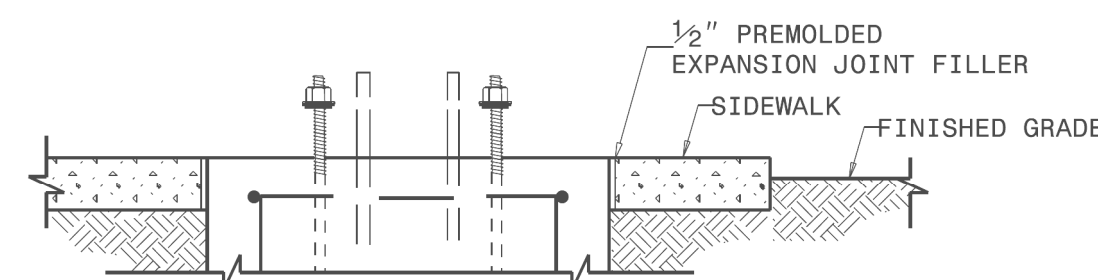
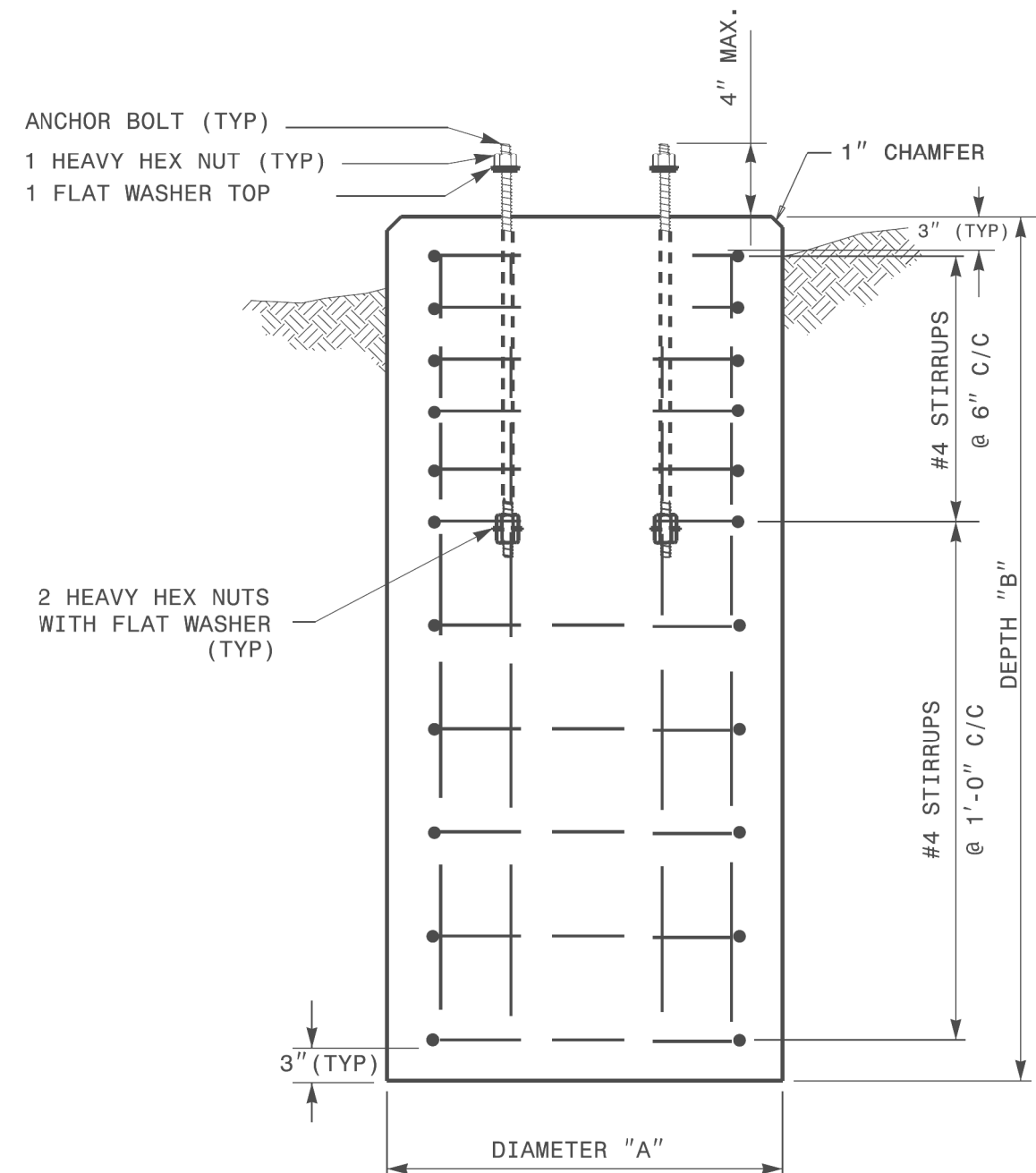


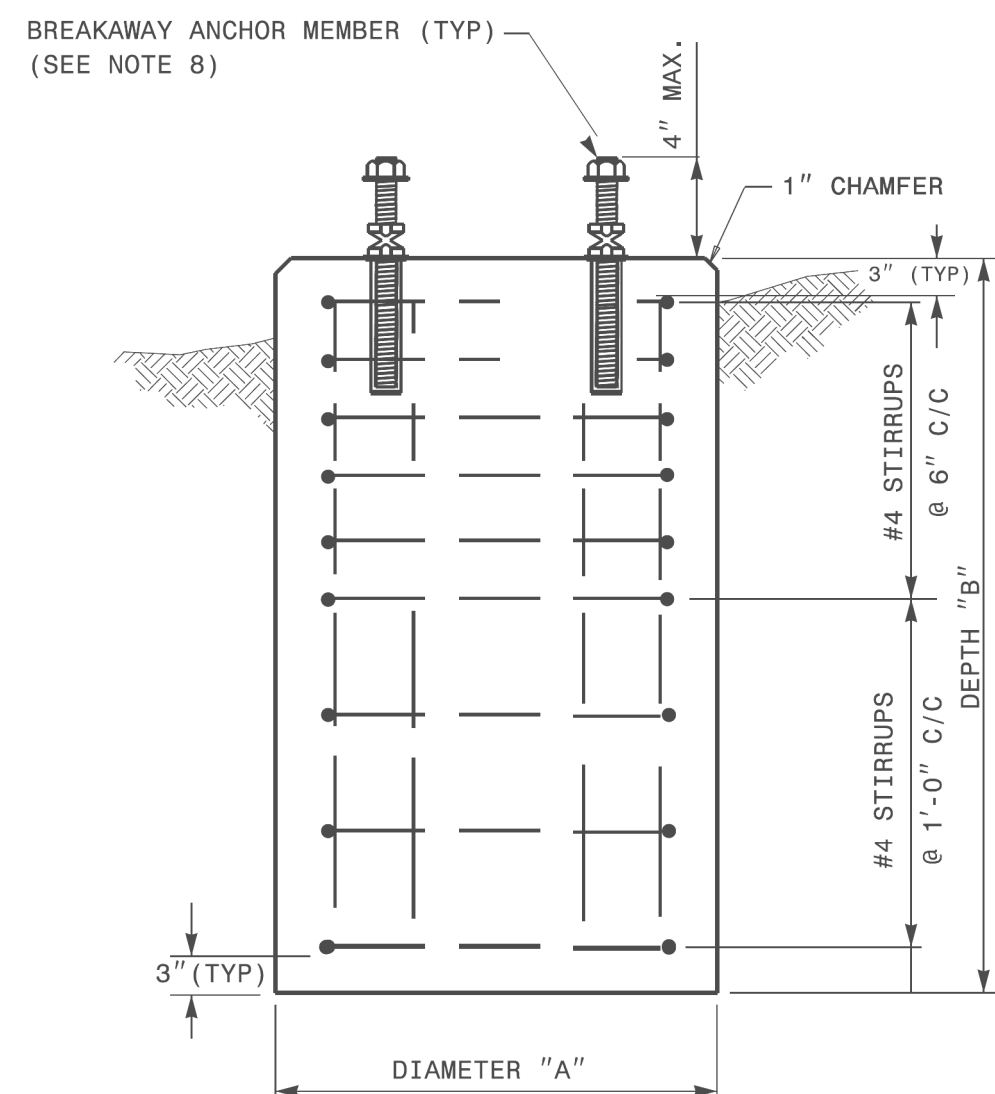
PEDESTAL FOUNDATION - PLAN VIEW



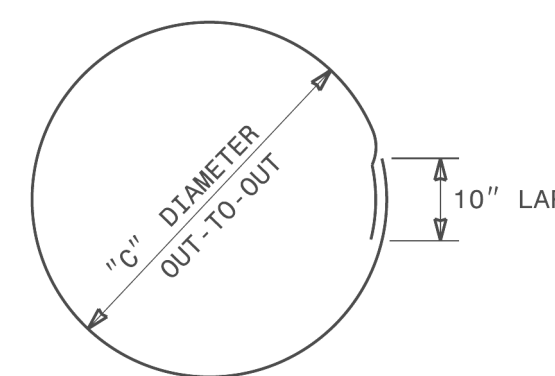
PEDESTAL FOUNDATION DETAILS FOR SIDEWALK



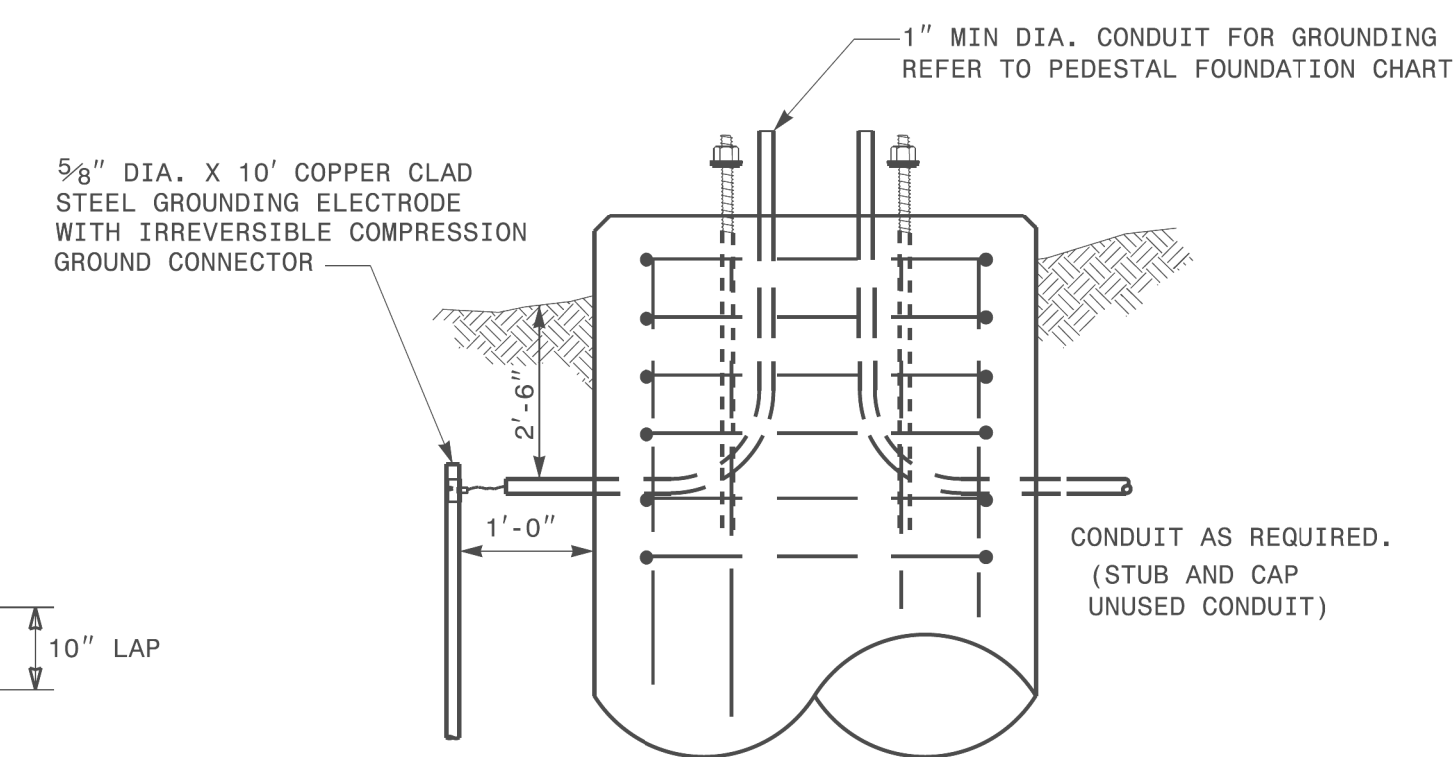
TYPES I, II & III
SECTION A-A



TYPES I & II ONLY
SECTION A-A



CLOSED HOOPS



GROUNDING & CONDUIT DETAIL

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:
 - SANDY TYPE SOIL
 - NO GROUND WATER WITHIN 5'-0" OF SURFACE ELEVATION
 - 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 1/2" AND FOR TYPE II MINIMUM DEPTH NECESSARY IS 0'-6 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	SIZE #	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"	15	71
II	8	6	4'-6"	86	4	5	3	8	5'-7"	1'-6"	0'-10"	30	116
III	8	6	6'-6"	122	4	7	4	11	7'-2"	2'-0"	0'-10"	53	175

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

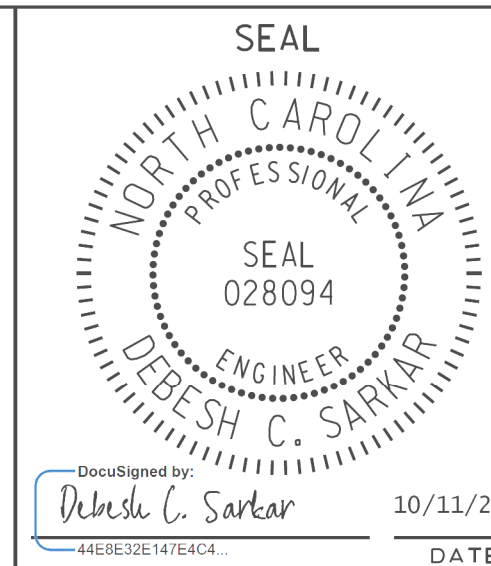
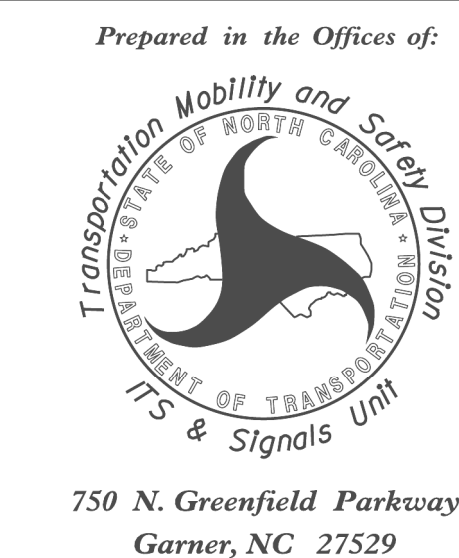
ENGLISH STANDARD DRAWING FOR
PEDESTALS
FOUNDATIONS

SHEET 1 OF 1
1743D01

11-001-2017_09x03
11-2018_Std Drawings\Plate Sheets\2018_Plate Sheet - dgn
r.w.hough

DOCUMENT NOT CONSIDERED
FINAL UNLESS ALL
SIGNATURES COMPLETED

See Plate for Title

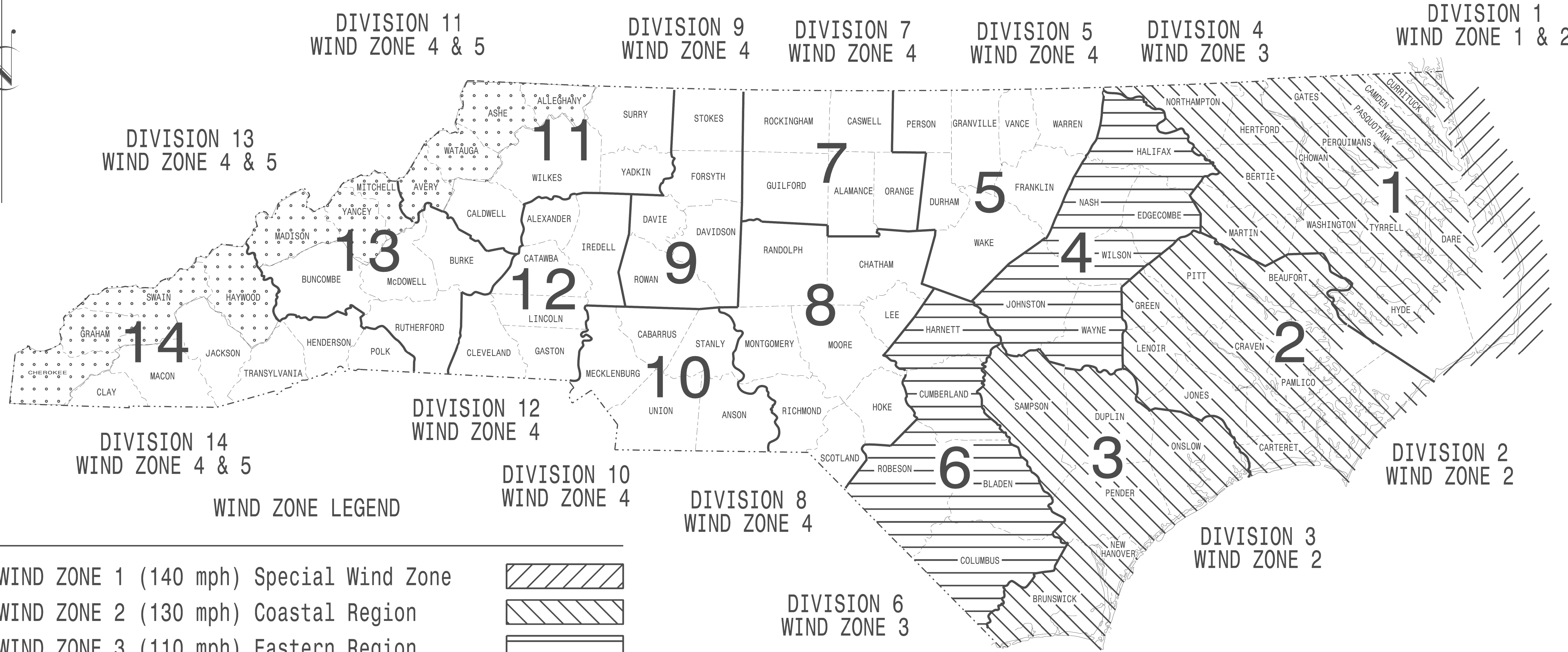


DocuSigned by:
Debesh C. Sarkar
10/11/2017
DATE

STATE OF NORTH CAROLINA DIVISION OF HIGHWAYS

PROJECT I.D. NO. R-3300B	SHEET NO. Sig.M1
------------------------------------	----------------------------

STANDARD DRAWINGS FOR ALL METAL POLES



<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

NC DOT CONTACTS:

MOBILITY AND SAFETY DIVISION - ITS AND SIGNALS UNIT

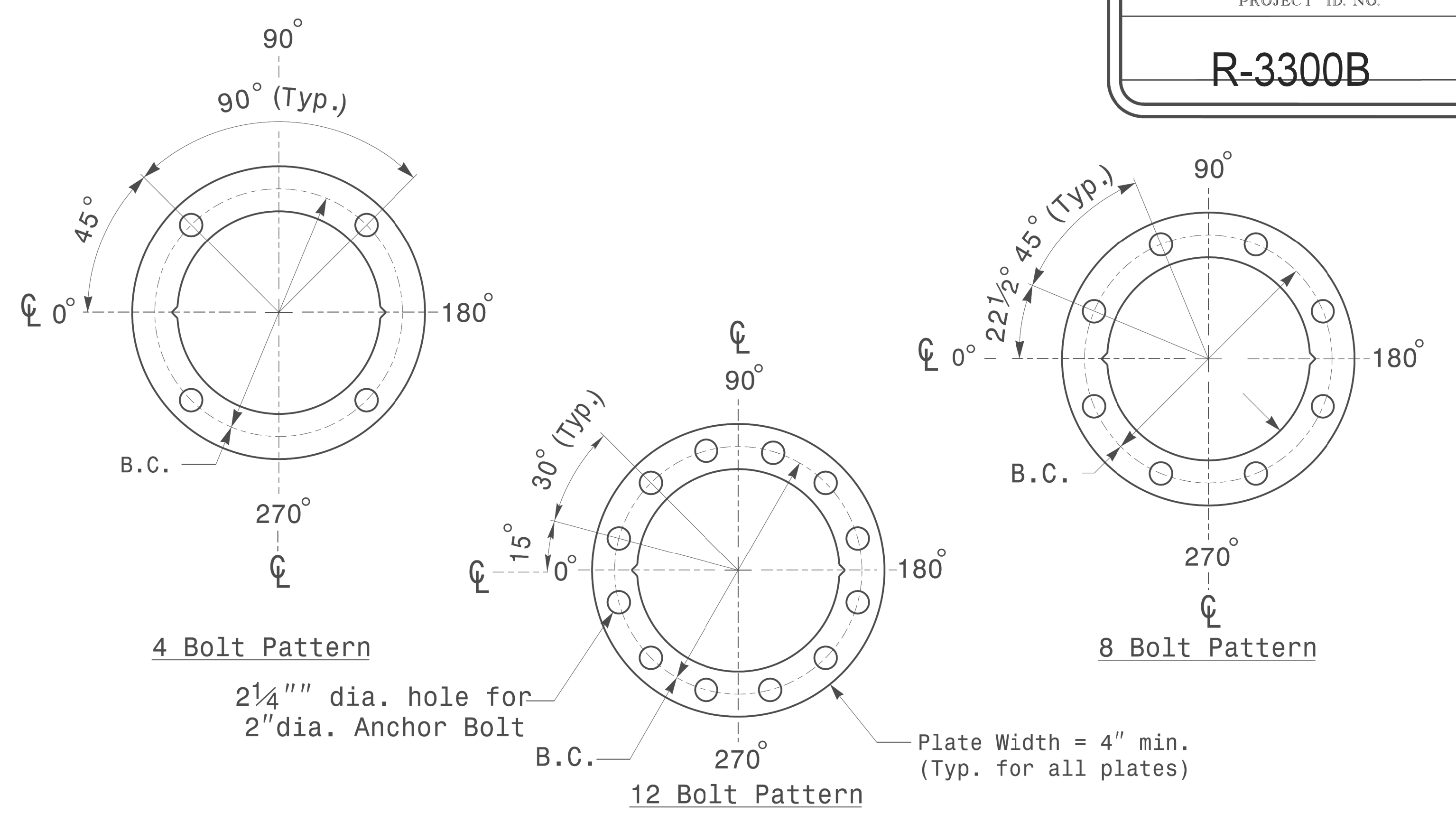
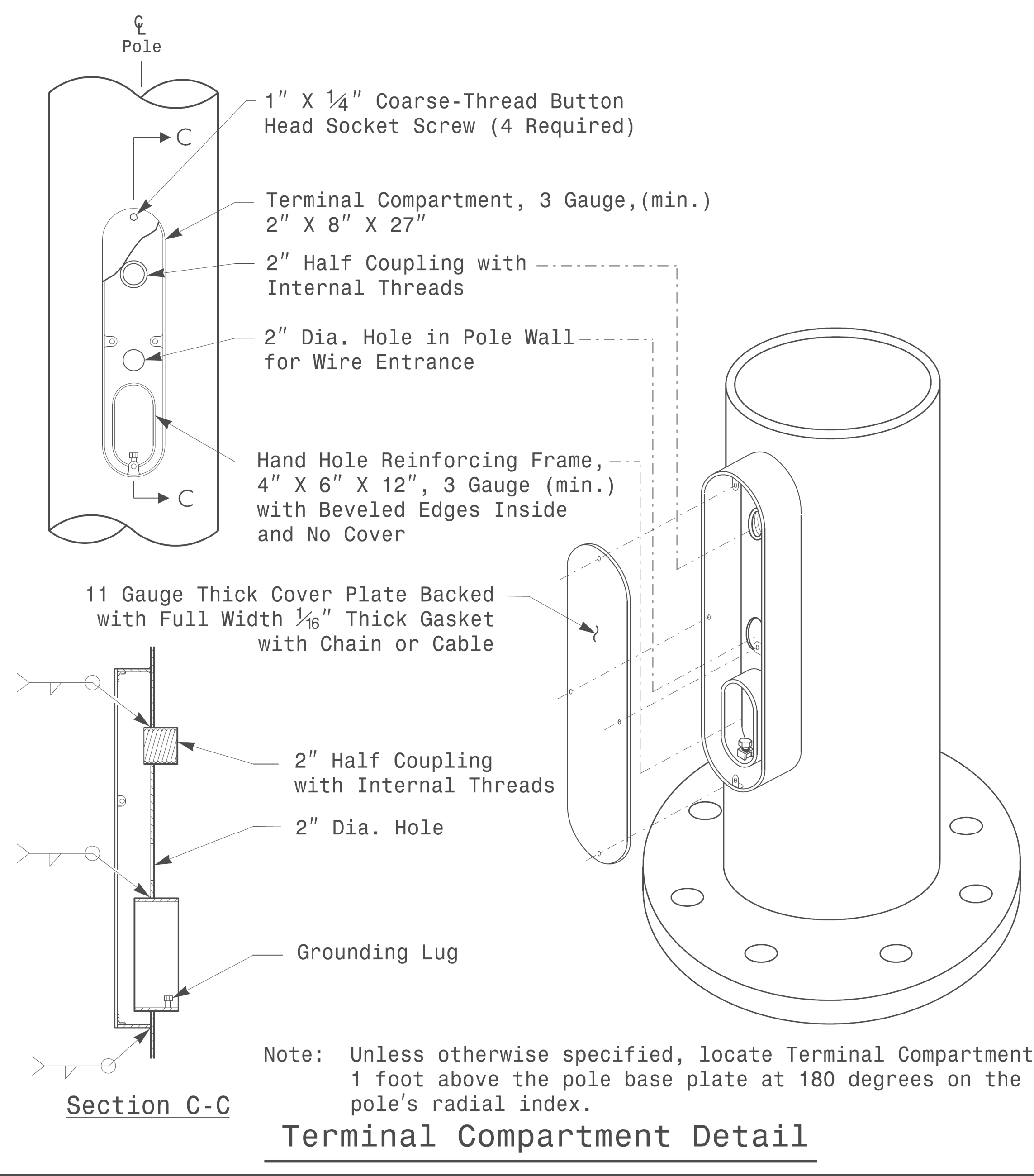
M.M. MCDIARMID, P.E. - STATE ITS AND SIGNALS ENGINEER

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

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

SEAL

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



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

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. _____	_____

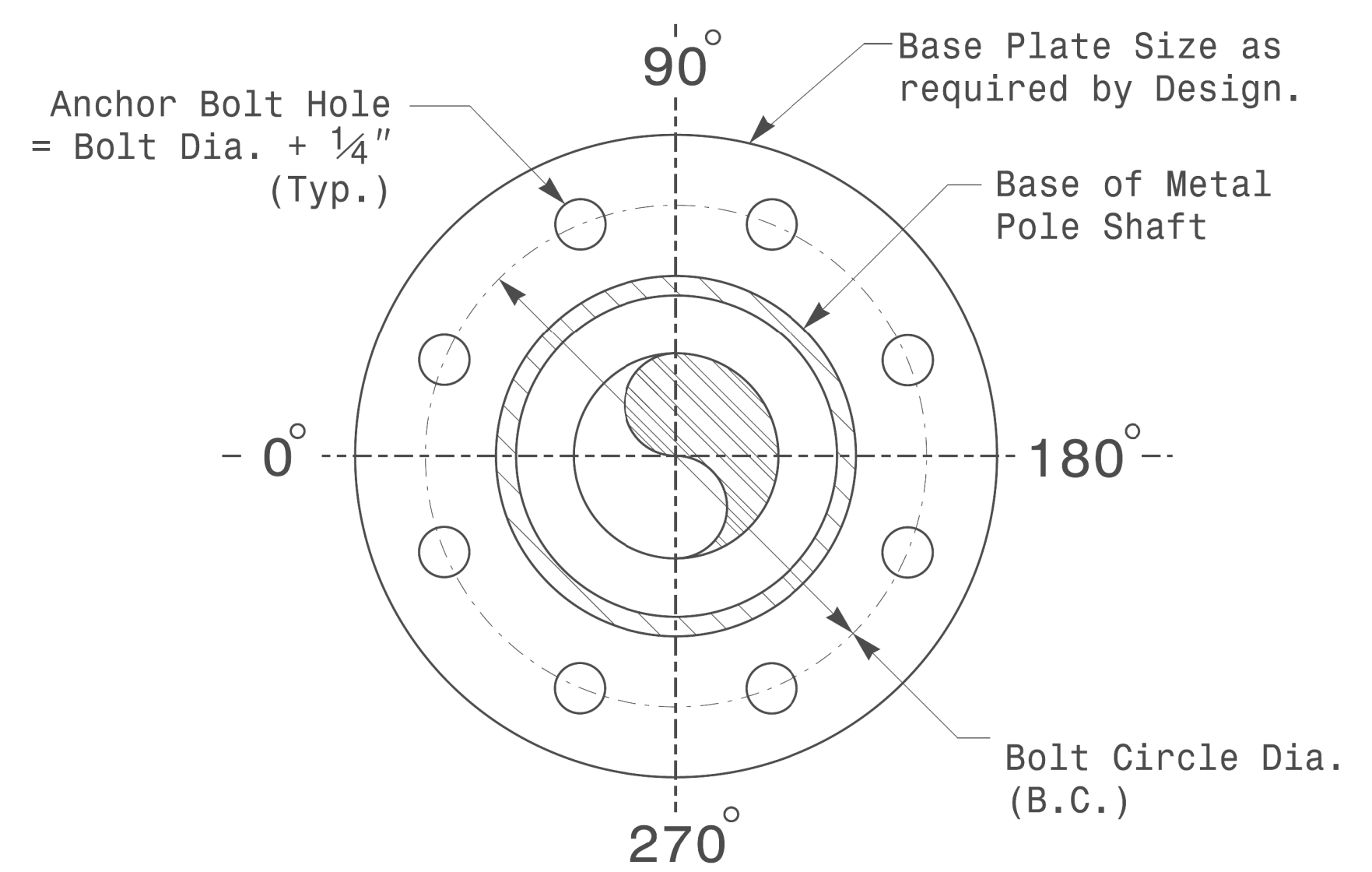
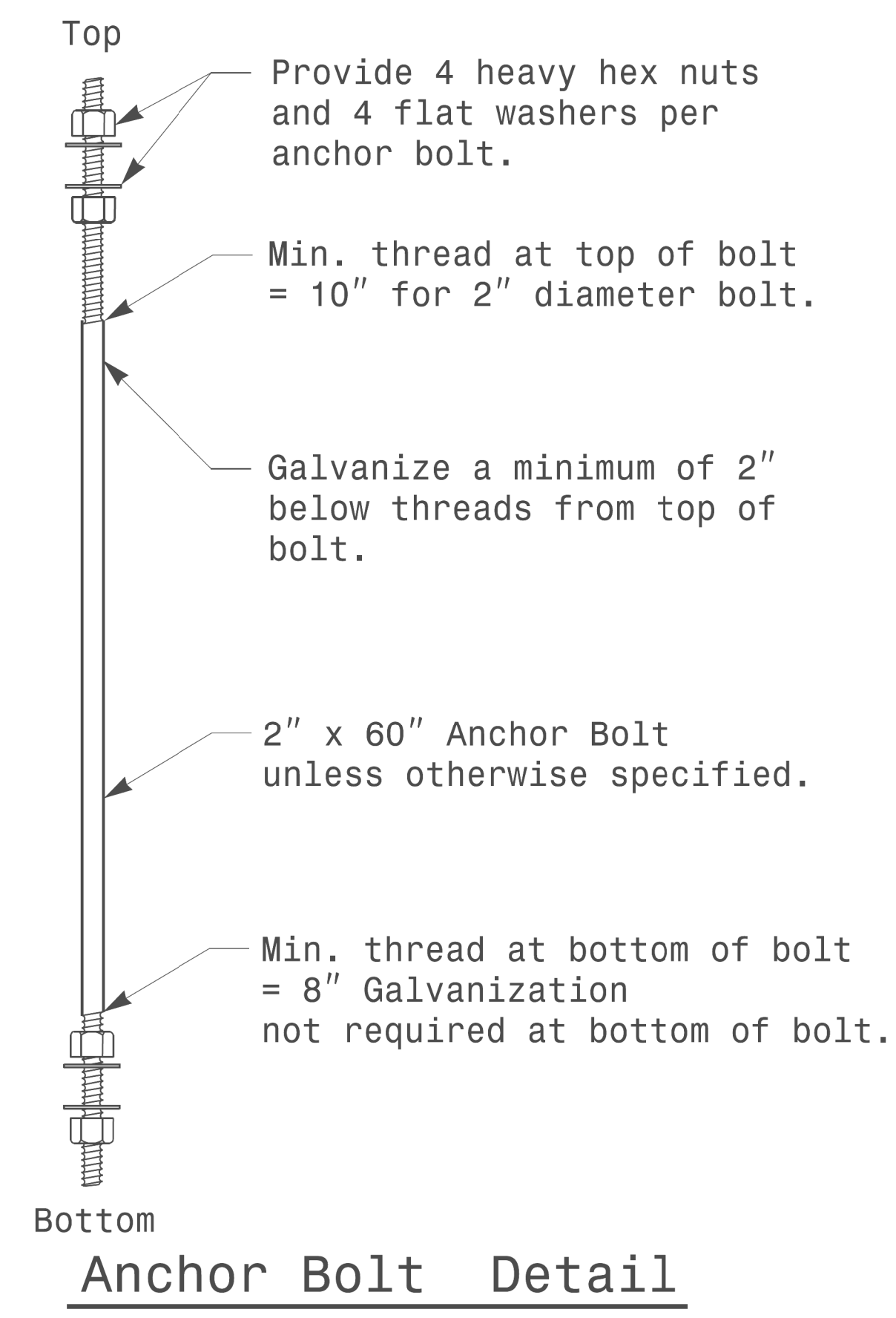
MFG _____	MFG. DATE:MM/YY _____
SECTION D/T/L/Y _____	_____
NCDOT SIG. INV. NO. _____	_____
NCDOT POLE NO. _____	_____

