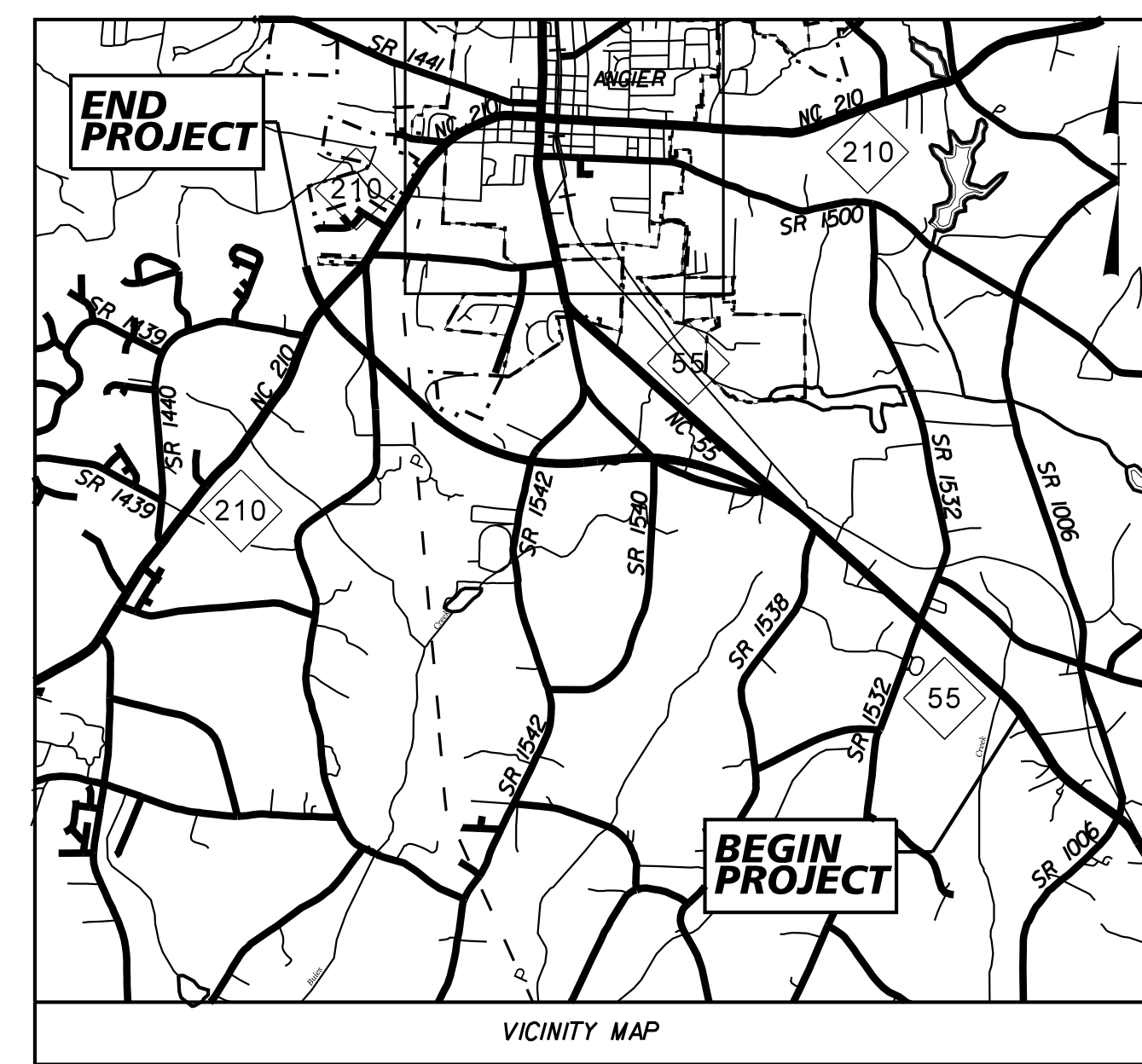


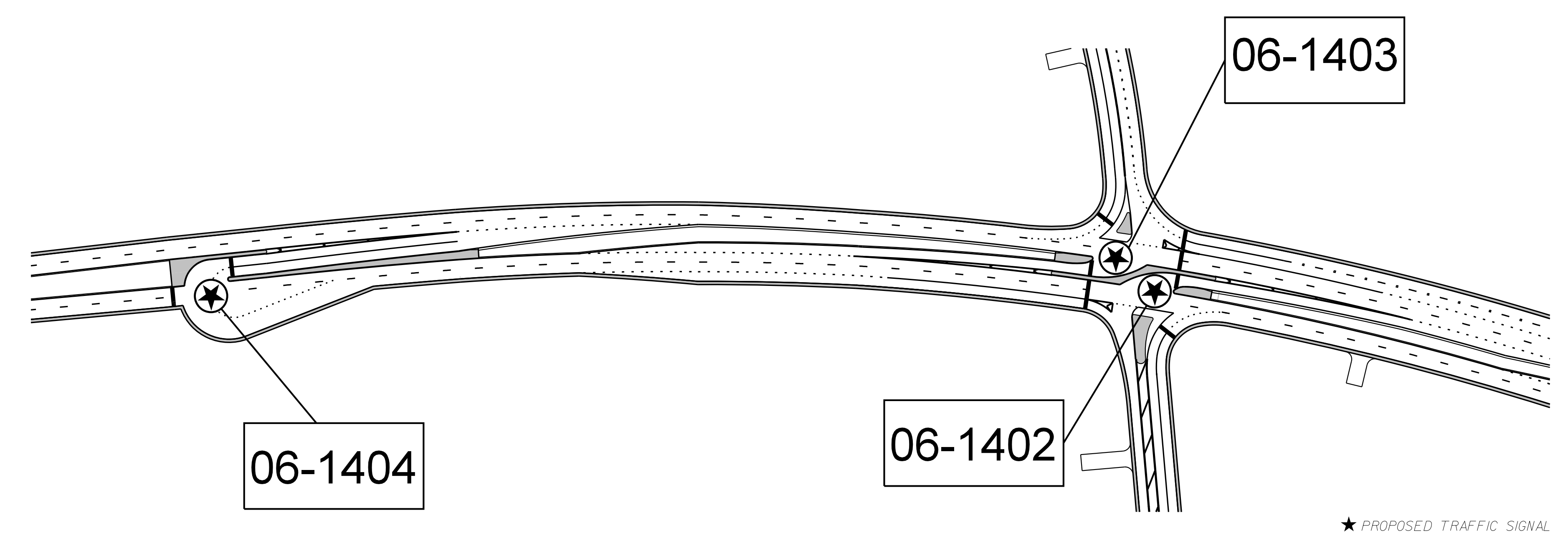
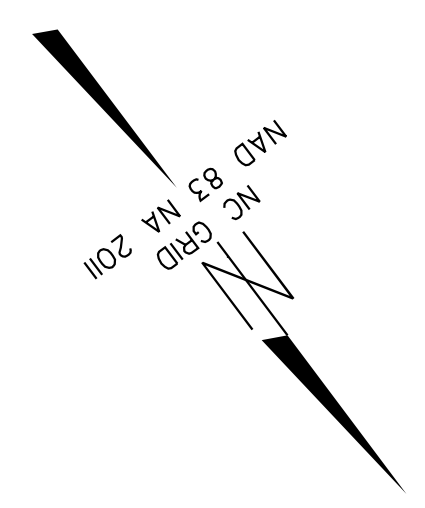
TIP PROJECT: R-5705A



STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS

# HARNETT COUNTY

LOCATION: NC 55 BYPASS FROM NC 210 TO U-TURN SOUTH OF NC 210  
TYPE OF WORK: TRAFFIC SIGNAL DESIGN AND CABLE ROUTING



★ PROPOSED TRAFFIC SIGNAL

Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.

Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	-----	Title Sheet	
Sig. 1.1-1.2	-----	2018 Standard Plate Sheets	
Sig. 2.0-2.4	06-1402	NC 55 Bypass Northbound at NC 210	
Sig. 3.0-3.4	06-1403	NC 55 Bypass Southbound at NC 210	
Sig. 4.0-4.2	06-1404	NC 55 Bypass Northbound at U-Turn South of NC 210	
Sig. M1-M8	-----	Standard Metal Pole Sheets	
SCP 1-5	-----	Signal Communication Plans	

NCDOT SIGNAL CONTACT:

Zachary Little, P.E.  
EASTERN REGION SIGNALS ENGINEER

Keith M. Mims, P.E.  
SIGNAL EQUIPMENT DESIGN ENGINEER

Gregory A. Green  
SIGNAL COMMUNICATIONS PROJECT ENGINEER

PLANS PREPARED BY:

**Kimley»Horn** © 2022  
421 Fayetteville Street, Suite 600  
Raleigh, North Carolina 27601  
PE NO. F-0102

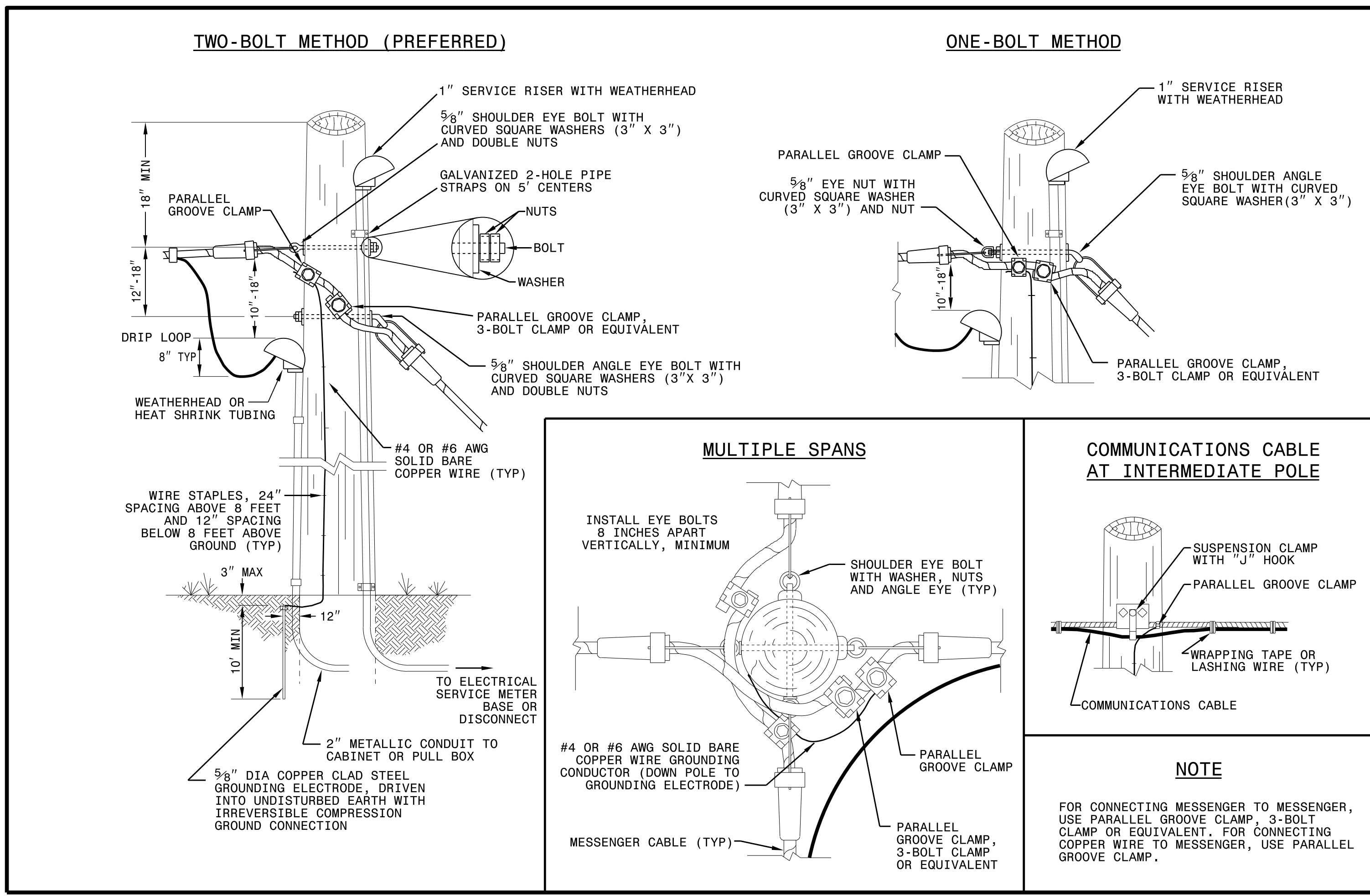
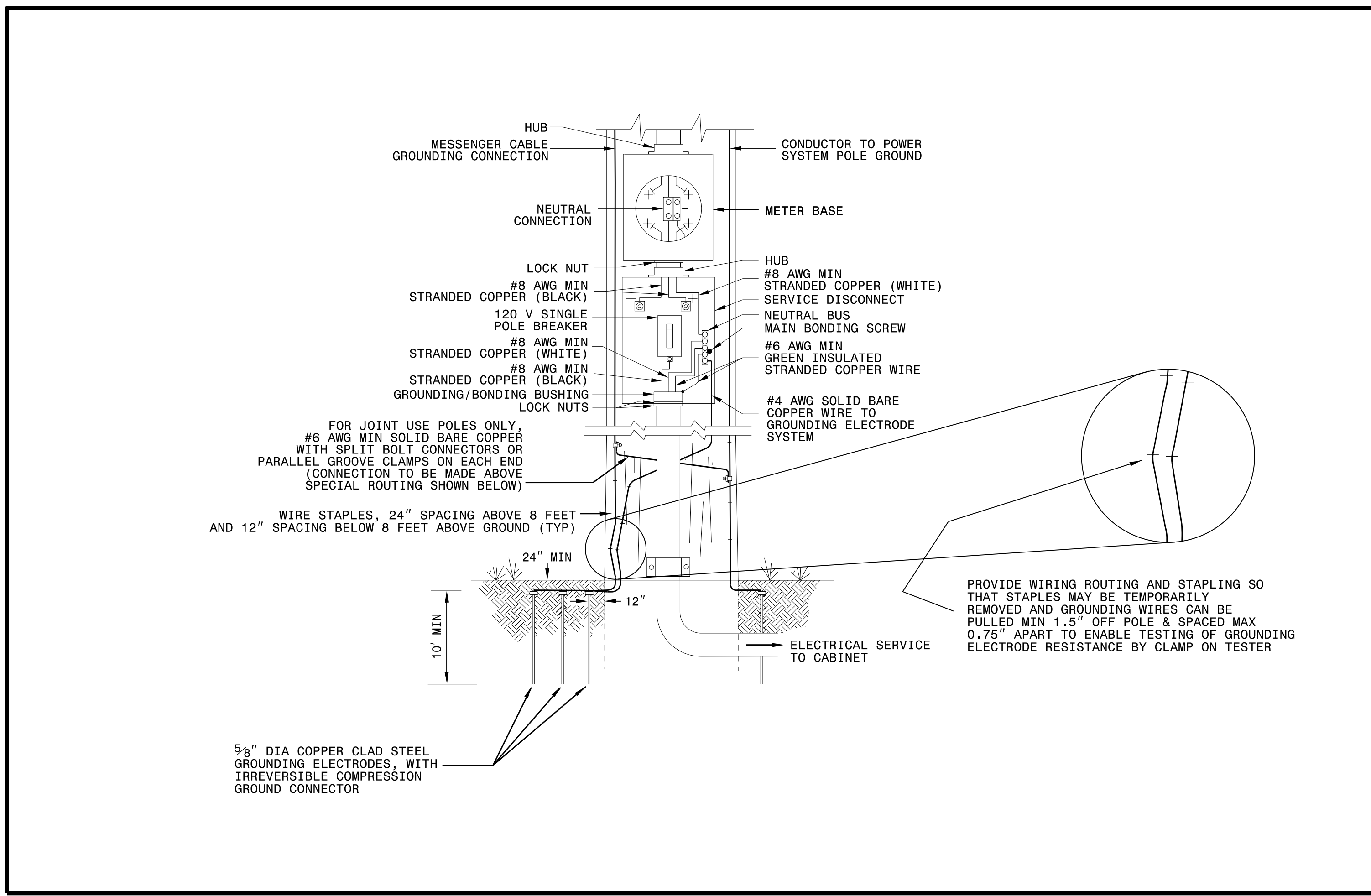
Kevin P. Baumann, P.E.  
TRAFFIC SIGNAL ENGINEER

DocuSigned by:  
*Kevin P. Baumann*  
SIGNATURE: 3/3/2023 P.E.

Prepared for:  
DIVISION OF HIGHWAYS  
TRANSPORTATION MOBILITY & SAFETY DIVISION

TSMO UNIT

750 N. Greenfield Parkway, Garner, NC 27529



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

See Plate for Title

Prepared in the Offices of:

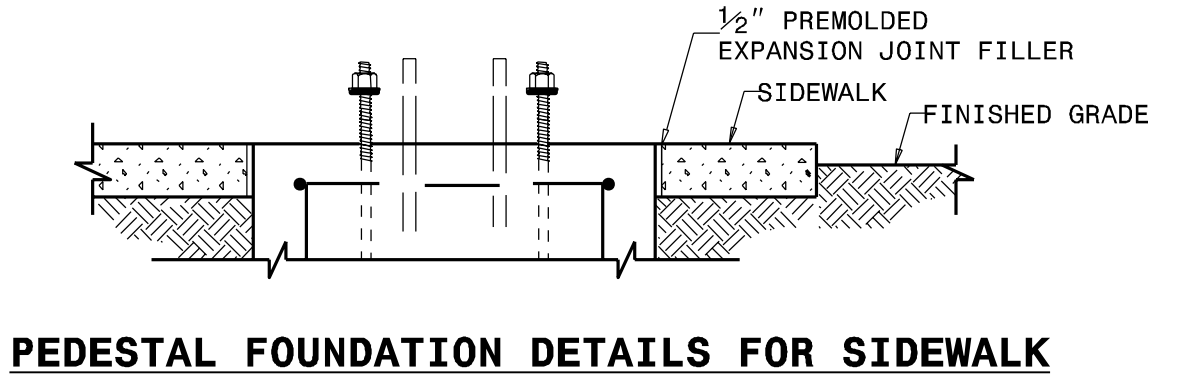
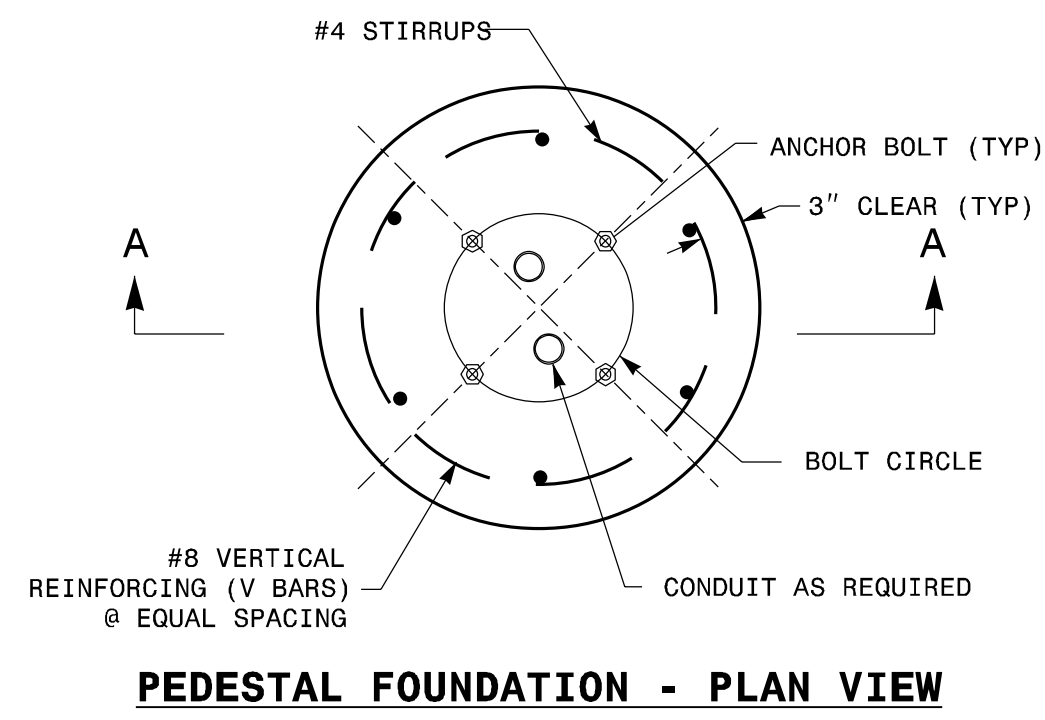
SEAL

DocuSigned by:  
*Mohd Aslami*

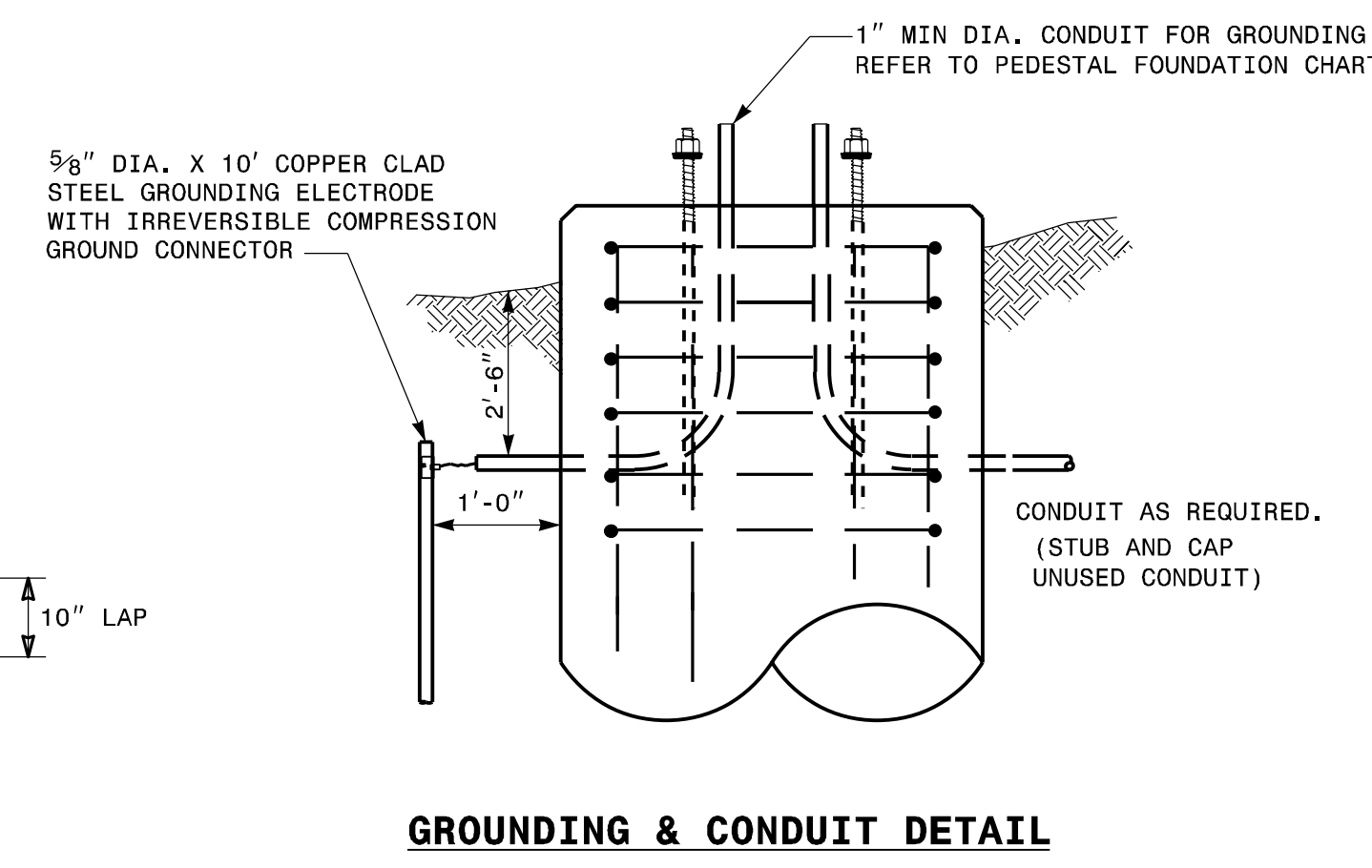
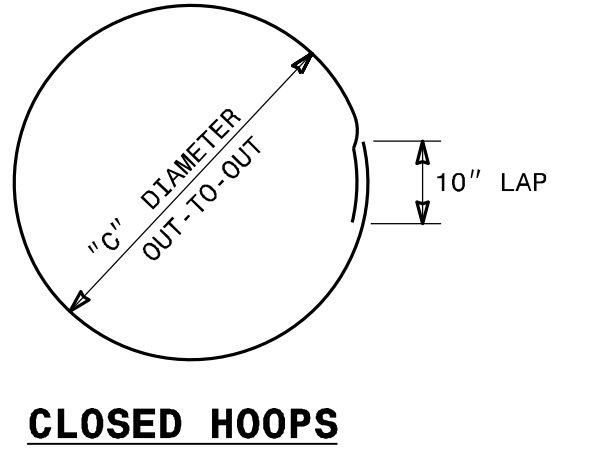
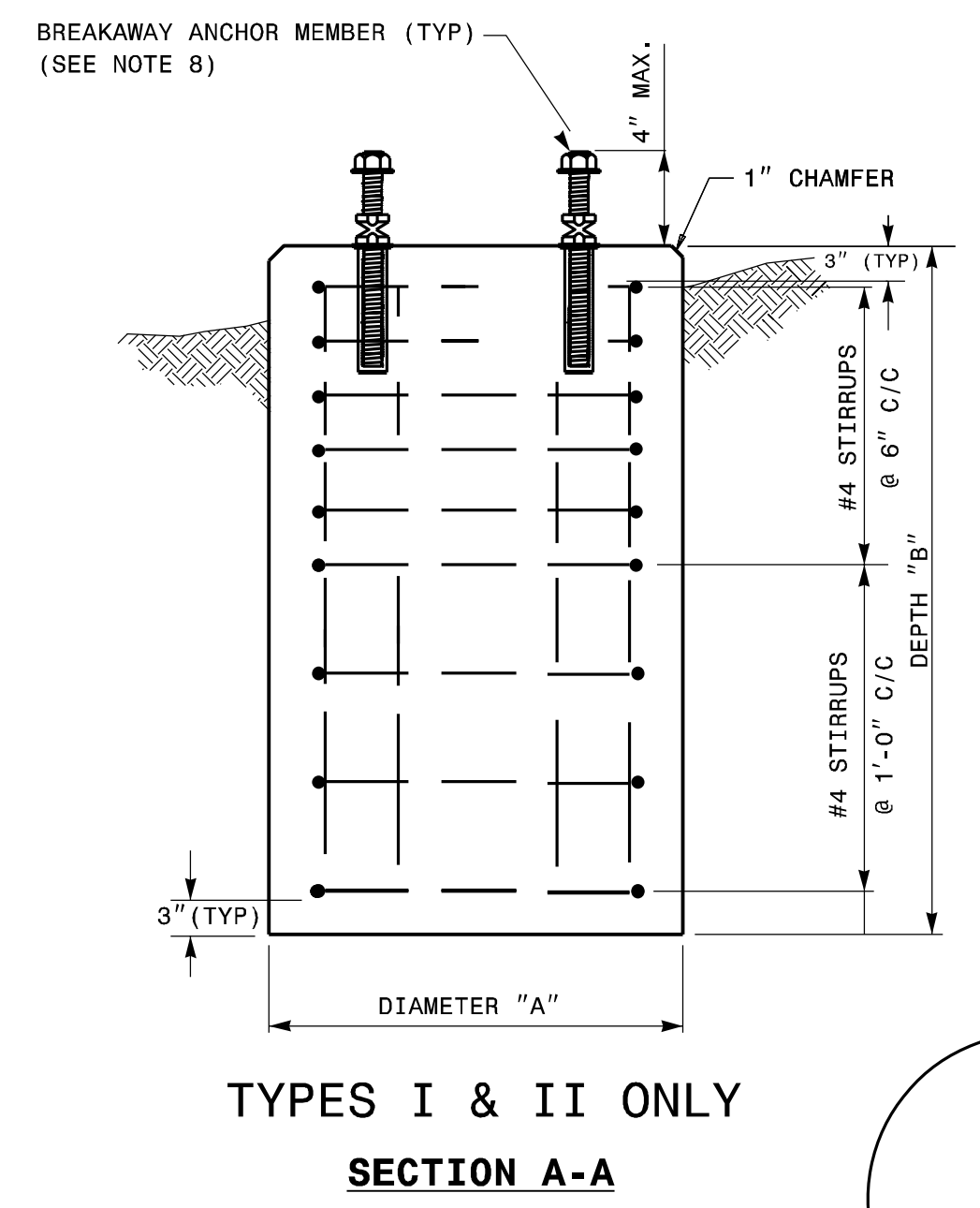
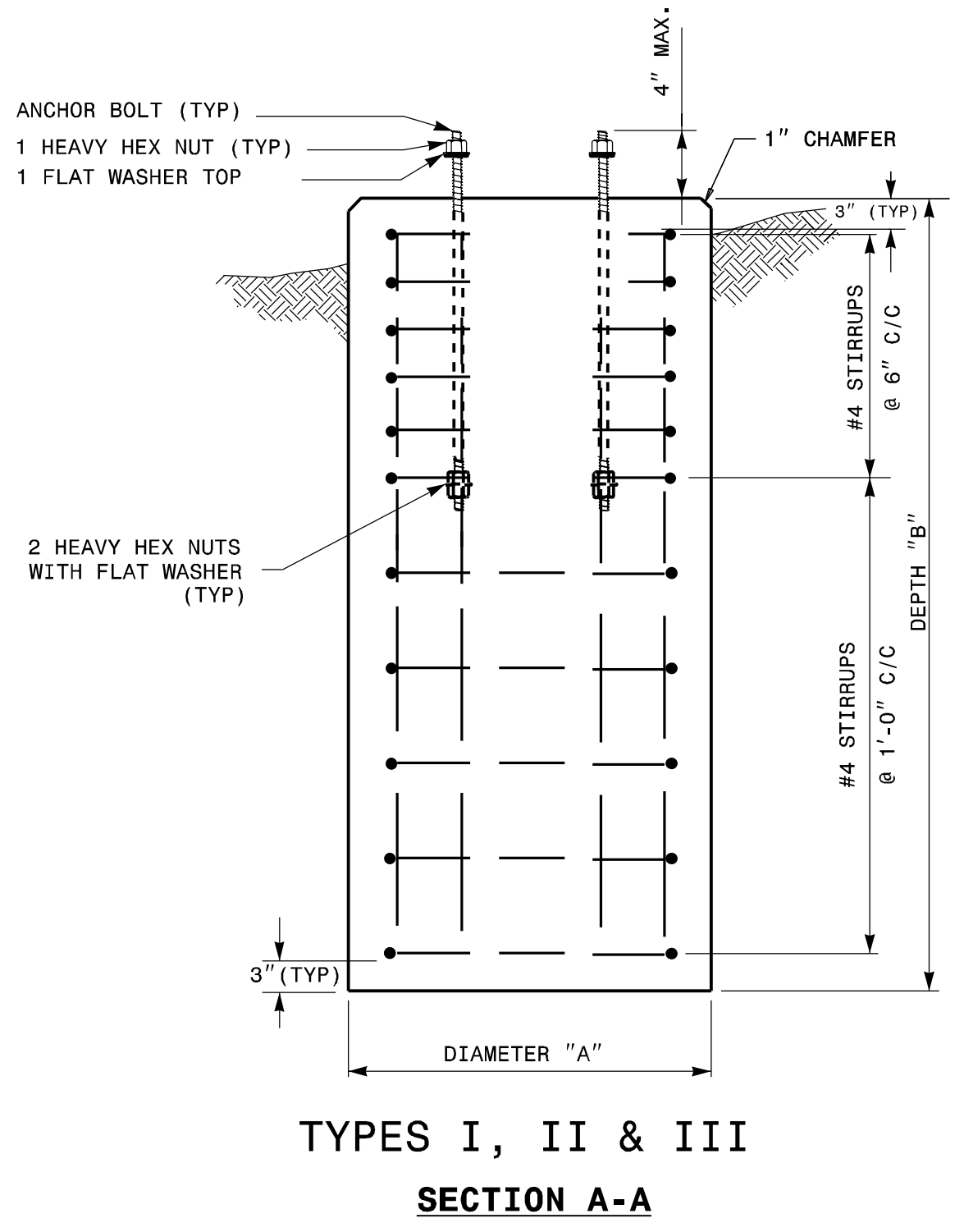
750 N. Greenfield Parkway  
Garner, NC 27529

10/11/2017  
DATE

11-0CT-2017\_08-56  
11-2018\_S14\_DrawingPlate\_Sheets2018\_Plate\_Sheet.dgn  
r:\rough



- NOTES:**
- CAST FOUNDATION AGAINST UNDISTURBED SOIL WHEREVER CONDITIONS PERMIT. IN UNSTABLE SOIL, CAST-IN-PLACE TUBE FORMS ARE ALLOWED WITH APPROVAL.
  - COMPLY WITH APPLICABLE PROVISIONS OF SECTION 825 FOR CONCRETE CONSTRUCTION.
  - USE CLASS "A" CONCRETE THAT MEETS THE REQUIREMENTS OF SECTION 1000 WITH A COMPRESSION STRENGTH AT 28 DAYS OF  $F'c=3000$  PSI (MIN.).
  - USE ASTM GRADE 60 DEFORMED BARS FOR ALL REINFORCING STEEL.
  - GRADE IS ASSUMED TO BE (8H:1V) OR FLATTER. FOUNDATION SIZE AND DEPTHS ARE BASED ON THE FOLLOWING SOIL DESIGN PARAMETERS:
    - A. SANDY TYPE SOIL
    - B. NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
    - C. WIND SPEED NOT TO EXCEED 140 MPH
 IF ACTUAL CONDITIONS VARY SUBSTANTIALLY FROM THOSE ASSUMED, THE FOUNDATION DEPTH MAY BE ADJUSTED. IN THIS CASE, CONTACT THE ENGINEER.
  - MAINTAIN AT LEAST 3" COVER ON ALL REINFORCEMENT.
  - ORIENT CONDUIT AS REQUIRED BY THE DESIGN OR AS DICTATED BY FIELD CONDITIONS.
  - USE ADHESIVE ANCHOR FOR THREADED COUPLING INSERT. FOR TYPE I MINIMUM DEPTH NECESSARY IS 0'-4 $\frac{1}{2}$ " AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6 $\frac{5}{8}$ ". FOLLOW MANUFACTURER'S INSTALLATION INSTRUCTIONS.



PEDESTAL FOUNDATION TYPE AND SIZE							
TYPE	PEDESTAL DESCRIPTION	SIZE			ANCHOR BOLT		INSTALL GROUNDING SYSTEM (YES/NO)
		DIAMETER "A" FT	DEPTH "B" FT	CONCRETE VOLUME CY	DIAMETER (MIN.) IN	LENGTH FT-IN	
I	PEDESTRIAN PUSHBUTTON	2'-0"	3'-6"	.41	1/2	1'-6"	NO
II	NORMAL-DUTY	2'-0"	5'-0"	.58	3/4	2'-0"	YES
III	HEAVY-DUTY	2'-6"	7'-0"	1.27	1	4'-0"	YES

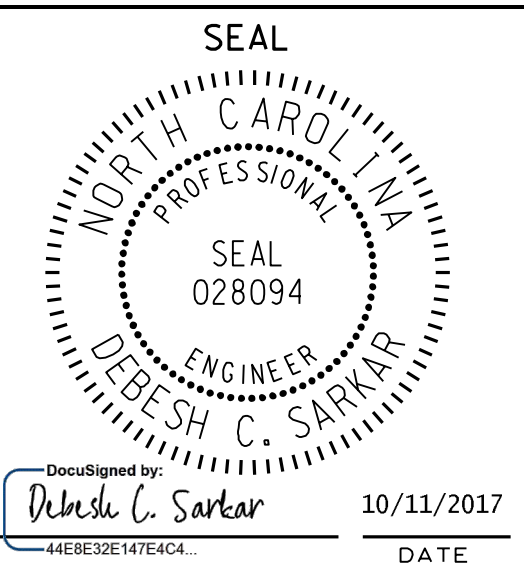
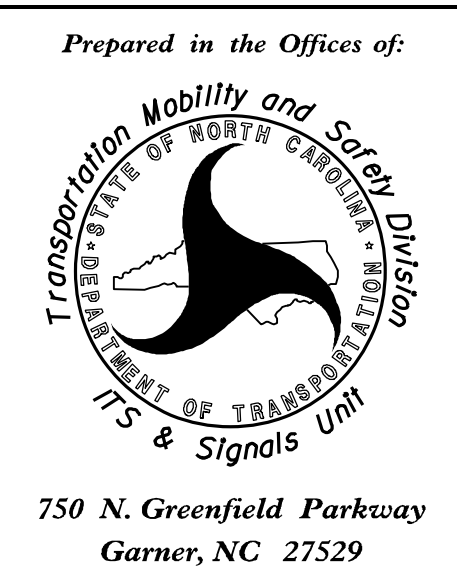
REINFORCING STEEL SCHEDULE												
TYPE	V-BAR				STIRRUP							
	SIZE #	QTY	LENGTH	WEIGHT LBS	QUANTITY			LENGTH	DIAMETER "C" FT	OVERLAP MIN.	WEIGHT LBS	TOTAL STEEL WEIGHT LBS
					VERTICAL SPACING ON 6" CENTERS	ON 12" CENTERS	TOTAL					
I	8	6	3'-0"	56	4	0	4	4	5'-7"	1'-6"	0'-10"	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	175

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

ENGLISH STANDARD DRAWING FOR  
**PEDESTALS**  
FOUNDATIONS

SHEET 1 OF 1  
**1743D01**

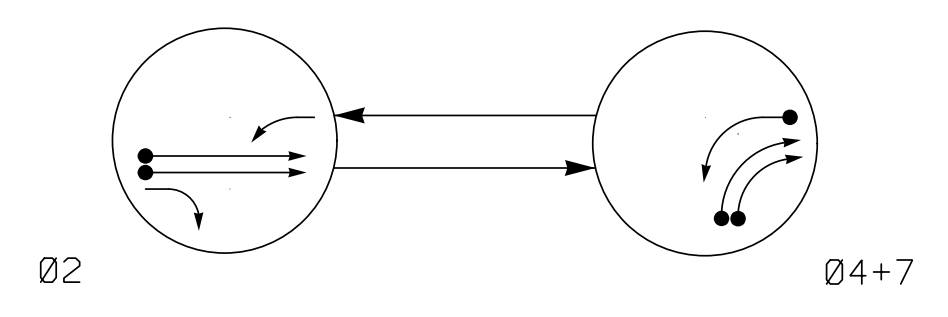
See Plate for Title



DOCUMENT NOT CONSIDERED  
FINAL UNLESS ALL  
SIGNATURES COMPLETED

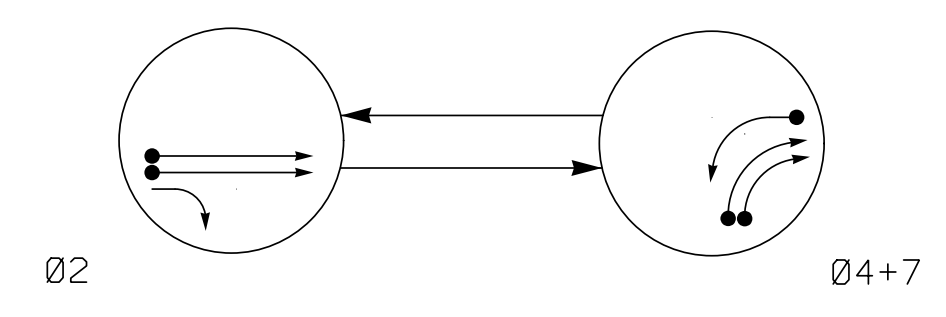
11-0CT-2017\_08-03  
11-2018\_S14 Drawings\*Plate\_Sheets\*2018\_Plate\_Sheet - .dgn  
r:\rough

DEFAULT PHASING DIAGRAM



SIGNAL FACE	PHASE		
	Ø 2	Ø 4+7	FLASH
21,22	G	R	Y
23	-	R	Y
41,42,43	R	-	R
71,72	F	-	Y

ALTERNATE PHASING DIAGRAM



SIGNAL FACE	PHASE		
	Ø 2	Ø 4+7	FLASH
21,22	G	R	Y
23	-	R	Y
41,42,43	R	-	R
71,72	R	-	Y

MAXTIME DETECTOR INSTALLATION CHART										
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING					
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL DELAY DURING GREEN
2A	6X6	420	6	X	2	-	-	X	X	X
2B	6X6	420	6	X	2	-	-	X	X	X
4A	6X40	0	2-4-2	X	4	15	-	X	X	X
4B	6X40	0	2-4-2	X	4	15	-	X	X	X
7A	6X40	0	2-4-2	X	7	15*	-	X	X	X

\* Disable delay during Alternate Phasing operation.

