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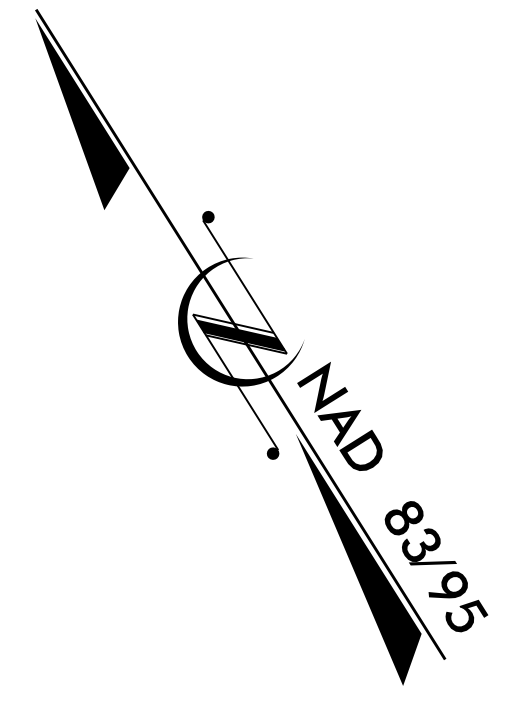
**This file or an individual page
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STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

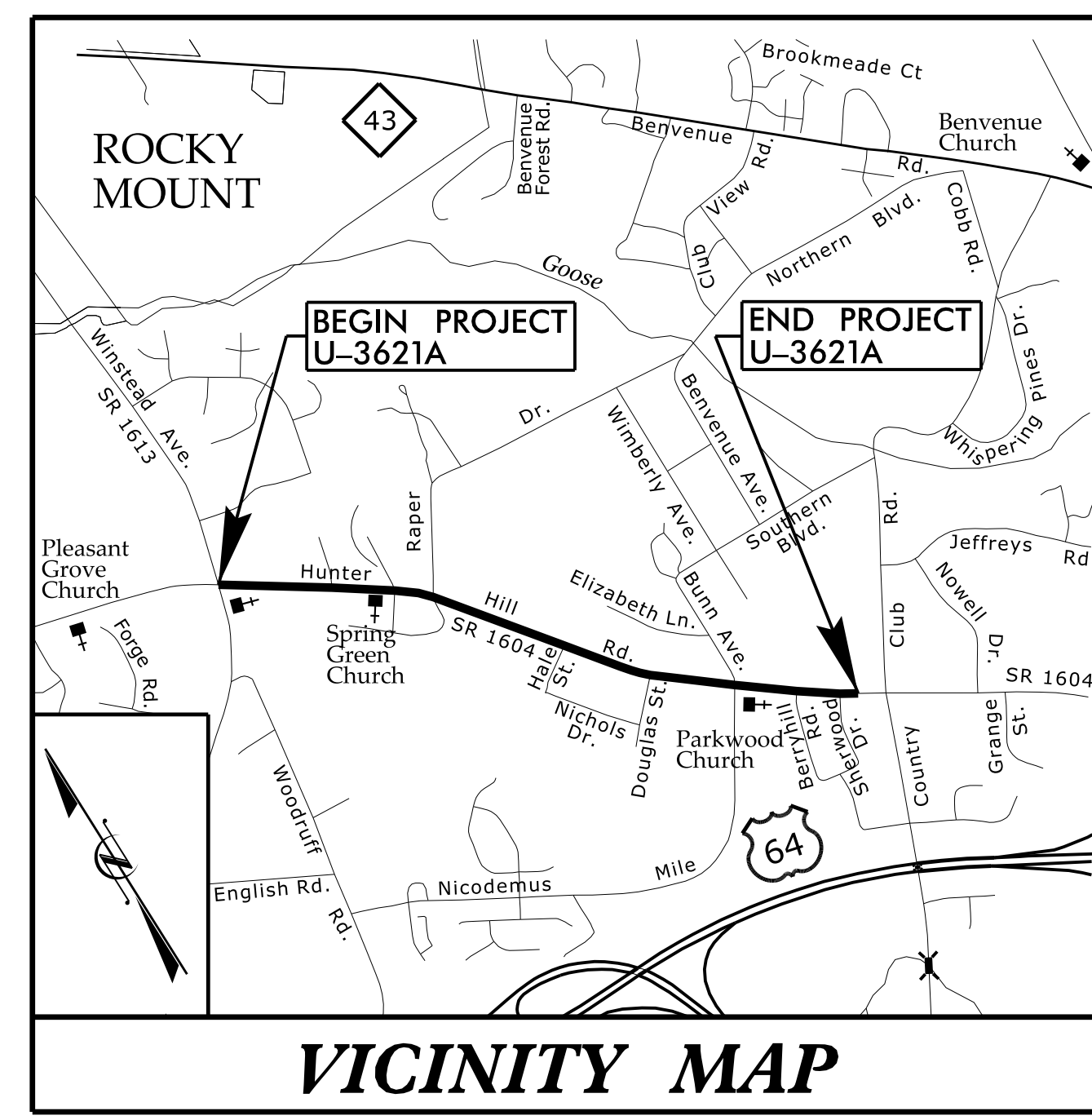
NASH COUNTY

LOCATION: ROCKY MOUNT - SR 1604 (HUNTER HILL ROAD)
FROM SR 1613 (NORTH WINSTEAD AVE) TO
SR 1616 (COUNTRY CLUB ROAD)

TYPE OF WORK: TRAFFIC SIGNALS

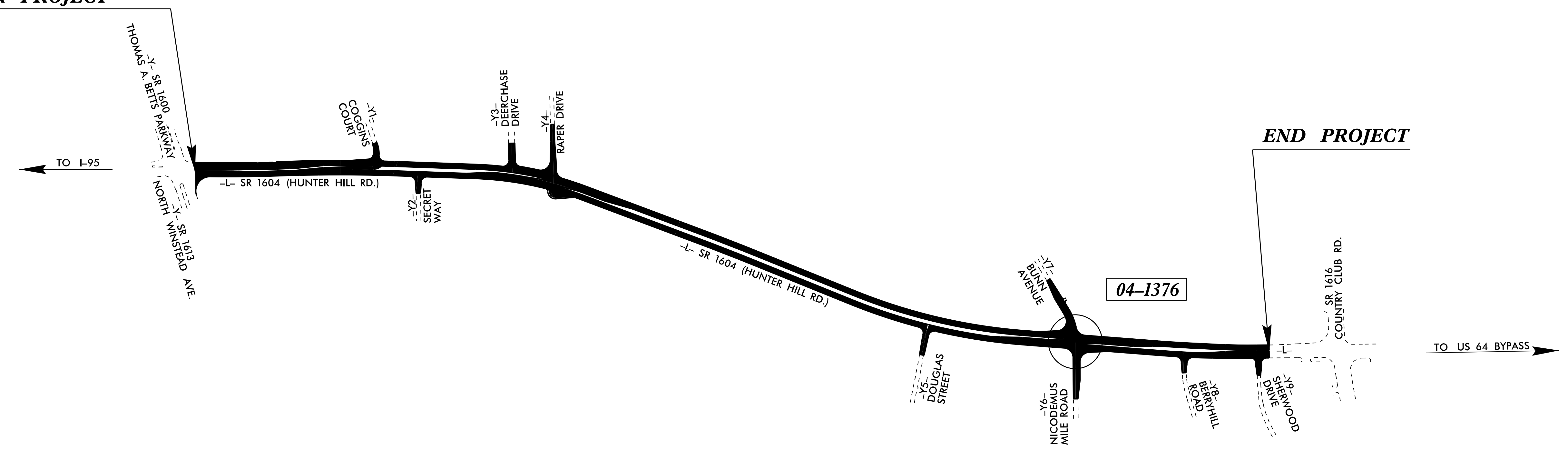


TIP Project: U-3621A



VICINITY MAP

BEGIN PROJECT



END PROJECT

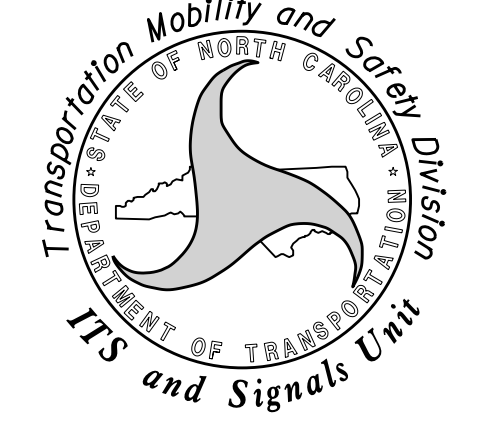
Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.

Sheet #	Reference #	Index of Plans	Location/Description
Sig. 1.0	04-1376	Title Sheet	SR 1604 (Hunter Hill Road) at Nicodemus Mill Road / Bunn Avenue
Sig. 2.0-2.2	N/A	Metal Pole Standards	
Sig. M1-M8	N/A	Signal Communication Plans	
SCP. 1-4	N/A		

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT

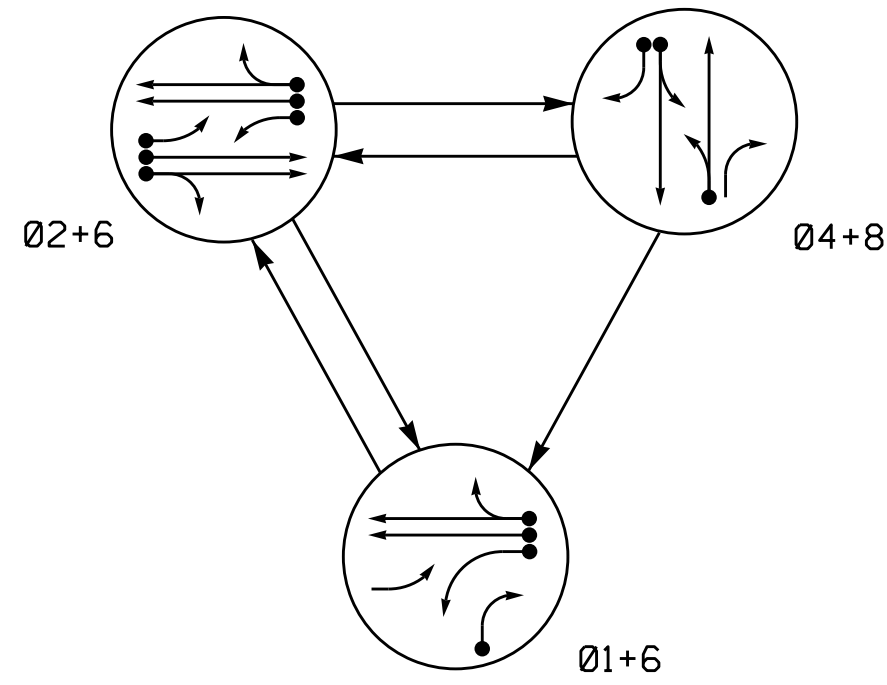
Contacts:
Jason P. Galloway, PE - Eastern Region Signals Engineer
Keith M. Mims, PE - Signal Equipment Design Engineer
Greg Fuller, PE - Intelligent Transportation Systems Engineer

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



R:\MAR_2017_09:54
 R:\c:\signals\Design\Signals\04-1376\U-3621A_title sheet.dgn
 local

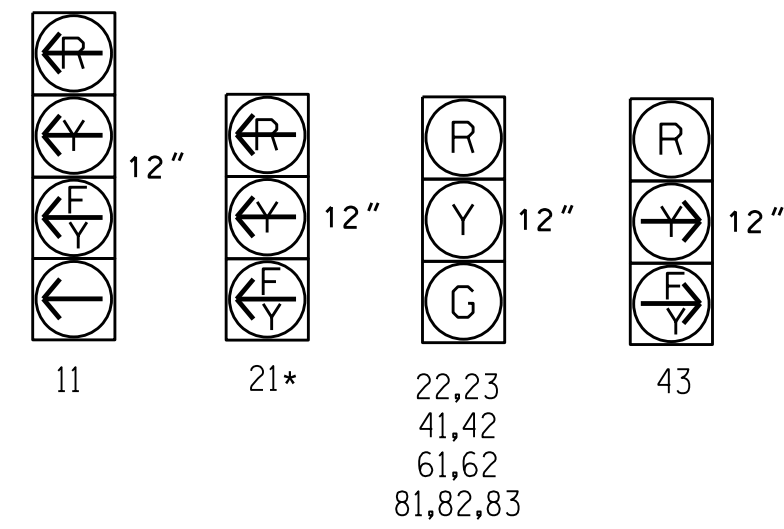
PHASING DIAGRAM



SIGNAL FACE	PHASE			
	01+6	02+6	04+8	01+6
11	Y	R	R	Y
21	Y	R	R	Y
22,23	R	G	R	Y
41,42	R	R	G	R
43	Y	R	Y	R
61,62	G	G	R	Y
81,82,83	R	R	G	R

SIGNAL FACE I.D.

All Heads L.E.D.
* Wire w/7 Conductor Cable



PHASING DIAGRAM DETECTION LEGEND

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

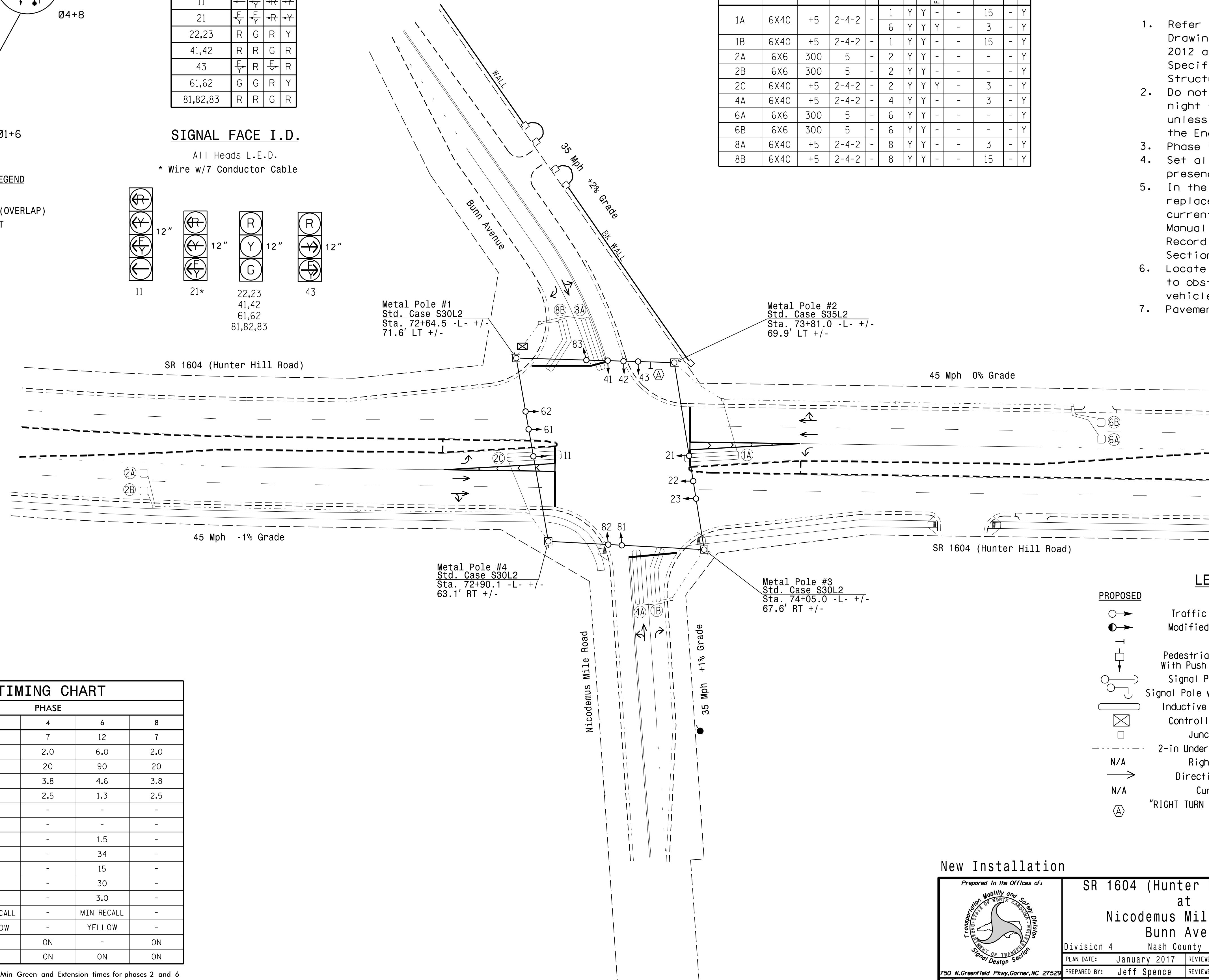
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

3 Phase Fully Actuated Rocky Mount Signal System

NOTES

- Refer to "Roadway Standard Drawings NCDOT" dated January 2012 and "Standard Specifications for Roads and Structures" dated January 2012.
- Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
- Phase 1 may be lagged.
- Set all detector units to presence mode.
- In the event of loop replacement, refer to the current ITS and Signals Design Manual and submit a Plan of Record to the Signal Design Section.
- Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.
- Pavement markings are existing.



FEATURE	PHASE				
	1	2	4	6	8
Min Green 1 *	7	12	7	12	7
Extension 1 *	2.0	6.0	2.0	6.0	2.0
Max Green 1 *	25	90	20	90	20
Yellow Clearance	3.0	4.6	3.8	4.6	3.8
Red Clearance	2.3	1.3	2.5	1.3	2.5
Walk 1 *	-	-	-	-	-
Don't Walk 1	-	-	-	-	-
Seconds Per Actuation *	-	1.5	-	1.5	-
Max Variable Initial *	-	34	-	34	-
Time Before Reduction *	-	15	-	15	-
Time To Reduce *	-	30	-	30	-
Minimum Gap	-	3.0	-	3.0	-
Recall Mode	-	MIN RECALL	-	MIN RECALL	-
Vehicle Call Memory	-	YELLOW	-	YELLOW	-
Dual Entry	-	-	ON	-	ON
Simultaneous Gap	ON	ON	ON	ON	ON

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

PROPOSED	EXISTING
○→	●→
●→	N/A
↓	↓
↓	↓
○→	●→
○→	●→
□	□
□	□
N/A	N/A
N/A	N/A
N/A	N/A
△	△

New Installation

SR 1604 (Hunter Hill Road) at Nicodemus Mile Road / Bunn Avenue

Nash County Rocky Mount

Division 4

PLAN DATE: January 2017 REVIEWED BY: JPG

PREPARED BY: Jeff Spence REVIEWED BY:

REVISIONS

INIT. DATE

SCALE 0 40 1"=40'

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

SEAL

SEAL 029904

SEAL 029904

Jason P. Galloway 2/1/2017

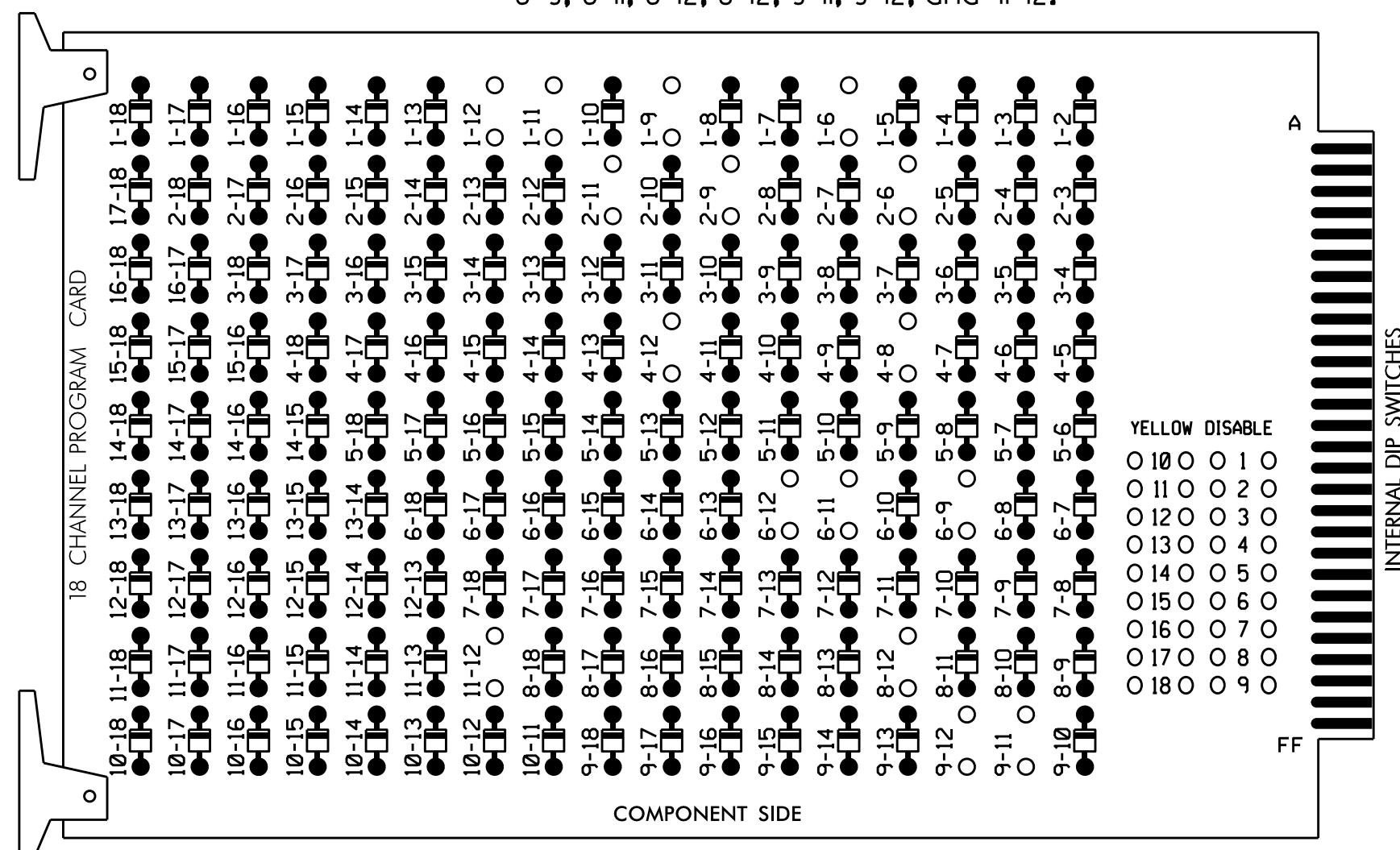
SIG. INVENTORY NO. 04-1376

04-1376-2017 11:19
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 2/1/2017 11:19 AM
 J. Spence

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

(remove jumpers and set switches as shown)

REMOVE DIODE JUMPERS 1-6, 1-9, 1-11, 1-12, 2-6, 2-9, 2-11, 4-8, 4-12, 6-9, 6-11, 6-12, 8-12, 9-11, 9-12, and 11-12.