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

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

- Notes:**
- 1) D= Diameter, T= Thickness, L= Length, Y= Yield Strength
 - 2) A.B. = Anchor Bolt
 - 3) B.C. = Bolt Circle of Anchor Bolts
 - 4) If Custom Design, use "NCDOT STANDARD" line for 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

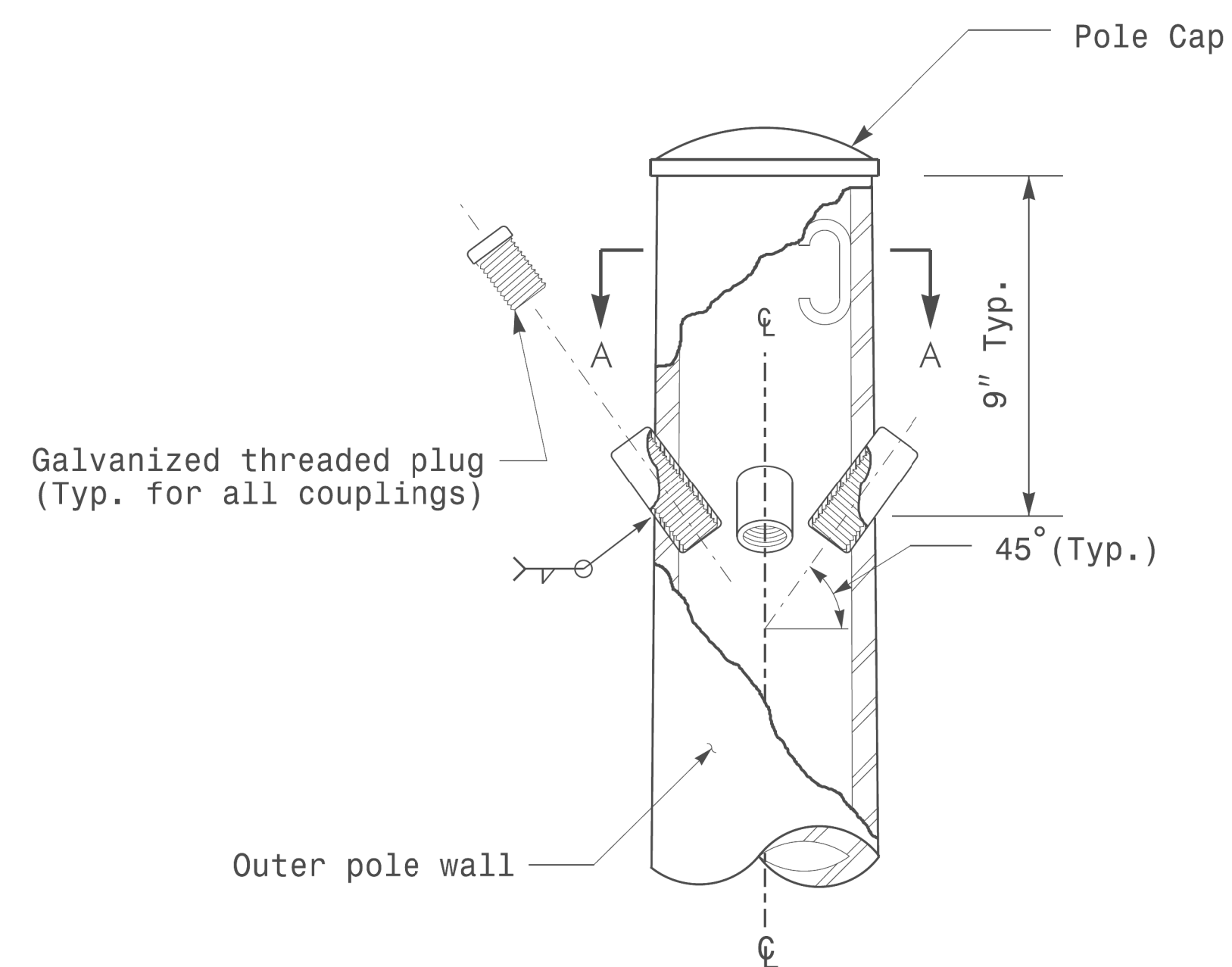
Typical Fabrication Details For All Metal Poles	
PLAN DATE: OCTOBER 2017	DESIGNED BY: C.F. ANDREWS
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE

SEAL

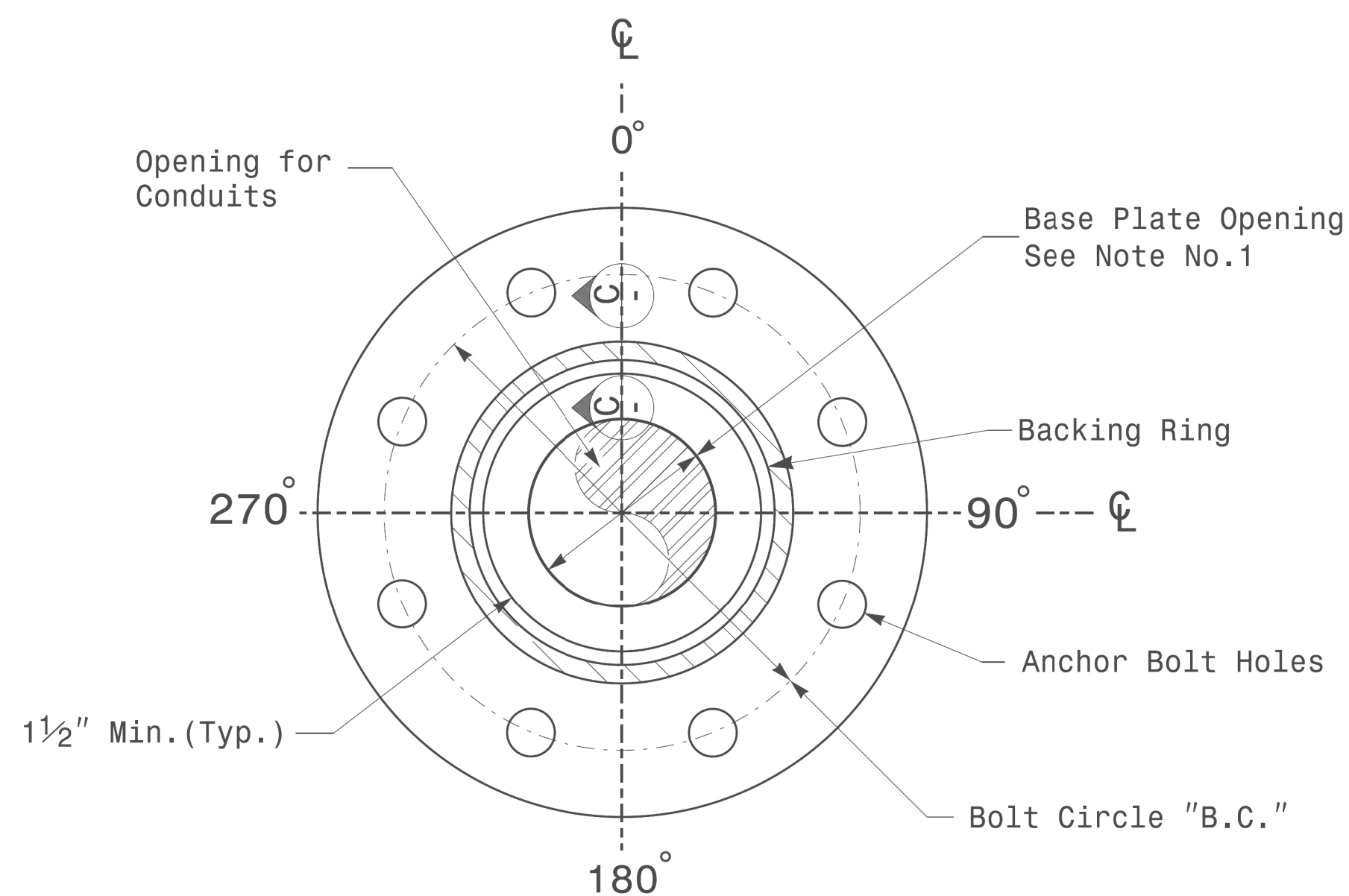
DocuSigned by: *Deshu C. Sarkar*
4488E328482474
10/11/2017
DATE

11-OCT-2017 08:30 5:41 PM 13530115 Signal 1545:gnat Design Section Eastern Region 0162014 Sig.M2 Std. Fabrication Detail Is-All Poles.dgn

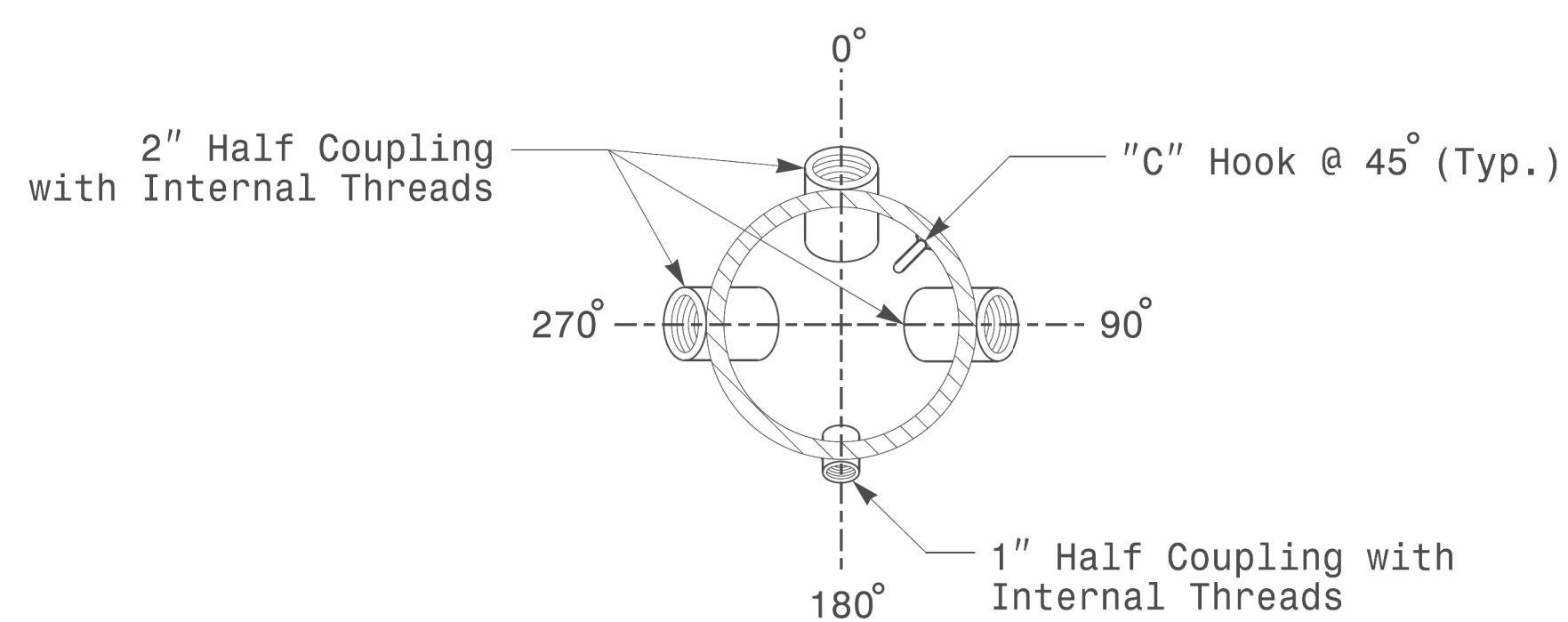
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



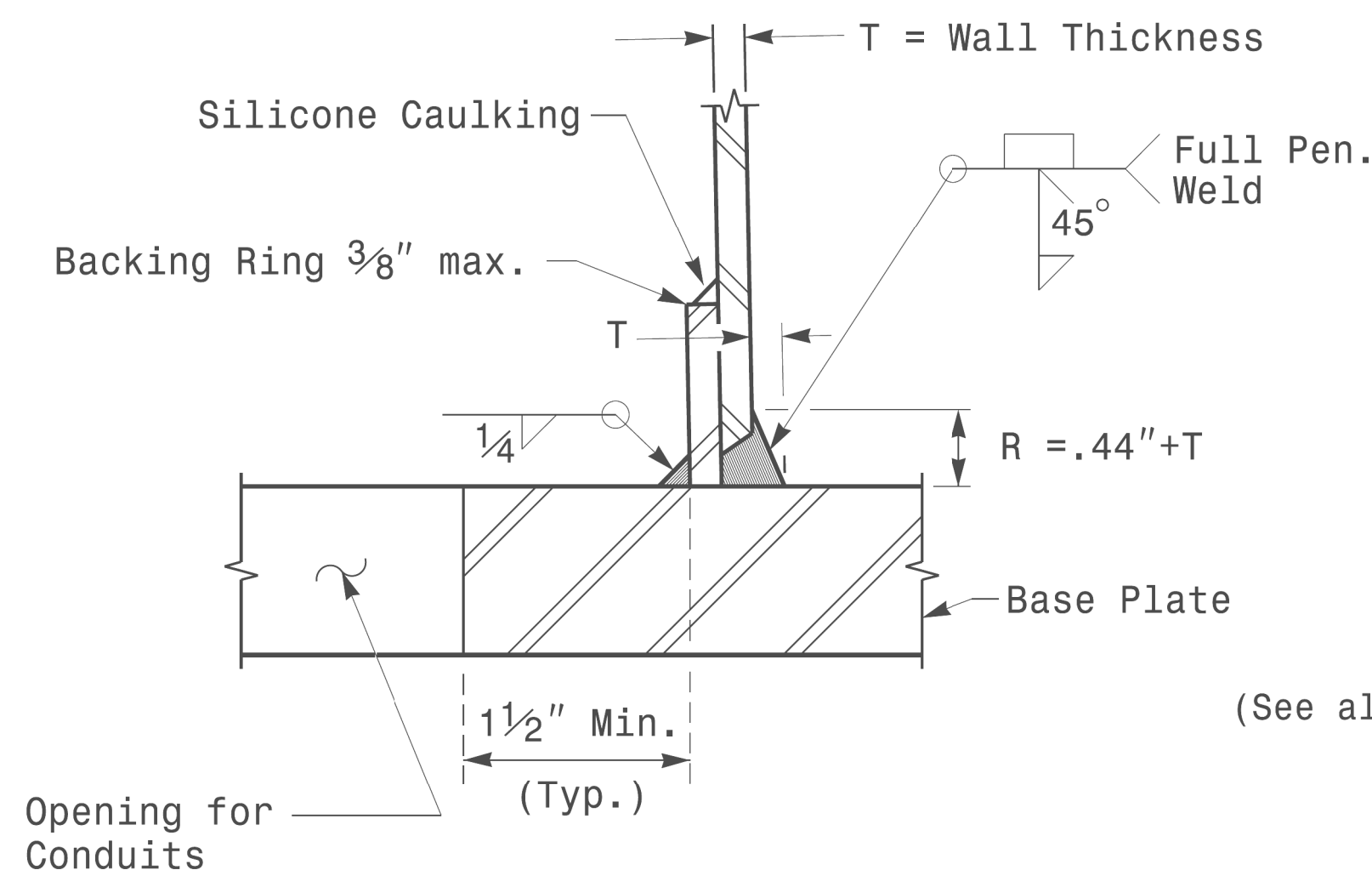
Cable Entrances at Top of Pole



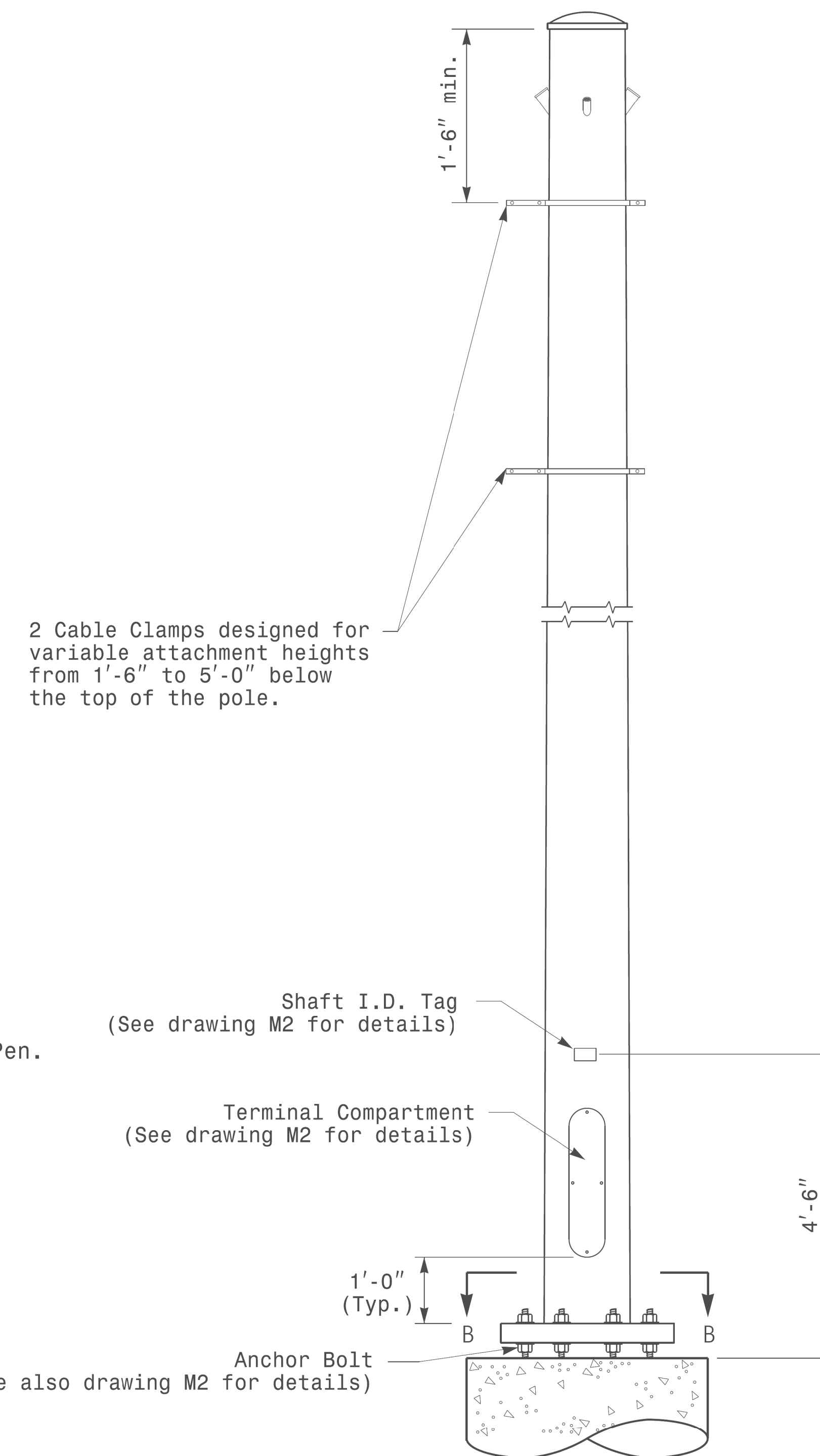
Section B-B Pole Base Plate Details (8 and 12 Bolt Pattern)



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



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

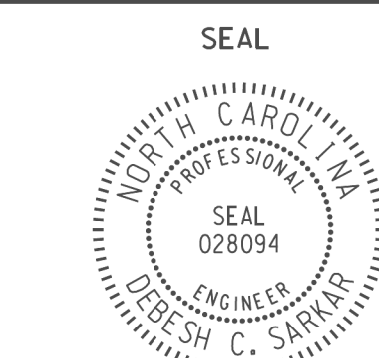


Monotube Strain Pole

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

Typical Fabrication Details For Strain Poles

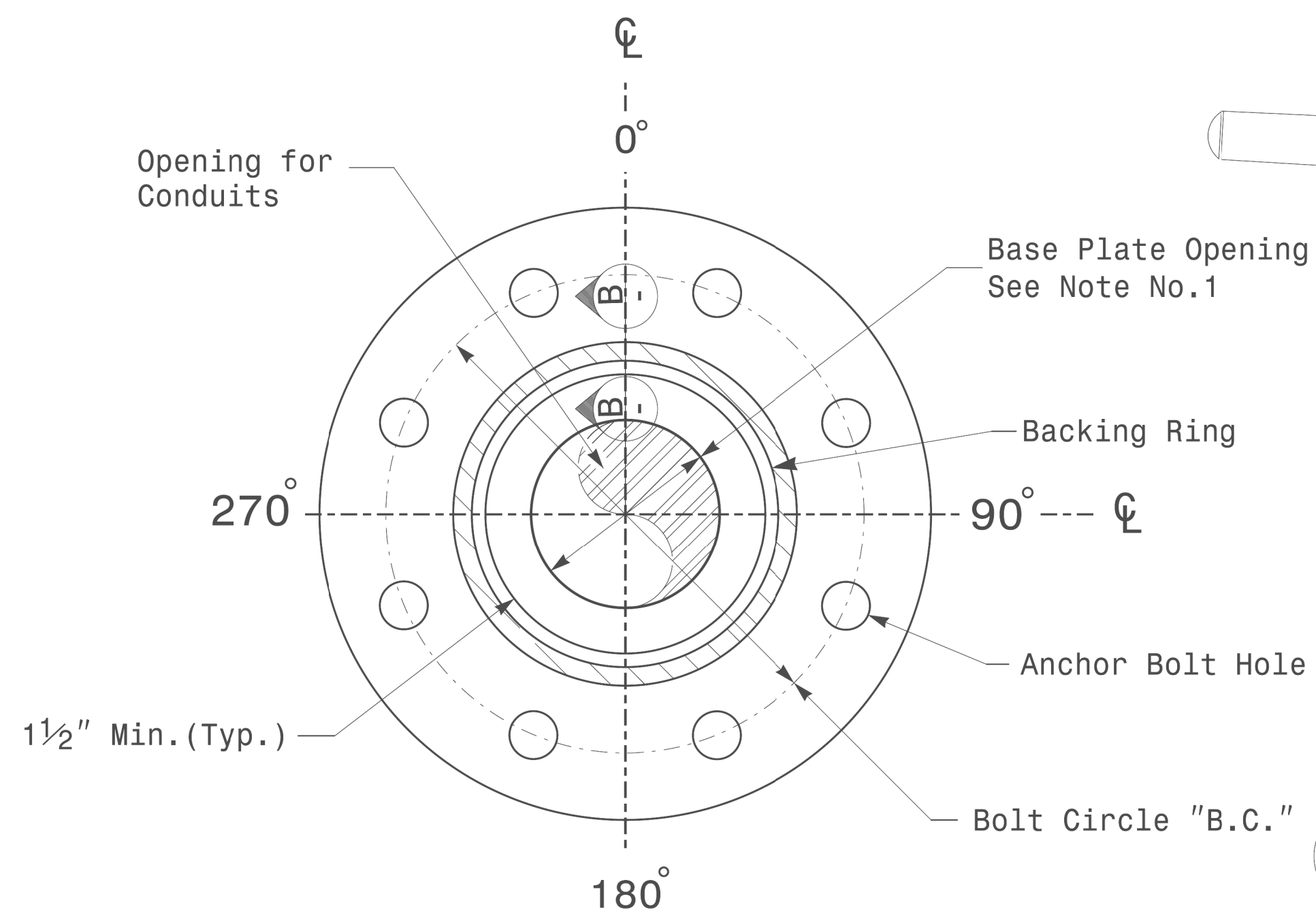
PLAN DATE: OCTOBER 2017	DESIGNED BY: K.C. DURIGON
PREPARED BY: N. BITTING	REVIEWED BY: D.C. SARKAR
REVISIONS	INIT. DATE



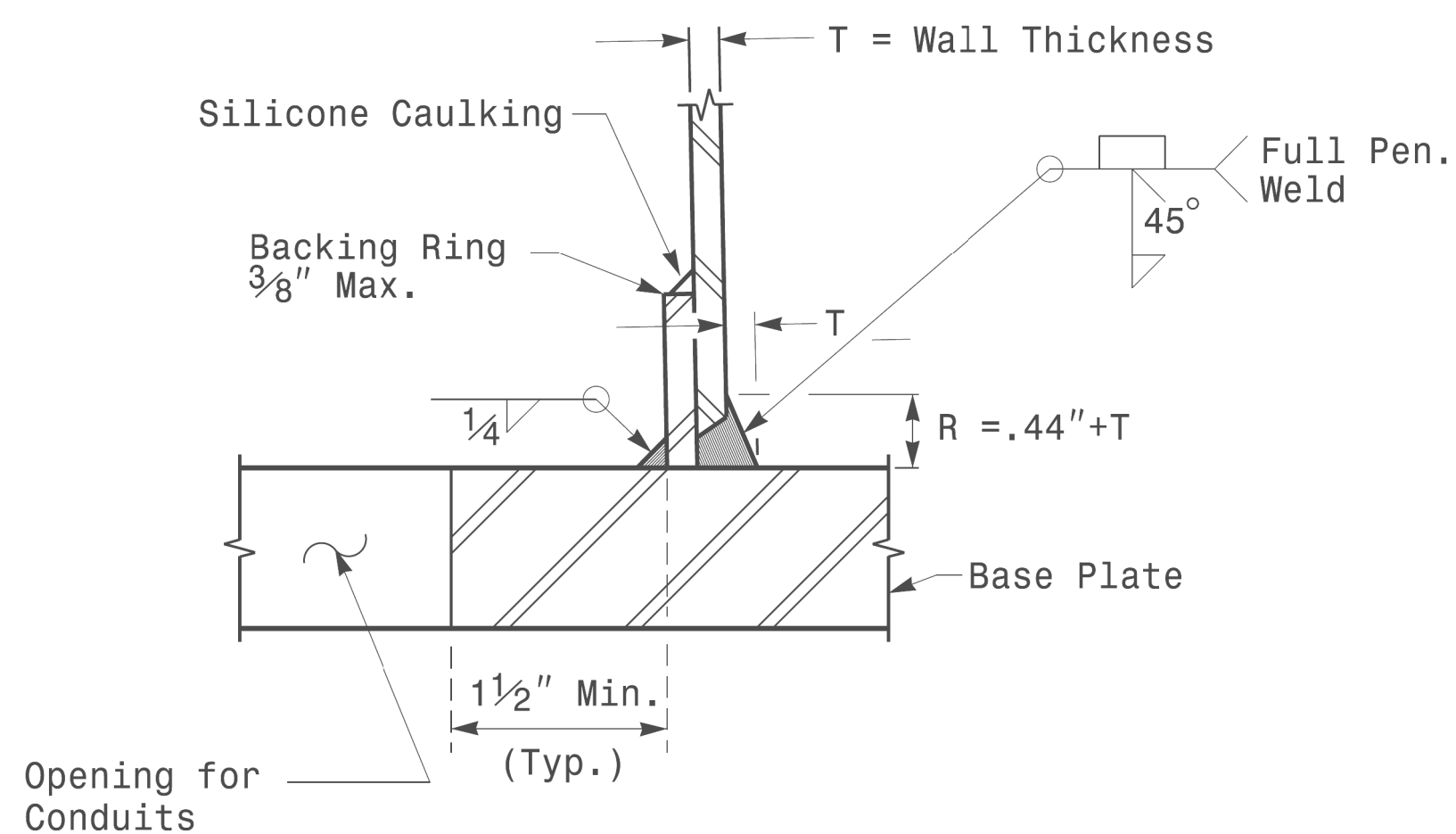
DocuSigned by: Debesh C. Sarkar

10/11/2017 DATE

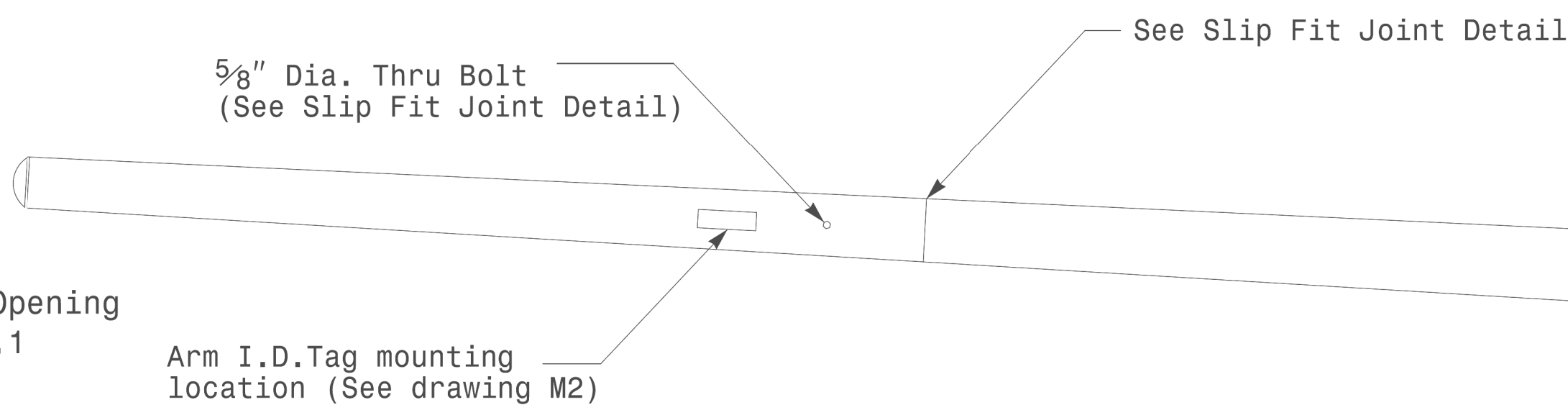
Note:
 1. Opening in pole base plate shall be equal to pole base inside diameter minus 3 1/2" but shall not be less than 8 1/2".



Section A-A
Pole Base Plate Details



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



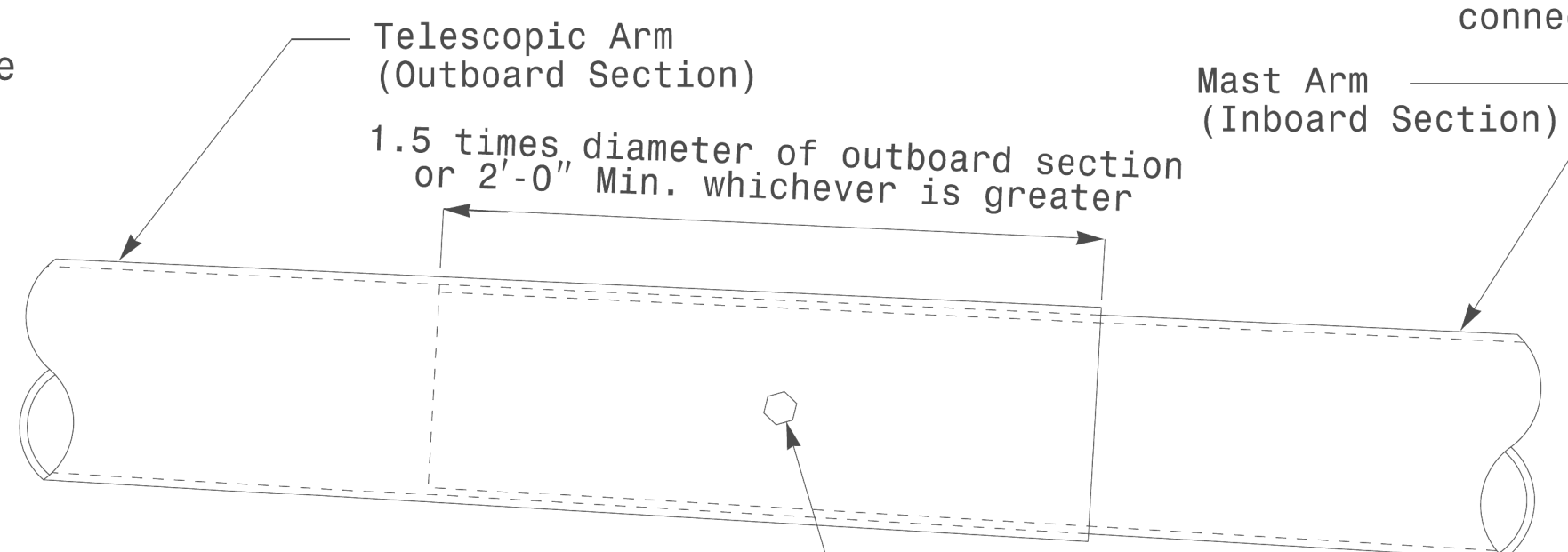
5/8" Dia. Thru Bolt
(See Slip Fit Joint Detail)

See Slip Fit Joint Detail

Hand Hole with cover

Arm I.D.Tag mounting location (See drawing M2)

Arm I.D.Tag mounting location (See drawing M2)



Telescopic Arm (Outboard Section)

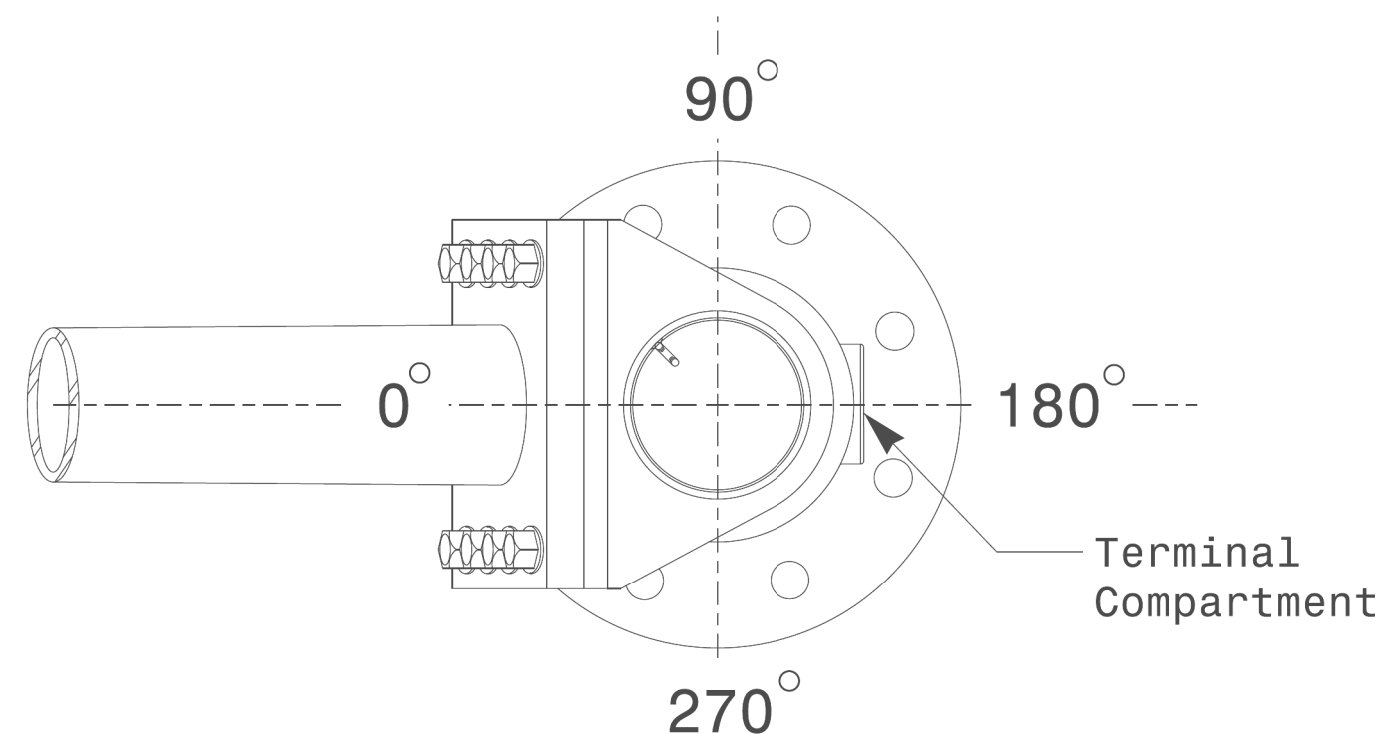
Mast Arm (Inboard Section)

1.5 times diameter of outboard section or 2'-0" Min. whichever is greater

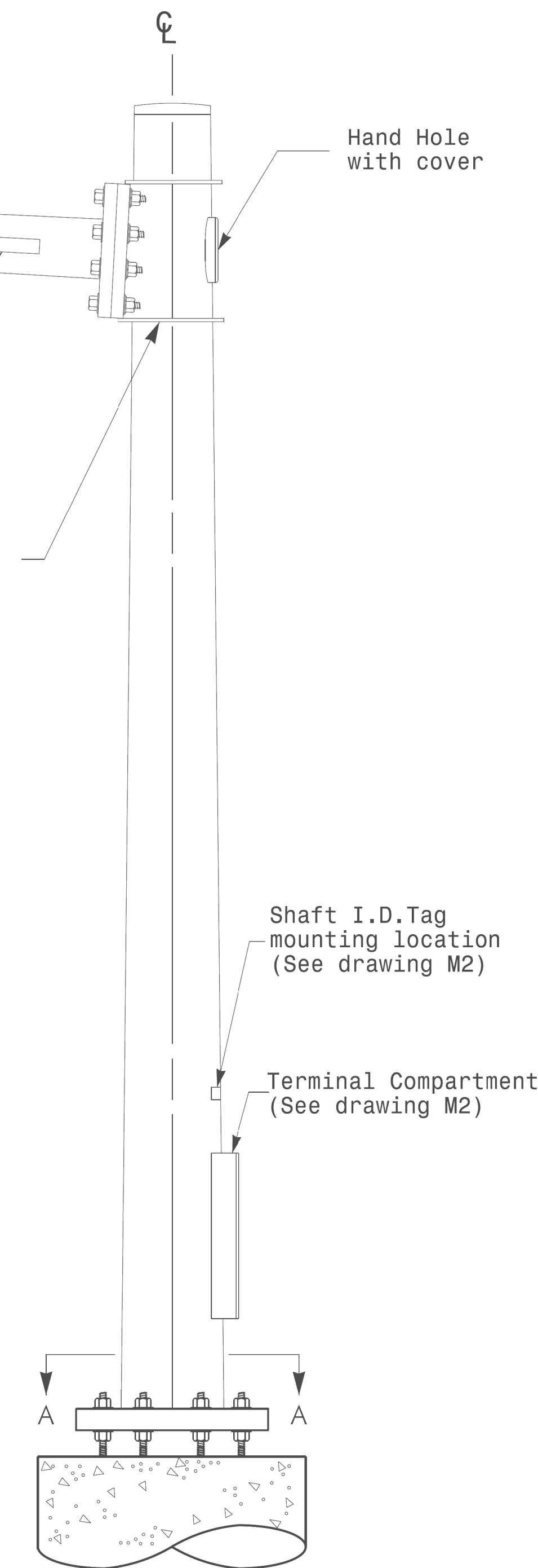
See drawing M5 for Mast Arm connection details

3/4" Factory Drilled Hole in Outboard Tube. Field Drill Inboard Tube. 5/8" Galvanized Thru Bolt with (2) Hex. Locknuts Each.

