



Crown Castle
3530 Toringdon Way Suite 300
Charlotte NC 28277

Tel (704) 405-6600

November 21, 2014

Melanie A. Bachman
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: T-Mobile-Exempt Modification - Crown Site BU: 876331
T-Mobile Site ID: CT11423B
Located at: 115 North Mountain Rd, New Britain, CT 06053

Dear Ms. Bachman:

This letter and exhibits are submitted on behalf of T-Mobile. T-Mobile is making modifications to certain existing sites in its Connecticut system in order to implement their LTE technology. Please accept this letter and exhibits as notification, pursuant to § 16-50j-73 of the Regulations of Connecticut State Agencies (“R.C.S.A.”), of construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In compliance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to The Honorable Erin E. Stewart, Mayor for the City of New Britain and Twenty-Four Inc, Property Owner.

T-Mobile plans to modify the existing wireless communications facility owned by Crown Castle and located at **115 North Mountain Rd, New Britain, CT 06053**. Attached are a compound plan and elevation depicting the planned changes (Exhibit-1), and documentation of the structural sufficiency of the structure to accommodate the revised antenna configuration (Exhibit-2). Also included is a power density table report reflecting the modification to T-Mobile’s operations at the site (Exhibit-3).

The changes to the facility do not constitute a modification as defined in Connecticut General Statutes (“C.G.S.”) § 16-50i(d) because the general physical characteristics of the facility will not be significantly changed. Rather, the planned changes to the facility fall squarely within those activities explicitly provided for in the R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing tower. T-Mobile’s replacement antennas will be located at the same elevation on the existing tower.
2. There will be no proposed modifications to the ground and no extension of boundaries.
3. The proposed modifications will not increase noise levels at the facility by six decibels or more.

4. The operation of the replacement antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) adopted safety standard. A cumulative General Power Density table report for T-Mobile's modified facility is included as Exhibit-3.
5. A Structural Modification Report confirming that the tower and foundation can support T-Mobile's proposed modifications is included as Exhibit-2.

For the foregoing reasons, T-Mobile respectfully submits the proposed modifications to the above-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2).

Sincerely,

Jerry Feathers
Real Estate Specialist

Enclosure

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes

Tab 2: Exhibit-2: Structural Modification Report

Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc: The Honorable Erin E. Stewart, Mayor
27 West Main Street
New Britain, CT 06051

cc: Twenty-Four Inc.
P.O. Box 279
Plainville, CT 06062



T-MOBILE NORTHEAST LLC

T-MOBILE SITE #: CT11423B
CROWN CASTLE BU #: 876331
SITE NAME: NEW BRITAIN GRAVEL PIT
115 NORTH MOUNTAIN RD
NEW BRITAIN, CT 06053
HARTFORD COUNTY



Dewberry Engineers Inc.
 600 PARSIPPANY ROAD
 SUITE 301
 PARSIPPANY, NJ 07054
 PHONE: 973.739.9400
 FAX: 973.739.9710



T-MOBILE NORTHEAST LLC

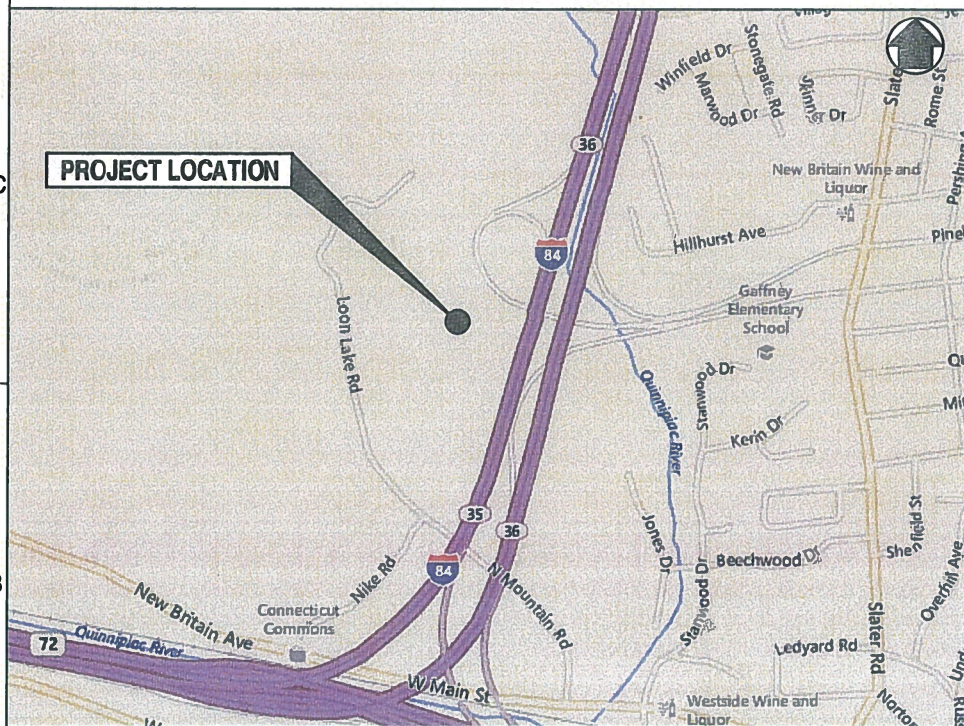
4 SYLVAN WAY
 PARSIPPANY, NJ 07054
 PHONE: (973) 397-4800
 FAX: (973) 292-8893

NEW BRITAIN
 GRAVEL PIT

CT11423B

115 NORTH MOUNTAIN ROAD
 NEW BRITAIN, CT 06053
 HARTFORD COUNTY

SITE INFORMATION



KEY MAP

N.T.S.

DIRECTIONS: (FROM PARSIPPANY):
 START OUT GOING WEST ON SYLVAN WAY TOWARD CENTURY DR. TURN RIGHT ONTO LITTLETON RD/US-202 NORTH. KEEP LEFT AT THE FORK TO GO ON LITTLETON RD E. MERGE ONTO I-287 N. MERGE ONTO I-87 S/I-287 E/NEW YORK TRWY S TOWARD I-87 S/TAPPAN ZEE BRG/NY. TAKE THE CROOKED YORK CITY. TAKE THE I-87 S EXIT TOWARD SAW MILL PKWY S/NEW YORK CITY, TAKE THE NY-119/SAW MILL PKWY N EXIT, EXIT 8A, TOWARD ELMSFORD. MERGE ONTO SAW MILL RIVER PKWY N VIA THE RAMP ON THE LEFT TOWARD KATONAH. MERGE ONTO I-684 N VIA THE EXIT ON THE LEFT. MERGE ONTO I-84 E VIA EXIT 9E TOWARD DANBURED STREET EXIT, EXIT 34, TOWARD PLAINVILLE/MOTOR VEHICLE DEPT. TURN LEFT ONTO CROOKED ST. TURN RIGHT ONTO CT-372/NEW BRITAIN AVE. CONTINUE TO FOLLOW CT-372. TURN LEFT ONTO N MOUNTAIN RD. N MOUNTAIN RD BECOMES LOON LAKE RD. 10 LOON LAKE RD IS ON THE LEFT.

PROJECT INFORMATION

T-MOBILE SITE #: CT11423B
 CROWN CASTLE BU #: 876331
 SITE ADDRESS: 115 NORTH MOUNTAIN RD
 NEW BRITAIN, CT 06053
 HARTFORD COUNTY

LATITUDE: N 41° 40' 35.72"
 LONGITUDE: W 72° 49' 17.09"

TOWER OWNER: CROWN CASTLE
 1200 MACARTHUR BLVD., SUITE 200
 MAHWAH, NJ 07430

CONTACT: WARREN KELLEHER
 (781) 970-0055

APPLICANT: T-MOBILE NORTHEAST, LLC
 4 SYLVAN WAY
 PARSIPPANY, NJ 07054

CONTACT: PHONE #: (973) 397-4800
 FAX #: (973) 292-8893

ENGINEER: DEWBERRY ENGINEERS INC.
 600 PARSIPPANY ROAD, SUITE 301
 PARSIPPANY, NJ 07054

CONTACT: GREG NAWROTZKI
 (973) 576-9653

SCOPE OF WORK: REMOVE AND REPLACE (6) EXISTING ANTENNAS WITH (6) NEW ANTENNAS, REMOVE AND REPLACE EXISTING TMA'S WITH (3) NEW TMA'S, REMOVE AND REPLACE (1) EXISTING EQUIPMENT CABINET WITH (1) NEW EQUIPMENT CABINET AT GRADE, ADD (1) NEW HYBRID CABLE.

PROPOSED DESIGN: 702C

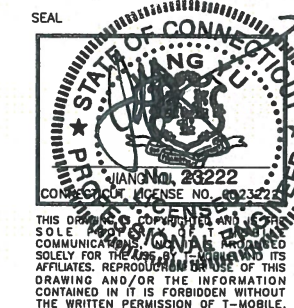
SHEET INDEX

SHEET NO.	SHEET DESCRIPTION
T-1	TITLE SHEET
G-1	GENERAL NOTES
C-1	COMPOUND PLAN & EQUIPMENT PLANS
C-2	ANTENNA LAYOUTS & ELEVATIONS
C-3	CONSTRUCTION DETAILS
E-1	GROUNDING NOTES & DETAILS

APPROVALS

T-MOBILE	DATE
OWNER/ LANDLORD	DATE
RF ENGINEER	DATE
ZONING	DATE
CONSTRUCTION	DATE

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.



SCALE: AS SHOWN

REV.	DATE	BY	DESCRIPTION
0	11/20/14	ALH	ISSUED AS FINAL
A	11/07/14	ALH	ISSUED FOR REVIEW

REVISIONS

DRAWN BY: ALH
 CHECKED BY: BSH
 APPROVED BY: GHN
 DATE: 11/04/14
 TITLE

TITLE SHEET

PROJECT NO. 50066258/50066275

T - 1

SHEET NO.

GENERAL NOTES:

- FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:
PROJECT MANAGEMENT - CROWN CASTLE
CONTRACTOR - GENERAL CONTRACTOR (CONSTRUCTION)
OWNER - T-MOBILE
OEM - ORIGINAL EQUIPMENT MANUFACTURER
- PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING CONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF PROJECT MANAGEMENT.
- ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK.
- ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
- DRAWINGS PROVIDED HERE ARE NOT TO SCALE UNLESS OTHERWISE NOTED AND ARE INTENDED TO SHOW OUTLINE ONLY.
- UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
- THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
- IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY PROJECT MANAGEMENT.
- CONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. CONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. CONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH PROJECT MANAGEMENT.
- THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
- CONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
- CONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
- THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE PROJECT DESCRIBED HEREIN. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER THE CONTRACT.
- CONTRACTOR SHALL NOTIFY DEWBERRY 48 HOURS IN ADVANCE OF POURING CONCRETE, OR BACKFILLING TRENCHES, SEALING ROOF AND WALL PENETRATIONS & POST DOWNS, FINISHING NEW WALLS OR FINAL ELECTRICAL CONNECTIONS FOR ENGINEER REVIEW.
- CONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. CONTRACTOR SHALL NOTIFY PROJECT MANAGEMENT OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
- THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY CONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
- SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

SITE WORK GENERAL NOTES:

- THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
- ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY CONTRACTOR. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS WILL INCLUDE BUT NOT BE LIMITED TO:
A) FALL PROTECTION
B) CONFINED SPACE
C) ELECTRICAL SAFETY
D) TRENCHING & EXCAVATION.
- ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWINGS AND PROJECT SPECIFICATIONS.
- IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES, TOP SOIL AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
- ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF CONTRACTOR, OWNER AND/OR LOCAL UTILITIES.
- CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION.
- THE CONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE T-MOBILE SPECIFICATION FOR SITE SIGNAGE.
- THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE TRANSMISSION EQUIPMENT AND TOWER AREAS.
- NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
- THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION, SEE SOIL COMPACTION NOTES.
- THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
- EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL JURISDICTION'S GUIDELINES FOR EROSION AND SEDIMENT CONTROL.

ELECTRICAL INSTALLATION NOTES:

- ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE LOCAL CODES.
- CONTRACTOR SHALL MODIFY EXISTING CABLE TRAY SYSTEM AS REQUIRED TO SUPPORT RF AND TRANSPORT CABLE TO THE NEW BTS EQUIPMENT. CONTRACTOR SHALL SUBMIT MODIFICATIONS TO PROJECT MANAGEMENT FOR APPROVAL.
- CONDUIT ROUTINGS ARE SCHEMATIC. CONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED.
- WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC AND TELCORDIA.
- ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC AND TELCORDIA.
- CABLES SHALL NOT BE ROUTED THROUGH LADDER-STYLE CABLE TRAY RUNGS.
- EACH END OF EVERY POWER, POWER PHASE CONDUCTOR (I.E., HOTS), GROUNDING, AND T1 CONDUCTOR AND CABLE SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC & OSHA, AND MATCH EXISTING INSTALLATION REQUIREMENTS.
- ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING, AND BRANCH CIRCUIT ID NUMBERS (I.E., PANELBOARD AND CIRCUIT ID'S).
- PANELBOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH ENGRAVED LAMACOID PLASTIC LABELS.
- ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
- POWER, CONTROL, AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- POWER PHASE CONDUCTORS (I.E., HOTS) SHALL BE LABELED WITH COLOR-CODED INSULATION OR ELECTRICAL TAPE (3M BRAND, 1/2 INCH PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL) PHASE CONDUCTOR COLOR CODES SHALL CONFORM WITH THE NEC & OSHA AND MATCH EXISTING INSTALLATION REQUIREMENTS.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (SIZE 8 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2 GREEN INSULATION, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED, UNLESS OTHERWISE SPECIFIED.
- SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED OUTDOORS, OR BELOW GRADE, SHALL BE SINGLE CONDUCTOR #2 AWG SOLID TINNED COPPER CABLE, UNLESS OTHERWISE SPECIFIED.
- POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI-CONDUCTOR, TYPE TC CABLE (SIZE 14 AWG OR LARGER), 600V, OIL RESISTANT THHN OR THWN-2, CLASS B STRANDED COPPER CABLE RATED FOR 90°C (WET AND DRY) OPERATION; WITH OUTER JACKET; LISTED OR LABELED FOR THE LOCATION USED, UNLESS OTHERWISE SPECIFIED.
- ALL POWER AND POWER GROUNDING CONNECTIONS SHALL BE CRIMP-STYLE, COMPRESSION WIRE LUGS AND WIRENUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRENUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75°C (90°C IF AVAILABLE).
- RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
- NEW RACEWAY OR CABLE TRAY WILL MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- ELECTRICAL METALLIC TUBING (EMT) OR RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40, OR RIGID PVC SCHEDULE 80 FOR LOCATIONS SUBJECT TO PHYSICAL DAMAGE) SHALL BE USED FOR EXPOSED INDOOR LOCATIONS.
- ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT), OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
- GALVANIZED STEEL INTERMEDIATE METALLIC CONDUIT (IMC) SHALL BE USED FOR OUTDOOR LOCATIONS ABOVE GRADE.
- RIGID NONMETALLIC CONDUIT (I.E., RIGID PVC SCHEDULE 40 OR RIGID PVC SCHEDULE 80) SHALL BE USED UNDERGROUND; DIRECT BURIED, IN AREAS OF OCCASIONAL LIGHT VEHICLE TRAFFIC OR ENCASED IN REINFORCED CONCRETE IN AREAS OF HEAVY VEHICLE TRAFFIC.
- LIQUID-TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID-TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
- CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION-TYPE AND APPROVED FOR THE LOCATION USED. SETSCREW FITTINGS ARE NOT ACCEPTABLE.
- CABINETS, BOXES, AND WIREWAYS SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE, AND NEC.
- CABINETS, BOXES, AND WIREWAYS TO MATCH THE EXISTING INSTALLATION WHERE POSSIBLE.
- WIREWAYS SHALL BE EPOXY-COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARD; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- EQUIPMENT CABINETS, TERMINAL BOXES, JUNCTION BOXES, AND PULL BOXES SHALL BE GALVANIZED OR EPOXY-COATED SHEET STEEL, SHALL MEET OR EXCEED UL 50, AND RATED NEMA 1 (OR BETTER) INDOORS, OR NEMA 3R (OR BETTER) OUTDOORS.
- METAL RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL BE GALVANIZED, EPOXY-COATED, OR NON-CORRODING; SHALL MEET OR EXCEED UL 514A AND NEMA OS 1; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- NONMETALLIC RECEPTACLE, SWITCH, AND DEVICE BOXES SHALL MEET OR EXCEED NEMA OS 2; AND RATED NEMA 1 (OR BETTER) INDOORS, OR WEATHER PROTECTED (WP OR BETTER) OUTDOORS.
- THE CONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM PROJECT MANAGEMENT BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
- THE CONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD AGAINST LIFE AND PROPERTY.

CONCRETE AND REINFORCING STEEL NOTES:

- ALL CONCRETE WORK SHALL BE IN ACCORDANCE WITH THE ACI 301, ACI 318, ACI 336, ASTM A184, ASTM A185 AND THE DESIGN AND CONSTRUCTION SPECIFICATION FOR CAST-IN-PLACE CONCRETE.
- ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 4000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. A HIGHER STRENGTH (4000 PSI) MAY BE USED. ALL CONCRETING WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
- REINFORCING STEEL SHALL CONFORM TO ASTM A 615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A 185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE (UNO). SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
- THE FOLLOWING MINIMUM CONCRETE COVER SHALL BE PROVIDED FOR REINFORCING STEEL UNLESS SHOWN OTHERWISE ON DRAWINGS:
CONCRETE CAST AGAINST EARTH.....3 IN.
CONCRETE EXPOSED TO EARTH OR WEATHER:
#8 AND LARGER2 IN.
#5 AND SMALLER & WWF.....1 1/2 IN.
CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
SLAB AND WALL3/4 IN.
BEAMS AND COLUMNS.....1 1/2 IN.
- A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNO, IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
- CONCRETE CYLINDER TEST IS NOT REQUIRED FOR SLAB ON GRADE WHEN CONCRETE IS LESS THAN 50 CUBIC YARDS (IBC 1905.6.2.3) IN THAT EVENT THE FOLLOWING RECORDS SHALL BE PROVIDED BY THE CONCRETE SUPPLIER:
(A) RESULTS OF CONCRETE CYLINDER TESTS PERFORMED AT THE SUPPLIER'S PLANT,
(B) CERTIFICATION OF MINIMUM COMPRESSIVE STRENGTH FOR THE CONCRETE GRADE SUPPLIED.
FOR GREATER THAN 50 CUBIC YARDS THE GC SHALL PERFORM THE CONCRETE CYLINDER TEST.
- AS AN ALTERNATIVE TO ITEM 7, TEST CYLINDERS SHALL BE TAKEN INITIALLY AND THEREAFTER FOR EVERY 50 YARDS OF CONCRETE FROM EACH DIFFERENT BATCH PLANT.
- EQUIPMENT SHALL NOT BE PLACED ON NEW PADS FOR SEVEN DAYS AFTER PAD IS POURED, UNLESS IT IS VERIFIED BY CYLINDER TESTS THAT COMPRESSIVE STRENGTH HAS BEEN ATTAINED.

STRUCTURAL STEEL NOTES:

- ALL STEEL WORK SHALL BE PAINTED OR GALVANIZED IN ACCORDANCE WITH THE DRAWINGS UNLESS NOTED OTHERWISE. STRUCTURAL STEEL SHALL BE ASTM-A-36 UNLESS OTHERWISE NOTED ON THE SITE SPECIFIC DRAWINGS. STEEL DESIGN, INSTALLATION AND BOLTING SHALL BE PERFORMED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) "MANUAL OF STEEL CONSTRUCTION".
- ALL WELDING SHALL BE PERFORMED USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "MANUAL OF STEEL CONSTRUCTION". PAINTED SURFACES SHALL BE TOUCHED UP.
- BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"Ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
- NON-STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8" DIA. ASTM A 307 BOLTS UNLESS NOTED OTHERWISE.
- INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S WRITTEN RECOMMENDED PROCEDURE. THE ANCHOR BOLT, DOWEL OR ROD SHALL CONFORM TO MANUFACTURER'S RECOMMENDATION FOR EMBEDMENT DEPTH OR AS SHOWN ON THE DRAWINGS. NO REBAR SHALL BE CUT WITHOUT PRIOR CONTRACTOR APPROVAL WHEN DRILLING HOLES IN CONCRETE. SPECIAL INSPECTIONS, REQUIRED BY GOVERNING CODES, SHALL BE PERFORMED IN ORDER TO MAINTAIN MANUFACTURER'S MAXIMUM ALLOWABLE LOADS. ALL EXPANSION/WEDGE ANCHORS SHALL BE STAINLESS STEEL OR HOT DIPPED GALVANIZED. EXPANSION BOLTS SHALL BE PROVIDED BY RAMSET/REDHEAD OR APPROVED EQUAL.
- CONTRACTOR SHALL SUBMIT SHOP DRAWINGS FOR ENGINEER REVIEW & APPROVAL ON PROJECTS REQUIRING STRUCTURAL STEEL.
- ALL STRUCTURAL STEEL WORK SHALL BE DONE IN ACCORDANCE WITH AISC SPECIFICATIONS.

CONSTRUCTION NOTES:

- FIELD VERIFICATION: CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, T-MOBILE ANTENNA PLATFORM LOCATION AND ANTENNAS TO BE REPLACED.
- COORDINATION OF WORK: CONTRACTOR SHALL COORDINATE RF WORK AND PROCEDURES WITH PROJECT MANAGEMENT.
- CABLE LADDER RACK: CONTRACTOR SHALL FURNISH AND INSTALL CABLE LADDER RACK, CABLE TRAY, AND CONDUIT AS REQUIRED TO SUPPORT CABLES TO THE NEW BTS LOCATION.
- GROUNDING OF ALL EQUIPMENT AND ANTENNAS IS NOT CONSIDERED PART OF THE SCOPE OF THIS PROJECT AND IS THE RESPONSIBILITY OF THE OWNER AND CONTRACTOR AT THE TIME OF CONSTRUCTION. ALL EQUIPMENT AND ANTENNAS TO BE INSTALLED AND GROUNDED IN ACCORDANCE WITH GOVERNING BUILDING CODE, MANUFACTURER RECOMMENDATIONS AND OWNER SPECIFICATIONS.



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T-MOBILE NORTHEAST LLC

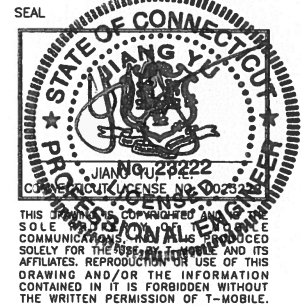
4 SYLVAN WAY
PARSIPPANY, NJ 07054
PHONE: (973) 397-4800
FAX: (973) 292-8883

NEW BRITAIN
GRAVEL PIT

CT11423B

115 NORTH MOUNTAIN ROAD
NEW BRITAIN, CT 06053
HARTFORD COUNTY

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AS SHOWN

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A	11/07/14	ALH	ISSUED FOR REVIEW

REVISIONS

DRAWN BY ALH

CHECKED BY BSH

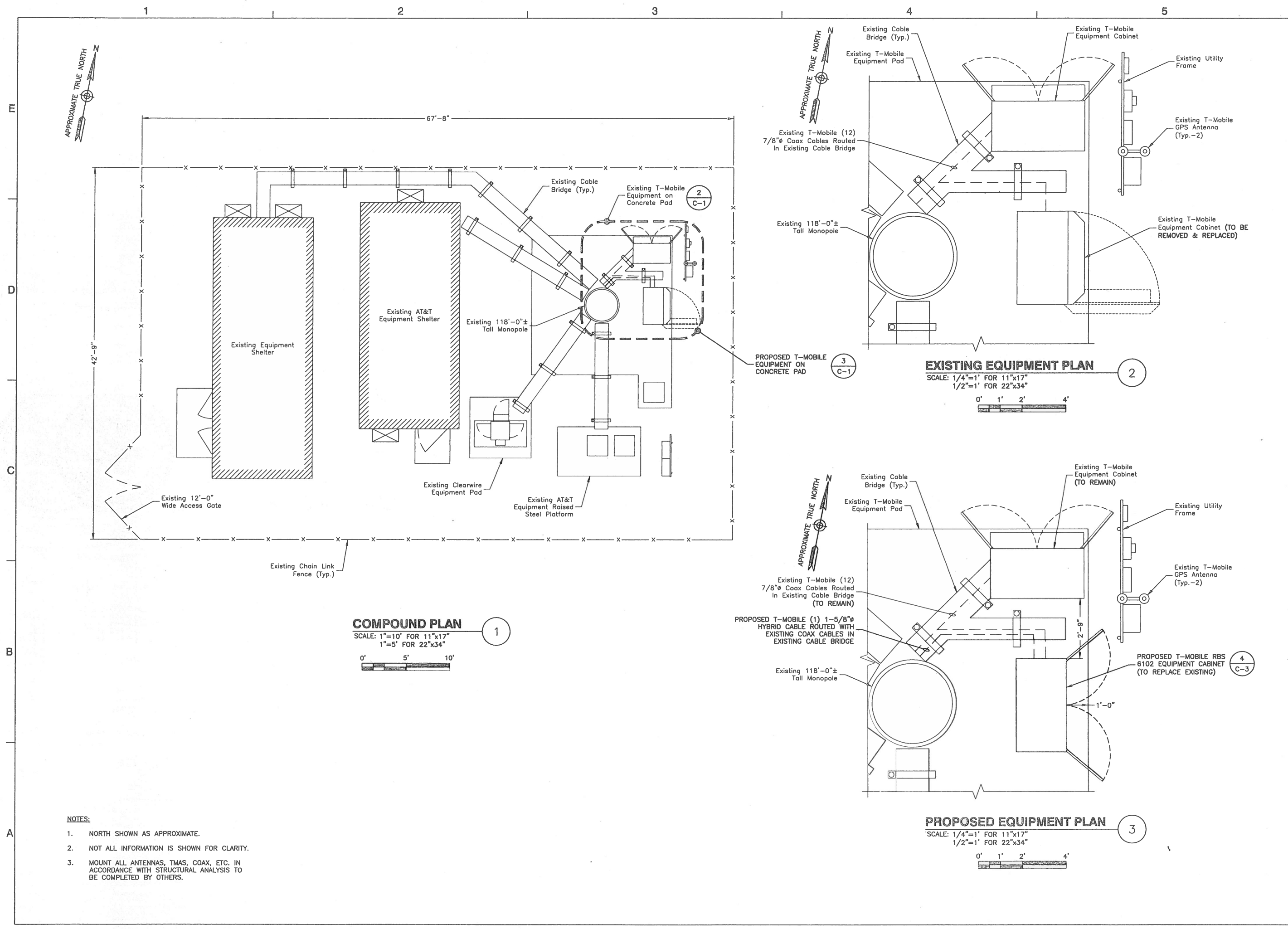
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DATE 11/04/14

TITLE

GENERAL NOTES

PROJECT NO. 50066258/50066275



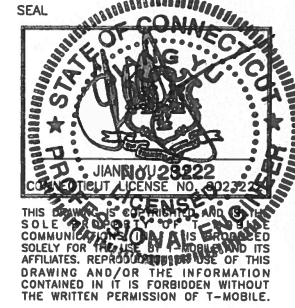
- NOTES:**
1. NORTH SHOWN AS APPROXIMATE.
 2. NOT ALL INFORMATION IS SHOWN FOR CLARITY.
 3. MOUNT ALL ANTENNAS, TMS, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS TO BE COMPLETED BY OTHERS.

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T-Mobile
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**NEW BRITAIN
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 HARTFORD COUNTY

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 DRAWN BY ALH
 CHECKED BY BSH
 APPROVED BY GHN
 DATE 11/04/14

**COMPOUND PLAN
 & EQUIPMENT
 PLANS**

PROJECT NO. 50066258/50066275

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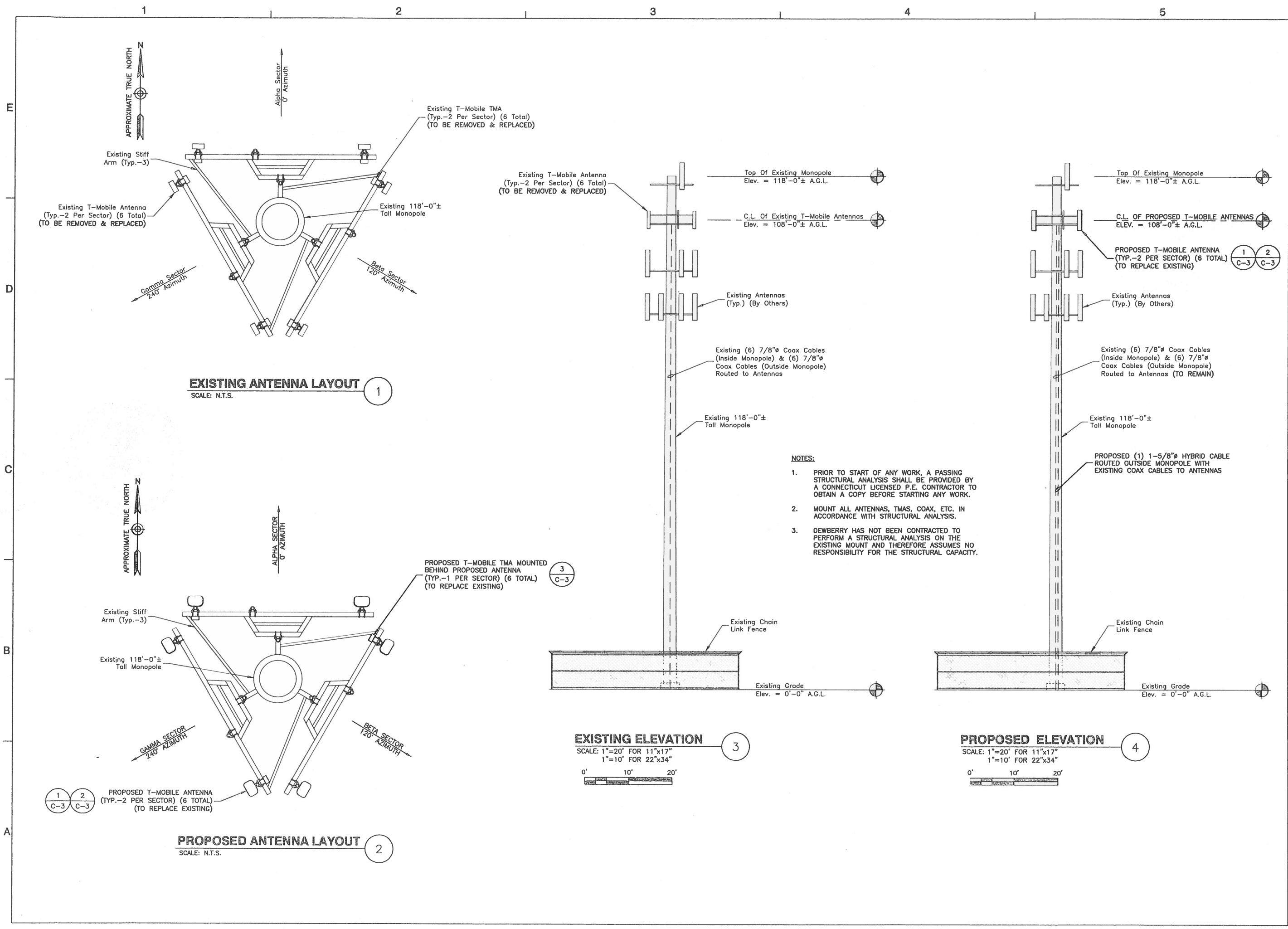
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REVISIONS

DRAWN BY ALH
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 APPROVED BY GHN
 DATE 11/04/14

**ANTENNA
 LAYOUTS &
 ELEVATIONS**

PROJECT NO. 50066258/50066275



EXISTING ANTENNA LAYOUT 1
 SCALE: N.T.S.

PROPOSED ANTENNA LAYOUT 2
 SCALE: N.T.S.

EXISTING ELEVATION 3
 SCALE: 1"=20' FOR 11"x17"
 1"=10' FOR 22"x34"

PROPOSED ELEVATION 4
 SCALE: 1"=20' FOR 11"x17"
 1"=10' FOR 22"x34"

- NOTES:**
1. PRIOR TO START OF ANY WORK, A PASSING STRUCTURAL ANALYSIS SHALL BE PROVIDED BY A CONNECTICUT LICENSED P.E. CONTRACTOR TO OBTAIN A COPY BEFORE STARTING ANY WORK.
 2. MOUNT ALL ANTENNAS, TMAS, COAX, ETC. IN ACCORDANCE WITH STRUCTURAL ANALYSIS.
 3. DEWBERRY HAS NOT BEEN CONTRACTED TO PERFORM A STRUCTURAL ANALYSIS ON THE EXISTING MOUNT AND THEREFORE ASSUMES NO RESPONSIBILITY FOR THE STRUCTURAL CAPACITY.

THIS DOCUMENT WAS DEVELOPED TO REFLECT A SPECIFIC SITE AND ITS SITE CONDITIONS AND IS NOT TO BE USED FOR ANOTHER SITE OR WHEN OTHER CONDITIONS PERTAIN. REUSE OF THIS DOCUMENT IS AT THE SOLE RISK OF THE USER.



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SCALE: AS SHOWN

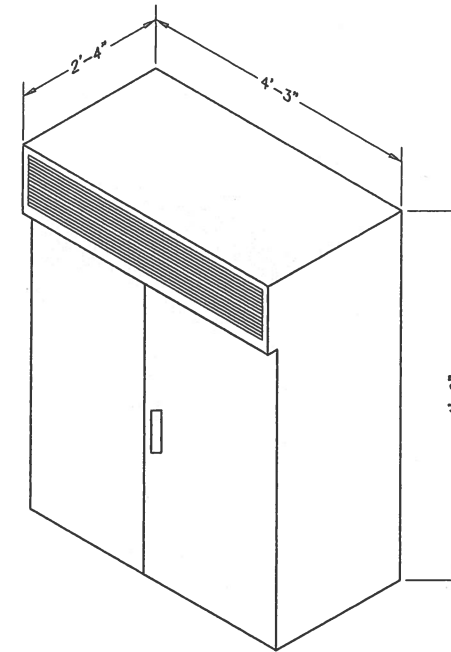
REV.	DATE	BY	DESCRIPTION
D	11/20/14	ALH	ISSUED AS FINAL
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REVISIONS

DRAWN BY: ALH
CHECKED BY: BSH
APPROVED BY: GHN
DATE: 11/04/14

**CONSTRUCTION
DETAILS**

PROJECT NO. 50066258/50066275

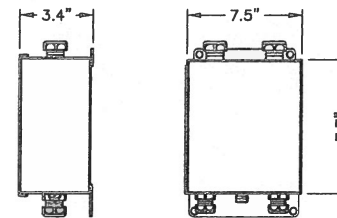


ISOMETRIC

NOTE:

- CONTRACTOR SHALL SECURE CABINET AS PER MANUFACTURER RECOMMENDATIONS.

ERICSSON RBS 6102 CABINET
SCALE: N.T.S.



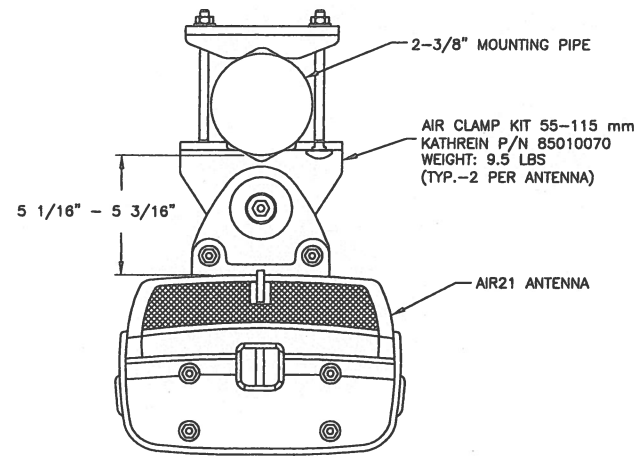
SIDE FRONT

ERICSSON KRY 112 144/1

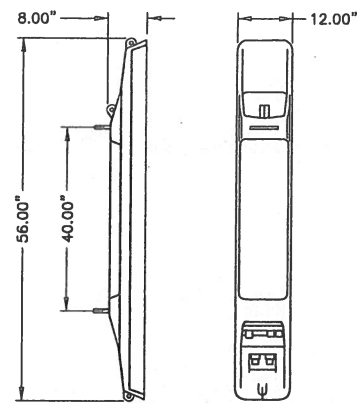
NOTES:

- MOUNT EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS.
- GROUND EQUIPMENT AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
- CONFIRM REQUIRED EQUIPMENT WITH THE LATEST RFDS.

DUAL-PORT TMA DETAIL
SCALE: N.T.S.



AIR21 MOUNT/CLAMP
SCALE: N.T.S.