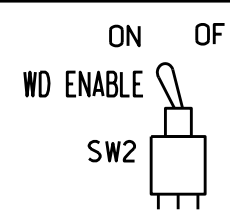


REMOVE JUMPERS AS SHOWN

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.

■ = DENOTES POSITION OF SWITCH



NOTES

- To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
- Program phases 4 and 8 for Dual Entry.
- Enable Simultaneous Gap-Out for all phases.
- Program phases 2 and 6 for Variable Initial and Gap Reduction.
- Program phases 2 and 6 for Start Up In Green.
- Program phases 2 and 6 for Yellow Flash, and overlap 1 as Wag Overlaps.
- The cabinet and controller are part of the Rocky Mount Signal System.

EQUIPMENT INFORMATION

CONTROLLER.....2070E
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S1,S2,S5,S8,S11,AUX S1,
 AUX S4,AUX S5
 PHASES USED.....1,2,4,6,8
 OVERLAP "A".....1+2
 OVERLAP "B".....NOT USED
 OVERLAP "C".....6
 OVERLAP "D".....1+4

SIGNAL HEAD HOOK-UP CHART

LOAD SWITCH NO.	S1	S2	S3	S4	S5	S6	S7	S8	S9	S10	S11	S12	AUX S1	AUX S2	AUX S3	AUX S4	AUX S5	AUX S6
CMU CHANNEL NO.	1	2	13	3	4	14	5	6	15	7	8	16	9	10	17	11	12	18
PHASE	1	2	2 PED	3	4	4 PED	5	6	6 PED	7	8	8 PED	OLA	OLB	SPARE	OLC	OLD	SPARE
SIGNAL HEAD NO.	11	22,23	NU	NU	41,42	NU	NU	61,62	NU	NU	81,82 83	NU	11	NU	NU	21	43	NU
RED		128			101			134			107							A101
YELLOW	*	129			102			135			108							
GREEN		130			103			136			109							
RED ARROW													A121				A114	
YELLOW ARROW													A122				A115	A102
FLASHING YELLOW ARROW													A123				A116	A103
GREEN ARROW	127																	

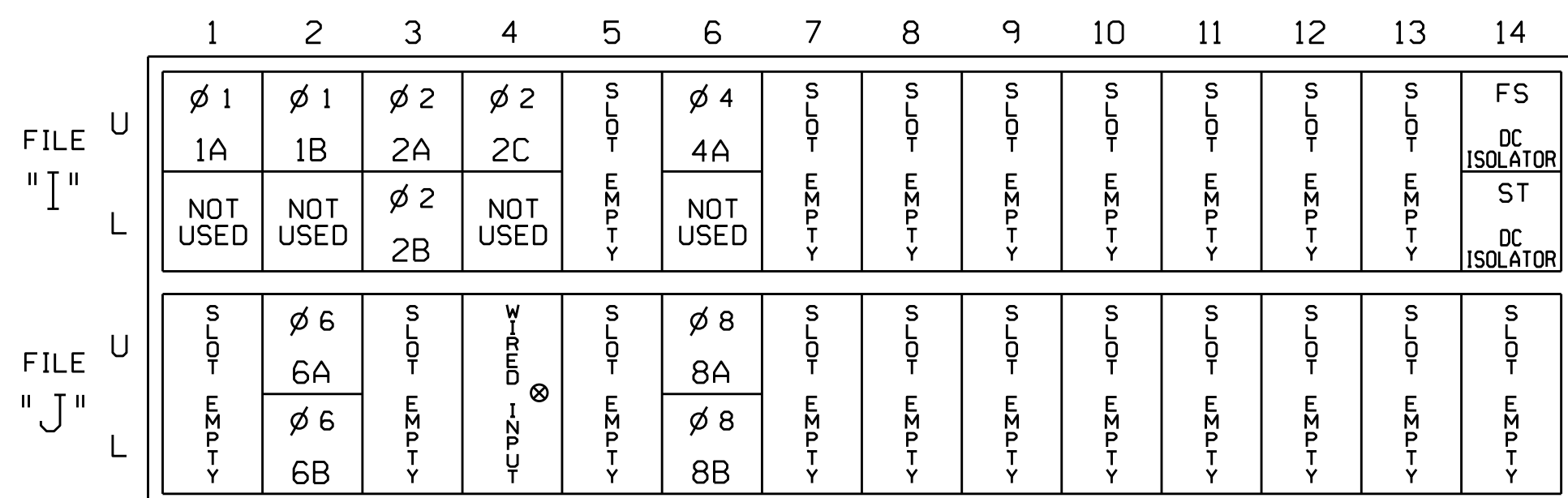
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
 ST = STOP TIME

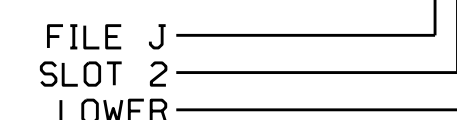
⊗ Wired Input - Do not populate slot with detector card

INPUT FILE CONNECTION & PROGRAMMING CHART

LOOP NO.	LOOP TERMINAL	INPUT FILE POS.	PIN NO.	INPUT ASSIGNMENT NO.	DETECTOR NO.	NEMA PHASE	CALL	EXTEND	FULL TIME DELAY	STRETCH TIME	DELAY TIME
1A ¹	TB2-1,2	I1U	56	18	1	1	Y	Y			15
	-	J4U	48	10	26	6	Y	Y	Y		3
1B	TB2-5,6	I2U	39	1	2	1	Y	Y			15
2A	TB2-9,10	I3U	63	25	32	2	Y	Y			
2B	TB2-11,12	I3L	76	38	42	2	Y	Y			
2C	TB4-1,2	I4U	47	9	22	2	Y	Y	Y		3
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			3
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			
8A	TB5-9,10	J6U	42	4	8	8	Y	Y			3
8B	TB5-11,12	J6L	46	8	18	8	Y	Y			15

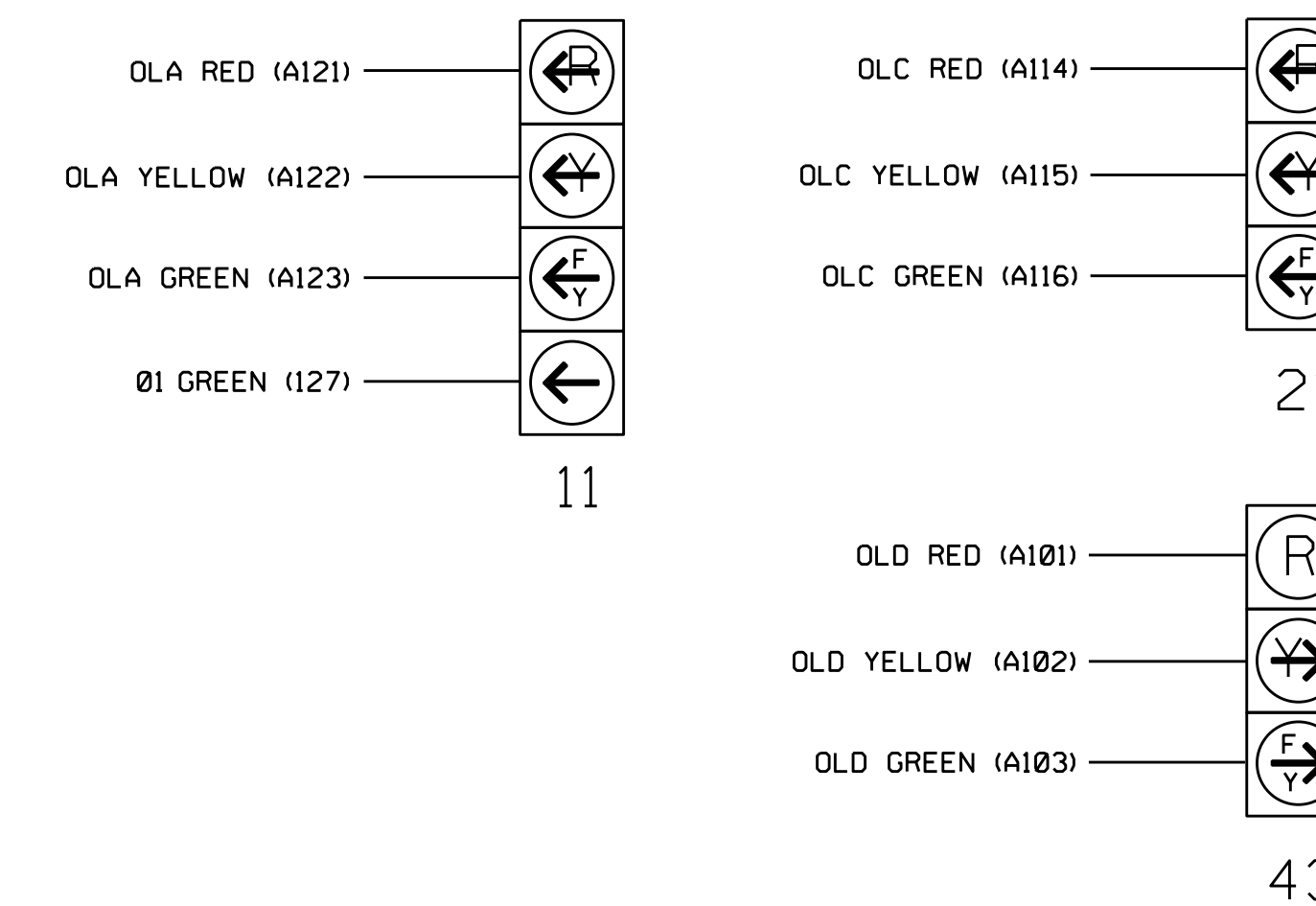
¹Add jumper from I1-W to J4-W, on rear of input file.

INPUT FILE POSITION LEGEND: J2L



FYA SIGNAL WIRING DETAIL

(wire signal heads as shown)



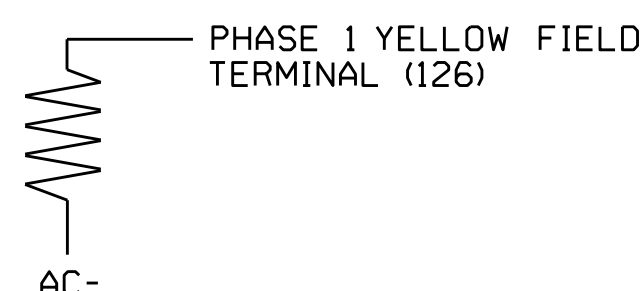
NOTE

The sequence display for signal head 11 requires special logic programming. See sheet 2 for programming instructions.

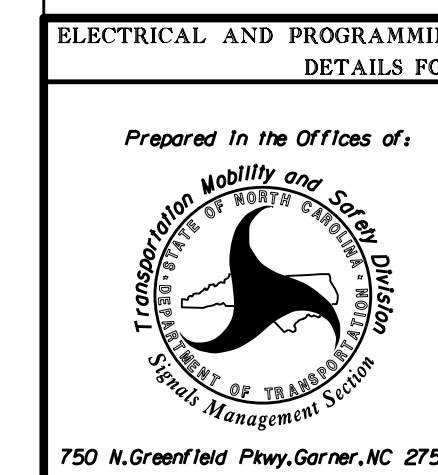
LOAD RESISTOR INSTALLATION DETAIL

(install resistor as shown below)

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



Electrical Detail - Sheet 1 of 2

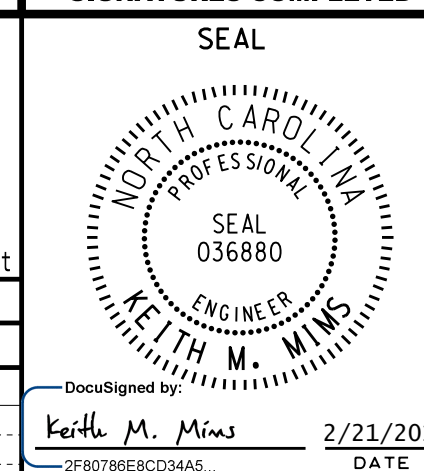


SR 1604 (Hunter Hill Road)
 at
 Nicodemus Mile Road/
 Bunn Avenue

Division 4 Nash County Rocky Mount
 PLAN DATE: January 2017 REVIEWED BY: BAS
 PREPARED BY: S. Armstrong REVIEWED BY:

REVISIONS	INIT.	DATE

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED



DocuSigned by: Keith M. Mims 2/21/2017
 DATE: 2/21/2017
 SIG. INVENTORY NO. 04-1376

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

(program controller as shown below)

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

LOGICAL I/O COMMAND #1 (+/-COMMAND#)
 IF ACTIVE PHASE #1 IS ON
 AND RED CLEAR ON PHASE #1 IS ON

SCROLL DOWN

THEN:
 SET OUTPUT ASSIGNMENT #50 ON
 SET OUTPUT ASSIGNMENT #51 OFF

PRESS '+'

NOTE: LOGIC FOR PHASE 1 RED CLEAR WHEN TRANSITIONING FROM PHASE 1 TO PHASE 2 (HEAD 11).

LOGICAL I/O COMMAND #2 (+/-COMMAND#)
 IF ACTIVE PHASE #1 IS ON

SCROLL DOWN

THEN:
 SET OUTPUT ASSIGNMENT #52 OFF

PRESS '+'

NOTE: LOGIC FOR SWITCHING FLASHING YELLOW ARROW "OFF" DURING PHASE 1 (HEAD 11).

LOGICAL I/O COMMAND #3 (+/-COMMAND#)
 IF YELLOW ON PHASE #1 IS ON

SCROLL DOWN

THEN:
 SET OUTPUT ASSIGNMENT #51 ON

NOTE: LOGIC FOR YELLOW ARROW CLEARANCE FROM PHASE 1 (HEAD 11).

LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE

OUTPUT 50 = Overlap A Red
 OUTPUT 51 = Overlap A Yellow
 OUTPUT 52 = Overlap A Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

PAGE 1: VEHICLE OVERLAP 'A' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: |XX
 VEH OVL NOT VEH: |
 VEH OVL NOT PED: |
 VEH OVL GRN EXT: |
 STARTUP COLOR: _ RED _ YELLOW _ GREEN
 FLASH COLORS: _ RED _ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0-255 SEC)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PRESS '+' TWICE

PAGE 1: VEHICLE OVERLAP 'C' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: | X
 VEH OVL NOT VEH: |
 VEH OVL NOT PED: |
 VEH OVL GRN EXT: |
 STARTUP COLOR: _ RED _ YELLOW _ GREEN
 FLASH COLORS: _ RED _ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...Y
 GREEN EXTENSION (0-255 SEC)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

PRESS '+' ONCE

PAGE 1: VEHICLE OVERLAP 'D' SETTINGS
 PHASE: 12345678910111213141516
 VEH OVL PARENTS: | X X
 VEH OVL NOT VEH: |
 VEH OVL NOT PED: |
 VEH OVL GRN EXT: |
 STARTUP COLOR: _ RED _ YELLOW _ GREEN
 FLASH COLORS: _ RED _ YELLOW X GREEN

SELECT VEHICLE OVERLAP OPTIONS: (Y/N)
 FLASH YELLOW IN CONTROLLER FLASH?...N
 GREEN EXTENSION (0-255 SEC)...0
 YELLOW CLEAR (0=PARENT,3-25.5 SEC)...0.0
 RED CLEAR (0=PARENT,0.1-25.5 SEC)...0.0
 OUTPUT AS PHASE # (0=NONE, 1-16)...0

← NOTICE GREEN FLASH

OVERLAP PROGRAMMING COMPLETE

FLASHER CIRCUIT MODIFICATION DETAIL

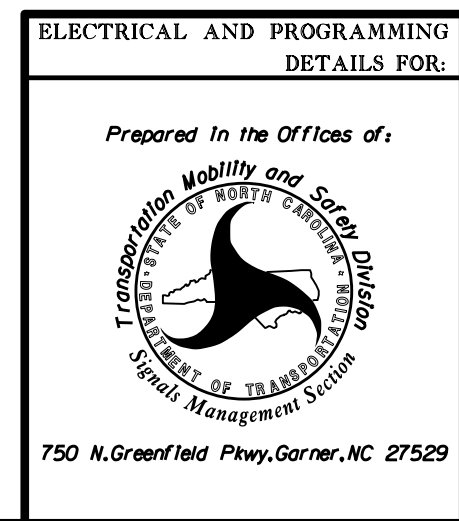
IN ORDER TO ENSURE THAT SIGNALS FLASH CONCURRENTLY ON THE SAME APPROACH, MAKE THE FOLLOWING FLASHER CIRCUIT CHANGES:

- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-4 AND TERMINATE ON T2-2.
- ON REAR OF PDA - REMOVE WIRE FROM TERM. T2-5 AND TERMINATE ON T2-3.
- REMOVE FLASHER UNIT 2.

THE CHANGES LISTED ABOVE TIES ALL PHASES AND OVERLAPS TO FLASHER UNIT 1.

THIS ELECTRICAL DETAIL IS FOR THE SIGNAL DESIGN: 04-1376
 DESIGNED: January 2017
 SEALED: 2/1/2017
 REVISED: N/A

Electrical Detail - Sheet 2 of 2



ELECTRICAL AND PROGRAMMING DETAILS FOR:		SR 1604 (Hunter Hill Road) at Nicodemus Mile Road/ Bunn Avenue	
PLAN DATE: January 2017	REVIEWED BY: BAS	Division 4	Nash County Rocky Mount
PREPARED BY: S. Armstrong	REVIEWED BY:		
REVISIONS	INIT.	DATE	

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

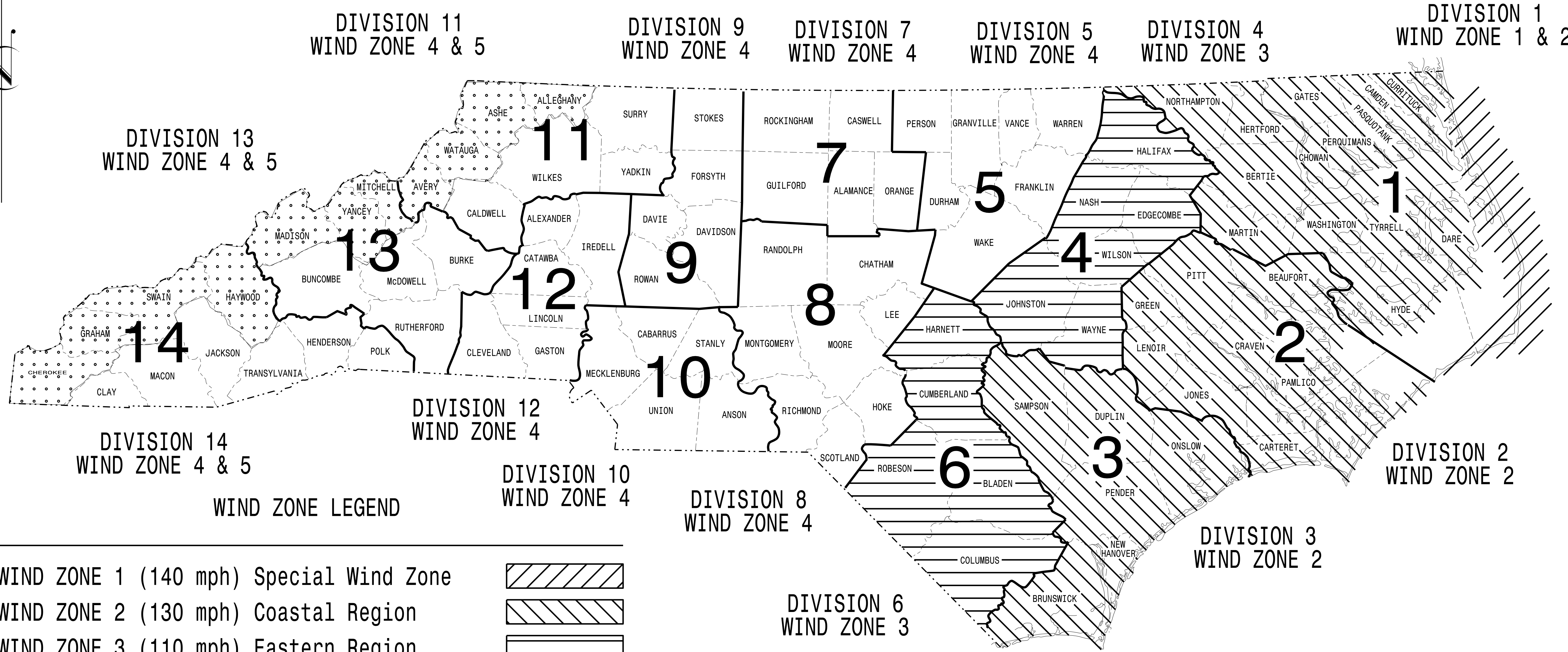
SEAL
 KEITH M. MINS
 PROFESSIONAL ENGINEER
 036880
 2/21/2017
 DATE
 SIG. INVENTORY NO. 04-1376

04-FEA-2017-1376
 S:\ITS\SIG\15\Sig\04\work\groups\Sig_Maps\Arms\stronp041376_sml.elec.xxx.dgn
 sarmstrong

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT I.D. NO. U-3621A	SHEET NO. Sig.M1
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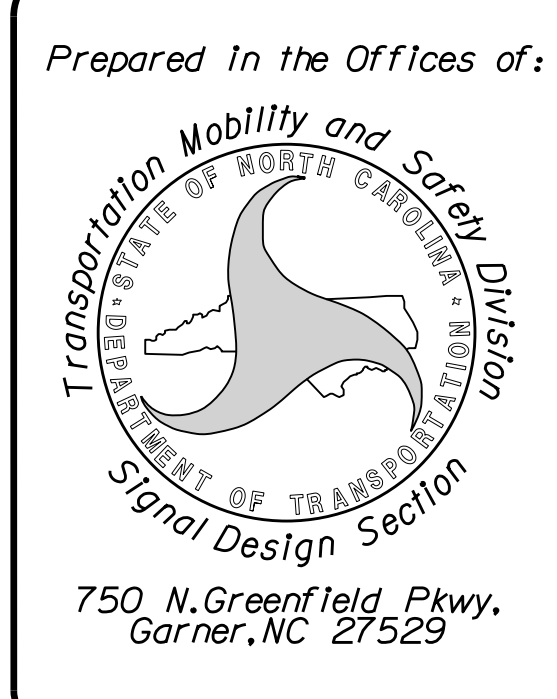
STANDARD DRAWINGS FOR ALL METAL POLES



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>



Designed in conformance with the latest 2015 Interim to the 6th Edition 2013 **AASHTO** Standard Specifications 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

NC DOT CONTACTS:

MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT

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

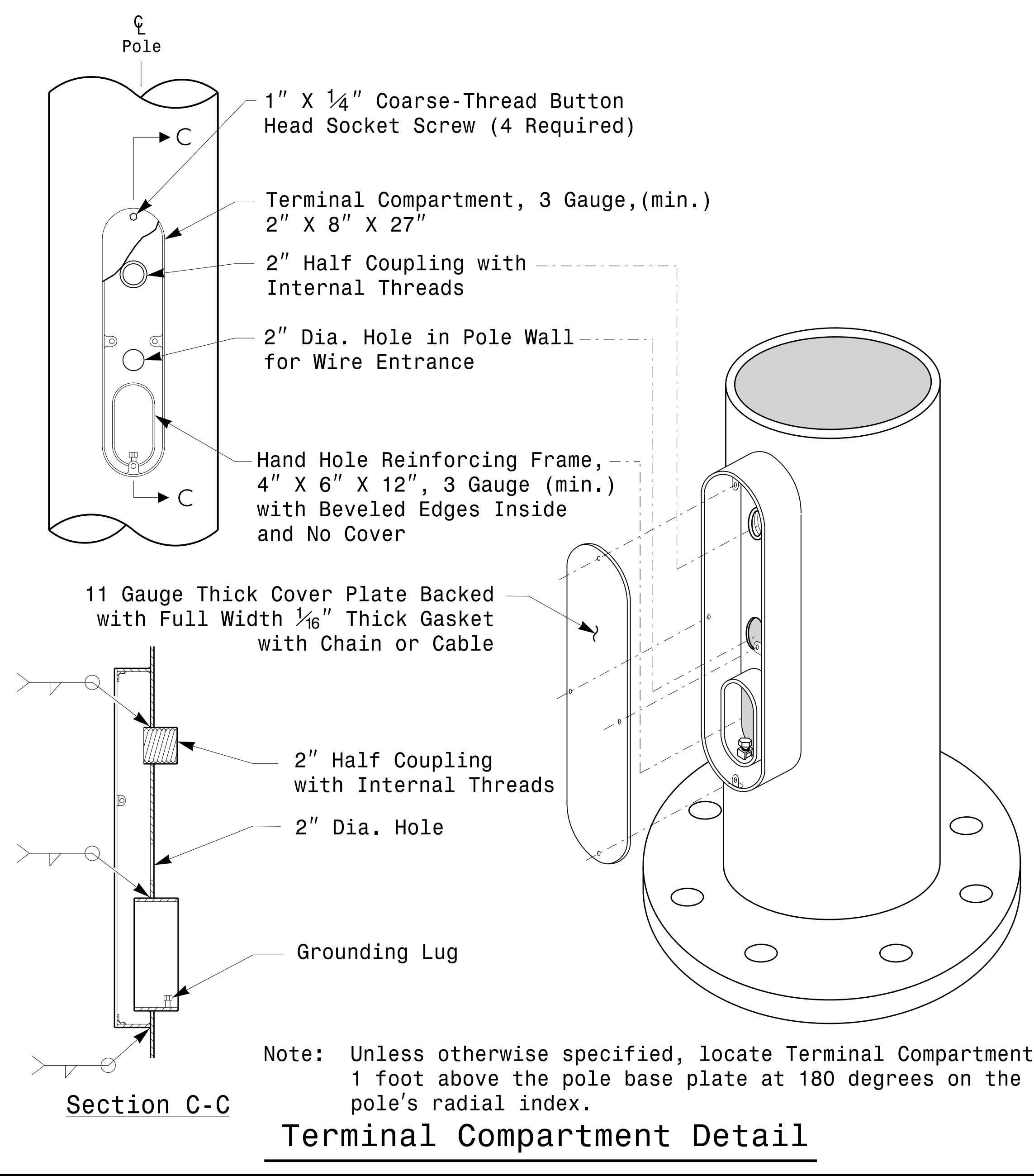
G. G. MURR, JR., P.E. - STATE SIGNALS ENGINEER

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

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

SEAL

DocuSigned by:
Debesh C. Sarkar
2/17/2016
DATE

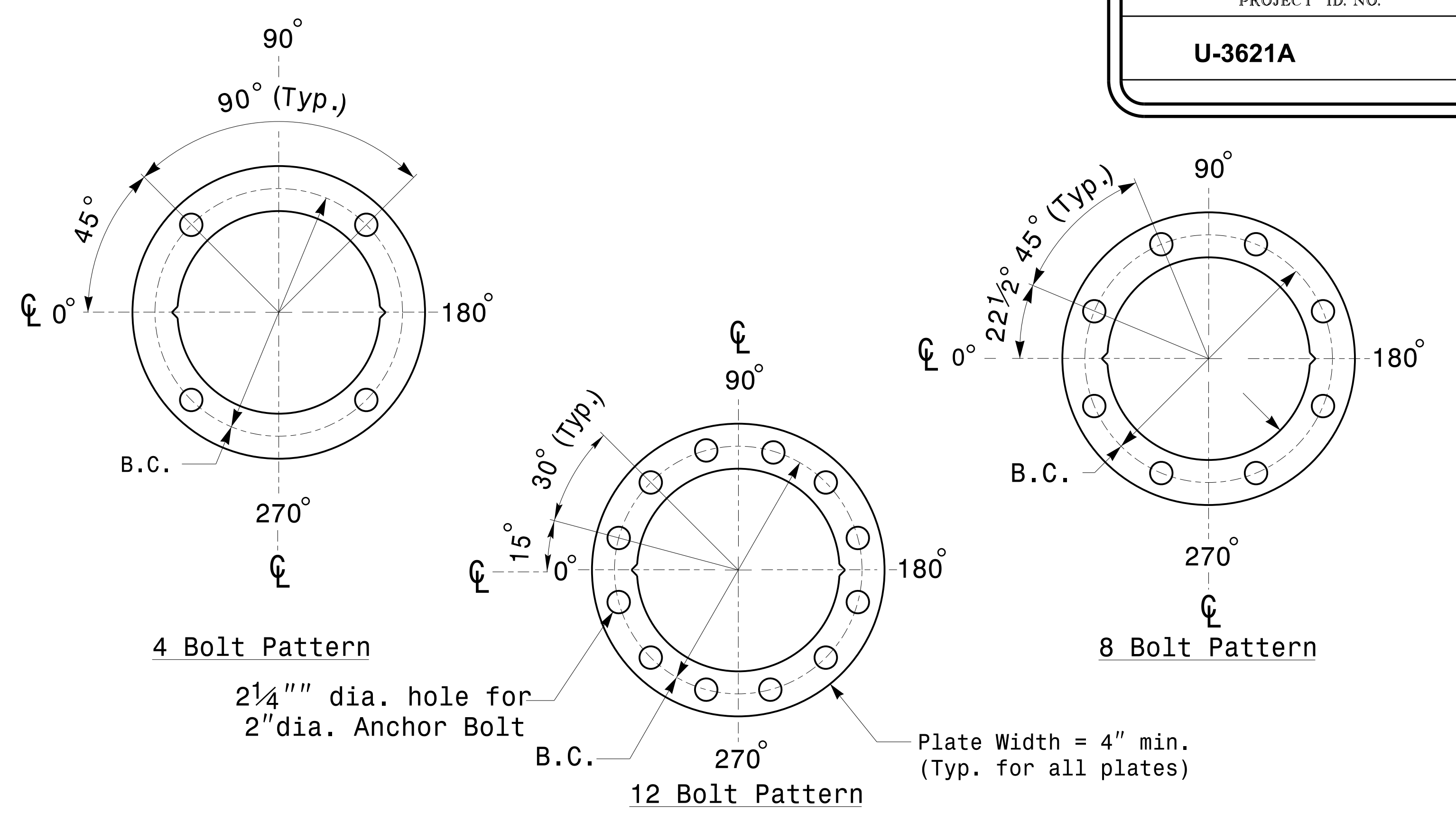


MFG _____	MFG. DATE: MM/YY _____
SHAFT D/T/L/Y _____	_____
ARM-A D/T/L/Y _____	_____
ARM-B D/T/L/Y _____	_____
A.B. DIA./B.C./L/Y _____	_____
NCDOT SIG. INV. NO. _____	_____
NCDOT POLE NO. _____	_____

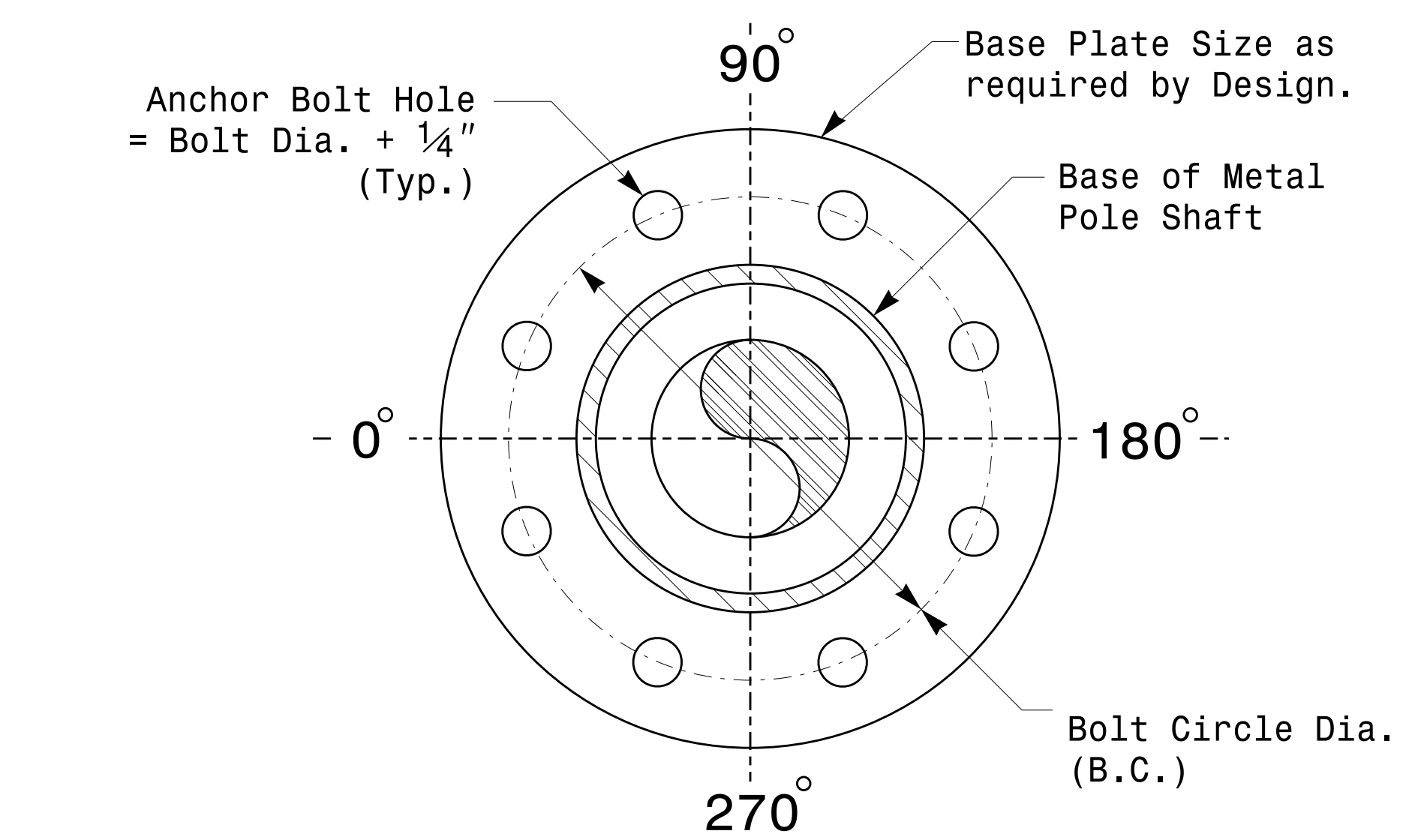
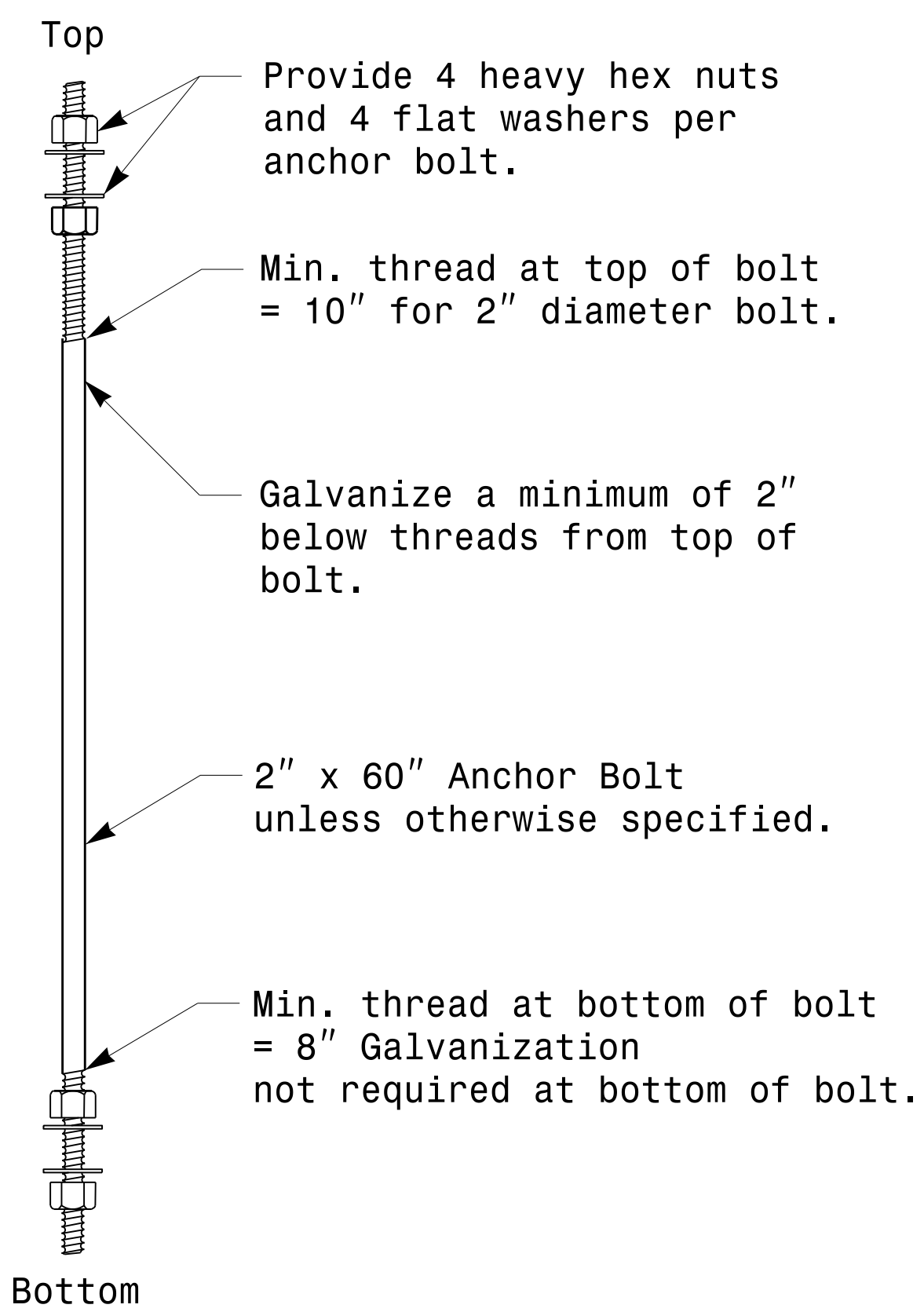
Shaft I.D. Tag
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)

- 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



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



Note: Base plate may be circular, octagonal, square or rectangular in shape.

Typical Base Plate Detail

Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Fabrication Details For All Metal Poles	
PLAN DATE: FEBRUARY 2016	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

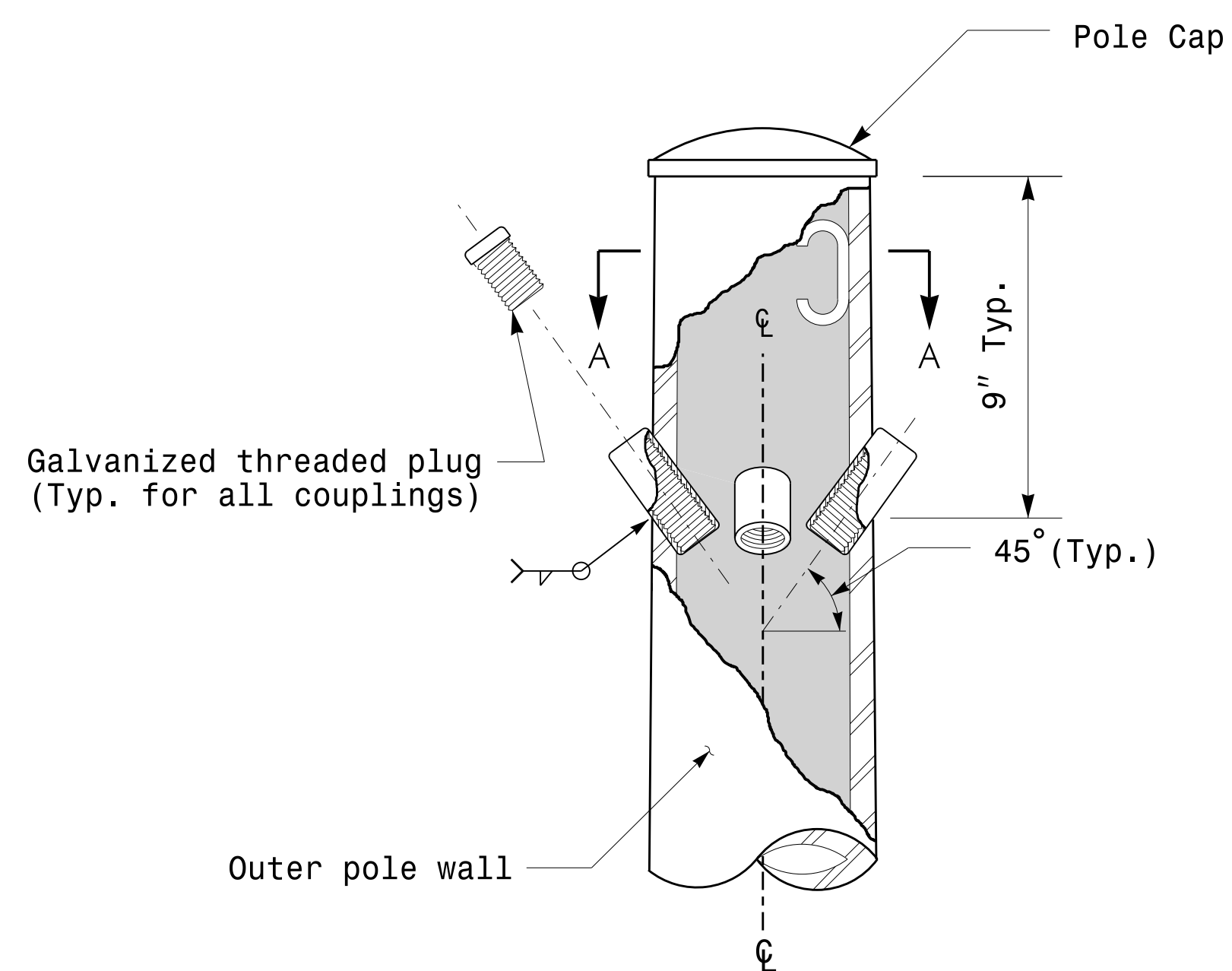
DocuSigned by
Debesh C. Sarkar
SIGNATURE

44E8E32E147E4C4...

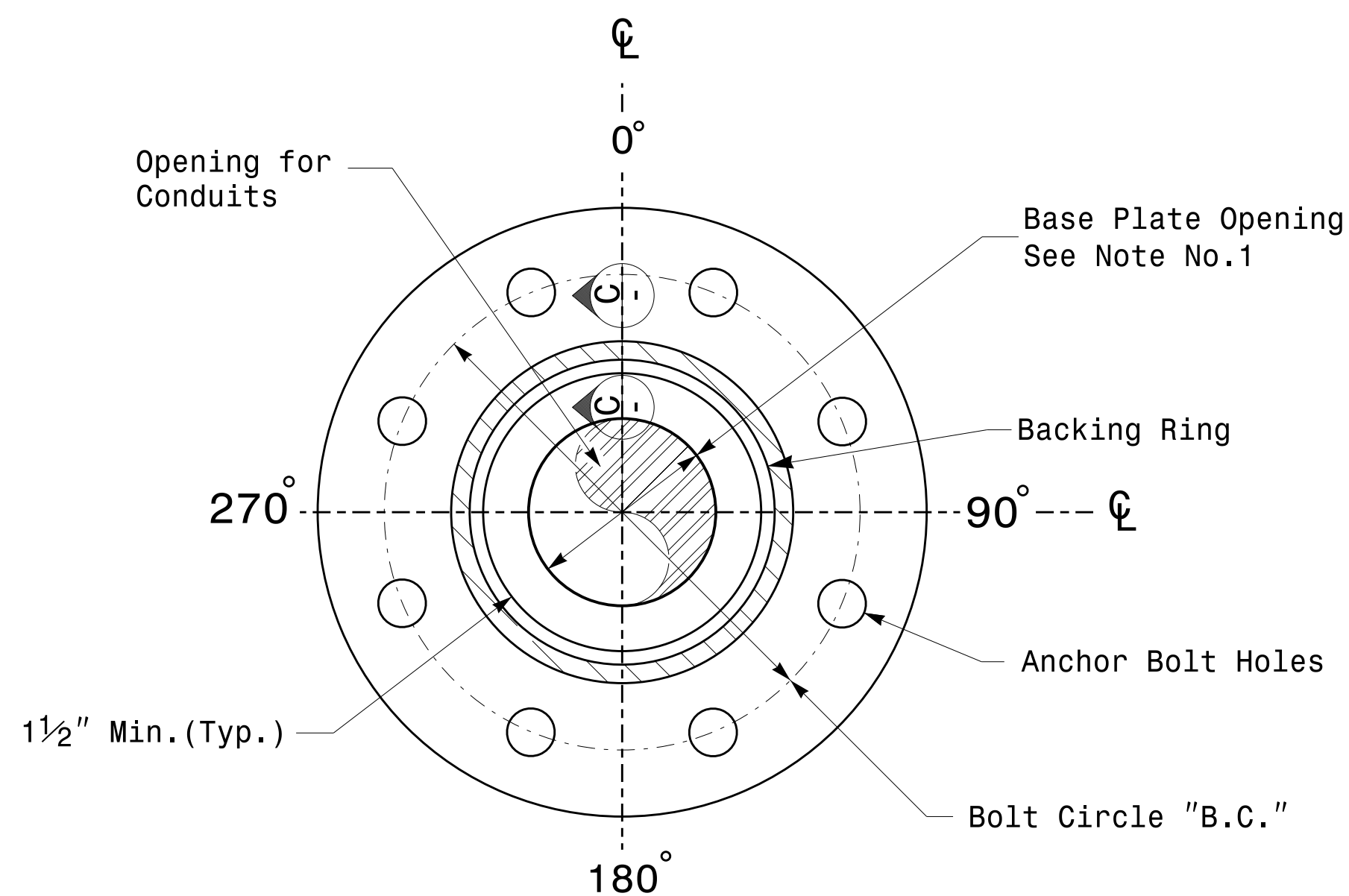
2/17/2016
DATE

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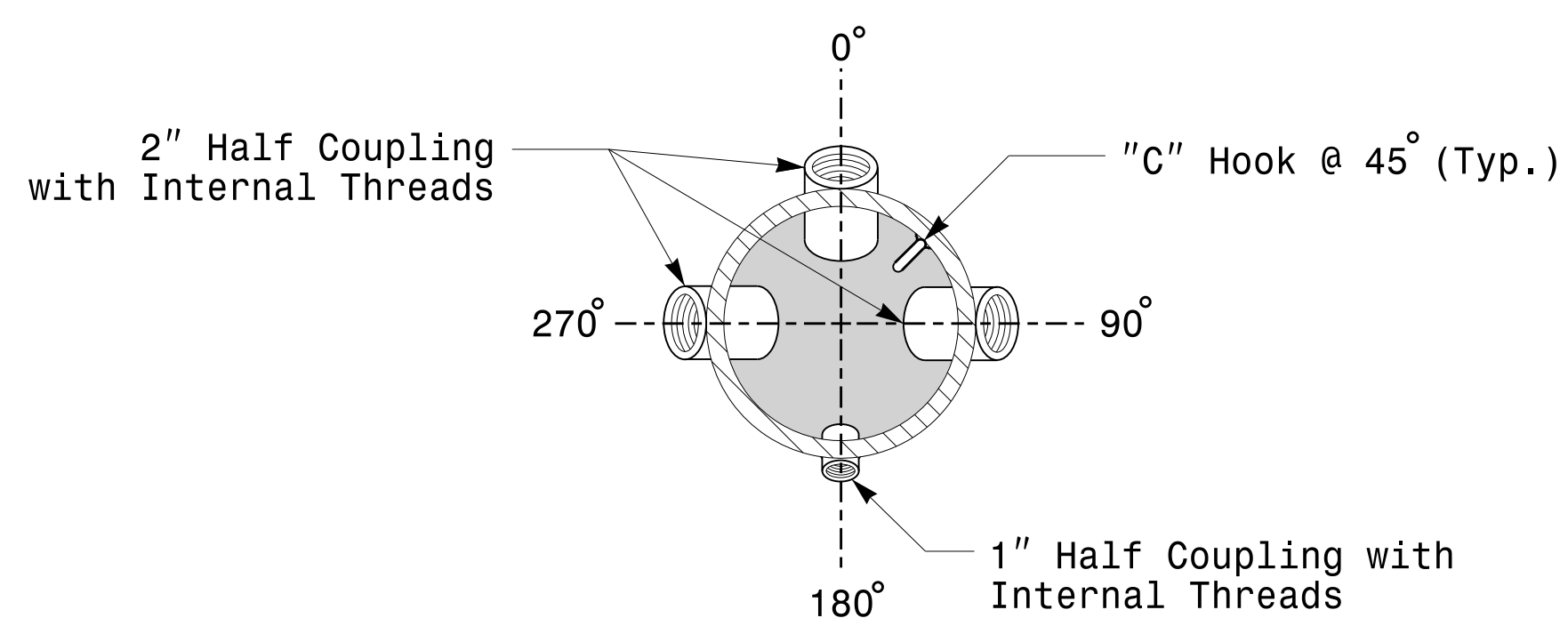
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



