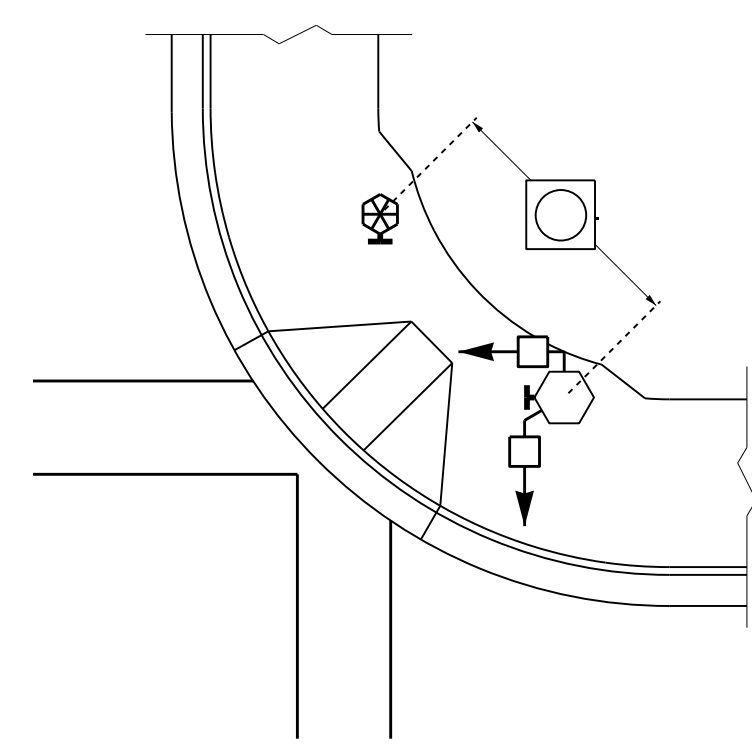
BACK OF SIDEWALK IS WITHIN 10' OF CURB OR PAVEMENT/SHOULDER



GRASS STRIP PLACEMENT IF BACK OF SIDEWALK EXCEEDS 10' FROM CURB OR PAVEMENT/SHOULDER

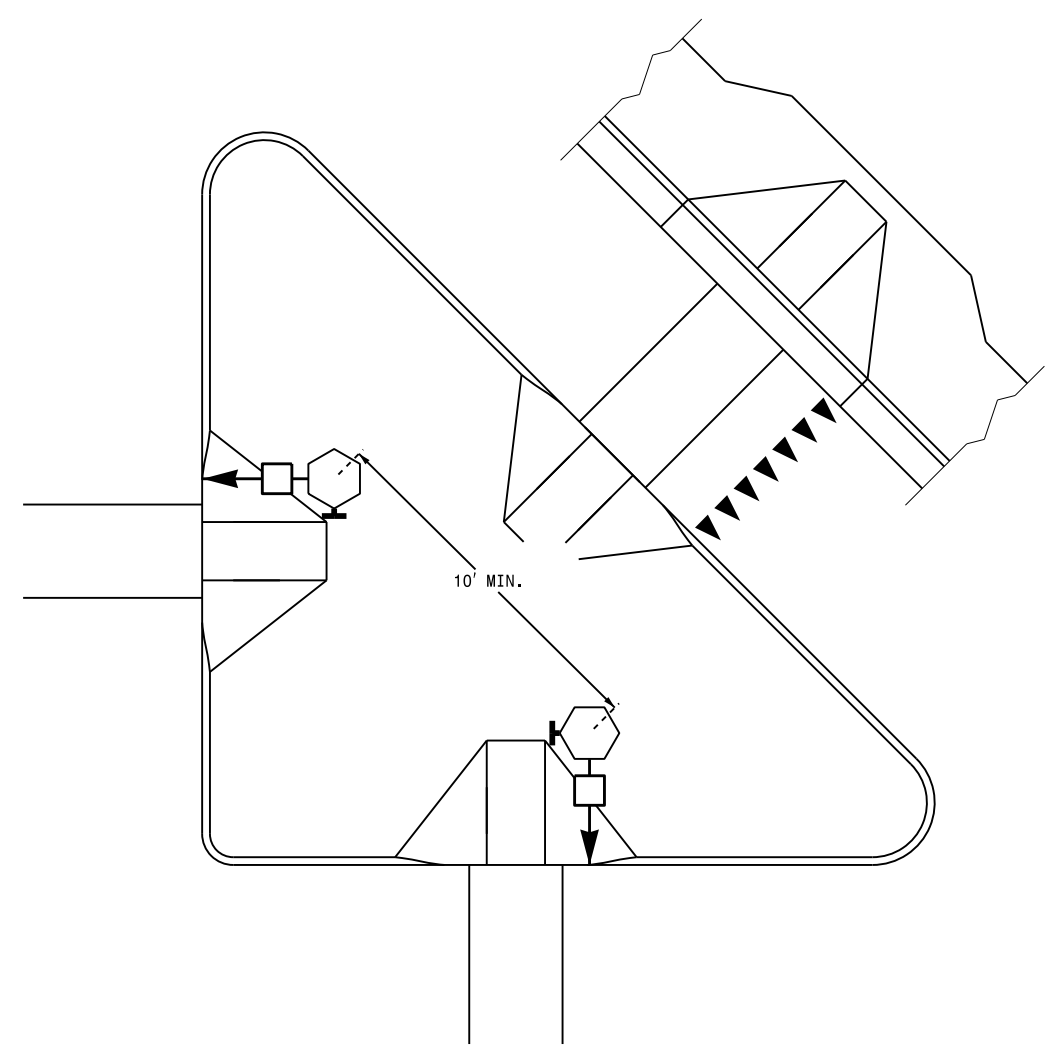


PUSHBUTTON PLACEMENT IN WIDE SIDEWALK (CORRESPONDING PUSHBUTTONS AND SIGNAL HEADS ON DIFFERENT PEDESTALS)

