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0012DEL_P28

GROUNDING AND BONDING NOTES

1. USE ONLY 4/0 STRANDED COPPER CONDUCTOR FOR GROUNDING AND BONDING.
2. REMOVE PAINT AND PROTECTIVE COATING PRIOR TO INSTALLATION OF GROUNDING AND BONDING HARDWARE. ALL GROUNDING AND BONDING CONNECTIONS NEED TO BE IN DIRECT CONTACT WITH THE BRIDGE GIRDERS.
3. ENSURE ALL BOLTED CONNECTIONS ARE MADE USING A HYDRAULIC, POWER OR RATCHETING TYPE CRIMPER WITH APPROPRIATE DIES. USE OF HANDHELD PLIERS FOR CRIMPING IS PROHIBITED.
4. INSTALL GROUND RODS AS SHOWN ON THE CONTRACT DRAWINGS. BURY GROUND RODS VERTICALLY; THE TOP OF GROUND RODS SHALL BE NO MORE THAN 6 INCHES BELOW FINISHED GRADE AND SHALL REMAIN EXPOSED UNTIL ELECTRICAL INSPECTION IS COMPLETE. IF EXTENSIVE ROCK FORMATION IS ENCOUNTERED, RELOCATE GROUND RODS TO A NEW LOCATION.
5. USE GROUND RODS WHICH ARE 3/4 INCH DIAMETER X 10 FEET COPPER CLAD STEEL. PERMANENTLY BOND GROUNDING CONDUCTOR TO GROUND ROD USING AN EXOTHERMIC WELD.
6. PROVIDE EXOTHERMIC WELDING OF BURIED AND EMBEDDED GROUND CONNECTIONS AS SPECIFIED IN THE PLANS. COMPRESSION OR MECHANICAL CONNECTIONS UNDERGROUND ARE PROHIBITED.
7. ATTACH FIBERGLASS INSULATION BOARD TO ALL BRIDGE GIRDERS LOCATED ON THE CENTERLINE OF CITYLYNX GOLD LINE EB AND WB TRACKS.
8. TWO LAYERS OF PROTECTIVE TEFLON MEMBRANE TO BE PLACED BETWEEN FIBERGLASS INSULATION BOARD CLAMPS AND BRIDGE GIRDER FLANGES.




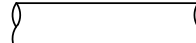


SITE SPECIFIC NOTES

1. OBTAIN APPROVAL FROM NCDOT PRIOR TO IMPLEMENTING ANY FIELD CHANGES.

ABBREVIATIONS

AWG	AMERICAN WIRE GAUGE
B.O.S.	BOTTOM OF STEEL
☉	CENTERLINE
CLR	CLEARANCE
CSK	COUNTERSUNK
CU	COPPER
DIA.	DIAMETER
EB	EASTBOUND
EL.	ELEVATION
ET	ELECTRIC TRACTION
MIN.	MINIMUM
MAX.	MAXIMUM
NCDOT	NORTH CAROLINA DEPARTMENT OF TRANSPORTATION
NTS	NOT TO SCALE
OCS	OVERHEAD CONTACT SYSTEM
PVC	POLYVINYL CHLORIDE
RGS	RIGID GALVANIZED STEEL
tf	FLANGE THICKNESS
TYP.	TYPICAL
V.I.F.	VERIFY IN FIELD
WB	WESTBOUND

LEGEND


4/0 CU GROUND WIRE	
FIBERGLASS INSULATION BOARD	
CONCRETE CLIP	
CONDUIT	
CLAMP ATTACHMENT	
GROUND ROD AND TEST STATION	

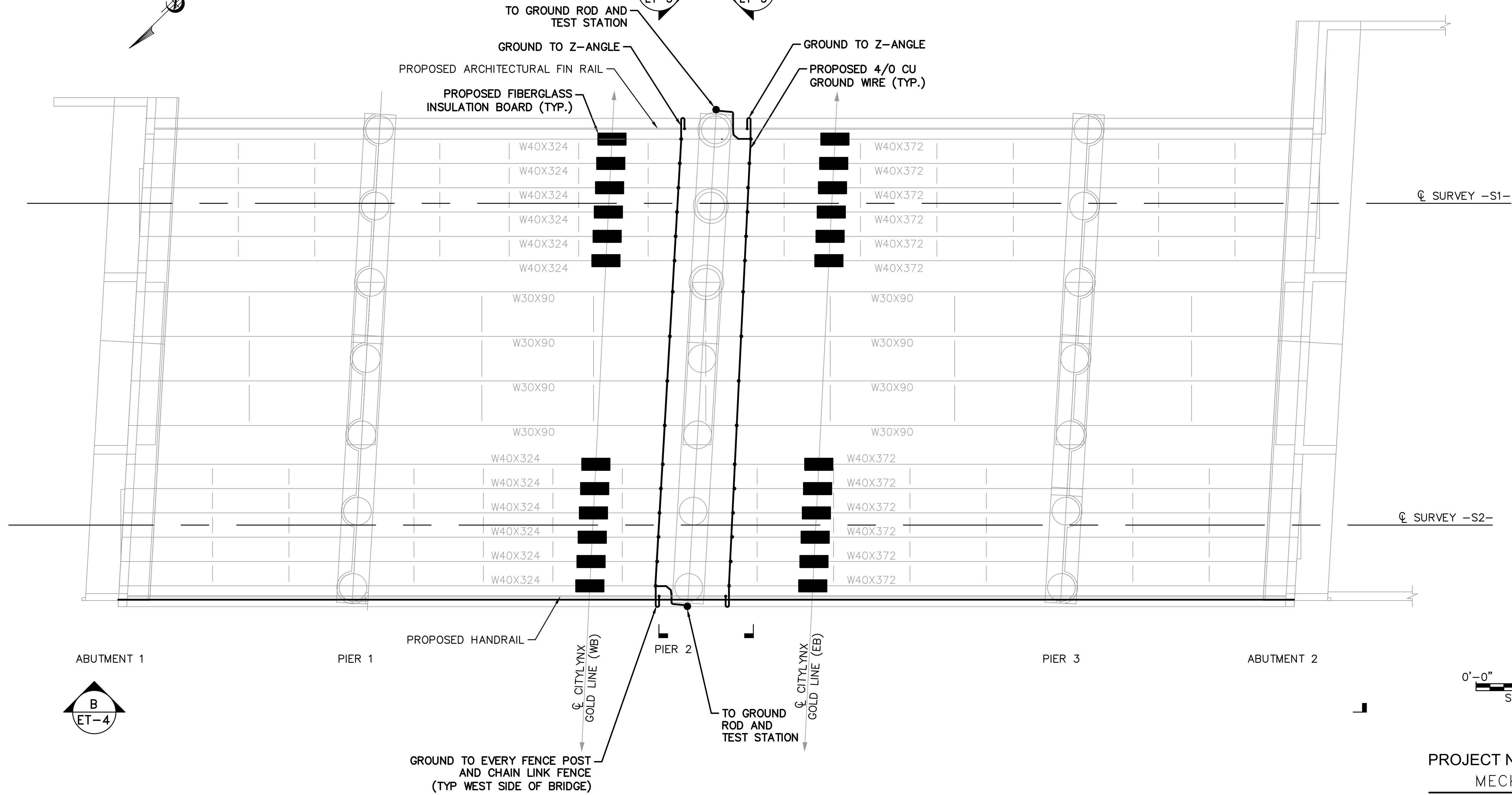
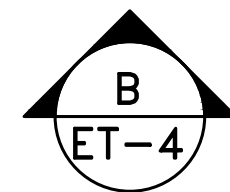
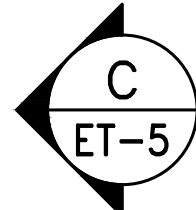
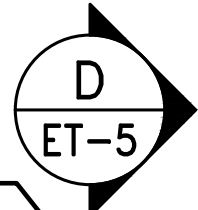
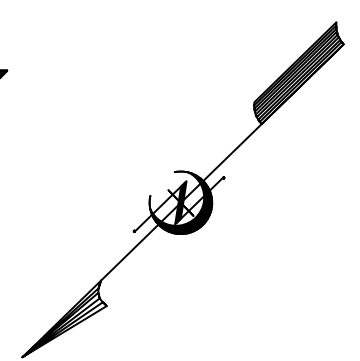
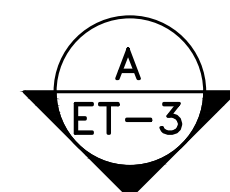
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-



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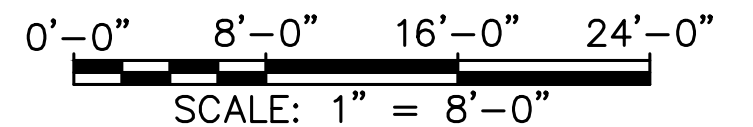
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GROUNDING AND BONDING
 GENERAL NOTES,
 LEGEND AND
 ABBREVIATIONS

 HNTB NORTH CAROLINA, P.C. <small>NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609</small>	REVISIONS						SHEET NO.
	NO.	BY	DATE	NO.	BY	DATE	ET-1
	1		03/27/2018	3			TOTAL SHEETS
DRAWN BY: P. FANZ CHECKED BY: M. RACHEVA	DATE: 03/27/2018	DATE: 03/27/2018	DWG. NO. 1	2		4	9



CL SURVEY -S1-

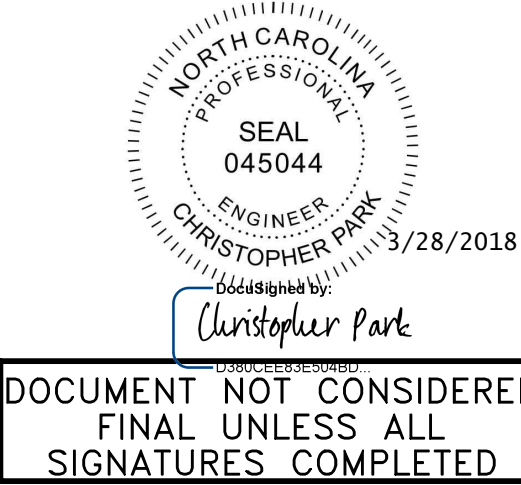
CL SURVEY -S2-



TRADE STREET BRIDGE PLAN VIEW
SCALE: 1" = 8'-0"

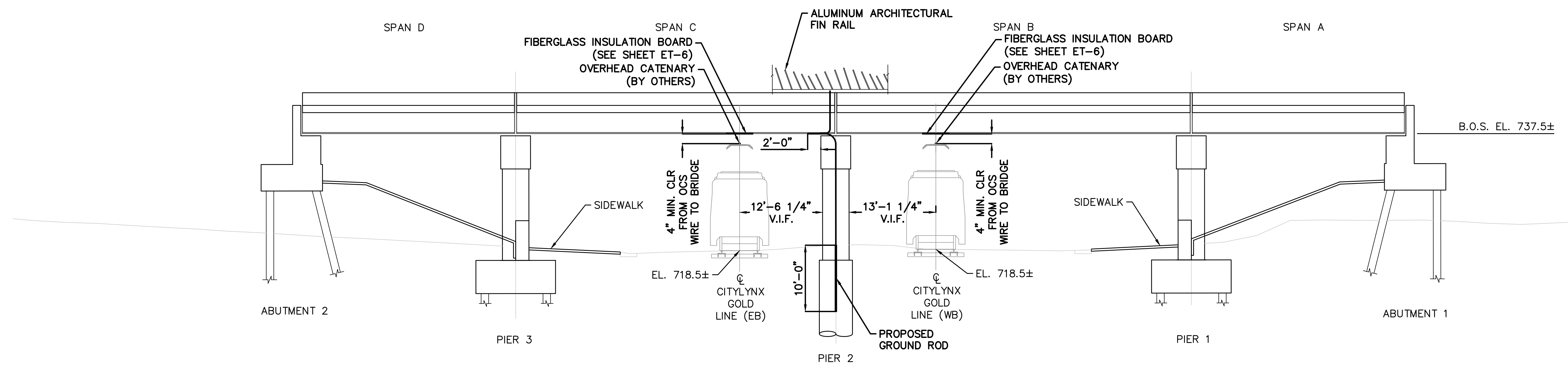
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