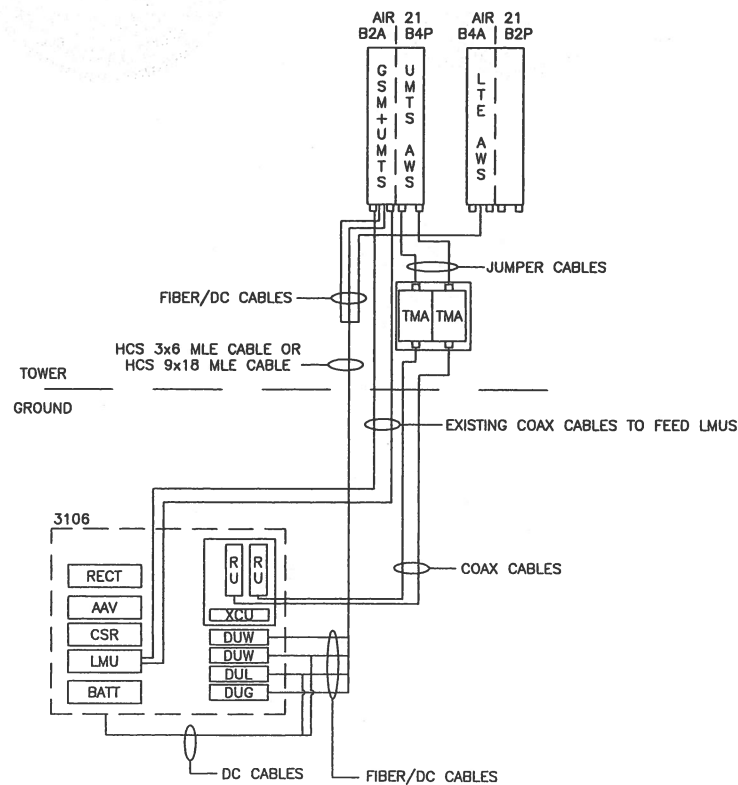


WEIGHT: 83 LBS.

NOTES:

- MOUNT ANTENNAS PER MANUFACTURER'S RECOMMENDATIONS.
- GROUND ANTENNAS AND MOUNTS PER MANUFACTURER'S RECOMMENDATIONS AND T-MOBILE STANDARDS.
- CONFIRM REQUIRED ANTENNAS WITH THE LATEST RFDS.

AIR21 ANTENNA DETAIL
SCALE: N.T.S.

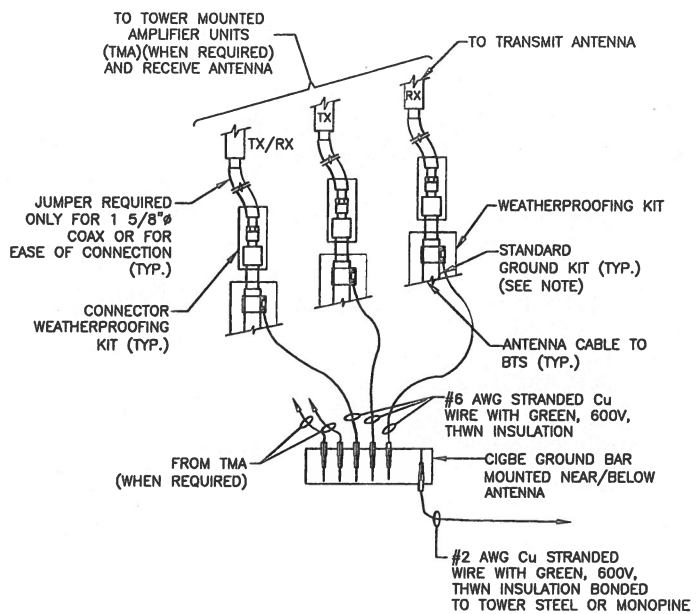


SITE CONFIGURATION
SCALE: N.T.S.

DESIGN CONFIGURATION						
	ANTENNAS		COAX		COAX LENGTH	HCS LENGTH
	EXISTING	PROPOSED	EXISTING	PROPOSED		
ALPHA	EXISTING RFS ANTENNA	ERICSSON AIR21 ANTENNA	(4) 7/8"	-	158'	(1) 1-5/8" @ 158' (ROUND UP TO NEXT AVAILABLE CABLE LENGTH)
	EXISTING RFS ANTENNA	ERICSSON AIR21 ANTENNA	(4) 7/8"	-		
BETA	EXISTING RFS ANTENNA	ERICSSON AIR21 ANTENNA	(4) 7/8"	-	158'	
	EXISTING RFS ANTENNA	ERICSSON AIR21 ANTENNA	(4) 7/8"	-		
GAMMA	EXISTING RFS ANTENNA	ERICSSON AIR21 ANTENNA	(4) 7/8"	-	158'	
	EXISTING RFS ANTENNA	ERICSSON AIR21 ANTENNA	(4) 7/8"	-		

GROUNDING NOTES:

- THE CONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTNING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE CONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE ENGINEER FOR RESOLUTION.
- ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS. ALL AVAILABLE GROUNDING ELECTRODES SHALL BE CONNECTED TOGETHER IN ACCORDANCE WITH THE NEC.
- THE CONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS. USE OF OTHER METHODS MUST BE PRE-APPROVED BY THE ENGINEER IN WRITING.
- THE CONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS ON TOWER SITES AND 10 OHMS OR LESS ON ROOFTOP SITES. WHEN ADDING ELECTRODES, CONTRACTOR SHALL MAINTAIN A MINIMUM DISTANCE BETWEEN THE ADDED ELECTRODE AND ANY OTHER EXISTING ELECTRODE EQUAL TO THE BURIED LENGTH OF THE ROD. IDEALLY, CONTRACTOR SHALL STRIVE TO KEEP THE SEPARATION DISTANCE EQUAL TO TWICE THE BURIED LENGTH OF THE RODS.
- THE CONTRACTOR IS RESPONSIBLE FOR PROPERLY SEQUENCING GROUNDING AND UNDERGROUND CONDUIT INSTALLATION AS TO PREVENT ANY LOSS OF CONTINUITY IN THE GROUNDING SYSTEM OR DAMAGE TO THE CONDUIT.
- METAL CONDUIT AND TRAY SHALL BE GROUNDING AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE AND UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
- METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO TRANSMISSION EQUIPMENT.
- CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED. BACK-TO-BACK CONNECTIONS ON OPPOSITE SIDES OF THE GROUND BUS ARE PERMITTED.
- ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
- USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED. IN ALL CASES, BENDS SHALL BE MADE WITH A MINIMUM BEND RADIUS OF 8 INCHES.
- EACH INTERIOR TRANSMISSION CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH #6 AWG STRANDED, GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRE UNLESS NOTED OTHERWISE IN THE DETAILS. EACH OUTDOOR CABINET FRAME/PLINTH SHALL BE DIRECTLY CONNECTED TO THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER WIRE UNLESS NOTED OTHERWISE IN THE DETAILS.
- ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING, SHALL BE 2 AWG SOLID TIN-PLATED COPPER UNLESS OTHERWISE INDICATED.
- EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE. CONNECTIONS TO ABOVE GRADE UNITS SHALL BE MADE WITH EXOTHERMIC WELDS WHERE PRACTICAL OR WITH 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS. HIGH PRESSURE CRIMP CONNECTORS MAY ONLY BE USED WITH WRITTEN PERMISSION FROM T-MOBILE MARKET REPRESENTATIVE.
- EXOTHERMIC WELDS SHALL BE PERMITTED ON TOWERS ONLY WITH THE EXPRESS APPROVAL OF THE TOWER MANUFACTURER OR THE CONTRACTOR'S STRUCTURAL ENGINEER.
- ALL WIRE TO WIRE GROUND CONNECTIONS TO THE INTERIOR GROUND RING SHALL BE FORMED USING HIGH PRESS CRIMPS OR SPLIT BOLT CONNECTORS WHERE INDICATED IN THE DETAILS.
- ON ROOFTOP SITES WHERE EXOTHERMIC WELDS ARE A FIRE HAZARD COPPER COMPRESSION CAP CONNECTORS MAY BE USED FOR WIRE TO WIRE CONNECTIONS. 2 HOLE MECHANICAL TYPE BRASS CONNECTORS WITH STAINLESS STEEL HARDWARE, INCLUDING SET SCREWS SHALL BE USED FOR CONNECTION TO ALL ROOFTOP TRANSMISSION EQUIPMENT AND STRUCTURAL STEEL.
- COAX BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR USING TWO-HOLE MECHANICAL TYPE BRASS CONNECTORS AND STAINLESS STEEL HARDWARE.
- APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
- ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
- MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
- BOND ALL METALLIC OBJECTS WITHIN 6 FT OF THE BURIED GROUND RING WITH 2 AWG SOLID TIN-PLATED COPPER GROUND CONDUCTOR. DURING EXCAVATION FOR NEW GROUND CONDUCTORS, IF EXISTING GROUND CONDUCTORS ARE ENCOUNTERED, BOND EXISTING GROUND CONDUCTORS TO NEW CONDUCTORS.
- GROUND CONDUCTORS USED IN THE FACILITY GROUND AND LIGHTNING PROTECTION SYSTEMS SHALL NOT BE ROUTED THROUGH METALLIC OBJECTS THAT FORM A RING AROUND THE CONDUCTOR, SUCH AS METALLIC CONDUITS, METAL SUPPORT CLIPS OR SLEEVES THROUGH WALLS OR FLOORS. WHEN IT IS REQUIRED TO BE HOUSED IN CONDUIT TO MEET CODE REQUIREMENTS OR LOCAL CONDITIONS, NON-METALLIC MATERIAL SUCH AS PVC PLASTIC CONDUIT SHALL BE USED. WHERE USE OF METAL CONDUIT IS UNAVOIDABLE (E.G., NON-METALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT WITH LISTED BONDING FITTINGS.



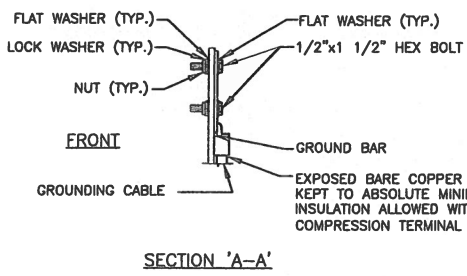
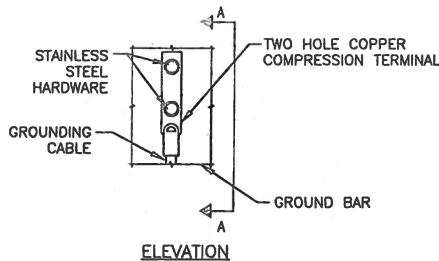
NOTE:

- DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

CONNECTION OF GROUND WIRES TO GROUNDING BAR (CIGBE)

SCALE: N.T.S.

1



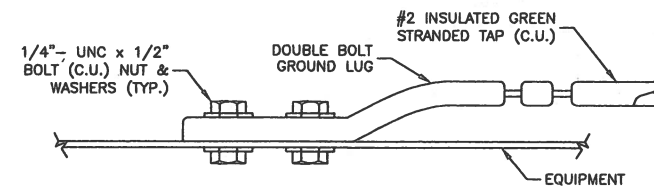
NOTES:

- DOUBLING UP OR STACKING OF CONNECTIONS IS NOT PERMITTED.
- OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR MECHANICAL CONNECTION DETAIL

SCALE: N.T.S.

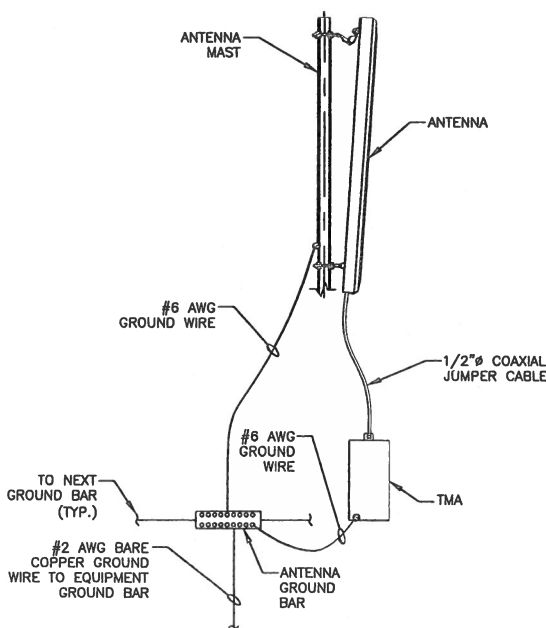
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CONNECTION TO EQUIPMENT DETAIL

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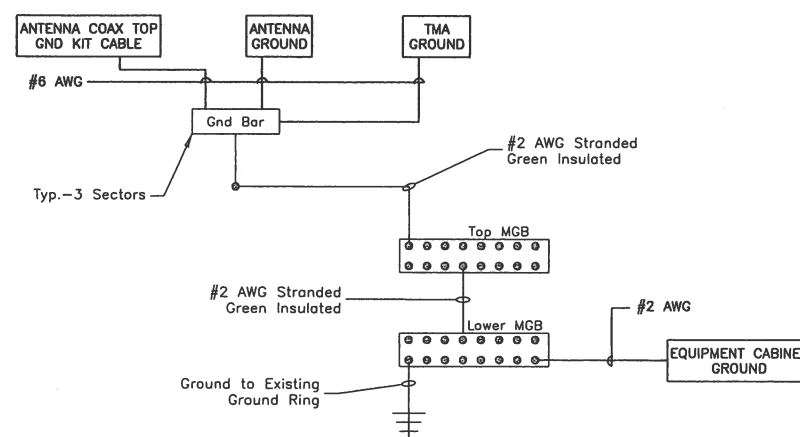
3



TYPICAL ANTENNA GROUNDING DETAIL

SCALE: N.T.S.

4



NOTES:

- BOND ANTENNA GROUNDING KIT CABLE TO TOP CIGBE
- BOND ANTENNA GROUNDING KIT CABLE TO BOTTOM CIGBE.
- SCHEMATIC GROUNDING DIAGRAM IS TYPICAL FOR EACH SECTOR.
- VERIFY EXISTING GROUND SYSTEM IS INSTALLED PER T-MOBILE STANDARDS.

SCHEMATIC GROUNDING DIAGRAM

SCALE: N.T.S.

5



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GRAVEL PIT

CT11423B

115 NORTH MOUNTAIN ROAD
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HARTFORD COUNTY

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REVISIONS

DRAWN BY ALH

CHECKED BY BSH

APPROVED BY GHN

DATE 11/04/14

TITLE

GROUNDING NOTES & DETAILS

PROJECT NO. 50066258/50066275

E - 1

SHEET NO.



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
 250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **October 21, 2014**

David Smith
 Crown Castle
 3530 Toringdon Way, Suite 300
 Charlotte, NC 28277

Paul J. Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 614.221.6679

Subject: Structural Modification Report

Carrier Designation: *T-Mobile Co-Locate*
Carrier Site Number: CT11423B
Carrier Site Name: I-84/New Britain

Crown Castle Designation:
Crown Castle BU Number: 876331
Crown Castle Site Name: NEW BRITAIN GRAVEL PIT
Crown Castle JDE Job Number: 301778
Crown Castle Work Order Number: 930502
Crown Castle Application Number: 260887 Rev. 0

Engineering Firm Designation: Paul J. Ford and Company Project Number: 37513-0921.004.7700

Site Data: 115 North Mountain Rd, NEW BRITAIN, Hartford County, CT
 Latitude 41° 40' 35.72", Longitude -72° 49' 17.09"
 118 Foot - Monopole Tower

Dear David Smith,

Paul J. Ford and Company is pleased to submit this "Structural Modification Report" to determine the structural integrity of the above mentioned tower. This analysis has been performed in accordance with the Crown Castle Structural 'Statement of Work' and the terms of Crown Castle Purchase Order Number 706055, in accordance with application 260887, revision 0.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment **Sufficient Capacity**
 Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

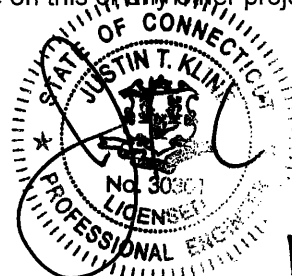
The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

All modifications and equipment proposed in this report shall be installed in accordance with the attached drawings for the determined available structural capacity to be effective.

We at Paul J. Ford and Company appreciate the opportunity of providing our continuing professional services to you and Crown Castle. If you have any questions or need further assistance on this or any other projects please give us a call.

Respectfully submitted by:

Joey Meinerding, E.I.
 Structural Designer



10-23-14



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: **October 21, 2014**

David Smith
Crown Castle
3530 Toringdon Way, Suite 300
Charlotte, NC 28277

Paul J. Ford and Company
250 E. Broad Street, Suite 600
Columbus, OH 43215
614.221.6679

Subject: Structural Modification Report

Carrier Designation:

T-Mobile Co-Locate
Carrier Site Number:
Carrier Site Name:

CT11423B
I-84/New Britain

Crown Castle Designation:

Crown Castle BU Number:
Crown Castle Site Name:
Crown Castle JDE Job Number:
Crown Castle Work Order Number:
Crown Castle Application Number:

876331
NEW BRITAIN GRAVEL PIT
301778
930502
260887 Rev. 0

Engineering Firm Designation:

Paul J. Ford and Company Project Number: 37513-0921.004.7700

Site Data:

115 North Mountain Rd, NEW BRITAIN, Hartford County, CT
Latitude 41° 40' 35.72", Longitude -72° 49' 17.09"
118 Foot - Monopole Tower

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LC4.7: Modified Structure w/ Existing + Reserved + Proposed Equipment
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Sufficient Capacity

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

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Respectfully submitted by:

Joey Meinerding, E.I.
Structural Designer

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Additional Calculations

1) INTRODUCTION

This tower is a 118 ft. monopole tower designed by Rohn in October of 1996. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-E.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of the 2005 Connecticut Building Code and the TIA/EIA-222-F Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a fastest mile wind speed of 80 mph with no ice, 37.6 mph with 0.75 inch ice thickness and 50 mph under service loads.

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
108.0	108.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	1	1-5/8	--
		3	ericsson	ERICSSON AIR 21 B4A B2P w/ Mount Pipe			
		3	ericsson	KRY 112 144/1			

Table 2 - Existing and Reserved Antenna and Cable Information

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
116.0	116.0	3	alcatel lucent	800MHz 2X50W RRH W/FILTER	--	--	1
		1	tower mounts	Pipe Mount [PM 601-3]			
	113.0	3	alcatel lucent	PCS 1900MHz 4x45W-65MHz			
114.0	116.0	3	rfs celwave	APXVTM14-C-120 w/ Mount Pipe	1	1-1/4	2
		3	alcatel lucent	TD-RRH8x20-25			
		1	rfs celwave	APXV9ERR18-C-A20 w/ Mount Pipe	3	1-1/4	1
		2	rfs celwave	APXVSPP18-C-A20 w/ Mount Pipe			
	114.0	1	tower mounts	Platform Mount [LP 501-1]			
108.0	108.0	3	andrew	ONEBASE TWIN DUAL DUPLEX TMA	--	--	3
		3	rfs celwave	APX16DWV-16DWV-S-E-ACU w/ Mount Pipe			
		3	rfs celwave	APX16PV-16PVL-E w/ Mount Pipe			
		1	tower mounts	Sector Mount [SM 802-3]			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note	
98.0	100.0	2	andrew	SBNH-1D6565C w/ Mount Pipe	1 2 12	3/8 3/4 1-1/4	1	
		3	communication components inc.	DTMABP7819VG12A				
		3	ericsson	RRUS-11				
		4	kmw communications	AM-X-CD-16-65-00T-RET w/ Mount Pipe				
		3	powerwave technologies	7770.00 w/ Mount Pipe				
		6	powerwave technologies	LGP13519				
	1	raycap	DC6-48-60-18-8F					
	98.0	1	tower mounts	Platform Mount [LP 712-1]				
85.0	86.0	1	antel	BXA-171040/8CF w/ Mount Pipe	--	--	2	
		1	kathrein	800 10735V01 w/ Mount Pipe				
		6	andrew	CBC721-DF	12	1-5/8	1	
		2	antel	BXA-171063/8CFx2 w/ Mount Pipe				
		2	antel	BXA-70063-6CF-2 w/ Mount Pipe				
		2	antel	LPA-4016 w/ Mount Pipe				
	4	antel	LPA-80063/4CF w/ Mount Pipe					
	85.0	1	tower mounts	Platform Mount [LP 303-1]				
80.0	81.0	1	lucent	KS24019-L112A	1	1/2	1	
	80.0	1	tower mounts	Side Arm Mount [SO 701-1]				
72.0	74.0	2	argus technologies	LLPX310R w/ Mount Pipe	3 3 2	5/8 1/4 1/2	1	
		1	dragonwave	HORIZON COMPACT				
		1	samsung telecommunications	WIMAX DAP HEAD				
	73.0	1	andrew	VHLP1-23				
		1	samsung telecommunications	WIMAX DAP HEAD				
	72.0	72.0	1	argus technologies				LLPX310R w/ Mount Pipe
			1	dragonwave				A-ANT-18G-2-C
			1	dragonwave				HORIZON COMPACT
			1	samsung telecommunications				WIMAX DAP HEAD
		1	tower mounts	Side Arm Mount [SO 101-3]				

Notes:

- 1) Existing Equipment
- 2) Reserved Equipment
- 3) Equipment To Be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH, 07-11435G, 01/23/2008	2192549	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 126879, 03/07/2013	3684848	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Rohn, 34738SW, 10/24/1996	1947809	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Rohn, 34738SW, 10/24/1996	1947800	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 41707-0508, 05/23/2008	2268906	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-0921 BP A, 04/11/2014	4858411	CCISITES
4-TOWER PROPOSED REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-0921.004.7700, 10/20/2014	--	PJF

3.1) Analysis Method

tnxTower (version 6.1.4.1), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
- 4) Monopole was reinforced in conformance with the referenced modification drawings.
- 5) The bridge stiffeners take the entire load through the flange connection.
- 6) Monopole will be reinforced in conformance with the attached proposed modification drawings.

This analysis may be affected if any assumptions are not valid or have been made in error. Paul J. Ford and Company should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	118 - 90	Pole	P24x0.25	1	-7.61	589.19	78.0	Pass
L2	90 - 74	Pole	P24x0.375	2	-12.56	934.94	98.9	Pass
L3	74 - 68.75	Pole	RPS 24" x 0.58729"	3	-14.04	1148.06	98.6	Pass
L4	68.75 - 64.5	Pole	RPS 24" x 0.81081"	4	-15.09	1483.43	88.5	Pass
L5	64.5 - 63	Pole	RPS 24" x 0.9855"	5	-15.52	1761.52	78.9	Pass
L6	63 - 60	Pole	RPS 24" x 0.93361"	6	-16.35	1684.45	89.1	Pass
L7	60 - 49.25	Pole	RPS 30" x 0.62249"	7	-20.21	1744.23	86.2	Pass
L8	49.25 - 42	Pole	RPS 30" x 0.77273"	8	-22.29	2119.52	82.8	Pass
L9	42 - 34.5	Pole	RPS 30" x 0.89547"	9	-24.73	2456.35	82.3	Pass
L10	34.5 - 34	Pole	RPS 30" x 1.00259"	10	-24.91	2740.06	74.9	Pass
L11	34 - 30	Pole	RPS 30" x 0.87892"	11	-26.20	2407.17	90.2	Pass
L12	30 - 28.5	Pole	RPS 36" x 0.57507"	12	-27.88	1836.59	98.7	Pass
L13	28.5 - 23.25	Pole	RPS 36" x 0.7026"	13	-29.51	2220.86	89.0	Pass
L14	23.25 - 21.5	Pole	RPS 36" x 0.80854"	14	-30.12	2549.48	80.0	Pass
L15	21.5 - 19	Pole	RPS 36" x 0.67863"	15	-30.88	2121.84	98.9	Pass
L16	19 - 12.7	Pole	RPS 36" x 0.83577"	16	-33.16	2607.45	88.3	Pass
L17	12.7 - 7.5	Pole	RPS 36" x 0.84294"	17	-35.05	2569.72	95.7	Pass
L18	7.5 - 3.75	Pole	RPS 36" x 0.83577"	18	-36.41	2607.45	98.7	Pass
L19	3.75 - 2.75	Pole	RPS 36" x 1.16096"	19	-36.90	3376.09	78.5	Pass
L20	2.75 - 2	Pole	RPS 36" x 1.02422"	20	-37.22	3202.56	82.9	Pass
L21	2 - 1	Pole	RPS 36" x 0.88991"	21	-37.60	2808.99	94.9	Pass
L22	1 - 0	Pole	RPS 36" x 1.90977"	22	-38.34	3212.80	88.7	Pass
							Summary	
						Pole (L2)	98.9	Pass
						Rating =	98.9	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	96.6	Pass
1	Base Plate	0	85.5	Pass
1	Base Foundation Structural Steel	0	77.0	Pass
1	Base Foundation Soil Interaction	0	68.1	Pass
1	Flange Connection	30	92.1	Pass
1	Flange Connection	60	67.6	Pass
1	Flange Connection	90	34.1	Pass

Structure Rating (max from all components) =	98.9%
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Notes:

- 1) See additional documentation in "Appendix C – Additional Calculations" for calculations supporting the % capacity consumed.

4.1) Recommendations

Install the proposed modifications per the attached drawings.

APPENDIX A
TNXTOWER OUTPUT

Tower Input Data

There is a pole section.

This tower is designed using the TIA/EIA-222-F standard.

The following design criteria apply:

- 1) Tower is located in Hartford County, Connecticut.
- 2) Basic wind speed of 80.0 mph.
- 3) Nominal ice thickness of 1.00 in.
- 4) Ice density of 56 pcf.
- 5) A wind speed of 37.6 mph is used in combination with ice.
- 6) Temperature drop of 50 °F.
- 7) Deflections calculated using a wind speed of 50.0 mph.
- 8) A non-linear (P-delta) analysis was used.
- 9) Pressures are calculated at each section.
- 10) Stress ratio used in pole design is 1.333.
- 11) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs Consider Moments - Horizontals Consider Moments - Diagonals Use Moment Magnification ✓ Use Code Stress Ratios ✓ Use Code Safety Factors - Guys Escalate Ice Always Use Max Kz Use Special Wind Profile Include Bolts In Member Capacity Leg Bolts Are At Top Of Section Secondary Horizontal Braces Leg Use Diamond Inner Bracing (4 Sided) Add IBC .6D+W Combination	Distribute Leg Loads As Uniform Assume Legs Pinned ✓ Assume Rigid Index Plate ✓ Use Clear Spans For Wind Area Use Clear Spans For KL/r Retension Guys To Initial Tension ✓ Bypass Mast Stability Checks ✓ Use Azimuth Dish Coefficients ✓ Project Wind Area of Appurt. Autocalc Torque Arm Areas SR Members Have Cut Ends Sort Capacity Reports By Component Triangulate Diamond Inner Bracing Use TIA-222-G Tension Splice Capacity Exemption	Treat Feedline Bundles As Cylinder Use ASCE 10 X-Brace Ly Rules Calculate Redundant Bracing Forces ✓ Ignore Redundant Members in FEA SR Leg Bolts Resist Compression All Leg Panels Have Same Allowable Offset Girt At Foundation Consider Feedline Torque Include Angle Block Shear Check <div style="text-align: center; background-color: #e0e0e0; padding: 2px;">Poles</div> ✓ Include Shear-Torsion Interaction Always Use Sub-Critical Flow Use Top Mounted Sockets
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Pole Section Geometry

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L1	118.00-90.00	28.00	P24x0.25	A572-42 (42 ksi)	5.00
L2	85.00-69.00	16.00	P24x0.375	A572-42 (42 ksi)	5.00
L3	69.00-63.75	5.25	RPS 24" x 0.58729"	Reinf 33.23 ksi (33 ksi)	5.00
L4	63.75-59.50	4.25	RPS 24" x 0.81081"	Reinf 31.40 ksi (31 ksi)	5.00
L5	59.50-58.00	1.50	RPS 24" x 0.9855"	Reinf 30.91 ksi (31 ksi)	5.00
L6	58.00-55.00	3.00	RPS 24" x 0.93361"	Reinf 31.13 ksi (31 ksi)	5.00
L7	55.00-44.25	10.75	RPS 30" x 0.62249"	Reinf 37.96 ksi (38 ksi)	5.00

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L8	44.25-37.00	7.25	RPS 30" x 0.77273"	Reinf 37.35 ksi (37 ksi)	5.00
L9	37.00-29.50	7.50	RPS 30" x 0.89547"	Reinf 37.51 ksi (38 ksi)	5.00
L10	29.50-29.00	0.50	RPS 30" x 1.00259"	Reinf 37.51 ksi (38 ksi)	5.00
L11	29.00-25.00	4.00	RPS 30" x 0.87892"	Reinf 37.43 ksi (37 ksi)	5.00
L12	25.00-23.50	1.50	RPS 36" x 0.57507"	Reinf 35.88 ksi (36 ksi)	5.00
L13	23.50-18.25	5.25	RPS 36" x 0.7026"	Reinf 35.64 ksi (36 ksi)	5.00
L14	18.25-16.50	1.75	RPS 36" x 0.80854"	Reinf 35.66 ksi (36 ksi)	5.00
L15	16.50-14.00	2.50	RPS 36" x 0.67863"	Reinf 35.23 ksi (35 ksi)	5.00
L16	14.00-7.70	6.30	RPS 36" x 0.83577"	Reinf 35.31 ksi (35 ksi)	5.00
L17	7.70-2.50	5.20	RPS 36" x 0.84294"	Reinf 34.51 ksi (35 ksi)	5.00
L18	2.50-1.25	3.75	RPS 36" x 0.83577"	Reinf 35.31 ksi (35 ksi)	5.00
L19	1.25-0.25	1.00	RPS 36" x 1.16096"	Reinf 33.22 ksi (33 ksi)	5.00
L20	2.25-1.50	0.75	RPS 36" x 1.02422"	Reinf 35.58 ksi (36 ksi)	5.00
L21	3.00-2.00	1.00	RPS 36" x 0.88991"	Reinf 35.78 ksi (36 ksi)	5.00
L22	4.00-3.00	1.00	RPS 36" x 1.90977"	Reinf 19.64 ksi (20 ksi)	

Tower Elevation ft	Gusset Area (per face) ft ²	Gusset Thickness in	Gusset Grade	Adjust. Factor A _t	Adjust. Factor A _r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
L1 118.00-90.00				1	1	1		
L2 90.00-74.00				1	1	1		
L3 74.00-68.75				1	1	1		
L4 68.75-64.50				1	1	1		
L5 64.50-63.00				1	1	1		
L6 63.00-60.00				1	1	1		
L7 60.00-49.25				1	1	1		
L8 49.25-42.00				1	1	1		

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_r	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in
ft	ft ²	in						
L9 42.00-34.50				1	1	1		
L10 34.50-34.00				1	1	1		
L11 34.00-30.00				1	1	1		
L12 30.00-28.50				1	1	1		
L13 28.50-23.25				1	1	1		
L14 23.25-21.50				1	1	1		
L15 21.50-19.00				1	1	1		
L16 19.00-12.70				1	1	1		
L17 12.70-7.50				1	1	1		
L18 7.50-3.75				1	1	1		
L19 3.75-2.75				1	1	1		
L20 2.75-2.00				1	1	1		
L21 2.00-1.00				1	1	1		
L22 1.00-0.00				1	1	1		

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		$C_A A_A$ ft ² /ft	Weight plf
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	114.00 - 0.00	2	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	72.00 - 0.00	1	No Ice	0.00	1.08
						1/2" Ice	0.00	2.33
						1" Ice	0.00	4.18
HB114-1-08U4-M5J(1 1/4")	C	No	CaAa (Out Of Face)	114.00 - 72.00	1	No Ice	0.15	1.08
						1/2" Ice	0.25	2.33
						1" Ice	0.35	4.18
HB114-21U3M12-XXXF(1-1/4")	C	No	CaAa (Out Of Face)	114.00 - 0.00	1	No Ice	0.00	1.22
						1/2" Ice	0.00	2.47
						1" Ice	0.00	4.32

AL5-50(7/8)	C	No	Inside Pole	108.00 - 0.00	12	No Ice	0.00	0.26
						1/2" Ice	0.00	0.26
						1" Ice	0.00	0.26
MLE Hybrid 9Power/18Fiber RL 2(1 5/8)	C	No	Inside Pole	108.00 - 0.00	1	No Ice	0.00	1.07
						1/2" Ice	0.00	1.07
						1" Ice	0.00	1.07

LDF6-50A(1-1/4")	C	No	Inside Pole	98.00 - 0.00	12	No Ice	0.00	0.66
						1/2" Ice	0.00	0.66
						1" Ice	0.00	0.66
FB-L98B-002-75000(3/8")	C	No	Inside Pole	98.00 - 0.00	1	No Ice	0.00	0.06
						1/2" Ice	0.00	0.06
						1" Ice	0.00	0.06
WR-VG86ST-BRD(3/4)	C	No	Inside Pole	98.00 - 0.00	2	No Ice	0.00	0.59
						1/2" Ice	0.00	0.59
						1" Ice	0.00	0.59
2" Conduit	C	No	Inside Pole	98.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	1.16
						1" Ice	0.00	1.16

LDF7-50A(1-5/8")	C	No	CaAa (Out Of	85.00 - 0.00	10	No Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number	C _A A _A		Weight
						ft ² /ft	plf	
LDF7-50A(1-5/8")	C	No	CaAa (Out Of Face)	85.00 - 0.00	2	1/2" Ice	0.00	2.33
						1" Ice	0.00	4.46
						No Ice	0.20	0.82
						1/2" Ice	0.30	2.33
						1" Ice	0.40	4.46

LDF4-50A(1/2")	C	No	CaAa (Out Of Face)	80.00 - 0.00	1	No Ice	0.00	0.15
						1/2" Ice	0.00	0.84
						1" Ice	0.00	2.14
1" Conduit	C	No	CaAa (Out Of Face)	80.00 - 0.00	1	No Ice	0.00	0.46
						1/2" Ice	0.00	1.33
						1" Ice	0.00	2.81

FSJ1-50A(1/4")	C	No	CaAa (Out Of Face)	72.00 - 0.00	3	No Ice	0.00	0.04
						1/2" Ice	0.00	0.53
						1" Ice	0.00	1.62
FSJ4P-50B-1(1/2")	C	No	CaAa (Out Of Face)	72.00 - 0.00	2	No Ice	0.00	0.14
						1/2" Ice	0.00	0.77
						1" Ice	0.00	2.01
HJ4.5-50(5/8")	C	No	CaAa (Out Of Face)	72.00 - 0.00	3	No Ice	0.00	0.40
						1/2" Ice	0.00	1.24
						1" Ice	0.00	2.69
2" Conduit	C	No	CaAa (Out Of Face)	72.00 - 0.00	1	No Ice	0.00	1.16
						1/2" Ice	0.00	2.53
						1" Ice	0.00	4.51
2" Conduit	C	No	CaAa (Out Of Face)	72.00 - 0.00	1	No Ice	0.17	1.16
						1/2" Ice	0.27	2.53
						1" Ice	0.37	4.51

1" Flat Reinforcement	C	No	CaAa (Out Of Face)	60.00 - 0.00	1	No Ice	0.17	0.00
						1/2" Ice	0.28	0.00
						1" Ice	0.39	0.00
3/4" Flat Reinforcement	C	No	CaAa (Out Of Face)	75.00 - 60.00	1	No Ice	0.13	0.00
						1/2" Ice	0.24	0.00
						1" Ice	0.35	0.00

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	118.00-90.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.696	0.27
L2	90.00-74.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.945	0.42
L3	74.00-68.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.609	0.17
L4	68.75-64.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.954	0.14
L5	64.50-63.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.043	0.05
L6	63.00-60.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.085	0.10
L7	60.00-49.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	7.919	0.36
L8	49.25-42.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.341	0.24
L9	42.00-34.50	A	0.000	0.000	0.000	0.000	0.00

Tower Section n	Tower Elevation ft	Face	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L10	34.50-34.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.525	0.25
		A	0.000	0.000	0.000	0.000	0.00
L11	34.00-30.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.368	0.02
		A	0.000	0.000	0.000	0.000	0.00
L12	30.00-28.50	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.947	0.13
		A	0.000	0.000	0.000	0.000	0.00
L13	28.50-23.25	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.105	0.05
		A	0.000	0.000	0.000	0.000	0.00
L14	23.25-21.50	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.868	0.18
		A	0.000	0.000	0.000	0.000	0.00
L15	21.50-19.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.289	0.06
		A	0.000	0.000	0.000	0.000	0.00
L16	19.00-12.70	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.842	0.08
		A	0.000	0.000	0.000	0.000	0.00
L17	12.70-7.50	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.641	0.21
		A	0.000	0.000	0.000	0.000	0.00
L18	7.50-3.75	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.831	0.17
		A	0.000	0.000	0.000	0.000	0.00
L19	3.75-2.75	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.763	0.13
		A	0.000	0.000	0.000	0.000	0.00
L20	2.75-2.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.737	0.03
		A	0.000	0.000	0.000	0.000	0.00
L21	2.00-1.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.553	0.03
		A	0.000	0.000	0.000	0.000	0.00
L22	1.00-0.00	B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.737	0.03
		A	0.000	0.000	0.000	0.000	0.00

