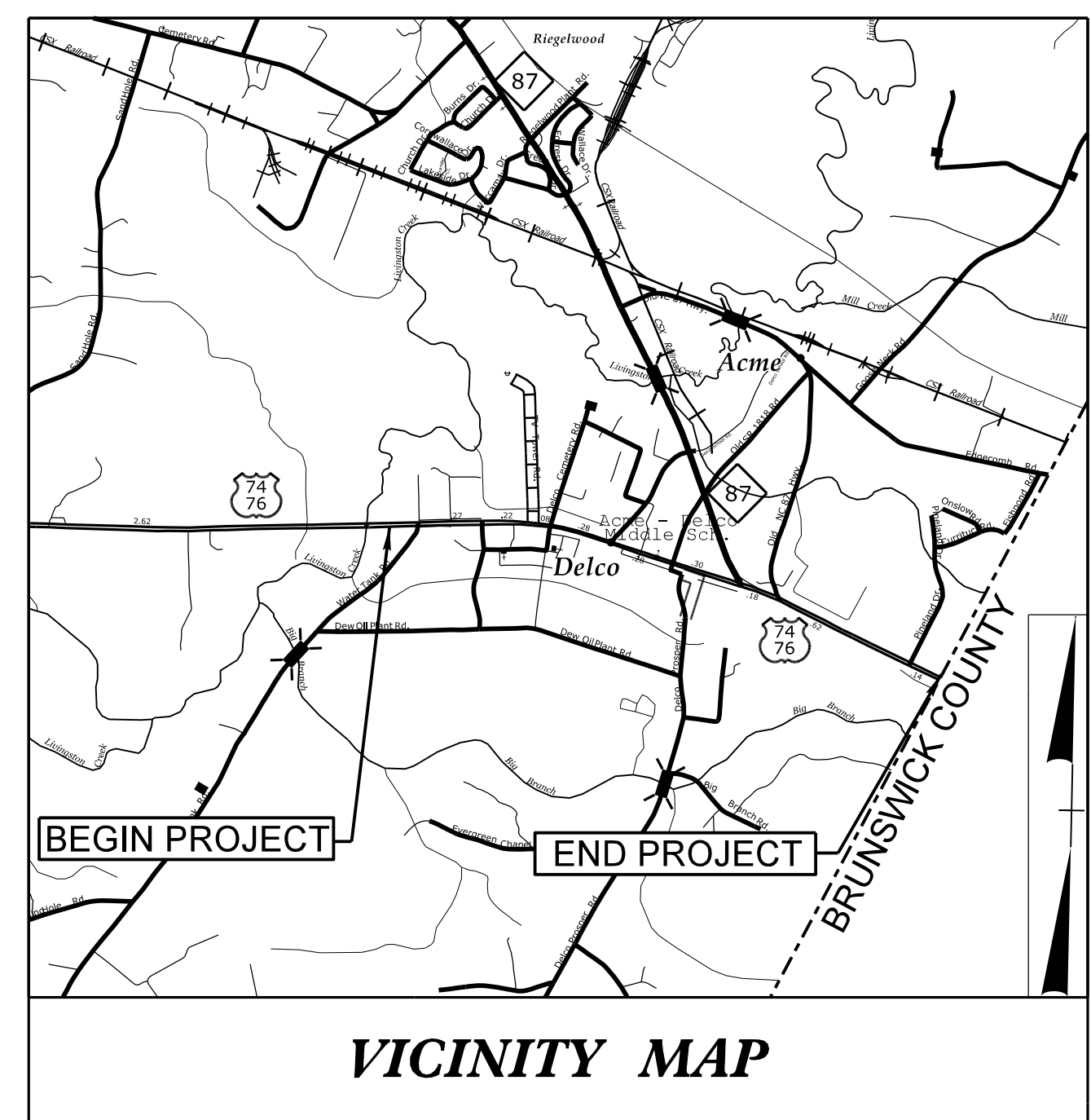


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TIP PROJECT: W-5601EV

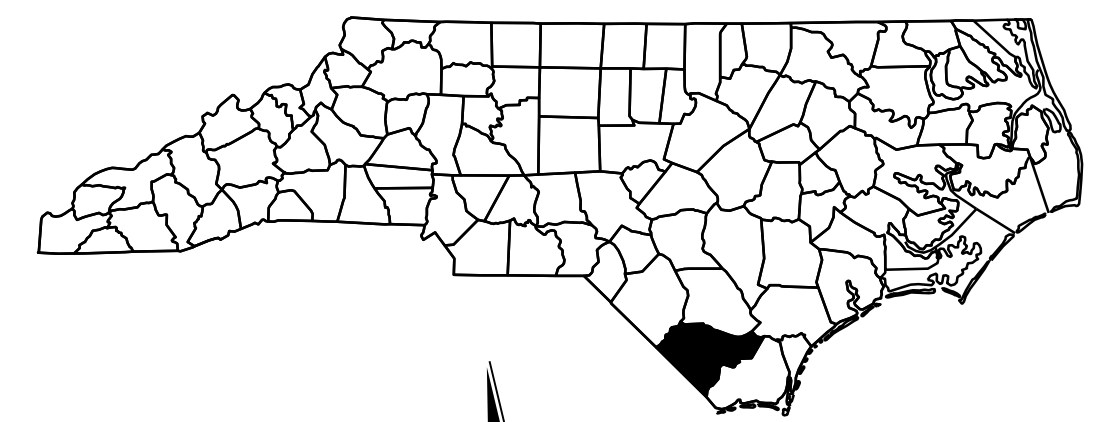


STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

COLUMBUS COUNTY

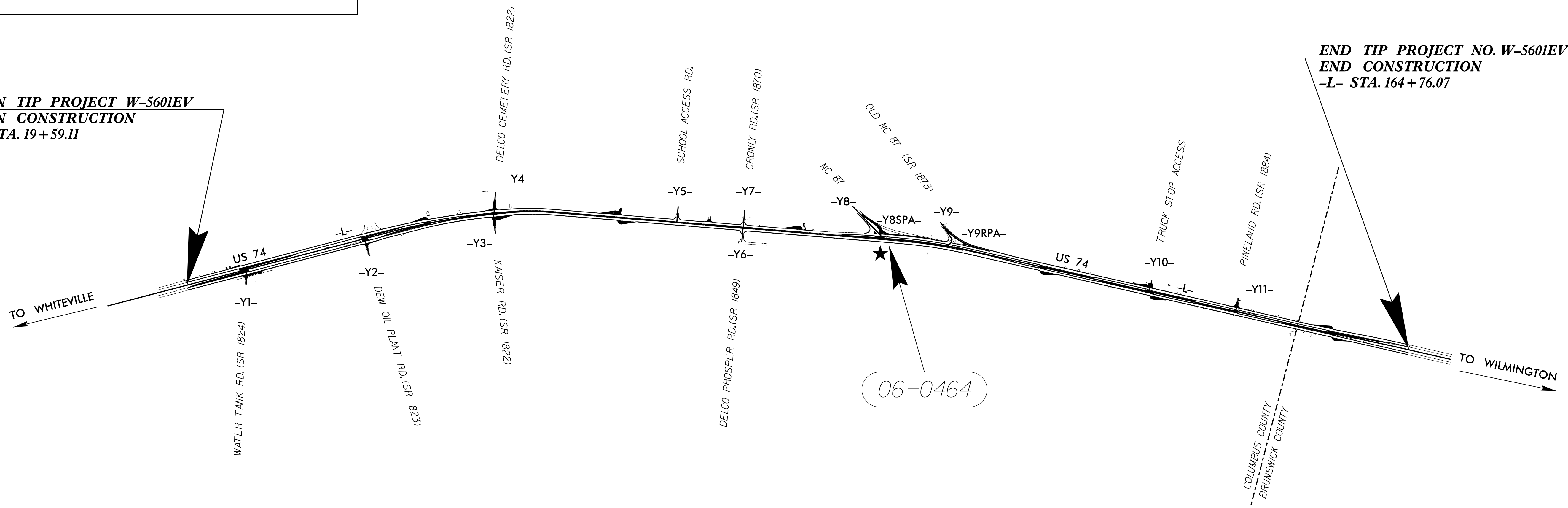
LOCATION: US 74 FROM SR 1824 (WATER TANK RD) TO JUST EAST OF THE BRUNSWICK COUNTY LINE

TYPE OF WORK: TRAFFIC SIGNAL WITH METAL STRAIN POLES



**BEGIN TIP PROJECT W-5601EV
BEGIN CONSTRUCTION
-L- STA. 19+59.11**

**END TIP PROJECT NO. W-5601EV
END CONSTRUCTION
-L- STA. 164+76.07**



CONTRACT:

Index of Plans		
Sheet No.	Reference	Description
SIG. 1.0		TITLE SHEET
SIG. 2.0-2.1	06-0464	US 74/US 76 (ANDREW JACKSON HWY) @ NC 87 (OLD STAGE RD)
SIG. 3.0		REVISED STANDARD PLATE SHEET
SIG. M1-M8		METAL POLE STANDARD DRAWINGS

LEGEND
XX-XXXX - SIGNAL INVENTORY NUMBER

INTELLIGENT TRANSPORTATION AND SIGNALS UNIT
Contacts:
Meghan LeBlanc, PE
Signals Project Engineer, Eastern Region
Todd Joyce, PE
Signal Equipment Design Review Engineer

Plans Prepared for:
DIVISION OF HIGHWAYS
TRANSPORTATION MOBILITY AND SAFETY DIVISION

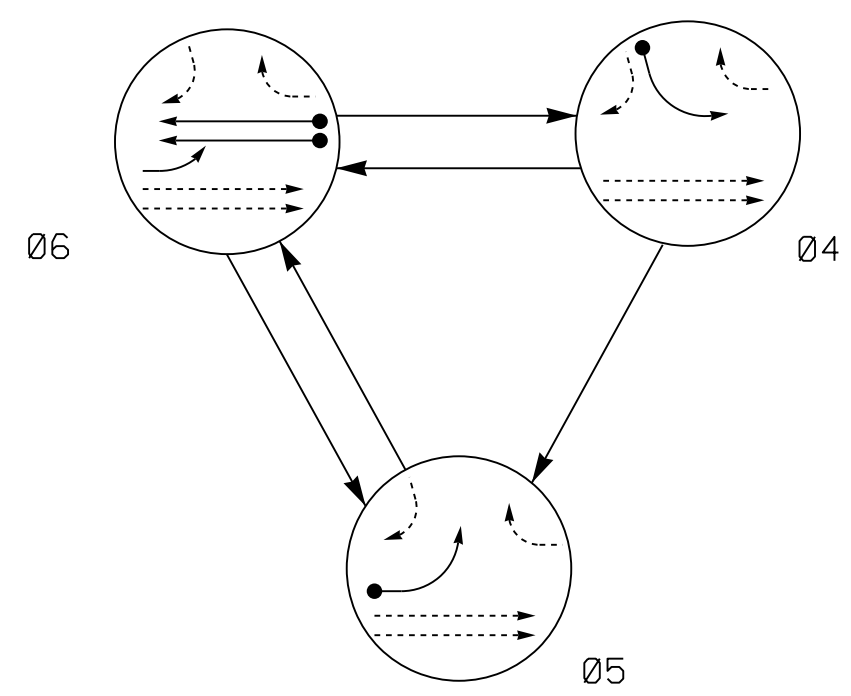
750 N. Greenfield Parkway, Garner, NC 27529

Stantec Consulting Services Inc.
801 Jones Franklin Rd-Suite 300
Raleigh, NC 27606
Tel. 919.851.6866
Fax. 919.851.7024
www.stantec.com
License No. F-0672
Regina Muncey, PE
Transportation Engineer
Dean Harris
Senior Transportation Designer
James Hambright
Senior Transportation Technician

APPROVED:
DATE: 5/29/2018

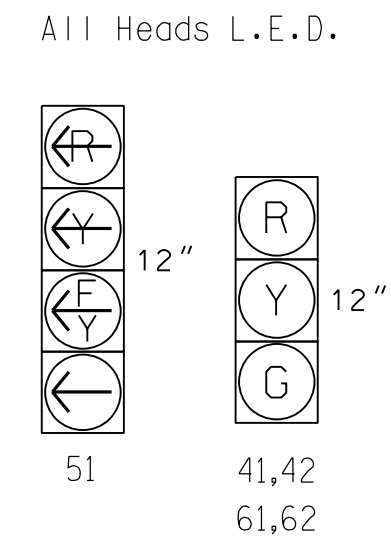
5/29/2018 \\US1564-F01\shared_projects\71001775\transportation\design\Traffic\Signals\Titlesheet\Title_Sheet.dgn r:muncey

PHASING DIAGRAM



SIGNAL FACE	PHASE			
	Ø 5	Ø 6	Ø 4	FLASH
41,42	R	R	G	R
51	-	-	-	-
61,62	R	G	R	Y

SIGNAL FACE I.D.



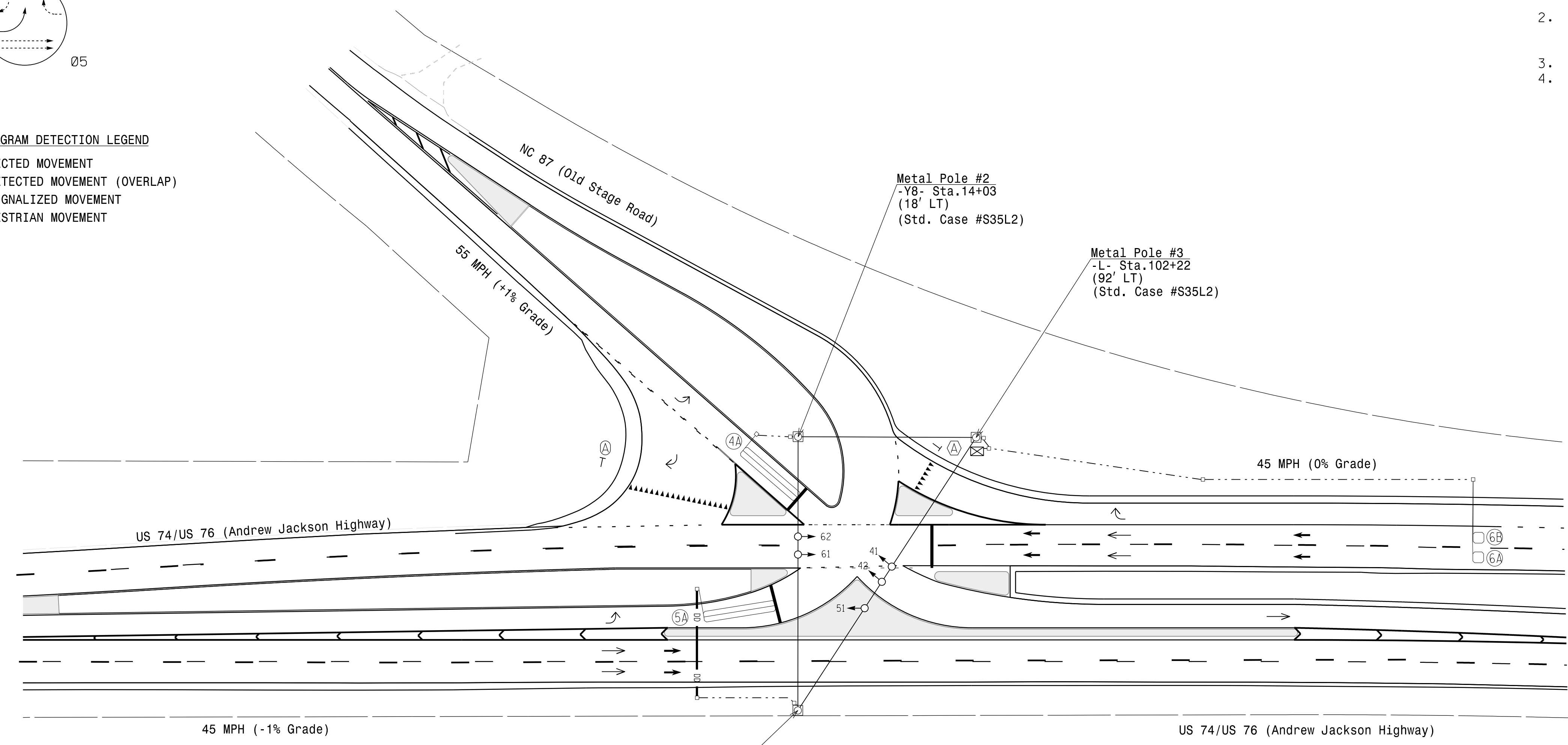
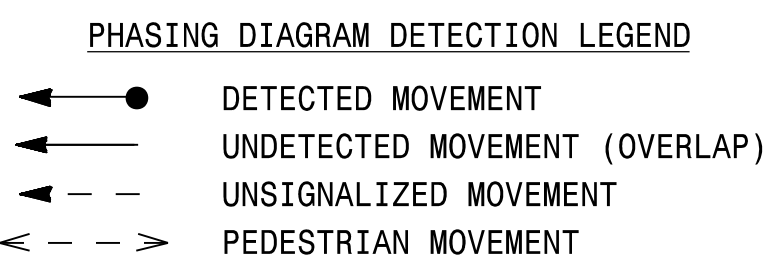
OASIS 2070 LOOP & DETECTOR INSTALLATION CHART

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

3 Phase Fully Actuated (Isolated)

NOTES

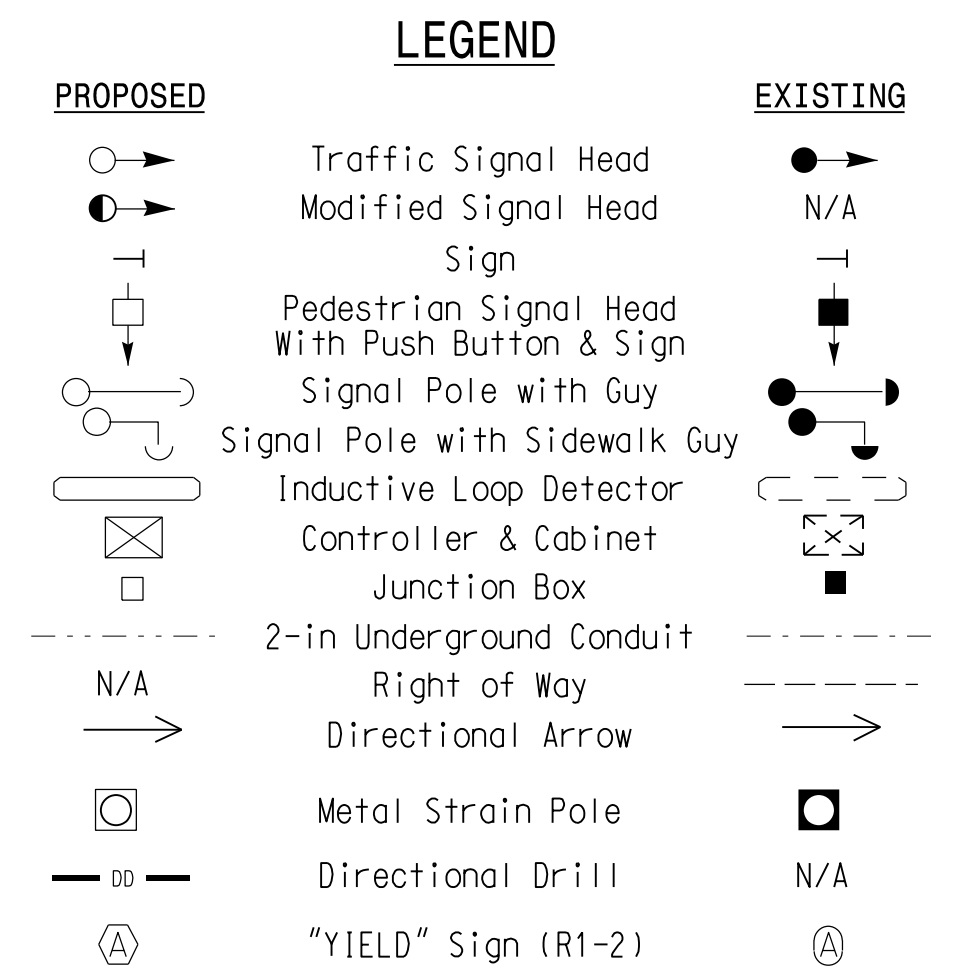
1. Refer to "Roadway Standard Drawings NCDOT" dated January 2018 and "Standard Specifications for Roads and Structures" dated January 2018.
2. Do not program signal for late night flashing operation unless otherwise directed by the Engineer.
3. Set all detector units to presence mode.
4. Locate new cabinet so as not to obstruct sight distance of vehicles turning right on red.



OASIS 2070 TIMING CHART

FEATURE	PHASE		
	4	5	6
Min Green 1 *	7	7	12
Extension 1 *	3.0	3.0	6.0
Max Green 1 *	25	20	60
Yellow Clearance	3.0	3.0	4.5
Red Clearance	2.3	2.4	1.2
Red Revert	-	-	-
Walk 1 *	-	-	-
Don't Walk 1	-	-	-
Seconds Per Actuation *	-	-	1.5
Max Variable Initial *	-	-	34
Time Before Reduction *	-	-	15
Time To Reduce *	-	-	30
Minimum Gap	-	-	3.0
Recall Mode	-	-	MIN RECALL
Vehicle Call Memory	-	-	YELLOW
Dual Entry	-	-	-
Simultaneous Gap	ON	ON	ON

* 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.