TOTAL BILL OF MATERIAL		
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STRUCTURE GROUNDING AND BONDING AT STA. 23+65.83 -S1-	1	LUMP SUM

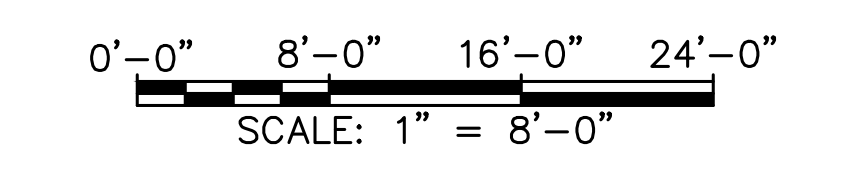


STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GROUNDING AND BONDING
 TRADE STREET
 BRIDGE PLAN VIEW

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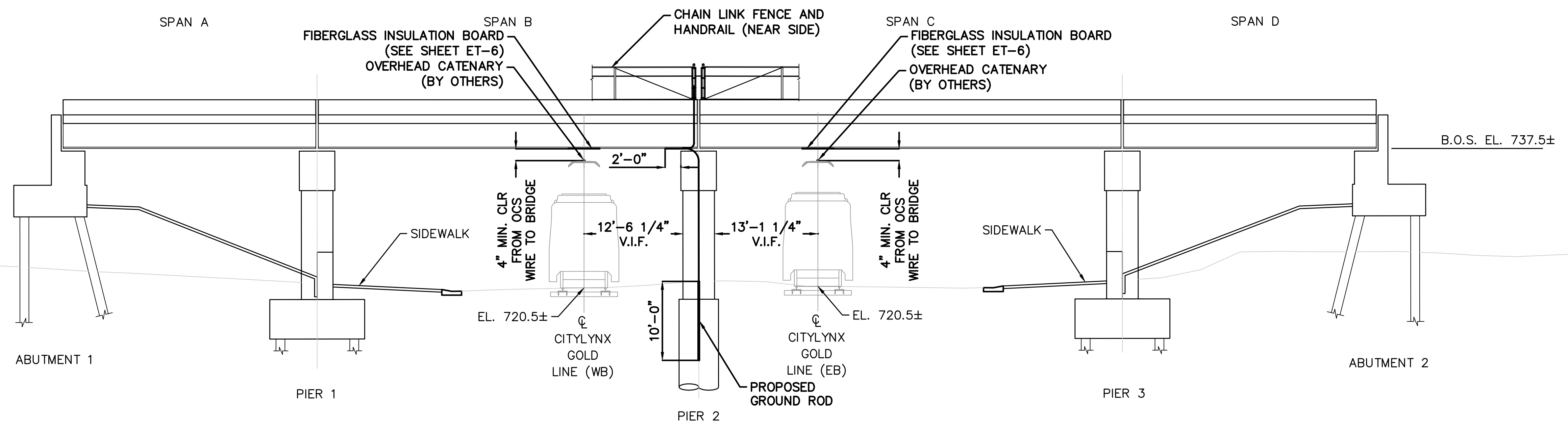
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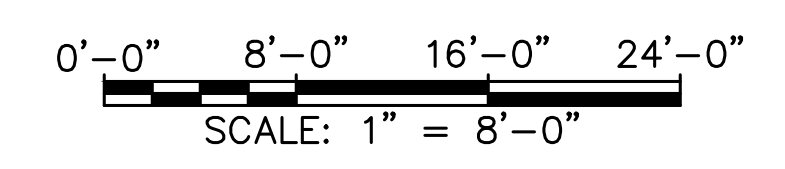
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

- NOTES:**
- HORIZONTAL CLEARANCES TO PIER 2 ARE BASED ON STRUCTURE PLANS. CONTRACTOR TO VERIFY CLEARANCES.
 - MINIMUM ACCEPTABLE ELECTRICAL CLEARANCE BETWEEN ENERGIZED OVERHEAD CONTACT SYSTEM AND BRIDGE SHALL BE MAINTAINED AT ALL TIMES.
 - ATTACHMENTS OF OCS SUPPORTS TO BRIDGE (IF ANY) ARE NOT PART OF THIS PACKAGE AND ARE TO BE DESIGNED BY OTHERS.

<p>SEAL 045044 ENGINEER CHRISTOPHER PARK 3/28/2018 Christopher Park</p>		STATE OF NORTH CAROLINA		SHEET NO.																			
		DEPARTMENT OF TRANSPORTATION RALEIGH		ET-3																			
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		GROUNDING AND BONDING																					
		TRADE STREET EAST BRIDGE FASCIA																					
<p>HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609</p>		<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>		NO.	BY	DATE	NO.	BY	DATE	1			3			2			4			<p>TOTAL SHEETS 9</p>	
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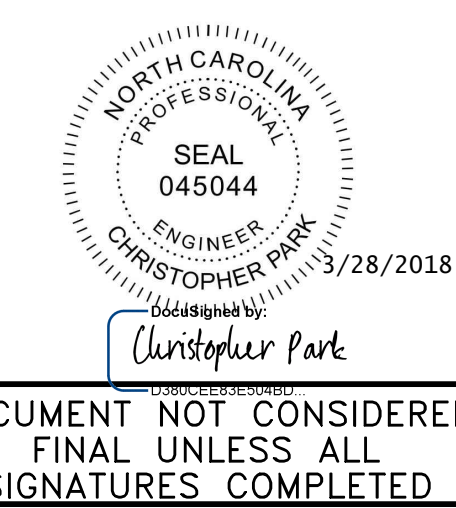


B VIEW
SCALE: 1" = 8'-0"



PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

- NOTES:**
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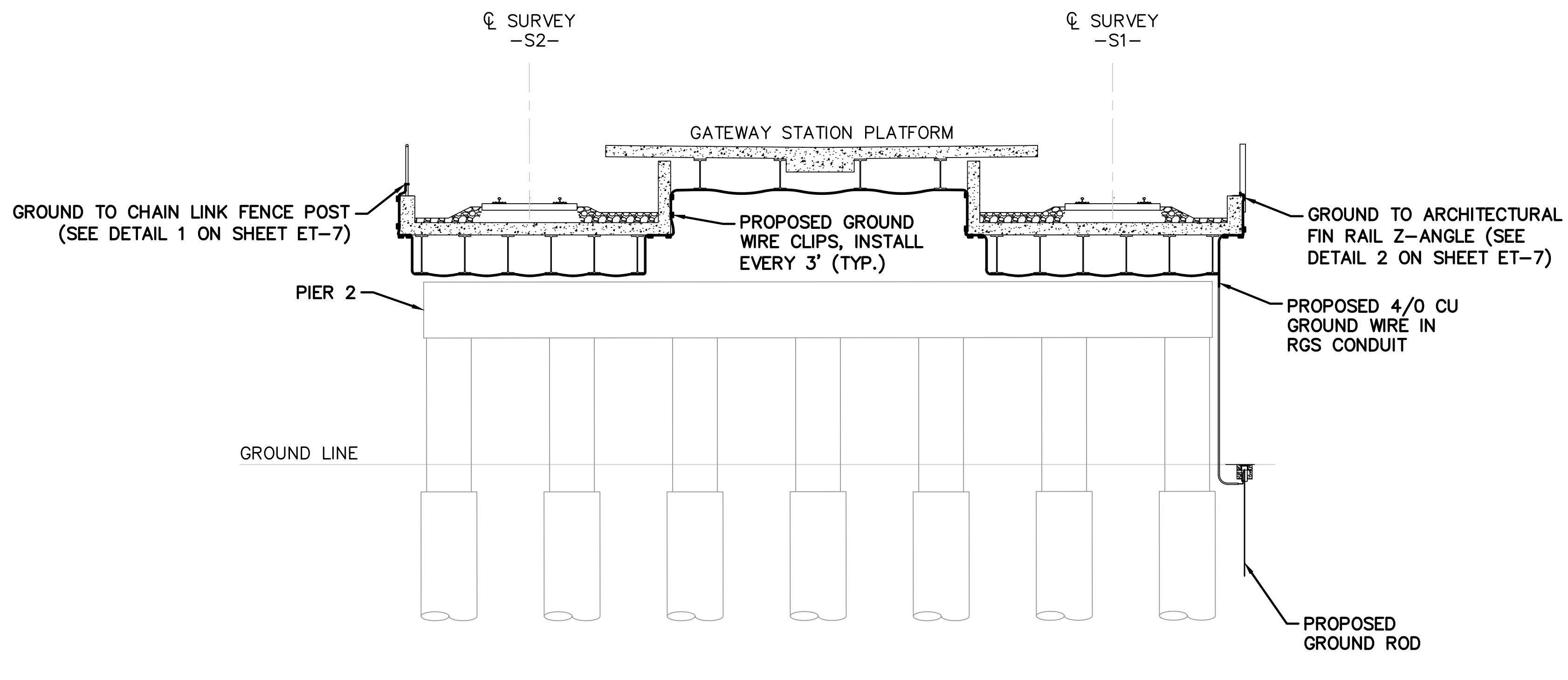


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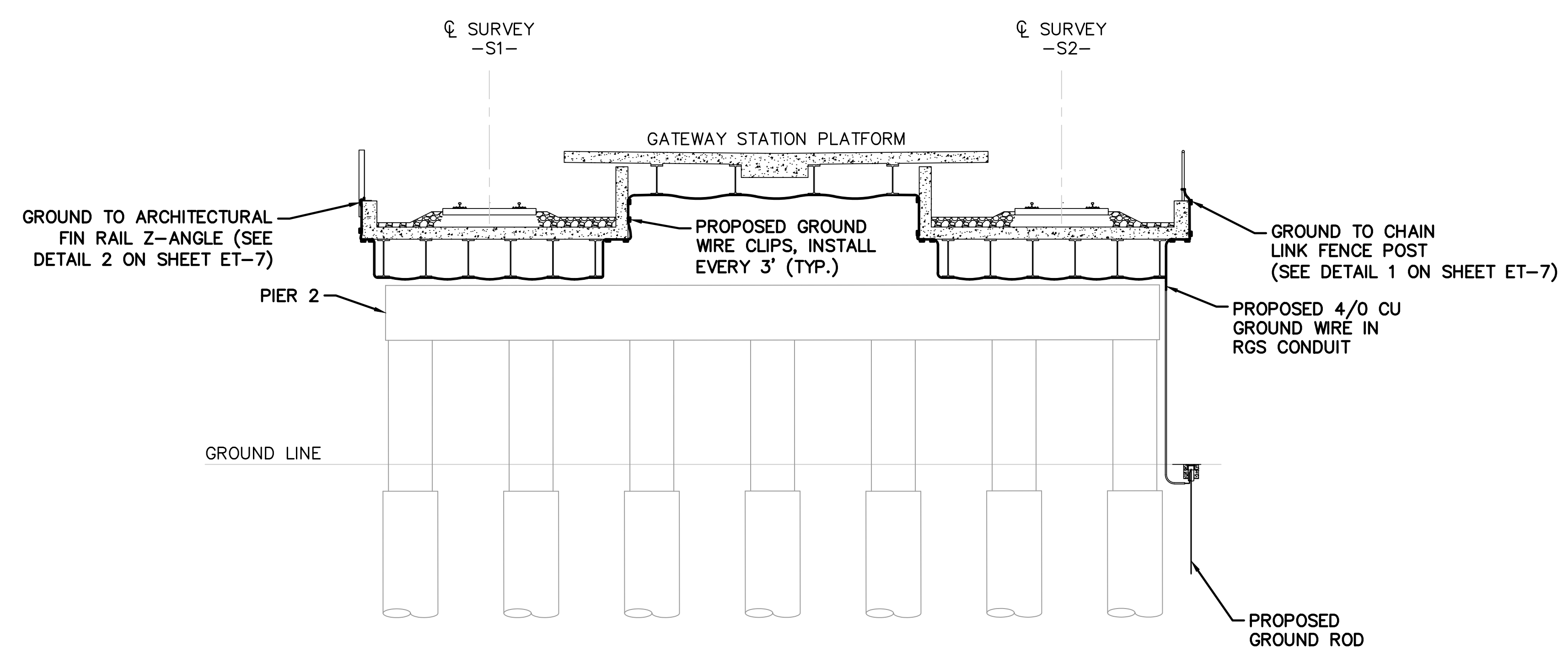
STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GROUNDING AND BONDING
 TRADE STREET WEST
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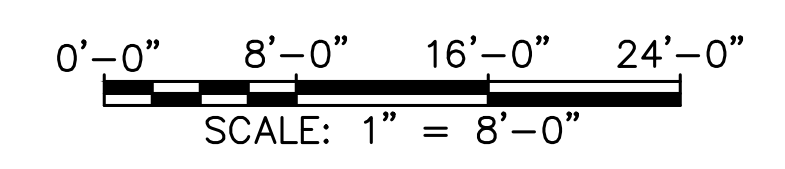
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C VIEW
SCALE: 1" = 8'-0"