Slip Fit Joint Detail for Mast Arm



Mast Arm Radial Orientation



Mast Arm Pole

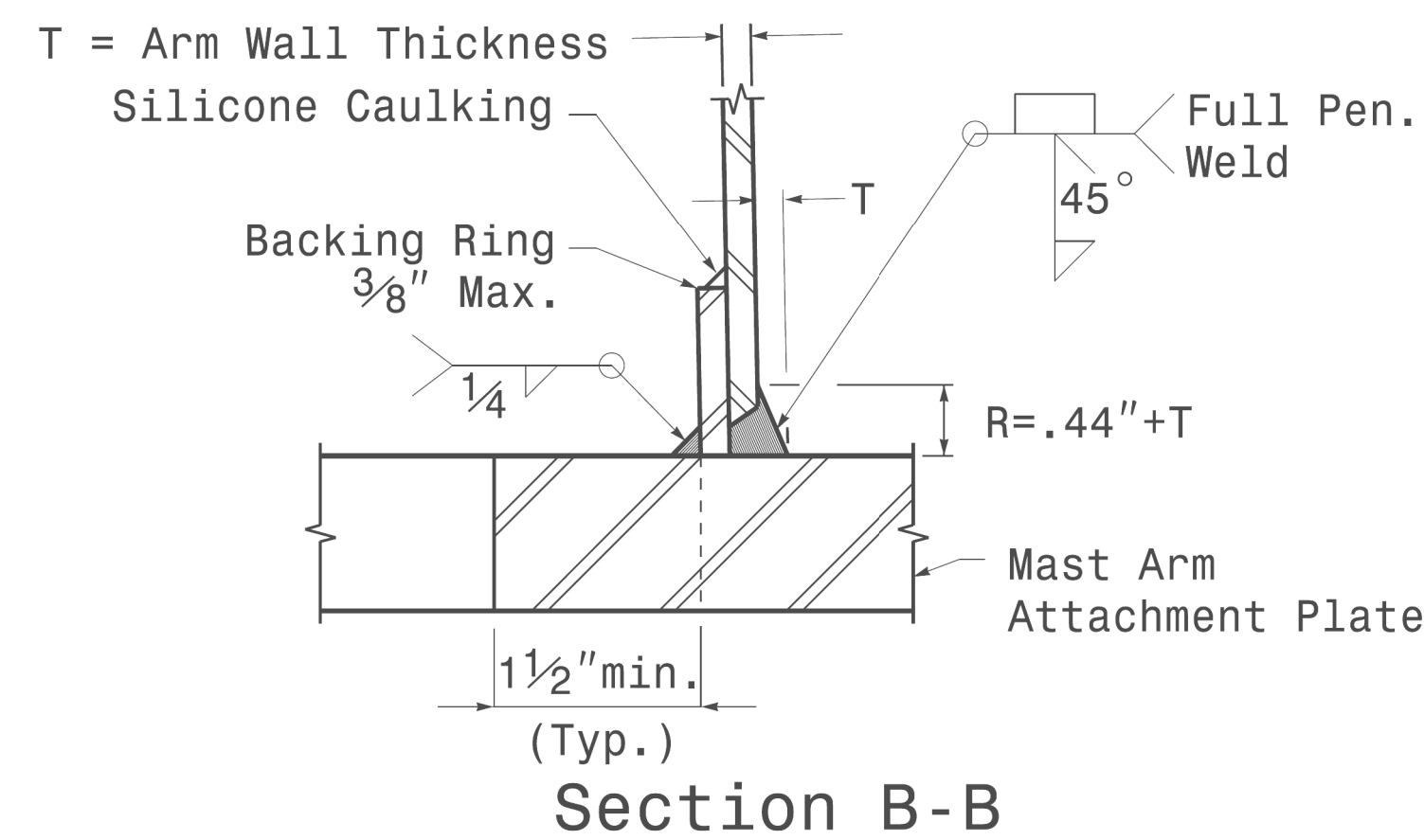
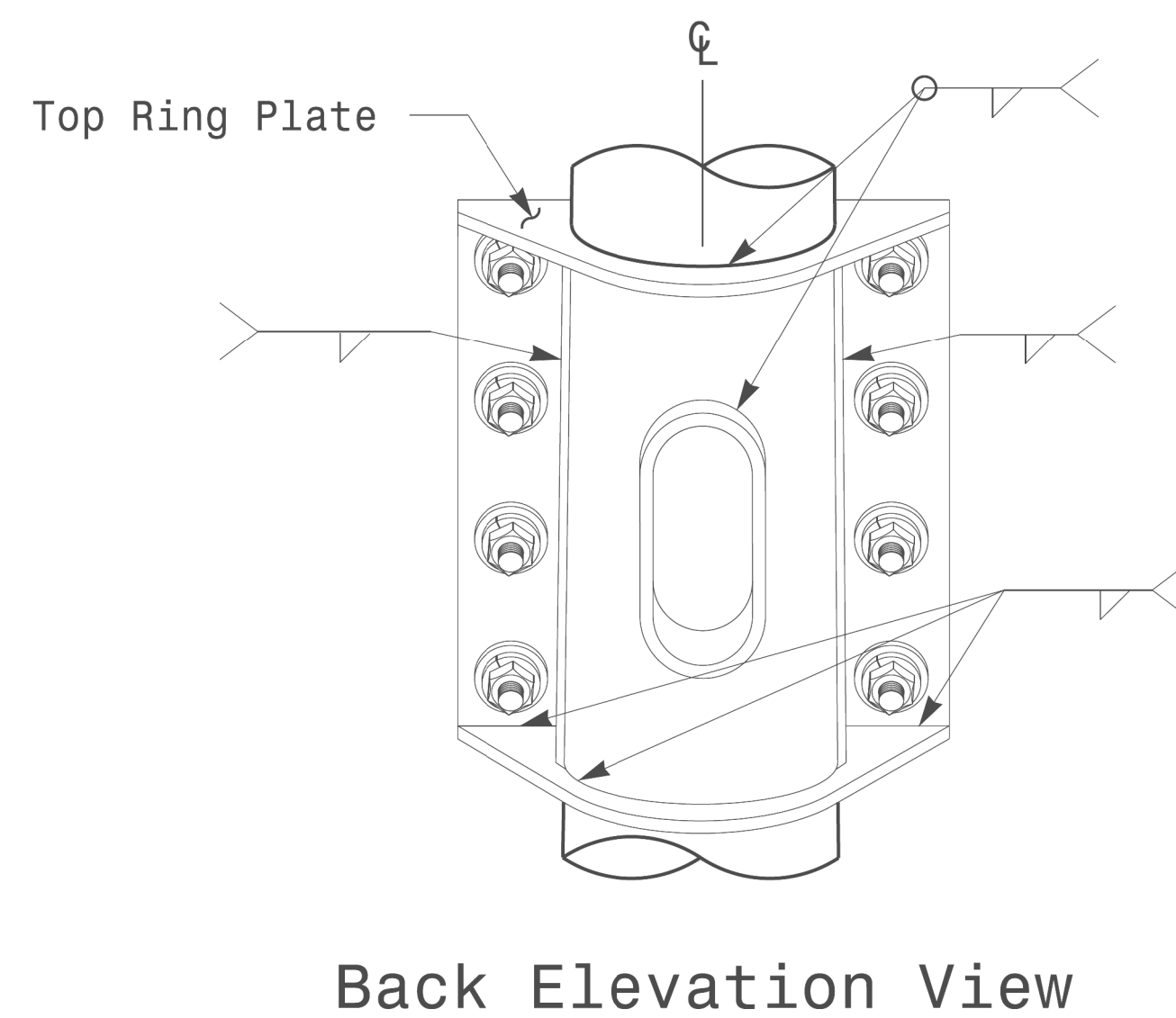
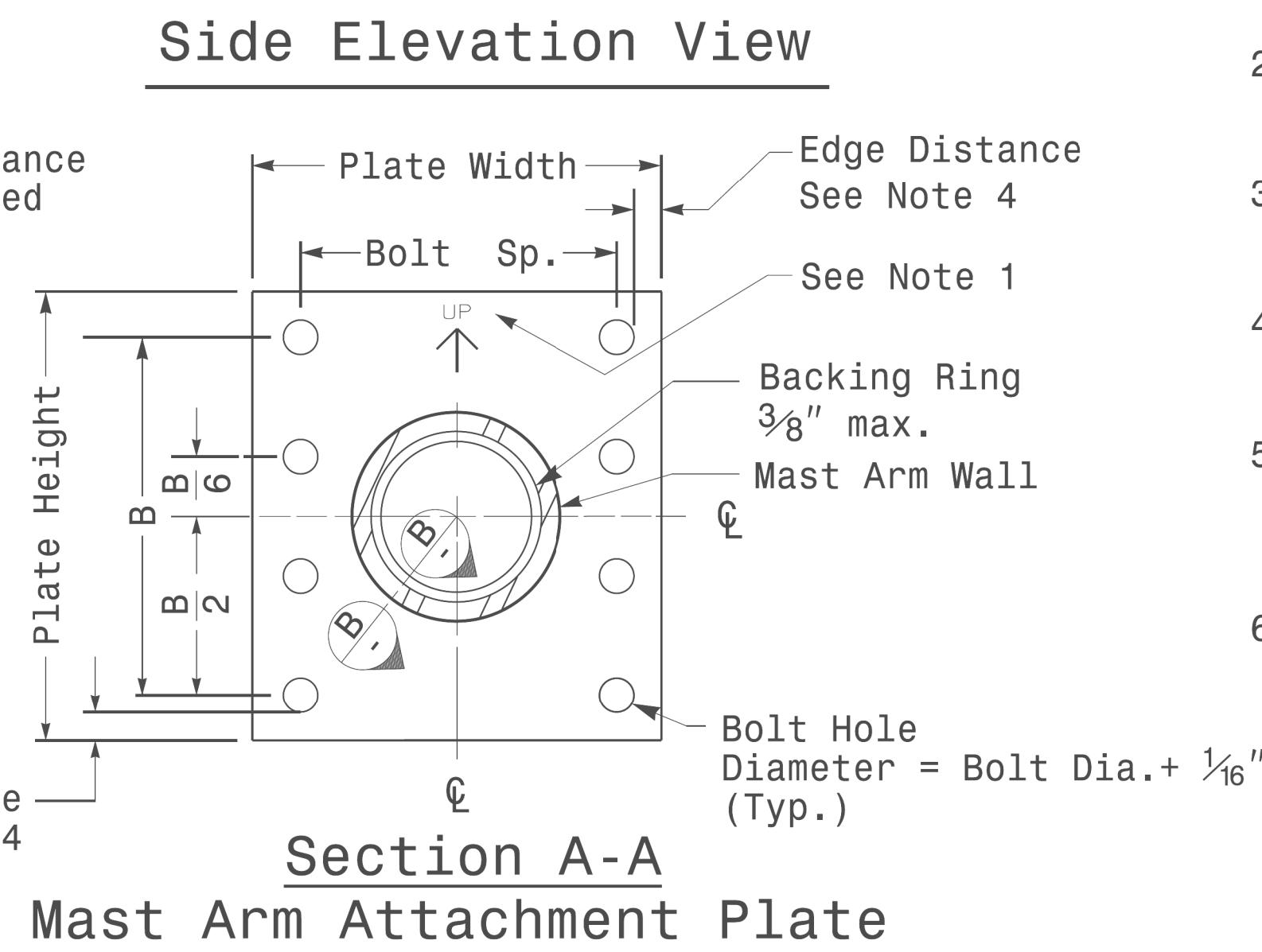
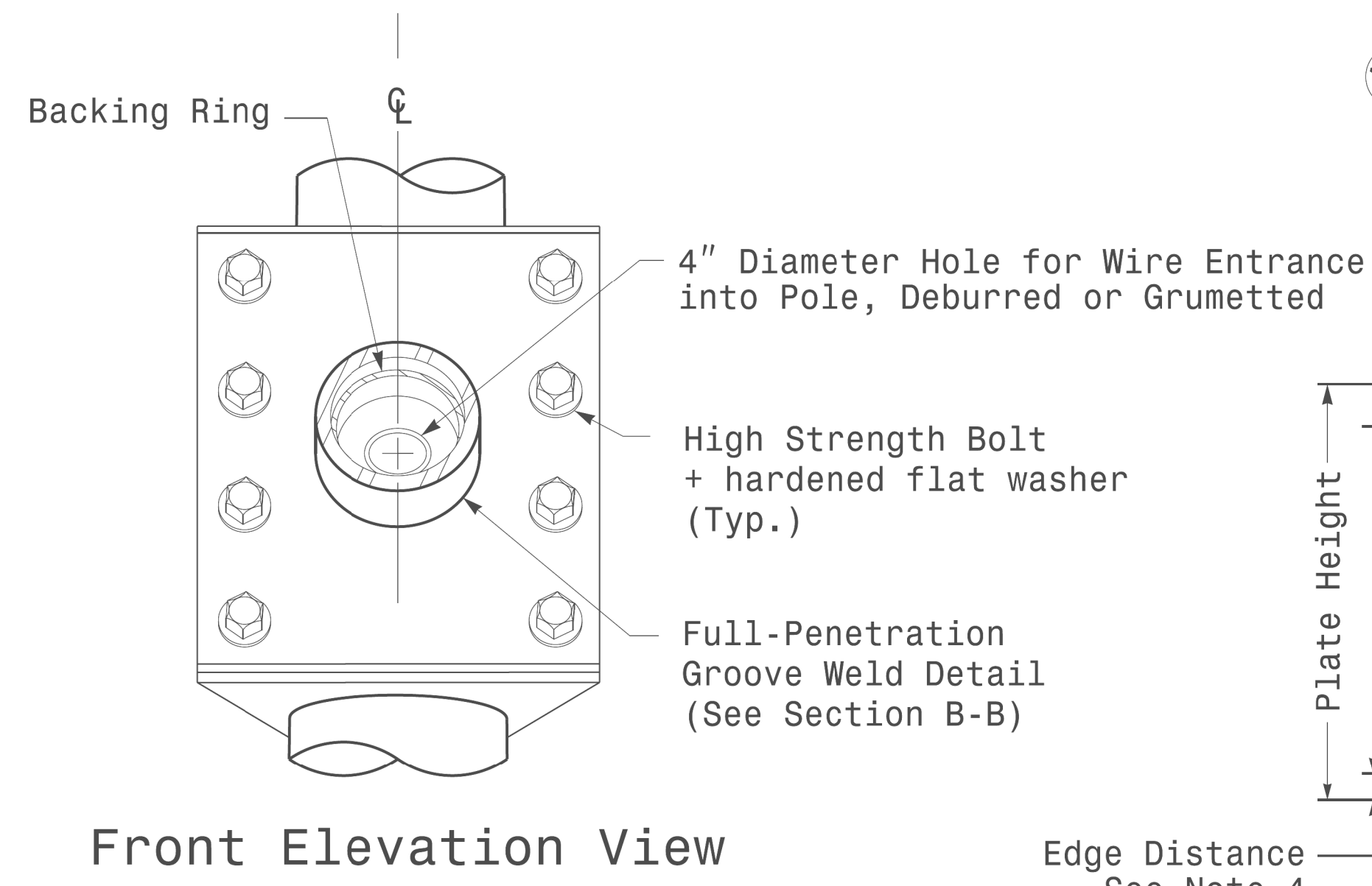
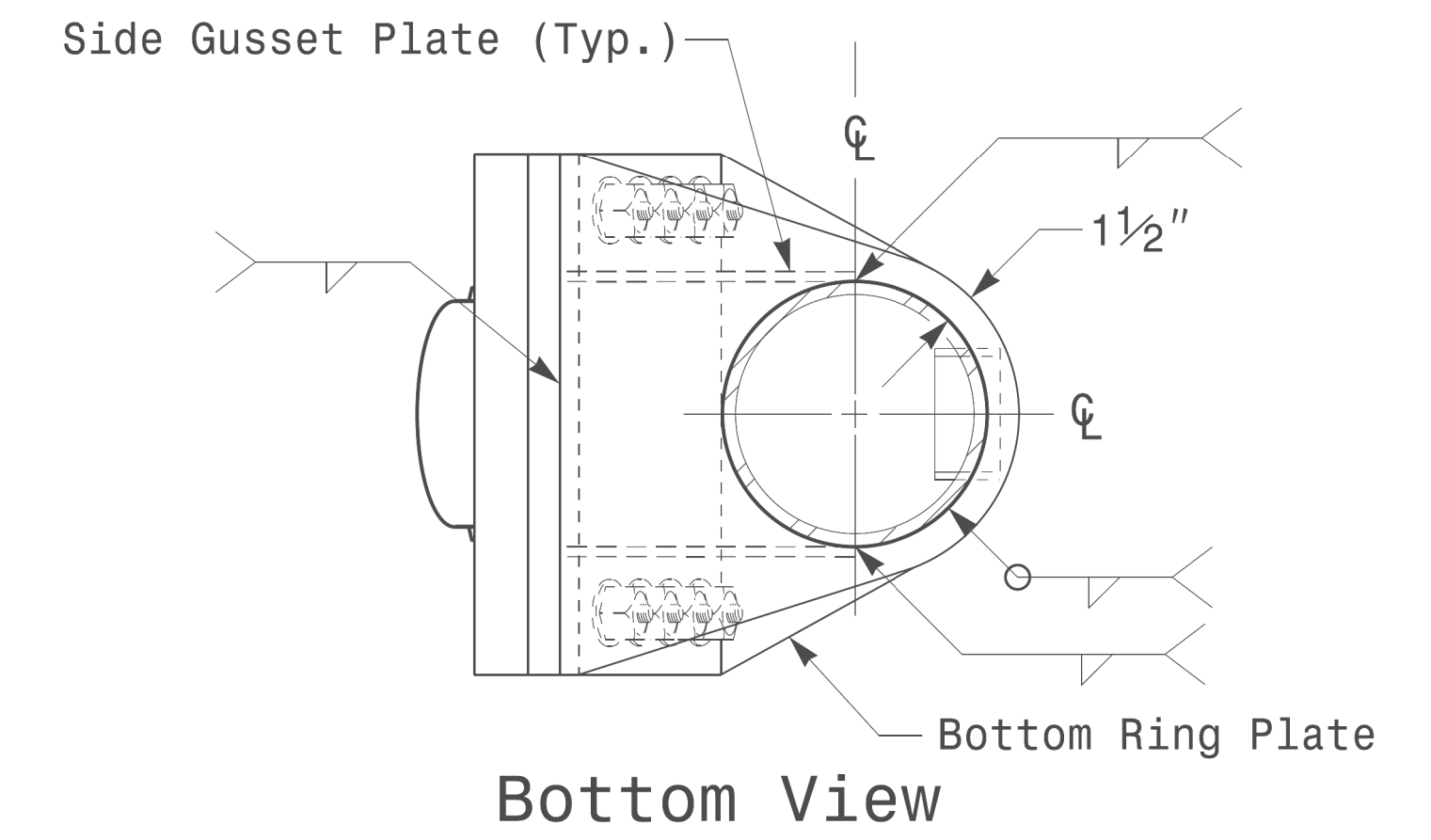
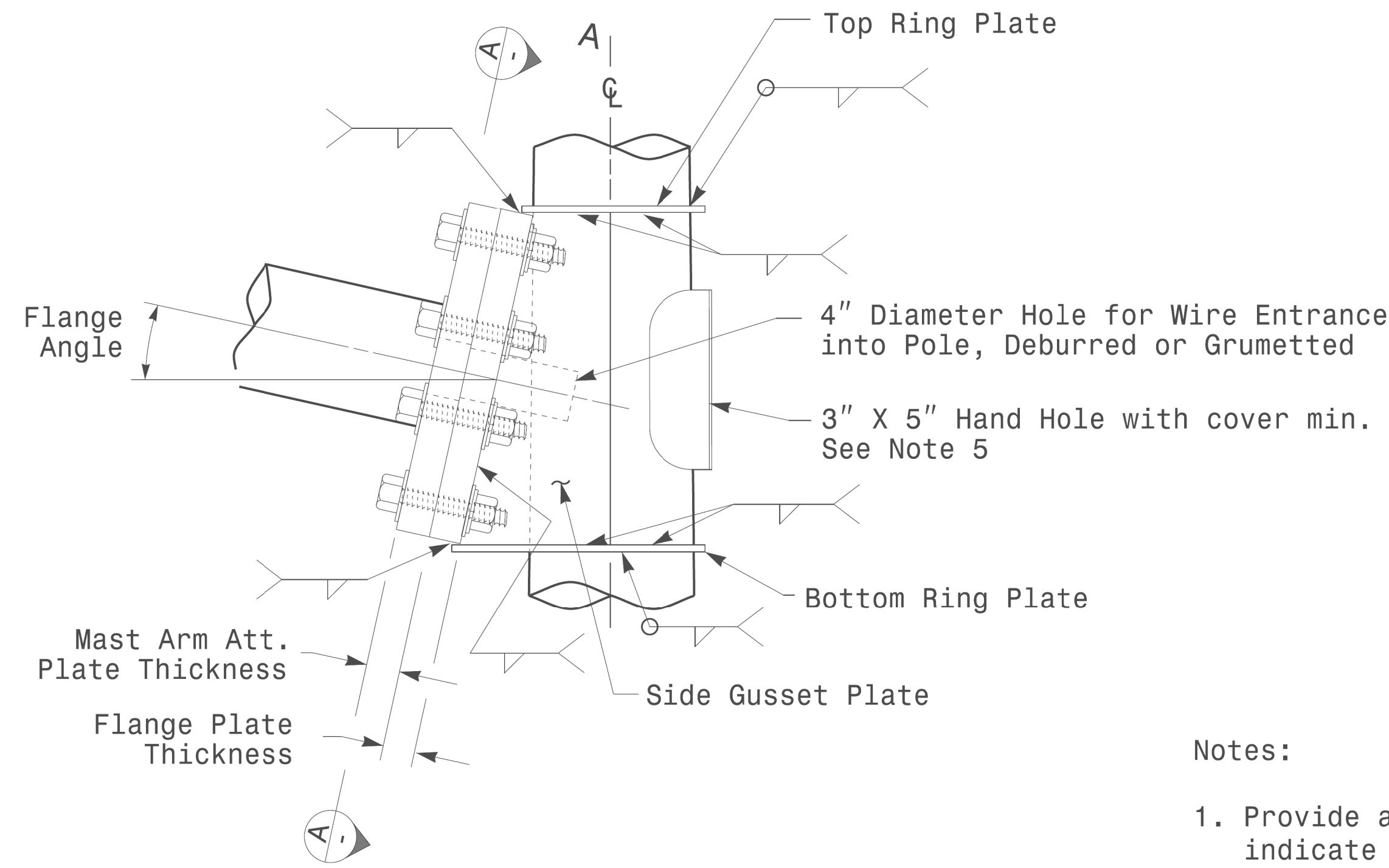
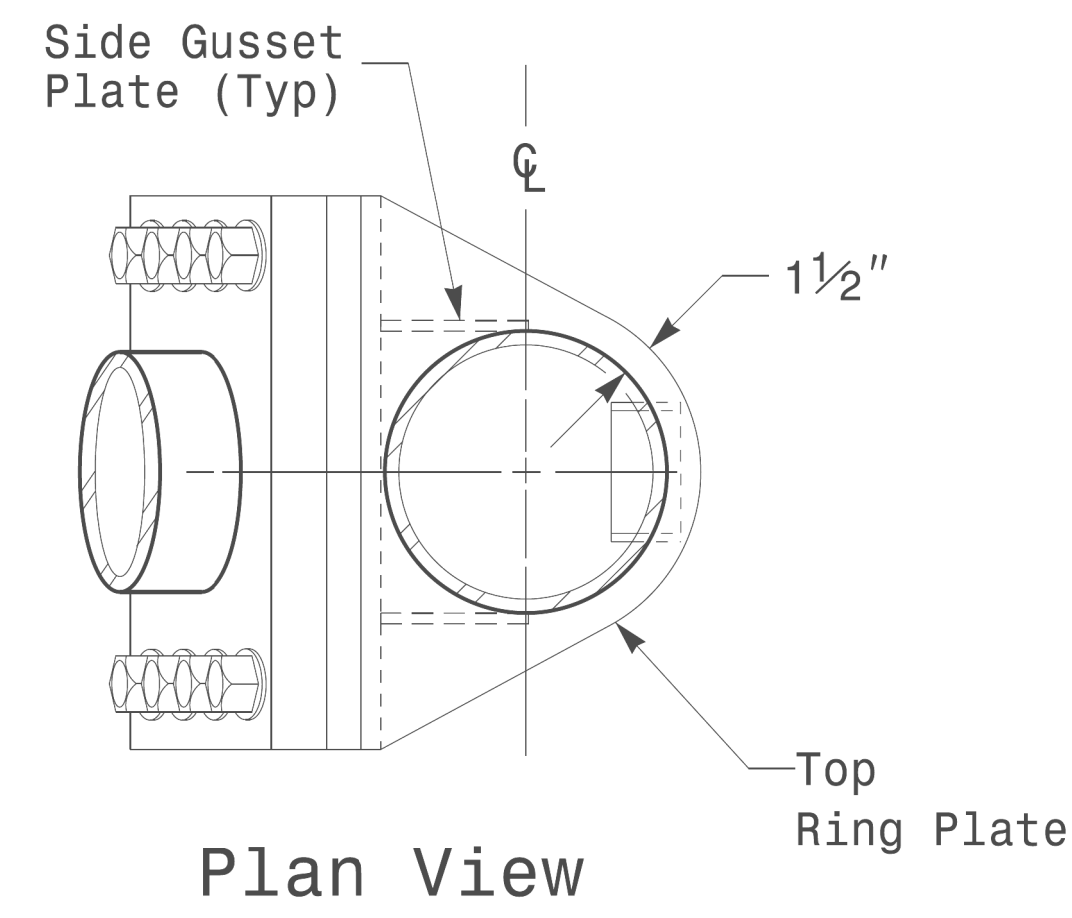
	Typical Fabrication Details For Mast Arm Poles		
	PLAN DATE: OCTOBER 2017 PREPARED BY: N. BITTING	DESIGNED BY: K.C. DURIGON REVIEWED BY: D.C. SARKAR	
Prepared in the Offices of:			SEAL NORTH CAROLINA PROFESSIONAL ENGINEER D. C. SARKAR 028094 DocuSigned by: Dinesh C. Sarkar 442632949
750 N. Greenfield Pkwy, Garner, NC 27529			10/11/2017 DATE

Fabrication Details – Mast Arm Poles

Welded Ring Stiffened Mast Arm Connection

PROJECT ID. NO. SHEET NO.