2 Phase Fully Actuated w/ Alternate Phasing NC 55 Byp. Closed Loop System

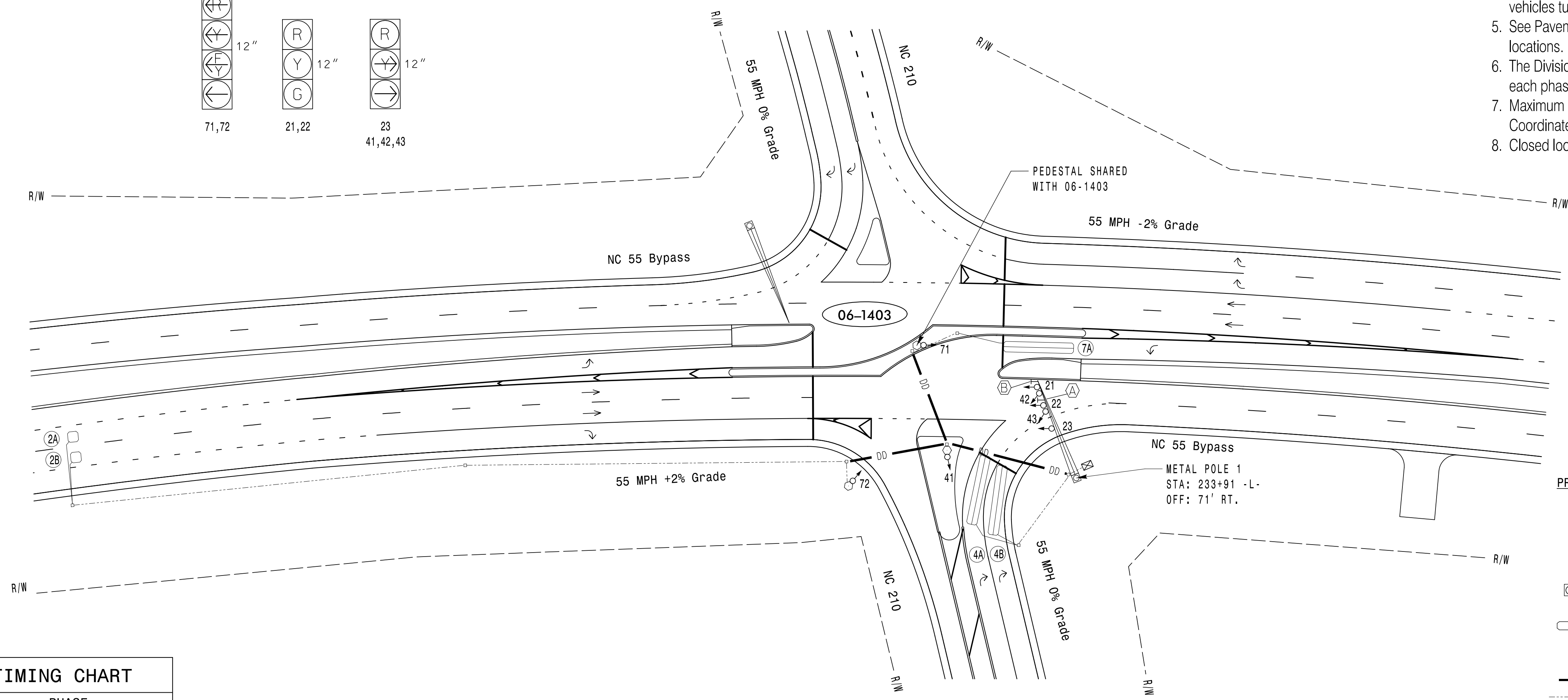
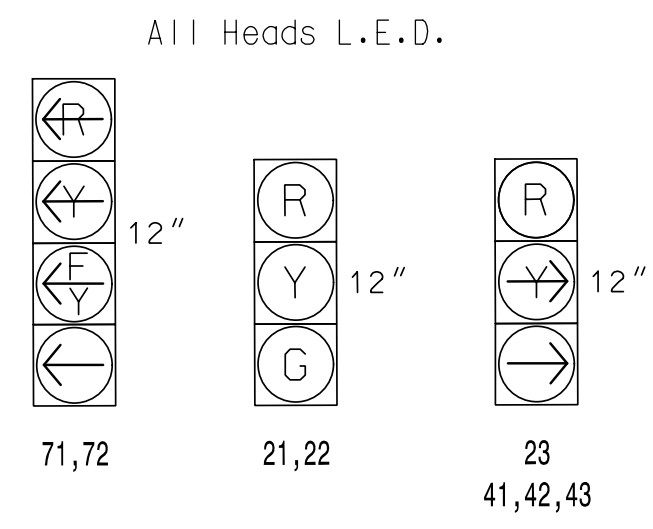
NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Set all detector units to presence mode.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- See Pavement Marking plans for proposed stop bar and crosswalk locations.
- The Division Traffic Engineer will determine the hours of use for each phasing plan.
- 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 #1402.

PHASING DIAGRAM DETECTION LEGEND

- → DETECTED MOVEMENT
- → UNDETECTED MOVEMENT (OVERLAP)
- → UNSIGNALIZED MOVEMENT
- ⇄ PEDESTRIAN MOVEMENT

SIGNAL FACE I.D.



FEATURE	PHASE		
	2	4	7
Walk *	-	-	-
Ped Clear *	-	-	-
Min Green	14	7	7
Passage *	6.0	2.0	2.0
Max 1 *	90	30	30
Yellow Change	5.0	3.0	3.0
Red Clear	2.0	2.8	2.8
Added Initial *	1.8	-	-
Maximum Initial *	46	-	-
Time Before Reduction *	15	-	-
Time To Reduce *	45	-	-
Minimum Gap	3.4	-	-
Advance Walk	-	-	-
Non Lock Detector	-	X	X
Vehicle Recall	MIN RECALL	-	-
Dual Entry	-	X	X

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

PROPOSED	EXISTING
	N/A
	N/A

New Installation

Prepared for:  
  
 750 N. Greenfield Pkwy, Garner, NC 27529  
 PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

NC 55 Bypass Northbound at NC 210  
 Division 6 Harnett County Angier  
 PLAN DATE: August 2022 REVIEWED BY: KP Baumann  
 PREPARED BY: CF Davis REVIEWED BY:  
 REVISIONS INIT. DATE

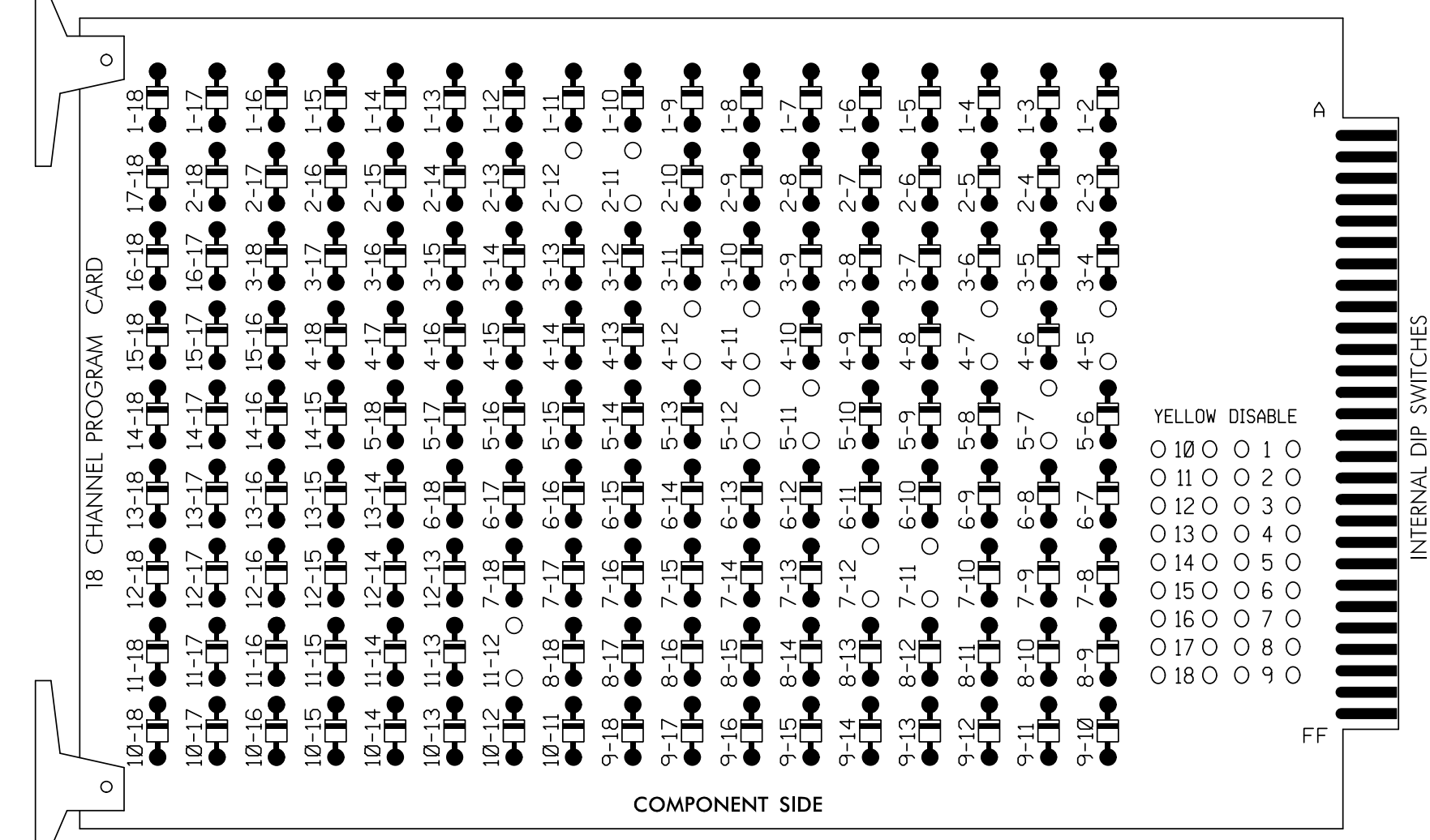
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED  
 SEAL  
  
 Kevin P. Baumann  
 PROFESSIONAL ENGINEER  
 044434  
 6/22/2023  
 SIGNATURE  
 S1G. INVENTORY NO. 06-1402

6/21/2023 2:48:30 PM c:\a\d\davis \*\*\*k:\in\ey-horn.com\CL\_RAL\RAL\_Roadway\011036479 - R-5705A - NC 55\Signal\Signal\54 - S1\Signal Design - MaxTime2.0 06-1402-2023.dgn

### 18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 2-II, 2-12, 4-5, 4-7, 4-II, 4-12, 5-7, 5-II, 5-12, 7-II, 7-12, and II-12



REMOVE JUMPERS AS SHOWN

**NOTES:**

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- 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 7 for Dual Entry.
- Program controller to start up in phase 2 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
- The cabinet and controller are part of the NC 55 Bypass Closed Loop System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....Q-Free MAXTIME  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S5,S7,S10,AUX S4,AUX S5  
 PHASES USED.....2,4,7  
 OVERLAP "1".....NOT USED  
 OVERLAP "2".....NOT USED  
 OVERLAP "3".....\*  
 OVERLAP "4".....\*  
 OVERLAP "5".....NOT USED  
 OVERLAP "6".....NOT USED  
 OVERLAP "7".....\*  
 \* See overlap programming detail on sheet 2

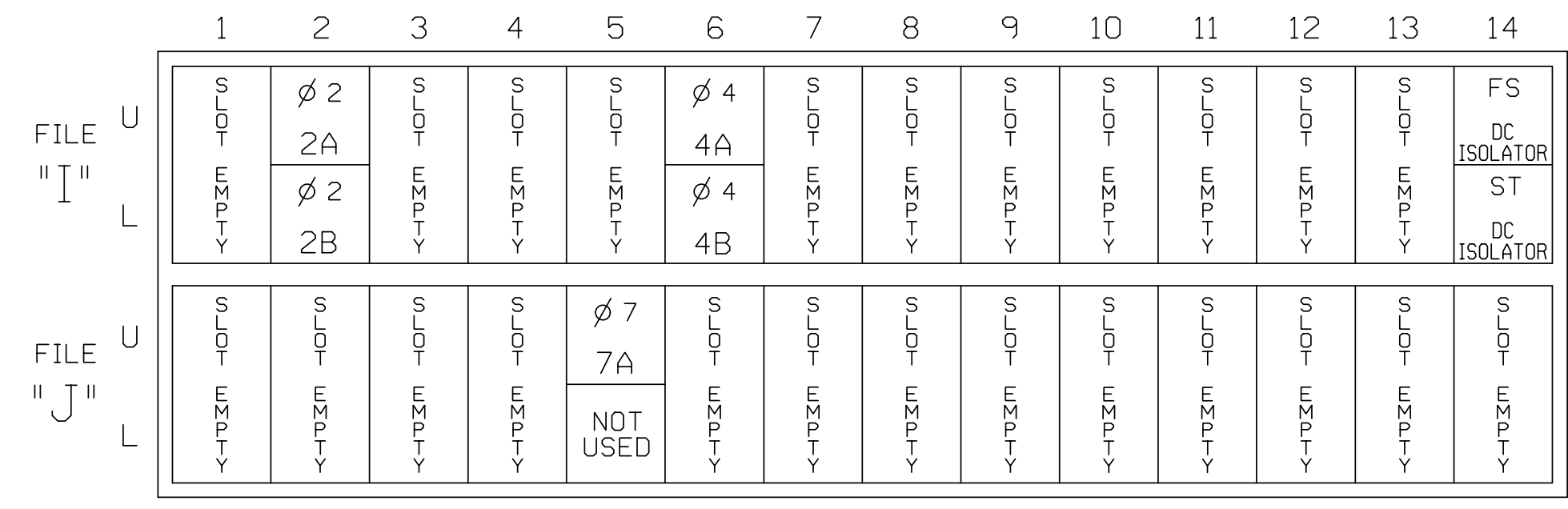
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	OL7	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	23	NU	NU	41,42,43	72	71	71	71	71	71	71	71	71	71	71	71
RED		128	128			101												
YELLOW		129					*			*								
GREEN		130																
RED ARROW																A114	A101	
YELLOW ARROW			129			102										A115	A102	
FLASHING YELLOW ARROW																A116	A103	
GREEN ARROW			130			103	133			124								

NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 ★ See pictorial of head wiring in detail this sheet.  
 NOTE: Load switch S7 requires special output remapping. See sheet 2 of this electrical detail for instruction.

### INPUT FILE POSITION LAYOUT

(front view)



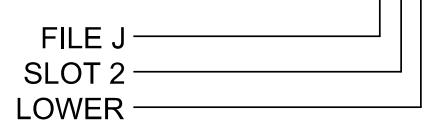
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2					X	X	
2B	TB2-7,8	I2L	43	5	3					X	X	
4A	TB4-9,10	I6U	41	3	8		15			X	X	
4B	TB4-11,12	I6L	45	7	9		15			X	X	
7A	TB5-5,6	J5U	57	19	21	7★	15			X	X	

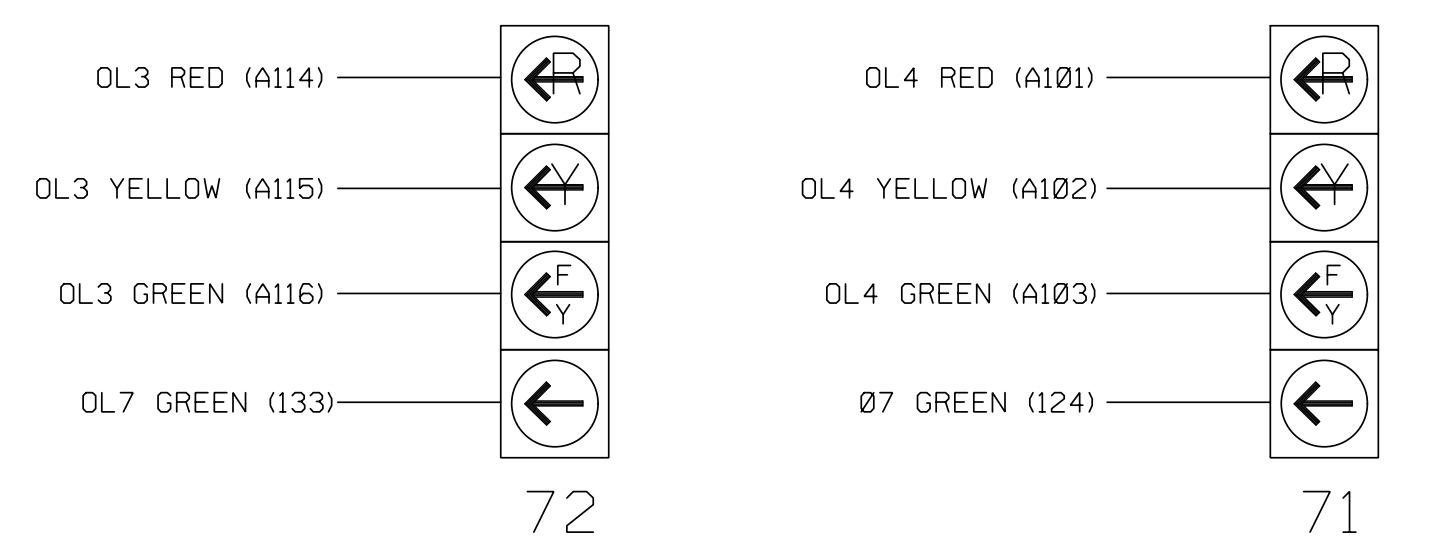
INPUT FILE POSITION LEGEND: J2L



★ For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.

### FYA SIGNAL WIRING DETAIL

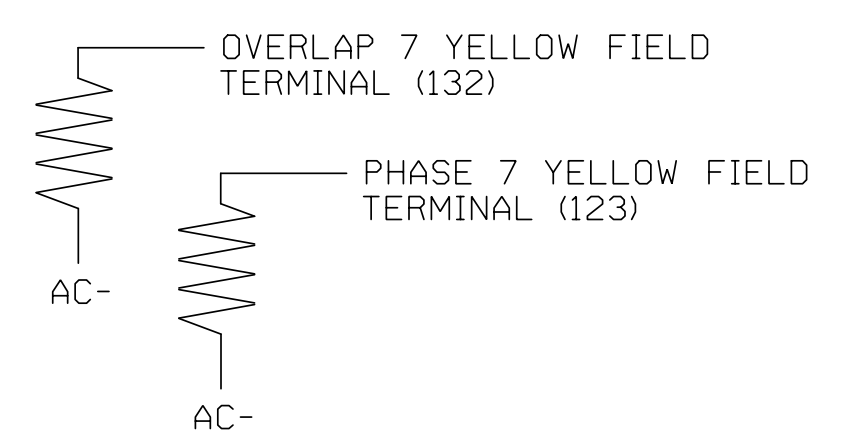
(wire signal heads as shown)



### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

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



PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

Electrical Detail - Sheet 1 of 3

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

Prepared For: **NC 55 Bypass Northbound at NC 210**

Division 6 Harnett County Angier

PLAN DATE: August 2022 REVIEWED BY: KP Baumann

PREPARED BY: CF Davis REVIEWED BY:

REVISIONS: INIT. DATE

DocuSigned by: **Kevin P. Baumann** 6/22/2023

750 N. Greenfield Pkwy, Garner, NC 27529

SIG. INVENTORY NO. 06-1402

6/21/2023 2:48:35 PM c:\01\p.davis mki:\meyer-horn.com\c\_ral\RAL\_Roadway\011036479 - R-5705A - NC 55 Signal\sig4 - S1\signal Design - MaxTime2.1 06-1402-2023p.dgn

### MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel  
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface  
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	3	4	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	2	2	7
Modifier Phases	-	7	-
Modifier Overlaps	7	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

### MAXTIME OUTPUT CHANNEL CONFIGURATION

Front Panel  
Main Menu >Controller >More>Channels>Channels Config

Web Interface  
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Phase Vehicle	1		X	X	1
2	Phase Vehicle	2	X			2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Overlap	7		X		5
6	Phase Vehicle	6	X		X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1	X		X	9
10	Overlap	2		X	X	10
11	Overlap	3	X			11
12	Overlap	4	X			12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

NOTICE OVERLAP 7  
ASSIGNED TO CHANNEL 5 →

← NOTICE CHANNELS  
11 AND 12 FLASH  
YELLOW

### MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel  
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface  
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	3	4	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	-	-	7
Modifier Phases	-	7	-
Modifier Overlaps	7	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

← NOTICE INCLUDED PHASE

### MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING LOOP 7A

Front Panel  
Main Menu >Controller >Detector >Veh Det Plans

Web Interface  
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

7A

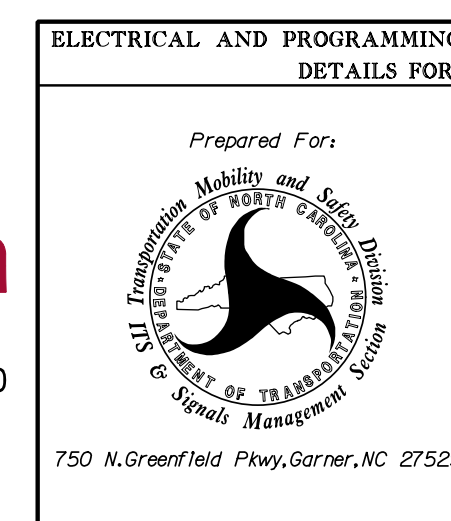
Detector	Call Phase	Delay
21	7	-

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1402  
DESIGNED: August 2022  
SEALED: 06/22/2023  
REVISED: N/A

6/21/2023 2:48:36 PM cr0101.davis mki:\my-horn.com\CAL\MRAL\_Roadway\011036479 - R-5705A - NC 55 Signal\54 - S1\signal Design - MaxTime2.1 06-1402-2023.r.dgn

Electrical Detail - Sheet 2 of 3

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
NC License #F-0102  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000



ELECTRICAL AND PROGRAMMING DETAILS FOR:	
Prepared For:	
NC 55 Bypass Northbound at NC 210	
Division 6	Harnett County Angier
PLAN DATE: August 2022	REVIEWED BY: KP Baumann
PREPARED BY: CF Davis	REVIEWED BY:
REVISIONS	INIT. DATE

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

SEAL

STATE OF NORTH CAROLINA

PROFESSIONAL ENGINEER

KEVIN P. BAUMANN

044434

DocuSigned by: Kevin P. Baumann

6/22/2023

SIG. INVENTORY NO. 06-1402

### MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2.  
A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	2

### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

- OVERLAP PLAN 2: Modifies overlap included phases for heads 71 and 72 to run protected turns only.
- VEH DET PLAN 2: Reduces delay time for phase 7 call on loop 7A to 0 seconds.

### MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel  
Main Menu >Controller >Coordination >Patterns

Web Interface  
Home >Controller >Coordination >Patterns

Pattern Parameters

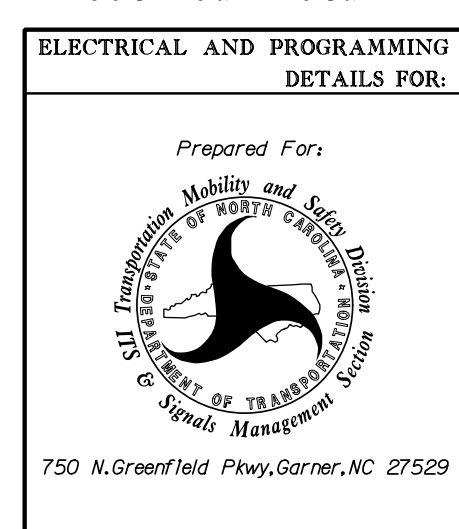
Pattern	Veh Det Plan	Overlap Plan
*	2	2

\* The Pattern number(s) are to be determined by the Division Traffic Engineer.

THIS ELECTRICAL DETAIL IS FOR  
THE SIGNAL DESIGN: 06-1402  
DESIGNED: August 2022  
SEALED: 06/22/2023  
REVISED: N/A

6/21/2023 2:48:37 PM c:\01\p.davis \*\*\*Kimley-Horn.com\CL\_RAL\RAL\_Roadway\011036479 - R-5705A - NC 55\Signal\Signal\54 - S1\Signal Design - MaxTime2.1 06-1402-2023.r.dgn

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
NC License #F-0102  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000



Electrical Detail - Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 55 Bypass Northbound at NC 210	
Prepared For:	Division 6	Harnett County	Angier
PLAN DATE: August 2022	REVIEWED BY: KP Baumann		
PREPARED BY: CF Davis	REVIEWED BY:		
REVISIONS	INIT.	DATE	

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

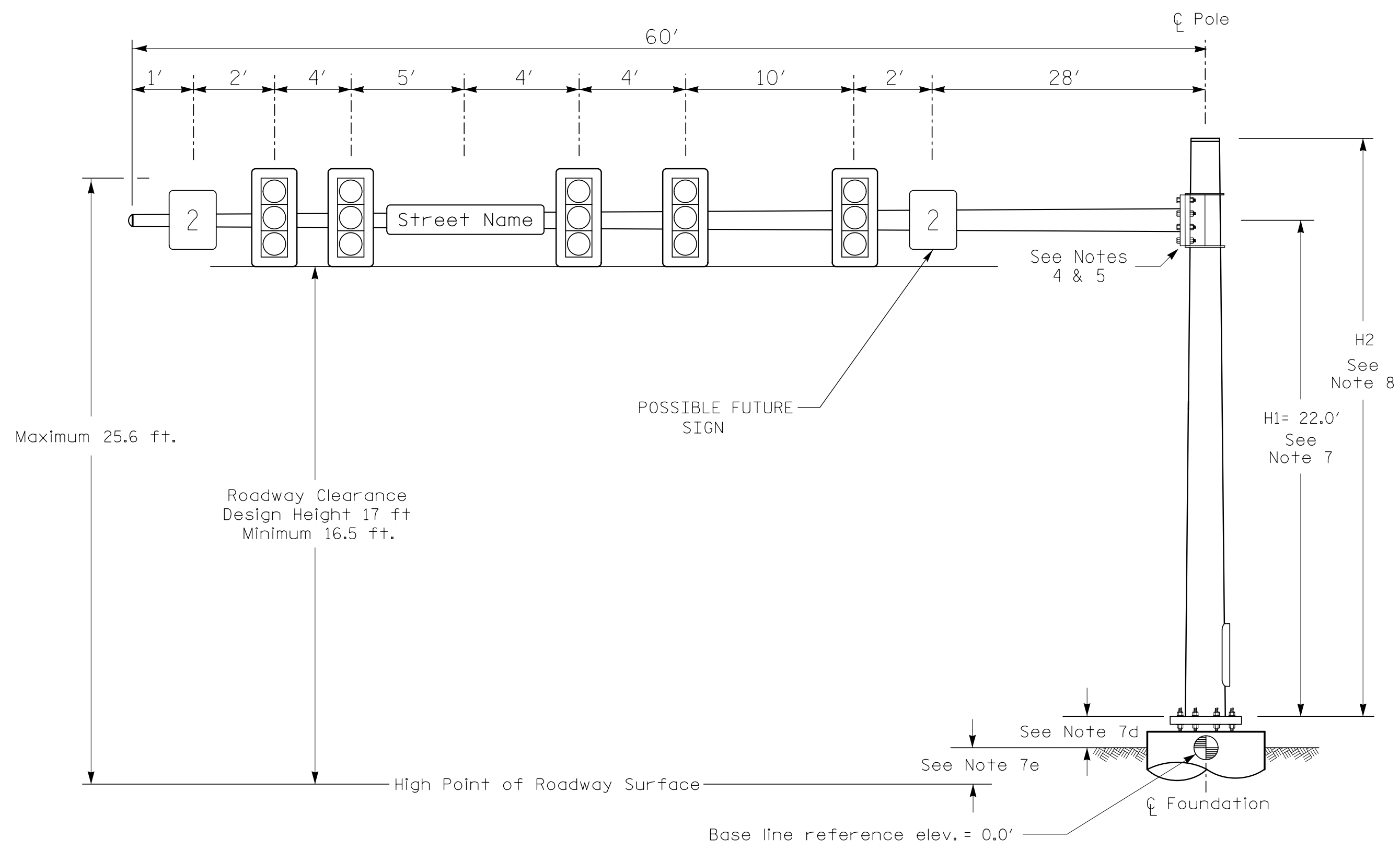
SEAL

STATE OF NORTH CAROLINA  
PROFESSIONAL ENGINEER  
SEAL 044434  
KEVIN P. BAUMANN

DocuSigned by:  
*Kevin P. Baumann*  
6/22/2023  
5DC709A9BCB447

SIG. INVENTORY NO. 06-1402

### Design Loading for METAL POLE NO. 1



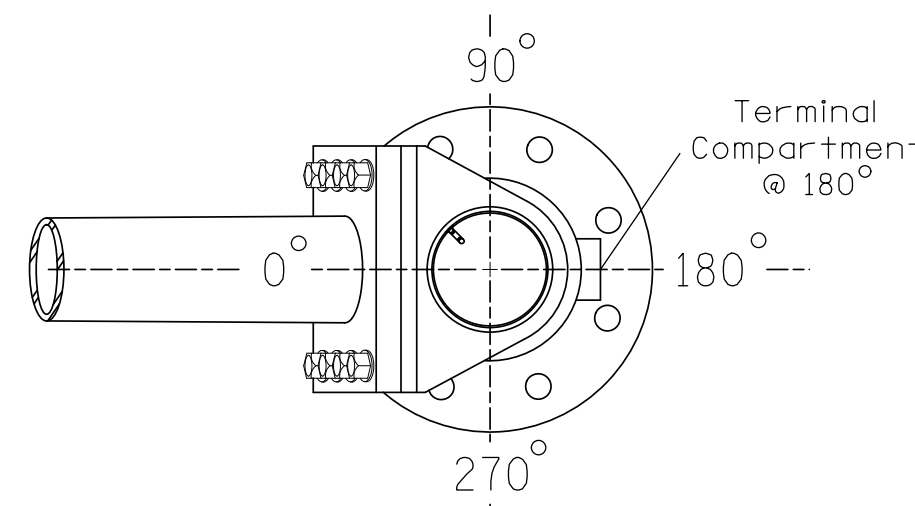
Elevation View

### SPECIAL NOTE

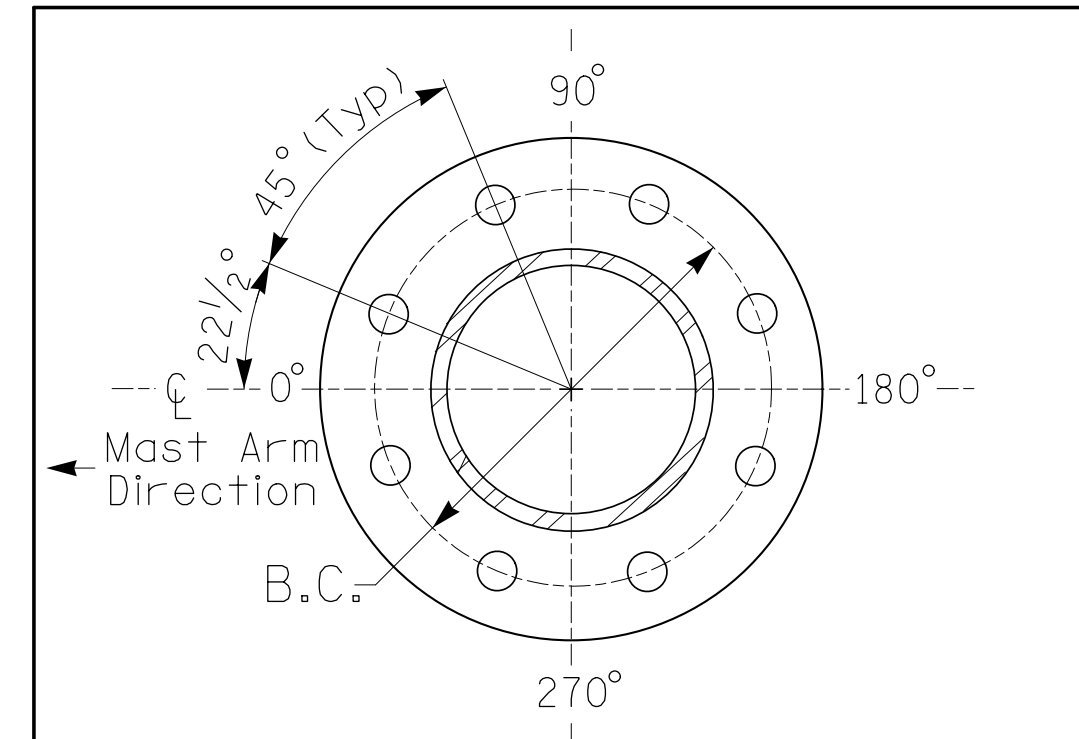
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:		Pole 1
Baseline reference point at $\phi$ Foundation @ ground level		0.0 ft.
Elevation difference at High point of roadway surface		+3.0 ft.
Elevation difference at Edge of travelway or face of curb		+3.0 ft.

