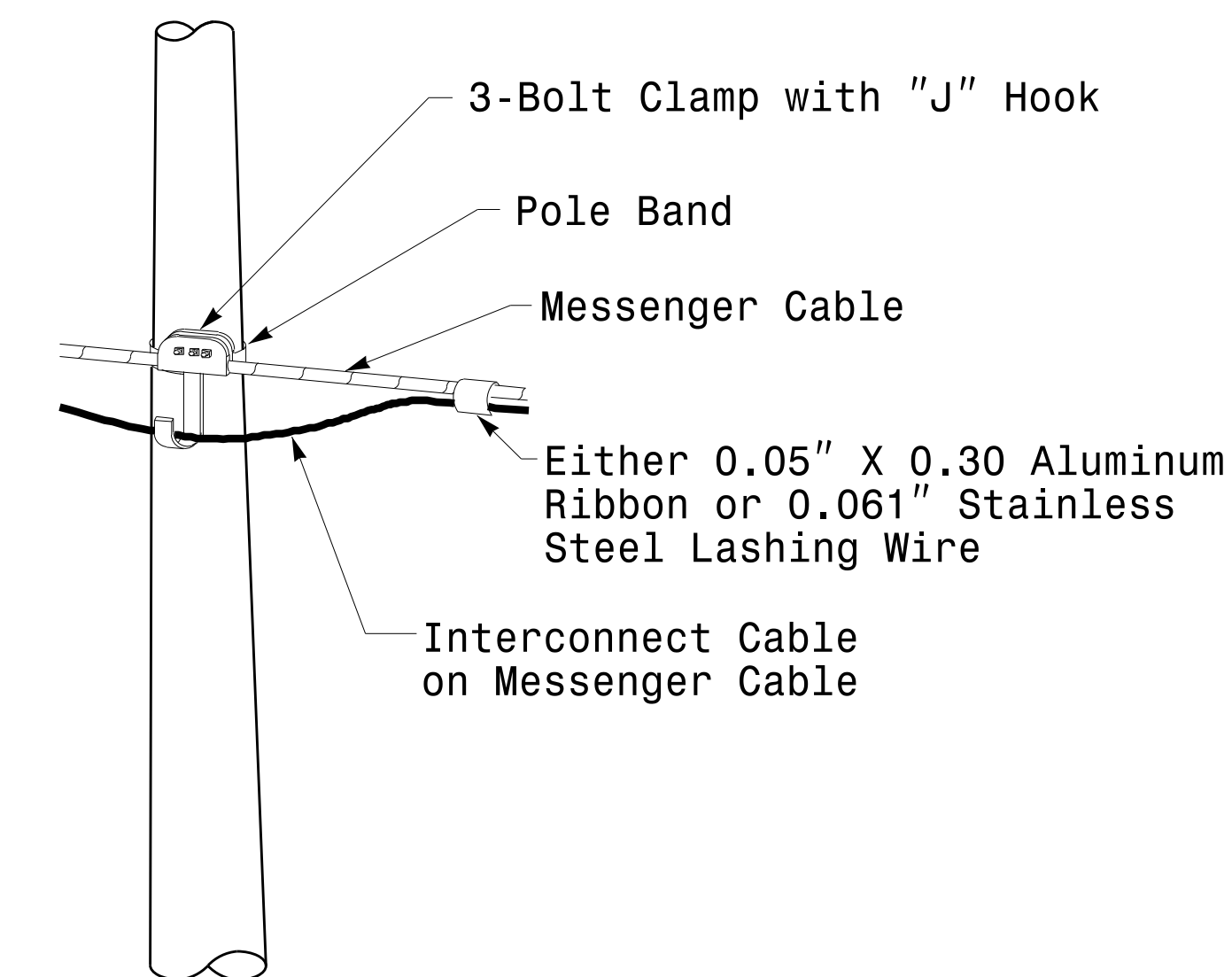


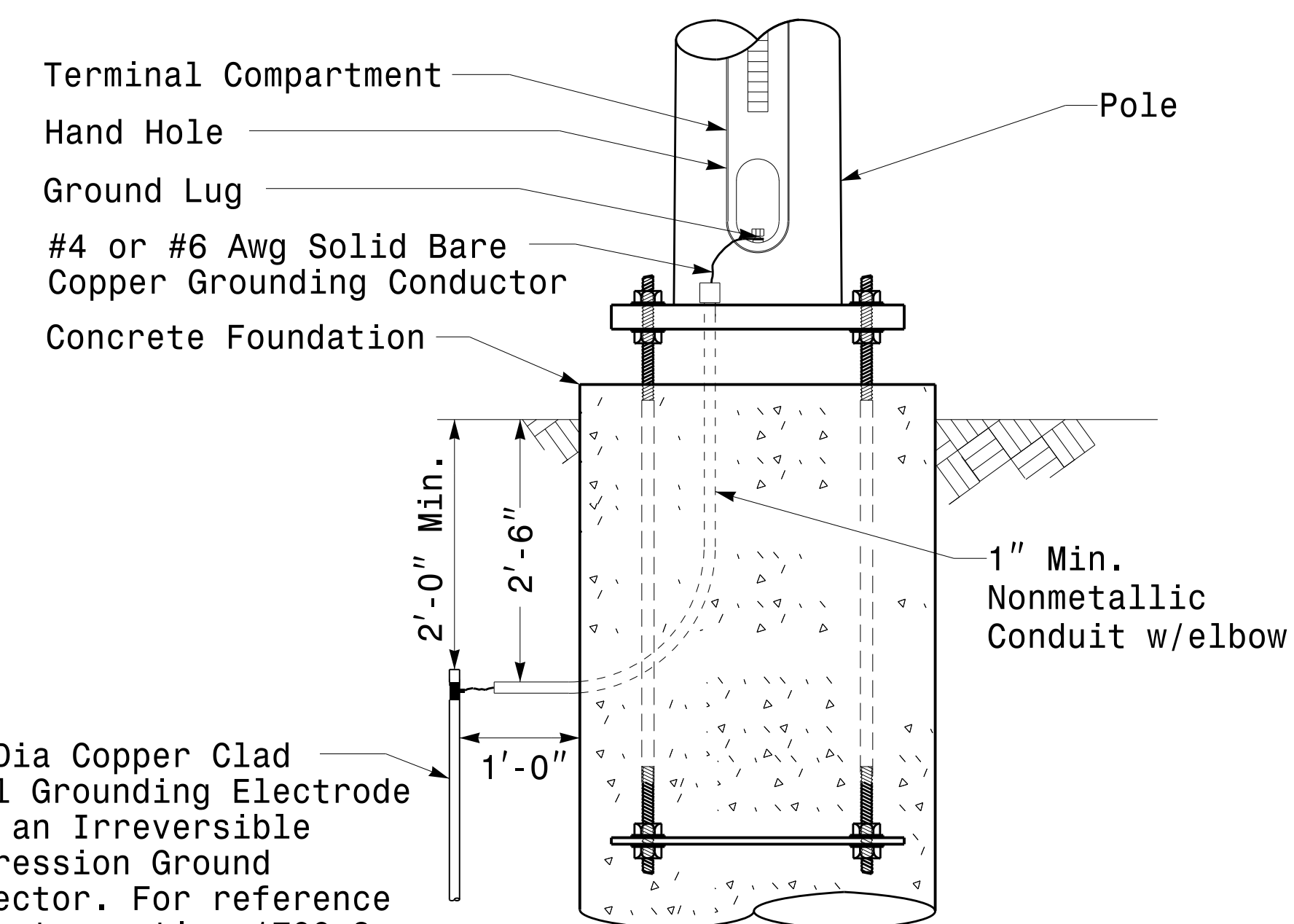
Strain Pole Attachments

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.

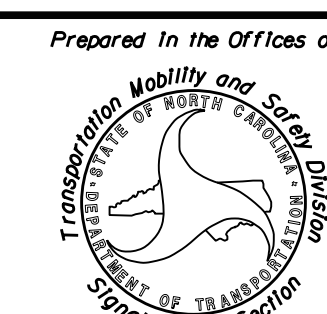


Attachment of Cable to Intermediate Metal Pole

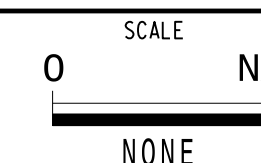


5/8" Dia Copper Clad Steel Grounding Electrode with an Irreversible Compression Ground Connector. For reference refer to section 1700-3 K and L for electrical grounding and bonding requirements, See Note 4.