New Installation

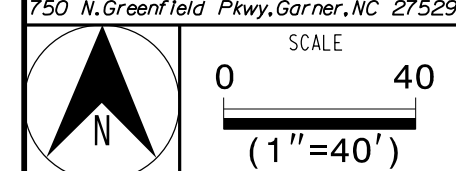
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

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 Tel. (919) 851-6866
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 www.stantec.com
 License No. F-0672

Prepared for the Offices of:
 Transportation Mobility and Safety Division
 DEPARTMENT OF TRANSPORTATION
 STATE OF NORTH CAROLINA
 Signal Design Section
 750 N. Greenfield Pkwy, Garner, NC 27529

US 74/76
 (Andrew Jackson Highway)
 at
 NC 87 (Old Stage Road)
 Division 6 Columbus County Delco
 PLAN DATE: May 2018 REVIEWED BY: E D Harris
 PREPARED BY: J B Hambright REVIEWED BY: B L Watson

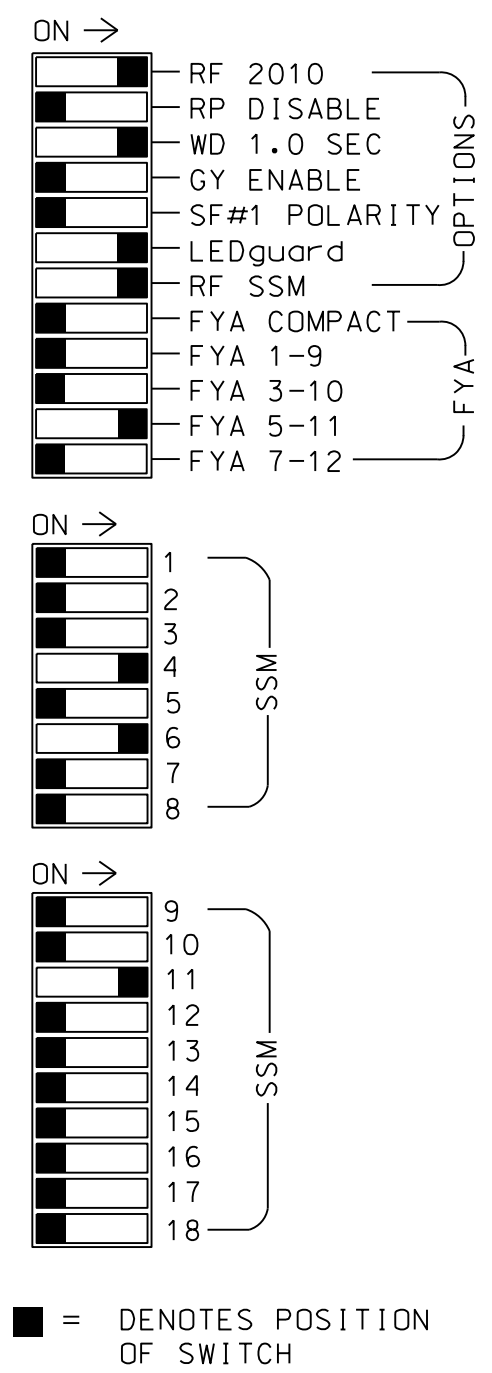
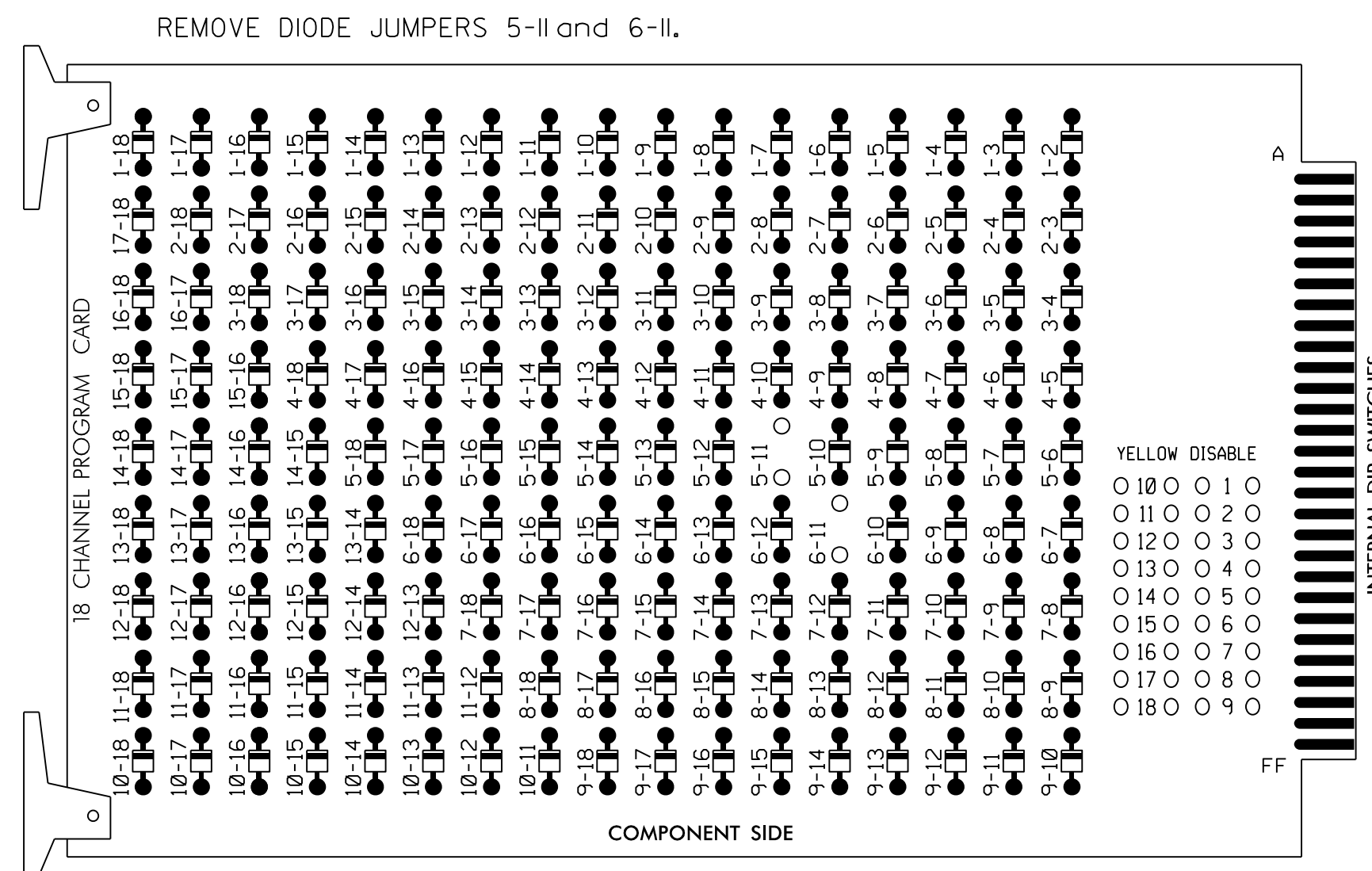
Professional Engineer Seal
 REGINA M. MURPHY
 No. 43239
 DATE: 5/29/2018
 SIG. INVENTORY NO. 06-0464



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 R:\Projects\2018\180888\180888.dwg

EDI MODEL 2018ECL-NC CONFLICT MONITOR PROGRAMMING DETAIL

(remove jumpers and set switches as shown)

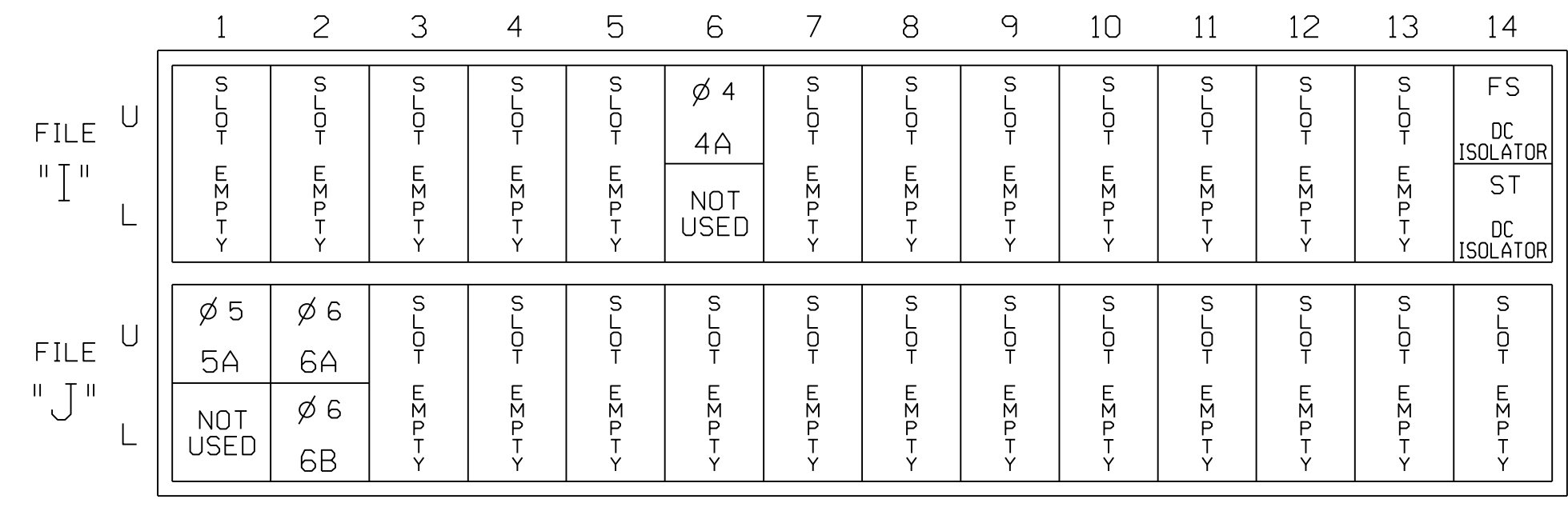


NOTES:

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

INPUT FILE POSITION LAYOUT

(front view)



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

FS = FLASH SENSE
ST = STOP TIME

NOTES

1. To prevent "flash-conflict" problems, insert red flash program blocks for all unused vehicle load switches in the output file. The installer shall verify that signal heads flash in accordance with the Signal Plans.
2. Enable Simultaneous Gap-Out for all Phases.
3. Program phase 6 for Variable Initial and Gap Reduction.
4. Program phase 6 for Startup In Green.
5. Program phase 6 for Yellow Flash.

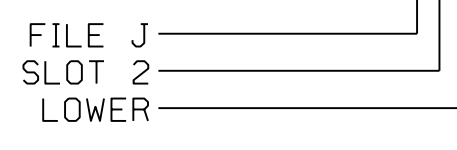
EQUIPMENT INFORMATION

CONTROLLER.....2070
 CABINET.....332 W/ AUX
 SOFTWARE.....ECONOLITE OASIS
 CABINET MOUNT.....BASE
 OUTPUT FILE POSITIONS...18 WITH AUX. OUTPUT FILE
 LOAD SWITCHES USED.....S5,S7,S8,AUX S4
 PHASES USED.....4,5,6
 OVERLAP "A".....NOT USED
 OVERLAP "B".....NOT USED
 OVERLAP "C".....5+6
 OVERLAP "D".....NOT USED

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
4A	TB4-9,10	I6U	41	3	4	4	Y	Y			
5A	TB3-1,2	J1U	55	17	5	5	Y	Y			
6A	TB3-5,6	J2U	40	2	6	6	Y	Y			
6B	TB3-7,8	J2L	44	6	16	6	Y	Y			

INPUT FILE POSITION LEGEND: J2L



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.	NU	NU	NU	NU	41,42	NU	51*	61,62	NU	NU	NU	NU	NU	NU	NU	51*	NU	NU
RED					101			134										
YELLOW					102		*	135										
GREEN					103			136										
RED ARROW																	A114	
YELLOW ARROW																	A115	
FLASHING YELLOW ARROW																	A116	
GREEN ARROW								133										

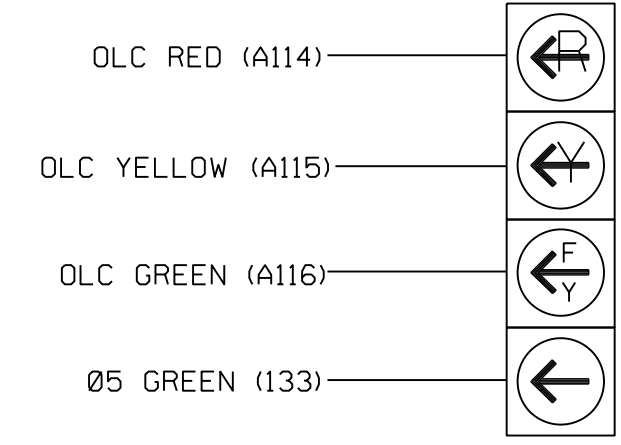
NU = Not Used

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

★ See pictorial of head wiring in detail this sheet.

4 SECTION FYA PPLT SIGNAL WIRING DETAIL

(wire signal heads as shown)



51

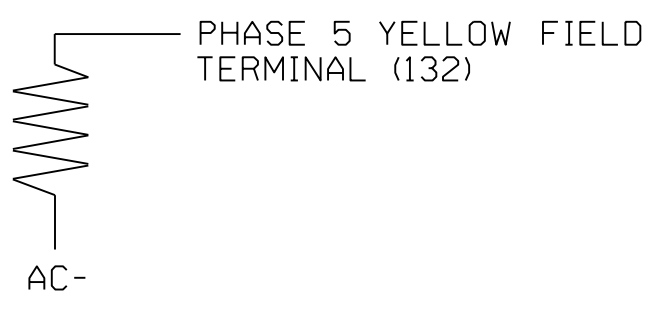
NOTE

1. The sequence display for this signal requires special logic programming. See sheet 2 of 2 for programming instructions.

LOAD RESISTOR INSTALLATION DETAIL

(install resistors as shown below)

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



Electrical Detail - Sheet 1 of 2

ELECTRICAL AND PROGRAMMING DETAILS FOR:

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

US 74/US76 (Andrew Jackson Hwy) at NC 87 (Old Stage Road)

Division 6 Columbus County Delco

PLAN DATE: May 2018 REVIEWED BY: E D HARRIS

PREPARED BY: J HAMBRIGHT REVIEWED BY: B L WATSON

REVISIONS	INIT.	DATE

SEAL

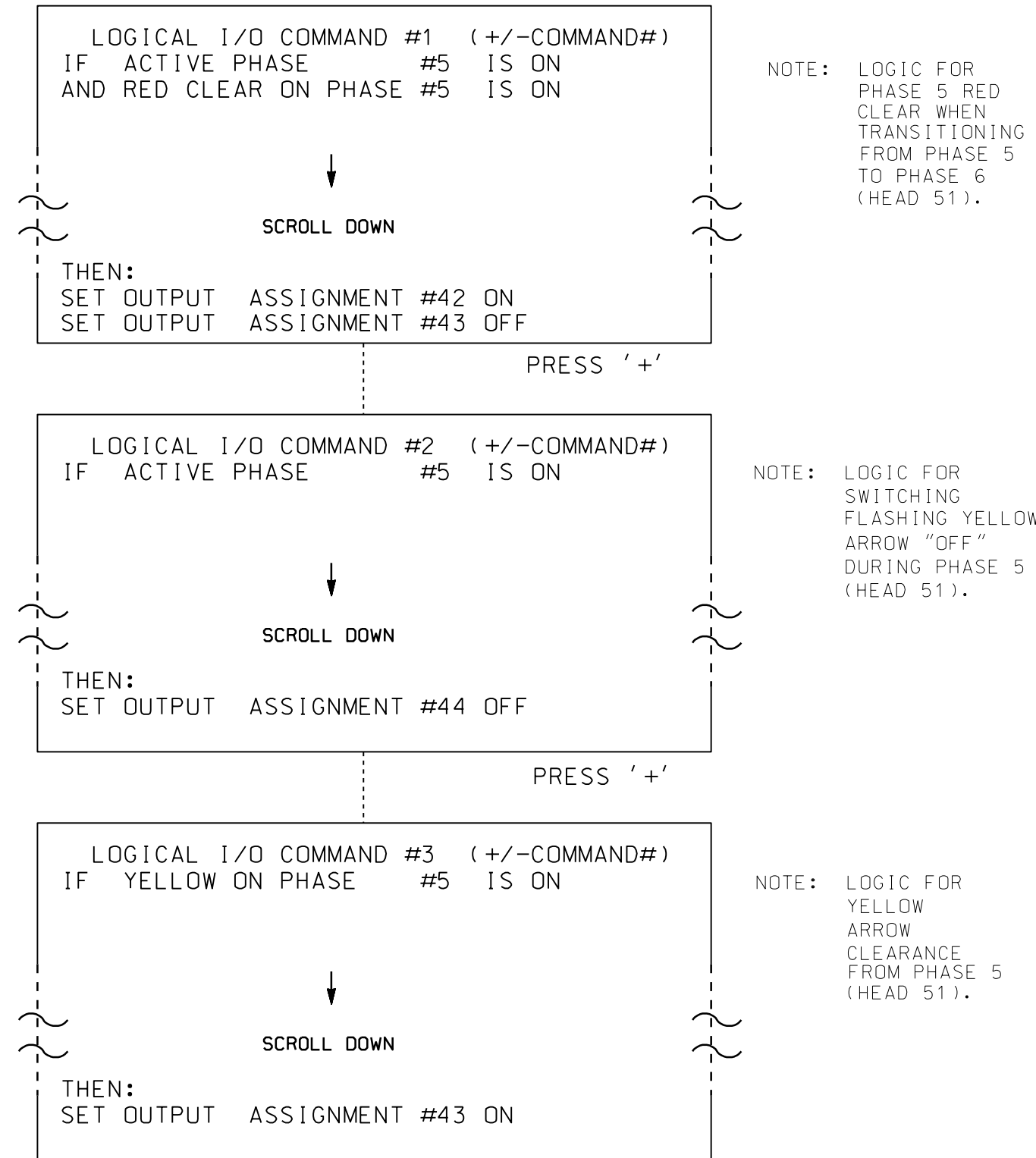
Regina M. Muncey 5/29/2018

SIG. INVENTORY NO. 06-0464

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).



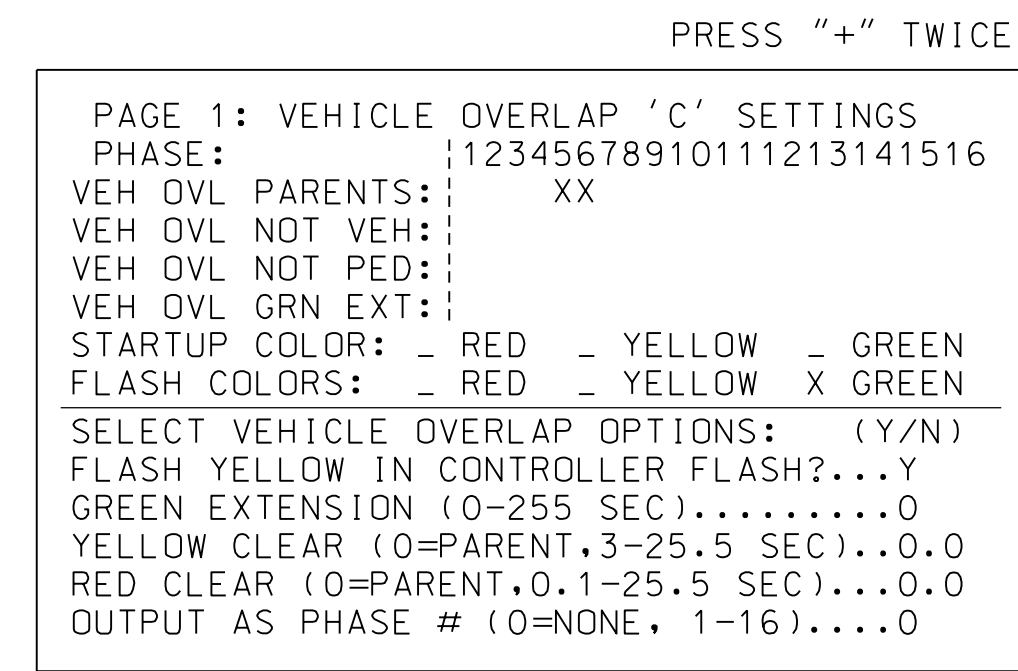
LOGIC I/O PROCESSOR PROGRAMMING COMPLETE

OUTPUT REFERENCE SCHEDULE	
OUTPUT 42 =	Overlap C Red
OUTPUT 43 =	Overlap C Yellow
OUTPUT 44 =	Overlap C Green

OVERLAP PROGRAMMING DETAIL

(program controller as shown below)

