



STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: siting.council@ct.gov

www.ct.gov/csc

VIA ELECTRONIC MAIL

October 10, 2018

Jeffrey Barbadora
Real Estate Specialist
Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

RE: **EM-SPRINT-166-180924** – Sprint notice of intent to modify an existing telecommunications facility located at 347 East Street, Wolcott, Connecticut.

Dear Mr. Barbadora:

The Connecticut Siting Council (Council) is in receipt of your correspondence of October 5, 2018 submitted in response to the Council's September 25, 2018 notification of an incomplete request for exempt modification with regard to the above-referenced matter.

The submission renders the request for exempt modification complete and the Council will process the request in accordance with the Federal Communications Commission 60-day timeframe.

Thank you for your attention and cooperation.

Sincerely,

Melanie A. Bachman
Executive Director

MAB/FOC/IN

Robidoux, Evan

From: Barbadora, Jeff <Jeff.Barbadora@crowncastle.com>
Sent: Friday, October 05, 2018 2:32 PM
To: Robidoux, Evan
Cc: CSC-DL Siting Council
Subject: RE: Council Incomplete Letter for EM-SPRINT-166-180924-EastSt-Wolcott
Attachments: CT52XC079_BU806362moddrawings.pdf

Good afternoon,

Per the incomplete letter, I will FedEx three (3) sets of 11x17 of the attached modification drawings to your office. The WO#1575608 references a failed structural analysis. Does the Council need a copy of the failed SA or will the modification drawings suffice as part of Appendix D?

Thanks,

Jeffrey Barbadora
781-970-0053
12 Gill Street, Suite 5800, Woburn, MA 01801
CrownCastle.com

From: Robidoux, Evan
Sent: Friday, September 28, 2018 1:50 PM
To: Barbadora, Jeff
Cc: CSC-DL Siting Council
Subject: Council Incomplete Letter for EM-SPRINT-166-180924-EastSt-Wolcott

Please see the attached correspondence.

Evan Robidoux
Clerk Typist
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

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TOWER REINFORCEMENT DRAWINGS PREPARED FOR CROWN CASTLE

SITE NAME: NHV 108 943133
BU NUMBER: 806362

SITE ADDRESS:
INTERSECTION OF RTE 322/ MERIDIAN RD
WOLCOTT, CT 06716
NEW HAVEN COUNTY, USA



PROJECT CONTACTS:

1. CROWN PROJECT MANAGER
ARDALAN ARABI
201-316-9156
Ardalan.Arabi@crowncastle.com
2. CROWN CONSTRUCTION MANAGER
JASON D'AMICO
860-209-0104
Jason.DAmico@crowncastle.com
3. DESIGN ENGINEER - MAIN RFI CONTACT
PHILIP LIN
919-859-5758
Philip.Lin@jacobs.com
4. ENGINEER OF RECORD
PAUL L. MUCCI, PE
120 ST JAMES AVENUE,
5TH FLOOR
BOSTON, MA 02116
Paul.Mucci@jacobs.com
5. FOR FABRICATION AND CONSTRUCTION
RELATED INQUIRIES: CONTACT
MOD_NTP@JACOBS.COM, DESIGN
ENGINEER, AND ENGINEER OF RECORD.

TOWER INFORMATION

TOWER MANUFACTURER / DWG #: ROHN / DWG #: A861188
TOWER HEIGHT / TYPE: 180 FT SELF SUPPORT TOWER
TOWER LOCATION: LAT: 41° 33' 34.41"
DATUM: (NAD 1983) LONG: -72° 56' 49.10"
STRUCTURAL DESIGN DRAWING: JACOBS / WO # 1590001
STRUCTURAL ANALYSIS REPORT: JACOBS / WO # 1564660
STRUCTURAL ANALYSIS DATE: 05/11/18
ORDER NUMBER: 436908 REV. 1
CCSITES DOCUMENT ID: 7542977

CODE COMPLIANCE

ANSI/TIA-222-G-2005 WITH ADDENDA 1 THROUGH 4
2016 CONNECTICUT STATE BUILDING CODE

ATTENTION ALL CONTRACTORS, ANYTIME YOU ACCESS A
CROWN SITE FOR ANY REASON YOU ARE TO CALL THE CROWN
NOC UPON ARRIVAL AND DEPARTURE, DAILY AT 800-788-7011.

DRAWINGS INCLUDED			
SHEET NO.	DESCRIPTION	SHEET NO.	DESCRIPTION
T-1	TITLE SHEET	S-7	HALF-PIPE END CONNECTION WELD PROCEDURE DETAILS
N-1	MODIFICATION INSPECTION CHECKLIST	S-8	DIAGONAL REINFORCEMENT DETAILS
N-2	NOTES		
N-2A	NOTES (CONTINUED)		
S-1	TOWER MODIFICATION SCHEDULE		
S-2	ANCHOR ROD DETAILS I		
S-3	ANCHOR ROD DETAILS II		
S-4	HALF PIPE LEG REINFORCEMENT		
S-5	U-BOLT BRACKET ASSEMBLY		
S-6	HALF-PIPE END CONNECTION DETAILS		

LOOK UP!
SAFETY CLIMB: 'LOOK UP'
THE INTEGRITY OF THE WIRE ROPE SAFETY CLIMB SYSTEM SHALL BE CONSIDERED DURING ALL STAGES OF DESIGN, INSTALLATION, AND INSPECTION. TOWER REINFORCEMENTS AND EQUIPMENT INSTALLATIONS SHALL NOT COMPROMISE THE INTEGRITY OR FUNCTIONAL USE OF ANY WIRE ROPE SAFETY CLIMB ON THE STRUCTURE. THIS SHALL INCLUDE, BUT NOT BE LIMITED TO: PINCHING OF THE WIRE ROPE, BENDING OF THE WIRE ROPE FROM ITS SUPPORTS, DIRECT CONTACT OR CLOSE PROXIMITY TO THE WIRE ROPE WHICH MAY CAUSE FRICTIONAL WEAR, OR IMPACT TO THE ANCHORAGE POINTS IN ANY WAY. ANY COMPROMISED SAFETY CLIMB MUST BE REPORTED TO YOUR CROWN POC FOR RESOLUTION, INCLUDING EXISTING CONDITIONS.

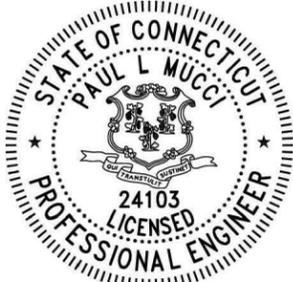
				JACOBS Jacobs Engineering Group, Inc.	
				THIS DOCUMENT IS PROPRIETARY TO JACOBS ENGINEERING AND MAY NOT BE REPRODUCED OR REDISTRIBUTED WITHOUT THE EXPRESS WRITTEN CONSENT FROM JACOBS ENGINEERING.	
0	07/10/18	FIRST ISSUE		JMB	
NO.	DATE	DESCRIPTION		BY	
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				BU NUMBER: 806362	
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				SITE ADDRESS: INTERSECTION OF RTE 322/MERIDIAN RD WOLCOTT, CT 06716 NEW HAVEN COUNTY, USA	
				DRAWN BY: JMB	
CHECKED BY: PL					
APPROVED BY: PLM					
SCALE: N.T.S					
I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.				TITLE SHEET	
				T-1	REV 0

GENERAL NOTES:

- ALL WORK PRESENTED ON THESE DRAWINGS MUST BE COMPLETED BY THE CONTRACTOR UNLESS NOTED OTHERWISE (UNO). THE CONTRACTOR MUST BE EXPERIENCED IN THE PERFORMANCE OF WORK SIMILAR TO THAT DESCRIBED HEREIN. BY ACCEPTANCE OF THIS ASSIGNMENT, THE CONTRACTOR IS ATTESTING THAT HE DOES HAVE SUFFICIENT EXPERIENCE AND ABILITY, THAT HE IS KNOWLEDGEABLE OF THE WORK TO BE PERFORMED, THAT HE IS PROPERLY LICENSED, AND THAT HE IS PROPERLY REGISTERED TO DO THIS WORK IN THE STATE AND/OR COUNTY IN WHICH THE WORK IS TO BE PERFORMED.
- ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/ASSE A10.48 (LATEST EDITION); FEDERAL, STATE, AND LOCAL REGULATIONS; AND ANY APPLICABLE INDUSTRY CONSENSUS STANDARDS RELATED TO THE CONSTRUCTION ACTIVITIES BEING PERFORMED. ALL RIGGING PLANS SHALL ADHERE TO ANSI/ASSE A10.48 (LATEST EDITION) AND CROWN STANDARD CED-STD-10253 INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION TO CERTIFY THE SUPPORTING STRUCTURE(S) IN ACCORDANCE WITH THE ANSI/TIA-322 (LATEST EDITION).
- THE NOTES AND TYPICAL DETAILS ARE APPLICABLE TO ALL PARTS OF THE STRUCTURE AND SHALL BE READ IN CONJUNCTION WITH THE STRUCTURAL DRAWINGS AND PROJECT SPECIFICATIONS. STRUCTURAL DRAWINGS SHALL GOVERN OVER ANY VARIANCE FROM THIS SHEET.
- THE CONTRACTOR IS RESPONSIBLE FOR OBTAINING APPROVALS FROM ALL AUTHORITIES HAVING JURISDICTION FOR THIS PROJECT AND SHALL NOTIFY THE APPLICABLE JURISDICTIONAL (STATE, COUNTY, OR CITY) ENGINEER 24 HOURS PRIOR TO THE BEGINNING OF CONSTRUCTION. FOR JURISDICTIONS THAT LICENSE INDIVIDUAL TRADES, THE TRADESMAN OR SUBCONTRACTORS PERFORMING THOSE TRADES SHALL BE LICENSED, RESEARCH AND COMPLY WITH LICENSING LAWS, PAY LICENSE FEES, AND SELECT AND INFORM SUBCONTRACTORS REGARDING THESE LAWS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ABIDING BY ALL CONDITIONS AND REQUIREMENTS OF THE PERMITS.
- THE CONTRACTOR SHALL FIELD VERIFY ALL EXISTING CONDITIONS, POSSIBLE INTERFERENCES, AND DIMENSIONS BEFORE PROCEEDING WITH THE WORK. REPORT ANY AND ALL DISCREPANCIES TO THE JACOBS ENGINEERING ENGINEER OF RECORD (EOR) AND TOWER OWNER FIELD PERSONNEL IMMEDIATELY. ANY AND ALL FIELD CHANGES SHALL BE APPROVED AND DOCUMENTED BY THE EOR PRIOR TO FIELD IMPLEMENTATION. NO EXTRA CHARGE OR COMPENSATION WILL BE ALLOWED DUE TO DIFFERENCES BETWEEN ACTUAL DIMENSIONS OR DIMENSIONS SHOWN ON PLANS. NO PLEA OF IGNORANCE OF CONDITIONS THAT EXIST OR OF DIFFICULTIES OF CONDITIONS THAT MAY BE ENCOUNTERED, OR OF ANY OTHER RELEVANT MATTER CONCERNING THE EXECUTION OF THE WORK WILL BE ACCEPTED AS AN EXCUSE FOR ANY FAILURE OR OMISSION ON THE PART OF THE CONTRACTOR TO FULFILL EVERY DETAIL OF ALL THE REQUIREMENTS OF THE CONSTRUCTION DOCUMENTS GOVERNING THE WORK.
- ALL MATERIALS AND WORKMANSHIP SHALL BE WARRANTED FOR TWO (2) YEARS FROM THE DATE OF COMPLETED CONSTRUCTION.
- ALL WORKMANSHIP SHALL BE IN ACCORDANCE WITH ANSI, ASTM, ACI, TIA, AND AISC STANDARDS AS REFERENCED IN THE APPLICABLE CODES. USE ONLY THE LATEST ISSUES OF ANY APPLICABLE CODES, STANDARDS, OR REGULATIONS MENTIONED IN THE FOLLOWING NOTES AND SPECIFICATIONS, UNO.
- ALL MATERIALS AND EQUIPMENT FURNISHED SHALL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS, AND IN CONFORMANCE WITH THE DRAWINGS. ANY AND ALL SUBSTITUTIONS MUST BE DULY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER OF RECORD PRIOR TO FABRICATION AND INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF THE MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- ALL MANUFACTURER'S HARDWARE ASSEMBLY INSTRUCTIONS SHALL BE FOLLOWED EXACTLY AND SHALL SUPERSEDE ANY CONFLICTING NOTES ENCLOSED HEREIN.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS ALSO RESPONSIBLE FOR ENSURING THAT ALL CONSTRUCTION PROCEDURES MEET THE REQUIREMENTS OF OSHA, THE OWNER, AND ALL OTHER APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. THESE REGULATIONS INCLUDE BUT ARE NOT LIMITED TO REGULATIONS DEALING WITH TOWER CONSTRUCTION AND SAFETY, EXCAVATIONS AND TRENCHING, ERECTION OF GUARDS AND BARRIERS, AND WORK IN CONFINED SPACES. ENSURE THAT EMPLOYEES AND SUBCONTRACTORS WEAR HARD HATS AT ALL TIMES DURING CONSTRUCTION.
- ACCESS TO THE PROPOSED WORK SITE MAY BE RESTRICTED. THE CONTRACTOR SHALL COORDINATE INTENDED CONSTRUCTION ACTIVITY, INCLUDING WORK SCHEDULE AND MATERIAL ACCESS, WITH THE RESIDENT LEASING AGENT.
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO SAFEGUARD ALL EXISTING STRUCTURES OR BURIED SERVICES AFFECTED BY THIS CONSTRUCTION. CONTRACTOR IS ALSO RESPONSIBLE FOR TEMPORARILY RELOCATING ANY LINES OR STRUTS AS NECESSARY TO COMPLETE THE REQUIRED WORK. THE CONTRACTOR IS COMPLETELY RESPONSIBLE FOR CONTAINMENT OF SEDIMENT AND CONTROL OF EROSION AT THE SITE. ANY DAMAGE TO ADJACENT OR DOWNSTREAM PROPERTIES WILL BE CORRECTED BY THE CONTRACTOR. THE CONTRACTOR IS TO MAINTAIN ADEQUATE DRAINAGE AT ALL TIMES. DO NOT ALLOW WATER TO STAND OR POND. ANY DAMAGE TO STRUCTURES OR WORK ON THE SITE CAUSED BY INADEQUATE MAINTENANCE OF DRAINAGE PROVISIONS WILL BE THE RESPONSIBILITY OF THE CONTRACTOR AND ANY COST ASSOCIATED WITH REPAIRS FOR SUCH DAMAGE WILL BE AT THE CONTRACTOR'S EXPENSE.
- STRUCTURAL DESIGN IS FOR THE COMPLETE CONDITION ONLY. THE CONTRACTOR MUST BE COGNIZANT THAT THE REMOVAL OF ANY STRUCTURAL COMPONENT OF AN EXISTING TOWER HAS THE POTENTIAL TO CAUSE THE PARTIAL OR COMPLETE COLLAPSE OF THE STRUCTURE. ALL NECESSARY PRECAUTIONS MUST BE TAKEN TO ENSURE THE STRUCTURAL INTEGRITY, INCLUDING, BUT NOT LIMITED TO, ENGINEERING ASSESSMENT OF CONSTRUCTION STRESSES WITH INSTALLATION MAXIMUM WIND SPEED AND/OR TEMPORARY BRACING AND SHORING.
- DO NOT SCALE DRAWINGS.
- FOR THIS ANALYSIS AND MODIFICATION, THE TOWER HAS BEEN ASSUMED TO BE IN GOOD CONDITION WITHOUT ANY DEFECTS. IF THE CONTRACTOR DISCOVERS ANY INDICATION OF AN EXISTING STRUCTURAL DEFECT, CONTACT THE ENGINEER OF RECORD IMMEDIATELY.
- MODIFICATION WORK SHALL BE COMPLETED IN CALM WIND CONDITIONS / OR APPROPRIATE WIND SPEED FOR THE TYPE OF MODIFICATION WORK TO BE INSTALLED.
- THE CLIMBING FACILITIES, SAFETY CLIMB, AND ALL PARTS THEREOF SHALL NOT BE IMPEDED, MODIFIED, OR ALTERED WITHOUT THE EXPRESS WRITTEN APPROVAL OF YOUR CROWN POC. ALL ALTERATIONS TO A SAFETY CLIMB'S ORIGINAL MANUFACTURER'S CONFIGURATION MUST BE DESIGNED BY THE ENGINEER OF RECORD. IF THE GENERAL CONTRACTOR FINDS THAT THE CLIMBING FACILITIES ARE IMPEDED, EITHER DURING BIDDING, DURING PRE-FABRICATION MAPPING, OR WHILE ON-SITE, THE GENERAL CONTRACTOR SHALL CONTACT THE CROWN POC TO DETERMINE A METHOD OF RESOLUTION.
- ANY WORK PERFORMED WITHOUT A PREFABRICATION MAPPING IS DONE AT THE RISK OF THE GENERAL CONTRACTOR AND/OR FABRICATOR.
- AT THE TIME OF NTP, THE CONTRACTOR IS RESPONSIBLE FOR ENGAGING A MODIFICATION INSPECTOR TO COORDINATE AN INSPECTION SCHEDULE AND ENSURE PROPER DOCUMENTATION IS MAINTAINED THROUGHOUT THE LIFE OF THE PROJECT. FOUNDATION WORK REQUIRES INSPECTION PRIOR TO POURING CONCRETE. SHOP DRAWINGS ARE TO BE SUBMITTED TO THE EOR PRIOR TO FABRICATION.
- IF, DURING THE COURSE OF A FOUNDATION MODIFICATION, THE GC ENCOUNTERS EXISTING CONDUIT LOCATED WITHIN THE CONFINES OF THE EXISTING OR PROPOSED FOUNDATION CONCRETE, AND THIS CONDUIT IS NOT IN A LOCATION THAT IS SPECIFIED WITHIN THESE DESIGN DRAWINGS, THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE BEFORE PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATION. IF CONDUIT IS TO BE INSTALLED THROUGH THE EXISTING FOUNDATION OR PROPOSED FOUNDATION MODIFICATION AND HASN'T BEEN SPECIFIED WITHIN THESE DESIGN DRAWINGS THEN THE GC SHALL IMMEDIATELY CONTACT THE EOR FOR GUIDANCE PRIOR TO PROCEEDING WITH THE INSTALLATION OF THE PROPOSED FOUNDATION MODIFICATIONS.

STRUCTURAL STEEL NOTES:

- DESIGN, FABRICATION, ERECTION, ALTERATION, AND MAINTENANCE SHALL CONFORM TO THE FOLLOWING, UNLESS NOTED OTHERWISE (UNO):
 - TIA-222: STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
 - TIA-1019-A: INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS
 - AISC: MANUAL OF STEEL CONSTRUCTION
- ALL STRUCTURAL STEEL IS TO BE NEW AND CONFORM TO THE FOLLOWING:
 - MONOPOLE: ASTM A572-65 (FY = 65 KSI), UNO
 - SELF SUPPORT TOWER AND GUYED TOWER: ASTM A572-50 (FY = 50 KSI), UNO
- ALL BOLTS SHALL BE HOT-DIP GALVANIZED ASTM A325 ASSEMBLIES, TO INCLUDE BOLT, ASTM A563 HEAVY HEX NUT, F436 FLAT WASHER, AND SPLIT LOCK WASHER, UNO. BOLT THREADS ARE TO BE EXCLUDED FROM THE SHEAR PLANES. USE BEARING TYPE CONNECTIONS. ALL PROPOSED AND/OR REPLACED BOLTS SHALL BE OF SUFFICIENT LENGTH SUCH THAT THE END OF THE BOLT BE AT LEAST FLUSH WITH THE FACE OF THE NUT. IT IS NOT PERMITTED FOR THE BOLT END TO BE BELOW THE FACE OF THE NUT AFTER TIGHTENING IS COMPLETED.
- ALL FASTENERS SHALL NOT BE REUSED.
- DRILL NO HOLES IN ANY NEW OR EXISTING STRUCTURAL STEEL MEMBERS OTHER THAN THOSE SHOWN ON STRUCTURAL DRAWINGS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD.
- ALL EXPOSED EXTERIOR STRUCTURAL STEEL (INCLUDING BOLTS, LOCK WASHERS, PINS, ETC.) SHALL BE HOT-DIP GALVANIZED IN ACCORDANCE WITH ASTM A153 AND A123. FOR ALL FABRICATED WELDED ASSEMBLIES TO BE HOT-DIP GALVANIZED, PROVIDE WELDS ALL AROUND OR ADD SEAL WELDS WHERE STRUCTURAL WELDS ARE NOT SPECIFIED. FOR HIGH STRENGTH STEEL FASTENERS WHERE HOT-DIP GALVANIZATION IS NOT PERMITTED, MAGNI 565 COATING SHALL BE USED. ALL NEW STEEL SHALL BE PAINTED TO MATCH EXISTING TOWER STEEL.
- WHERE SPECIFIED, THE SEALANT BETWEEN STEEL COMPONENTS IS TO BE SILICONE CAULKING THAT IS EXTERIOR GRADE, ABLE TO BE PAINTED, AND ACCEPTABLE TO THE ENGINEER OF RECORD.
- FOR A LIST OF CROWN APPROVED COLD GALVANIZING COMPOUNDS, REFER TO CROWN ENG-BUL-10149, " TOWER PROTECTIVE COATINGS BULLETIN".
- AFTER FINAL INSPECTION, ALL EXPOSED STRUCTURAL STEEL AS THE RESULT OF THIS SCOPE OF WORK INCLUDING WELDS, FIELD DRILLED HOLES, AND SHAFT INTERIORS (WHERE ACCESSIBLE), SHALL BE CLEANED AND COLD GALVANIZING APPLIED BY BRUSH IN ACCORDANCE WITH CROWN ENG-BUL-10149, "TOWER PROTECTIVE COATINGS BULLETIN". PHOTO DOCUMENTATION IS REQUIRED TO BE SUBMITTED TO THE MI INSPECTOR.
- NO WELDING, TORCH CUTTING, OR OPEN FLAME IS PERMITTED ON THIS CONSTRUCTION SITE UNLESS DIRECTLY SPECIFIED IN THE DRAWINGS.