Metal Pole Grounding Detail For Strain Pole and Mast Arm



750 N. Greenfield Pkwy, Garner, NC 27529

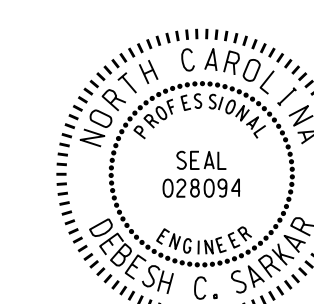


Typical Fabrication Details For Strain Pole Attachments

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

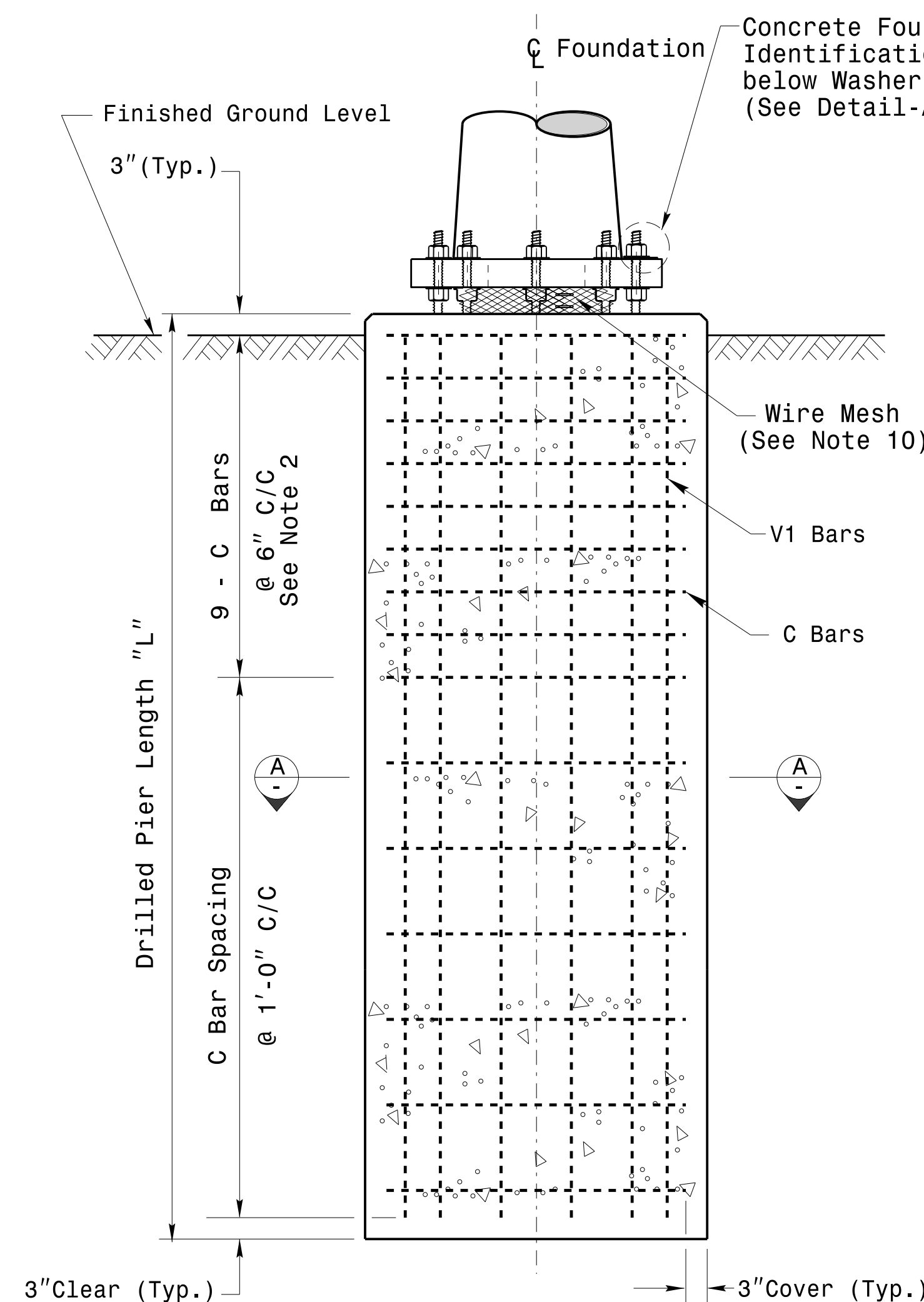
REVISIONS	INIT.	DATE

SEAL

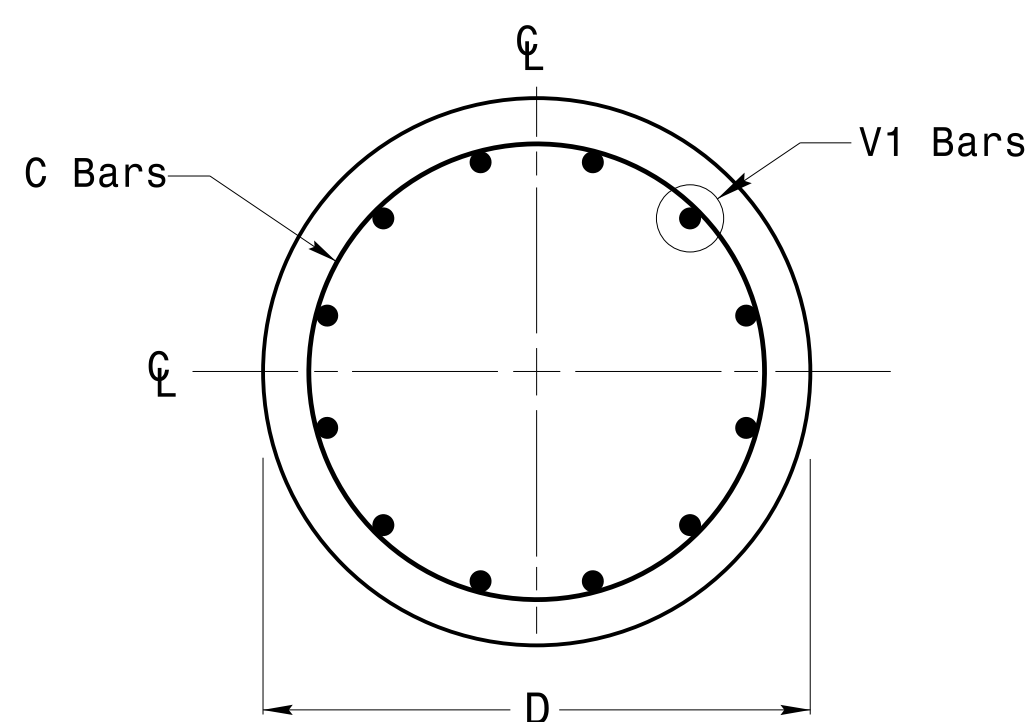


DocuSigned by: D. C. Sarkar

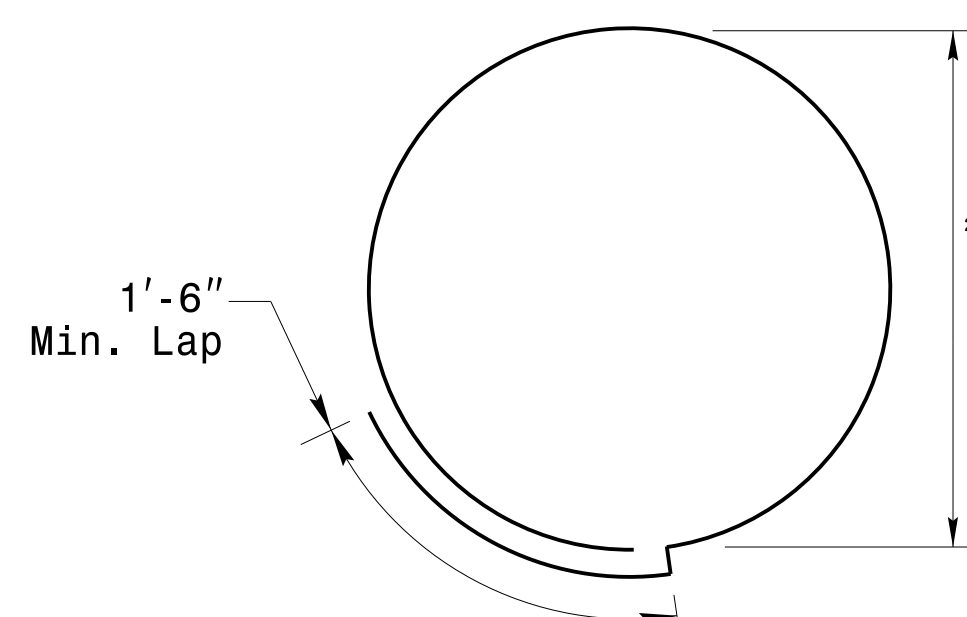
10/11/2017 DATE