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section n	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
L1	118.00-90.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.496	0.56
L2	90.00-74.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.767	1.12
L3	74.00-68.75	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	7.925	0.56
L4	68.75-64.50	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.448	0.49
L5	64.50-63.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.276	0.17
L6	63.00-60.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	4.552	0.35
L7	60.00-49.25	A	1.000	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A _R ft ²	A _F ft ²	C _A A _A In Face ft ²	C _A A _A Out Face ft ²	Weight K
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.758	1.25
L8	49.25-42.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.302	0.84
L9	42.00-34.50	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	11.692	0.87
L10	34.50-34.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.779	0.06
L11	34.00-30.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	6.236	0.46
L12	30.00-28.50	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.338	0.17
L13	28.50-23.25	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.184	0.61
L14	23.25-21.50	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.728	0.20
L15	21.50-19.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.897	0.29
L16	19.00-12.70	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.821	0.73
L17	12.70-7.50	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.106	0.60
L18	7.50-3.75	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.846	0.43
L19	3.75-2.75	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.559	0.12
L20	2.75-2.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.169	0.09
L21	2.00-1.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.559	0.12
L22	1.00-0.00	A	1.000	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.559	0.12

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustmen t °	Placement ft	C _A A _A Front ft ²	C _A A _A Side ft ²	Weight K	
PCS 1900MHz 4x45W-65MHz	A	From Leg	1.00	0.000	116.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-3.00			Ice	3.20	3.09	0.11
PCS 1900MHz 4x45W-65MHz	B	From Leg	1.00	0.000	116.00	1" Ice	2.71	2.61	0.06
			0.00			No Ice	2.95	2.85	0.08
			-3.00			1/2"	3.20	3.09	0.11
						Ice			
					1" Ice				

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
PCS 1900MHz 4x45W-65MHz	C	From Leg	1.00	0.000	116.00	No Ice	2.71	2.61	0.06
			0.00			1/2"	2.95	2.85	0.08
			-3.00			Ice	3.20	3.09	0.11
800MHz 2X50W RRH W/FILTER	A	From Leg	1.00	0.000	116.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			0.00			Ice	2.83	2.68	0.11
800MHz 2X50W RRH W/FILTER	B	From Leg	1.00	0.000	116.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			0.00			Ice	2.83	2.68	0.11
800MHz 2X50W RRH W/FILTER	C	From Leg	1.00	0.000	116.00	No Ice	2.40	2.25	0.06
			0.00			1/2"	2.61	2.46	0.09
			0.00			Ice	2.83	2.68	0.11
Pipe Mount [PM 601-3]	C	None		0.000	116.00	No Ice	4.39	4.39	0.20
						1/2"	5.48	5.48	0.24
						Ice	6.57	6.57	0.28

APXVSP18-C-A20 w/ Mount Pipe	A	From Leg	4.00	0.000	114.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			2.00			Ice	9.77	9.02	0.23
APXVSP18-C-A20 w/ Mount Pipe	B	From Leg	4.00	0.000	114.00	No Ice	8.50	6.95	0.08
			0.00			1/2"	9.15	8.13	0.15
			2.00			Ice	9.77	9.02	0.23
APXV9ERR18-C-A20 w/ Mount Pipe	C	From Leg	4.00	0.000	114.00	No Ice	8.50	7.47	0.09
			0.00			1/2"	9.15	8.66	0.16
			2.00			Ice	9.77	9.56	0.24
APXVTM14-C-120 w/ Mount Pipe	A	From Leg	4.00	0.000	114.00	No Ice	7.13	4.96	0.08
			0.00			1/2"	7.66	5.75	0.13
			2.00			Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	B	From Leg	4.00	0.000	114.00	No Ice	7.13	4.96	0.08
			0.00			1/2"	7.66	5.75	0.13
			2.00			Ice	8.18	6.47	0.19
APXVTM14-C-120 w/ Mount Pipe	C	From Leg	4.00	0.000	114.00	No Ice	7.13	4.96	0.08
			0.00			1/2"	7.66	5.75	0.13
			2.00			Ice	8.18	6.47	0.19
TD-RRH8x20-25	A	From Leg	4.00	0.000	114.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			2.00			Ice	5.32	2.15	0.13
TD-RRH8x20-25	B	From Leg	4.00	0.000	114.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			2.00			Ice	5.32	2.15	0.13
TD-RRH8x20-25	C	From Leg	4.00	0.000	114.00	No Ice	4.72	1.70	0.07
			0.00			1/2"	5.01	1.92	0.10
			2.00			Ice	5.32	2.15	0.13
(2) 2.375" OD x 4' Mount Pipe	A	From Leg	4.00	0.000	114.00	No Ice	0.87	0.87	0.02
			0.00			1/2"	1.11	1.11	0.03
			0.00			Ice	1.36	1.36	0.04
(2) 2.375" OD x 4' Mount Pipe	B	From Leg	4.00	0.000	114.00	No Ice	0.87	0.87	0.02
			0.00			1/2"	1.11	1.11	0.03
			0.00			Ice	1.36	1.36	0.04
(2) 2.375" OD x 4' Mount Pipe			4.00	0.000	114.00	No Ice	0.87	0.87	0.02
			0.00			1/2"	1.11	1.11	0.03
			0.00			Ice	1.36	1.36	0.04

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft		C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K
(2) 2.375" OD x 4' Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	114.00	No Ice	0.87	0.87	0.02
						1/2"	1.11	1.11	0.03
						Ice	1.36	1.36	0.04
						1" Ice			
Platform Mount [LP 501-1]	C	None		0.000	114.00	No Ice	32.04	32.04	0.98
						1/2"	45.28	45.28	1.28
						Ice	58.51	58.51	1.57
						1" Ice			

ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	6.83	5.64	0.11
						1/2"	7.35	6.48	0.17
						Ice	7.86	7.26	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	6.83	5.64	0.11
						1/2"	7.35	6.48	0.17
						Ice	7.86	7.26	0.23
						1" Ice			
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	6.83	5.64	0.11
						1/2"	7.35	6.48	0.17
						Ice	7.86	7.26	0.23
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	6.82	5.63	0.11
						1/2"	7.34	6.47	0.17
						Ice	7.85	7.25	0.23
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	6.82	5.63	0.11
						1/2"	7.34	6.47	0.17
						Ice	7.85	7.25	0.23
						1" Ice			
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	6.82	5.63	0.11
						1/2"	7.34	6.47	0.17
						Ice	7.85	7.25	0.23
						1" Ice			
KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	0.41	0.20	0.01
						1/2"	0.50	0.27	0.01
						Ice	0.59	0.35	0.02
						1" Ice			
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	0.41	0.20	0.01
						1/2"	0.50	0.27	0.01
						Ice	0.59	0.35	0.02
						1" Ice			
KRY 112 144/1	C	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	0.41	0.20	0.01
						1/2"	0.50	0.27	0.01
						Ice	0.59	0.35	0.02
						1" Ice			
2.375" OD x 4' Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	0.87	0.87	0.02
						1/2"	1.11	1.11	0.03
						Ice	1.36	1.36	0.04
						1" Ice			
2.375" OD x 4' Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	0.87	0.87	0.02
						1/2"	1.11	1.11	0.03
						Ice	1.36	1.36	0.04
						1" Ice			
2.375" OD x 4' Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	108.00	No Ice	0.87	0.87	0.02
						1/2"	1.11	1.11	0.03
						Ice	1.36	1.36	0.04
						1" Ice			
Sector Mount [SM 802-3]	C	None		0.000	108.00	No Ice	24.41	24.41	0.93
						1/2"	31.39	31.39	1.36
						Ice	38.37	38.37	1.79
						1" Ice			

AM-X-CD-16-65-00T-RET w/ Mount Pipe	A	From Leg	4.00	0.000	98.00	No Ice	8.50	6.30	0.07
			0.00			1/2"	9.15	7.48	0.14
			2.00			Ice	9.77	8.37	0.21

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
			Horz Lateral ft	Vert ft						
AM-X-CD-16-65-00T-RET w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	98.00	1" Ice			
			0.00	0.00			No Ice	8.50	6.30	0.07
			2.00	0.00			1/2"	9.15	7.48	0.14
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	98.00	Ice	9.77	8.37	0.21
			0.00	0.00			1" Ice			
			2.00	0.00			No Ice	8.50	6.30	0.07
7770.00 w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	98.00	1/2"	9.15	7.48	0.14
			0.00	0.00			Ice	9.77	8.37	0.21
			2.00	0.00			1" Ice			
7770.00 w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	98.00	No Ice	6.22	4.82	0.09
			0.00	0.00			1/2"	6.71	5.51	0.14
			2.00	0.00			Ice	7.22	6.21	0.21
7770.00 w/ Mount Pipe	C	From Leg	4.00	0.00	0.000	98.00	1" Ice			
			0.00	0.00			No Ice	6.22	4.82	0.09
			2.00	0.00			1/2"	6.71	5.51	0.14
SBNH-1D6565C w/ Mount Pipe	A	From Leg	4.00	0.00	0.000	98.00	Ice	7.22	6.21	0.21
			0.00	0.00			1" Ice			
			2.00	0.00			No Ice	6.22	4.82	0.09
SBNH-1D6565C w/ Mount Pipe	B	From Leg	4.00	0.00	0.000	98.00	1/2"	6.71	5.51	0.14
			0.00	0.00			Ice	7.22	6.21	0.21
			2.00	0.00			1" Ice			
RRUS-11	A	From Leg	4.00	0.00	0.000	98.00	No Ice	11.56	9.72	0.10
			0.00	0.00			1/2"	12.22	11.19	0.19
			2.00	0.00			Ice	12.89	12.59	0.28
RRUS-11	B	From Leg	4.00	0.00	0.000	98.00	1" Ice			
			0.00	0.00			No Ice	11.56	9.72	0.10
			2.00	0.00			1/2"	12.22	11.19	0.19
RRUS-11	C	From Leg	4.00	0.00	0.000	98.00	Ice	12.89	12.59	0.28
			0.00	0.00			1" Ice			
			2.00	0.00			No Ice	3.25	1.37	0.05
(2) LGP13519	A	From Leg	4.00	0.00	0.000	98.00	1/2"	3.49	1.55	0.07
			0.00	0.00			Ice	3.74	1.74	0.09
			2.00	0.00			1" Ice			
(2) LGP13519	B	From Leg	4.00	0.00	0.000	98.00	No Ice	3.25	1.37	0.05
			0.00	0.00			1/2"	3.49	1.55	0.07
			2.00	0.00			Ice	3.74	1.74	0.09
(2) LGP13519	C	From Leg	4.00	0.00	0.000	98.00	1" Ice			
			0.00	0.00			No Ice	3.25	1.37	0.05
			2.00	0.00			1/2"	3.49	1.55	0.07
DTMABP7819VG12A	A	From Leg	4.00	0.00	0.000	98.00	Ice	3.74	1.74	0.09
			0.00	0.00			1" Ice			
			2.00	0.00			No Ice	0.34	0.21	0.01
(2) LGP13519	B	From Leg	4.00	0.00	0.000	98.00	1/2"	0.42	0.28	0.01
			0.00	0.00			Ice	0.51	0.36	0.01
			2.00	0.00			1" Ice			
(2) LGP13519	C	From Leg	4.00	0.00	0.000	98.00	No Ice	0.34	0.21	0.01
			0.00	0.00			1/2"	0.42	0.28	0.01
			2.00	0.00			Ice	0.51	0.36	0.01
DTMABP7819VG12A	A	From Leg	4.00	0.00	0.000	98.00	1" Ice			
			0.00	0.00			No Ice	1.14	0.39	0.02
			2.00	0.00			1/2"	1.28	0.49	0.03
DTMABP7819VG12A	B	From Leg	4.00	0.00	0.000	98.00	Ice	1.44	0.59	0.04
			0.00	0.00			1" Ice			
			2.00	0.00			No Ice	1.14	0.39	0.02
DTMABP7819VG12A	C	From Leg	4.00	0.00	0.000	98.00	1/2"	1.28	0.49	0.03
			0.00	0.00			Ice	1.44	0.59	0.04
			2.00	0.00			1" Ice			

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight	
			Horz	Lateral						Vert
			ft	ft	°	ft	ft ²	ft ²	K	
DC6-48-60-18-8F	A	From Leg	4.00		0.000	98.00	No Ice	2.51	2.51	0.02
			0.00				1/2"	2.74	2.74	0.04
			2.00				Ice	2.98	2.98	0.07
							1" Ice			
Platform Mount [LP 712-1]	C	None			0.000	98.00	No Ice	24.53	24.53	1.34
							1/2"	29.94	29.94	1.65
							Ice	35.35	35.35	1.96
							1" Ice			

(2) LPA-4016 w/ Mount Pipe	A	From Leg	4.00		0.000	85.00	No Ice	10.01	7.46	0.04
			0.00				1/2"	10.52	8.15	0.12
			1.00				Ice	11.04	8.87	0.21
							1" Ice			
(2) LPA-80063/4CF w/ Mount Pipe	B	From Leg	4.00		0.000	85.00	No Ice	7.25	7.26	0.04
			0.00				1/2"	7.72	7.96	0.10
			1.00				Ice	8.20	8.67	0.18
							1" Ice			
(2) LPA-80063/4CF w/ Mount Pipe	C	From Leg	4.00		0.000	85.00	No Ice	7.25	7.26	0.04
			0.00				1/2"	7.72	7.96	0.10
			1.00				Ice	8.20	8.67	0.18
							1" Ice			
BXA-171063/8CFx2 w/ Mount Pipe	B	From Leg	4.00		0.000	85.00	No Ice	3.14	3.51	0.03
			0.00				1/2"	3.52	4.13	0.06
			1.00				Ice	3.92	4.76	0.10
							1" Ice			
BXA-171063/8CFx2 w/ Mount Pipe	C	From Leg	4.00		0.000	85.00	No Ice	3.14	3.51	0.03
			0.00				1/2"	3.52	4.13	0.06
			1.00				Ice	3.92	4.76	0.10
							1" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	A	From Leg	4.00		0.000	85.00	No Ice	7.97	5.80	0.04
			0.00				1/2"	8.61	6.95	0.10
			1.00				Ice	9.22	7.82	0.17
							1" Ice			
BXA-70063-6CF-2 w/ Mount Pipe	B	From Leg	4.00		0.000	85.00	No Ice	7.97	5.80	0.04
			0.00				1/2"	8.61	6.95	0.10
			1.00				Ice	9.22	7.82	0.17
							1" Ice			
(2) CBC721-DF	A	From Leg	4.00		0.000	85.00	No Ice	0.45	0.12	0.00
			0.00				1/2"	0.54	0.18	0.01
			1.00				Ice	0.64	0.26	0.01
							1" Ice			
(2) CBC721-DF	B	From Leg	4.00		0.000	85.00	No Ice	0.45	0.12	0.00
			0.00				1/2"	0.54	0.18	0.01
			1.00				Ice	0.64	0.26	0.01
							1" Ice			
(2) CBC721-DF	C	From Leg	4.00		0.000	85.00	No Ice	0.45	0.12	0.00
			0.00				1/2"	0.54	0.18	0.01
			1.00				Ice	0.64	0.26	0.01
							1" Ice			
800 10735V01 w/ Mount Pipe	A	From Leg	4.00		0.000	85.00	No Ice	9.04	5.49	0.06
			0.00				1/2"	9.72	6.71	0.12
			1.00				Ice	10.37	7.69	0.19
							1" Ice			
BXA-171040/8CF w/ Mount Pipe	C	From Leg	4.00		0.000	85.00	No Ice	5.84	3.61	0.03
			0.00				1/2"	6.30	4.24	0.07
			1.00				Ice	6.76	4.87	0.12
							1" Ice			
Platform Mount [LP 303-1]	C	None			0.000	85.00	No Ice	14.66	14.66	1.25
							1/2"	18.87	18.87	1.48
							Ice	23.08	23.08	1.71
							1" Ice			

KS24019-L112A	A	From Leg	3.00		0.000	80.00	No Ice	0.16	0.16	0.01
			0.00				1/2"	0.22	0.22	0.01
			1.00				Ice	0.30	0.30	0.01

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment t °	Placement ft	C _{AA} Front ft ²	C _{AA} Side ft ²	Weight K	
Side Arm Mount [SO 701-1]	A	None		0.000	80.00	1" Ice No Ice 1/2" Ice 1" Ice	0.85 1.14 1.43 3.01	1.67 2.34 3.01	0.07 0.08 0.09

LLPX310R w/ Mount Pipe	A	From Leg	2.00 0.00 2.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	4.96 5.35 5.75	2.85 3.37 3.90	0.04 0.08 0.12
LLPX310R w/ Mount Pipe	B	From Leg	2.00 0.00 0.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	4.96 5.35 5.75	2.85 3.37 3.90	0.04 0.08 0.12
LLPX310R w/ Mount Pipe	C	From Leg	2.00 0.00 2.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	4.96 5.35 5.75	2.85 3.37 3.90	0.04 0.08 0.12
WIMAX DAP HEAD	A	From Leg	2.00 0.00 2.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	1.80 1.99 2.18	0.78 0.92 1.07	0.03 0.04 0.06
WIMAX DAP HEAD	B	From Leg	2.00 0.00 0.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	1.80 1.99 2.18	0.78 0.92 1.07	0.03 0.04 0.06
WIMAX DAP HEAD	B	From Leg	2.00 0.00 1.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	1.80 1.99 2.18	0.78 0.92 1.07	0.03 0.04 0.06
HORIZON COMPACT	A	From Leg	2.00 0.00 0.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	0.84 0.97 1.10	0.43 0.52 0.63	0.01 0.02 0.03
HORIZON COMPACT	C	From Leg	2.00 0.00 2.00	0.000	72.00	No Ice 1/2" Ice 1" Ice	0.84 0.97 1.10	0.43 0.52 0.63	0.01 0.02 0.03
Side Arm Mount [SO 101-3]	C	None		0.000	72.00	No Ice 1/2" Ice 1" Ice	7.50 8.90 10.30	7.50 8.90 10.30	0.25 0.33 0.41

Bridge Stiffener (84" x 14.5" x 1.25")	A	None		0.000	90.00	No Ice 1/2" Ice 1" Ice	11.84 12.48 13.14	1.46 2.25 3.06	0.43 0.48 0.53
Bridge Stiffener (84" x 14.5" x 1.25")	B	None		0.000	90.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.43 0.48 0.53
Bridge Stiffener (84" x 14.5" x 1.25")	C	None		0.000	90.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.43 0.48 0.53

Bridge Stiffener (84" x 14.5" x 1.25")	A	None		0.000	60.00	No Ice 1/2" Ice 1" Ice	11.84 12.48 13.14	1.46 2.25 3.06	0.43 0.48 0.53
Bridge Stiffener (84" x 14.5" x 1.25")	B	None		0.000	60.00	No Ice 1/2" Ice 1" Ice	0.00 0.00 0.00	0.00 0.00 0.00	0.43 0.48 0.53
Bridge Stiffener (84" x 14.5" x 1.25")	C	None		0.000	60.00	No Ice	0.00	0.00	0.43

Description	Face or Leg	Offset Type	Offsets:			Azimuth Adjustment	Placement	C _{AA} _{Front}	C _{AA} _{Side}	Weight
			Horz	Lateral	Vert					
14.5" x 1.25")							1/2"	0.00	0.00	0.48
							Ice	0.00	0.00	0.53
							1" Ice			

Bridge Stiffener (84" x 14.5" x 1.25")	A	None			0.000	30.00	No Ice	11.84	1.46	0.43
							1/2"	12.48	2.25	0.48
							Ice	13.14	3.06	0.53
							1" Ice			
Bridge Stiffener (84" x 14.5" x 1.25")	B	None			0.000	30.00	No Ice	0.00	0.00	0.43
							1/2"	0.00	0.00	0.48
							Ice	0.00	0.00	0.53
							1" Ice			
Bridge Stiffener (84" x 14.5" x 1.25")	C	None			0.000	30.00	No Ice	0.00	0.00	0.43
							1/2"	0.00	0.00	0.48
							Ice	0.00	0.00	0.53
							1" Ice			

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets:			Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				Horz	Lateral	Vert						
A-ANT-18G-2-C	A	Paraboloid w/Radome	From Leg	2.00	0.00	0.000		72.00	2.17	No Ice	3.72	0.03
				0.00						1/2" Ice	4.01	0.04
				0.00						1" Ice	4.30	0.05
VHLP1-23	B	Paraboloid w/o Radome	From Leg	2.00	0.00	0.000		72.00	1.27	No Ice	1.28	0.01
				0.00						1/2" Ice	1.45	0.02
				1.00						1" Ice	1.62	0.03

Tower Pressures - No Ice

$G_H = 1.690$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _{AA} _{In}	C _{AA} _{Out}
ft	ft		psf	ft ²		ft ²	ft ²	ft ²		ft ²	ft ²
L1 118.00-90.00	104.00	1.388	23	56.000	A	0.000	56.000	56.000	100.00	0.000	0.000
					B	0.000	56.000	56.000	100.00	0.000	0.000
					C	0.000	56.000	56.000	100.00	0.000	3.696
L2 90.00-74.00	82.00	1.297	21	32.000	A	0.000	32.000	32.000	100.00	0.000	0.000
					B	0.000	32.000	32.000	100.00	0.000	0.000
					C	0.000	32.000	32.000	100.00	0.000	6.945
L3 74.00-68.75	71.38	1.247	20	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500	10.500	100.00	0.000	0.000
					C	0.000	10.500	10.500	100.00	0.000	3.609
L4 68.75-64.50	66.63	1.222	20	8.500	A	0.000	8.500	8.500	100.00	0.000	0.000
					B	0.000	8.500	8.500	100.00	0.000	0.000
					C	0.000	8.500	8.500	100.00	0.000	2.954
L5 64.50-63.00	63.75	1.207	20	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000	3.000	100.00	0.000	0.000
					C	0.000	3.000	3.000	100.00	0.000	1.043
L6 63.00-60.00	61.50	1.195	20	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000	6.000	100.00	0.000	0.000
					C	0.000	6.000	6.000	100.00	0.000	0.000

Section Elevation ft	z ft	K _Z	q _z psf	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L7 60.00-49.25	54.63	1.155	19	26.875	C	0.000	6.000	26.875	100.00	0.000	2.085
					A	0.000	26.875	26.875	100.00	0.000	0.000
					B	0.000	26.875	26.875	100.00	0.000	0.000
					C	0.000	26.875	26.875	100.00	0.000	7.919
L8 49.25-42.00	45.63	1.097	18	18.125	A	0.000	18.125	18.125	100.00	0.000	0.000
					B	0.000	18.125	18.125	100.00	0.000	0.000
					C	0.000	18.125	18.125	100.00	0.000	5.341
L9 42.00-34.50	38.25	1.043	17	18.750	A	0.000	18.750	18.750	100.00	0.000	0.000
					B	0.000	18.750	18.750	100.00	0.000	0.000
					C	0.000	18.750	18.750	100.00	0.000	5.525
L10 34.50-34.00	34.25	1.011	17	1.250	A	0.000	1.250	1.250	100.00	0.000	0.000
					B	0.000	1.250	1.250	100.00	0.000	0.000
					C	0.000	1.250	1.250	100.00	0.000	0.368
L11 34.00-30.00	32.00	1	16	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000	10.000	100.00	0.000	0.000
					C	0.000	10.000	10.000	100.00	0.000	2.947
L12 30.00-28.50	29.25	1	16	4.500	A	0.000	4.500	4.500	100.00	0.000	0.000
					B	0.000	4.500	4.500	100.00	0.000	0.000
					C	0.000	4.500	4.500	100.00	0.000	1.105
L13 28.50-23.25	25.88	1	16	15.750	A	0.000	15.750	15.750	100.00	0.000	0.000
					B	0.000	15.750	15.750	100.00	0.000	0.000
					C	0.000	15.750	15.750	100.00	0.000	3.868
L14 23.25-21.50	22.38	1	16	5.250	A	0.000	5.250	5.250	100.00	0.000	0.000
					B	0.000	5.250	5.250	100.00	0.000	0.000
					C	0.000	5.250	5.250	100.00	0.000	1.289
L15 21.50-19.00	20.25	1	16	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500	7.500	100.00	0.000	0.000
					C	0.000	7.500	7.500	100.00	0.000	1.842
L16 19.00-12.70	15.85	1	16	18.900	A	0.000	18.900	18.900	100.00	0.000	0.000
					B	0.000	18.900	18.900	100.00	0.000	0.000
					C	0.000	18.900	18.900	100.00	0.000	4.641
L17 12.70-7.50	10.10	1	16	15.600	A	0.000	15.600	15.600	100.00	0.000	0.000
					B	0.000	15.600	15.600	100.00	0.000	0.000
					C	0.000	15.600	15.600	100.00	0.000	3.831
L18 7.50-3.75	5.63	1	16	11.250	A	0.000	11.250	11.250	100.00	0.000	0.000
					B	0.000	11.250	11.250	100.00	0.000	0.000
					C	0.000	11.250	11.250	100.00	0.000	2.763
L19 3.75-2.75	3.25	1	16	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000	3.000	100.00	0.000	0.000
					C	0.000	3.000	3.000	100.00	0.000	0.737
L20 2.75-2.00	2.38	1	16	2.250	A	0.000	2.250	2.250	100.00	0.000	0.000
					B	0.000	2.250	2.250	100.00	0.000	0.000
					C	0.000	2.250	2.250	100.00	0.000	0.553
L21 2.00-1.00	1.50	1	16	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000	3.000	100.00	0.000	0.000
					C	0.000	3.000	3.000	100.00	0.000	0.737
L22 1.00-0.00	0.50	1	16	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000	3.000	100.00	0.000	0.000
					C	0.000	3.000	3.000	100.00	0.000	0.737

Tower Pressure - With Ice

$G_H = 1.690$

Section Elevation ft	z ft	K _Z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L1 118.00-90.00	104.00	1.388	5	1.00	60.667	A	0.000	60.667	60.667	100.00	0.000	0.000
						B	0.000	60.667	60.667	100.00	0.000	0.000
						C	0.000	60.667	60.667	100.00	0.000	8.496
L2 90.00-74.00	82.00	1.297	5	1.00	34.667	A	0.000	34.667	34.667	100.00	0.000	0.000
						B	0.000	34.667	34.667	100.00	0.000	0.000
						C	0.000	34.667	34.667	100.00	0.000	14.767
L3 74.00-68.75	71.38	1.247	5	1.00	11.375	A	0.000	11.375	11.375	100.00	0.000	0.000

Section Elevation ft	z ft	K _z	q _z psf	t _z in	A _G ft ²	F a c e	A _F ft ²	A _R ft ²	A _{leg} ft ²	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
L4 68.75-64.50	66.63	1.222	4	1.00	9.208	B	0.000	11.375	9.208	100.00	0.000	0.000
						C	0.000	11.375		100.00	0.000	7.925
						A	0.000	9.208		100.00	0.000	0.000
L5 64.50-63.00	63.75	1.207	4	1.00	3.250	B	0.000	9.208	3.250	100.00	0.000	0.000
						C	0.000	9.208		100.00	0.000	6.448
						A	0.000	3.250		100.00	0.000	0.000
L6 63.00-60.00	61.50	1.195	4	1.00	6.500	B	0.000	3.250	6.500	100.00	0.000	0.000
						C	0.000	3.250		100.00	0.000	2.276
						A	0.000	6.500		100.00	0.000	0.000
L7 60.00-49.25	54.63	1.155	4	1.00	28.667	B	0.000	6.500	28.667	100.00	0.000	0.000
						C	0.000	6.500		100.00	0.000	4.552
						A	0.000	28.667		100.00	0.000	0.000
L8 49.25-42.00	45.63	1.097	4	1.00	19.333	B	0.000	28.667	19.333	100.00	0.000	0.000
						C	0.000	28.667		100.00	0.000	16.758
						A	0.000	19.333		100.00	0.000	0.000
L9 42.00-34.50	38.25	1.043	4	1.00	20.000	B	0.000	19.333	20.000	100.00	0.000	0.000
						C	0.000	19.333		100.00	0.000	11.302
						A	0.000	20.000		100.00	0.000	0.000
L10 34.50-34.00	34.25	1.011	4	1.00	1.333	B	0.000	20.000	1.333	100.00	0.000	0.000
						C	0.000	20.000		100.00	0.000	0.000
						A	0.000	1.333		100.00	0.000	0.000
L11 34.00-30.00	32.00	1	4	1.00	10.667	B	0.000	1.333	10.667	100.00	0.000	0.000
						C	0.000	1.333		100.00	0.000	0.779
						A	0.000	10.667		100.00	0.000	0.000
L12 30.00-28.50	29.25	1	4	1.00	4.750	B	0.000	10.667	4.750	100.00	0.000	0.000
						C	0.000	10.667		100.00	0.000	6.236
						A	0.000	4.750		100.00	0.000	0.000
L13 28.50-23.25	25.88	1	4	1.00	16.625	B	0.000	4.750	16.625	100.00	0.000	0.000
						C	0.000	4.750		100.00	0.000	2.338
						A	0.000	16.625		100.00	0.000	0.000
L14 23.25-21.50	22.38	1	4	1.00	5.542	B	0.000	16.625	5.542	100.00	0.000	0.000
						C	0.000	16.625		100.00	0.000	8.184
						A	0.000	5.542		100.00	0.000	0.000
L15 21.50-19.00	20.25	1	4	1.00	7.917	B	0.000	5.542	7.917	100.00	0.000	0.000
						C	0.000	5.542		100.00	0.000	2.728
						A	0.000	7.917		100.00	0.000	0.000
L16 19.00-12.70	15.85	1	4	1.00	19.950	B	0.000	7.917	19.950	100.00	0.000	0.000
						C	0.000	7.917		100.00	0.000	3.897
						A	0.000	19.950		100.00	0.000	0.000
L17 12.70-7.50	10.10	1	4	1.00	16.467	B	0.000	19.950	16.467	100.00	0.000	0.000
						C	0.000	19.950		100.00	0.000	9.821
						A	0.000	16.467		100.00	0.000	0.000
L18 7.50-3.75	5.63	1	4	1.00	11.875	B	0.000	16.467	11.875	100.00	0.000	0.000
						C	0.000	16.467		100.00	0.000	8.106
						A	0.000	11.875		100.00	0.000	0.000
L19 3.75-2.75	3.25	1	4	1.00	3.167	B	0.000	11.875	3.167	100.00	0.000	0.000
						C	0.000	11.875		100.00	0.000	5.846
						A	0.000	3.167		100.00	0.000	0.000
L20 2.75-2.00	2.38	1	4	1.00	2.375	B	0.000	3.167	2.375	100.00	0.000	0.000
						C	0.000	3.167		100.00	0.000	1.559
						A	0.000	2.375		100.00	0.000	0.000
L21 2.00-1.00	1.50	1	4	1.00	3.167	B	0.000	2.375	3.167	100.00	0.000	1.169
						C	0.000	2.375		100.00	0.000	0.000
						A	0.000	3.167		100.00	0.000	0.000
L22 1.00-0.00	0.50	1	4	1.00	3.167	B	0.000	3.167	3.167	100.00	0.000	0.000
						C	0.000	3.167		100.00	0.000	1.559
						A	0.000	3.167		100.00	0.000	0.000

Tower Pressure - Service

$G_H = 1.690$

Section Elevation	z	K _Z	q _z	A _G	F a c e	A _F	A _R	A _{leg}	Leg %	C _A A _A In Face ft ²	C _A A _A Out Face ft ²
ft	ft		psf	ft ²		ft ²	ft ²	ft ²			
L1 118.00-90.00	104.00	1.388	9	56.000	A	0.000	56.000	56.000	100.00	0.000	0.000
					B	0.000	56.000		100.00	0.000	0.000
					C	0.000	56.000		100.00	0.000	3.696
L2 90.00-74.00	82.00	1.297	8	32.000	A	0.000	32.000	32.000	100.00	0.000	0.000
					B	0.000	32.000		100.00	0.000	0.000
					C	0.000	32.000		100.00	0.000	6.945
L3 74.00-68.75	71.38	1.247	8	10.500	A	0.000	10.500	10.500	100.00	0.000	0.000
					B	0.000	10.500		100.00	0.000	0.000
					C	0.000	10.500		100.00	0.000	3.609
L4 68.75-64.50	66.63	1.222	8	8.500	A	0.000	8.500	8.500	100.00	0.000	0.000
					B	0.000	8.500		100.00	0.000	0.000
					C	0.000	8.500		100.00	0.000	2.954
L5 64.50-63.00	63.75	1.207	8	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000		100.00	0.000	0.000
					C	0.000	3.000		100.00	0.000	1.043
L6 63.00-60.00	61.50	1.195	8	6.000	A	0.000	6.000	6.000	100.00	0.000	0.000
					B	0.000	6.000		100.00	0.000	0.000
					C	0.000	6.000		100.00	0.000	2.085
L7 60.00-49.25	54.63	1.155	7	26.875	A	0.000	26.875	26.875	100.00	0.000	0.000
					B	0.000	26.875		100.00	0.000	0.000
					C	0.000	26.875		100.00	0.000	7.919
L8 49.25-42.00	45.63	1.097	7	18.125	A	0.000	18.125	18.125	100.00	0.000	0.000
					B	0.000	18.125		100.00	0.000	0.000
					C	0.000	18.125		100.00	0.000	5.341
L9 42.00-34.50	38.25	1.043	7	18.750	A	0.000	18.750	18.750	100.00	0.000	0.000
					B	0.000	18.750		100.00	0.000	0.000
					C	0.000	18.750		100.00	0.000	5.525
L10 34.50-34.00	34.25	1.011	6	1.250	A	0.000	1.250	1.250	100.00	0.000	0.000
					B	0.000	1.250		100.00	0.000	0.000
					C	0.000	1.250		100.00	0.000	0.368
L11 34.00-30.00	32.00	1	6	10.000	A	0.000	10.000	10.000	100.00	0.000	0.000
					B	0.000	10.000		100.00	0.000	0.000
					C	0.000	10.000		100.00	0.000	2.947
L12 30.00-28.50	29.25	1	6	4.500	A	0.000	4.500	4.500	100.00	0.000	0.000
					B	0.000	4.500		100.00	0.000	0.000
					C	0.000	4.500		100.00	0.000	1.105
L13 28.50-23.25	25.88	1	6	15.750	A	0.000	15.750	15.750	100.00	0.000	0.000
					B	0.000	15.750		100.00	0.000	0.000
					C	0.000	15.750		100.00	0.000	3.868
L14 23.25-21.50	22.38	1	6	5.250	A	0.000	5.250	5.250	100.00	0.000	0.000
					B	0.000	5.250		100.00	0.000	0.000
					C	0.000	5.250		100.00	0.000	1.289
L15 21.50-19.00	20.25	1	6	7.500	A	0.000	7.500	7.500	100.00	0.000	0.000
					B	0.000	7.500		100.00	0.000	0.000
					C	0.000	7.500		100.00	0.000	1.842
L16 19.00-12.70	15.85	1	6	18.900	A	0.000	18.900	18.900	100.00	0.000	0.000
					B	0.000	18.900		100.00	0.000	0.000
					C	0.000	18.900		100.00	0.000	4.641
L17 12.70-7.50	10.10	1	6	15.600	A	0.000	15.600	15.600	100.00	0.000	0.000
					B	0.000	15.600		100.00	0.000	0.000
					C	0.000	15.600		100.00	0.000	3.831
L18 7.50-3.75	5.63	1	6	11.250	A	0.000	11.250	11.250	100.00	0.000	0.000
					B	0.000	11.250		100.00	0.000	0.000
					C	0.000	11.250		100.00	0.000	2.763
L19 3.75-2.75	3.25	1	6	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000		100.00	0.000	0.000
					C	0.000	3.000		100.00	0.000	0.737
L20 2.75-2.00	2.38	1	6	2.250	A	0.000	2.250	2.250	100.00	0.000	0.000
					B	0.000	2.250		100.00	0.000	0.000
					C	0.000	2.250		100.00	0.000	0.553
L21 2.00-1.00	1.50	1	6	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000		100.00	0.000	0.000
					C	0.000	3.000		100.00	0.000	0.737
L22 1.00-0.00	0.50	1	6	3.000	A	0.000	3.000	3.000	100.00	0.000	0.000
					B	0.000	3.000		100.00	0.000	0.000
					C	0.000	3.000		100.00	0.000	0.737