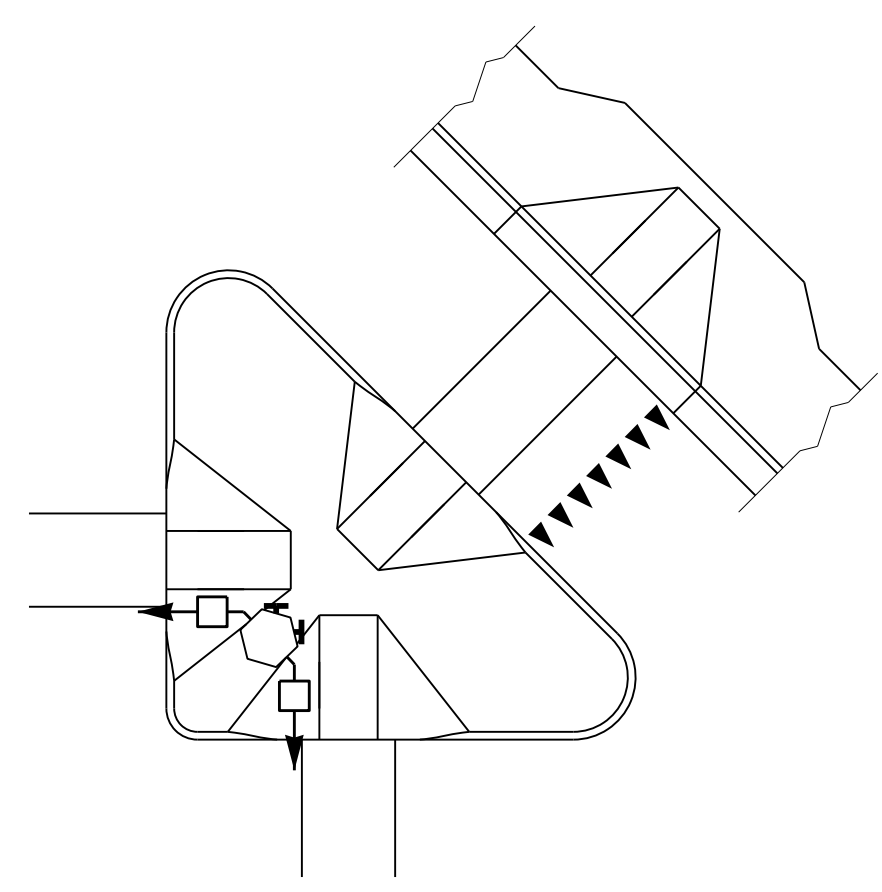


PUSHBUTTON PLACEMENT WITH SHARED TYPE II SIGNAL PEDESTAL AND TYPE I PUSHBUTTON POST

**TRAFFIC ISLAND PUSHBUTTON LOCATIONS**



PUSHBUTTON PLACEMENT IN LARGE "PORK CHOP ISLAND" WITH SEPARATE PEDESTALS



PUSHBUTTON PLACEMENT IN SMALL "PORK CHOP ISLAND" WITH SHARED PEDESTAL

**PUSHBUTTON PLACEMENT IN MEDIAN**

TYPE II PEDESTAL (FOR STAGED OR MULTI-PHASE CROSSING)

TYPE I PEDESTAL (FOR COMPLETE CROSSING CURB TO CURB WITH OPTIONAL REFUGE)

**PROPOSED**

- Signal Pole
- Type I Pushbutton Post
- Type II Signal Pedestal
- Pushbutton & Sign
- Pedestrian Signal Head
- Curb Ramp
- Pushbutton Location Area

**LEGEND**

06-1406-2017.dwg 10:36  
S:\ITS\ASU\ITS\_Signals\Signal Design\Section\Central\_Regional\Rob's Files\Red Stds\Pushbutton Drawings\Pushbutton Place Drawings\20140617.dwg  
rz1emba

See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway  
Garner, NC 27529

SEAL

DocuSigned by:

10004582745404

SIGNATURE DATE

6/17/2014



- 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 STUBOUTS
- 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

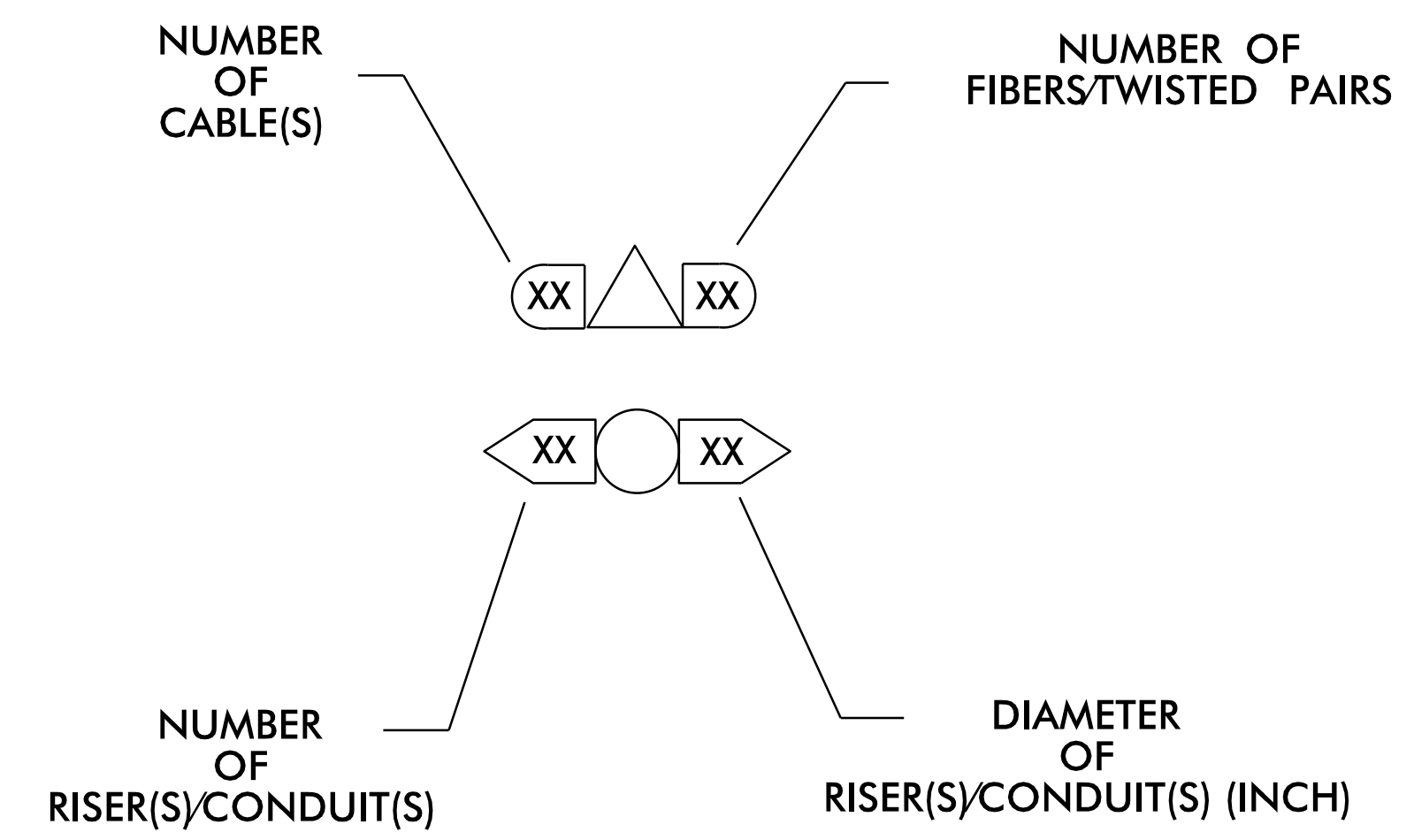
- 35 REMOVE EXISTING CABINET FOUNDATION
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40 INSTALL OVERSIZED JUNCTION BOX
- 41 REMOVE EXISTING JUNCTION BOX
- 42 INSTALL WOOD POLE
- 43 REMOVE EXISTING WOOD POLE
- 44 INSTALL AERIAL GUY ASSEMBLY
- 45 INSTALL STANDARD GUY ASSEMBLY
- 46 INSTALL SIDEWALK GUY ASSEMBLY
- 47 INSTALL MESSENGER CABLE
- 48 REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE
- 49 REMOVE EXISTING COMMUNICATIONS 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**