Cable Entrances at Top of Pole

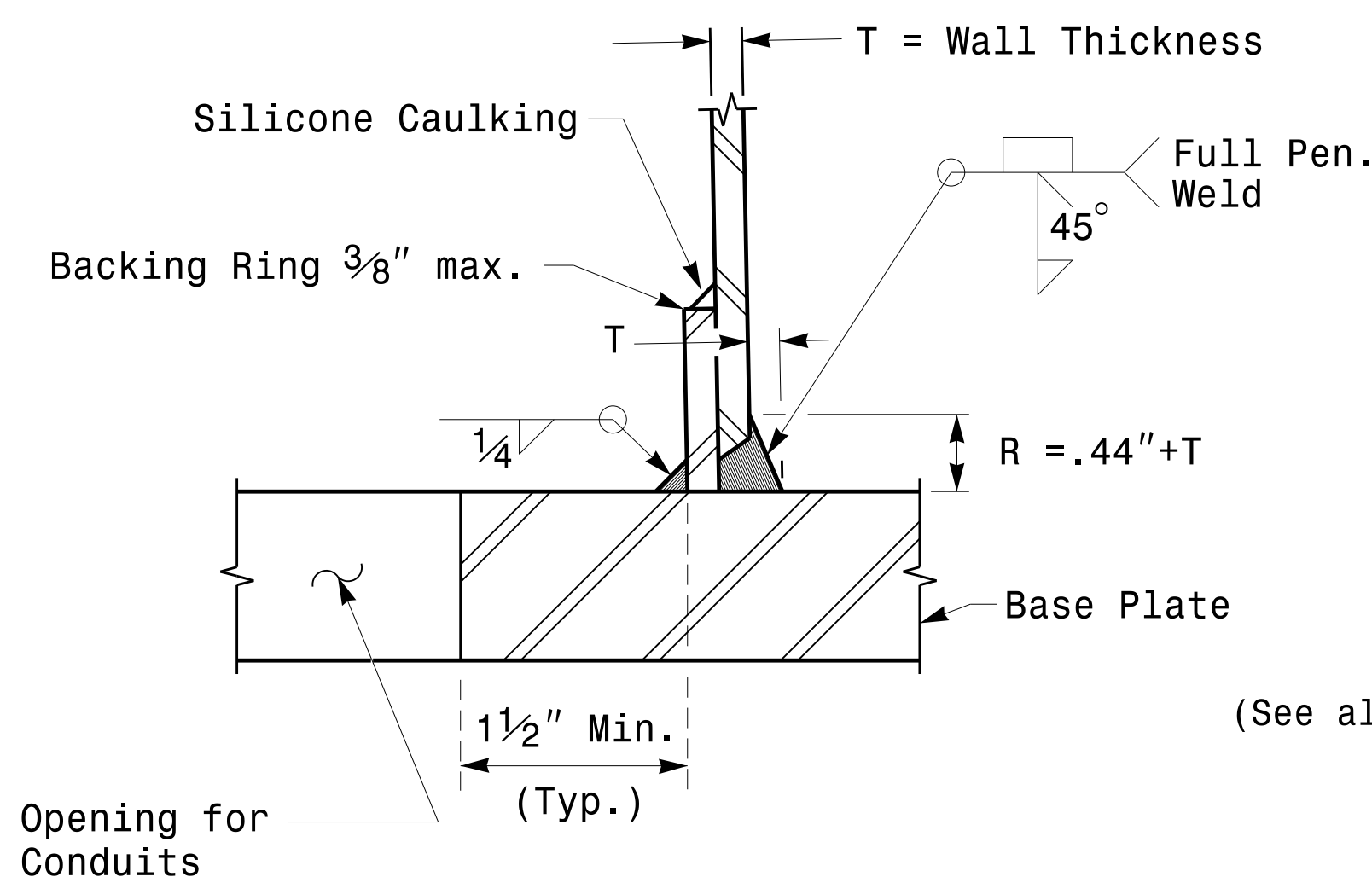


Section B-B
 Pole Base Plate Details
 (8 and 12 Bolt Pattern)



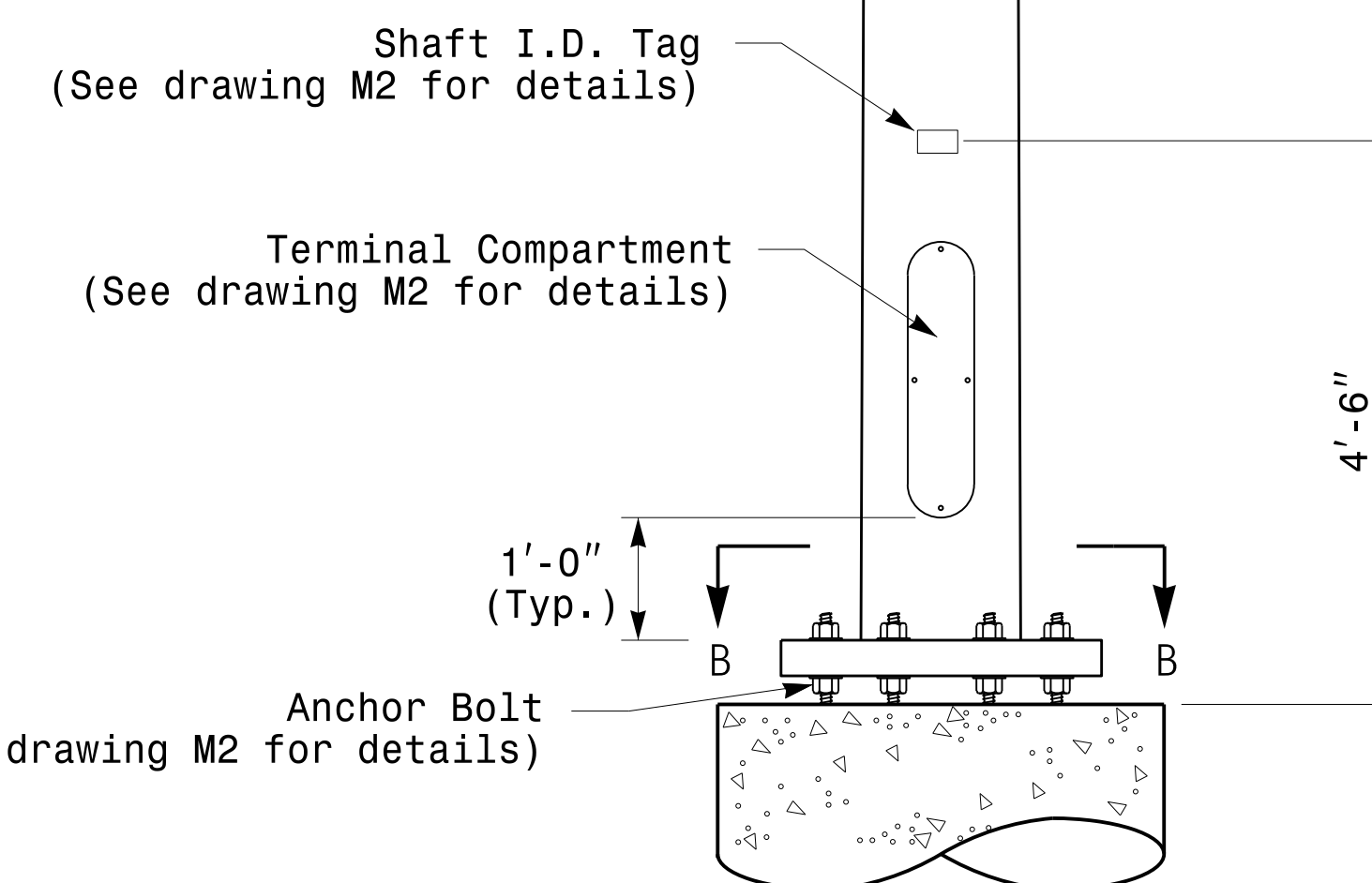
Section A-A

Radial Orientation for Factory Installed Accessories at Top of Pole



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

2 Cable Clamps designed for variable attachment heights from 1'-6" to 5'-0" below the top of the pole.

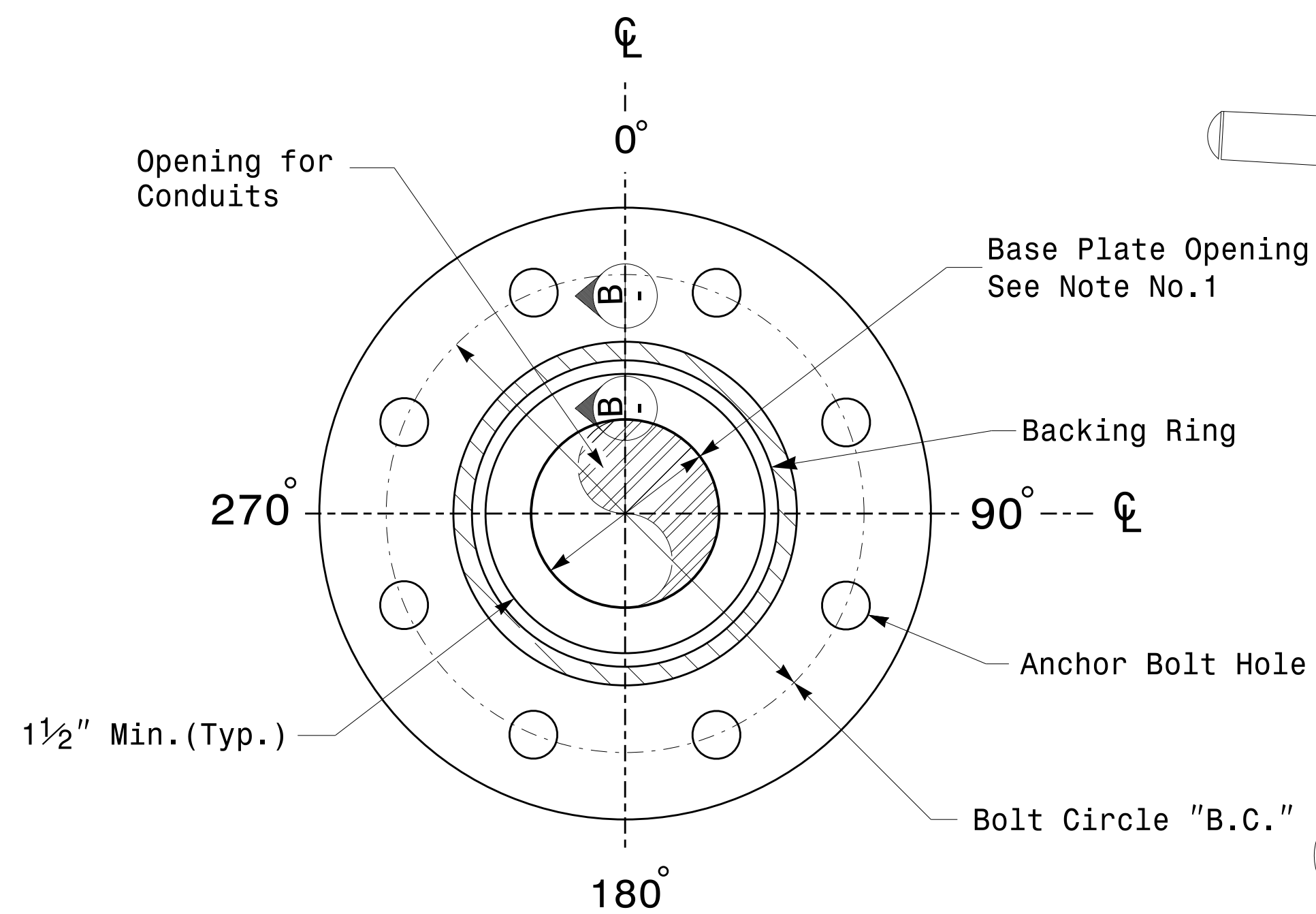


Monotube Strain Pole

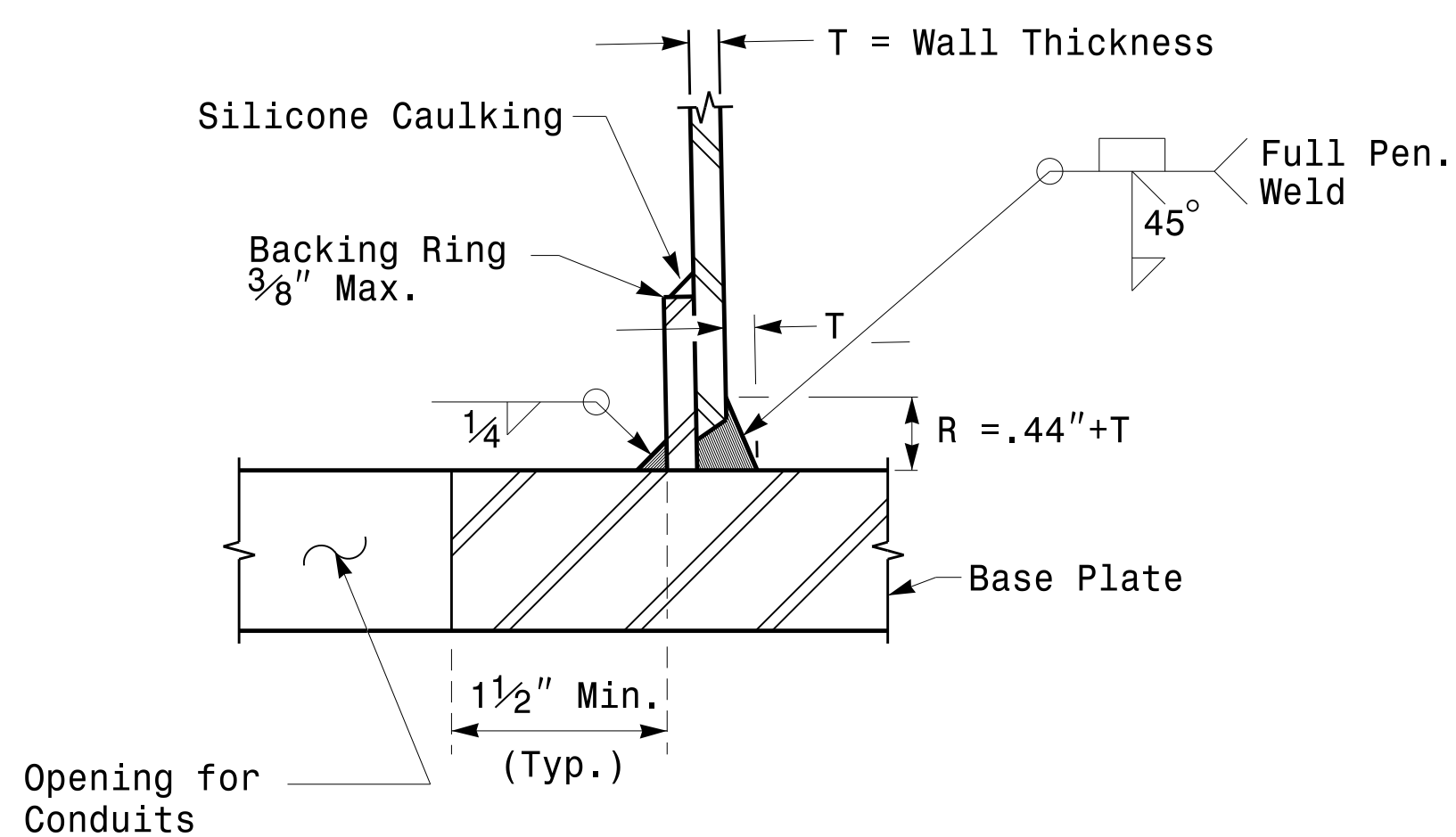
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Strain Poles</p>		<p>SEAL</p> <p>DocuSigned by Debesh C. Sarkar SIGNATURE 44E8E32E147E4C4...</p>
	<p>PLAN DATE: FEBRUARY 2016</p>	<p>DESIGNED BY: K.C. DURIGON</p>	
<p>SCALE: NONE</p>	<p>PREPARED BY: N. BITTING</p>	<p>REVIEWED BY: D.C. SARKAR</p>	<p>DATE: 2/17/2016</p>

Fabrication Details – Strain Poles

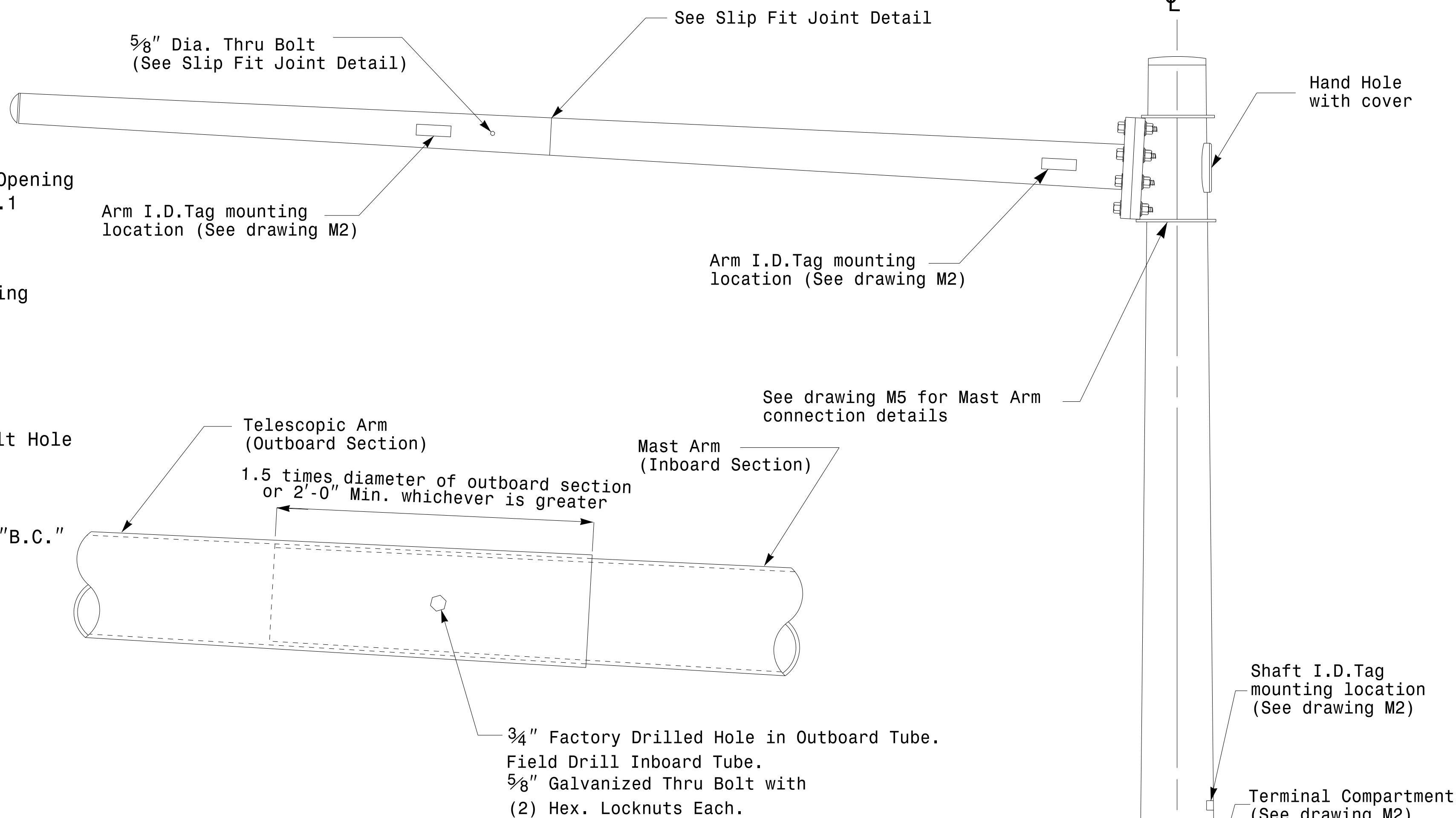
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



