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TIP PROJECT: U-2525C

CONTRACT: C204096

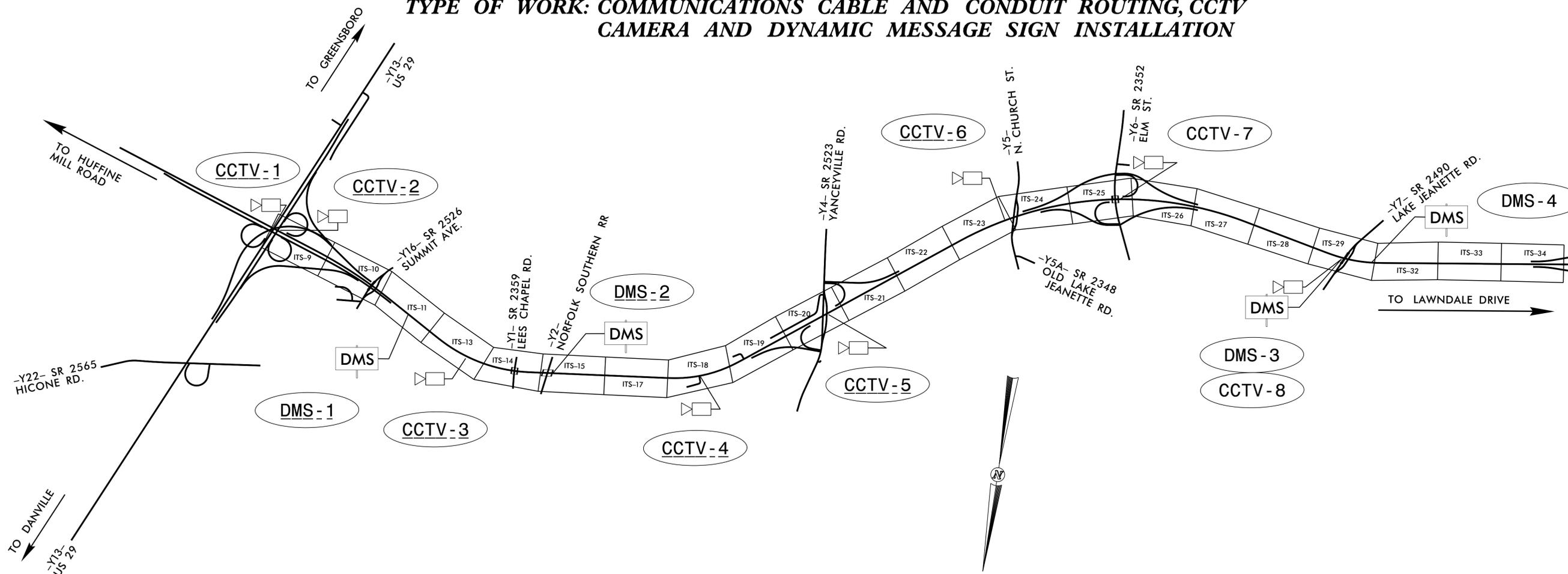
STATE OF NORTH CAROLINA
DIVISION OF HIGHWAYS

GUILFORD COUNTY

STATE	STATE PROJECT REFERENCE NO.	SHEET NO.
N.C.	U-2525C	ITS-1
STATE PROJ. NO.	F.A. PROJ. NO.	DESCRIPTION
34821.3.7		CONST.
34821.1.5		PE

**LOCATION: GREENSBORO EASTERN LOOP FROM US 29 NORTH
OF GREENSBORO TO SR 2303 (LAWNDALE DRIVE)**

**TYPE OF WORK: COMMUNICATIONS CABLE AND CONDUIT ROUTING, CCTV
CAMERA AND DYNAMIC MESSAGE SIGN INSTALLATION**



2018 STANDARD SPECIFICATIONS

PROJECT LENGTH

PROJECT LENGTH = 5.6 MILES

LETTING DATE:

MARCH 20, 2018

INDEX OF SHEETS

SHEET ITS 1	TITLE SHEET
SHEET ITS 2	CONSTRUCTION NOTES AND LEGEND
SHEET ITS 3-8	TYPICAL DETAILS
SHEET ITS 9-34	CABLE ROUTING PLANS
SHEET ITS 35-36	TRAVEL TIME SIGNS
SHEET ITS 37-40	SPLICE DETAILS

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 2012 ARE APPLICABLE TO THIS PROJECT AND BY REFERENCE HEREBY ARE CONSIDERED A PART OF THESE PLANS:

STD. NO.	TITLE
1700.01	ELECTRICAL SERVICE OPTIONS
1700.02	ELECTRICAL SERVICE GROUNDING
1715.01	UNDERGROUND CONDUIT-TRENCHING
1716.01	JUNCTION BOXES
1720.01	WOOD POLES
1730.01	FIBER OPTIC CABLE
1751.01	CONTROLLER AND CABINETS
1751.02	CONTROLLER AND CABINETS

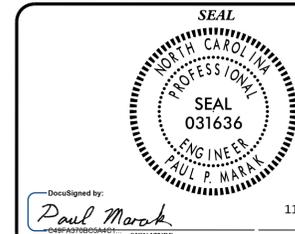
2018 STANDARD SPECIFICATION

NCDOT CONTACT:
TRANSPORTATION MOBILITY AND SAFETY
M.A. ASLAMI, P.E.
STATE ITS & SIGNALS
MANAGEMENT ENGINEER



ENGLISH

ALL DIMENSIONS IN THESE PLANS ARE IN FEET UNLESS OTHERWISE NOTED



LEGEND

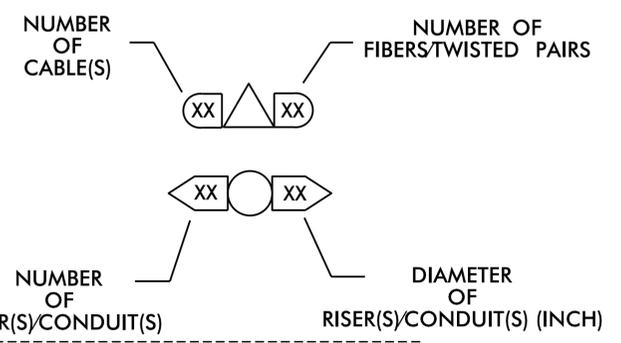
- NEW FIBER OPTIC COMMUNICATIONS CABLE
- NEW CONDUIT
- EXISTING CONDUIT
- NEW DIRECTIONAL DRILLED CONDUIT
- NEW BORED AND JACKED CONDUIT
- NEW GUARDRAIL
- EXISTING GUARDRAIL
- EXISTING CONTROLLED ACCESS FENCE
- NEW JUNCTION BOX
- EXISTING JUNCTION BOX
- NEW WOOD POLE
- EXISTING WOOD POLE
- NEW SPLICE ENCLOSURE
- EXISTING SPLICE ENCLOSURE
- NEW METAL POLE
- NEW CCTV CAMERA ASSEMBLY
- PROPOSED PEDESTAL-MOUNTED DMS STRUCTURE
- EXISTING PEDESTAL-MOUNTED DMS STRUCTURE
- NEW STANDARD GUY ASSEMBLY
- NEW ELECTRICAL SERVICE
- NEW ITS DEVICE NUMBER

- INSTALL 3-WIRE COPPER SERVICE ENTRANCE CONDUCTORS
- INSTALL 4-WIRE COPPER FEEDER CONDUCTORS
- INSTALL 3-WIRE COPPER FEEDER CONDUCTORS
- INSTALL SMFO CABLE
- REUSE EXISTING SMFO CABLE
- INSTALL FIBER OPTIC DROP CABLE
- INSTALL TRACER WIRE
- TRENCH
- INSTALL PVC CONDUIT
- INSTALL RIGID, GALVANIZED STEEL CONDUIT
- INSTALL RIGID, GALVANIZED STEEL RISER WITH WEATHERHEAD
- INSTALL RIGID, GALVANIZED STEEL RISER WITH FIBER OPTIC CABLE SEAL
- INSTALL POLYETHYLENE CONDUIT IN EXISTING OUTERDUCT
- INSTALL POLYETHYLENE CONDUIT
- DIRECTIONAL DRILL CONDUIT
- BORE AND JACK CONDUIT
- INSTALL CABLE(S) IN EXISTING CONDUIT
- INSTALL CABLE(S) IN NEW CONDUIT
- INSTALL CABLE(S) IN EXISTING RISER
- INSTALL CABLE(S) IN NEW RISER
- INSTALL CABLE(S) IN EXISTING CONDUIT STUBOUTS
- INSTALL NEW CONDUIT INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- INSTALL NEW RISER INTO EXISTING CABINET BASE (USE EXISTING CONDUIT STUB-OUTS WHEN AVAILABLE)
- INSTALL NEW CONDUIT INTO NEW POLE MOUNTED CABINET
- INSTALL NEW RISER INTO EXISTING POLE MOUNTED CABINET
- TERMINATE COMMUNICATIONS CABLE ON EXISTING TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
- INSTALL NEW TELEMETRY INTERFACE PANEL IN TRAFFIC SIGNAL CONTROLLER CABINET
- INSTALL INTERCONNECT CENTER, PATCH PANEL, JUMPERS, AND FUSION SPLICE CABLE IN CABINET
- INSTALL UNDERGROUND SPLICE ENCLOSURE
- MODIFY EXISTING UNDERGROUND SPLICE ENCLOSURE
- MODIFY EXISTING BASE MOUNTED SPLICE CABINET
- INSTALL BASE MOUNTED SPLICE CABINET
- REMOVE EXISTING SPLICE CABINET
- INSTALL CABINET FOUNDATION

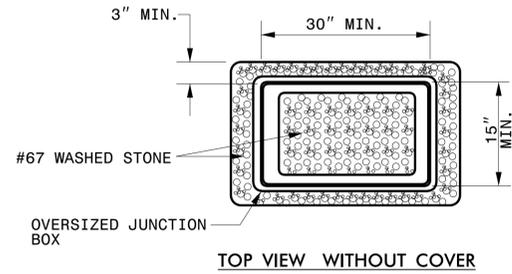
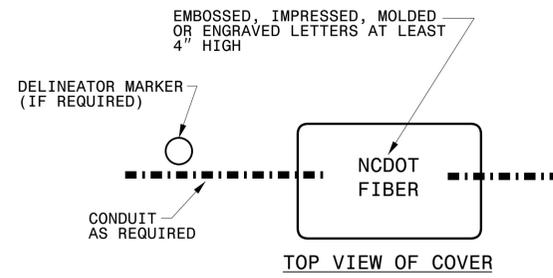
- REMOVE EXISTING CABINET FOUNDATION
- INSTALL CCTV CAMERA ASSEMBLY
- INSTALL CCTV CAMERA METAL POLE WITH LOWERING DEVICE AND FOUNDATION
- INSTALL CCTV CAMERA METAL POLE AND FOUNDATION
- INSTALL STANDARD JUNCTION BOX
- INSTALL OVERSIZED JUNCTION BOX
- INSTALL SPECIAL OVERSIZED JUNCTION BOX
- INSTALL WOOD POLE
- INSTALL 6" x 6" WOOD PEDESTAL
- INSTALL AERIAL GUY ASSEMBLY
- INSTALL STANDARD GUY ASSEMBLY
- INSTALL SIDEWALK GUY ASSEMBLY
- INSTALL MESSENGER CABLE
- REMOVE EXISTING COMMUNICATIONS CABLE AND MESSENGER CABLE
- REMOVE EXISTING COMMUNICATIONS CABLE
- INSTALL TELEPHONE SERVICE
- INSTALL CABLE STORAGE RACKS (SNOW SHOES) AND STORE 100 FEET OF CABLE
- INSTALL DELINEATOR MARKER
- STORE 50 FEET OF COMMUNICATIONS CABLE
- LASH CABLE(S) TO NEW MESSENGER CABLE
- INSTALL 10KVA SINGLE PHASE TRANSFORMER
- INSTALL NEW EQUIPMENT CABINET DISCONNECT
- MODIFY EXISTING ELECTRICAL SERVICE
- INSTALL NEW ELECTRICAL SERVICE
- INSTALL NEW POLE MOUNTED CABINET
- INSTALL FIELD ETHERNET SWITCH
- INSTALL VIDEO CODEC UNIT
- INSTALL DMS ASSEMBLY

CONSTRUCTION NOTE SYMBOLOGY KEY

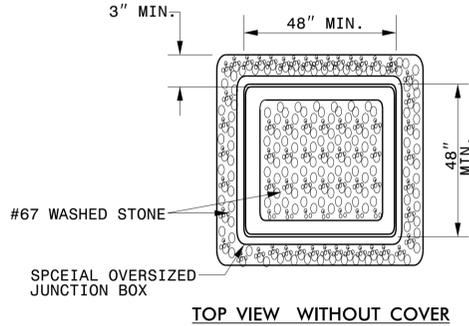
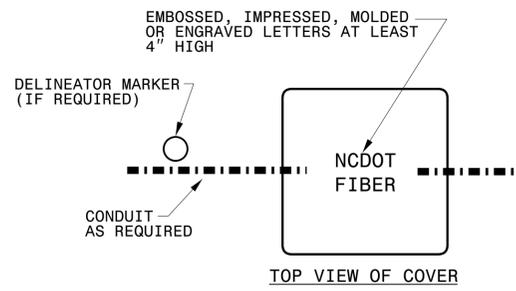
- INDICATES NUMBER OF CABLES, LOOPS, ETC.
- INDICATES NUMBER OF FIBERS PER CABLE, TWISTED PAIRS PER CABLE, ETC.
- INDICATES NUMBER OF RISER(S)/CONDUIT(S)
- INDICATES DIAMETER OF RISER(S)/CONDUIT(S) (INCH)



	CONSTRUCTION NOTES AND LEGEND		
	DIVISION 07 GUILFORD CO. GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE		
750 N. Greenfield Pkwy., Garner, NC 27529 SCALE: 0 N/A	REVISIONS: _____ INIT.: _____ DATE: _____	REVISIONS: _____ INIT.: _____ DATE: _____	SIGNATURE: _____ DATE: _____ CADD Filename: _____

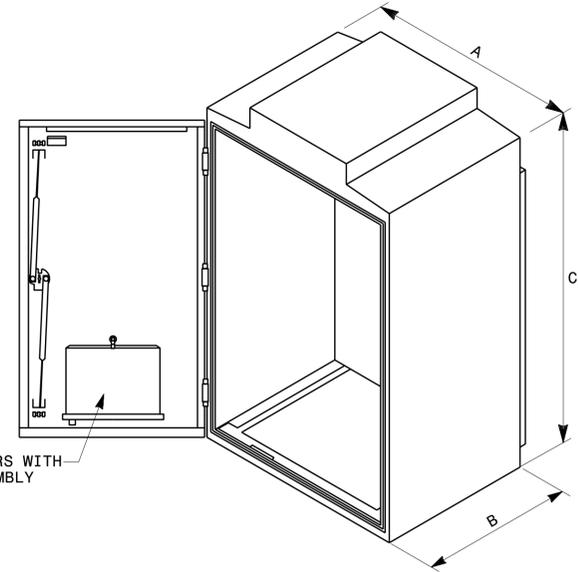


**OVERSIZED HEAVY DUTY JUNCTION BOX
TYPICAL DETAIL**

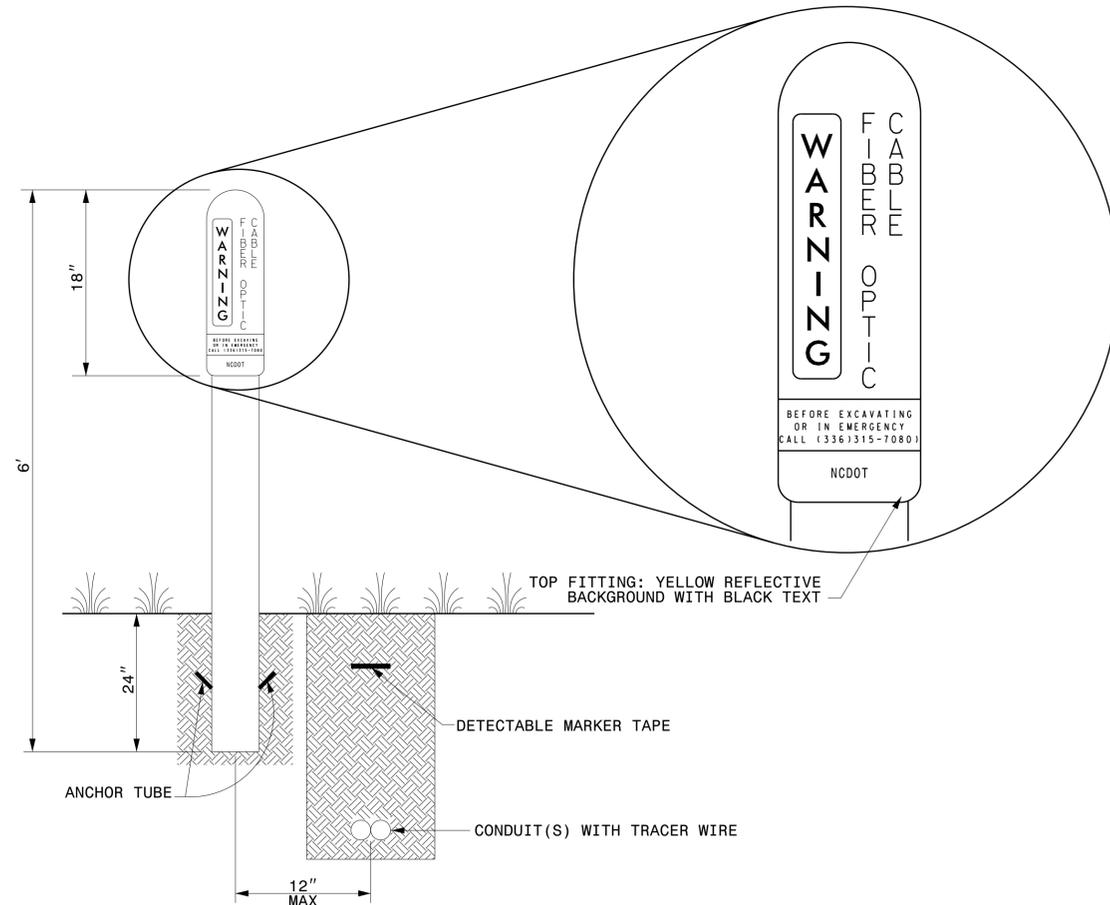


**SPECIAL OVERSIZED JUNCTION BOX
TYPICAL DETAIL**

CABINET HOUSING DIMENSIONS
336S
A 24"
B 20"
C 46"



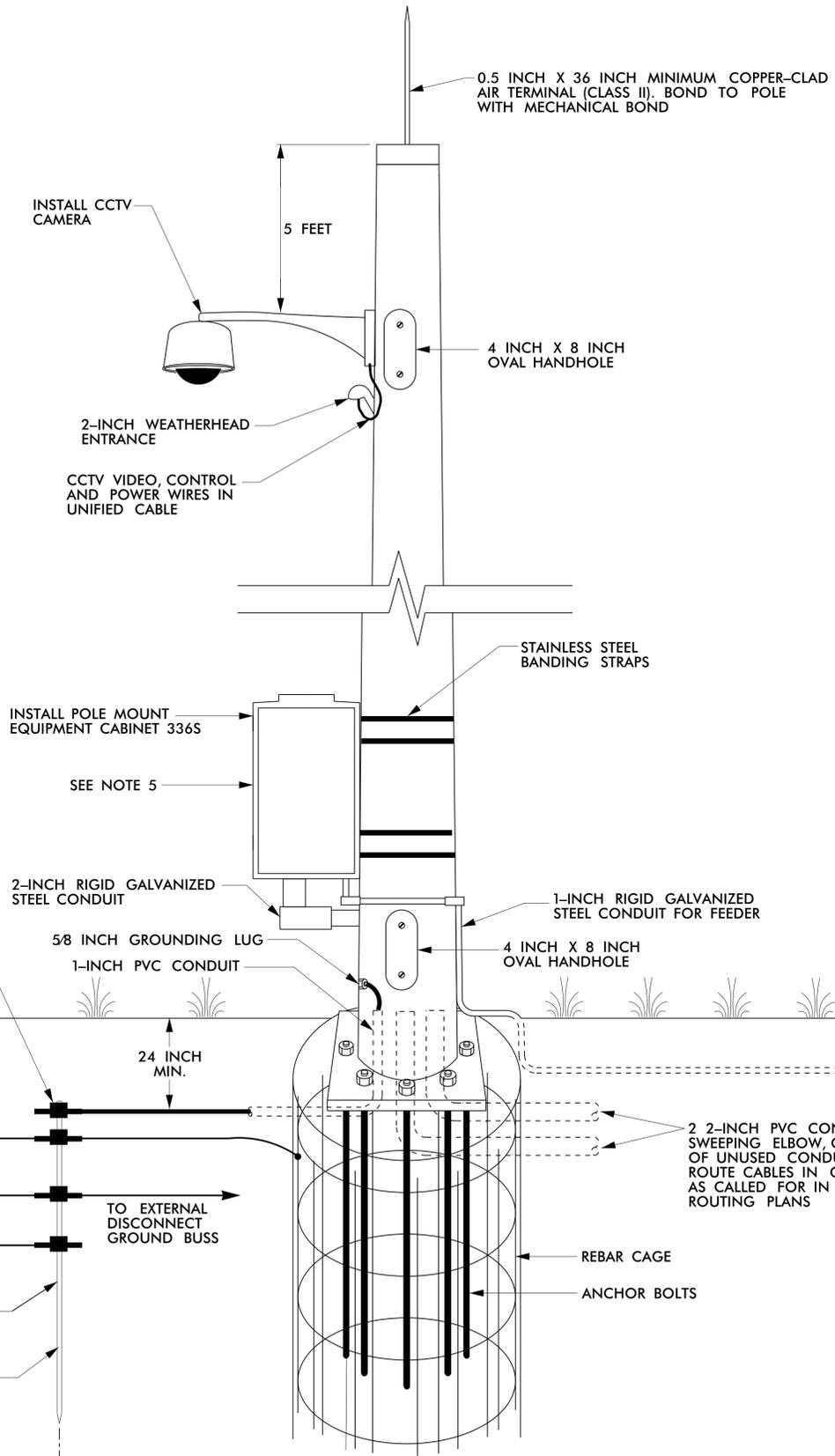
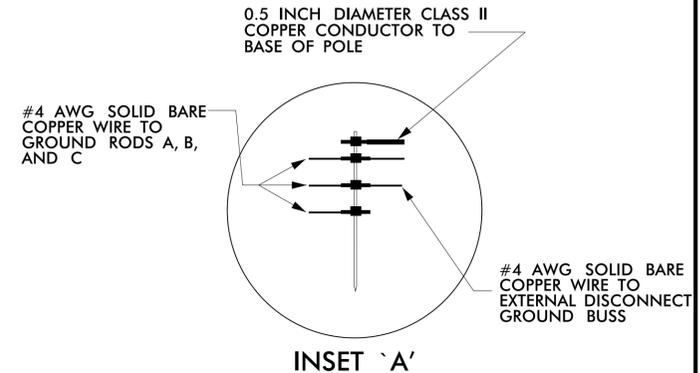
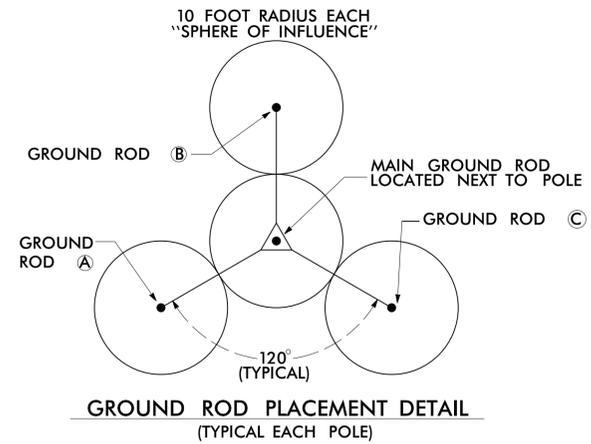
EQUIPMENT CABINET SIZES