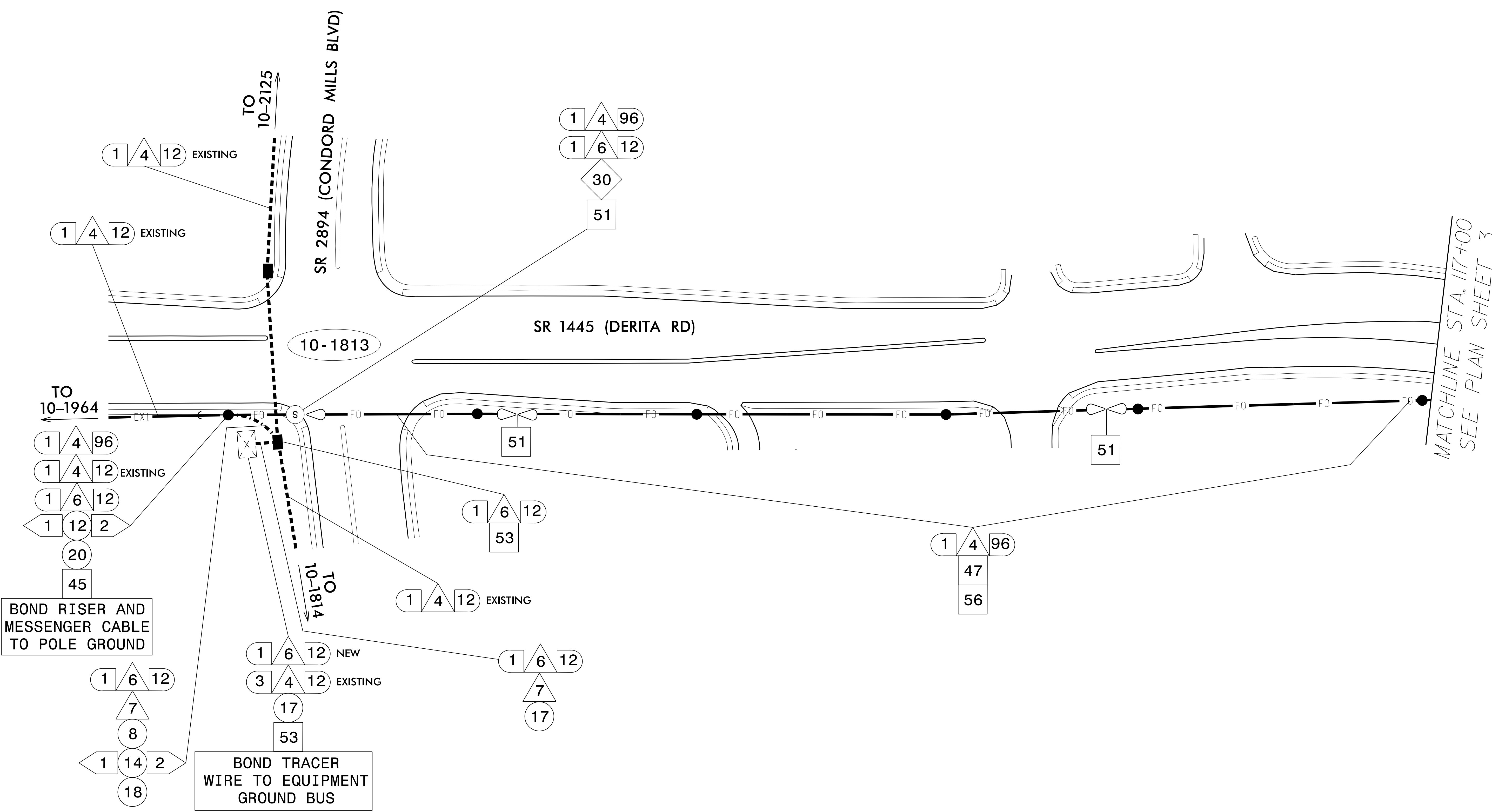
- FO NEW FIBER OPTIC COMMUNICATIONS CABLE
- TWIST PR NEW TWISTED PAIR COMMUNICATIONS CABLE
- EXI EXISTING COMMUNICATIONS CABLE
- REM EXISTING COMMUNICATIONS CABLE TO BE REMOVED
- NEW AERIAL GUY ASSEMBLY
- NEW CONDUIT
- EXISTING CONDUIT
- DD NEW DIRECTIONAL DRILLED CONDUIT
- BAJ NEW BORED AND JACKED CONDUIT
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- S NEW AERIAL SPLICE ENCLOSURE
- NEW METAL POLE
- EXISTING METAL POLE
- NEW CCTV CAMERA ASSEMBLY
- NEW STANDARD GUY ASSEMBLY
- NEW STANDARD GUY USING EXISTING ANCHOR
- 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)

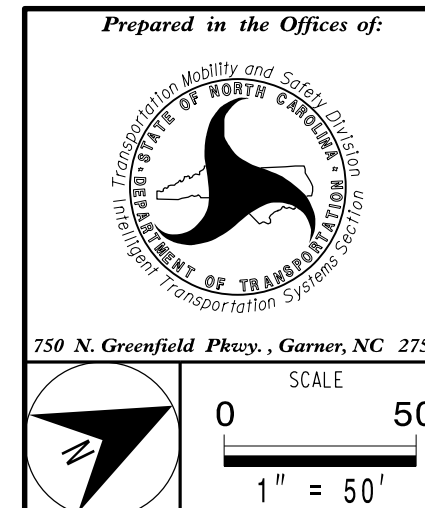


Prepared in the Offices of:  750 N. Greenfield Pkwy., Garner, NC 27529	<b>Construction Notes</b>		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER STEVEN W. COX 37856
	Division 10 Cabarrus Co. Concord		
PLAN DATE: _____	REVIEWED BY: _____		
PREPARED BY: _____	REVIEWED BY: _____		
SCALE: 0 _____	REVISIONS: _____	INIT.: _____	DATE: _____
Signature: <i>Steven Cox</i>		DATE: 7/7/2016	
CADD Filename: _____			

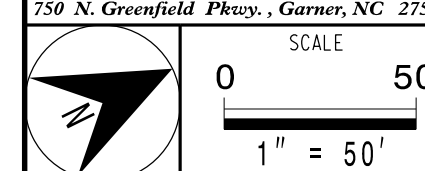
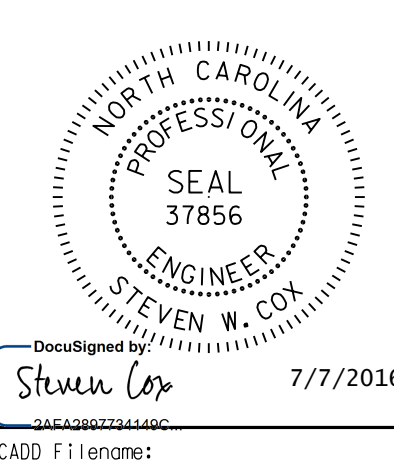


- NOTES:**
1. ALL NCDOT CABLE ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.
  2. COIL THE DROP CABLE IN THE EXISTING CABINET.
  3. PROVIDE THE FIBER INTERCONNECT CENTER TO THE CITY OF CONCORD FOR INSTALLATION.