Load Combinations

Comb. No.	Description
1	Dead Only
2	Dead+Wind 0 deg - No Ice
3	Dead+Wind 30 deg - No Ice
4	Dead+Wind 60 deg - No Ice
5	Dead+Wind 90 deg - No Ice
6	Dead+Wind 120 deg - No Ice
7	Dead+Wind 150 deg - No Ice
8	Dead+Wind 180 deg - No Ice
9	Dead+Wind 210 deg - No Ice
10	Dead+Wind 240 deg - No Ice
11	Dead+Wind 270 deg - No Ice
12	Dead+Wind 300 deg - No Ice
13	Dead+Wind 330 deg - No Ice
14	Dead+Ice+Temp
15	Dead+Wind 0 deg+Ice+Temp
16	Dead+Wind 30 deg+Ice+Temp
17	Dead+Wind 60 deg+Ice+Temp
18	Dead+Wind 90 deg+Ice+Temp
19	Dead+Wind 120 deg+Ice+Temp
20	Dead+Wind 150 deg+Ice+Temp
21	Dead+Wind 180 deg+Ice+Temp
22	Dead+Wind 210 deg+Ice+Temp
23	Dead+Wind 240 deg+Ice+Temp
24	Dead+Wind 270 deg+Ice+Temp
25	Dead+Wind 300 deg+Ice+Temp
26	Dead+Wind 330 deg+Ice+Temp
27	Dead+Wind 0 deg - Service
28	Dead+Wind 30 deg - Service
29	Dead+Wind 60 deg - Service
30	Dead+Wind 90 deg - Service
31	Dead+Wind 120 deg - Service
32	Dead+Wind 150 deg - Service
33	Dead+Wind 180 deg - Service
34	Dead+Wind 210 deg - Service
35	Dead+Wind 240 deg - Service
36	Dead+Wind 270 deg - Service
37	Dead+Wind 300 deg - Service
38	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	118 - 90	Pole	Max Tension	27	0.00	0	0
			Max. Compression	14	-15.44	0	1
			Max. Mx	5	-7.62	-219	0
			Max. My	2	-7.61	0	220
			Max. Vy	5	12.73	-219	0
			Max. Vx	2	-12.74	0	220
			Max. Torque	12			-1
L2	90 - 74	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-24.01	0	1
			Max. Mx	5	-12.59	-479	0
			Max. My	2	-12.56	0	484
			Max. Vy	5	17.60	-479	0
			Max. Vx	2	-17.95	0	484
			Max. Torque	12			-2
L3	74 - 68.75	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-26.59	-1	2
			Max. Mx	5	-14.07	-577	0
			Max. My	2	-14.04	0	583
			Max. Vy	11	-18.90	576	1

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L4	68.75 - 64.5	Pole	Max. Vx	8	19.28	-1	-582
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-28.07	-1	2
			Max. Mx	5	-15.12	-657	0
			Max. My	2	-15.09	1	666
			Max. Vy	11	-19.17	657	1
			Max. Vx	8	19.54	-1	-665
L5	64.5 - 63	Pole	Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-28.65	-1	2
			Max. Mx	5	-15.55	-686	0
			Max. My	2	-15.52	1	695
			Max. Vy	11	-19.26	686	1
			Max. Vx	8	19.64	-1	-694
			Max. Torque	12			-2
L6	63 - 60	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-29.78	-1	2
			Max. Mx	5	-16.38	-744	0
			Max. My	2	-16.35	1	754
			Max. Vy	11	-19.44	744	1
			Max. Vx	8	19.82	-1	-753
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
L7	60 - 49.25	Pole	Max. Compression	14	-35.13	-1	2
			Max. Mx	5	-20.23	-961	-1
			Max. My	2	-20.21	2	976
			Max. Vy	11	-20.59	961	2
			Max. Vx	8	20.97	-1	-975
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-37.99	-1	2
L8	49.25 - 42	Pole	Max. Mx	11	-22.31	1112	2
			Max. My	2	-22.29	3	1129
			Max. Vy	11	-21.03	1112	2
			Max. Vx	8	21.41	-2	-1128
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-41.24	-1	2
			Max. Mx	11	-24.74	1271	2
L9	42 - 34.5	Pole	Max. My	2	-24.73	3	1291
			Max. Vy	11	-21.45	1271	2
			Max. Vx	8	21.82	-2	-1291
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-41.47	-1	2
			Max. Mx	11	-24.93	1282	2
			Max. My	2	-24.91	3	1302
L10	34.5 - 34	Pole	Max. Vy	11	-21.47	1282	2
			Max. Vx	8	21.85	-2	-1301
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-43.18	-1	2
			Max. Mx	11	-26.21	1368	3
			Max. My	2	-26.20	4	1390
			Max. Vy	11	-21.66	1368	3
L11	34 - 30	Pole	Max. Vx	8	22.04	-2	-1389
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-45.34	-1	2
			Max. Mx	11	-27.89	1401	3
			Max. My	2	-27.88	4	1424
			Max. Vy	11	-22.10	1401	3
			Max. Vx	8	22.48	-2	-1423
L12	30 - 28.5	Pole	Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-47.58	-1	2
			Max. Mx	11	-29.53	1518	3
			Max. My	2	-29.51	4	1542
			Max. Vy	11	-29.51	4	1542
			Max. Vx	8	22.48	-2	-1423
			Max. Torque	12			-2
L13	28.5 - 23.25	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-47.58	-1	2
			Max. Mx	11	-29.53	1518	3
			Max. My	2	-29.51	4	1542

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Force K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L14	23.25 - 21.5	Pole	Max. Vy	11	-22.40	1518	3
			Max. Vx	8	22.77	-2	-1542
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-48.39	-1	2
			Max. Mx	11	-30.13	1557	3
			Max. My	2	-30.12	4	1582
			Max. Vy	11	-22.50	1557	3
L15	21.5 - 19	Pole	Max. Vx	8	22.88	-2	-1581
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-49.43	-1	2
			Max. Mx	11	-30.89	1614	3
			Max. My	2	-30.88	5	1639
			Max. Vy	11	-22.63	1614	3
			Max. Vx	8	23.00	-2	-1639
L16	19 - 12.7	Pole	Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-52.43	-1	2
			Max. Mx	11	-33.16	1757	3
			Max. My	2	-33.16	5	1785
			Max. Vy	11	-22.97	1757	3
			Max. Vx	8	23.34	-3	-1785
			Max. Torque	12			-2
L17	12.7 - 7.5	Pole	Max Tension	1	0.00	0	0
			Max. Compression	14	-54.91	-1	2
			Max. Mx	11	-35.06	1877	4
			Max. My	2	-35.05	6	1907
			Max. Vy	11	-23.23	1877	4
			Max. Vx	8	23.60	-3	-1907
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
L18	7.5 - 3.75	Pole	Max. Compression	14	-56.70	-1	2
			Max. Mx	11	-36.42	1965	4
			Max. My	2	-36.41	6	1996
			Max. Vy	11	-23.41	1965	4
			Max. Vx	8	23.78	-3	-1995
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-57.29	-1	2
L19	3.75 - 2.75	Pole	Max. Mx	11	-36.90	1988	4
			Max. My	2	-36.90	6	2020
			Max. Vy	11	-23.45	1988	4
			Max. Vx	8	23.82	-3	-2019
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-57.70	-1	2
			Max. Mx	11	-37.22	2006	4
L20	2.75 - 2	Pole	Max. My	2	-37.22	6	2038
			Max. Vy	11	-23.49	2006	4
			Max. Vx	8	23.86	-3	-2037
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-58.19	-1	2
			Max. Mx	11	-37.60	2029	4
			Max. My	2	-37.60	6	2062
L21	2 - 1	Pole	Max. Vy	11	-23.54	2029	4
			Max. Vx	8	23.91	-3	-2061
			Max. Torque	12			-2
			Max Tension	1	0.00	0	0
			Max. Compression	14	-59.05	-1	2
			Max. Mx	11	-38.34	2053	4
			Max. My	2	-38.34	6	2086
			Max. Vy	11	-23.59	2053	4
L22	1 - 0	Pole	Max. Vx	8	23.96	-3	-2085
			Max. Torque	12			-2

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	14	59.05	0.00	-0.00
	Max. H _x	11	38.35	23.58	0.05
	Max. H _z	2	38.35	0.08	23.95
	Max. M _x	2	2086	0.08	23.95
	Max. M _z	5	2052	-23.56	-0.05
	Max. Torsion	6	2	-20.45	-12.01
	Min. Vert	2	38.35	0.08	23.95
	Min. H _x	5	38.35	-23.56	-0.05
	Min. H _z	8	38.35	-0.03	-23.95
	Min. M _x	8	-2085	-0.03	-23.95
	Min. M _z	11	-2053	23.58	0.05
	Min. Torsion	12	-2	20.45	11.99

Tower Mast Reaction Summary

Load Combination	Vertical K	Shear _x K	Shear _z K	Overturning Moment, M _x kip-ft	Overturning Moment, M _z kip-ft	Torque kip-ft
Dead Only	38.35	0.00	-0.00	0	0	0
Dead+Wind 0 deg - No Ice	38.35	-0.08	-23.95	-2086	6	1
Dead+Wind 30 deg - No Ice	38.35	11.76	-20.69	-1802	-1024	0
Dead+Wind 60 deg - No Ice	38.35	20.39	-11.91	-1038	-1776	-1
Dead+Wind 90 deg - No Ice	38.35	23.56	0.05	3	-2052	-2
Dead+Wind 120 deg - No Ice	38.35	20.45	12.01	1045	-1780	-2
Dead+Wind 150 deg - No Ice	38.35	11.83	20.77	1807	-1030	-2
Dead+Wind 180 deg - No Ice	38.35	0.03	23.95	2085	-3	-1
Dead+Wind 210 deg - No Ice	38.35	-11.77	20.72	1804	1025	0
Dead+Wind 240 deg - No Ice	38.35	-20.45	11.91	1037	1780	1
Dead+Wind 270 deg - No Ice	38.35	-23.58	-0.05	-4	2053	2
Dead+Wind 300 deg - No Ice	38.35	-20.45	-11.99	-1044	1780	2
Dead+Wind 330 deg - No Ice	38.35	-11.86	-20.74	-1806	1031	2
Dead+Ice+Temp	59.05	-0.00	0.00	-2	-1	0
Dead+Wind 0 deg+Ice+Temp	59.05	-0.02	-7.01	-625	0	0
Dead+Wind 30 deg+Ice+Temp	59.05	3.46	-6.06	-540	-309	0
Dead+Wind 60 deg+Ice+Temp	59.05	6.00	-3.49	-312	-534	0
Dead+Wind 90 deg+Ice+Temp	59.05	6.93	0.01	-1	-617	0
Dead+Wind 120 deg+Ice+Temp	59.05	6.01	3.51	310	-535	-1
Dead+Wind 150 deg+Ice+Temp	59.05	3.47	6.08	538	-309	0
Dead+Wind 180 deg+Ice+Temp	59.05	0.00	7.01	621	-1	0
Dead+Wind 210 deg+Ice+Temp	59.05	-3.47	6.07	538	307	0
Dead+Wind 240 deg+Ice+Temp	59.05	-6.02	3.49	309	534	0
Dead+Wind 270 deg+Ice+Temp	59.05	-6.94	-0.01	-2	616	0
Dead+Wind 300 deg+Ice+Temp	59.05	-6.01	-3.50	-313	533	1
Dead+Wind 330 deg+Ice+Temp	59.05	-3.48	-6.07	-541	308	0
Dead+Wind 0 deg - Service	38.35	-0.03	-9.35	-815	2	0
Dead+Wind 30 deg - Service	38.35	4.59	-8.08	-705	-400	0
Dead+Wind 60 deg - Service	38.35	7.96	-4.65	-406	-694	0
Dead+Wind 90 deg - Service	38.35	9.20	0.02	1	-802	-1
Dead+Wind 120 deg -	38.35	7.99	4.69	408	-696	-1

Load Combination	Vertical	Shear _x	Shear _z	Overturning Moment, M _x	Overturning Moment, M _z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
Service						
Dead+Wind 150 deg - Service	38.35	4.62	8.11	706	-403	-1
Dead+Wind 180 deg - Service	38.35	0.01	9.35	815	-1	0
Dead+Wind 210 deg - Service	38.35	-4.60	8.09	705	400	0
Dead+Wind 240 deg - Service	38.35	-7.99	4.65	405	695	0
Dead+Wind 270 deg - Service	38.35	-9.21	-0.02	-2	802	1
Dead+Wind 300 deg - Service	38.35	-7.99	-4.68	-408	695	1
Dead+Wind 330 deg - Service	38.35	-4.63	-8.10	-706	403	1

Solution Summary

Load Comb.	Sum of Applied Forces			Sum of Reactions			% Error
	PX K	PY K	PZ K	PX K	PY K	PZ K	
1	0.00	-38.35	0.00	-0.00	38.35	0.00	0.000%
2	-0.08	-38.35	-23.95	0.08	38.35	23.95	0.003%
3	11.76	-38.35	-20.69	-11.76	38.35	20.69	0.000%
4	20.39	-38.35	-11.91	-20.39	38.35	11.91	0.000%
5	23.56	-38.35	0.05	-23.56	38.35	-0.05	0.003%
6	20.45	-38.35	12.01	-20.45	38.35	-12.01	0.000%
7	11.83	-38.35	20.77	-11.83	38.35	-20.77	0.000%
8	0.03	-38.35	23.95	-0.03	38.35	-23.95	0.003%
9	-11.77	-38.35	20.72	11.77	38.35	-20.72	0.000%
10	-20.45	-38.35	11.91	20.45	38.35	-11.91	0.000%
11	-23.58	-38.35	-0.05	23.58	38.35	0.05	0.003%
12	-20.45	-38.35	-11.99	20.45	38.35	11.99	0.000%
13	-11.86	-38.35	-20.74	11.86	38.35	20.74	0.000%
14	0.00	-59.05	0.00	0.00	59.05	-0.00	0.001%
15	-0.02	-59.05	-7.01	0.02	59.05	7.01	0.000%
16	3.46	-59.05	-6.06	-3.46	59.05	6.06	0.000%
17	6.00	-59.05	-3.49	-6.00	59.05	3.49	0.000%
18	6.93	-59.05	0.01	-6.93	59.05	-0.01	0.000%
19	6.01	-59.05	3.51	-6.01	59.05	-3.51	0.000%
20	3.47	-59.05	6.08	-3.47	59.05	-6.08	0.000%
21	0.00	-59.05	7.01	-0.00	59.05	-7.01	0.000%
22	-3.47	-59.05	6.07	3.47	59.05	-6.07	0.000%
23	-6.02	-59.05	3.49	6.02	59.05	-3.49	0.000%
24	-6.94	-59.05	-0.01	6.94	59.05	0.01	0.000%
25	-6.01	-59.05	-3.50	6.01	59.05	3.50	0.000%
26	-3.48	-59.05	-6.07	3.48	59.05	6.07	0.000%
27	-0.03	-38.35	-9.35	0.03	38.35	9.35	0.003%
28	4.59	-38.35	-8.08	-4.59	38.35	8.08	0.001%
29	7.96	-38.35	-4.65	-7.96	38.35	4.65	0.001%
30	9.20	-38.35	0.02	-9.20	38.35	-0.02	0.003%
31	7.99	-38.35	4.69	-7.99	38.35	-4.69	0.001%
32	4.62	-38.35	8.11	-4.62	38.35	-8.11	0.001%
33	0.01	-38.35	9.36	-0.01	38.35	-9.36	0.003%
34	-4.60	-38.35	8.09	4.60	38.35	-8.09	0.001%
35	-7.99	-38.35	4.65	7.99	38.35	-4.65	0.001%
36	-9.21	-38.35	-0.02	9.21	38.35	0.02	0.003%
37	-7.99	-38.35	-4.68	7.99	38.35	4.68	0.001%
38	-4.63	-38.35	-8.10	4.63	38.35	8.10	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	13	0.00000001	0.00008351
3	Yes	16	0.00000001	0.00006716
4	Yes	16	0.00000001	0.00006893
5	Yes	13	0.00000001	0.00013282
6	Yes	16	0.00000001	0.00006387
7	Yes	16	0.00000001	0.00007143
8	Yes	13	0.00000001	0.00009600
9	Yes	16	0.00000001	0.00006705
10	Yes	16	0.00000001	0.00006501
11	Yes	13	0.00000001	0.00014544
12	Yes	16	0.00000001	0.00007162
13	Yes	16	0.00000001	0.00006440
14	Yes	6	0.00000001	0.00002561
15	Yes	14	0.00000001	0.00013449
16	Yes	15	0.00000001	0.00005895
17	Yes	15	0.00000001	0.00005886
18	Yes	14	0.00000001	0.00013303
19	Yes	14	0.00000001	0.00014888
20	Yes	15	0.00000001	0.00005879
21	Yes	14	0.00000001	0.00013307
22	Yes	14	0.00000001	0.00014902
23	Yes	14	0.00000001	0.00014827
24	Yes	14	0.00000001	0.00013243
25	Yes	15	0.00000001	0.00005888
26	Yes	15	0.00000001	0.00005861
27	Yes	12	0.00000001	0.00007233
28	Yes	13	0.00000001	0.00009421
29	Yes	13	0.00000001	0.00010191
30	Yes	12	0.00000001	0.00008578
31	Yes	13	0.00000001	0.00008174
32	Yes	13	0.00000001	0.00011171
33	Yes	12	0.00000001	0.00007386
34	Yes	13	0.00000001	0.00009352
35	Yes	13	0.00000001	0.00008575
36	Yes	12	0.00000001	0.00008818
37	Yes	13	0.00000001	0.00011286
38	Yes	13	0.00000001	0.00008314

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	118 - 90	22.20	27	1.648	0.005
L2	90 - 74	12.82	27	1.462	0.004
L3	74 - 68.75	8.38	27	1.145	0.003
L4	68.75 - 64.5	7.18	27	1.040	0.002
L5	64.5 - 63	6.29	27	0.965	0.002
L6	63 - 60	5.99	27	0.941	0.002
L7	60 - 49.25	5.41	27	0.887	0.002
L8	49.25 - 42	3.59	27	0.721	0.001
L9	42 - 34.5	2.58	27	0.609	0.001
L10	34.5 - 34	1.72	27	0.492	0.001
L11	34 - 30	1.67	27	0.485	0.001
L12	30 - 28.5	1.29	27	0.414	0.001
L13	28.5 - 23.25	1.16	27	0.391	0.001
L14	23.25 - 21.5	0.77	27	0.320	0.000
L15	21.5 - 19	0.66	27	0.298	0.000
L16	19 - 12.7	0.51	27	0.260	0.000
L17	12.7 - 7.5	0.22	27	0.175	0.000
L18	7.5 - 3.75	0.07	27	0.101	0.000
L19	3.75 - 2.75	0.02	27	0.044	0.000
L20	2.75 - 2	0.01	27	0.033	0.000
L21	2 - 1	0.00	27	0.023	0.000
L22	1 - 0	0.00	27	0.008	0.000

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
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Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
116.00	PCS 1900MHz 4x45W-65MHz	27	21.50	1.644	0.005	22517
114.00	APXVSPP18-C-A20 w/ Mount Pipe	27	20.80	1.639	0.005	22517
108.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	27	18.73	1.620	0.005	11258
98.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	27	15.36	1.558	0.005	5628
90.00	Bridge Stiffener (84" x 14.5" x 1.25")	27	12.82	1.462	0.004	3984
85.00	(2) LPA-4016 w/ Mount Pipe	27	11.32	1.374	0.004	3262
80.00	KS24019-L112A	27	9.92	1.273	0.003	2744
73.00	VHLP1-23	27	8.14	1.124	0.003	2525
72.00	A-ANT-18G-2-C	27	7.91	1.104	0.003	2617
60.00	Bridge Stiffener (84" x 14.5" x 1.25")	27	5.41	0.887	0.002	3605
30.00	Bridge Stiffener (84" x 14.5" x 1.25")	27	1.29	0.414	0.001	3569

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	118 - 90	56.70	2	4.211	0.013
L2	90 - 74	32.75	2	3.734	0.011
L3	74 - 68.75	21.43	2	2.926	0.007
L4	68.75 - 64.5	18.35	2	2.657	0.006
L5	64.5 - 63	16.07	2	2.467	0.005
L6	63 - 60	15.31	2	2.406	0.005
L7	60 - 49.25	13.84	2	2.268	0.004
L8	49.25 - 42	9.19	2	1.842	0.003
L9	42 - 34.5	6.61	2	1.556	0.002
L10	34.5 - 34	4.39	2	1.258	0.002
L11	34 - 30	4.26	2	1.239	0.002
L12	30 - 28.5	3.30	2	1.060	0.002
L13	28.5 - 23.25	2.97	2	1.000	0.001
L14	23.25 - 21.5	1.97	2	0.817	0.001
L15	21.5 - 19	1.68	2	0.761	0.001
L16	19 - 12.7	1.31	2	0.664	0.001
L17	12.7 - 7.5	0.57	2	0.449	0.001
L18	7.5 - 3.75	0.19	2	0.259	0.000
L19	3.75 - 2.75	0.04	2	0.113	0.000
L20	2.75 - 2	0.02	2	0.083	0.000
L21	2 - 1	0.01	2	0.058	0.000
L22	1 - 0	0.00	2	0.020	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
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Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
116.00	PCS 1900MHz 4x45W-65MHz	2	54.91	4.199	0.013	8902
114.00	APXVSPP18-C-A20 w/ Mount Pipe	2	53.14	4.186	0.013	8902
108.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	2	47.84	4.138	0.013	4450
98.00	AM-X-CD-16-65-00T-RET w/ Mount Pipe	2	39.25	3.980	0.013	2223
90.00	Bridge Stiffener (84" x 14.5" x 1.25")	2	32.75	3.734	0.011	1573
85.00	(2) LPA-4016 w/ Mount Pipe	2	28.94	3.511	0.010	1286
80.00	KS24019-L112A	2	25.35	3.252	0.009	1081
73.00	VHLP1-23	2	20.82	2.873	0.007	994
72.00	A-ANT-18G-2-C	2	20.22	2.820	0.006	1029
60.00	Bridge Stiffener (84" x 14.5" x 1.25")	2	13.84	2.268	0.004	1415
30.00	Bridge Stiffener (84" x 14.5" x 1.25")	2	3.30	1.060	0.002	1397

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L _u ft	Kl/r	F _a ksi	A in ²	Actual P K	Allow. P _a K	Ratio P P _a
L1	118 - 90 (1)	P24x0.25	28.00	0.00	0.0	23.70	18.65	-7.61	442.00	0.017
L2	90 - 74 (2)	P24x0.375	16.00	0.00	0.0	25.20	27.83	-12.56	701.38	0.018
L3	74 - 68.75 (3)	RPS 24" x 0.58729"	5.25	0.00	0.0	19.94	43.20	-14.04	861.26	0.016
L4	68.75 - 64.5 (4)	RPS 24" x 0.81081"	4.25	0.00	0.0	18.84	59.07	-15.09	1112.85	0.014
L5	64.5 - 63 (5)	RPS 24" x 0.9855"	1.50	0.00	0.0	18.55	71.25	-15.52	1321.47	0.012
L6	63 - 60 (6)	RPS 24" x 0.93361"	3.00	0.00	0.0	18.68	67.65	-16.35	1263.65	0.013
L7	60 - 49.25 (7)	RPS 30" x 0.62249"	10.75	0.00	0.0	22.78	57.45	-20.21	1308.50	0.015
L8	49.25 - 42 (8)	RPS 30" x 0.77273"	7.25	0.00	0.0	22.41	70.95	-22.29	1590.04	0.014
L9	42 - 34.5 (9)	RPS 30" x 0.89547"	7.50	0.00	0.0	22.51	81.88	-24.73	1842.72	0.013
L10	34.5 - 34 (10)	RPS 30" x 1.00259"	0.50	0.00	0.0	22.51	91.33	-24.91	2055.56	0.012
L11	34 - 30 (11)	RPS 30" x 0.87892"	4.00	0.00	0.0	22.46	80.41	-26.20	1805.83	0.015
L12	30 - 28.5 (12)	RPS 36" x 0.57507"	1.50	0.00	0.0	21.53	64.00	-27.88	1377.79	0.020
L13	28.5 - 23.25 (13)	RPS 36" x 0.7026"	5.25	0.00	0.0	21.38	77.91	-29.51	1666.06	0.018
L14	23.25 - 21.5 (14)	RPS 36" x 0.80854"	1.75	0.00	0.0	21.40	89.39	-30.12	1912.59	0.016
L15	21.5 - 19 (15)	RPS 36" x 0.67863"	2.50	0.00	0.0	21.14	75.30	-30.88	1591.78	0.019
L16	19 - 12.7 (16)	RPS 36" x 0.83577"	6.30	0.00	0.0	21.19	92.33	-33.16	1956.08	0.017
L17	12.7 - 7.5 (17)	RPS 36" x 0.84294"	5.20	0.00	0.0	20.71	93.10	-35.05	1927.77	0.018
L18	7.5 - 3.75 (18)	RPS 36" x 0.83577"	3.75	0.00	0.0	21.19	92.33	-36.41	1956.08	0.019
L19	3.75 - 2.75 (19)	RPS 36" x 1.16096"	1.00	0.00	0.0	19.93	127.07	-36.90	2532.70	0.015
L20	2.75 - 2 (20)	RPS 36" x 1.02422"	0.75	0.00	0.0	21.35	112.54	-37.22	2402.52	0.015
L21	2 - 1 (21)	RPS 36" x 0.88991"	1.00	0.00	0.0	21.47	98.16	-37.60	2107.27	0.018
L22	1 - 0 (22)	RPS 36" x 1.90977"	1.00	0.00	0.0	11.78	204.53	-38.34	2410.20	0.016

Pole Bending Design Data

Section No.	Elevation ft	Size	Actual M _x kip-ft	Actual f _{bx} ksi	Allow. F _{bx} ksi	Ratio f _{bx} F _{bx}	Actual M _y kip-ft	Actual f _{by} ksi	Allow. F _{by} ksi	Ratio f _{by} F _{by}
L1	118 - 90 (1)	P24x0.25	220	24.06	23.70	1.016	0	0.00	23.70	0.000

Section No.	Elevation ft	Size	Actual M_x kip-ft	Actual f_{bx} ksi	Allow. F_{bx} ksi	Ratio $\frac{f_{bx}}{F_{bx}}$	Actual M_y kip-ft	Actual f_{by} ksi	Allow. F_{by} ksi	Ratio $\frac{f_{by}}{F_{by}}$
L2	90 - 74 (2)	P24x0.375	484	35.88	27.72	1.294	0	0.00	27.72	0.000
L3	74 - 68.75 (3)	RPS 24" x 0.58729"	583	28.36	21.93	1.293	0	0.00	21.93	0.000
L4	68.75 - 64.5 (4)	RPS 24" x 0.81081"	666	24.11	20.72	1.163	0	0.00	20.72	0.000
L5	64.5 - 63 (5)	RPS 24" x 0.9855"	695	21.18	20.40	1.038	0	0.00	20.40	0.000
L6	63 - 60 (6)	RPS 24" x 0.93361"	754	24.10	20.55	1.173	0	0.00	20.55	0.000
L7	60 - 49.25 (7)	RPS 30" x 0.62249"	976	28.32	25.05	1.131	0	0.00	25.05	0.000
L8	49.25 - 42 (8)	RPS 30" x 0.77273"	1129	26.81	24.65	1.088	0	0.00	24.65	0.000
L9	42 - 34.5 (9)	RPS 30" x 0.89547"	1291	26.79	24.76	1.082	0	0.00	24.76	0.000
L10	34.5 - 34 (10)	RPS 30" x 1.00259"	1302	24.39	24.76	0.985	0	0.00	24.76	0.000
L11	34 - 30 (11)	RPS 30" x 0.87892"	1390	29.33	24.70	1.187	0	0.00	24.70	0.000
L12	30 - 28.5 (12)	RPS 36" x 0.57507"	1424	30.62	23.68	1.293	0	0.00	23.68	0.000
L13	28.5 - 23.25 (13)	RPS 36" x 0.7026"	1542	27.44	23.52	1.167	0	0.00	23.52	0.000
L14	23.25 - 21.5 (14)	RPS 36" x 0.80854"	1582	24.68	23.54	1.049	0	0.00	23.54	0.000
L15	21.5 - 19 (15)	RPS 36" x 0.67863"	1639	30.14	23.25	1.296	0	0.00	23.25	0.000
L16	19 - 12.7 (16)	RPS 36" x 0.83577"	1785	27.01	23.30	1.159	0	0.00	23.30	0.000
L17	12.7 - 7.5 (17)	RPS 36" x 0.84294"	1907	28.62	22.78	1.257	0	0.00	22.78	0.000
L18	7.5 - 3.75 (18)	RPS 36" x 0.83577"	1996	30.20	23.30	1.296	0	0.00	23.30	0.000
L19	3.75 - 2.75 (19)	RPS 36" x 1.16096"	2020	22.61	21.93	1.031	0	0.00	21.93	0.000
L20	2.75 - 2 (20)	RPS 36" x 1.02422"	2038	25.56	23.48	1.088	0	0.00	23.48	0.000
L21	2 - 1 (21)	RPS 36" x 0.88991"	2062	29.42	23.61	1.246	0	0.00	23.61	0.000
L22	1 - 0 (22)	RPS 36" x 1.90977"	2086	15.11	12.96	1.166	0	0.00	12.96	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V K	Actual f_v ksi	Allow. F_v ksi	Ratio $\frac{f_v}{F_v}$	Actual T kip-ft	Actual f_{vt} ksi	Allow. F_{vt} ksi	Ratio $\frac{f_{vt}}{F_{vt}}$
L1	118 - 90 (1)	P24x0.25	12.74	1.37	16.80	0.081	1	0.04	11.90	0.004
L2	90 - 74 (2)	P24x0.375	17.95	1.29	16.80	0.077	1	0.03	16.80	0.002
L3	74 - 68.75 (3)	RPS 24" x 0.58729"	19.28	0.89	13.29	0.067	1	0.02	13.29	0.002
L4	68.75 - 64.5 (4)	RPS 24" x 0.81081"	19.54	0.66	12.56	0.053	1	0.02	12.56	0.001
L5	64.5 - 63 (5)	RPS 24" x 0.9855"	19.64	0.55	12.36	0.045	1	0.01	12.36	0.001
L6	63 - 60 (6)	RPS 24" x 0.93361"	19.82	0.59	12.45	0.047	1	0.02	12.45	0.001
L7	60 - 49.25 (7)	RPS 30" x 0.62249"	20.96	0.73	15.18	0.048	1	0.01	15.18	0.001
L8	49.25 - 42 (8)	RPS 30" x 0.77273"	21.40	0.60	14.94	0.040	1	0.01	14.94	0.001
L9	42 - 34.5 (9)	RPS 30" x 0.89547"	21.82	0.53	15.00	0.036	1	0.01	15.00	0.001
L10	34.5 - 34 (10)	RPS 30" x 1.00259"	21.84	0.48	15.00	0.032	1	0.01	15.00	0.001
L11	34 - 30 (11)	RPS 30" x 0.87892"	22.04	0.55	14.97	0.037	1	0.01	14.97	0.001
L12	30 - 28.5 (12)	RPS 36" x 0.57507"	22.47	0.70	14.35	0.049	1	0.01	14.35	0.001
L13	28.5 - 23.25 (13)	RPS 36" x 0.7026"	22.77	0.58	14.26	0.041	1	0.01	14.26	0.001
L14	23.25 - 21.5 (14)	RPS 36" x 0.80854"	22.87	0.51	14.26	0.036	1	0.01	14.26	0.001
L15	21.5 - 19 (15)	RPS 36" x 0.67863"	23.00	0.61	14.09	0.043	1	0.01	14.09	0.001
L16	19 - 12.7 (16)	RPS 36" x 0.83577"	23.34	0.51	14.12	0.036	1	0.01	14.12	0.001
L17	12.7 - 7.5 (17)	RPS 36" x 0.84294"	23.60	0.51	13.80	0.037	1	0.01	13.80	0.001
L18	7.5 - 3.75 (18)	RPS 36" x 0.83577"	23.77	0.51	14.12	0.036	1	0.01	14.12	0.001
L19	3.75 - 2.75 (19)	RPS 36" x 1.16096"	23.82	0.37	13.29	0.028	1	0.01	13.29	0.000
L20	2.75 - 2 (20)	RPS 36" x 1.02422"	23.85	0.42	14.23	0.030	1	0.01	14.23	0.000
L21	2 - 1 (21)	RPS 36" x 0.88991"	23.90	0.49	14.31	0.034	1	0.01	14.31	0.000
L22	1 - 0 (22)	RPS 36" x 1.90977"	23.95	0.23	7.86	0.030	1	0.00	7.86	0.000

Pole Interaction Design Data

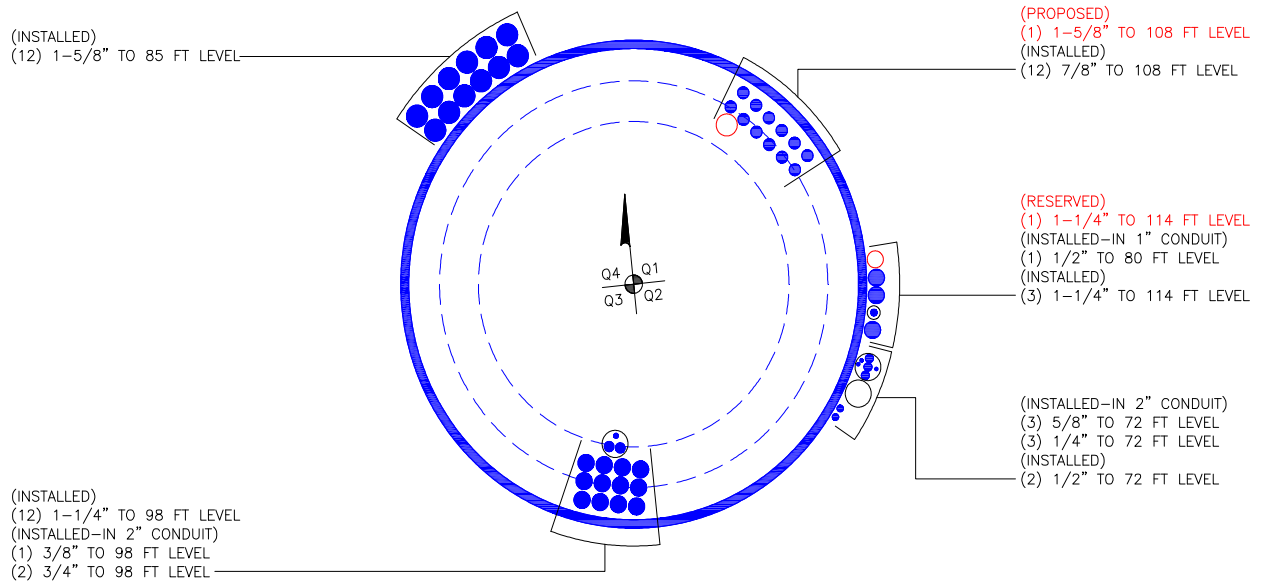
Section No.	Elevation ft	Ratio $\frac{P}{P_a}$	Ratio $\frac{f_{bx}}{F_{bx}}$	Ratio $\frac{f_{by}}{F_{by}}$	Ratio $\frac{f_v}{F_v}$	Ratio $\frac{f_{vt}}{F_{vt}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	118 - 90 (1)	0.017	1.016	0.000	0.081	0.004	1.040	1.333	H1-3+VT ✓
L2	90 - 74 (2)	0.018	1.294	0.000	0.077	0.002	1.318	1.333	H1-3+VT ✓
L3	74 - 68.75 (3)	0.016	1.293	0.000	0.067	0.002	1.314	1.333	H1-3+VT ✓
L4	68.75 - 64.5 (4)	0.014	1.163	0.000	0.053	0.001	1.180	1.333	H1-3+VT ✓
L5	64.5 - 63 (5)	0.012	1.038	0.000	0.045	0.001	1.052	1.333	H1-3+VT ✓
L6	63 - 60 (6)	0.013	1.173	0.000	0.047	0.001	1.188	1.333	H1-3+VT ✓
L7	60 - 49.25 (7)	0.015	1.131	0.000	0.048	0.001	1.148	1.333	H1-3+VT ✓
L8	49.25 - 42 (8)	0.014	1.088	0.000	0.040	0.001	1.103	1.333	H1-3+VT ✓
L9	42 - 34.5 (9)	0.013	1.082	0.000	0.036	0.001	1.097	1.333	H1-3+VT ✓
L10	34.5 - 34 (10)	0.012	0.985	0.000	0.032	0.001	0.998	1.333	H1-3+VT ✓
L11	34 - 30 (11)	0.015	1.187	0.000	0.037	0.001	1.203	1.333	H1-3+VT ✓
L12	30 - 28.5 (12)	0.020	1.293	0.000	0.049	0.001	1.316	1.333	H1-3+VT ✓
L13	28.5 - 23.25 (13)	0.018	1.167	0.000	0.041	0.001	1.186	1.333	H1-3+VT ✓
L14	23.25 - 21.5 (14)	0.016	1.049	0.000	0.036	0.001	1.066	1.333	H1-3+VT ✓
L15	21.5 - 19 (15)	0.019	1.296	0.000	0.043	0.001	1.318	1.333	H1-3+VT ✓
L16	19 - 12.7 (16)	0.017	1.159	0.000	0.036	0.001	1.177	1.333	H1-3+VT ✓
L17	12.7 - 7.5 (17)	0.018	1.257	0.000	0.037	0.001	1.276	1.333	H1-3+VT ✓
L18	7.5 - 3.75 (18)	0.019	1.296	0.000	0.036	0.001	1.316	1.333	H1-3+VT ✓
L19	3.75 - 2.75 (19)	0.015	1.031	0.000	0.028	0.000	1.046	1.333	H1-3+VT ✓
L20	2.75 - 2 (20)	0.015	1.088	0.000	0.030	0.000	1.105	1.333	H1-3+VT ✓
L21	2 - 1 (21)	0.018	1.246	0.000	0.034	0.000	1.265	1.333	H1-3+VT ✓
L22	1 - 0 (22)	0.016	1.166	0.000	0.030	0.000	1.183	1.333	H1-3+VT ✓