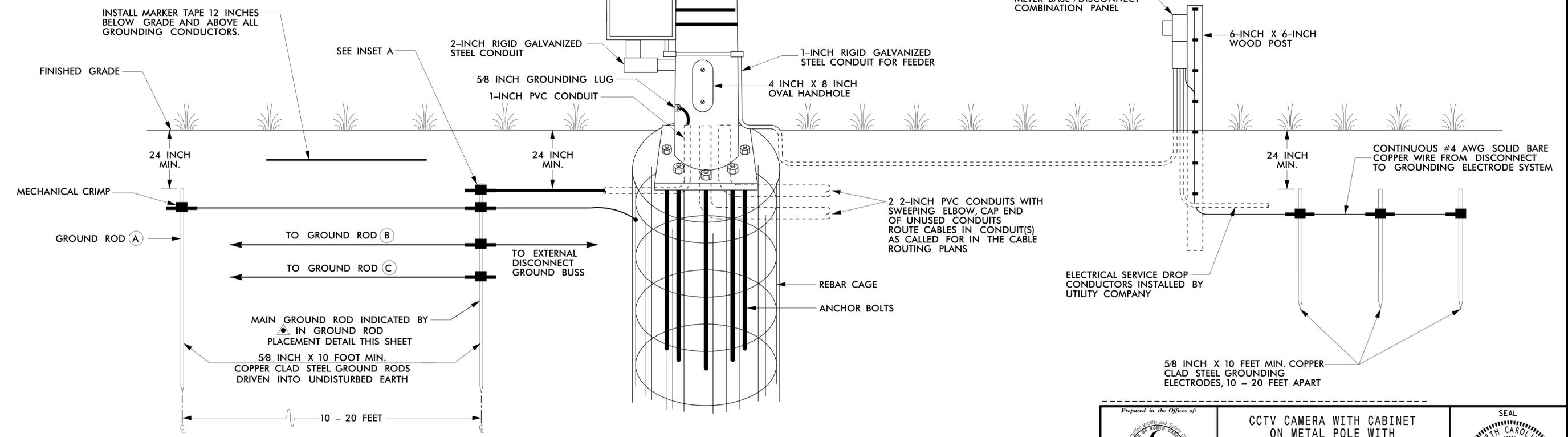
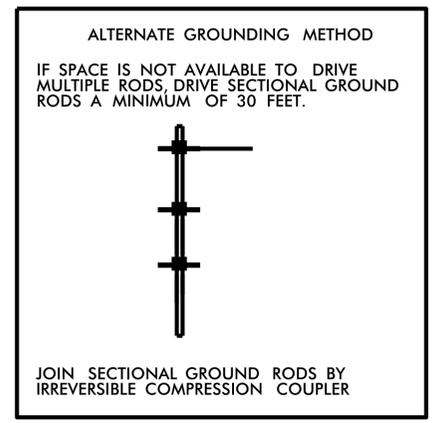
PVC POST-MOUNTED DELINEATOR MARKER

NOTE:
BACKFILL WITH EXCAVATED MATERIAL AND COMPACT THE SOIL TO 95% OF ITS ORIGINAL DENSITY. REMOVE ROCK AND DEBRIS FROM BACKFILL MATERIAL.

	<p>Prepared in the Offices of:</p>		<p>SEAL</p>
	<p>TYPICAL DETAILS</p>		
<p>DIVISION 07 GUILFORD CO. GREENSBORO</p>		<p>REVIEWED BY: P.P. MARAK, PE</p>	
<p>PLAN DATE: NOVEMBER 2017</p>		<p>REVIEWED BY: M.A. ASLAMI, PE</p>	
<p>PREPARED BY: G.A. GREEN</p>		<p>REVIEWED BY: M.A. ASLAMI, PE</p>	
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>		<p>DATE: 11/14/2017</p>	
<p>SCALE: 0 N/A</p>		<p>SIGNATURE: <i>Paul P. Marak</i></p>	
<p>CADD Filename:</p>		<p>DATE:</p>	

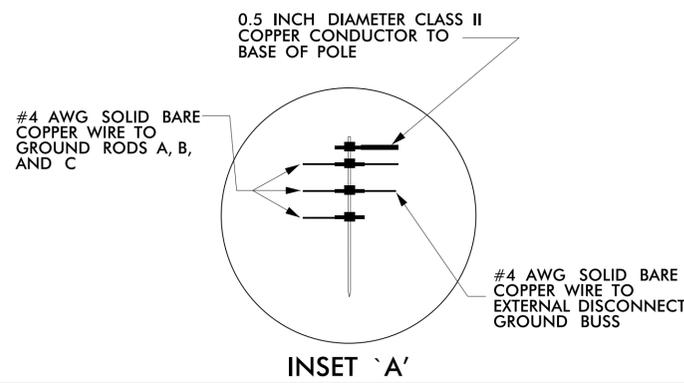
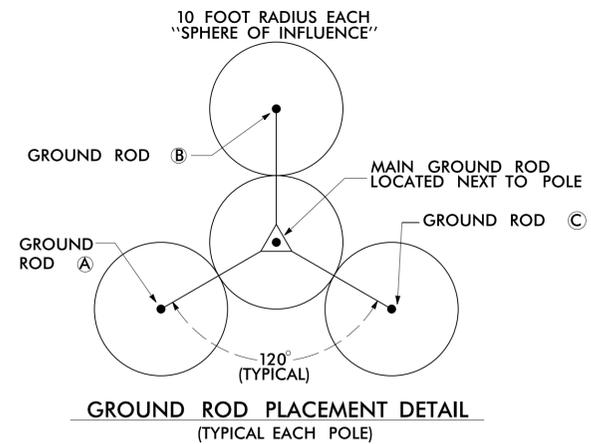


- NOTES**
1. BOND 0.5 INCH DIAMETER, 28 STRAND (MINIMUM) CLASS II COPPER CONDUCTOR TO THE MAIN GROUND ROD BY A MECHANICAL CRIMP USING AN IRREVERSIBLE COMPRESSION TOOL.
 2. MECHANICALLY CRIMP ALL CONNECTIONS TO GROUND RODS USING AN IRREVERSIBLE COMPRESSION TOOL.
 3. BOND #4 AWG SOLID BARE COPPER WIRE TO REBAR CAGE AND THE MAIN GROUND ROD BY A MECHANICAL CRIMP USING AN IRREVERSIBLE COMPRESSION TOOL.
 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 - RADIALGROUND RODS.
 7. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12 INCHES.

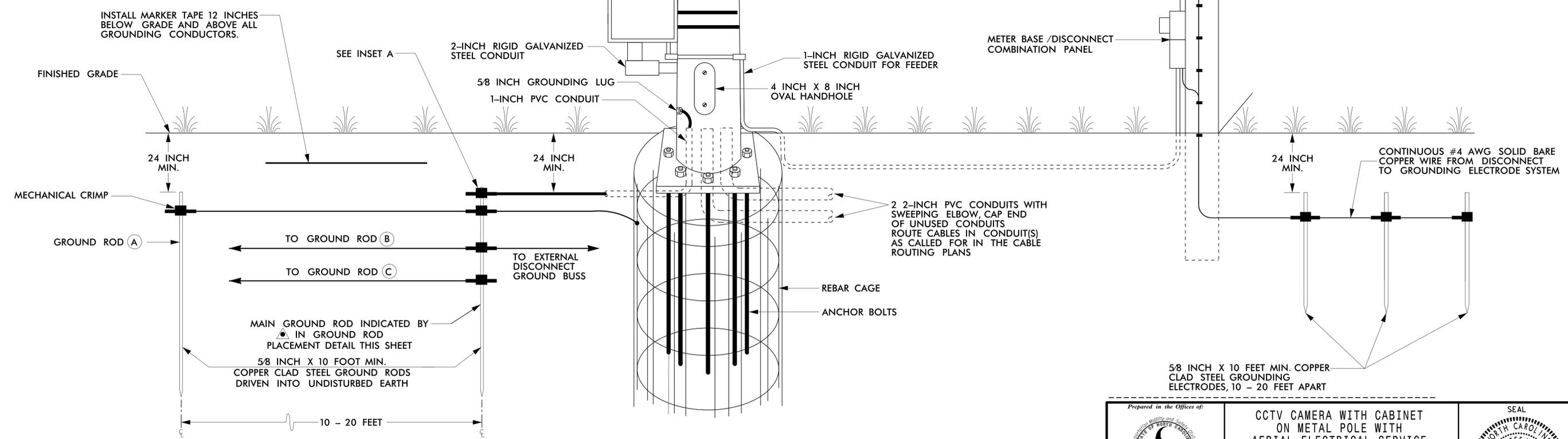
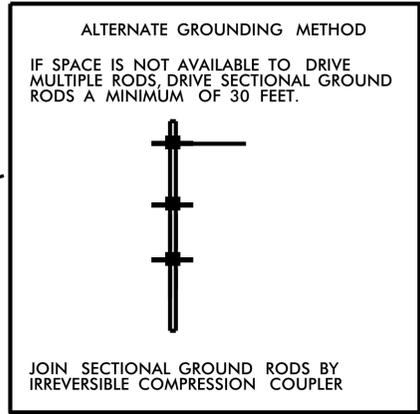


	<p>Prepared in the Offices of:</p> <p>CCTV CAMERA WITH CABINET ON METAL POLE WITH UNDERGROUND ELECTRICAL SERVICE TYPICAL DETAIL</p>		<p>SEAL</p> <p>NORTH CAROLINA PROFESSIONAL ENGINEER</p> <p>SEAL 031636</p> <p>PAUL P. MARAK</p> <p>11/14/2017</p> <p>SIGNATURE DATE</p>					
	<p>DIVISION 07 GUILFORD CO. GREENSBORO</p> <p>PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE</p> <p>PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE</p>	<p>SCALE</p> <p>0</p> <p>N/A</p>		<table border="1"> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </table>	REVISIONS	INIT.	DATE	
REVISIONS	INIT.	DATE						

CADD File name:



- NOTES**
1. BOND 0.5 INCH DIAMETER, 28 STRAND (MINIMUM) CLASS II COPPER CONDUCTOR TO THE MAIN GROUND ROD BY A MECHANICAL CRIMP USING AN IRREVERSIBLE COMPRESSION TOOL.
 2. MECHANICALLY CRIMP ALL CONNECTIONS TO GROUND RODS USING AN IRREVERSIBLE COMPRESSION TOOL.
 3. BOND #4 AWG SOLID BARE COPPER WIRE TO REBAR CAGE AND THE MAIN GROUND ROD BY A MECHANICAL CRIMP USING AN IRREVERSIBLE COMPRESSION TOOL.
 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 - RADIALGROUND RODS.
 7. INSTALL MARKER TAPE DIRECTLY ABOVE ALL GROUNDING ELECTRODES AND CONDUCTORS AT A DEPTH OF 12 INCHES.



Prepared in the Offices of:

CCTV CAMERA WITH CABINET ON METAL POLE WITH AERIAL ELECTRICAL SERVICE TYPICAL DETAIL

DIVISION 07 GUILFORD CO. GREENSBORO

PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE

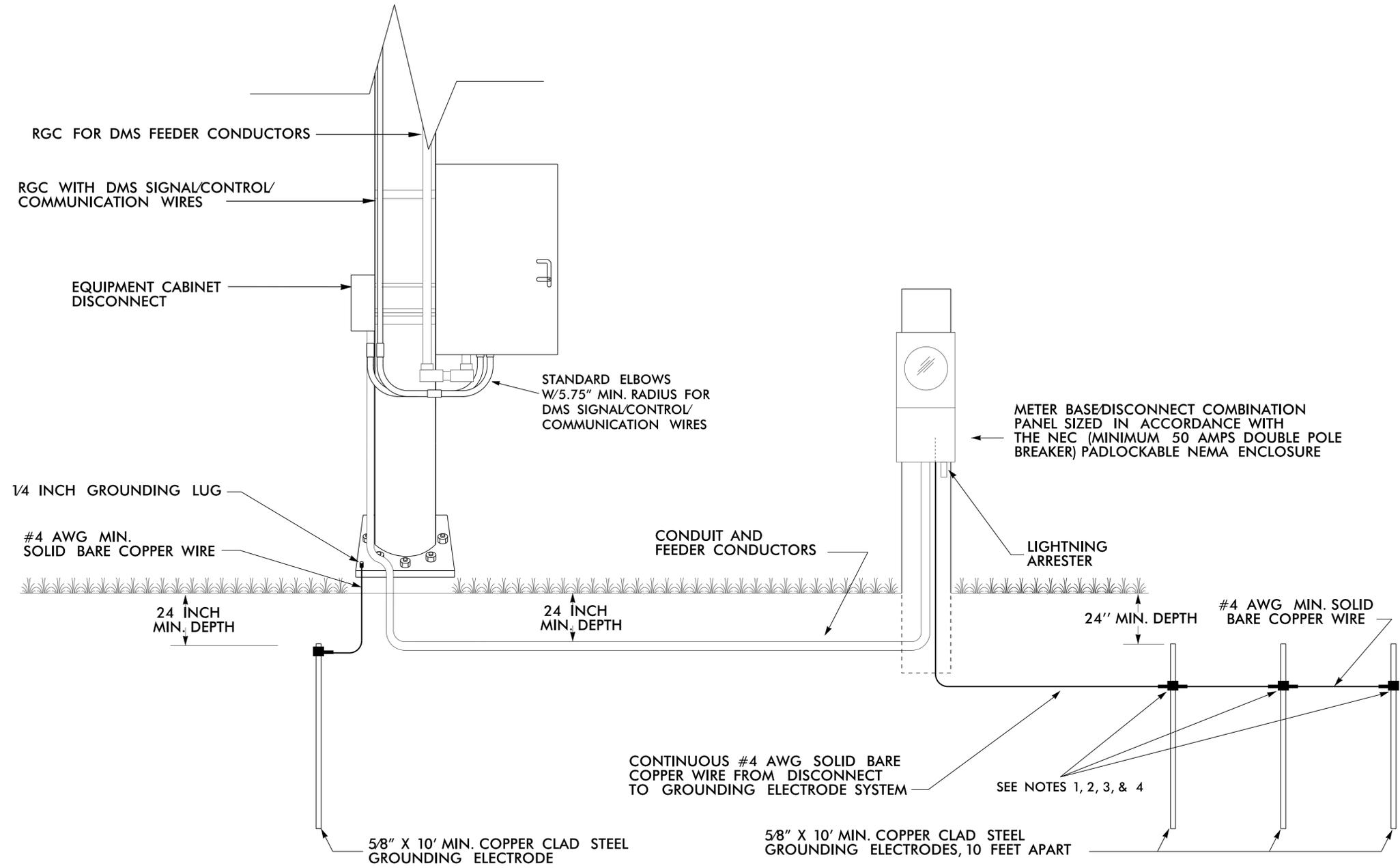
PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE

REVISIONS	INIT.	DATE

SCALE: 0 N/A

DATE: 11/14/2017

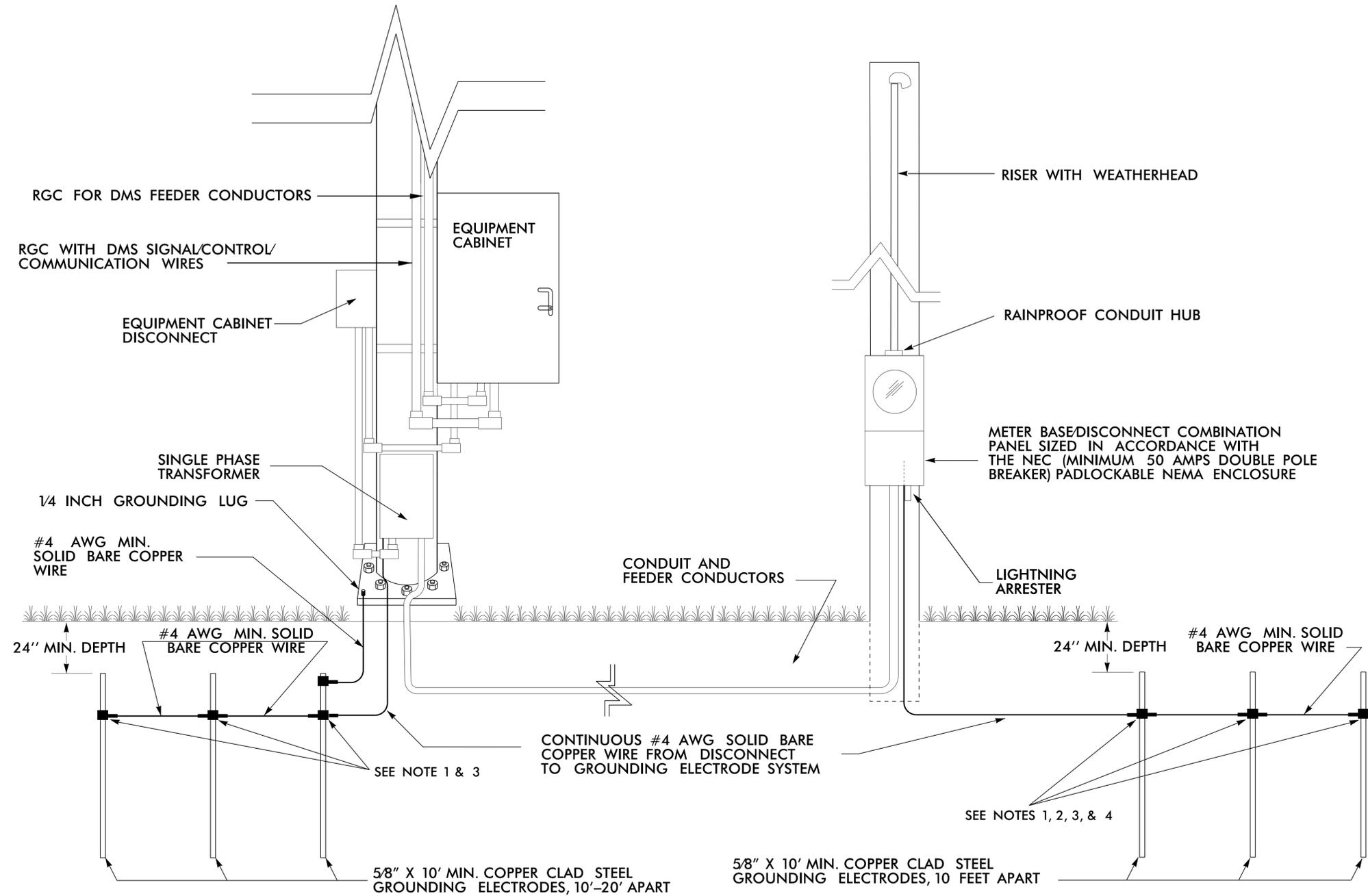
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NOTES

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. MECHANICALLY CRIMP ALL CONNECTIONS TO GROUND RODS USING AN IRREVERSIBLE COMPRESSION TOOL.
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. INSTALL CONDUIT BETWEEN DISCONNECT AND CABINET.
8. ENSURE EQUIPMENT GROUND IS ELECTRICALLY BONDED TO CABINET.

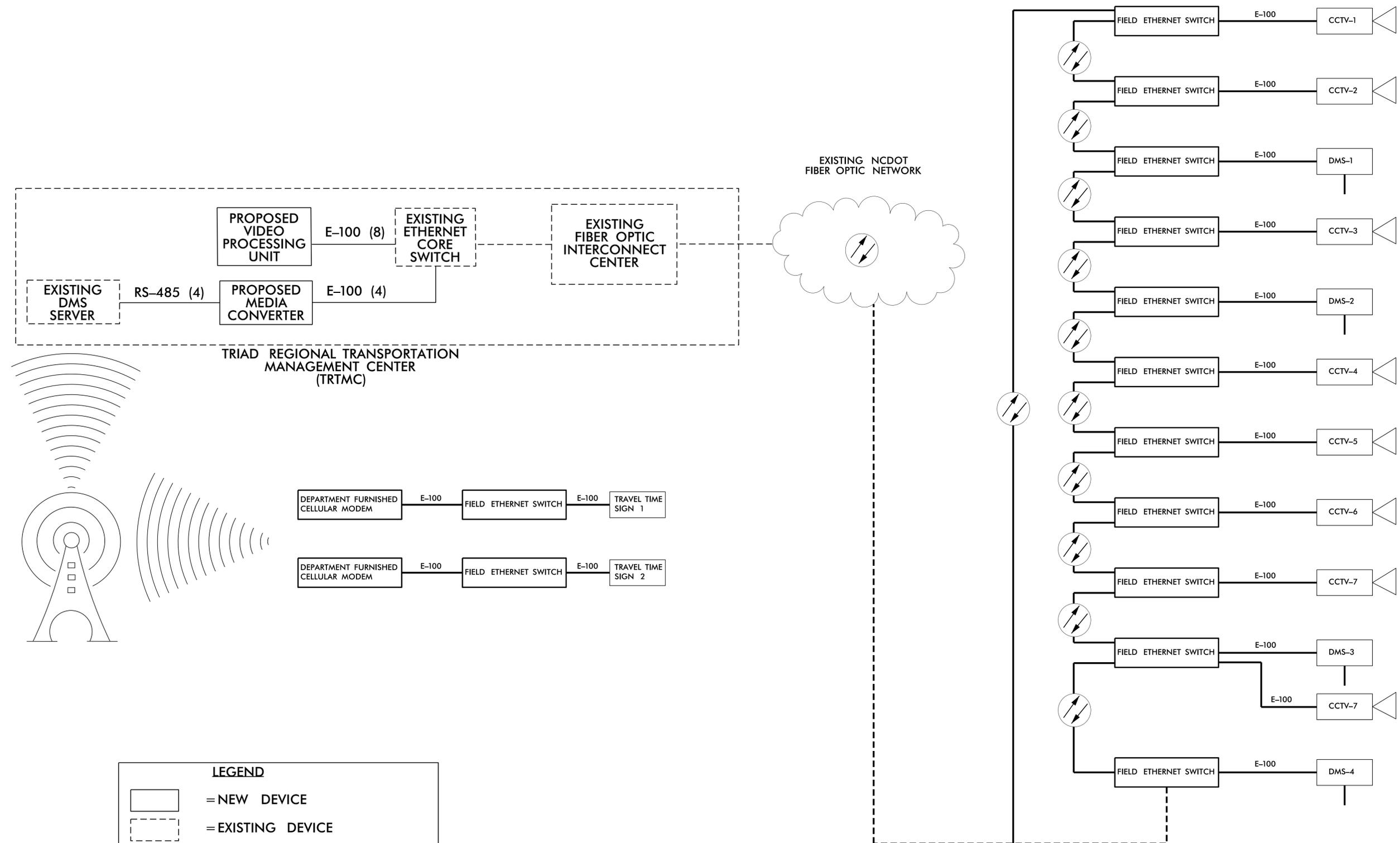
	Prepared in the Offices of: 		DYNAMIC MESSAGE SIGN WITH UNDERGROUND ELECTRICAL SERVICE TYPICAL DETAIL DIVISION 07 GUILFORD CO., GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAUL P. MARAK 031636 11/14/2017 SIGNATURE DATE
	SCALE 0 N/A	REVISIONS INIT. DATE		



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. MECHANICALLY CRIMP ALL CONNECTIONS TO GROUND RODS USING AN IRREVERSIBLE COMPRESSION TOOL.
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. INSTALL CONDUIT BETWEEN DISCONNECT AND CABINET.
8. ENSURE EQUIPMENT GROUND IS ELECTRICALLY BONDED TO CABINET.