R-3300B Sig.M5



Notes:

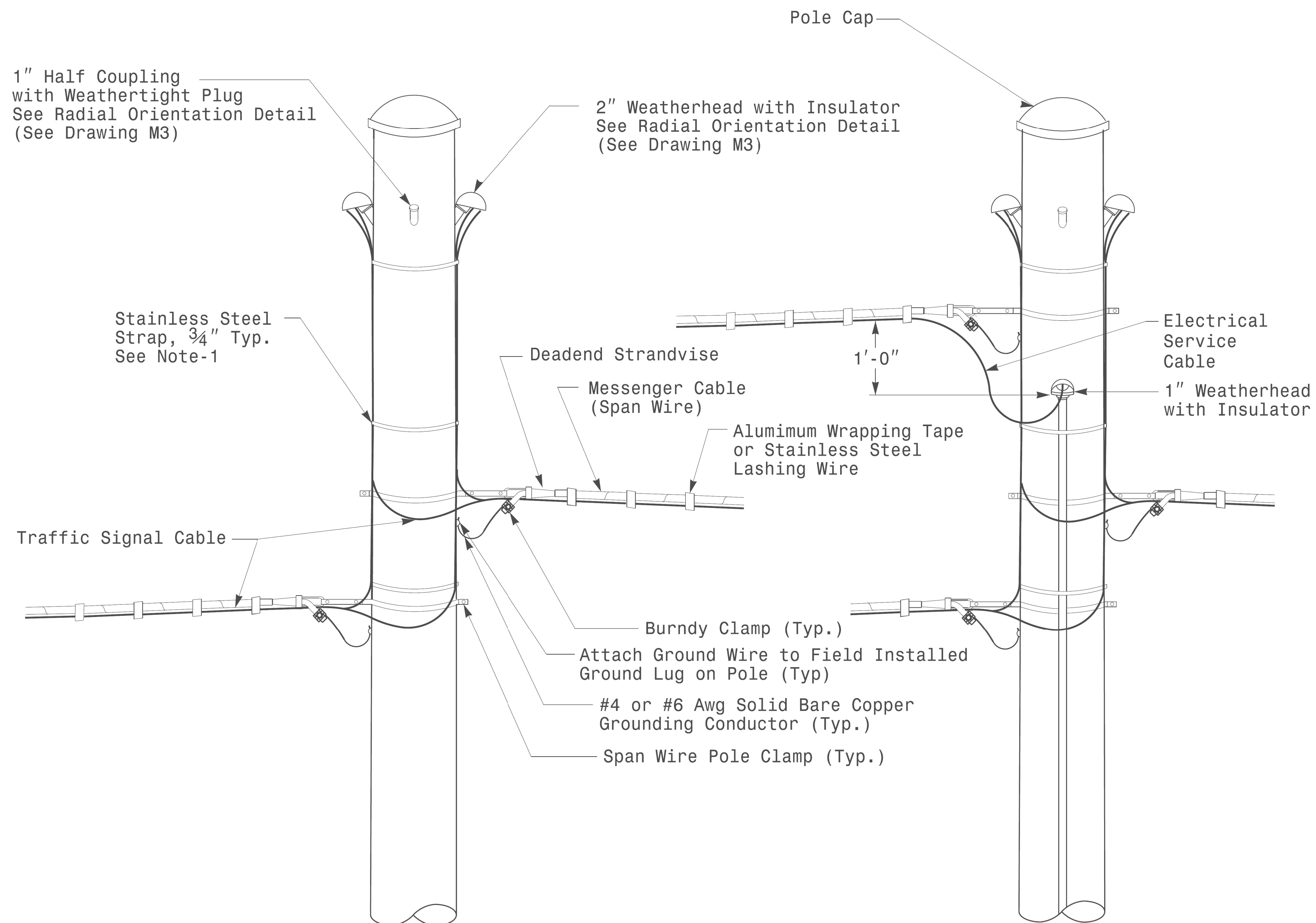
1. Provide a permanent means of identification above the mast arm to indicate proper attachment orientation of the mast arm.
2. Designer will determine the size of all structural components, plates, fasteners, and welds shown unless they are already specified.
3. Fabricator is responsible for providing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

<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> <p>DocuSigned by: Dinesh C. Sarkar</p>
	<p>PLAN DATE: OCTOBER 2017</p>	<p>DESIGNED BY: C.F. ANDREWS</p>	
<p>SCALE: 0 NA NONE</p>	<p>PREPARED BY: N. BITTING</p>	<p>REVIEWED BY: D.C. SARKAR</p>	<p>INIT. DATE</p>
			<p>10/11/2017</p>

11-001-2017-08-135
 S:\Projects\1715\Sig.M5\1715_Sig.M5.dgn
 Connection Fabricator: Detail: Mast Arm Pole.dgn
 11-001-2017-08-135
 S:\Projects\1715\Sig.M5\1715_Sig.M5.dgn
 Connection Fabricator: Detail: Mast Arm Pole.dgn

Fabrication Details - Mast Arm Connection

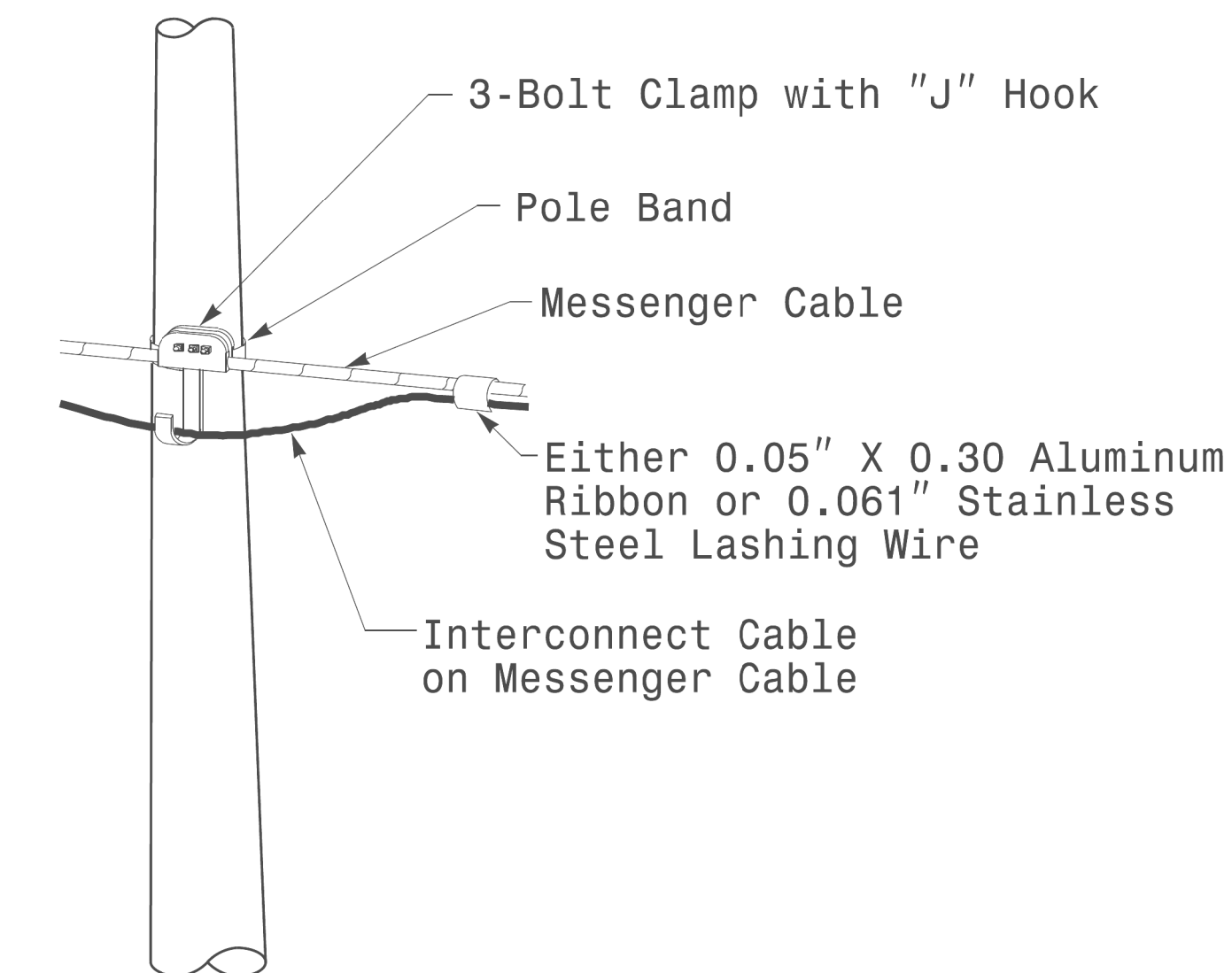
Fabrication Details – Strain Pole Attachments



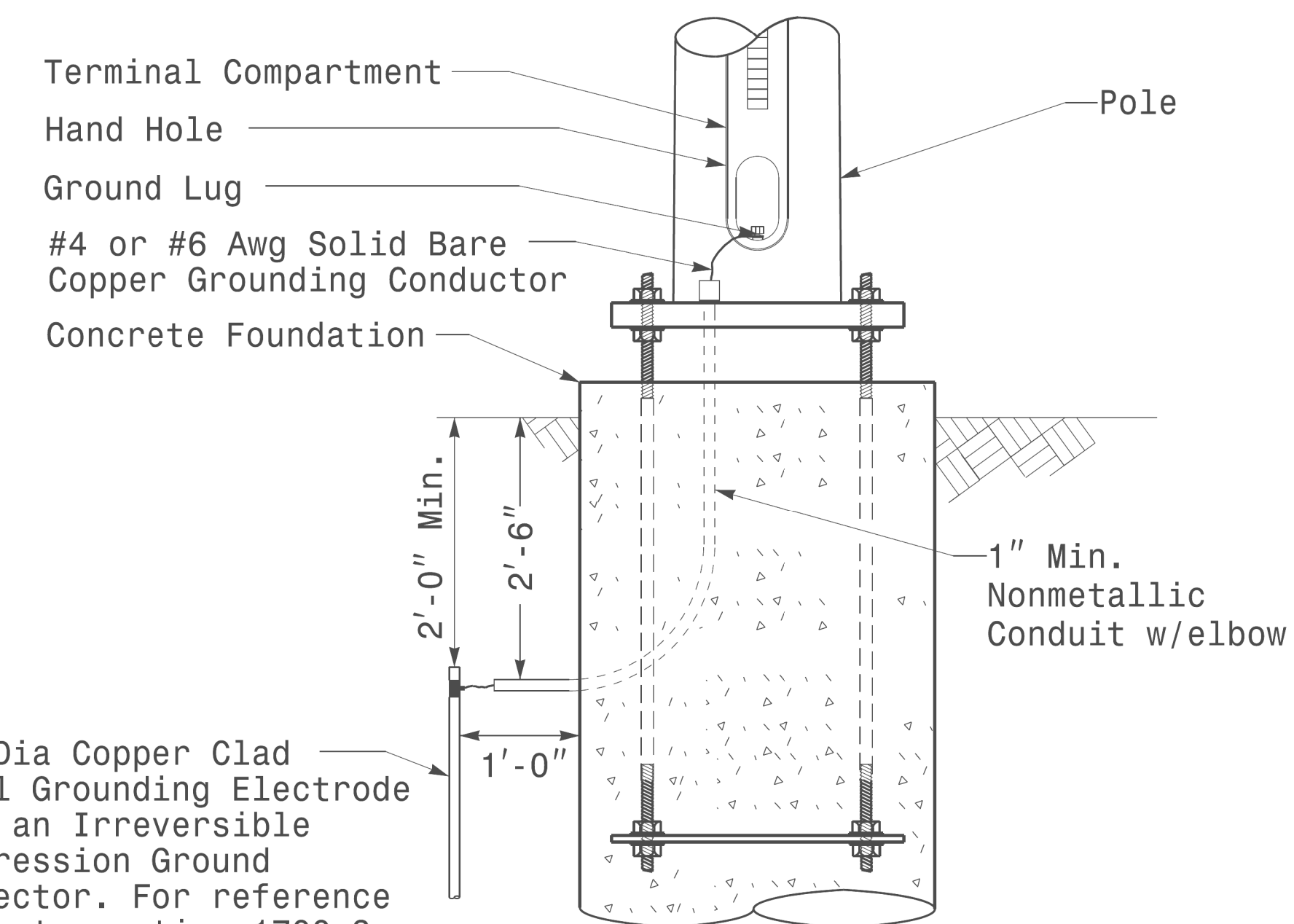
Strain Pole Attachments

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

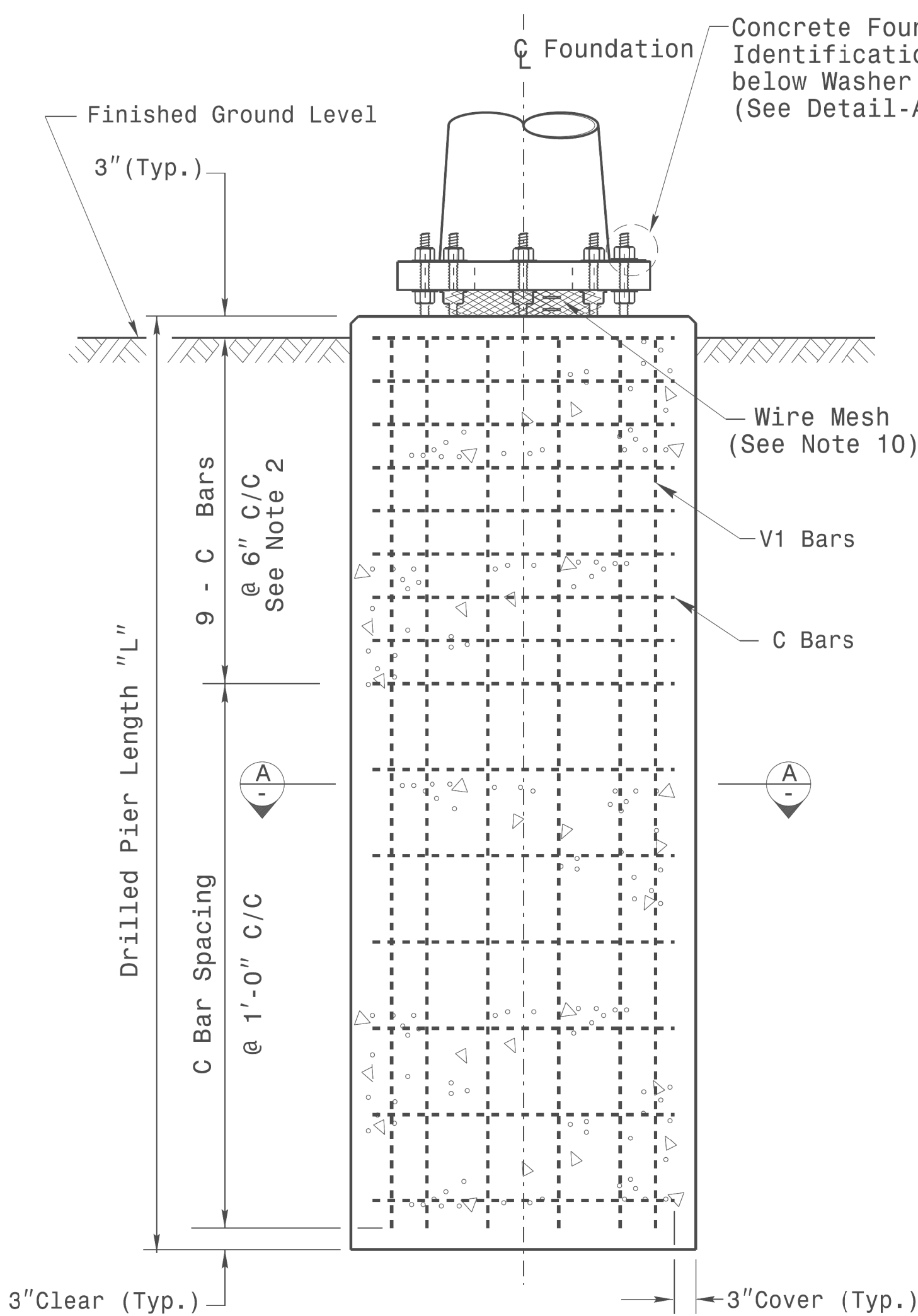


5/8" Dia Copper Clad Steel Grounding Electrode with an Irreversible Compression Ground Connector. For reference refer to section 1700-3 K and L for electrical grounding and bonding requirements, See Note 4.

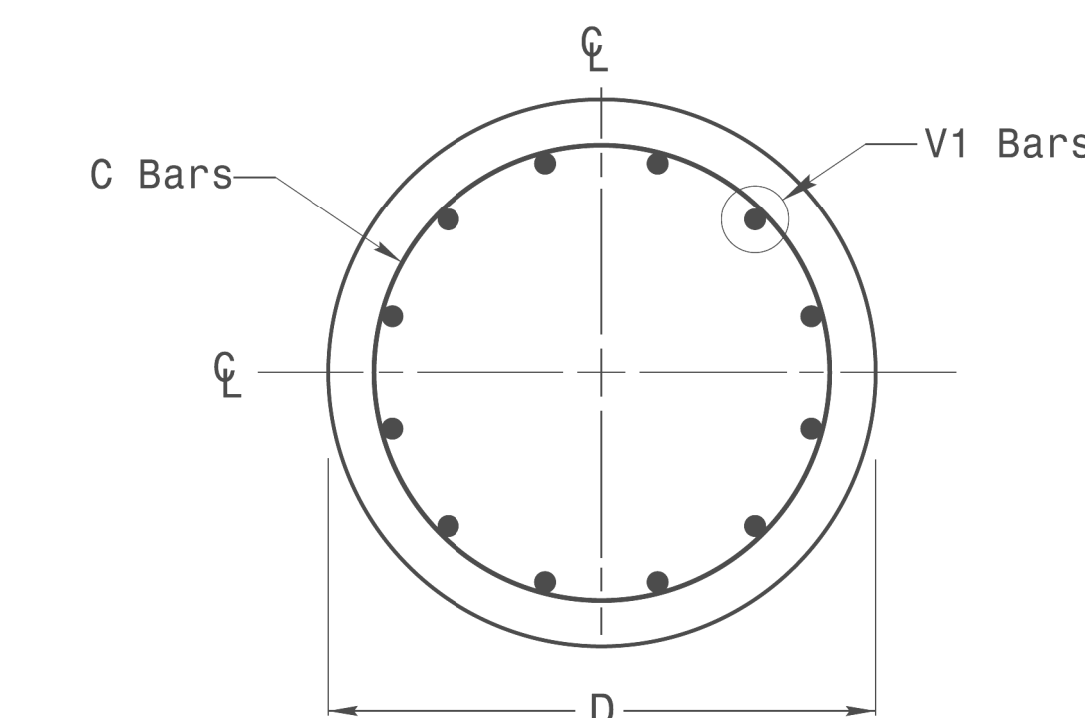
Metal Pole Grounding Detail For Strain Pole and Mast Arm

<p>Prepared In the Offices of:</p> <p>750 N. Greenfield Pkwy, Garner, NC 27529</p>	<p>Typical Fabrication Details For Strain Pole Attachments</p>		<p>SEAL</p> <p>DocuSigned by: Debesh C. Sarkar 10/11/2017</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>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> </tr> </table>		INIT.	DATE			
INIT.	DATE							

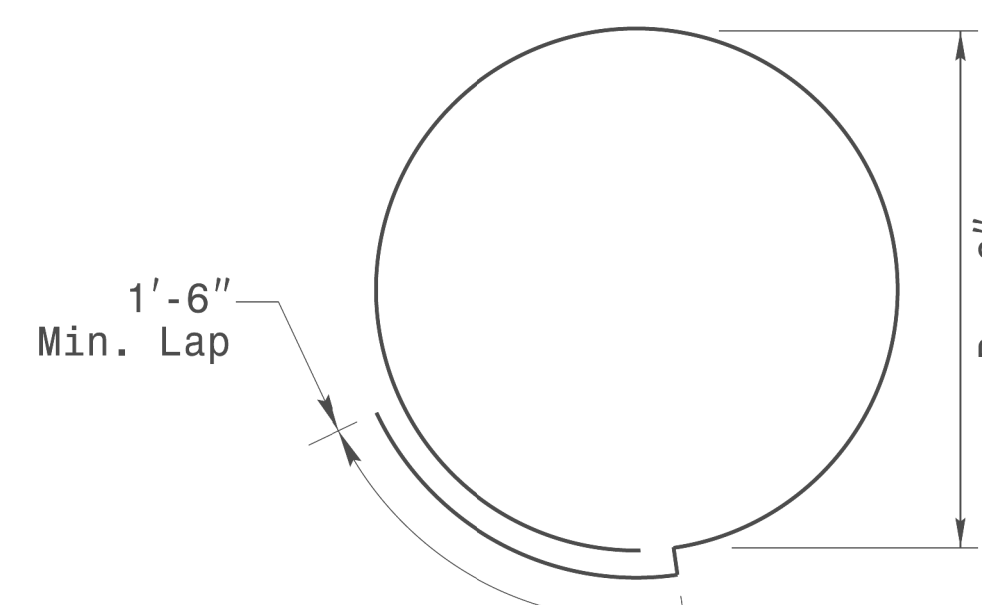
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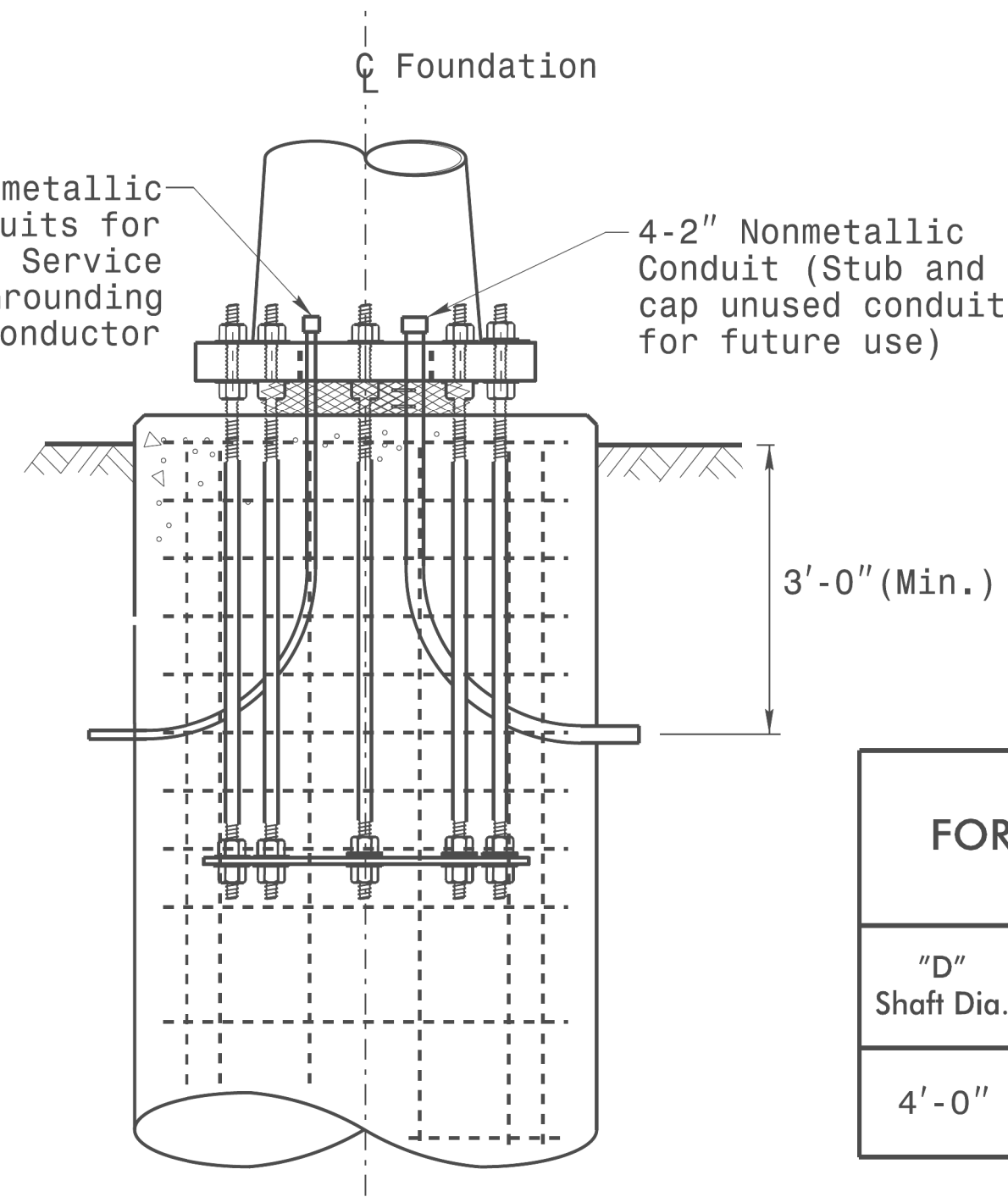
Concrete Shaft Elevation



Section A-A



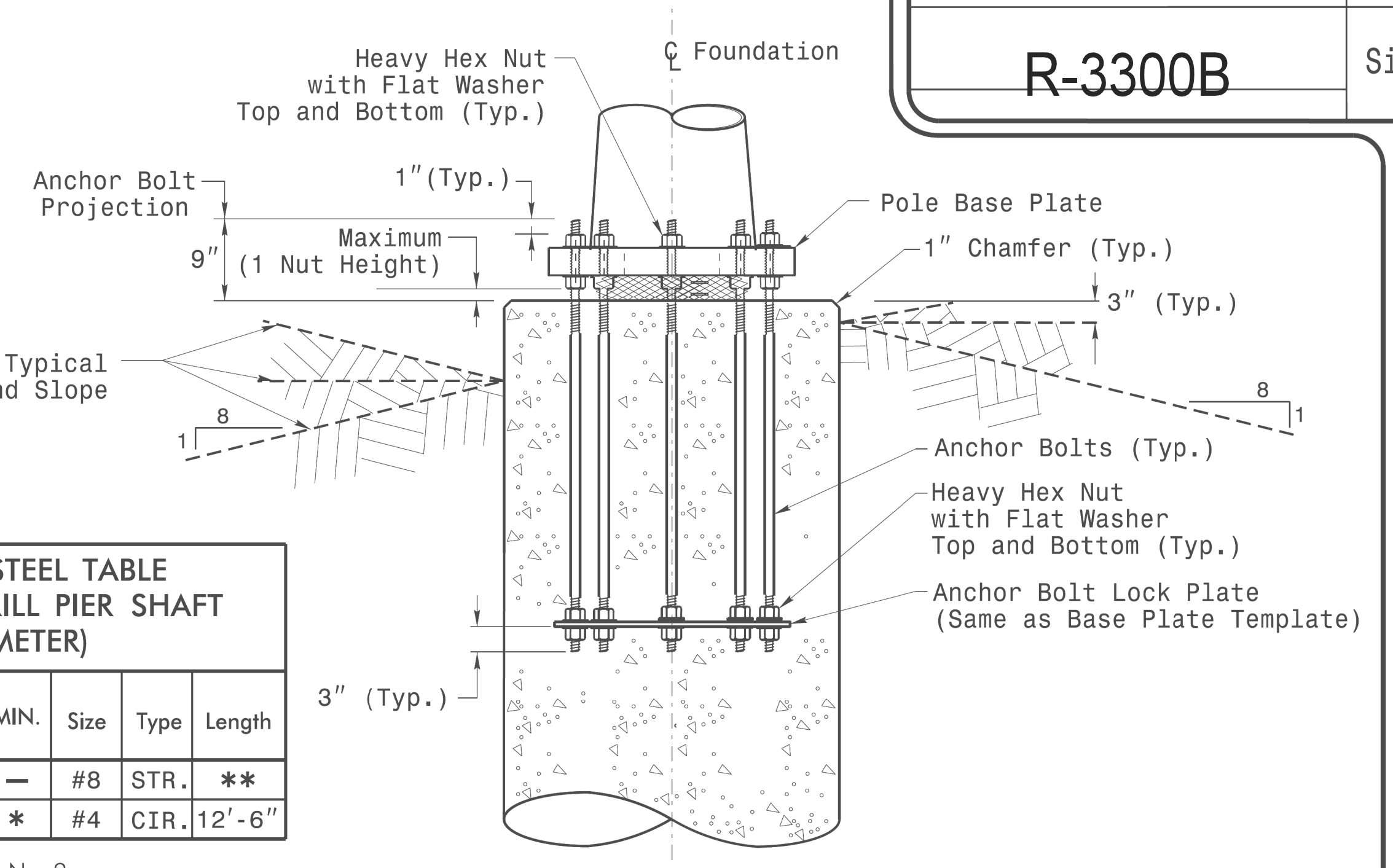
Typical "C" Bar Detail



Typical Foundation Conduit Details

REINFORCING STEEL TABLE FOR STANDARD DRILL PIER SHAFT (4'-0" DIAMETER)						
"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

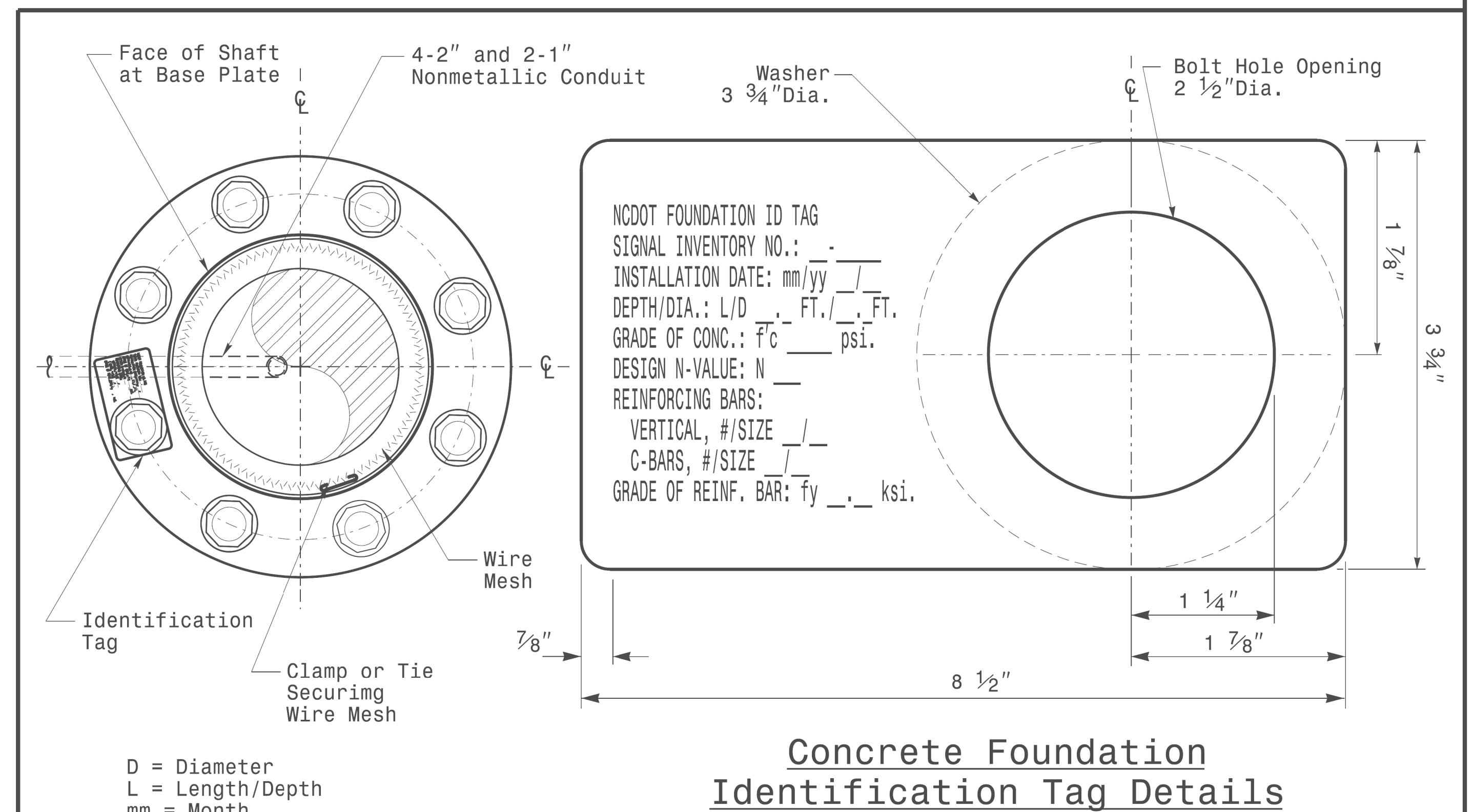


Typical Foundation Anchor Bolt Details

(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](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;



Concrete Foundation Identification Tag Details

Detail-A

Prepared in the Offices of:

**Construction Details
For
Foundations**

PLAN DATE: OCTOBER 2018 DESIGNED BY: C.B. COGDPELL
PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR

REV. NO.	COMMENTS	INIT.	DATE
1	Revised Foundation Tag Details	N.B.	5/11/2015

SEAL

DocuSigned by: *D. Sarkar*
ADDRESS/SIGNATURE

10/11/2017
DATE

Construction Details – Foundations

SOIL CONDITION

PROJECT ID. NO. SHEET NO.

R-3300B 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.