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail
L1	118 - 90	Pole	P24x0.25	1	-7.61	589.19	78.0	Pass
L2	90 - 74	Pole	P24x0.375	2	-12.56	934.94	98.9	Pass
L3	74 - 68.75	Pole	RPS 24" x 0.58729"	3	-14.04	1148.06	98.6	Pass
L4	68.75 - 64.5	Pole	RPS 24" x 0.81081"	4	-15.09	1483.43	88.5	Pass
L5	64.5 - 63	Pole	RPS 24" x 0.9855"	5	-15.52	1761.52	78.9	Pass
L6	63 - 60	Pole	RPS 24" x 0.93361"	6	-16.35	1684.45	89.1	Pass
L7	60 - 49.25	Pole	RPS 30" x 0.62249"	7	-20.21	1744.23	86.2	Pass
L8	49.25 - 42	Pole	RPS 30" x 0.77273"	8	-22.29	2119.52	82.8	Pass

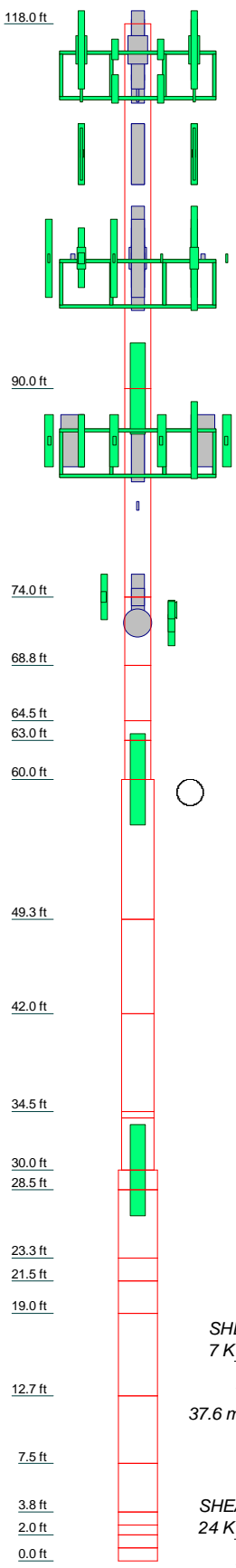
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	SF*P _{allow} K	% Capacity	Pass Fail	
L9	42 - 34.5	Pole	RPS 30" x 0.89547"	9	-24.73	2456.35	82.3	Pass	
L10	34.5 - 34	Pole	RPS 30" x 1.00259"	10	-24.91	2740.06	74.9	Pass	
L11	34 - 30	Pole	RPS 30" x 0.87892"	11	-26.20	2407.17	90.2	Pass	
L12	30 - 28.5	Pole	RPS 36" x 0.57507"	12	-27.88	1836.59	98.7	Pass	
L13	28.5 - 23.25	Pole	RPS 36" x 0.7026"	13	-29.51	2220.86	89.0	Pass	
L14	23.25 - 21.5	Pole	RPS 36" x 0.80854"	14	-30.12	2549.48	80.0	Pass	
L15	21.5 - 19	Pole	RPS 36" x 0.67863"	15	-30.88	2121.84	98.9	Pass	
L16	19 - 12.7	Pole	RPS 36" x 0.83577"	16	-33.16	2607.45	88.3	Pass	
L17	12.7 - 7.5	Pole	RPS 36" x 0.84294"	17	-35.05	2569.72	95.7	Pass	
L18	7.5 - 3.75	Pole	RPS 36" x 0.83577"	18	-36.41	2607.45	98.7	Pass	
L19	3.75 - 2.75	Pole	RPS 36" x 1.16096"	19	-36.90	3376.09	78.5	Pass	
L20	2.75 - 2	Pole	RPS 36" x 1.02422"	20	-37.22	3202.56	82.9	Pass	
L21	2 - 1	Pole	RPS 36" x 0.88991"	21	-37.60	2808.99	94.9	Pass	
L22	1 - 0	Pole	RPS 36" x 1.90977"	22	-38.34	3212.80	88.7	Pass	
							Summary		
							Pole (L2)	98.9	Pass
							RATING =	98.9	Pass

APPENDIX B
BASE LEVEL DRAWING



APPENDIX C
ADDITIONAL CALCULATIONS

Section	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	2222019	
Size	P24x0.25	P24x0.375	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS	RPS 30" x 0.622 RPS
Length (ft)	28.00	16.00	5.25	4.25	5.00	3.00	10.75	7.25	7.50	4.00	1.50	5.25	1.75	2.50	6.30	5.20	3.75	3.75	1.00	
Socket Length (ft)	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	5.00	
Grade	A572-42	A572-42	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	Reinf 37.96 ksi	
Weight (K)	1.8	1.5	0.8	0.9	0.4	0.7	2.1	1.8	2.1	1.1	0.3	1.4	0.5	0.6	2.0	1.6	1.2	0.4	0.4	



DESIGNED APPURTENANCE LOADING

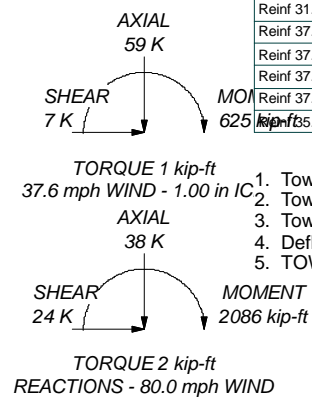
TYPE	ELEVATION	TYPE	ELEVATION
PCS 1900MHz 4x45W-65MHz	116	SBNH-1D6565C w/ Mount Pipe	98
PCS 1900MHz 4x45W-65MHz	116	SBNH-1D6565C w/ Mount Pipe	98
PCS 1900MHz 4x45W-65MHz	116	RRUS-11	98
800MHz 2X50W RRH W/FILTER	116	RRUS-11	98
800MHz 2X50W RRH W/FILTER	116	RRUS-11	98
800MHz 2X50W RRH W/FILTER	116	(2) LGP13519	98
Pipe Mount [PM 601-3]	116	(2) LGP13519	98
APXVSP18-C-A20 w/ Mount Pipe	114	(2) LGP13519	98
APXVSP18-C-A20 w/ Mount Pipe	114	DTMABP7819VG12A	98
APXVSP18-C-A20 w/ Mount Pipe	114	DTMABP7819VG12A	98
APXVTM14-C-120 w/ Mount Pipe	114	DTMABP7819VG12A	98
APXVTM14-C-120 w/ Mount Pipe	114	DC6-48-60-18-8F	98
APXVTM14-C-120 w/ Mount Pipe	114	Platform Mount [LP 712-1]	98
TD-RRH8x20-25	114	Bridge Stiffener (84" x 14.5" x 1.25")	90
TD-RRH8x20-25	114	Bridge Stiffener (84" x 14.5" x 1.25")	90
TD-RRH8x20-25	114	Bridge Stiffener (84" x 14.5" x 1.25")	90
(2) 2.375" OD x 4" Mount Pipe	114	BXA-171063/8CFx2 w/ Mount Pipe	85
(2) 2.375" OD x 4" Mount Pipe	114	BXA-171063/8CFx2 w/ Mount Pipe	85
(2) 2.375" OD x 4" Mount Pipe	114	BXA-70063-6CF-2 w/ Mount Pipe	85
Platform Mount [LP 501-1]	114	BXA-70063-6CF-2 w/ Mount Pipe	85
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108	(2) CBC721-DF	85
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108	(2) CBC721-DF	85
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108	(2) CBC721-DF	85
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108	800 10735V01 w/ Mount Pipe	85
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	108	BXA-171040/8CF w/ Mount Pipe	85
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108	Platform Mount [LP 303-1]	85
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108	(2) LPA-4016 w/ Mount Pipe	85
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108	(2) LPA-80063/4CF w/ Mount Pipe	85
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108	(2) LPA-80063/4CF w/ Mount Pipe	85
ERICSSON AIR 21 B4A B2P w/ Mount Pipe	108	KS24019-L112A	80
KRY 112 144/1	108	Side Arm Mount [SO 701-1]	80
KRY 112 144/1	108	WIMAX DAP HEAD	72
KRY 112 144/1	108	WIMAX DAP HEAD	72
KRY 112 144/1	108	WIMAX DAP HEAD	72
2.375" OD x 4" Mount Pipe	108	HORIZON COMPACT	72
2.375" OD x 4" Mount Pipe	108	HORIZON COMPACT	72
2.375" OD x 4" Mount Pipe	108	Side Arm Mount [SO 101-3]	72
Sector Mount [SM 802-3]	108	LLPX310R w/ Mount Pipe	72
AM-X-CD-16-65-00T-RET w/ Mount Pipe	98	LLPX310R w/ Mount Pipe	72
AM-X-CD-16-65-00T-RET w/ Mount Pipe	98	LLPX310R w/ Mount Pipe	72
(2) AM-X-CD-16-65-00T-RET w/ Mount Pipe	98	A-ANT-18G-2-C	72
7770.00 w/ Mount Pipe	98	VHLP1-23	72
7770.00 w/ Mount Pipe	98	Bridge Stiffener (84" x 14.5" x 1.25")	60
7770.00 w/ Mount Pipe	98	Bridge Stiffener (84" x 14.5" x 1.25")	60
7770.00 w/ Mount Pipe	98	Bridge Stiffener (84" x 14.5" x 1.25")	60
		Bridge Stiffener (84" x 14.5" x 1.25")	30
		Bridge Stiffener (84" x 14.5" x 1.25")	30
		Bridge Stiffener (84" x 14.5" x 1.25")	30

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-42	42 ksi	60 ksi	Reinf 35.64 ksi	36 ksi	45 ksi
Reinf 33.23 ksi	33 ksi	42 ksi	Reinf 35.66 ksi	36 ksi	45 ksi
Reinf 31.40 ksi	31 ksi	40 ksi	Reinf 35.23 ksi	35 ksi	45 ksi
Reinf 30.91 ksi	31 ksi	39 ksi	Reinf 35.31 ksi	35 ksi	45 ksi
Reinf 31.13 ksi	31 ksi	39 ksi	Reinf 34.51 ksi	35 ksi	44 ksi
Reinf 37.96 ksi	38 ksi	48 ksi	Reinf 33.22 ksi	33 ksi	42 ksi
Reinf 37.35 ksi	37 ksi	47 ksi	Reinf 35.58 ksi	36 ksi	45 ksi
Reinf 37.51 ksi	38 ksi	47 ksi	Reinf 35.78 ksi	36 ksi	45 ksi
Reinf 37.43 ksi	37 ksi	47 ksi	Reinf 19.64 ksi	20 ksi	25 ksi
Reinf 35.88 ksi	36 ksi	45 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for a 80.0 mph basic wind in accordance with the TIA/EIA-222-F Standard.
3. Tower is also designed for a 37.6 mph basic wind with 1.00 in ice.
4. Deflections are based upon a 50.0 mph wind.
5. TOWER RATING: 98.9%



Paul J. Ford and Company
 250 E. Broad Street, Suite 600
 Columbus, OH 43215
 Phone: 614.221.6679
 FAX: 614.448.4105

Job: **Ex 118 ft Monopole / Great Britain Gravel Pit**
 Project: **PJF 37513-0921 / BU 876331**
 Client: **CCI** Drawn by: **Joey Meinerding** App'd:
 Code: **TIA/EIA-222-F** Date: **10/21/14** Scale: **NTS**
 Path: Dwg No. **E-1**



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: 10/21/2014
Project No: 37513-0921.004.7700
Site Name: New Britain Gravel Pit
Site Number/BUN: 876331
Description:
Owner:
Engineer:

v2.0, Effective Date: 1-12-12

Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

Flange Elevation:	90.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	220.0	k-ft
Axial, Pf:	7.6	kips
Shear, Vf:	12.7	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	24.00	24.00	in
Pole Thickness, tp:	0.2500	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	32.00	32.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	0	
Upper Weld Length, L1:	39.00	0.00	in
Lower Weld Length, L2:	39.00	0.00	in
Weld Size, w:	0.3750	0.0000	in
Electrode:	E70	E70	
Effective Stiffener Width, Ws:	4.50	0.00	in
Stiffener Thickness, ts:	1.25	0.00	in
Notch, n:	0.50	0.00	in
Stiffener Fy:	65	0	ksi
Stiffener Fu:	80	0	ksi
Unbraced Length, L:	4.63	0.00	in
K:	0.80	0.00	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Stiffener Circle:	37.50	32.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	6.75	4.00	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	6.75	4.00	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.00	0.00	in
Bolt Circle:	29.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Table XIX & pg. 4-72:

	Stiffener Type 1	Stiffener Type 2	
Upper Pole			
D:	6	0	Num. of Sixteenths in Weld
a:	0.1731	0.0000	= e1 / L1
k:	0	0	
C:	1.4546	0.0000	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	96.7	0.0	kips
Allowable Axial, Pa:	453.8	0.0	kips = ASIF C C1 D L
Ratio:	21.3%	0.0%	
Lower Pole			
D:	6	0	Num. of Sixteenths in Weld
a:	0.1731	0.0000	= e2 / L2
k:	0	0	
C:	1.4546	0.0000	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	96.7	0.0	kips
Allowable Axial, Pa:	453.8	0.0	kips = ASIF C C1 D L
Ratio:	21.3%	0.0%	

Pole Analysis per AISC Sect. F4:

	Stiffener Type 1	Stiffener Type 2	
Upper Pole			
Stiffener Axial, P:	96.7	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	1.2	0.0	kips/in = P / (2 L1)
Section Modulus, S:	507.0	0.0	in ² = L1 ² / 3
Bending Stress, fb:	1.3	0.0	kips/in = P e1 / S
Combined Stress, f:	1.8	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	5.6	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	31.9%	0.0%	
Lower Pole			
Stiffener Axial, P:	96.7	0.0	kips
Effective Throat, te:	0.2651	0.0000	in = 0.707 w
Shear Stress, fv:	1.2	0.0	ksi = P / (2 L2)
Section Modulus, S:	507.0	0.0	in ² = L2 ² / 3
Bending Stress, fb:	1.3	0.0	ksi = P e2 / S
Combined Stress, f:	1.8	0.0	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	0.0000	
Allowable Stress, F:	8.4	0.0	kips/in = ASIF (0.4 Fy) tp
Ratio:	21.3%	0.0%	

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	5.6250	in ²
Net Area, An:	5.6250	in ²
Stiffener Axial, P:	96.7	kips
Stiffener Stress, f:	17.2	ksi = P / Ag
b:	9.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	7.2000	in
Q, Where Qa = 1.0:	1.0000	
r:	0.3608	in ³
K L / r:	10.2537	
ASIF:	1.3333	
Allowable Axial, Fa:	50.45	ksi = ASIF [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	52.00	ksi = ASIF 0.6 Fy
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	34.1%	

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	0.0000	in ²
Net Area, An:	0.0000	in ²
Stiffener Axial, P:	0.0	kips
Stiffener Stress, f:	0.0	ksi = P / Ag
b:	0.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	0.0000	in
Q, Where Qa = 1.0:	0.0000	
r:	0.0000	in ³
K L / r:	0.0000	
ASIF:	0.0000	
Allowable Axial, Fa:	0.00	ksi = ASIF [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc - (K L / r) ³ / 8 Cc ³]
ASIF:	0.0000	
Allowable Bending, Fb:	0.00	ksi = ASIF 0.6 Fy
ASIF:	0.0000	
Allowable Net Tension, Ft:	0.00	ksi = ASIF 0.5 Fu
Ratio:	0.0%	

Analysis

Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 21.3% PASS
Pole Analysis Ratio: 31.9% PASS
Stiffener Analysis Ratio: 34.1% PASS

Bridge Stiffener Type 2
Weld Analysis Ratio: 0.0% PASS
Pole Analysis Ratio: 0.0% PASS
Stiffener Analysis Ratio: 0.0% PASS



PAUL J. FORD AND COMPANY
STRUCTURAL ENGINEERS
250 East Broad Street • Suite 600 • Columbus, Ohio 43215-3708

Date: 10/21/2014
Project No: 37513-0921.004.7700
Site Name: New Britain Gravel Pit
Site Number/BUN: 876331
Description:
Owner:
Engineer:

v2.0, Effective Date: 1-12-12

Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

Flange Elevation:	60.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	754.0	k-ft
Axial, Pf:	16.4	kips
Shear, Vf:	19.8	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	24.00	30.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	41.00	41.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	3	
Upper Weld Length, L1:	65.00	23.25	in
Lower Weld Length, L2:	39.00	20.00	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E70	E70	
Effective Stiffener Width, Ws:	4.50	3.00	in
Stiffener Thickness, ts:	1.25	1.00	in
Notch, n:	0.50	0.50	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	5.63	5.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Stiffener Circle:	46.50	45.00	in = Df + 2 n + Ws
Upper Eccentricity, e1:	11.25	10.50	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	8.25	7.50	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

	(1) Bolt Circle		
Number of Bolt Circles:	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	35.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Table XIX & pg. 4-72:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
D:	6	6	Num. of Sixteenths in Weld
a:	0.1731	0.4516	= e1 / L1
k:	0	0	
C:	1.4546	0.8605	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	176.7	91.3	kips
Allowable Axial, Pa:	756.4	160.1	kips = ASIF C C1 D L
Ratio:	23.4%	57.0%	
Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.2115	0.3750	= e2 / L2
k:	0	0	
C:	1.3600	0.9893	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	176.7	91.3	kips
Allowable Axial, Pa:	424.3	158.3	kips = ASIF C C1 D L
Ratio:	41.7%	57.7%	

Pole Analysis per AISC Sect. F4:

Upper Pole	Stiffener Type 1	Stiffener Type 2	
Stiffener Axial, P:	176.7	91.3	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	1.4	2.0	kips/in = P / (2 L1)
Section Modulus, S:	1408.3	180.2	in ² = L1 ² / 3
Bending Stress, fb:	1.4	5.3	kips/in = P e1 / S
Combined Stress, f:	2.0	5.7	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	23.3%	67.5%	
Lower Pole			
Stiffener Axial, P:	176.7	91.3	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	2.3	2.3	ksi = P / (2 L2)
Section Modulus, S:	507.0	133.3	in ² = L2 ² / 3
Bending Stress, fb:	2.9	5.1	ksi = P e2 / S
Combined Stress, f:	3.7	5.6	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	43.6%	66.9%	

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	5.6250	in ²
Net Area, An:	5.6250	in ²
Stiffener Axial, P:	176.7	kips
Stiffener Stress, f:	31.4	ksi = P / Ag
b:	13.5000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	10.8000	in
Q, Where Qa = 1.0:	0.9508	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.3608	in ³
K L / r:	12.4708	
ASIF:	1.3333	
Allowable Axial, Fa:	47.64	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	49.44	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	65.9%	

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	3.0000	in ²
Net Area, An:	3.0000	in ²
Stiffener Axial, P:	91.3	kips
Stiffener Stress, f:	30.4	ksi = P / Ag
b:	12.0000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	12.0000	in
Q, Where Qa = 1.0:	0.9075	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.2887	in ³
K L / r:	15.5885	
ASIF:	1.3333	
Allowable Axial, Fa:	45.01	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	47.19	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	67.6%	

Analysis Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 41.7% PASS
Pole Analysis Ratio: 43.6% PASS
Stiffener Analysis Ratio: 65.9% PASS

Bridge Stiffener Type 2
Weld Analysis Ratio: 57.7% PASS
Pole Analysis Ratio: 67.5% PASS
Stiffener Analysis Ratio: 67.6% PASS



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Site Number/BUN: 876331
Description:
Owner:
Engineer:

v2.0, Effective Date: 1-12-12

Welded Bridge Stiffener Analysis per TIA/EIA-222-F & AISC 9th Ed. (Green)

General Parameters and Loading:

Flange Elevation:	30.00	ft
TIA Reference Standard:	TIA/EIA-222-F	
AISC Manual:	9th Ed. (Green)	
Method:	ASD	
ASD Stress Increase, ASIF:	1.333333333	
Moment, Mf:	1390.0	k-ft
Axial, Pf:	26.2	kips
Shear, Vf:	22.0	kips

Pole Parameters:

	Upper Pole	Lower Pole	
Pole Diameter, Dp:	30.00	36.00	in
Pole Thickness, tp:	0.3750	0.3750	in
Pole Fy:	42	42	ksi
Pole Fu:	60	60	ksi
Flange Diameter, Df:	47.00	47.00	in

Bridge Stiffener Parameters:

	Stiffener Type 1	Stiffener Type 2	
Qty. Stiffeners:	3	3	
Upper Weld Length, L1:	39.00	32.25	in
Lower Weld Length, L2:	39.00	28.25	in
Weld Size, w:	0.3750	0.3750	in
Electrode:	E70	E70	
Effective Stiffener Width, Ws:	7.20	5.50	in
Stiffener Thickness, ts:	1.47	1.00	in
Notch, n:	0.50	0.50	in
Stiffener Fy:	65	65	ksi
Stiffener Fu:	80	80	ksi
Unbraced Length, L:	5.63	5.63	in
K:	0.80	0.80	
Stiffener Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Stiffener Circle:	55.20	53.50	in = Df + 2 n + Ws
Upper Eccentricity, e1:	12.60	11.75	in = (Df - Dp) / 2 + n + Ws / 2
Lower Eccentricity, e2:	9.60	8.75	in = (Df - Dp) / 2 + n + Ws / 2

Flange Bolt Parameters:

	(1) Bolt Circle		
	Bolt Circle 1	Bolt Circle 2	
Number of Bolt Circles:	(1) Bolt Circle		
Qty. Bolts:	0	0	
Bolt Diameter:	1.50	0.00	in
Bolt Circle:	41.00	0.00	in
Bolt Spacing:	Symmetric	Symmetric	
Start Angle, for Symmetric:	0	0	degrees
Bolt Area, Ag:	0.0000	0.0000	in
Max. Tension:	0.00	0.00	kips
Max. Net Tension:	0.00	0.00	kips
Max. Net Compression:	0.00	0.00	kips
Moment to Bolt Circle:	0.00	0.00	k-ft
Axial to Bolt Circle:	0.00	0.00	kips
Shear to Bolt Circle:	0.00	0.00	kips
Equivalent Bolt Circle:	0.00	0.00	in

Weld Analysis per AISC Table XIX & pg. 4-72:

	Stiffener Type 1	Stiffener Type 2	
Upper Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.3231	0.3643	= e1 / L1
k:	0	0	
C:	1.0936	1.0107	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	276.6	139.4	kips
Allowable Axial, Pa:	341.2	260.8	kips = ASIF C C1 D L
Ratio:	81.1%	53.5%	
Lower Pole			
D:	6	6	Num. of Sixteenths in Weld
a:	0.2462	0.3097	= e2 / L2
k:	0	0	
C:	1.2700	1.1204	Tabulated Coefficient
C1:	1.0000	1.0000	Coefficient for Electrode
ASIF:	1.3333	1.3333	
Stiffener Axial, Ps:	276.6	139.4	kips
Allowable Axial, Pa:	396.2	253.2	kips = ASIF C C1 D L
Ratio:	69.8%	55.1%	

Pole Analysis per AISC Sect. F4:

	Stiffener Type 1	Stiffener Type 2	
Upper Pole			
Stiffener Axial, P:	276.6	139.4	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	3.5	2.2	kips/in = P / (2 L1)
Section Modulus, S:	507.0	346.7	in ² = L1 ² / 3
Bending Stress, fb:	6.9	4.7	kips/in = P e1 / S
Combined Stress, f:	7.7	5.2	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	92.1%	61.9%	
Lower Pole			
Stiffener Axial, P:	276.6	139.4	kips
Effective Throat, te:	0.2651	0.2651	in = 0.707 w
Shear Stress, fv:	3.5	2.5	ksi = P / (2 L2)
Section Modulus, S:	507.0	266.0	in ² = L2 ² / 3
Bending Stress, fb:	5.2	4.6	ksi = P e2 / S
Combined Stress, f:	6.3	5.2	kips/in = (fv ² + fb ²) ^{1/2}
ASIF:	1.3333	1.3333	
Allowable Stress, F:	8.4	8.4	kips/in = ASIF (0.4 Fy) tp
Ratio:	75.3%	62.0%	

Stiffener 1 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 1	
Gross Area, Ag:	10.5840	in ²
Net Area, An:	10.5840	in ²
Stiffener Axial, P:	276.6	kips
Stiffener Stress, f:	26.1	ksi = P / Ag
b:	16.2000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	11.0204	in
Q, Where Qa = 1.0:	0.9428	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.4244	in ³
K L / r:	10.6044	
ASIF:	1.3333	
Allowable Axial, Fa:	47.56	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	49.03	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	54.9%	

Stiffener 2 Analysis per AISC Sect. D1, E2, F1.2 & App. B

	Stiffener Type 2	
Gross Area, Ag:	5.5000	in ²
Net Area, An:	5.5000	in ²
Stiffener Axial, P:	139.4	kips
Stiffener Stress, f:	25.3	ksi = P / Ag
b:	14.5000	in = (Df - Dp) / 2 + n + Ws, Upper Pole
b / ts:	14.5000	in
Q, Where Qa = 1.0:	0.8174	= Qa 1.340 - 0.00447 (b / ts) Fy ^{1/2}
r:	0.2887	in ³
K L / r:	15.5885	
ASIF:	1.3333	
Allowable Axial, Fa:	40.66	ksi = ASIF Q [1 - (K L / r) / 2 Cc ²] Fy / [5/3 + 3(K L / r) / 8 Cc' - (K L / r) ³ / 8 Cc ³]
ASIF:	1.3333	
Allowable Bending, Fb:	42.51	ksi = ASIF 0.6 Fy Q
ASIF:	1.3333	
Allowable Net Tension, Ft:	53.33	ksi = ASIF 0.5 Fu
Ratio:	62.3%	

Analysis Summary:

Bridge Stiffener Type 1
Weld Analysis Ratio: 81.1% PASS
Pole Analysis Ratio: 92.1% PASS
Stiffener Analysis Ratio: 54.9% PASS

Bridge Stiffener Type 2
Weld Analysis Ratio: 55.1% PASS
Pole Analysis Ratio: 62.0% PASS
Stiffener Analysis Ratio: 62.3% PASS



v4.4 - Effective 7-12-13

Asymmetric Anchor Rod Analysis

Moment = 2086 k-ft
Axial = 38.0 kips
Shear = 24.0 kips
Anchor Qty = 21

TIA Ref. = F
ASIF = 1.3333
Max Ratio = 100.0%

Location = Base Plate
η = N/A for BP, Rev. G Sect. 4.9.9
Threads = N/A for FP, Rev. G

**** For Post Installed Anchors: Check anchors for embedment, epoxy/grout bond, and capacity based on proof load. ****

Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Area Override, in ²	Area, in ²	Max Net Compression, kips	Max Net Tension, kips	Load for Capacity Calc, kips	Capacity Override, kips	Capacity, kips	Capacity Ratio
1	1.500	A354 Gr BC	109	125	0.0	41.00	0.00	1.77	88.77	85.65	85.65	0.00	97.19	88.1%
2	1.500	A354 Gr BC	109	125	22.5	41.00	0.00	1.77	89.21	86.09	86.09	0.00	97.19	88.6%
3	1.500	A354 Gr BC	109	125	45.0	41.00	0.00	1.77	91.80	88.68	88.68	0.00	97.19	91.2%
4	1.500	A354 Gr BC	109	125	67.5	41.00	0.00	1.77	94.51	91.39	91.39	0.00	97.19	94.0%
5	1.500	A354 Gr BC	109	125	90.0	41.00	0.00	1.77	94.98	91.86	91.86	0.00	97.19	94.5%
6	1.500	A354 Gr BC	109	125	112.5	41.00	0.00	1.77	91.80	88.68	88.68	0.00	97.19	91.2%
7	1.500	A354 Gr BC	109	125	135.0	41.00	0.00	1.77	85.22	82.11	82.11	0.00	97.19	84.5%
8	1.500	A354 Gr BC	109	125	157.5	41.00	0.00	1.77	77.36	74.25	74.25	0.00	97.19	76.4%
9	1.500	A354 Gr BC	109	125	180.0	41.00	0.00	1.77	71.88	68.76	68.76	0.00	97.19	70.8%
10	1.500	A354 Gr BC	109	125	202.5	41.00	0.00	1.77	72.03	68.91	68.91	0.00	97.19	70.9%
11	1.500	A354 Gr BC	109	125	225.0	41.00	0.00	1.77	77.61	74.49	74.49	0.00	97.19	76.6%
12	1.500	A354 Gr BC	109	125	247.5	41.00	0.00	1.77	85.20	82.09	82.09	0.00	97.19	84.5%
13	1.500	A354 Gr BC	109	125	270.0	41.00	0.00	1.77	91.28	88.16	88.16	0.00	97.19	90.7%
14	1.500	A354 Gr BC	109	125	292.5	41.00	0.00	1.77	93.95	90.83	90.83	0.00	97.19	93.5%
15	1.500	A354 Gr BC	109	125	315.0	41.00	0.00	1.77	93.22	90.10	90.10	0.00	97.19	92.7%
16	1.500	A354 Gr BC	109	125	337.5	41.00	0.00	1.77	90.69	87.58	87.58	0.00	97.19	90.1%
17	1.750	Dywidag (150 ksi)	127.7	150	60.0	51.50	0.00	2.71	177.76	172.97	172.97	0.00	178.99	96.6%
18	1.750	Dywidag (150 ksi)	127.7	150	146.0	51.50	0.00	2.71	158.08	153.30	153.30	0.00	178.99	85.6%
19	1.750	Dywidag (150 ksi)	127.7	150	244.0	51.50	0.00	2.71	163.18	158.40	158.40	0.00	178.99	88.5%
20	1.750	Dywidag (150 ksi)	127.7	150	326.0	51.50	0.00	2.71	174.56	169.78	169.78	0.00	178.99	94.9%
21	2.250	A193 Gr B7	105	125	191.3	51.50	0.00	3.98	205.25	198.24	198.24	0.00	218.68	90.6%

43.10

Stiffened or Unstiffened, UngROUTed, Circular Base Plate - Any Rod Material

TIA Rev F

Site Data

BU#: 876331
Site Name: Great Britain Gravel Pit
App #:
Pole Manufacturer: Other

Reactions

Moment:	1276.7	ft-kips
Axial:	24.9	kips
Shear:	15.7	kips

Reactions adjusted to account for additional anchor rods.

Anchor Rod Data

Qty:	16	
Diam:	1.5	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	109	ksi
Bolt Circle:	41	in

If No stiffeners, Criteria: **AISC ASD** <-Only Applicable to Unstiffened Cases

Anchor Rod Results

Maximum Rod Tension: 91.9 Kips

Rigid
Service, ASD
Fty*ASIF

Plate Data

Diam:	47	in
Thick:	2	in
Grade:	36	ksi
Single-Rod B-eff:	7.07	in

Base Plate Results

Base Plate Stress: 30.8 ksi
 Allowable Plate Stress: 36.0 ksi
 Base Plate Stress Ratio: 85.5% **Pass**

Flexural Check

Rigid
Service ASD
0.75*Fy*ASIF
Y.L. Length: 19.62

Stiffener Data (Welding at both sides)

Config:	0	*
Weld Type:		
Groove Depth:		in **
Groove Angle:		degrees
Fillet H. Weld:		<-- Disregard
Fillet V. Weld:		in
Width:		in
Height:		in
Thick:		in
Notch:		in
Grade:		ksi
Weld str.:		ksi

n/a

Stiffener Results

Horizontal Weld : n/a
 Vertical Weld: n/a
 Plate Flex+Shear, fb/Fb+(fv/Fv)^2: n/a
 Plate Tension+Shear, ft/Ft+(fv/Fv)^2: n/a
 Plate Comp. (AISC Bracket): n/a

Pole Results

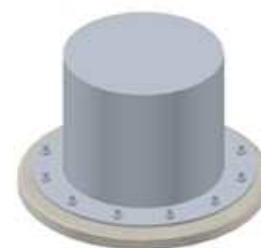
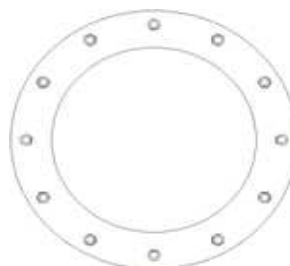
Pole Punching Shear Check: n/a

Pole Data

Diam:	36	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Stress Increase Factor

ASIF:	1.333
-------	-------



* 0 = none, 1 = every bolt, 2 = every 2 bolts, 3 = 2 per bolt

** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

CURRENT MOMENT = 1949

By comparison THE CAPACITIES ARE:

$$(2086/2024) 66.1 = 68.1\%, \quad (2086/2024) 74.7 = 77.0\%$$



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PAGE 1 OF 5
BY R.M.K. DATE 10/10/2012
PROJECT 118' MONOPOLE
CLIENT cci PROJ# 32512-112

FOUNDATION ANALYSIS

BASE REACTIONS:

$M = 2024 \text{ k}$
 $V = 83 \text{ kips}$
 $P = 33 \text{ kips}$

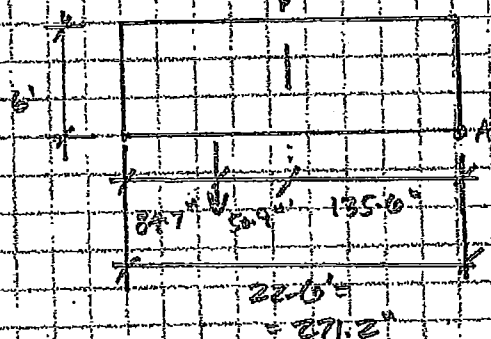
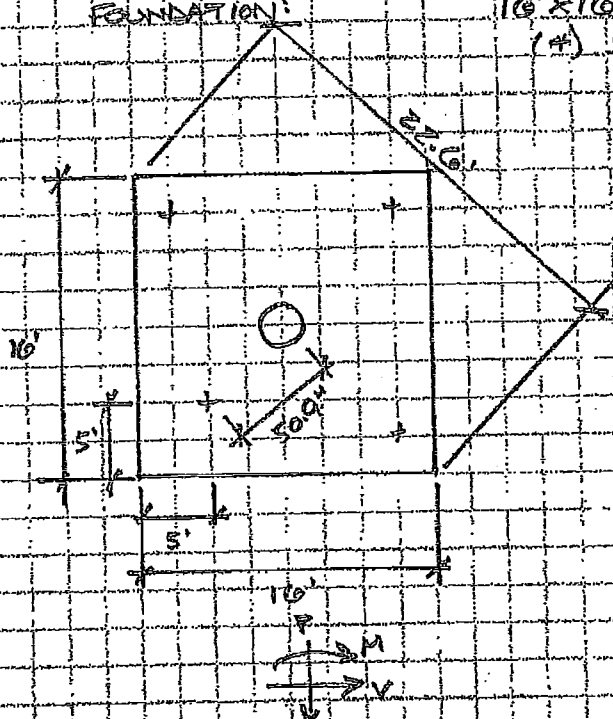
FOUNDATION:

16' x 16' x 6' DE. MAT w/
(4) SOIL ANCHORS

WT. MAT = $(16)(16)(6)(145) = 222.7 \text{ kips}$

ALLOW. SOIL = 130 kips
ANCHOR

ALLOW. SOIL = 10 kips
BEG. PRESSURE



$M_{OT} = 2024 + 83(6) = 2162 \text{ k}$
 $= 25944 \text{ kft}$



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PAGE 2 OF 5
BY PMR DATE 6/18/2012
PROJECT 118' MONOPOLE
CLIENT CCI PROJ# 87512-119

FOUNDATION ANALYSIS CONT.

$$M_{RESIST_{WT}} = (33 + 222.7)(135.6) = 34672.92 \text{ kft}$$

$$M_{RESIST_{SOIL ANCHOR}} = (130)(135.6 + 50.9) = 24225 \text{ kft}$$

$$M_{RESIST_{TOT}} = 34672.92 + 24225 = 58917.92 \text{ kft}$$

$$F.S. = \frac{58917.92}{25744} = 2.27$$

$$F.S._{REQD} = 1.5$$

$$\text{STRESS RATIO} = \frac{1.5}{2.27} = 66.1\% \text{ OK}$$

$$\text{NOTE: F.S. w/o SOIL ANCHOR} = \frac{34672.92}{25744} = 1.34 \text{ NOT OK}$$



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PAGE 3 OF 5
BY RAK DATE 10/18/2012
PROJECT 118' MONOPOLE
CLIENT CCI PROJ# 37512-112

FOUNDATION ANALYSIS CONT.