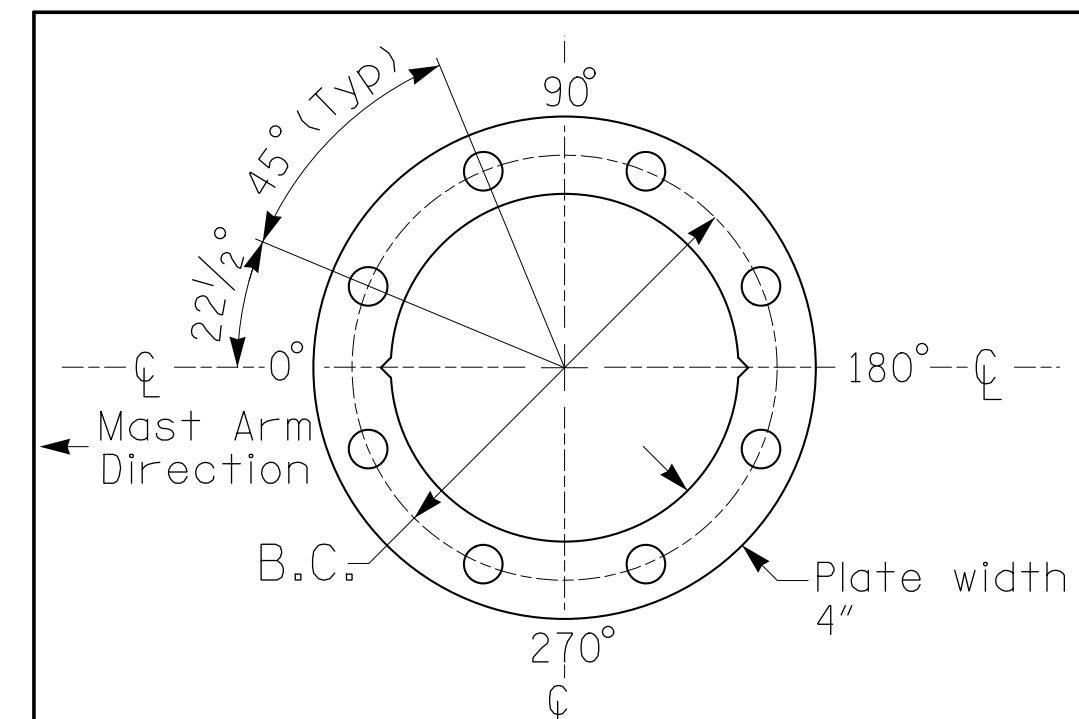


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

### METAL POLE No. 1

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	Sig. 2.4

#### MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
2	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 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 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
  - The 2018 NCDOT Roadway Standard Drawings.
  - The traffic signal project plans and special provisions.
  - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

##### 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 are rigidly mounted and vertically centered on the mast arm.
  - The roadway clearance height for design is as shown in the elevation views.
  - The top of the pole base plate is 0.75 feet above the ground elevation.
  - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
  - Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the 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 Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 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 3 (110 mph)

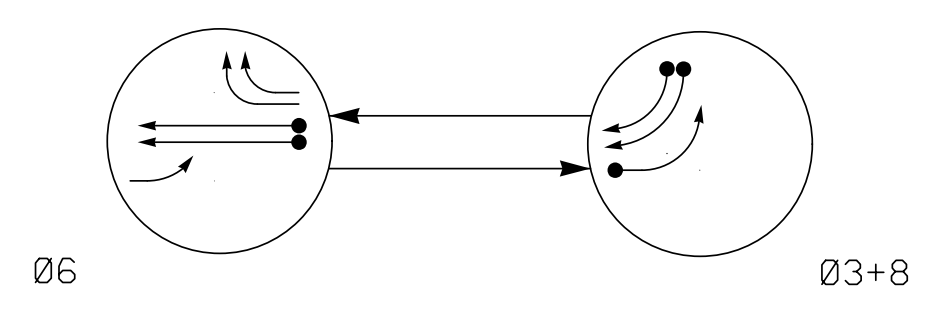
PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
NC License #F-0102  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000

	<b>NC 55 Bypass Northbound at NC 210</b>		
	Division 6 Harnett County Angier		
PLAN DATE: August 2022 PREPARED BY: CF Davis	REVIEWED BY: KP Baumann		6/22/2023 DATE
SCALE: 0 N/A N/A	REVISIONS:		

6/21/2023 2:48:40 PM cr01g.davis  
 \\k:\meyer-horn.com\CL\_RAL\_M\RAL\_Roadway\011036479 - R-5705A - NC 55 Signal\564 - 51 Signal Design - MaxTime2.4 06-1402-2023MP.dgn



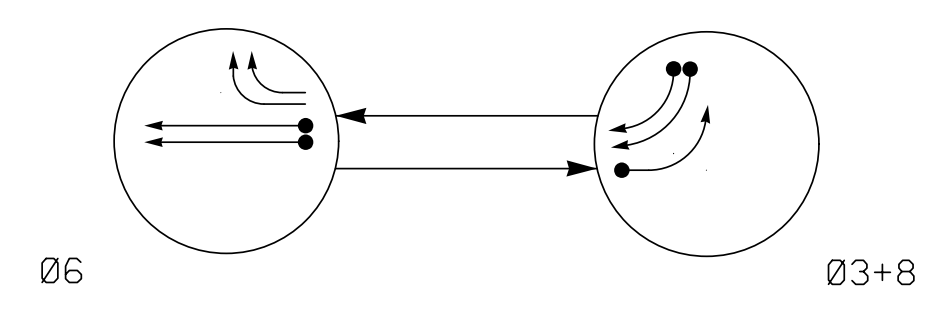
**DEFAULT PHASING DIAGRAM**



**DEFAULT PHASING TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	06	03+8	FLASH
31,32	F	←	←
61,62	G	R	Y
63,64	←	R	Y
81,82,83	R	→	R

**ALTERNATE PHASING DIAGRAM**



**ALTERNATE PHASING TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	06	03+8	FLASH
31,32	←	←	←
61,62	G	R	Y
63,64	←	R	Y
81,82,83	R	→	R

**MAXTIME DETECTOR INSTALLATION CHART**

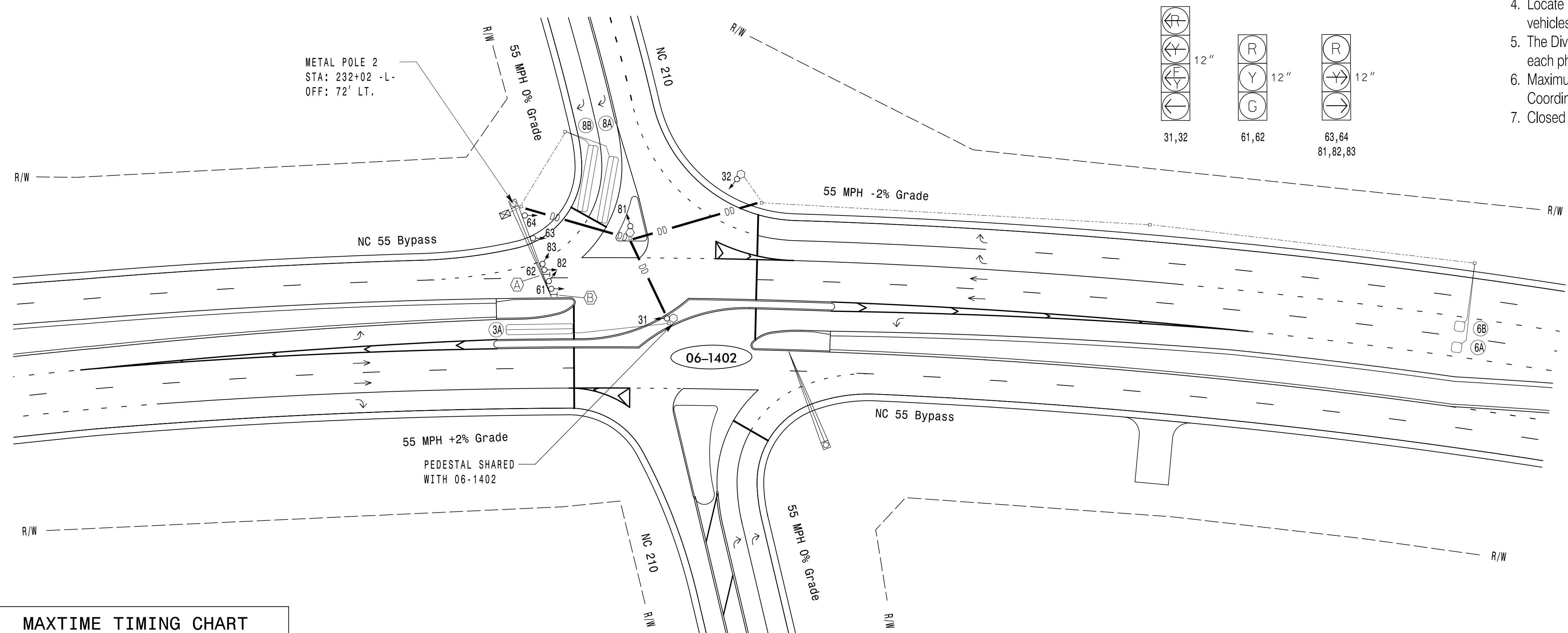
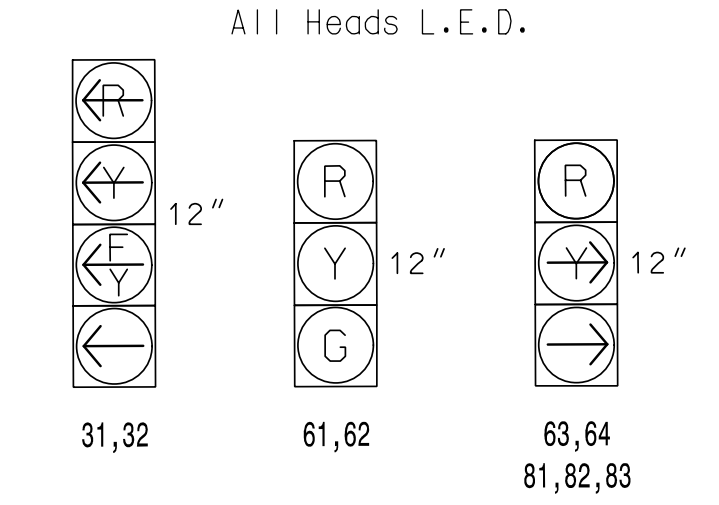
LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN	NEW CARD
3A	6X40	0	2-4-2	X	3	15*	-	X	-	X	-	X
6A	6X6	420	6	X	6	-	-	X	X	X	-	X
6B	6X6	420	6	X	6	-	-	X	X	X	-	X
8A	6X40	0	2-4-2	X	8	15	-	X	-	X	-	X
8B	6X40	0	2-4-2	X	8	15	-	X	-	X	-	X

\* Disable delay during Alternate Phasing operation.

**PHASING DIAGRAM DETECTION LEGEND**

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

**SIGNAL FACE I.D.**



**MAXTIME TIMING CHART**

FEATURE	PHASE		
	3	6	8
Walk *	-	-	-
Ped Clear *	-	-	-
Min Green	7	14	7
Passage *	2.0	6.0	2.0
Max 1 *	30	90	30
Yellow Change	3.0	5.4	3.0
Red Clear	2.8	1.8	2.8
Added Initial *	-	1.8	-
Maximum Initial *	-	46	-
Time Before Reduction *	-	15	-
Time To Reduce *	-	45	-
Minimum Gap	-	3.4	-
Advance Walk	-	-	-
Non Lock Detector	X	-	X
Vehicle Recall	-	MIN RECALL	-
Dual Entry	X	-	X

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

**2 Phase Fully Actuated w/ Alternate Phasing NC 55 Byp. Closed Loop System**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. The Division Traffic Engineer will determine the hours of use for each phasing plan.
6. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
7. Closed loop system data: Controller Asset #1403.

**LEGEND**

PROPOSED	EXISTING
○→ Traffic Signal Head	●→ N/A
○→ Modified Signal Head	○→ N/A
⊥ Sign	⊥ N/A
⊥ Pedestrian Signal Head With Push Button & Sign	⊥ N/A
⊥ Metal Pole with Mastarm	⊥ N/A
○ Type II Signal Pedestal	○ N/A
⊠ Inductive Loop Detector	⊠ N/A
⊠ Controller & Cabinet	⊠ N/A
□ Junction Box	□ N/A
— Directional Drill	— N/A
— 2-in Underground Conduit	— N/A
— Right of Way	— N/A
→ Directional Arrow	→ N/A
⊠ Street Name Sign (D3-1)	⊠ N/A
⊠ No U-Turn/Left Turn Sign (R3-18)	⊠ N/A

**New Installation**

**NC 55 Bypass Southbound at NC 210**

Division 6 Harnett County Angier

PLAN DATE: August 2022 REVIEWED BY: KP Baumann

PREPARED BY: CF Davis REVIEWED BY:

REVISIONS	INIT.	DATE

6/22/2023

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SEAL 044434

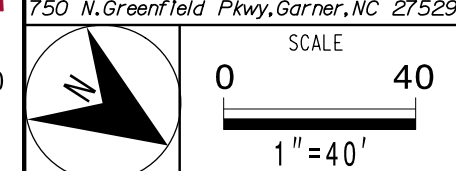
ENGINEER KEVIN P. BAUMANN

SIGNATURE

6/22/2023

SIG. INVENTORY NO. 06-1403

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

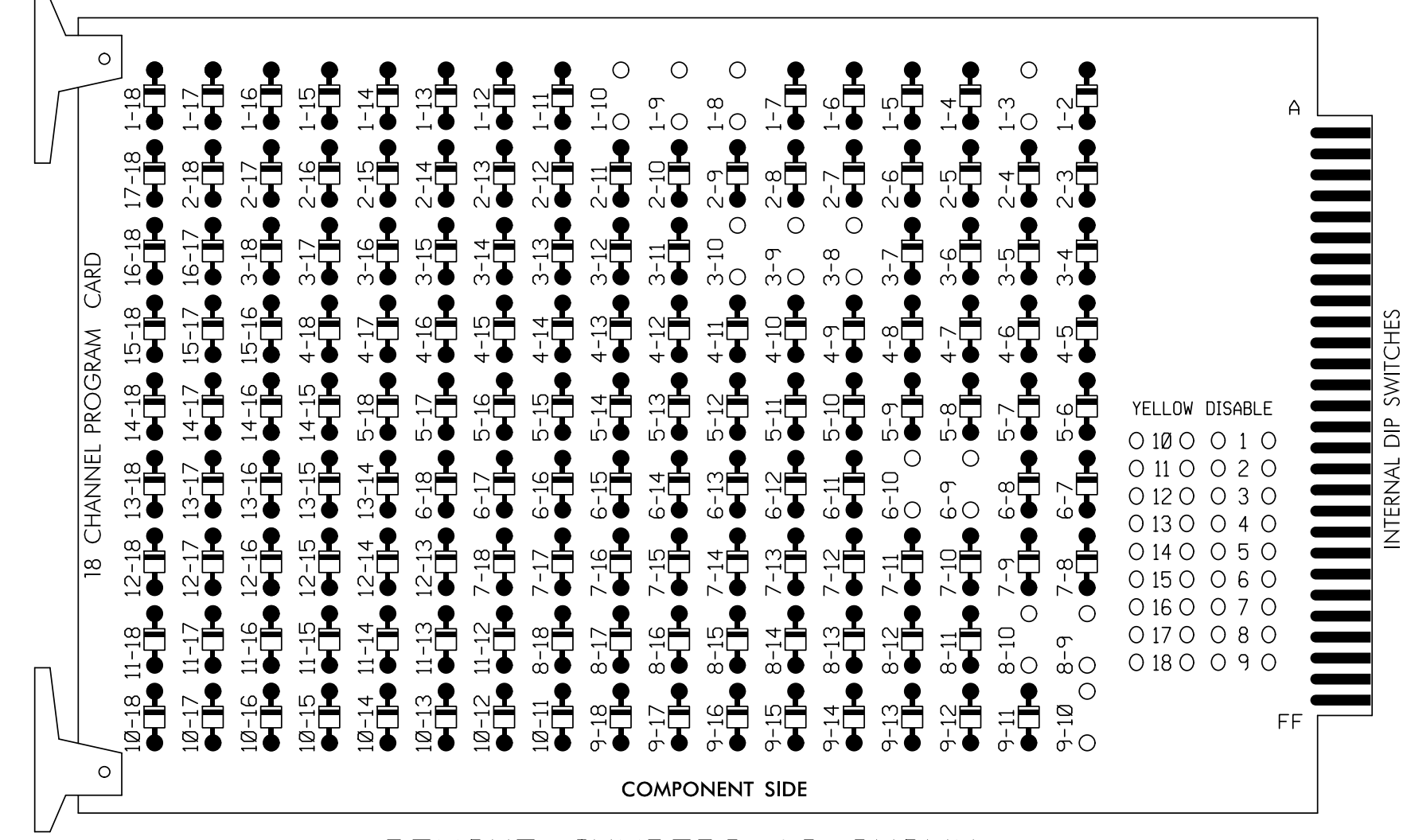


6/21/2023 2:48:55 PM craf01@davis

### 18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

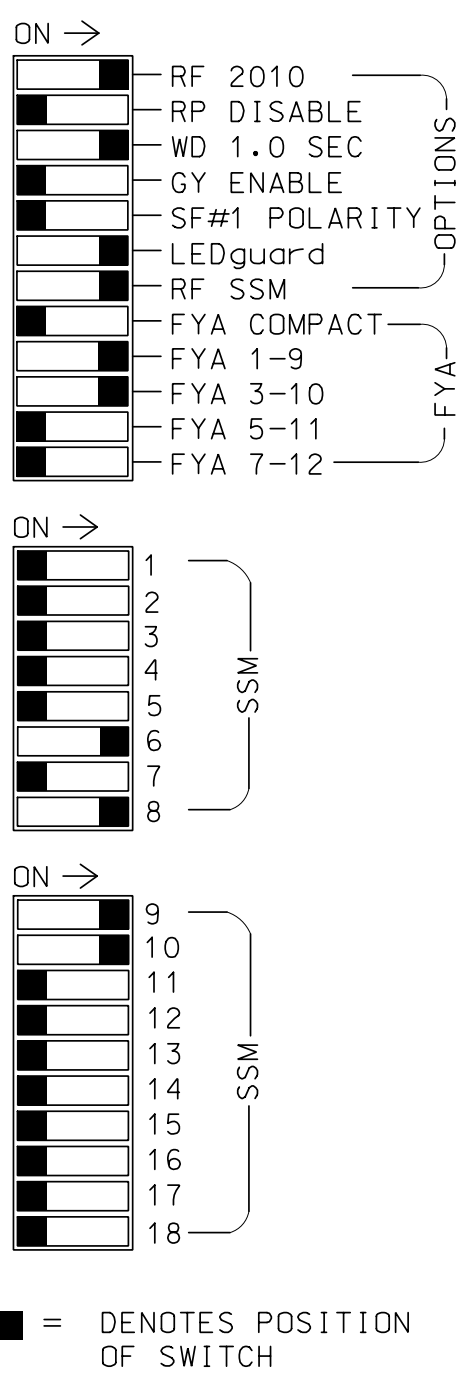
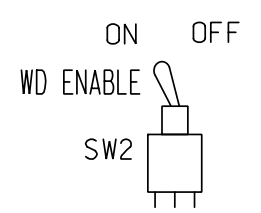
REMOVE DIODE JUMPERS 1-3, 1-8, 1-9, 1-10, 3-8, 3-9, 3-10, 6-9, 6-10, 8-9, 8-10, and 9-10.



REMOVE JUMPERS AS SHOWN

NOTES:

- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
- Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
- Ensure that Red Enable is active at all times during normal operation.
- 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 3 and 8 for Dual Entry.
- Program controller to start up in phase 6 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all enabled detectors.
- The cabinet and controller are part of the NC 55 Bypass Closed Loop System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....0-Free MAXTIME  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S1,S4,S8,S11,AUX S1,AUX S2  
 PHASES USED.....3,6,8  
 OVERLAP "1".....\*  
 OVERLAP "2".....\*  
 OVERLAP "3".....NOT USED  
 OVERLAP "4".....NOT USED  
 OVERLAP "5".....NOT USED  
 OVERLAP "6".....NOT USED  
 OVERLAP "7".....\*

\* See overlap programming detail on sheet 2

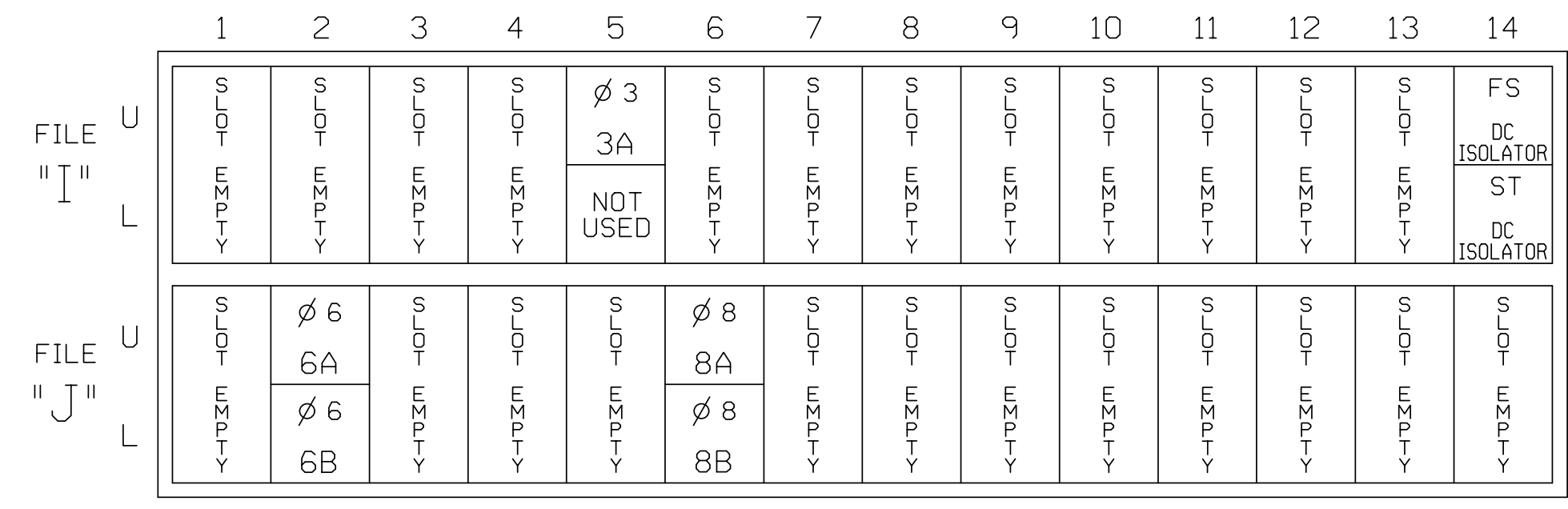
### SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	OL7	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	32	NU	NU	31	NU	NU	NU	61,62	63,64	NU	NU	81,82,83	32	31	NU	NU	NU	NU
RED								134	134			107						
YELLOW	*			*				135										
GREEN								136										
RED ARROW													A121	A124				
YELLOW ARROW								135			108		A122	A125				
FLASHING YELLOW ARROW													A123	A126				
GREEN ARROW	127			118				136			109							

NU = Not Used  
 \* Denotes install load resistor. See load resistor installation detail this sheet.  
 \* See pictorial of head wiring in detail this sheet.  
 NOTE: Load switch S1 requires special output remapping. See sheet 2 of this electrical detail for instruction.

### INPUT FILE POSITION LAYOUT

(front view)



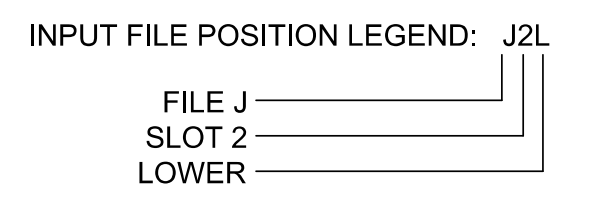
EX.: 1A, 2A, ETC. = LOOP NO.'S

FS = FLASH SENSE  
 ST = STOP TIME

### INPUT FILE CONNECTION & PROGRAMMING CHART

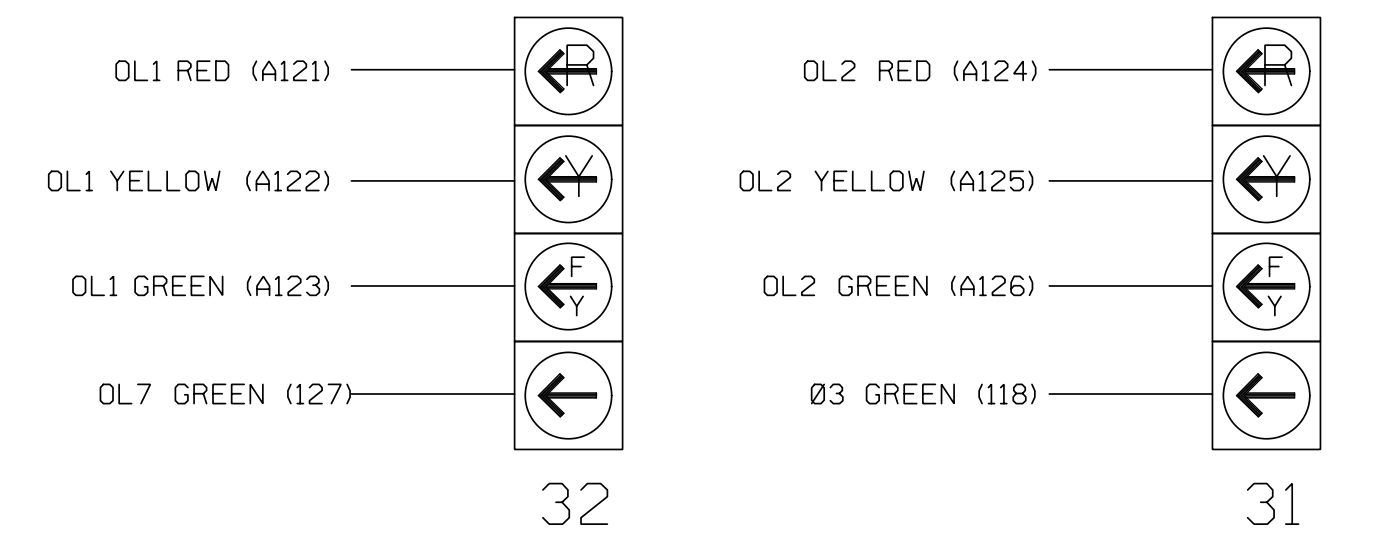
LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
3A	TB4-5,6	I6U	58	20	7	3	15		X		X	
6A	TB3-5,6	J2U	40	2	16	6			X	X	X	
6B	TB3-7,8	J2L	44	6	17	6			X	X	X	
8A	TB5-9,10	J6U	42	4	22	8	15		X		X	
8B	TB5-11,12	J6L	46	8	23	8	15		X		X	

\* For the detectors to work as shown on the signal design plan, see the Vehicle Detector Setup Programming Detail for Alternate Phasing on sheet 2.



### FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)

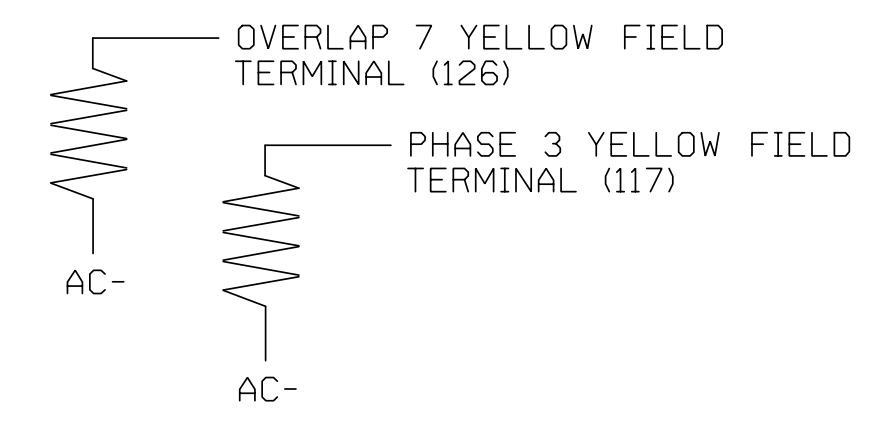


### LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown)

ACCEPTABLE VALUES

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



Electrical Detail - Sheet 1 of 3

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000



NC 55 Bypass Southbound at NC 210  
 Division 6 Harnett County Angier  
 PLAN DATE: August 2022 REVIEWED BY: KP Baumann  
 PREPARED BY: CF Davis REVIEWED BY:

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1403  
 DESIGNED: August 2022  
 SEALED: 06/22/2023  
 REVISED: N/A  
 6/22/2023 DATE  
 SIG. INVENTORY NO. 06-1403

### MAXTIME OVERLAP PROGRAMMING DETAIL FOR DEFAULT PHASING

Front Panel  
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface  
Home >Controller >Overlap Configuration >Overlaps

Overlap Plan 1

Overlap	1	2	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	6	6	3
Modifier Phases	-	3	-
Modifier Overlap	7	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

### MAXTIME OUTPUT CHANNEL CONFIGURATION

Front Panel  
Main Menu >Controller >More>Channels>Channels Config

Web Interface  
Home >Controller >Advanced IO>Channels>Channels Configuration

Channel Configuration

Channel	Control Type	Control Source	Flash Yellow	Flash Red	Flash Alt	MMU Channel
1	Overlap	7		X	X	1
2	Phase Vehicle	2	X			2
3	Phase Vehicle	3		X	X	3
4	Phase Vehicle	4		X		4
5	Phase Vehicle	5		X		5
6	Phase Vehicle	6	X		X	6
7	Phase Vehicle	7		X		7
8	Phase Vehicle	8		X	X	8
9	Overlap	1	X		X	9
10	Overlap	2	X		X	10
11	Overlap	3	X			11
12	Overlap	4		X		12
13	Phase Ped	2				13
14	Phase Ped	4				14
15	Phase Ped	6				15
16	Phase Ped	8				16
17	Overlap	5		X	X	17
18	Overlap	6		X		18

NOTICE OVERLAP 7 ASSIGNED TO CHANNEL 1 →

← NOTICE CHANNELS 9 AND 10 FLASH YELLOW

### MAXTIME OVERLAP PROGRAMMING DETAIL FOR ALTERNATE PHASING

Front Panel  
Main Menu >Controller >Overlap >Overlap Parameters/Overlap Timings

Web Interface  
Home >Controller >Overlap Configuration >Overlaps

In the table view of the web interface, right click on "Overlap" in the top left corner of the table. Copy the entire contents of Overlap Plan 1. Paste Overlap Plan 1 into Overlap Plan 2. Modify Overlap Plan 2 as shown below and save changes.

Overlap Plan 2

Overlap	1	2	7
Type	FYA 4 - Section	FYA 4 - Section	Normal
Included Phases	-	-	3
Modifier Phases	-	3	-
Modifier Overlap	7	-	-
Trail Green	0	0	0
Trail Yellow	0.0	0.0	0.0
Trail Red	0.0	0.0	0.0

← NOTICE INCLUDED PHASE

### MAXTIME DETECTOR PROGRAMMING DETAIL FOR ALTERNATE PHASING FOR LOOP 3A

Front Panel  
Main Menu >Controller >Detector >Veh Det Plans

Web Interface  
Home >Controller >Detector Configuration >Vehicle Detectors

In the table view of web interface right click on "Detector" in the top left corner of the table. Copy the entire contents of Detector Plan 1. Paste Detector Plan 1 into Detector Plan 2. Modify Detector Plan 2 as shown below and save changes.

Plan 2

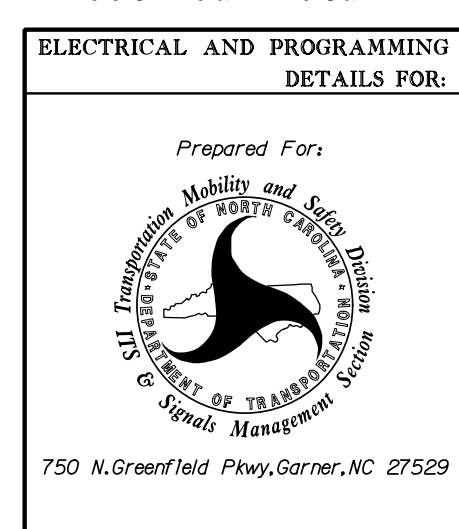
Detector	Call Phase	Delay
7	3	-

3A

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1403  
DESIGNED: August 2022  
SEALED: 06/22/2023  
REVISED: N/A

6/22/2023 11:20:14 AM cr01g.davis \*\*\*k:\meyer-horn.com\CAL\MAL\_Roadway\011036479 - R-5705A - NC 55\Signal\WS4 - S1\Signal Design - MaxTime3.1 06-1403-2023.r.dgn

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
NC License #F-0102  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000



Electrical Detail - Sheet 2 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:		NC 55 Bypass Southbound at NC 210	
Prepared For:	Division 6	Harnett County	Angier
PLAN DATE: August 2022	REVIEWED BY: KP Baumann		
PREPARED BY: CF Davis	REVIEWED BY:		
REVISIONS	INIT.	DATE	

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

SEAL  
NORTH CAROLINA PROFESSIONAL ENGINEER  
SEAL 044434  
KEVIN P. BAUMANN

DocuSigned by:  
*Kevin P. Baumann*  
6/22/2023  
SDCT08A88BC847  
DATE  
SIG. INVENTORY NO. 06-1403

### MAXTIME ALTERNATE PHASING ACTIVATION DETAIL

To run alternate phasing, select a Pattern that is programmed to run Overlap Plan 2 and Detector Plan 2.  
A Pattern can be selected through the scheduler or manually by changing the Operational Mode.

PHASING	OVERLAP PLAN	VEH DET PLAN
ACTIVE PLAN REQUIRED TO <u>RUN DEFAULT PHASING</u>	1	1
ACTIVE PLAN REQUIRED TO <u>RUN ALTERNATE PHASING</u>	2	2

#### ALTERNATE PHASING CHANGE SUMMARY

THE FOLLOWING IS A SUMMARY OF WHAT TAKES PLACE WHEN OVERLAP PLAN 2 AND VEHICLE DETECTOR PLAN 2 ACTIVATE TO CALL THE "ALTERNATE PHASING":

- OVERLAP PLAN 2: Modifies overlap included phases for heads 31 and 32 to run protected turns only.
- VEH DET PLAN 2: Reduces delay time for phase 3 call on loop 3A to 0 seconds.

### MAXTIME ALTERNATE PHASING PATTERN PROGRAMMING DETAIL

Front Panel  
Main Menu >Controller >Coordination >Patterns

Web Interface  
Home >Controller >Coordination >Patterns


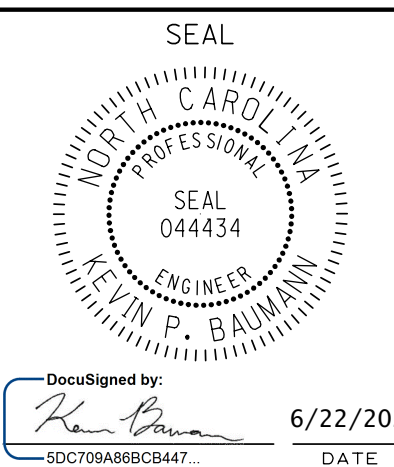
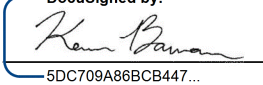
#### Pattern Parameters

Pattern	Veh Det Plan	Overlap Plan
*	2	2

\* The Pattern number(s) are to be determined by the Division Traffic Engineer.

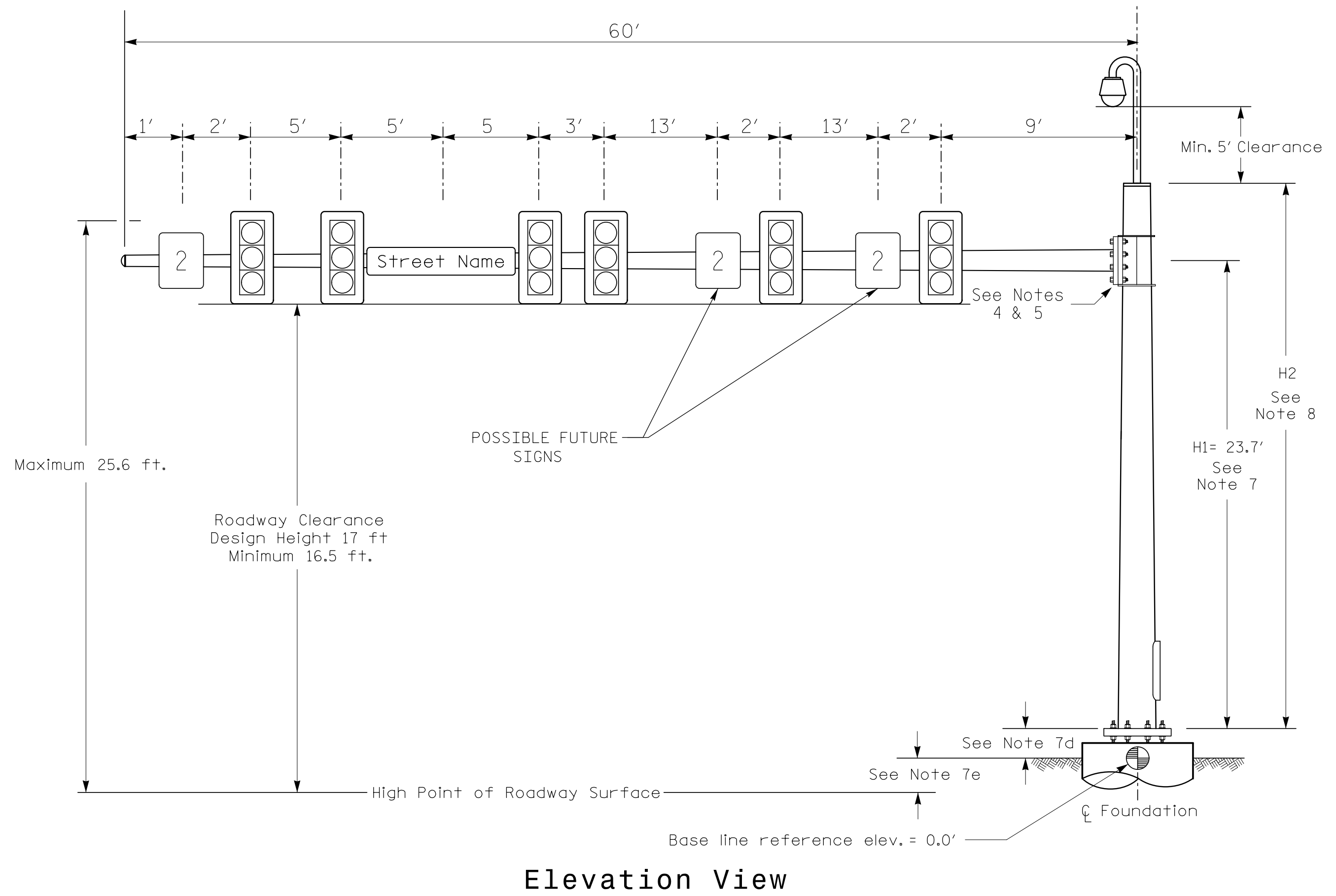
THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1403  
DESIGNED: August 2022  
SEALED: 06/22/2023  
REVISED: N/A

Electrical Detail - Sheet 3 of 3

ELECTRICAL AND PROGRAMMING DETAILS FOR:  Prepared For:  750 N. Greenfield Pkwy, Garner, NC 27529 PLANS PREPARED IN THE OFFICE OF: <b>Kimley»Horn</b> NC License #F-0102 421 Fayetteville Street, Suite 600 Raleigh, NC 27601 (919) 677-2000	<b>NC 55 Bypass Southbound at NC 210</b>		SEAL  KEVIN P. BAUMANN ENGINEER SEAL 044434 PROFESSIONAL ENGINEER STATE OF NORTH CAROLINA
	Division 6      Harnett County      Angier	PLAN DATE: August 2022      REVIEWED BY: KP Baumann	
REVISIONS	INIT.	DATE	DocuSigned by:  6/22/2023 DATE SIG. INVENTORY NO. 06-1403

6/22/2023 11:20:15 AM c:\01\p.davis \*\*\*Kimley-Horn.com\c:\RAL\RAL\_Roadway\011036479 - R-5705A - NC 55\Signal\Signal\54 - S1\Signal Design - MaxTime\1 06-1403-2023.r.dgn

### Design Loading for METAL POLE NO. 2



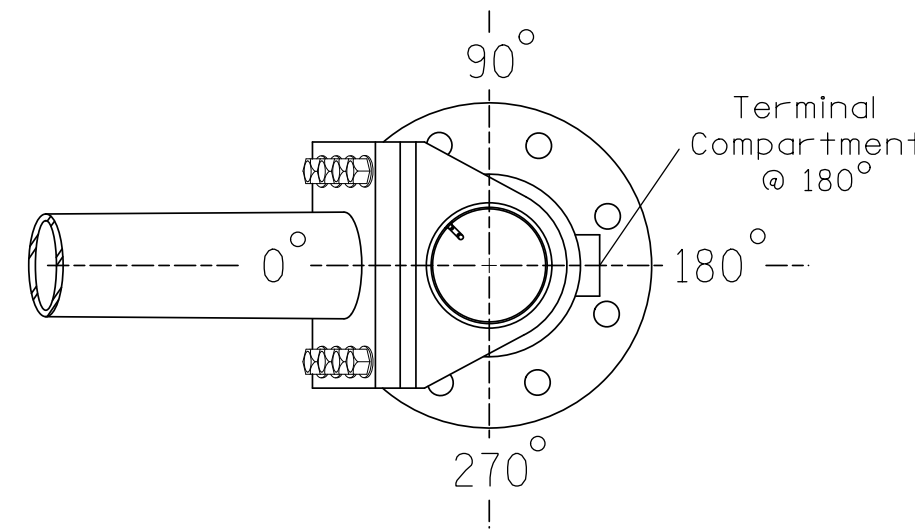
Elevation View

### SPECIAL NOTE

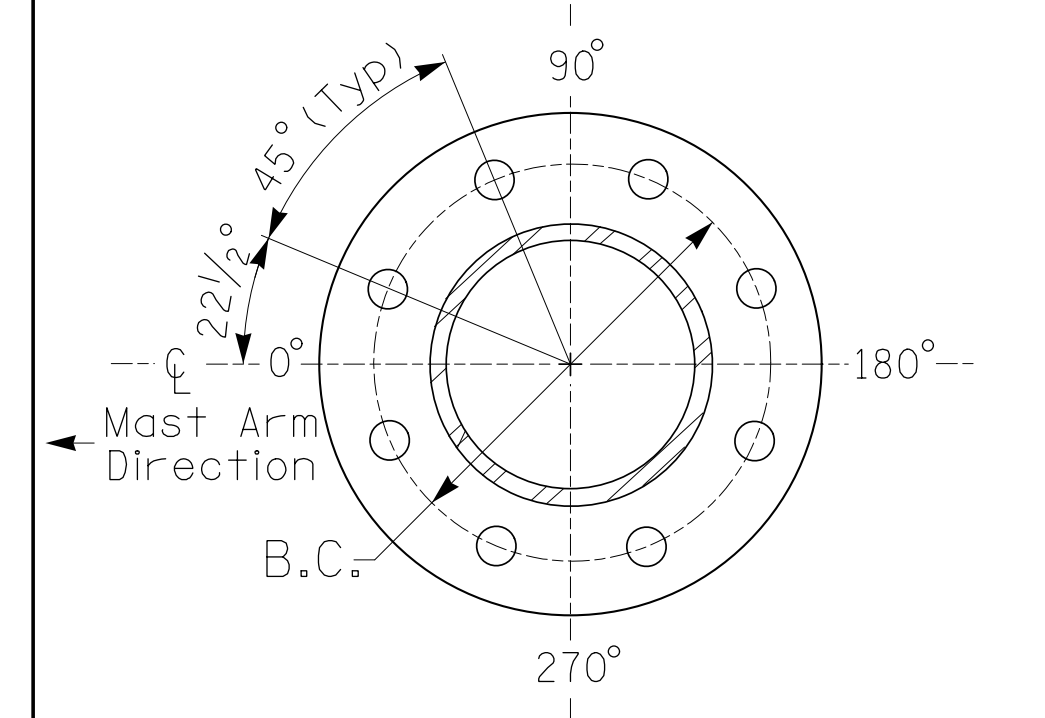
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:		Pole 2
Baseline reference point at $\phi$ Foundation @ ground level	$\oplus$	0.0 ft.
Elevation difference at High point of roadway surface		+4.7 ft.
Elevation difference at Edge of travelway or face of curb		+0.8 ft.