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

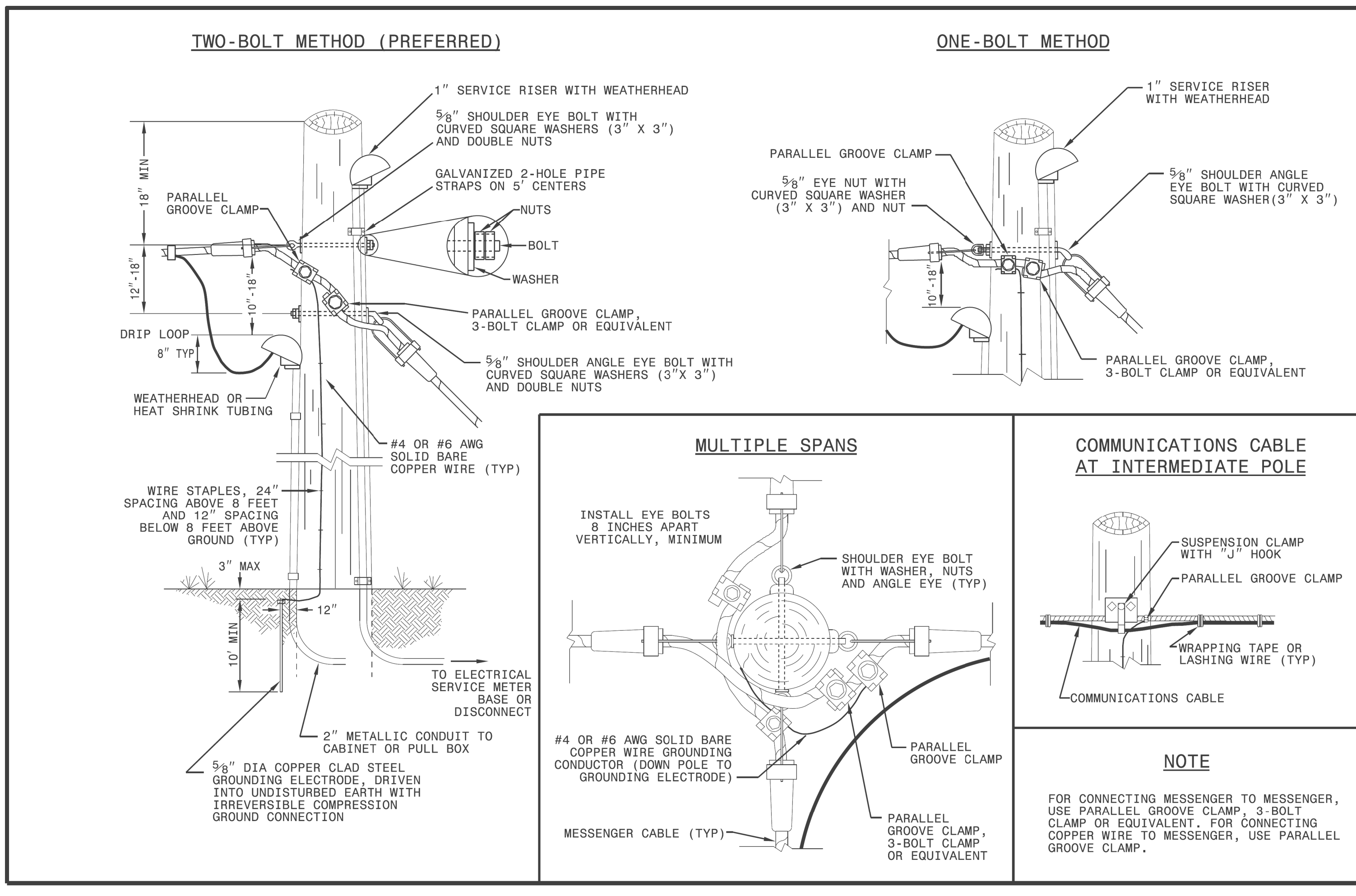
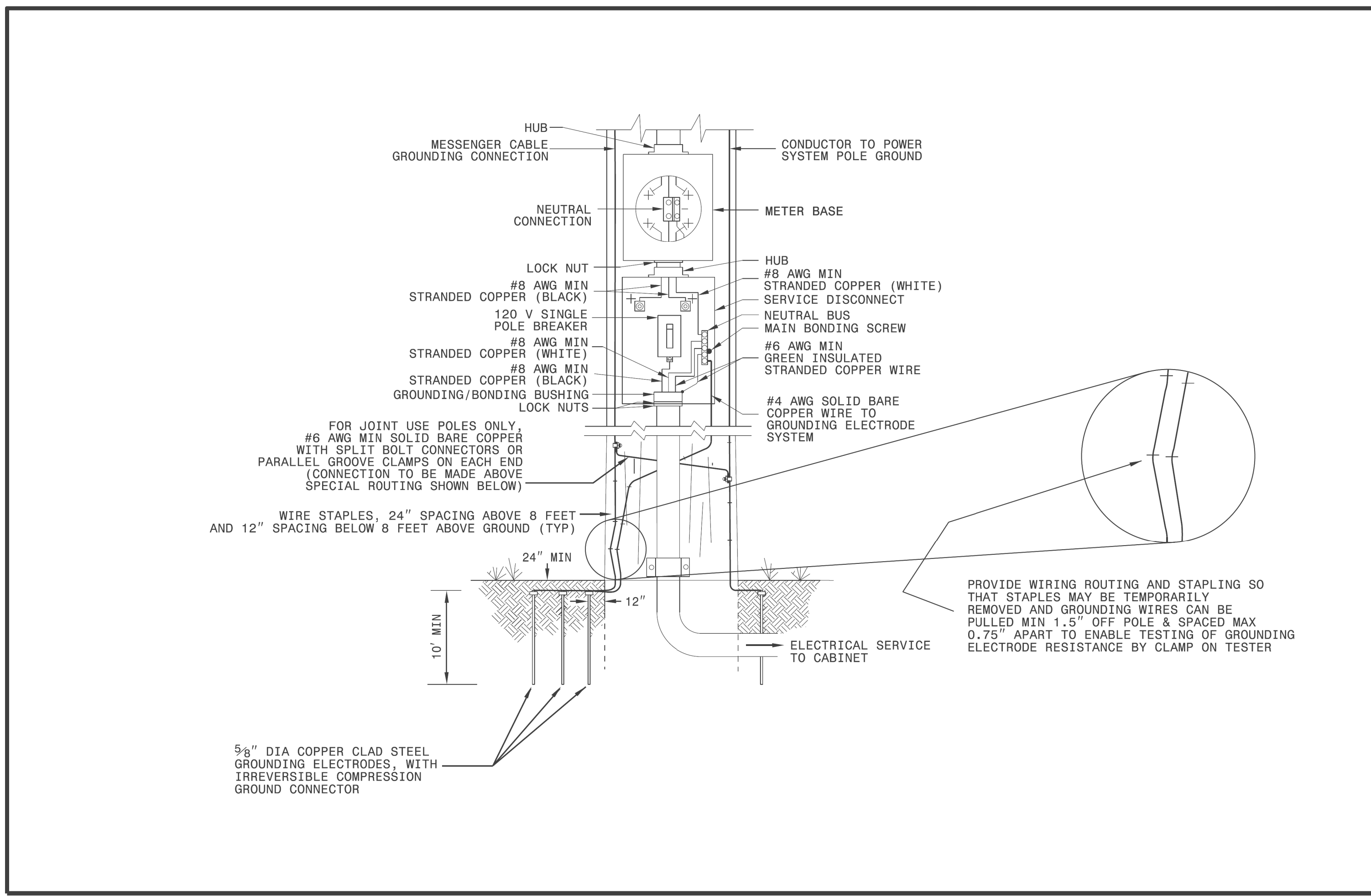


← NOTICE GREEN FLASH

THIS ELECTRICAL DETAIL IS FOR
THE SIGNAL DESIGN: 06-0464
DESIGNED: May 2018
SEALED:
REVISED: N/A

Electrical Detail - Sheet 2 of 2

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<p>5/29/2018 U:\Projects\c451\gnpl\sig\gnpl\ecr\loc\ Detail\sig\gnpl\5601EV_060464_s1.qd\el.e-dgn r\muncey</p>															



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See Plate for Title

Prepared in the Offices of:

750 N. Greenfield Parkway
Garner, NC 27529

SEAL

SEAL
032108
ENGINEER
MOHD A. ASLAMI

DocuSigned by:
Mohd Aslami

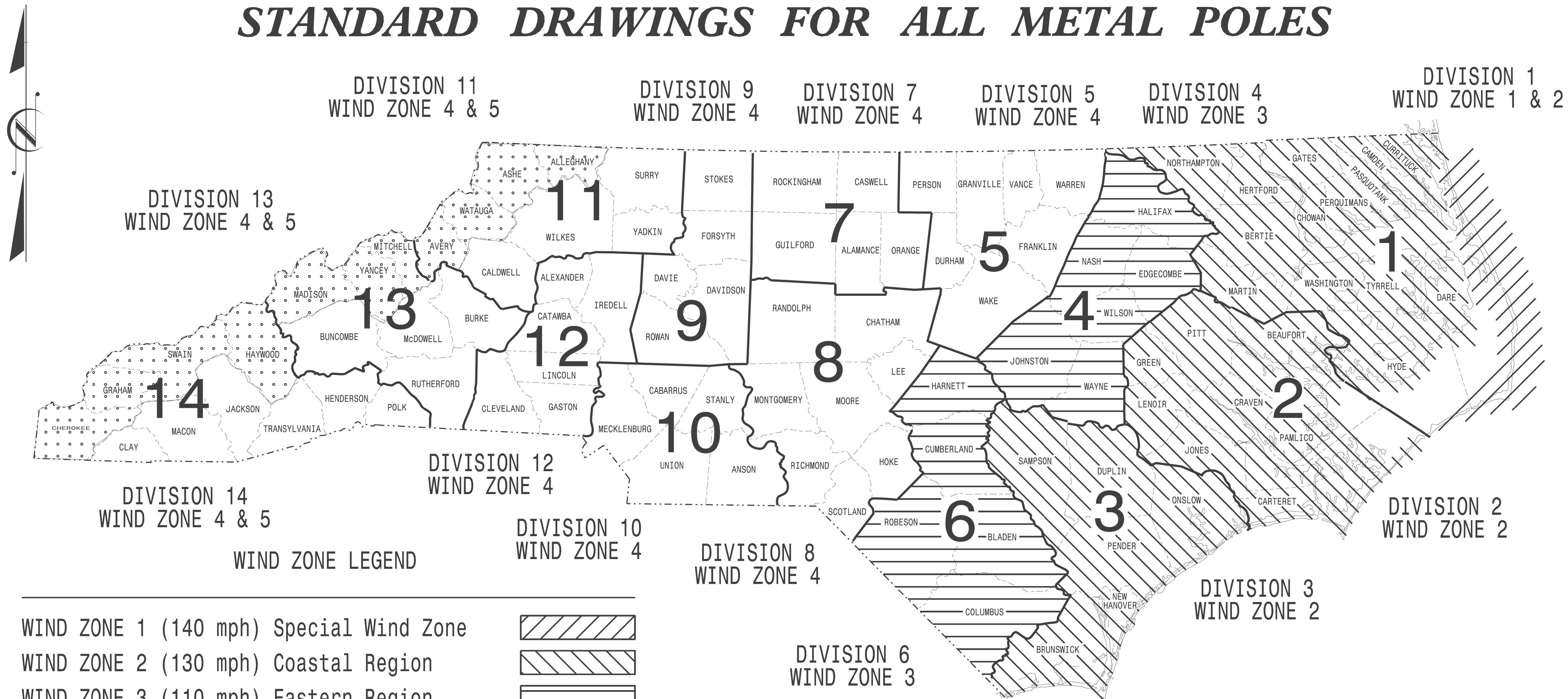
10/11/2017
DATE

11-001-2017_08-156
11-2018 3rd Drawings/Plate Sheets/2018_Plate Sheet - dgn
r.wrough

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT I.D. NO. W-5601EV	SHEET NO. Sig.M1
-------------------------------------	----------------------------

STANDARD DRAWINGS FOR ALL METAL POLES

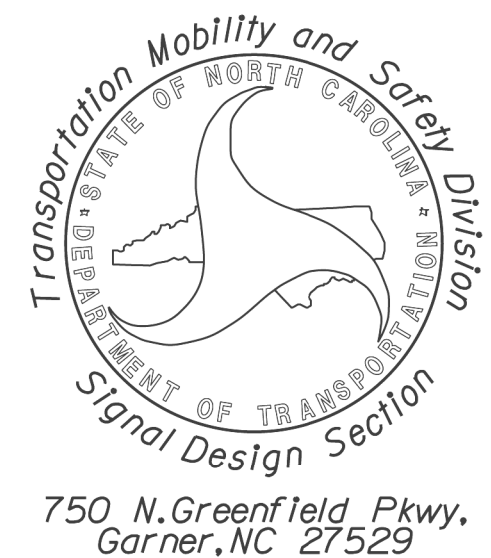


WIND ZONE LEGEND

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:



Designed in conformance
with the latest
2015 Interim to the
6th Edition 2013
AASHTO
Standard Specifications for
Structural Supports for
Highway Signs, Luminaires,
and Traffic Signals

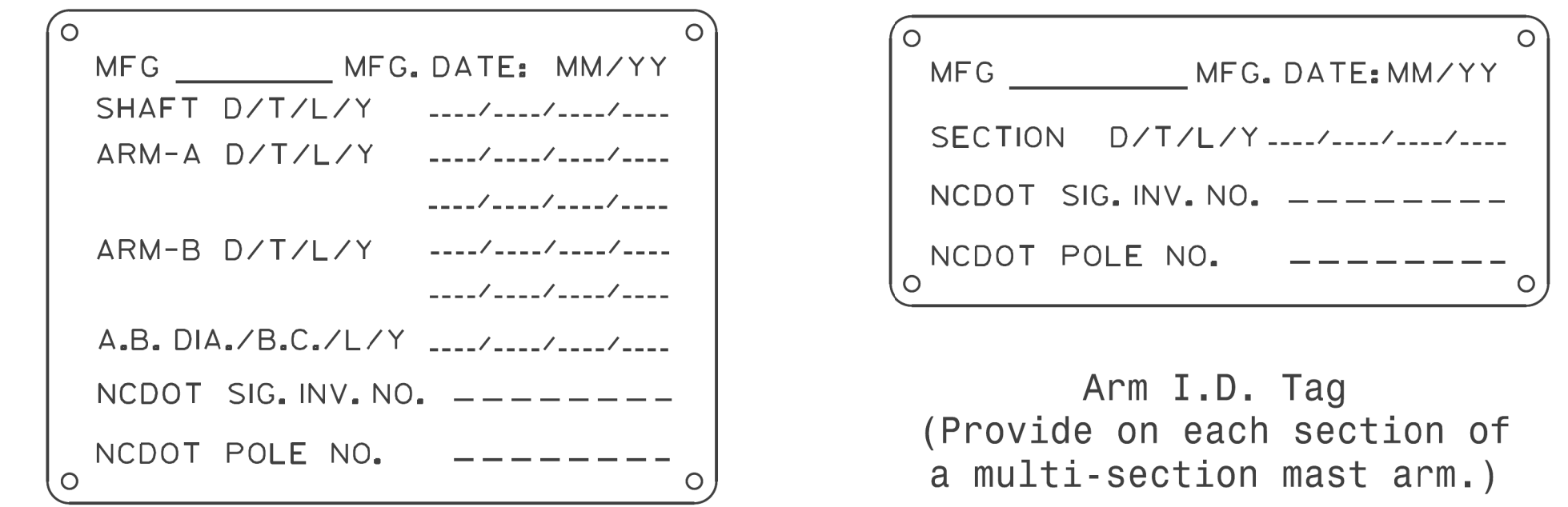
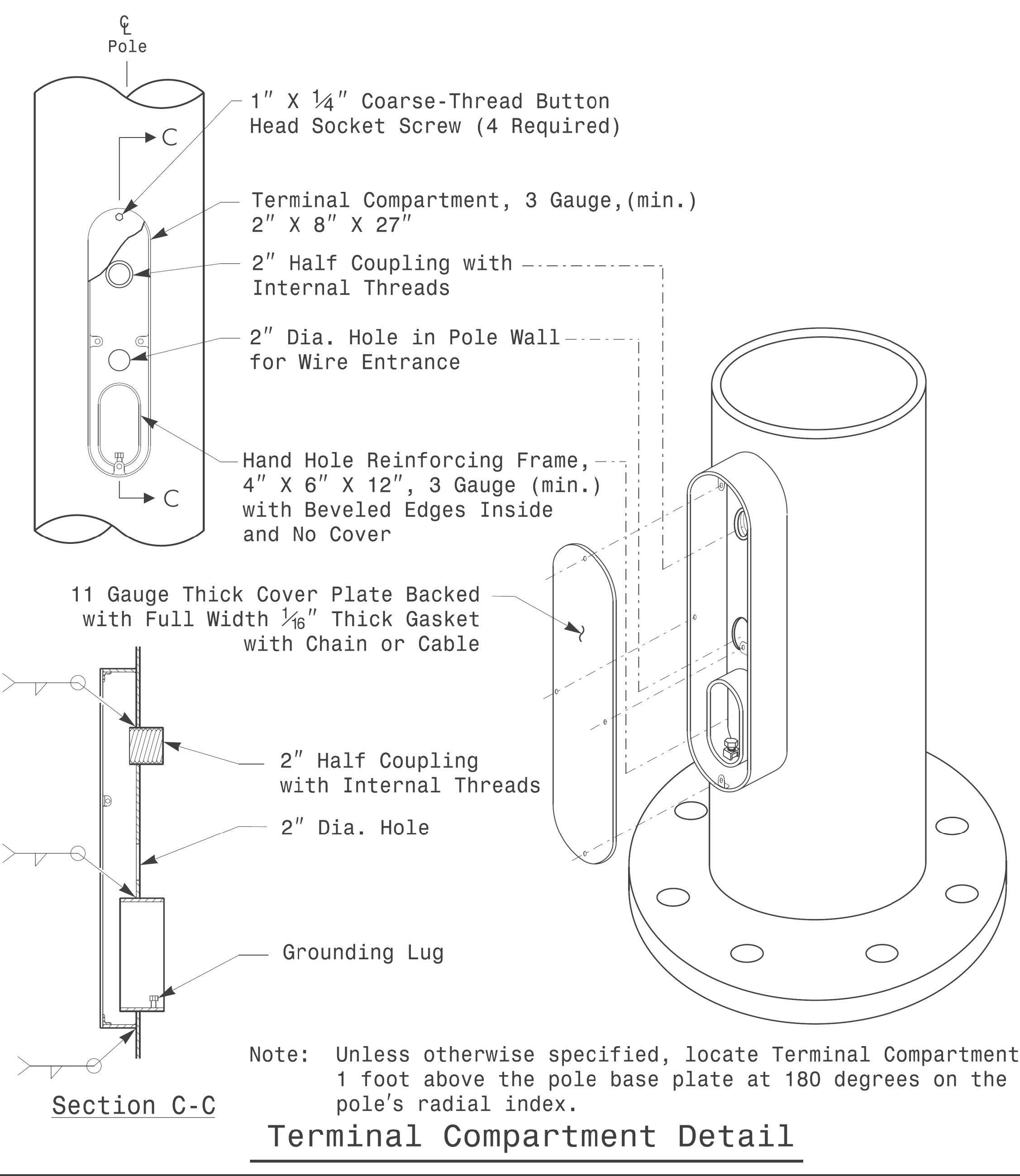
DRAWING NUMBER	DESCRIPTION
Sig. M 1	Statewide Wind Zone Map
Sig. M 2	Typical Fabrication Details-All Metal Poles
Sig. M 3	Typical Fabrication Details-Strain Poles
Sig. M 4	Typical Fabrication Details-Mast Arm Poles
Sig. M 5	Typical Fabrication Details-Mast Arm Connection
Sig. M 6	Typical Fabrication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

NC DOT CONTACTS:
MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT

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

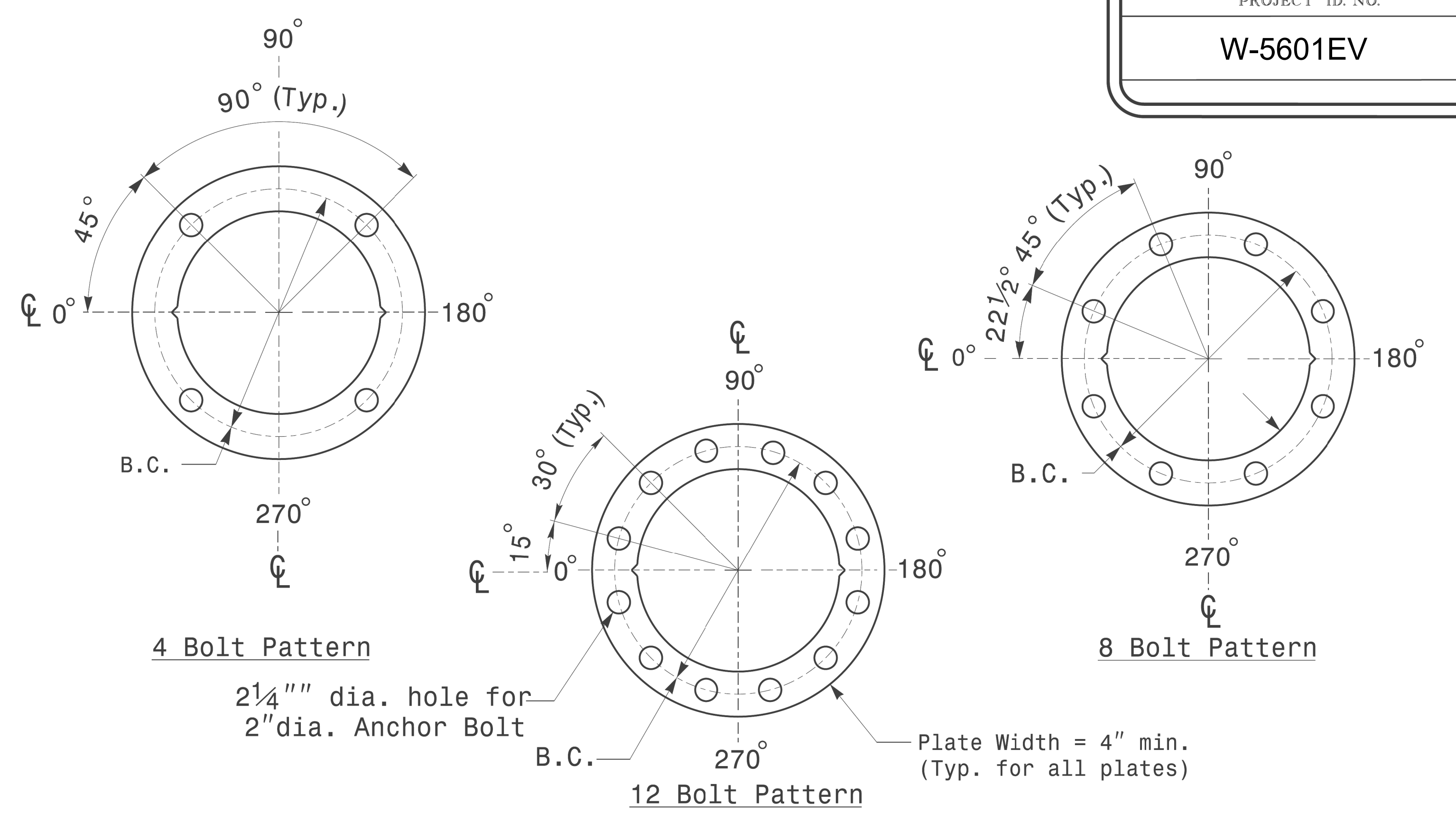
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DocuSigned by:
Debesh C. Sarkar
DATE: 10/11/2017