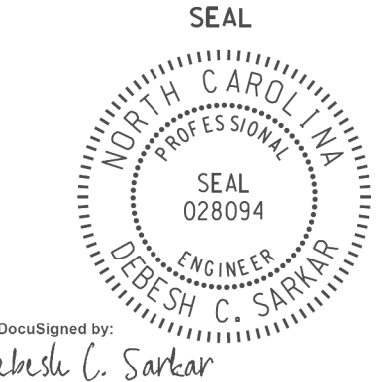
Foundation Selection:

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

11/05/2017 08:40 S:\IT\ASU\15 Signal\sigmod_Design Section\Eastern Region\MM_Sheets\2016\2014 Sig.M8 Std. Strain Pole Found.-Structured Soil Condition.dgn rnz/rae

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



SEAL
NORTH CAROLINA
PROFESSIONAL ENGINEER
028094
D.C. SARKAR

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

Scale: 0 NA NONE

750 N. Greenfield Pkwy, Garner, NC 27529

0 NONE

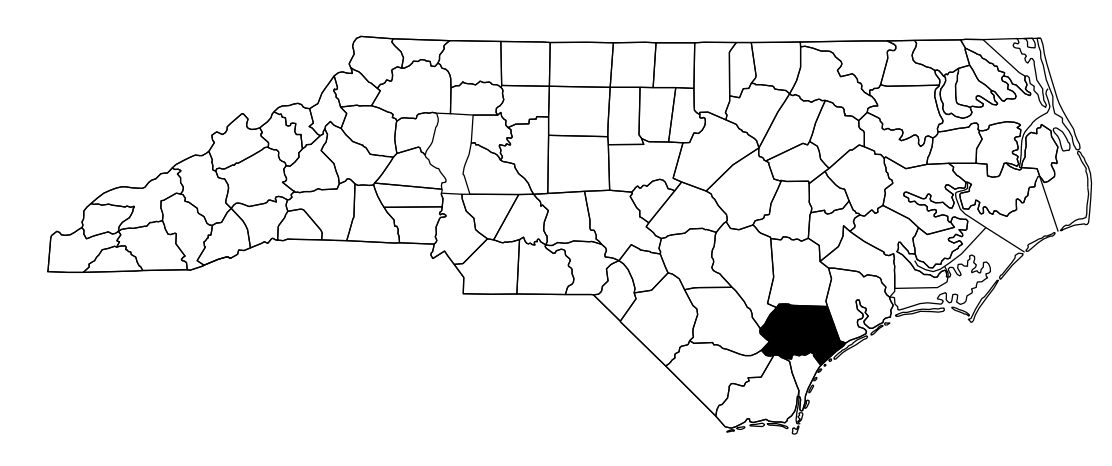
10/11/2017

STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

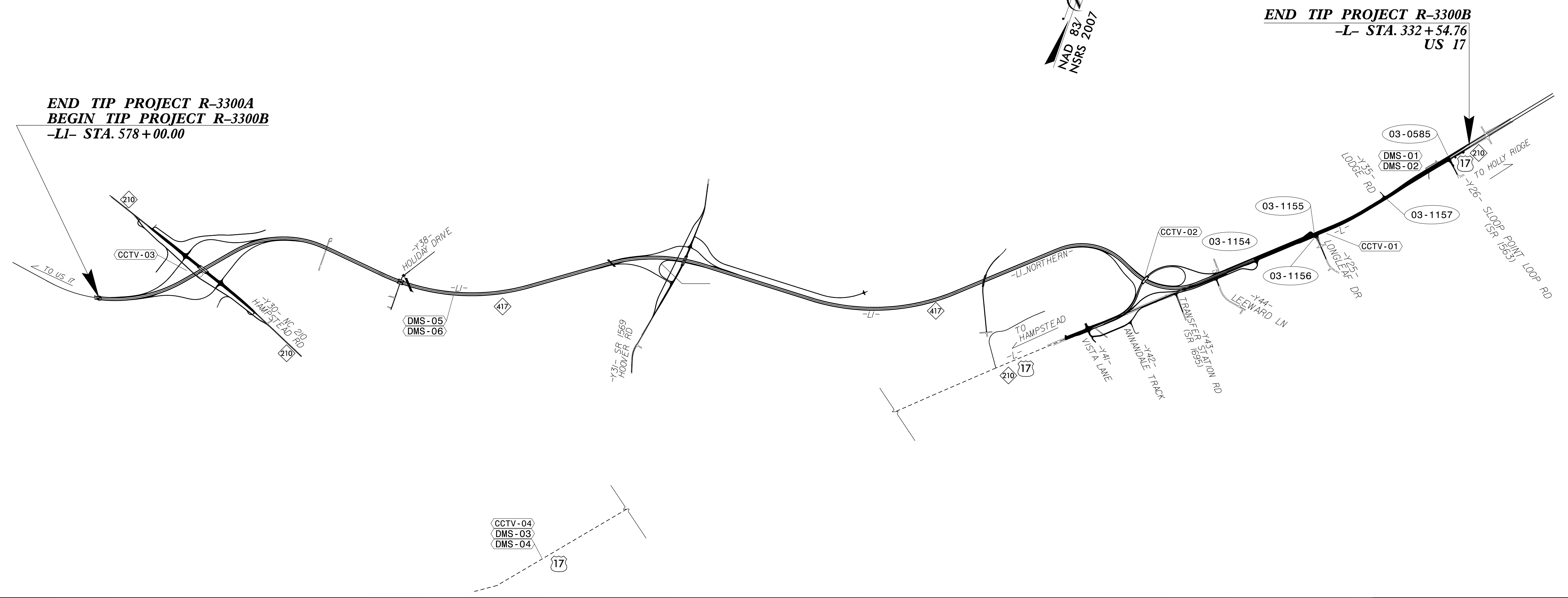
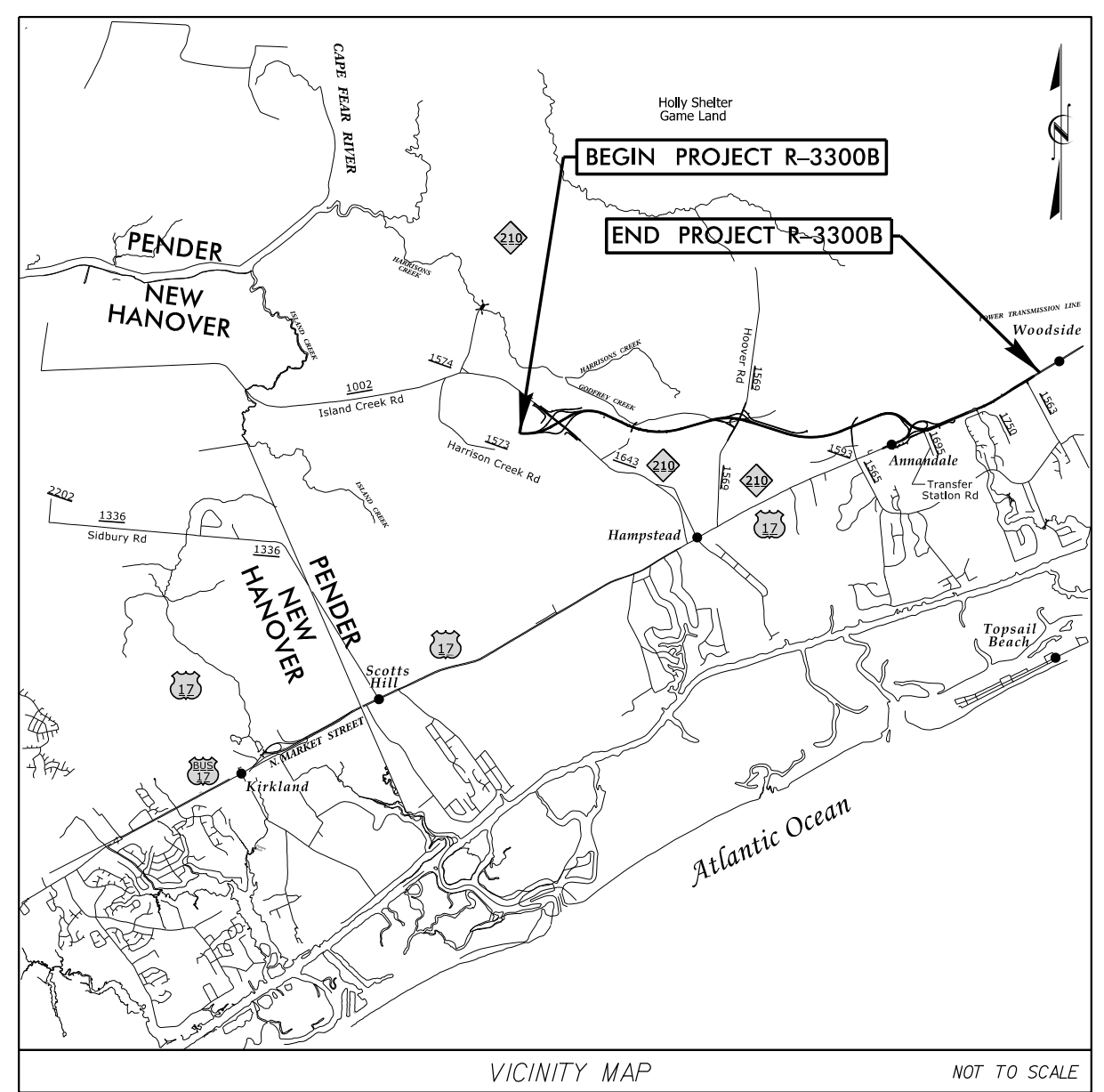
PENDER COUNTY

LOCATION: NC 417 (HAMPSTEAD BYPASS) FROM SOUTH OF NC 210 TO NORTH OF SR 1563 (SLOOP POINT LOOP ROAD).

TYPE OF WORK : TRAFFIC SIGNAL COMMUNICATIONS SYSTEM #10324



TIP PROJECT: R-3300B



CONTRACT:

2018 STANDARD SPECIFICATIONS
PROJECT LENGTH: 6.916 MILES
LETTING DATE: SEPTEMBER 2020
LEGEND XX-XXXX SIGNAL INVENTORY No.

INDEX OF PLANS	
SCP-1 SCP-2 SCP-3 thru SCP-15 SCP-16 thru SCP-18 SCP-19 thru SCP-22 SCP-23 SCP-24	TITLE SHEET CONSTRUCTION NOTES AND LEGEND CABLE ROUTING PLANS FIBER-OPTIC SPLICING DETAILS DMS INSTALLATION (DUAL-MOUNTED ON SINGLE POLE PEDESTAL) DMS UNDERGROUND FED ELECTRICAL SERVICE DETAIL CCTV ON METAL POLE WITH AERIAL ELECTRICAL SERVICE DETAIL

ROADWAY STANDARD DRAWINGS	
THE FOLLOWING ROADWAY STANDARDS AS APPEAR IN "ROADWAY STANDARD DRAWINGS" ROADWAY DESIGN UNIT - N.C. DEPARTMENT OF TRANSPORTATION - RALEIGH, N.C. DATED JANUARY 2018 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS.	
STD. No.	TITLE
1101.01	WORK ZONE WARNING SIGNS
1101.02	TEMPORARY LANE CLOSURE
1101.04	TEMPORARY SHOULDER CLOSURE
1715.01	UNDERGROUND CONDUIT - TRENCHING
1716.01	JUNCTION BOXES
1730.01	FIBER OPTIC CABLE - SPARE CABLE STORAGE
1751.01	CONTROLLERS AND CABINETS - CABINET COMPONENT LAYOUT
1751.02	CONTROLLERS AND CABINETS - POWER, GROUND, AND AUXILIARY

NC DOT CONTACT:
TRANSPORTATION SAFETY AND MOBILITY
INTELLIGENT TRANSPORTATION SYSTEMS SECTION

Gregory Green Signal Communication Project Engineer

Doug Sonderfan Signal Communication Design Engineer

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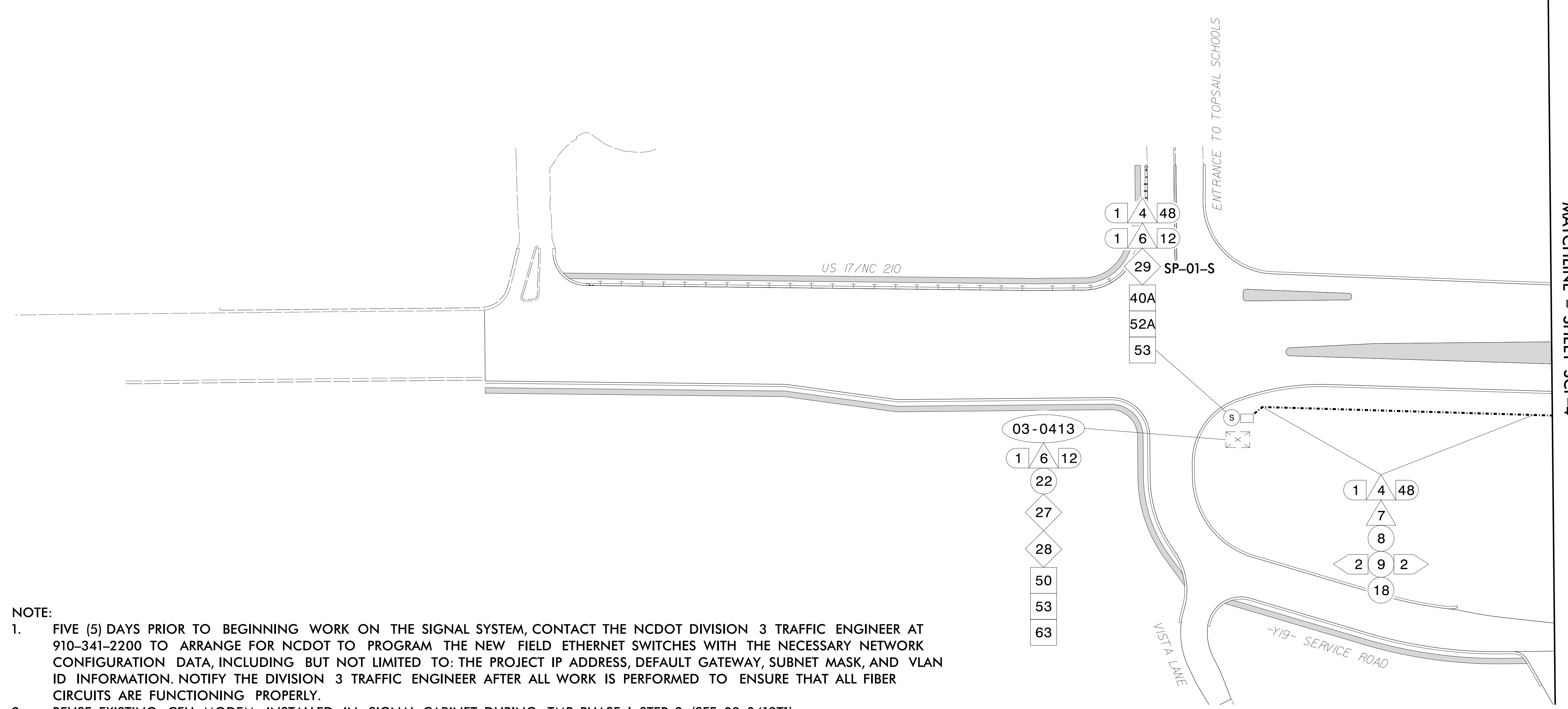
Larry Overn, PE, PTOE Senior Transportation Engineer
Dean Harris Senior Transportation Designer
Regina Muncey, PE Transportation Engineer

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

Regina M. Muncey 10/5/2021

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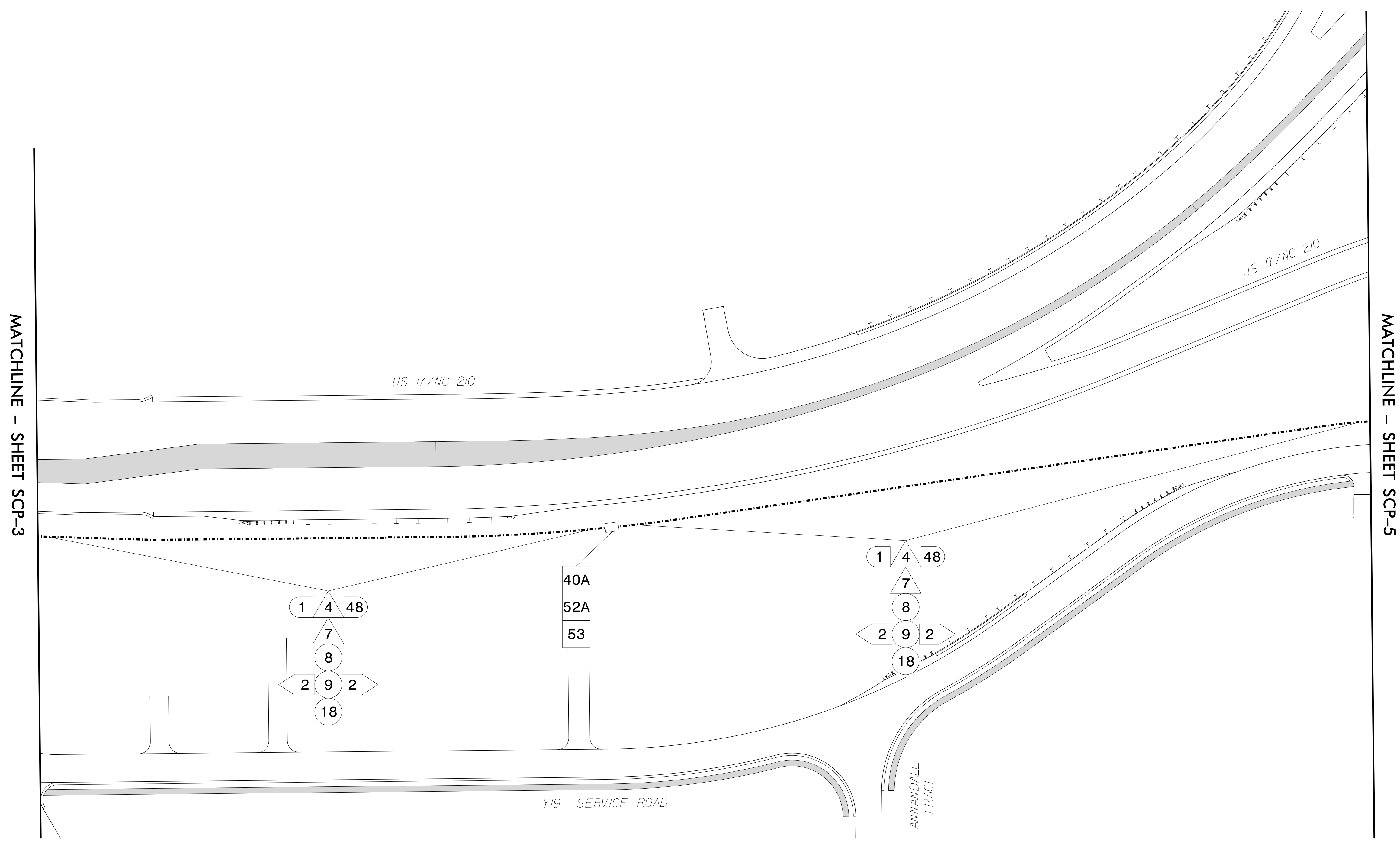


- NOTE:**
- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 TO ARRANGE FOR NCDOT TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA, INCLUDING BUT NOT LIMITED TO: THE PROJECT IP ADDRESS, DEFAULT GATEWAY, SUBNET MASK, AND VLAN ID INFORMATION. NOTIFY THE DIVISION 3 TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY.
 - REUSE EXISTING CELL MODEM INSTALLED IN SIGNAL CABINET DURING TMP PHASE I, STEP 2 (SEE 03-0413T1).

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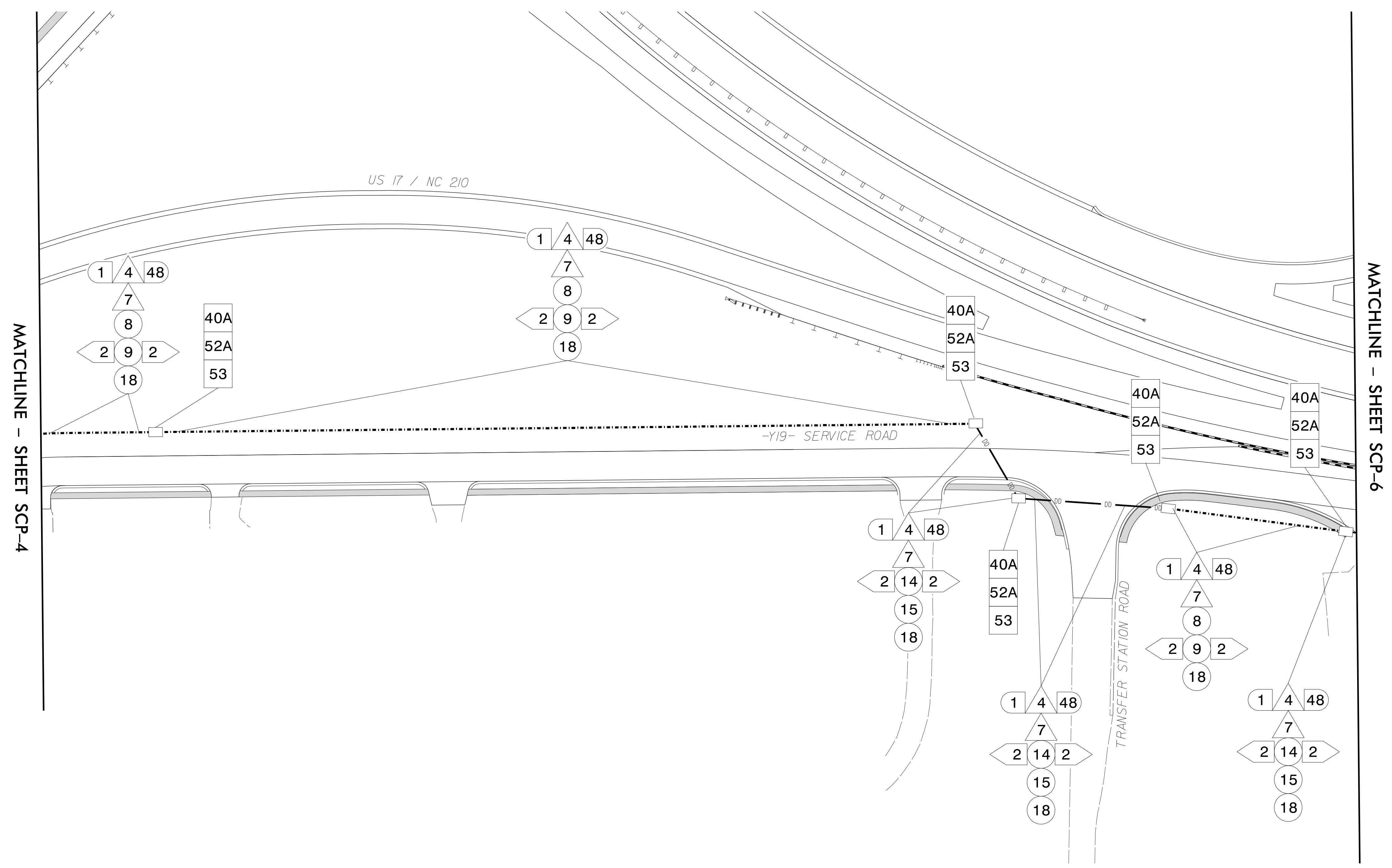
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		REVISIONS	INIT.		DATE					
<p>SCALE 0 50 1" = 50'</p>	<p>Seal of the State of North Carolina Professional Engineer SEAL 43239 REGINA M. MUNCEY</p> <p>DocuSigned by: Regina M. Muncey 10/5/2021 C:\Users\rmuncey\Documents\Signature SIGNATURE DATE CADD Filename: _____</p>									



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			REVISIONS	INIT.		DATE					
<p>SCALE 0 50 1" = 50'</p>		<p>Seal of Regina M. Muncey, Professional Engineer, License No. 43239</p> <p>DocuSigned by: Regina M. Muncey 10/5/2021</p> <p>C:\Users\rmuncey\Documents\Projects\Signals\Design\ITS and SCP Design\Cable Routing\R-3300B_SCP_04-CR_02.dgn</p>									



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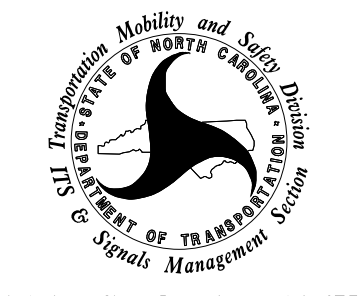
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Cable Routing Plans**

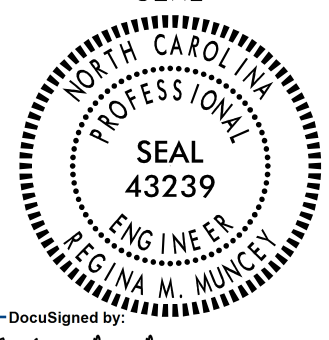
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PREPARED BY: **R M Muncey** REVIEWED BY: **L Overn**

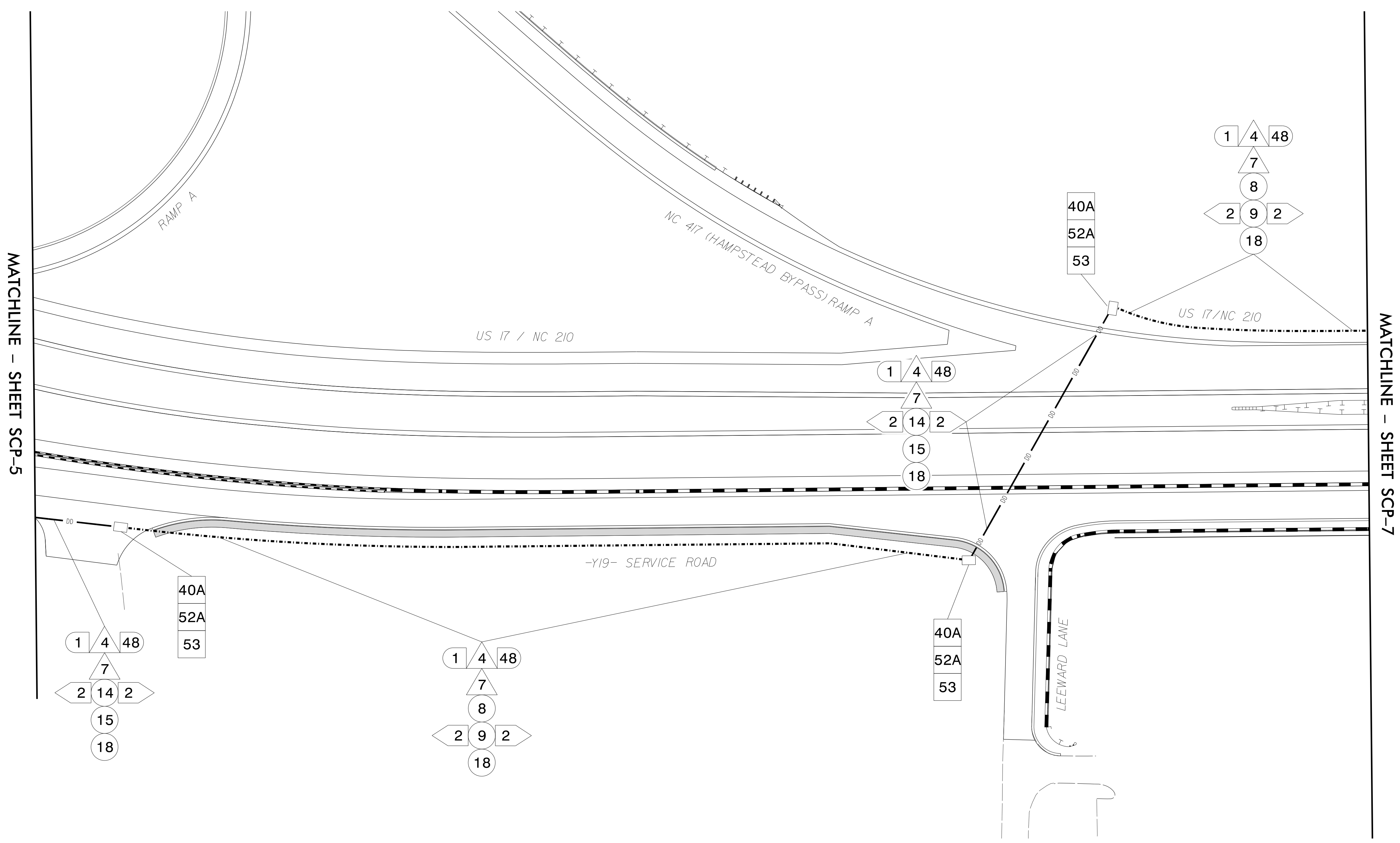
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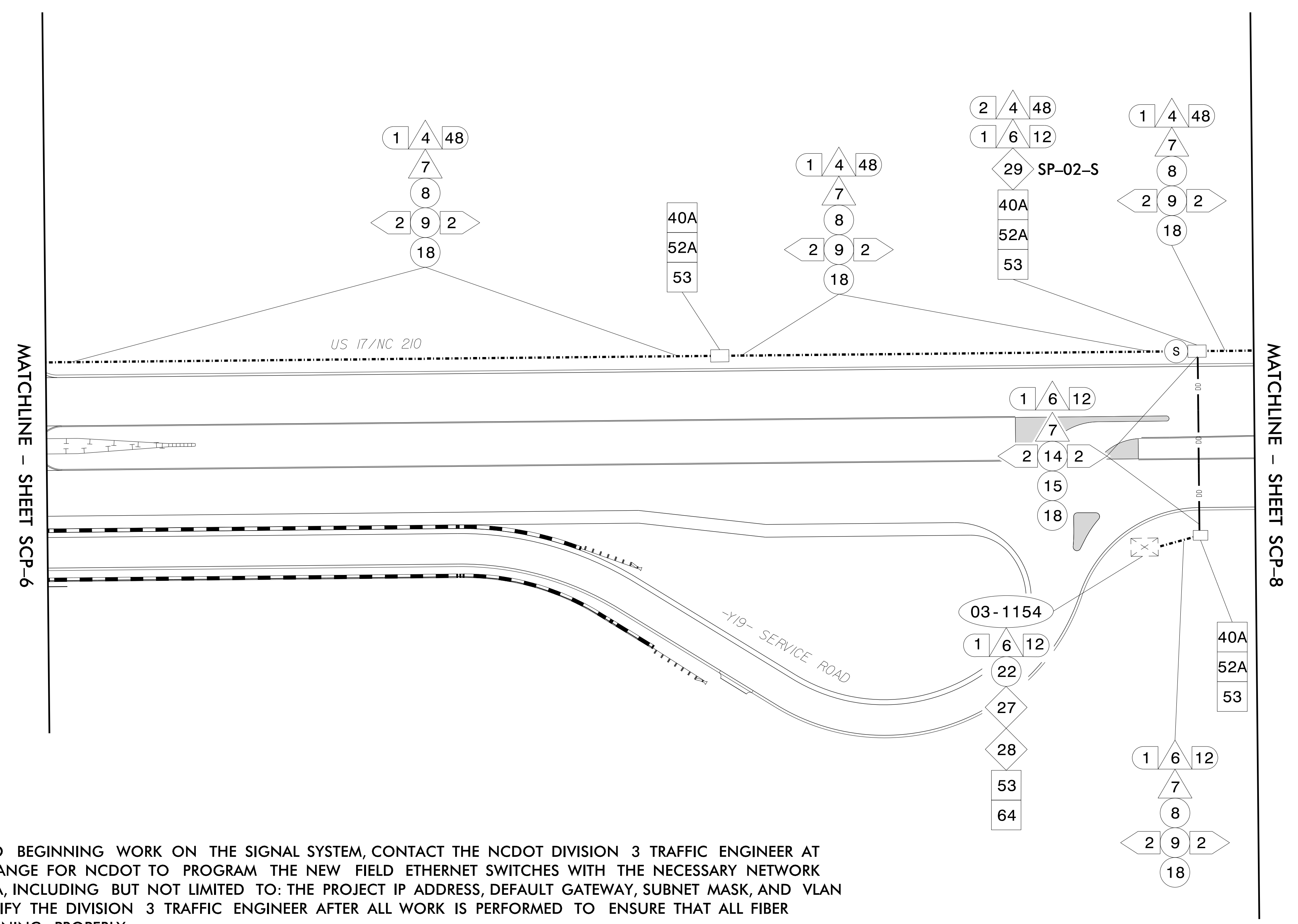
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Cable Routing Plans
 Division 3 Pender County Near Topsail Beach
 PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris
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 43239
 ENGINEER
 REGINA M. MUNCEY
 Documented by: Regina M. Muncey 10/5/2021
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NOTE:

- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 TO ARRANGE FOR NCDOT 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 3 TRAFFIC ENGINEER AFTER ALL WORK IS PERFORMED TO ENSURE THAT ALL FIBER CIRCUITS ARE FUNCTIONING PROPERLY.

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Division 3 Pender County Near Topsail Beach

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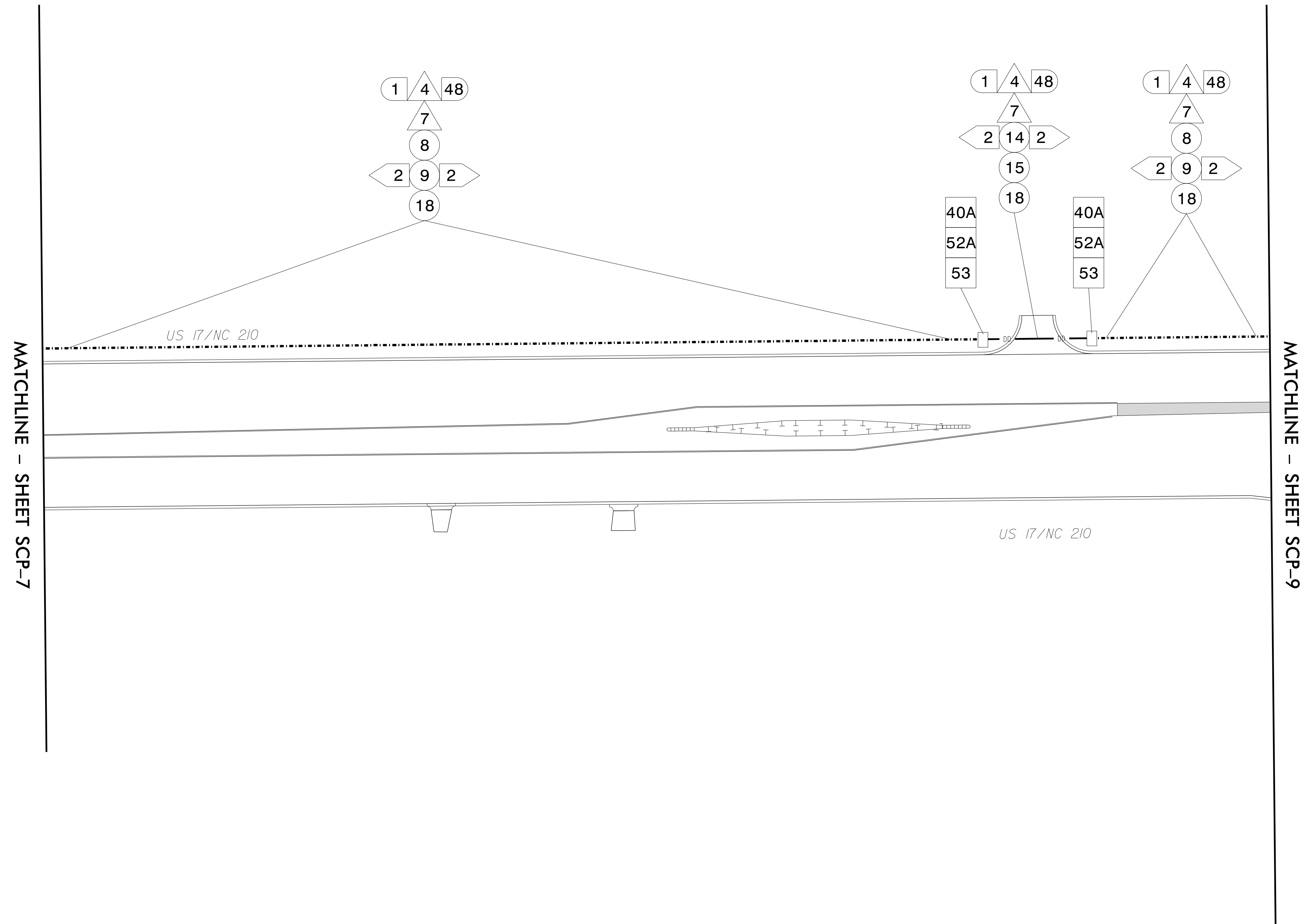
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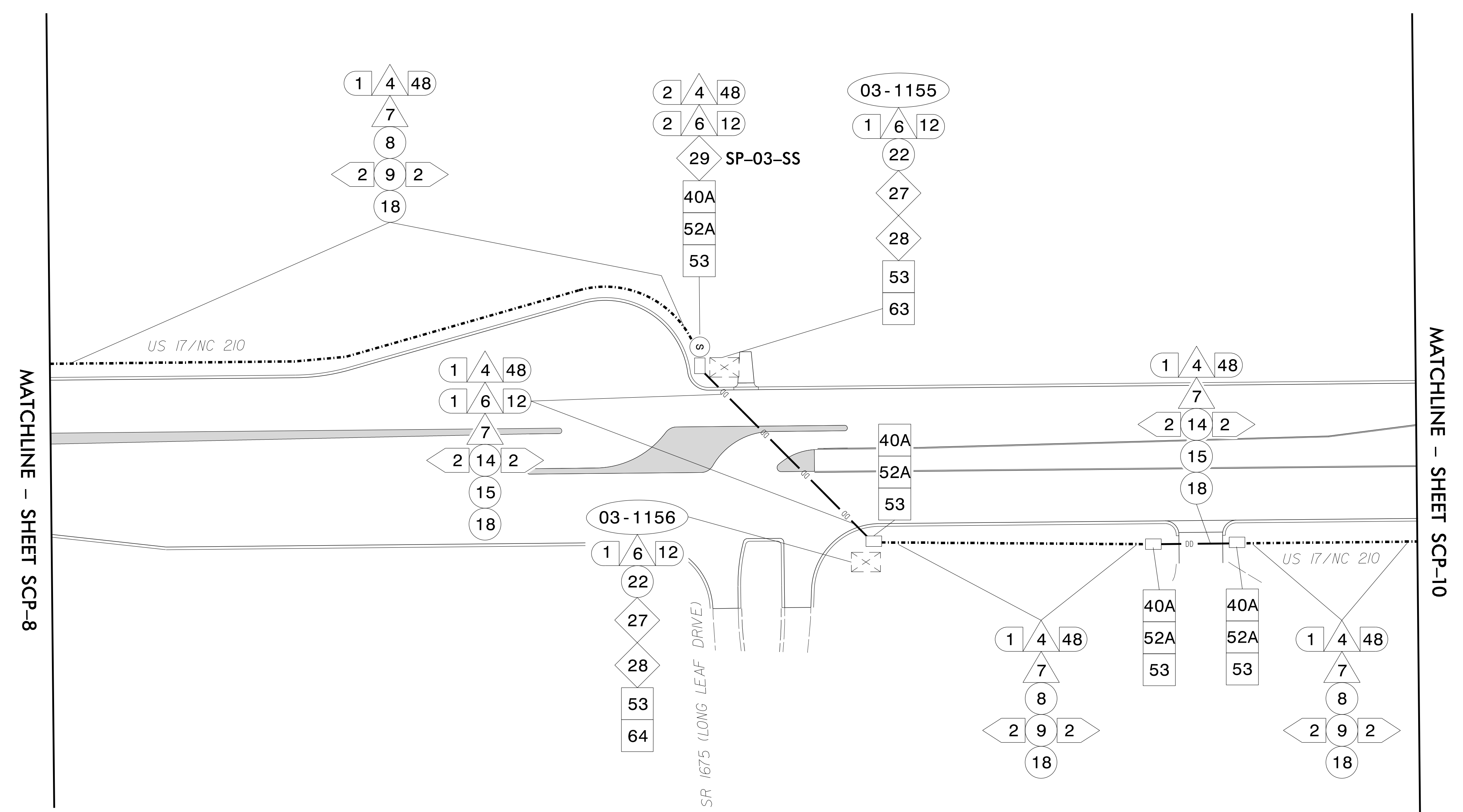
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Cable Routing Plans