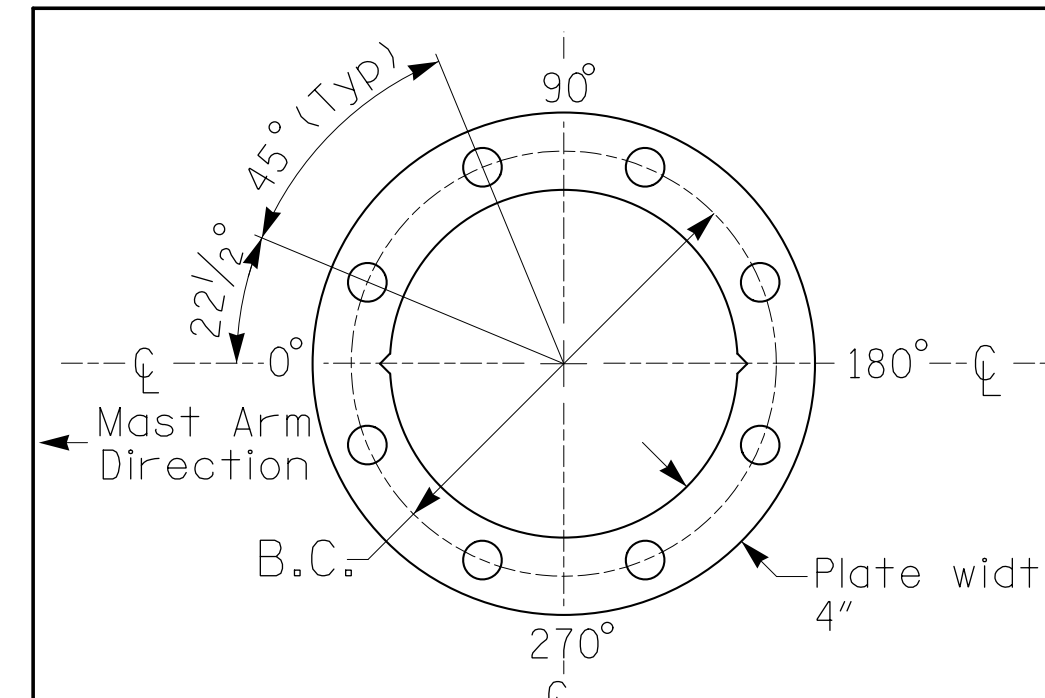


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

### METAL POLE No. 2

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	Sig. 3.4

#### MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS
	STREET NAME SIGN RIGID MOUNTED	16.0 S.F.	24.0" W X 96.0" L	36 LBS
	CCTV CAMERA $\phi$ POLE-MOUNTED	1.6 S.F.	12.0" W X 74.4" L	45 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 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
  - The 2018 NCDOT Roadway Standard Drawings.
  - The traffic signal project plans and special provisions.
  - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

##### 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 are rigidly mounted and vertically centered on the mast arm.
  - The roadway clearance height for design is as shown in the elevation views.
  - The top of the pole base plate is 0.75 feet above the ground elevation.
  - Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
  - Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the 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 Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 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.

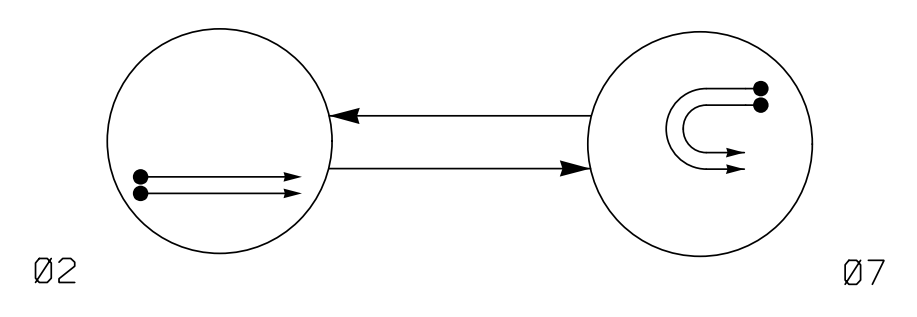
NCDOT Wind Zone 3 (110 mph)

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

	NC 55 Bypass Southbound at NC 210	
	Division 6 Harnett County Angier	PLAN DATE: August 2022 REVIEWED BY: KP Baumann
PREPARED BY: CF Davis	REVIEWED BY:	DATE: 6/22/2023
SCALE: 0 N/A N/A	REVISIONS:	INIT. DATE:
SIGNATURE:	DATE:	SIG. INVENTORY NO. 06-1403

6/21/2023 2:49:03 PM crd\g.davis  
 \\k:\meyer-horn.com\CL-RAL\RAL-Roadway\011036479 - R-5705A - NC 55 Signal\sig3.4 - 51 Signal Design - Mast\m3.4 06-1403-2023MP.dgn

**PHASING DIAGRAM**



**PHASING DIAGRAM DETECTION LEGEND**

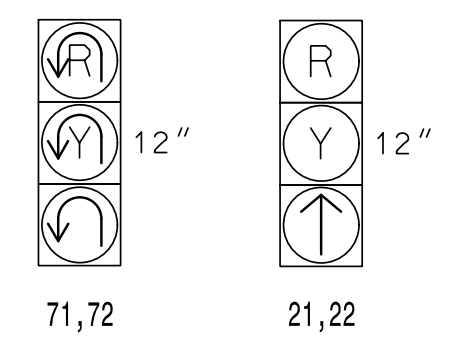
- ● DETECTED MOVEMENT
- UNDETECTED MOVEMENT (OVERLAP)
- · UNSIGNALIZED MOVEMENT
- ↔ PEDESTRIAN MOVEMENT

**TABLE OF OPERATION**

SIGNAL FACE	PHASE		
	Ø 2	Ø 7	FLASH
21,22	↑	R	Y
71,72	↻	↻	↻

**SIGNAL FACE I.D.**

All Heads L.E.D.



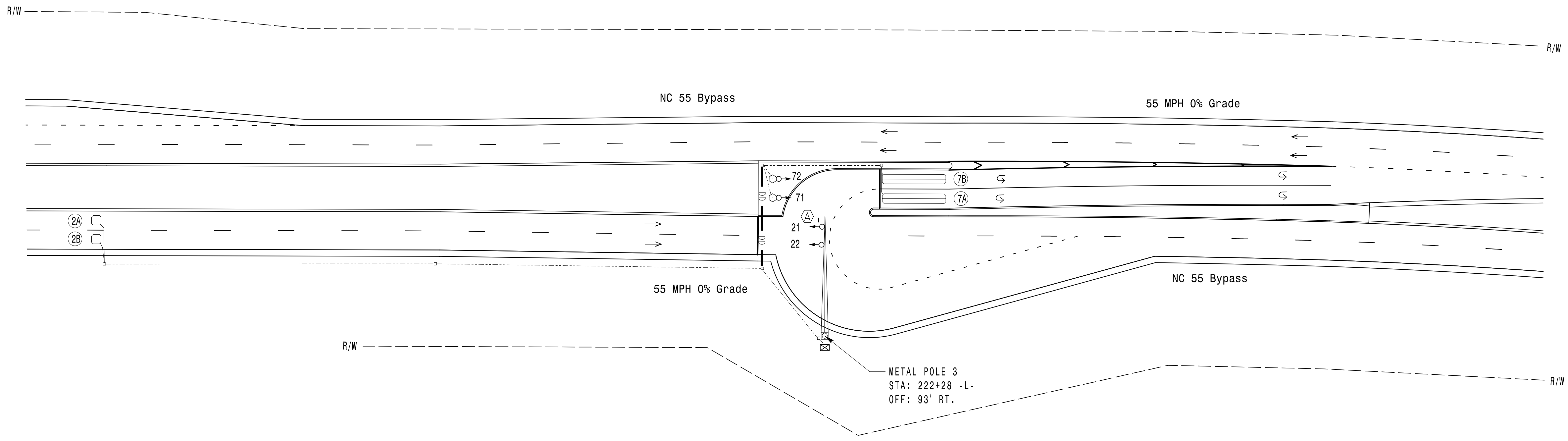
**MAXTIME DETECTOR INSTALLATION CHART**

LOOP	SIZE (FT)	DISTANCE FROM STOPBAR (FT)	TURNS	NEW LOOP	PROGRAMMING							
					CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL CALL	DELAY DURING GREEN	NEW CARD	
2A	6X6	420	6	X	2	-	-	X	X	X	-	X
2B	6X6	420	6	X	2	-	-	X	X	X	-	X
7A	6X40	0	2-4-2	X	7	-	-	X	-	X	-	X
7B	6X40	0	2-4-2	X	7	-	-	X	-	X	-	X

**2 Phase Fully Actuated NC 55 Byp. Closed Loop System**

**NOTES**

1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
5. Maximum times shown in timing chart are for free-run operation only. Coordinated signal system timing values supersede these values.
6. Closed loop system data: Controller Asset #1404.



**MAXTIME TIMING CHART**

FEATURE	PHASE	
	2	7
Walk *	-	-
Ped Clear *	-	-
Min Green	14	7
Passage *	6.0	2.0
Max I *	90	30
Yellow Change	5.2	3.0
Red Clear	1.0	4.8
Added Initial *	1.8	-
Maximum Initial *	46	-
Time Before Reduction *	15	-
Time To Reduce *	45	-
Minimum Gap	3.4	-
Advance Walk	-	-
Non Lock Detector	-	X
Vehicle Recall	MIN RECALL	-
Dual Entry	-	-

\* These values may be field adjusted. Do not adjust Min Green and Extension times for phase 2 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	— Sign
□ → Pedestrian Signal Head With Push Button & Sign	□ → Metal Pole with Mastarm
○ → Type II Signal Pedestal	○ → Inductive Loop Detector
⊠ → Controller & Cabinet	⊠ → Junction Box
□ → Junction Box	□ → Directional Drill
— 00 — 2-in Underground Conduit	— 00 — N/A
N/A → Right of Way	→ → Directional Arrow
→ → Directional Arrow	ⓐ → No Left Turn Sign (R3-2)
ⓐ → No Left Turn Sign (R3-2)	ⓐ → N/A

6/21/2023 2:49:03 PM cr01g.davis \*\*\*K:\In\ey-horn.com\CL\_RAL\RAL\_Roadway\011036479 - R-5705A - NC 55\Signal\554 - Signal Design - MaxTime4.0 06-1404.dgn

**New Installation**

PLANS PREPARED IN THE OFFICE OF:  
**Kimley Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

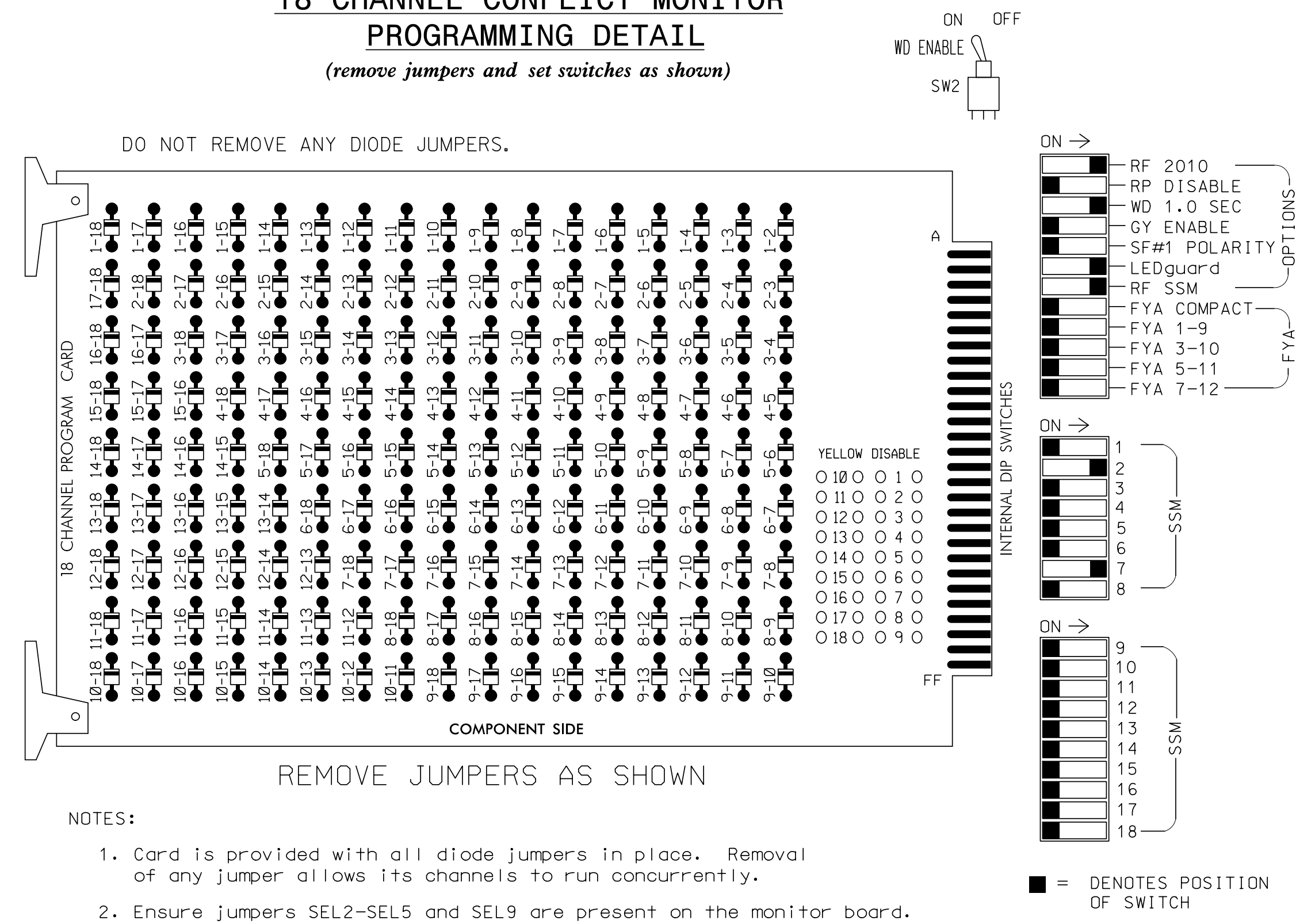
Prepared for:		NC 55 Bypass Northbound at U-Turn South of NC 210	
Division 6		Harnett County Angier	
PLAN DATE:	August 2022	REVIEWED BY:	KP Baumann
PREPARED BY:	CF Davis	REVIEWED BY:	
REVISIONS	INIT.	DATE	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 KEVIN P. BAUMANN  
 ENGINEER  
 6/22/2023  
 SIGNATURE

### 18 CHANNEL CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)



- DO NOT REMOVE ANY DIODE JUMPERS.
- REMOVE JUMPERS AS SHOWN
- NOTES:
- Card is provided with all diode jumpers in place. Removal of any jumper allows its channels to run concurrently.
  - Ensure jumpers SEL2-SEL5 and SEL9 are present on the monitor board.
  - Ensure that Red Enable is active at all times during normal operation.
  - 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 plan.
- Program controller to start up in phase 2 Green No Walk.
- If this signal will be managed by an ATMS software, enable controller and detector logging for all detectors used at this location.
- The cabinet and controller are part of the NC 55 Bypass Closed Loop System.

### EQUIPMENT INFORMATION

CONTROLLER.....2070LX  
 CABINET.....332 W/AUX  
 SOFTWARE.....Q-Free MAXTIME  
 CABINET MOUNT.....BASE  
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE  
 LOAD SWITCHES USED.....S2,S10  
 PHASES USED.....2,7  
 OVERLAP "1".....NOT USED  
 OVERLAP "2".....NOT USED  
 OVERLAP "3".....NOT USED  
 OVERLAP "4".....NOT USED

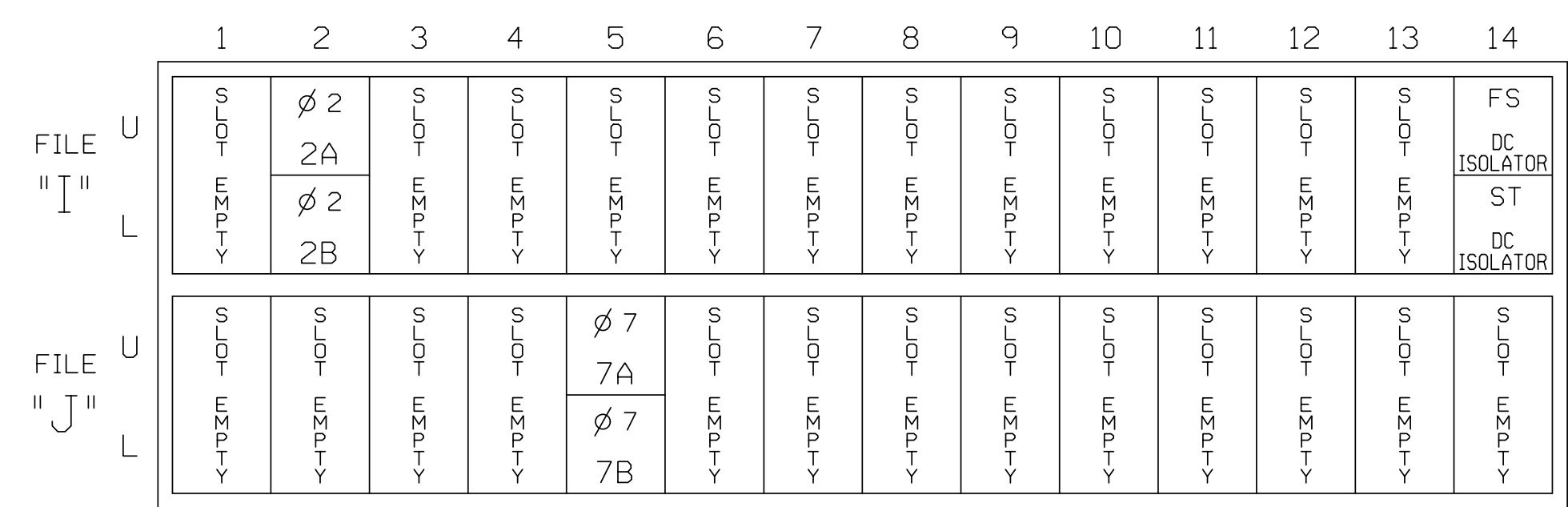
### SIGNAL HEAD HOOK-UP CHART

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
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	OL1	OL2	SPARE	OL3	OL4	SPARE
SIGNAL HEAD NO.	NU	21,22	NU	NU	NU	NU	NU	NU	NU	71,72	NU	NU	NU	NU	NU	NU	NU	NU
RED		128																
YELLOW		129																
GREEN																		
RED ARROW											122							
YELLOW ARROW											123							
FLASHING YELLOW ARROW																		
GREEN ARROW		130								124								

NU = Not Used

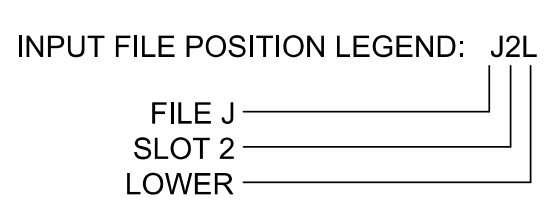
### INPUT FILE POSITION LAYOUT

(front view)



### INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT POINT	DETECTOR NO.	CALL PHASE	DELAY TIME	EXTEND TIME	EXTEND	ADDED INITIAL	CALL	DELAY DURING GREEN
2A	TB2-5,6	I2U	39	1	2	2			X	X	X	
2B	TB2-7,8	I2L	43	5	3	2			X	X	X	
7A	TB5-5,6	J5U	57	19	21	7			X		X	
7B	TB5-7,8	J5L	57	19	21	7			X		X	



THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 06-1404  
 DESIGNED: August 2022  
 SEALED: 06/22/2023  
 REVISED: N/A

6/21/2023 2:49:12 PM cr01g.davis \*\*\*k:\meyer-horn.com\c\_ral\RAL\_Roadway\011036479 - R-5705A - NC 55\SIGNAL\SW4 - S1\sigal Design - MaxTime4.1 06-104-2023a.dgn

### Electrical Detail

ELECTRICAL AND PROGRAMMING DETAILS FOR:

PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000

NC 55 Bypass Northbound at U-Turn South of NC 210	
Division 6	Harnett County Angier
PLAN DATE: August 2022	REVIEWED BY: KP Baumann
PREPARED BY: CF Davis	REVIEWED BY:
REVISIONS	INIT. DATE

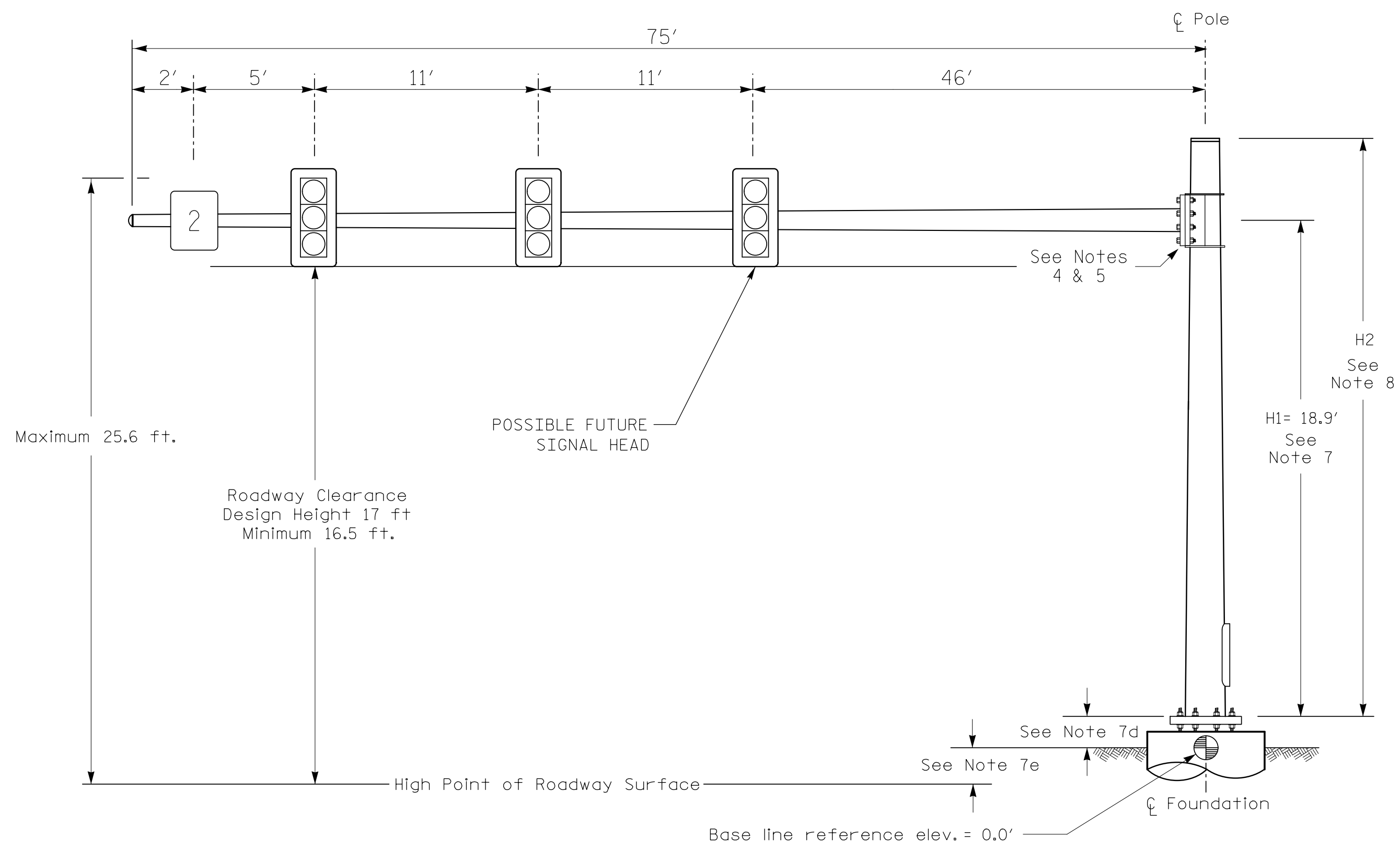
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

DocuSigned by:  
 Kevin P. Baumann  
 6/22/2023  
 DATE

SIG. INVENTORY NO. 06-1404

### Design Loading for METAL POLE NO. 3



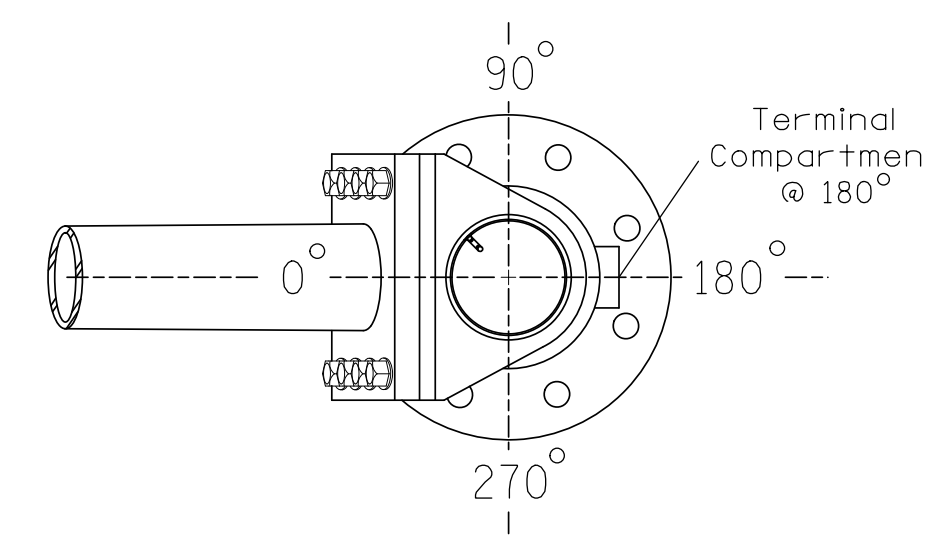
Elevation View

### SPECIAL NOTE

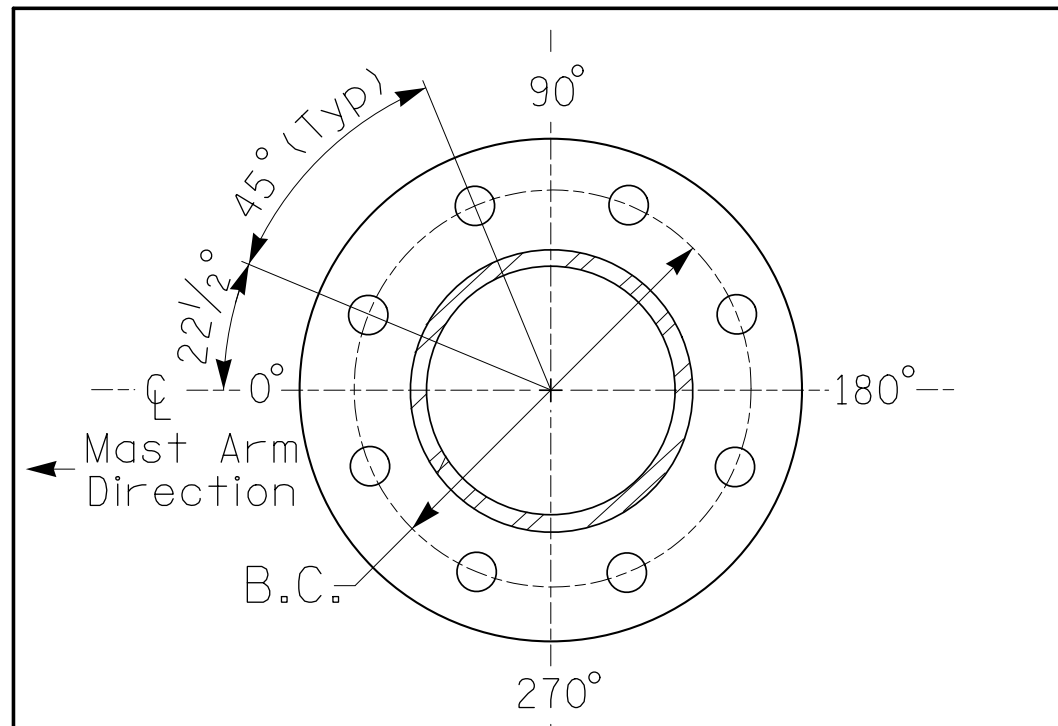
The contractor is responsible for verifying that the mast arm attachment height (H1) will provide the "Design Height" clearance from the roadway before submitting final shop drawings for approval. Verify elevation data below which was obtained by field measurement or from available project survey data.

#### Elevation Data for Mast Arm Attachment (H1)

Elevation Differences for:	Pole 3
Baseline reference point at $\phi$ Foundation @ ground level	0.0 ft.
Elevation difference at High point of roadway surface	-0.1 ft.
Elevation difference at Edge of travelway or face of curb	0.0 ft.

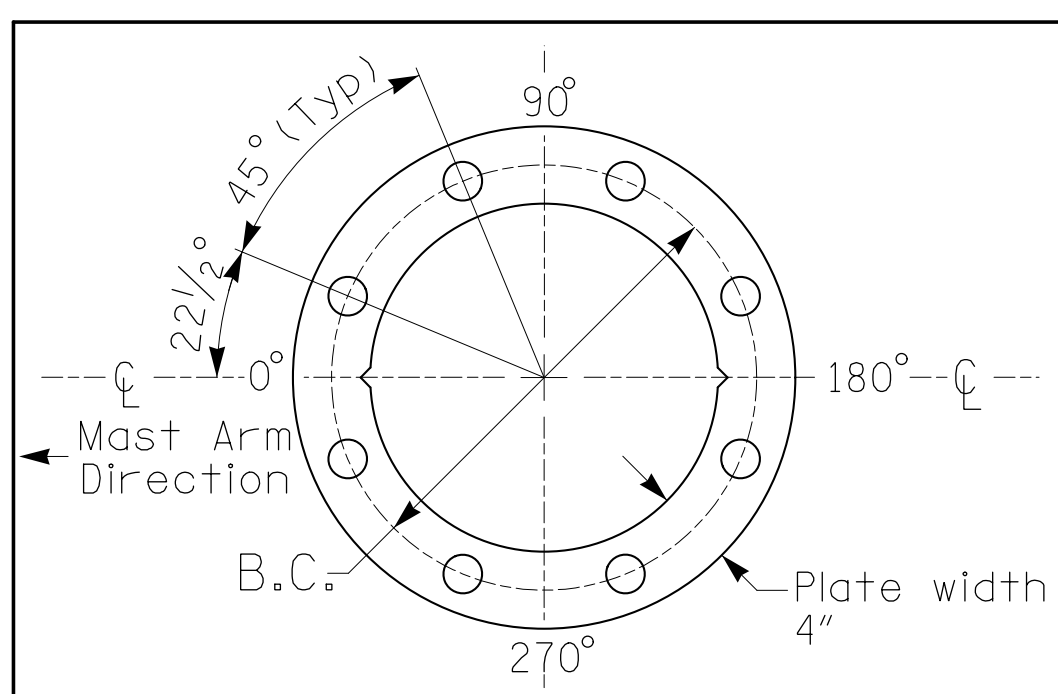


POLE RADIAL ORIENTATION



8 BOLT BASE PLATE DETAIL

See Note 5



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

### METAL POLE No. 3

PROJECT REFERENCE NO.	SHEET NO.
R-5705A	Sig. 4.2

#### MAST ARM LOADING SCHEDULE

LOADING SYMBOL	DESCRIPTION	AREA	SIZE	WEIGHT
	RIGID MOUNTED SIGNAL HEAD 12"-3 SECTION-WITH BACKPLATE	9.3 S.F.	25.5" W X 52.5" L	60 LBS
	SIGN RIGID MOUNTED	7.5 S.F.	30.0" W X 36.0" L	14 LBS

#### 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 2018 NCDOT "Standard Specifications for Roads and Structures." The latest addenda to the specifications can be found in the traffic signal project special provisions.
  - The 2018 NCDOT Roadway Standard Drawings.
  - The traffic signal project plans and special provisions.
  - The NCDOT "Metal Pole Standards" located at the following NCDOT website: <https://connect.ncdot.gov/resources/safety/Pages/ITS-Design-Resources.aspx>

#### 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 are rigidly mounted and vertically centered on the mast arm.
  - The roadway clearance height for design is as shown in the elevation views.
  - The top of the pole base plate is 0.75 feet above the ground elevation.
- Refer to the Elevation Data Chart for the elevation differences between the proposed foundation ground level and the high point of the roadway.
- Provide horizontal distance from the proposed centerline of the foundation to the edge of travelway. Refer to the Elevation Data Chart for elevation difference between the proposed foundation ground level and the edge of travelway. This information is necessary to ensure that the roadway clearance is maintained at the edge of the travelway and to aid in the camber design of the 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 Signal Design Section Senior Structural Engineer for assistance at (919) 814-5000.
- 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 3 (110 mph)

	Prepared in the Offices of: <b>NC 55 Bypass Northbound at U-Turn South of NC 210</b>		SEAL  KEVIN P. BAUMANN ENGINEER 044434
	Division 6 Harnett County Angier PLAN DATE: August 2022 REVIEWED BY: KP Baumann PREPARED BY: CF Davis REVIEWED BY:	REVISIONS INIT. DATE	

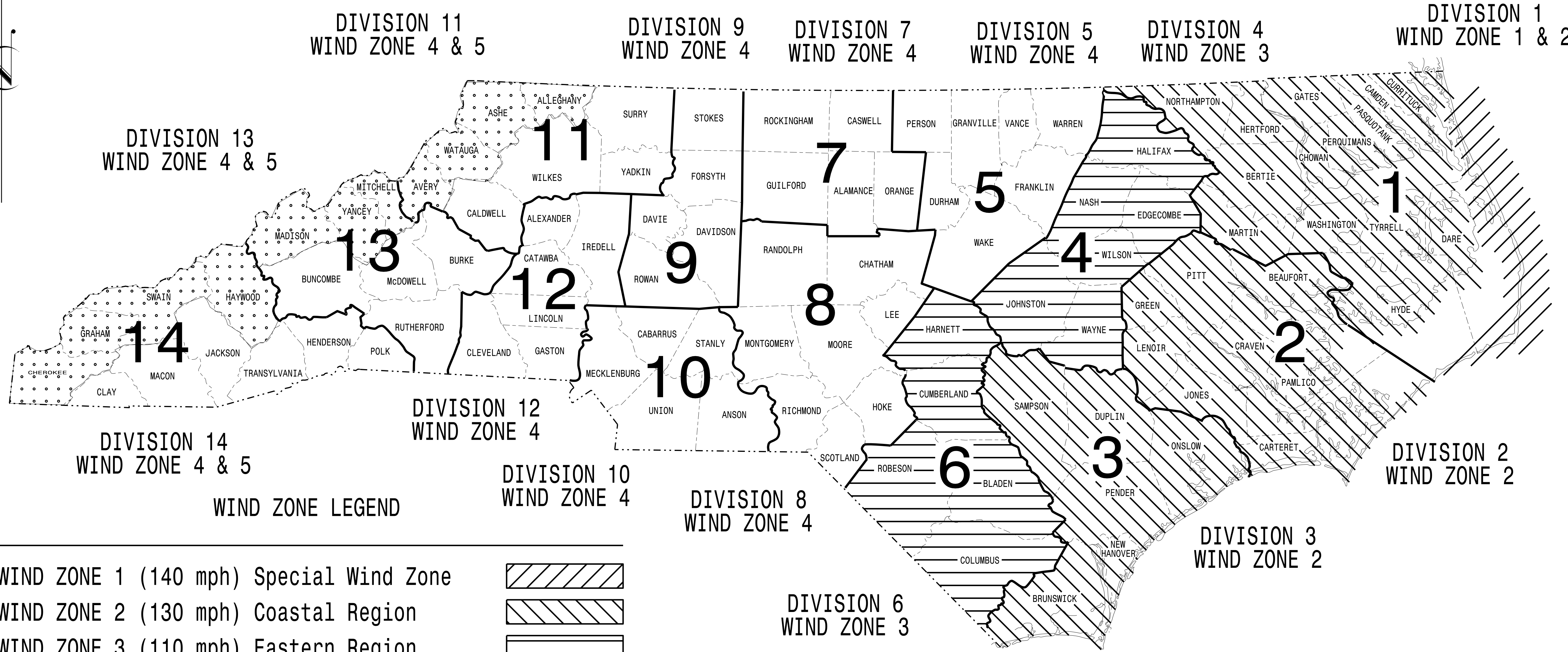
6/21/2023 2:49:14 PM crd\g.davis  
 \\k:\meyer-horn.com\CL-RAL\RAL\_Roadway\011036479 - R-5705A - NC 55 Signal\479 - 51 Signal Design - MaxTime\4.2 06-1404-2023MP.dgn