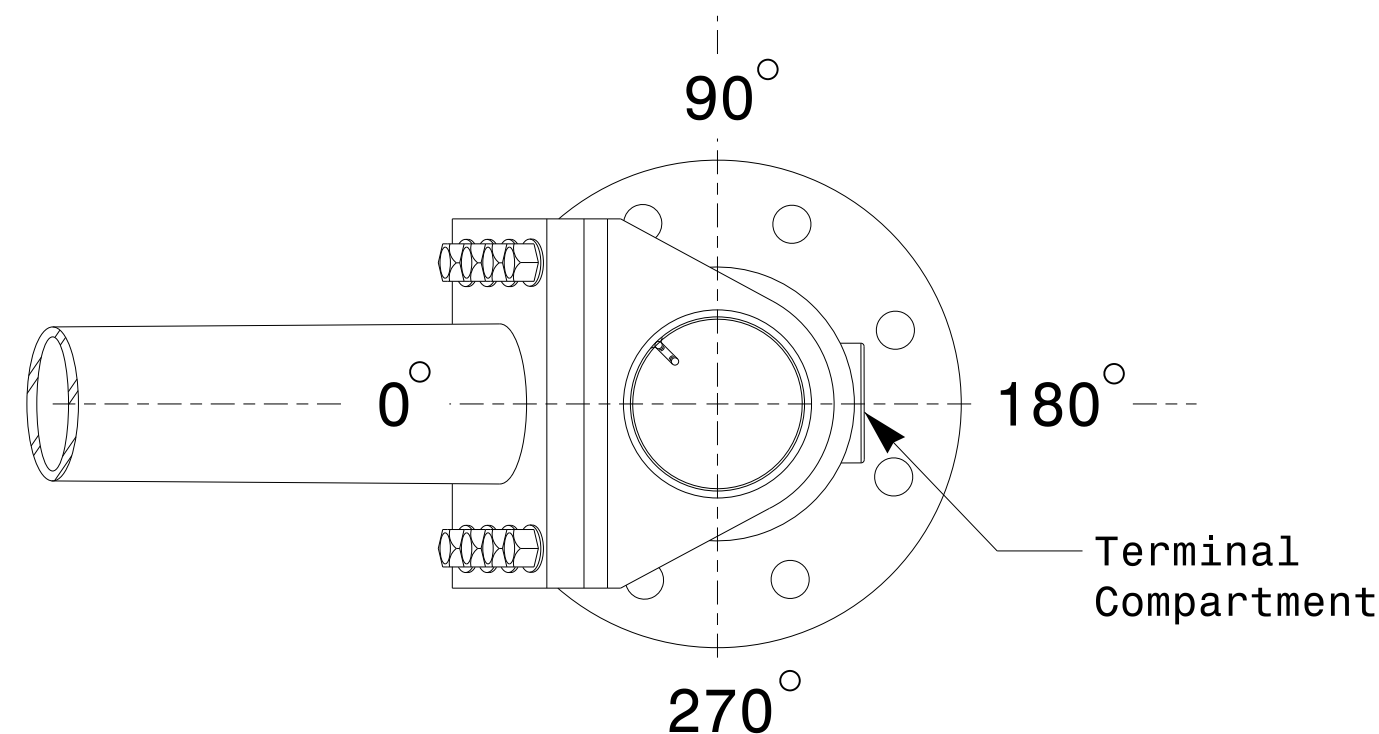
Section A-A
Pole Base Plate Details



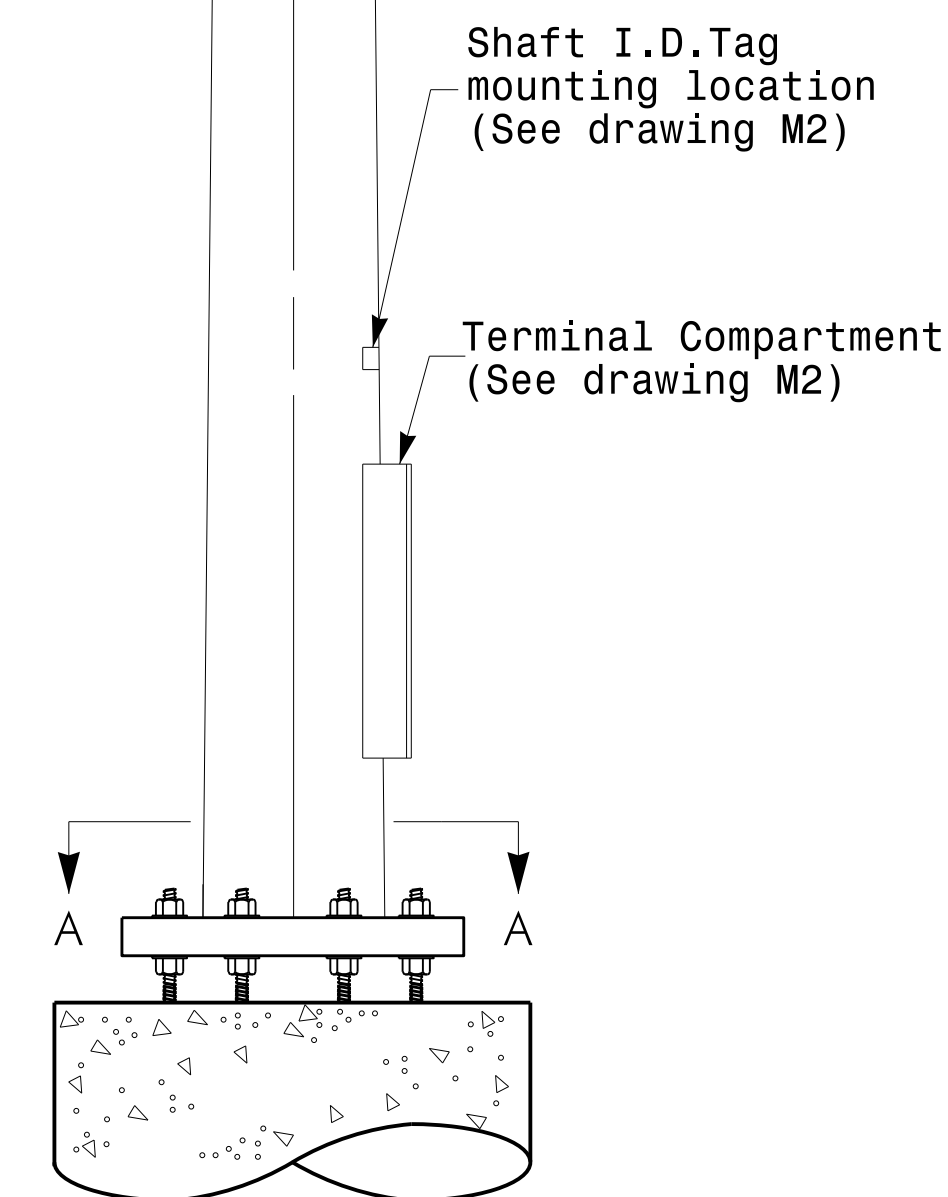
Section B-B
 (Pole Attachment to Base Plate)
Full-Penetration Groove Weld Detail



Slip Fit Joint Detail for Mast Arm



Mast Arm Radial Orientation



Mast Arm Pole

Fabrication Details – Mast Arm Poles

Prepared in the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	Typical Fabrication Details For Mast Arm Poles		SEAL DocuSigned by <i>Dibesh C. Sarkar</i> 44E8E32E147E4C4...
	PLAN DATE: FEBRUARY 2016 PREPARED BY: N. BITTING	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR	
SCALE: 0 NA NONE			DATE: 2/17/2016

17-FEB-2016 16:05
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 Design Section Eastern Region\Sig.M4\Sig.M4.dgn
 17-FEB-2016 16:05
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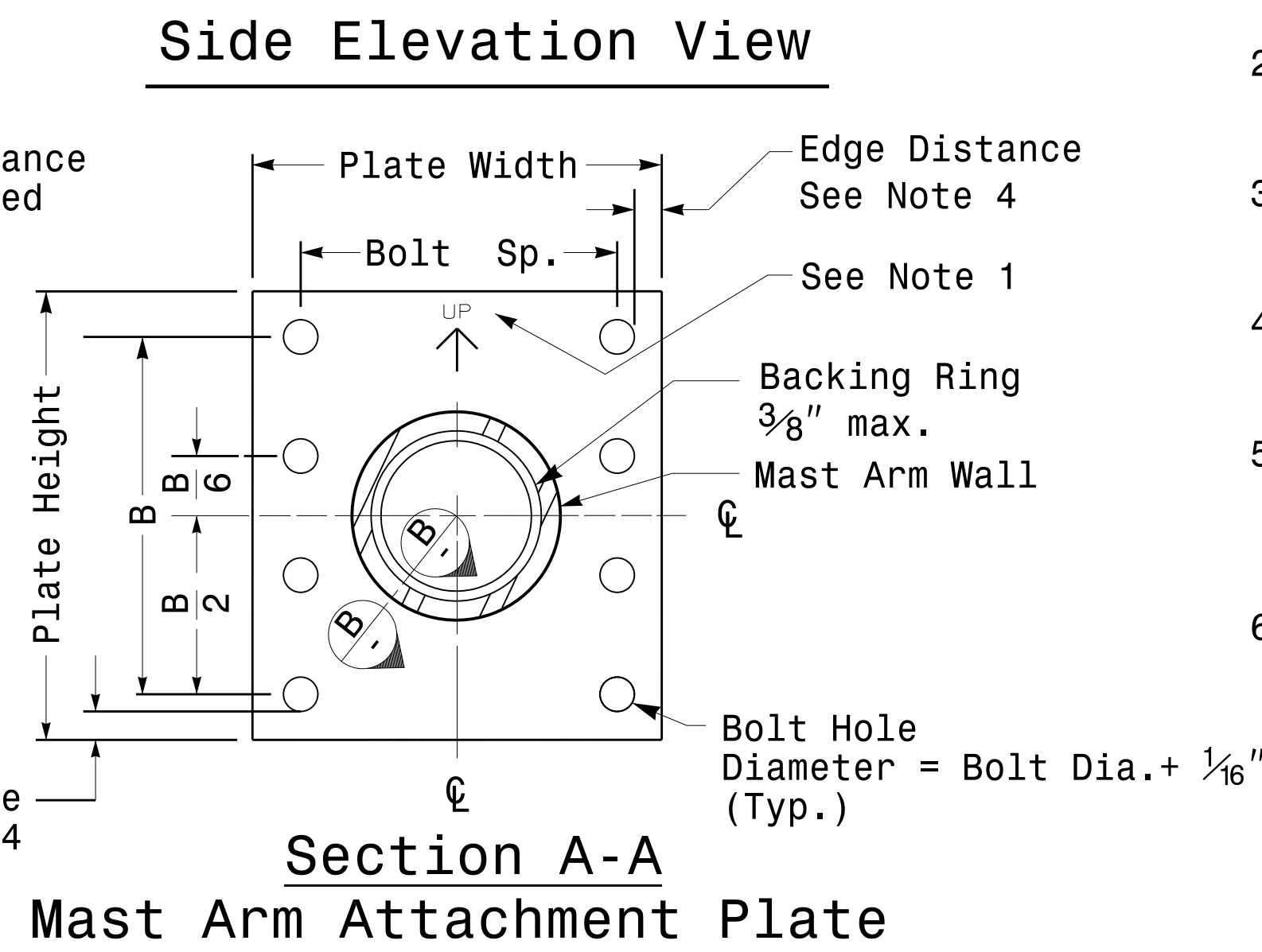
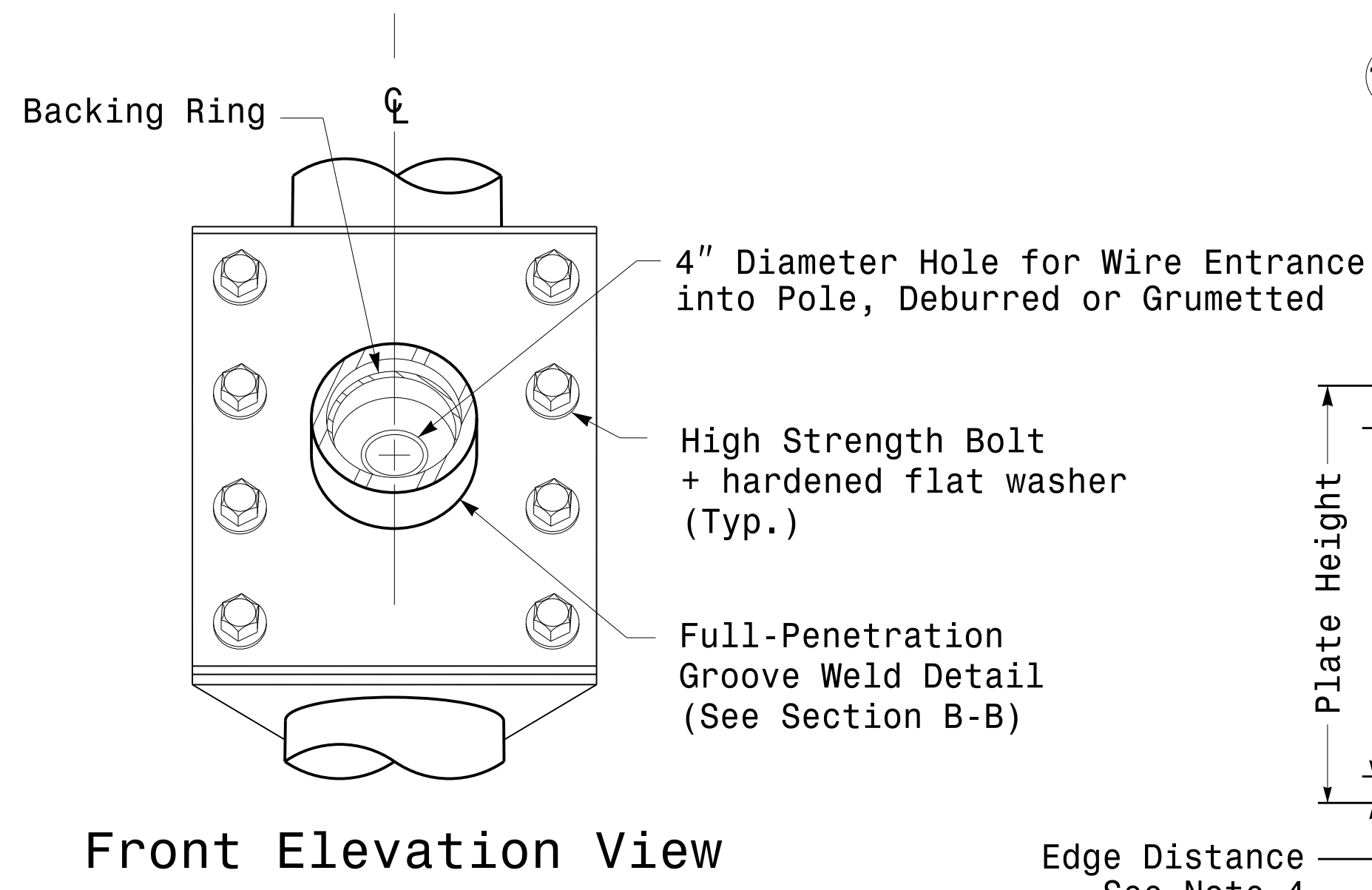
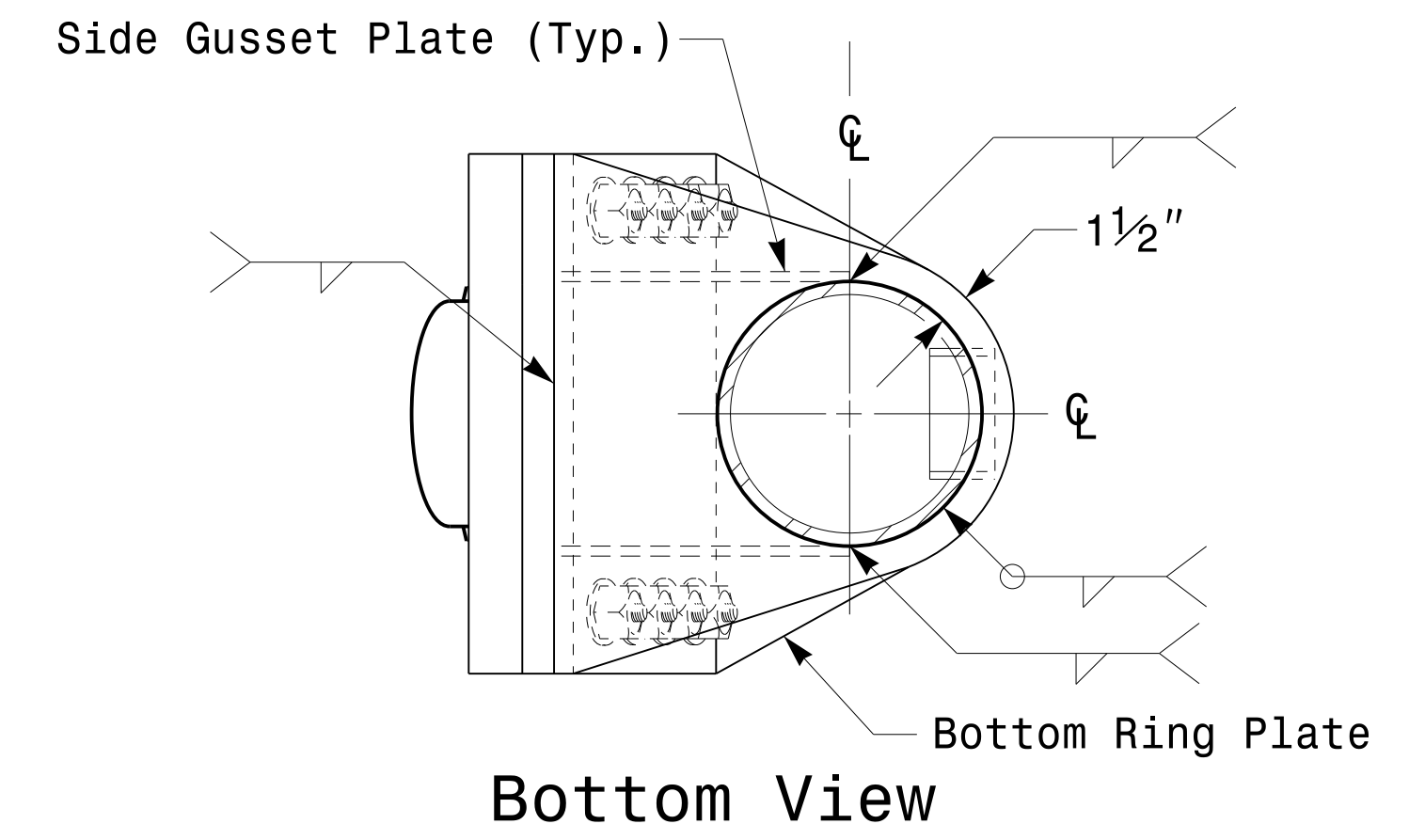
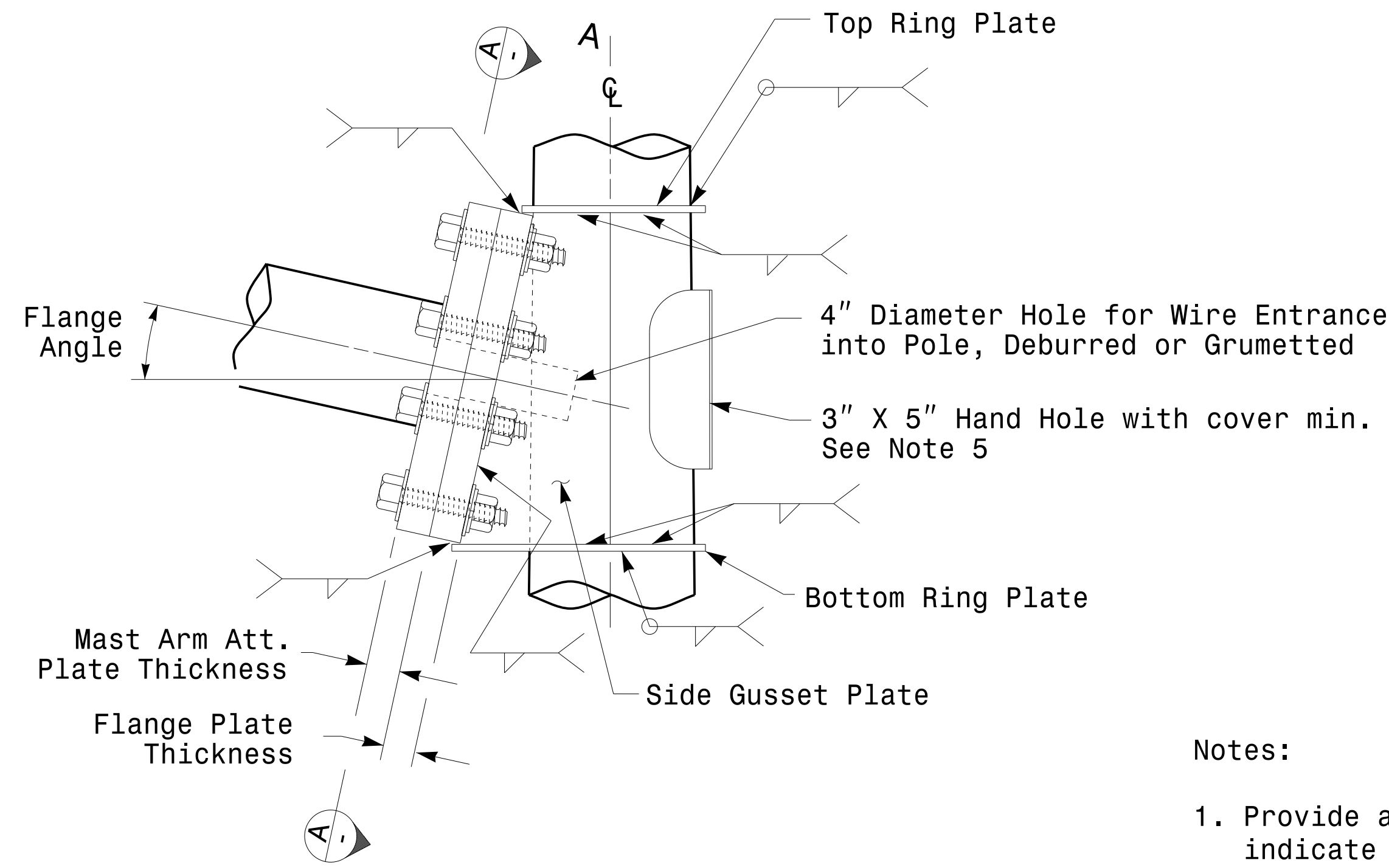
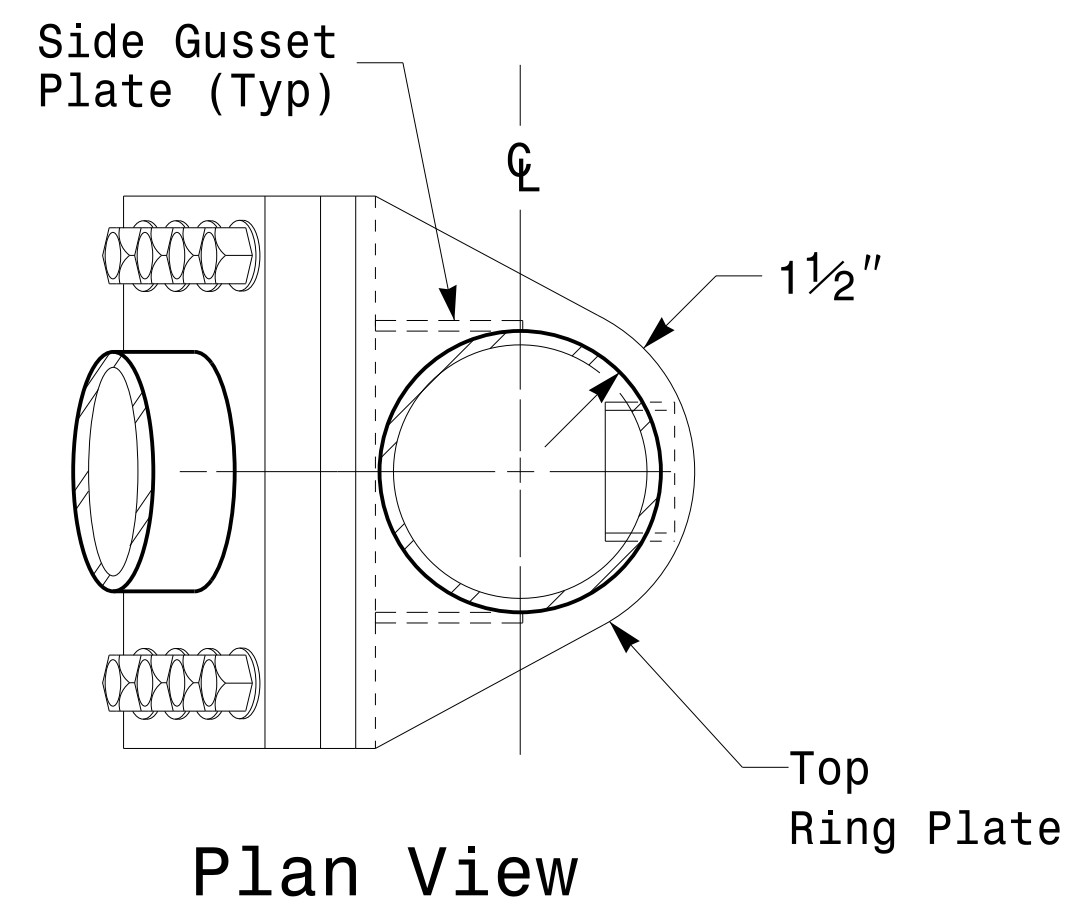
Welded Ring Stiffened Mast Arm Connection

PROJECT ID. NO.