Division 3 Pender County Near Topsail Beach

PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris

PREPARED BY: R M Muncey REVIEWED BY: L Overn

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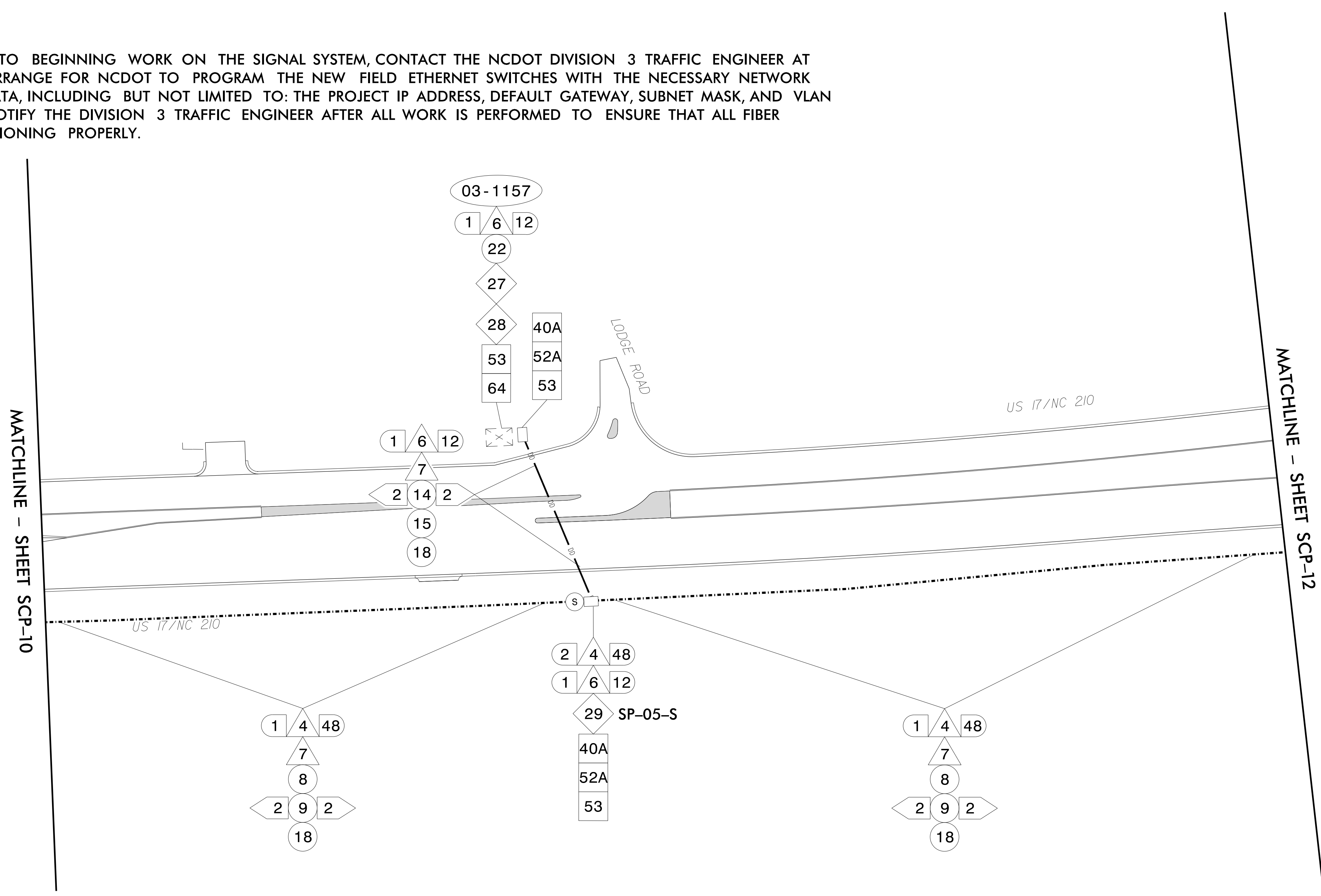
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Regina M. Muncey 10/5/2021

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PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris

PREPARED BY: R M Muncey REVIEWED BY: L Overn

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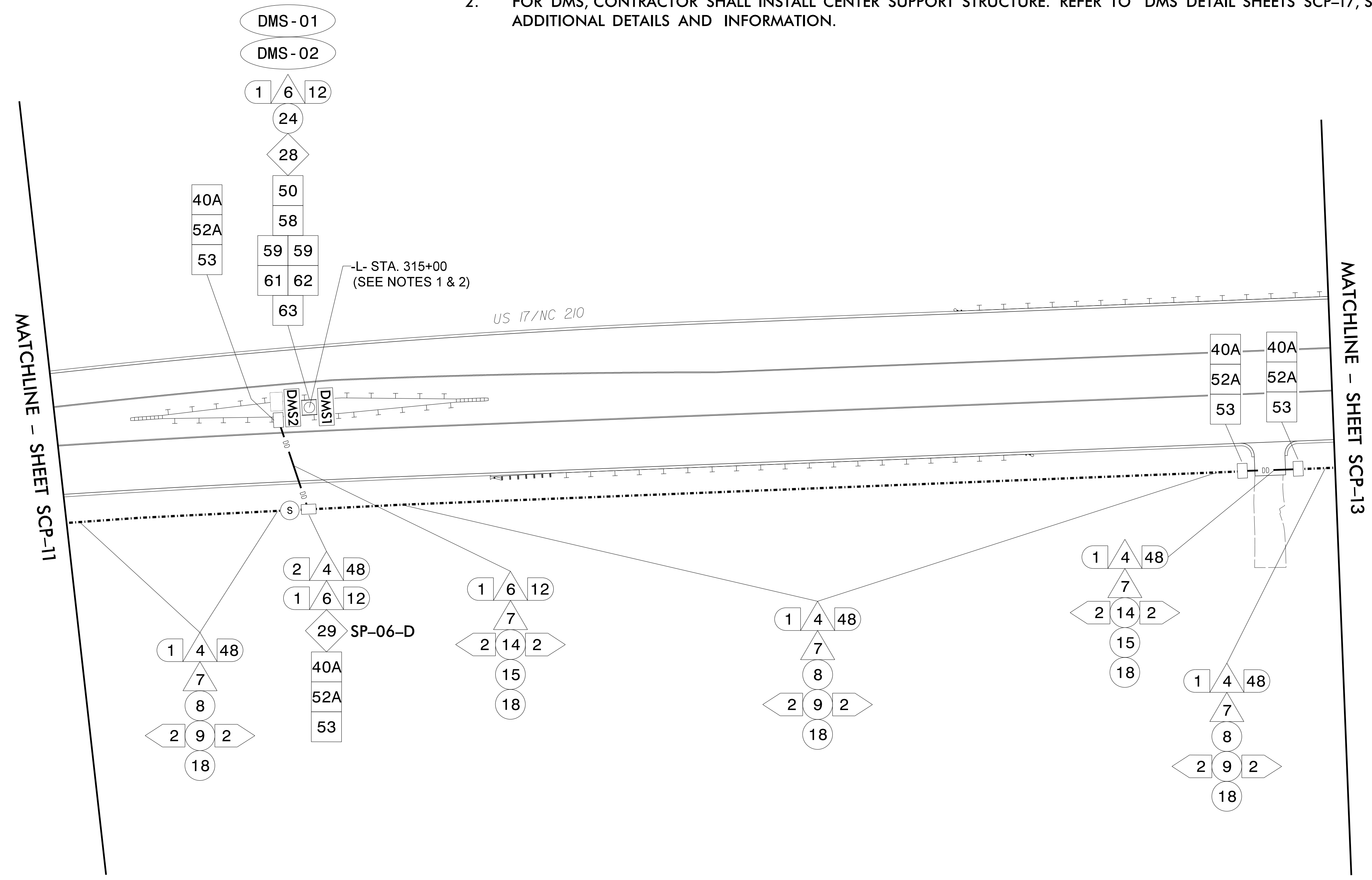
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NOTE:

1. CELL MODEM FOR DMS CABINET WILL BE PROVIDED TO CONTRACTOR BY NCDOT. CONTRACTOR MUST CONTACT NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 EIGHT (8) WEEKS PRIOR TO INSTALLATION TO ALLOW LEAD TIME FOR ACQUIRING DEVICES.
2. FOR DMS, CONTRACTOR SHALL INSTALL CENTER SUPPORT STRUCTURE. REFER TO DMS DETAIL SHEETS SCP-17, SCP-18, AND SCP-21 FOR ADDITIONAL DETAILS AND INFORMATION.



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 Cable Routing Plans

Division 3 Pender County Near Topsail Beach

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PREPARED BY: R M Muncey REVIEWED BY: L Overn

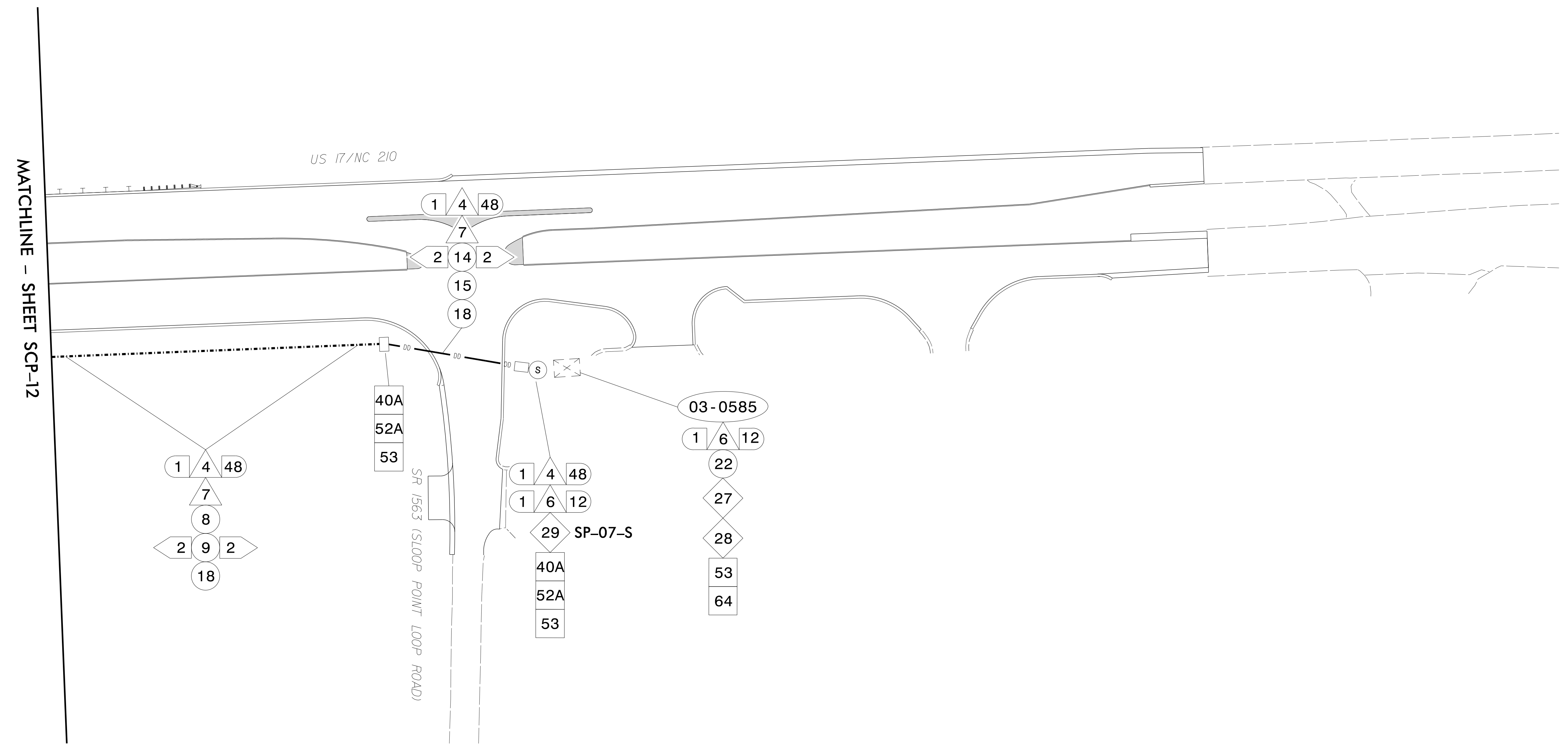
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Regina M. Muncey 10/5/2021

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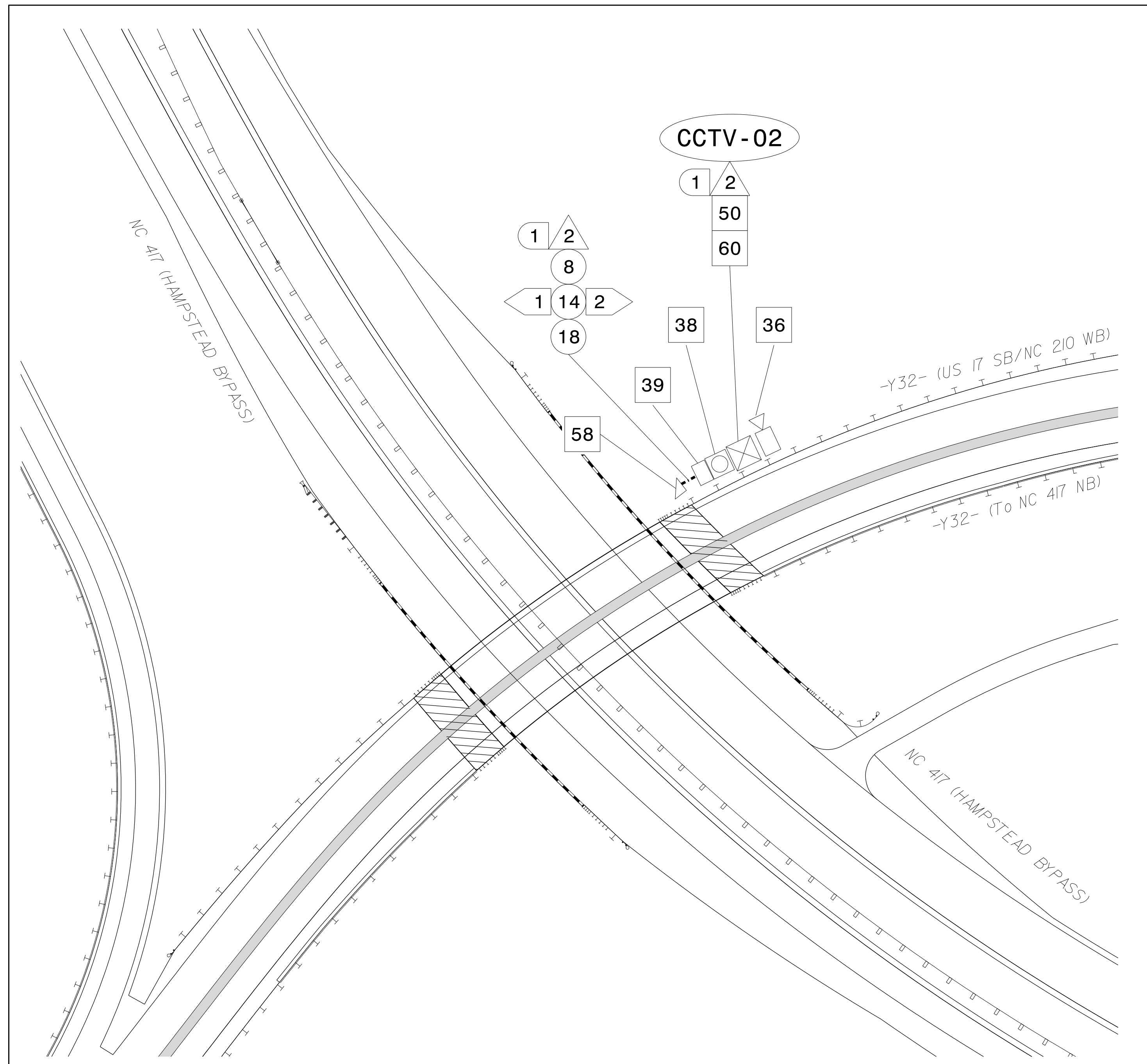
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Prepared for the Offices of:
North Carolina Department of Transportation
Division 3
750 N. Greenfield Pkwy, Garner, NC 27529

US 17/NC 210
Cable Routing Plans
Division 3 Pender County Near Topsail Beach
PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris
PREPARED BY: R M Muncey REVIEWED BY: L Overn

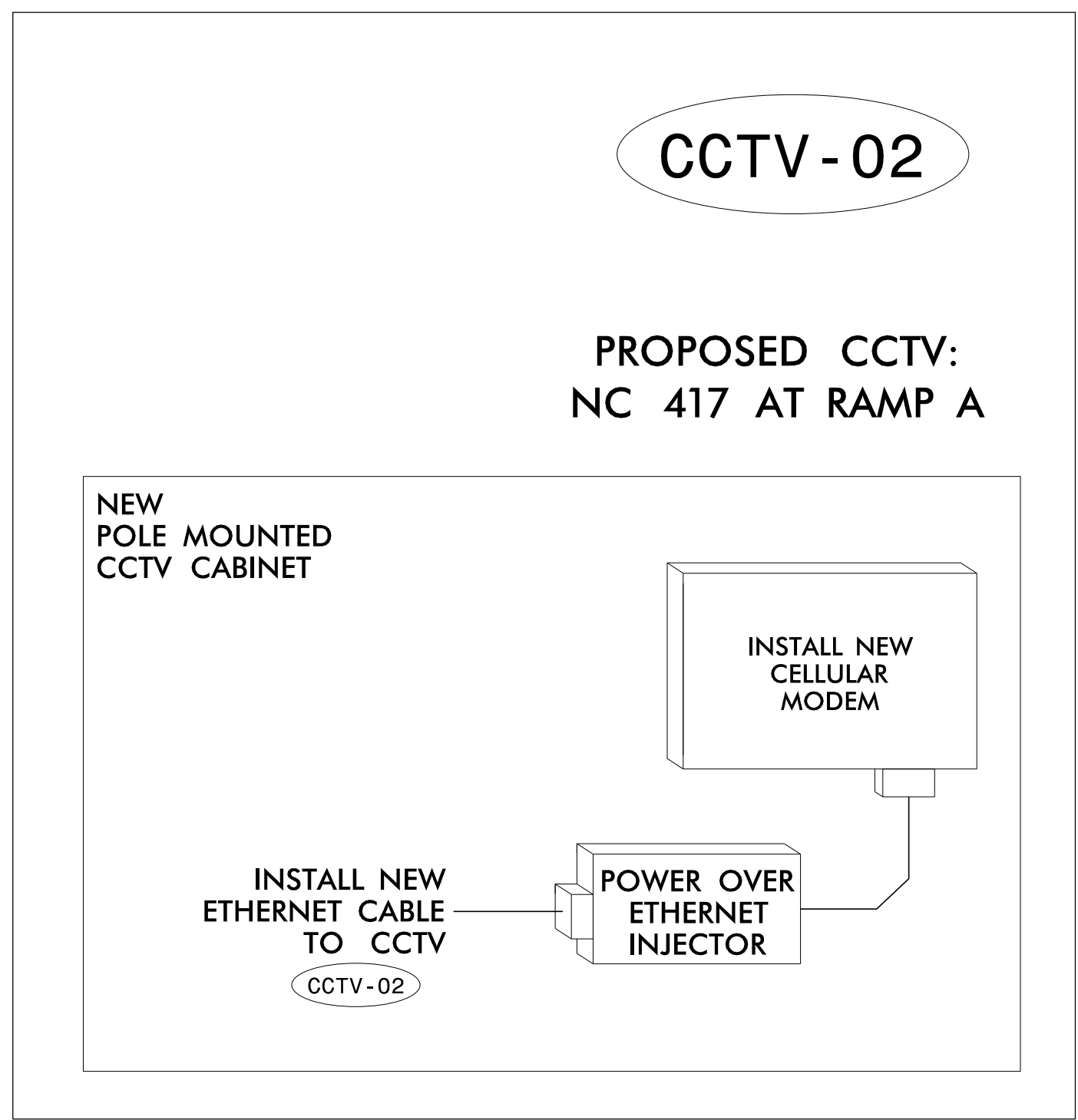
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SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
REGINA M. MUNCEY
43239
DocuSigned by:
Regina M. Muncey 10/5/2021
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NOTES:

- 1. CELL MODEM FOR CCTV CABINET WILL BE PROVIDED TO CONTRACTOR BY NCDOT. CONTRACTOR MUST CONTACT NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 EIGHT (8) WEEKS PRIOR TO INSTALLATION TO ALLOW LEAD TIME FOR ACQUIRING DEVICES.



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License No. F-0672

Prepared for the Offices of:

750 N. Greenfield Pkwy, Garner, NC 27529

**US 17/NC 210
Cable Routing Plans**

Division 3 Pender County Near Topsail Beach

PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris

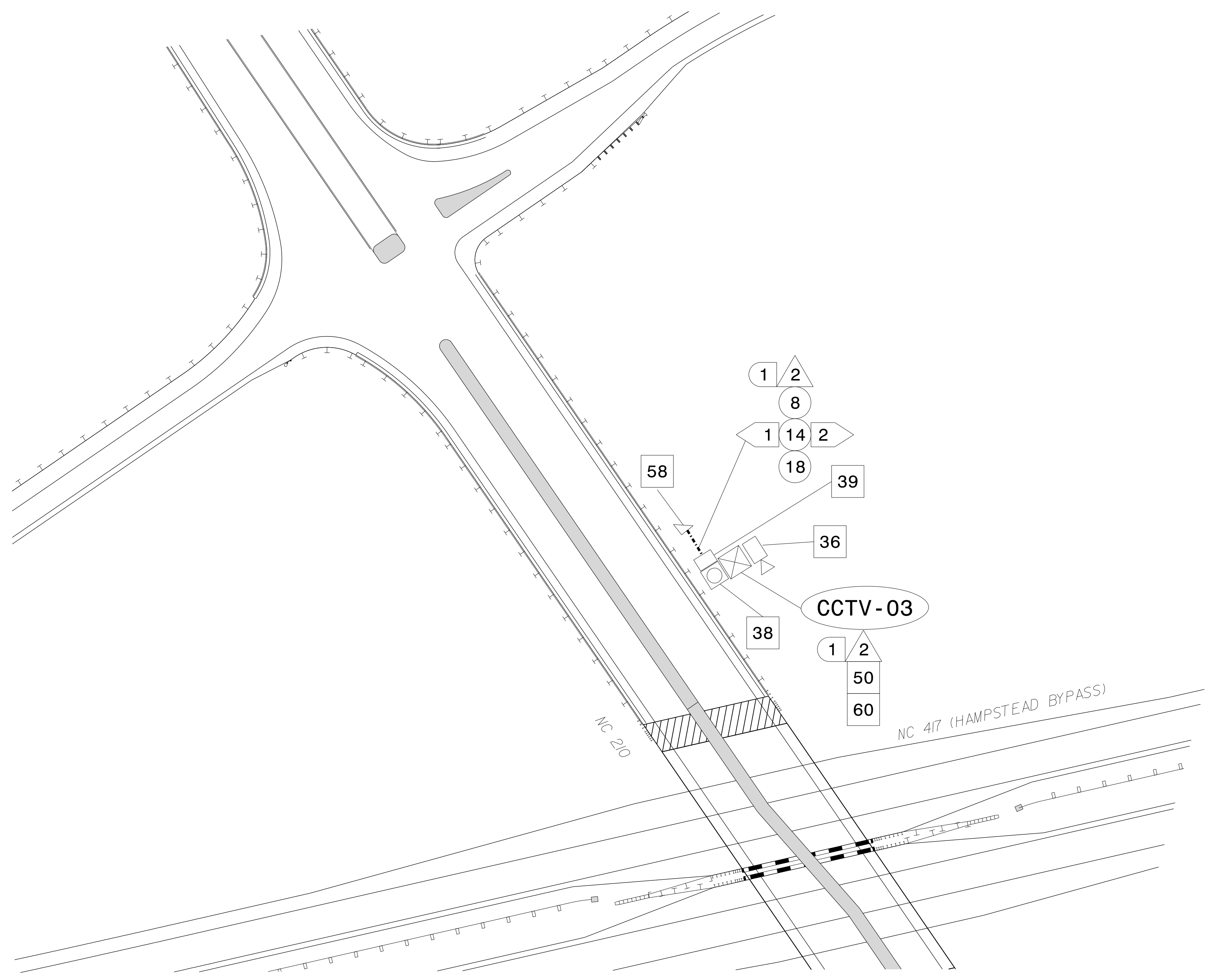
PREPARED BY: R M Muncey REVIEWED BY: L Overn

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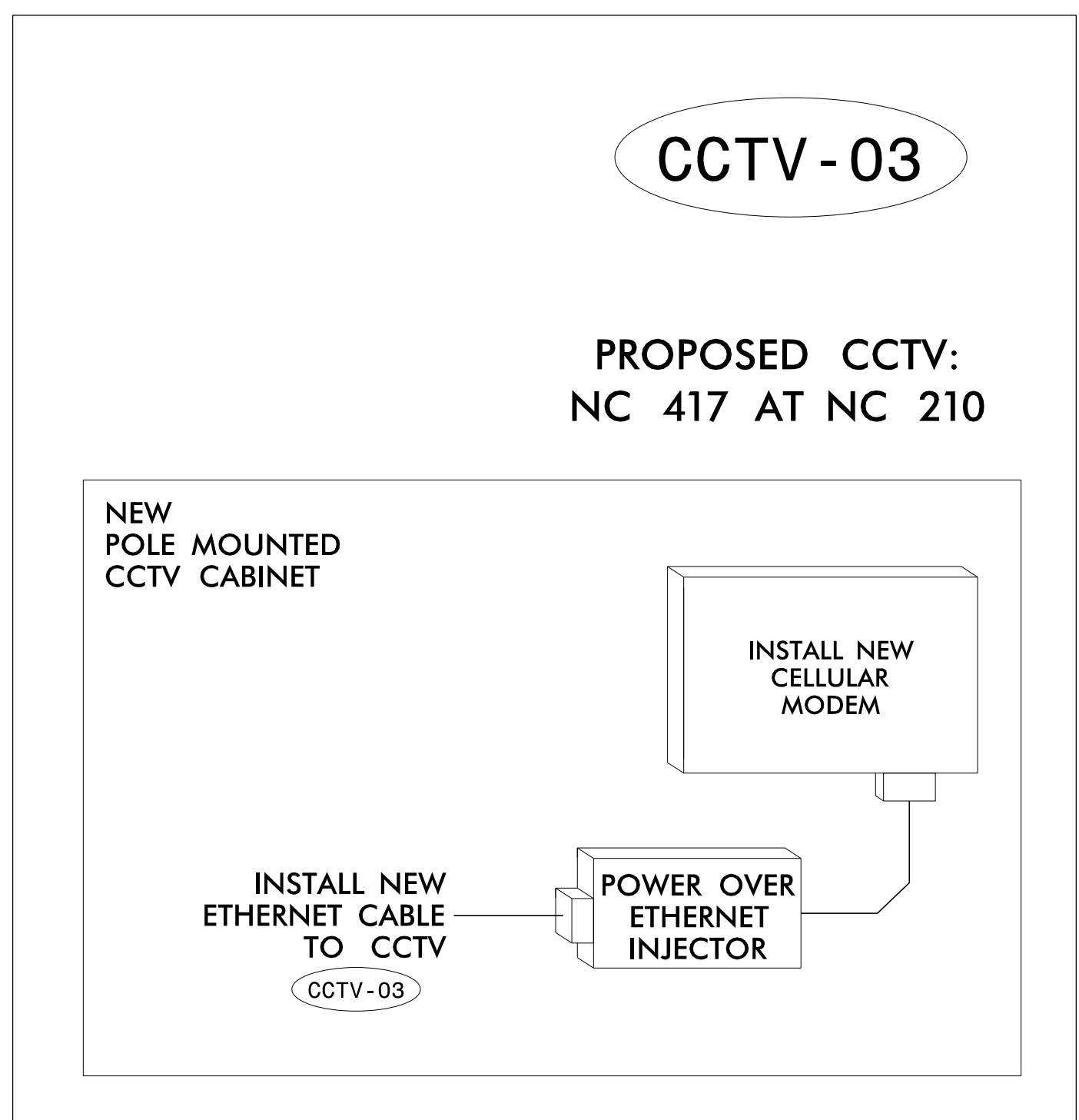
Regina M. Muncey 10/5/2021

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NOTES:

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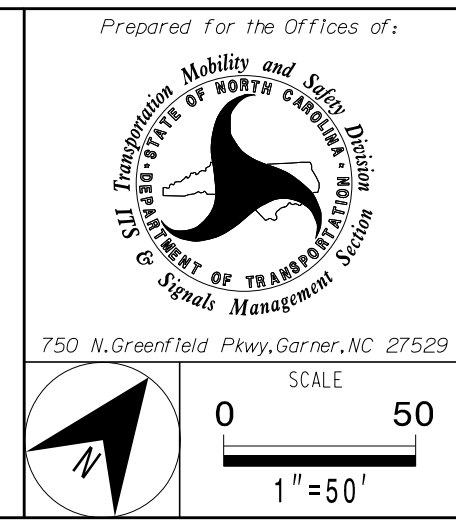
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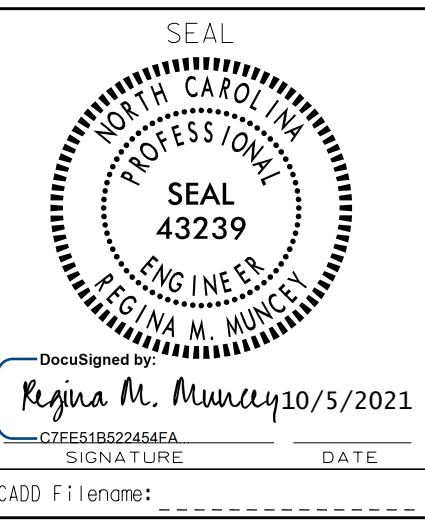
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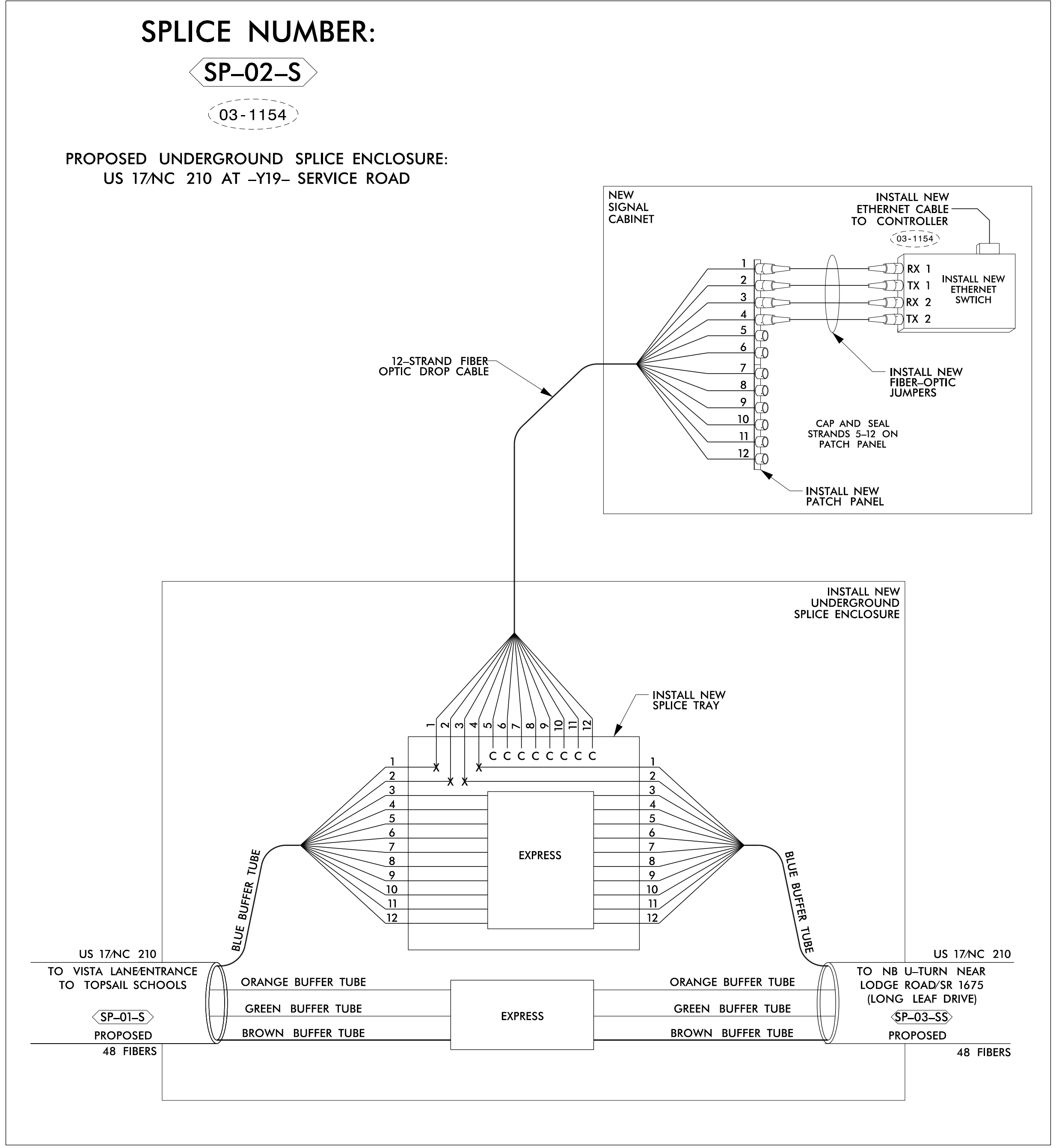
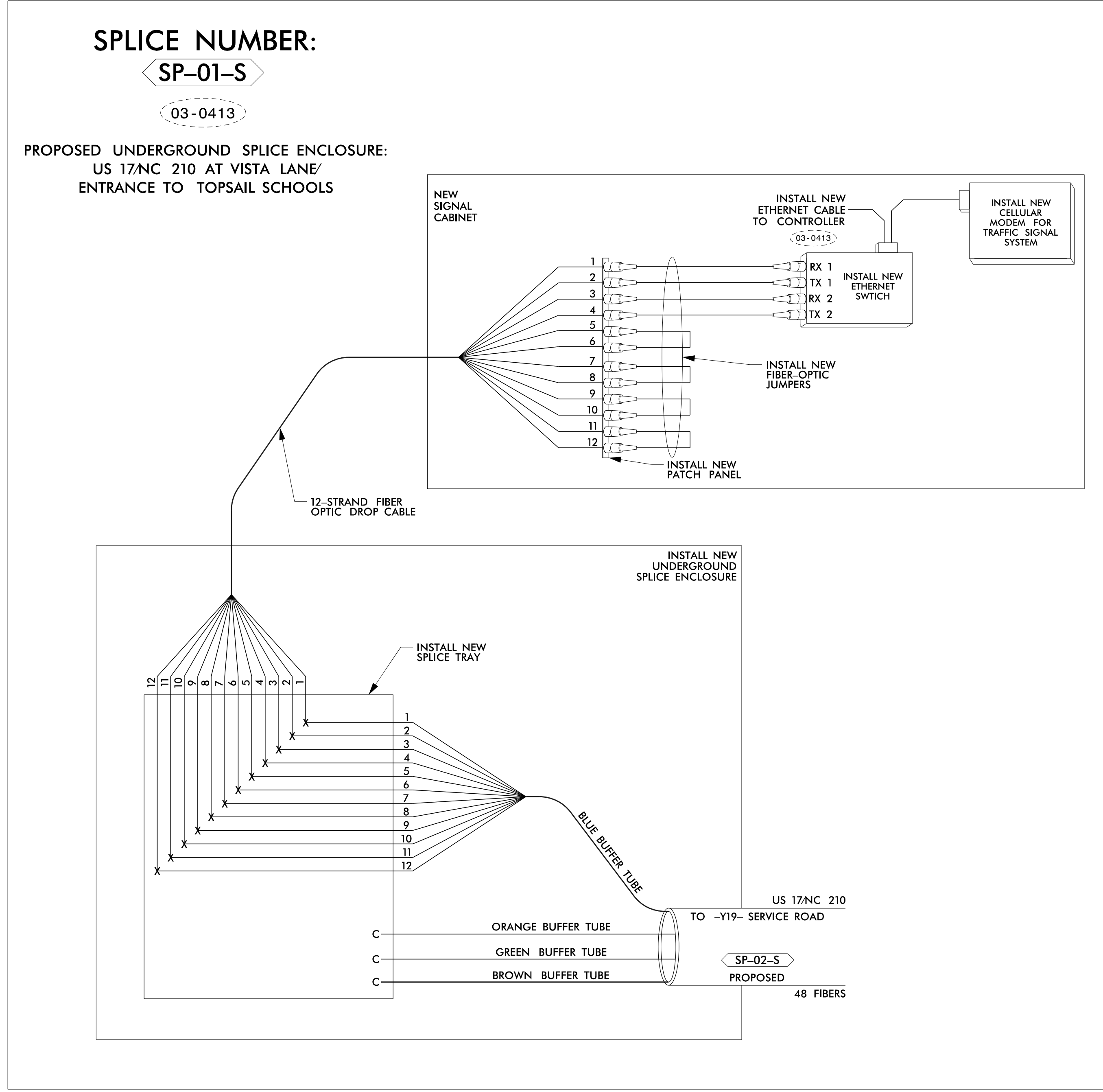


**US 17/NC 210
Cable Routing Plans**

Division 3 Pender County Near Topsail Beach
PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris
PREPARED BY: R M Muncey REVIEWED BY: L Overn

REVISIONS	INIT.	DATE





NOTE:
1. CELL MODEM FOR MASTER SIGNAL SYSTEM CABINET WILL BE PROVIDED TO CONTRACTOR BY NCDOT. CONTRACTOR MUST CONTACT NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 EIGHT (8) WEEKS PRIOR TO INSTALLATION TO ALLOW LEAD TIME FOR ACQUIRING DEVICES.