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I HEREBY CERTIFY THAT THIS ENGINEERING DOCUMENT WAS PREPARED BY ME OR UNDER MY DIRECT PERSONAL SUPERVISION AND THAT I AM A DULY LICENSED PROFESSIONAL ENGINEER UNDER THE LAWS OF THE STATE OF CONNECTICUT.				N-2	
				REV	0

WELDING NOTES:

1. ALL WELDING SHALL BE CARRIED OUT UNDER GOOD OPERATOR CONDITIONS AS DEFINED IN SECTION 5.12 OF AWS D1.1
2. ALL ARC WELDING ON CROWN STRUCTURES SHALL BE DONE IN ACCORDANCE WITH THE CROWN ENG-PLN-10015, "CUTTING AND WELDING SAFETY PLAN" AND AWS D1.1 (LATEST EDITION). THIS SHALL INCLUDE A CERTIFIED WELDING INSPECTOR (CWI) FOR ACCEPTANCE OR REJECTION OF ALL WELDING OPERATIONS, PRE-DURING-POST, USING THE ACCEPTANCE CRITERIA OF AWS D1.1. THE CWI SHALL WORK WITH THE GC ON THE LEVEL OF INTERACTION NEEDED TO CONDUCT THE WELDING INSPECTION. THE CERTIFIED WELDING INSPECTION IS THE RESPONSIBILITY OF THE GC.
3. THE CWI SHALL INDICATE, IN A WRITTEN WELDING REPORT, THAT ALL WELDING OPERATIONS, PRE-DURING-POST, WERE CONDUCTED IN ACCORDANCE WITH AWS D1.1 INCLUDING PHOTOGRAPHS AND DOCUMENTATION SUPPORTING THE ACCEPTANCE OR REJECTION OF ALL WELDING. FOR INFORMATION, SEE CROWN ENG-STD-10069, "GC INSPECTION STANDARD FOR FABRICATION AND FIELD WELDING OF STRUCTURAL STEEL" AND CROWN ENG-SOW-10007, "MODIFICATION INSPECTION SOW". ALL CWI WELDING INSPECTION DOCUMENTATION AND PHOTOS SHALL BE SUBMITTED TO THE MI INSPECTOR.
4. FOR ALL WELDING, USE E70XX ELECTRODES, UNO.
5. SURFACES TO BE WELDED SHALL BE FREE FROM SCALE, SLAG, RUST, MOISTURE, GREASE OR ANY OTHER FOREIGN MATERIAL THAT WOULD PREVENT PROPER WELDING. GRIND THE SURFACE ADJACENT TO THE WELD FOR A DISTANCE OF 2" MINIMUM ALL AROUND. ENSURE BOTH AREAS ARE 100% FREE OF ALL GALVANIZING.
6. DO NOT WELD IF THE TEMPERATURE OF THE STEEL IN THE VICINITY OF THE WELD AREA IS BELOW 0°F. WHEN THE TEMPERATURE IS BETWEEN 0°F AND 32°F, PREHEAT AND MAINTAIN THE STEEL IN THE VICINITY OF THE WELD AREA AT 70°F DURING THE WELDING PROCESS.
7. DO NOT WELD ON WET OR FROST-COVERED SURFACES AND PROVIDE ADEQUATE PROTECTION FROM HIGH WINDS.
8. WELDING NDE NOTES: "FIELD NDE MINIMUM REQUIREMENTS:
 - A. ALL NDE SHALL BE IN ACCORDANCE WITH AWS D1.1.
 - B. FOR NEW BASE STIFFENERS (INCLUSIVE OF TRANSITION STIFFENERS) AND ANCHOR ROD BRACKETS, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT.
 - C. FOR NEW FLAT PLATE REINFORCEMENT AT THE BASE OF THE TOWER, COMPLETE JOINT PENETRATION WELDS SHALL BE 100% INSPECTED BY UT. ALL PARTIAL JOINT PENETRATION AND FILLET WELDS SHALL BE 100% INSPECTED BY MT, BUT MAY BE LIMITED TO A HEIGHT OF 10'-0".
 - D. FOR NDE OF THE EXISTING BASE PLATE CIRCUMFERENTIAL WELD, GC SHALL REFERENCE THE MI CHECKLIST FOR APPLICABILITY. PLEASE SEE ENG-SOW-10033: TOWER BASE PLATE NDE, AND ENG-BUL-10051: NDE REQUIREMENTS FOR MONOPOLE BASE PLATE TO PREVENT CONNECTION FAILURE. NOTIFY THE EOR AND CROWN ENGINEERING IMMEDIATELY IF ANY CRACKS ARE SUSPECTED OR HAVE BEEN IDENTIFIED. THE NDE SHALL INCLUDE ALL EXISTING MODIFICATIONS THAT HAVE BEEN WELDED TO THE BASE PLATE.
 - E. ALL TESTING LIMITATIONS SHALL BE DETAILED IN THE NDE REPORT."

PULLOUT TESTING OF POST INSTALLED ANCHOR RODS:

1. EPOXY AGENTS SHOULD BE ALLOWED TO CURE ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
2. CONTRACTOR SHALL ENSURE THAT CONSTRUCTION DOES NOT GO BEYOND POINT WHERE THE ANCHOR RODS CAN BE EFFECTIVELY TESTED. CONSTRUCTION MAY PROCEED AFTER TESTING IS COMPLETED.
3. 50% OF POST INSTALLED ANCHOR RODS SHALL BE TESTED OR TOTAL OF 4, WHICHEVER IS GREATER.
4. ANCHOR ROD PULL OUT TESTING IS TO BE DONE IN ACCORDANCE WITH CROWN ENG-PRC-10119.
5. MAINTAIN COMPLETE LOAD-DISPLACEMENT RECORDS THROUGHOUT THE TEST. LOAD THE ANCHOR IN INCREMENTS OF UP TO 15% OF THE TARGET TENSION.
6. IF A DISPLACEMENT GREATER THAN 0.010" REMAINS AFTER THE INITIAL TEST CYCLE, ADDITIONAL TEST SHALL BE PERFORMED UP TO A MAXIMUM OF 3 TEST CYCLES TO DETERMINE IF THE MOVEMENT CONTINUES TO ACCUMULATE. INCREMENTAL RESIDUAL MOVEMENT RECORDED FROM EACH TEST CYCLE MUST BE DECREASING IN VALUE AND STABILIZE TO A VALUE NO MORE THAN 0.010" OR THE ANCHOR SHALL BE CONSIDERED TO FAIL THE TEST.
7. THIS INFORMATION SHALL BE DOCUMENTED AND INCLUDED IN THE MODIFICATION INSPECTION REPORT.
8. CONTACT JACOBS ENGINEERING GROUP IF ANY OF THE ANCHORS FAIL THE PULL TEST.

				JACOBS Jacobs Engineering Group, Inc.				
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EL: 180.0'
[TOP OF STRUCTURE]

SECTION 9

EL: 160.0'

SECTION 8

EL: 140.0'

SECTION 7

EL: 120.0'

SECTION 6

EL: 100.0'

SECTION 5

EL: 80.0'

SECTION 4

EL: 60.0'

SECTION 3

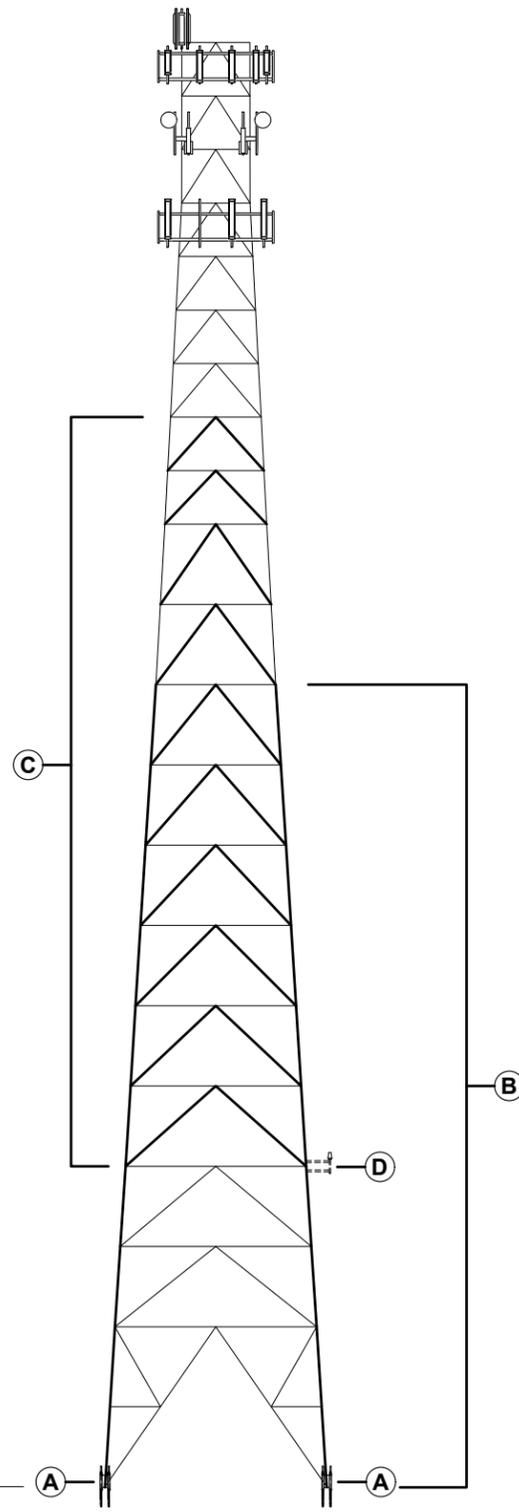
EL: 40.0'

SECTION 2

EL: 20.0'

SECTION 1

EL: 0.0'
[BOTTOM OF STRUCTURE]