**STATE OF NORTH CAROLINA  
DIVISION OF HIGHWAYS**

PROJECT I.D. NO.	SHEET NO.
	Sig.M1

**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*

**INDEX OF PLANS**

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

**NCDOT CONTACTS:**

**MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT**

---

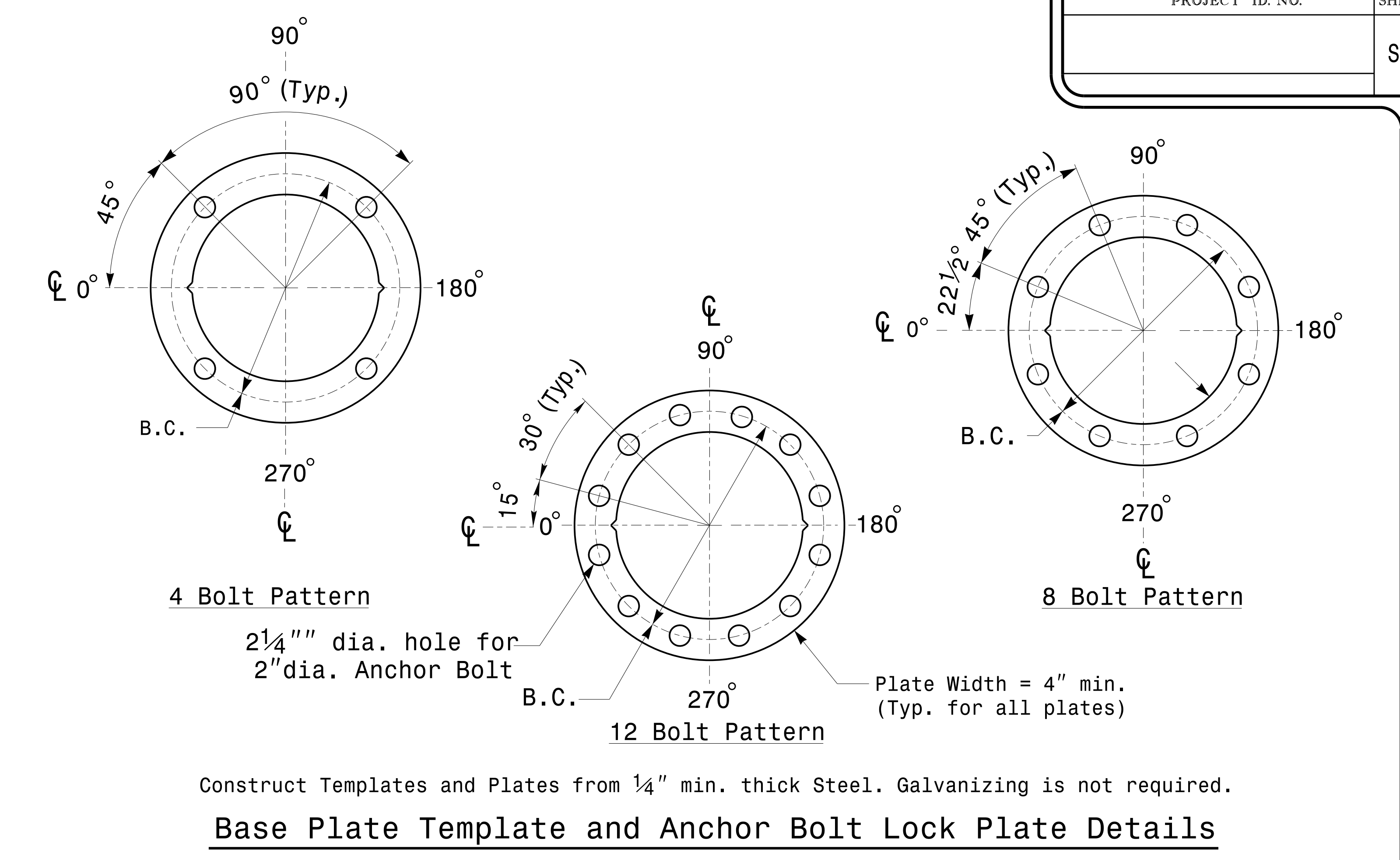
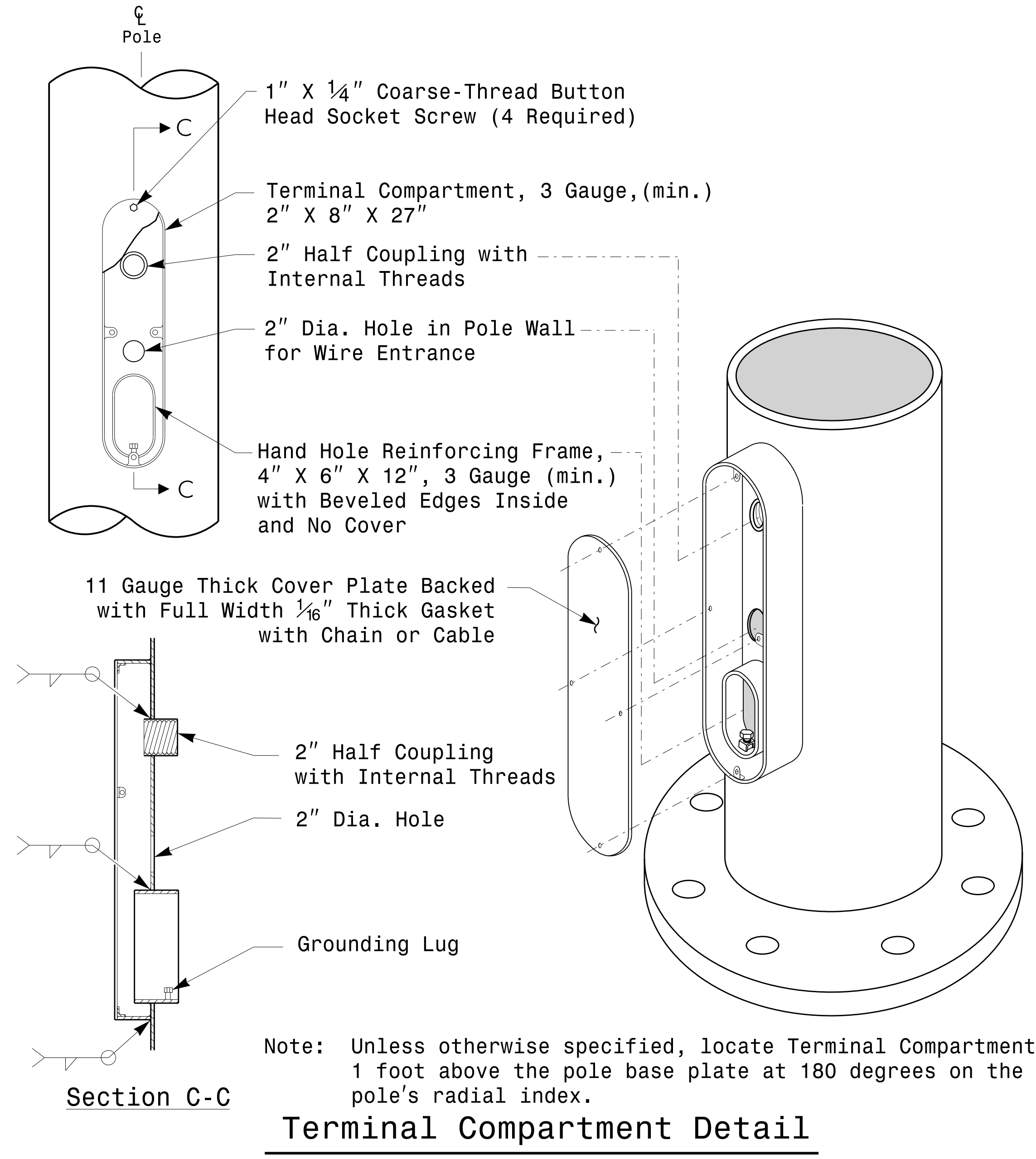
**M.M. MCDIARMID, P.E. - STATE ITS AND SIGNALS ENGINEER**

**J.P. GALLOWAY, P.E. - STATE SIGNALS ENGINEER**

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

SEAL

DocuSigned by:  
*Debesh C. Sarkar*  
DATE: 10/11/2017

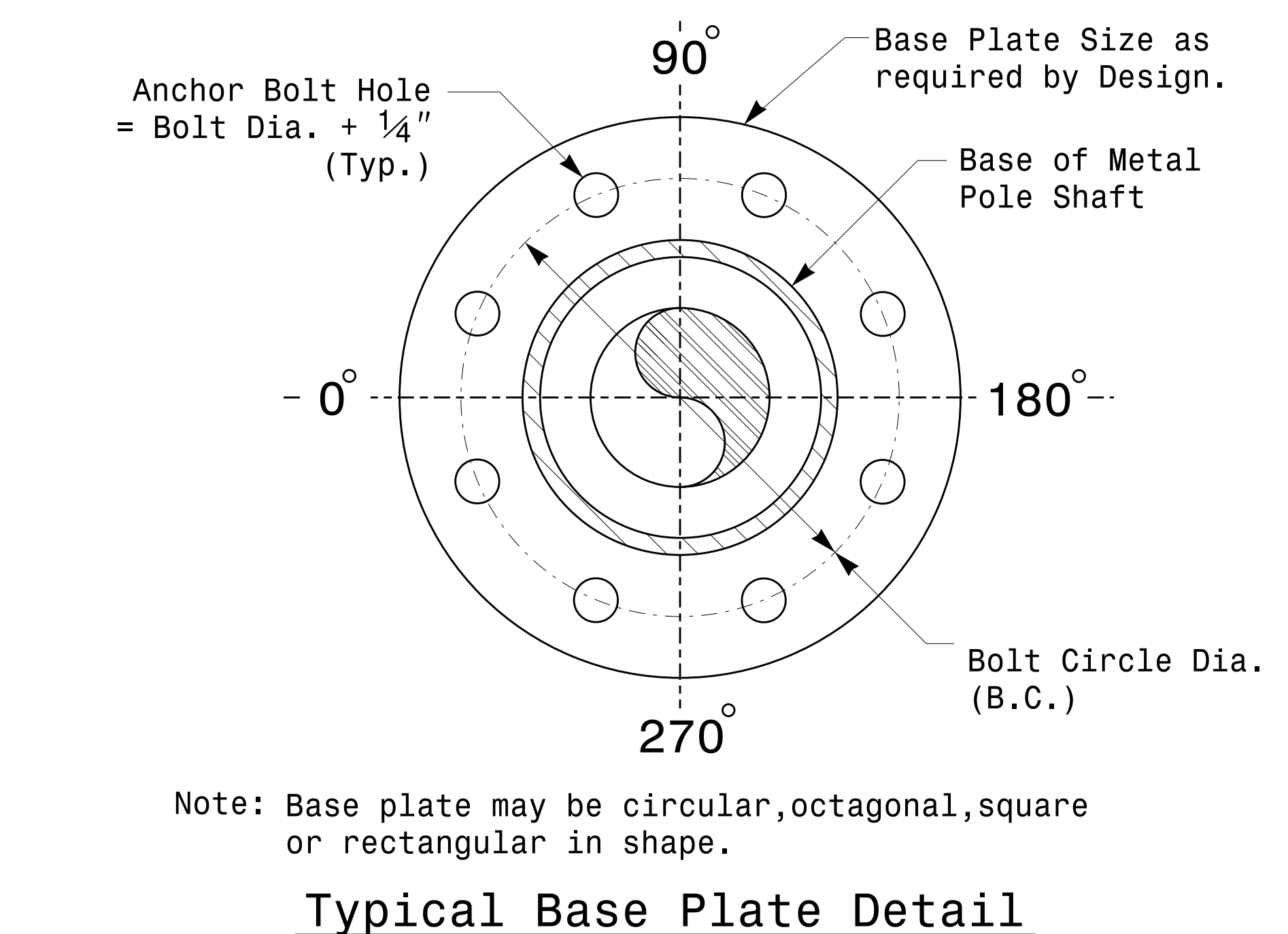
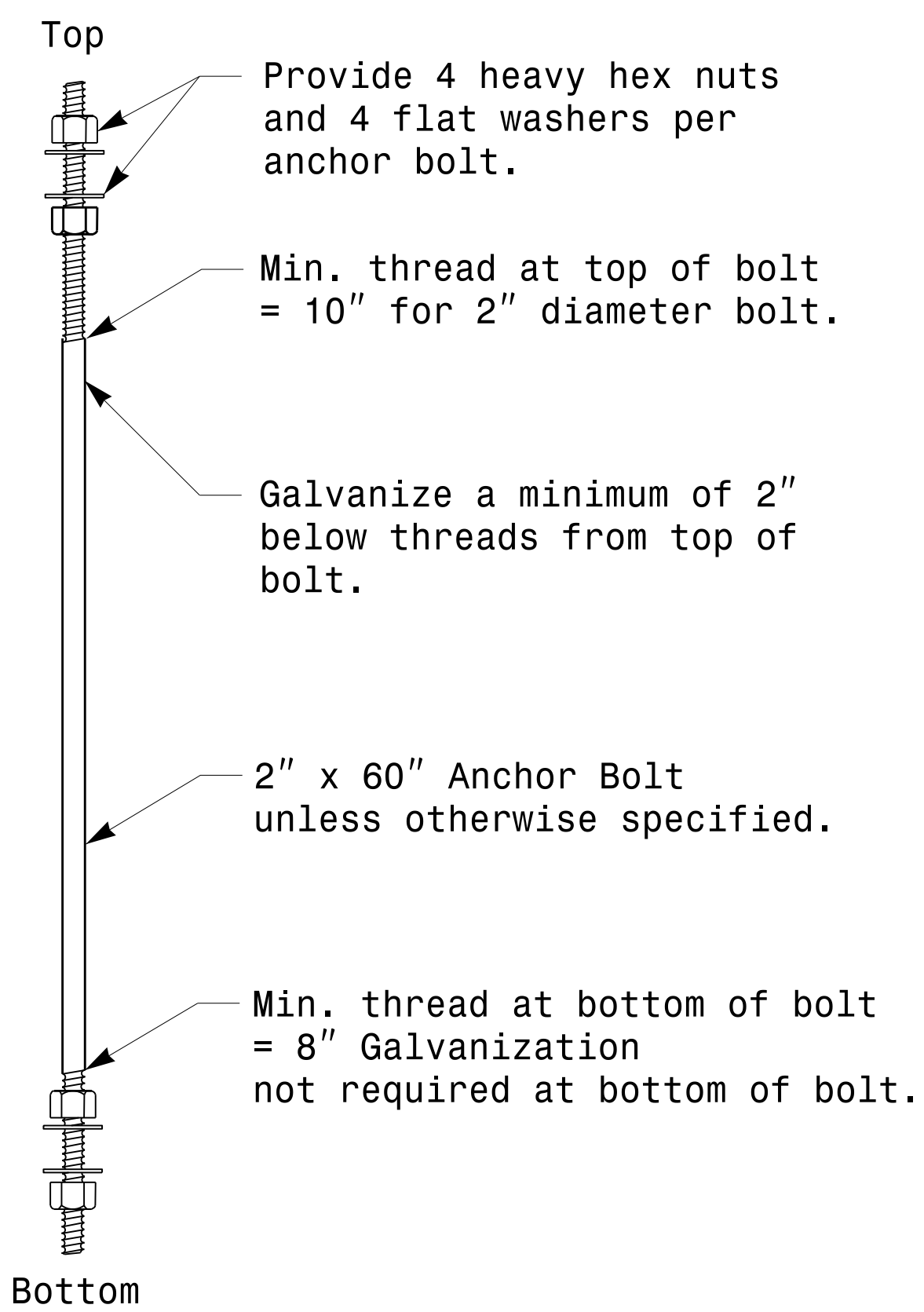


MFG _____	MFG. DATE: MM/YY _____	MFG _____	MFG. DATE: MM/YY _____
SHAFT D/T/L/Y _____	_____	SECTION D/T/L/Y _____	_____
ARM-A D/T/L/Y _____	_____	NCDOT SIG. INV. NO. _____	_____
ARM-B D/T/L/Y _____	_____	NCDOT POLE NO. _____	_____
A.B. DIA./B.C./L/Y _____	_____	Arm I.D. Tag (Provide on each section of a multi-section mast arm.)	
NCDOT SIG. INV. NO. _____	_____		
NCDOT POLE NO. _____	_____		

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

- Notes:
- 1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
  - 2) A.B. = Anchor Bolt
  - 3) B.C. = Bolt Circle of Anchor Bolts
  - 4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. number
  - 5) See drawing M3 and M4 for mounting positions of I.D. tags.

**Identification Tag Details**



Prepared In the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 NONE

Typical Fabrication Details For All Metal Poles

PLAN DATE: OCTOBER 2017	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

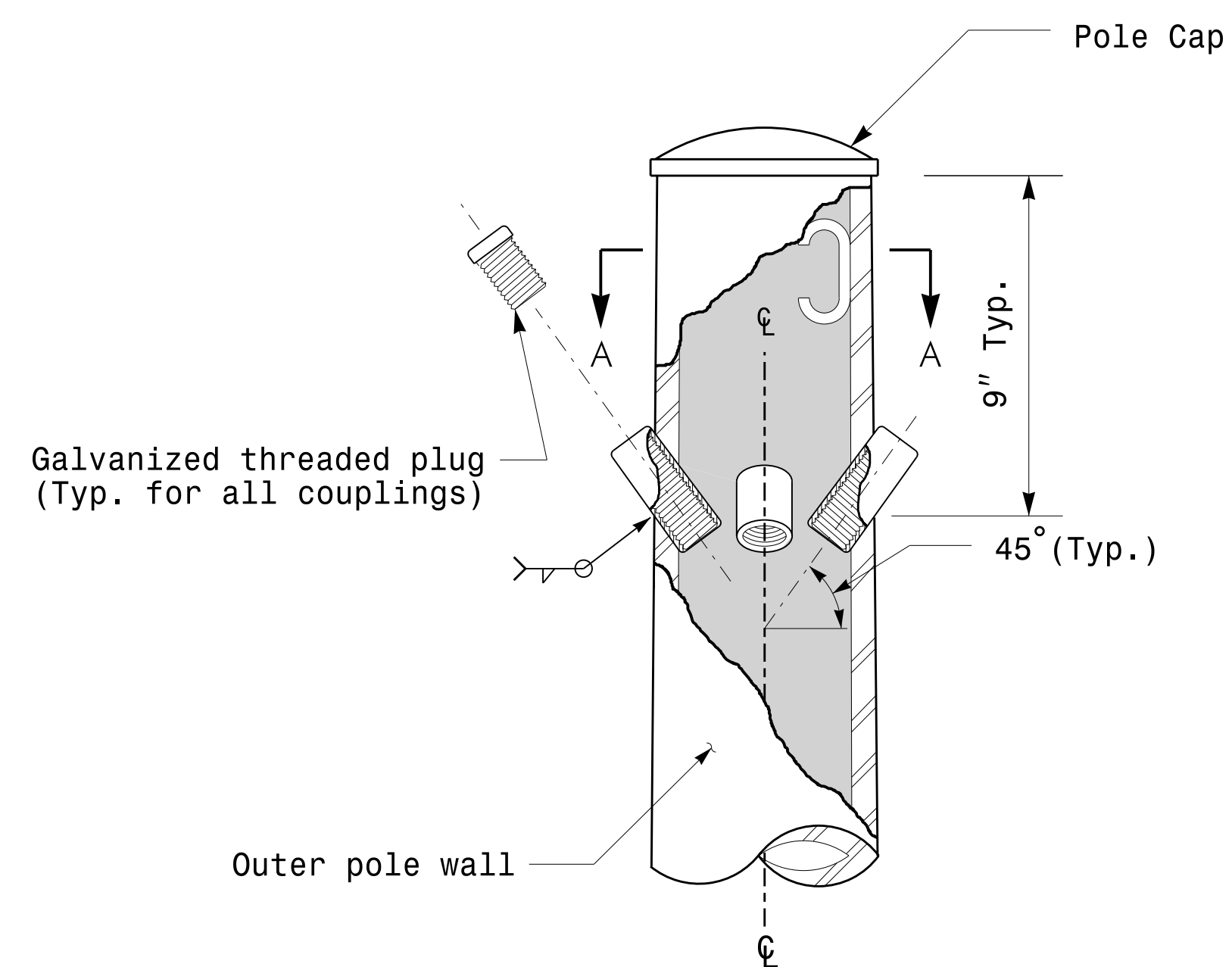
DocuSigned by: Debesh C. Sarkar  
4483328 SIGNATURE

10/11/2017  
DATE

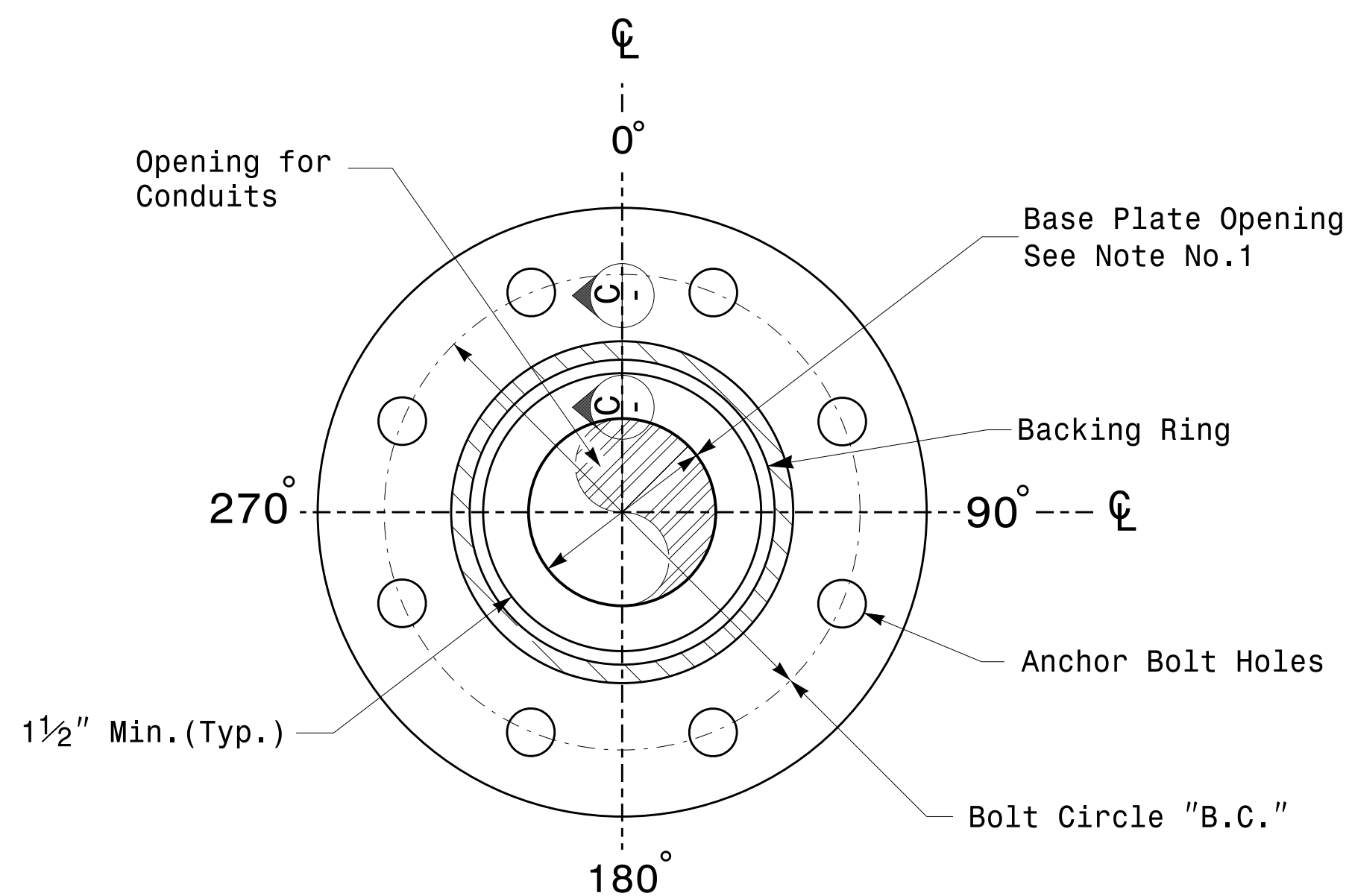
11-001-2017-08530  
138600415 Signal Design Section Detail: 11-001-2017-08530  
11-001-2017-08530

**Fabrication Details - All Metal Poles**

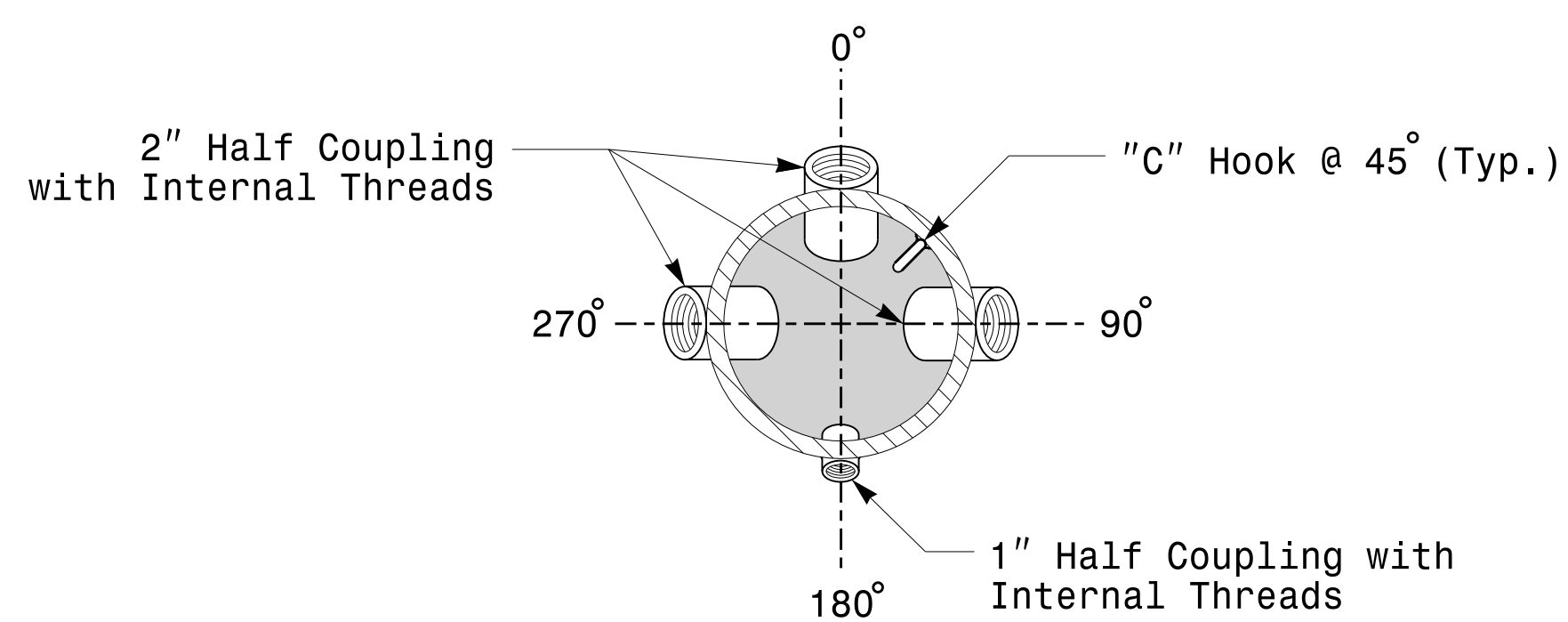
Note:  
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



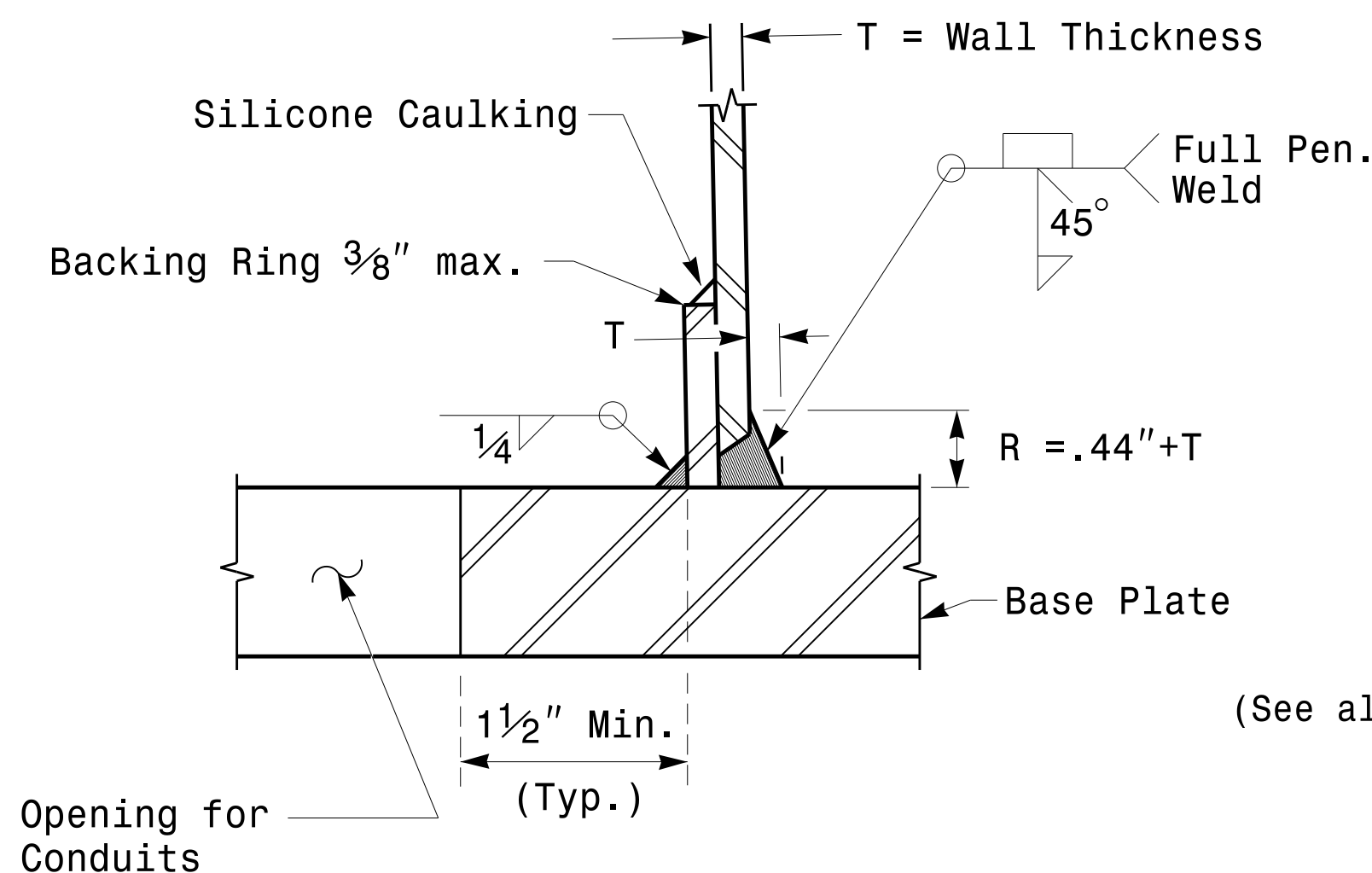
Cable Entrances at Top of Pole



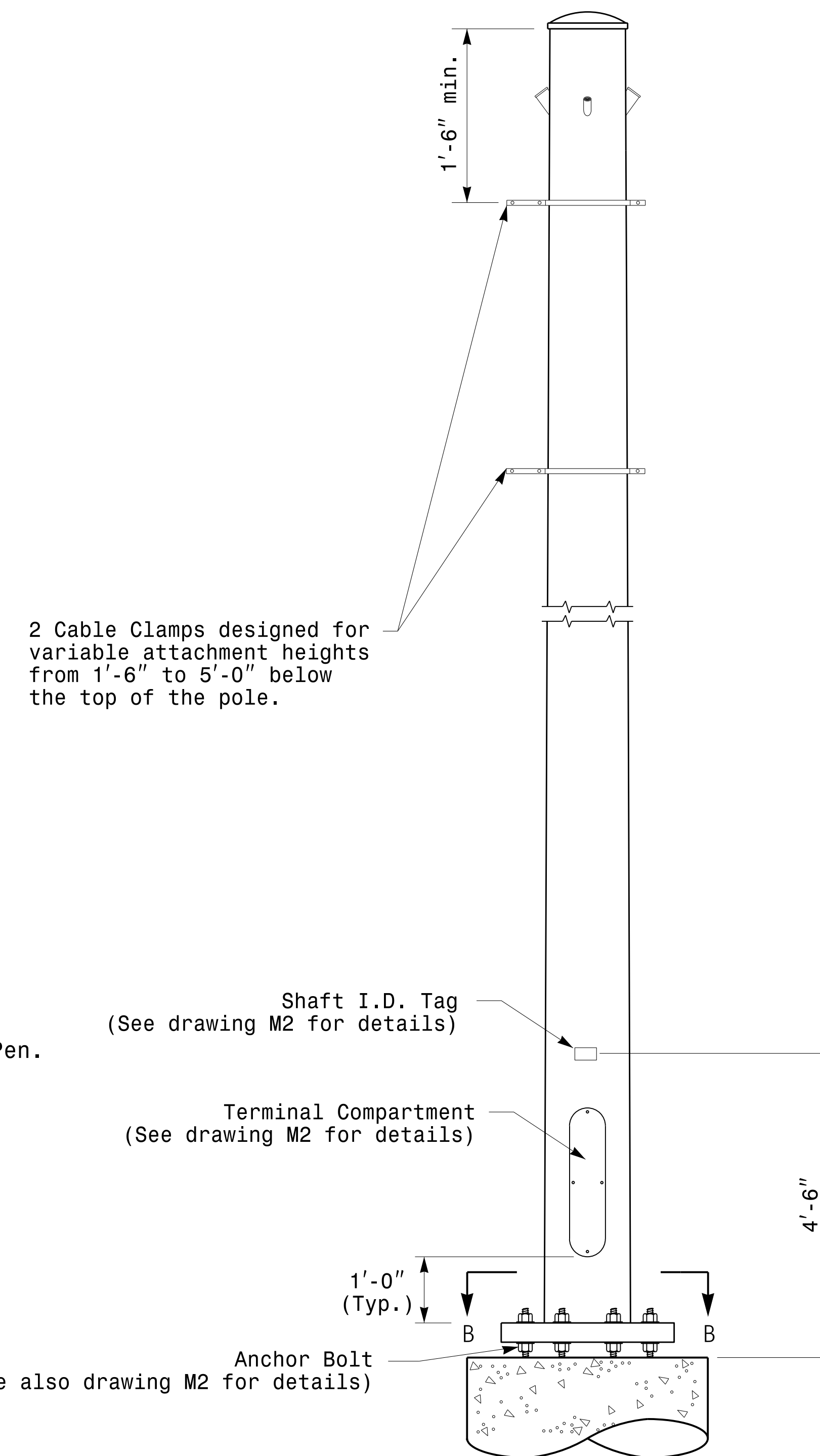
Section B-B  
Pole Base Plate Details  
(8 and 12 Bolt Pattern)



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

Prepared in the Offices of:  
  
 750 N. Greenleaf Pkwy, Garner, NC 27529

SCALE: 0 NONE

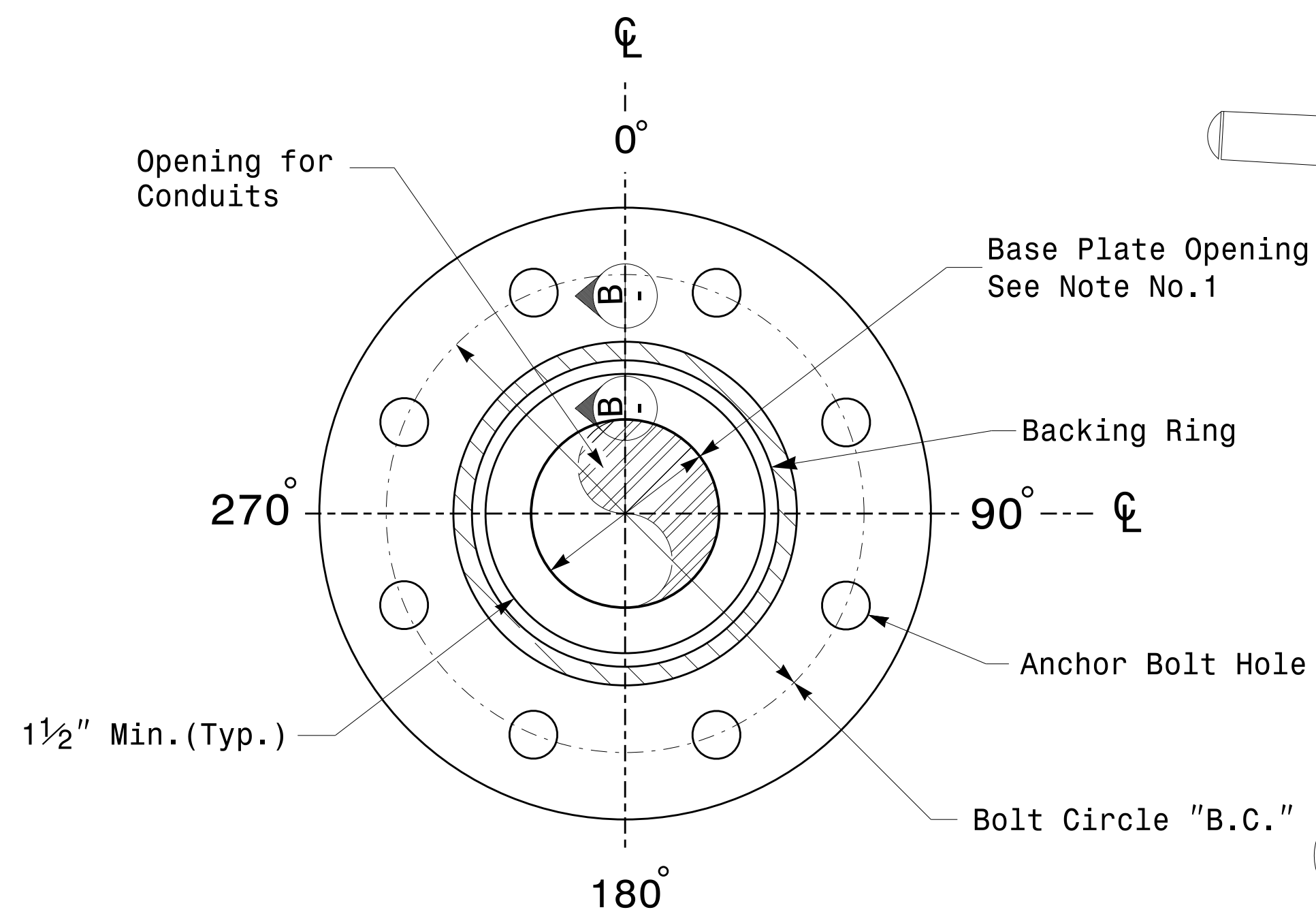
Typical Fabrication Details For Strain Poles

PLAN DATE: OCTOBER 2017	DESIGNED BY: K.C. DURIGON
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