D VIEW
SCALE: 1" = 8'-0"



PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

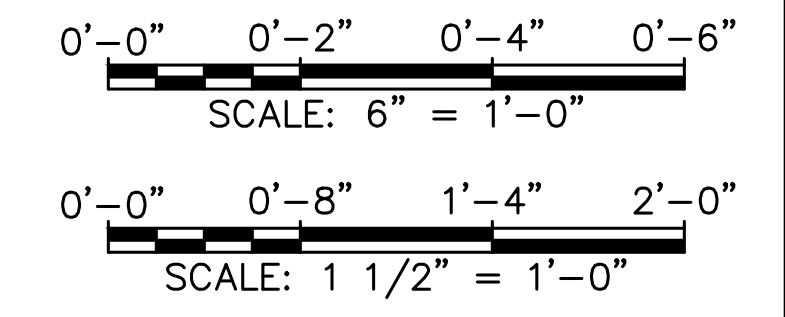
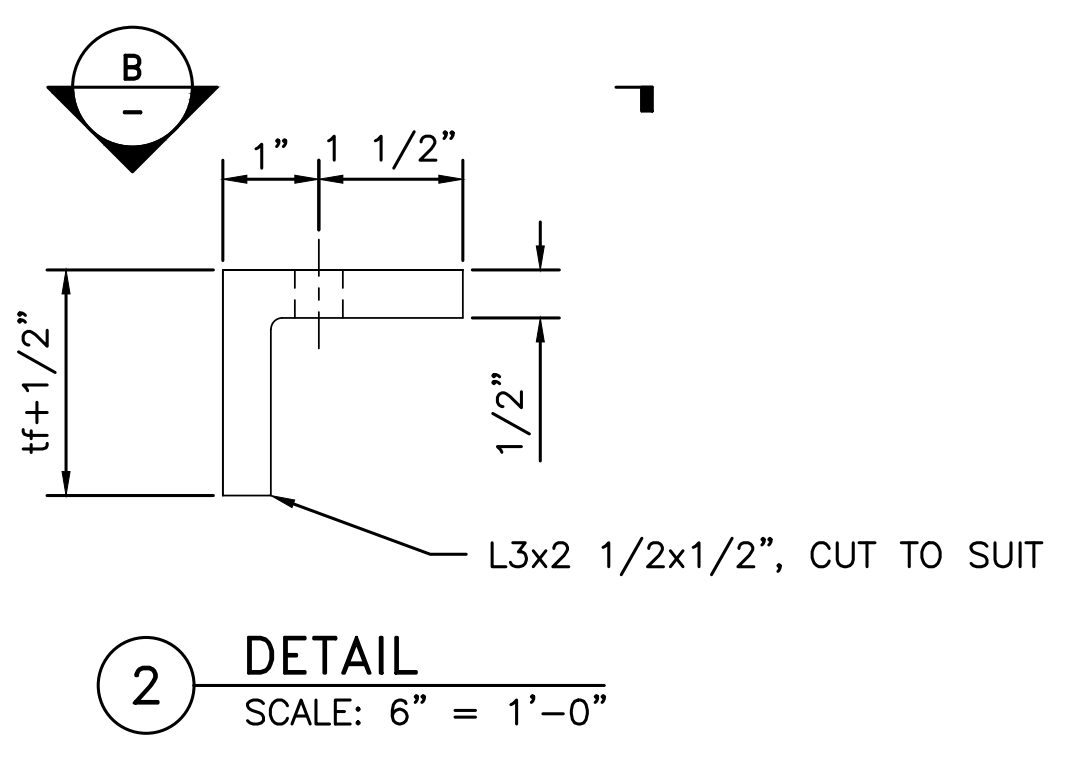
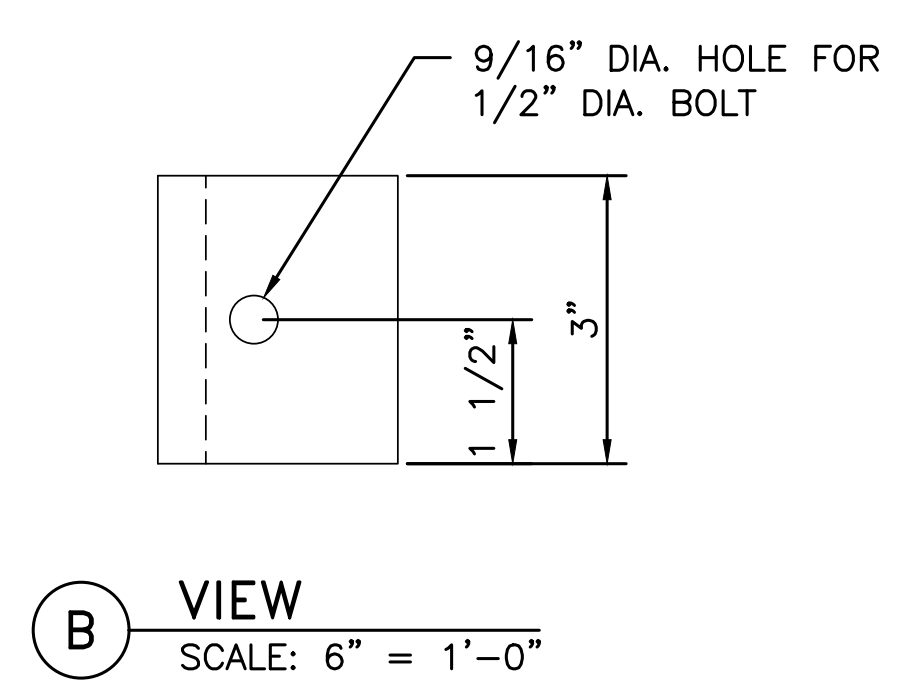
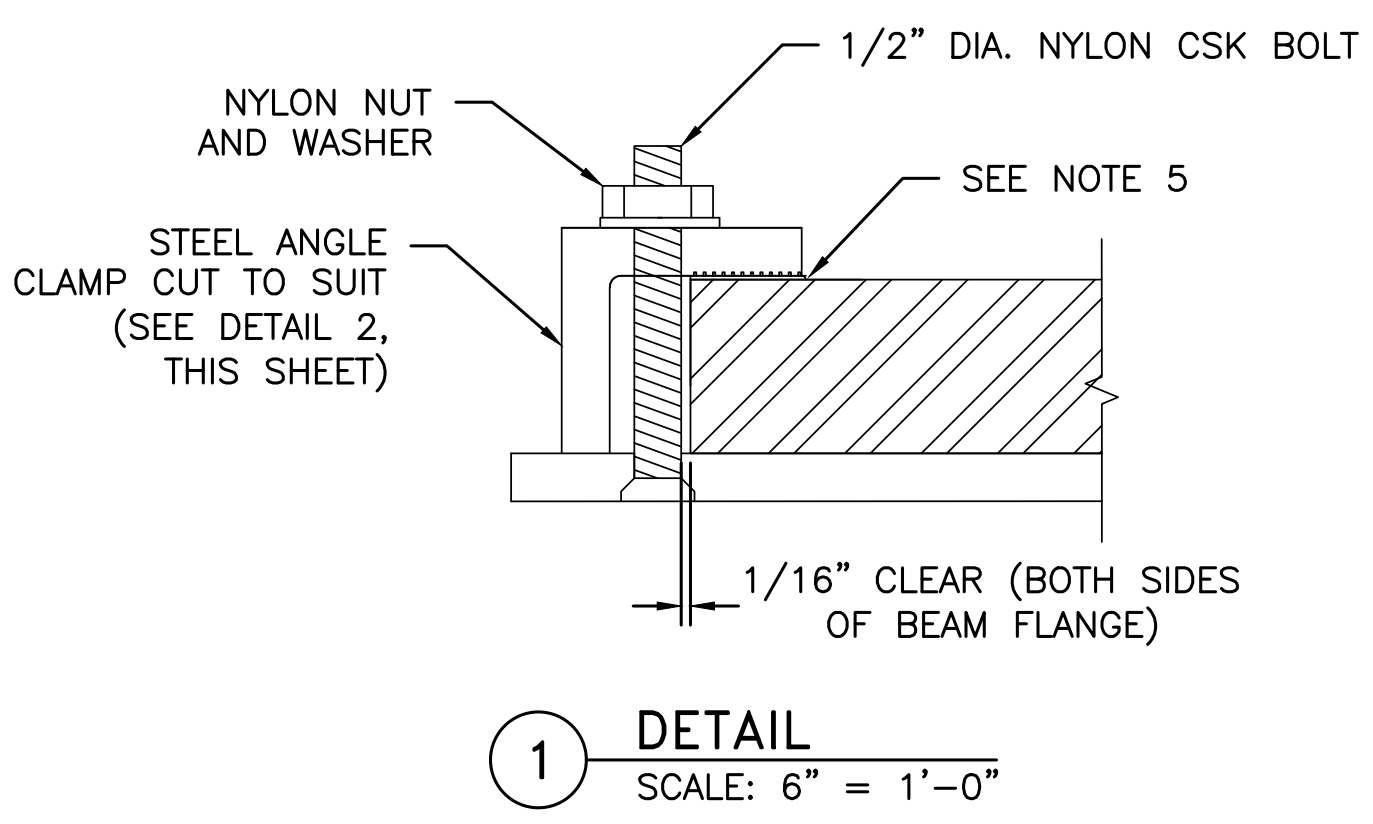
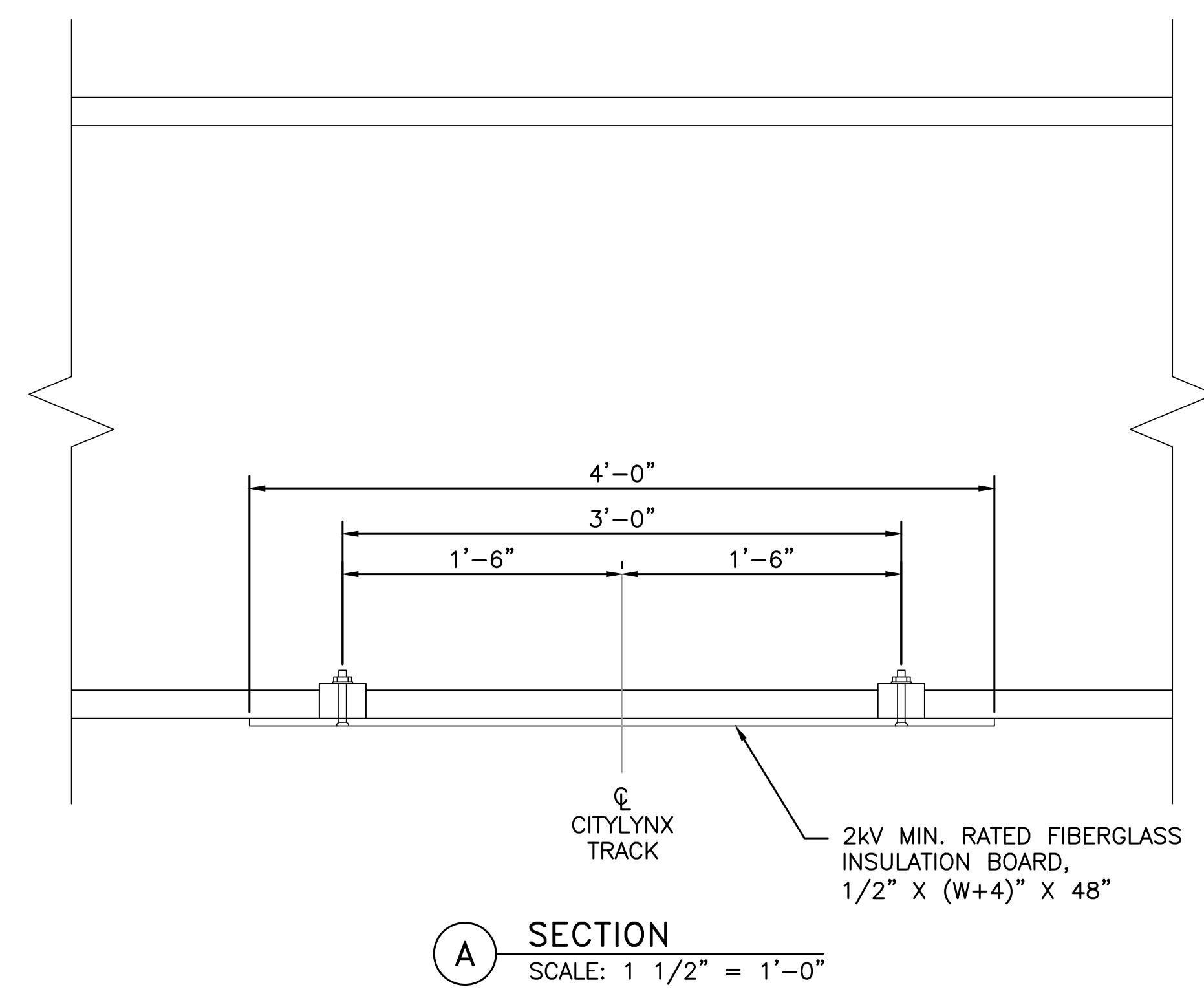
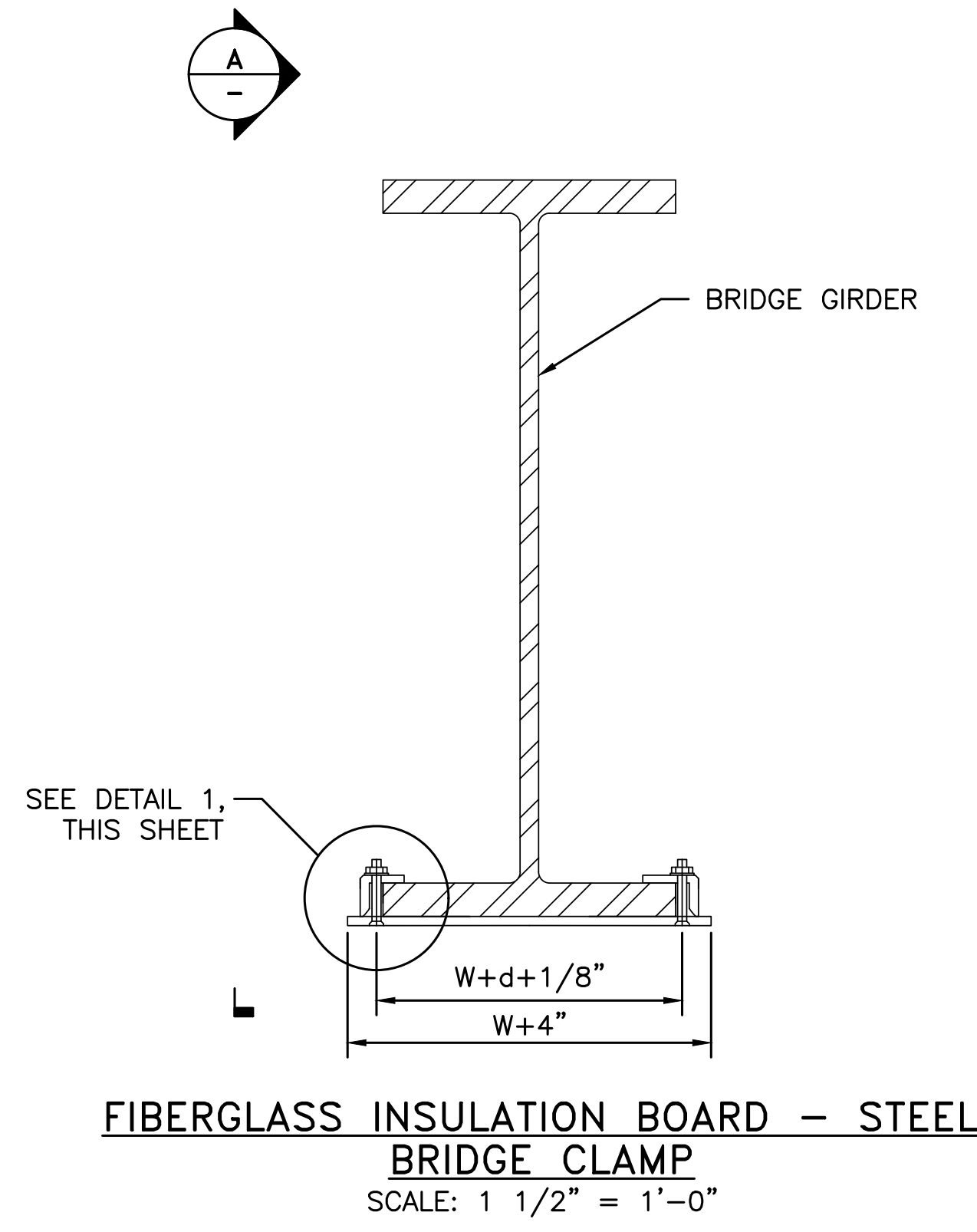
STATE OF NORTH CAROLINA
 PROFESSIONAL SEAL
 045044
 ENGINEER
 CHRISTOPHER PARK
 3/28/2018
 Christopher Park
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STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GROUNDING AND BONDING
 TRADE STREET BRIDGE
 CROSS SECTION

HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS						SHEET NO. ET-5 TOTAL SHEETS 9
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NOTES:

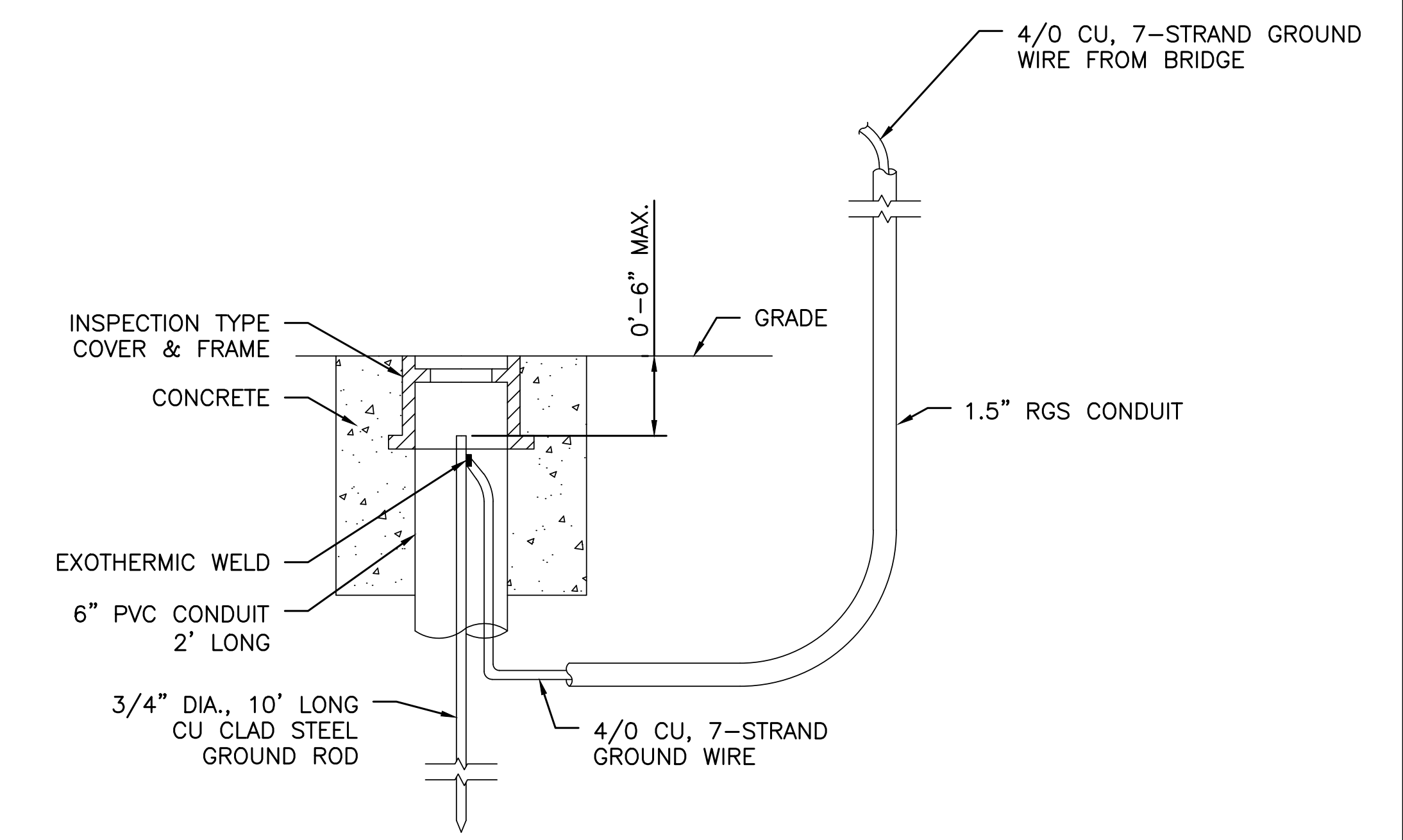
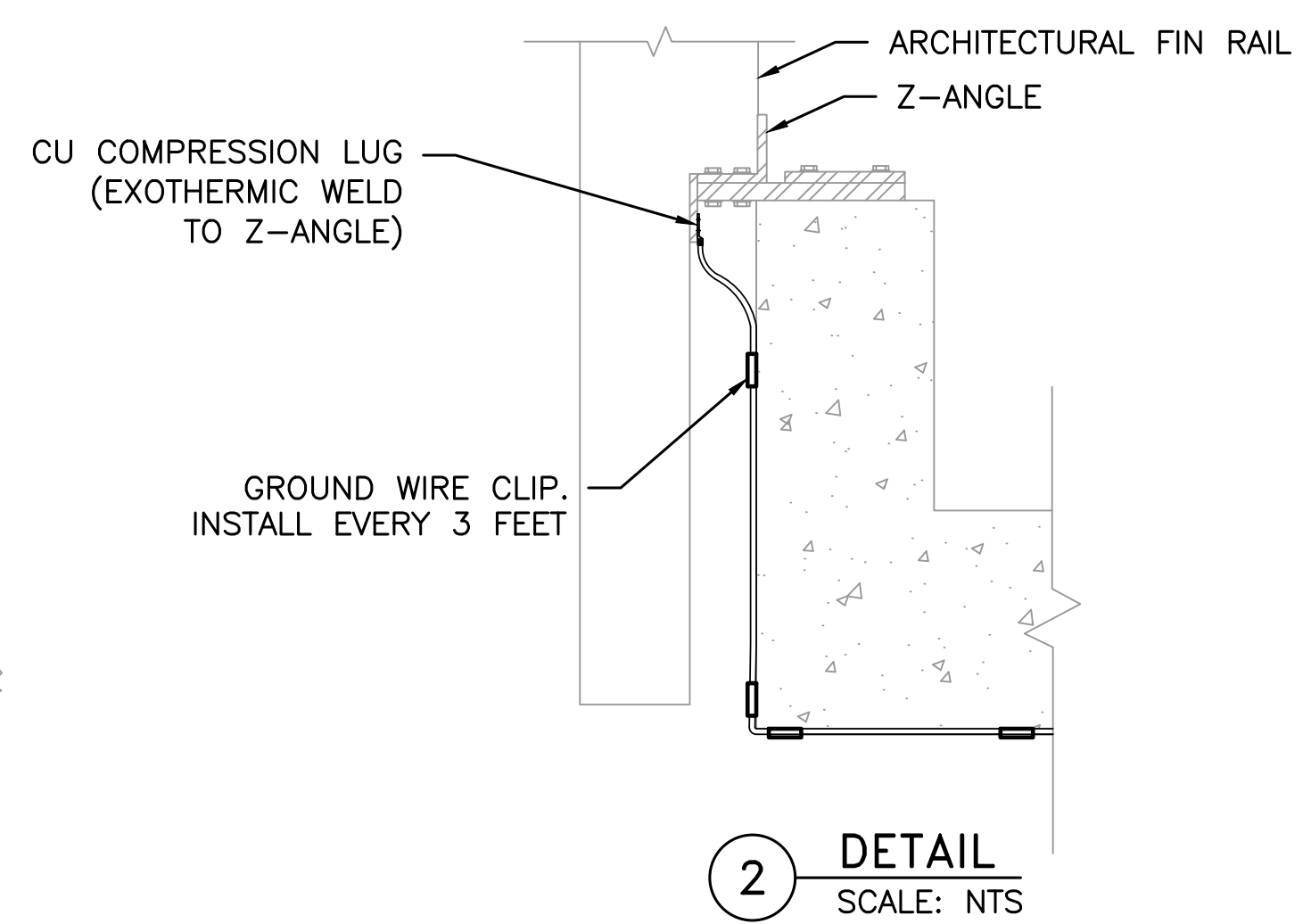
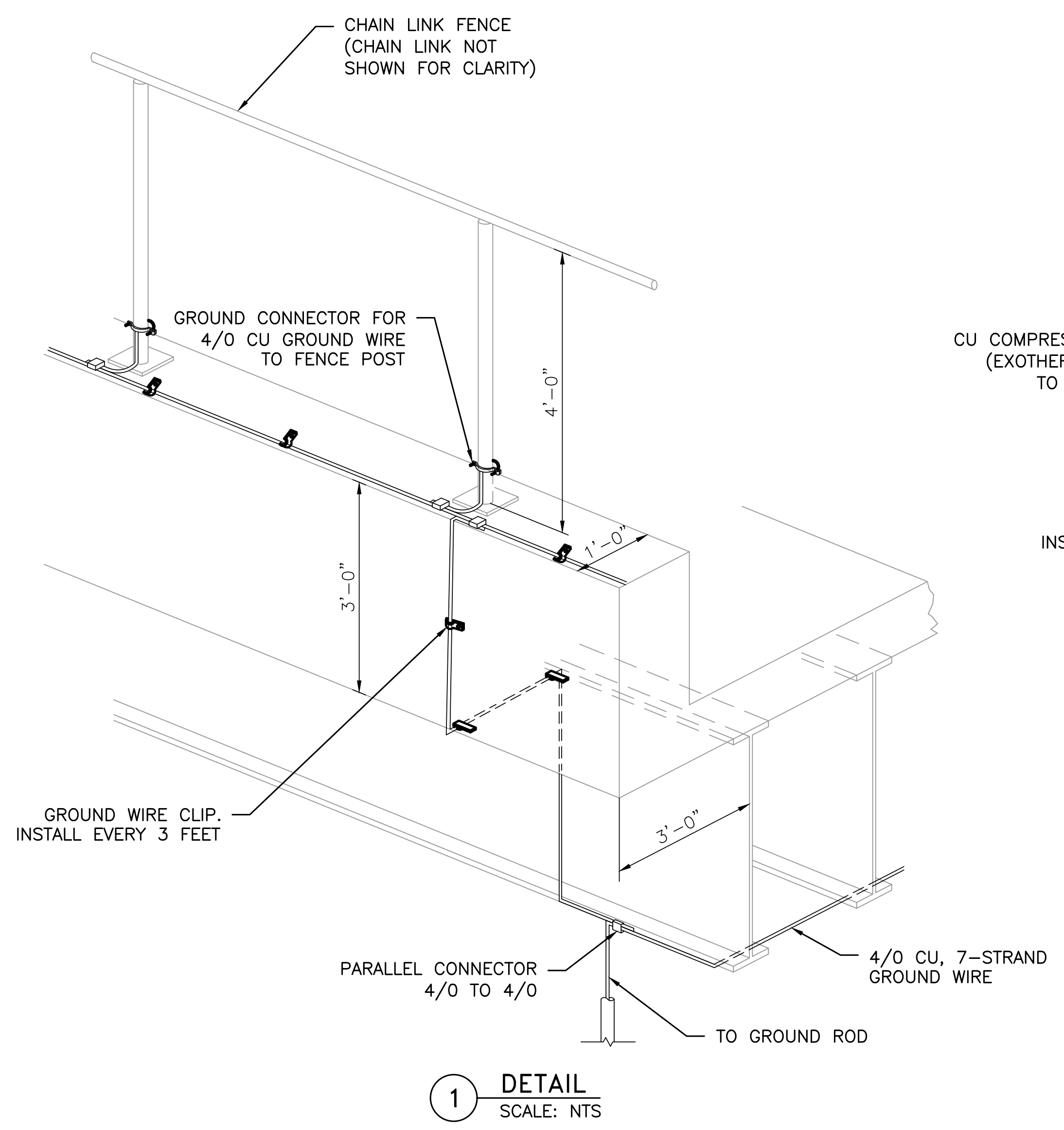
1. FOR GROUNDING AND BONDING NOTES, SEE SHEET ET-1.
2. CITYLYNX GOLD LINE CONTACT WIRE UPLIFT SHALL BE RESTRICTED TO 3" MAXIMUM.
3. ELECTRICAL AND MECHANICAL CLEARANCES FROM THE PANTOGRAPH DYNAMIC ENVELOPE SHALL BE MAINTAINED AT ALL TIMES.
4. ATTACH 2KV MIN. RATED FIBERGLASS INSULATION BOARDS TO ALL BRIDGE GIRDERS LOCATED ON THE CENTERLINE OF CITYLYNX GOLD LINE EB AND WB TRACKS.
5. TWO LAYERS OF PROTECTIVE TEFLON MEMBRANE TO BE PLACED BETWEEN FIBERGLASS INSULATION BOARD CLAMPS AND BRIDGE GIRDER FLANGES.



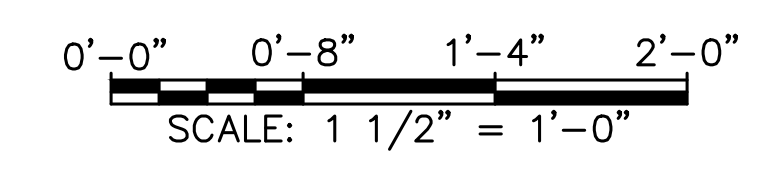
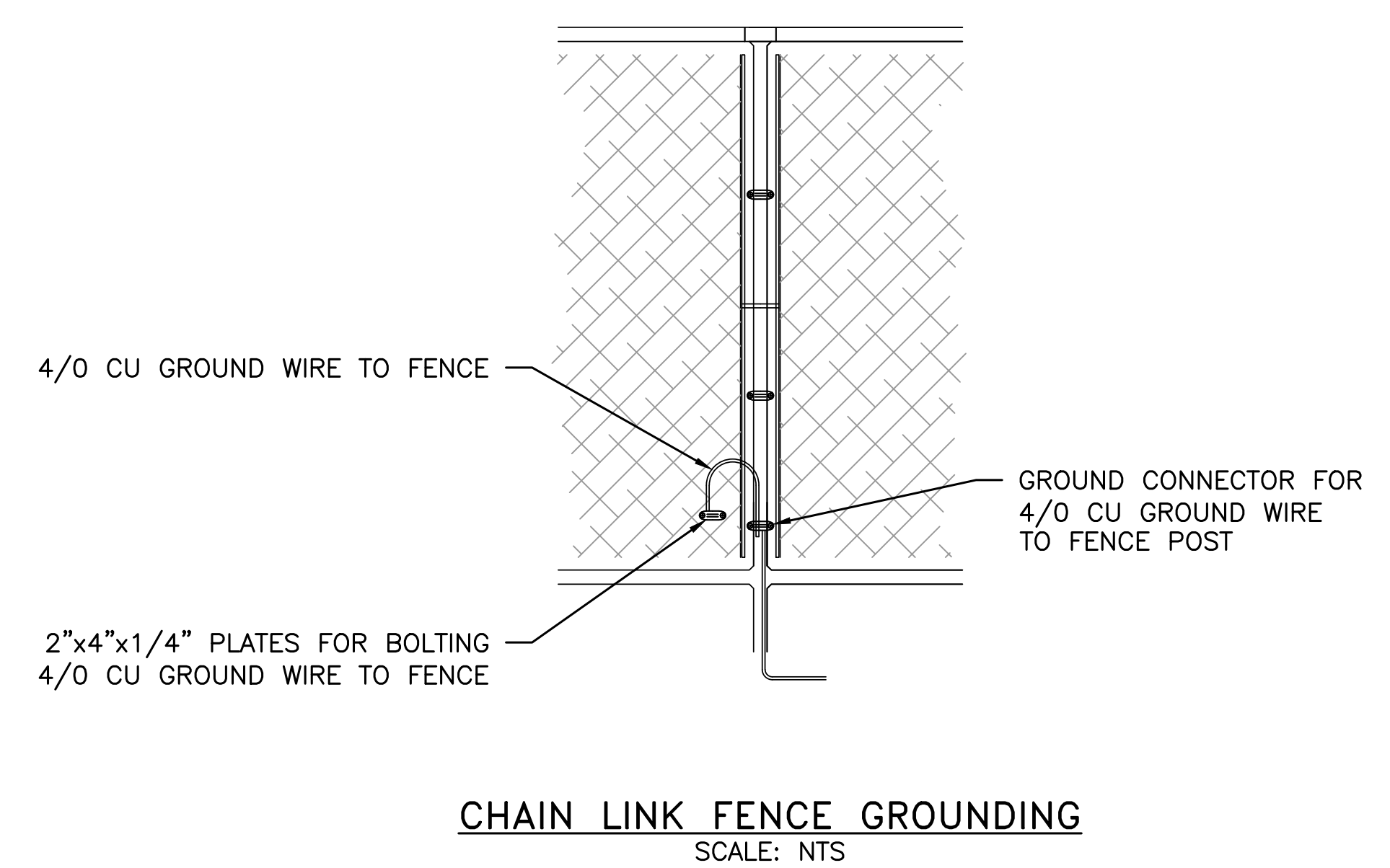
PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

SHEET 1 OF 4

<p>4/4/2018 NORTH CAROLINA PROFESSIONAL SEAL 045044 ENGINEER CHRISTOPHER PARK</p> <p>Document Not Considered Final Unless All Signatures Completed</p>		STATE OF NORTH CAROLINA DEPARTMENT OF TRANSPORTATION RALEIGH		SHEET NO.																		
		GROUNDING AND BONDING DETAILS		ET-6																		
<p>HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609</p>		<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>		NO.	BY	DATE	NO.	BY	DATE	1			3			2			4			TOTAL SHEETS
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DRAWN BY: P. FANZ CHECKED BY: M. RACHEVA		DATE: 03/27/2018 DATE: 03/27/2018		DWG. NO. 6																		



GROUND ROD BURIAL AND TEST STATION DETAILS
SCALE: 1 1/2" = 1'-0"