SHEET NO.

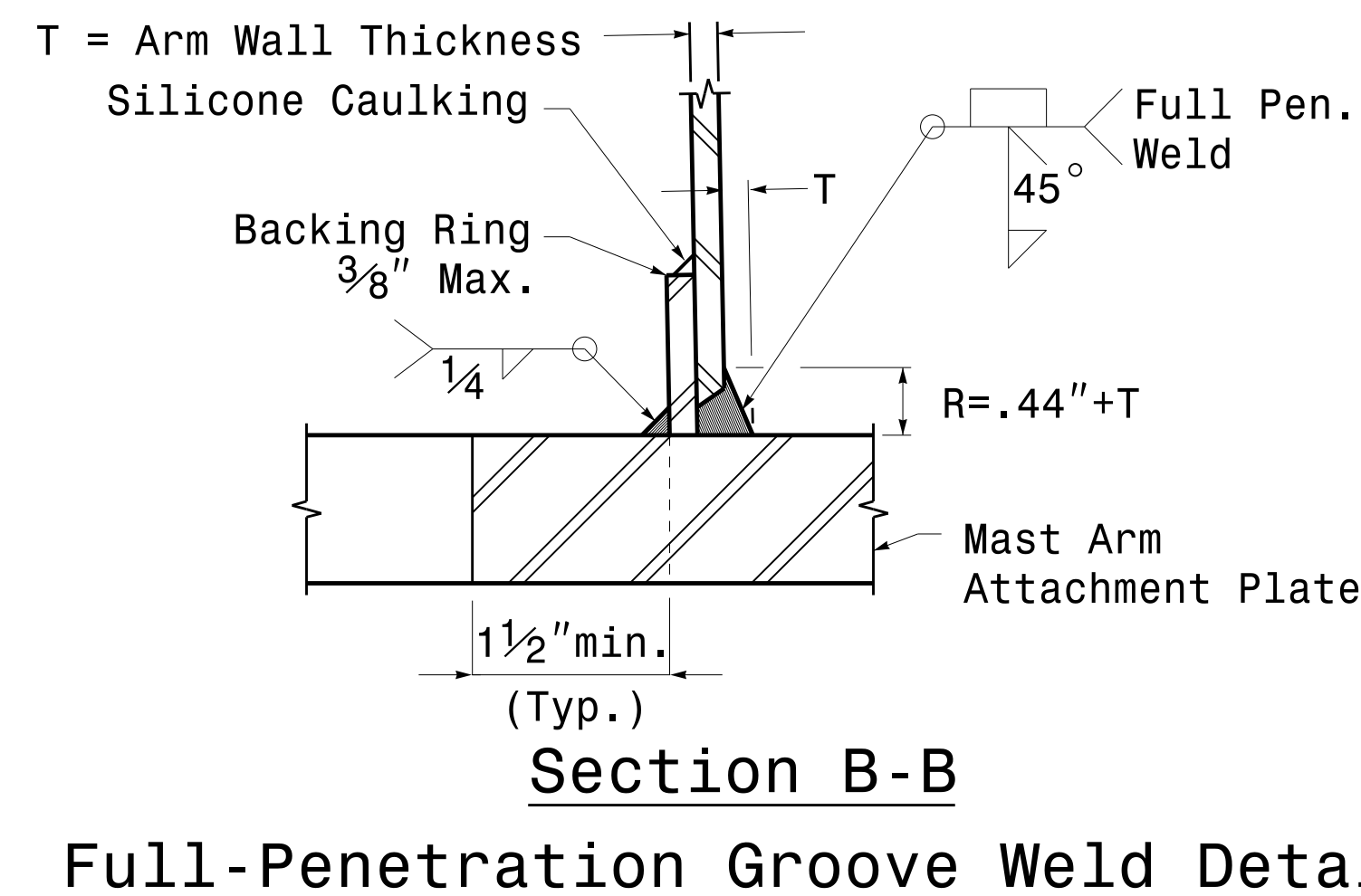
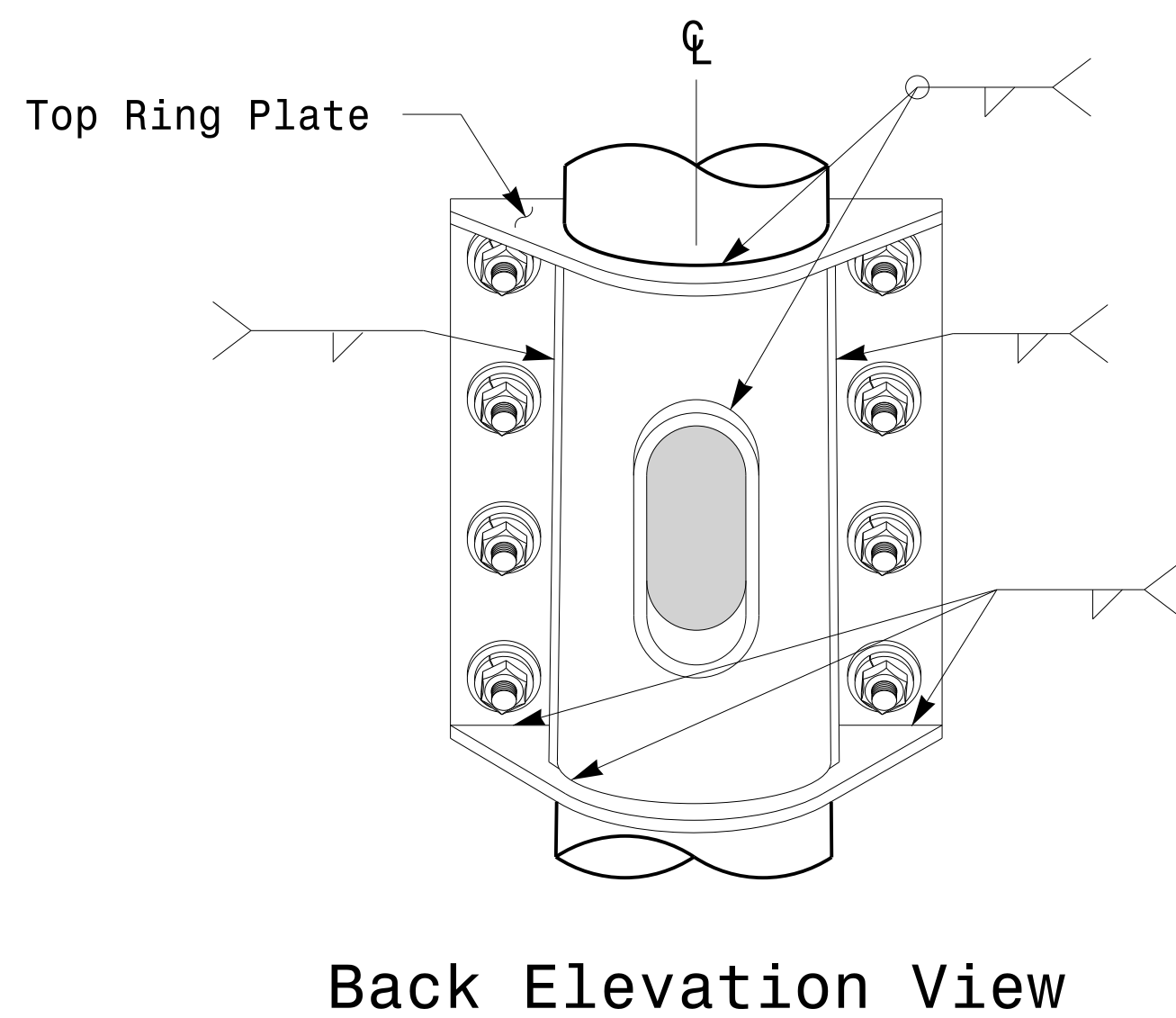
U-3621A

Sig.M5



Notes:

1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing appropriate holes at drainage points to drain galvanizing materials.
4. For minimum edge distance follow AISC Table J3.4 and J3.5. For nominal bolt hole size use Table J3.3.
5. Provide upper handhole as necessary when shaft extensions are required for luminaire arms or camera. For poles without luminaires/camera, wiring can be done through the top of pole.
6. Allowable range of flange tilt angle will vary from 0° to as required.



Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

SCALE: 0 NA NONE

Typical Fabrication Details For Mast Arm Connection To Pole

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

SEAL

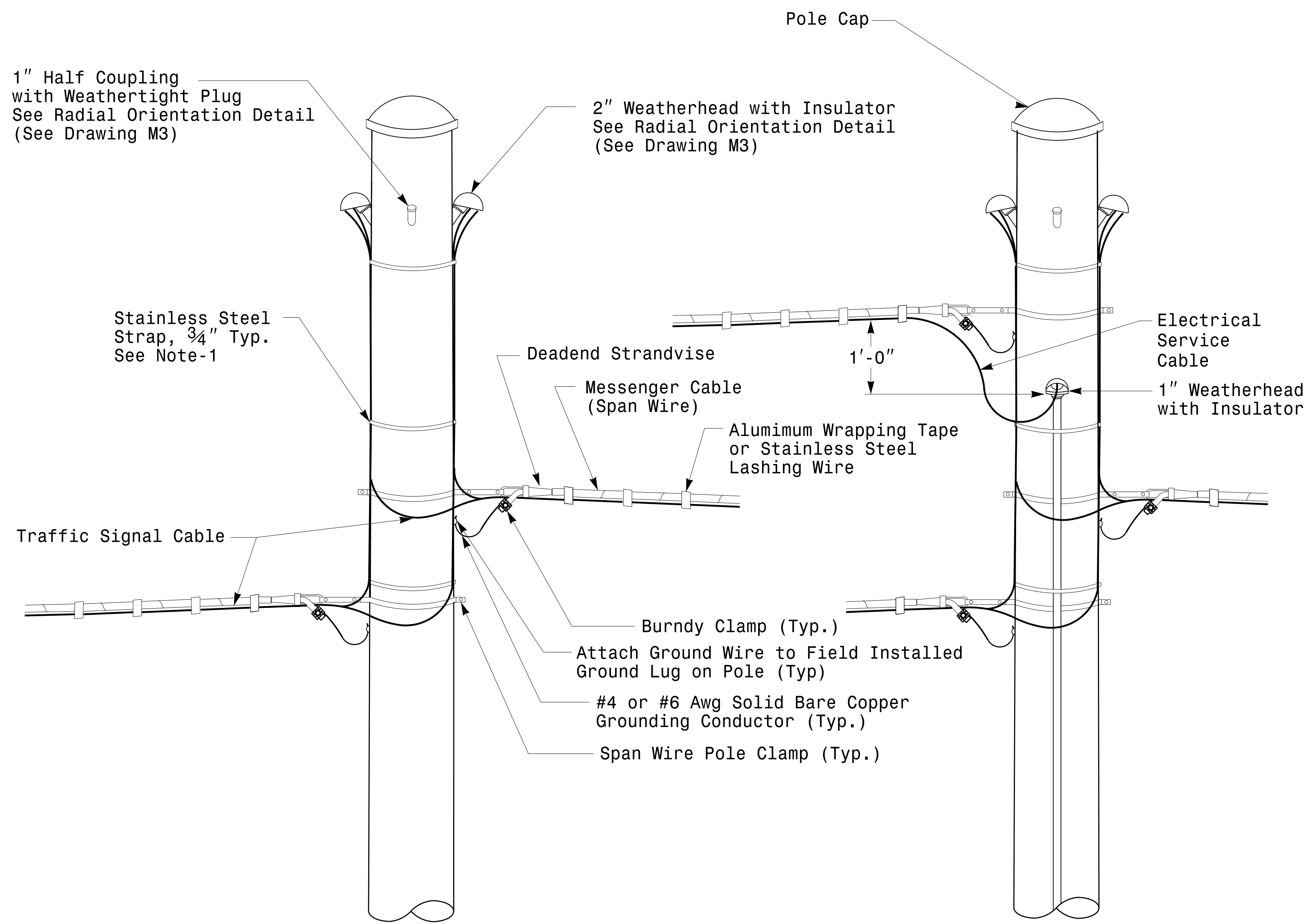
DocuSigned by: Debesh C. Sarkar

2/17/2016

DATE

Fabrication Details - Mast Arm Connection

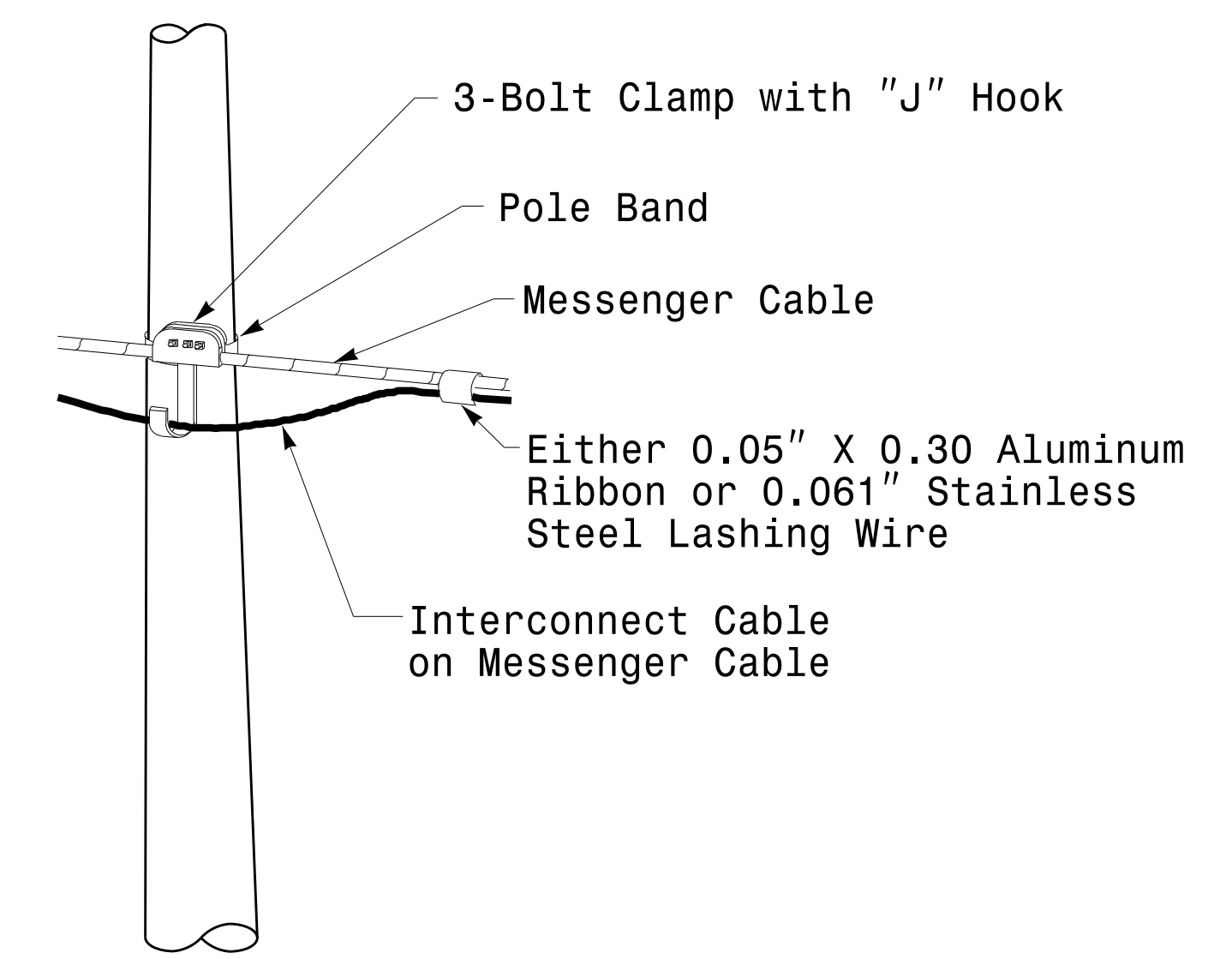
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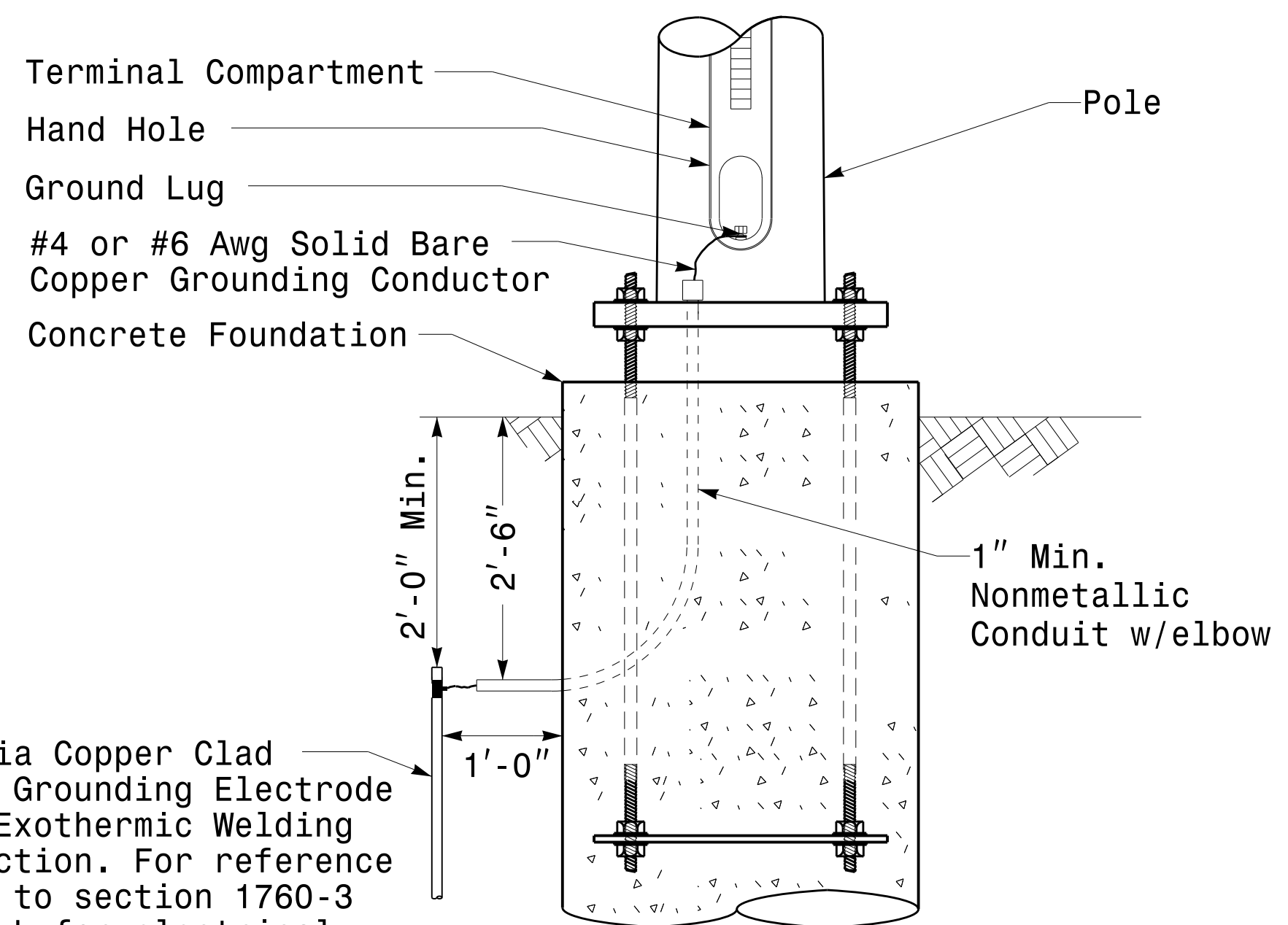
Strain Pole Attachments

NOTE:

1. Strap all signal cables to the side of the pole with 3/4" stainless steel straps when the distance between the spanwire attachment clamp and the weatherheads exceeds 3'-0".
2. Provide minimum two spanwire pole clamps per pole.
3. It is prohibited to attach two span wires at one pole clamp.
4. For general requirements refer to NCDOT Standard Specifications for Roadway and Structures, January 2012.