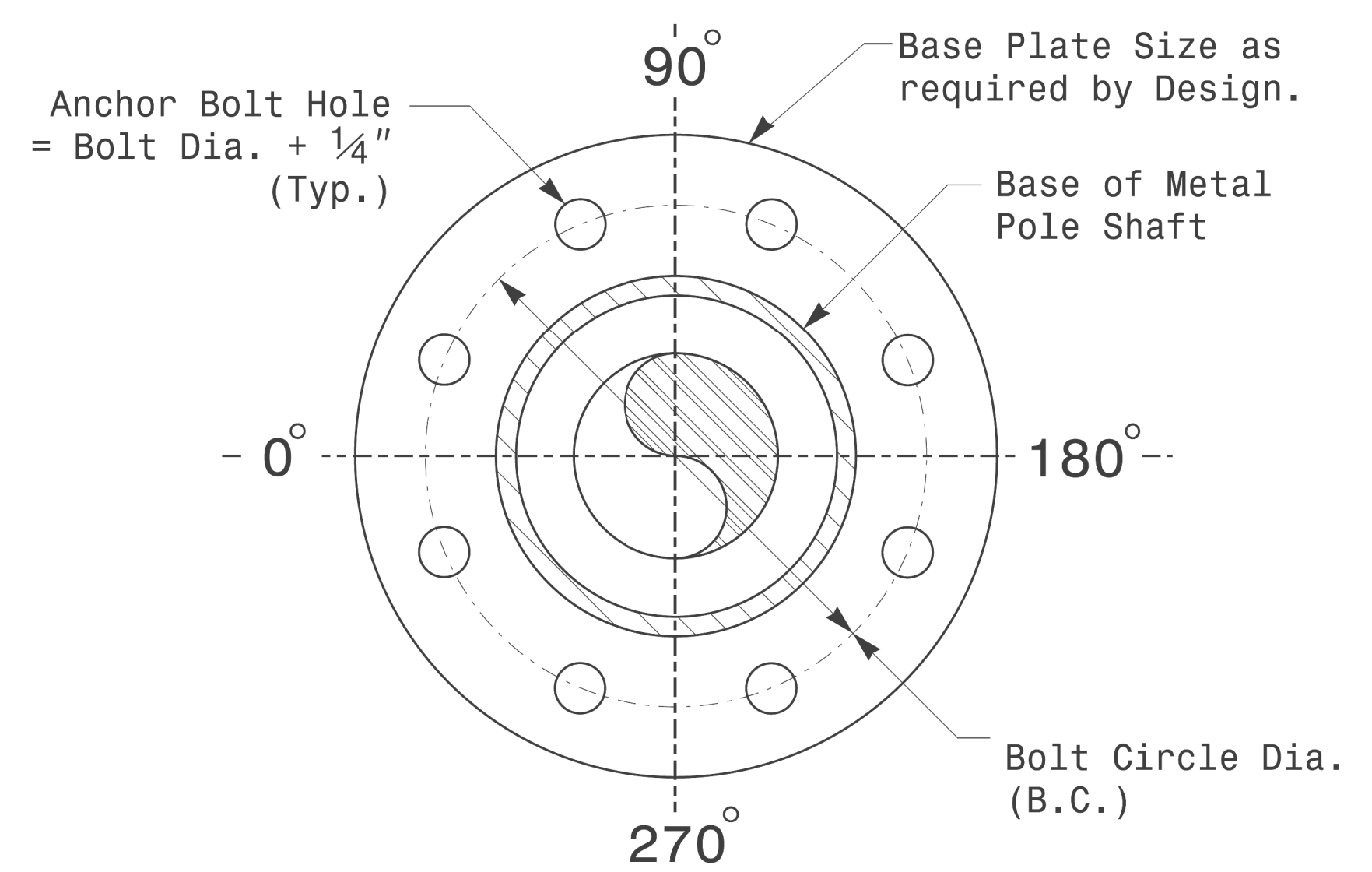
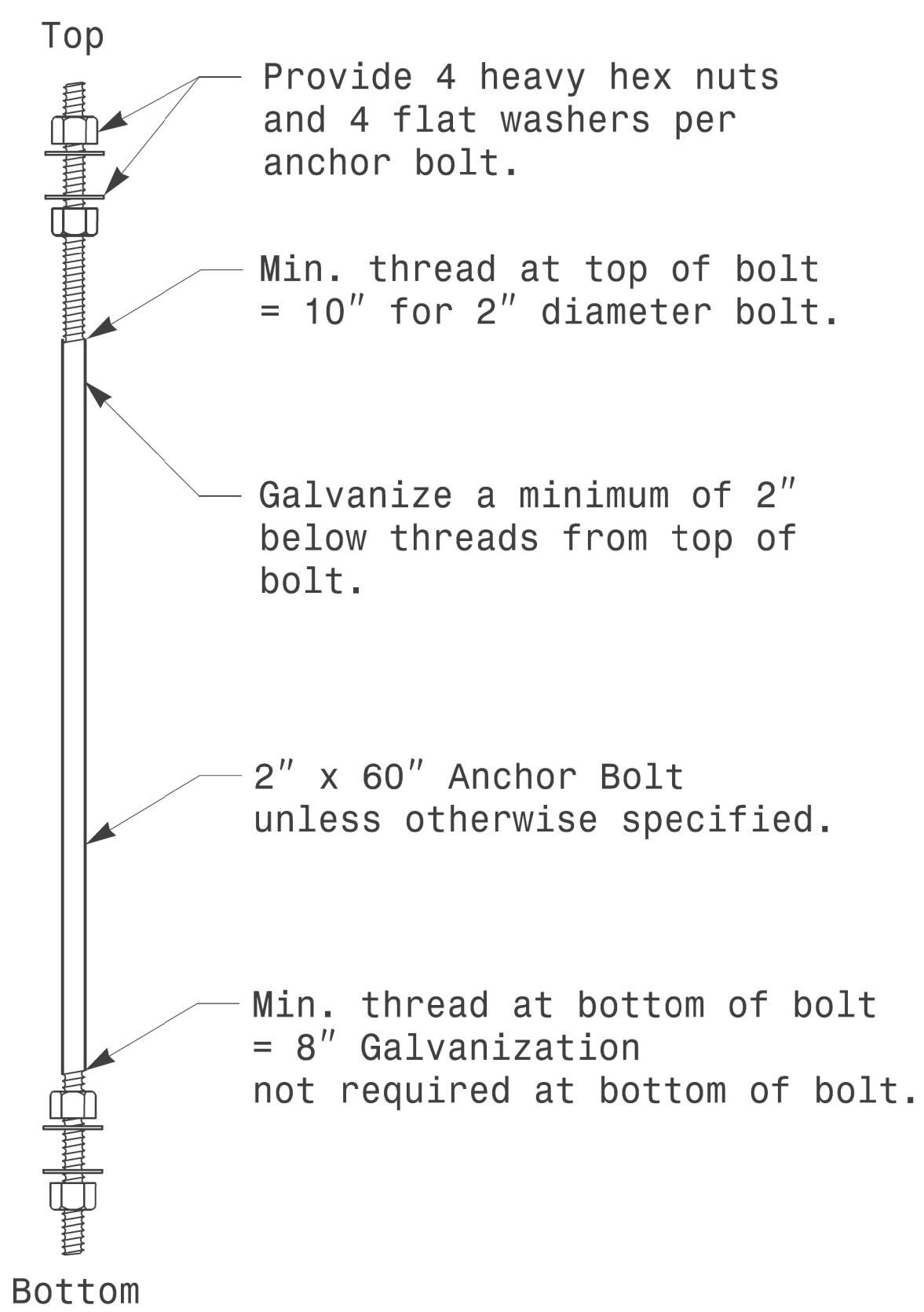


- Shaft I.D. Tag**
(Provide on Shaft of Strain Poles and Mast Arm Poles Shaft)
- Notes:
- 1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
 - 2) A.B. = Anchor Bolt
 - 3) B.C. = Bolt Circle of Anchor Bolts
 - 4) If Custom Design, use "NCDOT STANDARD" line for Signal Inv. Number and pole I.D. 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.

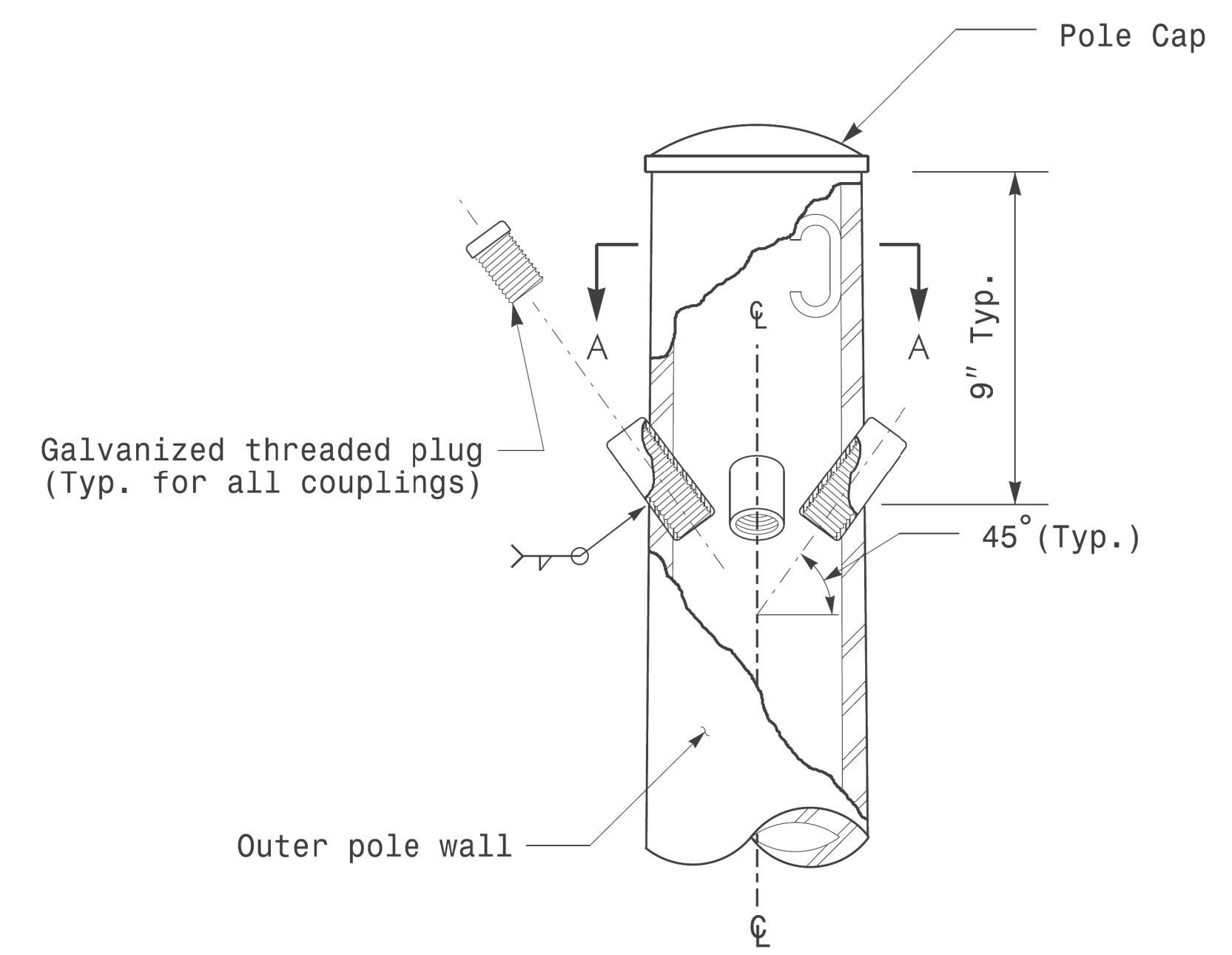


Note: Base plate may be circular, octagonal, square or rectangular in shape.

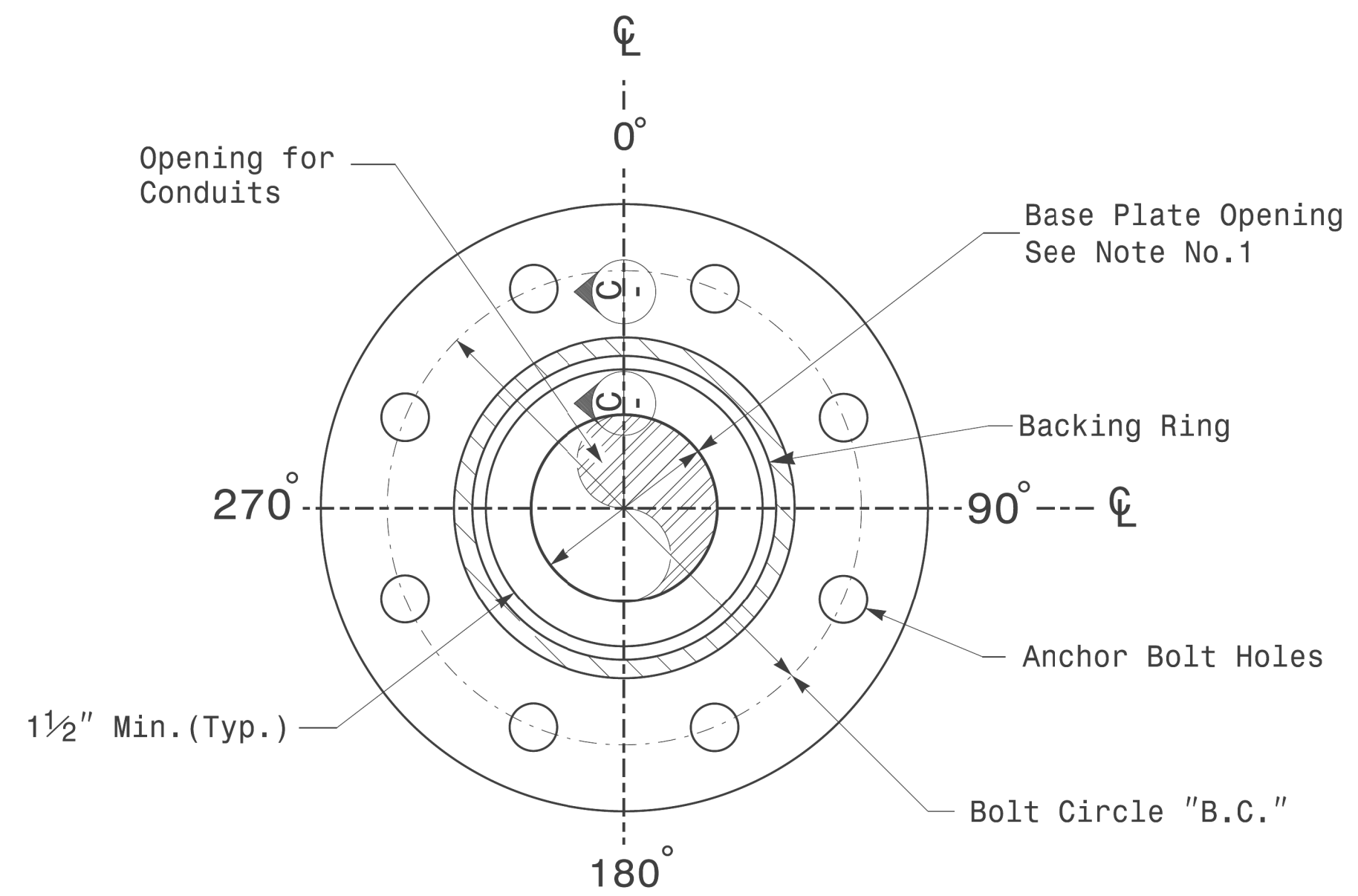
Typical Base Plate Detail

	Typical Fabrication Details For All Metal Poles	
	PLAN DATE: OCTOBER 2017 DESIGNED BY: C.F. ANDREWS	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 028094 DEBESH C. SARKAR
SCALE: NONE	REVISIONS:	INIT. DATE
DocuSigned by: <i>Debes C. Sarkar</i>		10/11/2017 DATE

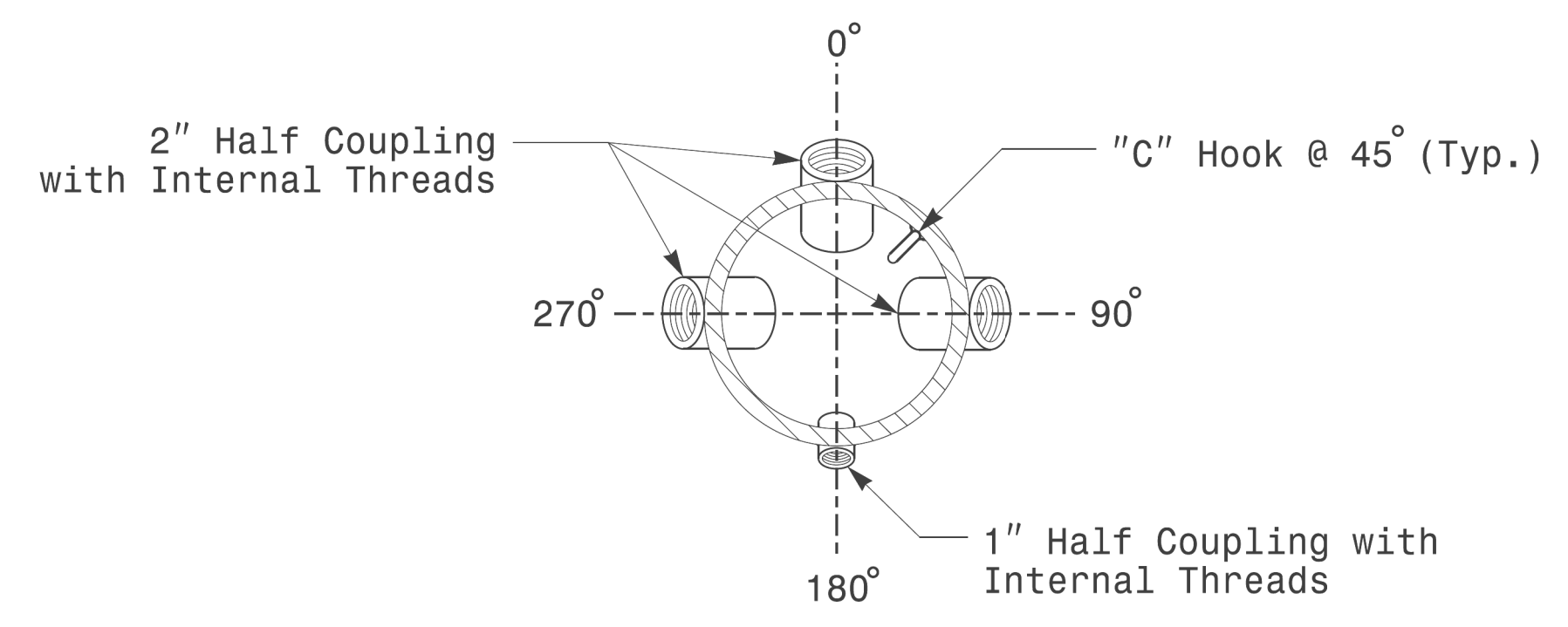
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