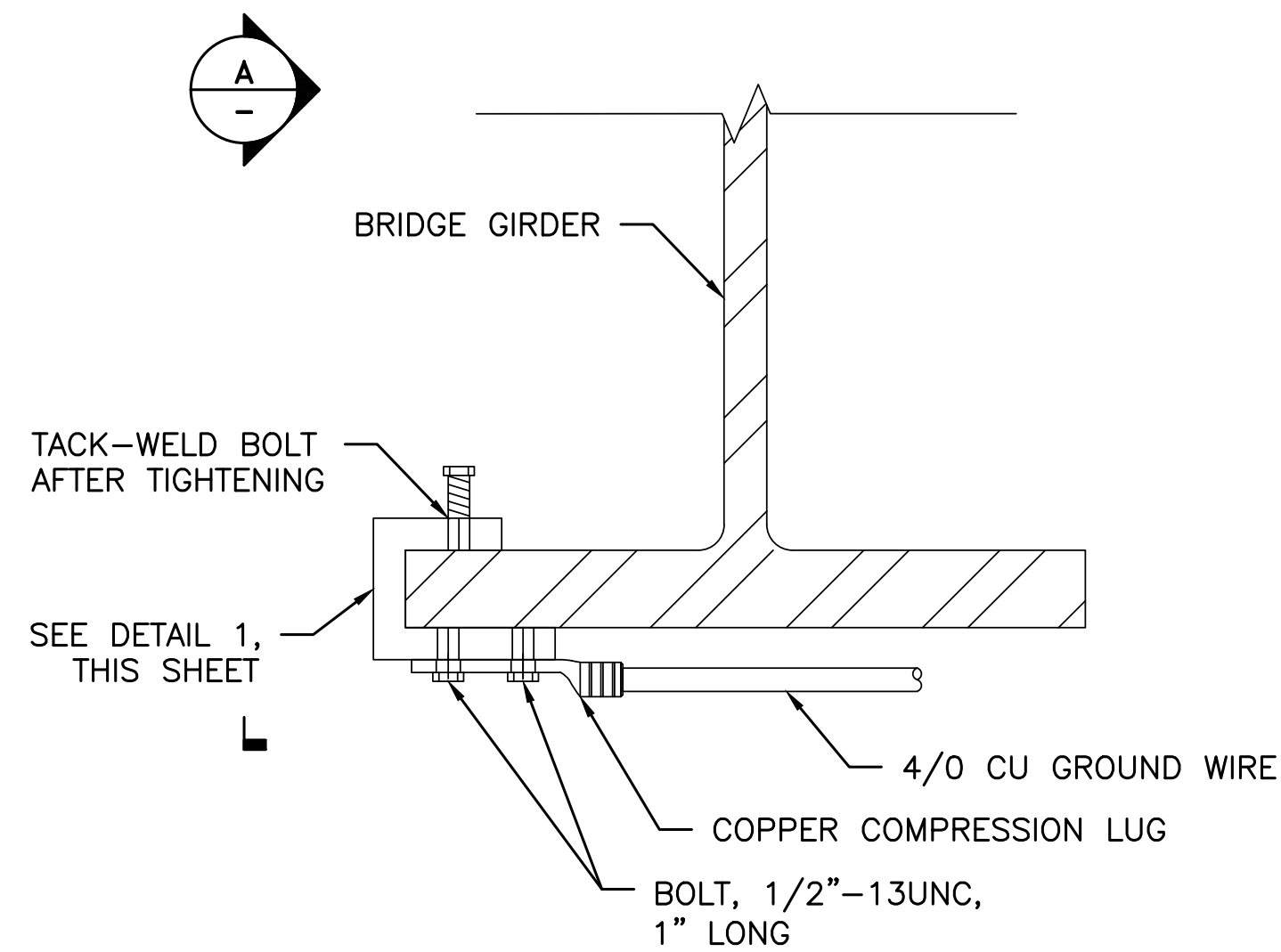


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MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

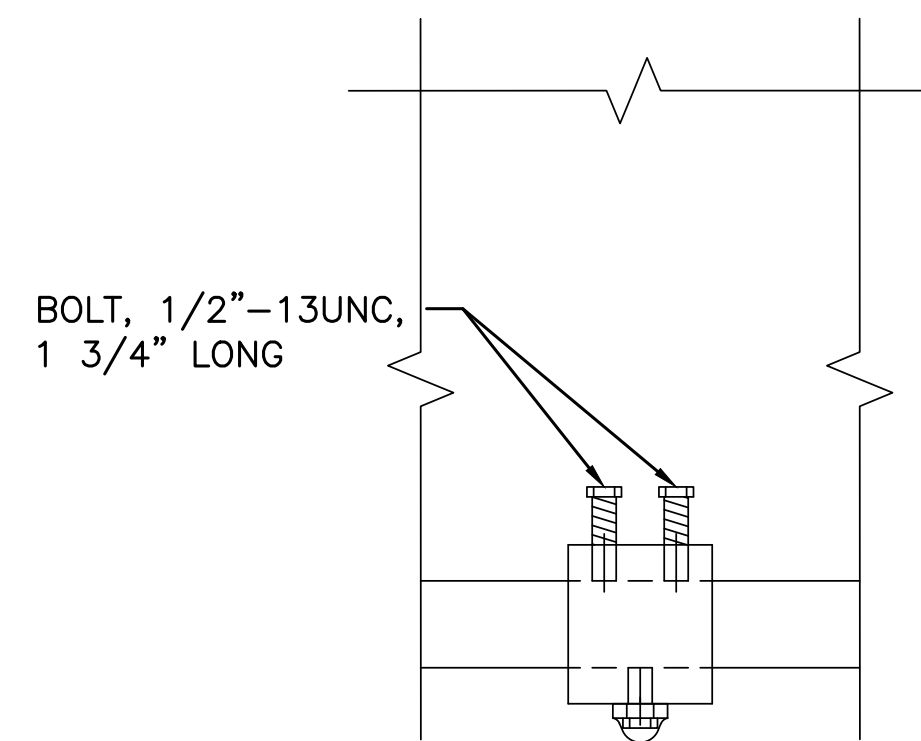
SHEET 2 OF 4

NOTES:
 1. SEE SHEET ET-1 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.