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

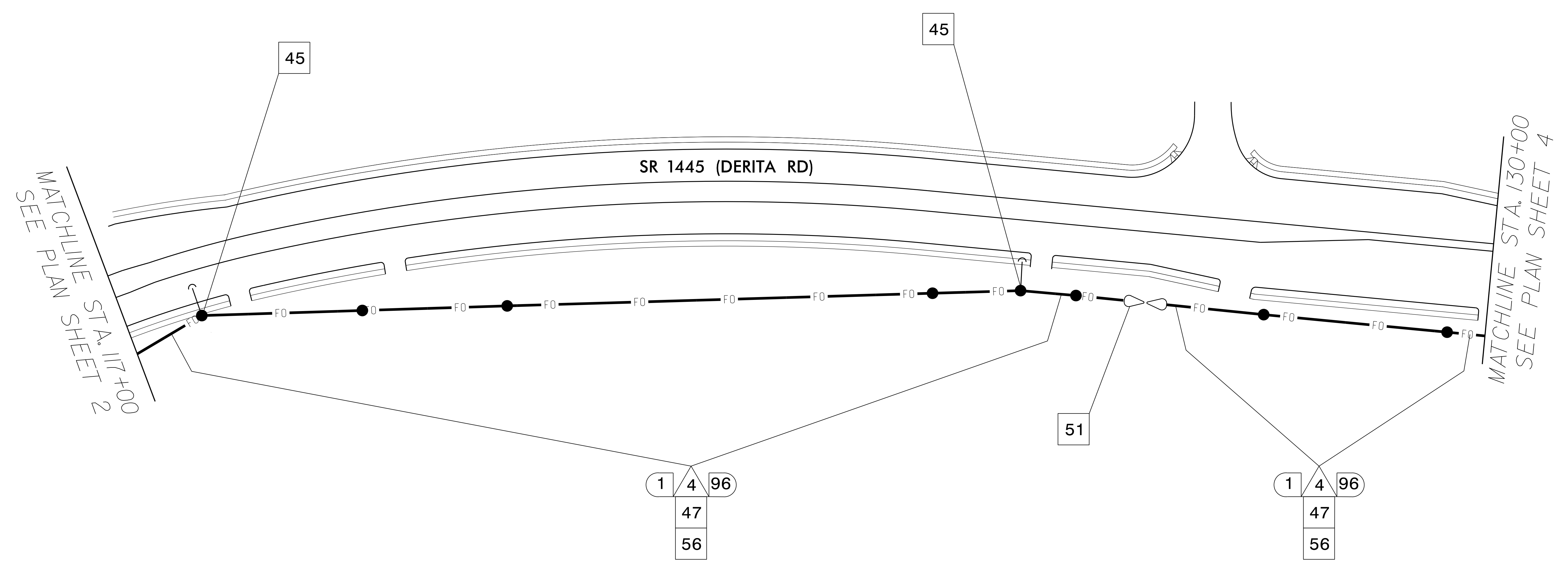


COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS	
Division 10 Cabarrus County	Concord
PLAN DATE: June 2016	REVIEWED BY: C.L. Kalencik
PREPARED BY: S.W. COX	REVIEWED BY:
REVISIONS	INIT. DATE



DocuSigned by:  
 Steven Cox  
 7/7/2016  
 CADD Filename:

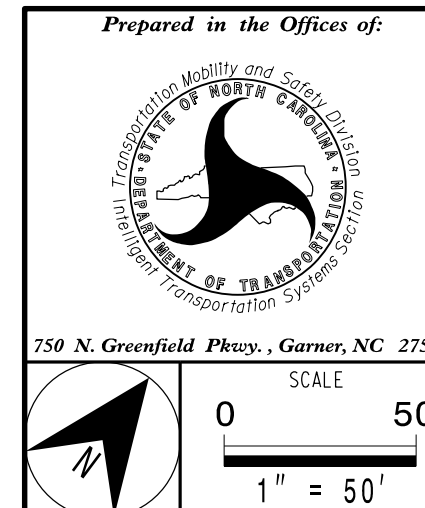




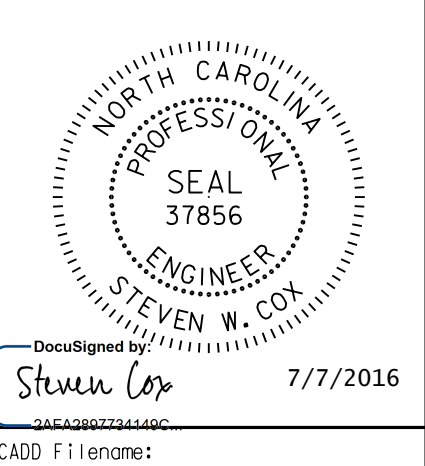
**NOTES:**

1. ALL NCDOT CABLE ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

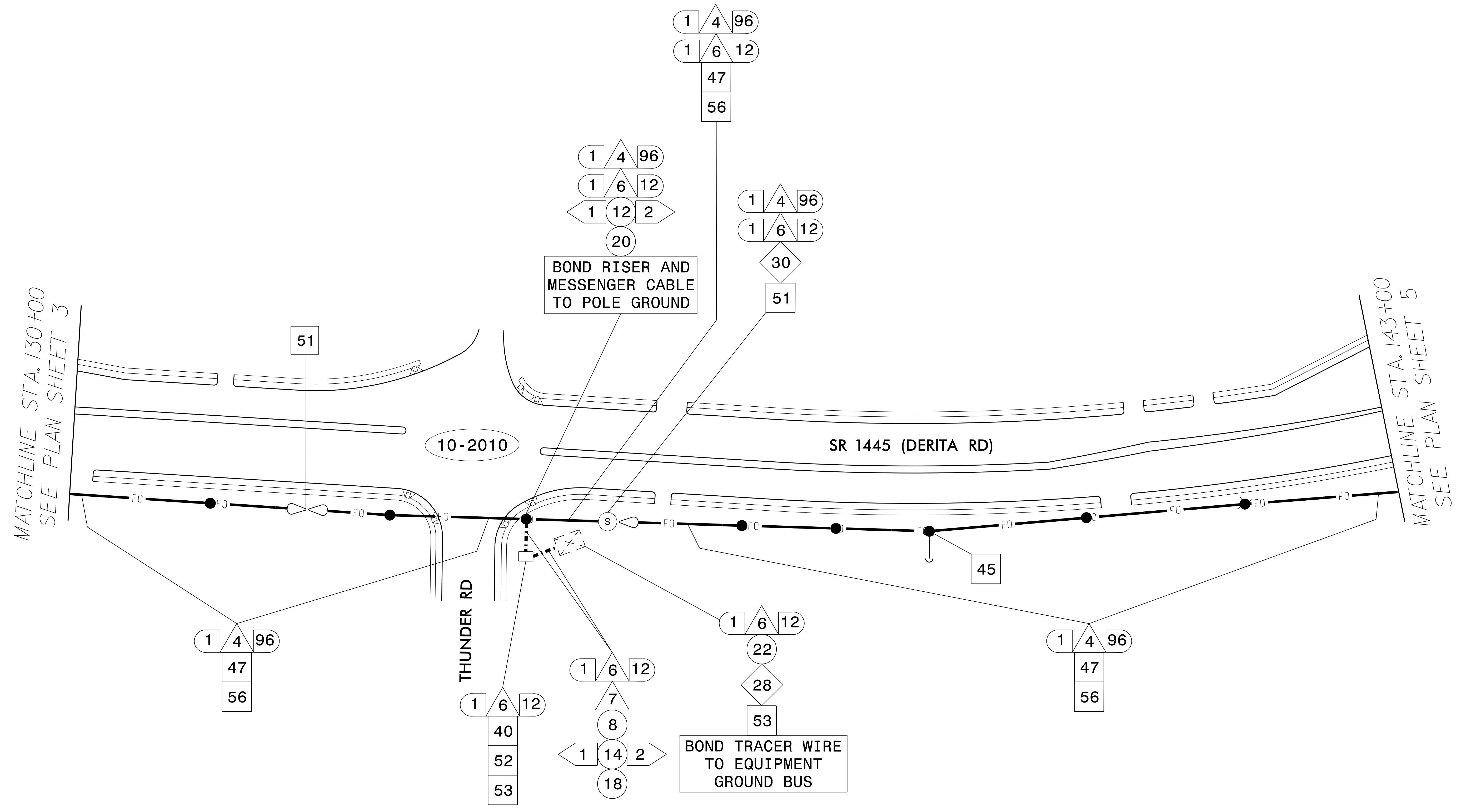
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<b>COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS</b>	
Division 10 Cabarrus County	Concord
PLAN DATE: June 2016	REVIEWED BY: C.L. Kalencik
PREPARED BY: S.W. Cox	REVIEWED BY:
REVISIONS	INIT. DATE