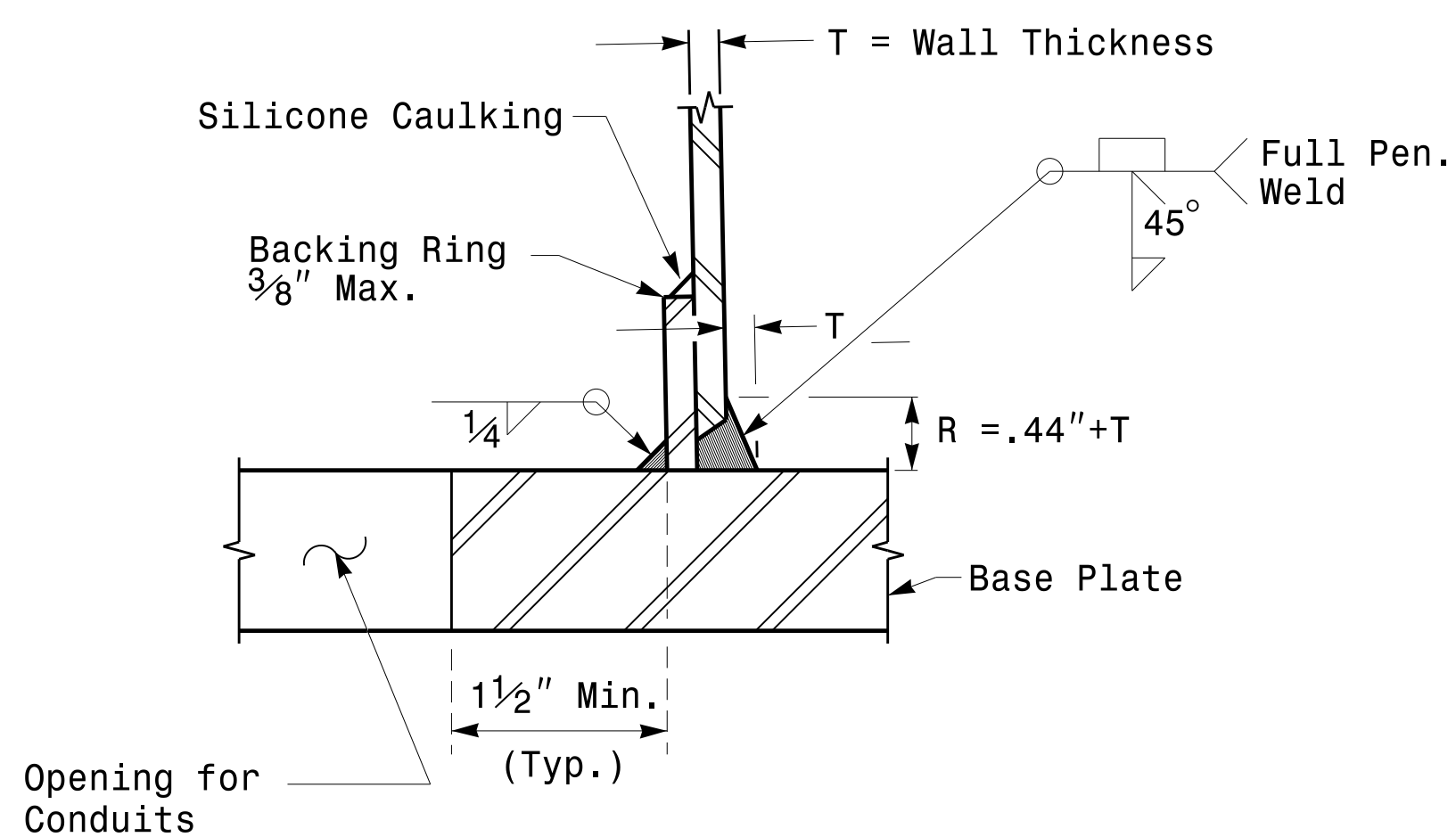
SEAL  
  
 DocuSigned by: Debesh C. Sarkar  
 10/11/2017  
 DATE

Fabrication Details – Strain Poles

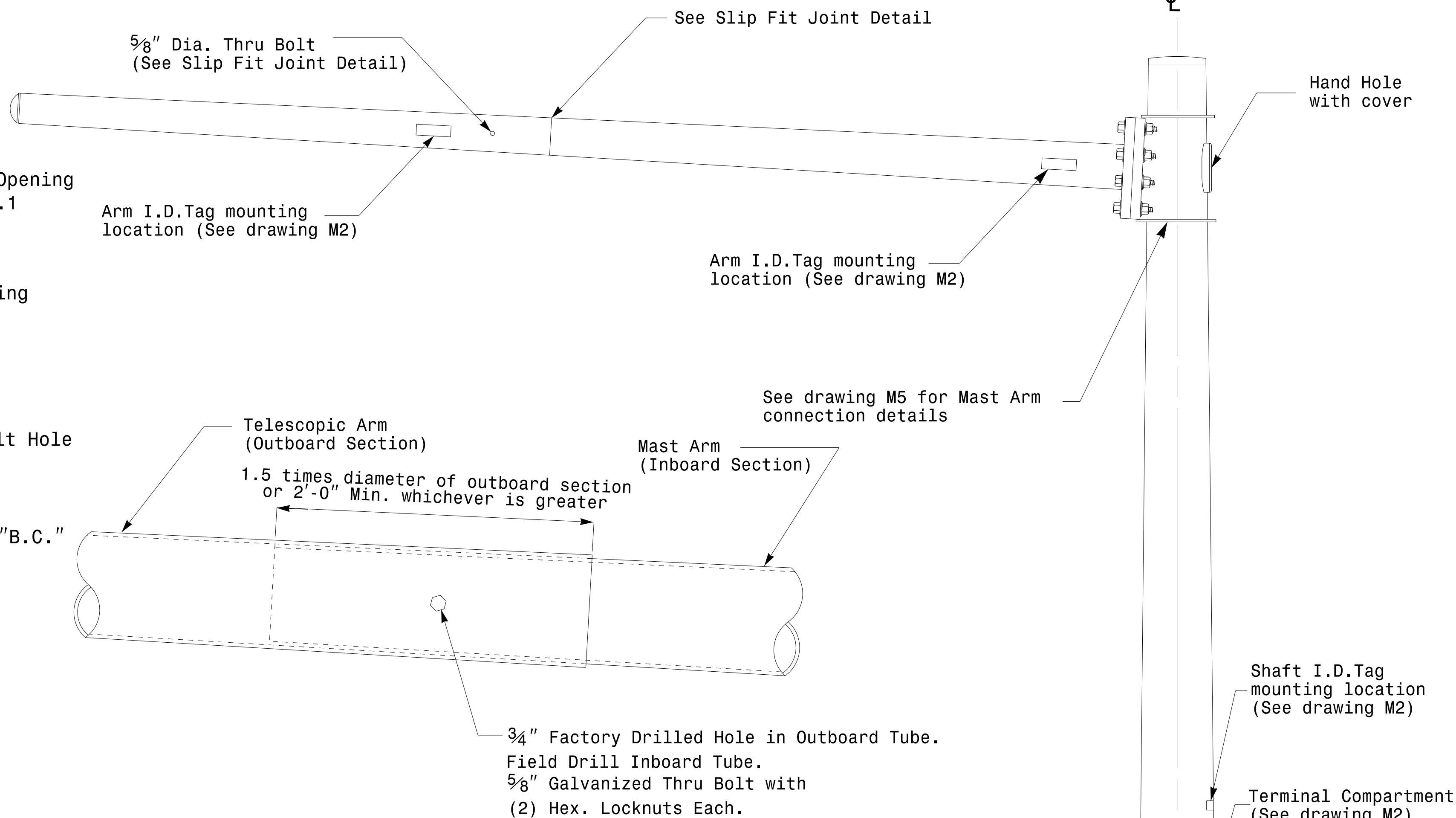
Note:  
1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



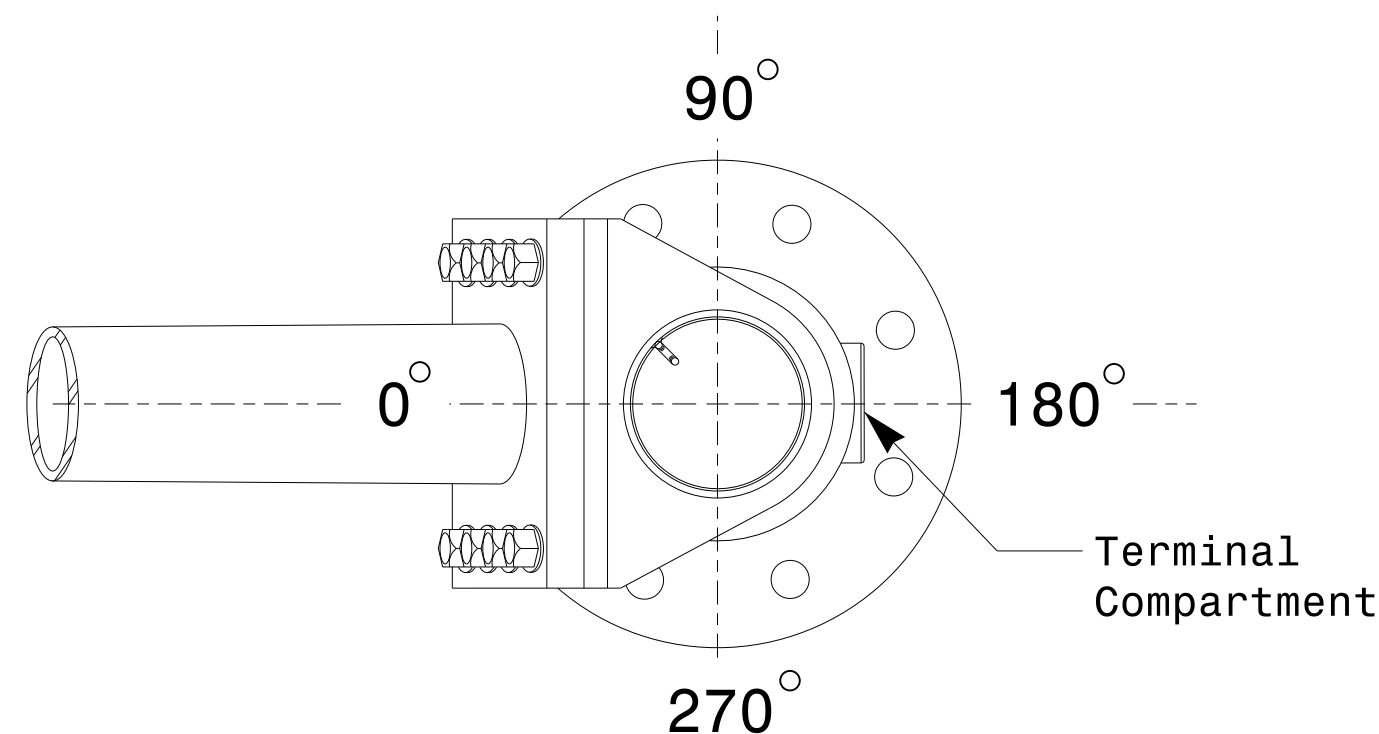
Section A-A  
Pole Base Plate Details



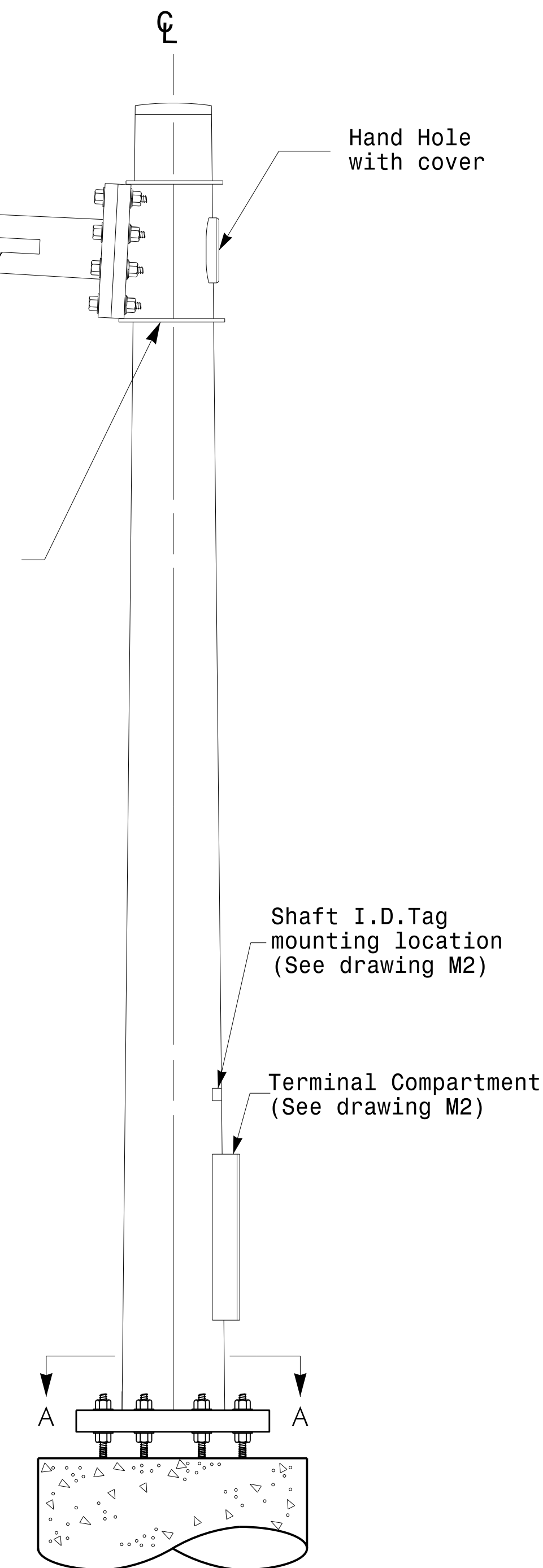
Section B-B  
(Pole Attachment to Base Plate)  
Full-Penetration Groove Weld Detail



Slip Fit Joint Detail for Mast Arm



Mast Arm Radial Orientation



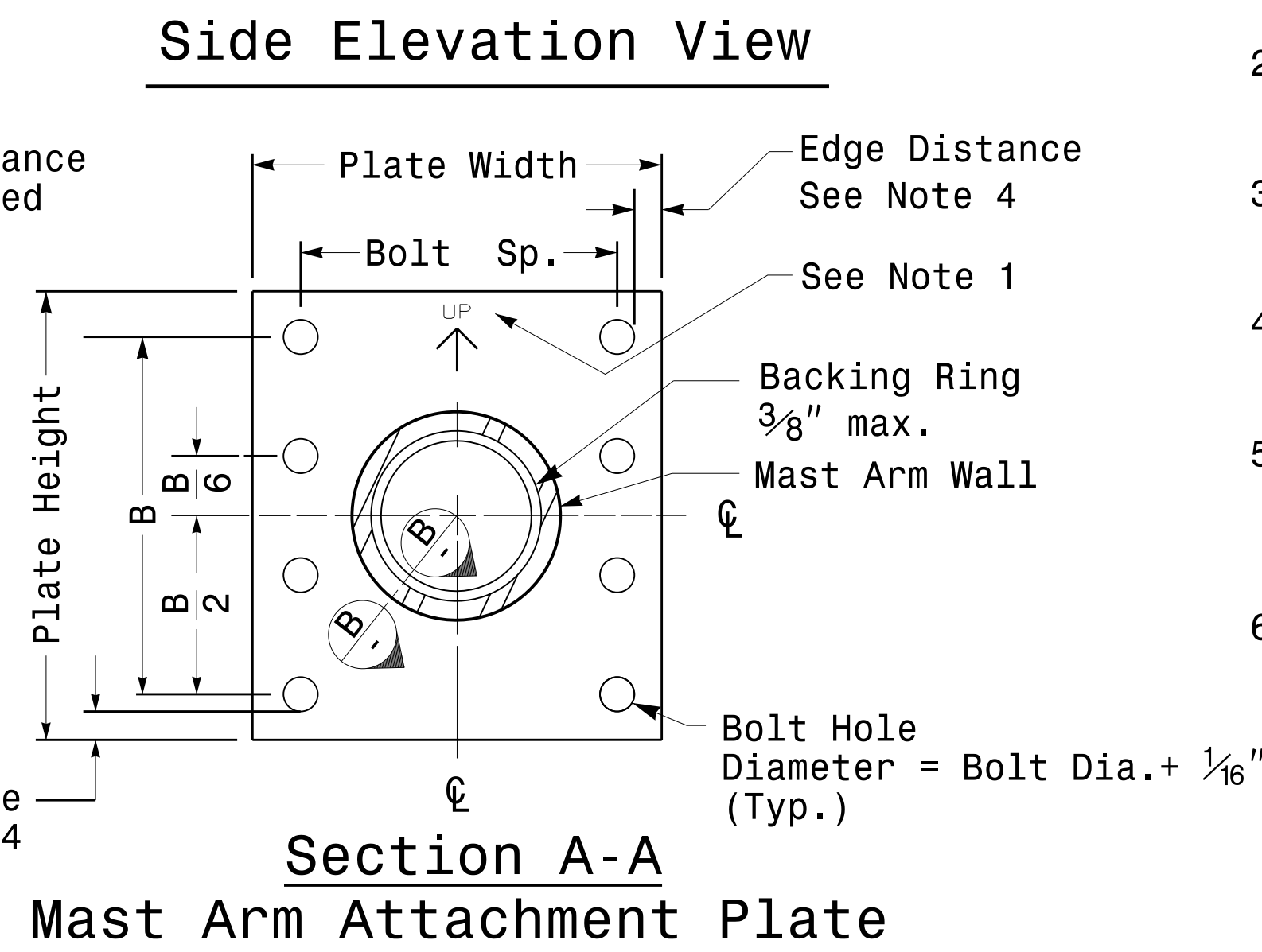
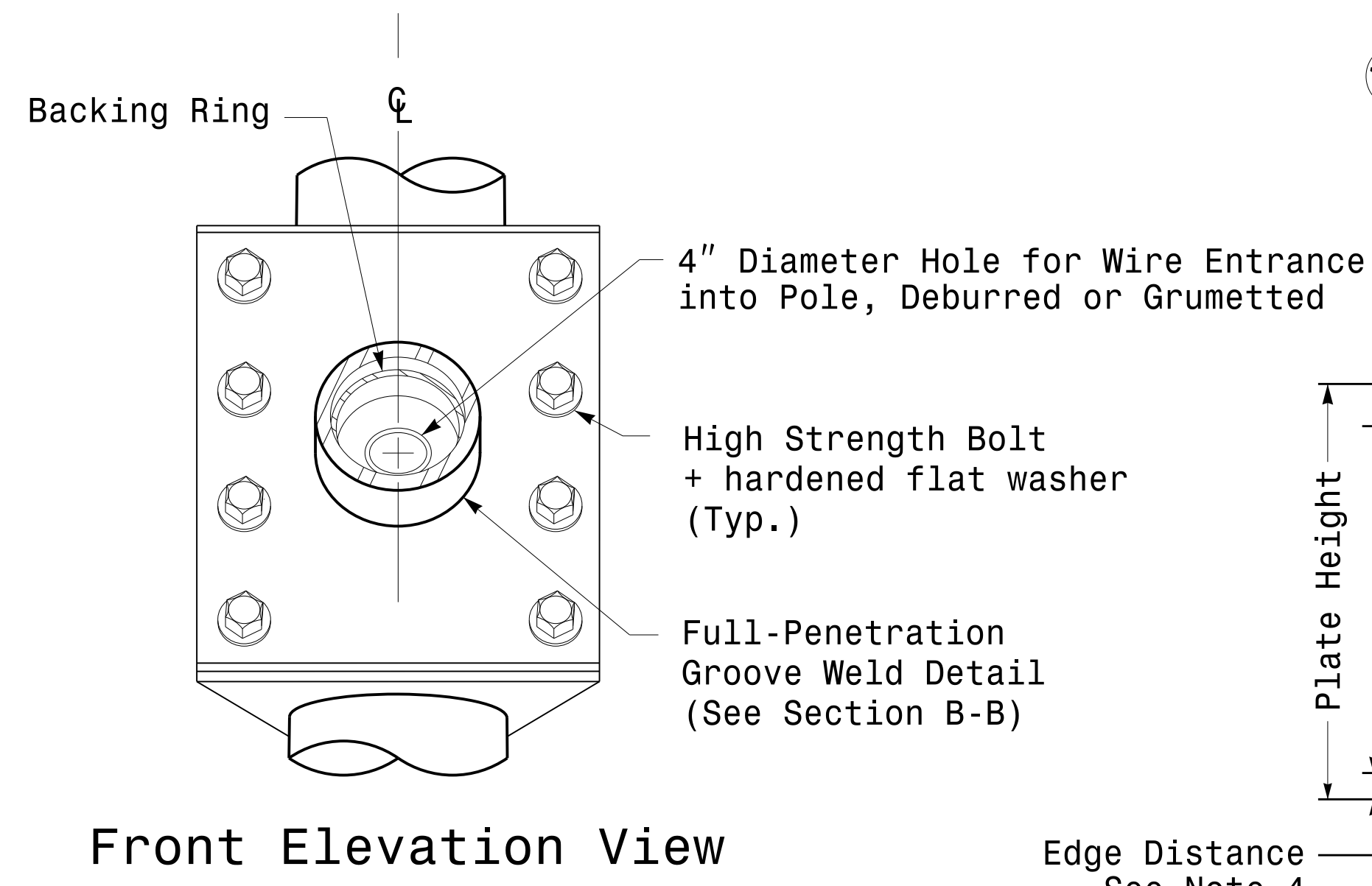
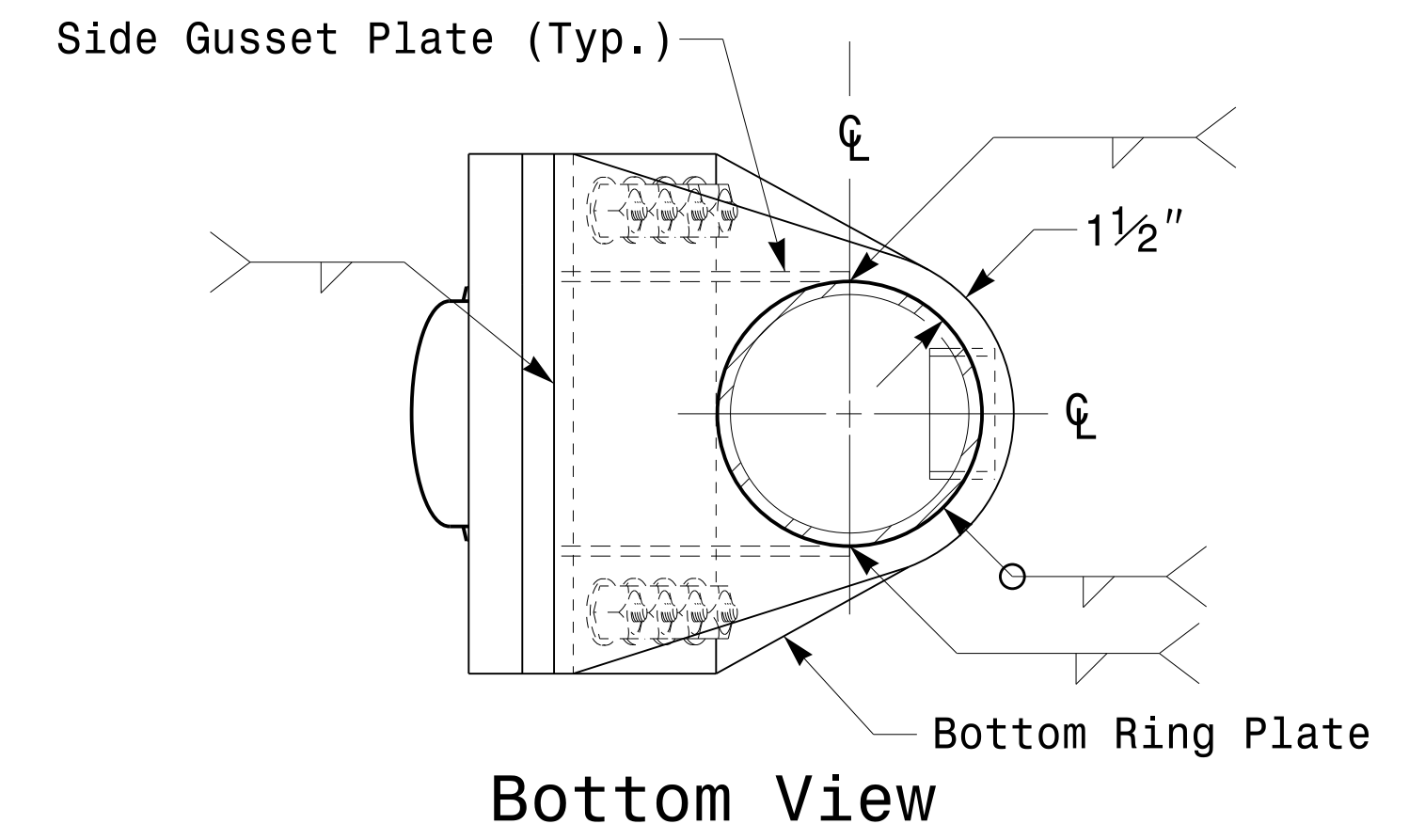
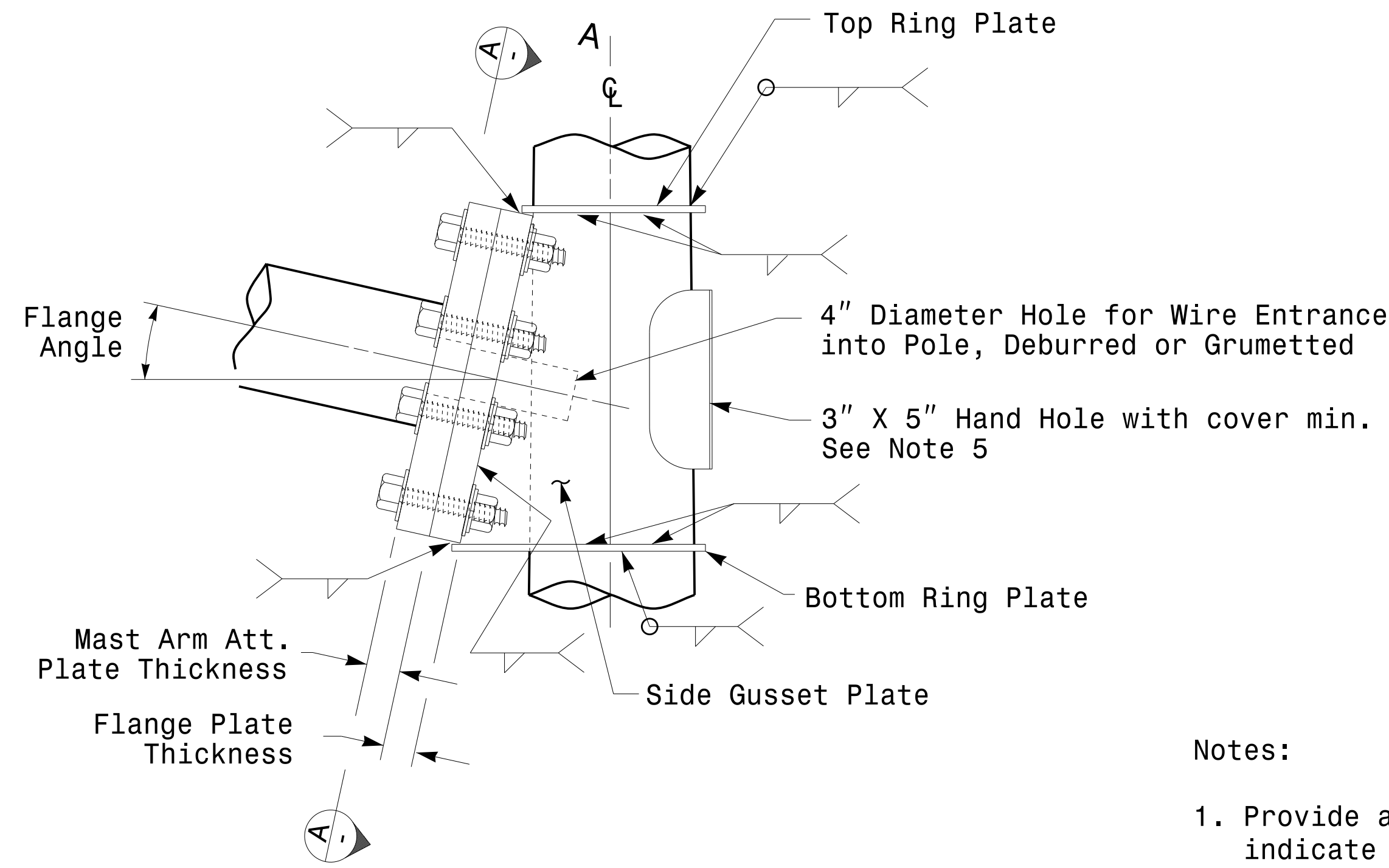
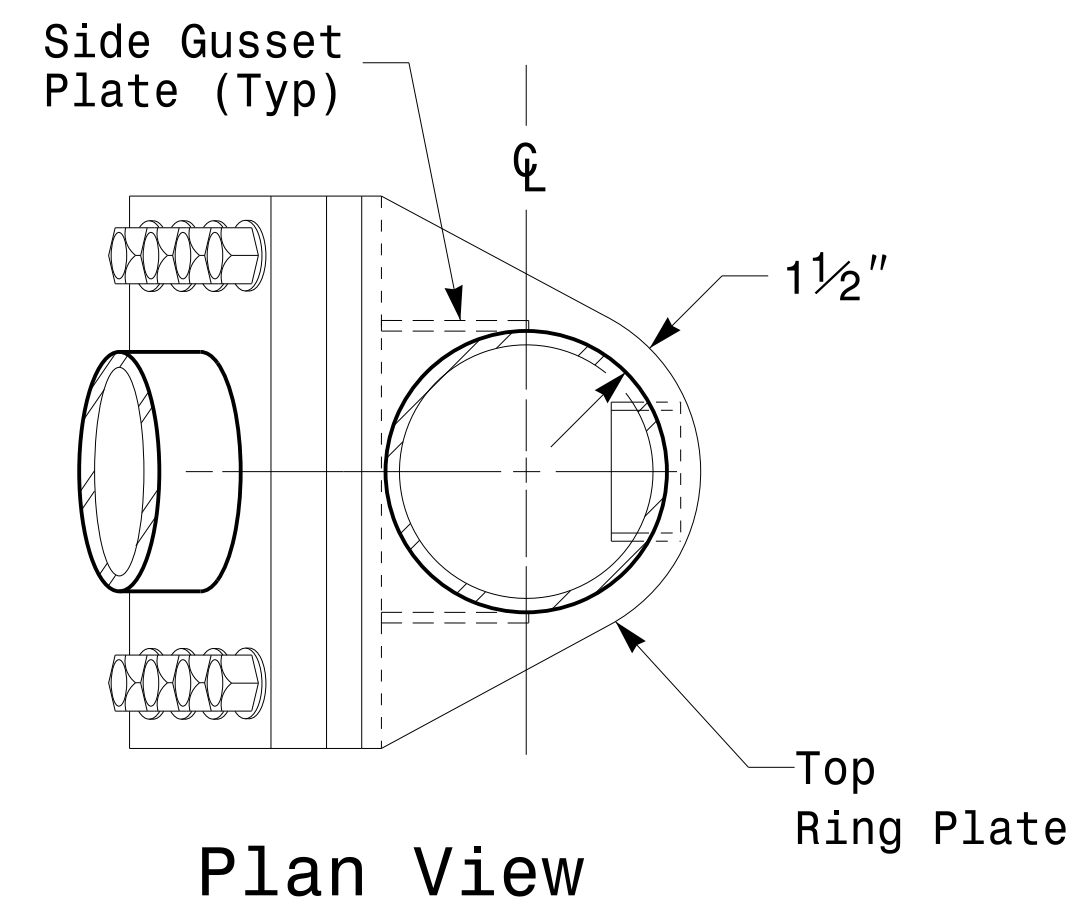
Mast Arm Pole

<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Mast Arm Poles</p>		<p>SEAL</p>
	<p>PLAN DATE: OCTOBER 2017</p>	<p>DESIGNED BY: K.C. DURIGON</p>	
<p>PREPARED BY: N. BITTING</p>	<p>REVIEWED BY: D.C. SARKAR</p>	<p>REVISIONS</p>	<p>INIT. DATE</p>
<p>SCALE: 0 NA NONE</p>	<p>DATE: 10/11/2017</p>		<p>DATE</p>

11-OCT-2017 08:33 136560115 Signal&Signal Design Section Eastern Region\m4 Sheets\2016\2014 Sig.M4 Std. Fabrication Detail - Mast Arm Poles.dgn

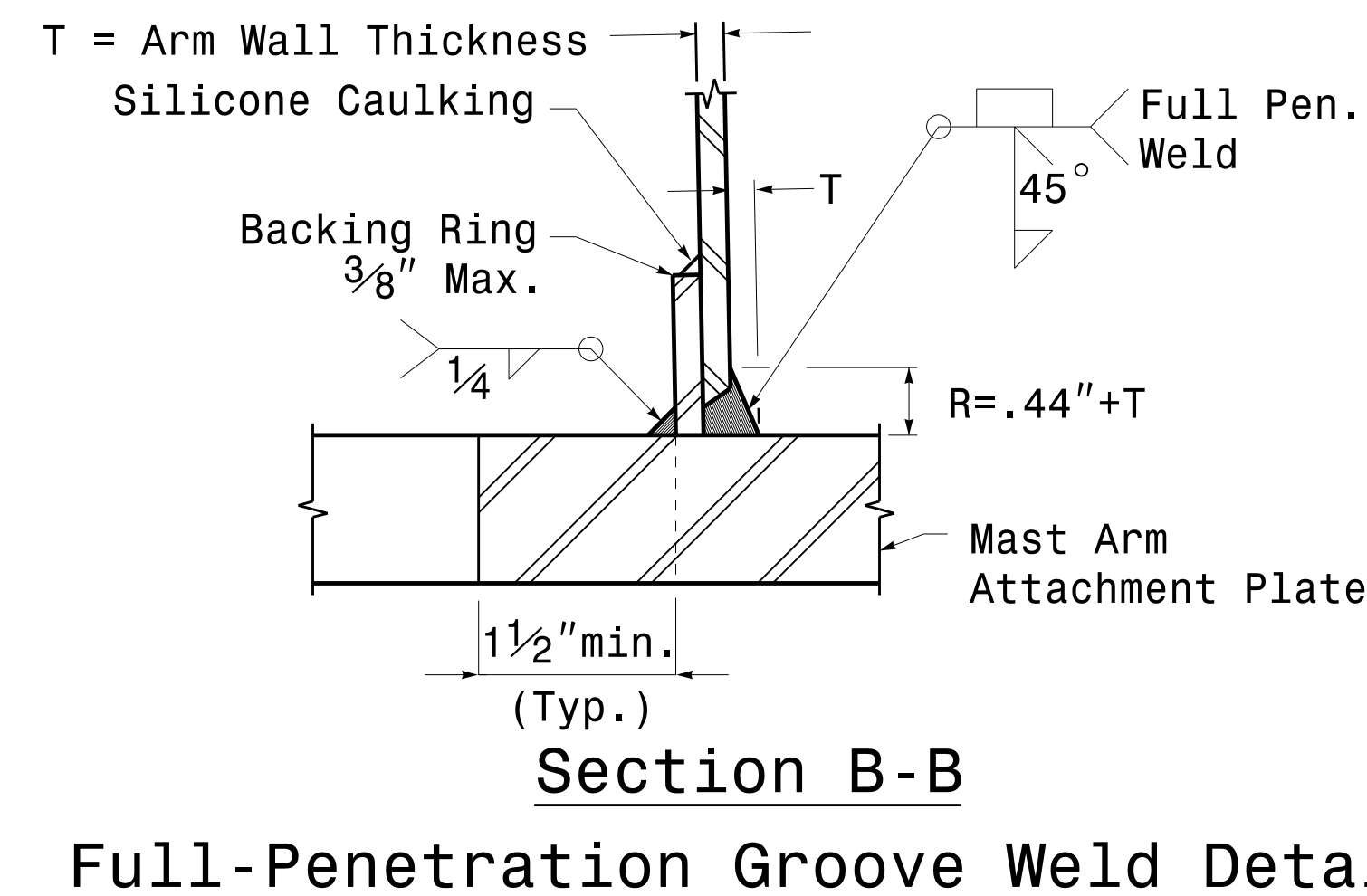
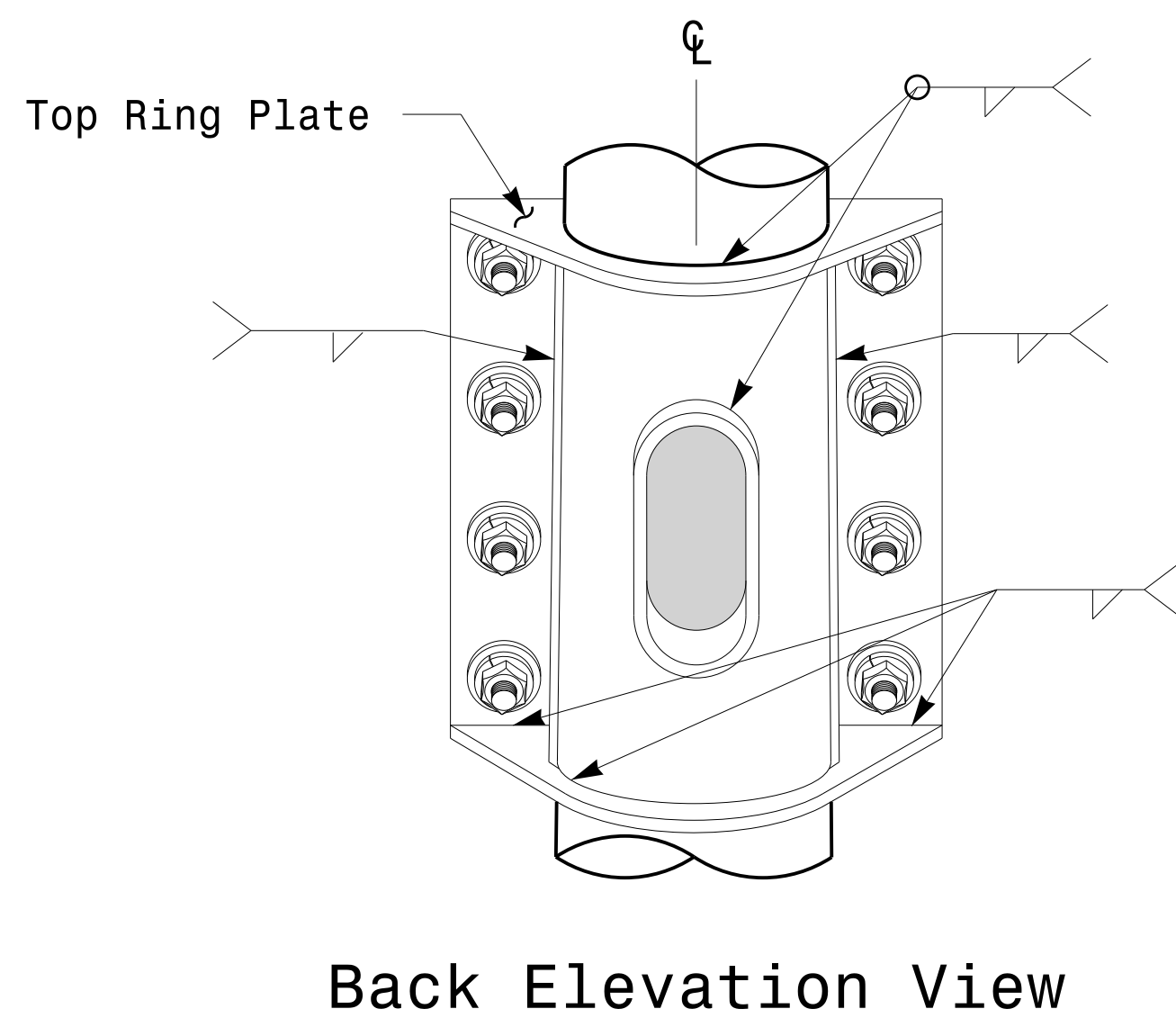
Fabrication Details - Mast Arm Poles