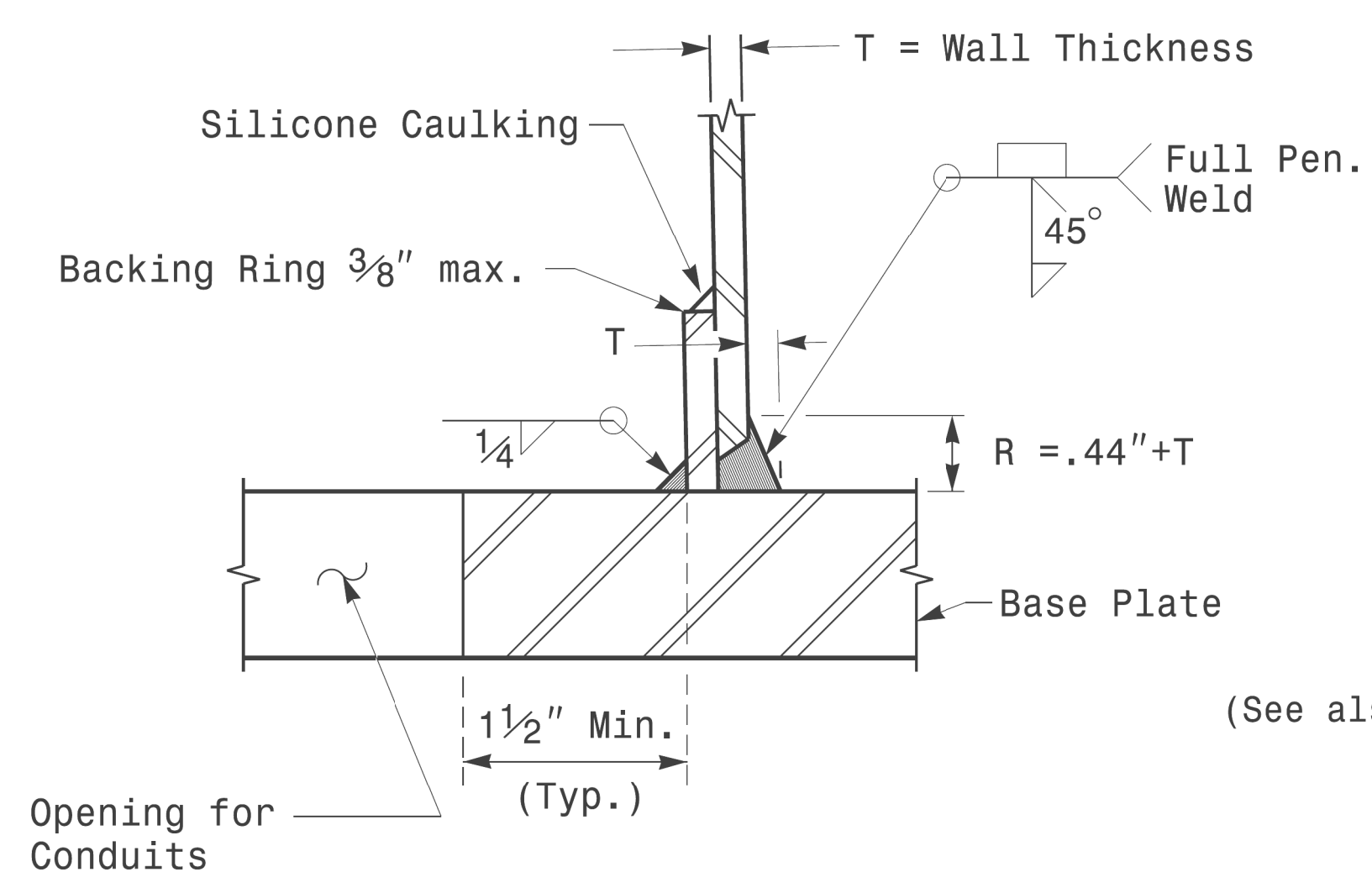
Cable Entrances at Top of Pole



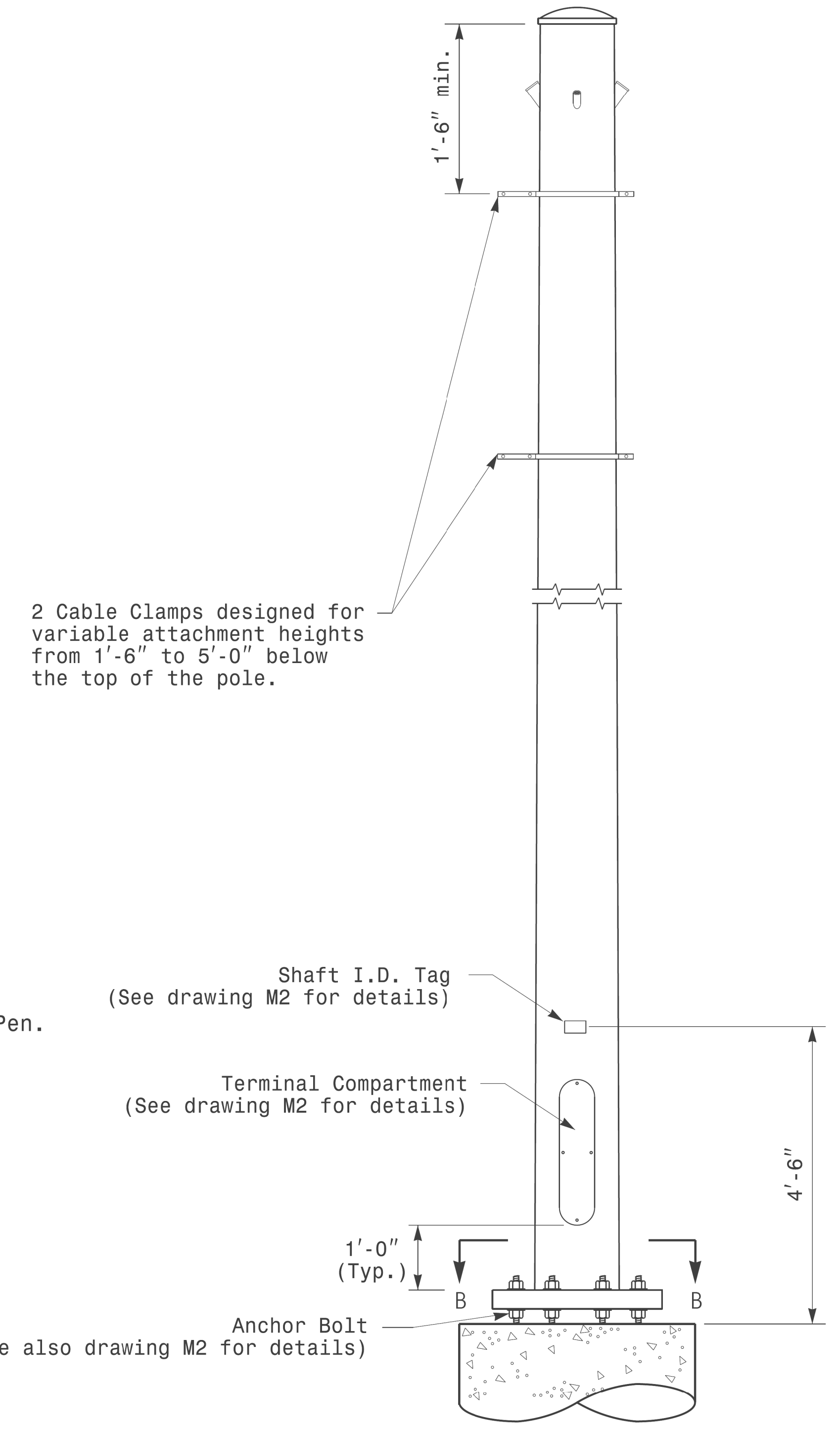
Section B-B
Pole Base Plate Details
(8 and 12 Bolt Pattern)



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



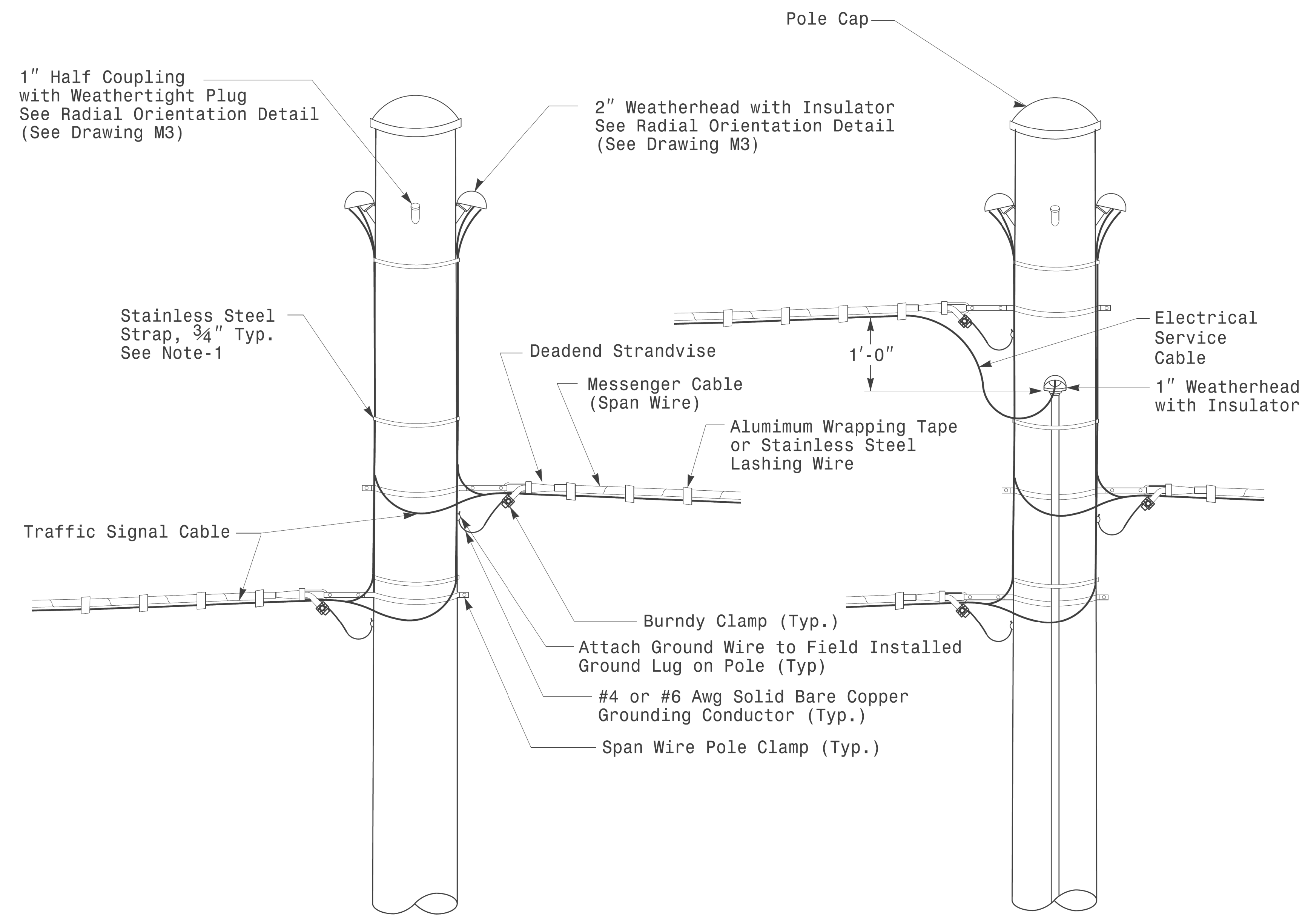
Monotube Strain Pole

Prepared In the Offices of: 750 N. Greenfield Pkwy, Garner, NC 27529	Typical Fabrication Details For Strain Poles		SEAL D.C. SARKAR ENGINEER
	PLAN DATE: OCTOBER 2017 DESIGNED BY: K.C. DURIGON	PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR	
SCALE: 0 NA NONE	DATE: 10/11/2017		DocuSigned by: Debesu C. Sarkar 44E8E78F6A4F49E

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 Fabrication Details-Strain Poles.dgn
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Fabrication Details – Strain Poles

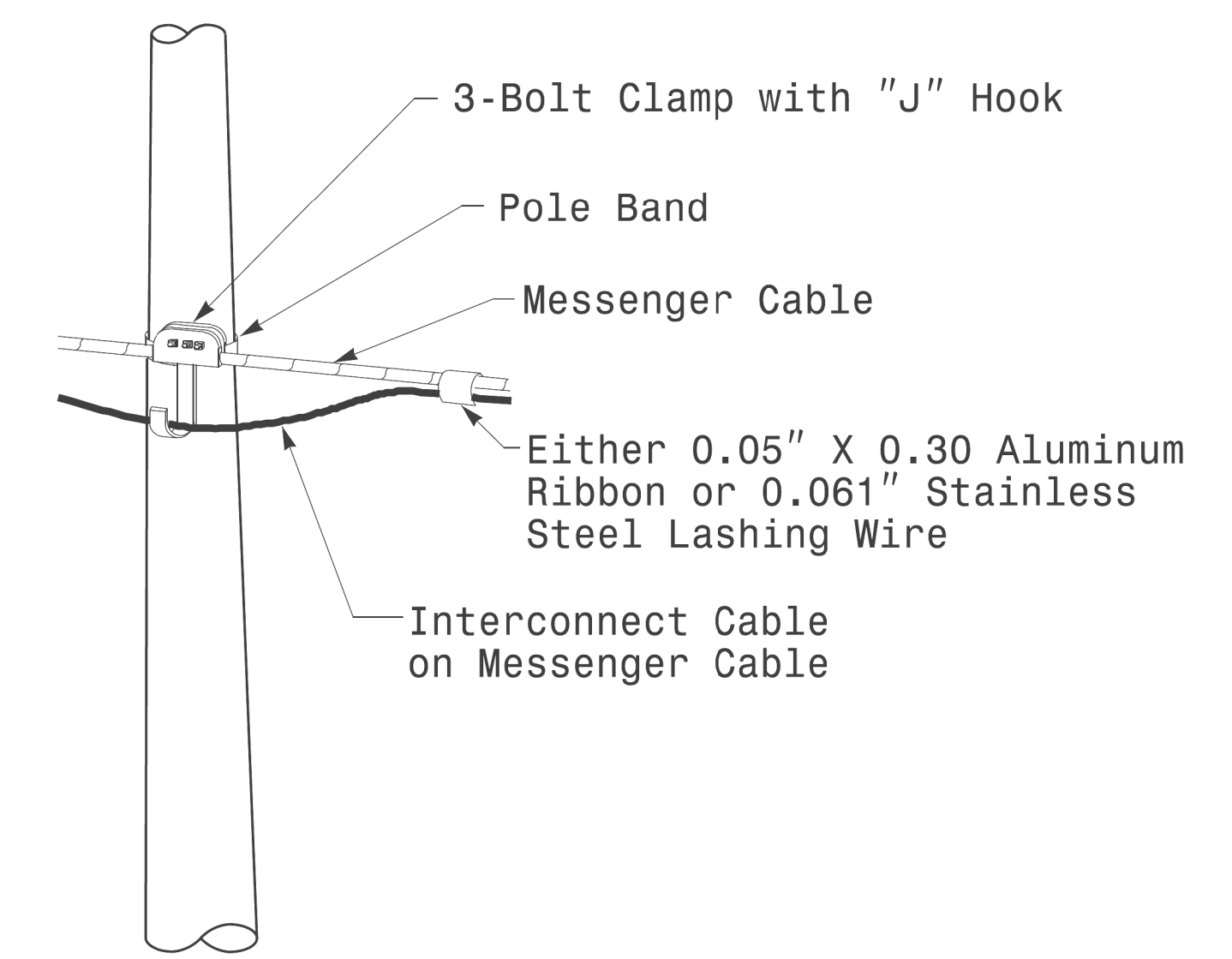
Fabrication Details – Strain Pole Attachments



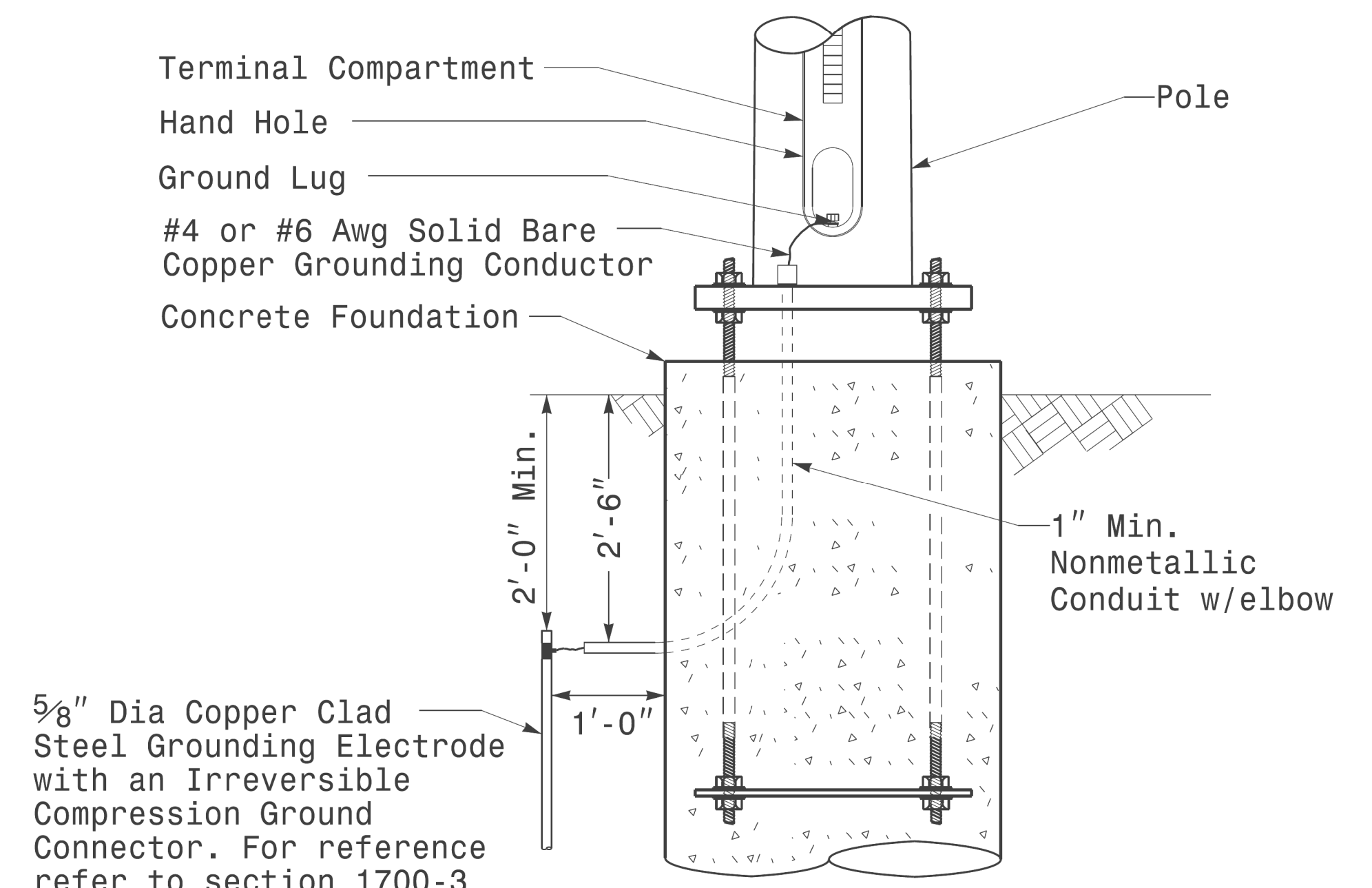
Strain Pole Attachments

NOTE:

1. Strap all signal cables to the side of the pole with $\frac{3}{4}$ " 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

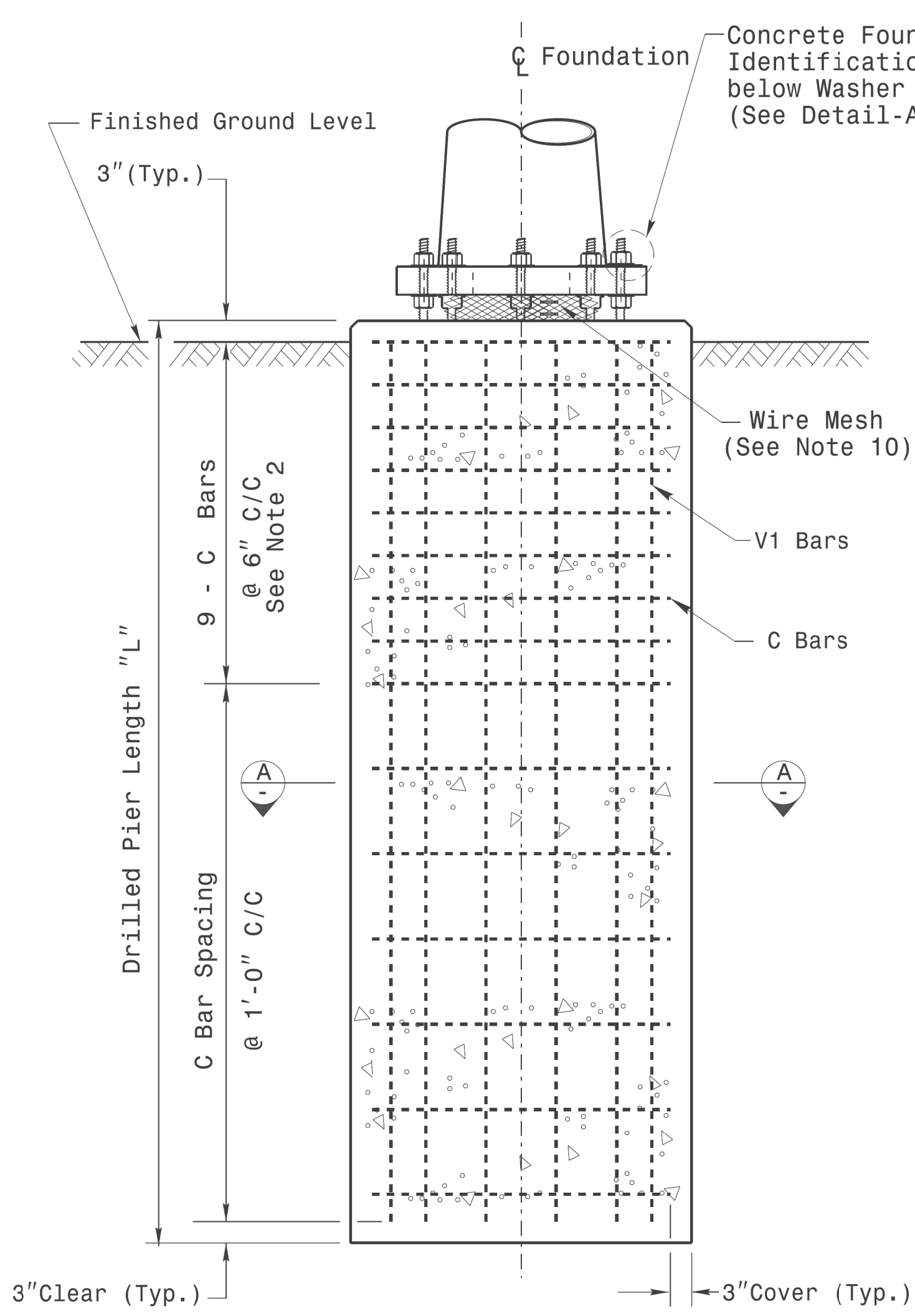
Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