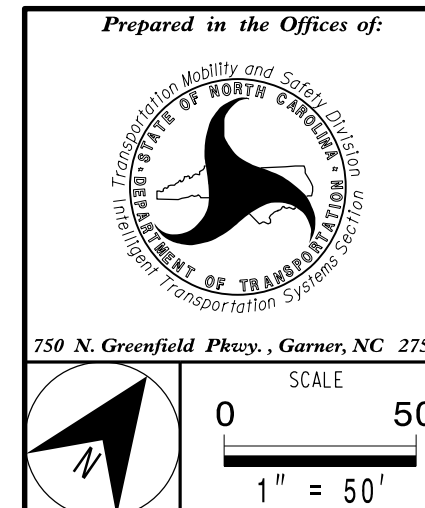
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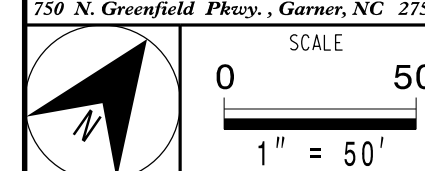
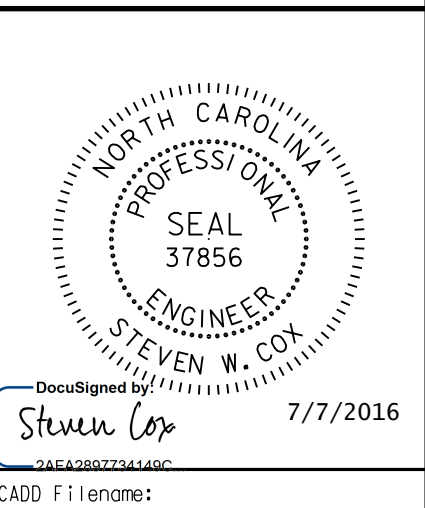
NOTES:

1. ALL NCDOT CABLE ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.
2. REMOVE AND RETURN EXISTING WIRELESS EQUIPMENT TO THE CITY OF CONCORD.

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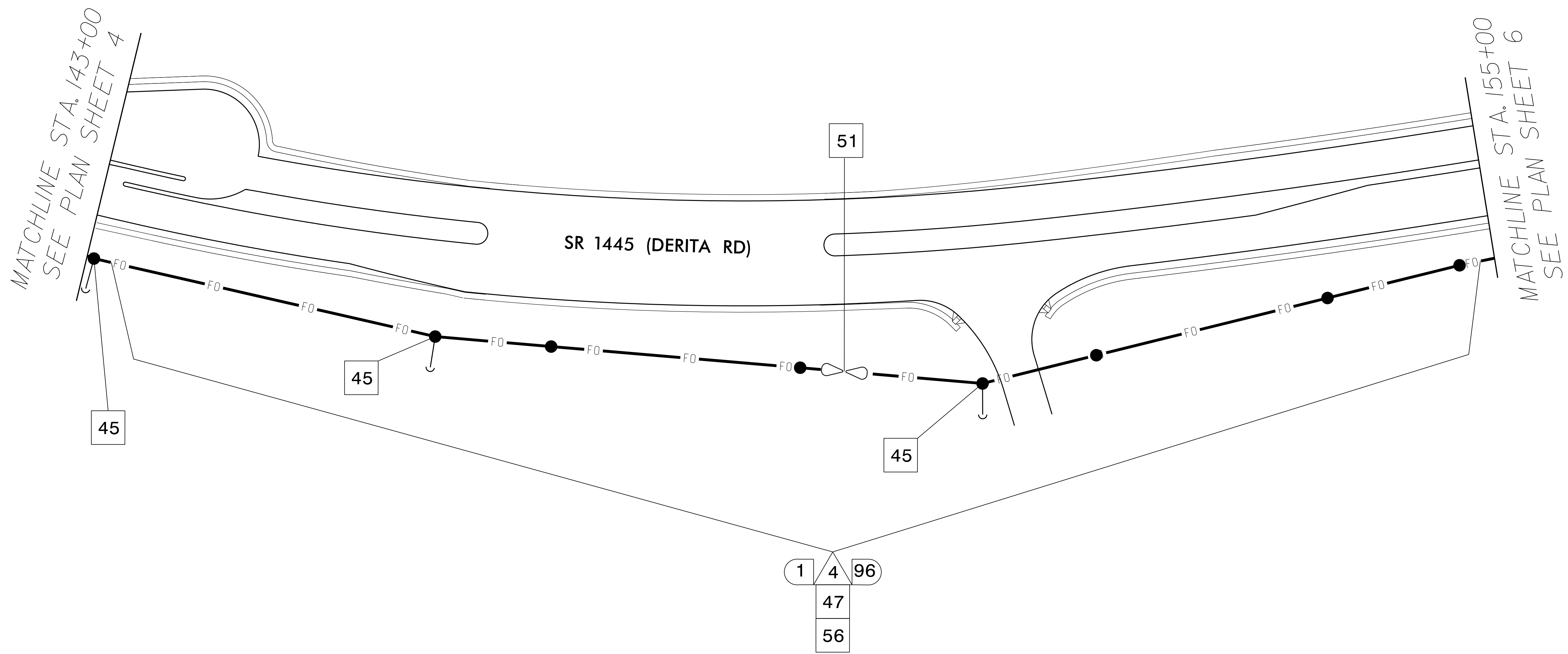


<b>COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS</b>	
Division 10 Cabarrus County	Concord
PLAN DATE: June 2016	REVIEWED BY: C.L. Kalencik
PREPARED BY: S.W. COX	REVIEWED BY:
REVISIONS	INIT. DATE



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Steven Cox  
7/7/2016  
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**NOTES:**

1. ALL NCDOT CABLE ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.

**DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED**

**AECOM**  
 NC Firm License No.: F-0342  
 701 Corporate Center Drive  
 Suite 475 Raleigh, NC 27607  
 Phone: 919-854-6200