# Welded Ring Stiffened Mast Arm Connection



**Notes:**

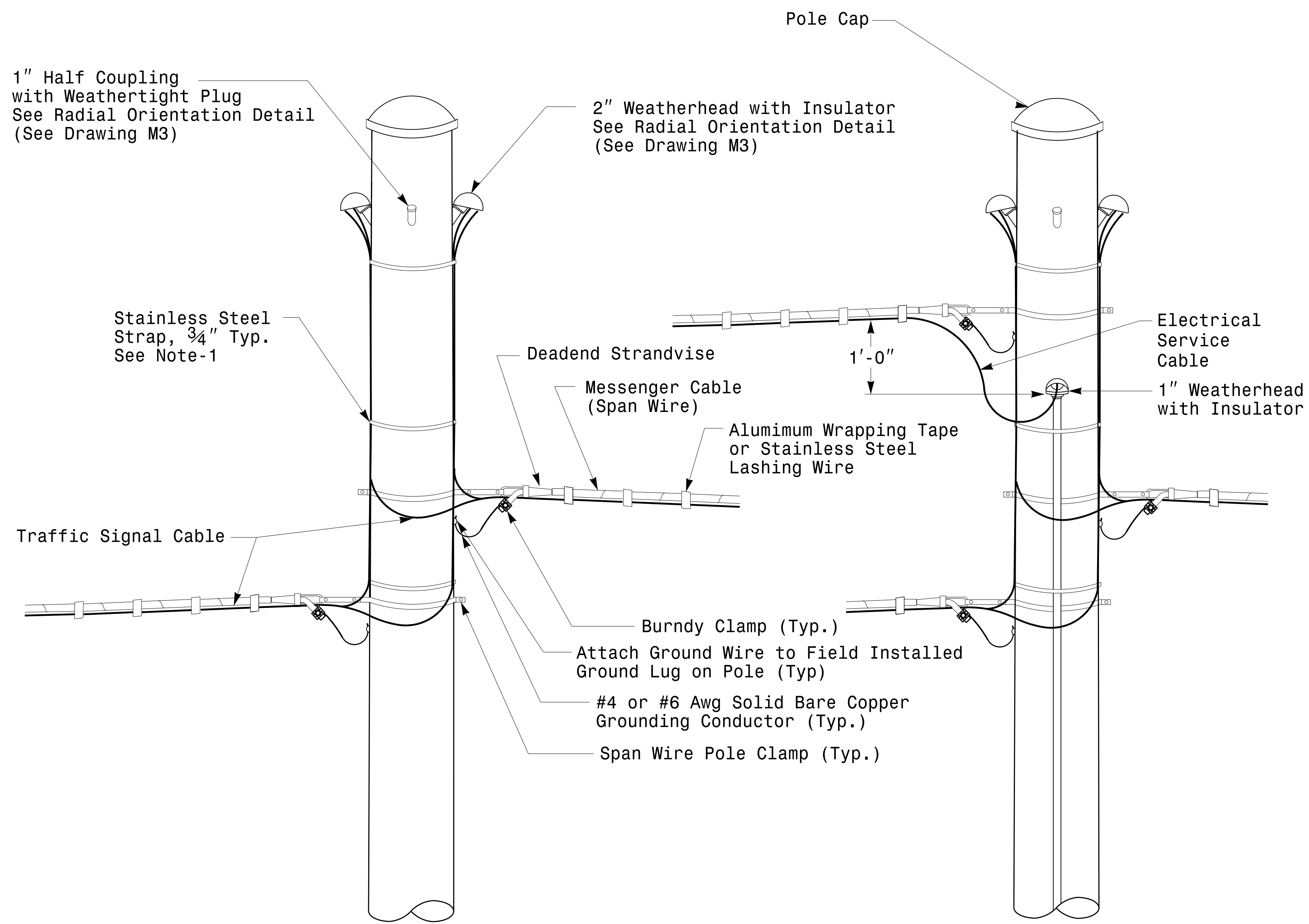
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing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



<p>Prepared in the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Mast Arm Connection To Pole</p>		<p>SEAL</p>					
	PLAN DATE: OCTOBER 2017	DESIGNED BY: C.F. ANDREWS	<p>Discussed by: <i>Dibesh C. Sarkar</i> DATE</p>					
	PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR						
<p>SCALE</p> <p>0 NA</p> <p>NONE</p>	<p>REVISIONS</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>	INIT.	DATE					<p>10/11/2017</p> <p>DATE</p>
INIT.	DATE							

11-OCT-2017 08:35 P:\SSD\W115\Sig.M5.dgn Design Section\Eastern Region\44 Sheets\2016\2014 Sig.M5 Std. Connection Fabrication Detail\Mast Arm Poles.dgn

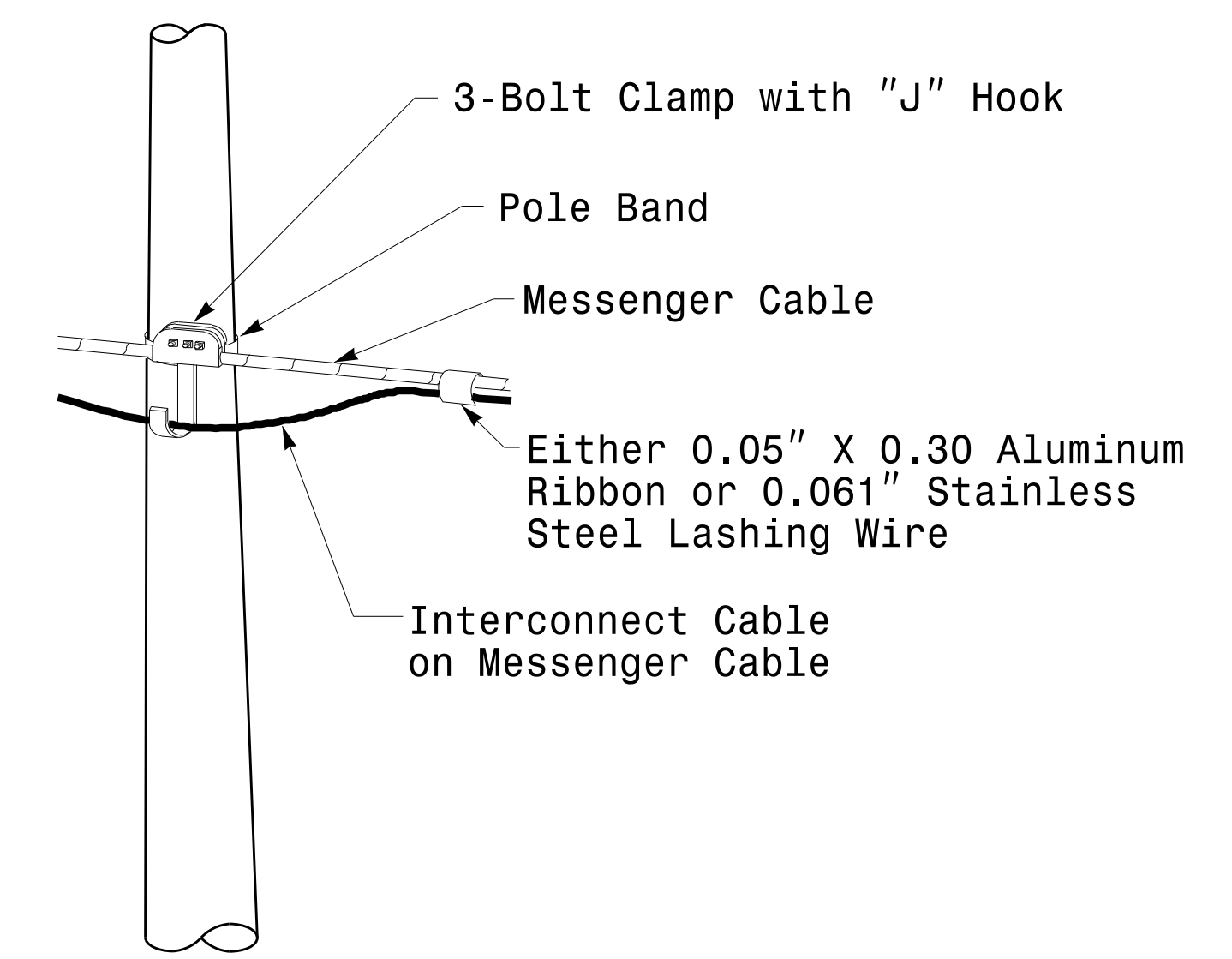
Fabrication Details – Mast Arm Connection



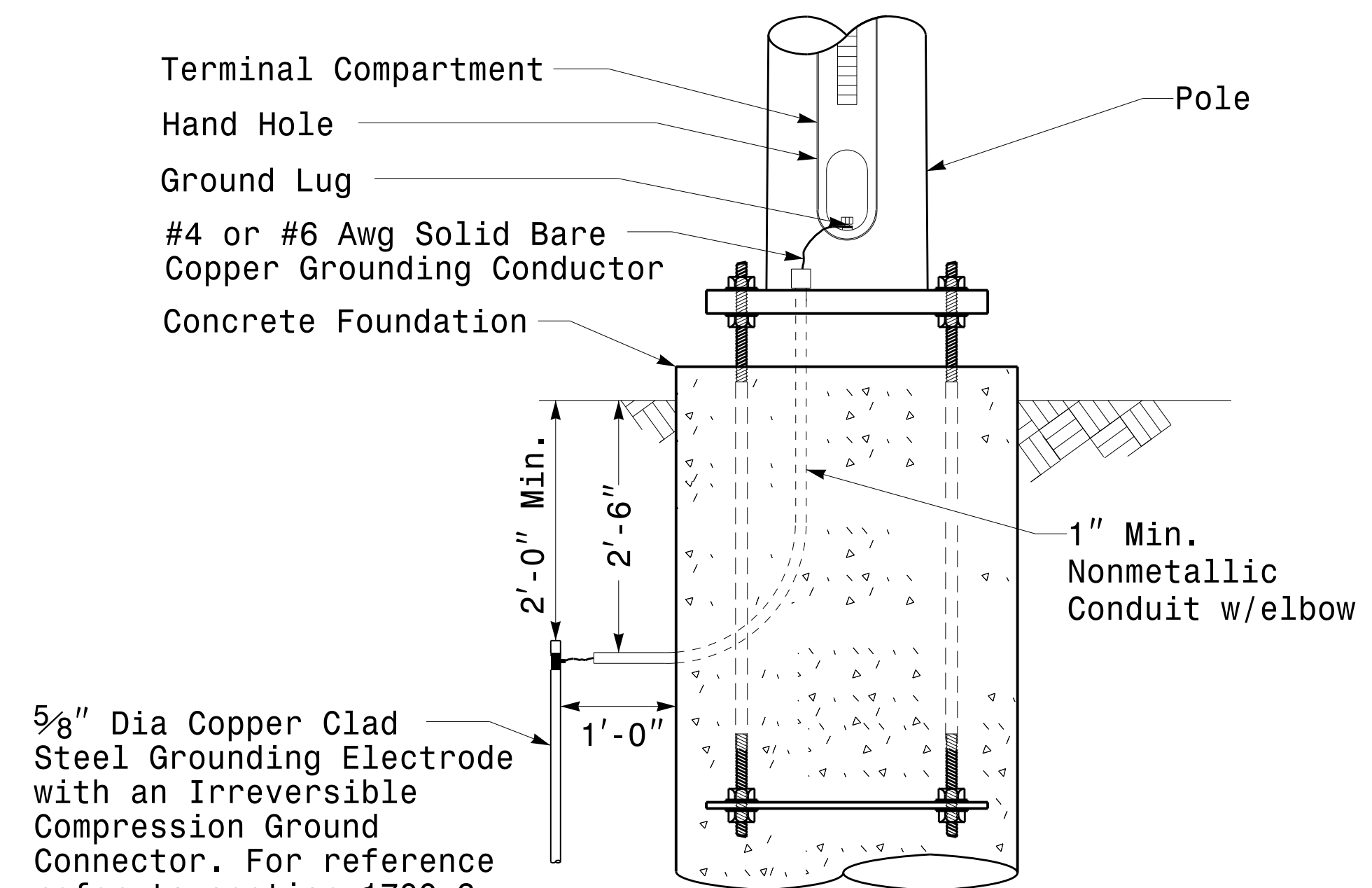
**Strain Pole Attachments**

**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 2018.



**Attachment of Cable to Intermediate Metal Pole**

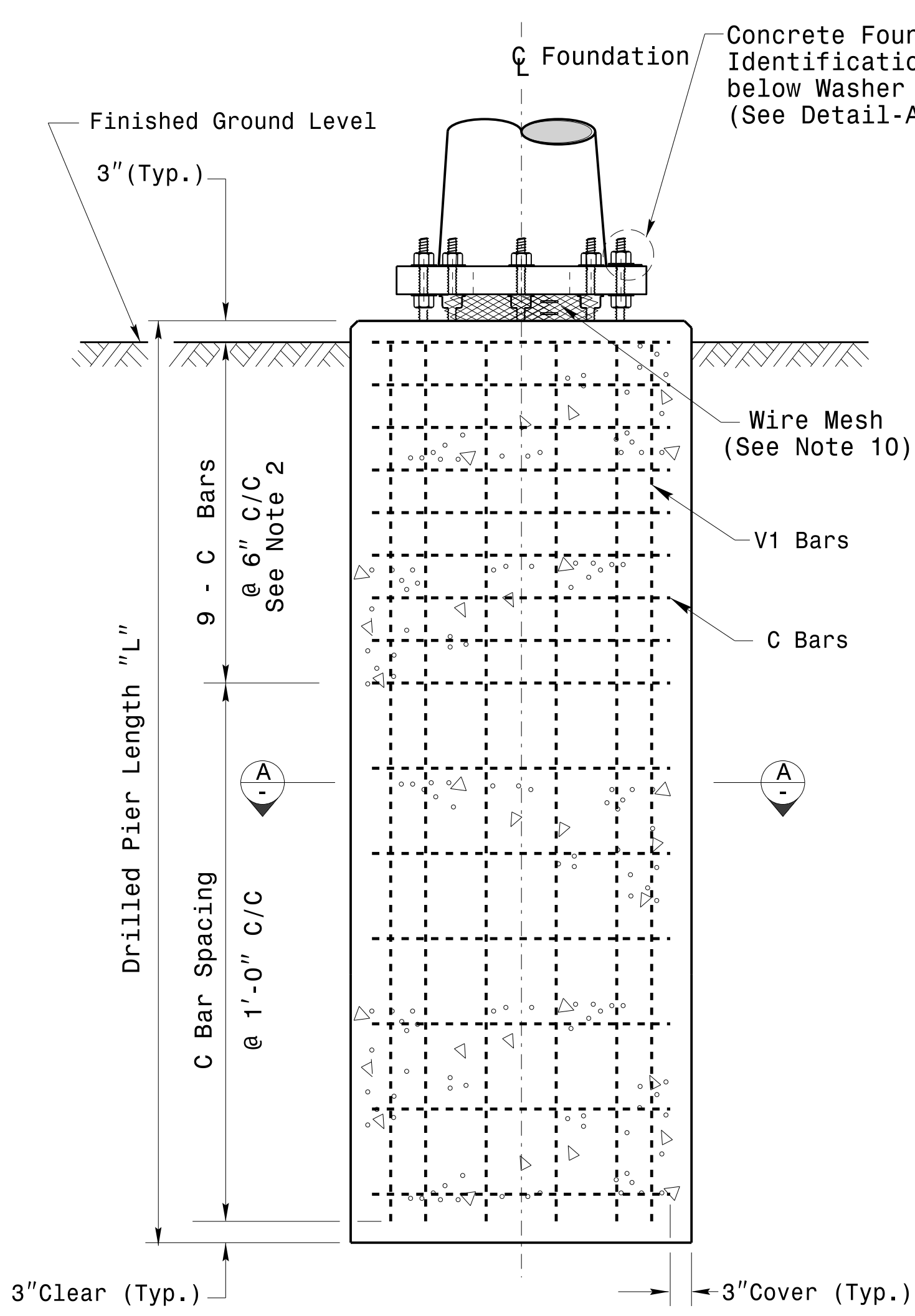


5/8" Dia Copper Clad Steel Grounding Electrode with an Irreversible Compression Ground Connector. For reference refer to section 1700-3 K and L for electrical grounding and bonding requirements, See Note 4.

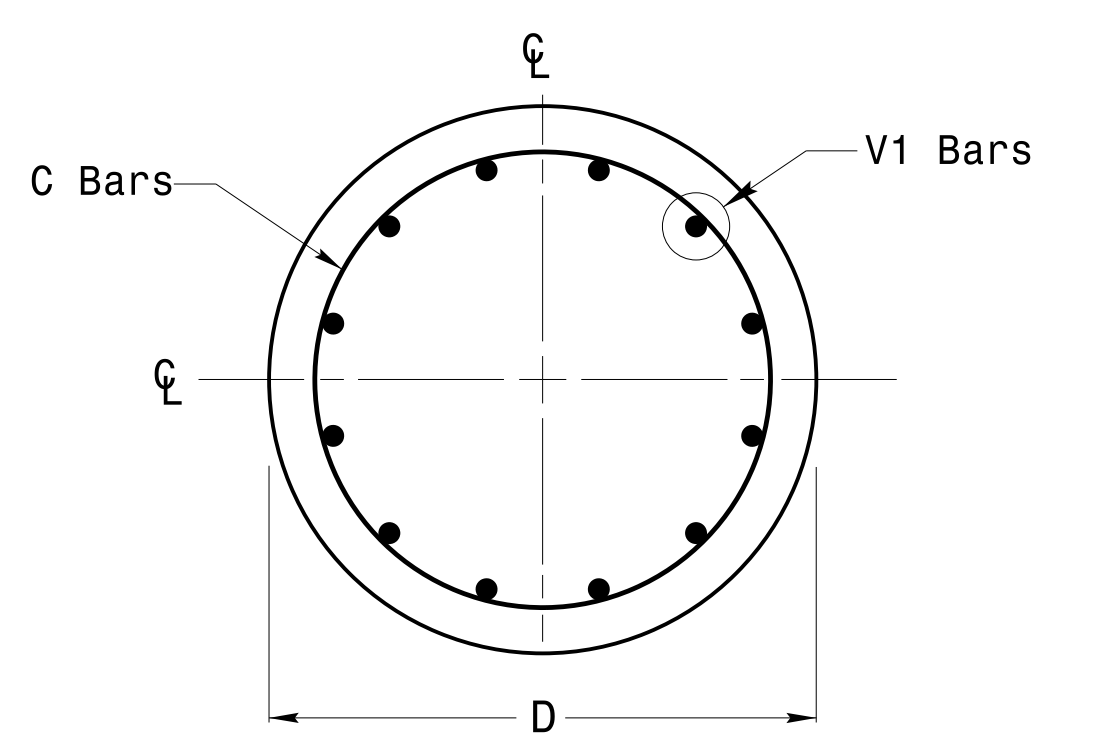
**Metal Pole Grounding Detail For Strain Pole and Mast Arm**

11-0CT-2017-08:36 136504115 StrainPole.dgn Design Section Eastern Region 0162014 Sig.M6 Std. Fabrication Detail: Strain Poles.dgn

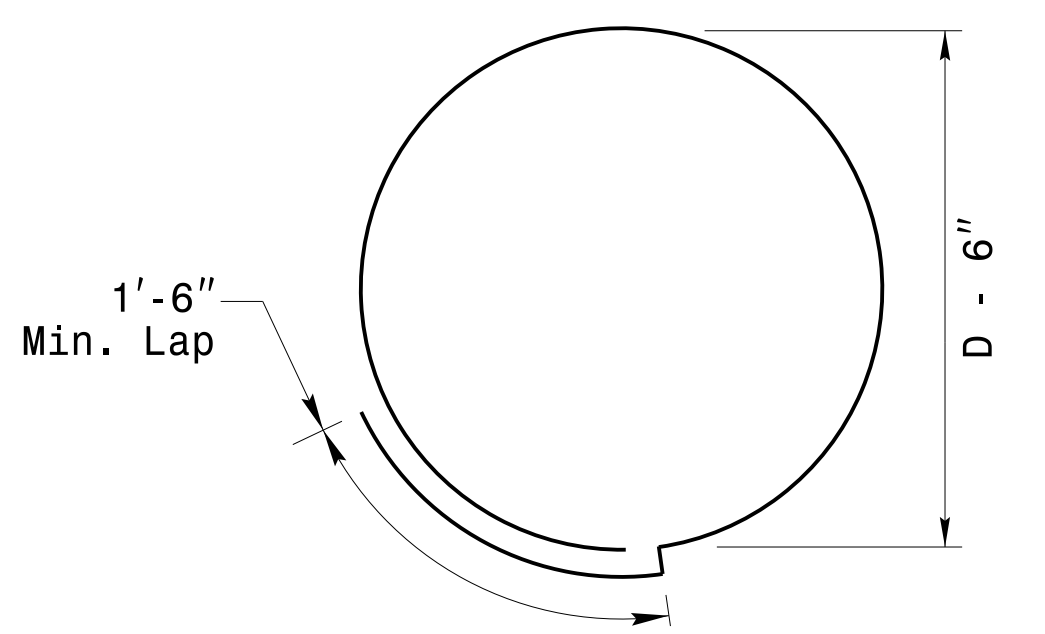
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Strain Pole Attachments</p>							
	<p>PLAN DATE: OCTOBER 2017</p> <p>DESIGNED BY: C.F. ANDREWS</p> <p>PREPARED BY: N. BITTING</p> <p>REVIEWED BY: D.C. SARKAR</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>		NO.	INIT.	DATE		
NO.	INIT.	DATE						
<p>DocuSigned by: <i>Deshi C. Sarkar</i></p>		<p>10/11/2017</p>	<p>DATE</p>					



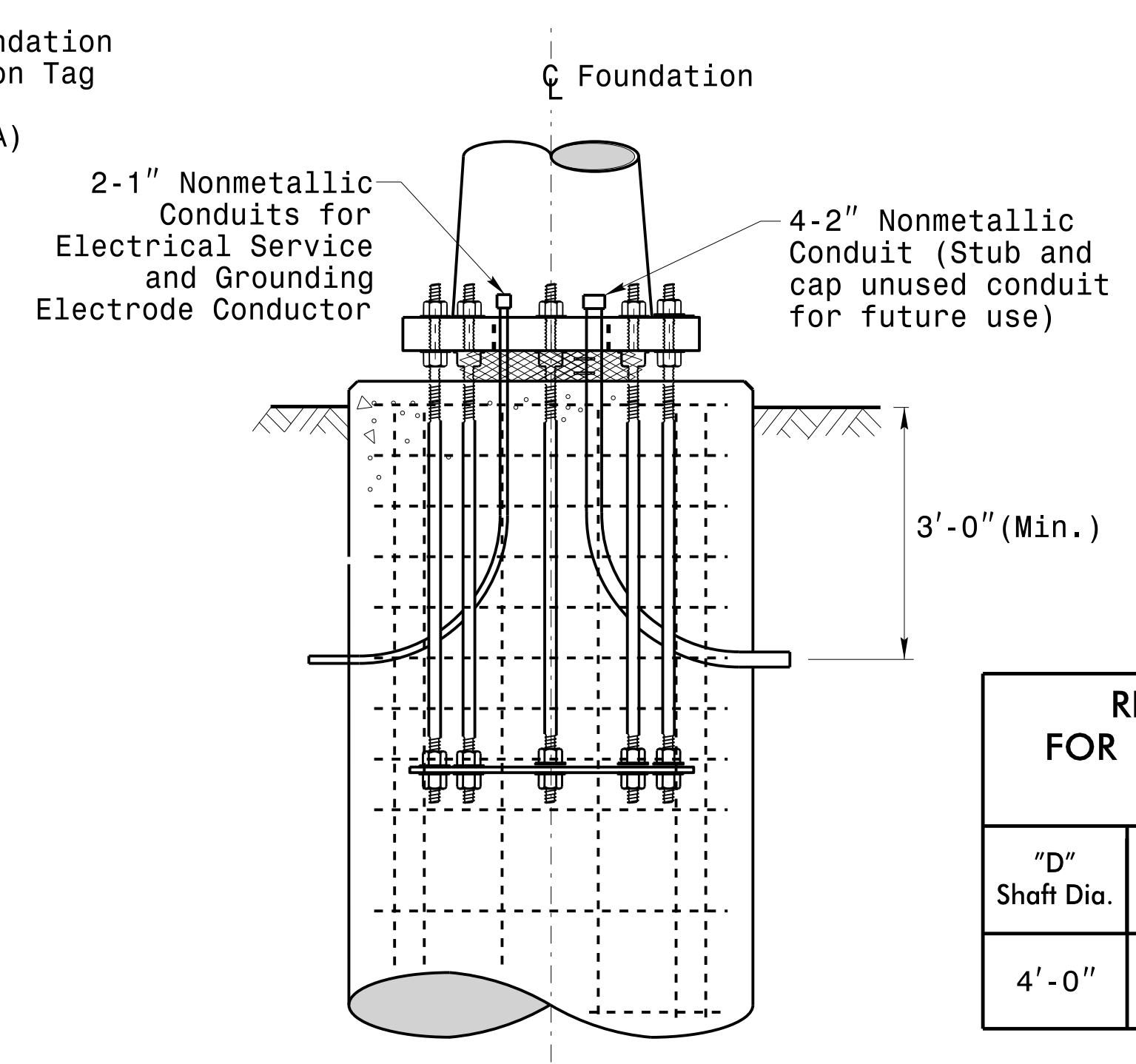
Concrete Shaft Elevation



Section A-A



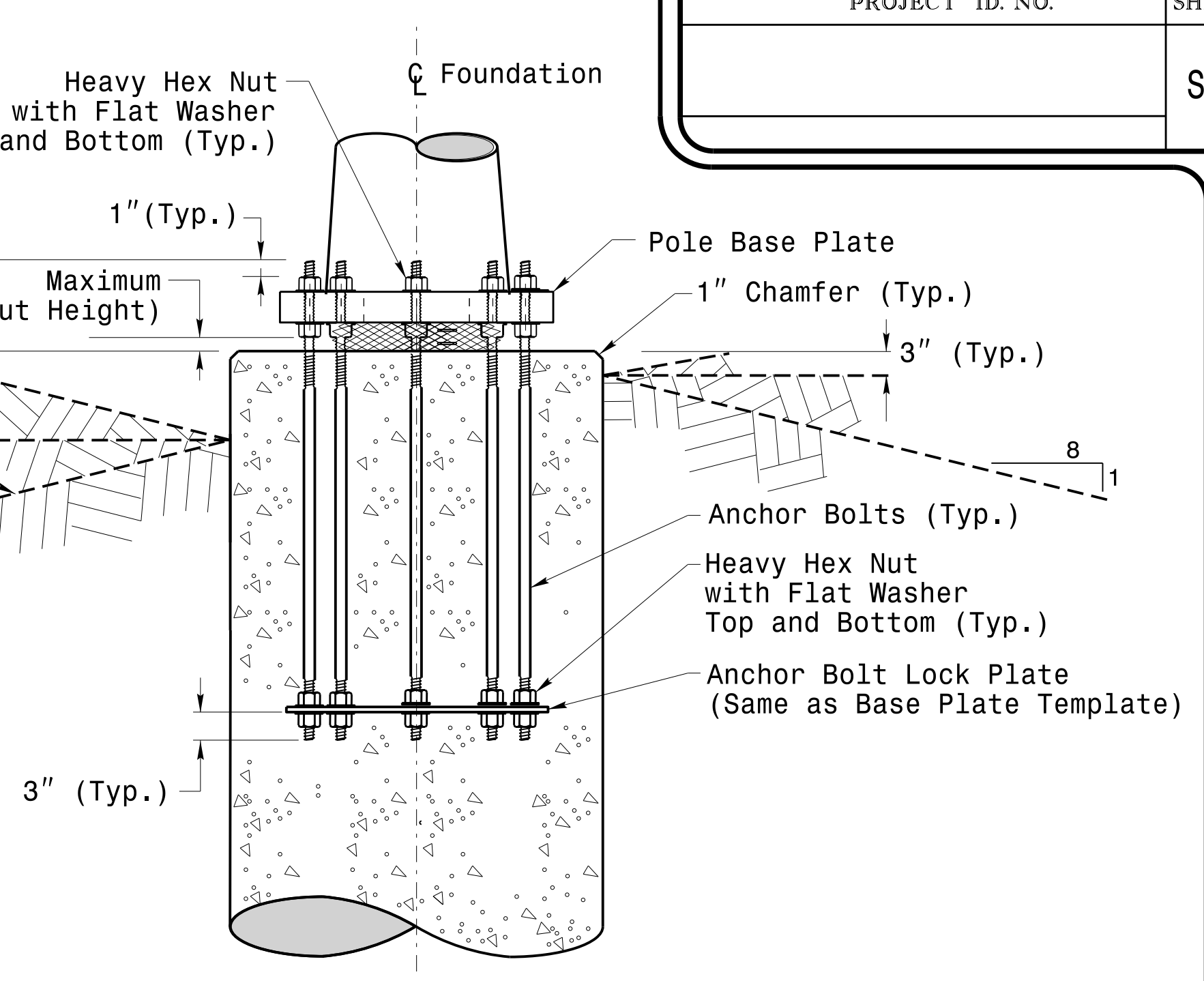
Typical "C" Bar Detail



Typical Foundation Conduit Details

"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

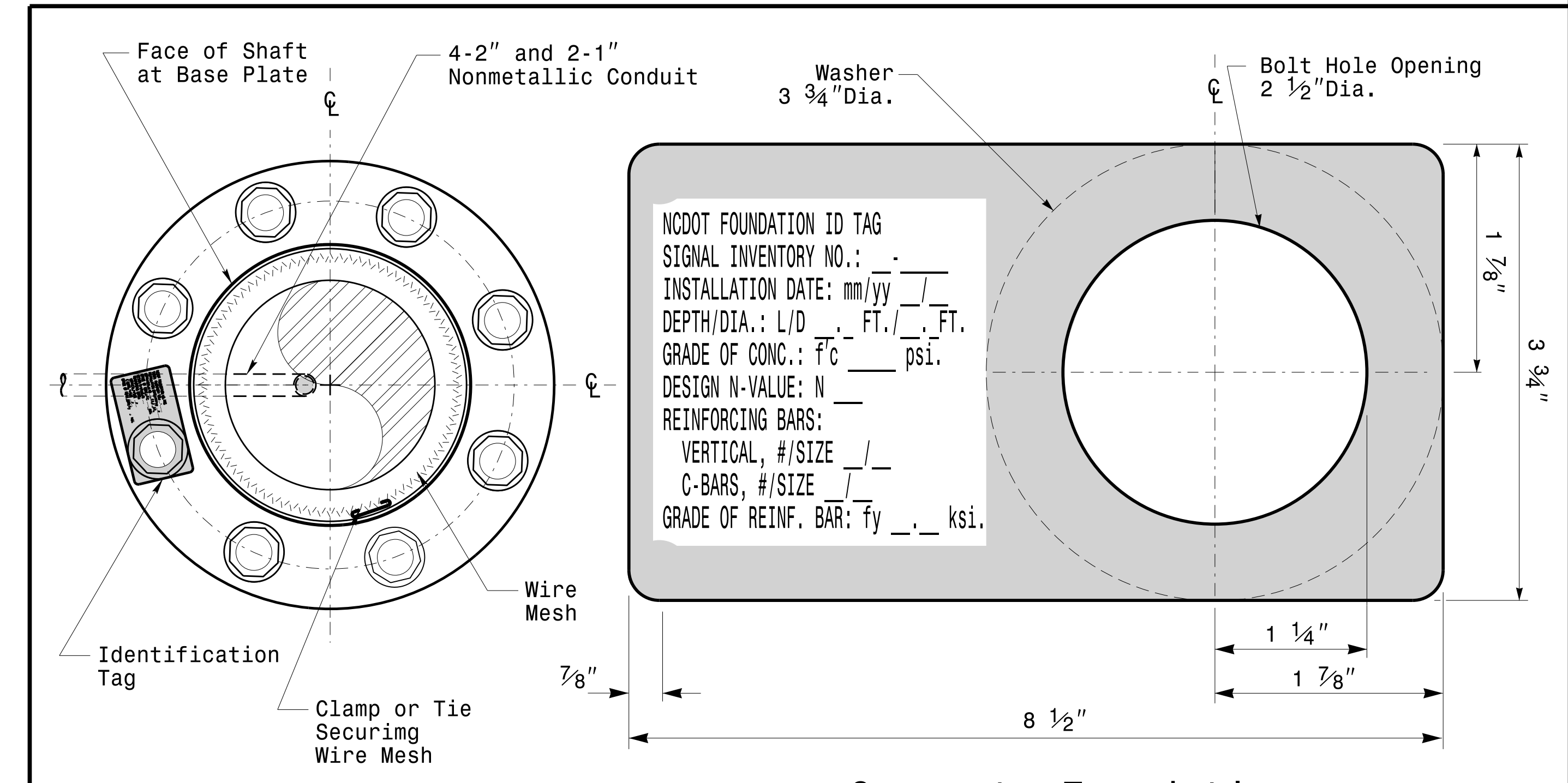


Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)

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 2018 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: OCTOBER 2018</p> <p>DESIGNED BY: C.B. COGDILL</p> <p>PREPARED BY: N. BITTING</p> <p>REVIEWED BY: D.C. SARKAR</p>	<p>REV. NO. 1</p> <p>COMMENTS: Revised Foundation Tag Details</p> <p>INIT. N.B.</p> <p>DATE: 5/11/2015</p>	

Construction Details - Foundations

11-001-2017-08:33T 1:56:00 PM 11/11/2015 5:00:00 PM Design Section Eastern Region\m\Sheets\2016\2014\_Sig.M7\_Shd\_Construction\_Detail\Is-Strain\_Poles.dgn

# SOIL CONDITION

		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
		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

### General Notes:

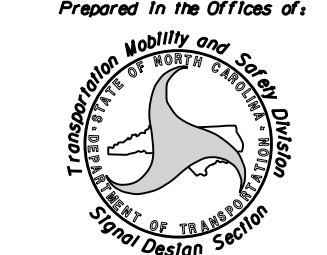
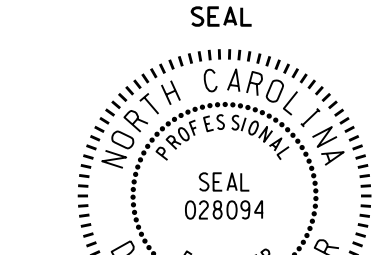
1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

### 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

	<p><b>Standard Strain Pole Foundation for All Soil Conditions</b></p> <p>PLAN DATE: OCTOBER 2017    DESIGNED BY: C.B. COGDILL                  PREPARED BY: N. BITTING    REVIEWED BY: D.C. SARKAR</p>									
SCALE: 0 NA NONE	REVISIONS: <table border="1" style="font-size: small;"> <tr> <th>NO.</th> <th>DATE</th> <th>INIT.</th> <th>DESCRIPTION</th> </tr> <tr> <td>1</td> <td>7/12/2015</td> <td>N.B.</td> <td>Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn.</td> </tr> </table>	NO.	DATE	INIT.	DESCRIPTION	1	7/12/2015	N.B.	Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn.	Documented by: <i>D. C. SARKAR</i> DATE: 10/11/2017
NO.	DATE	INIT.	DESCRIPTION							
1	7/12/2015	N.B.	Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn.							

11-007-2017-08-10 S:\11242017\Sig.M8\15 Signal\Signal Design Section\Eastern Region\M Sheets\2016\2014 Sig.M8 Std. Strain Pole Found.-Saturated Soil -Cond111on.dgn rnz\insg



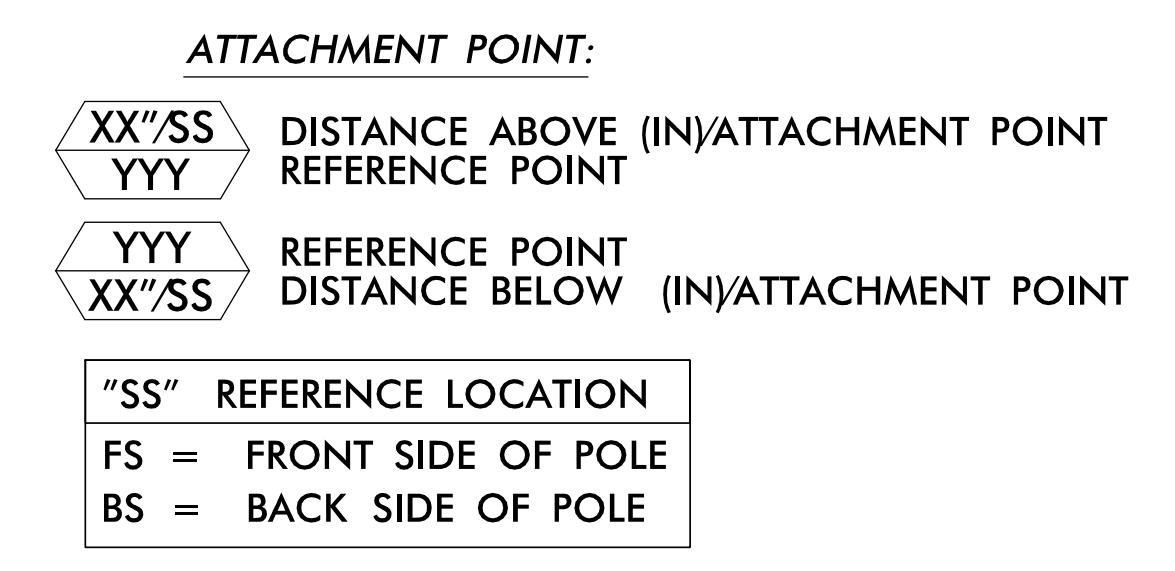
- 1 INSTALL COAX CABLE
- 2 INSTALL ETHERNET CABLE
- 3 EXISTING ETHERNET (OR COAX) CABLE
- 4 INSTALL SMFO CABLE
- 5 EXISTING SMFO CABLE
- 6 INSTALL FIBER OPTIC DROP CABLE ASSEMBLY
- 7 INSTALL TRACER WIRE
- 8 TRENCH
- 9 INSTALL PVC CONDUIT
- 10 INSTALL RIGID, GALVANIZED STEEL CONDUIT
- 11 INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- 12 INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
- 13 INSTALL OUTER-DUCT POLYETHYLENE CONDUIT
- 14 INSTALL POLYETHYLENE CONDUIT
- 15 DIRECTIONAL DRILL CONDUIT
- 16 BORE AND JACK CONDUIT
- 17 INSTALL CABLE(S) IN EXISTING CONDUIT
- 18 INSTALL CABLE(S) IN NEW CONDUIT
- 19 INSTALL CABLE(S) IN EXISTING RISER
- 20 INSTALL CABLE(S) IN NEW RISER
- 21 INSTALL CABLE(S) IN EXISTING CONDUIT STUB-OUTS
- 22 INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 23 INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- 24 INSTALL NEW CONDUIT INTO BASE MOUNTED CABINET
- 25 INSTALL NEW RISER INTO BASE MOUNTED CABINET
- 26 INSTALL NEW ETHERNET EDGE SWITCH
- 27 INSTALL NEW FIBER OPTIC TRANSCEIVER
- 28 INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS AND FUSION SPLICE CABLE IN CABINET
- 29 INSTALL UNDERGROUND SPLICE ENCLOSURE
- 30 INSTALL AERIAL SPLICE ENCLOSURE
- 31 MODIFY EXISTING INTERCONNECT CENTER /SPLICE ENCLOSURE
- 32 INSTALL POLE MOUNTED SPLICE CABINET
- 33 INSTALL BASE MOUNTED SPLICE CABINET

- 34 INSTALL CABINET FOUNDATION
- 35 INSTALL CCTV CAMERA POLE MOUNTED CABINET
- 36 INSTALL CCTV CAMERA ASSEMBLY
- 37 INSTALL CCTV CAMERA WOOD POLE
- 38 INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- 39 INSTALL JUNCTION BOX
- 40A INSTALL OVERSIZED JUNCTION BOX
- 40B INSTALL SPECIAL OVERSIZED JUNCTION BOX (36" x 24" x 24")
- 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
- 48A REMOVE EXISTING COMMUNICATIONS AND MESSENGER CABLE
- 48B REMOVE EXISTING COMMUNICATIONS CABLE
- 49 BACK PULL EXISTING COMMUNICATIONS CABLE
- 50 INSTALL CELL MODEM AND ANTENNA
- 51 INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- 52A INSTALL DELINEATOR MARKER
- 52B INSTALL JUNCTION BOX MARKER
- 53A STORE 20 FEET OF COMMUNICATIONS CABLE
- 53B STORE 50 FEET OF EACH COMMUNICATIONS CABLE
- 54 LASH CABLE(S) TO EXISTING 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
- 59 INSTALL NEW EQUIPMENT CABINET DISCONNECT
- 60 BOND TRACER WIRE TO EQUIPMENT GROUND BUS
- 61 DO NOT BOND TRACER WIRE TO EQUIPMENT GROUND BUS
- 62 BOND RISER AND MESSENGER CABLE TO POLE GROUND
- 63 BOND RISER TO POLE GROUND
- 64 BOND MESSENGER CABLE TO POLE GROUND
- 65 INSTALL HEAT SHRINK TUBING RETROFIT KIT
- 66 INSTALL MOLDABLE DUCT SEAL
- 67 SLACK SPAN