	Prepared in the Offices of: 		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031636 PAUL P. MARAK 11/14/2017 SIGNATURE DATE
	DYNAMIC MESSAGE SIGN WITH AERIAL ELECTRICAL SERVICE TYPICAL DETAIL		
DIVISION 07 GUILFORD CO., GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE		REVISIONS INIT. DATE	
SCALE 0 A/B		CADD Filename:	



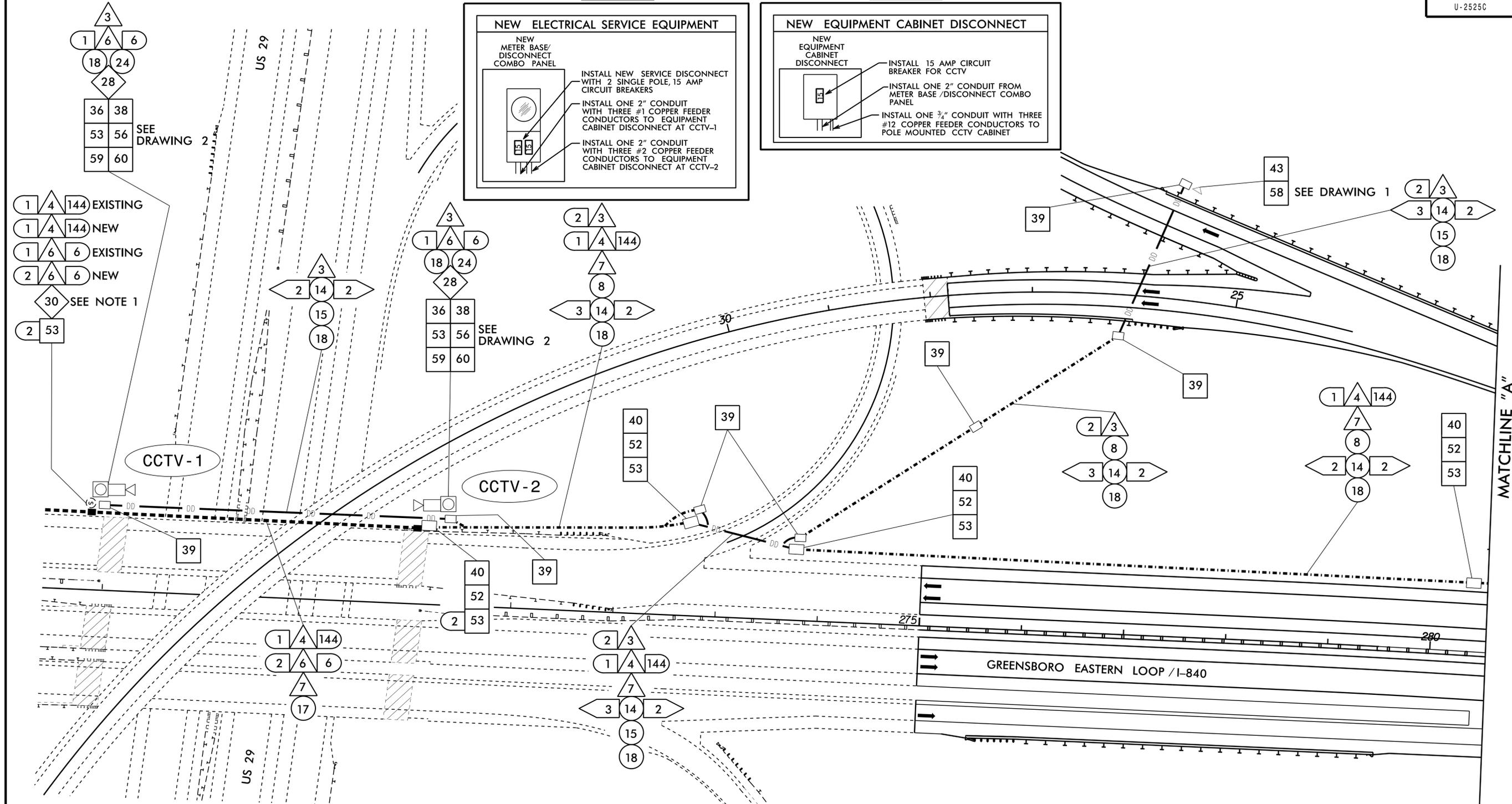
LEGEND

- = NEW DEVICE
- = EXISTING DEVICE
- = NEW COMMUNICATIONS
- = EXISTING COMMUNICATIONS
- E-100** = ETHERNET
- = FIBER OPTIC CABLE
- = CELLULAR NETWORK

 <small>750 N. Greenfield Pkwy., Garner, NC 27529</small>	SYSTEM BLOCK DIAGRAM		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAUL P. MARAK 031636
	DIVISION 07 GUILFORD CO. GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE	REVISIONS INIT. DATE	DATE: 12/29/2018 SIGNATURE: <i>Paul Marak</i>
SCALE: 0 A/B	CADD Filename:		

DRAWING 1

DRAWING 2



NOTES

- EXISTING CONDUIT, FIBER, JUNCTION BOX, AND SPLICE ENCLOSURE INSTALLED BY PROJECT U-2525B.
- INSTALL CCTV METAL POLES SIX FEET (6') BEHIND GUARDRAIL AND FIFTEEN FEET (15') FROM BRIDGE DECK.
- OBTAIN FINAL CCTV LOCATION APPROVAL FROM THE REGIONAL ITS ENGINEER (336-315-7080) BEFORE INITIATING ANY WORK AT THIS LOCATION.
- MOUNT CAMERA ON NEW METAL POLE 45' ABOVE GRADE. INSTALL NEW FIELD EQUIPMENT CABINET ON NEW METAL POLE.
- MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
- INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
- INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-04 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
- SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

NOTE:
ELECTRICAL SERVICE DETAILS AND CONSTRUCTION METHODS DEPICT FIELD CONDITIONS AT THE TIME OF DESIGN. CONTRACTOR TO VERIFY ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO MAKING ANY CHANGES.

	<p>CABLE ROUTING PLAN</p>		
	<p>DIVISION 07 GUILFORD CO. GREENSBORO</p> <p>PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE</p> <p>PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE</p>	<p>REVISIONS</p> <p>INIT. DATE</p>	

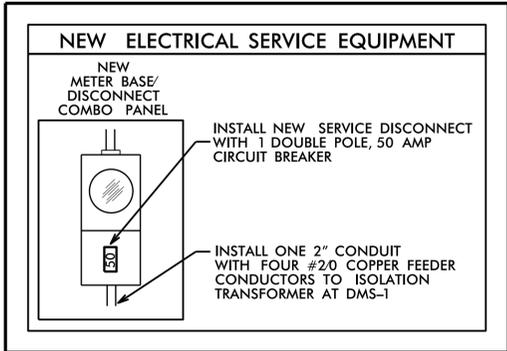
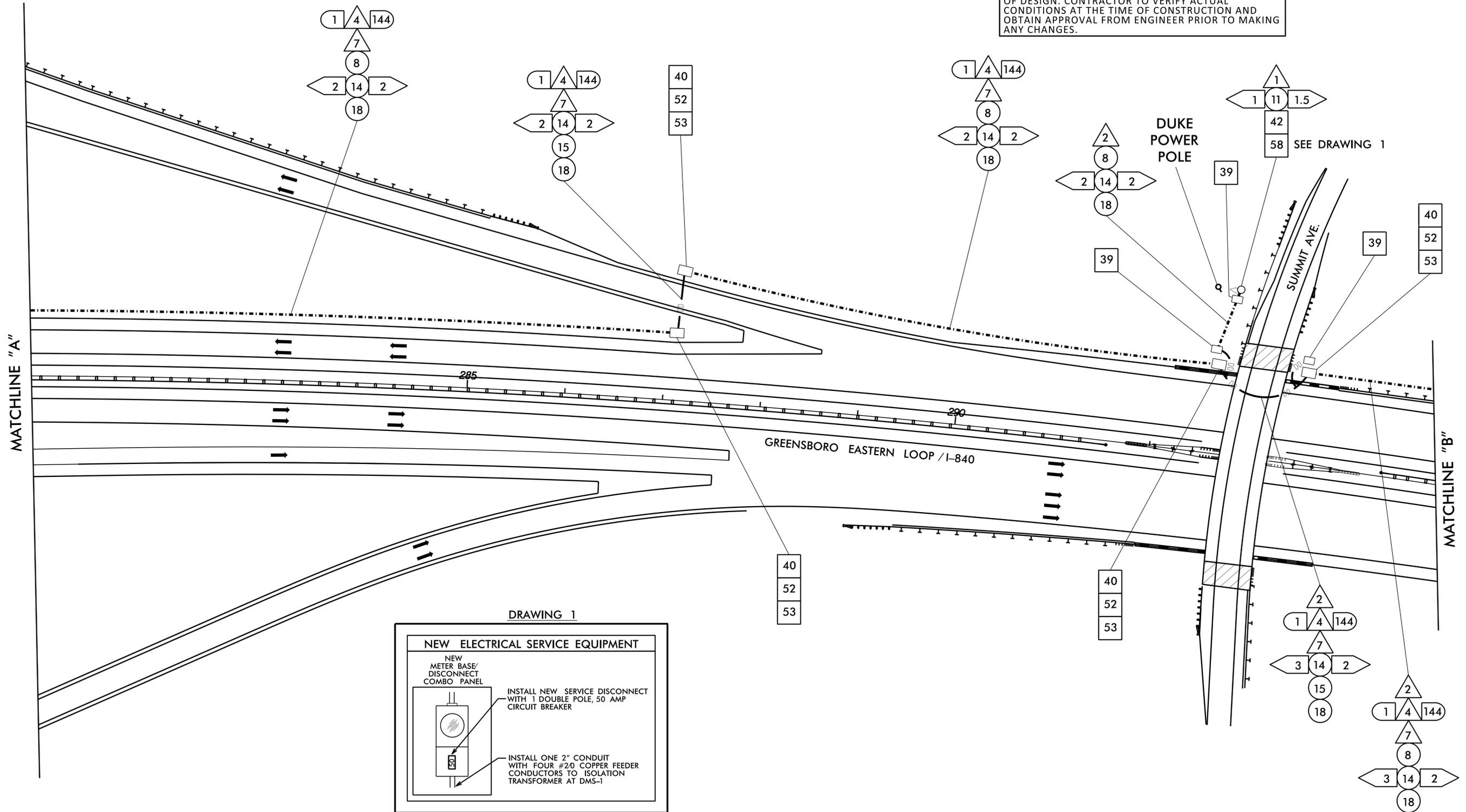
750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: 0 A/B

Prepared in the Offices of:

CADD Filename:

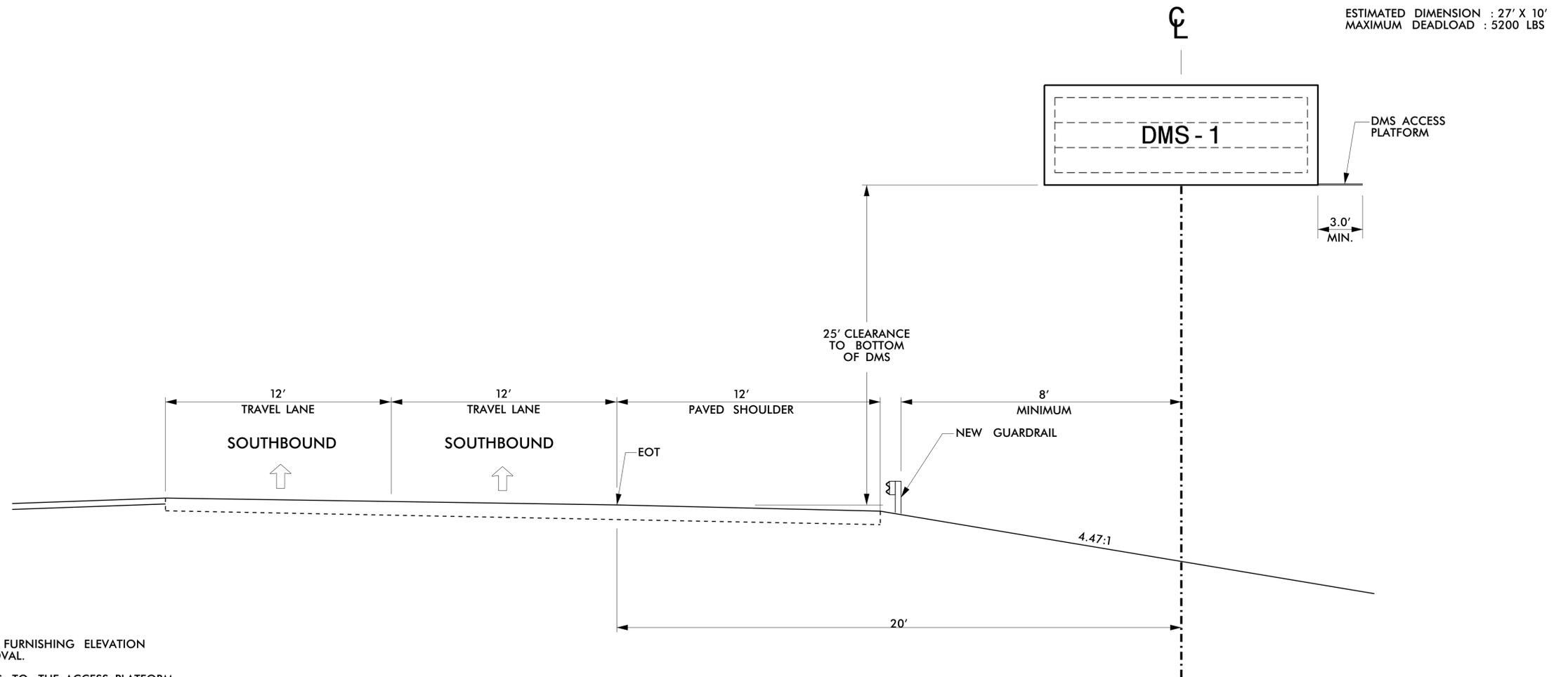
NOTE:
ELECTRICAL SERVICE DETAILS AND CONSTRUCTION METHODS DEPICT FIELD CONDITIONS AT THE TIME OF DESIGN. CONTRACTOR TO VERIFY ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO MAKING ANY CHANGES.



NOTES

1. INSTALL SERVICE POLE 20' FROM EXISTING DUKE ENERGY POWER POLE.
2. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
3. INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
4. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-05 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
5. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

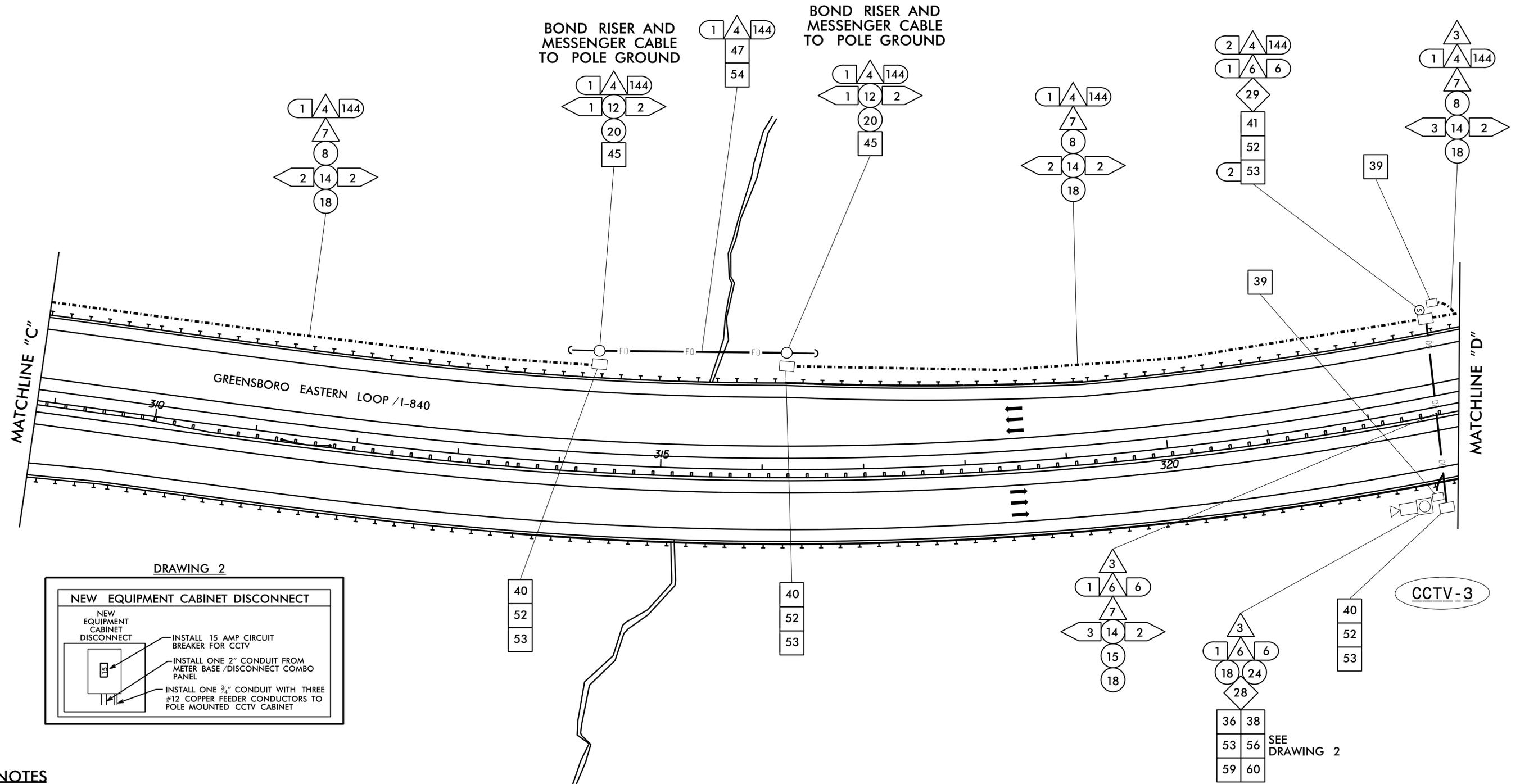
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>	<p>Prepared in the Offices of:</p>		<p>SEAL</p>								
	<p>CABLE ROUTING PLAN</p>										
<p>SCALE</p> <p>0</p> <p>A/B</p>	<p>DIVISION 07 GUILFORD CO., GREENSBORO</p> <p>PLAN DATE: NOVEMBER 2017</p> <p>PREPARED BY: G.A. GREEN</p>	<p>REVIEWED BY: P.P. MARAK, PE</p> <p>REVIEWED BY: M.A. ASLAMI, PE</p>	<p>REVISIONS</p> <table border="1"> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>INIT.</th> <th>DATE</th> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </table>	NO.	DESCRIPTION	INIT.	DATE				
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<p>SIGNATURE</p> <p>DATE</p>			<p>DATE</p>								



NOTES

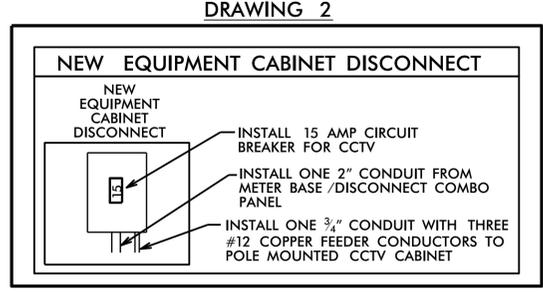
1. CONTRACTOR IS RESPONSIBLE FOR FURNISHING ELEVATION DRAWINGS FOR ENGINEER'S APPROVAL.
2. PROVIDE A FIXED LADDER LEADING TO THE ACCESS PLATFORM.
3. EQUIP THE LADDER WITH A SECURITY COVER (LADDER GUARD). START THE FIRST LADDER RUNG NO MORE THAN 18 INCHES ABOVE A CONCRETE LANDING PAD. DESIGN RUNGS ON 12 INCH CENTER-TO-CENTER TYPICAL SPACING.
4. INSTALL A CONCRETE LANDING PAD MEASURING A MINIMUM 4 INCHES DEEP, 24 INCHES WIDE, AND 36 INCHES LONG DIRECTLY BENEATH THE LADDER.
5. USE ACTUAL DIMENSIONS AND WEIGHT OF THE DMS TO COMPLETE THE DESIGN OF THE DMS STRUCTURE.
6. FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTING USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
7. 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.
8. VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK. DO NOT DAMAGE ANY EXISTING UTILITIES OR NCDOT CABLES DURING CONSTRUCTION.
9. DESIGN THE STRUCTURE TO ACCOMMODATE THE INSTALLATION OF THE DMS WITH A CCTV CAMERA EXTENSION POLE.
10. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

Prepared in the Offices of:		SEAL	
			
ELEVATION PLAN		SEAL 031636 ENGINEER PAUL P. MARAK	
DIVISION 07 GUILFORD CO., GREENSBORO		REVIEWED BY: P.P. MARAK, PE	
PLAN DATE: NOVEMBER 2017		REVIEWED BY: M.A. ASLAMI, PE	
PREPARED BY: G.A. GREEN		REVIEWED BY: M.A. ASLAMI, PE	
750 N. Greenfield Pkwy., Garner, NC 27529		December 14, 2017	
SCALE 0 A/B		REVISIONS INIT. DATE	
		SIGNATURE DATE	
CADD Filename:			



NOTES

1. INSTALL CCTV METAL POLE SIX FEET (6') BEHIND GUARDRAIL AT STA. 322.5.
2. OBTAIN FINAL CCTV LOCATION APPROVAL FROM THE REGIONAL ITS ENGINEER (336-315-7080) BEFORE INITIATING ANY WORK AT THIS LOCATION.
3. MOUNT CAMERA ON NEW METAL POLE 45' ABOVE GRADE. INSTALL NEW FIELD EQUIPMENT CABINET ON NEW METAL POLE.
4. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
5. INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
6. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-05 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
7. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.