CHECK OVERSTRENGTH ACROSS MAJOR AXIS (X-Y):

$$M_{RESIST_{WT}} = (33 + 222.7) \left(\frac{(16)(18)}{2} \right) = 24547.2 \text{ k-ft}$$

$$M_{RESIST_{SOIL ANCHOR}} = [(130)(16-5) + (130)(16-25)](18) = 39000 \text{ k-ft}$$

$$M_{RESIST_{TOT}} = 24547.2 + 39000 = 63547.2 \text{ k-ft}$$

$$F.S. = \frac{63547.2}{25944} = 2.45$$

$$\text{STRESS RATIO} = \frac{1.5}{2.45} = 61.2\% \text{ TO } 90$$



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BY RMK DATE 10/19/10
PROJECT 118' MONOPOLE
CLIENT CEI PROJ# 37512-1112

FOUNDATION ANALYSIS CONT.

CHECK BENTG. STR. IN MAT.

$$\text{BRG. PRESSURE FROM WEIGHTS } \left(\frac{33 + 2227}{16} \right) = 1 \text{ ksf}$$

THAT LEAVES \approx 9 ksf ALLOW. BRG. PRESSURE REMAINING

AREA OF SOIL REQ'D TO SUPPORT (2) SOIL ANCHORS
 \approx ASSUMES SOIL ANCHORS FULLY EFFECTIVE

$$\frac{200 \text{ kips}}{9 \text{ ksf}} = 22.22 \text{ FT}^2$$

$$\text{LENGTH} = \frac{22.22}{10} = 2.22 \text{ FT}$$

M. MAX

1. AXIAL LOAD DOESN'T CONTRIBUTE TOO MUCH MOMENT TO MAT SO IT WAS NOT CONSIDERED
2. CONSERVATIVELY CONSIDERS SOIL ANCHORS TO BE FULLY EFFECTIVE
3. CONSERVATIVELY TAKES MOMENT ABOUT C OF MONOPOLE

$$M_{U} = (1.3)(200) \left(\frac{16}{2} - \frac{2.22}{2} \right) = 3009 \text{ FT-KIP} = 36110 \text{ KIP-FT}$$



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PAGE 5 OF 5
BY RMK DATE 10/10/2012
PROJECT 118' MONOPILE
CLIENT CMLC PROJ# 27512-112

FOUNDATION ANALYSIS CONT.

CHECK BEAR STL IN MAT CONT.

MAT HAS (17) #8 BARS TO G. REIN.

$$A_s = 13.43 \text{ in}^2$$

$$b = (6)(12) = 72 \text{ in}$$

$$d = (6)(12) - 3 - (1.5)(1) = 67.5 \text{ in}$$

$$f_c = 3 \text{ ksi}$$

$$\alpha = \frac{A_s f_y}{(0.85)(f_c)b} = \frac{(13.43)(60)}{(0.85)(3)(72)} = 1.046$$

$$z = d - \frac{a}{2} = 67.5 - \frac{1.046}{2} = 66.677 \text{ in}$$

$$\phi M_n = (0.9)(13.43)(60)(66.677) = 48355 \text{ ft-k}$$

OR

$$(0.9)(0.85)(3)(1.046)(72)(66.677) = 48300 \text{ ft-k}$$

$$\text{STRESS RATIO} = \frac{36910}{48355} = 74.7\%$$

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME

BU #876331; NEW BRITAIN GRAVEL PIT

APP: 260887 REV. 0; WO: 930502

SITE ADDRESS

**115 NORTH MOUNTAIN RD
NEW BRITAIN, CONNECTICUT 06053
HARTFORD COUNTY**

PROJECT NOTES

1. DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
2. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
3. ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
4. (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

(B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

(C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

PROJECT CONTACTS:

MONOPOLE OWNER:

CROWN CASTLE
3530 TORINGDON WAY, CHARLOTTE, NC 28277
TSA CONTACT: DAVID SMITH AT DAVID.SMITH@CROWNCastle.COM
PH: (724) 416-2000
MOD PM: JERRY BRUNO AT JERRY.BRUNO.CONTRACTOR@CROWNCastle.COM
PH: (781) 970-0069

STRUCTURAL ENGINEER OF RECORD (EOR):

PAUL J. FORD AND COMPANY
250 EAST BROAD STREET, SUITE 600
COLUMBUS, OHIO 43215-3708
CONTACT: JOEY MEINERDING AT JMEINERDING@PJFWEB.COM
PHONE: 614-221-6679

DESIGN STANDARD

THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE 2005 CONNECTICUT BUILDING CODE AND THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (FASTEST MILE) WITH NO ICE, 37.6 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS.

REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-0921.004.7700), DATED 10-21-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
FIELD WELDED ANCHOR BRACKETS
POST INSTALLED ANCHOR RODS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
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S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
S-5	BASE PLATE DETAILS
S-6	MISC DETAILS
S-7	MI CHECKLIST



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CROWN CASTLE

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PH: (724) 416-2000

BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.
CHECKED BY:
J.W.M.
APPROVED BY:
DATE:
10-21-2014

TITLE SHEET

T-1

CROWN CASTLE PROJECT: BU #876331; NEW BRITAIN GRAVEL PIT; NEW BRITAIN, CONNECTICUT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

A. GENERAL NOTES

- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
- THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F-1996 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
- IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
- THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. **IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES:** THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING, FIRE PREVENTION AND SAFETY GUIDELINES. PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY 'CUTTING AND WELDING PLAN' (DOC # ENG-PLN-10015) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT".
- THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
- ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
- ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

- ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
- ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
- OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
- AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 - ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES.
 - THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
- THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
 - GENERAL:**
 - PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
 - FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)**
 - CONCRETE TESTING PER ACI - (NOT REQUIRED)**
 - STRUCTURAL STEEL**
 - CHECK THE STEEL ON THE JOB WITH THE PLANS.
 - CHECK MILL CERTIFICATIONS.
 - CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
 - CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - CHECK BOLT TIGHTENING ACCORDING TO AISC "TURN OF THE NUT" METHOD.
 - WELDING:**
 - VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
 - APPROVE FIELD WELDING SEQUENCE.
 - A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
 - INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - INSPECT WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
 - VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
 - SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
 - INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
 - VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - REVIEW THE REPORTS BY TESTING LABS.
 - CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
 - REPORTS:**
 - COMPILE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.
- THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
- AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
- RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.



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CROWN CASTLE

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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.

CHECKED BY:
J.W.M.

APPROVED BY:

DATE:
10-21-2014

GENERAL NOTES

S-1

D. STRUCTURAL STEEL

1. STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
- A. BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
- "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
 - "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
 - "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
- B. BY THE AMERICAN WELDING SOCIETY (AWS):
- "STRUCTURAL WELDING CODE - STEEL D1.1."
 - "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
2. ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
3. TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
4. WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
5. ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
6. STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
7. SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
8. UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
9. ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
10. NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
11. FIELD CUTTING OF STEEL:
- PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
 - ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
 - ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)**F. FOUNDATION WORK - (NOT REQUIRED)****G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)****H. EPOXY GROUTED REINFORCING ANCHOR RODS**

1. UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A722. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL.
2. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775.
3. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS, PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY. CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS, EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
4. ULTRABOND 1, HILTI HIT RE-500 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY, ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
5. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
6. ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

I. TOUCH UP OF GALVANIZING

1. THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. **GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.**
2. CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
3. THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

J. HOT DIP GALVANIZING

1. HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
2. PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
3. DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
4. ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

K. PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

1. AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
2. THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. **ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.**
3. THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. **PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT.** ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".



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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.

CHECKED BY:
J.W.M.

APPROVED BY:

DATE:
10-21-2014

GENERAL NOTES

S-2

AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

- NOTES:**
1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
 3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.
 4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH RED DURABLE SQUIRT MEDIA EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY APPLIED BOLTING TECHNOLOGY PRODUCTS' INC.:

PART NUMBER: 2DTIM208MGAFSIF

DESCRIPTION: P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONESIDE BOLT. FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
15401 COMMERCE PARK DR.
BROOKPARK, OHIO 44142
PHONE: 440-232-6060
E-MAIL: SALES@ALLFASTENERS.COM

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

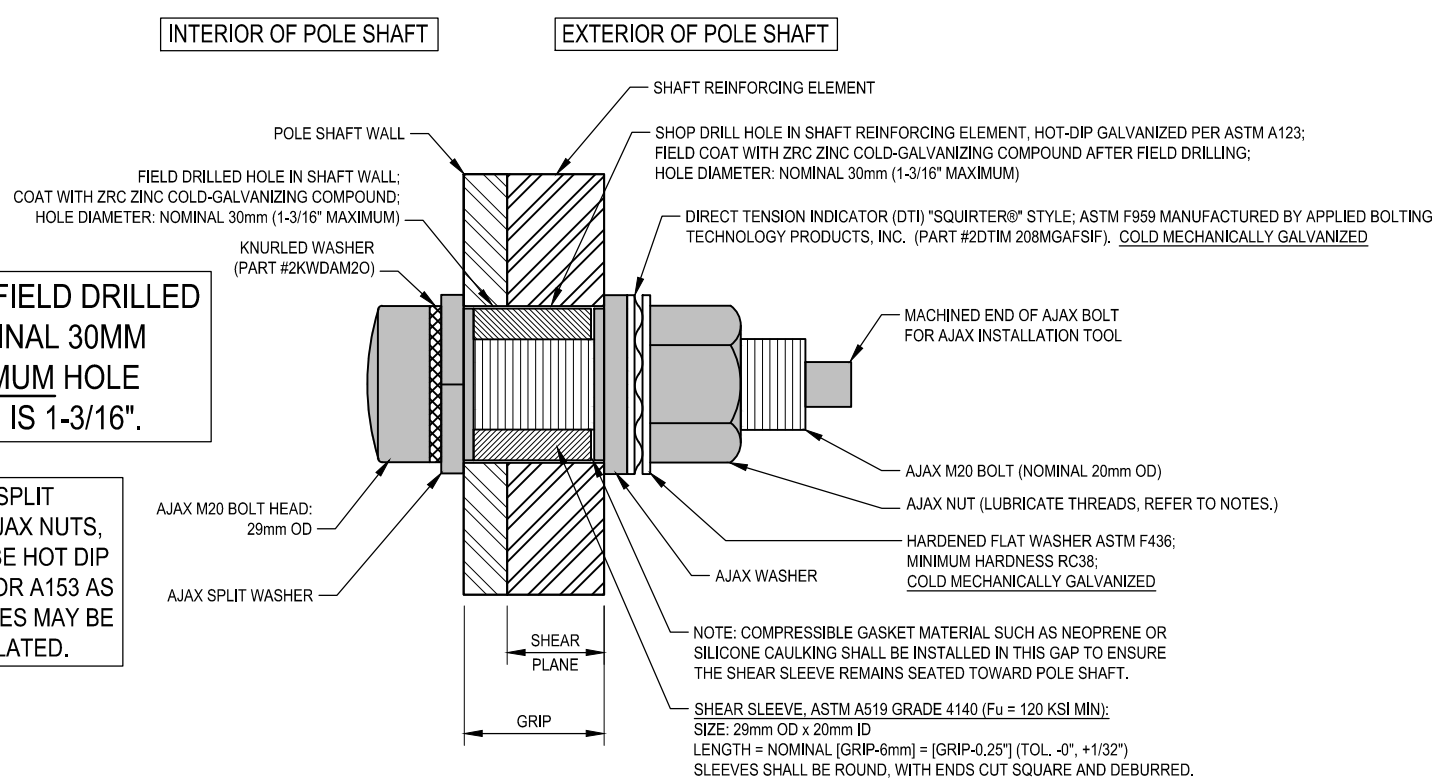
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.

TYPICAL AJAX BOLT DETAIL 1
S-3



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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.
CHECKED BY:
J.W.M.
APPROVED BY:

AJAX BOLT DETAIL

DATE:
10-21-2014

S-3

POLE SPECIFICATIONS	
POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	Fy = 42 KSI
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1 1/2"Ø ASTM A354 GR. BC

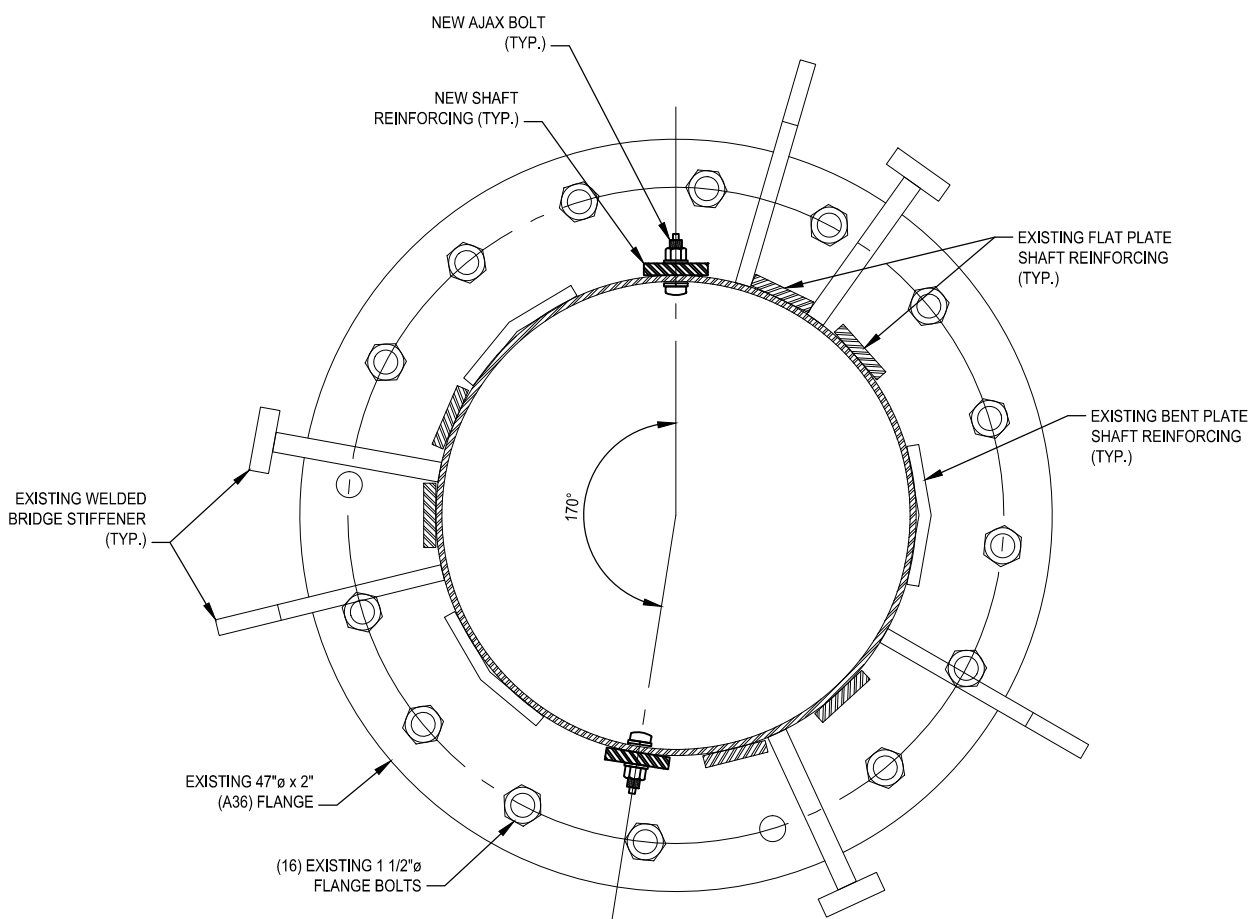
SHAFT SECTION DATA					
SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPLICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	28.00	0.2500		24.000	24.000
2	30.00	0.3750		24.000	24.000
3	30.00	0.3750		30.000	30.000
4	30.00	0.3750		36.000	36.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

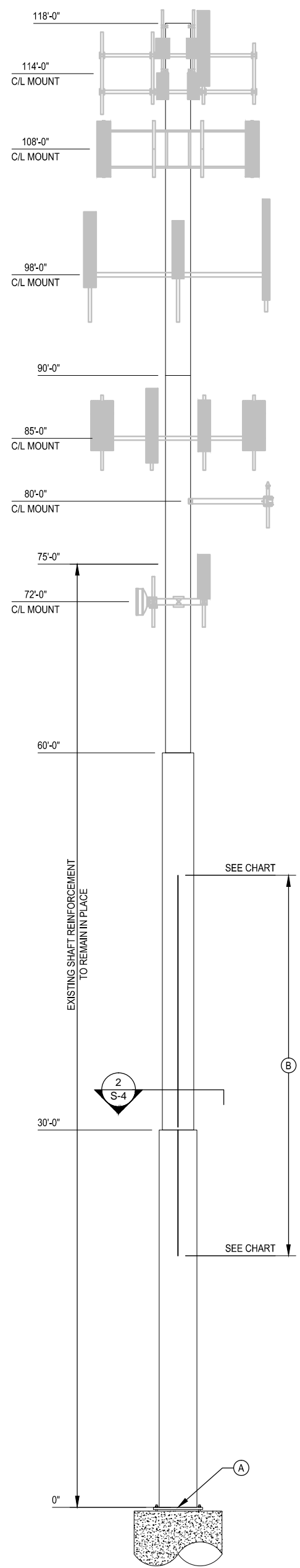
MODIFICATIONS:	
(A)	INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-5.
(B)	INSTALL NEW SHAFT REINFORCING. SEE CHART.

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE											
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
20'-0"	30'-0"	30, 160 & 270	CCI-SFP-04510010	10'-0"	3	16	48	6	6	20"	459 LBS.
30'-3"	50'-3"	90 & 260	CCI-SFP-04007520	20'-0"	2	21	42	4	4	16"	408 LBS.
						90					867 LBS.

- NOTES:**
- 1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
 - 2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
 - 3.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
 - 4.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
 - 5.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
 - 6.) ALL SHIMS SHALL BE ASTM A-36.



SECTION **2**
30'-0" S-4



POLE ELEVATION **1**
S-4

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,849,659; 8,424,269 AND PATENT PENDING

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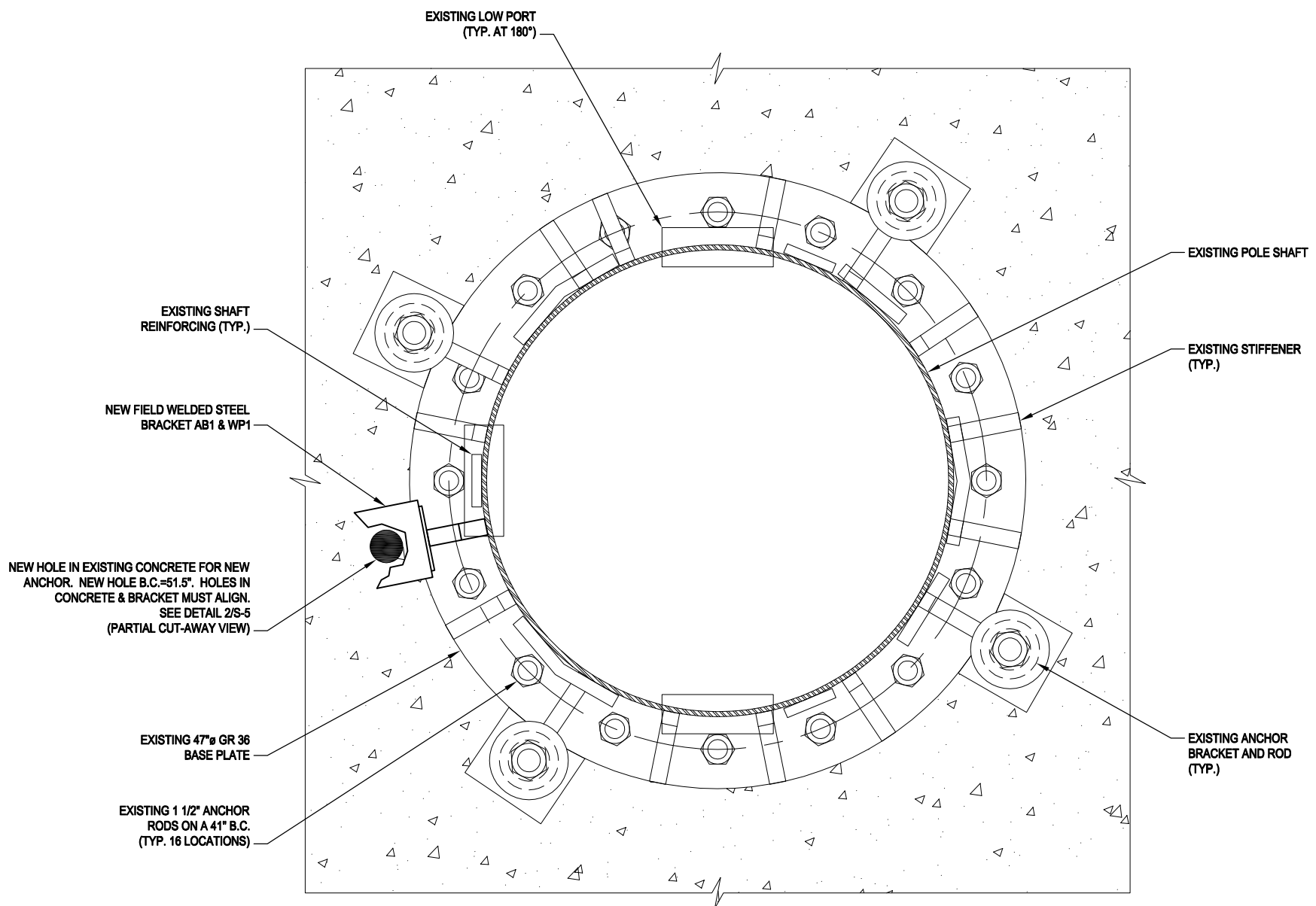
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CHECKED BY:
J.W.M.
APPROVED BY:

MONOPOLE PROFILE

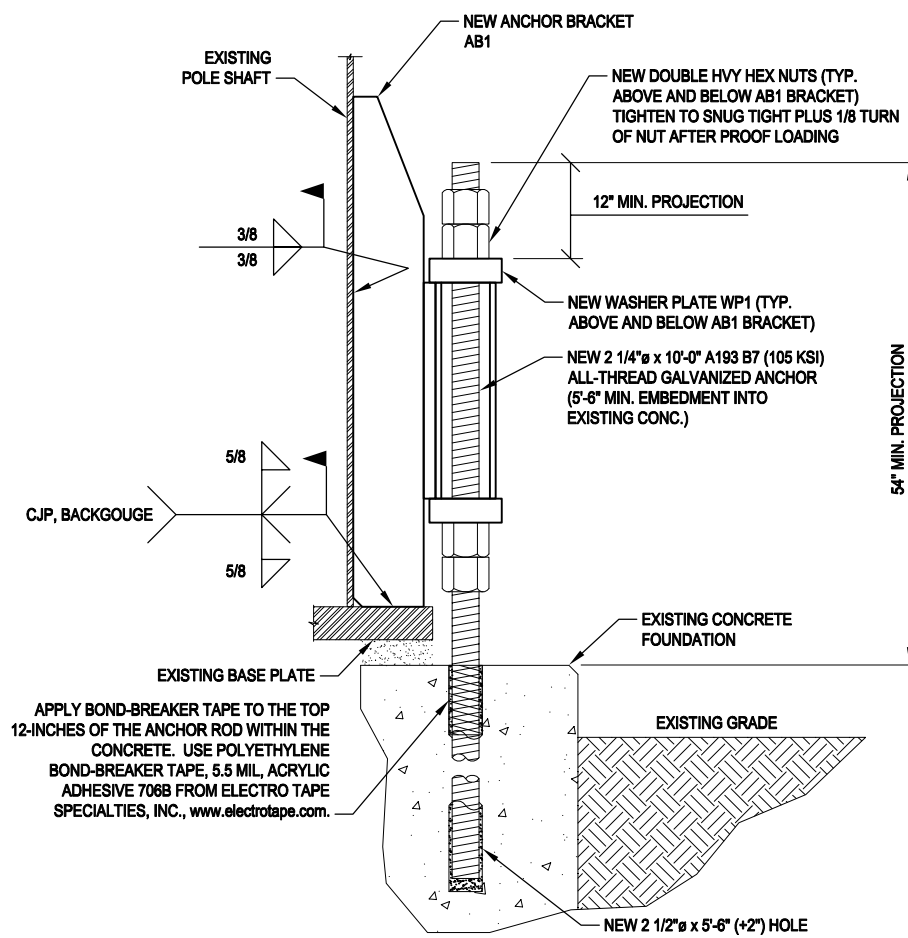
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S-4

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BASE PLATE 1
S-5



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 205 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

NEW ANCHOR & BRACKET DETAIL 2
S-5

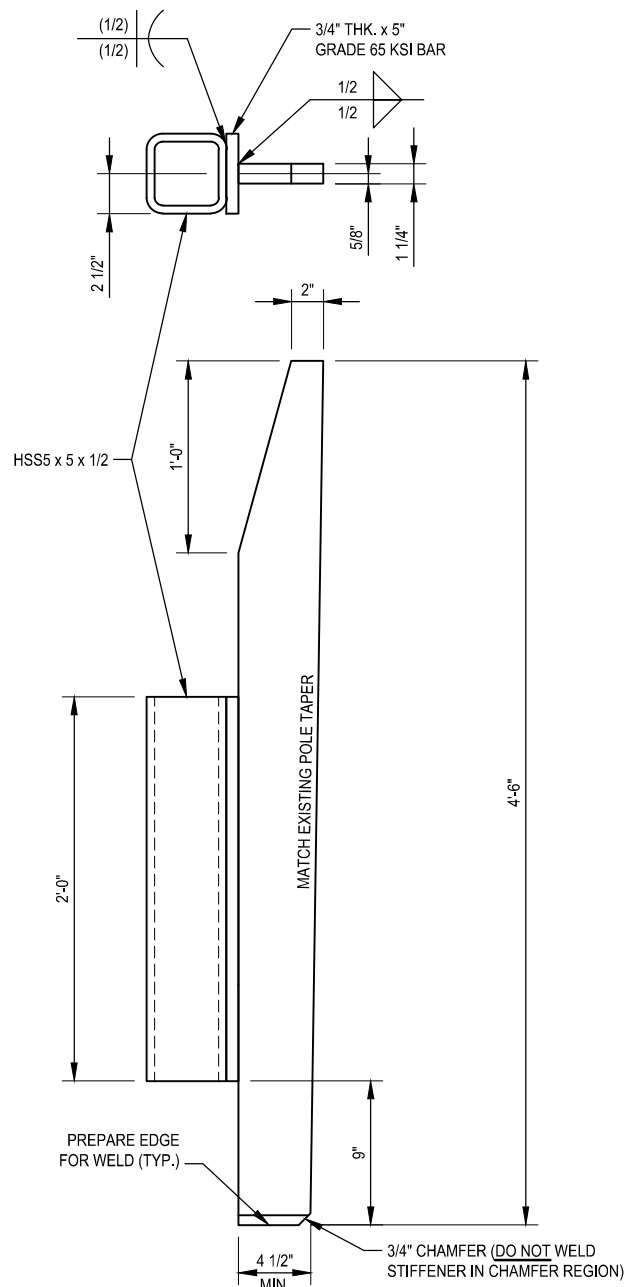
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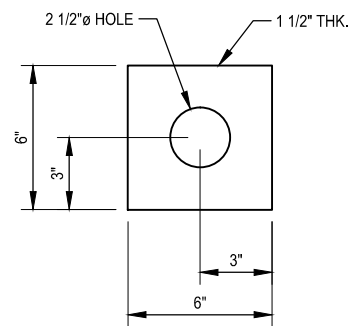
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PROJECT: 37513-0921.004.7700	
DRAWN BY: B.M.S.	BASE PLATE DETAILS
CHECKED BY: J.W.M.	
APPROVED BY:	S-5
DATE: 10-21-2014	



ANCHOR BRACKET MK~AB1

(1 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



WASHER PLATE MK~WP1

(2 REQUIRED) (Fy = 50 KSI)

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CHECKED BY:
 J.W.M.

APPROVED BY:

DATE:
 10-21-2014

MISC DETAILS

S-6

MODIFICATION INSPECTION NOTES:**GENERAL**

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MI'S SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007 : MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN DENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED.
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTION(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MIP'S

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION/REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTION(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/ERECTION AND INSPECTION
 - RAW MATERIALS
 - PHOTOS OF ALL CRITICAL DETAILS
 - FOUNDATION MODIFICATIONS
 - WELD PREPARATION
 - BOLT INSTALLATION AND TORQUE
 - FINAL INSTALLED CONDITION
 - SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
 - FINAL INFIELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOR REVIEW
X	FABRICATION INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS: -----	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF AJAX BOLTS AND DTI'S PER REQUIREMENTS ON SHEET S-3
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QA/QC DOCUMENTS
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
ADDITIONAL TESTING AND INSPECTIONS: -----	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS: -----	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT

NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT



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STRUCTURAL ENGINEERS
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CROWN CASTLE

3530 TORINGDON WAY, CHARLOTTE, NC 28277
PH: (724) 416-2000

BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.

CHECKED BY:
J.W.M.

APPROVED BY:

DATE:
10-21-2014

MI CHECKLIST

S-7

MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

BU NUMBER; SITE NAME
BU #876331; NEW BRITAIN GRAVEL PIT
 APP: 260887 REV. 0; WO: 930502

SITE ADDRESS
**115 NORTH MOUNTAIN RD
 NEW BRITAIN, CONNECTICUT 06053
 HARTFORD COUNTY**

PROJECT NOTES

- DETAILED FIELD INFORMATION REGARDING INTERFERENCES AND/OR EXISTING FIELD CONDITIONS MAY BE AVAILABLE ON CROWN'S CCISITES AND FROM CONTRACTOR'S PRE-MOD MAPPING. IT IS THE CONTRACTOR'S RESPONSIBILITY TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS AND COORDINATE WITH THE AVAILABLE SOURCES OF INFORMATION ABOVE AND WITH THE PROJECT PLANS BEFORE PROCEEDING WITH THE WORK. CONTRACTOR SHALL IMMEDIATELY REPORT ANY AND ALL DISCREPANCIES TO PAUL J. FORD AND COMPANY AND CROWN CASTLE FIELD PERSONNEL BEFORE PROCEEDING WITH THE WORK.
- ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
- ALL STRUCTURAL BOLTS SHALL BE FIELD INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.
- (A.) DTI'S REQUIRED: ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAILS ON SHEET S-3 FOR REQUIREMENTS ON THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

(B.) EFFECTIVE 5/30/2012: UNTIL FURTHER NOTICE, CROWN CASTLE WILL ACCEPT AJAX BOLTS TIGHTENED USING AISC "TURN-OF-NUT" METHOD. INSTALLERS SHALL FOLLOW CROWN GUIDELINES FOR AISC "TURN-OF-NUT" METHOD AND ALSO PROVIDE COMPLETE INSPECTION DOCUMENTATION IN THE PMI. PRIOR TO STARTING WORK, CONTRACTOR SHALL CONSULT WITH CROWN ENGINEERING TO DETERMINE WHETHER THIS POLICY IS STILL IN PLACE.

(C.) REQUIREMENT EFFECTIVE 04/20/2013, PER CROWN CASTLE DIRECTIVE: ANY AND ALL STRUCTURAL BOLTS THAT ARE TIGHTENED TO THE PRETENSIONED CONDITION USING THE AISC "TURN-OF-NUT" TENSIONING PROCEDURE (NON-TENSION CONTROLLED [NON-TC] BOLTS AND/OR BOLTS WITHOUT DTI'S INSTALLED) SHALL BE INSPECTED ONSITE BY AN INDEPENDENT THIRD-PARTY BOLT INSPECTOR, AS APPROVED BY CROWN. **THIS INSPECTION IS REQUIRED TO BE AN ONSITE FIELD INSPECTION.** THE THIRD-PARTY BOLT INSPECTOR SHALL FOLLOW THE PUBLISHED CROWN CASTLE INSPECTION PROCEDURE "MI NON-TC BOLT INSPECTION", DATED APRIL 2013. THE THIRD-PARTY BOLT INSPECTOR SHALL PREPARE A FULLY DOCUMENTED BOLT INSPECTION REPORT, AS SPECIFIED BY CROWN, AND SHALL SUBMIT A COPY OF THE BOLT INSPECTION REPORT TO THE MI INSPECTOR, THE EOR, AND TO CROWN CASTLE.

PROJECT CONTACTS:

MONOPOLE OWNER:

CROWN CASTLE
 3530 TORINGDON WAY, CHARLOTTE, NC 28277
 TSA CONTACT: DAVID SMITH AT DAVID.SMITH@CROWNCASTLE.COM
 PH: (724) 416-2000
 MOD PM: JERRY BRUNO AT JERRY.BRUNO.CONTRACTOR@CROWNCASTLE.COM
 PH: (781) 970-0069

STRUCTURAL ENGINEER OF RECORD (EOR):

PAUL J. FORD AND COMPANY
 250 EAST BROAD STREET, SUITE 600
 COLUMBUS, OHIO 43215-3708
 CONTACT: JOEY MEINERDING AT JMEINERDING@PJFWEB.COM
 PHONE: 614-221-6679

DESIGN STANDARD

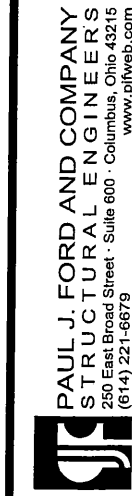
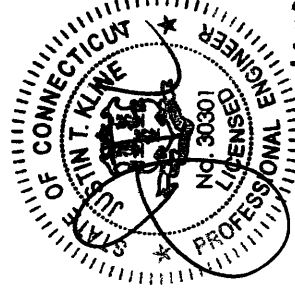
THIS REINFORCEMENT DESIGN IS BASED UPON THE REQUIREMENTS OF THE 2005 CONNECTICUT BUILDING CODE AND THE TIA/EIA-222-F-1996 STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS, USING A DESIGN BASIC WIND SPEED OF 80 MPH (FASTEST MILE) WITH NO ICE, 37.6 MPH WITH 1 INCH ICE AND 50 MPH SERVICE LOADS. REFER TO THE POLE DESIGN AND ANTENNA LOADING DOCUMENTED IN THE PJF STRUCTURAL ANALYSIS FOR THIS SITE (PJF#37513-0921.004.7700), DATED 10-21-2014.

THIS PROJECT INCLUDES THE FOLLOWING REINFORCING ELEMENTS:

SHAFT REINFORCING
 FIELD WELDED ANCHOR BRACKETS
 POST INSTALLED ANCHOR RODS

SHEET INDEX

SHEET NUMBER	DESCRIPTION
T-1	TITLE SHEET
S-1	GENERAL NOTES
S-2	GENERAL NOTES
S-3	AJAX BOLT DETAIL
S-4	MONOPOLE PROFILE
S-5	BASE PLATE DETAILS
S-6	MISC DETAILS
S-7	MI CHECKLIST



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PROJECT: 37513-0921.004.7700
 DRAWN BY:
 B.M.S.
 CHECKED BY:
 J.W.M.
 APPROVED BY:

 DATE:
 10-21-2014

**BU #876331; NEW BRITAIN GRAVEL PIT
 NEW BRITAIN, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT**

PROJECT: 37513-0921.004.7700

DRAWN BY:

B.M.S.

CHECKED BY:

J.W.M.