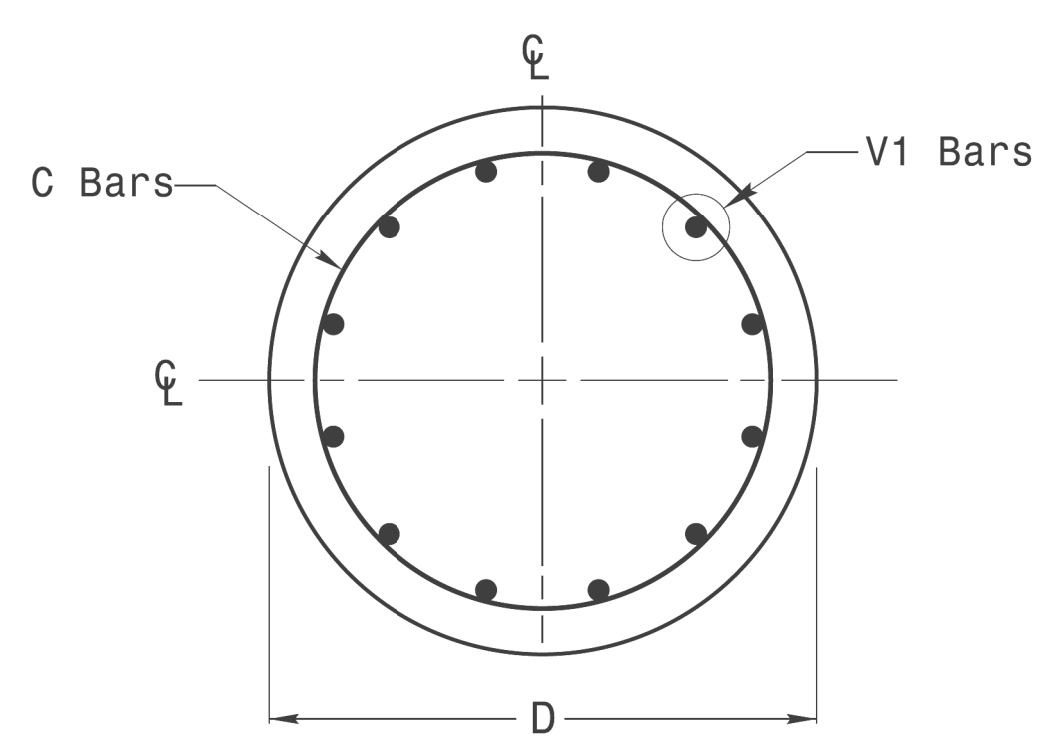
Typical Fabrication Details For Strain Pole Attachments			
PLAN DATE:	OCTOBER 2017	DESIGNED BY:	C.F. ANDREWS
PREPARED BY:	N. BITTING	REVIEWED BY:	D.C. SARKAR
REVISIONS	INIT.	DATE	

SEAL

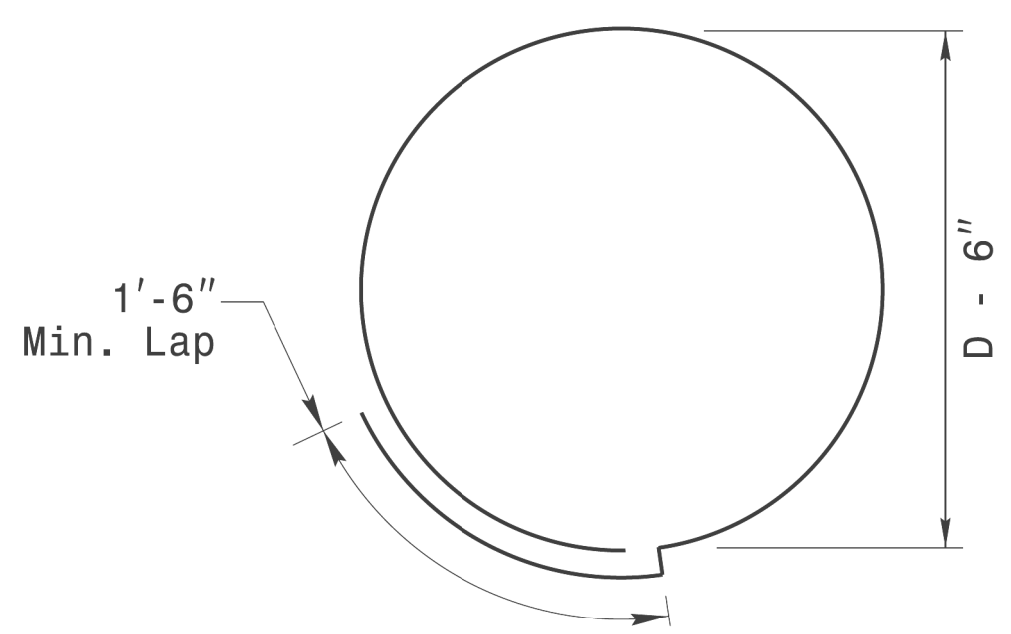
DocuSigned by: D. Sarkar
DATE: 10/11/2017



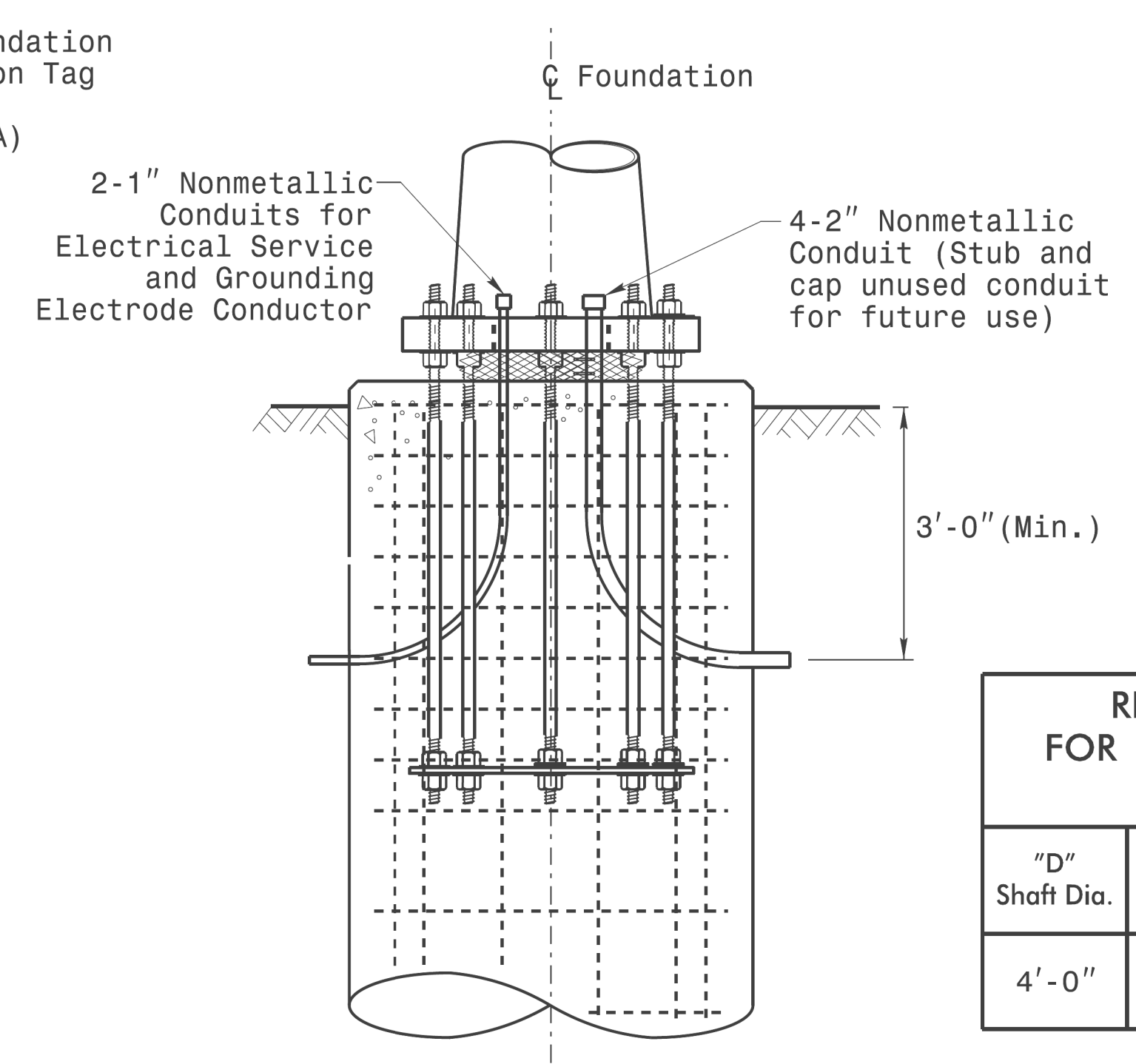
Concrete Shaft Elevation



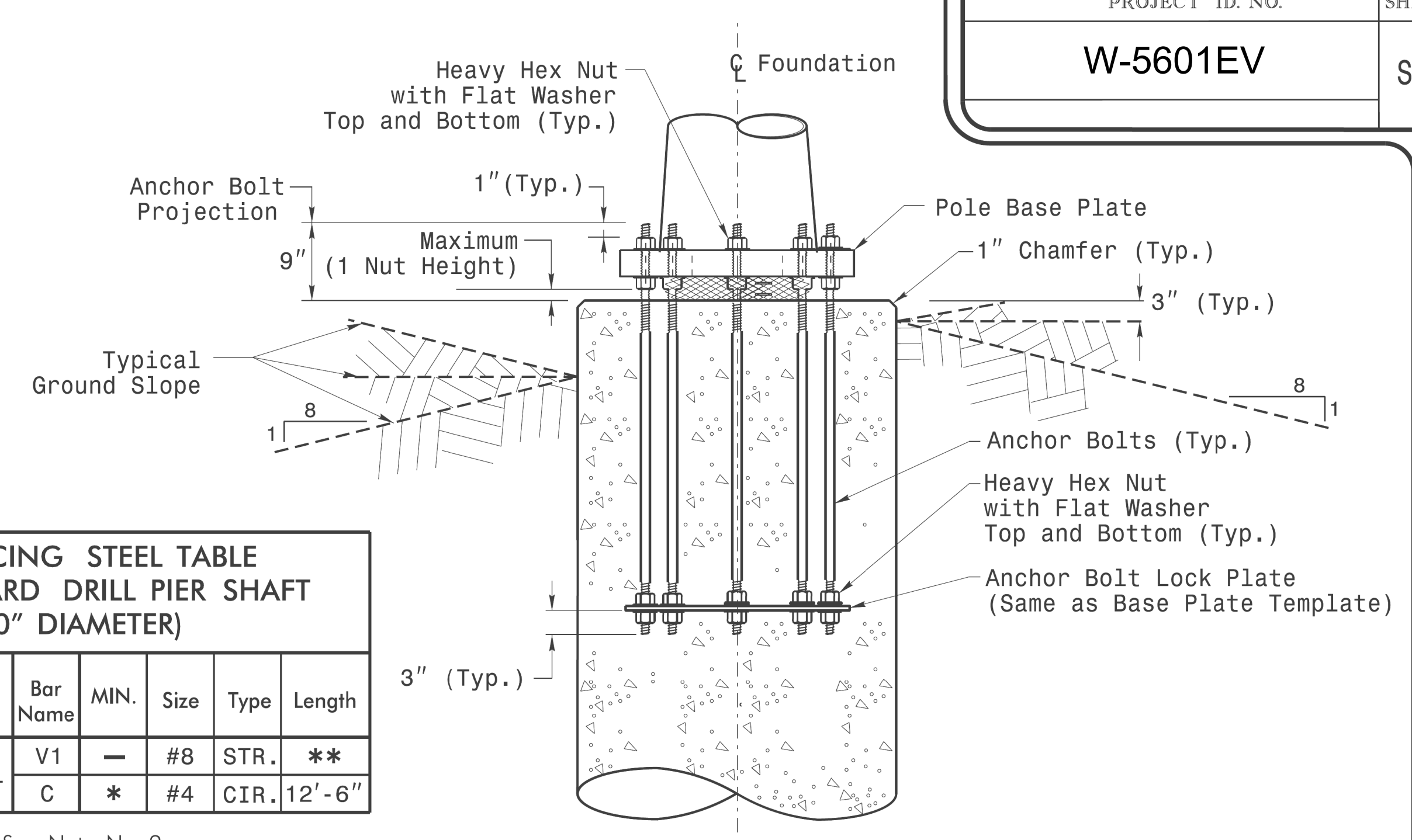
Section A-A



Typical "C" Bar Detail



Typical Foundation Conduit Details



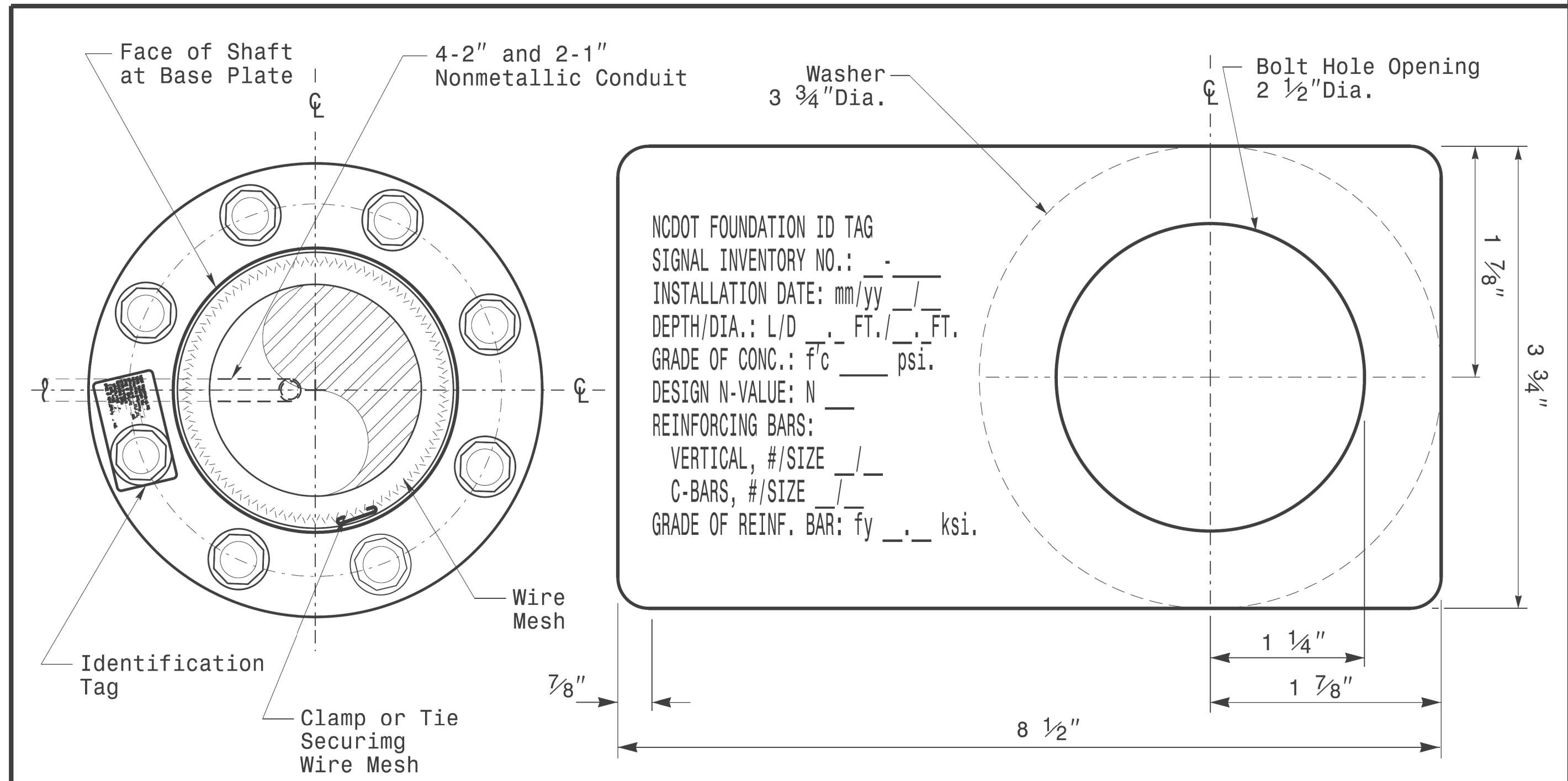
Typical Foundation Anchor Bolt Details
(Reinforcing Cage Not Shown for Clarity)

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

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

General Notes:

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

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

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.</p> <p>COMMENTS</p> <p>INIT.</p> <p>DATE</p>	

11-001-2017-08-37
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 P:\Users\jgarcia\OneDrive\Documents\11-001-2017-08-37_Sig_M7_Std_Construction_Details-Strain_Poles.dgn

Construction Details - Foundations

SOIL CONDITION

PROJECT ID. NO. SHEET NO.

W-5601EV 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.

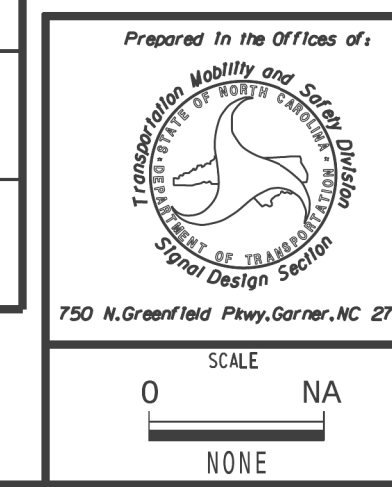
Foundation Selection:

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

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



Standard Strain Pole Foundation for All Soil Conditions			
PLAN DATE: OCTOBER 2017	DESIGNED BY: C.B. COGDELL		
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR		
REVISIONS	INIT.	DATE	
Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn.	N.B.	7/12/2015	