Prepared in the Offices of:

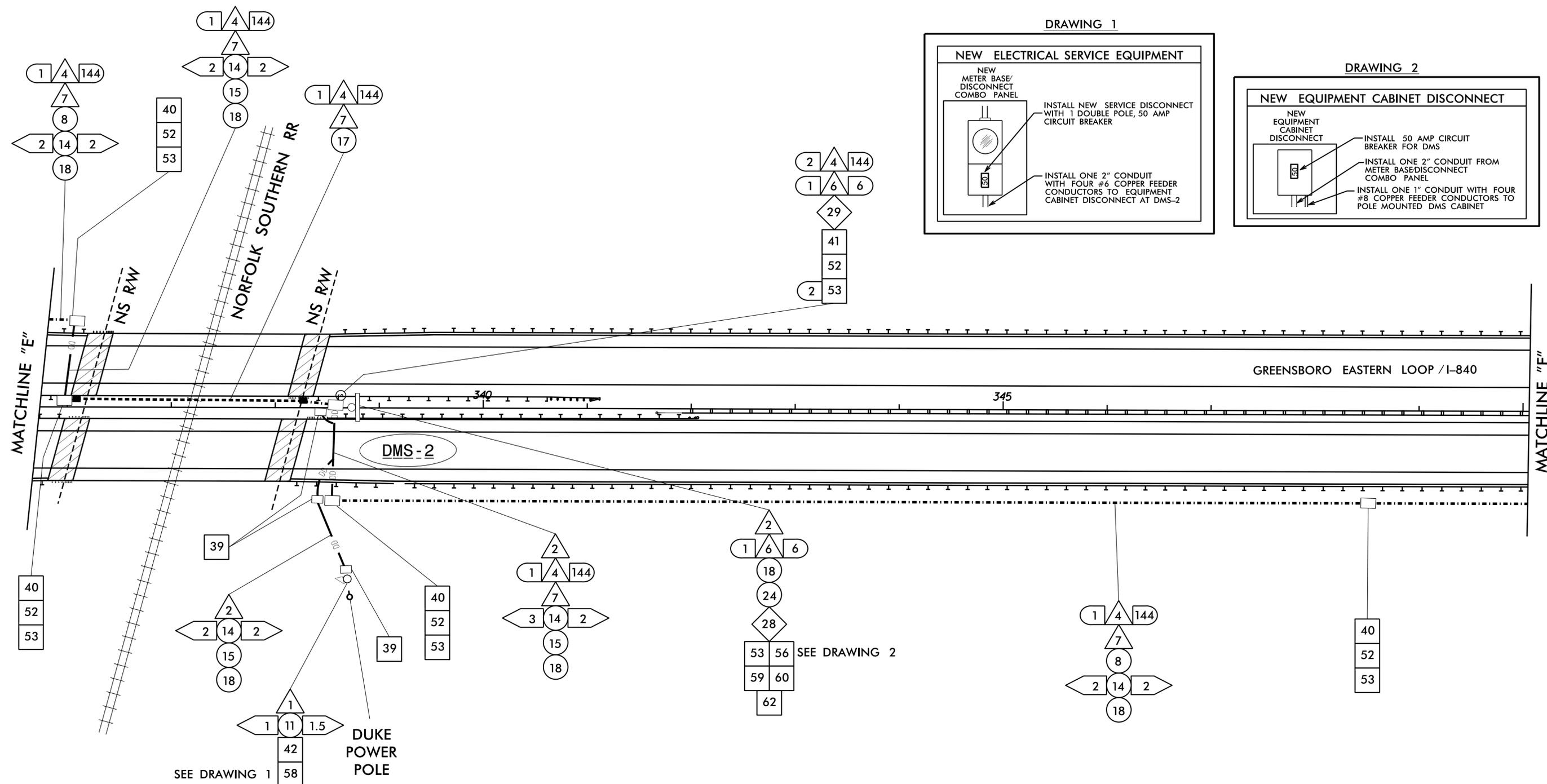
CABLE ROUTING PLAN

DIVISION 07 GUILFORD CO. GREENSBORO
 PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE
 PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE

REVISIONS	INIT.	DATE

SCALE: 0' = 1" A/B

Signature: Paul P. Marak, Date: 11/14/2017

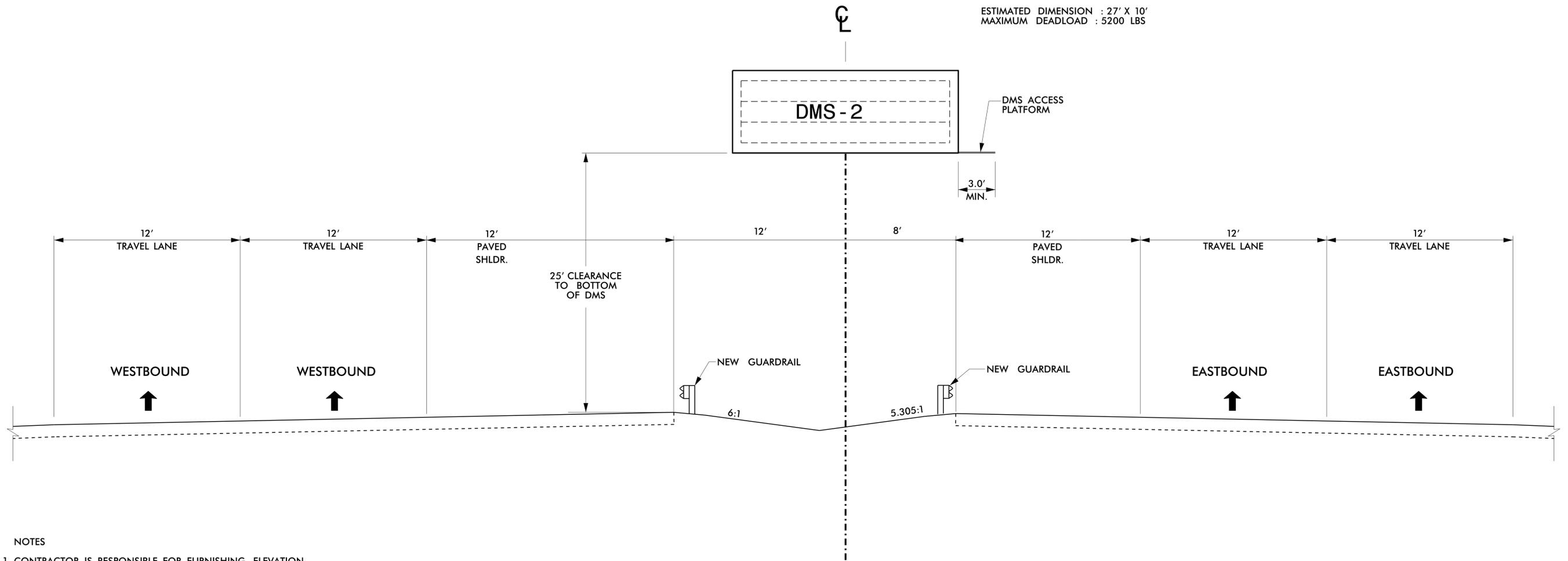


NOTES

1. INSTALL SERVICE POLE 20' FROM EXISTING DUKE ENERGY POWER POLE.
2. INSTALL DMS STRUCTURE EIGHT FEET (8') BEHIND EAST BOUND GUARDRAIL AT STA. 338.5.
3. OBTAIN FINAL DMS LOCATION APPROVAL FROM THE REGIONAL ITS ENGINEER (336-315-7080) BEFORE INITIATING ANY WORK AT THIS LOCATION.
4. INSTALL NEW DMS, WALKWAY, AND LADDER ON NEW DMS STRUCTURE. INSTALL NEW DMS POLE MOUNTED CABINET ON NEW DMS STRUCTURE.
5. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
6. INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
7. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-06 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
8. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

NOTE:
ELECTRICAL SERVICE DETAILS AND CONSTRUCTION METHODS DEPICT FIELD CONDITIONS AT THE TIME OF DESIGN. CONTRACTOR TO VERIFY ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO MAKING ANY CHANGES.

	Prepared in the Offices of: 		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER PAUL P. MARAK 031636 DATE: 11/14/2017
	CABLE ROUTING PLAN		
DIVISION 07 GUILFORD CO. GREENSBORO		PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE	
PREPARED BY: G.A. GREEN		REVIEWED BY: M.A. ASLAMI, PE	
SCALE: 0' = 1" A/B		REVISIONS: _____ INIT. DATE: _____	

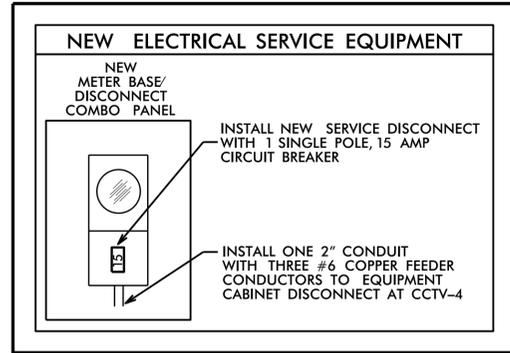


NOTES

1. CONTRACTOR IS RESPONSIBLE FOR FURNISHING ELEVATION DRAWINGS FOR ENGINEER'S APPROVAL.
2. PROVIDE A FIXED LADDER LEADING TO THE ACCESS PLATFORM.
3. EQUIP THE LADDER WITH A SECURITY COVER (LADDER GUARD). START THE FIRST LADDER RUNG NO MORE THAN 18 INCHES ABOVE A CONCRETE LANDING PAD. DESIGN RUNGS ON 12 INCH CENTER-TO-CENTER TYPICAL SPACING.
4. INSTALL A CONCRETE LANDING PAD MEASURING A MINIMUM 4 INCHES DEEP, 24 INCHES WIDE, AND 36 INCHES LONG DIRECTLY BENEATH THE LADDER.
5. USE ACTUAL DIMENSIONS AND WEIGHT OF THE DMS TO COMPLETE THE DESIGN OF THE DMS STRUCTURE.
6. FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTING USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
7. 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.
8. DESIGN AND CONSTRUCT THE PEDESTAL STRUCTURE AND DMS ENCLOSURE TO WITHSTAND WIND VELOCITIES OF 90 MPH.
9. VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK. DO NOT DAMAGE ANY EXISTING UTILITIES OR NCDOT CABLES DURING CONSTRUCTION.
10. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

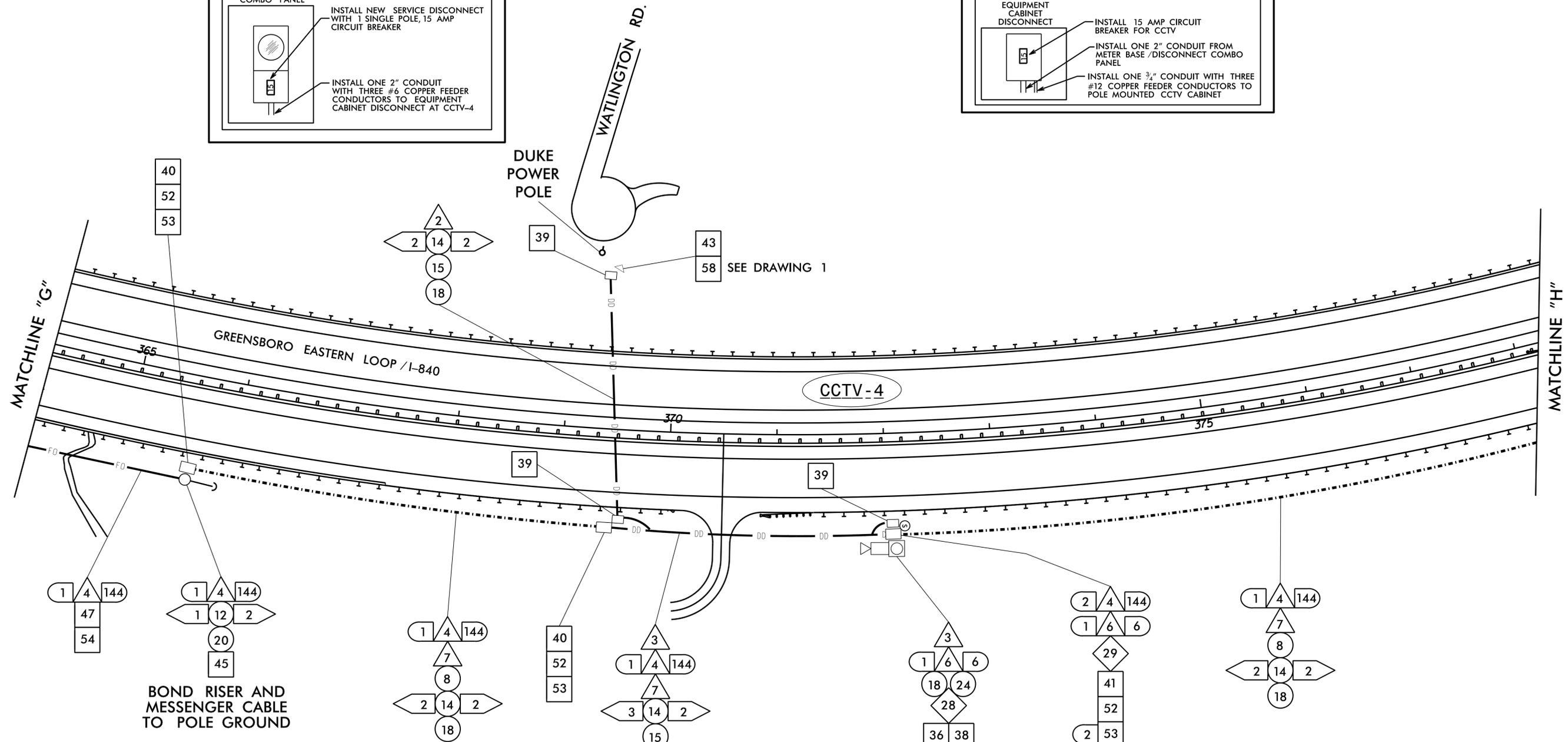
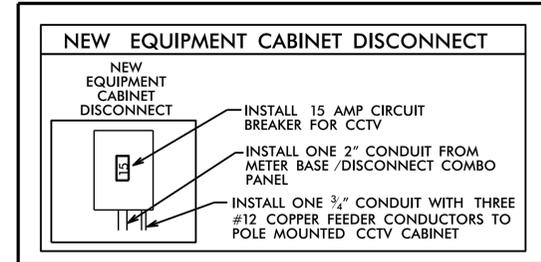
 <small>750 N. Greenfield Pkwy., Garner, NC 27529</small>	<p>Prepared in the Offices of:</p> <p>ELEVATION PLAN</p> <p>DIVISION 07 GUILFORD CO. GREENSBORO</p> <p>PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE</p> <p>PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE</p>	<p>SEAL</p>  <p>PAUL P. MARAK ENGINEER NOVEMBER 14, 2017</p>												
<p>SCALE</p> <p>0</p> <p>A/B</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>REVISIONS</th> <th>INIT.</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table>	REVISIONS	INIT.	DATE										<p>SIGNATURE</p> <p>DATE</p> <p>CADD Filename:</p>
REVISIONS	INIT.	DATE												

DRAWING 1



NOTE: ELECTRICAL SERVICE DETAILS AND CONSTRUCTION METHODS DEPICT FIELD CONDITIONS AT THE TIME OF DESIGN. CONTRACTOR TO VERIFY ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO MAKING ANY CHANGES.

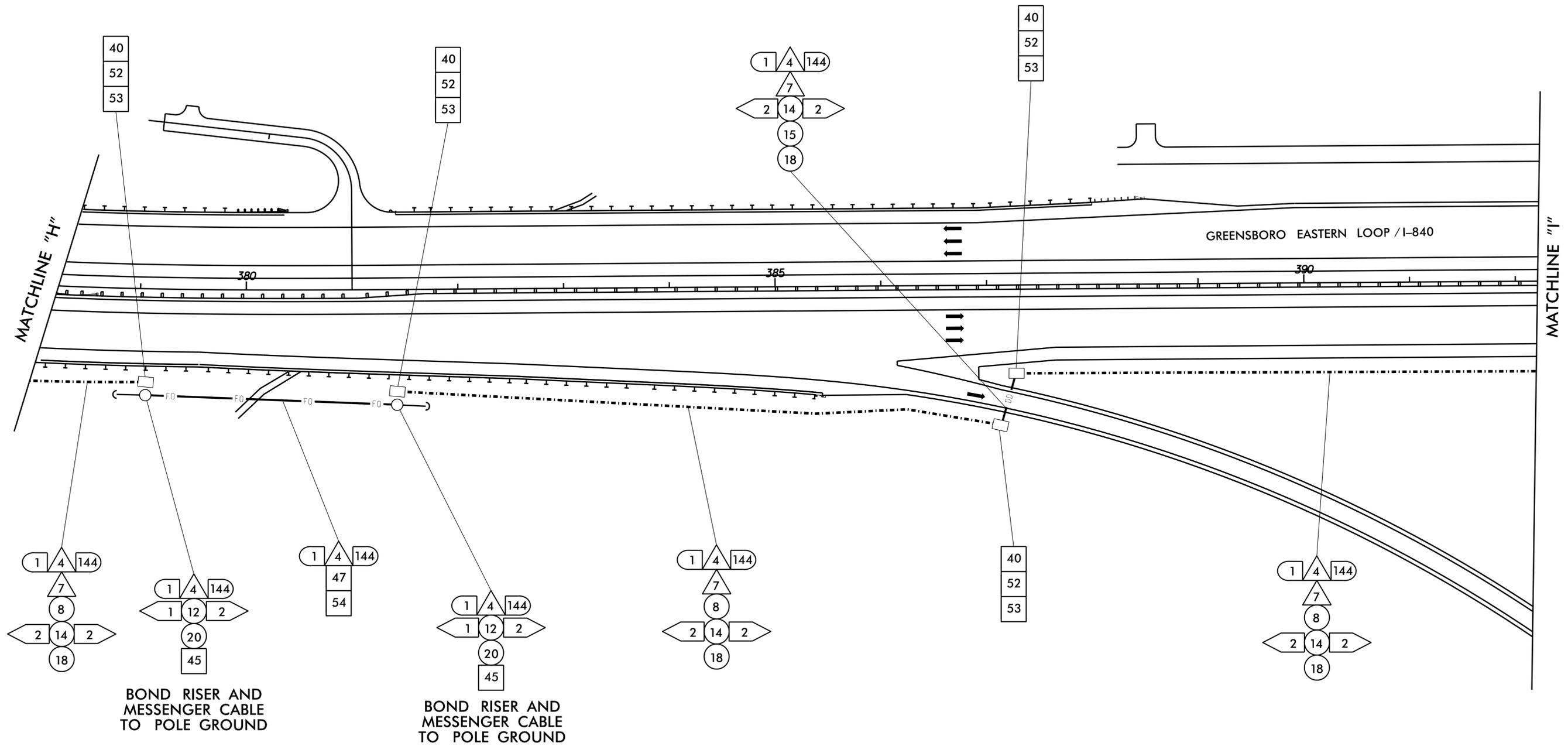
DRAWING 2



NOTES

1. INSTALL SERVICE PEDESTAL 20' FROM EXISTING DUKE ENERGY POWER POLE.
2. INSTALL CCTV METAL POLE SIX FEET (6') BEHIND GUARDRAIL AT STA. 372.
3. OBTAIN FINAL CCTV LOCATION APPROVAL FROM THE REGIONAL ITS ENGINEER (336-315-7080) BEFORE INITIATING ANY WORK AT THIS LOCATION.
4. MOUNT CAMERA ON NEW METAL POLE 45' ABOVE GRADE. INSTALL NEW FIELD EQUIPMENT CABINET ON NEW METAL POLE.
5. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
6. INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
7. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-04 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
8. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

	<p>Prepared in the Offices of:</p> <p>GREENSBORO ENGINEERING & CONSULTING</p> <p>750 N. Greenfield Pkwy., Garner, NC 27529</p>		<p>CABLE ROUTING PLAN</p>		<p>SEAL</p> <p>NORTH CAROLINA</p> <p>PROFESSIONAL</p> <p>ENGINEER</p> <p>031636</p> <p>PAUL P. MARAK</p> <p>11/14/2017</p>
	<p>DIVISION 07 GUILFORD CO. GREENSBORO</p> <p>PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE</p> <p>PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE</p>	<p>SCALE</p> <p>0</p> <p>A/B</p>	<p>REVISIONS</p> <p>INIT.</p> <p>DATE</p>	<p>DATE</p>	