APPROVED BY:



DATE:

10-21-2014

TITLE SHEET

T-1

CROWN CASTLE PROJECT: BU #876331; NEW BRITAIN GRAVEL PIT; NEW BRITAIN, CONNECTICUT
MONOPOLE RETROFIT PROJECT MASTER NOTES DOCUMENT (REV. 2, 1/22/2009)

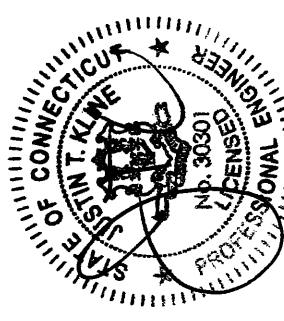
- A. GENERAL NOTES
- IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO FIELD VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS PRIOR TO FABRICATION AND CONSTRUCTION. THESE DRAWINGS WERE PREPARED FROM INFORMATION AND DOCUMENTS PROVIDED TO PAUL J. FORD & COMPANY BY CROWN CASTLE. THIS INFORMATION PROVIDED HAS NOT BEEN FIELD VERIFIED BY PAUL J. FORD & COMPANY FOR ACCURACY AND THEREFORE DISCREPANCIES BETWEEN THESE DRAWINGS AND ACTUAL SITE CONDITIONS SHOULD BE ANTICIPATED. ANY DISCREPANCIES AND/OR CHANGES BETWEEN THE INFORMATION CONTAINED IN THESE DRAWINGS AND THE ACTUAL VERIFIED SITE CONDITIONS SHALL BE IMMEDIATELY BROUGHT TO THE ATTENTION OF CROWN CASTLE AND PAUL J. FORD & COMPANY SO THAT ANY CHANGES AND/OR ADJUSTMENTS, IF NECESSARY, CAN BE MADE TO THE DESIGN AND DRAWINGS.
 - THE EXISTING UNREINFORCED MONOPOLE STRUCTURE DOES NOT HAVE THE STRUCTURAL CAPACITY TO CARRY ALL OF THE ANTENNA AND PLATFORM LOADS SHOWN ON THESE DRAWINGS AT THE REQUIRED MINIMUM TIA/EIA-222-F-1996 BASIC WIND SPEEDS. DO NOT INSTALL ANY ADDITIONAL OR NEW ANTENNA AND PLATFORM LOADS UNTIL THE MONOPOLE REINFORCING SYSTEM IS COMPLETELY AND SUCCESSFULLY INSTALLED.
 - IF MATERIALS, QUANTITIES, STRENGTHS OR SIZES INDICATED BY THE DRAWINGS OR SPECIFICATIONS ARE NOT IN AGREEMENT WITH THESE NOTES, THE BETTER QUALITY AND/OR GREATER QUANTITY, STRENGTH OR SIZE INDICATED, SPECIFIED OR NOTED SHALL BE PROVIDED.
 - THIS STRUCTURE IS DESIGNED TO BE SELF-SUPPORTING AND STABLE AFTER THE INSTALLATION OF THE REINFORCING REPAIR SYSTEM HAS BEEN PROPERLY AND ADEQUATELY COMPLETED. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO INSURE THE SAFETY AND STABILITY OF THE MONOPOLE AND ITS COMPONENT PARTS DURING FIELD MODIFICATIONS. THIS INCLUDES, BUT IS NOT LIMITED TO, THE ADDITION OF WHATEVER TEMPORARY BRACING, GUYS OR TIE DOWNS THAT MAY BE NECESSARY. SUCH MATERIAL SHALL BE REMOVED AND SHALL REMAIN THE PROPERTY OF THE CONTRACTOR AFTER THE COMPLETION OF THE PROJECT. IMPORTANT CUTTING, WELDING AND SAFETY GUIDELINES: THE CONTRACTOR SHALL FOLLOW ALL CROWN CASTLE CUTTING, WELDING AND SAFETY GUIDELINES. THE GUIDELINES, PRIOR TO CONSTRUCTION, THE CONTRACTOR SHALL OBTAIN A COPY OF THE CURRENT CROWN CASTLE GUIDELINES FROM CROWN CASTLE. PER THE 12-01-2005 CROWN CASTLE DIRECTIVE: "ALL CUTTING AND WELDING ACTIVITIES SHALL BE CONDUCTED IN ACCORDANCE WITH CROWN CASTLE POLICY CUTTING AND WELDING PLAN" (DOC # ENG-PEN-100151) ON AN ONGOING BASIS THROUGHOUT THE ENTIRE LIFE OF THE PROJECT.
 - THE STRUCTURAL CONTRACT DOCUMENTS DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES. OBSERVATION VISITS TO THE SITE BY THE OWNER AND/OR THE ENGINEER SHALL NOT INCLUDE INSPECTIONS OF THE PROTECTIVE MEASURES OR THE CONSTRUCTION PROCEDURES. ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY THE INSPECTION/TESTING AGENCY. THESE SUPPORT SERVICES WHICH ARE FURNISHED BY SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
 - ALL MATERIALS AND EQUIPMENT FURNISHED WILL BE NEW AND OF GOOD QUALITY, FREE FROM FAULTS AND DEFECTS AND IN CONFORMANCE WITH THE CONTRACT DOCUMENTS. ANY AND ALL SUBSTITUTIONS MUST BE PROPERLY APPROVED AND AUTHORIZED IN WRITING BY THE OWNER AND ENGINEER PRIOR TO INSTALLATION. THE CONTRACTOR SHALL FURNISH SATISFACTORY EVIDENCE AS TO THE KIND AND QUALITY OF MATERIALS AND EQUIPMENT BEING SUBSTITUTED.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR INITIATING, MAINTAINING, AND SUPERVISING ALL SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK. THE CONTRACTOR IS RESPONSIBLE TO ENSURE THAT THIS PROJECT AND RELATED WORK COMPLIES WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY CODES AND REGULATIONS GOVERNING THIS WORK AS WELL AS CROWN CASTLE SAFETY GUIDELINES.
 - THE CONTRACTOR SHALL BE RESPONSIBLE FOR PROTECTING ALL EXISTING AND NEW COAXIAL CABLES AND OTHER EQUIPMENT DURING CONSTRUCTION.
 - ANY EXISTING ATTACHMENTS AND/OR PROJECTIONS ON THE POLE THAT MAY INTERFERE WITH THE INSTALLATION OF THE REINFORCING SYSTEM WILL HAVE TO BE REMOVED, AND/OR RELOCATED, AND/OR REPLACED AND RE-INSTALLED AFTER THE REINFORCING IS SUCCESSFULLY COMPLETED. THE CONTRACTOR SHALL IDENTIFY AND COORDINATE THESE ITEMS PRIOR TO CONSTRUCTION WITH THE OWNER, TESTING AGENCY, AND ENGINEER.
 - ANY AND ALL EXISTING PLATFORMS THAT ARE LOCATED IN AREAS OF THE POLE SHAFT WHERE SHAFT REINFORCING MUST BE APPLIED SHALL BE TEMPORARILY REMOVED OR OTHERWISE SUPPORTED TO PERMIT NEW CONTINUOUS REINFORCEMENT TO BE ATTACHED. AFTER THE CONTRACTOR HAS SUCCESSFULLY INSTALLED THE MONOPOLE REINFORCEMENT SYSTEM, THE CONTRACTOR SHALL RE-INSTALL THE PLATFORMS. IN NO CASE SHALL ANY NEW AND/OR ADDITIONAL PLATFORMS AND/OR ANTENNAS AND/OR COAX CABLES AND/OR OTHER EQUIPMENT BE INSTALLED ON THE MONOPOLE UNTIL THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF ALL OF THE REQUIRED STRUCTURAL REINFORCING SYSTEM COMPONENTS.

B. (SECTION NOT USED)

C. SPECIAL INSPECTION AND TESTING

- ALL WORK SHALL BE SUBJECT TO REVIEW AND OBSERVATION BY THE OWNER'S REPRESENTATIVE AND THE OWNER'S AUTHORIZED INDEPENDENT INSPECTION AND TESTING AGENCY. REFER TO CROWN CASTLE DOCUMENT ENG-SOW-10066 FOR SPECIFICATION.
 - ANY SUPPORT SERVICES PERFORMED BY THE ENGINEER DURING CONSTRUCTION SHALL BE DISTINGUISHED FROM CONTINUOUS AND DETAILED INSPECTION SERVICES WHICH ARE FURNISHED BY OTHERS. THESE SUPPORT SERVICES PERFORMED BY THE ENGINEER ARE PERFORMED SOLELY FOR THE PURPOSE OF ASSISTING IN QUALITY CONTROL AND IN ACHIEVING CONFORMANCE WITH CONTRACT DOCUMENTS. THEY DO NOT GUARANTEE CONTRACTOR'S PERFORMANCE AND SHALL NOT BE CONSTRUED AS SUPERVISION OF CONSTRUCTION.
 - OBSERVED DISCREPANCIES BETWEEN THE WORK AND THE CONTRACT DOCUMENTS SHALL BE CORRECTED BY THE CONTRACTOR AT NO ADDITIONAL COST.
 - AN INDEPENDENT QUALIFIED INSPECTION/TESTING AGENCY SHALL BE SELECTED, RETAINED AND PAID FOR BY THE OWNER FOR THE SOLE PURPOSE OF INSPECTING, TESTING, DOCUMENTING, AND APPROVING ALL WELDING AND FIELD WORK PERFORMED BY THE CONTRACTOR.
 - ACCESS TO ANY PLACE WHERE WORK IS BEING DONE SHALL BE PERMITTED AT ALL TIMES. THE INSPECTION AGENCY SHALL SO SCHEDULE THIS WORK AS TO CAUSE A MINIMUM OF INTERRUPTION TO, AND COORDINATE WITH, THE WORK IN PROGRESS. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE THE WORK SCHEDULE WITH THE TESTING AGENCY. THE CONTRACTOR SHALL ALLOW FOR ADEQUATE TIME AND ACCESS FOR THE TESTING AGENCY TO PERFORM THEIR DUTIES.
 - THE INSPECTION AND TESTING AGENCY SHALL BE RESPONSIBLE TO PERFORM THE FOLLOWING SERVICES FOR THE OWNER. THE TESTING AGENCY SHALL INSPECT THE FOLLOWING ITEMS IN ACCORDANCE WITH THE CONSTRUCTION DRAWINGS. THE TESTING AGENCY SHALL INSPECT ITEMS ON THIS LIST AND OTHER ITEMS AS NECESSARY TO FULFILL THEIR RESPONSIBILITY. THE TESTING AGENCY SHALL UTILIZE EXPERIENCED, TRAINED INSPECTORS INCLUDING AWS CERTIFIED WELDING INSPECTORS (CWI). INSPECTORS SHALL HAVE THE TRAINING, CREDENTIALS, AND EXPERIENCE APPROPRIATE FOR AND COMMENSURATE WITH THE SCOPE AND TYPE OF INSPECTION WORK TO BE PERFORMED.
 - GENERAL:
 - PERFORM PERIODIC ON-SITE OBSERVATION, INSPECTION, VERIFICATION, AND TESTING DURING THE TIME THE CONTRACTOR IS WORKING ON-SITE. AGENCY SHALL NOTIFY OWNER IMMEDIATELY WHEN FIELD PROBLEMS OR DISCREPANCIES OCCUR.
 - FOUNDATIONS, CONCRETE, AND SOIL PREPARATION - (NOT REQUIRED)
 - CONCRETE TESTING PER ACI - (NOT REQUIRED)
 - STRUCTURAL STEEL
 - CHECK THE STEEL ON THE JOB WITH THE PLANS.
 - CHECK MILL CERTIFICATIONS.
 - CHECK GRADE OF STEEL MEMBERS, AND BOLTS FOR CONFORMANCE WITH DRAWINGS.
 - INSPECT STEEL MEMBERS FOR DISTORTION, EXCESSIVE RUST, FLAWS AND BURNED HOLES.
 - CALL FOR LABORATORY TEST REPORTS WHEN IN DOUBT.
 - CHECK STEEL MEMBERS FOR SIZES, SWEEP AND DIMENSIONAL TOLERANCES.
 - CHECK FOR SURFACE FINISH SPECIFIED, GALVANIZED.
 - CHECK BOLT TIGHTENING ACCORDING TO ASC "TURN OF THE NUT" METHOD.
 - WELDING:
 - VERIFY FIELD WELDING PROCEDURES, WELDERS, AND WELDING OPERATORS, NOT DEEMED PREQUALIFIED, IN ACCORDANCE WITH AWS D1.1.
 - INSPECT FIELD WELDED CONNECTIONS IN ACCORDANCE WITH THE REQUIREMENTS SPECIFIED AND IN ACCORDANCE WITH AWS D1.1.
 - APPROVE FIELD WELDING SEQUENCE.
 - A PROGRAM OF THE APPROVED SEQUENCES SHALL BE SUBMITTED TO THE OWNER BEFORE WELDING BEGINS. NO CHANGE IN APPROVED SEQUENCES MAY BE MADE WITHOUT PERMISSION FROM THE OWNER.
 - INSPECT WELDED CONNECTIONS AS FOLLOWS AND IN ACCORDANCE WITH AWS D1.1:
 - VERIFY WELDING EQUIPMENT FOR CAPACITY, MAINTENANCE AND WORKING CONDITIONS.
 - VERIFY SPECIFIED ELECTRODES AND HANDLING AND STORAGE OF ELECTRODES FOR CONFORMANCE TO SPECIFICATIONS.
 - INSPECT PREHEATING AND INTERPASS TEMPERATURES FOR CONFORMANCE WITH AWS D1.1.
 - VISUALLY INSPECT ALL WELDS AND VERIFY THAT QUALITY OF WELDS MEETS THE REQUIREMENTS OF AWS D1.1.
 - SPOT TEST AT LEAST ONE FILLET WELD OF EACH MEMBER USING MAGNETIC PARTICLE OR DYE PENETRANT.
 - INSPECT FOR SIZE, SPACING, TYPE AND LOCATION AS PER APPROVED PLANS.
 - VERIFY THAT THE BASE METAL CONFORMS TO THE DRAWINGS.
 - CHECK TO SEE THAT WELDS ARE CLEAN AND FREE FROM SLAG.
 - INSPECT RUST PROTECTION OF WELDS AS PER SPECIFICATIONS.
 - CHECK THAT DEFECTIVE WELDS ARE CLEARLY MARKED AND HAVE BEEN ADEQUATELY REPAIRED.
- REPORTS:
 - COMPLETE AND PERIODICALLY SUBMIT DAILY INSPECTION REPORTS TO THE OWNER.

- THE INSPECTION PLAN OUTLINED HEREIN IS INTENDED AS A DESCRIPTION OF GENERAL AND SPECIFIC ITEMS OF CONCERN. IT IS NOT INTENDED TO BE ALL-INCLUSIVE. IT DOES NOT LIMIT THE TESTING AND INSPECTION AGENCY TO THE ITEMS LISTED. ADDITIONAL TESTING, INSPECTION, AND CHECKING MAY BE REQUIRED AND SHOULD BE ANTICIPATED. THE TESTING AGENCY SHALL USE THEIR PROFESSIONAL JUDGMENT AND KNOWLEDGE OF THE JOB SITE CONDITIONS AND THE CONTRACTOR'S PERFORMANCE TO DECIDE WHAT OTHER ITEMS REQUIRE ADDITIONAL ATTENTION. THE TESTING AGENCY'S JUDGMENT MUST PREVAIL ON ITEMS NOT SPECIFICALLY COVERED. ANY DISCREPANCIES AND PROBLEMS SHALL BE BROUGHT IMMEDIATELY TO THE OWNER'S ATTENTION. RESOLUTIONS ARE NOT TO BE MADE WITHOUT THE OWNER'S REVIEW AND SPECIFIC WRITTEN CONSENT. THE OWNER RESERVES THE RIGHT TO DETERMINE WHAT IS AN ACCEPTABLE RESOLUTION OF DISCREPANCIES AND PROBLEMS.
- AFTER EACH INSPECTION, THE TESTING AGENCY WILL PREPARE A WRITTEN ACCEPTANCE OR REJECTION WHICH WILL BE GIVEN TO THE CONTRACTOR AND FILED AS DAILY REPORTS TO THE OWNER. THIS WRITTEN ACTION WILL GIVE THE CONTRACTOR A LIST OF ITEMS TO BE CORRECTED, PRIOR TO CONTINUING CONSTRUCTION, AND/OR LOADING OF STRUCTURAL ITEMS.
- RESPONSIBILITY: THE TESTING AGENCY DOES NOT RELIEVE THE CONTRACTOR'S CONTRACTUAL OR STATUTORY OBLIGATIONS. THE CONTRACTOR HAS THE SOLE RESPONSIBILITY FOR ANY DEVIATIONS FROM THE OFFICIAL CONTRACT DOCUMENTS. THE TESTING AGENCY WILL NOT REPLACE THE CONTRACTOR'S QUALITY CONTROL PERSONNEL.



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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:

B.M.S.

CHECKED BY:

J.W.M.

APPROVED BY:

JWF

DATE:

10-21-2014

GENERAL NOTES

S-1

- D. STRUCTURAL STEEL**
STRUCTURAL STEEL MATERIALS, FABRICATION, DETAILING, AND WORKMANSHIP SHALL CONFORM TO THE LATEST EDITION OF THE FOLLOWING REFERENCE STANDARDS:
- "AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC):
(A) "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS."
(B) "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS," AS APPROVED BY THE RESEARCH COUNCIL ON STRUCTURAL CONNECTIONS OF THE ENGINEERING FOUNDATION.
(C) "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (PARAGRAPH 4.2.1 SPECIFICALLY EXCLUDED).
 - BY THE AMERICAN WELDING SOCIETY (AWS):
(A) "STRUCTURAL WELDING CODE - STEEL D1.1."
(B) "SYMBOLS FOR WELDING AND NON-DESTRUCTIVE TESTING"
ANY MATERIAL OR WORKMANSHIP WHICH IS OBSERVED TO BE DEFECTIVE OR INCONSISTENT WITH THE CONTRACT DOCUMENTS SHALL BE CORRECTED, MODIFIED, OR REPLACED AT THE CONTRACTOR'S EXPENSE.
 - TIGHTEN ALL STRUCTURAL BOLTS, INCLUDING THE AJAX M20 BOLTS WITH SHEAR SLEEVES, ACCORDING TO THE REQUIREMENTS OF THE AISC "TURN OF THE NUT" METHOD. TIGHTEN BOLTS 1/3 TURN PAST THE SNUG TIGHT CONDITION AS DEFINED BY AISC.
 - WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY, AWS D1.1. ALL WELD ELECTRODES SHALL BE E80XX UNLESS NOTED OTHERWISE ON THE DRAWINGS.
 - ALL WELDED CONNECTIONS SHALL BE MADE BY WELDERS CERTIFIED BY AWS. CONTRACTOR SHALL SUBMIT WELDERS' CERTIFICATION AND QUALIFICATION DOCUMENTATION TO THE OWNER'S TESTING AGENCY FOR REVIEW AND APPROVAL PRIOR TO CONSTRUCTION.
 - STRUCTURAL STEEL PLATES SHALL CONFORM TO ASTM A572 GRADE 65 (FY = 65 KSI MIN.) UNLESS NOTED OTHERWISE ON THE DRAWINGS.
 - SURFACES OF EXISTING STEEL SHALL BE PREPARED AS REQUIRED FOR FIELD WELDING PER AWS. SEE SECTION I NOTES REGARDING TOUCH-UP OF GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS FIELD WELDING.
 - UNLESS OTHERWISE NOTED, ALL STEEL MEMBERS SHALL BE HOT-DIP GALVANIZED, AFTER FABRICATION, IN ACCORDANCE WITH ASTM A123. SEE SECTION J FOR FURTHER NOTES AND FOR EXCEPTIONS (IF ANY).
 - ALL WELDS SHALL BE VISUALLY INSPECTED BY THE OWNER'S APPROVED TESTING AGENCY. OTHER TESTS MAY ALSO BE PERFORMED ON THE WELDS BY THE TESTING AGENCY IN ORDER FOR THEM TO PERFORM THEIR DUTIES FOR THIS PROJECT. THE CONTRACTOR SHALL COOPERATE WITH THE TESTING AGENCY IN THEIR TESTING EFFORTS.
 - NO WELDING SHALL BE DONE TO THE EXISTING STRUCTURE WITHOUT THE PRIOR APPROVAL AND SUPERVISION OF THE TESTING AGENCY.
 - FIELD CUTTING OF STEEL:
(A) PRIOR TO ANY FIELD CUTTING, THE CONTRACTOR SHALL MARK THE CUT OUTLINES ON THE STEEL AND THE INSPECTION/TESTING AGENCY SHALL VERIFY PROPOSED LAYOUT, LOCATION, AND DIMENSIONS.
(B) ANY REQUIRED CUTS IN THE STEEL SHALL BE CAREFULLY CUT BY MECHANICAL METHODS SUCH AS DRILLING, SAW CUTTING, AND GRINDING. THE CONTRACTOR IS RESPONSIBLE TO PREVENT ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, DURING THE CUTTING WORK. ANY DAMAGE TO THE COAX CABLES, AND/OR OTHER EQUIPMENT AND/OR THE STRUCTURE, RESULTING FROM THE CONTRACTOR'S ACTIVITIES SHALL BE REPAIRED AT THE CONTRACTOR'S EXPENSE. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.
(C) ALL REQUIRED CUTS SHALL BE CUT WITHIN THE DIMENSIONS SHOWN ON THE DRAWINGS. NO CUTS SHALL EXTEND BEYOND THE OUTLINE OF THE DIMENSIONS SHOWN ON THE DRAWINGS. ALL CUT EDGES SHALL BE GROUND SMOOTH AND DE-BURRED. CUT EDGES THAT ARE TO BE FIELD WELDED SHALL BE PREPARED FOR FIELD WELDING PER AWS D1.1 AND AS SHOWN ON THE DRAWINGS. IT MAY BE NECESSARY TO DRILL STARTER HOLES AS REQUIRED TO MAKE THE CUTS. THE INSPECTION/TESTING AGENCY SHALL CLOSELY AND CONTINUOUSLY MONITOR THIS ACTIVITY.

E. BASE PLATE GROUT - (NOT REQUIRED)**F. FOUNDATION WORK - (NOT REQUIRED)****G. CAST-IN-PLACE CONCRETE - (NOT REQUIRED)**

- EPOXY GROUTED REINFORCING ANCHOR RODS**
UNLESS OTHERWISE NOTED, REINFORCING ANCHOR RODS SHALL BE 150 KSI ALL-THREAD BAR CONFORMING TO ASTM A772. RECOMMENDED MANUFACTURERS/SUPPLIERS OF 150 KSI ALL-THREAD BAR ARE WILLIAMS FORM ENGINEERING CORPORATION AND DYWIDAG SYSTEMS INTERNATIONAL. ALL REINFORCING ANCHOR RODS SHALL BE HOT DIP GALVANIZED PER ASTM A153. ALTERNATIVELY, ALL REINFORCING ANCHOR RODS MAY BE EPOXY COATED PER ASTM A775. THE CORE-DRILLED HOLES IN THE CONCRETE FOR THE ANCHOR RODS SHALL BE CLEAN AND DRY, AND OTHERWISE PROPERLY PREPARED ACCORDING TO THE ANCHOR ROD AND EPOXY MANUFACTURERS' INSTRUCTIONS. PRIOR TO PLACEMENT OF ANCHOR RODS AND EPOXY CONTRACTOR SHALL FOLLOW ALL ANCHOR ROD AND EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF RODS; EPOXY; ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
ULTRABOND 1, HILTI HIT 800 OR ANCHORTITE EPOXY SHALL BE USED TO ANCHOR THE 150 KSI ALL-THREAD BAR IN THE DRILL HOLES. IF CONTRACTOR WISHES TO USE A DIFFERENT EPOXY, A REQUEST INCLUDING THE EPOXY TECHNICAL DATA SHEET(S) SHALL BE SUBMITTED TO PAUL J FORD AND COMPANY FOR REVIEW PRIOR TO CONSTRUCTION. AS NOTED ABOVE, FOLLOW ALL EPOXY MANUFACTURER RECOMMENDATIONS REGARDING HANDLING OF EPOXY; ACCEPTABLE AMBIENT TEMPERATURE RANGE DURING INSTALLATION AND POST-INSTALLATION CURING, THE EFFECT OF TEMPERATURE ON EPOXY CURING TIME, PREPARATION OF HOLE, ETC.
ONCE THE REINFORCING ANCHOR RODS HAVE BEEN INSTALLED AND ALL EPOXY AND GROUT HAVE CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED PRIOR TO TESTING), ALL REINFORCING ANCHOR RODS SHALL BE LOAD TESTED PER CROWN CASTLE ENGINEERING DOCUMENT #ENG-PRC-10119. REFER TO THE NEW ANCHOR & BRACKET DETAIL ON FOLLOWING DRAWING SHEETS FOR SPECIFIED ANCHOR ROD PROOF LOAD.
ONCE THE REINFORCING ANCHOR RODS HAVE BEEN SUCCESSFULLY LOAD TESTED AND APPROVED AND BASE PLATE / BEARING PLATE GROUT HAS CURED (IF BASE PLATE AND/OR BEARING PLATES HAVE BEEN GROUTED AFTER TESTING), CONTRACTOR SHALL TIGHTEN ALL HEAVY HEX ANCHOR NUTS TO SNUG TIGHT PLUS 1/8 TURN OF NUT.

TOUCH UP OF GALVANIZING

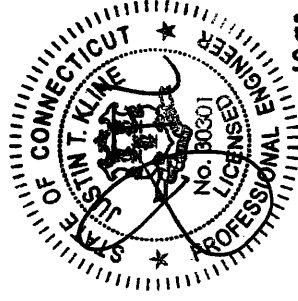
- THE CONTRACTOR SHALL TOUCH UP ANY AND/OR ALL AREAS OF GALVANIZING ON THE EXISTING STRUCTURE OR NEW COMPONENTS THAT ARE DAMAGED OR ABRADED DURING CONSTRUCTION. GALVANIZED SURFACES DAMAGED DURING TRANSPORTATION OR ERECTION AND ASSEMBLY AS WELL AS ANY AND ALL ABRASIONS, CUTS, FIELD DRILLING, AND ALL FIELD WELDING SHALL BE TOUCHED UP WITH TWO (2) COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
CONTRACTOR SHALL CLEAN AND PREPARE ALL FIELD WELDS ON GALVANIZED AND PRIME PAINTED SURFACES FOR TOUCH-UP COATING IN ACCORDANCE WITH AWS D1.1. THE OWNER'S TESTING AGENCY SHALL VERIFY THE PREPARED SURFACE PRIOR TO APPLICATION OF THE TOUCH-UP COATING.
THE OWNER'S TESTING AGENCY SHALL TEST AND VERIFY THE COATING THICKNESS AFTER THE CONTRACTOR HAS APPLIED THE ZRC COLD GALVANIZING COMPOUND AND IT HAS SUFFICIENTLY DRIED. AREAS FOUND TO BE INADEQUATELY COATED, SHALL BE RE-COATED BY THE CONTRACTOR AND RE-TESTED BY THE TESTING AGENCY.

HOT DIP GALVANIZING

- HOT-DIP GALVANIZE ALL STRUCTURAL STEEL MEMBERS AND ALL STEEL ACCESSORIES, BOLTS, WASHERS, ETC. PER ASTM A123 OR PER ASTM A153, AS APPROPRIATE.
PROPERLY PREPARE STEEL ITEMS FOR GALVANIZING.
DRILL OR PUNCH WEEP AND/OR DRAINAGE HOLES AS REQUIRED.
ALL GALVANIZING SHALL BE DONE AFTER FABRICATION IS COMPLETED AND PRIOR TO FIELD INSTALLATION.

PERPETUAL INSPECTION AND MAINTENANCE BY THE OWNER

- AFTER THE CONTRACTOR HAS SUCCESSFULLY COMPLETED THE INSTALLATION OF THE MONOPOLE REINFORCING SYSTEM AND THE WORK HAS BEEN ACCEPTED BY THE OWNER, THE OWNER WILL BE RESPONSIBLE FOR THE LONG TERM AND PERPETUAL INSPECTION AND MAINTENANCE OF THE POLE AND REINFORCING SYSTEM.
THE MONOPOLE REINFORCING SYSTEM INDICATED IN THESE DOCUMENTS USES REINFORCING COMPONENTS THAT INVOLVE FIELD WELDING STEEL MEMBERS TO THE EXISTING GALVANIZED STEEL POLE STRUCTURE. THESE FIELD WELDED CONNECTIONS ARE SUBJECT TO CORROSION DAMAGE AND DETERIORATION IF THEY ARE NOT PROPERLY MAINTAINED AND COVERED WITH CORROSION PREVENTIVE COATING SUCH AS THE ZRC GALVANIZING COMPOUND SPECIFIED PREVIOUSLY. THE STRUCTURAL LOAD CARRYING CAPACITY OF THE REINFORCED POLE SYSTEM IS DEPENDENT UPON THE INSTALLED SIZE AND QUALITY, MAINTAINED SOUND CONDITION AND STRENGTH OF THESE FIELD WELDED CONNECTIONS. ANY CORROSION OF, DAMAGE TO, FATIGUE, FRACTURE, AND/OR DETERIORATION OF THESE WELDS AND/OR THE CONNECTED COMPONENTS WILL RESULT IN THE LOSS OF STRUCTURAL LOAD CARRYING CAPACITY AND MAY LEAD TO FAILURE OF THE STRUCTURAL SYSTEM. THEREFORE, IT IS IMPERATIVE THAT THE OWNER REGULARLY INSPECTS, MAINTAINS, AND REPAIRS AS NECESSARY, ALL OF THESE WELDS, CONNECTIONS, AND COMPONENTS FOR THE LIFE OF THE STRUCTURE.
THE OWNER SHALL REFER TO TIA/EIA-222-F-1996, SECTION 14 AND ANNEX E FOR RECOMMENDATIONS FOR MAINTENANCE AND INSPECTION. THE FREQUENCY OF THE INSPECTION AND MAINTENANCE INTERVALS IS TO BE DETERMINED BY THE OWNER BASED UPON ACTUAL SITE AND ENVIRONMENTAL CONDITIONS. PAUL J. FORD & COMPANY RECOMMENDS THAT A COMPLETE AND THOROUGH INSPECTION OF THE ENTIRE REINFORCED MONOPOLE STRUCTURAL SYSTEM BE PERFORMED YEARLY AND/OR AS FREQUENTLY AS CONDITIONS WARRANT. ACCORDING TO TIA/EIA-222-F-1996 SECTION 14.1, NOTE 1: "IT IS RECOMMENDED THAT THE STRUCTURE BE INSPECTED AFTER SEVERE WIND AND/OR ICE STORMS OR OTHER EXTREME LOADING CONDITIONS".



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CROWN CASTLE

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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:

B.M.S.

CHECKED BY:

J.W.M.

APPROVED BY:

[Signature]

DATE:

10-21-2014

GENERAL NOTES

S-2

AJAX BOLT NOTE SHEET: REV. 1.5, 5-12-2014

NOTES: 1. ALL STRUCTURAL BOLTS SHALL BE INSTALLED AND TIGHTENED TO THE PRETENSIONED CONDITION ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

2. ALL STRUCTURAL BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009.

3. ALL AJAX M20 BOLTS WITH SHEAR SLEEVES SHALL BE PRETENSIONED AND TIGHTENED UNTIL THE DIRECT TENSION INDICATOR (DTI) WASHERS SHOW THAT THE PROPER BOLT TENSION HAS BEEN REACHED. SEE NOTES AND DETAIL BELOW FOR THE USE OF DIRECT TENSION INDICATOR (DTI) WASHERS WITH THE AJAX M20 BOLTS.

4. ALL AJAX BOLTS SHALL BE INSTALLED USING DIRECT TENSION INDICATORS (DTI'S) AND HARDENED WASHERS. DTI'S SHALL BE THE SQUIRTER® STYLE, MADE TO ASTM F959 LATEST REVISION; AND HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A HARDNESS OF RC 38 OR HIGHER.

NOTES FOR AJAX M20 'ONE-SIDE BOLTS WITH DIRECT TENSION INDICATORS (DTI'S):

DTI'S REQUIRED: DTI'S SHALL BE "SELF-INDICATING" SQUIRTER® STYLE DTI'S MADE WITH DURABLE SQUIRT MEDIA EMBEDDED IN THEM, INSPECTED BY MEANS OF THE VISUAL EJECTION OF SILICONE AS THE DTI PROTRUSIONS COMPRESS. SQUIRTER® DTI'S SHALL BE CALIBRATED PER MANUFACTURER'S INSTRUCTIONS PRIOR TO USE.

THE DIRECT TENSION INDICATOR (DTI) WASHERS SHALL BE THE "SQUIRTER® STYLE" AS MANUFACTURED BY APPLIED BOLTING TECHNOLOGY PRODUCTS' INC.:

PART NUMBER: 2DTIM208MGAFSIF

DESCRIPTION: P.C. 8.8 DTI SQUIRTER WASHER WITH RED DURABLE SQUIRT MEDIA DESIGNED SPECIFICALLY FOR THE AJAX M20 ONESIDE BOLT. FINISH SHALL BE ZINC GALVANIZED AS PROVIDED BY THE DTI MANUFACTURER.

DISTRIBUTOR CONTACT DETAILS:

ALLFASTENERS
15401 COMMERCE PARK DR.
BROOKPARK, OHIO 44142
PHONE: 440-232-6060
E-MAIL: SALES@ALLFASTENERS.COM

DTI: USE DIRECT TENSION INDICATOR (DTI) WASHERS COMPATIBLE WITH 20 MM (M20) NOMINAL A325 BOLTS FOR THE AJAX M20 BOLTS. DTI'S SHALL NOT BE HOT-DIP GALVANIZED. DTI'S SHALL BE MECHANICALLY GALVANIZED (MG) BY THE COLD MECHANICAL PROCESS ONLY AS PROVIDED BY THE DTI MANUFACTURER.

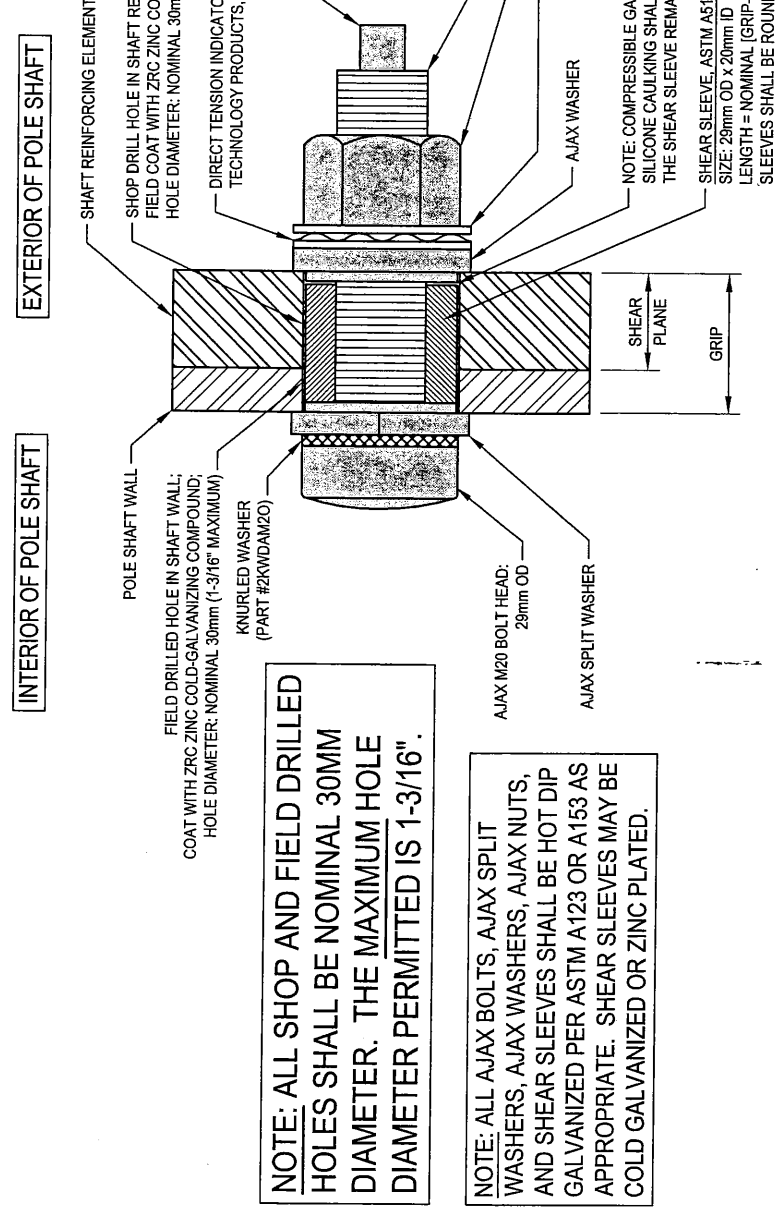
HARDENED WASHERS REQUIRED: USE A HARDENED WASHER FOR A 20 MM (M20) NOMINAL BOLT BETWEEN THE TOP OF THE DIRECT TENSION INDICATOR (DTI) WASHER AND THE NUT OF THE AJAX M20 BOLTS. HARDENED WASHERS SHALL CONFORM TO ASTM F436 AND HAVE A MINIMUM HARDNESS OF RC 38 OR HIGHER. THE HARDENED WASHERS SHALL BE MECHANICALLY GALVANIZED BY THE COLD MECHANICAL PROCESS. ALTERNATIVELY, CORRECTLY MADE HOT DIP GALVANIZED HARDENED FLAT WASHERS HAVING A MINIMUM HARDNESS OF RC 38 CAN BE USED; CONTRACTOR SHALL PROVIDE DOCUMENTATION OF WASHER SPECIFICATION AND HARDNESS.

NUT LUBRICATION REQUIRED: PROPERLY LUBRICATE THE THREADS OF THE NUT OF THE AJAX BOLT SO THAT IT CAN BE PROPERLY TIGHTENED WITHOUT GALLING AND/OR LOCKING UP ON THE BOLT THREADS. CONTRACTOR SHALL FOLLOW DTI MANUFACTURER INSTRUCTIONS FOR PROPER LUBRICATION AND TIGHTENING.

NOTE: COMPLETELY COMPRESSED DTI'S SHOWING NO VISIBLE REMAINING GAP ARE ACCEPTABLE. DTI WASHERS SHALL BE PLACED DIRECTLY AGAINST THE OUTER AJAX WASHER WITH THE DTI BUMPS FACING AWAY FROM THE AJAX WASHER. PLACE A HARDENED WASHER BETWEEN THE DTI AND THE AJAX NUT. THE DTI BUMPS SHALL BEAR AGAINST THE UNDERSIDE OF A HARDENED FLAT WASHER, NEVER DIRECTLY AGAINST THE NUT.