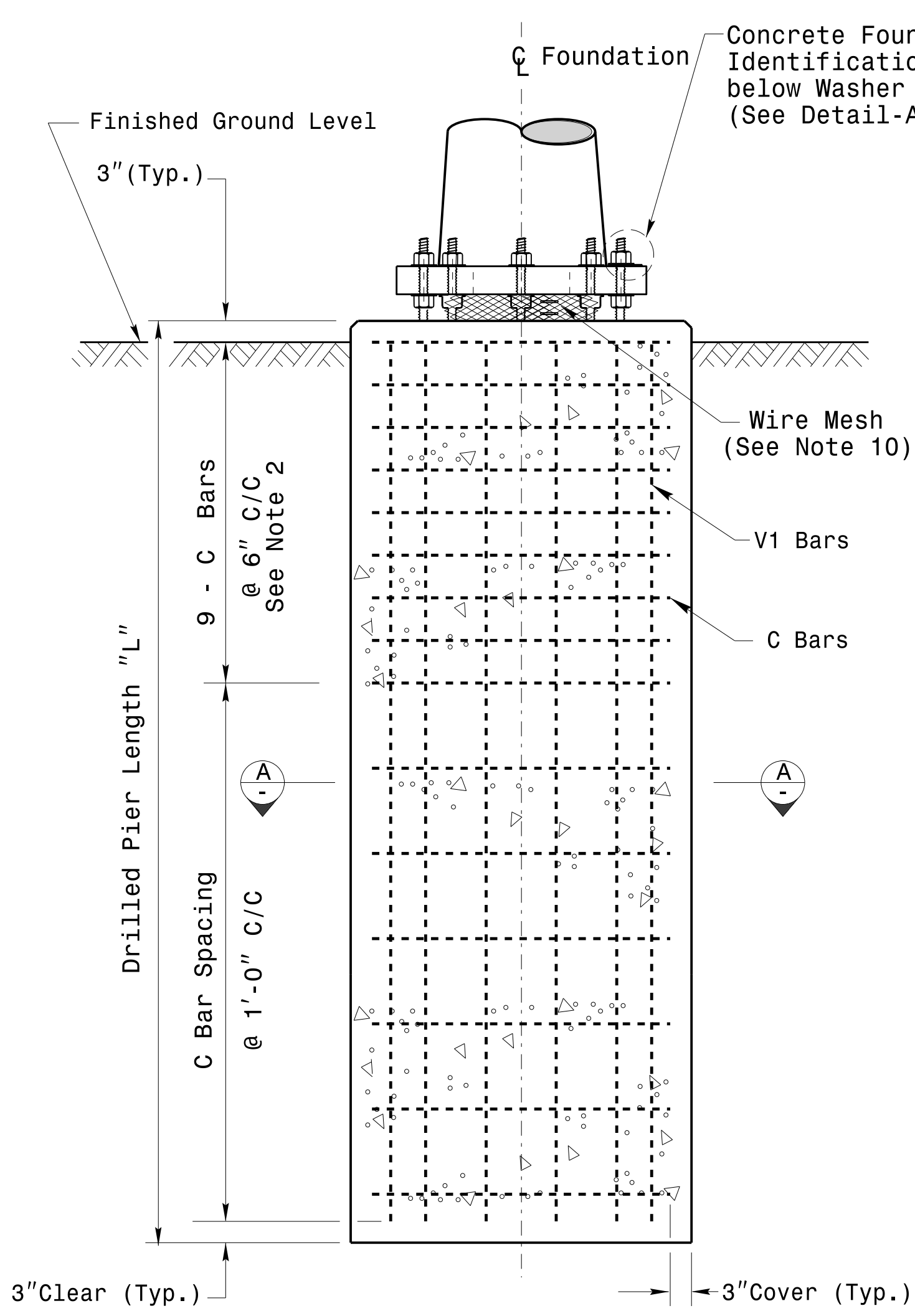
Attachment of Cable to Intermediate Metal Pole



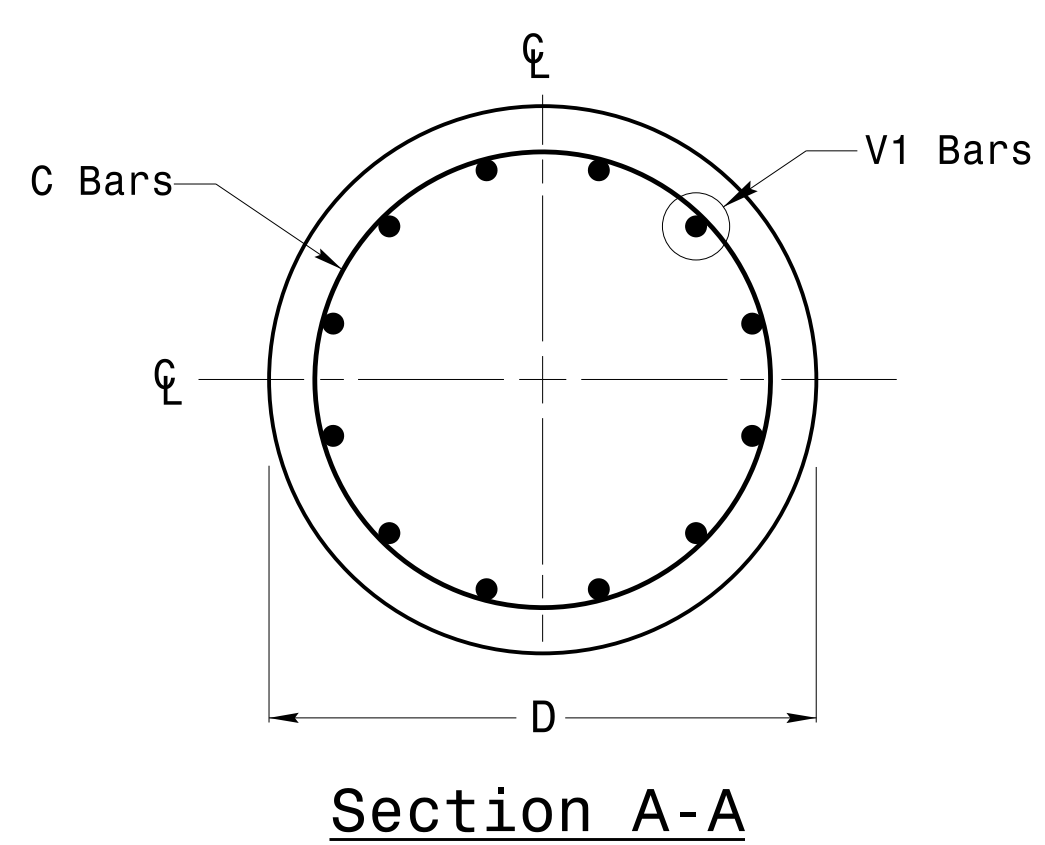
Metal Pole Grounding Detail For Strain Pole and Mast Arm

	<p>Typical Fabrication Details For Strain Pole Attachments</p>		
	<p>PLAN DATE: FEBRUARY 2016</p>	<p>DESIGNED BY: C.F. ANDREWS</p>	
<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>SCALE: 0 NA NONE</p>	<p>REVISIONS</p>	<p>INIT. DATE</p>
<p>DocuSigned By: <i>Debash C. Sarkar</i></p>			<p>2/17/2016</p>

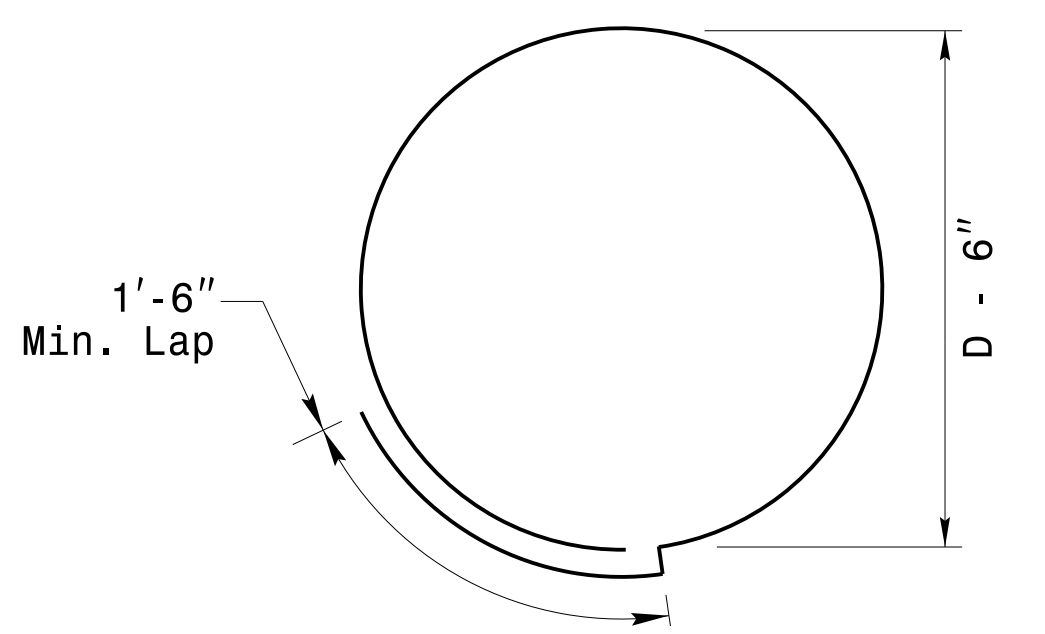
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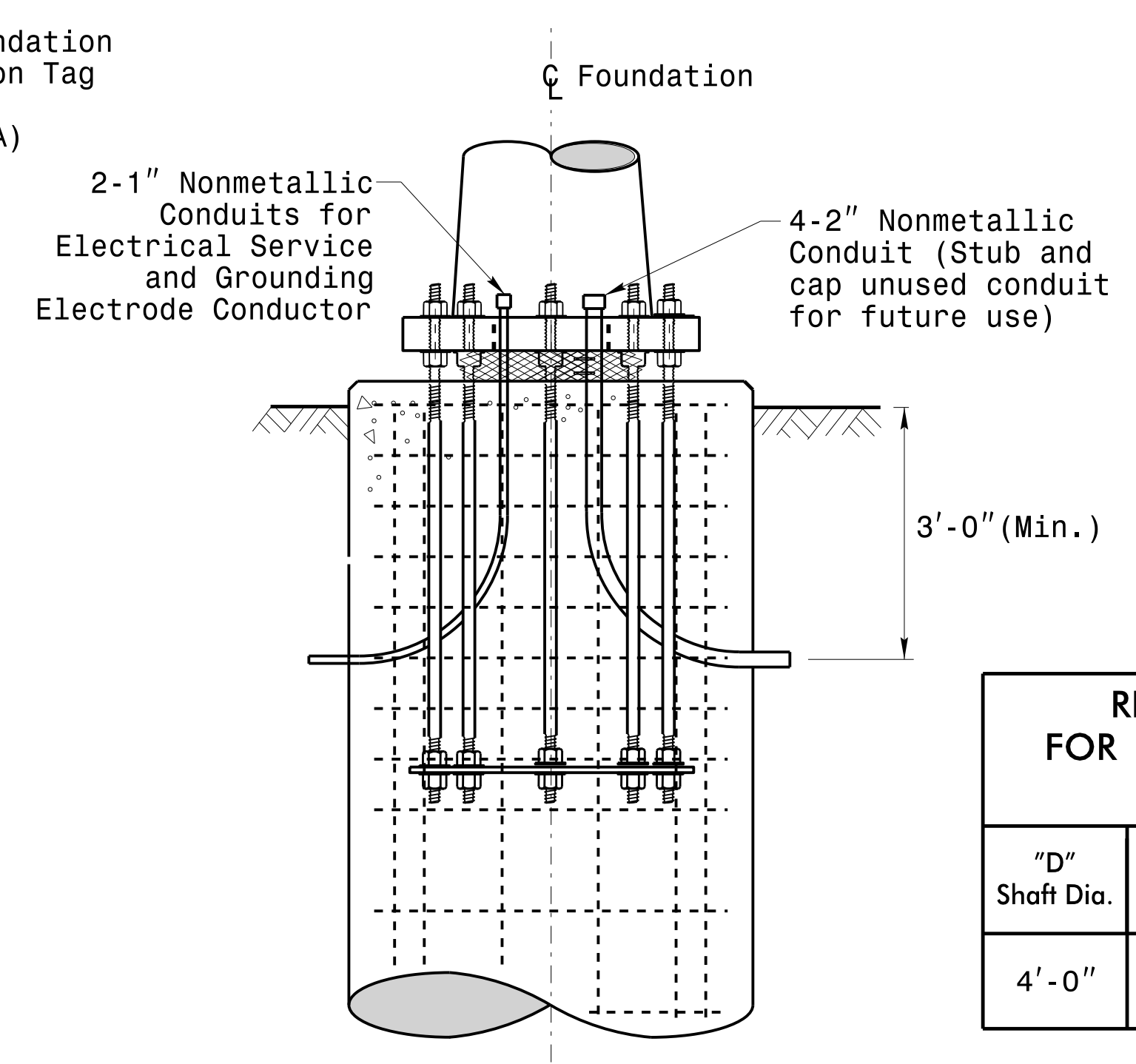
Concrete Shaft Elevation



Section A-A



Typical "C" Bar Detail



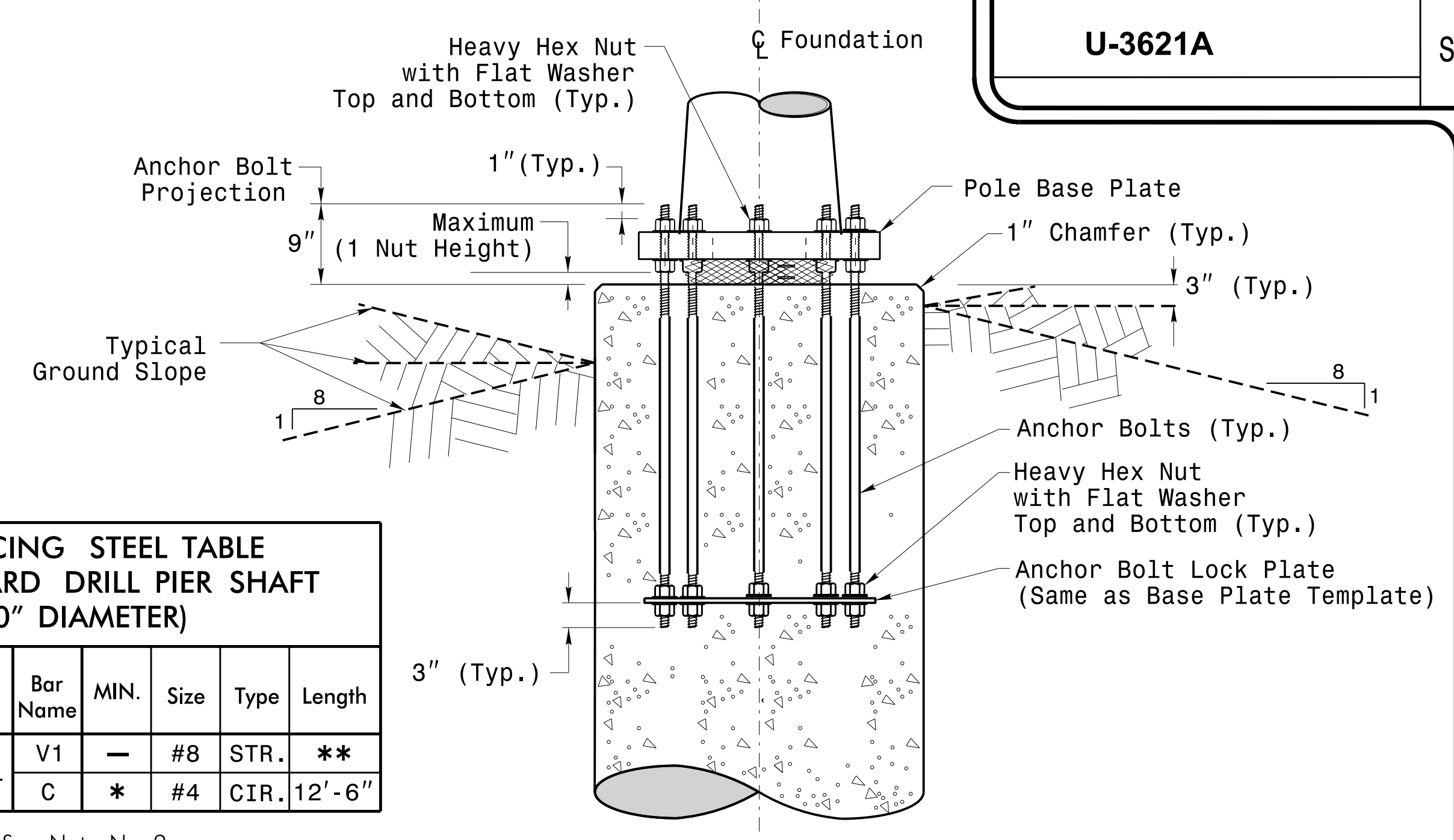
Typical Foundation Conduit Details

"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

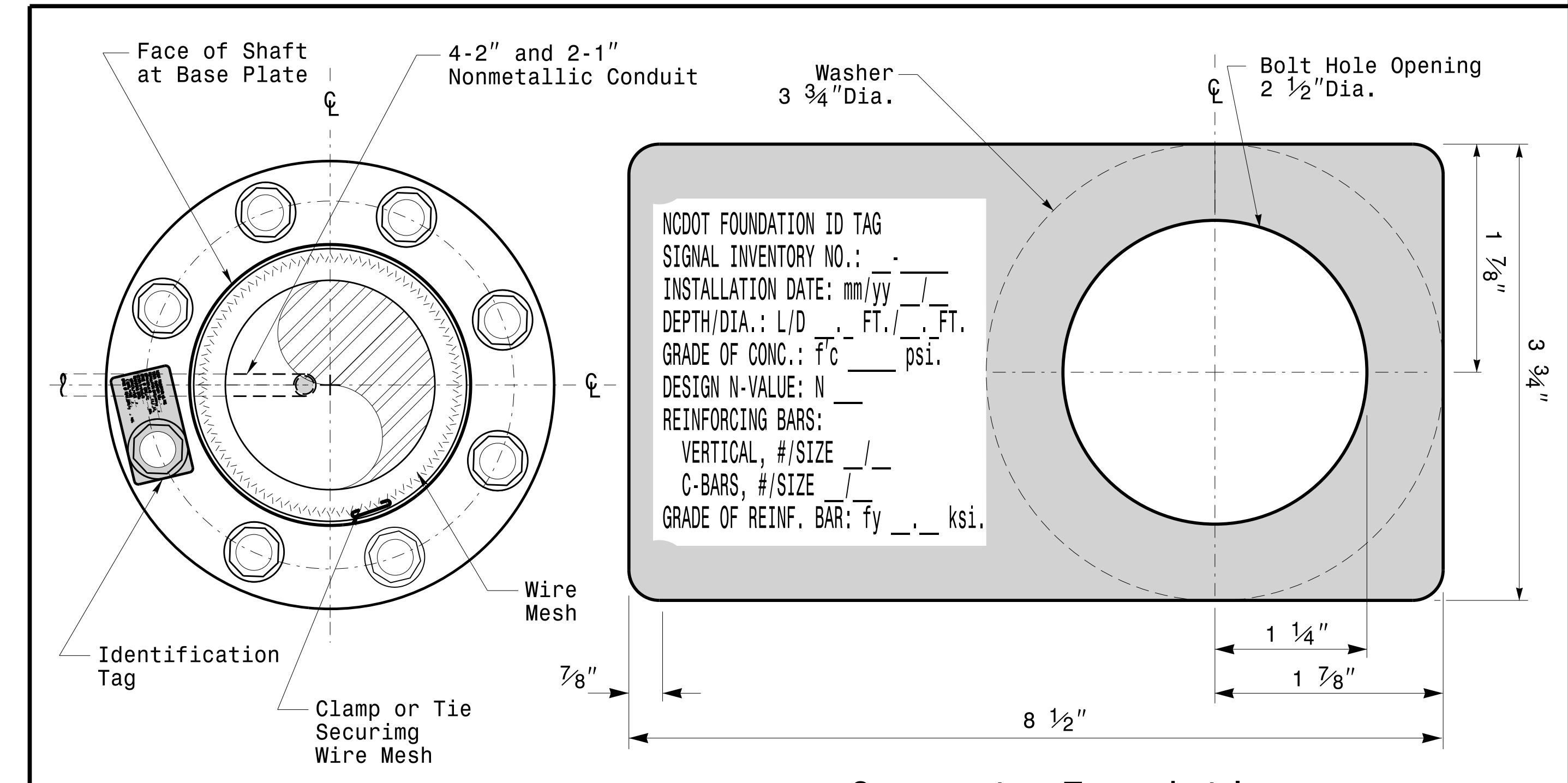
General Notes:

1. If actual subsurface conditions differ significantly from boring data contact the Engineer before excavating or placing concrete.
2. Circular tie reinforcing rings may be vertically adjusted by +/-3" at a depth between 2'-0" and 3'-0" to facilitate the installation of electrical conduit entering in the cage.
3. For standard foundations, see sheet Sig. M8 for details. Vertical reinforcing bars (V1) may be horizontally adjusted by +/-3" to facilitate the installation of electrical conduit entering into the cage.
4. Provide 2" to 5" foundation projection above ground level depending on the ground slope.
5. Unless otherwise shown, foundation designs are based on non-sloping level ground surfaces with slope ratios of 8:1 (H:V) or flatter. If actual ground line slopes are steeper contact the Engineer before excavating or placing concrete.
6. Construct foundations in accordance with NCDOT Standard Provisions SP09 R005- Foundations and Anchor Rod Assemblies for Metal Poles. All applicable 2012 NCDOT Standard Specifications are referenced in this provision. Refer to the NCDOT Resources/Specifications page located on the Connect NCDOT website.
[https://connect.ncdot.gov/resources/Specifications and Special Provisions.aspx](https://connect.ncdot.gov/resources/Specifications%20and%20Special%20Provisions.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.



Typical Foundation Anchor Bolt Details

(Reinforcing Cage Not Shown for Clarity)



Concrete Foundation Identification Tag Details

D = Diameter
L = Length/Depth
mm = Month
yy = Year

Detail-A

	Construction Details For Foundations		
	PLAN DATE: FEBRUARY 2016	DESIGNED BY: C.B. COGDILL	
	PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR	
SCALE: NONE	REV. NO. 1	COMMENTS: Revised Foundation Top Details	INIT. N.B. DATE: 5/11/2015

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Construction Details - Foundations

SOIL CONDITION

PROJECT ID. NO.	SHEET NO.
U-3621A	Sig.M8

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

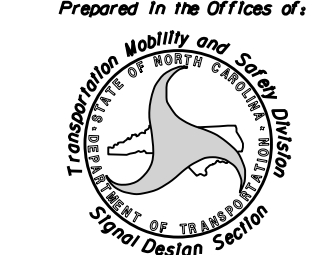

1. Values shown in the "Reactions at the Pole Base" column represent the minimum acceptable capacity allowed for design using a design CSR of 1.00.
2. Use chairs and spacers to maintain proper clearance.
3. For foundation, always use air-entrain concrete mix.