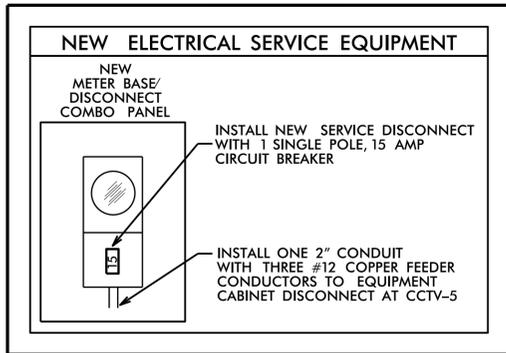


NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

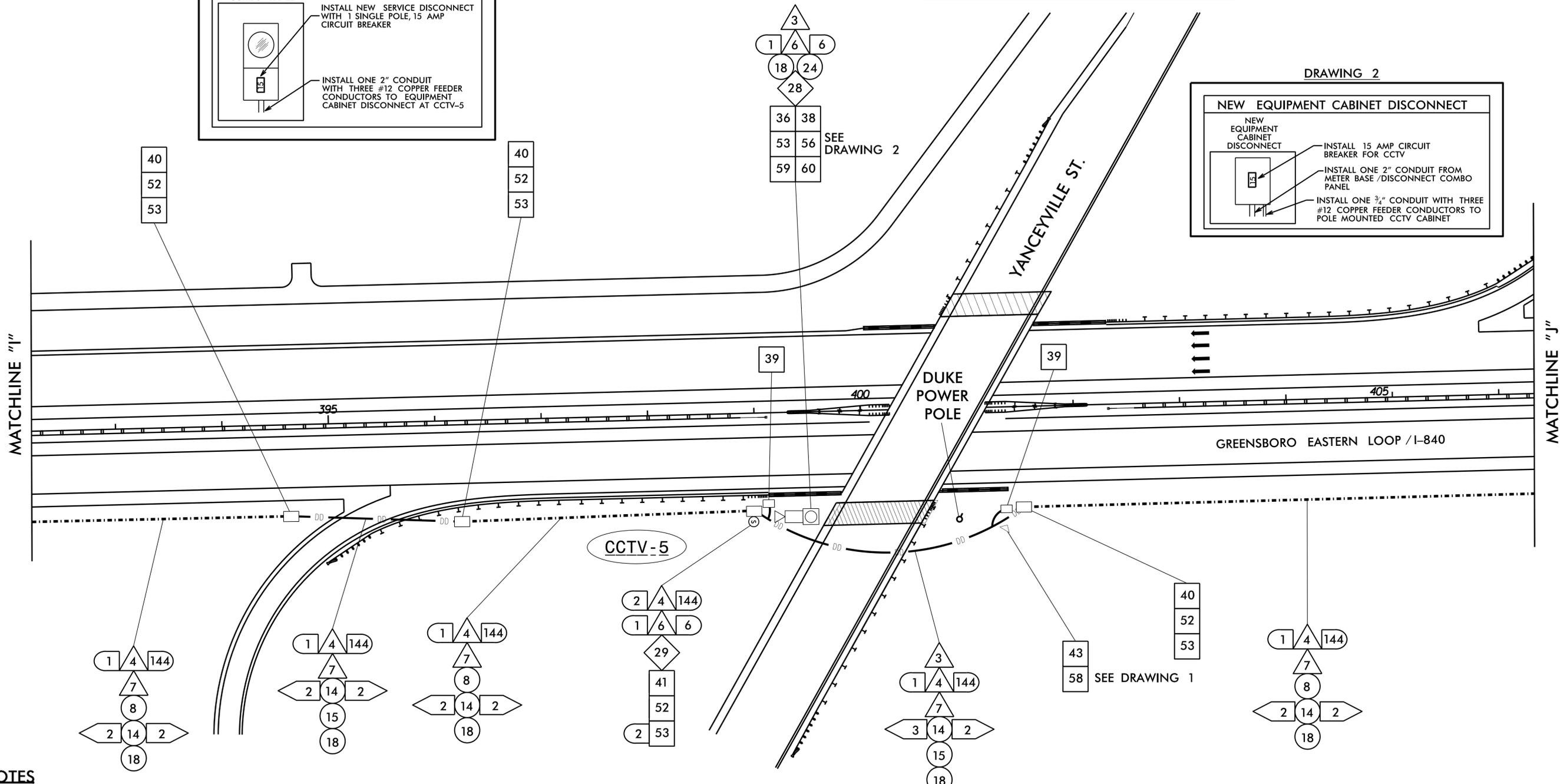
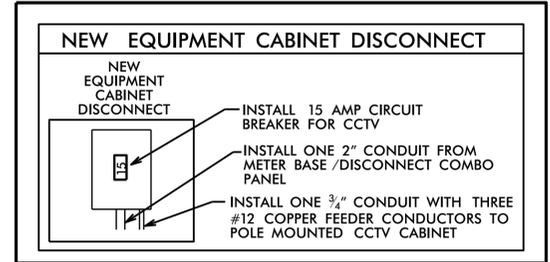
	Prepared in the Offices of: DIVISION 07 GUILFORD CO., GREENSBORO		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 031636 PAUL P. MARAK 11/14/2017
	SCALE: 0' = 1" A/B		
CABLE ROUTING PLAN		PLAN DATE: NOVEMBER 2017 PREPARED BY: G.A. GREEN REVIEWED BY: P.P. MARAK, PE REVIEWED BY: M.A. ASLAMI, PE	REVISIONS INIT. DATE

DRAWING 1



NOTE: ELECTRICAL SERVICE DETAILS AND CONSTRUCTION METHODS DEPICT FIELD CONDITIONS AT THE TIME OF DESIGN. CONTRACTOR TO VERIFY ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO MAKING ANY CHANGES.

DRAWING 2



NOTES

1. INSTALL SERVICE PEDESTAL 20' FROM EXISTING DUKE ENERGY POWER POLE.
2. INSTALL CCTV METAL POLE SIX FEET (6') BEHIND GUARDRAIL AT STA. 399.5.
3. OBTAIN FINAL CCTV LOCATION APPROVAL FROM THE REGIONAL ITS ENGINEER (336-315-7080) BEFORE INITIATING ANY WORK AT THIS LOCATION.
4. MOUNT CAMERA ON NEW METAL POLE 45' ABOVE GRADE. INSTALL NEW FIELD EQUIPMENT CABINET ON NEW METAL POLE.
5. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
6. INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
7. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-04 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
8. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

Prepared in the Offices of:

CABLE ROUTING PLAN

DIVISION 07 GUILFORD CO. GREENSBORO

PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE

PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE

750 N. Greenfield Pkwy., Garner, NC 27529

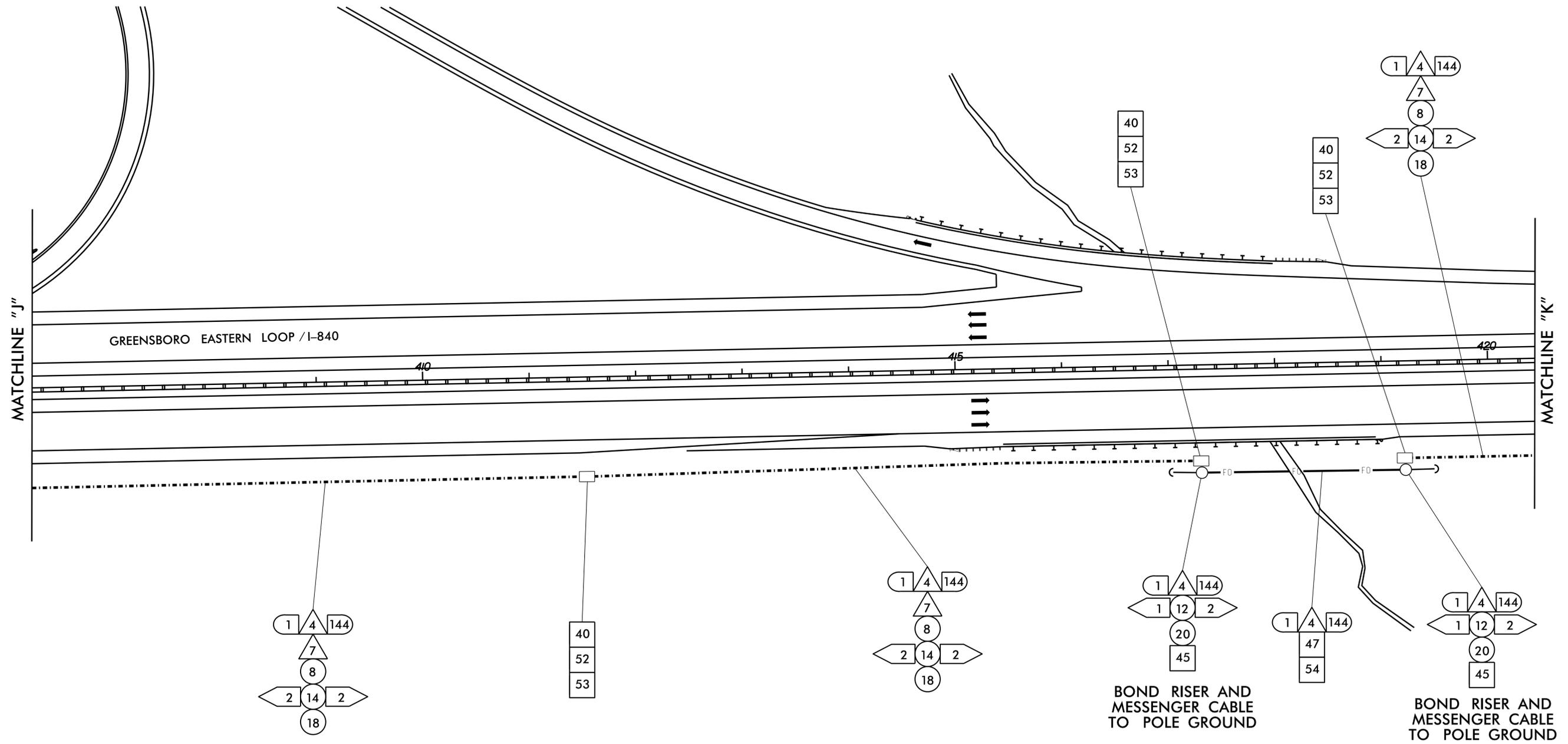
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REVISIONS: INIT. DATE

SEAL: NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031636

SIGNATURE: Paul P. Marak DATE: 11/14/2017

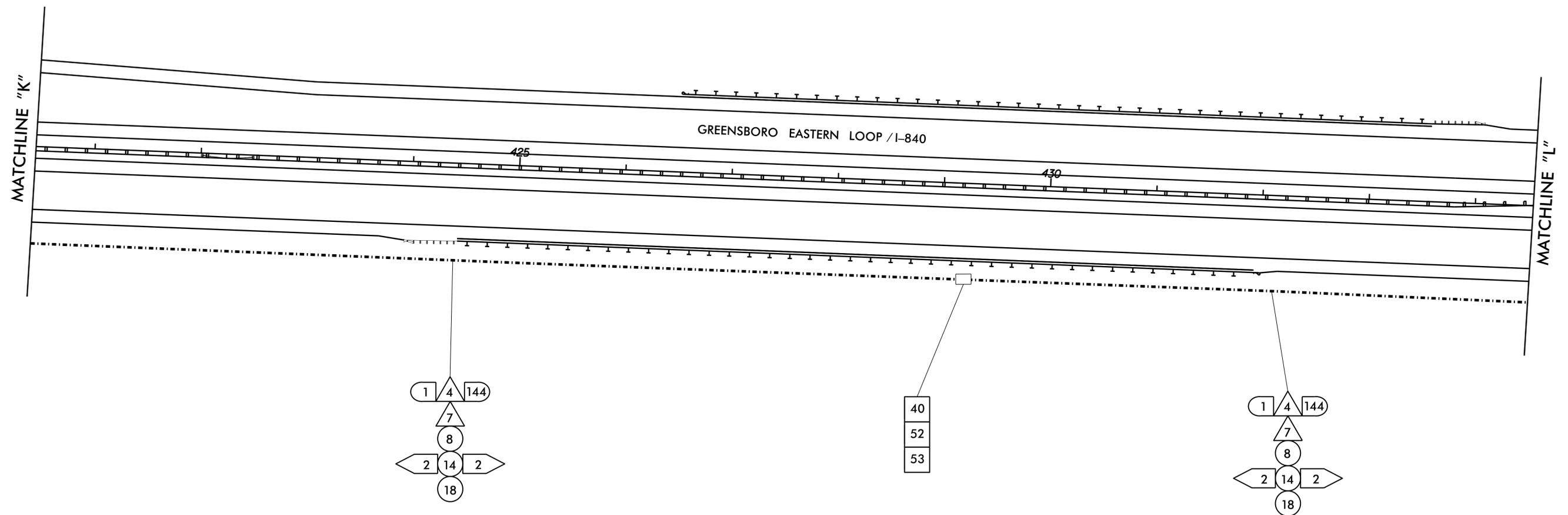
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NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

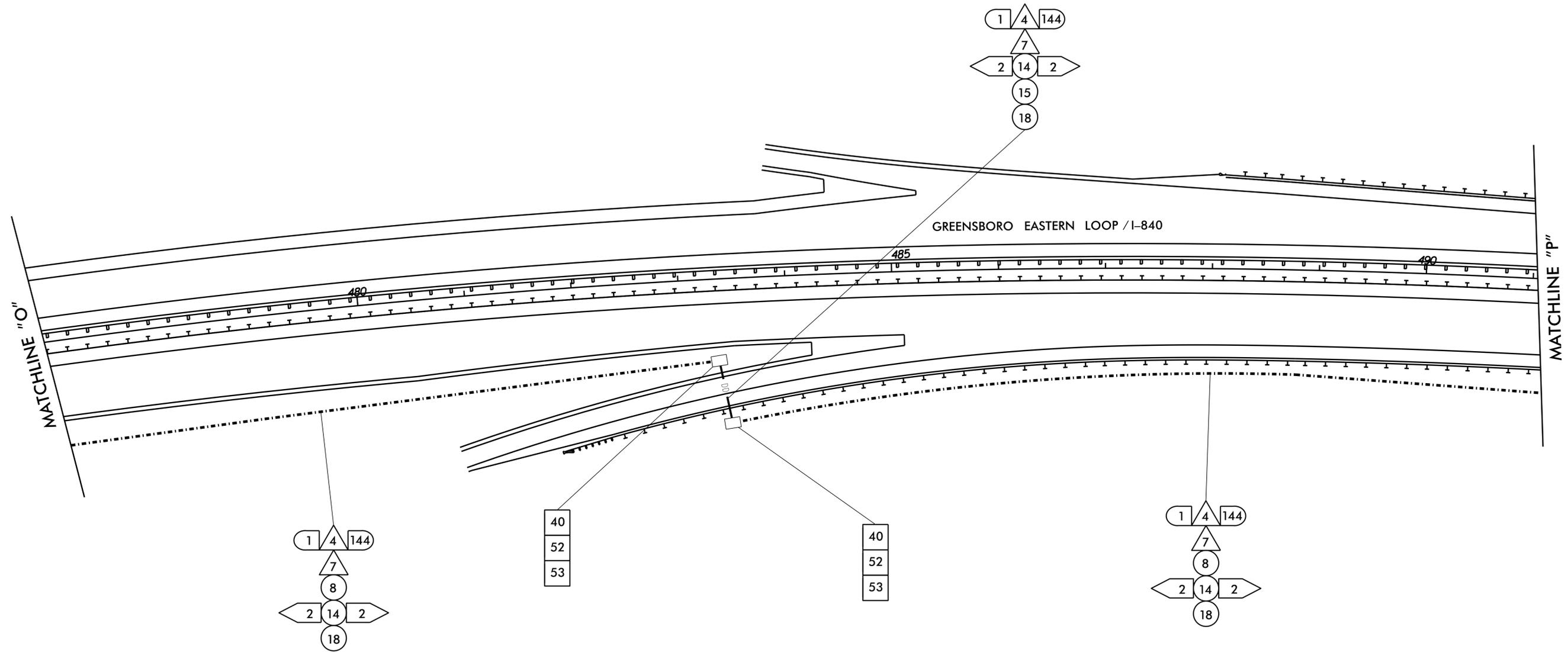
	Prepared in the Offices of: 	
	750 N. Greenfield Pkwy., Garner, NC 27529	
CABLE ROUTING PLAN		
DIVISION 07 PLAN DATE: NOVEMBER 2017	GUILFORD CO. REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN	GREENSBORO REVIEWED BY: M.A. ASLAMI, PE
SCALE 0' = 1"	REVISIONS _____	INIT. DATE _____
Signature: <i>Paul P. Marak</i>		Date: 11/14/2017



NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
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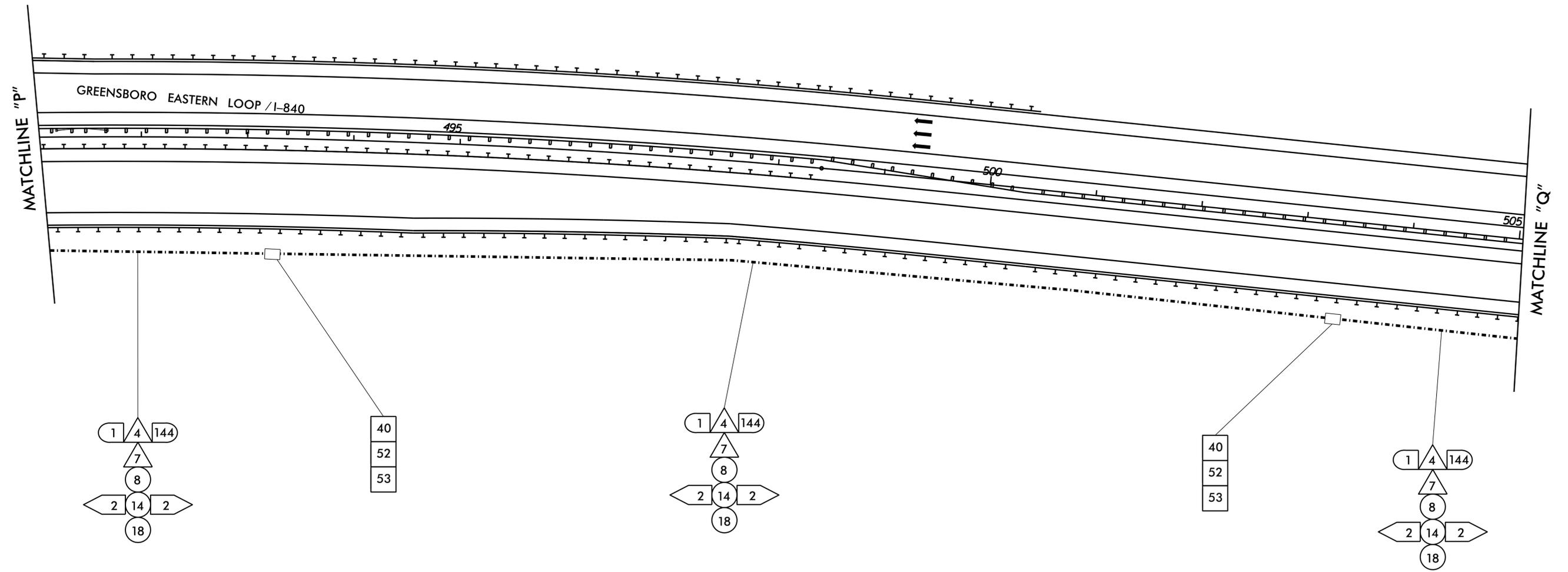
	Prepared in the Offices of:		
	<p align="center">CABLE ROUTING PLAN</p>		
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>	<p>DIVISION 07 GUILFORD CO., GREENSBORO</p>	<p>PLAN DATE: NOVEMBER 2017</p>	<p>REVIEWED BY: P.P. MARAK, PE</p>
<p>SCALE: 0' = 1" (A/B)</p>	<p>PREPARED BY: G.A. GREEN</p>	<p>REVIEWED BY: M.A. ASLAMI, PE</p>	<p>REVISIONS</p>
			<p>INIT. DATE</p>
			<p>SIGNATURE DATE</p>



NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

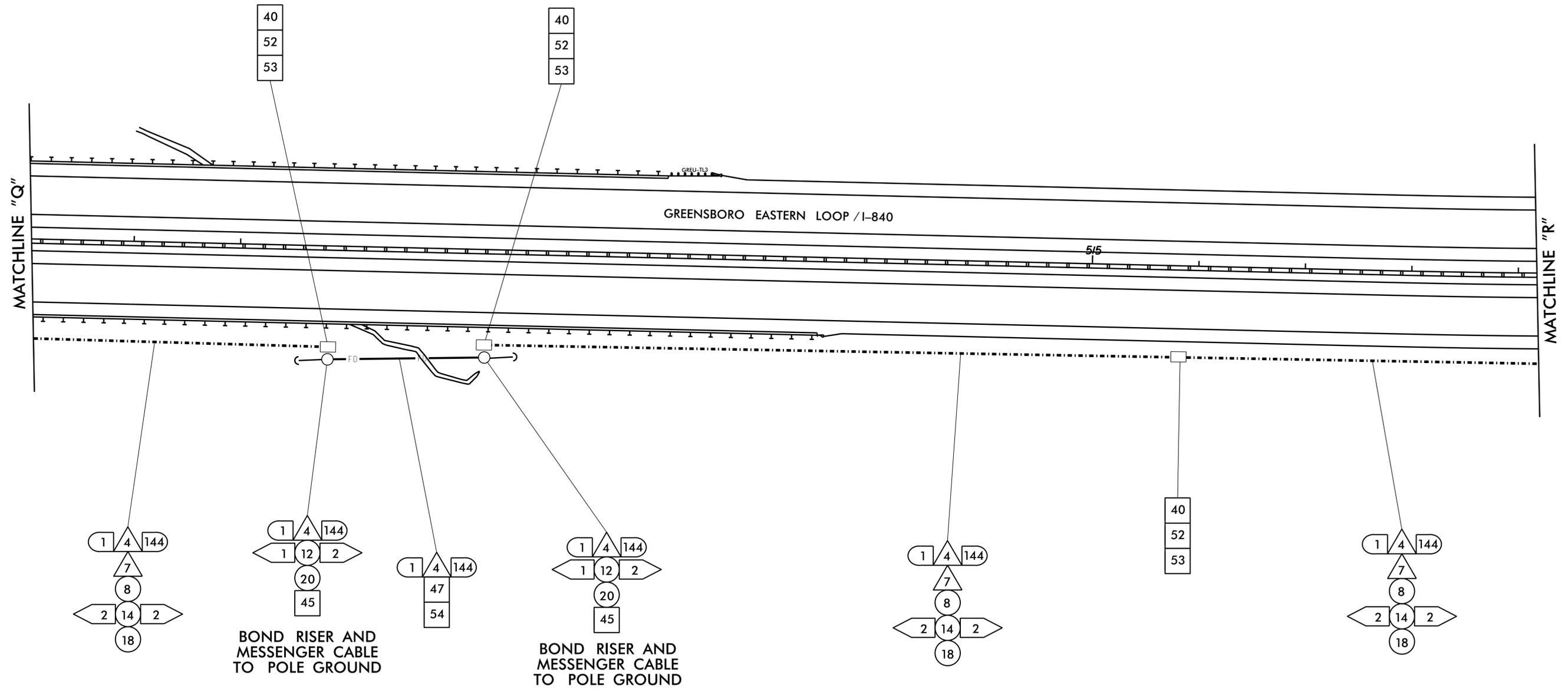
	Prepared in the Offices of: _____ _____ _____		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 031636 PAUL P. MARAK 11/14/2017
	SCALE 0 _____ T A/B		
REVISIONS _____ _____ _____		INIT. DATE _____ _____ _____	



NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

	Prepared in the Offices of:		
	<p align="center">CABLE ROUTING PLAN</p>		
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>	<p>DIVISION 07 GUILFORD CO., GREENSBORO</p>	<p>PLAN DATE: NOVEMBER 2017</p>	<p>REVIEWED BY: P.P. MARAK, PE</p>
<p>SCALE: 0' = 1" (A/B)</p>	<p>PREPARED BY: G.A. GREEN</p>	<p>REVIEWED BY: M.A. ASLAMI, PE</p>	<p>REVISIONS: _____</p>
<p>INITIALS: _____</p>	<p>DATE: _____</p>	<p>SIGNATURE: _____</p>	<p>DATE: 11/14/2017</p>