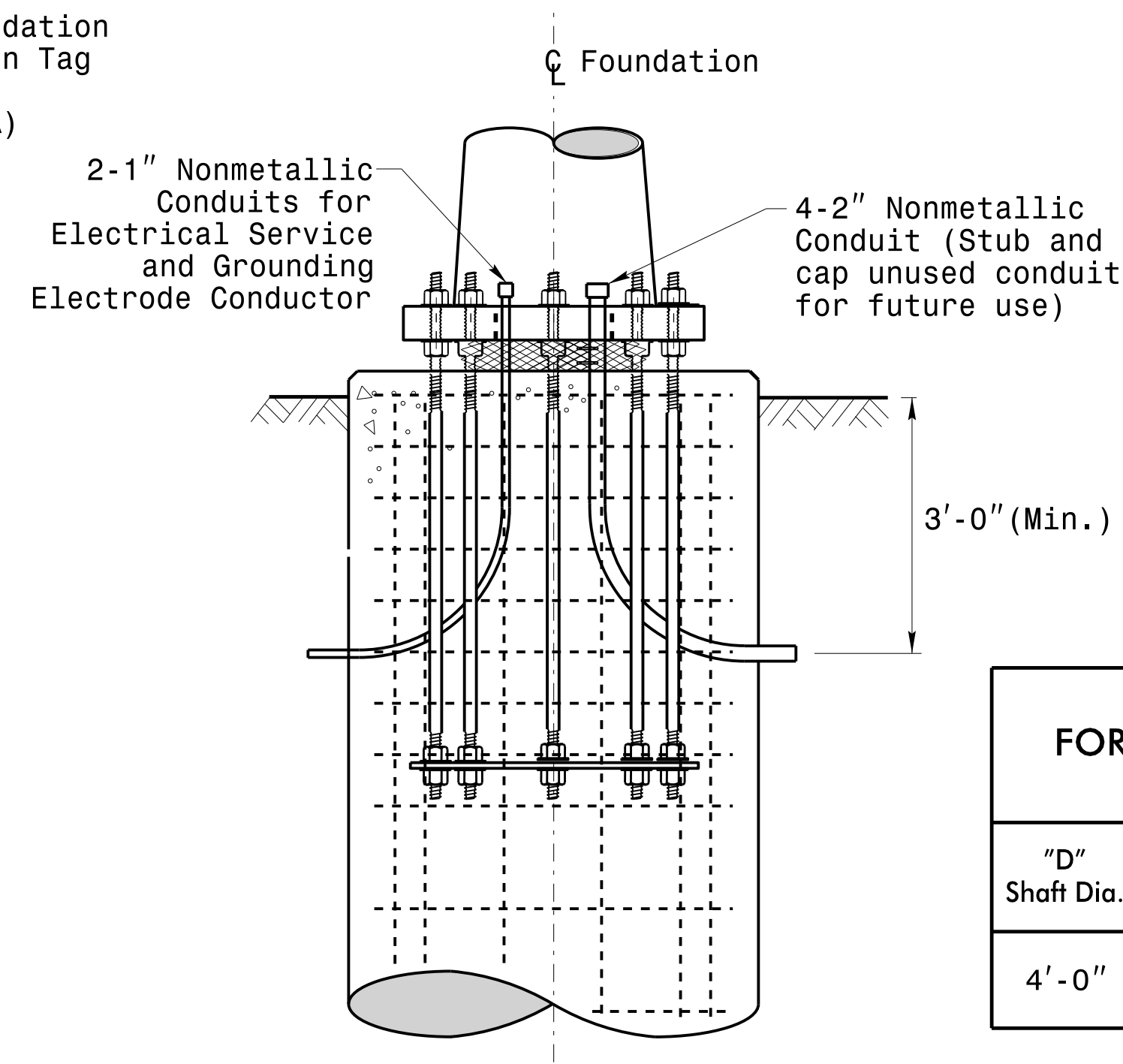
Concrete Shaft Elevation



Section A-A



Typical "C" Bar Detail



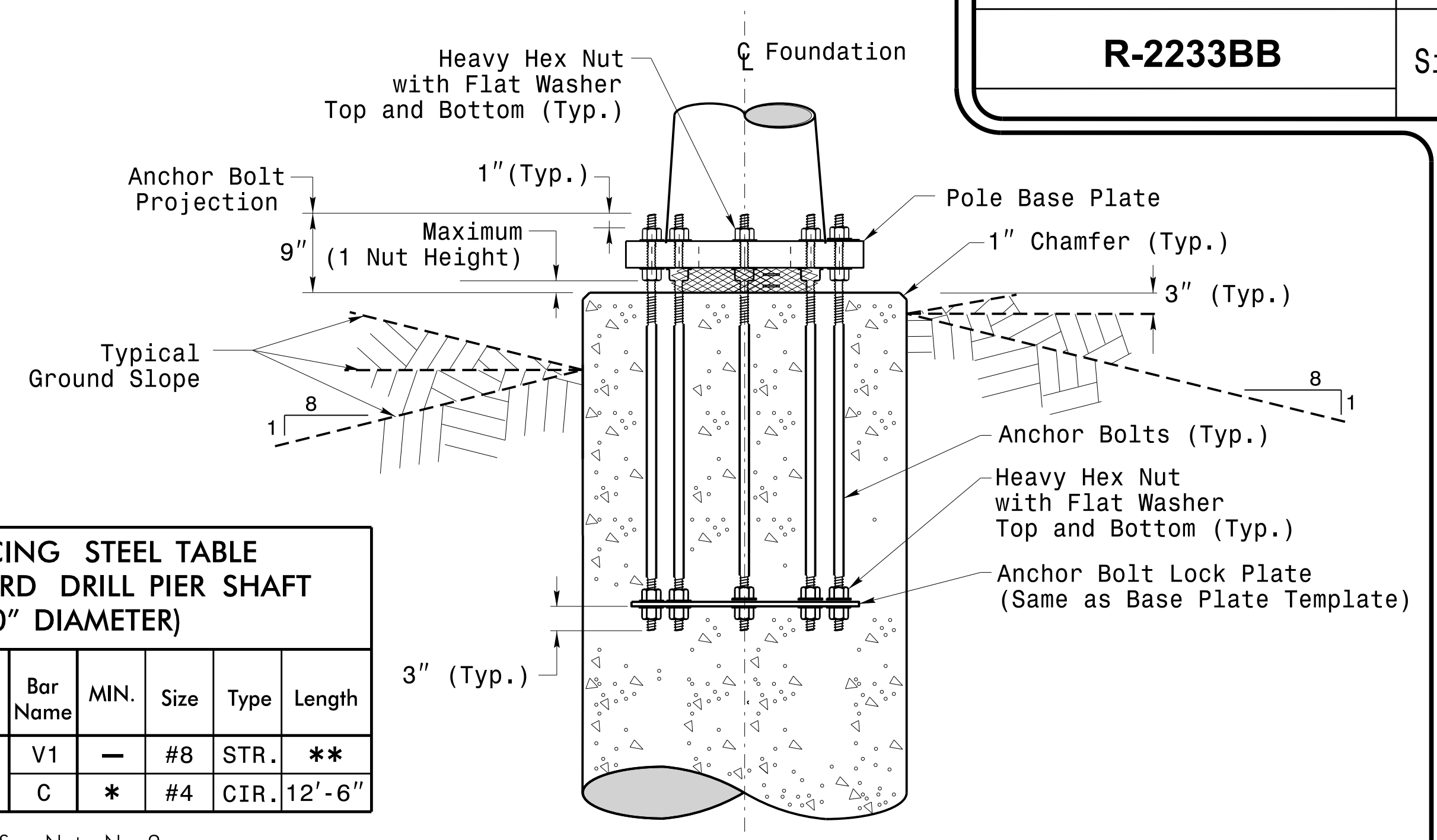
Typical Foundation Conduit Details

"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

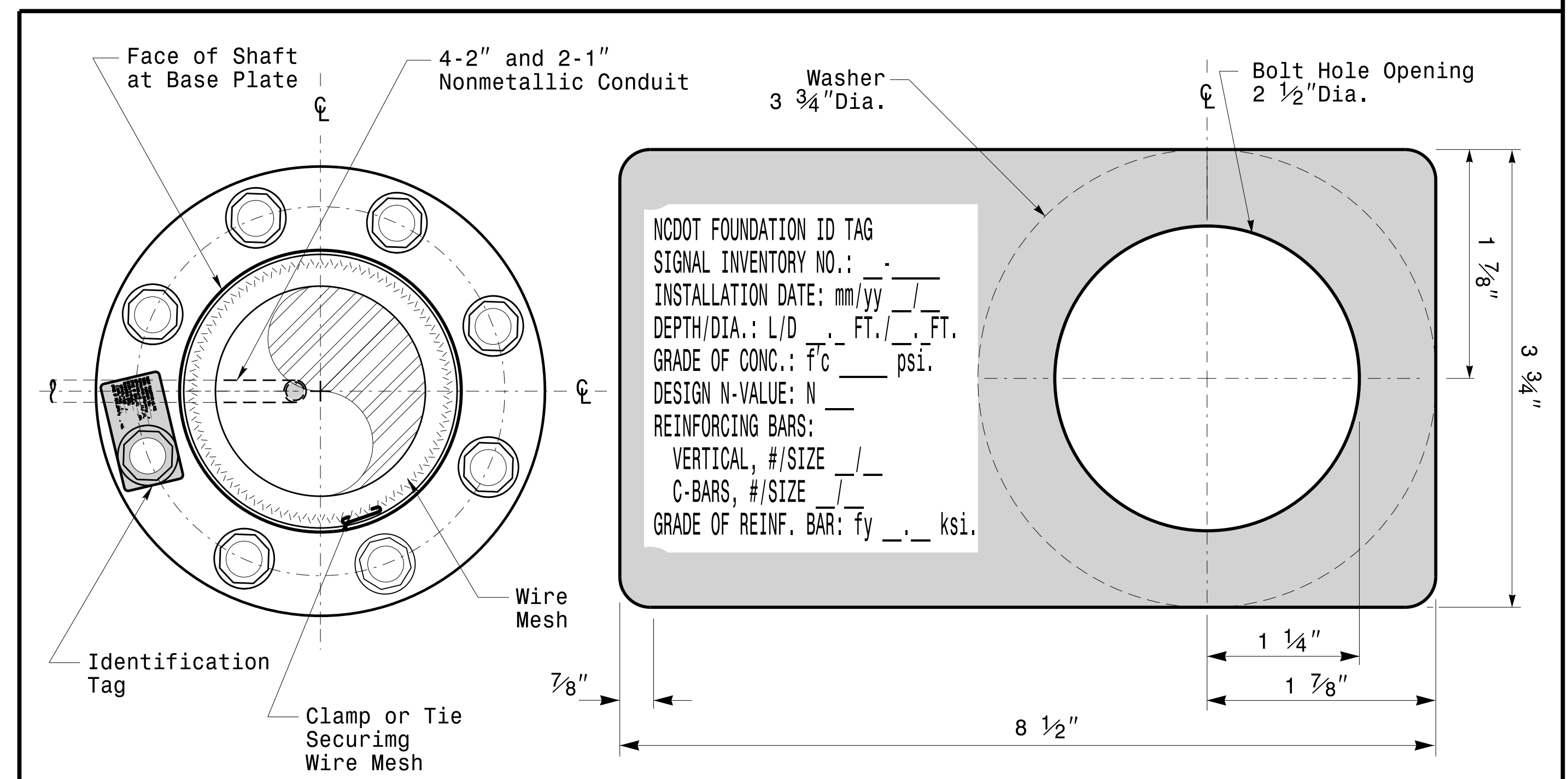
General Notes:

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 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.



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

<p>750 N. Greenfield Pkwy, Garner, NC 27529</p>		<p>Construction Details For Foundations</p>		
<p>Prepared In the Offices of:</p>		<p>PLAN DATE: OCTOBER 2018 DESIGNED BY: C.B. COGDILL</p>		
<p>SCALE: NONE</p>		<p>PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR</p>		
REV. NO.	COMMENTS	INIT.	DATE	
1	Revised Foundation Top Details	N.B.	5/11/2015	

DocuSigned by: 10/11/2017 DATE

11-001-2017-08:37
 \\S60W115\Stg\Drawings\Design\Section\Eastern_Region\M7_Sheets\2016\2014_Sig_M7_Shd_Construction_Detail\Is-Strain_Poles.dgn
 PLOT: 10/11/2017 10:42:15 AM

Construction Details – Foundations

SOIL CONDITION

PROJECT ID. NO. R-2233BB	SHEET NO. 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:

- 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.
- Use chairs and spacers to maintain proper clearance.
- For foundation, always use air-entrain concrete mix.