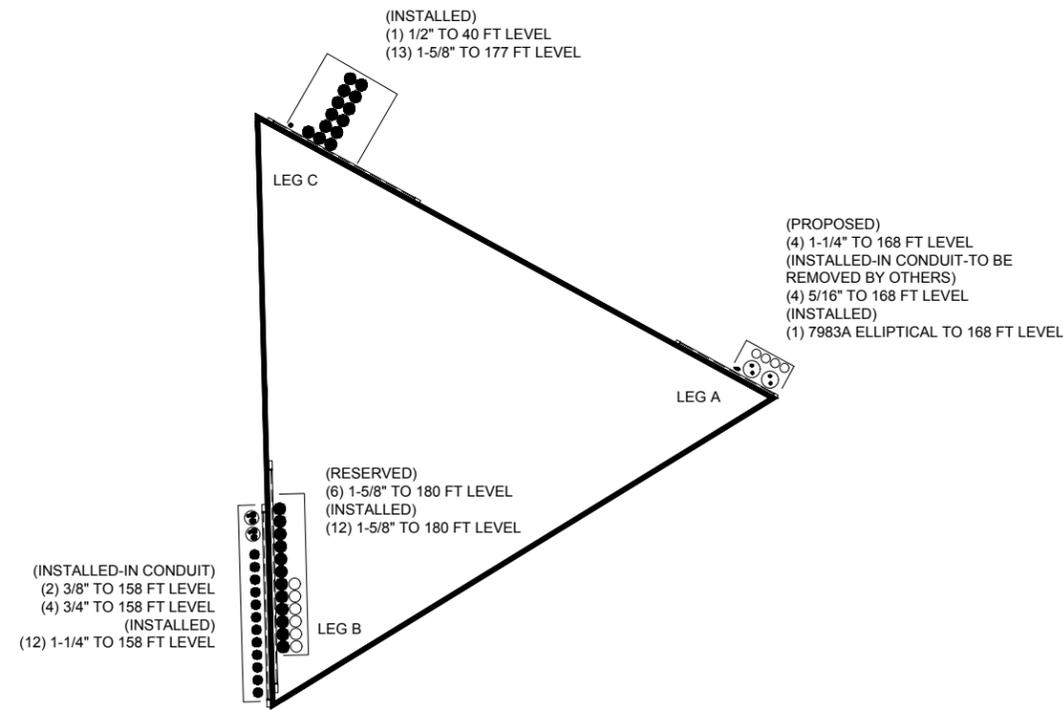
TOWER ELEVATION VIEW

MODIFICATION SCHEDULE			
LETTER	ELEVATION (FT)	TOWER MODIFICATION DESCRIPTION	REFERENCE SHEET
(A)	BASE PLATE	INSTALL ANCHOR RODS W/ ANCHOR ROD BRACKETS TO EACH TOWER LEG	S-2, S-3 & S-6
(B)	100.0 TO 0.0	INSTALL NEW HALF-PIPE LEG REINFORCEMENT.	S-4 TO S-7
(C)	133.3 TO 40.0	INSTALL HALF PIPE REINFORCEMENT TO EXISTING DIAGONALS	S-5 & S-8
(D)	40.0'	TEMPORARILY RELOCATE GPS & MOUNT TO ALLOW FOR HALF PIPE LEG REINFORCEMENT.	S-1
(E)	100.0 TO 0.0	WHERE INTERFERENCE EXISTS, RELOCATE EXISTING STEP BOLTS TO NEW HALF PIPE LEG REINFORCEMENT.	S-4

PRIOR TO FABRICATION AND INSTALLATION, CONTRACTOR SHALL FIELD VERIFY ALL LENGTHS AND QUANTITIES GIVEN. LENGTHS AND QUANTITIES PROVIDED ARE FOR QUOTING PURPOSES ONLY, AND SHALL NOT BE USED FOR FABRICATION.

NOTES:

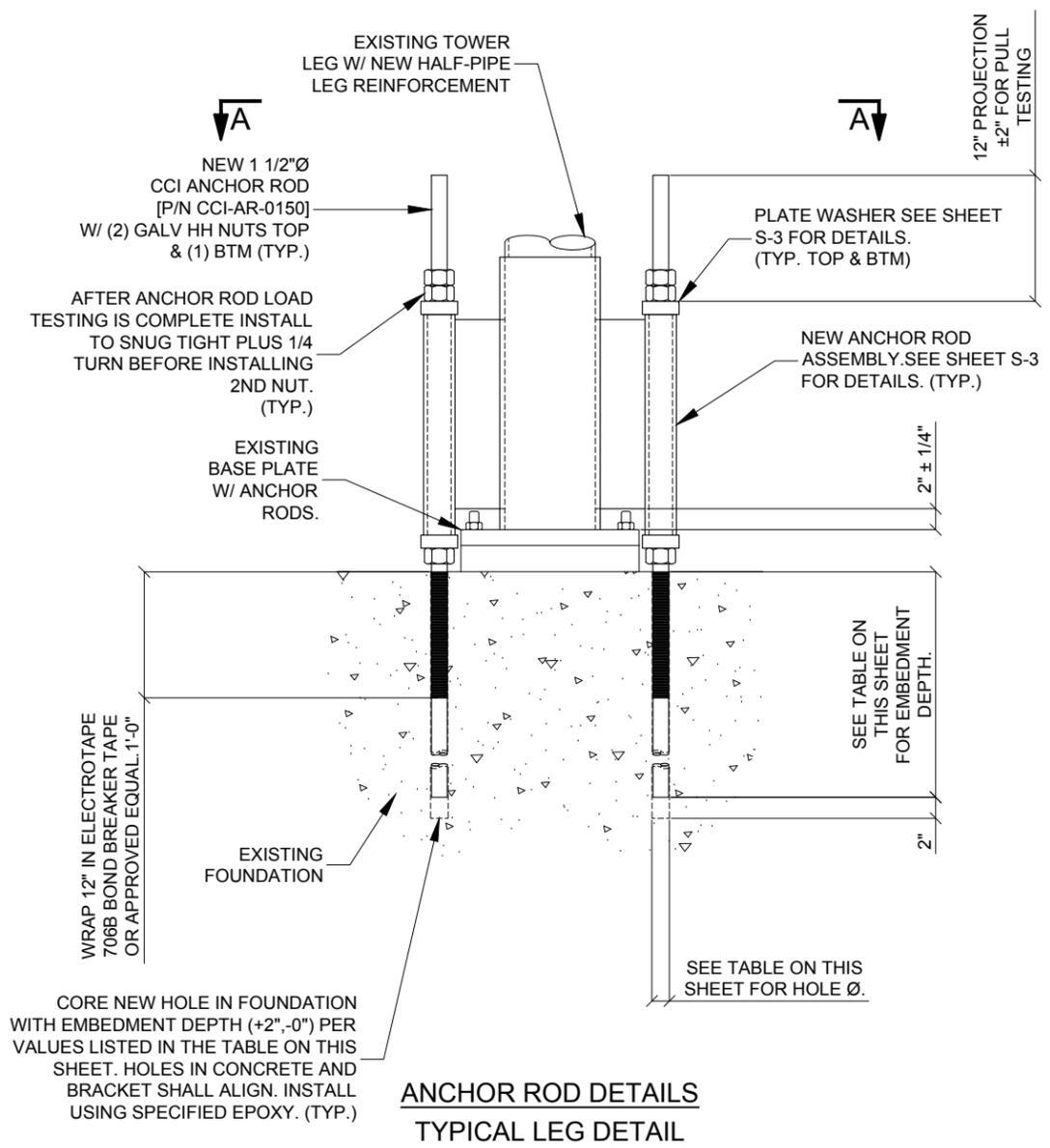
1. MODIFICATIONS TYPICAL FOR ALL TOWER FACES.
2. COAXIAL CABLES AND ANTENNAS CONFLICTING WITH PROPOSED REINFORCEMENT TO BE TEMPORARILY RELOCATED. THE CONTRACTOR SHALL COORDINATE THE WORK WITH CROWN AND THE OWNER OF THE APPURTENANCES INVOLVED.



TOWER BASE LEVEL VIEW

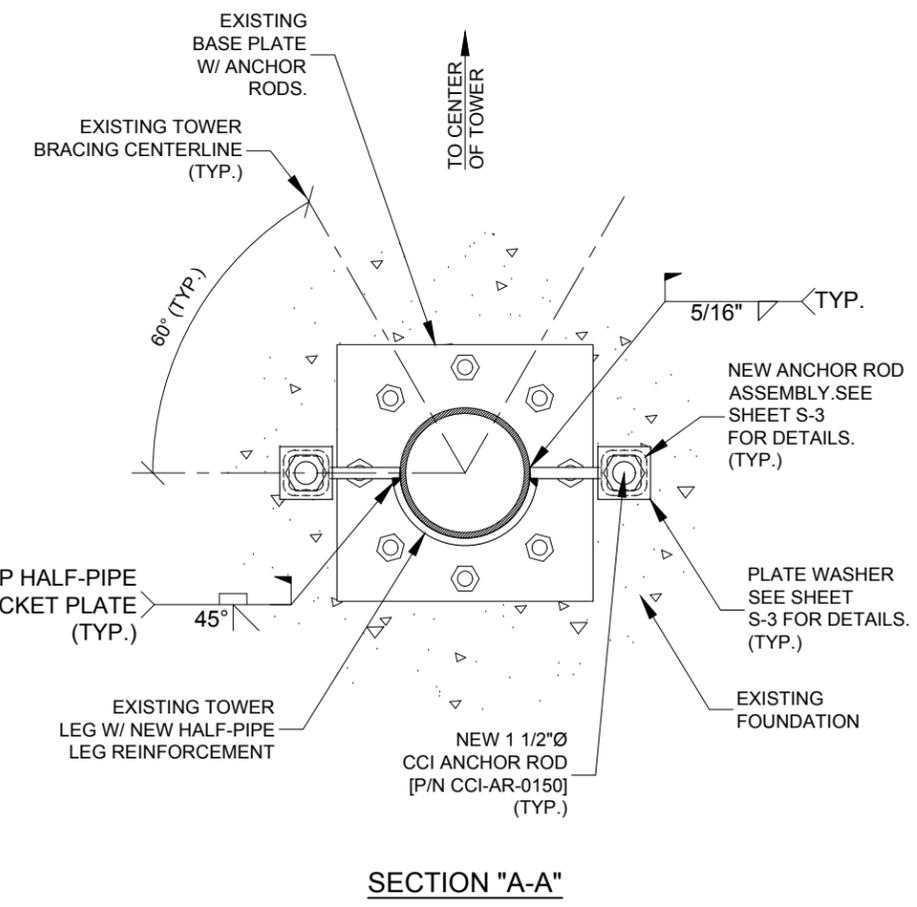
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TOWER MODIFICATION SCHEDULE			
S-1			REV 0