NOTES

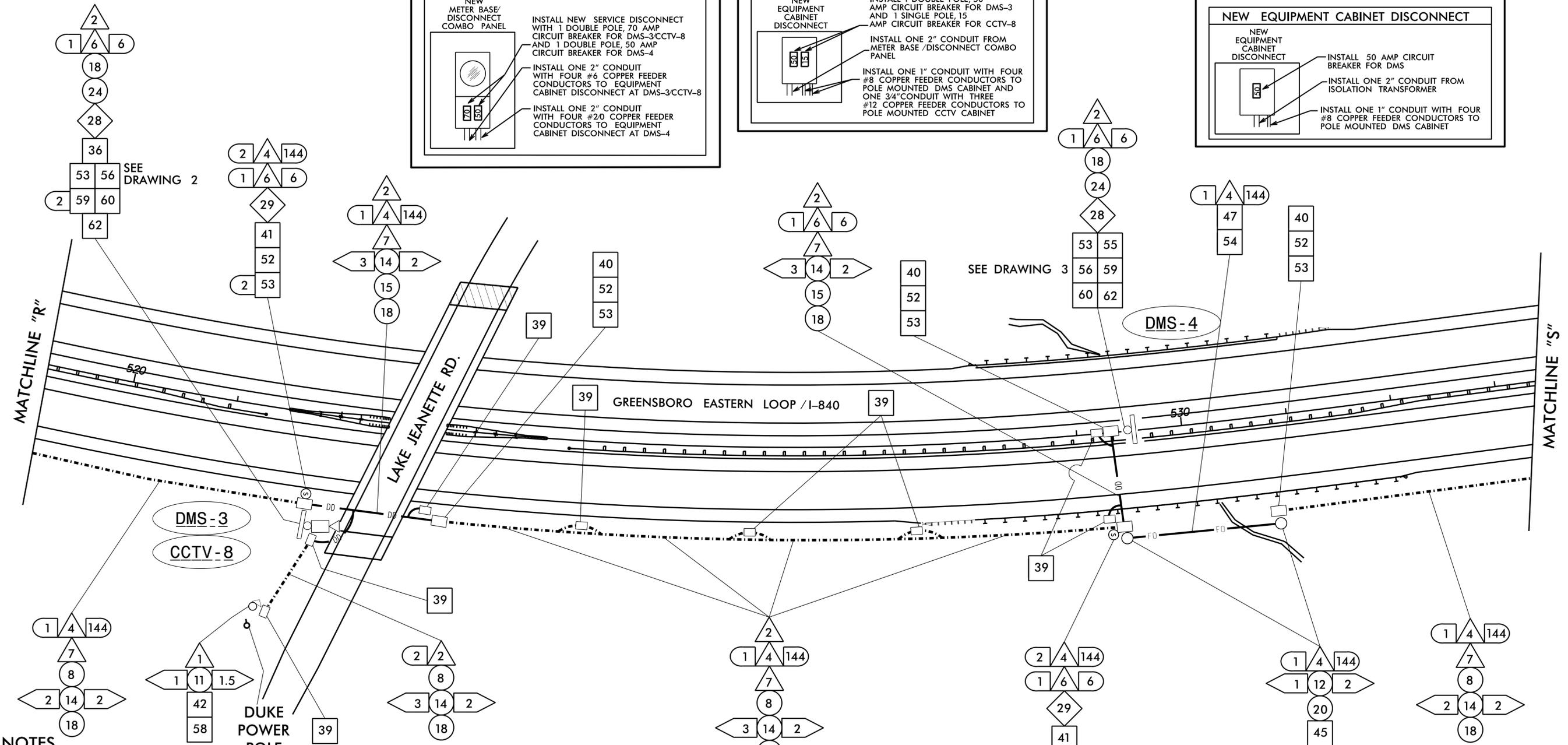
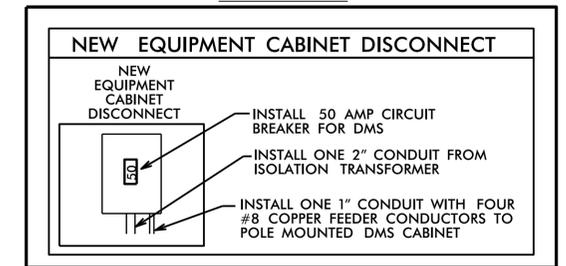
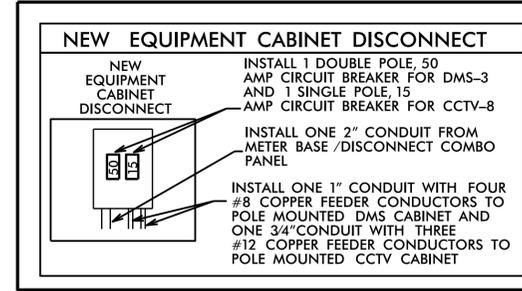
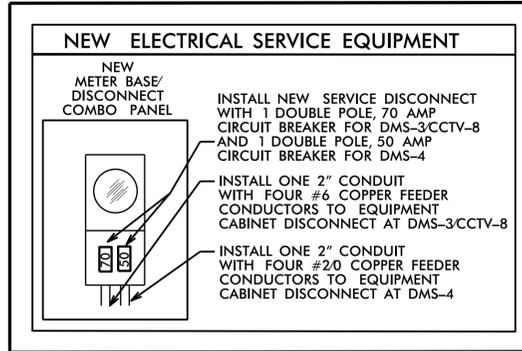
1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

	Prepared in the Offices of: _____ _____	
	SCALE: 0' = _____ A/B	
CABLE ROUTING PLAN		
DIVISION 07 GUILFORD CO. GREENSBORO		
PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE		
PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE		
REVISIONS _____ _____	INIT. _____ _____	DATE _____ _____
SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031636 PAUL P. MARAK _____ SIGNATURE DATE		CADD Filename: _____

DRAWING 1

DRAWING 2

DRAWING 3



NOTES

1. INSTALL SERVICE POLE 20' FROM EXISTING DUKE ENERGY POWER POLE.
2. INSTALL DMS-3/CCTV-8 STRUCTURE EIGHT FEET (8') BEHIND GUARDRAIL AT STA. 522. INSTALL DMS-4 STRUCTURE EIGHT FEET (8') BEHIND EAST BOUND GUARDRAIL AT STA. 529.5.
3. OBTAIN FINAL DMS/CCTV LOCATION APPROVAL FROM THE REGIONAL ITS ENGINEER (336-315-7080) BEFORE INITIATING ANY WORK AT THIS LOCATION.
4. INSTALL NEW DMSs, CCTV & POLE EXTENSION, WALKWAYS, AND LADDERS ON NEW DMS STRUCTURE. INSTALL NEW DMS POLE MOUNTED CABINETS ON NEW DMS STRUCTURES.
5. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
6. INSTALL CONDUITS FOR FEEDER CONDUCTORS AND FIBER OPTIC CABLE IN SAME TRENCH OR BORE. USE SEPERATE CONDUIT AND JUNCTION BOXES.
7. INSTALL NEW GROUNDING SYSTEM AT DMS-3/CCTV-8 AS DESCRIBED ON SHEET ITS-06 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
8. INSTALL NEW GROUNDING SYSTEM AT DMS-4 AS DESCRIBED ON SHEET ITS-07 AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
9. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

BOND RISER AND MESSENGER CABLE TO POLE GROUND

NOTE: ELECTRICAL SERVICE DETAILS AND CONSTRUCTION METHODS DEPICT FIELD CONDITIONS AT THE TIME OF DESIGN. CONTRACTOR TO VERIFY ACTUAL CONDITIONS AT THE TIME OF CONSTRUCTION AND OBTAIN APPROVAL FROM ENGINEER PRIOR TO MAKING ANY CHANGES.

Prepared in the Offices of:

CABLE ROUTING PLAN

DIVISION 07 GUILFORD CO. GREENSBORO

PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE

PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE

750 N. Greenfield Pkwy., Garner, NC 27529

SCALE: 0' = 1" A/B

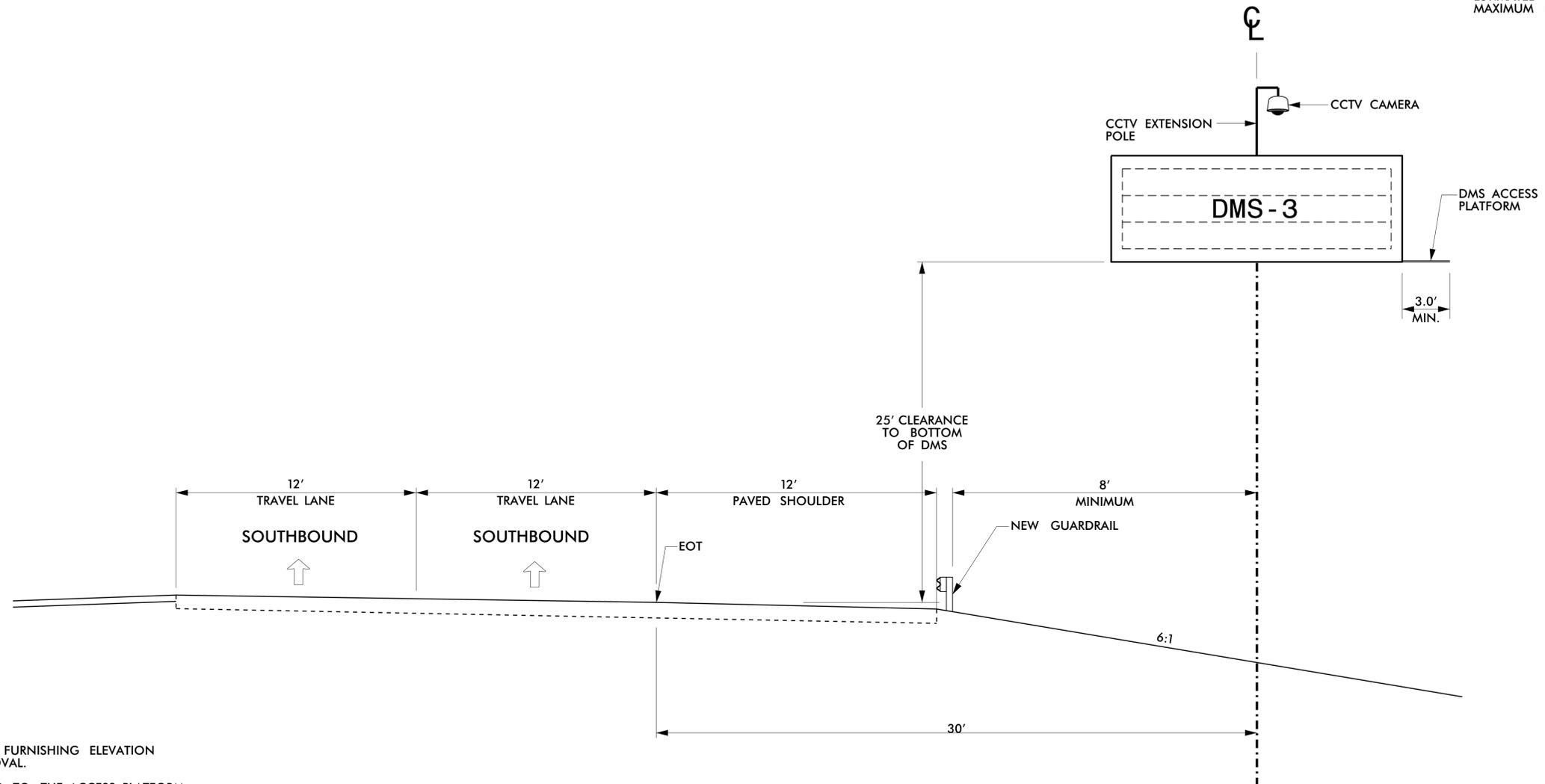
REVISIONS	INIT.	DATE

SEAL

DATE: 11/14/2017

CADD Filename: _____

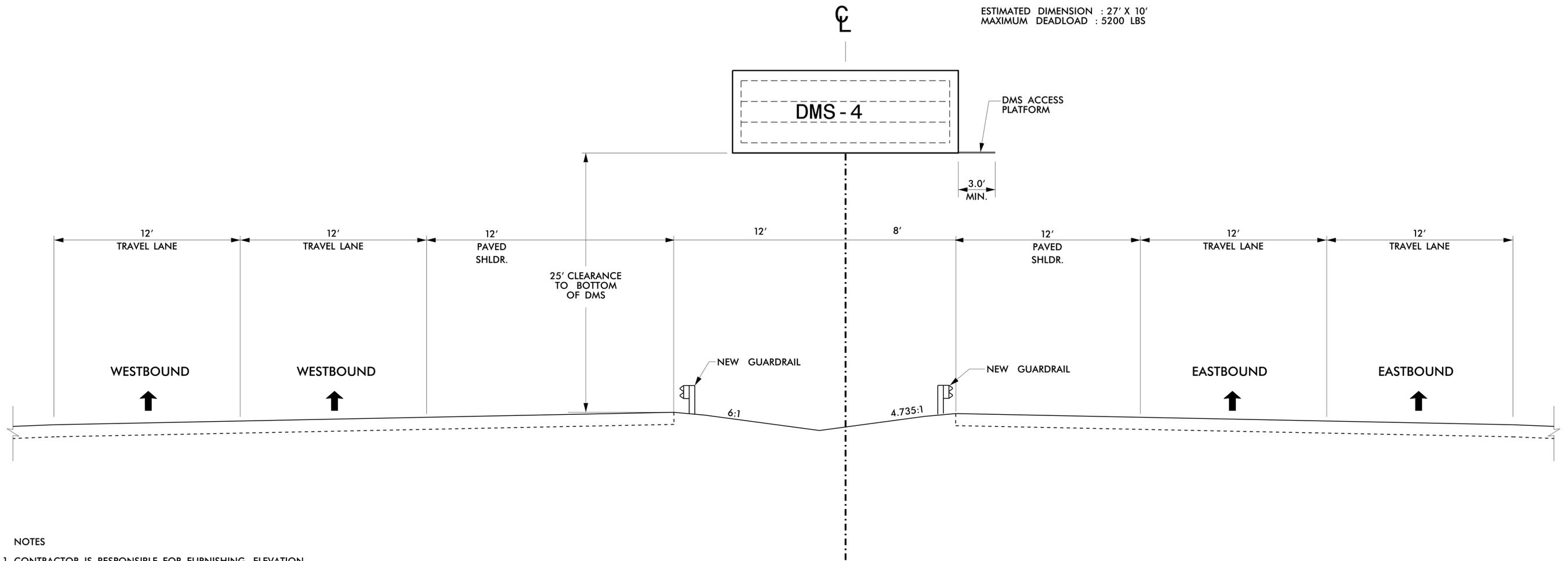
ESTIMATED DIMENSION : 27' X 10'
 MAXIMUM DEADLOAD : 5200 LBS



NOTES

- CONTRACTOR IS RESPONSIBLE FOR FURNISHING ELEVATION DRAWINGS FOR ENGINEER'S APPROVAL.
- PROVIDE A FIXED LADDER LEADING TO THE ACCESS PLATFORM.
- EQUIP THE LADDER WITH A SECURITY COVER (LADDER GUARD). START THE FIRST LADDER RUNG NO MORE THAN 18 INCHES ABOVE A CONCRETE LANDING PAD. DESIGN RUNGS ON 12 INCH CENTER-TO-CENTER TYPICAL SPACING.
- INSTALL A CONCRETE LANDING PAD MEASURING A MINIMUM 4 INCHES DEEP, 24 INCHES WIDE, AND 36 INCHES LONG DIRECTLY BENEATH THE LADDER.
- USE ACTUAL DIMENSIONS AND WEIGHT OF THE DMS TO COMPLETE THE DESIGN OF THE DMS STRUCTURE.
- FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTING USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
- 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.
- DESIGN AND CONSTRUCT THE PEDESTAL STRUCTURE AND DMS ENCLOSURE TO WITHSTAND WIND VELOCITIES OF 90 MPH.
- VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK. DO NOT DAMAGE ANY EXISTING UTILITIES OR NCDOT CABLES DURING CONSTRUCTION.
- DESIGN THE STRUCTURE TO ACCOMODATE THE INSTALLATION OF THE DMS WITH A CCTV CAMERA EXTENSION POLE AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
- SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

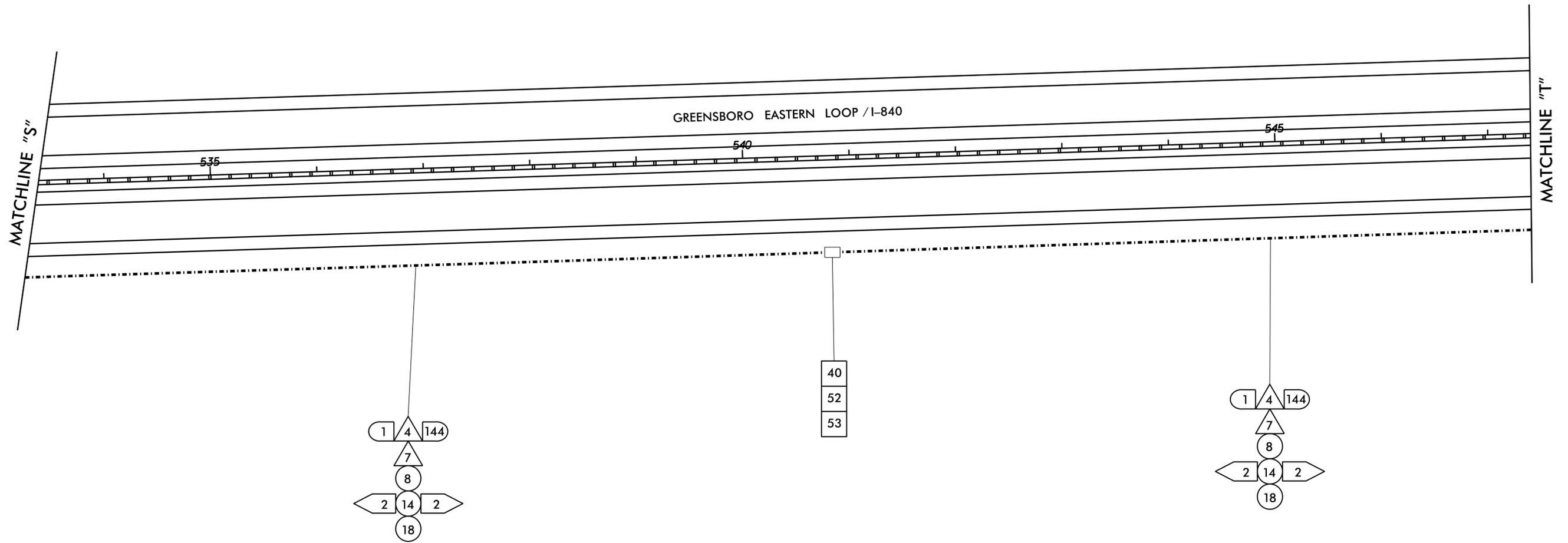
Prepared in the Offices of:		SEAL	
		NORTH CAROLINA PROFESSIONAL SEAL 031636 ENGINEER PAUL P. MARAK	
		750 N. Greenfield Pkwy., Garner, NC 27529	
SCALE 0 A/B		DIVISION 07 GUILFORD CO., GREENSBORO PLAN DATE: NOVEMBER 2017 PREPARED BY: G.A. GREEN REVIEWED BY: P.P. MARAK, PE REVIEWED BY: M.A. ASLAMI, PE	
REVISIONS INIT. DATE		REVISIONS INIT. DATE	
SIGNATURE DATE		SIGNATURE DATE	
CADD Filename:		11/14/2017	



NOTES

1. CONTRACTOR IS RESPONSIBLE FOR FURNISHING ELEVATION DRAWINGS FOR ENGINEER'S APPROVAL.
2. PROVIDE A FIXED LADDER LEADING TO THE ACCESS PLATFORM.
3. EQUIP THE LADDER WITH A SECURITY COVER (LADDER GUARD). START THE FIRST LADDER RUNG NO MORE THAN 18 INCHES ABOVE A CONCRETE LANDING PAD. DESIGN RUNGS ON 12 INCH CENTER-TO-CENTER TYPICAL SPACING.
4. INSTALL A CONCRETE LANDING PAD MEASURING A MINIMUM 4 INCHES DEEP, 24 INCHES WIDE, AND 36 INCHES LONG DIRECTLY BENEATH THE LADDER.
5. USE ACTUAL DIMENSIONS AND WEIGHT OF THE DMS TO COMPLETE THE DESIGN OF THE DMS STRUCTURE.
6. FIELD VERIFY ALL FOOTING ELEVATIONS AND GROUND SLOPES AT THE FOOTING USING THE LATEST NCDOT STANDARD SPECIFICATIONS FOR ROADS AND STRUCTURES.
7. 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.
8. DESIGN AND CONSTRUCT THE PEDESTAL STRUCTURE AND DMS ENCLOSURE TO WITHSTAND WIND VELOCITIES OF 90 MPH.
9. VERIFY ALL UNDERGROUND UTILITY LOCATIONS BEFORE BEGINNING ANY UNDERGROUND WORK. DO NOT DAMAGE ANY EXISTING UTILITIES OR NCDOT CABLES DURING CONSTRUCTION.
10. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