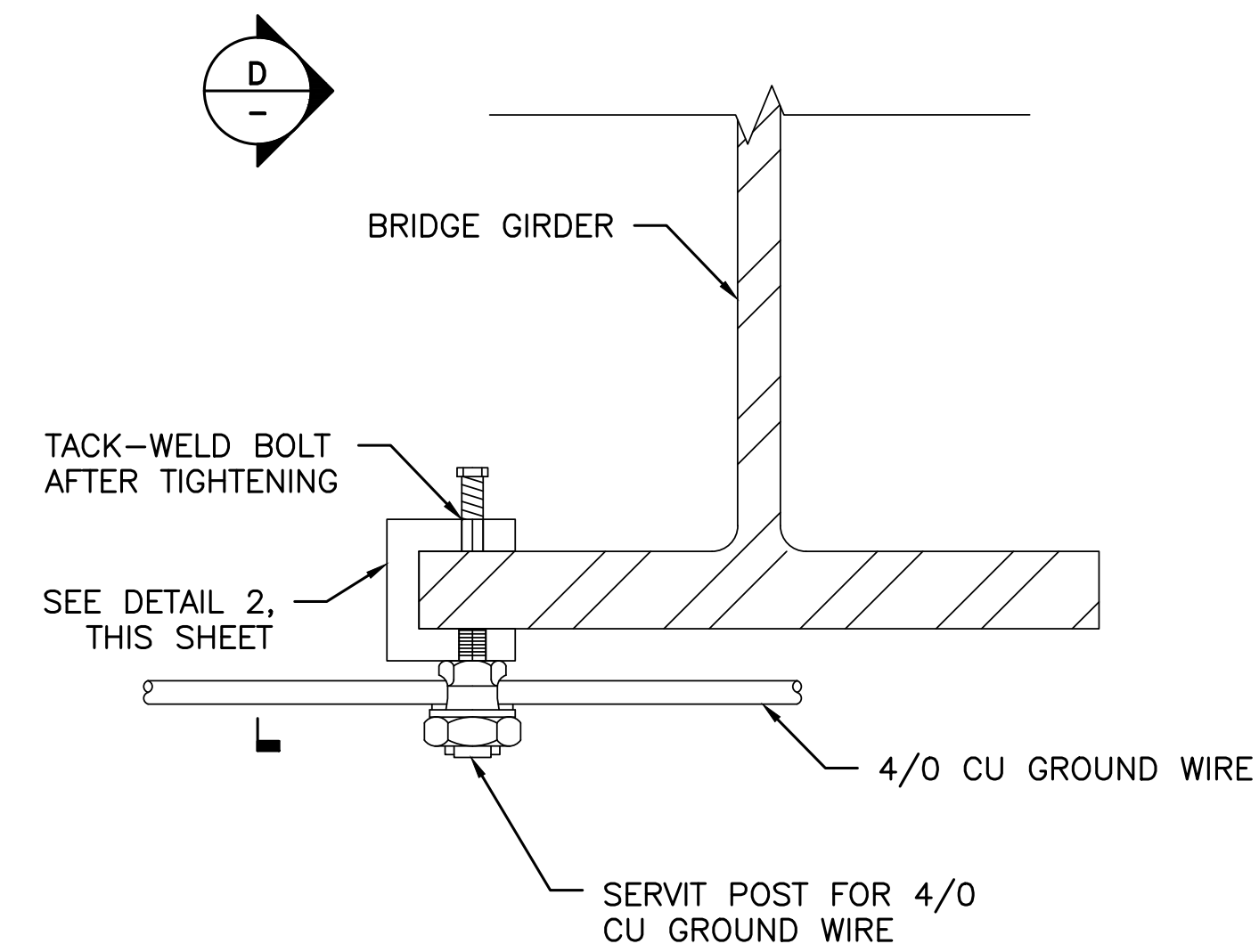
<p>DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED</p>		STATE OF NORTH CAROLINA		SHEET NO.																				
		DEPARTMENT OF TRANSPORTATION RALEIGH		ET-7																				
<p>HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609</p>		<p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>BY</th> <th>DATE</th> <th>NO.</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td></td> <td></td> <td>3</td> <td></td> <td></td> </tr> <tr> <td>2</td> <td></td> <td></td> <td>4</td> <td></td> <td></td> </tr> </tbody> </table>				NO.	BY	DATE	NO.	BY	DATE	1			3			2			4			TOTAL SHEETS
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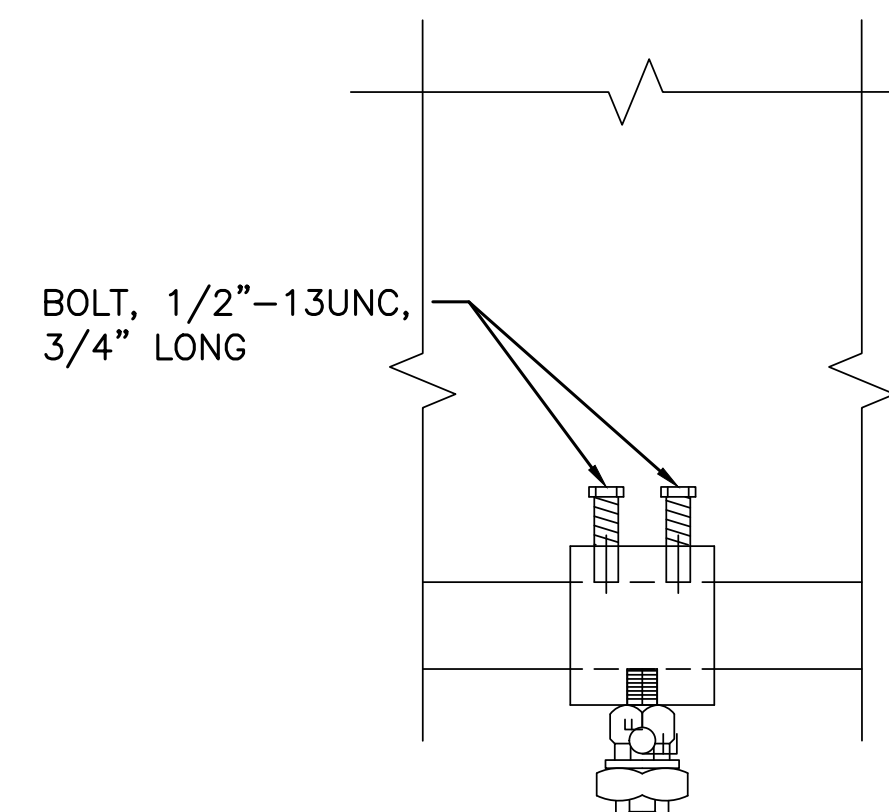
A GROUND WIRE TERMINATION
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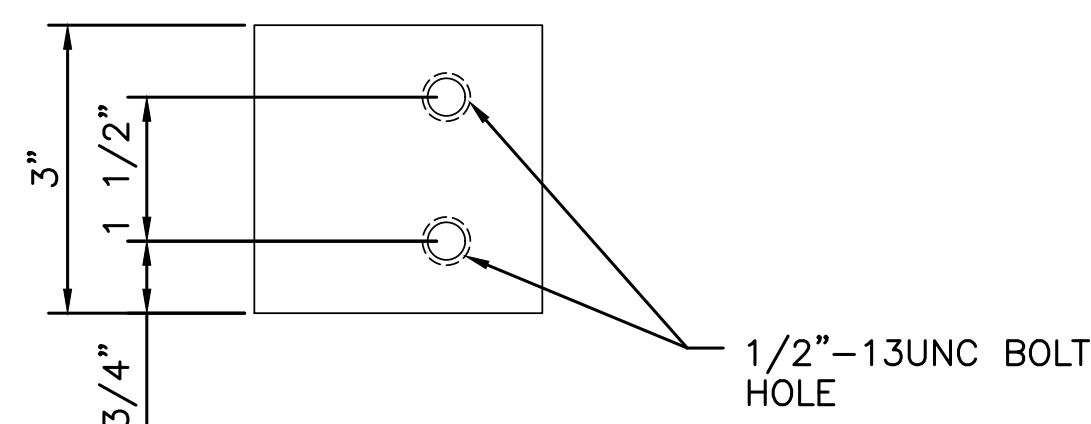
A VIEW