SEAL

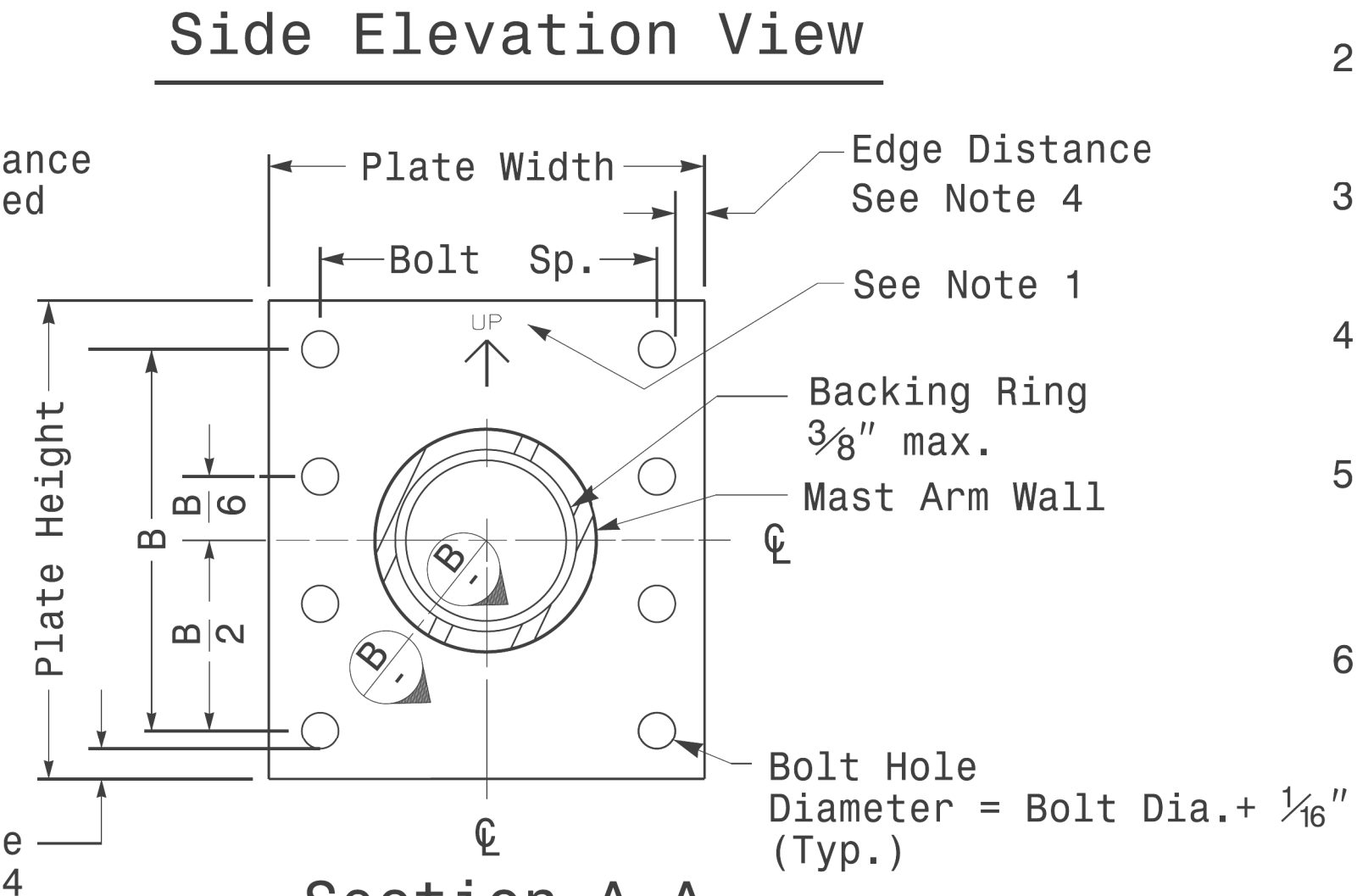
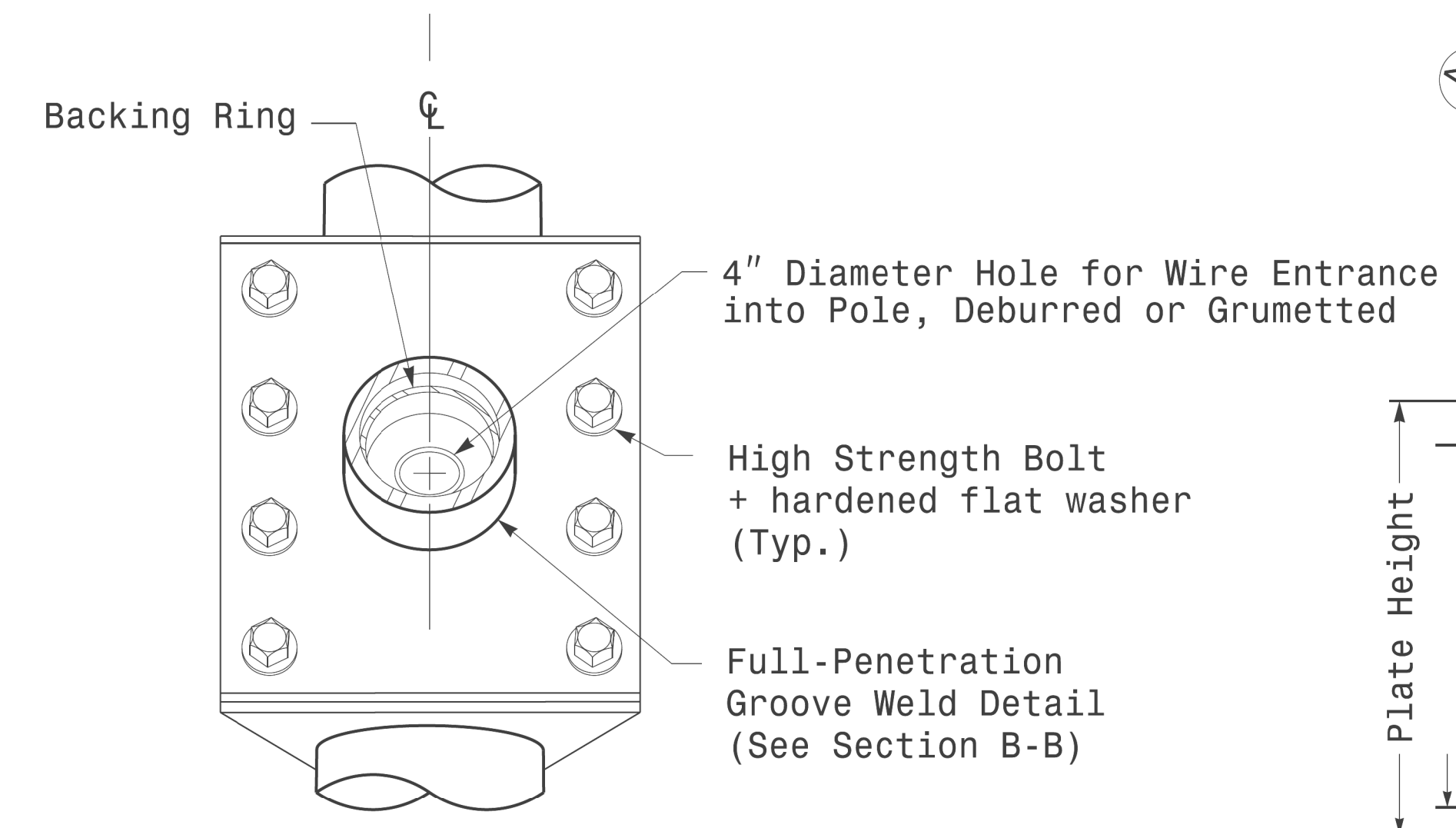
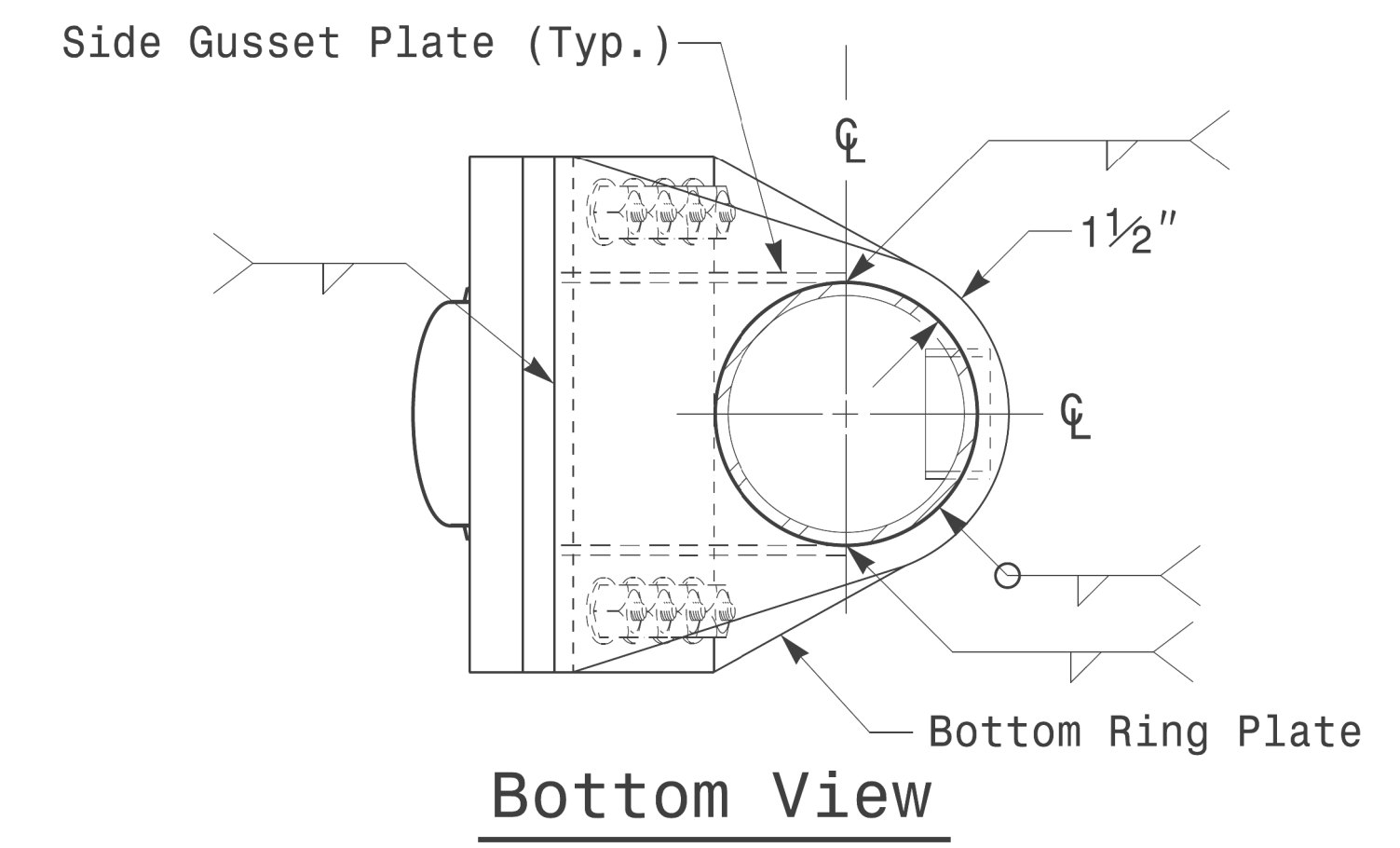
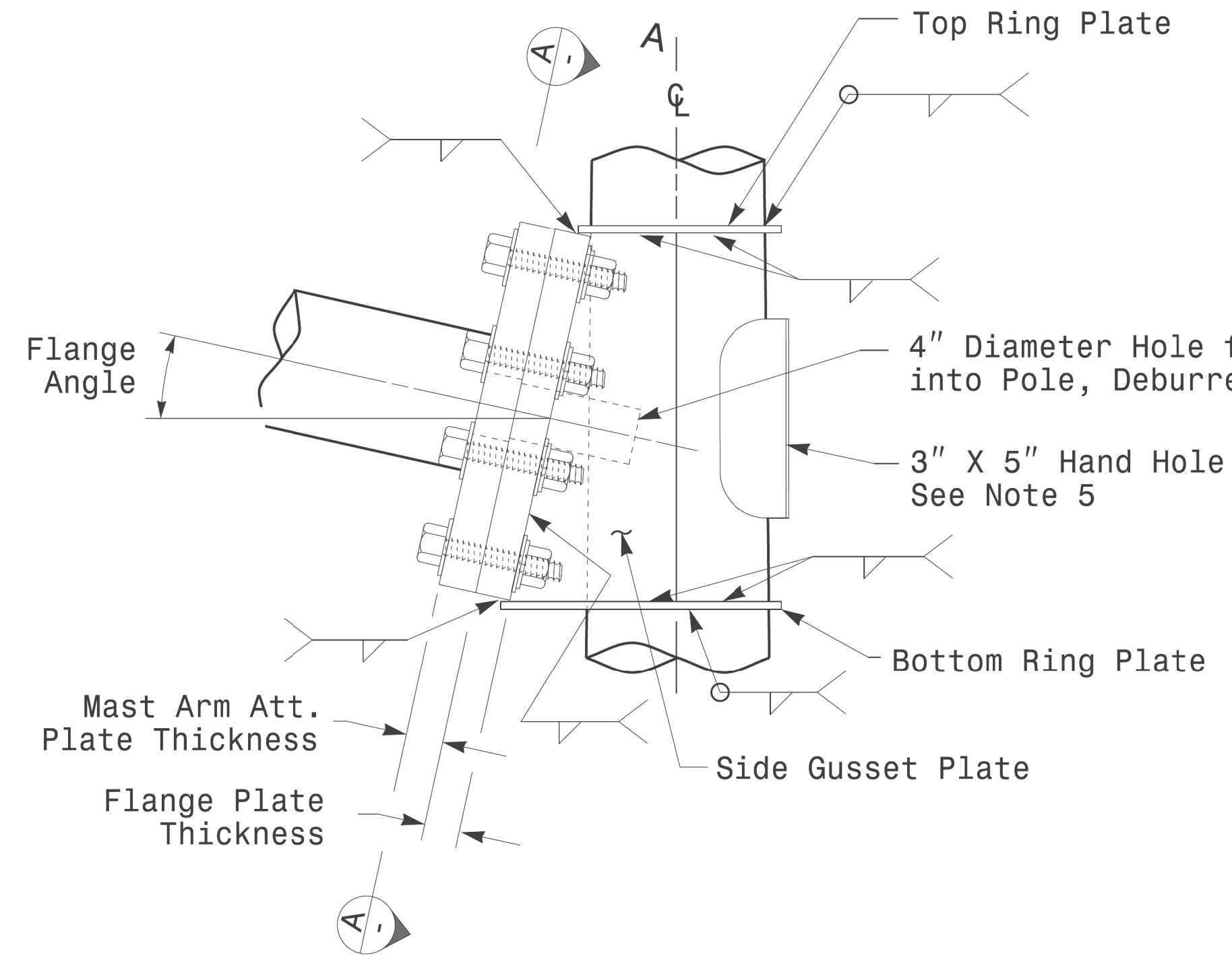
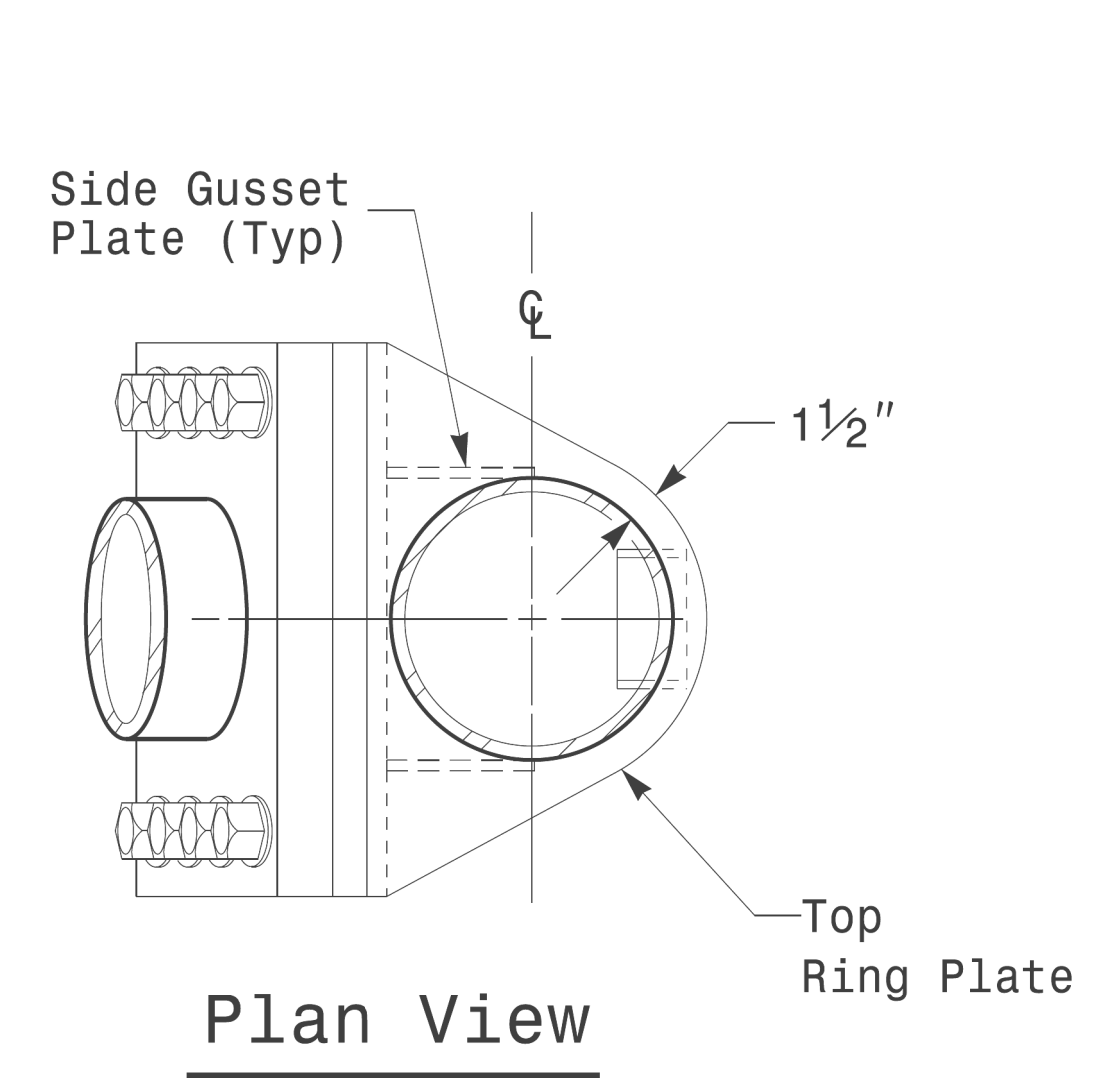
Designed by: *Deshu C. Sarkar*

10/11/2017

DATE

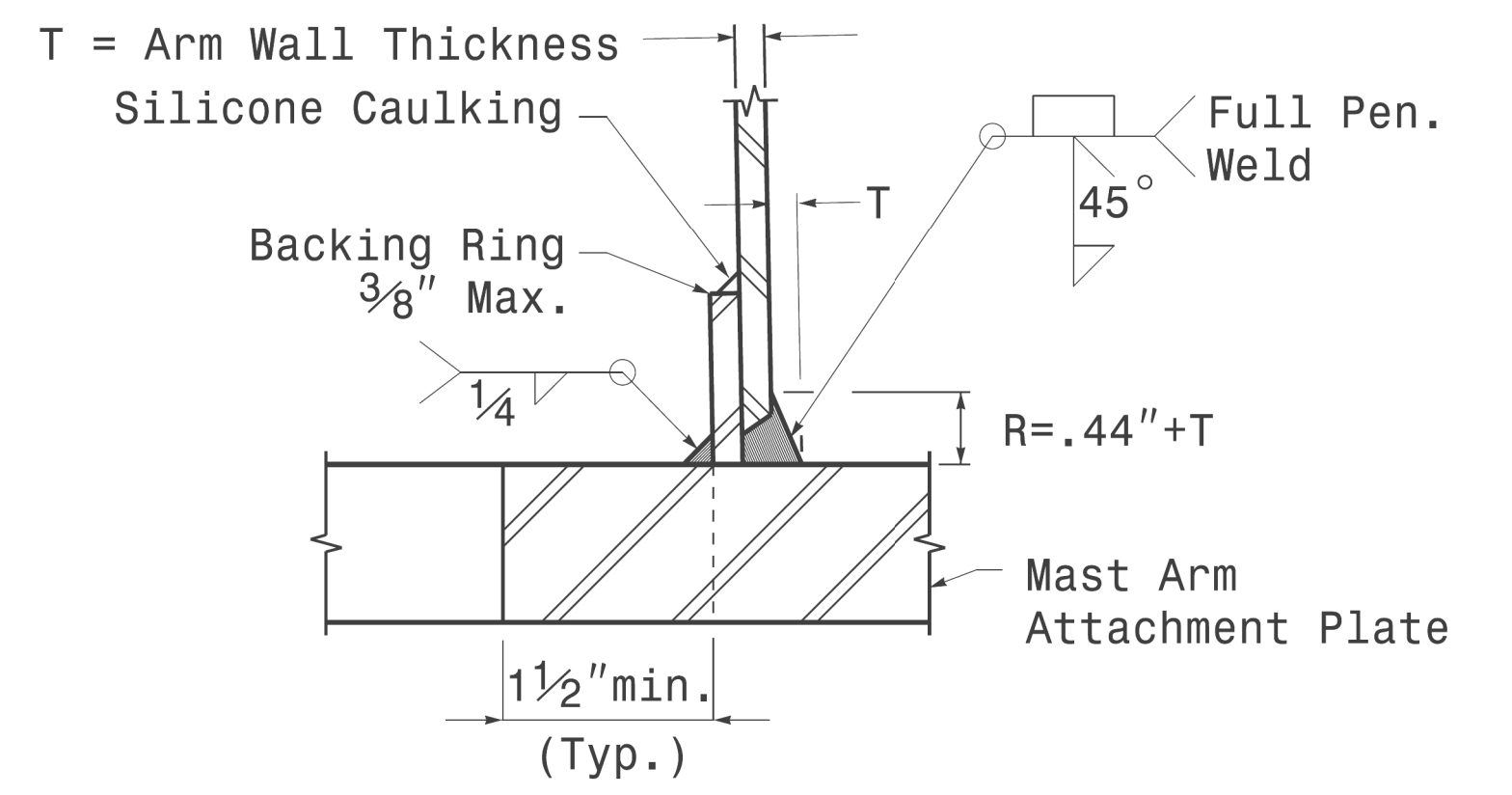
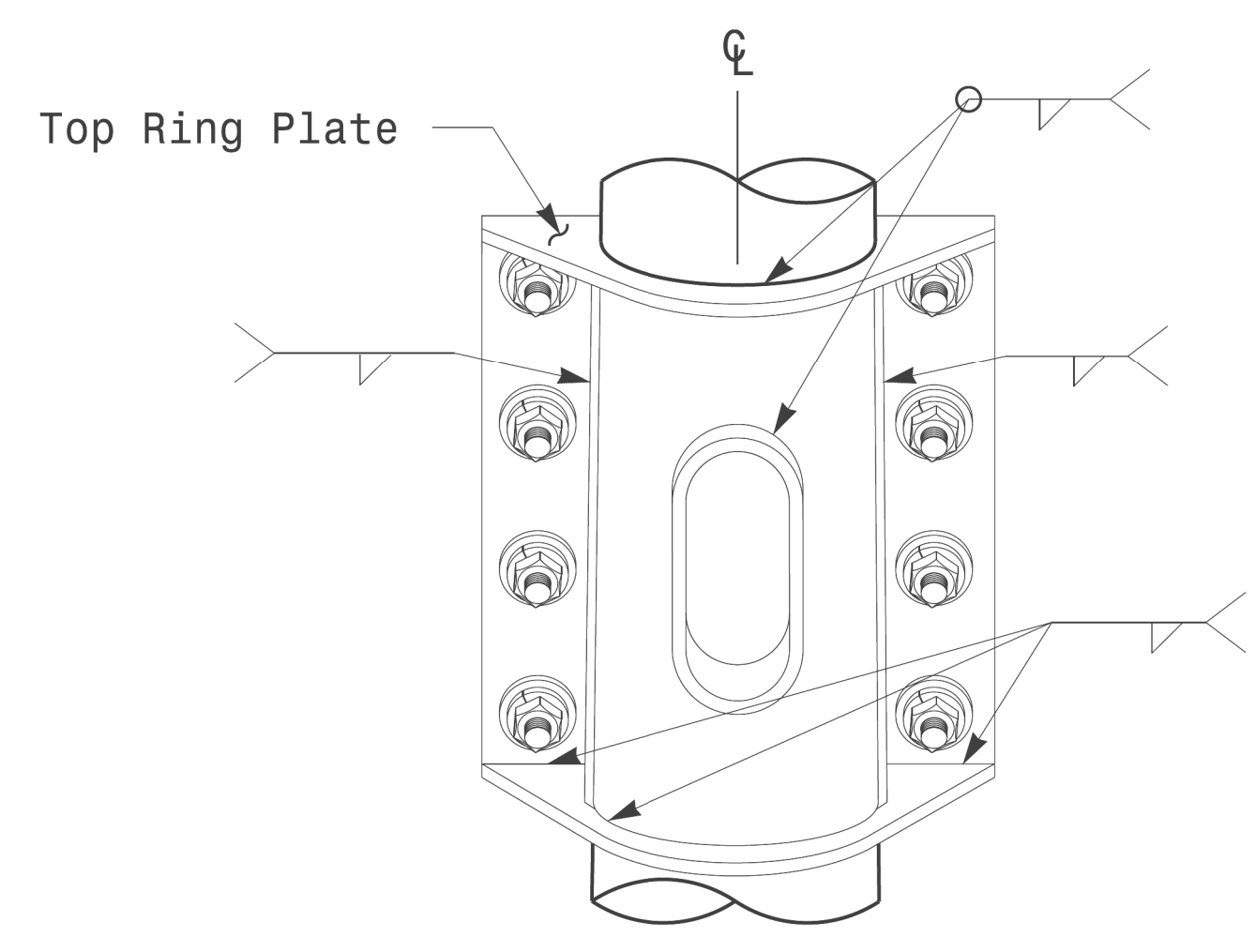
Welded Ring Stiffened Mast Arm Connection