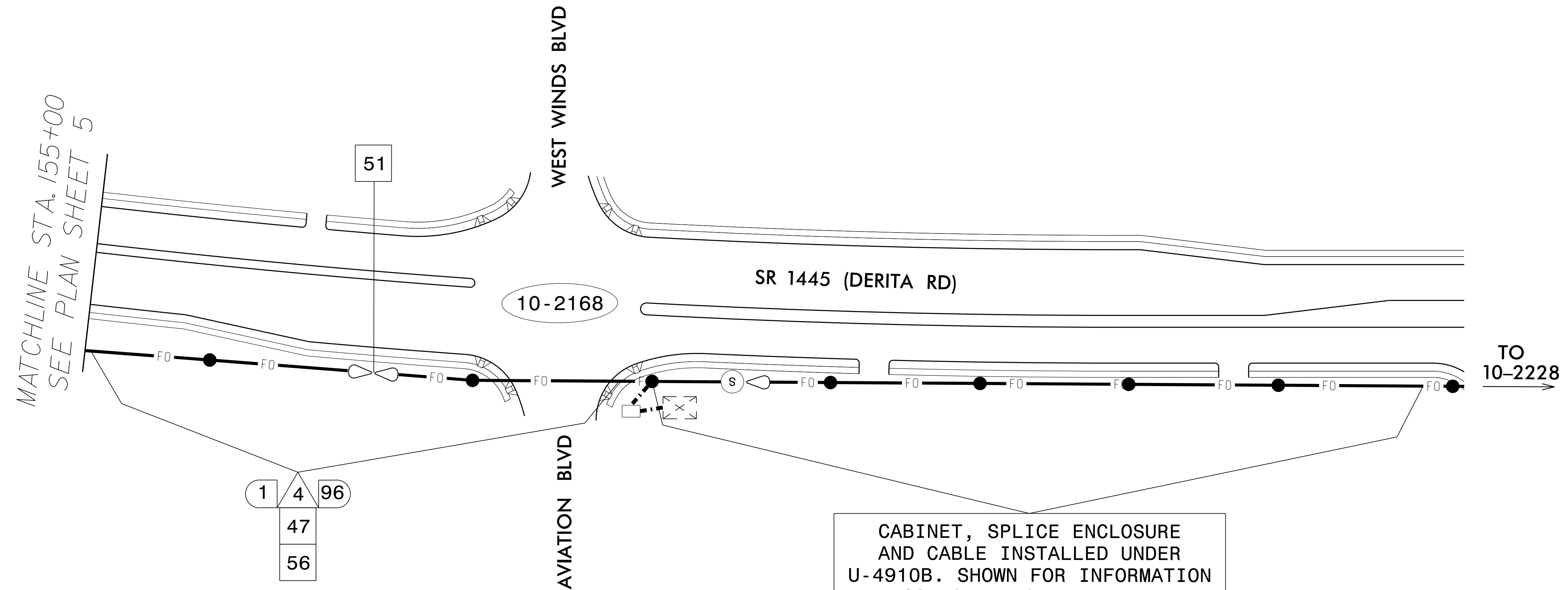
Prepared in the Offices of:

750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: 0 50  
1" = 50'

<b>COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS</b>	
Division 10 Cabarrus County	Concord
PLAN DATE: June 2016	REVIEWED BY: C.L. Kalencik
PREPARED BY: S.W. Cox	REVIEWED BY:
REVISIONS	INIT. DATE

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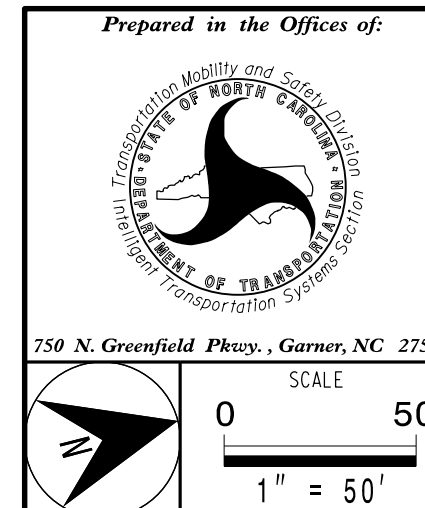


CABINET, SPLICE ENCLOSURE AND CABLE INSTALLED UNDER U-4910B. SHOWN FOR INFORMATION PURPOSE ONLY. SEE U-4910B FOR CABLE INSTALLATION DETAILS.

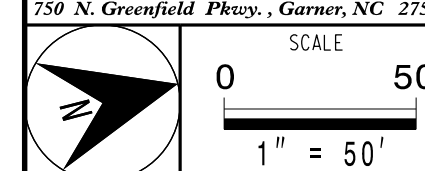
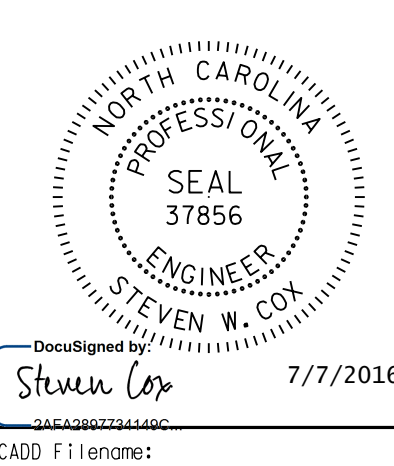
**NOTES:**

1. ALL NCDOT CABLE ATTACHMENT POINTS ARE 40" BELOW POWER, FRONT SIDE OF POLE, UNLESS OTHERWISE NOTED.
2. COORDINATE WITH THE U-4910B PROJECT SO THAT UNUSED FIBERS ARE EXPRESSED THROUGH THE AERIAL SPLICE ENCLOSURE AT 10-2168.