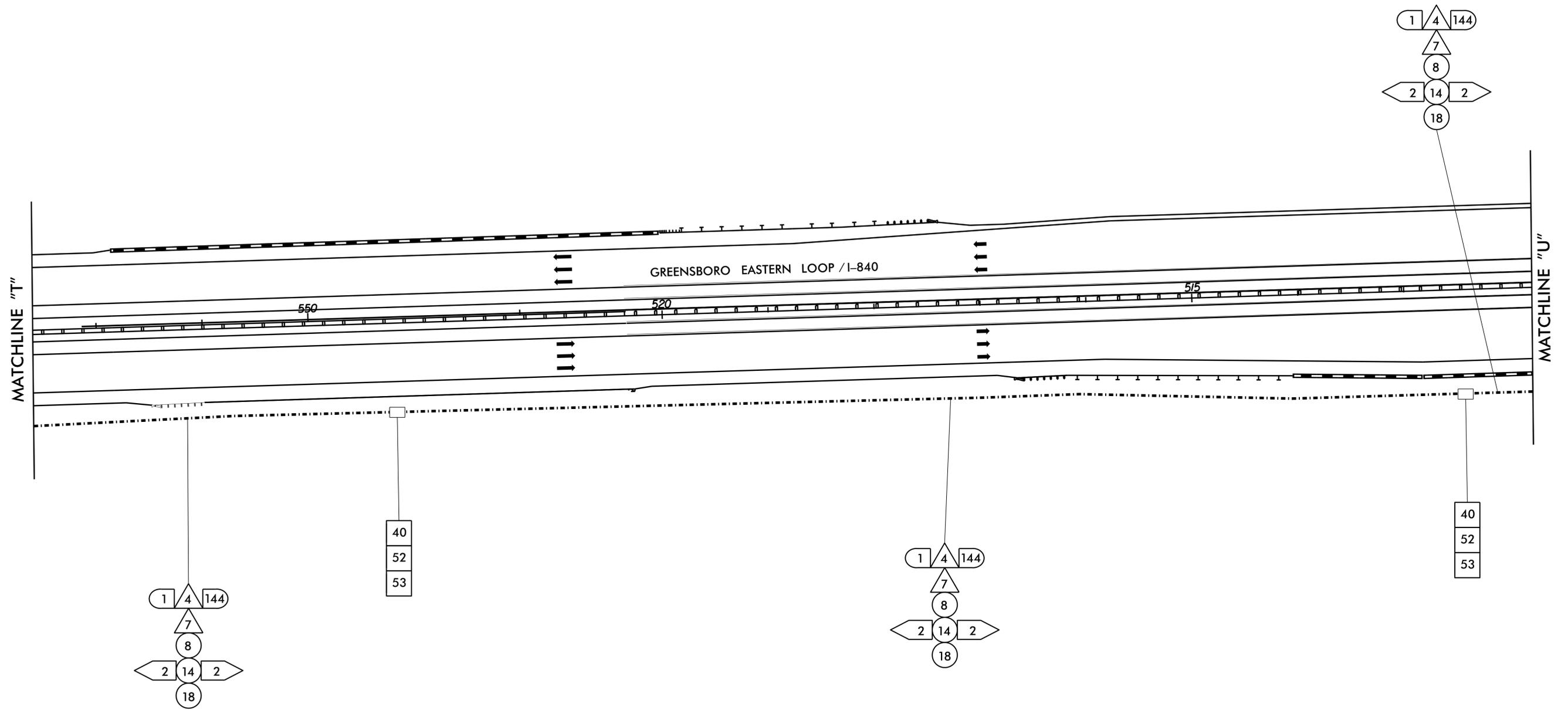
Prepared in the Offices of:		SEAL	
			
ELEVATION PLAN		DIVISION 07 GUILFORD CO. GREENSBORO	
PLAN DATE: NOVEMBER 2017		REVIEWED BY: P.P. MARAK, PE	
PREPARED BY: G.A. GREEN		REVIEWED BY: M.A. ASLAMI, PE	
SCALE	REVISIONS	INIT.	DATE
0			
A/B			
CADD Filename:			



NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

	<p>Prepared in the Offices of:</p>	
	<p>CABLE ROUTING PLAN</p>	
<p>750 N. Greenfield Pkwy., Garner, NC 27529</p>	<p>DIVISION 07 GUILFORD CO., GREENSBORO</p>	<p>SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 031636 PAUL P. MARAK</p>
<p>PLAN DATE: NOVEMBER 2017</p>	<p>REVIEWED BY: P.P. MARAK, PE</p>	<p>REVISIONS</p>
<p>PREPARED BY: G.A. GREEN</p>	<p>REVIEWED BY: M.A. ASLAMI, PE</p>	<p>INIT. DATE</p>
<p>SCALE 0 A/B</p>	<p>SIGNATURE <i>Paul P. Marak</i></p>	<p>DATE 11/14/2017</p>
<p>CADD Filename:</p>		

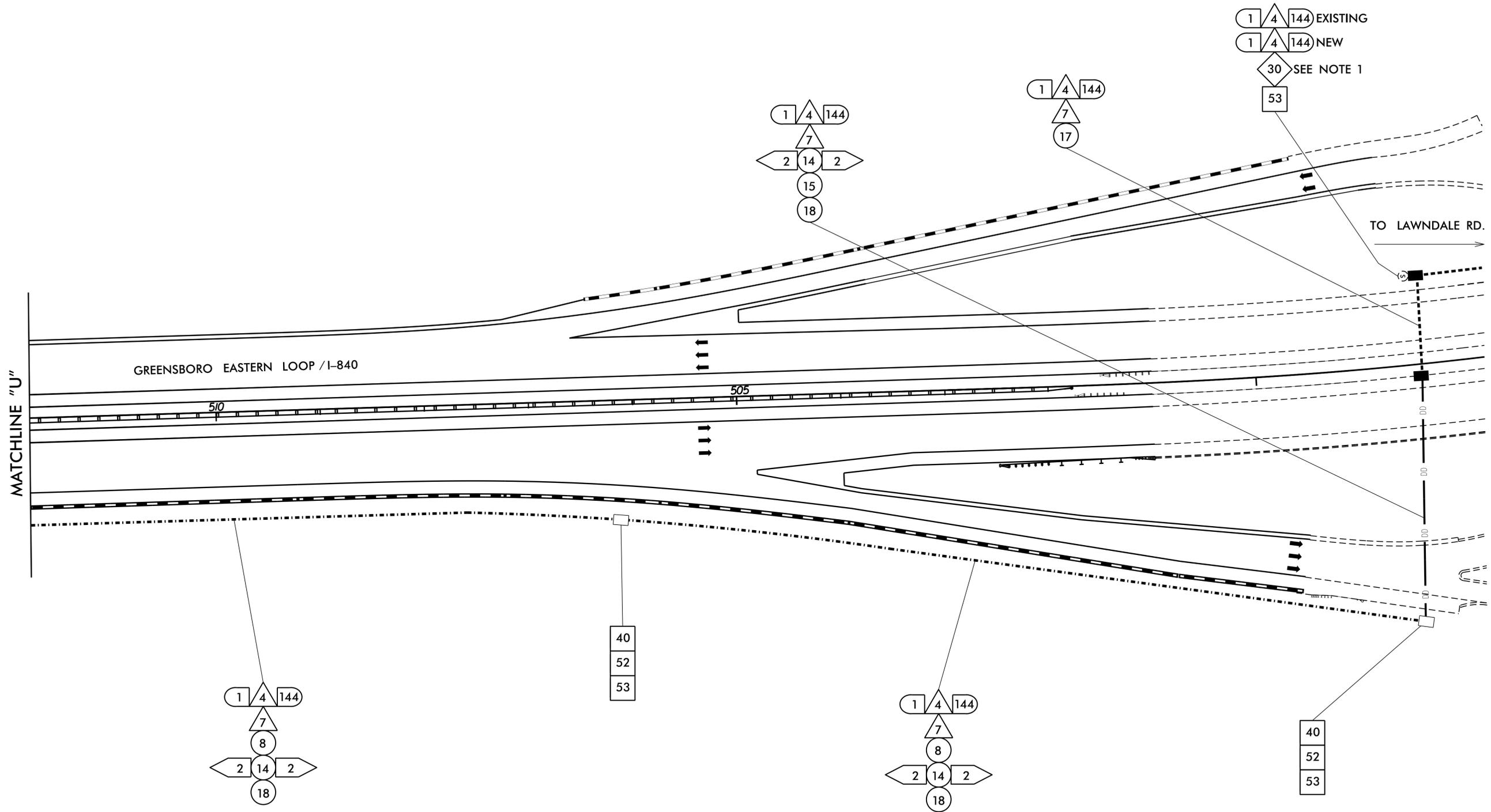


NOTES

1. MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
2. SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

	Prepared in the Offices of: _____ _____ _____		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 031636 PAUL P. MARAK 11/14/2017
	SCALE 0' _____ T A/B		
REVISIONS _____ _____ _____			INIT. DATE _____ _____

CADD Filename: _____

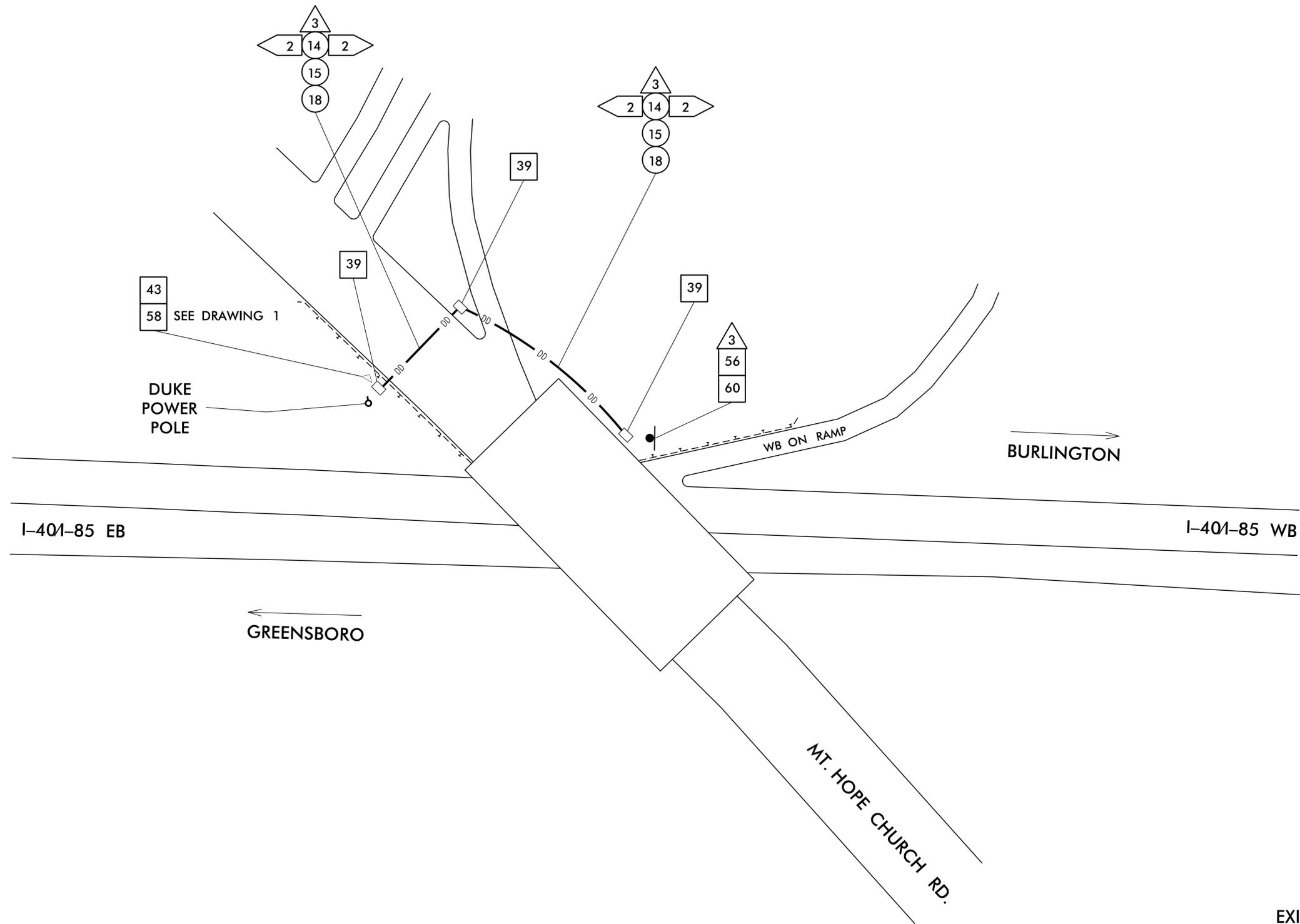


NOTES

- EXISTING CONDUIT, FIBER, JUNCTION BOX, AND SPLICE ENCLOSURE INSTALLED BY PROJECT U-2524D.
- MAINTAIN A MINIMUM OF SIX (6) FEET FROM EDGE OF PAVEMENT WHEN TRENCHING PARALLEL TO THE ROADWAY. MAXIMUM JUNCTION BOX SPACING 1000' FOR FIBER OPTIC CABLE AND 150' FOR FEEDER CONDUCTORS OR AS DIRECTED BY THE ENGINEER.
- SEE ROADWAY PLANS FOR GUARDRAIL DETAILS.

	Prepared in the Offices of: DIVISION 07 GUILFORD CO., GREENSBORO		SEAL NORTH CAROLINA PROFESSIONAL ENGINEER 031636 PAUL P. MARAK 11/14/2017
	CABLE ROUTING PLAN		
750 N. Greenfield Pkwy., Garner, NC 27529	PLAN DATE: NOVEMBER 2017 PREPARED BY: G.A. GREEN	REVIEWED BY: P.P. MARAK, PE REVIEWED BY: M.A. ASLAMI, PE	REVISIONS INIT. DATE
SCALE 0' = 1"	SIGNATURE DATE		CADD Filename:

APPROXIMATE GPS COORDINATES
N 36 03.568 W 79 39.665



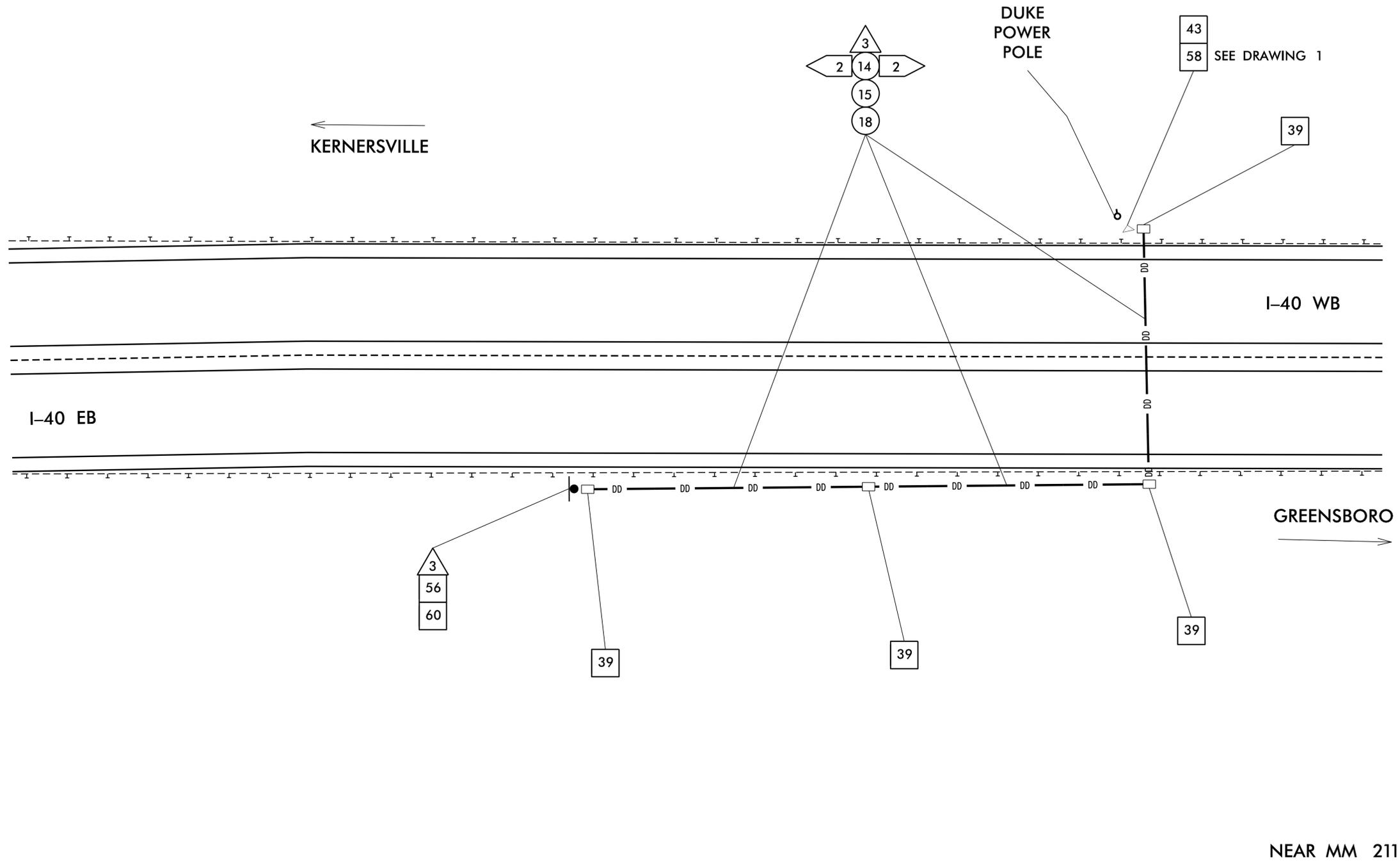
NOTES

1. INSTALL SERVICE PEDESTAL TWENTY (20') FROM EXISTING DUKE ENERGY POWER POLE AND SIX (6') BEHIND EXISTING GUARDRAIL.
2. MOUNT NEW EQUIPMENT CABINET DISCONNECT ON EXISTING SIGN STRUCTURE.
3. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-6A AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
4. INSTALL DEPARTMENT FURNISHED CELLULAR MODEM IN EQUIPMENT CABINET TO BE INSTALLED BY OTHERS.
5. INTEGRATE CENTER TO FIELD COMMUNICATIONS AT THE TRTMC.

EXIT 132

	Prepared in the Offices of:		
	TRAVEL TIME SIGN #1		
DIVISION 07 GUILFORD CO. GREENSBORO		SEAL	
PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE		SEAL	
PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE		SEAL	
SCALE: 0' = 1" A/B		SEAL	
REVISIONS		SEAL	
INIT. DATE		SEAL	
SIGNATURE		SEAL	
DATE		SEAL	
CADD Filename:		SEAL	

APPROXIMATE GPS COORDINATES
N 36 04.350 W 79 56.135



NOTES

1. INSTALL SERVICE PEDESTAL TWENTY (20') FROM EXISTING DUKE ENERGY POWER POLE AND SIX (6') BEHIND EXISTING GUARDRAIL.
2. MOUNT NEW EQUIPMENT CABINET DISCONNECT ON EXISTING SIGN STRUCTURE.
3. INSTALL NEW GROUNDING SYSTEM AS DESCRIBED ON SHEET ITS-6A AND AS DESCRIBED IN THE PROJECT SPECIAL PROVISIONS.
4. INSTALL DEPARTMENT FURNISHED CELLULAR MODEM IN EQUIPMENT CABINET TO BE INSTALLED BY OTHERS.
5. INTEGRATE CENTER TO FIELD COMMUNICATIONS AT THE TRTMC.

 750 N. Greenfield Pkwy., Garner, NC 27529	Prepared in the Offices of:		SEAL  SEAL 031636 ENGINEER PAUL P. MARAK 11/14/2017 SIGNATURE DATE
	TRAVEL TIME SIGN #2		
DIVISION 07 GUILFORD CO., GREENSBORO		PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE	
PREPARED BY: G.A. GREEN		REVIEWED BY: M.A. ASLAMI, PE	
SCALE 0' = 1"		REVISIONS INIT. DATE	
A/B		CADD Filename:	

**EXISTING SPLICE ENCLOSURE
AT I-840 AND US 29**

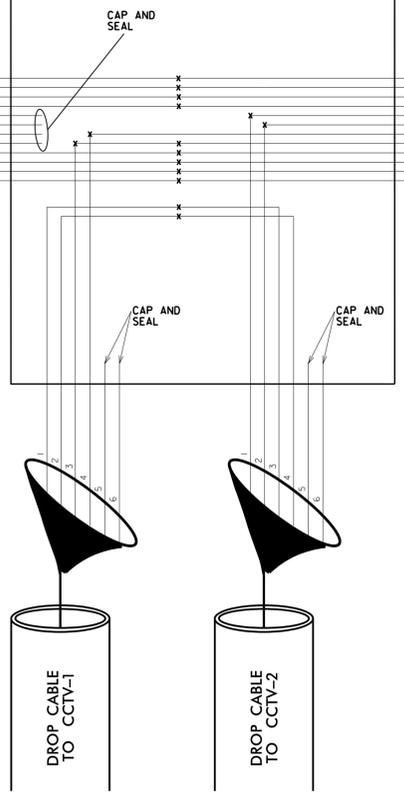
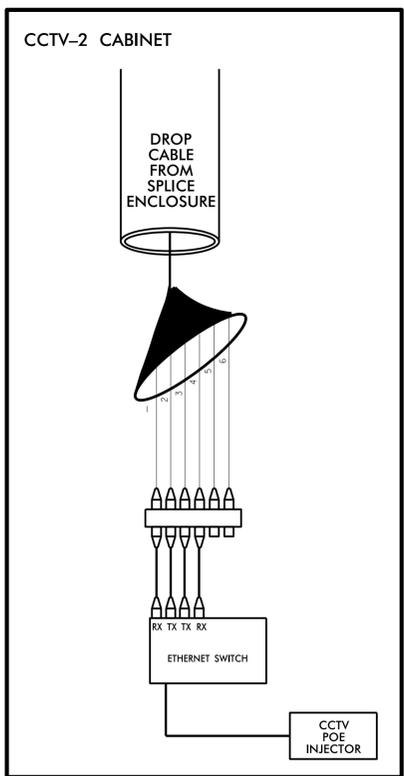
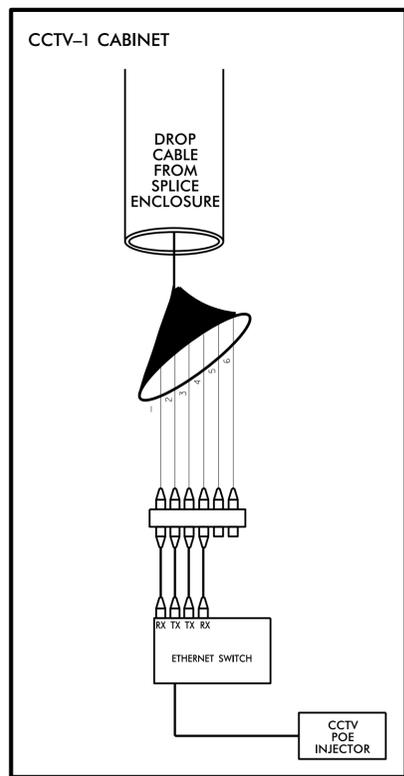
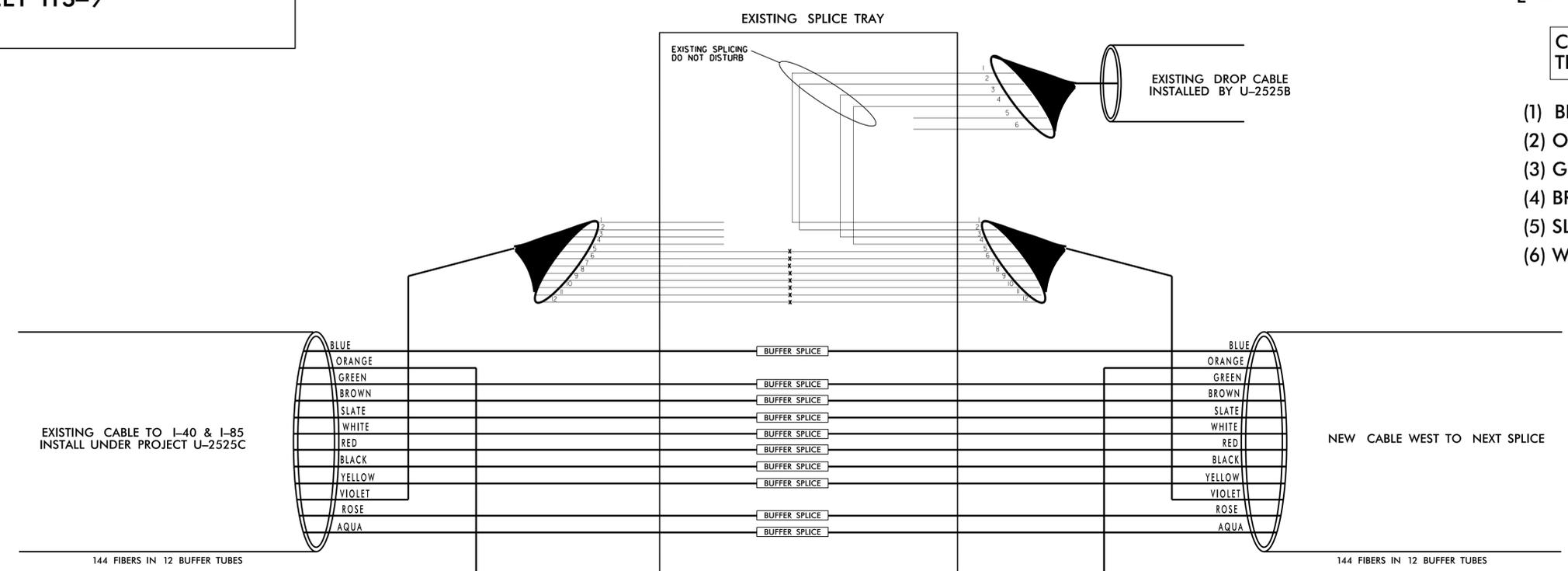
SHEET ITS-9

LEGEND

X = FUSION SPLICE
E = EXISTING FUSION SPLICE

**COLOR CODE
TIA/EIA 598-A**

- | | |
|------------|-------------|
| (1) BLUE | (7) RED |
| (2) ORANGE | (8) BLACK |
| (3) GREEN | (9) YELLOW |
| (4) BROWN | (10) VIOLET |
| (5) SLATE | (11) ROSE |
| (6) WHITE | (12) AQUA |



COLOR CODE TIA/EIA 598-C	LEGEND
(1) BLUE (7) RED (2) ORANGE (8) BLACK (3) GREEN (9) YELLOW (4) BROWN (10) VIOLET (5) SLATE (11) ROSE (6) WHITE (12) AQUA	ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATION. X - NEW FUSION SPLICE INDIVIDUAL FIBER O - EXISTING FUSION SPLICE INDIVIDUAL FIBER [Buffer Splice Symbol] - SPLICE ENTIRE BUFFER TUBE [Express Symbol] - EXPRESS ENTIRE BUFFER TUBE

NOTES:
1. COIL AND STORE ALL UNUSED FIBERS IN SPLICE TRAY. CAP UNUSED BUFFER TUBES.