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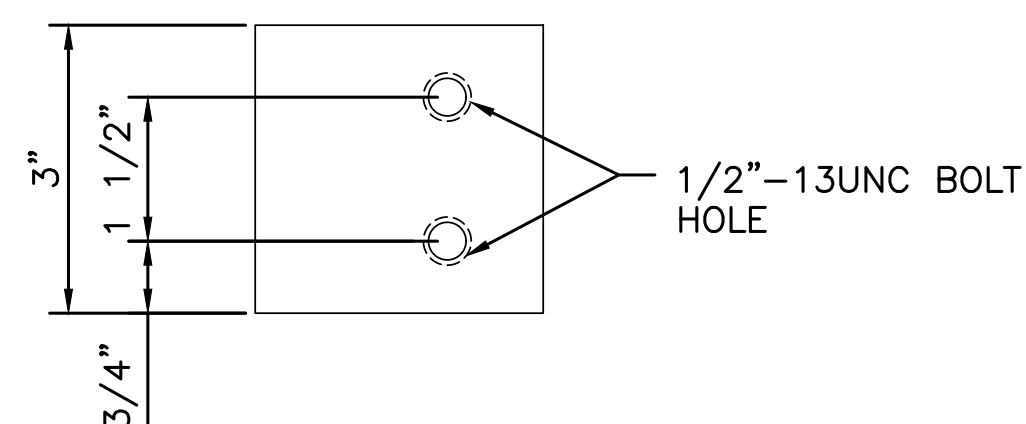
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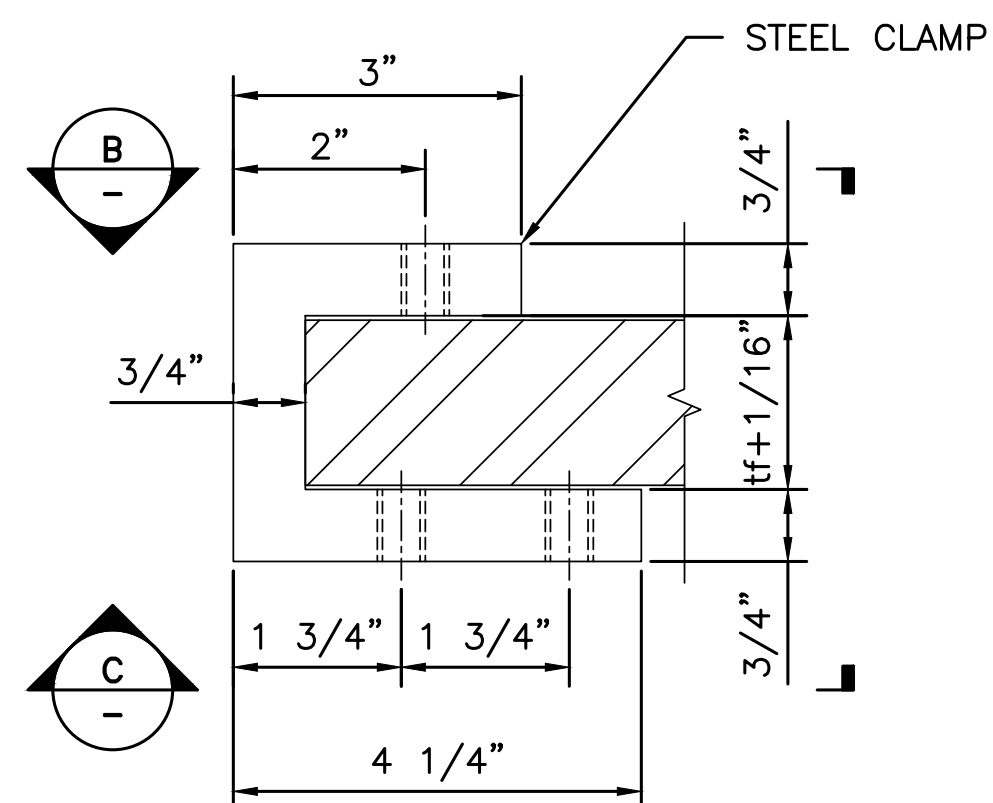
D VIEW
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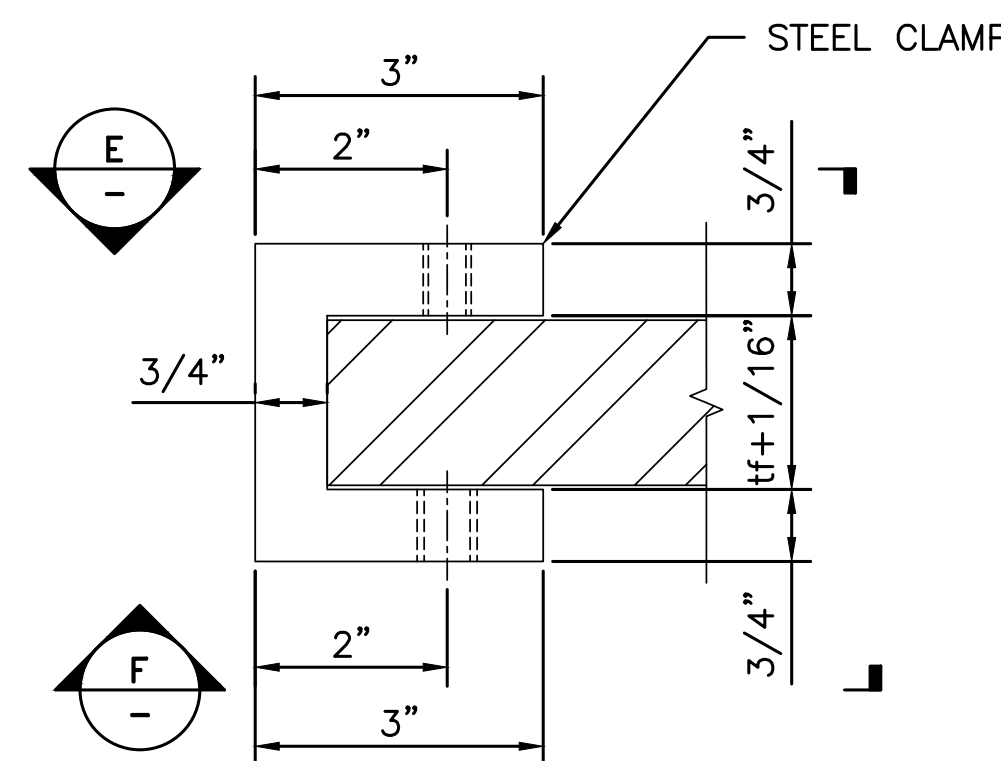
B VIEW
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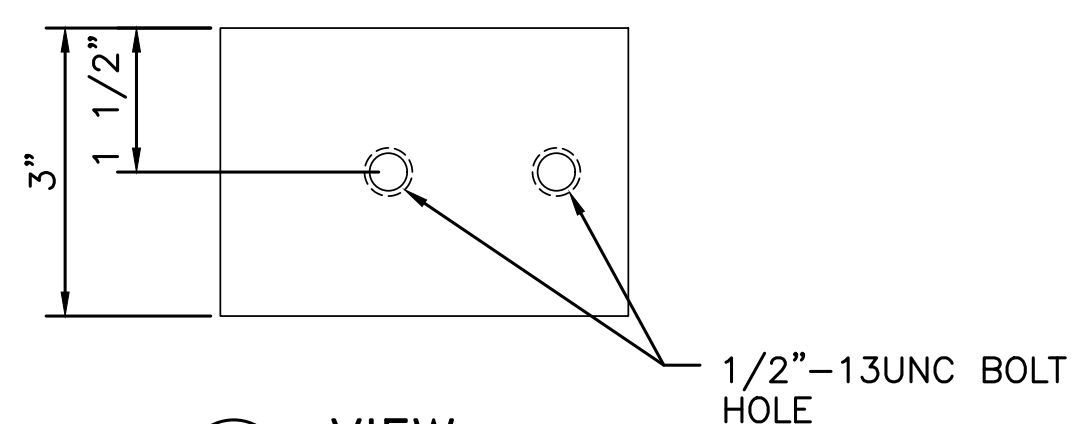
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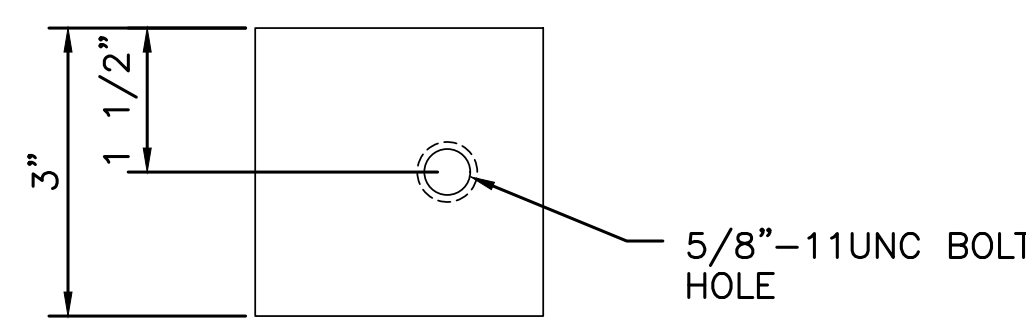
1 DETAIL
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2 DETAIL
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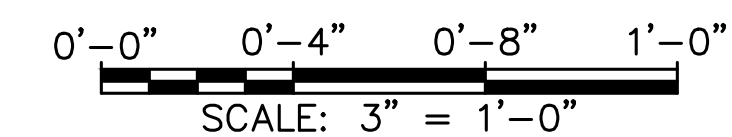
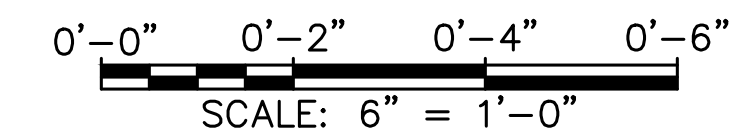
C VIEW
SCALE: 6" = 1'-0"



F VIEW
SCALE: 6" = 1'-0"

NOTES:

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MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