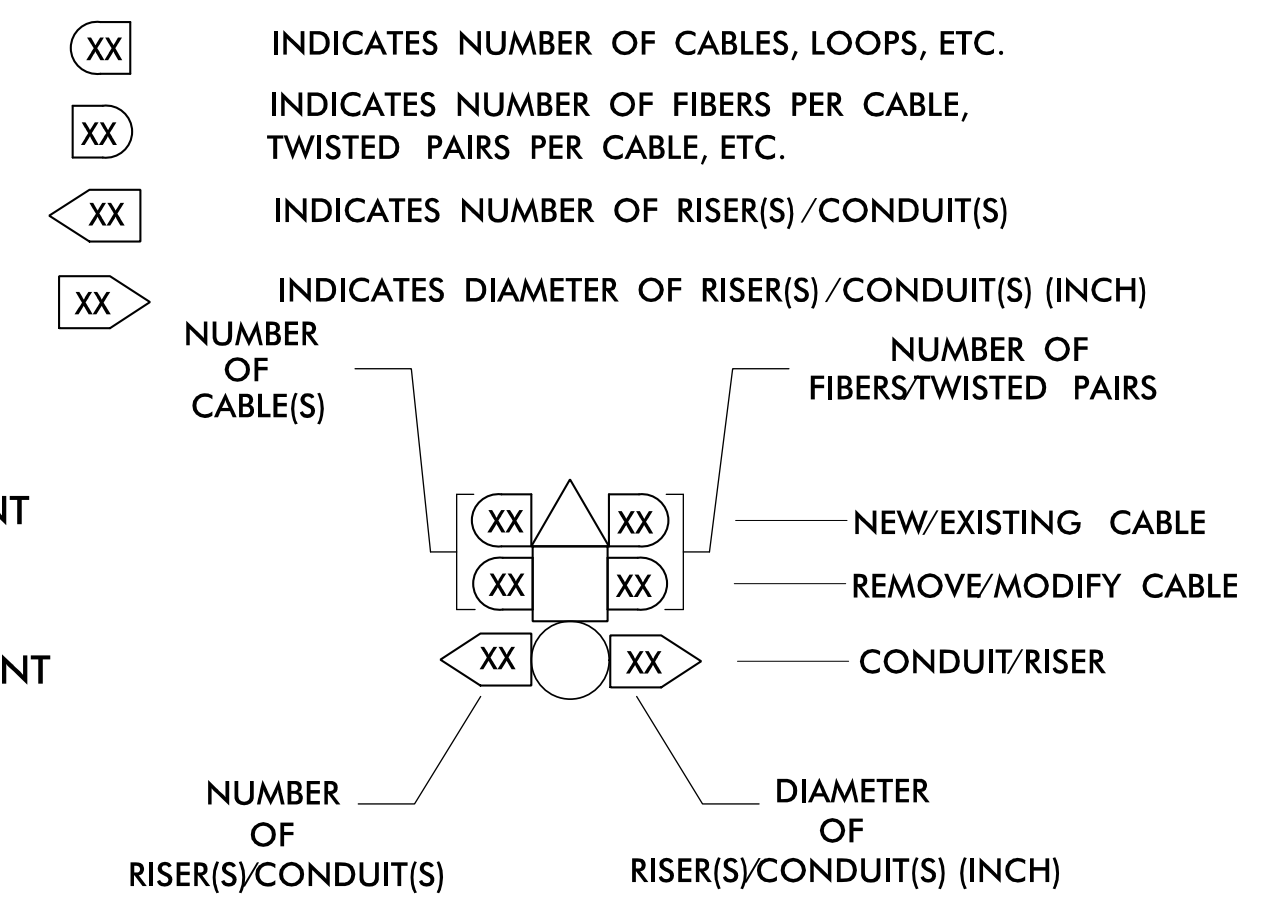
**LEGEND**

	NEW FIBER OPTIC COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
	NEW DIRECTIONAL DRILLED CONDUIT

NEW		EXISTING
	OVERSIZED JUNCTION BOX	
	WOOD POLE	
	AERIAL SPLICE ENCLOSURE	
	UNDERGROUND SPLICE ENCLOSURE	
	METAL POLE	
	CCTV ASSEMBLY	
	STANDARD GUY ASSEMBLY	
	SIDEWALK GUY ASSEMBLY	
	CABLE STORAGE RACKS (SNOW SHOES)	
	SIGNAL/EQUIPMENT CABINET	
	SPLICE CABINET	
	FLAT PANEL ANTENNA (SINGLE)	
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION	
	YAGI ANTENNA (SINGLE)	
	OMNI ANTENNA	
	SIGNAL POLE	
	SIGNAL INVENTORY NUMBER	



**CONSTRUCTION NOTE SYMBOLOGY KEY**



K:\RAL\_Roadway\01036479 - R-5705A - NC 55451gn1s455 - Cable Routing\SCP-01.dgn 8:27:43 AM susan.pennington 3/23/2023

PLANS PREPARED IN THE OFFICE OF:  
**KimleyHorn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000



Signal System D06-14 Angier Communication Cable and Conduit Routing Plans

Division 6 Harnett County Angier

PLAN DATE: October 2022 REVIEWED BY: KW Smith

PREPARED BY: SS Butler REVIEWED BY:

REVISIONS	INIT.	DATE

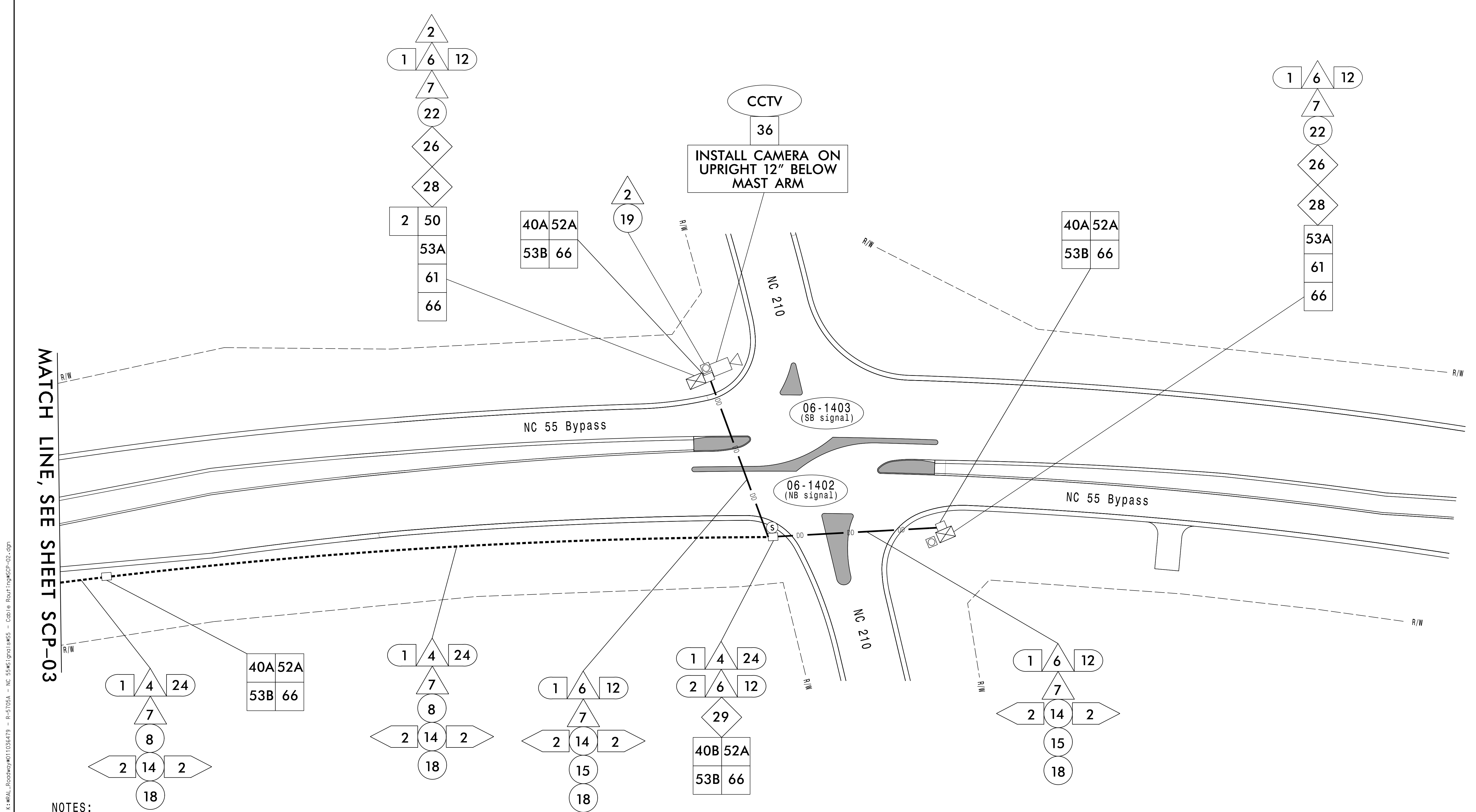
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

**KEVIN W. SMITH**  
 PROFESSIONAL ENGINEER  
 STATE OF NORTH CAROLINA  
 LICENSE NO. 030472

DocuSigned by:  
 Kevin Smith  
 3/3/2023

SIG. INVENTORY NO.



MATCH LINE, SEE SHEET SCP-03

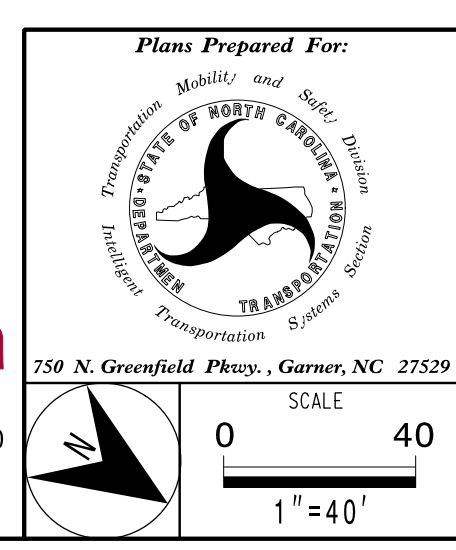
NOTES:

1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION TRAFFIC ENGINEER AT (910) 364-0600 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE DIVISION TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

2) CELL MODEMS TO BE SUPPLIED BY THE DEPARTMENT. CONTACT THE DIVISION TRAFFIC ENGINEER TO REQUEST THE CELL MODEMS. ALLOW EIGHT (8) WEEKS LEAD TIME BEFORE ANTICIPATED DEPLOYMENT.

K:\RAL\_Roadway\01036479 - R-5705A - NC 55\51signals\55 - Cable Routing\SCP-02.dgn 8:27:45 AM susen.pennington 3/3/2023

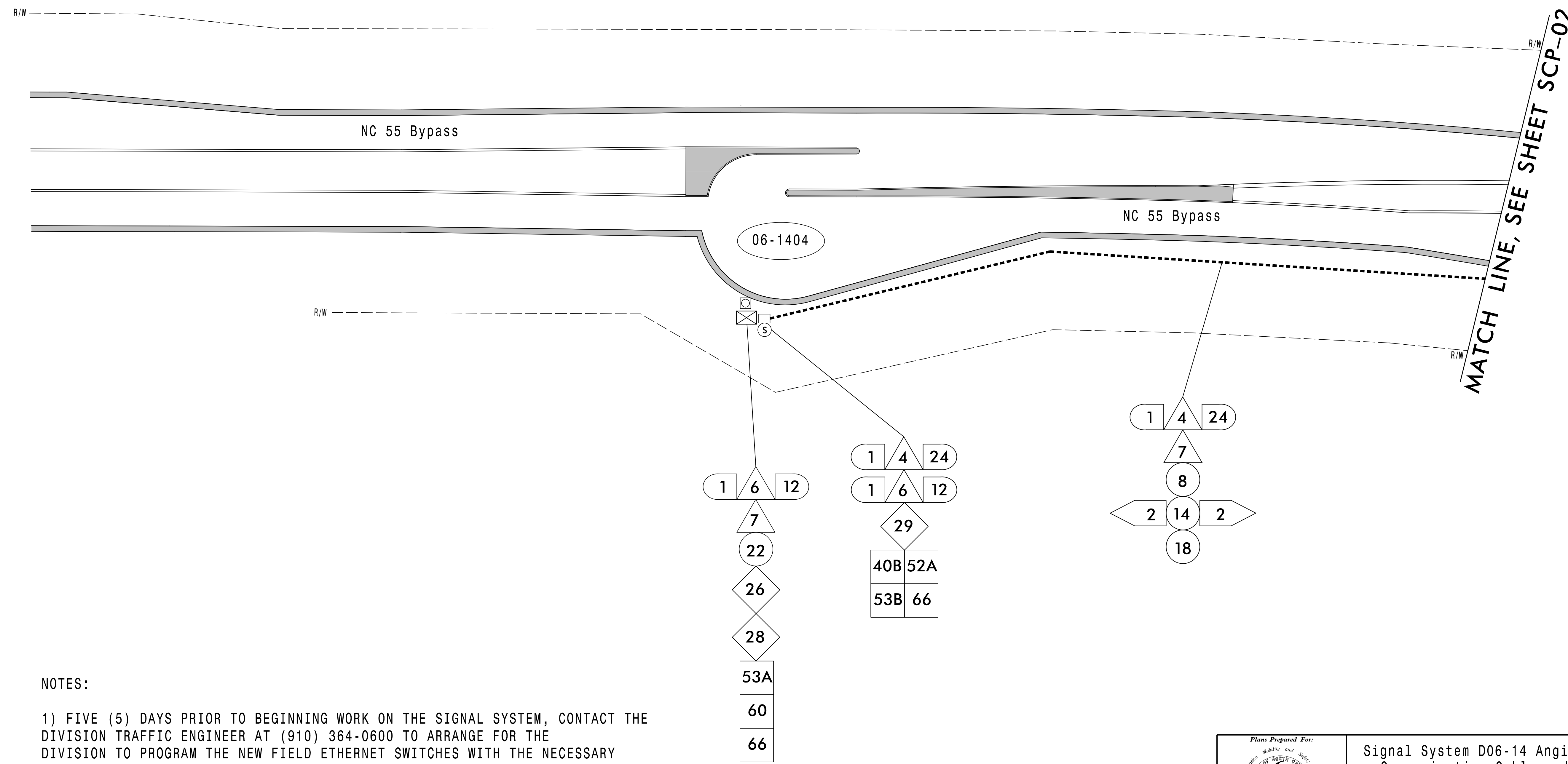
PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
 750 N. Greenfield Place, Garner, NC 27529  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000



Signal System D06-14 Angier Communication Cable and Conduit Routing Plans	
Division 6	Harnett County
PLAN DATE: October 2022	REVIEWED BY: KW Smith
PREPARED BY: SS Butler	REVIEWED BY:
REVISIONS	INIT. DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL  
 NORTH CAROLINA PROFESSIONAL ENGINEER  
 SEAL 030472  
 KEVIN W. SMITH  
 3/3/2023  
 SIG. INVENTORY NO.

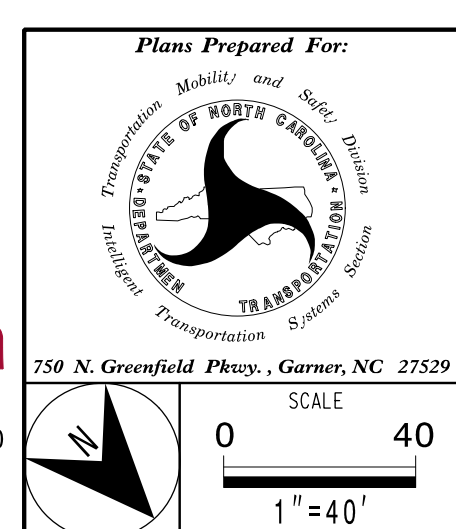


**NOTES:**

1) FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE DIVISION TRAFFIC ENGINEER AT (910) 364-0600 TO ARRANGE FOR THE DIVISION TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK AND VLAN ID INFORMATION. NOTIFY THE DIVISION TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.

3/23/2023 8:27:48 AM s:\user\pennington K:\RAL\_Roadway\01036479 - R-5705A - NC 55\51signals\55 - Cable Routing\SCP-03.dgn

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
 NC License #F-0102  
 421 Fayetteville Street, Suite 600  
 Raleigh, NC 27601  
 (919) 677-2000



Signal System D06-14 Angier Communication Cable and Conduit Routing Plans	
Division 6	Harnett County Angier
PLAN DATE: October 2022	REVIEWED BY: KW Smith
PREPARED BY: SS Butler	REVIEWED BY:
REVISIONS	INIT. DATE

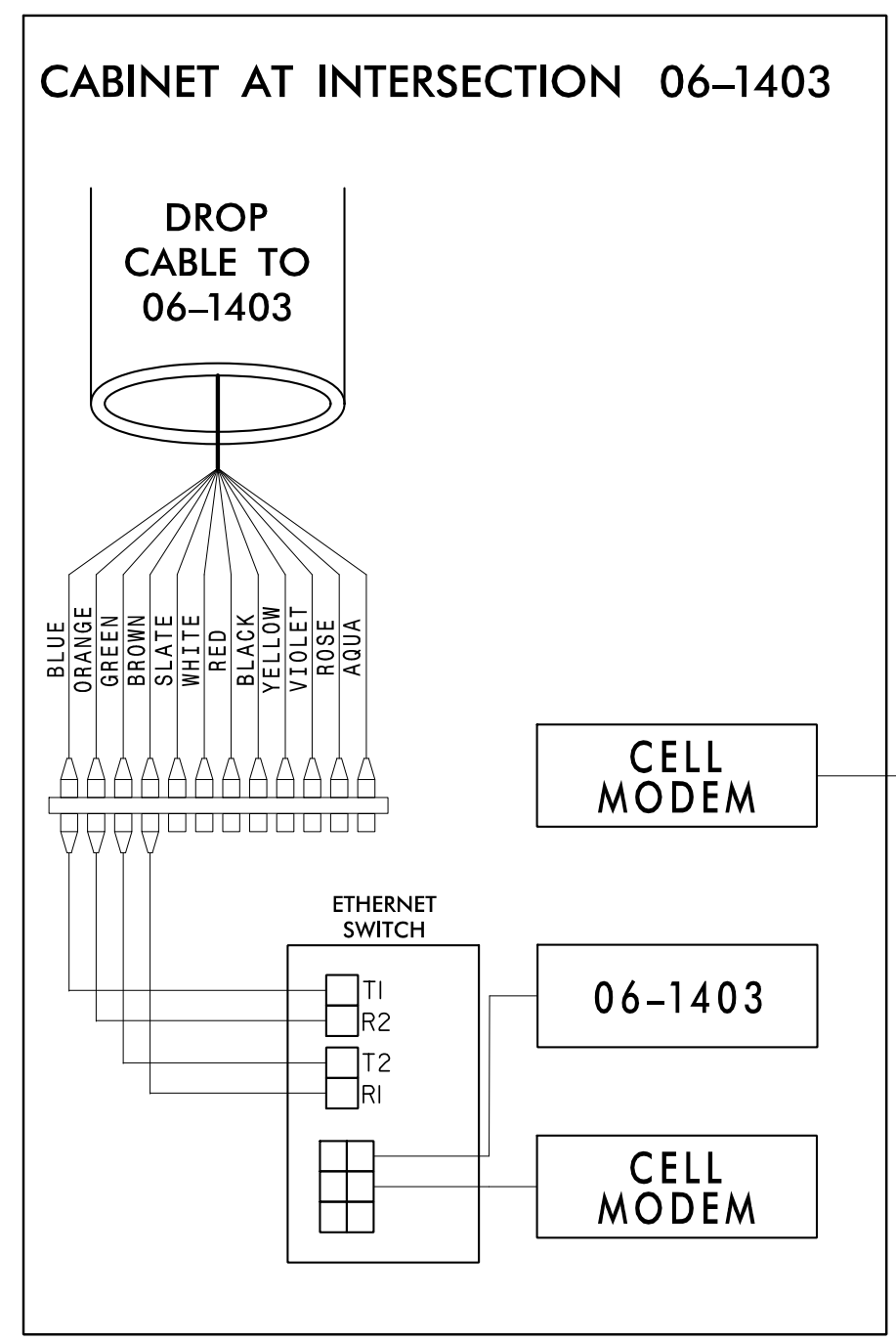
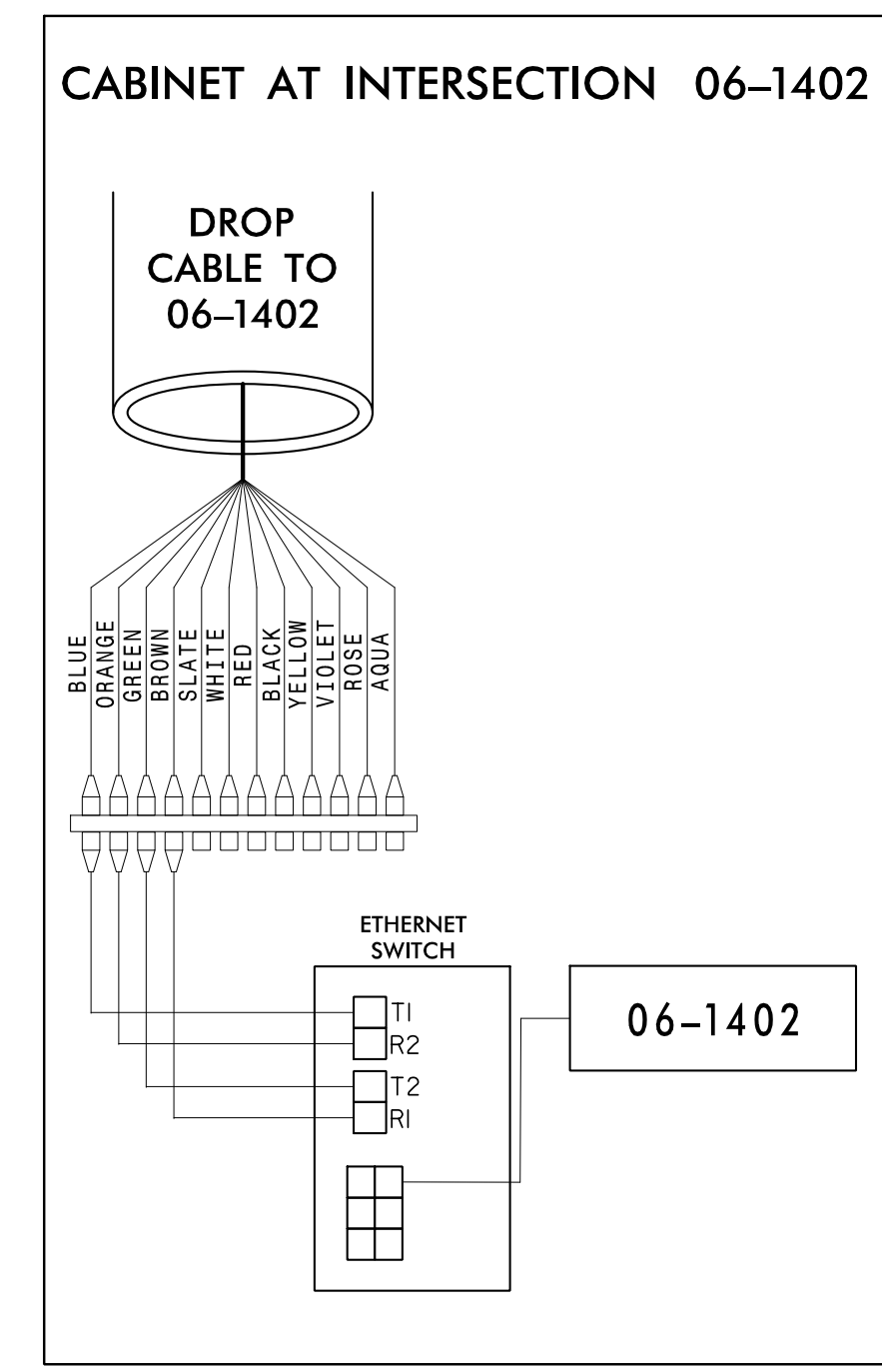
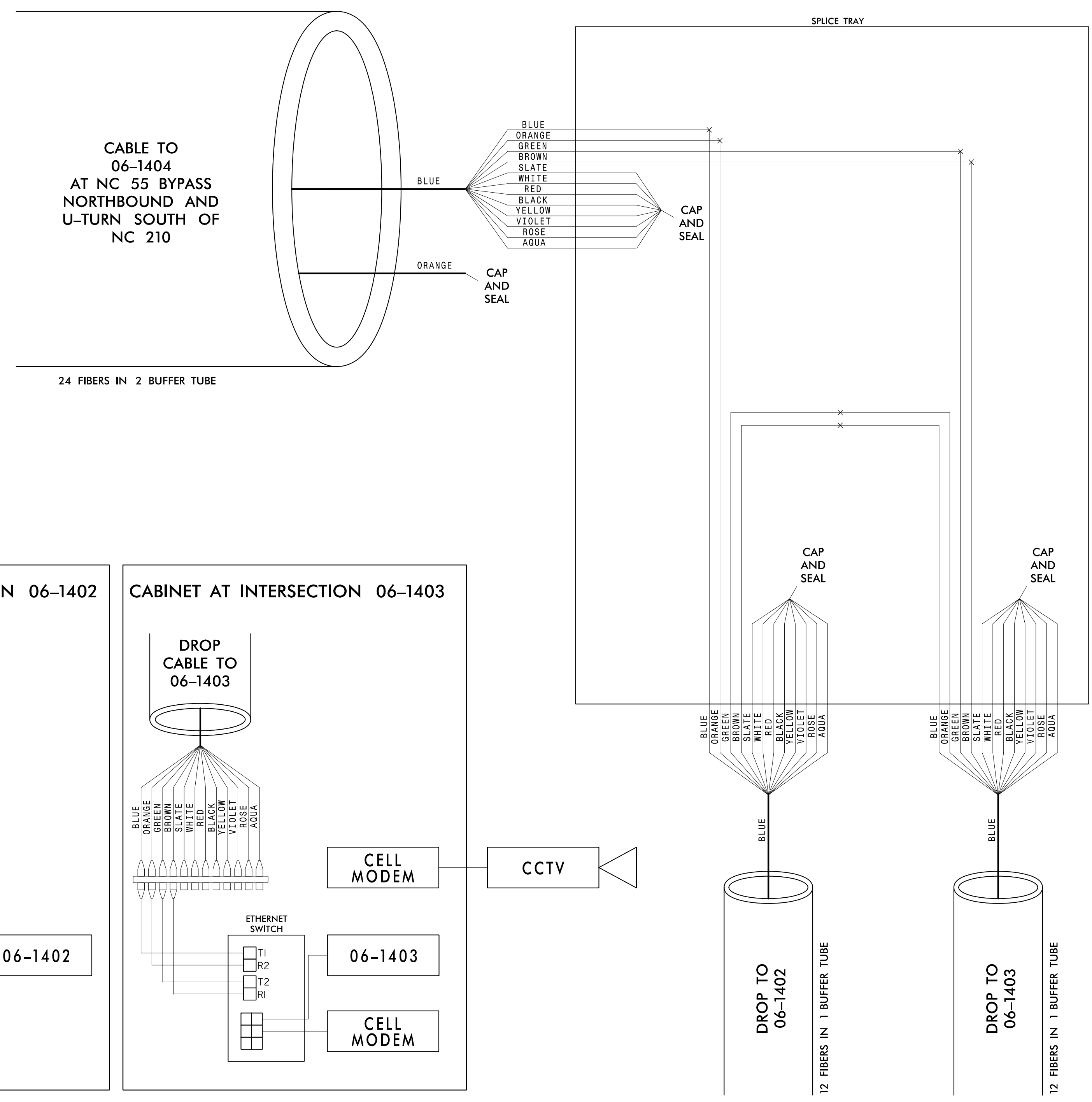
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED	
SEAL	SEAL
Kevin W. Smith 3/3/2023	Kevin W. Smith 3/3/2023
SIG. INVENTORY NO.	

# SPLICE ENCLOSURE AT NC 55 BYPASS AND NC 210 06-1402 (Northbound) 06-1403 (Southbound)

COLOR CODE TIA/EIA 598-C		LEGEND	
(1) BLUE	(7) RED	X	- FUSION SPLICE INDIVIDUAL FIBER
(2) ORANGE	(8) BLACK	O	- EXISTING SPLICE
(3) GREEN	(9) YELLOW	EXPRESS	EXPRESS ENTIRE BUFFER TUBE
(4) BROWN	(10) VIOLET	SPLICE	SPLICE ENTIRE BUFFER TUBE
(5) SLATE	(11) ROSE	NOTE:	
(6) WHITE	(12) AQUA	1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY - ACTUAL EQUIPMENT FORM MAY VARY.	

**NOTES:**

1. NOTIFY THE DIVISION TRAFFIC ENGINEER AT (910) 364-0600 48 HOURS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC ENGINEER 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. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING PROPER TERMINATIONS.
  3. 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 DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.



PLANS PREPARED IN THE OFFICE OF:  
**Kimley-Horn**  
NC License #F-0102  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000



Signal System D06-14 Angier Splice Detail			
Division 6	Harnett County	Angier	
PLAN DATE: October 2022	REVIEWED BY: KW Smith		
PREPARED BY: SS Butler	REVIEWED BY:		
REVISIONS	INIT.	DATE	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030472

KEVIN W. SMITH

DocuSigned by:  
Kevin Smith  
3/3/2023

SIG. INVENTORY NO.

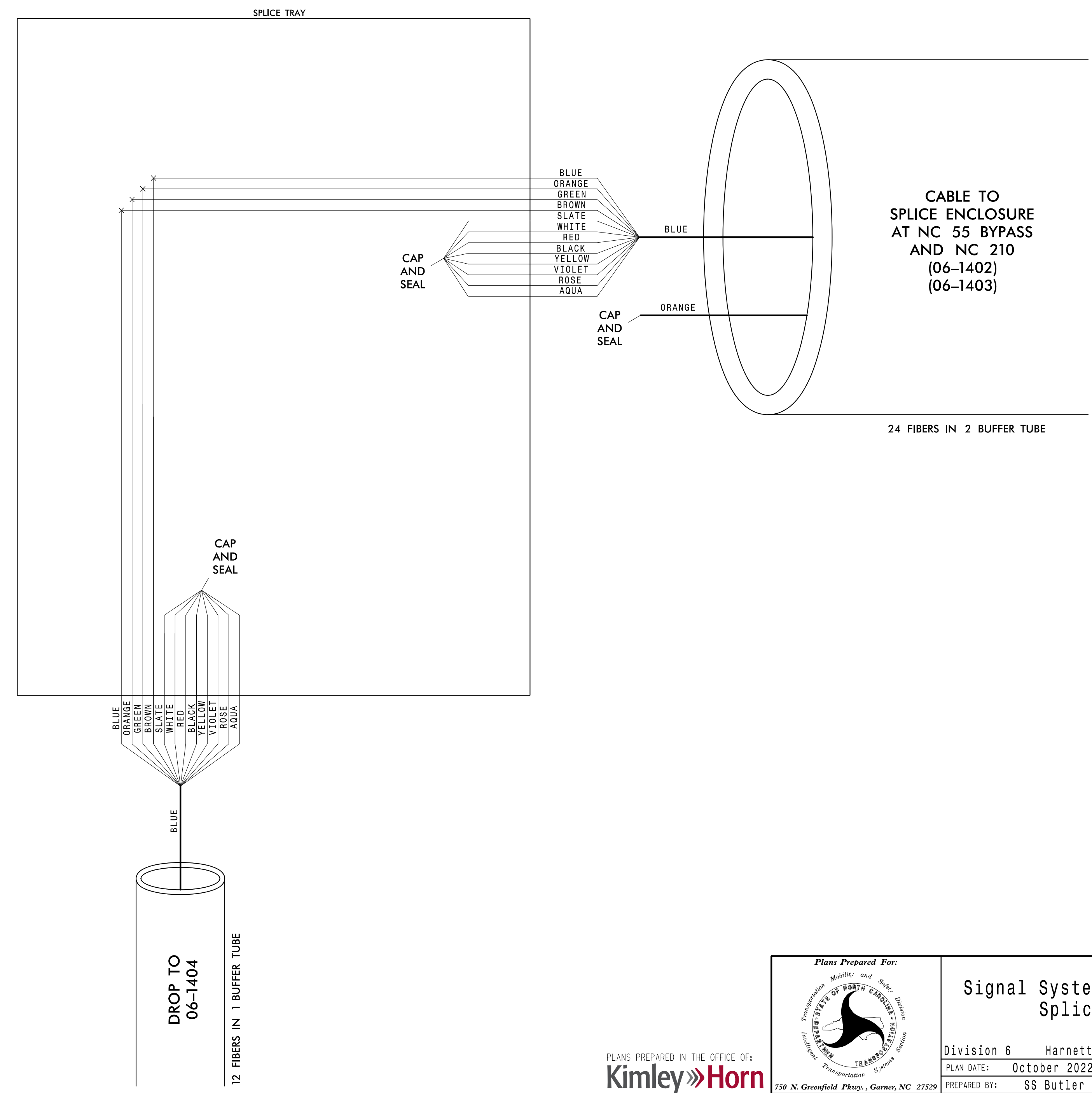
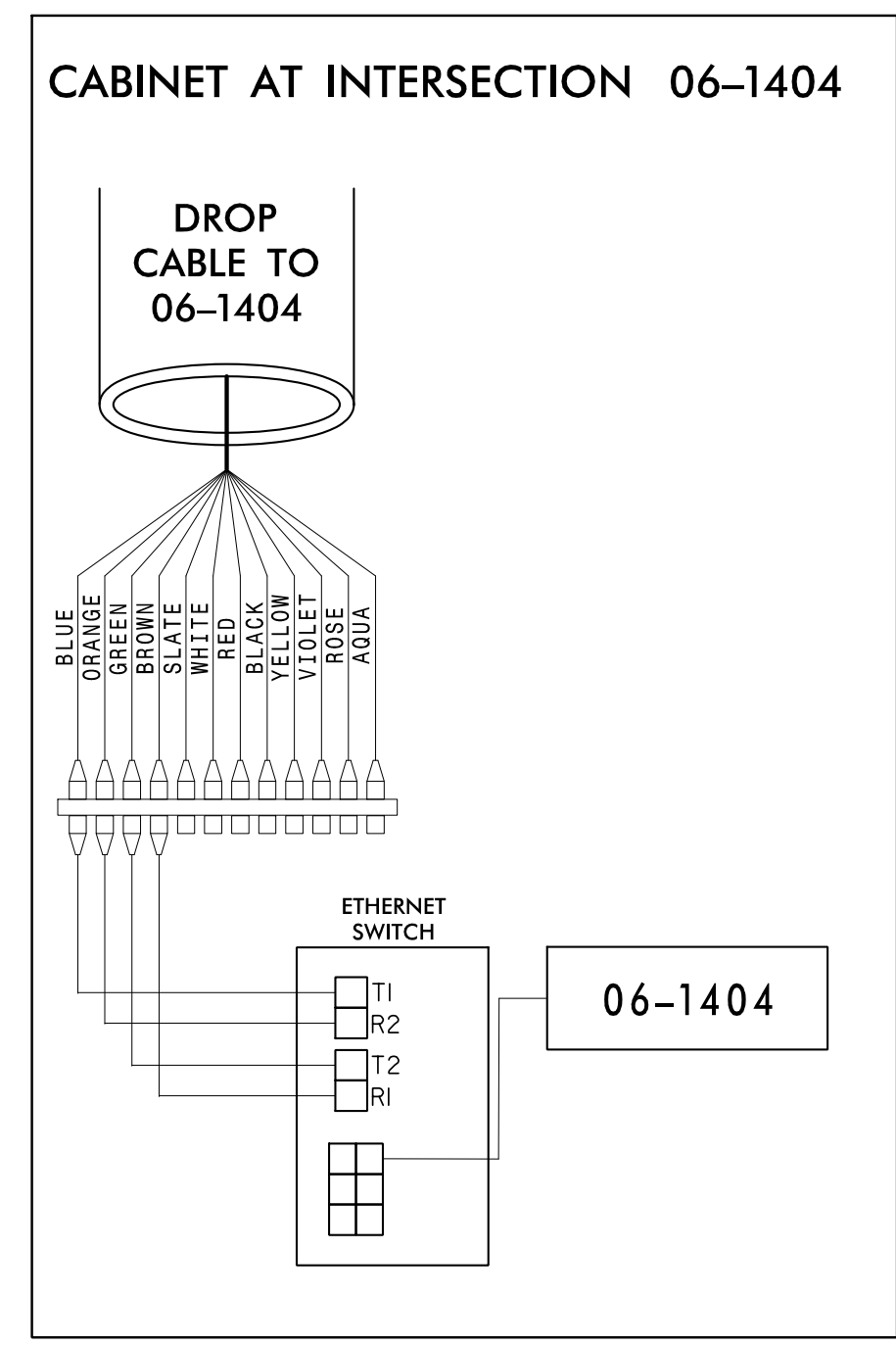
3/23/2023 8:27:49 AM susan.pennington K:\RAL\_Roadway\01036479 - R-5705A - NC 55\51\gnols\55 - Cable Routing\SCP-04.dgn

# SPlice ENCLOSURE AT NC 55 BYPASS NORTHBOUND AND U-TURN SOUTH OF NC 210 06-1404

**NOTES:**

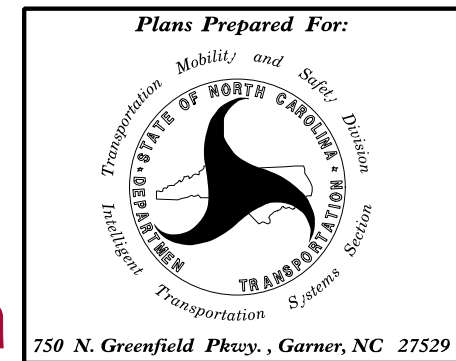
1. NOTIFY THE DIVISION TRAFFIC ENGINEER AT (910) 364-0600 48 HOURS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.
  2. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING PROPER TERMINATIONS.
  3. 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 DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (1-4) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

<b>COLOR CODE</b> TIA/EIA 598-C		<b>LEGEND</b>	
(1) BLUE	(7) RED	X	- FUSION SPLICE INDIVIDUAL FIBER
(2) ORANGE	(8) BLACK	O	- EXISTING SPLICE
(3) GREEN	(9) YELLOW	EXPRESS	EXPRESS ENTIRE BUFFER TUBE
(4) BROWN	(10) VIOLET	SPLICE	SPLICE ENTIRE BUFFER TUBE
(5) SLATE	(11) ROSE	<b>NOTES:</b>	
(6) WHITE	(12) AQUA	1. FIBER INTERCONNECT CENTER RACKS ARE SCHEMATIC ONLY - ACTUAL EQUIPMENT FORM MAY VARY.	



3/23/2023 8:27:51 AM susan.pennington K:\RAL\_Roadway\01036479 - R-5705A - NC 55\51\signal\55 - Cable Routing\SCP-05.dgn

PLANS PREPARED IN THE OFFICE OF:  
**Kimley»Horn**  
NC License #F-0102  
421 Fayetteville Street, Suite 600  
Raleigh, NC 27601  
(919) 677-2000



**Signal System D06-14 Angier  
Splice Detail**

Division 6 Harnett County Angier

PLAN DATE: October 2022 REVIEWED BY: KW Smith

PREPARED BY: SS Butler REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 030472 KEVIN W. SMITH

DocuSigned by: Kevin Smith 3/3/2023

SIG. INVENTORY NO.