LEGEND

COLOR CODE TIA/EIA 598-B	
(1) BLUE	(7) RED
(2) ORANGE	(8) BLACK
(3) GREEN	(9) YELLOW
(4) BROWN	(10) VIOLET
(5) SLATE	(11) ROSE
(6) WHITE	(12) AQUA

13-XXXX	= PROPOSED DEVICE
13-XXXX	= EXISTING DEVICE

EXPRESS	= EXPRESS ENTIRE BUFFER TUBE/FIBERS THROUGH WITHOUT CUTTING
BUFFER SPlice	= SPlice ALL FIBERS IN BUFFER TUBE COLOR TO COLOR
SM FIBER PATCH CORD WITH CONNECTORS	= SM FIBER PATCH CORD WITH CONNECTORS

NOTES:

- UNUSED FIBERS AND/OR BUFFER TUBES LEFT COILED AND STORED IN SPlice TRAY.
- ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING THE PROPER TERMINATIONS.
- FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 TO ARRANGE FOR NCDOT 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 NCDOT DIVISION 3 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 UP AND OPERATIONAL.
- INCLUDE ON THE COVER OF SPlice TRAY THE FOLLOWING INFORMATION (REFERENCE STANDARD SPECIFICATIONS SECTION 1731):
 A. SPlice LOCATION
 B. DATE
 C. COMPANY NAME
 D. NAME OF INDIVIDUAL PERFORMING THE SPlice
 PRIOR TO INSTALLING THE COVER OF THE SPlice TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPlice TRAY AND INFORMATION SHOWN ABOVE (ITEMS A-D) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.

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Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

N. T. S.

**US 17/NC 210
Fiber Optic Splice Details**

Division 3	Pender County	Near Topsail Beach
PLAN DATE: OCTOBER 2021	REVIEWED BY: E D Harris	
PREPARED BY: R M Muncey	REVIEWED BY: L Overn	
REVISIONS	INIT.	DATE

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SEAL
NORTH CAROLINA PROFESSIONAL ENGINEER
REGINA M. MUNCEY
43239

DocuSigned by:
Regina M. Muncey 10/5/2021

CFEE1852454FA
SIGNATURE DATE

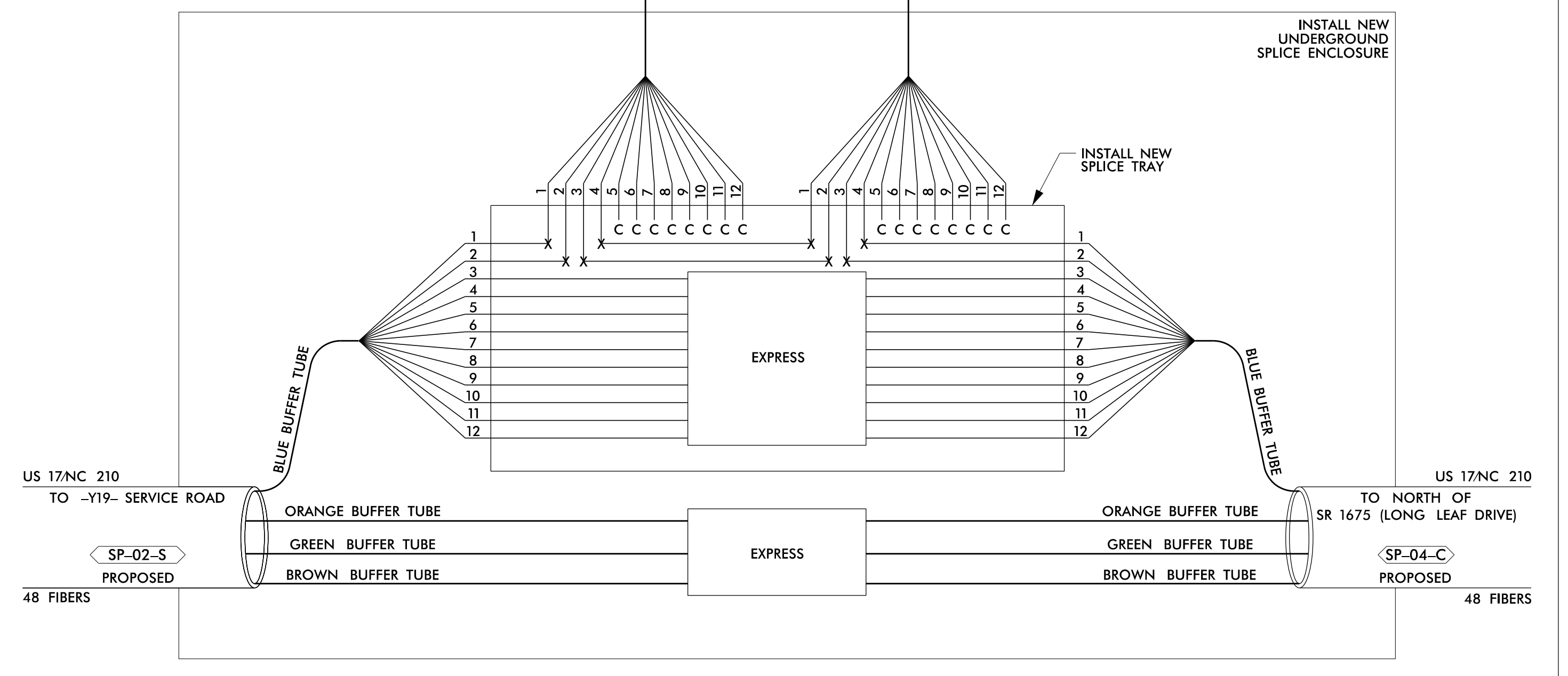
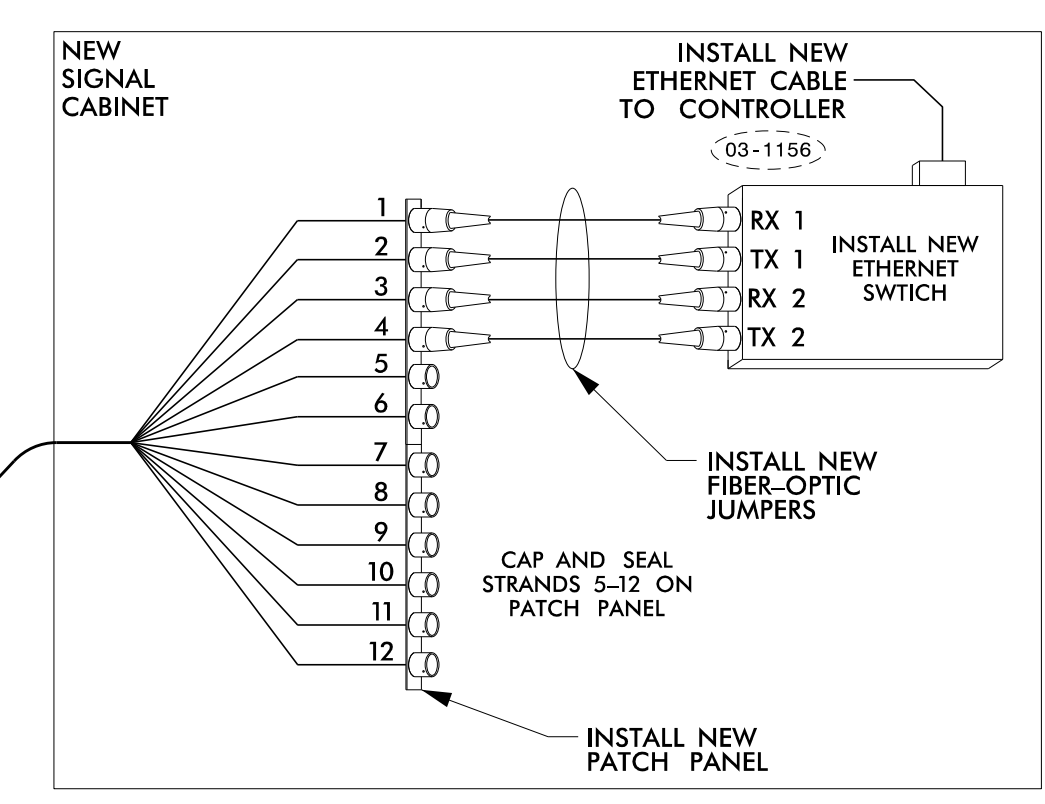
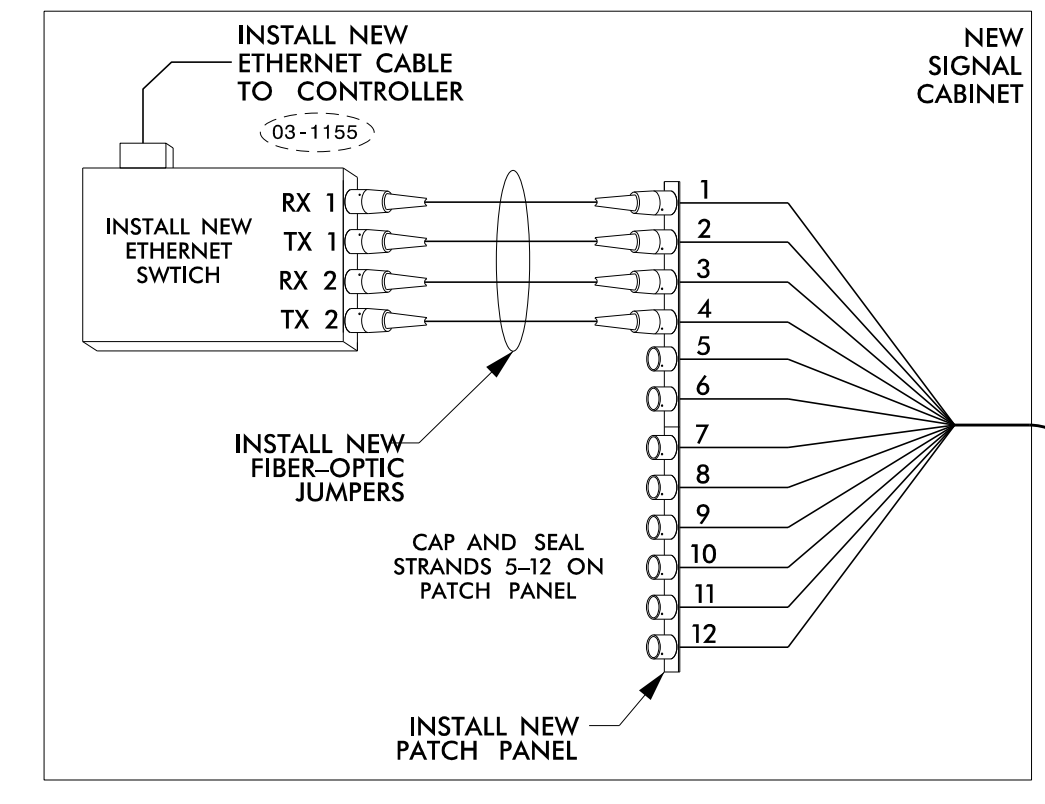
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SPLICE NUMBER: SP-03-SS

03-1155 03-1156

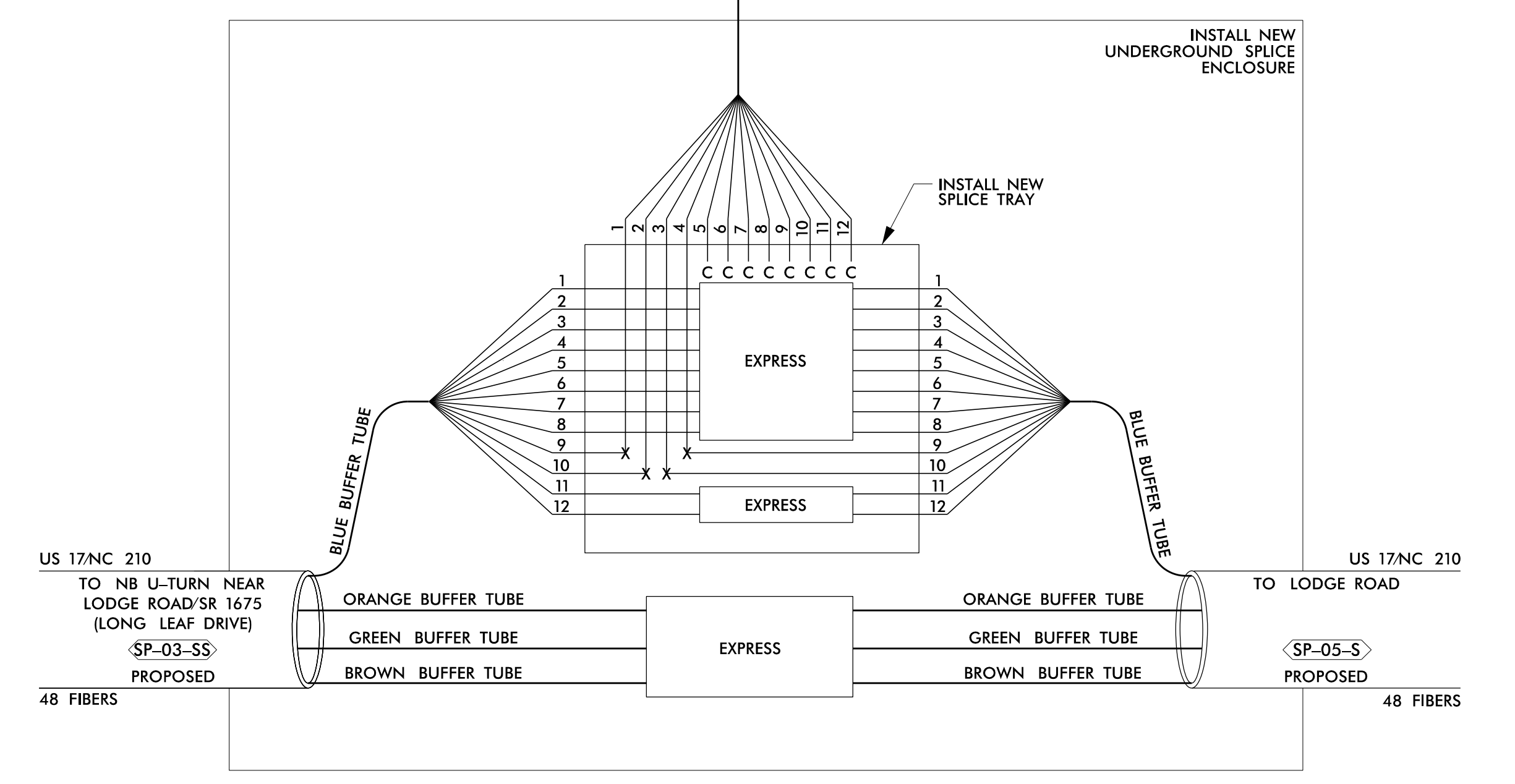
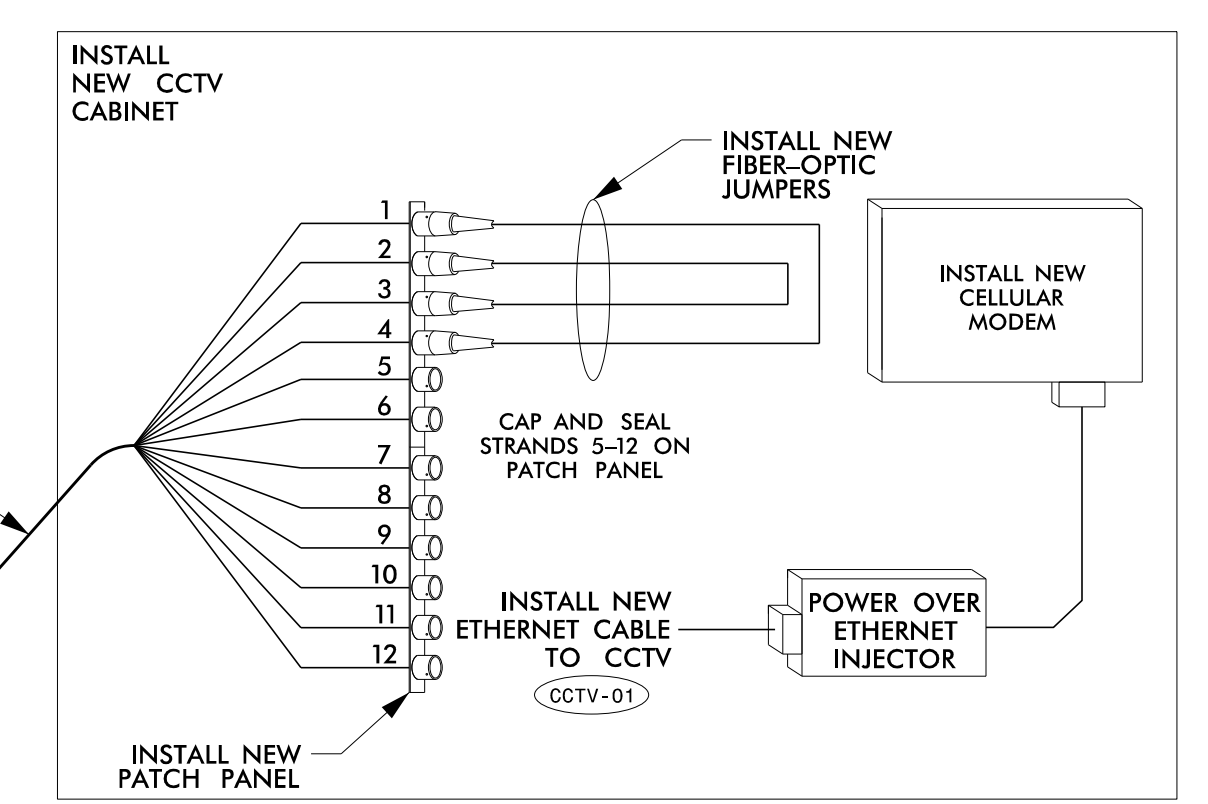
PROPOSED UNDERGROUND SPLICE ENCLOSURE: US 17/NC 210 AT NB U-TURN NEAR LODGE ROAD/ SR 1675 (LONG LEAF DRIVE)



SPLICE NUMBER: SP-04-C

CCTV-01

PROPOSED UNDERGROUND SPLICE ENCLOSURE: US 17/NC 210 AT NORTH OF LONG LEAF DRIVE



LEGEND

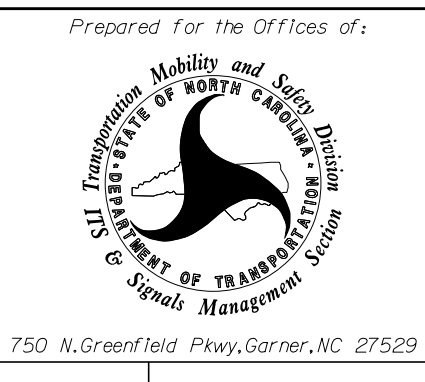
Table with 2 columns: COLOR CODE TIA/EIA 598-B (listing colors 1-12) and BUFFER SPLICE (listing symbols for splice and SM fiber patch cord).

NOTES:

- 1. UNUSED FIBERS AND/OR BUFFER TUBES LEFT COILED AND STORED IN SPLICE TRAY.
2. ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING/ENSURING THE PROPER TERMINATIONS.
3. FIVE (5) DAYS PRIOR TO BEGINNING WORK ON THE SIGNAL SYSTEM, CONTACT THE NCDOT DIVISION 3 TRAFFIC ENGINEER AT 910-341-2200 TO ARRANGE FOR NCDOT TO PROGRAM THE NEW FIELD ETHERNET SWITCHES WITH THE NECESSARY NETWORK CONFIGURATION DATA...
4. INCLUDE ON THE COVER OF SPLICE TRAY THE FOLLOWING INFORMATION (REFERENCE STANDARD SPECIFICATIONS SECTION 1731):
A. SPLICE LOCATION
B. DATE
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D. NAME OF INDIVIDUAL PERFORMING THE SPLICE
PRIOR TO INSTALLING THE COVER ON THE SPLICE TRAY, TAKE A DIGITAL PHOTOGRAPH SHOWING THE SPLICE TRAY AND INFORMATION SHOWN ABOVE (ITEMS A-D) AND SUBMIT PHOTOGRAPH ALONG WITH OTDR TEST RESULTS.



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US 17/NC 210 Fiber Optic Splice Details

Table with project details: Division 3, Pender County, Near Topsail Beach. Includes dates (OCTOBER 2021), names (R M Muncey, E D Harris, L Overn), and a revisions table.

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Professional Engineer seal for Regina M. Muncey, License No. 43239, dated 10/5/2021.

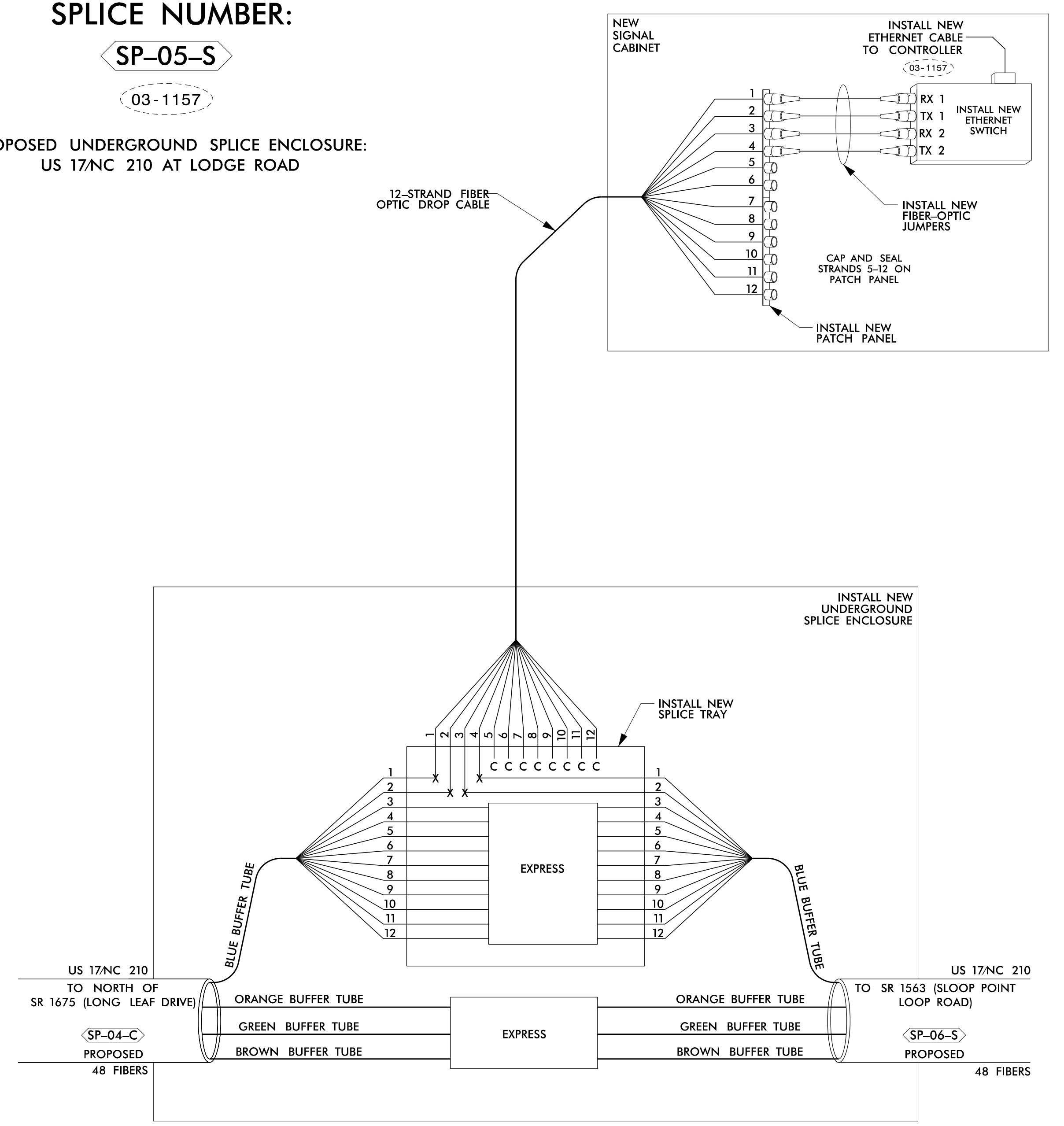
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SPLICE NUMBER:

SP-05-S

03-1157

PROPOSED UNDERGROUND SPLICE ENCLOSURE: US 17/NC 210 AT LODGE ROAD

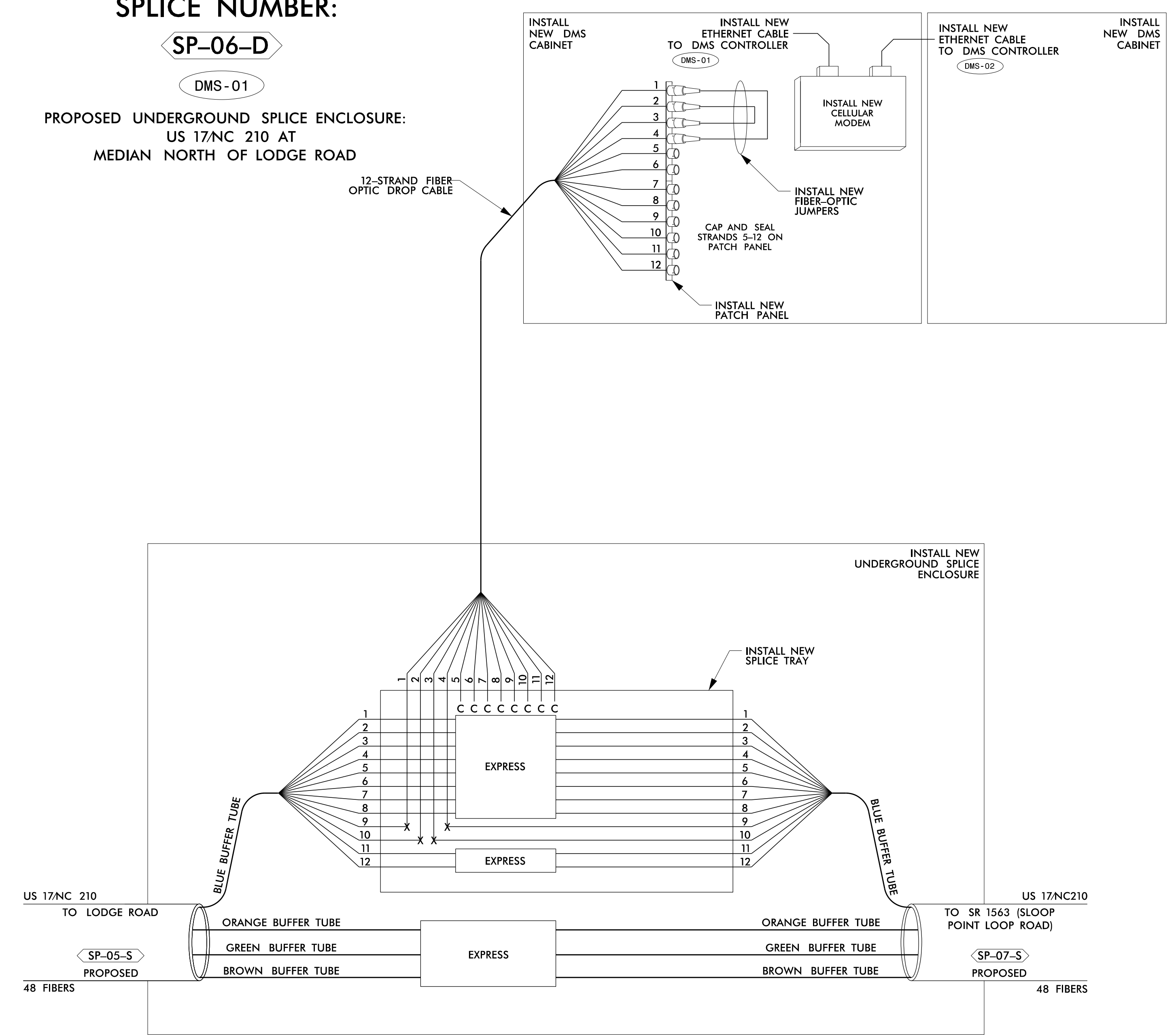


SPLICE NUMBER:

SP-06-D

DMS-01

PROPOSED UNDERGROUND SPLICE ENCLOSURE: US 17/NC 210 AT MEDIAN NORTH OF LODGE ROAD



LEGEND

COLOR CODE TIA/EIA 598-B		E =	EXISTING FUSION SPLICE INDIVIDUAL FIBER TO REMAIN
(1) BLUE	(7) RED	X =	FUSION SPLICE INDIVIDUAL FIBER
(2) ORANGE	(8) BLACK	C =	CAP AND SEAL
(3) GREEN	(9) YELLOW	EXPRESS	EXPRESS ENTIRE BUFFER TUBE/FIBERS THROUGH WITHOUT CUTTING
(4) BROWN	(10) VIOLET	BUFFER SPLICE	SPLICE ALL FIBERS IN BUFFER TUBE COLOR TO COLOR
(5) SLATE	(11) ROSE	SM FIBER PATCH CORD WITH CONNECTORS	
(6) WHITE	(12) AQUA		

NOTES:

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Prepared for the Offices of:

 750 N. Greenfield Pkwy, Garner, NC 27529

US 17/NC 210
Fiber Optic Splice Details

Division 3	Pender County	Near Topsail Beach
PLAN DATE: OCTOBER 2021	REVIEWED BY: E D Harris	
PREPARED BY: R M Muncey	REVIEWED BY: L Overn	
REVISIONS	INIT.	DATE

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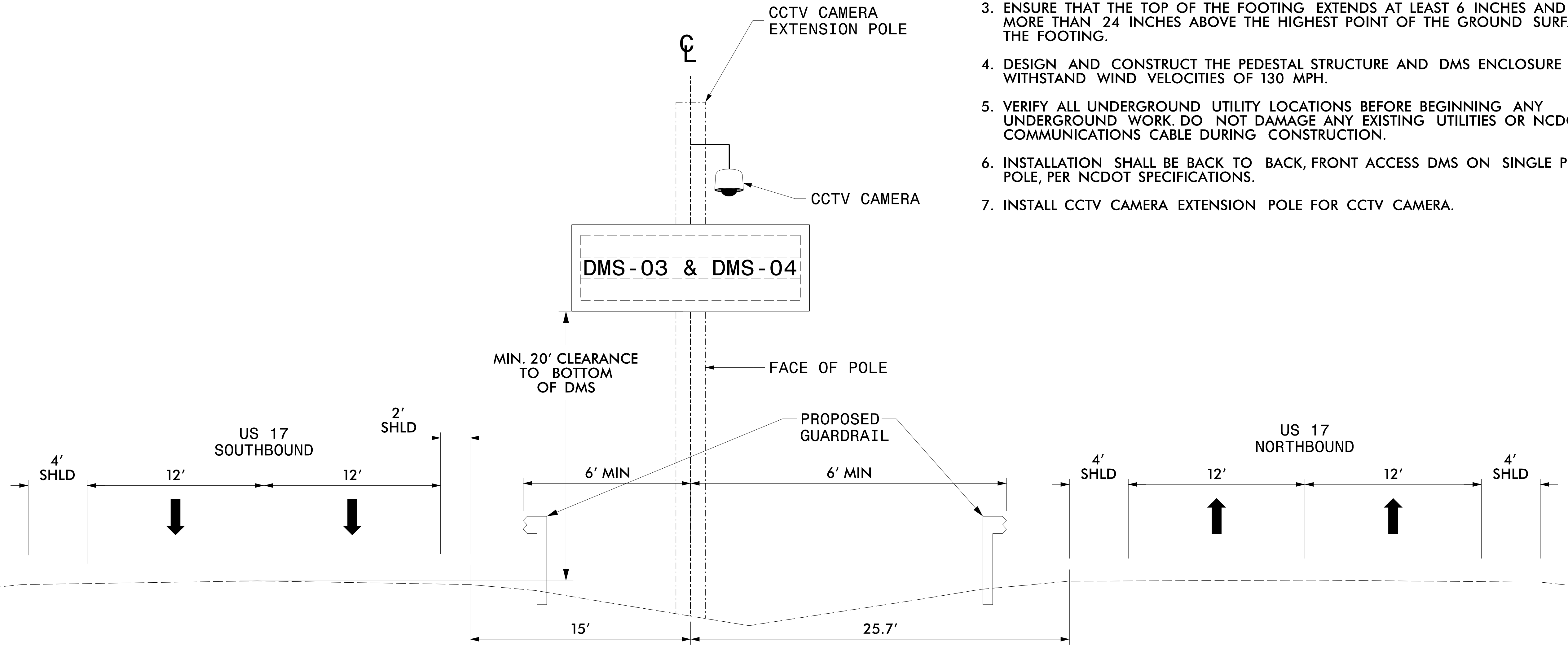
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Regina M. Muncey 10/5/2021

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ESTIMATED DIMENSION : 15' X 8' (EACH)
 MAXIMUM DEADLOAD OF 1500 LBS (EACH)

NOTES:

1. USE THE ACTUAL DIMENSIONS AND WEIGHT OF THE DMS PROVIDED BY THE DMS FABRICATOR TO COMPLETE THE DESIGN OF THE DMS STRUCTURE.
2. FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTINGS USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
3. ENSURE THAT THE TOP OF THE FOOTING EXTENDS AT LEAST 6 INCHES AND NOT MORE THAN 24 INCHES ABOVE THE HIGHEST POINT OF THE GROUND SURFACE AT THE FOOTING.
4. DESIGN AND CONSTRUCT THE PEDESTAL STRUCTURE AND DMS ENCLOSURE TO WITHSTAND WIND VELOCITIES OF 130 MPH.
5. VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK. DO NOT DAMAGE ANY EXISTING UTILITIES OR NCDOT COMMUNICATIONS CABLE DURING CONSTRUCTION.
6. INSTALLATION SHALL BE BACK TO BACK, FRONT ACCESS DMS ON SINGLE PEDESTAL POLE, PER NCDOT SPECIFICATIONS.
7. INSTALL CCTV CAMERA EXTENSION POLE FOR CCTV CAMERA.