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CORE NEW HOLE IN FOUNDATION WITH EMBEDMENT DEPTH (+2\"/>

**ANCHOR ROD DETAILS
TYPICAL LEG DETAIL**

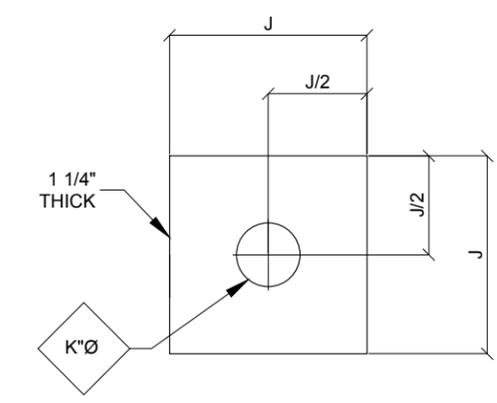
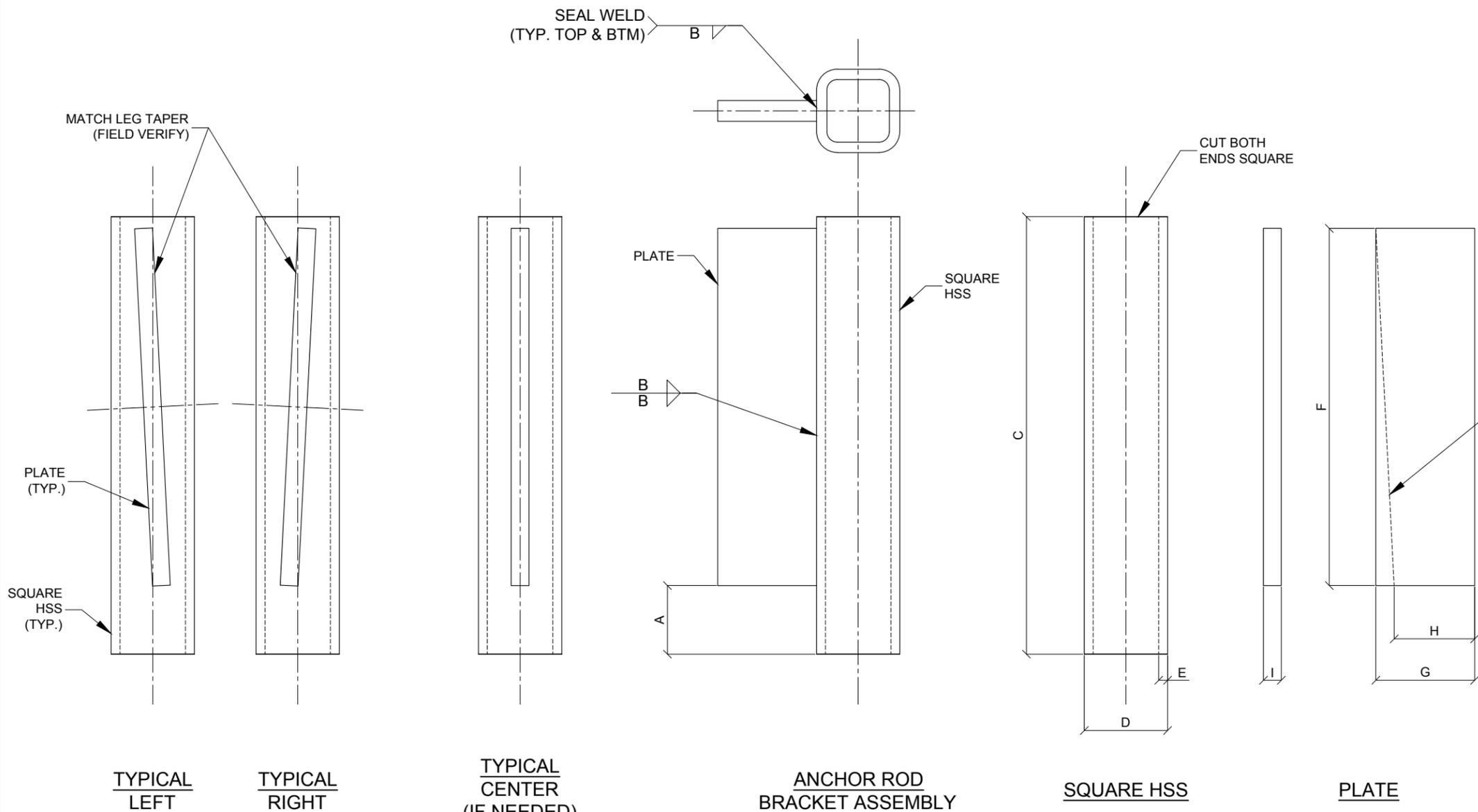


SECTION "A-A"

- NOTES:**
1. PLATE WASHER SHALL FULLY BEAR ON TUBE.
 2. REFERENCE CC APPROVED COMPONENTS (CURRENT VERSION) FOR ANCHOR ROD DIMENSIONS.
 3. RODS SHALL BE GALVANIZED FROM THE TOP OF THE PROJECTION TO 15" BELOW SURFACE OF CONCRETE, AT A MINIMUM.
 4. CORED HOLES SHALL BE MECHANICALLY ROUGHENED USING A CARBIDE HOLE ROUGHENER OR EQUIVALENT. BRUSHING WITH A NYLON OR WIRE BRUSH SHALL BE USED IN THE PROCESS OF HOLE CLEANING, BUT DOES NOT SATISFY THE HOLE ROUGHENING REQUIREMENT.
 5. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS FOR HOLE CLEANING.
 6. ALL HOLES SHALL BE DRY PRIOR TO PLACING EPOXY.
 7. FOLLOW EPOXY MANUFACTURER'S RECOMMENDATIONS REGARDING HANDLING OF THREADED ROD AND EPOXY, AS WELL AS ALL INSTALLATION INSTRUCTIONS AND REQUIREMENTS.
 8. TAKE ALL MEASUREMENTS NECESSARY TO AVOID DAMAGING EXISTING REINFORCING BARS DURING CORING OPERATIONS. NOTIFY EOR IMMEDIATELY IF EXISTING REINFORCING BARS ARE ENCOUNTERED AND INTERFERE WITH PLACEMENT OF NEW ANCHORS. MINOR ADJUSTMENT TO PROPOSED LOCATION OF NEW ANCHORS MAY BE REQUIRED.
 9. IF BASE PLATE GROUT REPAIR IS REQUIRED FOR ANCHOR ROD INSTALLATION, SEE ENG-PRC-10012: BASE PLATE GROUT REPAIR, FOR PROCEDURES AND RECOMMENDED MANUFACTURERS. CONTRACTOR TO DETERMINE QUANTITY REQUIRED.
 10. ONCE ALL RESIN AND GROUT HAVE CURED, NEW ANCHOR ROD REINFORCING SHALL BE TARGET TENSIONED TO THE VALUES LISTED IN THE TABLE SEEN ON THIS SHEET. SEE ENG-PRC-10119: PULL-OUT TESTING POST-INSTALLED ANCHOR RODS FOR SPECIFICATIONS.
 11. CONTRACTOR SHALL VERIFY THAT A PULL TEST IS ABLE TO BE PERFORMED USING THE ANCHOR ROD PROJECTION SHOWN.
 12. WHEN COMPLETED WITH EPOXY INSTALLATION, THE TOP OF THE EPOXY SHALL BE EQUAL TO OR HIGHER THAN THE TOP OF THE FOUNDATION, SUCH THAT WATER IS NOT ABLE TO COLLECT IN THE ANNULAR AREA AROUND THE EXPOSED PORTION OF THE ANCHOR ROD.

ANCHOR ROD SPECIFICATIONS								
CCI PART NO.	DIAMETER	QUANTITY	INSTALLED LENGTH	MATERIAL	EMBEDMENT DEPTH	FOUNDATION HOLE Ø	EPOXY	TARGET TENSION LOAD
CCI-AR-0150	1 1/2"Ø	6	8'-1 3/4"	A193-B7 ALL THREADED ROD	5'-0"	1 3/4"	HILTI HIT-RE 500 V3	83.0 K

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ANCHOR ROD DETAILS I			REV
S-2			0
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- NOTES:**
1. ALL HOLES TO BE SHOP FABRICATED, UNLESS NOTED OTHERWISE.
 2. FOR LOCATIONS WHERE THE TOWER TAPER CAUSES THE BRACKET PLATE TO EXTEND BEYOND THE WORKABLE FLAT OF THE HSS TUBE, CONTACT THE EOR FOR REVISED WELD DETAILS PRIOR TO FABRICATION.

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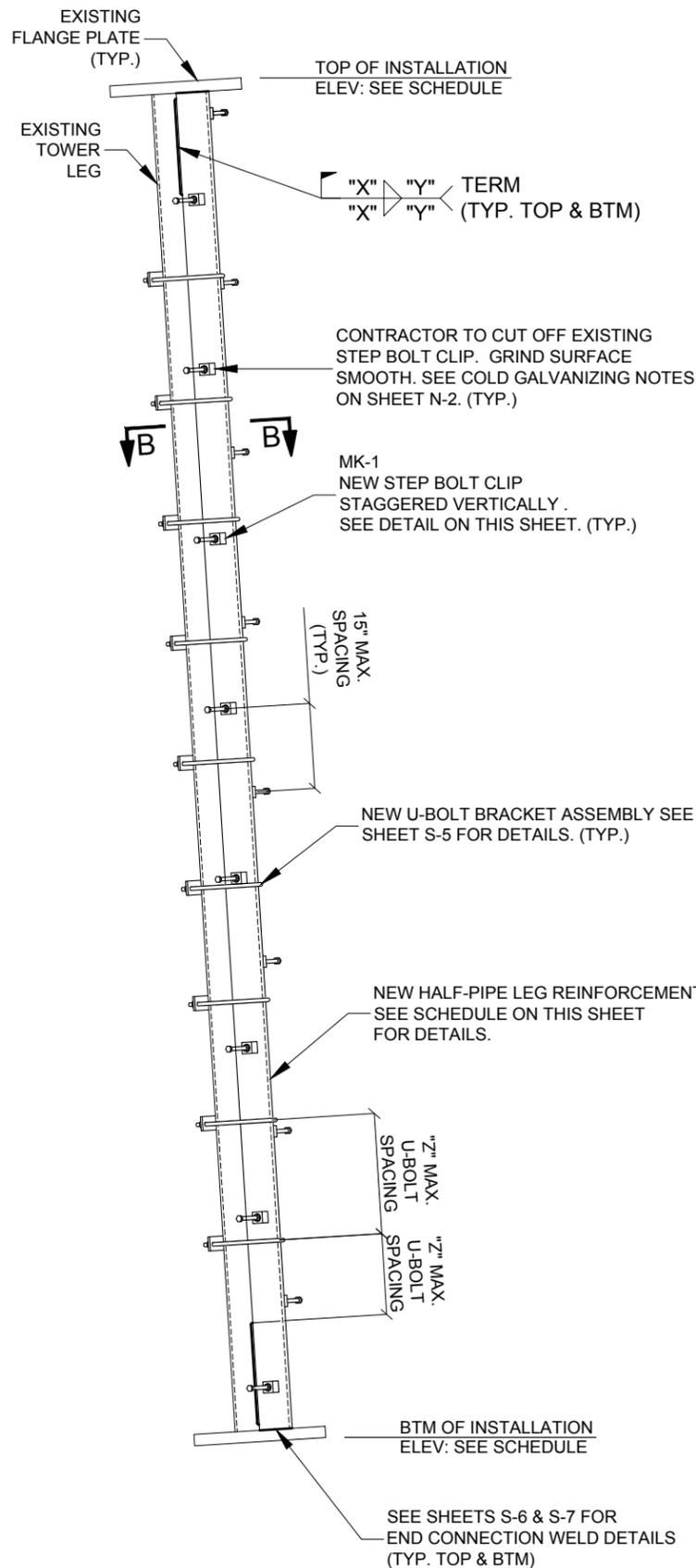
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ANCHOR ROD DETAILS II