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

 Prepared in the Office of: Transportation Mobility and Safety Division North Carolina Department of Transportation Design Section 750 N. Greenfield Pkwy, Corner, NC 27529	Standard Strain Pole Foundation for All Soil Conditions PLAN DATE: FEBRUARY 2016 DESIGNED BY: C.B. COGDILL PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR	DocuSigned by:  2/17/2016
SCALE: 0 NA NONE	REVISIONS Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn. N.B. 7/12/2015	DATE: 2/17/2016	DATE:

U:\P&ID\2014_15\14_Signals\Signal Design Section\Eastern Region\MM_Sheets\2016\2014_Sig.M8 Std. Strain Pole Found.-Saturated Soil -Cond111on.dgn

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

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

LEGEND

	NEW FIBER OPTIC COMMUNICATIONS CABLE
	NEW TWISTED PAIR COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE
	EXISTING COMMUNICATIONS CABLE TO BE REMOVED
	NEW AERIAL GUY ASSEMBLY
	NEW CONDUIT
	EXISTING CONDUIT
	NEW DIRECTIONAL DRILLED CONDUIT
	NEW BORED AND JACKED CONDUIT
	NEW JUNCTION BOX
	EXISTING JUNCTION BOX
	NEW WOOD POLE
	EXISTING WOOD POLE
	AERIAL SPlice ENCLOSURE
	NEW METAL POLE
	EXISTING METAL POLE
	NEW CCTV ASSEMBLY
	NEW STANDARD GUY ASSEMBLY
	NEW SIDEWALK GUY ASSEMBLY
	NEW CABLE STORAGE RACKS (SNOW SHOES)
	EXISTING CONTROLLER AND CABINET
	EXISTING SPlice CABINET
	NEW SPlice CABINET
	SIGNAL POLE
	SIGNAL INVENTORY NUMBER

CONSTRUCTION NOTE SYMBOLOGY KEY

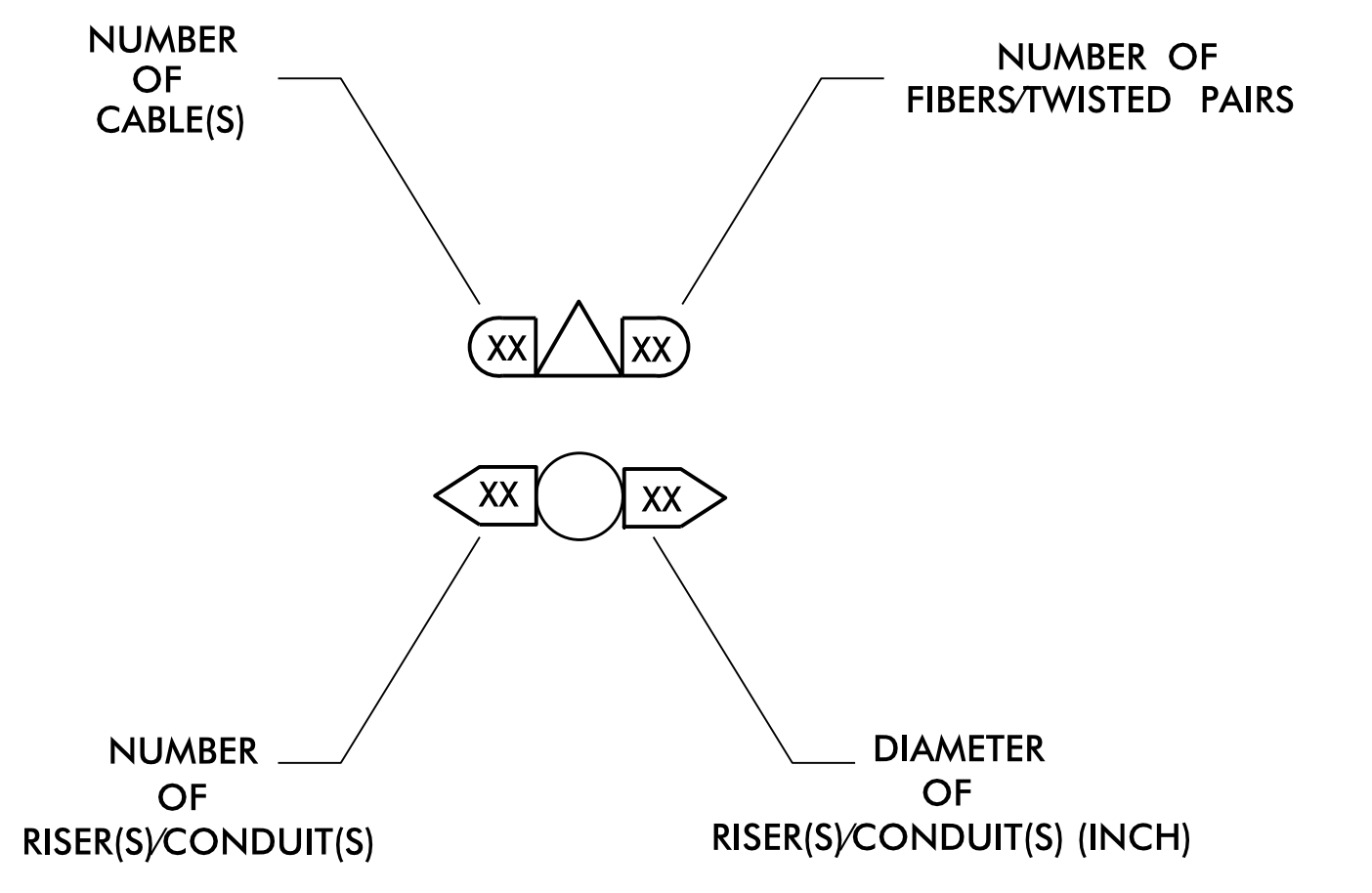
- INDICATES NUMBER OF CABLES, LOOPS, ETC.
- INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)

ATTACHMENT POINT:

DISTANCE ABOVE (IN) REFERENCE POINT

REFERENCE POINT DISTANCE BELOW (IN)

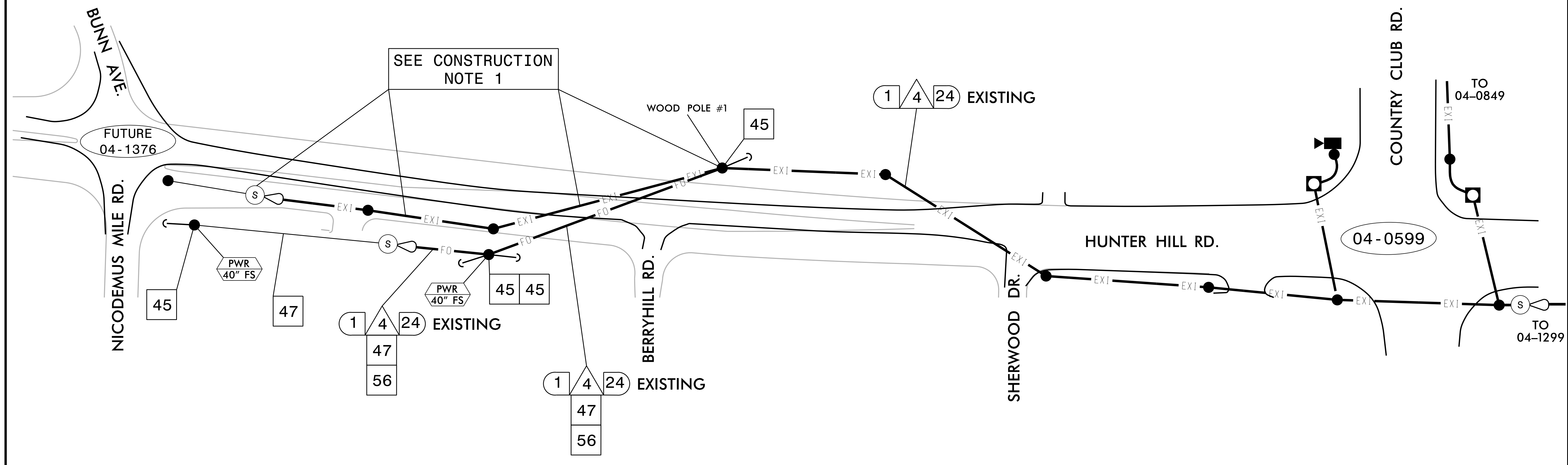
FS – FRONT SIDE OF POLE
BS – BACK SIDE OF POLE



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	<p>CONSTRUCTION NOTES</p> <p>DIVISION 04 NASH COUNTY ROCKY MOUNT</p>		
	<p>PLAN DATE: FEBRUARY 2017</p> <p>PREPARED BY: A. J. SKUCE</p>	<p>REVIEWED BY: Neil Avery</p> <p>DATE: 2/15/2017</p>	

TMP PHASE I



CONSTRUCTION NOTES:

- 1) UNLASH EXISTING 24-FIBER CABLE AND AERIAL SPlice ENCLOSURE AND BACKPULL TO "WOOD POLE #1". REMOVE OLD MESSENGER CABLE AND LASH BACKPULLED CABLE AND SPlice ENCLOSURE TO NEW MESSENGER CABLE AS SHOWN.

NOTES:

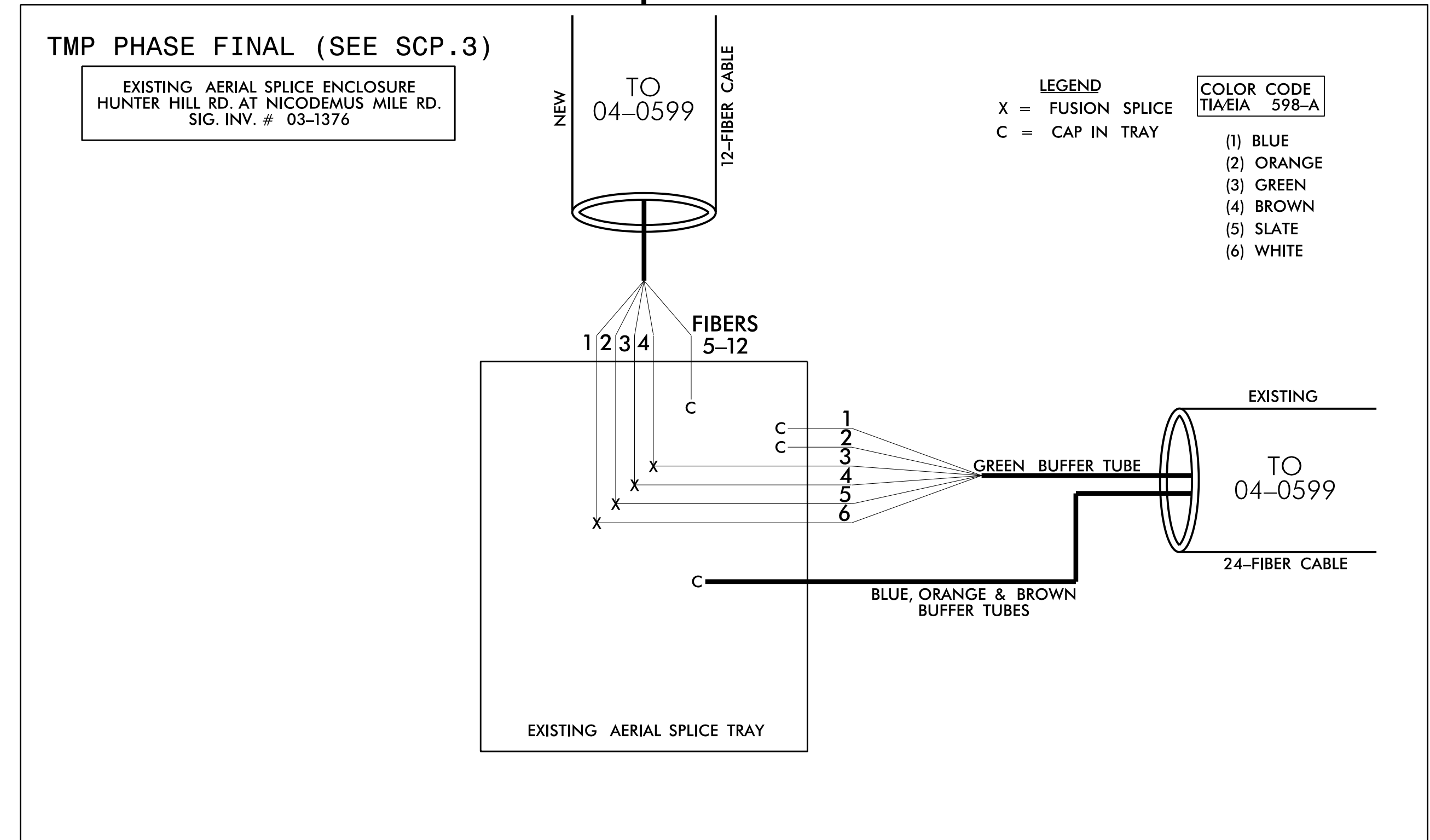
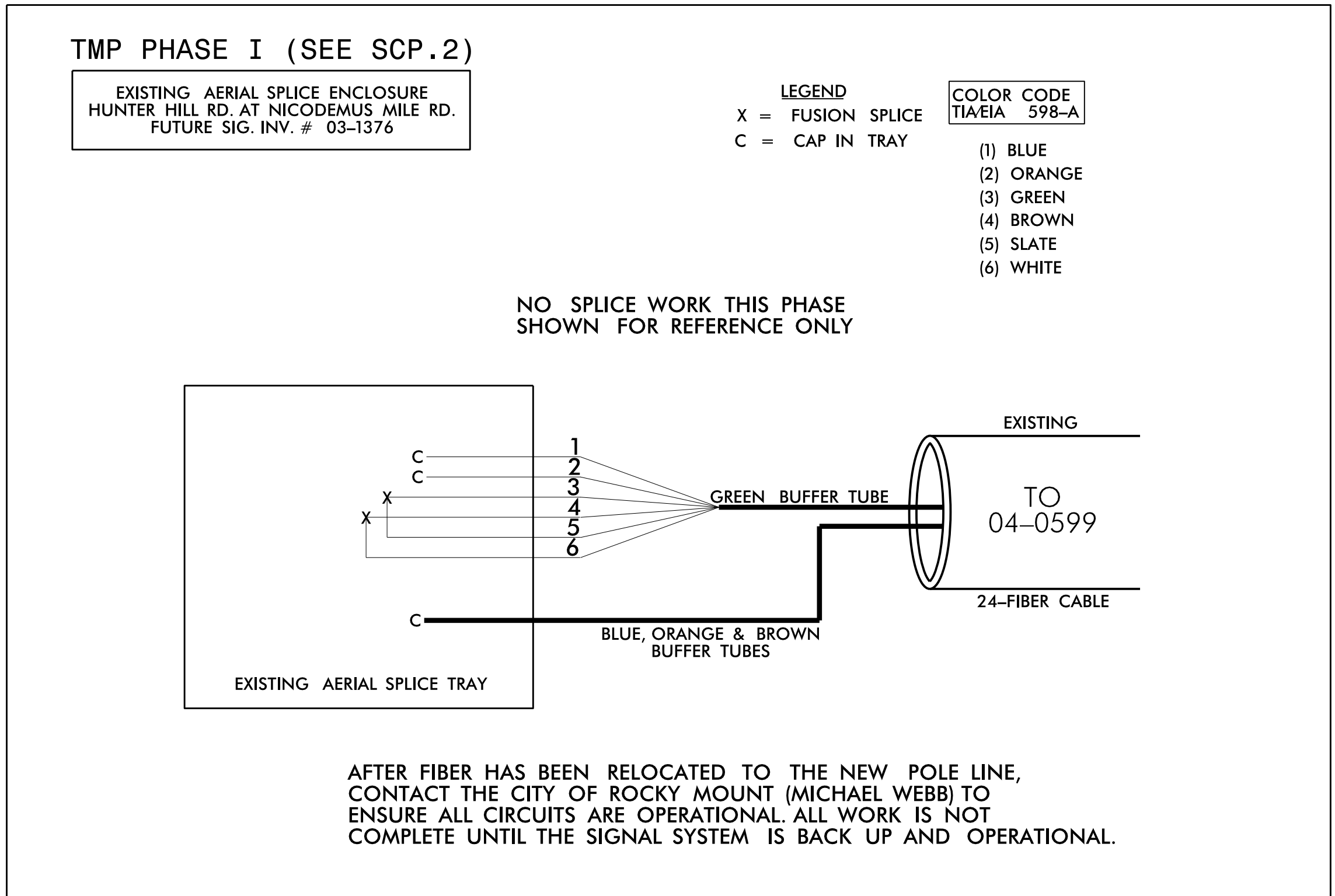
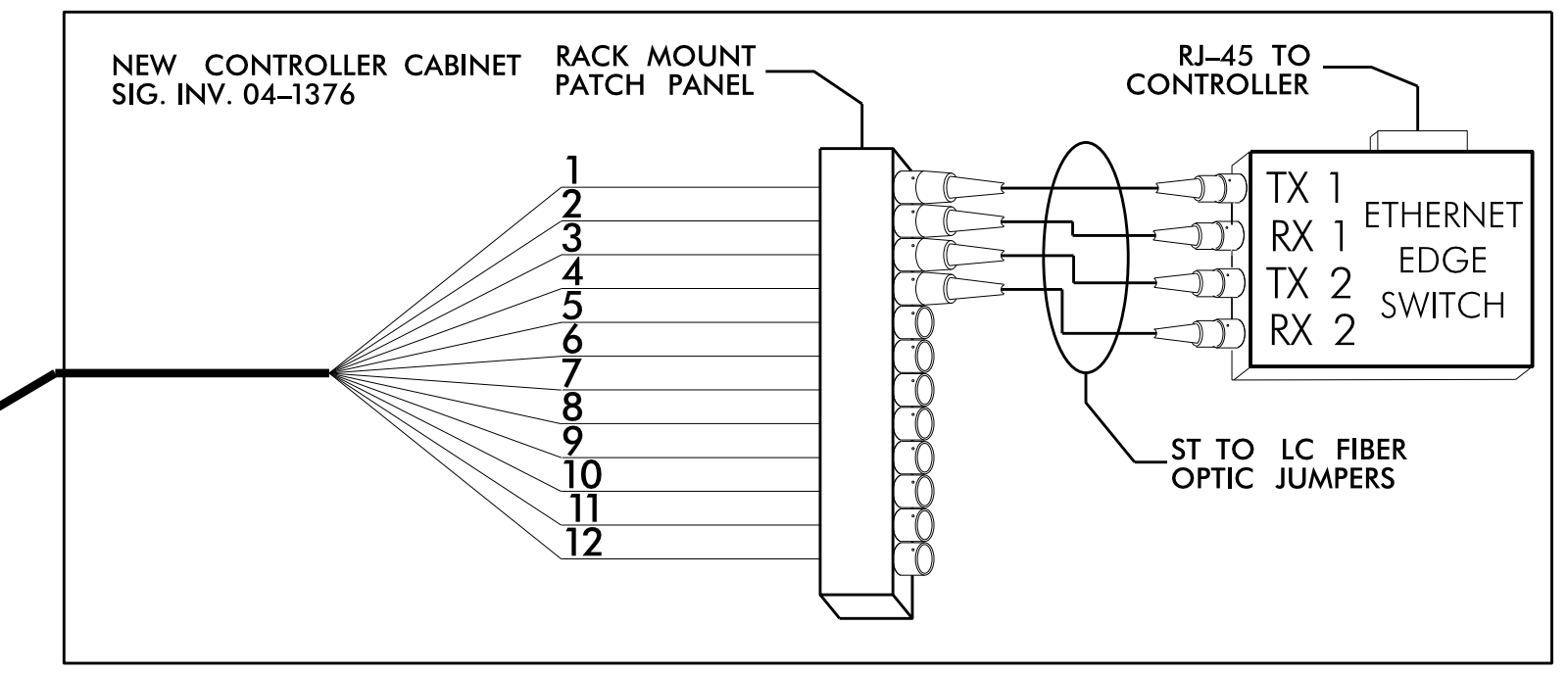
- 1) NOTIFY THE CITY OF ROCKY MOUNT SIGNAL SYSTEM OPERATOR, MICHAEL WEBB, AT 252-972-1132 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE SIGNAL SYSTEM OPERATOR AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY. ALL WORK IS NOT COMPLETE UNTIL THE SIGNAL SYSTEM IS BACK UP AND OPERATIONAL.
- 2) CONTRACTOR TO RECORD EXISTING SPlice ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPlice DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPlice ARRANGEMENT DIFFERS FROM THE SUPPLIED SPlice DETAILS.

TMP PHASE 1

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	<p>COMMUNICATIONS CABLE AND CONDUIT ROUTING PLANS</p>	
	<p>DIVISION 04 NASH COUNTY ROCKY MOUNT</p> <p>PLAN DATE: FEBRUARY 2017</p> <p>PREPARED BY: A. J. SKUCE</p>	<p>REVIEWED BY: <i>Neil Avery</i></p> <p>DATE: _____</p>
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p> <p>SCALE: 1" = 55'</p>	<p>REVISIONS</p> <p>INIT. DATE</p>	<p>DocuSign by: <i>Gregory A. Fuller</i> 2/15/2017</p> <p>CADD Filename: _____</p>

TMP PHASE FINAL



- 1) NOTIFY THE CITY OF ROCKY MOUNT SIGNAL SYSTEM OPERATOR, MICHAEL WEBB, AT 252-972-1132 FIVE (5) DAYS PRIOR TO BEGINNING WORK ON SIGNAL SYSTEM COMMUNICATIONS CABLE. NOTIFY THE SIGNAL SYSTEM OPERATOR 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) CONTRACTOR TO RECORD EXISTING SPLICE ARRANGEMENT FOR COMPARISON TO THE SUPPLIED SPLICE DETAILS. IF DISCREPANCIES EXIST, CONTACT THE ENGINEER TO DETERMINE HOW TO PROCEED WITH RESPLICING. PROVIDE AS-BUILT PLANS TO THE ENGINEER IF FINAL SPLICE ARRANGEMENT DIFFERS FROM THE SUPPLIED SPLICE DETAILS.
- 3) ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING \ ENSURING PROPER TERMINATIONS.
- 4) INCLUDE ON THE COVER OF EACH SPLICE TRAY THE FOLLOWING:
REFERENCE SECTION 1731 "FIBER OPTIC SPLICE ENCLOSURE"
 - 1) SPLICE LOCATION
 - 2) DATE
 - 3) COMPANY NAME
 - 4) NAME OF INDIVIDUAL PERFORMING THE SPLICING

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

TMP PHASE FINAL

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>	SPLICE DETAIL		
	DIVISION 04 NASH COUNTY PLAN DATE: FEBRUARY 2017 PREPARED BY: A. J. SKUCE	ROCKY MOUNT REVIEWED BY: <i>Neil Avery</i> DATE:	
REVISIONS		INIT. DATE	DATE