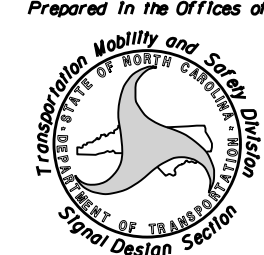

Foundation Selection:

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

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

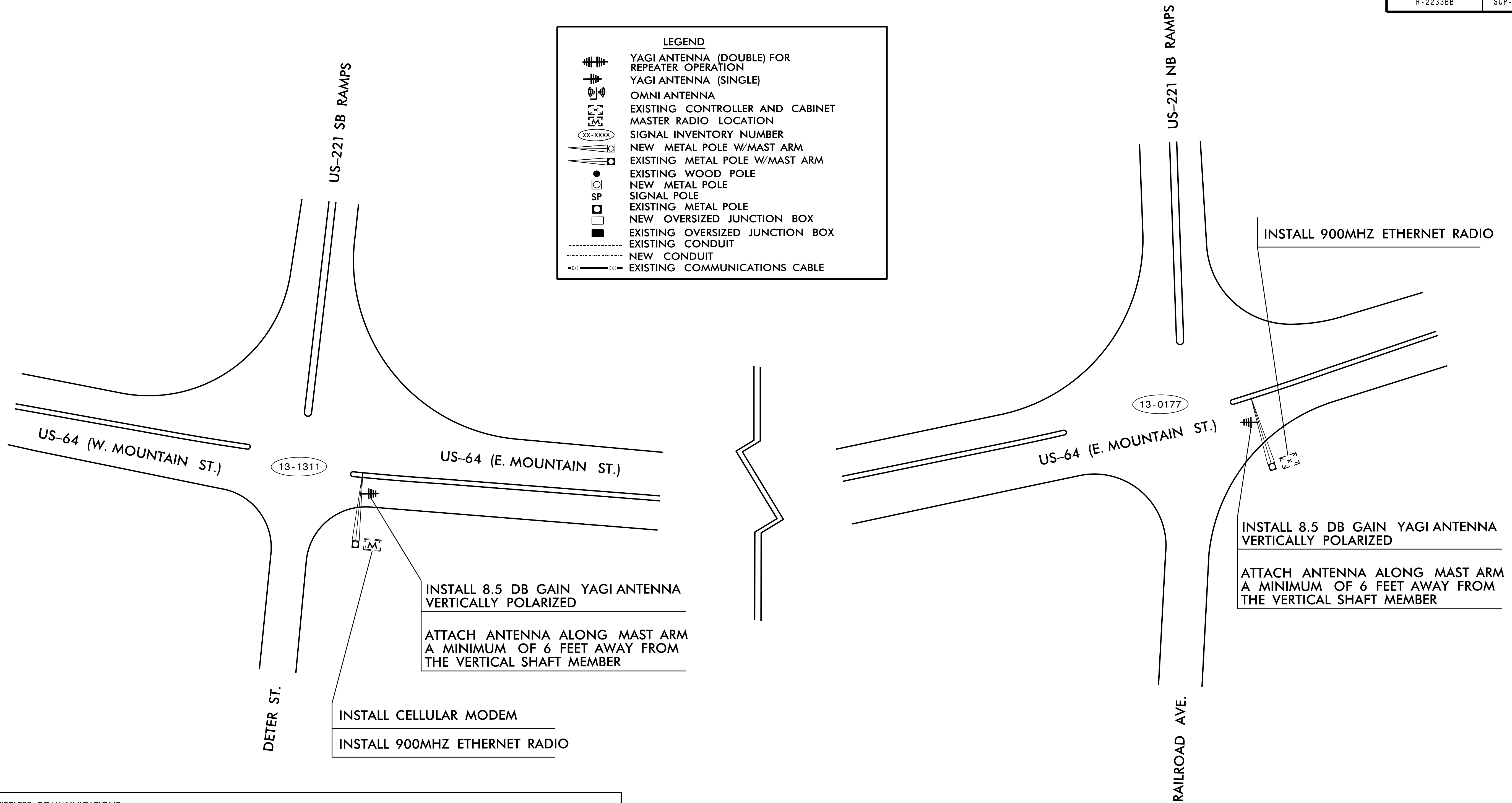
Standard Strain Pole Foundation-All Soil Condition

I:\Projects\2017_08-10_Signals\2017_08-10_Signals\Design\Section\Eastern Region\MM_Sheets\2016\2014_Sig.M8_Std_Strain Pole Found-Saturated Soil_Condition.dgn

	<p>Standard Strain Pole Foundation for All Soil Conditions</p> <p>PLAN DATE: OCTOBER 2017 DESIGNED BY: C.B. COGDILL PREPARED BY: N. BITTING REVIEWED BY: D.C. SARKAR</p>	
SCALE: 0 NA NONE	REVISIONS: Changed "Foundation Depth" to "Drilled Pier Length" in Conc. Egn. N.B. 7/12/2015	DATE: 10/11/2017

LEGEND

- YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
- YAGI ANTENNA (SINGLE)
- OMNI ANTENNA
- EXISTING CONTROLLER AND CABINET
- MASTER RADIO LOCATION
- SIGNAL INVENTORY NUMBER
- NEW METAL POLE W/MAST ARM
- EXISTING METAL POLE W/MAST ARM
- EXISTING WOOD POLE
- NEW METAL POLE
- SIGNAL POLE
- EXISTING METAL POLE
- NEW OVERSIZED JUNCTION BOX
- EXISTING OVERSIZED JUNCTION BOX
- EXISTING CONDUIT
- NEW CONDUIT
- EXISTING COMMUNICATIONS CABLE