S-3 REV 0

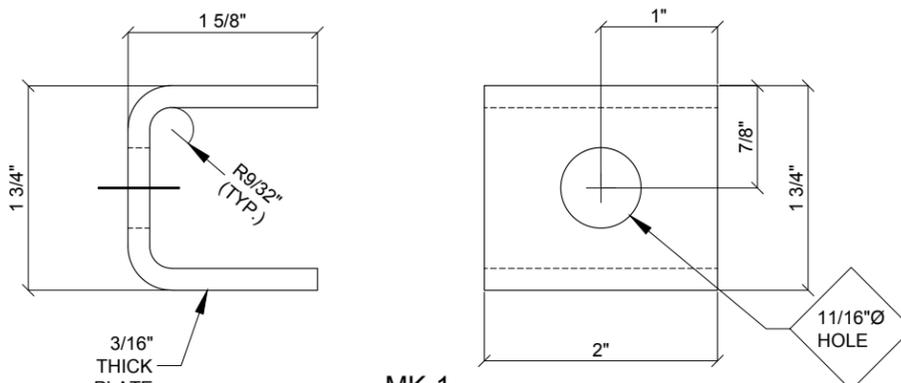
ANCHOR BRACKET SPECIFICATIONS											
ASSEMBLY	SQUARE HSS				PLATE				PLATE WASHER		
	A	B	C	D	E	F	G	H	I	J	K
	2 1/2"	3/16"	1'-9"	3"	3/8"	1'-6"	4 3/4"	FIELD VERIFY	3/4"	3 1/2"	1 5/8"
TOTAL QUANTITY	6		6			6				12	
MATERIAL	---		A500 GR. C (Fy = 50 KSI)			A572-50				A572-50	



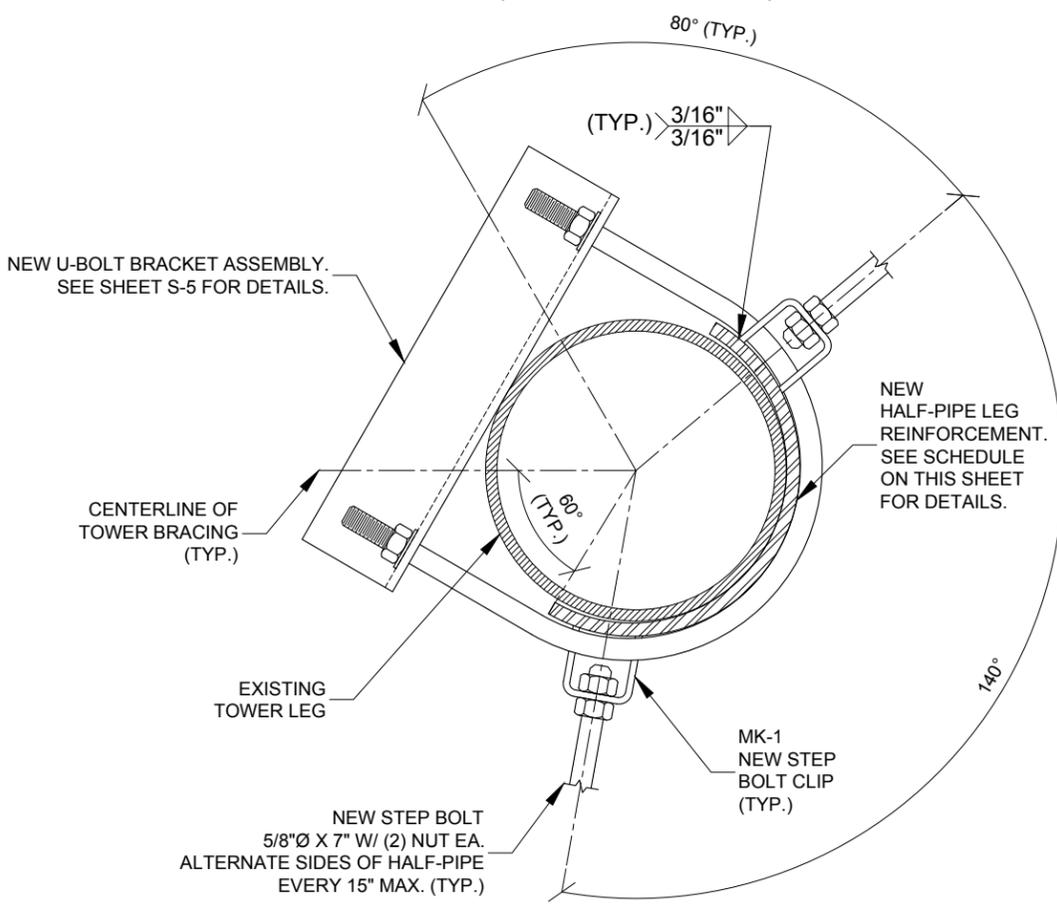
**HALF PIPE LEG REINFORCEMENT
ELEVATION VIEW
(TYPICAL LEG DETAIL)**

HALF-PIPE LEG REINFORCEMENT INSTALLATION SCHEDULE									
ELEVATION (FT.)	EXISTING LEG SIZE	NEW HALF PIPE REINFORCEMENT	PRELIMINARY LENGTH	REQUIRED TERM WELD SIZE "X" (IN)	BTM END TERM WELD LENGTH "Y" (IN)	MAX. U-BOLT SPACING "Z" (IN)	ESTIMATED TOTAL U-BOLT ASSEMBLIES REQUIRED	STEP BOLT CLIP	STEP BOLT
100.0 TO 80.0	PIPE 5.563" OD X 0.375"	(3) HSS 6.625" OD X 0.500"	20'-6"	5/16	12	30	24	(48) MK-1	(48) 5/8"Ø X 7"
80.0 TO 60.0	PIPE 6.625" OD X 0.340"	(3) HSS 7.5" OD X 0.375"	20'-6"	5/16	12	30	24	(48) MK-1	(48) 5/8"Ø X 7"
60.0 TO 40.0	PIPE 6.625" OD X 0.432"	(3) HSS 7.5" OD X 0.375"	20'-6"	5/16	12	30	24	(48) MK-1	(48) 5/8"Ø X 7"
40.0 TO 20.0	PIPE 6.625" OD X 0.432"	(3) HSS 7.5" OD X 0.375"	20'-6"	5/16	12	30	24	(48) MK-1	(48) 5/8"Ø X 7"
20.0 TO 0.0	PIPE 8.750" OD X 0.375"	(3) HSS 9.625" OD X 0.375"	20'-6"	5/16	**	30	24	(48) MK-1	(48) 5/8"Ø X 7"

** 18" TOP / SEE SHEETS S-2 & S-6 FOR BOTTOM WELD DETAILS.



**MK-1
STEP BOLT CLIP (ASTM A572-50)
(FRONT & TOP VIEW)**



**SECTION "B-B
TYPICAL DETAIL**

NOTES:

- ALL HOLES TO BE SHOP FABRICATED, UNLESS NOTED OTHERWISE.
- TOLERANCES, UNLESS NOTED OTHERWISE: FRACTIONS ± 1/16" ANGLES ± 1/2 DEGREE DECIMALS ± .010" HOLES ± 1/32"
- ANGLES TO BE ASTM A572-50.
- U-BOLTS SHALL MEET REQUIREMENTS OF ASME B18.31.5-2011 BENT BOLTS.
- U-BOLTS TO BE ASTM A36/A307, SAE 429 GR 2. U-BOLTS TO BE TIGHTENED PER AISC "SNUG-TIGHT" REQUIREMENTS.
- STANDARD 9/16"Ø HOLES IN PLACE OF SLOTTED HORIZONTAL HOLES ON THE ANGLE ARE PERMITTED. WHEN STANDARD HOLES ARE USED, FLAT WASHERS ARE NOT REQUIRED.
- U-BOLT ASSEMBLY, COMPLETE WITH NUTS (ASTM A563), FLAT WASHERS (ASTM F436) AND LOCK WASHERS.
- FULL ASSEMBLY TO BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE.
- ALL HSS STEEL, ASTM DESIGNATION A500 GR. C (FY = 46 KSI)
- USE E70XX FOR ELECTRODES FOR WELDING.
- STEP BOLT CLIPS SHALL BE SHOP WELDED. STEP BOLT CLIP WELDS ARE SUBJECT TO AWS D1.1 AND MUST BE INSPECTED BY A CWI. REFER TO DOCUMENT "ENG-STD-10069 GC CWI REQUIREMENT STANDARD" FOR CWI REQUIREMENTS. STEP BOLT CLIPS SHALL BE WELDED IN PLACE PRIOR TO HOT DIP GALVANIZING THE WELDMENT.
- CONTRACTOR SHALL USE ALL NEW STEP BOLTS AND HARDWARE. STEP BOLT MATERIAL SHALL MEET THE REQUIREMENTS OF ASTM A449. STEP BOLTS SHALL BE INSTALLED USING DOUBLE NUTS. A STEP BOLT INSTALLED IN A STEP BOLT CLIP SHALL BE TURNED WITH THE OUTER NUT LOOSE UNTIL THE END OF THE STEP BOLT MAKES CONTACT WITH THE SUPPORTING MEMBER. THE OUTER STEP BOLT NUT SHALL THEN BE TIGHTENED TO A SNUG TIGHT CONDITION AND PRETENSIONED BY ROTATING THE OUTER NUT 1/3 TURN.

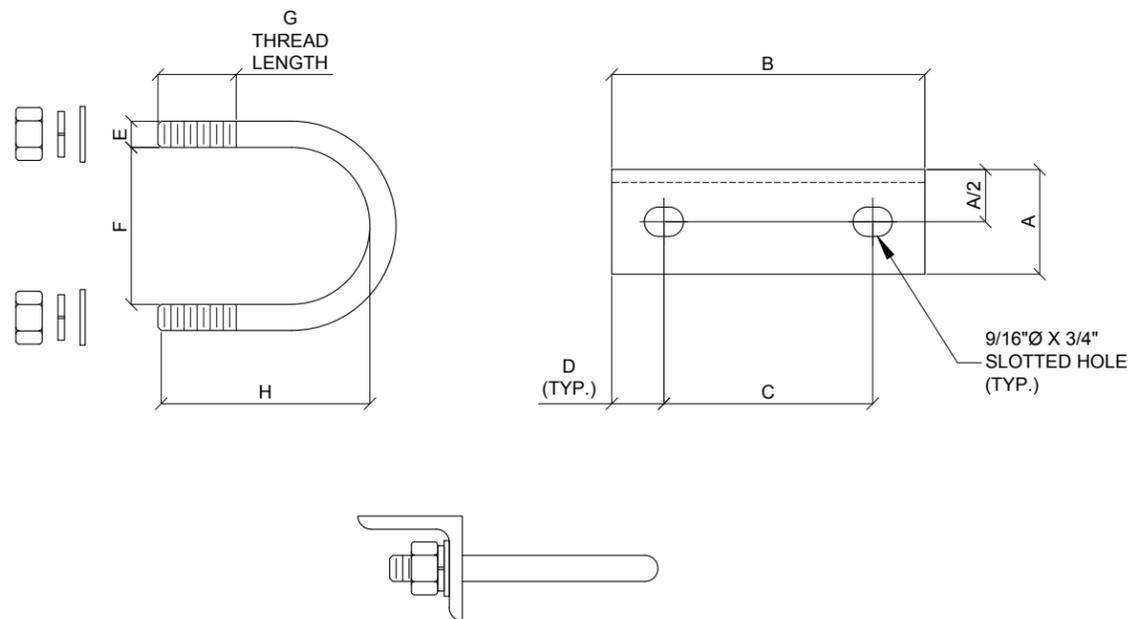
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HALF-PIPE LEG REINFORCEMENT			
S-4			REV 0
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HALF PIPE LEG U-BOLT BRACKET ASSEMBLY SCHEDULE								
ELEVATION (FT)	ANGLE SIZE	ANGLE LENGTH	C/C DISTANCE	MIN. EDGE DISTANCE	U-BOLT DIAMETER	INSIDE DISTANCE	THREAD LENGTH	U-BOLT LENGTH
	A	B	C	D	E	F	G	H
100.0 TO 80.0	L 3" X 3" X 1/4"	9 1/4"	7 1/4"	1"	1/2"	6 3/4"	1 1/2"	7 13/16"
80.0 TO 20.0	L 3" X 3" X 1/4"	10 1/8"	8 1/8"	1"	1/2"	7 5/8"	1 1/2"	8 3/4"
20.0 TO 0.0	L 3" X 3" X 1/4"	1'-0 1/4"	10 1/4"	1"	1/2"	9 3/4"	1 1/2"	10 7/8"

REFERENCE NOTES ON HALF-PIPE LEG REINFORCEMENT SHEET.