	SPLICE DETAILS		
	DIVISION 07 GUILFORD CO. GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE	REVISIONS INIT. DATE	

**NEW SPLICE ENCLOSURE
AT CCTV-3, DMS-1, DMS-2, CCTV-4, CCTV-5,
CCTV-6, CCTV-7, & DMS-4**

**SHEET ITS-11, 13, 15, 18, 20, 23,
25, & 29**

**COLOR CODE
TIA/EIA 598-C**

- | | |
|------------|-------------|
| (1) BLUE | (7) RED |
| (2) ORANGE | (8) BLACK |
| (3) GREEN | (9) YELLOW |
| (4) BROWN | (10) VIOLET |
| (5) SLATE | (11) ROSE |
| (6) WHITE | (12) AQUA |

LEGEND

ETHERNET SWITCH TERMINATION CONFIGURATIONS
ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR
DETERMINING /ENSURING PROPER TERMINATION.
X - NEW FUSION SPLICE INDIVIDUAL FIBER
O - EXISTING FUSION SPLICE INDIVIDUAL FIBER
[] BUFFER SPLICE SPLICE ENTIRE BUFFER TUBE
[] EXPRESS EXPRESS ENTIRE BUFFER TUBE

LEGEND

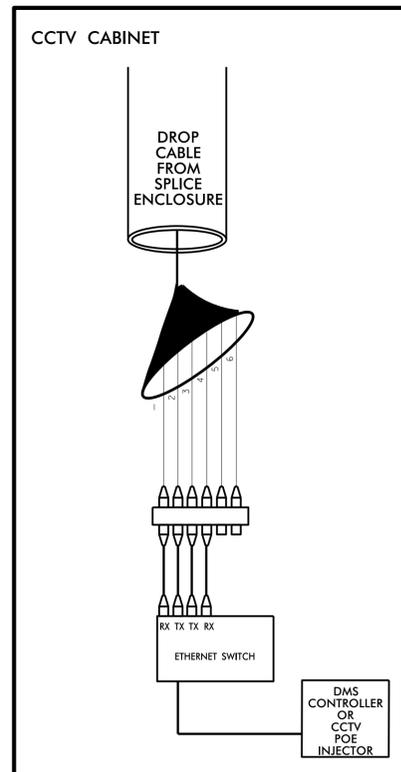
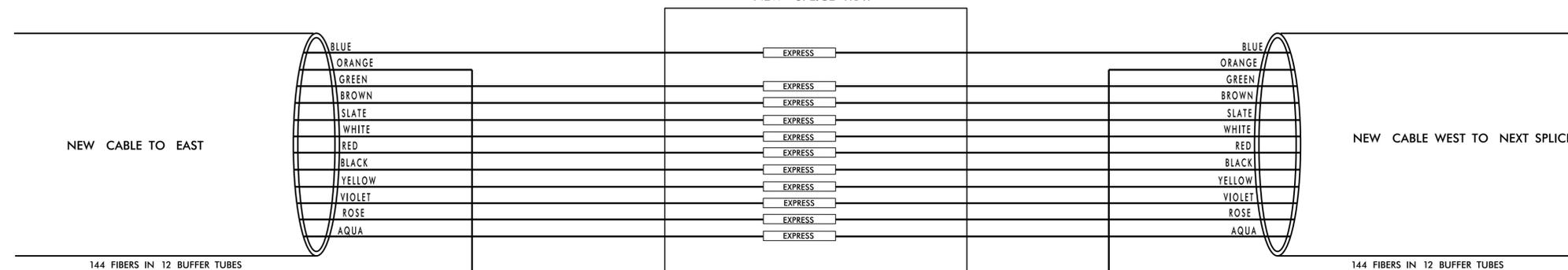
X = FUSION SPLICE
E = EXISTING FUSION SPLICE

**COLOR CODE
TIA/EIA 598-A**

- | | |
|------------|-------------|
| (1) BLUE | (7) RED |
| (2) ORANGE | (8) BLACK |
| (3) GREEN | (9) YELLOW |
| (4) BROWN | (10) VIOLET |
| (5) SLATE | (11) ROSE |
| (6) WHITE | (12) AQUA |

**EXPRESS ALL FIBERS IN BLUE, GREEN,
BROWN, SLATE, WHITE, RED, BLACK, YELLOW,
VIOLET, ROSE AND AQUA BUFFER TUBES**

NEW SPLICE TRAY



NOTES:
1. COIL AND STORE ALL UNUSED FIBERS IN SPLICE TRAY. CAP UNUSED BUFFER TUBES.

	SPLICE DETAILS		
	DIVISION 07 GUILFORD CO. GREENSBORO PLAN DATE: NOVEMBER 2017 PREPARED BY: G.A. GREEN	REVIEWED BY: P.P. MARAK, PE REVIEWED BY: M.A. ASLAMI, PE	
750 N. Greenfield Plaza, Garner, NC 27529		SIGNATURE: <i>Paul P. Marak</i> DATE: 11/14/2017	SEAL

**NEW SPLICE ENCLOSURE
AT I-840 AND LAKE JEANETTE RD.
OVERPASS**

SHEET ITS-29

COLOR CODE TIA/EIA 598-C		LEGEND	
(1) BLUE	(7) RED	ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATION.	
(2) ORANGE	(8) BLACK	X - NEW FUSION SPLICE INDIVIDUAL FIBER	
(3) GREEN	(9) YELLOW	O - EXISTING FUSION SPLICE INDIVIDUAL FIBER	
(4) BROWN	(10) VIOLET	 BUFFER SPLICE	SPLICE ENTIRE BUFFER TUBE
(5) SLATE	(11) ROSE	 EXPRESS	EXPRESS ENTIRE BUFFER TUBE
(6) WHITE	(12) AQUA		

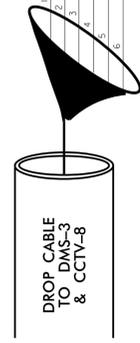
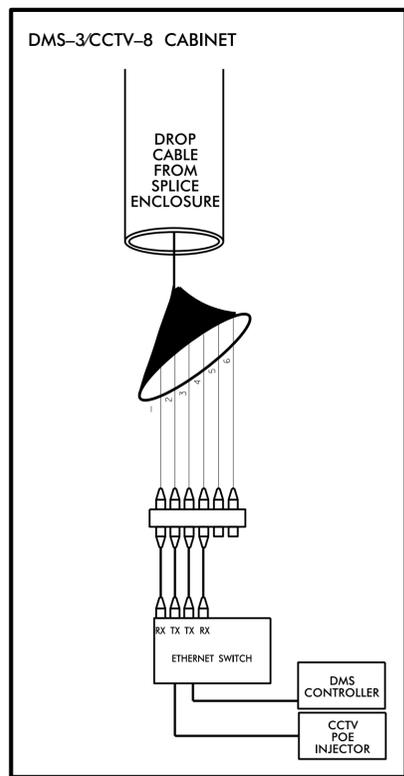
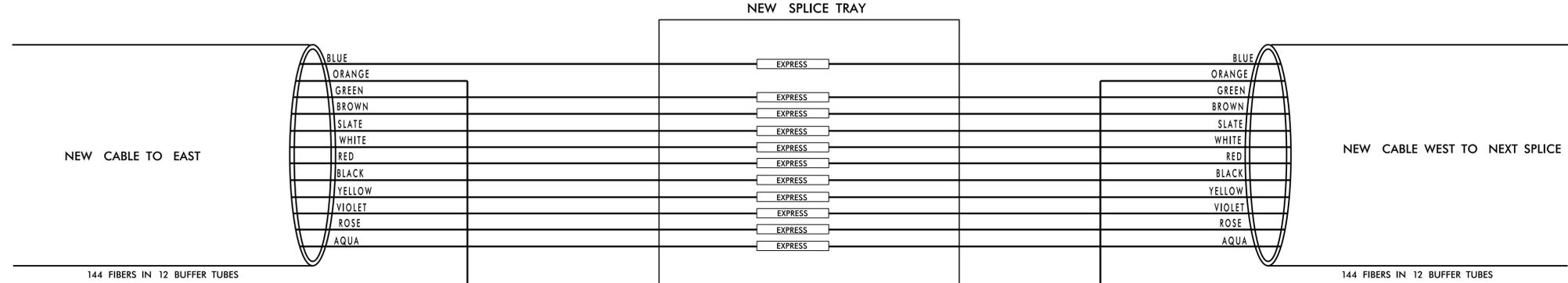
LEGEND

X = FUSION SPLICE
E = EXISTING FUSION SPLICE

**COLOR CODE
TIA/EIA 598-A**

- | | |
|------------|-------------|
| (1) BLUE | (7) RED |
| (2) ORANGE | (8) BLACK |
| (3) GREEN | (9) YELLOW |
| (4) BROWN | (10) VIOLET |
| (5) SLATE | (11) ROSE |
| (6) WHITE | (12) AQUA |

EXPRESS ALL FIBERS IN BLUE, GREEN, BROWN, SLATE, WHITE, RED, BLACK, YELLOW, VIOLET, ROSE AND AQUA BUFFER TUBES



NOTES:
1. COIL AND STORE ALL UNUSED FIBERS IN SPLICE TRAY. CAP UNUSED BUFFER TUBES.

	SPLICE DETAILS	
	DIVISION 07 GUILFORD CO. GREENSBORO PLAN DATE: NOVEMBER 2017 PREPARED BY: G.A. GREEN	REVIEWED BY: P.P. MARAK, PE REVIEWED BY: M.A. ASLAMI, PE
REVISIONS INIT. DATE	SIGNATURE DATE	CADD Filename:

EXISTING SPLICE ENCLOSURE
AT I-840 AND LAWNSDALE RD.

SHEET ITS-34

COLOR CODE
TIA/EIA 598-C

- | | |
|------------|-------------|
| (1) BLUE | (7) RED |
| (2) ORANGE | (8) BLACK |
| (3) GREEN | (9) YELLOW |
| (4) BROWN | (10) VIOLET |
| (5) SLATE | (11) ROSE |
| (6) WHITE | (12) AQUA |

LEGEND

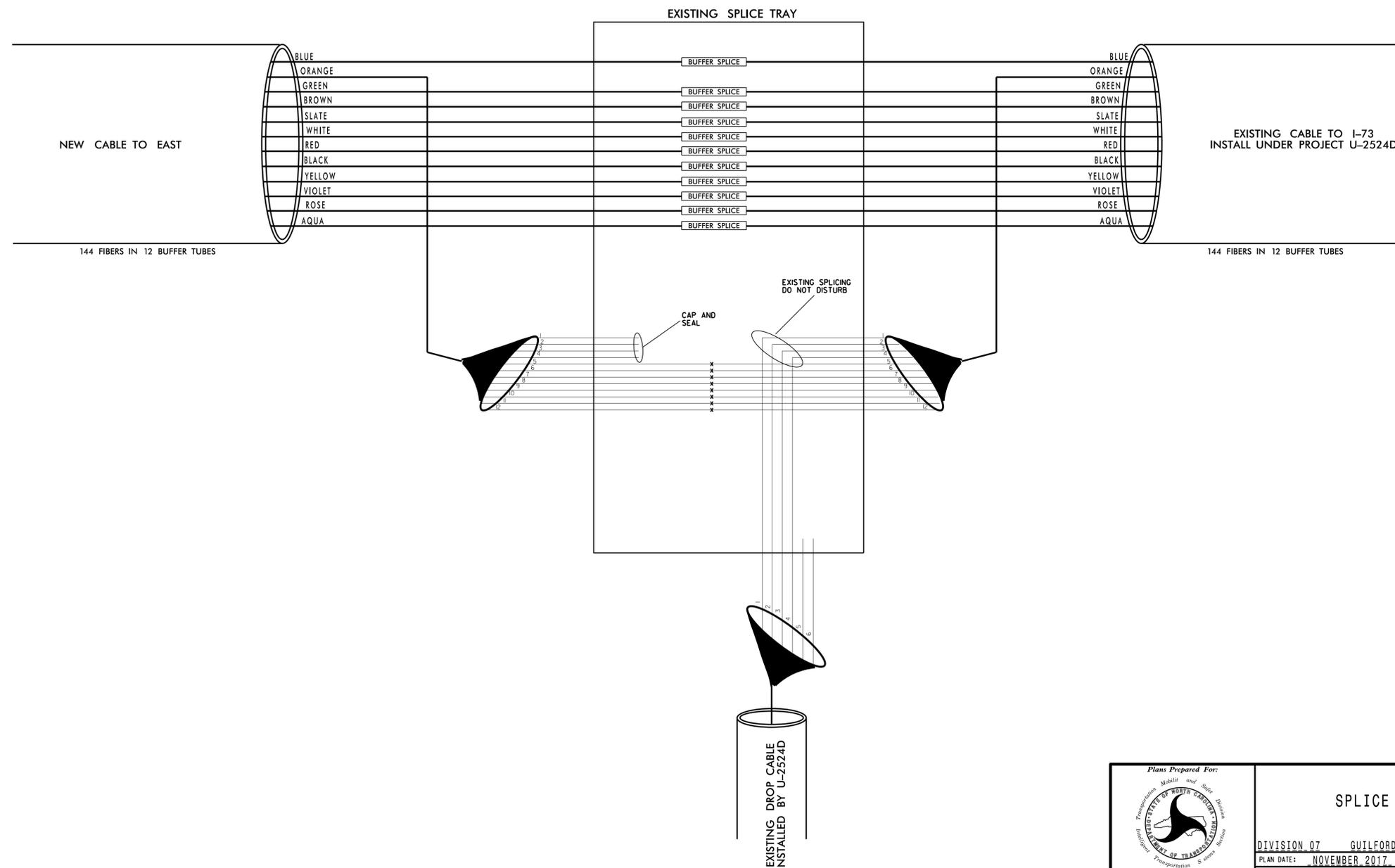
- ETHERNET SWITCH TERMINATION CONFIGURATIONS ARE GENERIC. CONTRACTOR IS RESPONSIBLE FOR DETERMINING /ENSURING PROPER TERMINATION.
- X - NEW FUSION SPLICE INDIVIDUAL FIBER
O - EXISTING FUSION SPLICE INDIVIDUAL FIBER
-  BUFFER SPLICE SPLICE ENTIRE BUFFER TUBE
 EXPRESS EXPRESS ENTIRE BUFFER TUBE

LEGEND

- X = FUSION SPLICE
E = EXISTING FUSION SPLICE

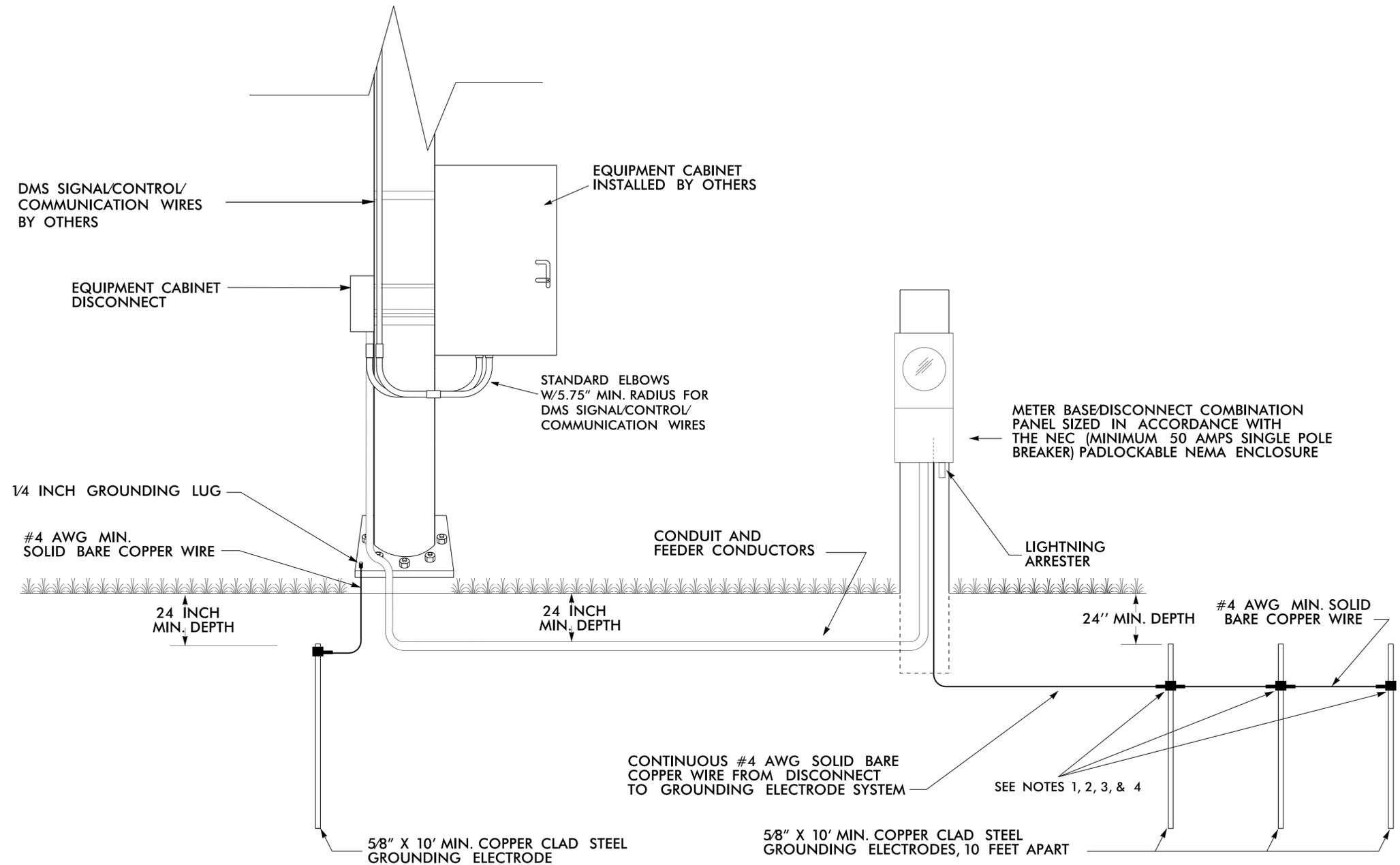
COLOR CODE
TIA/EIA 598-A

- | | |
|------------|-------------|
| (1) BLUE | (7) RED |
| (2) ORANGE | (8) BLACK |
| (3) GREEN | (9) YELLOW |
| (4) BROWN | (10) VIOLET |
| (5) SLATE | (11) ROSE |
| (6) WHITE | (12) AQUA |



- NOTES:
1. COIL AND STORE ALL UNUSED FIBERS IN SPLICE TRAY. CAP UNUSED BUFFER TUBES.

	SPLICE DETAILS		
	DIVISION 07 GUILFORD CO. GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P. P. MARAK, PE PREPARED BY: G. A. GREEN REVIEWED BY: M. A. ASLAMI, PE		
750 N. Greenfield Plaza, Garner, NC 27529		CADD Filename: _____	



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. MECHANICALLY CRIMP ALL CONNECTIONS TO GROUND RODS USING AN IRREVERSIBLE COMPRESSION TOOL.
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. INSTALL CONDUIT BETWEEN DISCONNECT AND CABINET.
8. ENSURE EQUIPMENT GROUND IS ELECTRICALLY BONDED TO CABINET.

	Prepared in the Offices of: 		DYNAMIC MESSAGE SIGN WITH UNDERGROUND ELECTRICAL SERVICE TYPICAL DETAIL DIVISION 07 GUILFORD CO., GREENSBORO PLAN DATE: NOVEMBER 2017 REVIEWED BY: P.P. MARAK, PE PREPARED BY: G.A. GREEN REVIEWED BY: M.A. ASLAMI, PE	SEAL NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 031636 PAUL P. MARAK 11/14/2017 SIGNATURE DATE CADD Filename:
	SCALE 0 N/A	REVISIONS INIT. DATE		