DMS-03, DMS-04 & CCTV-04
 AT
 US 17

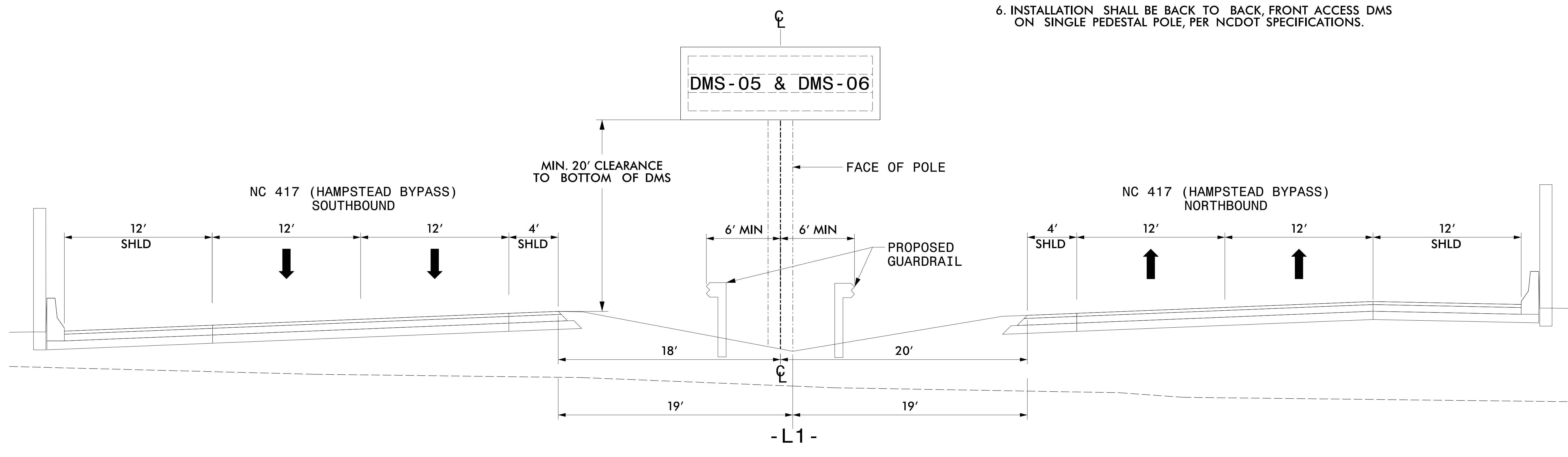
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		Division 3 Pender County Near Topsail Beach PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris PREPARED BY: R M Muncey REVIEWED BY: L Overn	REVISIONS INIT. DATE	

ESTIMATED DIMENSION : 15' X 8' (EACH)
 MAXIMUM DEADLOAD OF 1500 LBS (EACH)

- NOTES:
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 2. FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTINGS USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
 3. ENSURE THAT THE TOP OF THE FOOTING EXTENDS AT LEAST 6 INCHES AND NOT MORE THAN 24 INCHES ABOVE THE HIGHEST POINT OF THE GROUND SURFACE AT THE FOOTING.
 4. DESIGN AND CONSTRUCT THE PEDESTAL STRUCTURE AND DMS ENCLOSURE TO WITHSTAND WIND VELOCITIES OF 130 MPH.
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 6. INSTALLATION SHALL BE BACK TO BACK, FRONT ACCESS DMS ON SINGLE PEDESTAL POLE, PER NCDOT SPECIFICATIONS.



DMS-05 & DMS-06
 AT
 NC 417 (HAMPSTEAD BYPASS)
 -L1- 671+75
 (Cross Section at -L1- Sta. 671+50)

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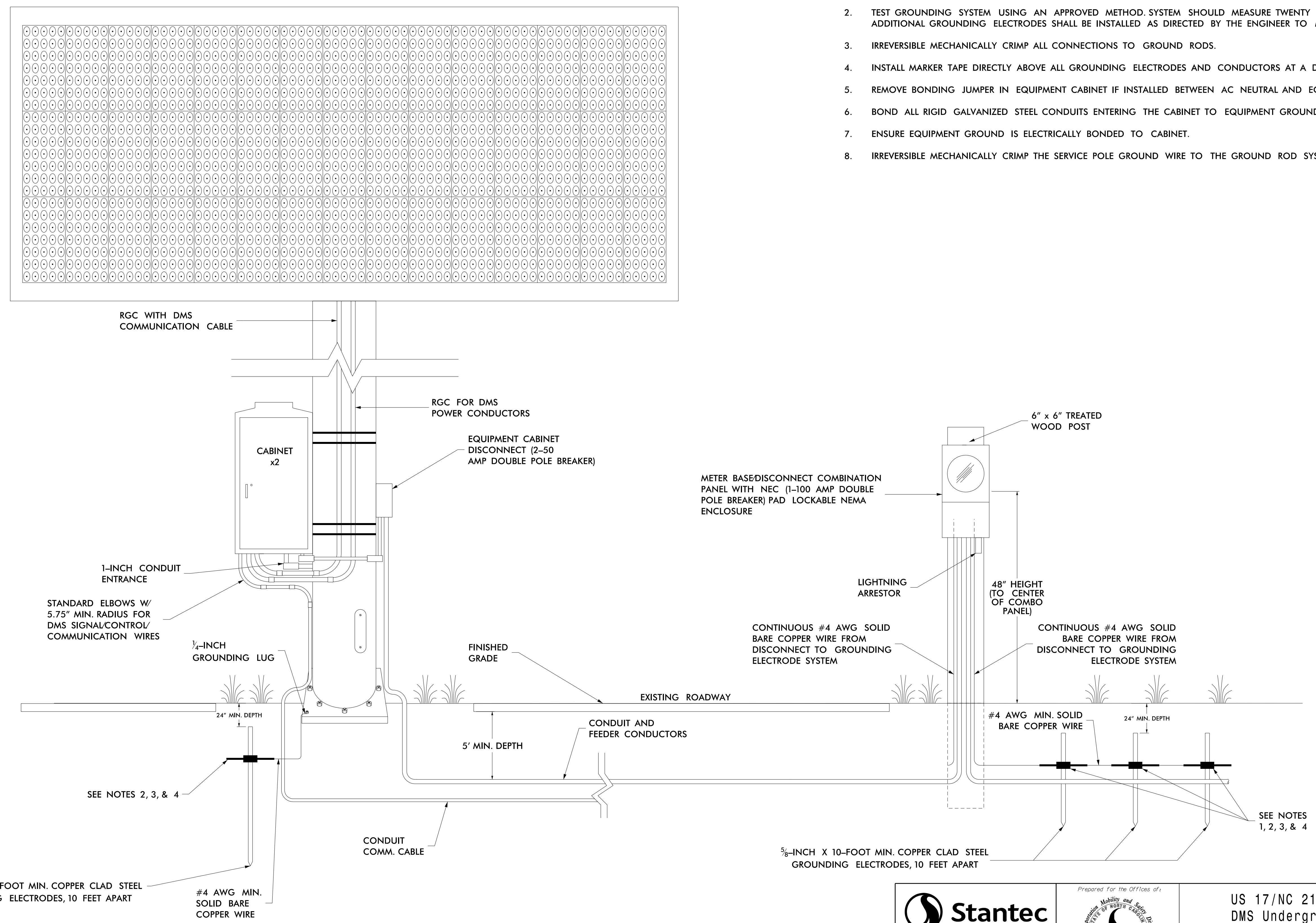
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		<p>Division 3 Pender County Near Topsail Beach</p> <p>PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris</p> <p>PREPARED BY: R M Muncey REVIEWED BY: L Overn</p>	<table border="1"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>		REVISIONS	INIT.	DATE
REVISIONS	INIT.	DATE					

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 Signature: Regina M. Muncey
 Date: 10/15/2021
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NOTES

1. INSTALL A MINIMUM OF THREE (3) GROUNDING ELECTRODES SPACED A MINIMUM OF 10 FEET APART. ENSURE THAT EXISTING UNDERGROUND FACILITIES ARE NOT DAMAGED DURING INSTALLATION.
2. TEST GROUNDING SYSTEM USING AN APPROVED METHOD. SYSTEM SHOULD MEASURE TWENTY (20) OHMS OR LESS. ADDITIONAL GROUNDING ELECTRODES SHALL BE INSTALLED AS DIRECTED BY THE ENGINEER TO MEET THIS REQUIREMENT.
3. IRREVERSIBLE MECHANICALLY CRIMP ALL CONNECTIONS TO GROUND RODS.
4. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12 INCHES.
5. REMOVE BONDING JUMPER IN EQUIPMENT CABINET IF INSTALLED BETWEEN AC NEUTRAL AND EQUIPMENT GROUND.
6. BOND ALL RIGID GALVANIZED STEEL CONDUITS ENTERING THE CABINET TO EQUIPMENT GROUND.
7. ENSURE EQUIPMENT GROUND IS ELECTRICALLY BONDED TO CABINET.
8. IRREVERSIBLE MECHANICALLY CRIMP THE SERVICE POLE GROUND WIRE TO THE GROUND ROD SYSTEM.



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Prepared for the Offices of:

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 N. T. S.

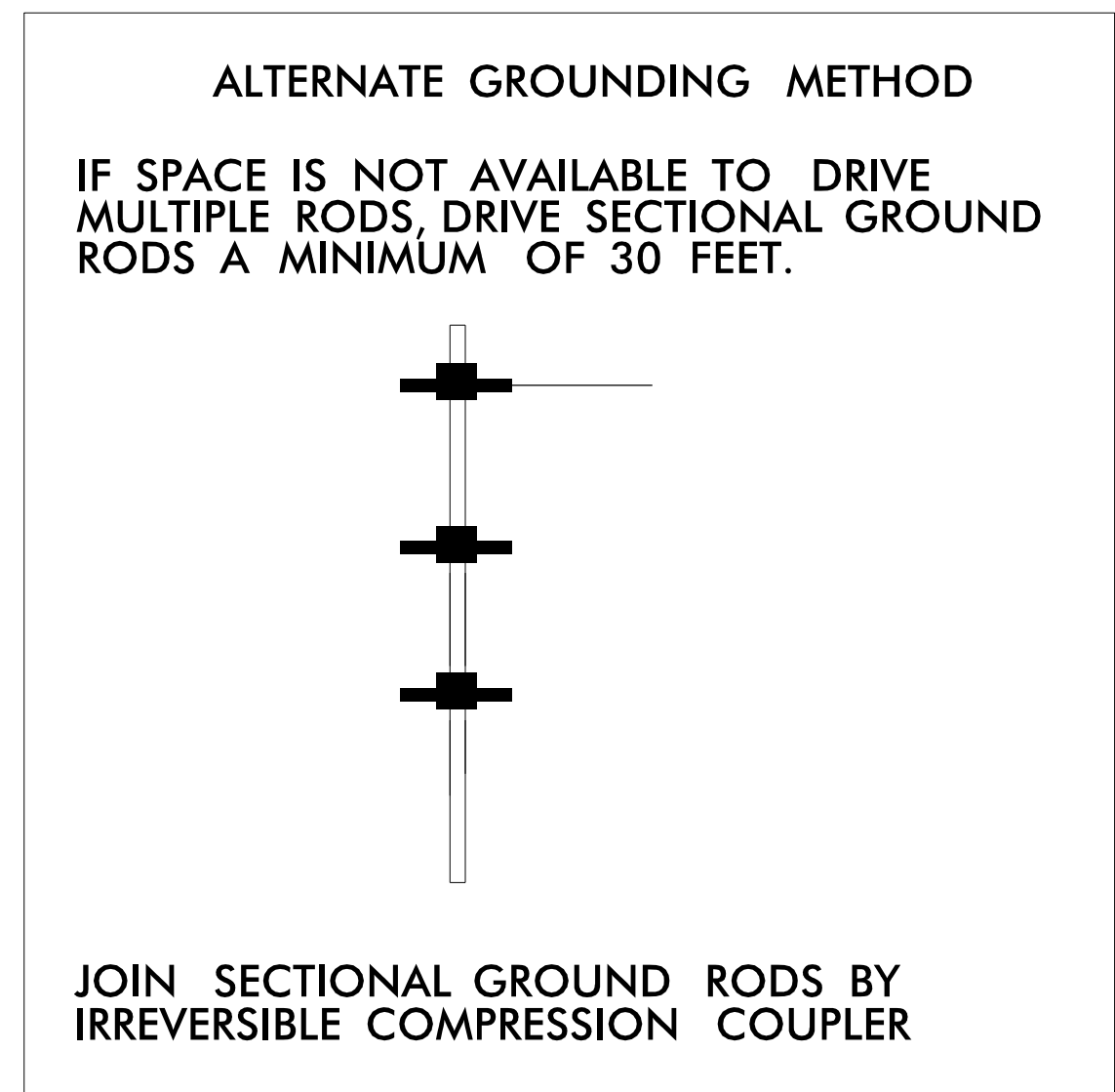
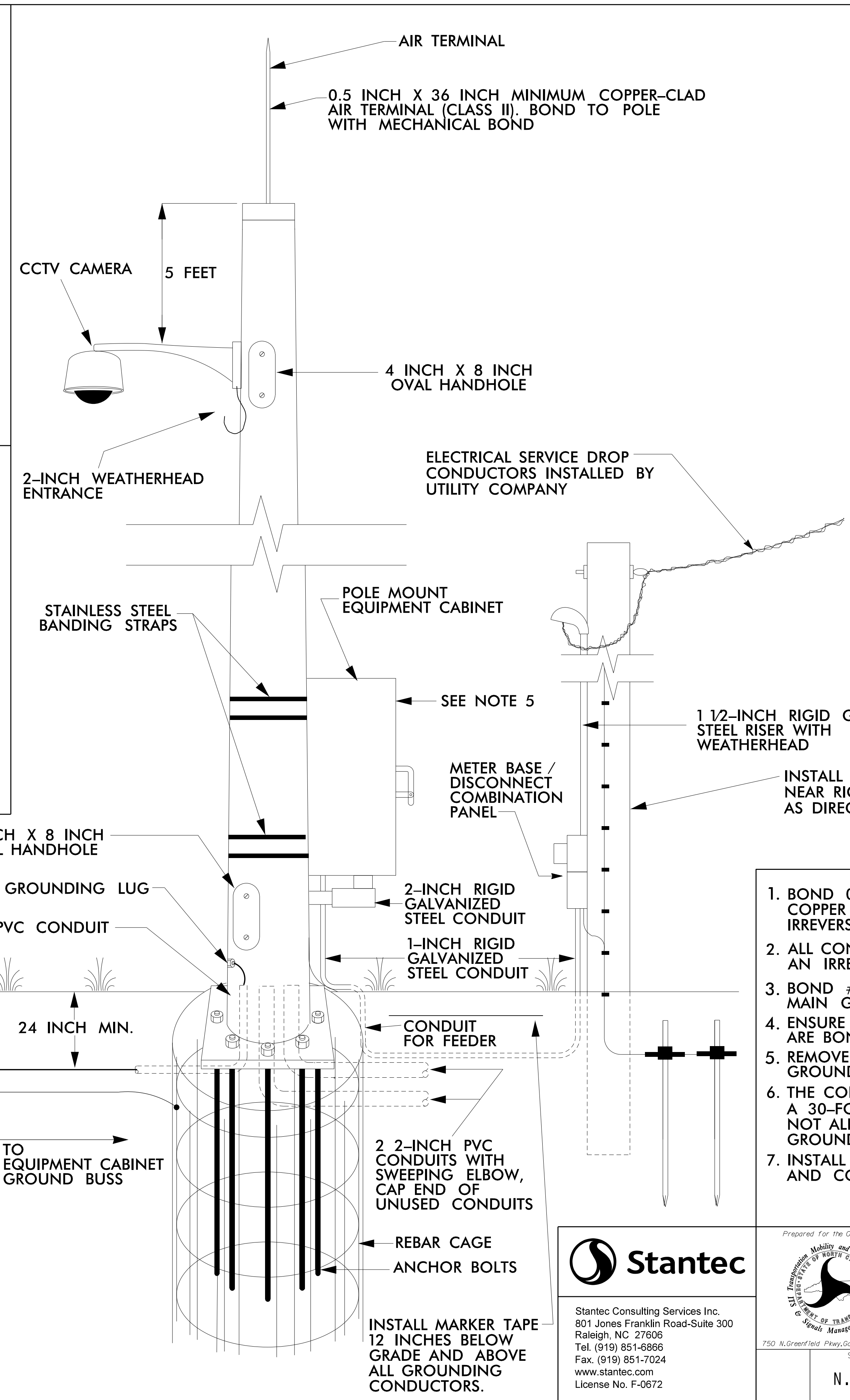
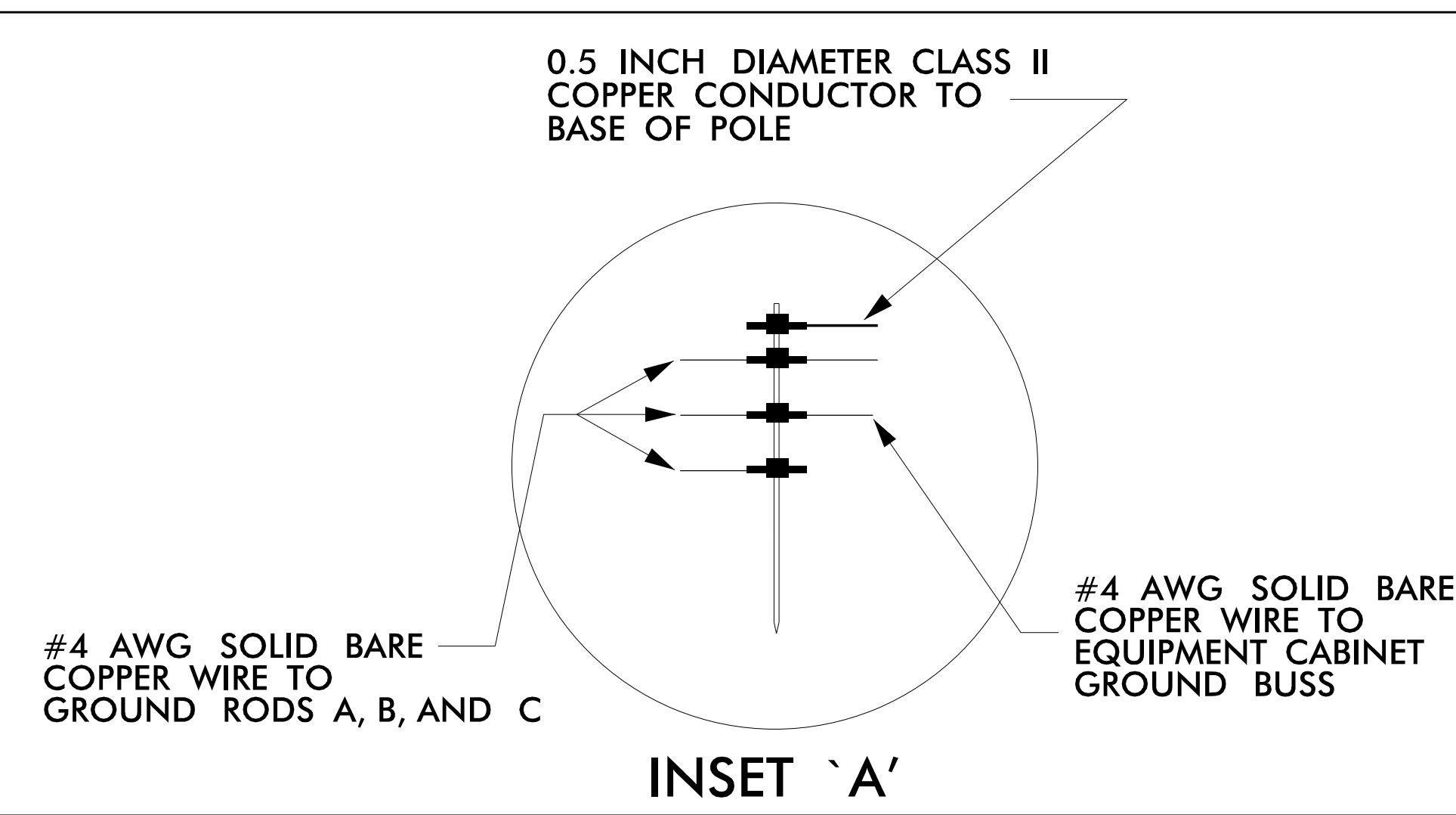
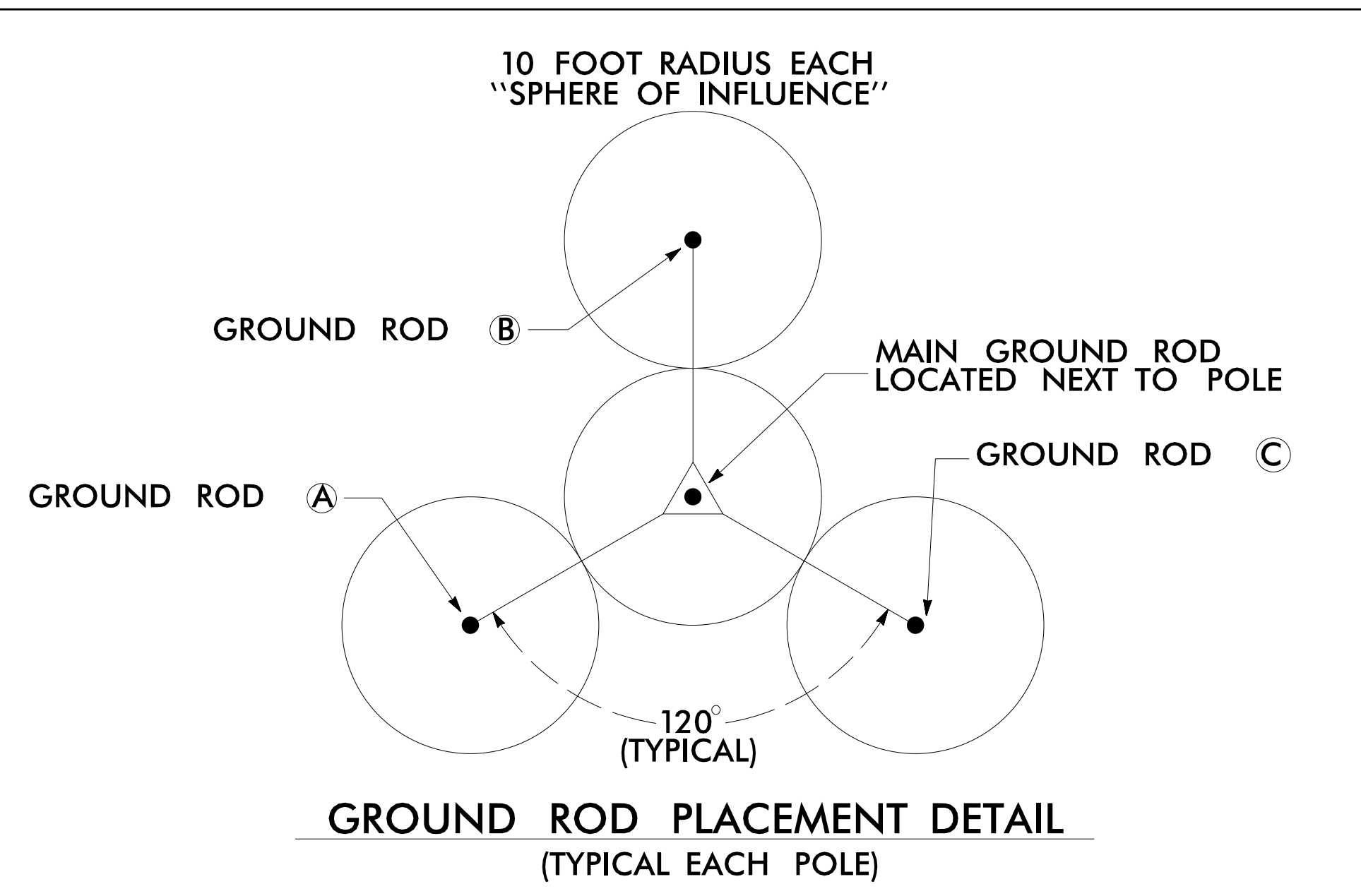
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 DMS Underground Fed
 Electrical Service Detail

Division 3 Pender County Near Topsail Beach
 PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris
 PREPARED BY: R M Muncey REVIEWED BY: L Overn

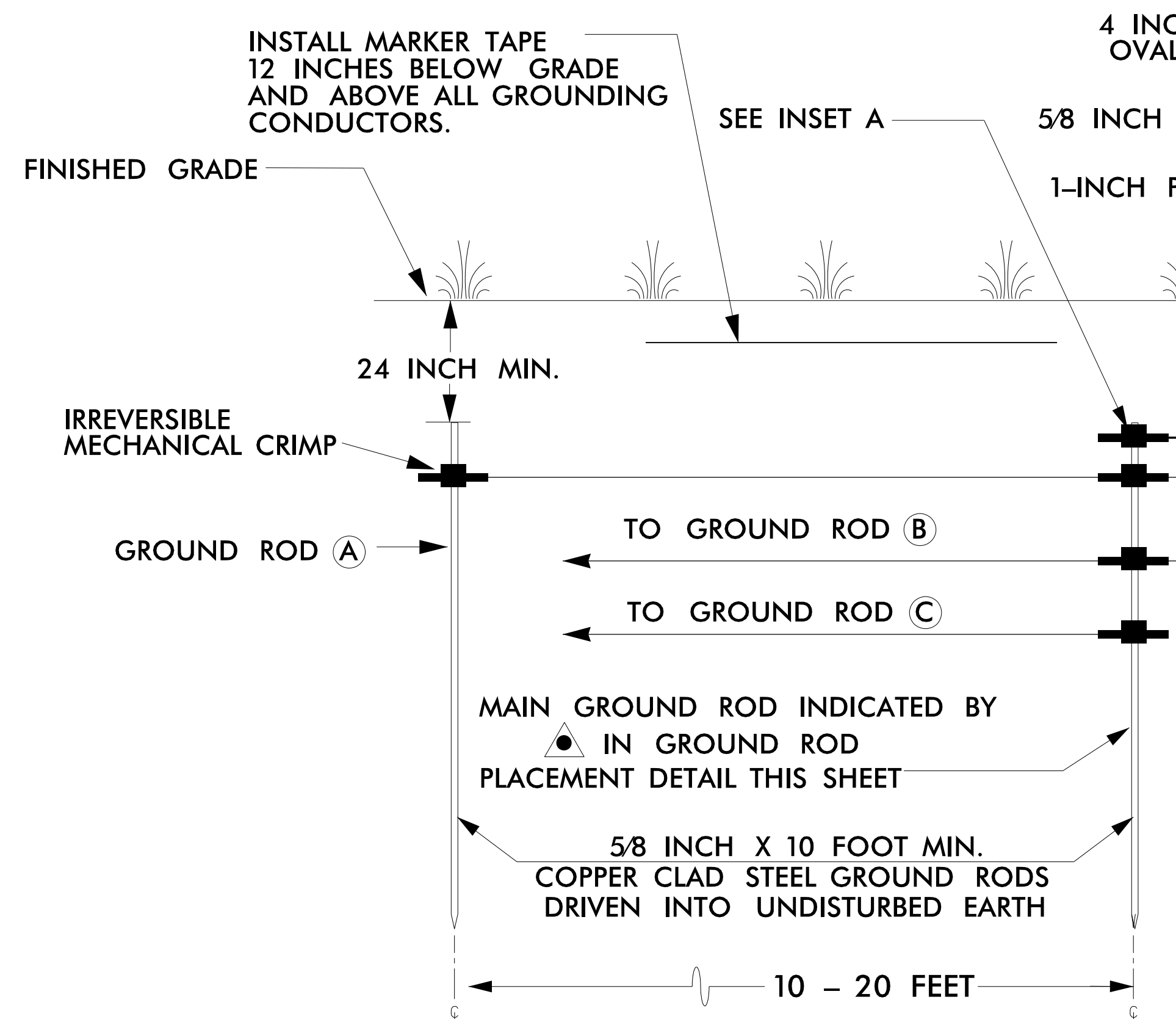
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SEAL

 SEAL
 43239
 REGINA M. MUNCEY
 ENGINEER
 DATE: 10/5/2021
 CADD Filename:



- NOTES**
1. BOND 0.5 INCH DIAMETER, 28 STRAND (MINIMUM) CLASS II COPPER CONDUCTOR TO THE MAIN GROUND ROD BY AN IRREVERSIBLE MECHANICAL CRIMP METHOD.
 2. ALL CONNECTIONS TO GROUND RODS SHOULD BE MADE WITH AN IRREVERSIBLE MECHANICAL CRIMP METHOD.
 3. BOND #4 AWG SOLID BARE COPPER WIRE TO REBAR CAGE AND THE MAIN GROUND ROD BY AN IRREVERSIBLE MECHANICAL CRIMP.
 4. ENSURE CAMERA HOUSING, CAMERA, AND PAN -TILT UNIT ARE BONDED TO POLE.
 5. REMOVE BONDING JUMPER BETWEEN EQUIPMENT CABINET GROUND BUSS AND NEUTRAL BUSS.
 6. THE CONTRACTOR MAY, UPON APPROVAL OF THE ENGINEER, INSTALL A 30-FOOT SECTIONAL GROUND ROD WHEN CONDITIONS WILL NOT ALLOW FOR THE INSTALLATION OF THE 3 - RADIAL GROUND RODS.
 7. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12 INCHES.



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Prepared for the Offices of:

SCALE: N.T.S.

CCTV CAMERA INSTALLATION FOR METAL POLE WITH AERIAL ELECTRICAL SERVICE TYPICAL DETAIL

Division 3 Pender County Near Topsail Beach

PLAN DATE: OCTOBER 2021 REVIEWED BY: E D Harris

PREPARED BY: R M Muncey REVIEWED BY: L Overn

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REGINA M. MUNCEY
 ENGINEER
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