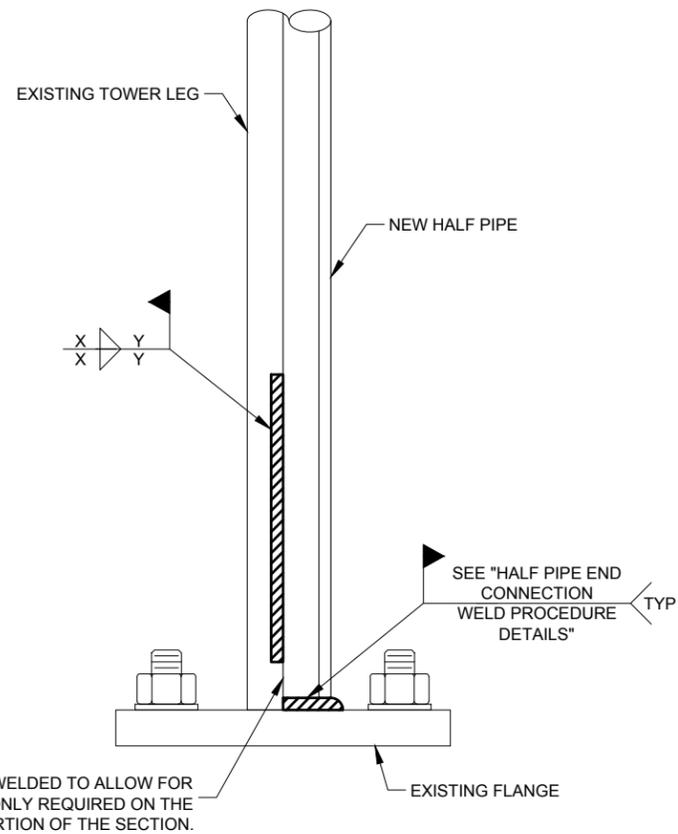
HALF PIPE DIAGONAL U-BOLT BRACKET ASSEMBLY SCHEDULE								
ELEVATION (FT)	ANGLE SIZE	ANGLE LENGTH	C/C DISTANCE	MIN. EDGE DISTANCE	U-BOLT DIAMETER	INSIDE DISTANCE	THREAD LENGTH	U-BOLT LENGTH
	A	B	C	D	E	F	G	H
133.3 TO 120.0	L 2" X 2" X 1/4"	5 1/2"	3 1/2"	1"	1/2"	3"	1 1/2"	4 3/8"
120.0 TO 40.0	L 2" X 2" X 1/4"	6 1/8"	4 1/8"	1"	1/2"	3 5/8"	1 1/2"	5"

REFERENCE NOTES ON DIAGONAL REINFORCEMENT DETAILS SHEET.

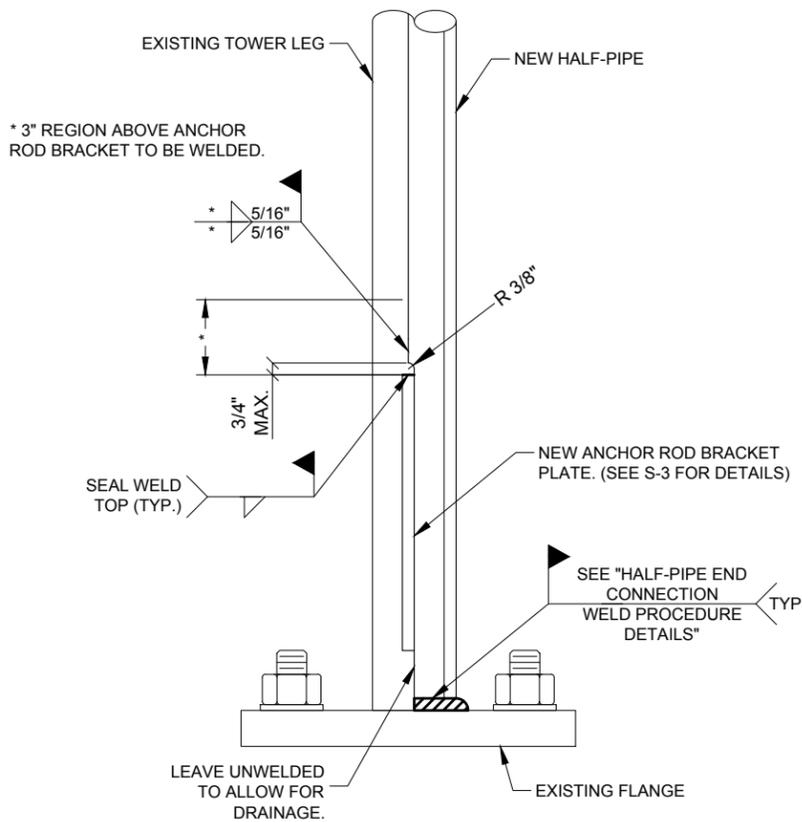


U-BOLT BRACKET ASSEMBLY

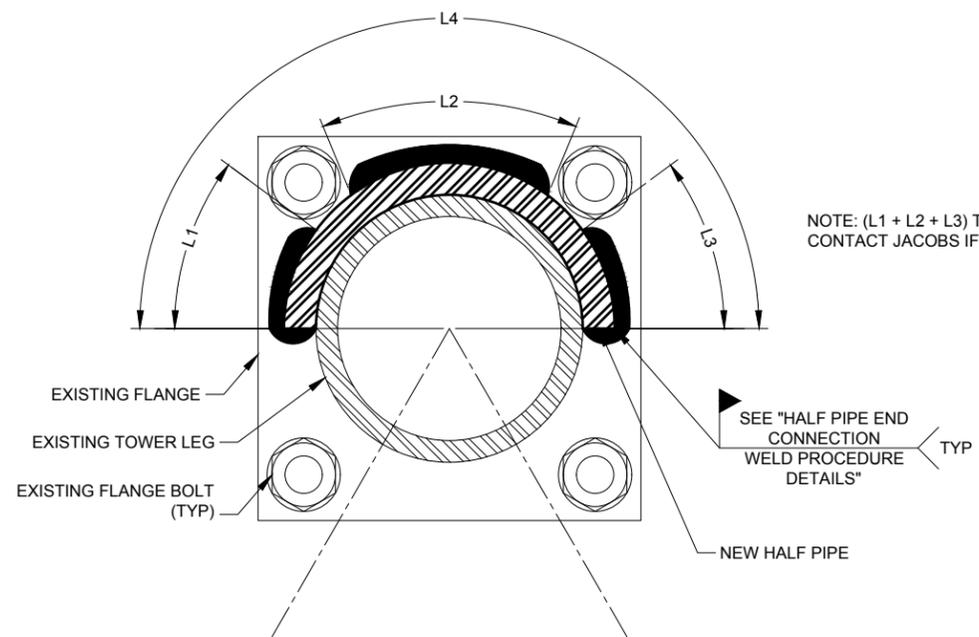
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				U-BOLT BRACKET ASSEMBLY
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BASE OF LEG FLANGE CONNECTION



**HALF-PIPE FLANGE CONNECTION
(TOWER BASE ONLY)**



FLANGE CONNECTION INTERFERENCE

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				HALF-PIPE END CONNECTION DETAILS
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NOTES:

- ① CLEAN GALVANIZING FROM EXISTING WELD AND ALL WELD CONTACT SURFACES.
- ② INSTALL PROPOSED HALF PIPE.

NOTES:

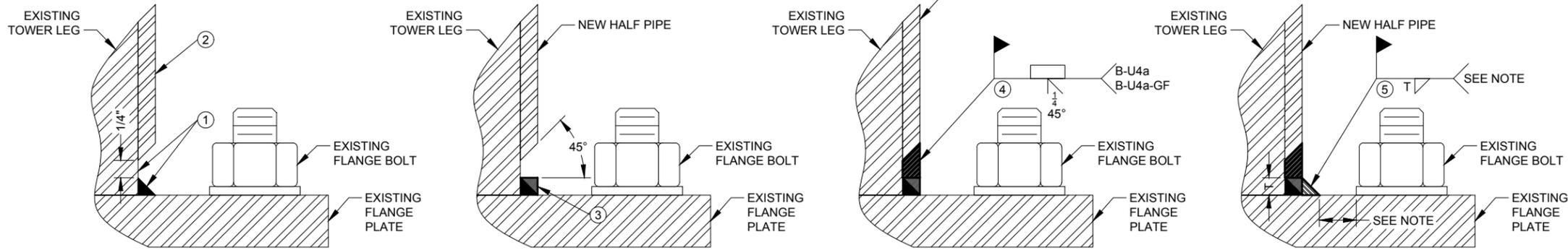
- ③ BUILD A PLATFORM WITH WELD (BUTTER) TO MATCH THE HEIGHT OF THE EXISTING FILLET WELD PER SECTION 5.22.4.3 OF AWS D1.1/D1.1M: 2010. ENGINEERING APPROVAL IS PROVIDED FOR CORRECTING ROOT OPENINGS GREATER THAN THOSE PERMITTED IN SECTION 5.22.4.3 IN ACCORDANCE WITH SECTION 5.22.4.4.

NOTES:

- ④ PERFORM A CJP WELD USING THE EXISTING TOWER LEG AS A BACKING BAR.

NOTES:

- ⑤ REINFORCING FILLET WELD SIZED TO MATCH EXISTING FILLET WELD. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT THERE IS ADEQUATE CLEARANCE BETWEEN THE PROPOSED WELD AND THE EXISTING FLANGE BOLTS. IF INTERFERENCE OCCURS AN ALTERNATIVE SLEEVE TERMINATION DETAIL MAY BE REQUIRED.