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PREPARED BY: S.W. COX	REVIEWED BY:
REVISIONS	INIT. DATE



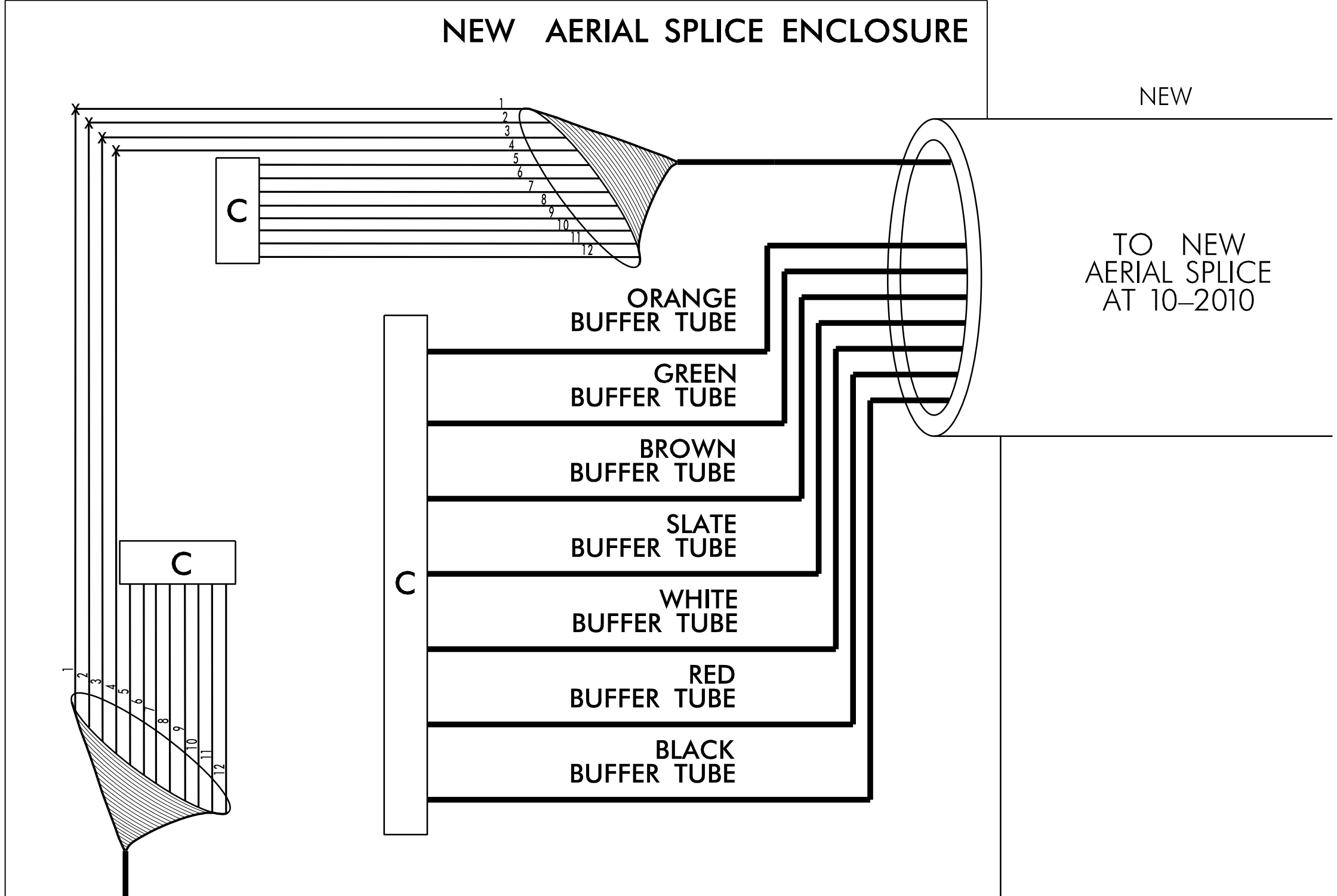
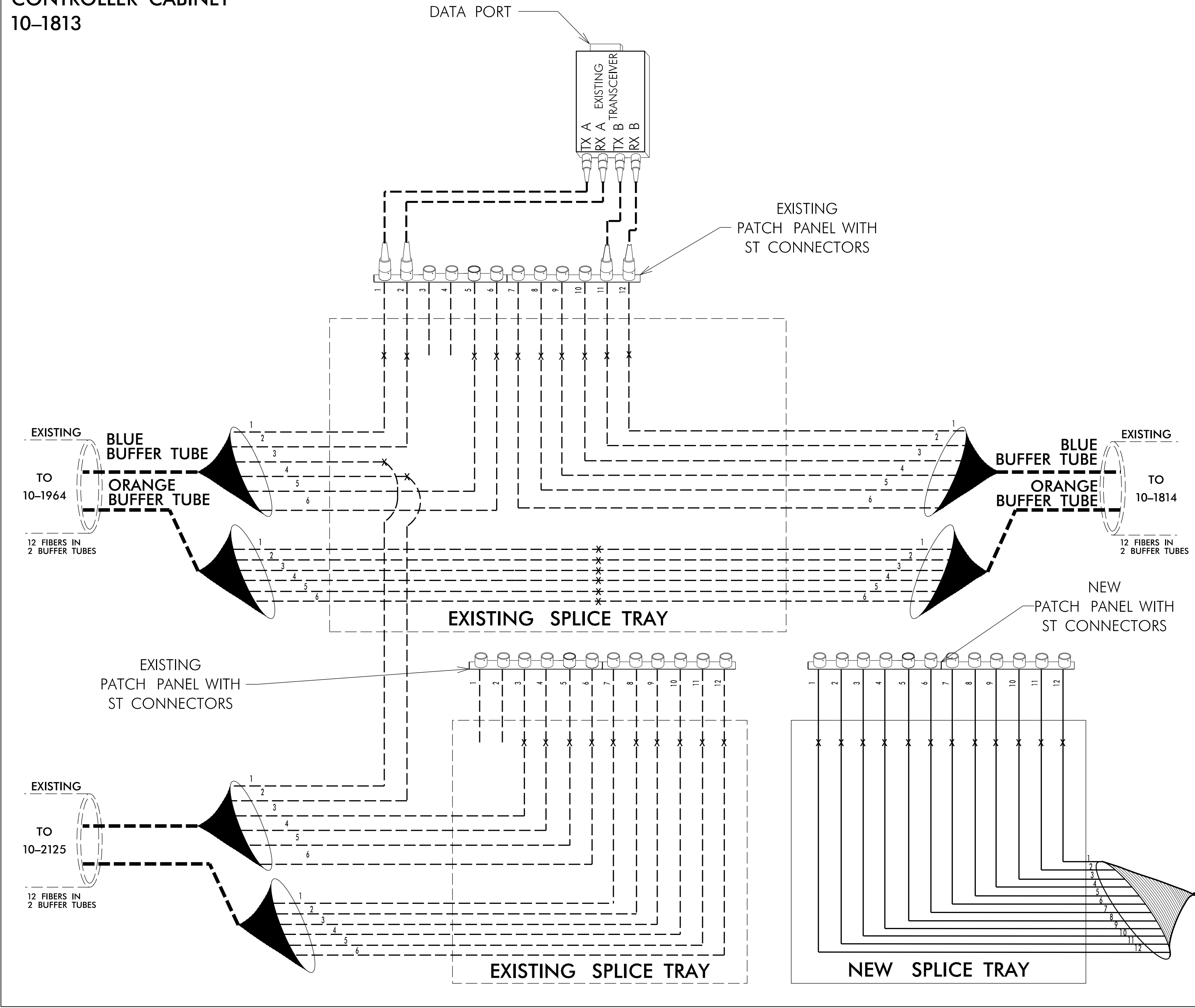


EXISTING CONTROLLER CABINET AND  
NEW AERIAL SPLICE ENCLOSURE  
AT SR 2894 (CHRISTENBURY PKWY)/  
CONCORD MILLS BLVD AND  
SR 1445 (DERITA RD)  
SIG. INV. # 10-1813

COLOR CODE TIA/EIA 598-A		LEGEND	
(1) BLUE	(7) RED	X =	NEW FUSION SPLICE INDIVIDUAL FIBER
(2) ORANGE	(8) BLACK	C =	CAP, COIL, AND SEAL
(3) GREEN	(9) YELLOW		
(4) BROWN	(10) VIOLET		
(5) SLATE	(11) ROSE		
(6) WHITE	(12) AQUA		

Notes:  
Unused fibers left coiled and stored in splice tray.  
Unused Buffer Tubes left coiled and stored in splice tray.

**CONTROLLER CABINET  
10-1813**

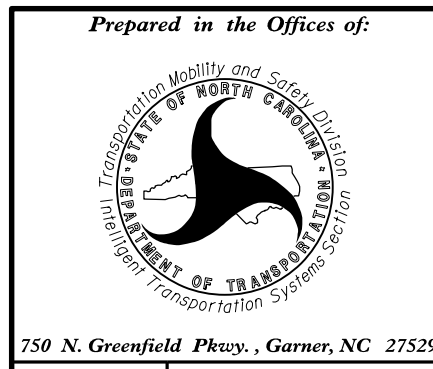


INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:  
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

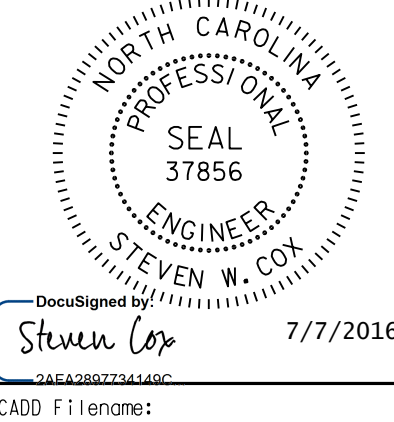
- 1) SPLICE LOCATION
- 2) DATE
- 3) COMPANY NAME
- 4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

- NOTES:**
1. NOTIFY THE CITY OF CONCORD TRAFFIC ENGINEER, ANDREI DUMITRU, AT (704) 920-5377 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE CONCORD TRANSPORTATION DIRECTOR AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.
  2. TRANSCIVER TERMINATION CONFIGURATIONS ARE GENERIC. THE CITY OF CONCORD IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATIONS AND SHALL PERFORM ALL SPLICING AND TERMINATIONS IN CONTROLLER CABINET.
  3. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE PLANS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGMENT DIFFERS FROM THE SUPPLIED SPLICE PLANS.