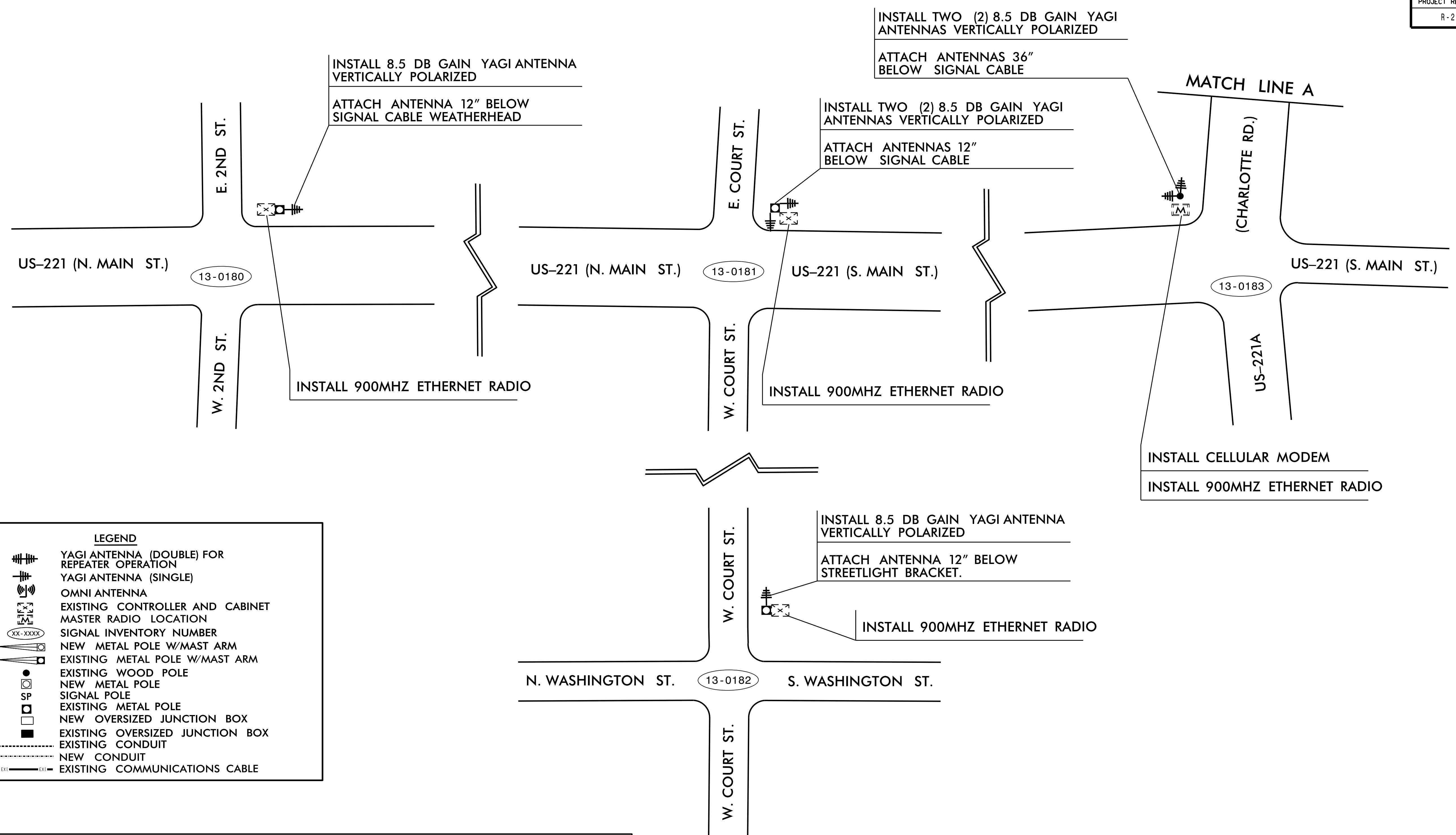
- NOTES FOR WIRELESS COMMUNICATIONS:**
- INSTALL COAXIAL CABLE:
 - ON WOOD POLES, REQUIRING A NEW RIGID GALVANIZED STEEL RISER, INSTALL A 2" RISER WITH WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
 - ON METAL POLES WITH MAST ARMS, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE MAST ARM; FIELD DRILL A 1/2" HOLE UP THROUGH THE BOTTOM OF MAST ARM FOR INSTALLATION OF THE COAXIAL CABLE TO THE ANTENNA.
 - ON METAL STRAIN POLES, RUN COAXIAL CABLE UP THROUGH THE POLE AND OUT THE WEATHERHEAD AND ROUTE THE COAXIAL CABLE TO THE ANTENNA.
 - BETWEEN THE POINT OF EXITING THE RISER, METAL POLE OR MAST ARM AND THE ANTENNA, SECURE THE COAXIAL CABLE TO THE STRUCTURE USING 3/4" STAINLESS STEEL STRAPS EVERY 12".
 - IF AN EXISTING 2" SPARE RIGID GALVANIZED STEEL RISER IS AVAILABLE, INSTALL THE COAXIAL CABLE IN THE SPARE RISER WITH A 2" WEATHERHEAD
 - INSTALL WIRELESS ANTENNA ON POLE WITH RF WARNING SIGN.
(NOTE: RF WARNING SIGN NOT REQUIRED WHEN ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
 - MAINTAIN PROPER CLEARANCE FROM ALL UTILITIES PER THE NATIONAL ELECTRICAL SAFETY CODE.
 - INSTALL WIRELESS RADIO MODEM WITH EXTERIOR DISCONNECT SWITCH LOCATED ON CABINET.
(NOTE: RF ANTENNA DISCONNECT SWITCH AND DECAL ARE NOT REQUIRED WHEN THE ANTENNA IS INSTALLED ON AN NCDOT-OWNED POLE.)
 - REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."
 - CELL MODEM TO BE SUPPLIED BY THE DEPARTMENT. CONTACT THE DEPUTY DIVISION TRAFFIC ENGINEER AT (828) 298-0094 TO REQUEST THE CELL MODEM. ALLOW 8 WEEK LEAD TIME BEFORE ANTICIPATED DEPLOYMENT.

SYSTEM NUMBER: 11331

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

<p>250 N. Greenfield Place, Garner, NC 27529</p>	<p>WIRELESS COMMUNICATION PLAN US-64 (EAST MOUNTAIN STREET)</p>		<p>SEAL</p>
	<p>DIVISION 13 RUTHERFORD CO. RUTHERFORDTON</p> <p>PLAN DATE: FEBRUARY 2020 REVIEWED BY: <i>Greg Green</i></p> <p>PREPARED BY: D. SONDERFAN</p>	<p>REVISIONS</p>	

CADD Filename:



LEGEND

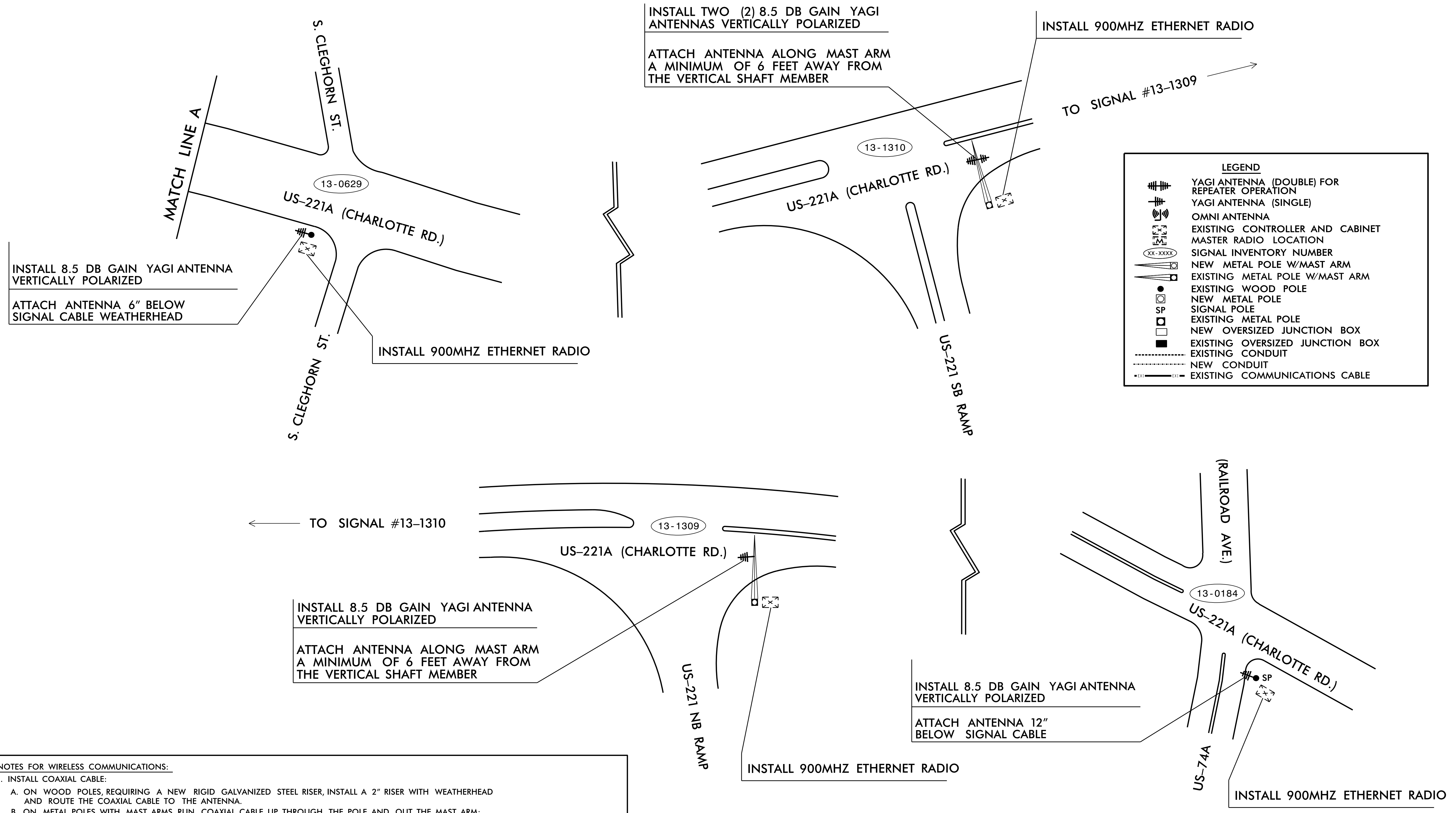
	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
	YAGI ANTENNA (SINGLE)
	OMNI ANTENNA
	EXISTING CONTROLLER AND CABINET
	MASTER RADIO LOCATION
	SIGNAL INVENTORY NUMBER
	NEW METAL POLE W/MAST ARM
	EXISTING METAL POLE W/MAST ARM
	EXISTING WOOD POLE
	NEW METAL POLE
	SIGNAL POLE
	EXISTING METAL POLE
	NEW OVERSIZED JUNCTION BOX
	EXISTING OVERSIZED JUNCTION BOX
	EXISTING CONDUIT
	NEW CONDUIT
	EXISTING COMMUNICATIONS CABLE

- NOTES FOR WIRELESS COMMUNICATIONS:**
- INSTALL COAXIAL CABLE:
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 - CELL MODEM TO BE SUPPLIED BY THE DEPARTMENT. CONTACT THE DEPUTY DIVISION TRAFFIC ENGINEER AT (828) 298-0094 TO REQUEST THE CELL MODEM. ALLOW 8 WEEK LEAD TIME BEFORE ANTICIPATED DEPLOYMENT.

SYSTEM NUMBER 11324

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

 Prepared in the Offices of: DIVISION OF TRANSPORTATION SYSTEMS 250 N. Greenfield Pkwy., Garner, NC 27529	WIRELESS COMMUNICATION PLAN US-221A (CHARLOTTE RD.) AND US-221 (S. MAIN ST.)		SEAL ENGINEER AUREF ASLAM
	DIVISION 13 RUTHERFORD CO. RUTHERFORDTON PLAN DATE: FEBRUARY 2020 REVIEWED BY: PREPARED BY: D. SONDERFAN	DocuSigned by: REVISIONS: _____ DATE: _____ DocuSigned by: 2/27/2020 SIGNATURE: _____ DATE: _____ CADD Filename: _____	



LEGEND

	YAGI ANTENNA (DOUBLE) FOR REPEATER OPERATION
	YAGI ANTENNA (SINGLE)
	OMNI ANTENNA
	EXISTING CONTROLLER AND CABINET
	MASTER RADIO LOCATION
	SIGNAL INVENTORY NUMBER
	NEW METAL POLE W/MAST ARM
	EXISTING METAL POLE W/MAST ARM
	EXISTING WOOD POLE
	NEW METAL POLE
	SIGNAL POLE
	EXISTING METAL POLE
	NEW OVERSIZED JUNCTION BOX
	EXISTING OVERSIZED JUNCTION BOX
	EXISTING CONDUIT
	NEW CONDUIT
	EXISTING COMMUNICATIONS CABLE

NOTES FOR WIRELESS COMMUNICATIONS:

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- REFERENCE "WIRELESS RADIO ANTENNA TYPICAL DETAILS."

SYSTEM NUMBER: 11324

DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

	WIRELESS COMMUNICATION PLAN US-221A (CHARLOTTE RD.)		
	DIVISION 13 RUTHERFORD CO. RUTHERFORDTON PLAN DATE: FEBRUARY 2020 REVIEWED BY: <i>Gary Ginn</i>	PREPARED BY: D. SONDERFAN REVISIONS: _____ DATE: _____	
250 N. Greenfield Place, Garner, NC 27529		DocuSigned by: <i>Auref Aslam, PE</i> 2/27/2020	SEAL

CADD File name: _____