WELD DETAIL (OPTION 1)

NOTES:

- ① CLEAN GALVANIZING FROM EXISTING WELD AND ALL WELD CONTACT SURFACES.
- ② PARTIALLY GRIND THE HEIGHT OF THE EXISTING FILLET WELD TO FORM A PLATFORM WITH TOP WIDTH TO MATCH THE HALF PIPE THICKNESS.

NOTES:

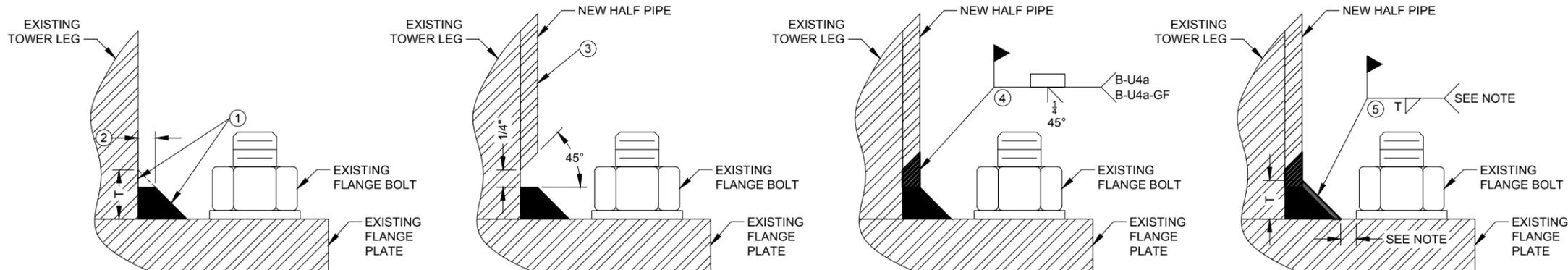
- ③ INSTALL PROPOSED HALF PIPE.

NOTES:

- ④ PERFORM A CJP WELD USING THE EXISTING TOWER LEG AS A BACKING BAR.

NOTES:

- ⑤ BUILD UP FILLET WELD TO MATCH EXISTING FILLET WELD. PRIOR TO CONSTRUCTION CONTRACTOR SHALL VERIFY THAT THERE IS ADEQUATE CLEARANCE BETWEEN THE PROPOSED WELD AND THE EXISTING FLANGE BOLTS. IF INTERFERENCE OCCURS AN ALTERNATIVE SLEEVE TERMINATION DETAIL MAY BE REQUIRED.

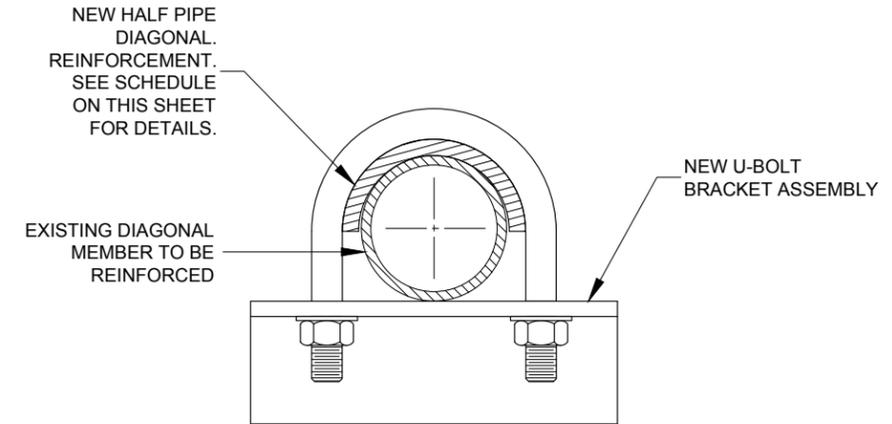
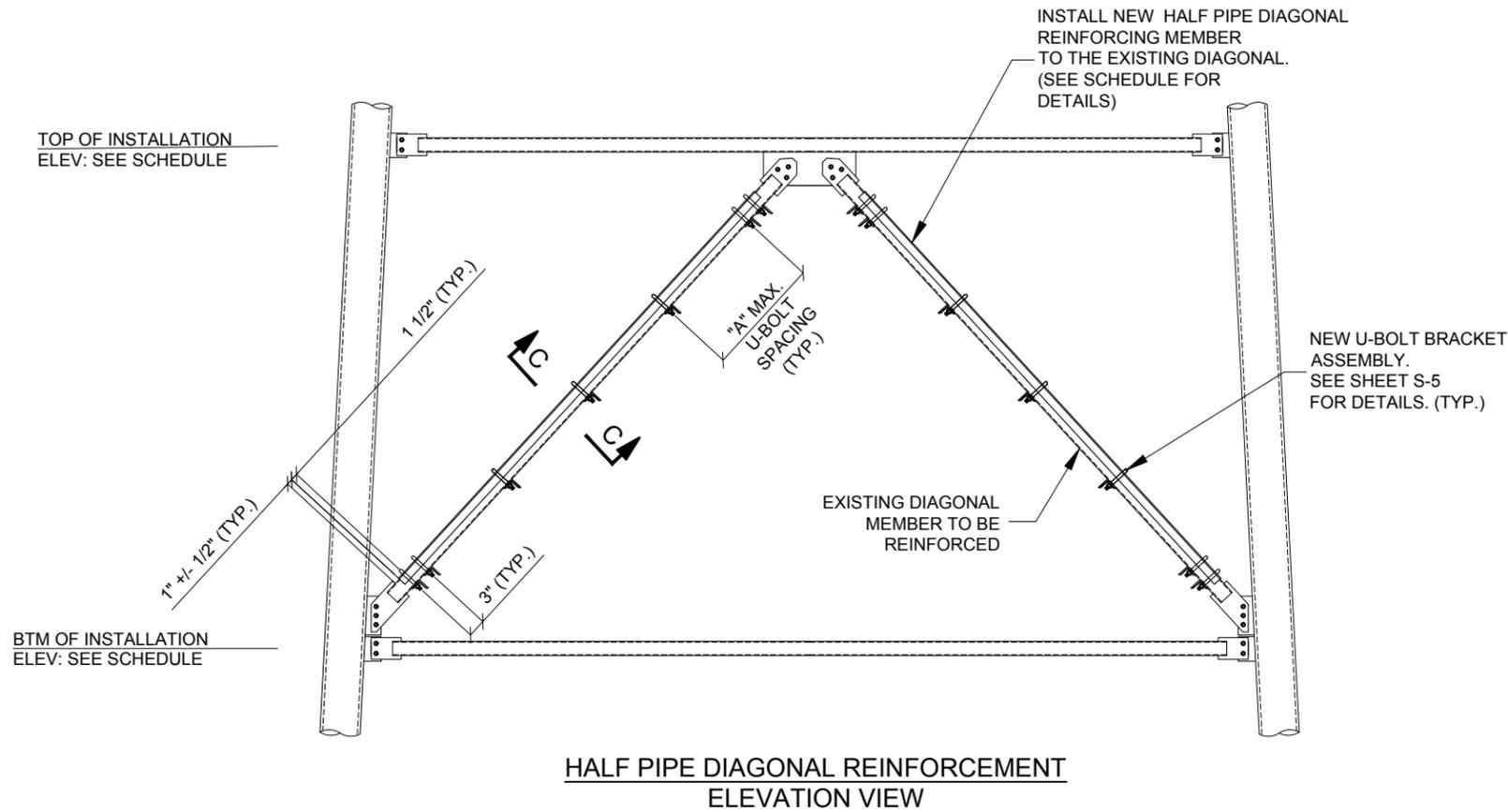


WELD DETAIL (OPTION 2)

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HALF-PIPE END CONNECTION WELD PROCEDURE DETAILS			
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NOTES:

1. ALL HOLES TO BE SHOP FABRICATED, UNLESS NOTED OTHERWISE.
2. TOLERANCES, UNLESS NOTED OTHERWISE: FRACTIONS $\pm 1/16"$
 ANGLES $\pm 1/2$ DEGREE
 DECIMALS $\pm .010"$
 HOLES $\pm 1/32"$
3. ANGLES TO BE ASTM A572-50.
4. U-BOLTS SHALL MEET REQUIREMENTS OF ASME B18.31.5-2011 *BENT BOLTS*.
5. U-BOLTS TO BE ASTM A36/A307, SAE 429 GR 2. U-BOLTS TO BE TIGHTENED PER AISC "SNUG-TIGHT" REQUIREMENTS.
6. STANDARD 9/16" \varnothing HOLES IN PLACE OF SLOTTED HORIZONTAL HOLES ON THE ANGLE ARE PERMITTED. WHEN STANDARD HOLES ARE USED, FLAT WASHERS ARE NOT REQUIRED.
7. U-BOLT ASSEMBLY, COMPLETE WITH NUTS (ASTM A563), FLAT WASHERS (ASTM F436) AND LOCK WASHERS.
8. FULL ASSEMBLY TO BE HOT-DIP GALVANIZED PER ASTM A153 / A153M OR A123, AS APPLICABLE.
9. ALL HSS STEEL, ASTM DESIGNATION A500 GR. C (FY = 46 KSI).



HALF PIPE DIAGONAL REINFORCEMENT INSTALLATION SCHEDULE					
ELEVATION	EXISTING DIAGONAL SIZE	NEW HALF PIPE DIAGONAL REINFORCEMENT	PRELIMINARY LENGTH	MAX. U-BOLT SPACING "A" (IN)	ESTIMATED QTY U-BOLT BRACKET ASSEMBLY
133.3' TO 126.7'	PIPE 2.375" OD X 0.154"	(6) HSS 2.875" O.D. X 0.250"	9'-0"	24	42
126.7' TO 120.0'	PIPE 2.375" OD X 0.154"	(6) HSS 2.875" O.D. X 0.250"	9'-3"	24	42
120.0' TO 110.0'	PIPE 2.875" OD X 0.203"	(6) HSS 3.5" O.D. X 0.300"	12'-2"	24	54
110.0' TO 100.0'	PIPE 2.875" OD X 0.203"	(6) HSS 3.5" O.D. X 0.300"	12'-6"	24	54
100.0' TO 90.0'	PIPE 2.875" OD X 0.203"	(6) HSS 3.5" O.D. X 0.300"	12'-11"	24	54
90.0' TO 80.0'	PIPE 2.875" OD X 0.203"	(6) HSS 3.5" O.D. X 0.300"	13'-4"	24	60
80.0' TO 70.0'	PIPE 2.875" OD X 0.203"	(6) HSS 3.5" O.D. X 0.300"	13'-9"	24	60
70.0' TO 60.0'	PIPE 2.875" OD X 0.203"	(6) HSS 3.5" O.D. X 0.300"	14'-2"	24	60
60.0' TO 50.0'	PIPE 2.875" OD X 0.276"	(6) HSS 3.5" O.D. X 0.300"	14'-8"	24	60
50.0' TO 40.0'	PIPE 2.875" OD X 0.276"	(6) HSS 3.5" O.D. X 0.300"	15'-1"	24	60

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