PROJECT ID. NO.	SHEET NO.
W-5601EV	Sig.M5



Notes:

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



Prepared in the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Typical Fabrication Details For Mast Arm Connection To Pole

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

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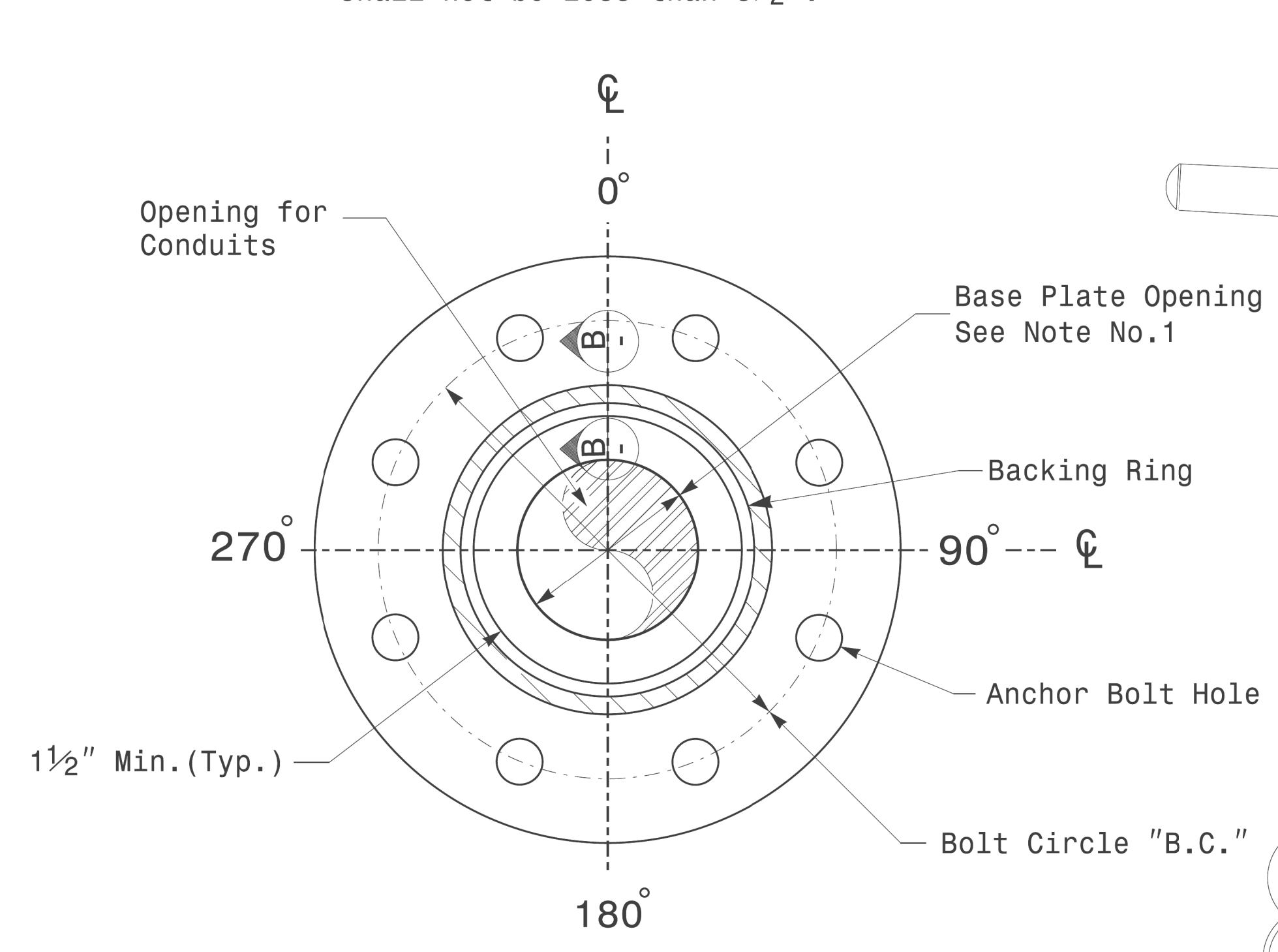
DocuSigned by: Dinesh C. Sarkar

10/11/2017

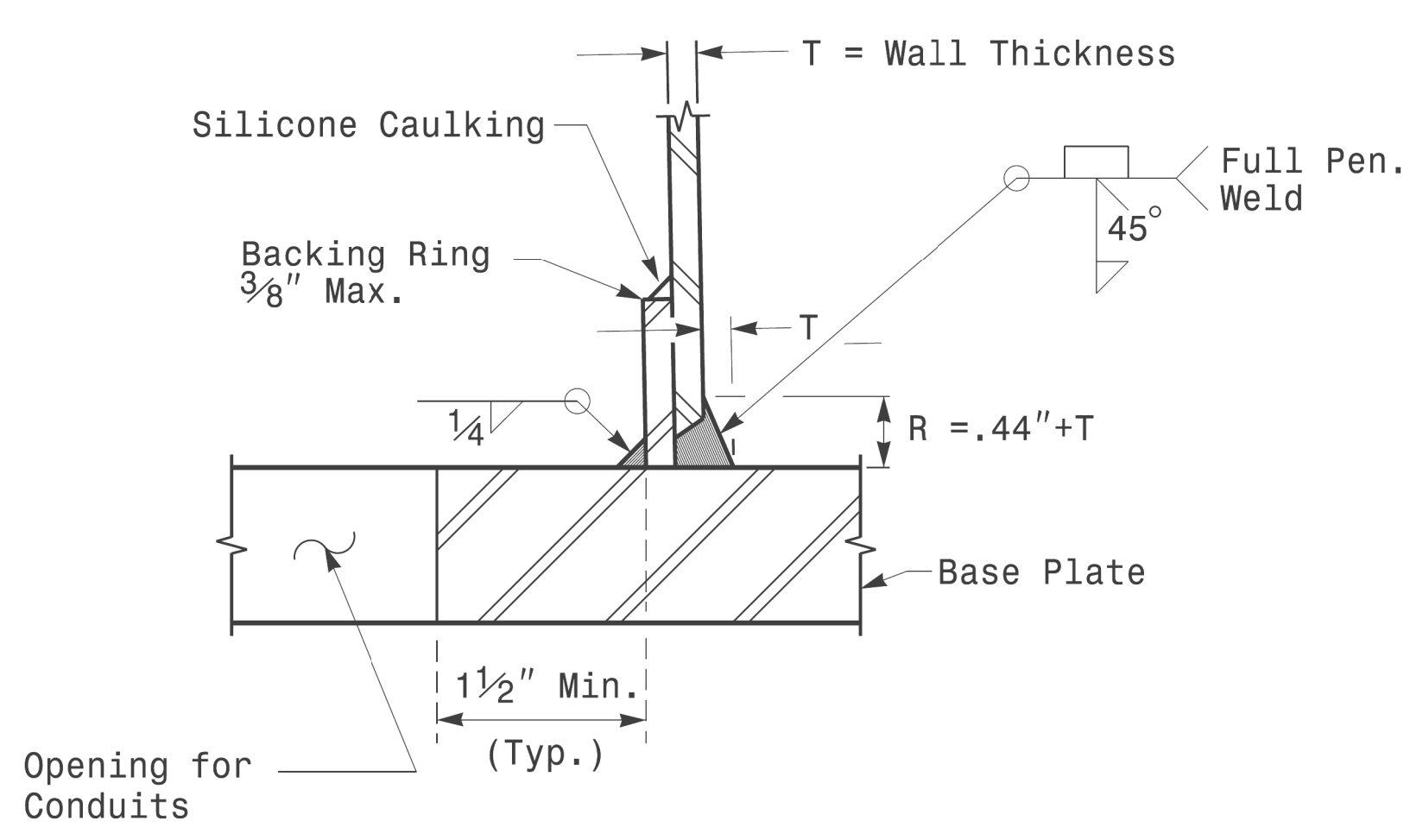
Fabrication Details - Mast Arm Connection

11-OCT-2017 08:35 51-TS624115-1-01.dwg Design Section Eastern Region 016x2014 Sig.M5 Std. Connection Fabricator Detail is Mast Arm Pole.dgn

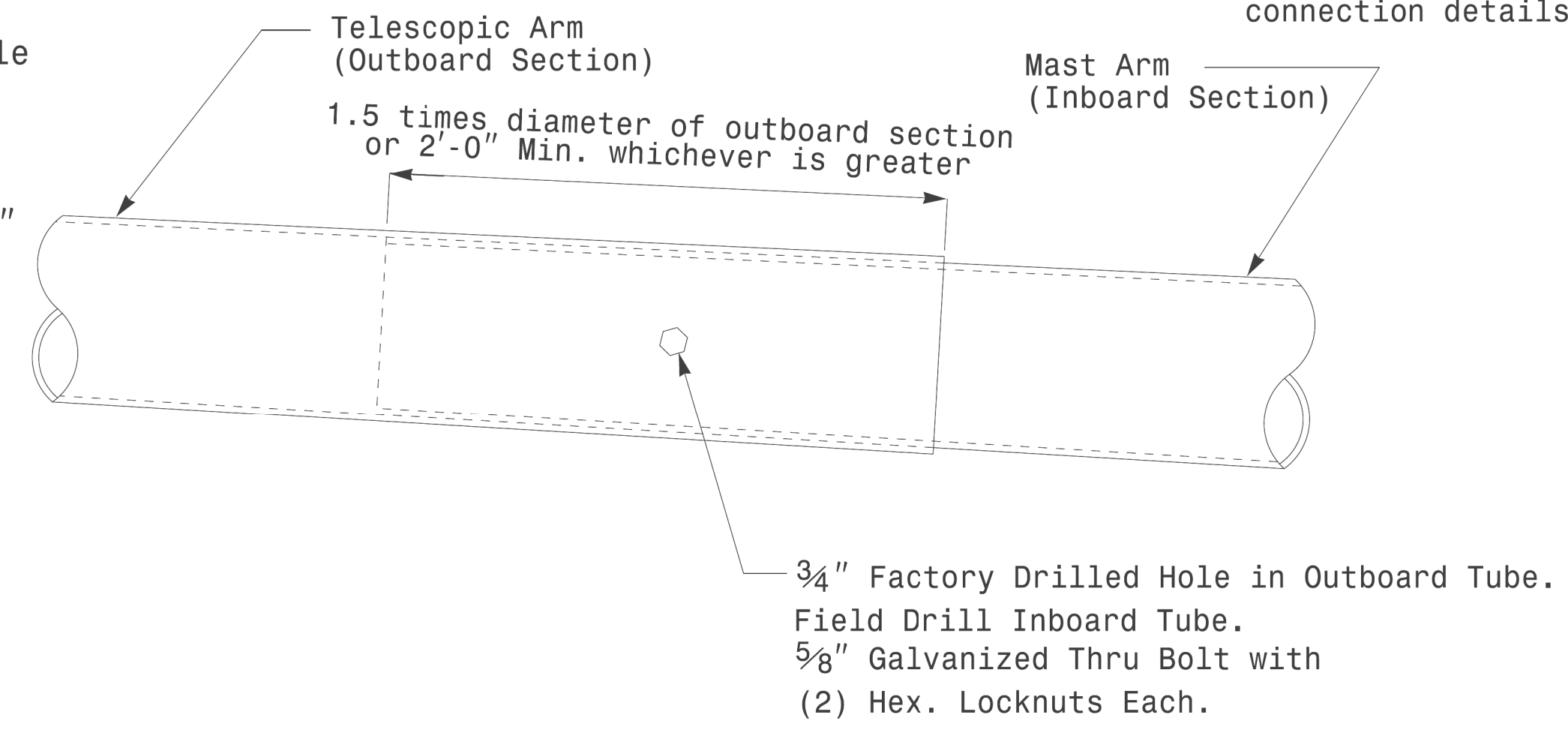
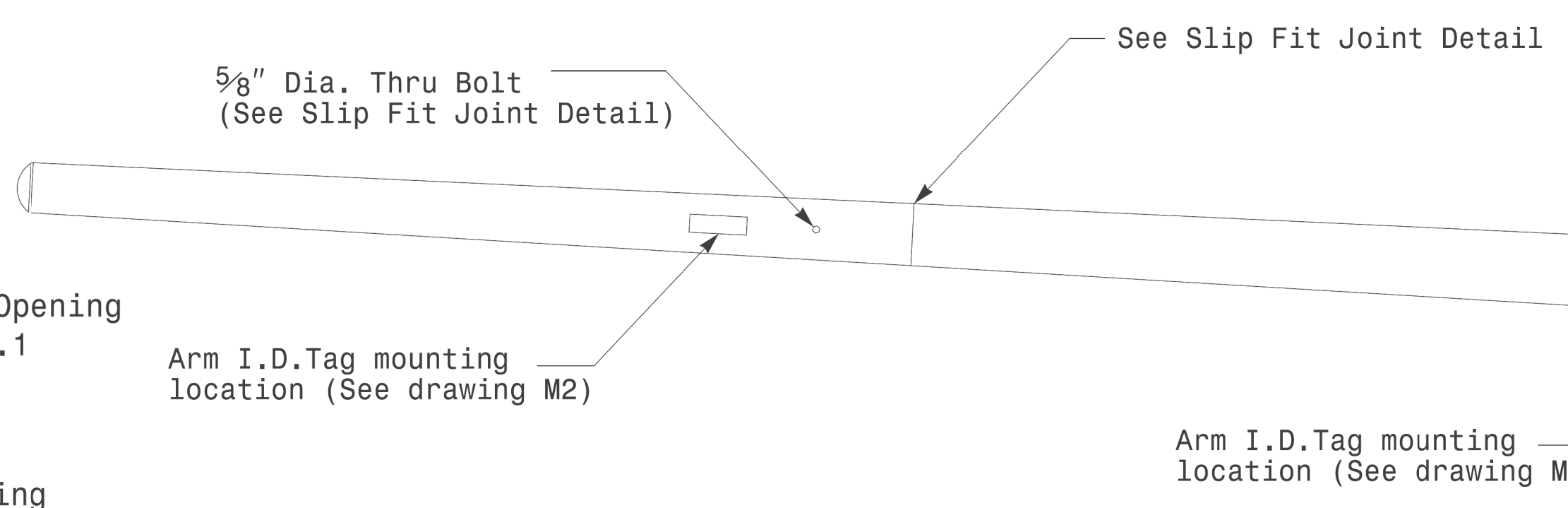
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



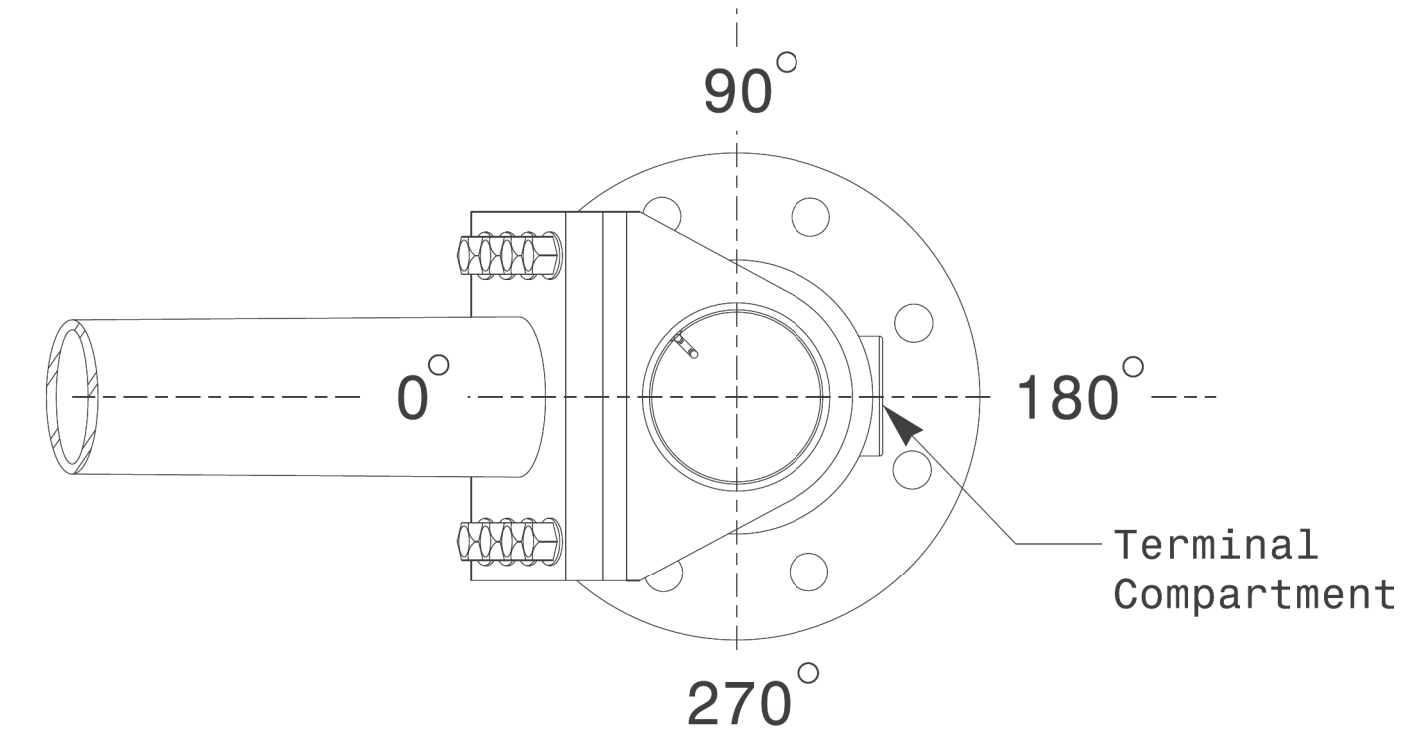
Section A-A
Pole Base Plate Details



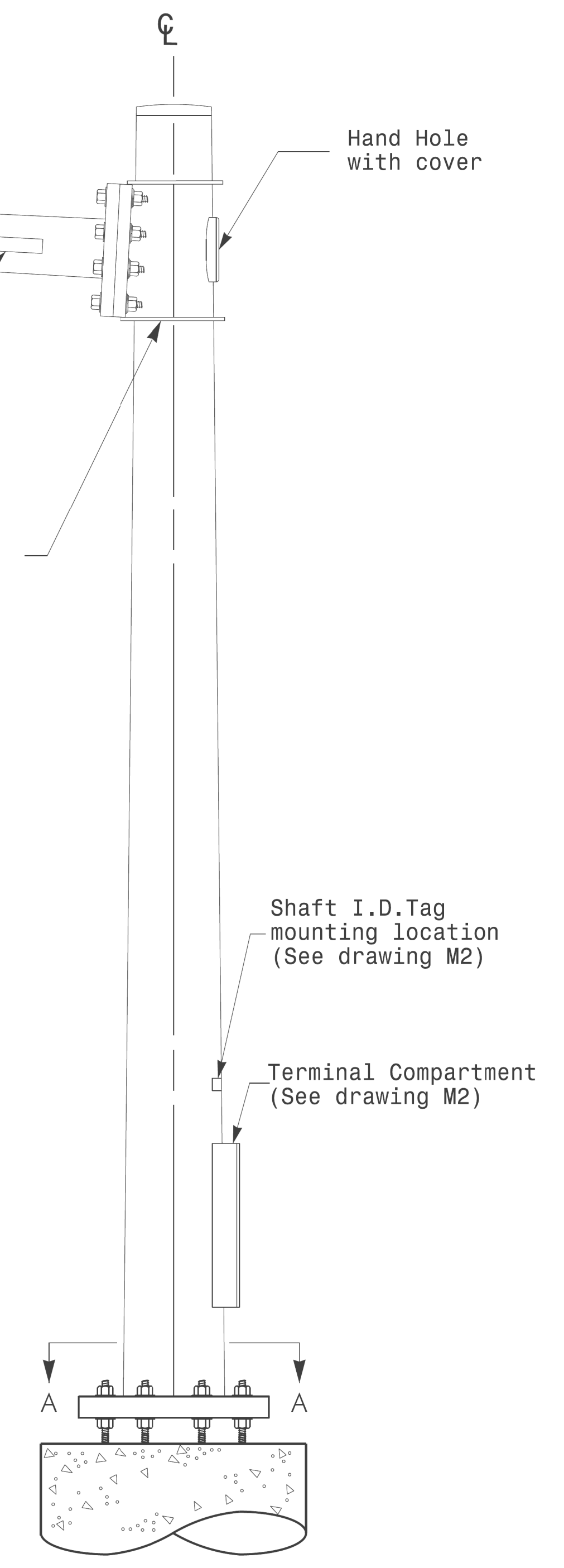
Section B-B
 (Pole Attachment to Base Plate)
Full-Penetration Groove Weld Detail



Slip Fit Joint Detail for Mast Arm



Mast Arm Radial Orientation



Mast Arm Pole

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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 D. C. SARKAR ENGINEER
	PLAN DATE: OCTOBER 2017 PREPARED BY: N. BITTING	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR	
SCALE 0 NA NONE	DocuSigned by: 442632894		10/11/2017 DATE