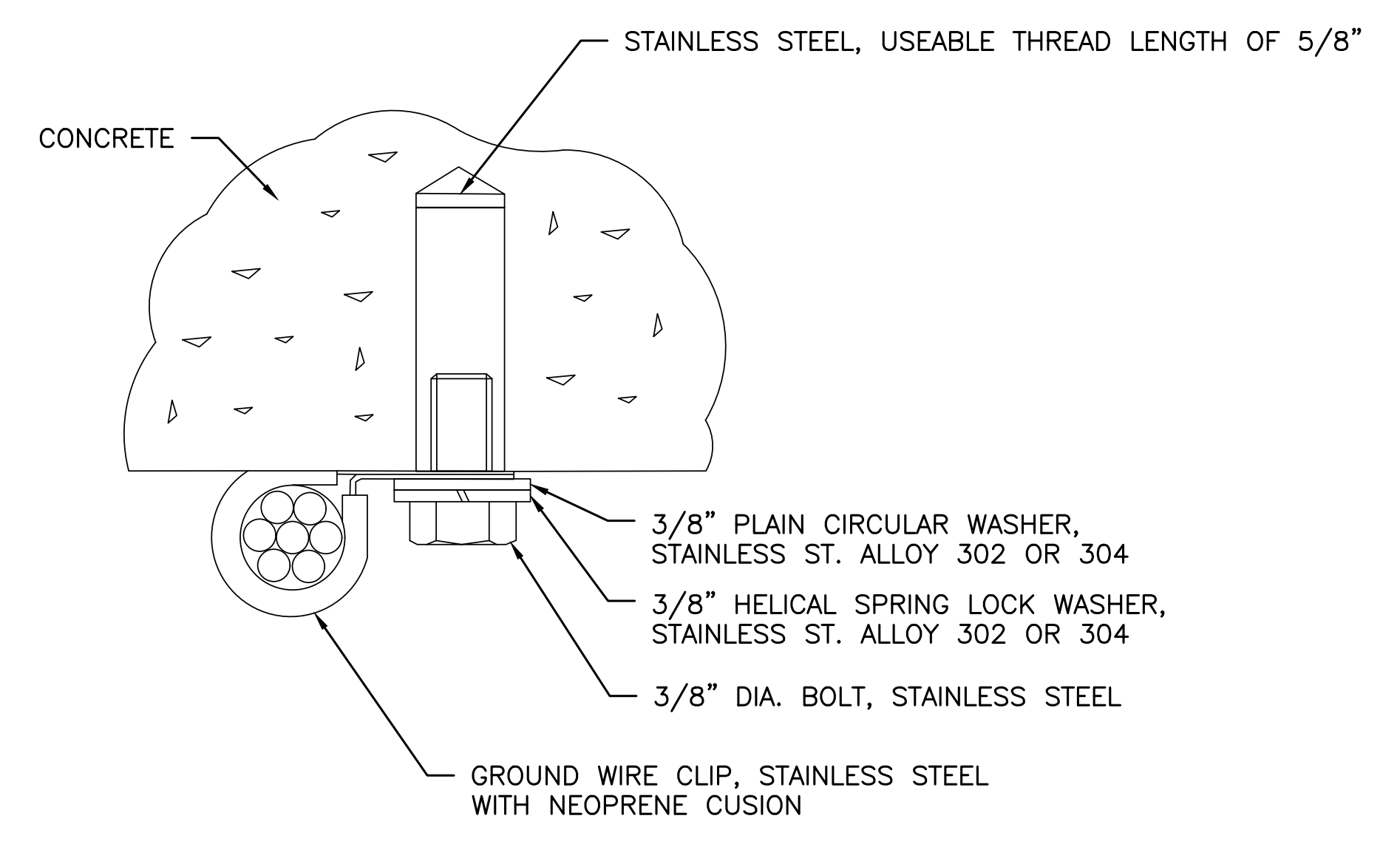
SHEET 3 OF 4



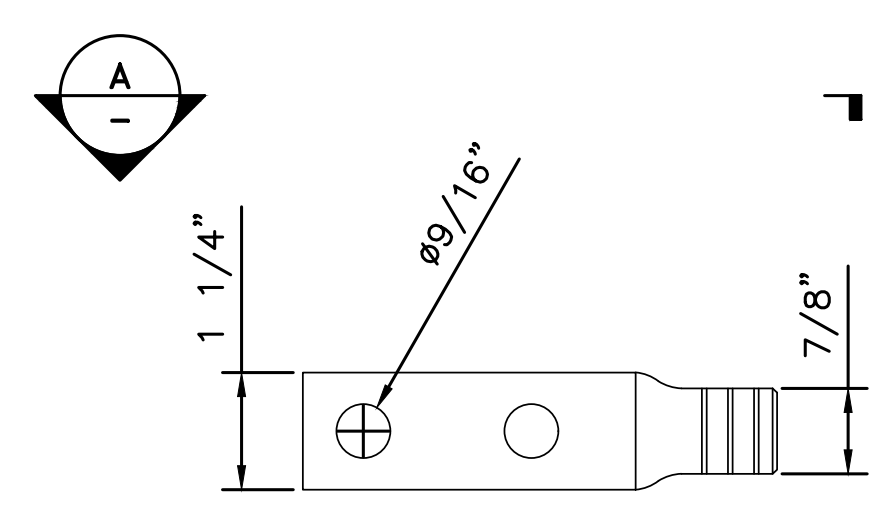
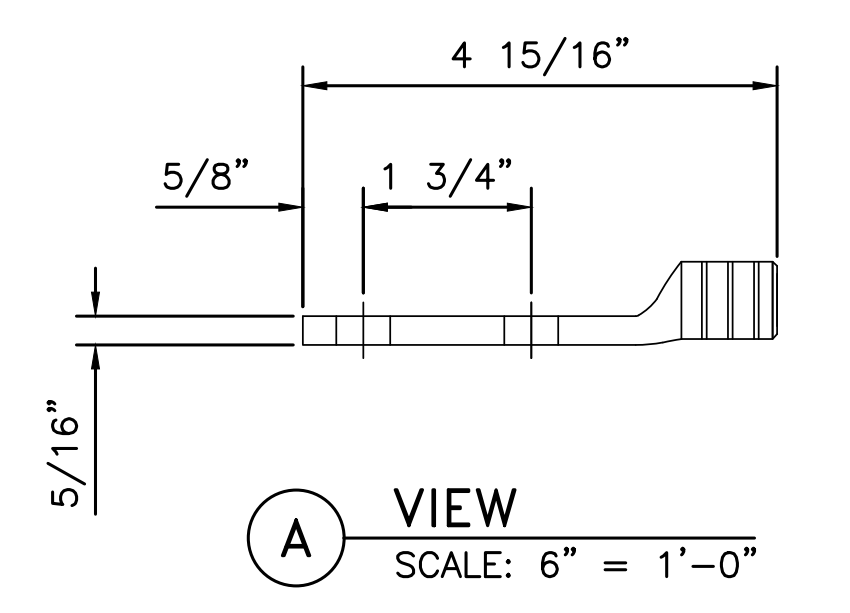
DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GROUNDING AND BONDING
 DETAILS

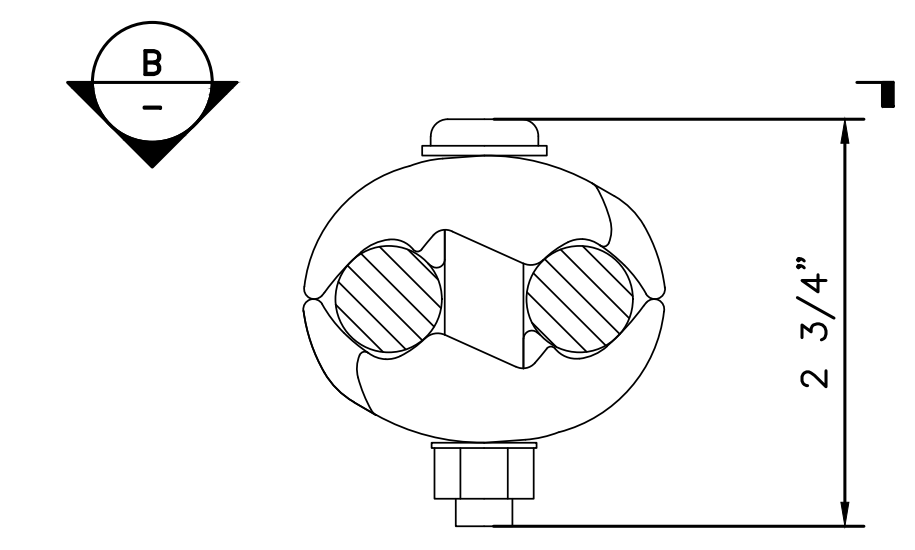
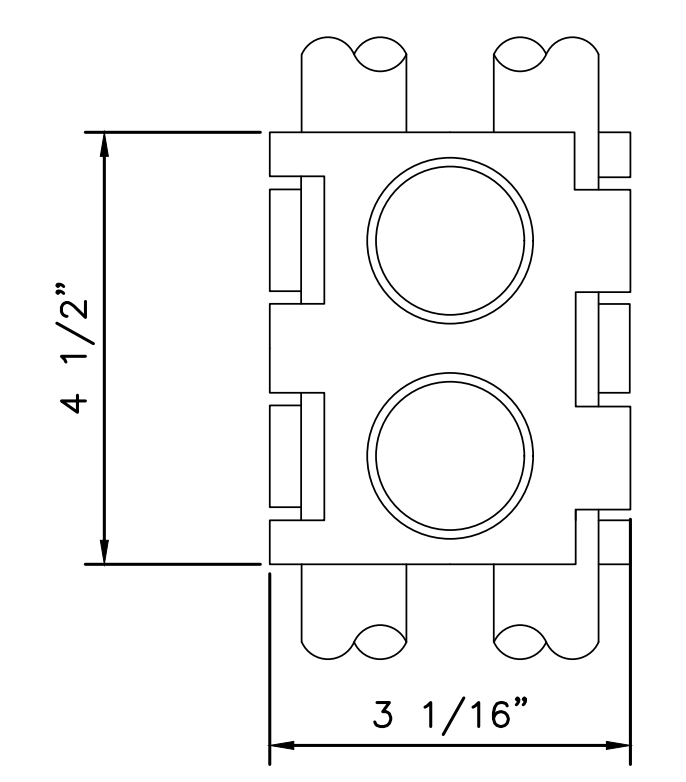
HNTB HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS						SHEET NO. ET-8 TOTAL SHEETS 9
	NO.	BY	DATE	NO.	BY	DATE	
	1			3			
DRAWN BY: P. FANZ CHECKED BY: M. RACHEVA	DATE: 03/27/2018 DATE: 03/27/2018	DWG. NO. 8	2	4	4	9	



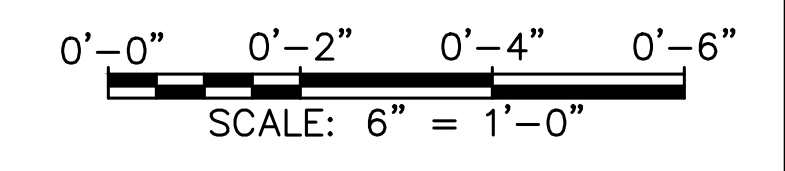
GROUND WIRE CLIP FOR ATTACHMENT TO CONCRETE
SCALE: NTS



COPPER COMPRESSION LUG
SCALE: 6" = 1'-0"



PARALLEL CONNECTOR 4/0 TO 4/0
SCALE: 6" = 1'-0"



PROJECT NO. P-5705BA
MECKLENBURG COUNTY
 STATION: 23+65.83 -S1-

SHEET 4 OF 4

NOTES:
 1. SEE SHEET ET-1 FOR GENERAL NOTES, LEGEND AND ABBREVIATIONS.



DOCUMENT NOT CONSIDERED FINAL UNLESS ALL SIGNATURES COMPLETED

STATE OF NORTH CAROLINA
 DEPARTMENT OF TRANSPORTATION
 RALEIGH
 GROUNDING AND BONDING
 DETAILS

HNTB NORTH CAROLINA, P.C. NC License No. C-1554 343 E. Six Forks Rd., Suite 200, Raleigh, N.C. 27609	REVISIONS						SHEET NO. ET-9 TOTAL SHEETS 9
	NO.	BY	DATE	NO.	BY	DATE	
	1			3			
DRAWN BY: P. FANZ CHECKED BY: M. RACHEVA	DATE: 03/27/2018 DATE: 03/27/2018	DWG. NO. 9	2	4			