SPLICE DETAILS	
Division 10 Cabarrus County	Concord
PLAN DATE: June 2016	REVIEWED BY: C.L. Kalencik
PREPARED BY: S.W. COX	REVIEWED BY:
REVISIONS	INIT. DATE



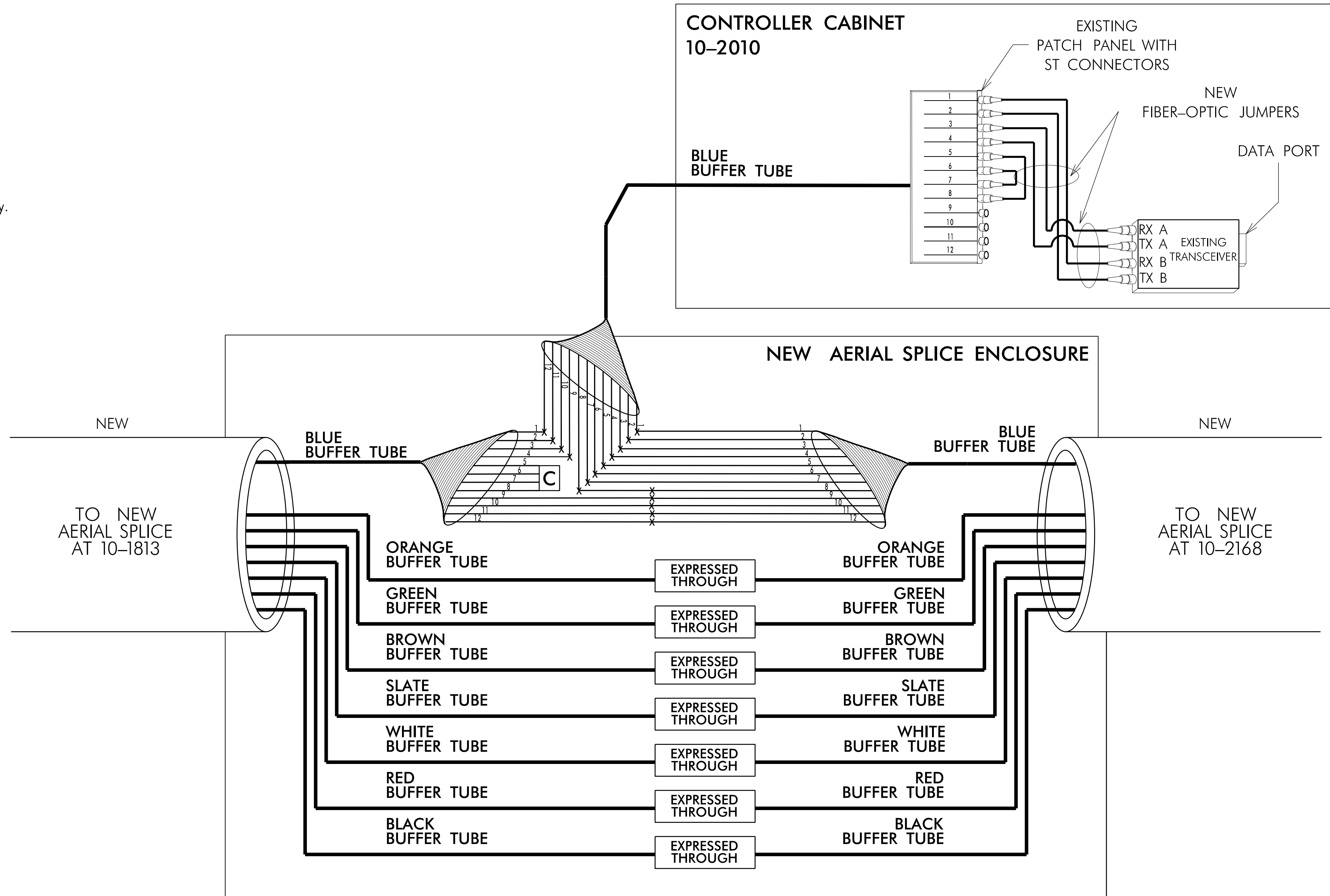
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Steven Cox  
7/7/2016  
CADD Filename:

NEW AERIAL SPLICE ENCLOSURE AT  
SR 1445 (DERITA RD) AND  
THUNDER RD /PNG DRIVEWAY  
SIG. INV. # 10-2010

COLOR CODE TIA/EIA 598-A		LEGEND	
(1) BLUE	(7) RED	X = NEW FUSION SPLICE INDIVIDUAL FIBER	
(2) ORANGE	(8) BLACK	C = CAP, COIL, AND SEAL	
(3) GREEN	(9) YELLOW		
(4) BROWN	(10) VIOLET		
(5) SLATE	(11) ROSE		
(6) WHITE	(12) AQUA		

Notes:  
Unused fibers left coiled and stored in splice tray.  
Unused Buffer Tubes left coiled and stored in splice tray.



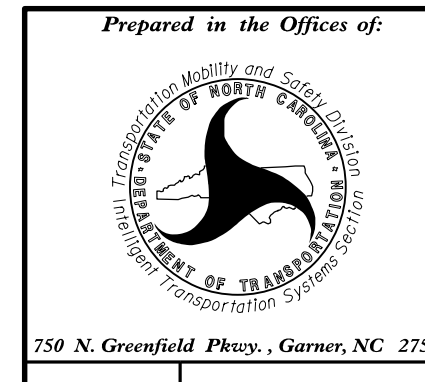
INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:  
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"

- 1) SPLICE LOCATION
- 2) DATE
- 3) COMPANY NAME
- 4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

- NOTES:
1. NOTIFY THE CITY OF CONCORD TRAFFIC ENGINEER, ANDREI DUMITRU, AT (704) 920-5377 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE CONCORD TRANSPORTATION DIRECTOR AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.
  2. TRANSCEIVER TERMINATION CONFIGURATIONS ARE GENERIC. THE CITY OF CONCORD IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATIONS AND SHALL PERFORM ALL SPLICING AND TERMINATIONS IN CONTROLLER CABINET.
  3. CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE PLANS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGMENT DIFFERS FROM THE SUPPLIED SPLICE PLANS.

DOCUMENT NOT CONSIDERED FINAL  
UNLESS ALL SIGNATURES COMPLETED



SPLICE DETAILS	
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PREPARED BY: S.W. Cox	REVIEWED BY:
REVISIONS	INIT. DATE

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