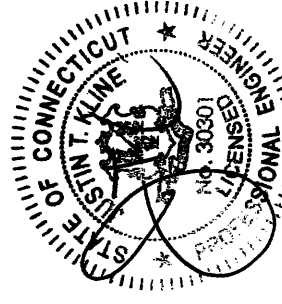
CONTRACTOR SHALL FOLLOW DTI MANUFACTURER'S INSTRUCTIONS FOR INSTALLATION, LUBRICATION, TIGHTENING AND INSPECTION.

INSPECTION REQUIRED: ALL AJAX BOLTS SHALL BE INSPECTED ACCORDING TO THE REQUIREMENTS OF THE AISC 'SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS', DEC. 31, 2009, BY A QUALIFIED BOLT INSPECTOR. DURING INSTALLATION, THE BOLT INSPECTOR SHALL VERIFY AND DOCUMENT: THE SHOP-DRILLED AND FIELD-DRILLED HOLE SIZES; THE INSTALLATION OF THE AJAX BOLT ASSEMBLY, INCLUDING THE SHEAR SLEEVE PLACEMENT AND NUT LUBRICATION; AND THE CONTRACTOR'S TENSIONING PROCEDURE. IN ADDITION, ALL AJAX BOLTS AND DTI'S SHALL BE VISUALLY INSPECTED ACCORDING TO THE DTI MANUFACTURER'S INSTRUCTIONS. THE BOLT INSPECTOR SHALL PROVIDE COMPLETE PHOTO DOCUMENTATION OF ALL BOLTS AFTER TIGHTENING CLEARLY SHOWING THE CONDITION OF THE DTI'S.



NOTE: ALL SHOP AND FIELD DRILLED HOLES SHALL BE NOMINAL 30MM DIAMETER. THE MAXIMUM HOLE DIAMETER PERMITTED IS 1-3/16".

NOTE: ALL AJAX BOLTS, AJAX SPLIT WASHERS, AJAX WASHERS, AJAX NUTS, AND SHEAR SLEEVES SHALL BE HOT DIP GALVANIZED PER ASTM A123 OR A153 AS APPROPRIATE. SHEAR SLEEVES MAY BE COLD GALVANIZED OR ZINC PLATED.



TYPICAL AJAX BOLT DETAIL 1

S-3

POLE SPECIFICATIONS

POLE SHAPE TYPE:	ROUND
TAPER:	N/A
SHAFT STEEL:	Fy = 42 KSI
BASE PL STEEL:	ASTM A36
ANCHOR RODS:	1 1/2" Ø ASTM A354 GR. BC

SHAFT SECTION DATA

SHAFT SECTION	SECTION LENGTH (FT)	PLATE THICKNESS (IN)	LAP SPICE (IN)	DIAMETER ACROSS FLATS (IN)	
				@ TOP	@ BOTTOM
1	28.00	0.2500		24.000	24.000
2	30.00	0.3750		24.000	24.000
3	30.00	0.3750		30.000	30.000
4	30.00	0.3750		36.000	36.000

NOTE: DIMENSIONS SHOWN DO NOT INCLUDE GALVANIZING TOLERANCES

MODIFICATIONS:

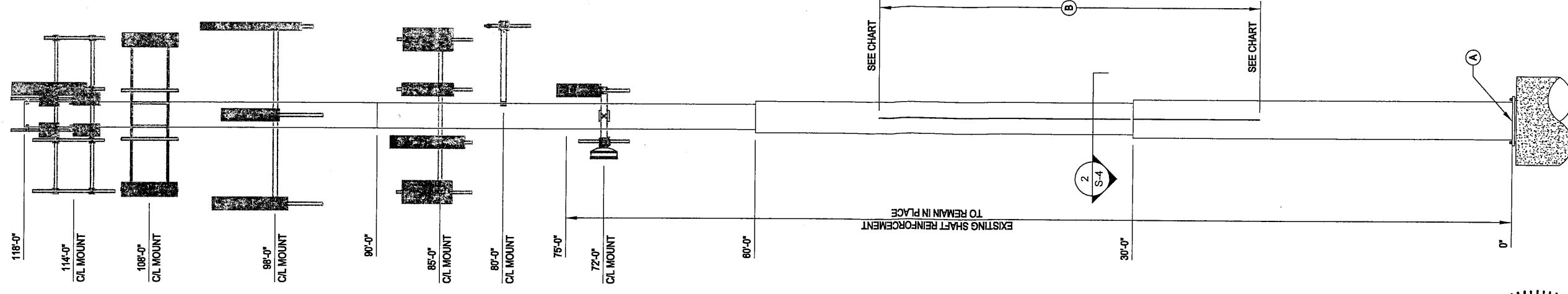
- (A) INSTALL NEW ANCHOR RODS AND BRACKETS AT BASE PLATE. SEE SHEET S-5.
- (B) INSTALL NEW SHAFT REINFORCING. SEE CHART.

NEW CCI FLAT PLATE (65 KSI) REINFORCING SCHEDULE

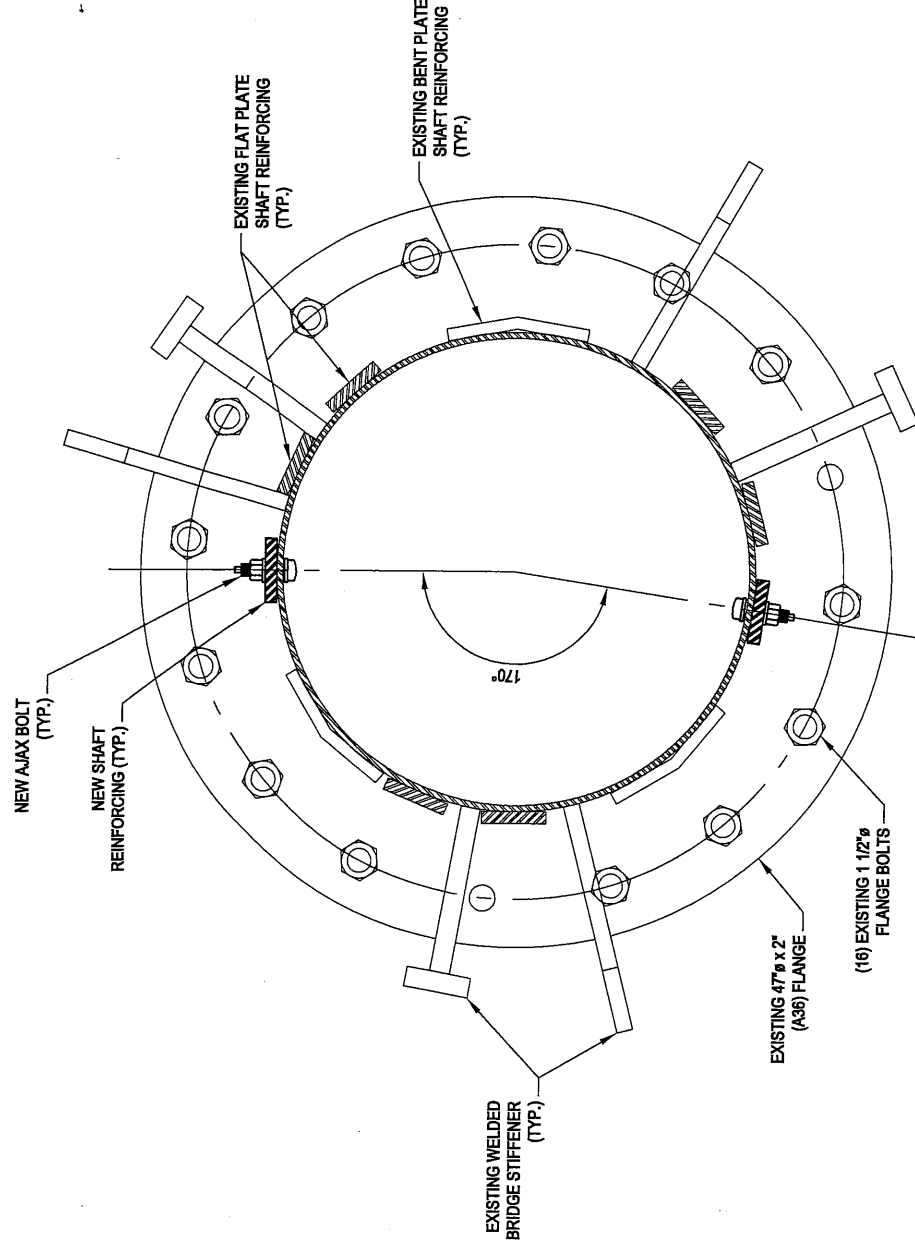
BOTTOM ELEVATION	TOP ELEVATION	FLAT # / DEGREE SEPARATION	ELEMENT LENGTH	ELEMENT QUANTITY	APPROXIMATE AJAX BOLTS PER ELEMENT	APPROXIMATE TOTAL AJAX BOLT QUANTITY	TERMINATION BOLTS (BOTTOM)	TERMINATION BOLTS (TOP)	MAXIMUM INTERMEDIATE BOLT SPACING	ESTIMATED TOTAL STEEL WEIGHT
20'-0"	30'-0"	30, 160 & 270	10'-0"	3	16	48	6	6	20"	459 LBS.
30'-3"	50'-3"	90 & 260	20'-0"	2	21	42	4	4	16"	408 LBS.
										867 LBS.

NOTES:

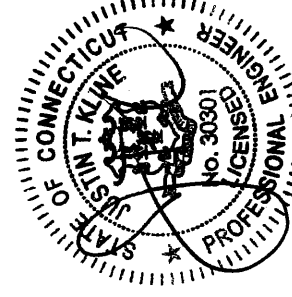
- 1.) AJAX BOLTS ARE TO BE 20mm DIAMETER WITH CORRESPONDING 29mm DIAMETER SLEEVE WITH MATCHING STEEL GRADE.
- 2.) ALL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123. ALTERNATIVELY, ALL NEW STIFFENER PLATE STEEL REINFORCING MAY BE COLD GALVANIZED AS FOLLOWS: APPLY A MINIMUM OF TWO COATS OF ZRC-BRAND ZINC-RICH COLD GALVANIZING COMPOUND. FILM THICKNESS PER COAT SHALL BE: WET 3.0 MILS; DRY 1.5 MILS. APPLY PER ZRC (MANUFACTURER) RECOMMENDED PROCEDURES. CONTACT ZRC AT 1-800-831-3275 FOR PRODUCT INFORMATION.
- 3.) ALL REINFORCING SHALL BE ASTM A572 GR. 65.
- 4.) WELDS SHALL BE E80XX OR GREATER. TERMINATION WELDS SHALL BE 3/8" FILLET WELDS.
- 5.) HOLES FOR AJAX BOLTS AND SHEAR SLEEVES ARE 30mm UNLESS NOTED OTHERWISE.
- 6.) ALL SHIMS SHALL BE ASTM A-36.



POLE ELEVATION 1
S-4



SECTION 2
30'-0"
S-4



10/20/14

CROWN CASTLE US PATENT NOS 8,046,972; 8,156,712; 7,649,659; 8,424,269 AND PATENT PENDING



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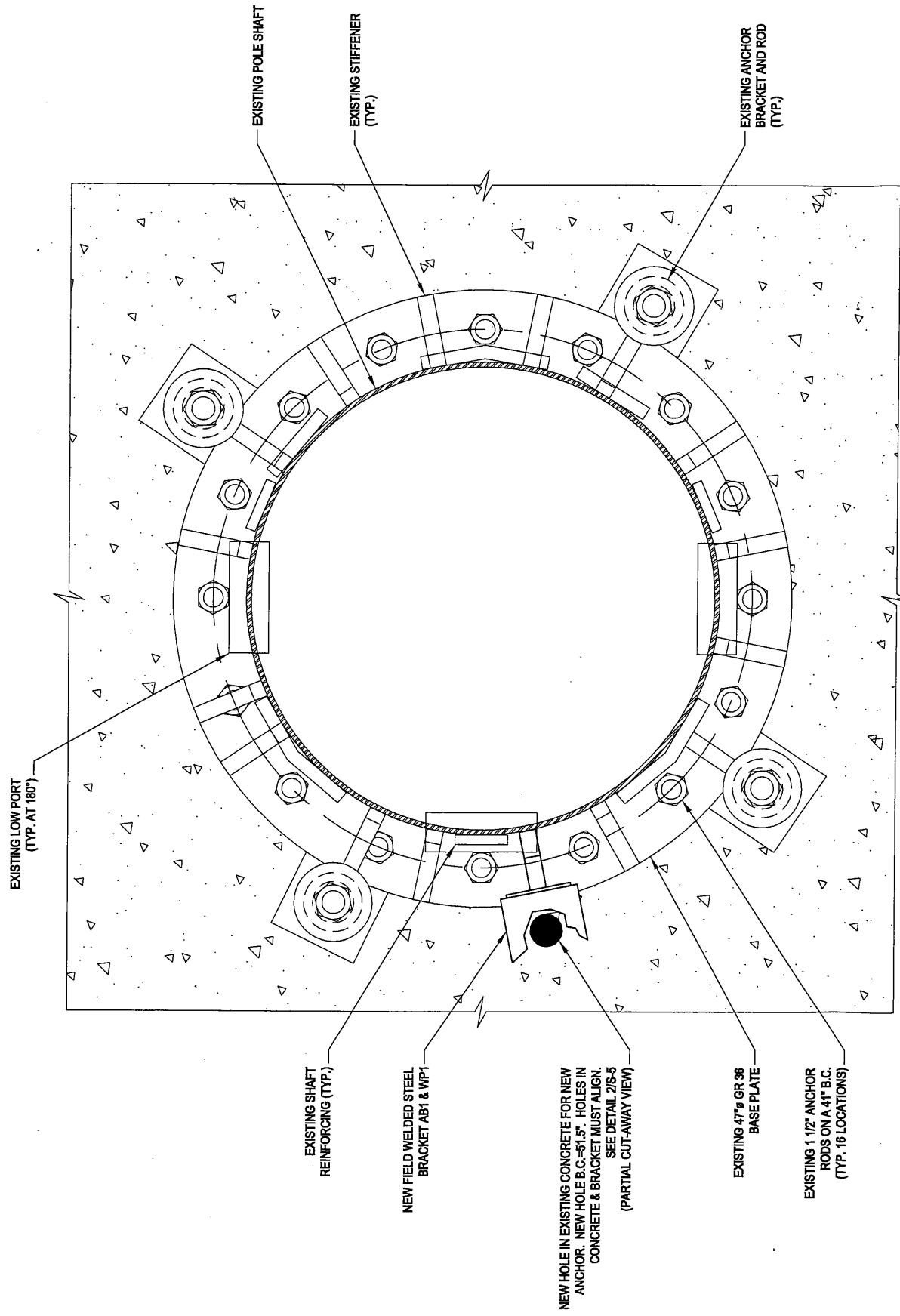
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APPROVED BY: JK

MONOPOLE PROFILE

DATE: 10-21-2014

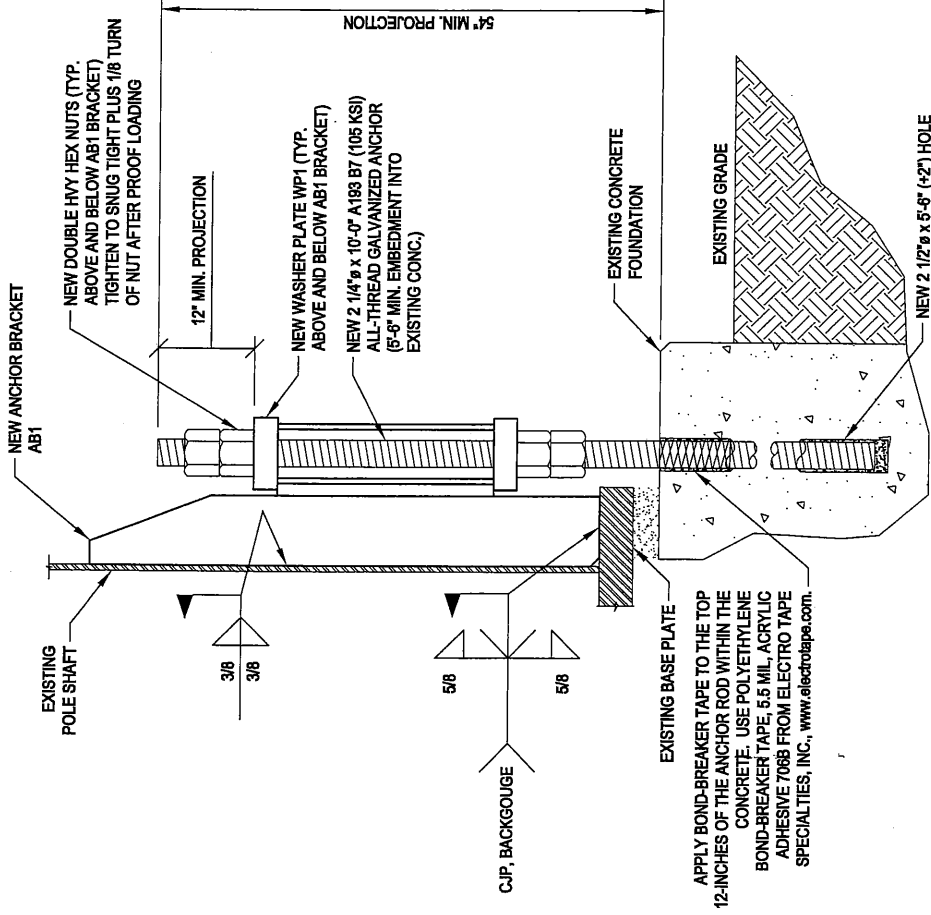
S-4

BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT



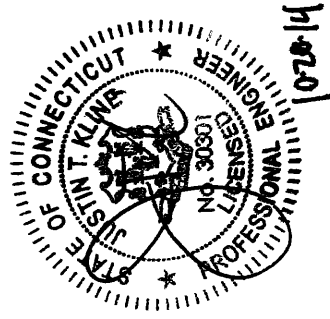
NEW HOLE IN EXISTING CONCRETE FOR NEW ANCHOR. NEW HOLE B.C.=51.5". HOLES IN CONCRETE & BRACKET MUST ALIGN. SEE DETAIL 2/S-5 (PARTIAL CUT-AWAY VIEW)

BASE PLATE 1
S-5



NEW ANCHOR ROD REINFORCING SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. ONCE ALL RESIN HAS CURED, ALL NEW ANCHOR ROD REINFORCING SHALL BE PROOF LOADED TO 205 KIPS. ONCE THE PROOF LOAD HAS BEEN RELEASED, TIGHTEN HEAVY HEX NUT TO SNUG TIGHT PLUS 1/8 TURN OF NUT. REFER TO SHEET S-2, SECTION H FOR ADDITIONAL INFORMATION.

APPLY BOND-BREAKER TAPE TO THE TOP 12-INCHES OF THE ANCHOR ROD WITHIN THE CONCRETE. USE POLYETHYLENE BOND-BREAKER TAPE, 5.5 MIL, ACRYLIC ADHESIVE 7088 FROM ELECTRO TAPE SPECIALTIES, INC., www.electrotape.com.



NEW ANCHOR & BRACKET DETAIL 2
S-5

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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

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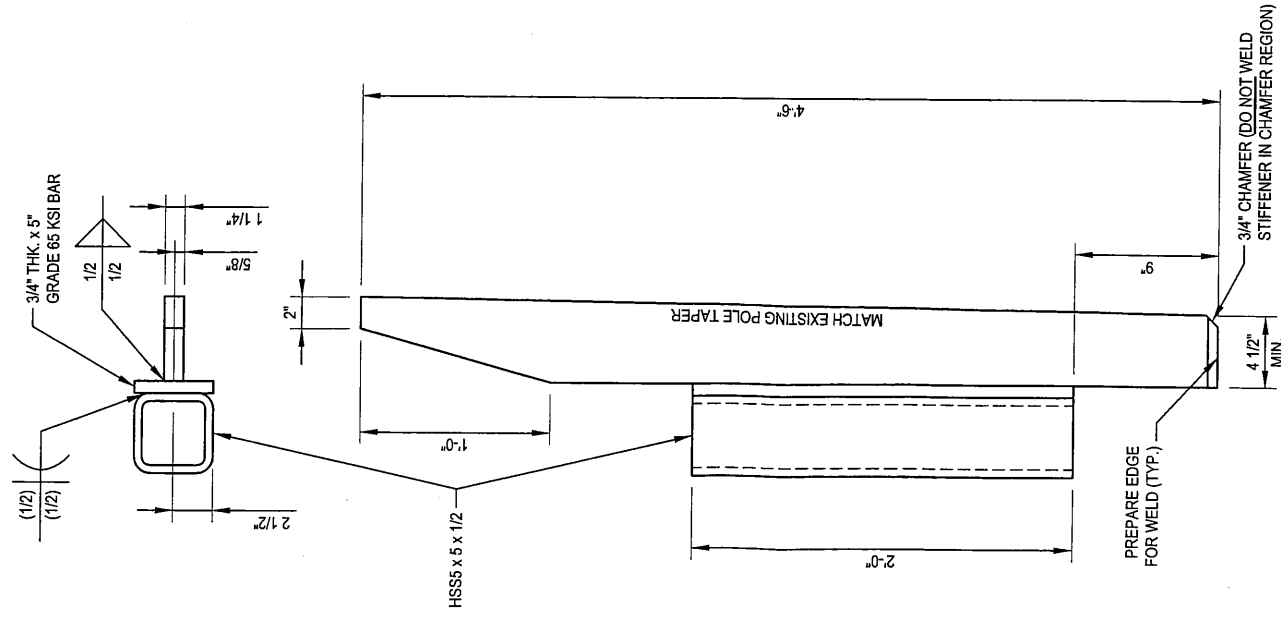
CHECKED BY:
J.W.M.

APPROVED BY:
JFK

DATE:
10-21-2014

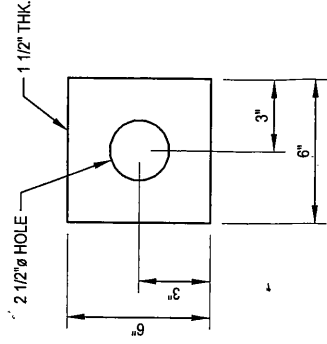
BASE PLATE DETAILS

S-5



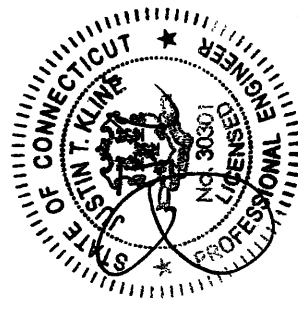
ANCHOR BRACKET MK~AB1

(1 REQUIRED) (TUBE Fy = 46 KSI) (STIFFENER Fy = 65 KSI)



WASHER PLATE MK~WP1

(2 REQUIRED) (Fy = 50 KSI)



10/28/14

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BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
 MONOPOLE REINFORCEMENT AND RETROFIT PROJECT

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.

CHECKED BY:
J.W.M.

APPROVED BY:
JJK

DATE:
10-21-2014

MISC DETAILS

S-6

MODIFICATION INSPECTION NOTES.**GENERAL**

THE MODIFICATION INSPECTION (MI) IS A VISUAL INSPECTION OF TOWER MODIFICATIONS AND A REVIEW OF CONSTRUCTION INSPECTIONS AND OTHER REPORTS TO ENSURE THE INSTALLATION WAS CONSTRUCTED IN ACCORDANCE WITH THE CONTRACT DOCUMENTS, NAMELY THE MODIFICATION DRAWINGS, AS DESIGNED BY THE ENGINEER OF RECORD (EOR).

THE MI IS TO CONFIRM INSTALLATION CONFIGURATION AND WORKMANSHIP ONLY AND IS NOT A REVIEW OF THE MODIFICATION DESIGN ITSELF, NOR DOES THE MI INSPECTOR TAKE OWNERSHIP OF THE MODIFICATION DESIGN. OWNERSHIP OF THE STRUCTURAL MODIFICATION DESIGN EFFECTIVENESS AND INTEGRITY RESIDES WITH THE EOR AT ALL TIMES.

ALL MIs SHALL BE CONDUCTED BY A CROWN ENGINEERING VENDOR (AEV) OR ENGINEERING SERVICE VENDOR (AESV) THAT IS APPROVED TO PERFORM ELEVATED WORK FOR CROWN. SEE ENG-BUL-10173 LIST OF APPROVED MI VENDORS.

TO ENSURE THAT THE REQUIREMENTS OF THE MI ARE MET, IT IS VITAL THAT THE GENERAL CONTRACTOR (GC) AND THE MI INSPECTOR BEGIN COMMUNICATING AND COORDINATING AS SOON AS A PO IS RECEIVED. IT IS EXPECTED THAT EACH PARTY WILL BE PROACTIVE IN REACHING OUT TO THE OTHER PARTY. IF CONTACT INFORMATION IS NOT KNOWN, CONTACT YOUR CROWN POINT OF CONTACT (POC).

REFER TO ENG-SOW-10007. MODIFICATION INSPECTION SOW FOR FURTHER DETAILS AND REQUIREMENTS.

MI INSPECTOR

THE MI INSPECTOR IS REQUIRED TO CONTACT THE GC AS SOON AS RECEIVING A PO FOR THE MI TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE GC TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS

THE MI INSPECTOR IS RESPONSIBLE FOR COLLECTING ALL GENERAL CONTRACTOR (GC) INSPECTION AND TEST REPORTS, REVIEWING THE DOCUMENTS FOR ADHERENCE TO THE CONTRACT DOCUMENTS, CONDUCTING THE IN-FIELD INSPECTIONS, AND SUBMITTING THE MI REPORT TO CROWN.

GENERAL CONTRACTOR

THE GC IS REQUIRED TO CONTACT THE MI INSPECTOR AS SOON AS RECEIVING A PO FOR THE MODIFICATION INSTALLATION OR TURNKEY PROJECT TO, AT A MINIMUM:

- REVIEW THE REQUIREMENTS OF THE MI CHECKLIST
- WORK WITH THE MI INSPECTOR TO DEVELOP A SCHEDULE TO CONDUCT ON-SITE INSPECTIONS, INCLUDING FOUNDATION INSPECTIONS
- BETTER UNDERSTAND ALL INSPECTION AND TESTING REQUIREMENTS

THE GC SHALL PERFORM AND RECORD THE TEST AND INSPECTION RESULTS IN ACCORDANCE WITH THE REQUIREMENTS OF THE MI CHECKLIST AN DENG-SOW-10007.

RECOMMENDATIONS

THE FOLLOWING RECOMMENDATIONS AND SUGGESTIONS ARE OFFERED TO ENHANCE THE EFFICIENCY AND EFFECTIVENESS OF DELIVERING A MI REPORT:

- IT IS SUGGESTED THAT THE GC PROVIDE A MINIMUM OF 5 BUSINESS DAYS NOTICE, PREFERABLE 10, TO THE MI INSPECTOR AS TO WHEN THE SITE WILL BE READY FOR THE MI TO BE CONDUCTED
- THE GC AND MI INSPECTOR COORDINATE CLOSELY THROUGHOUT THE ENTIRE PROJECT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE SIMULTANEOUSLY FOR ANY GUY WIRE TENSIONING OR RE-TENSIONING OPERATIONS
- IT MAY BE BENEFICIAL TO INSTALL ALL TOWER MODIFICATIONS PRIOR TO CONDUCTING THE FOUNDATION INSPECTIONS TO ALLOW FOUNDATION AND MI INSPECTIONS(S) TO COMMENCE WITH ONE SITE VISIT.
- WHEN POSSIBLE, IT IS PREFERRED TO HAVE THE GC AND MI INSPECTOR ON-SITE DURING THE MI TO HAVE ANY DEFICIENCIES CORRECTED DURING THE INITIAL MI. THEREFORE, THE GC MAY CHOOSE TO COORDINATE THE MI CAREFULLY TO ENSURE ALL CONSTRUCTION FACILITIES ARE AT THEIR DISPOSAL WHEN THE MI INSPECTOR IS ON SITE.

CANCELLATION OR DELAYS IN SCHEDULED MI

IF THE GC AND MI INSPECTOR AGREE TO A DATE ON WHICH THE MI WILL BE CONDUCTED, AND EITHER PARTY CANCELS OR DELAYS, CROWN SHALL NOT BE RESPONSIBLE FOR ANY COSTS, FEES, LOSS OF DEPOSITS AND/OR OTHER PENALTIES RELATED TO THE CANCELLATION OR DELAY INCURRED BY EITHER PARTY FOR ANY TIME (E.G. TRAVEL AND LODGING, COSTS OF KEEPING EQUIPMENT ON-SITE, ETC.). IF CROWN CONTRACTS DIRECTLY FOR A THIRD PARTY MI, EXCEPTIONS MAY BE MADE IN THE EVENT THAT THE DELAY/CANCELLATION IS CAUSED BY WEATHER OR OTHER CONDITIONS THAT MAY COMPROMISE THE SAFETY OF THE PARTIES INVOLVED.

CORRECTION OF FAILING MIs

IF THE MODIFICATION INSTALLATION WOULD FAIL THE MI ("FAILED MI"), THE GC SHALL WORK WITH CROWN TO COORDINATE A REMEDIATION PLAN IN ONE OF TWO WAYS:

- CORRECT FAILING ISSUES TO COMPLY WITH THE SPECIFICATIONS CONTAINED IN THE ORIGINAL CONTRACT DOCUMENTS AND COORDINATE A SUPPLEMENT MI.
- OR, WITH CROWN'S APPROVAL, THE GC MAY WORK WITH THE EOR TO RE-ANALYZE THE MODIFICATION REINFORCEMENT USING THE AS-BUILT CONDITION

MI VERIFICATION INSPECTIONS

CROWN RESERVES THE RIGHT TO CONDUCT A MI VERIFICATION INSPECTION TO VERIFY THE ACCURACY AND COMPLETENESS OF PREVIOUSLY COMPLETED MI INSPECTIONS(S) ON TOWER MODIFICATION PROJECTS.

ALL VERIFICATION INSPECTIONS SHALL BE HELD TO THE SAME SPECIFICATIONS AND REQUIREMENTS IN THE CONTRACT DOCUMENTS AND IN ACCORDANCE WITH ENG-SOW-10007.

VERIFICATION INSPECTION MAY BE CONDUCTED BY AN INDEPENDENT AEV/AESV FIRM AFTER A MODIFICATION PROJECT IS COMPLETED, AS MARKED BY THE DATE OF AN ACCEPTED "PASSING MI" OR "PASS AS NOTED MI" REPORT FOR THE ORIGINAL PROJECT.

PHOTOGRAPHS

BETWEEN THE GC AND THE MI INSPECTOR THE FOLLOWING PHOTOGRAPHS, AT A MINIMUM, ARE TO BE TAKEN AND INCLUDED IN THE MI REPORT:

- PRE-CONSTRUCTION GENERAL SITE CONDITION
- PHOTOGRAPHS DURING THE REINFORCEMENT MODIFICATION CONSTRUCTION/RECTION AND INSPECTION
- RAW MATERIALS
- PHOTOS OF ALL CRITICAL DETAILS
- FOUNDATION MODIFICATIONS
- WELD PREPARATION
- BOLT INSTALLATION AND TORQUE
- FINAL INSTALLED CONDITION
- SURFACE COATING REPAIR
- POST CONSTRUCTION PHOTOGRAPHS
- FINAL INFELD CONDITION

PHOTOS OF ELEVATED MODIFICATIONS TAKEN FROM THE GROUND SHALL BE CONSIDERED INADEQUATE.

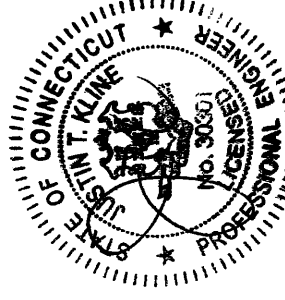
THIS IS NOT A COMPLETE LIST OF REQUIRED PHOTOS, PLEASE REFER TO ENG-SOW-10007.

MI CHECKLIST

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY EOR)	REPORT ITEM
PRE-CONSTRUCTION	
X	MI CHECKLIST DRAWINGS
X	EOIR REVIEW
X	FABRICATOR INSPECTION
X	FABRICATOR CERTIFIED WELD INSPECTION
X	MATERIAL TEST REPORT (MTR)
NA	FABRICATOR NDE INSPECTION
NA	NDE REPORT OF MONOPOLE BASE PLATE (AS REQUIRED)
X	PACKING SLIPS
ADDITIONAL TESTING AND INSPECTIONS:	
CONSTRUCTION	
X	CONSTRUCTION INSPECTIONS
NA	FOUNDATION INSPECTIONS
NA	CONCRETE COMP. STRENGTH AND SLUMP TESTS
X	POST INSTALLED ANCHOR ROD VERIFICATION
NA	BASE PLATE GROUT VERIFICATION
X	CONTRACTOR'S CERTIFIED WELD INSPECTION
NA	EARTHWORK: LIFT AND DENSITY
X	ON SITE COLD GALVANIZING VERIFICATION
NA	GUY WIRE TENSION REPORT
X	GC AS-BUILT DOCUMENTS
X	INSPECTION OF AJAX BOLTS AND DT'S PER REQUIREMENTS ON SHEET S-3
NA	MICROPILE/ROCK ANCHOR INSTALLER'S DRILLING AND INSTALLATION LOGS AND QI/QC DOCUMENTS
NA	REFER TO MICROPILE/ROCK ANCHOR NOTES FOR SPECIAL INSPECTION AND TESTING REQUIREMENTS.
ADDITIONAL TESTING AND INSPECTIONS:	
POST-CONSTRUCTION	
X	MI INSPECTOR REDLINE OR RECORD DRAWING(S)
X	POST INSTALLED ANCHOR ROD PULL-OUT TESTING
X	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTE: X DENOTES A DOCUMENT NEEDED FOR THE PMI REPORT

NA DENOTES A DOCUMENT THAT IS NOT REQUIRED FOR THE PMI REPORT



10/20/14

PROJECT: 37513-0921.004.7700

DRAWN BY:
B.M.S.CHECKED BY:
J.W.M.APPROVED BY:
JKKDATE:
10-21-2014

BU #876331; NEW BRITAIN GRAVEL PIT
NEW BRITAIN, CONNECTICUT
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MI CHECKLIST

S-7

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL
TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11423B

I-84 / New Britain
125 North Mountain Road
New Britain, CT 06053

October 13, 2014

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	70.28 %

October 13, 2014

T-Mobile USA
Attn: Jason Overbey, RF Manager
35 Griffin Road South
Bloomfield, CT 06002

Emissions Analysis for Site: **CT11423B – I-84 / New Britain**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **125 North Mountain Road, New Britain, CT**, for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01 and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The number of $\mu\text{W}/\text{cm}^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

All results were compared to the FCC (Federal Communications Commission) radio frequency exposure rules, 47 CFR 1.1307(b)(1) – (b)(3), to determine compliance with the Maximum Permissible Exposure (MPE) limits for General Population/Uncontrolled environments as defined below.

General population/uncontrolled exposure limits apply to situations in which the general public may be exposed or in which persons who are exposed as a consequence of their employment may not be made fully aware of the potential for exposure or cannot exercise control over their exposure. Therefore, members of the general public would always be considered under this category when exposure is not employment related, for example, in the case of a telecommunications tower that exposes persons in a nearby residential area.

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu\text{W}/\text{cm}^2$). The general population exposure limit for both the PCS and AWS bands is 1000 $\mu\text{W}/\text{cm}^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at **125 North Mountain Road, New Britain, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was focused at the base of the tower. For this report the sample point is the top of a 6 foot person standing at the base of the tower.

For all calculations, all equipment was calculated using the following assumptions:

- 1) 2 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel
- 2) 2 UMTS channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.
- 3) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.
- 4) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

- 5) For the following calculations the sample point was the top of a six foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufactures supplied specifications minus 10 dB was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 6) The antennas used in this modeling are the **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **Ericsson AIR21 B4A/B2P** has a maximum gain of **15.9 dBd** at its main lobe. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.
- 7) The antenna mounting height centerline of the proposed antennas is **108 feet** above ground level (AGL).
- 8) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

All calculations were done with respect to uncontrolled / general public threshold limits.

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	108	Height (AGL):	108	Height (AGL):	108
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	# PCS Channels:	2
Total TX Power:	120	Total TX Power:	120	# AWS Channels:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A1 MPE%	1.61	Antenna B1 MPE%	1.61	Antenna C1 MPE%	1.61
Antenna #:	2	Antenna #:	2	Antenna #:	2
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	108	Height (AGL):	108	Height (AGL):	108
Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz(PCS) / 2100 MHz (AWS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power:	120	Total TX Power:	120	Total TX Power:	120
ERP (W):	1,906.06	ERP (W):	1,906.06	ERP (W):	1,906.06
Antenna A2 MPE%	1.61	Antenna B2 MPE%	1.61	Antenna C2 MPE%	1.61

Site Composite MPE%	
Carrier	MPE%
T-Mobile	9.68
AT&T	40.05 %
Clearwire	3.59 %
Sprint	7.39 %
Verizon Wireless	9.57 %
Site Total MPE %:	70.28 %

T-Mobile Sector 1 Total:	3.23 %
T-Mobile Sector 2 Total:	3.23 %
T-Mobile Sector 3 Total:	3.23 %
Site Total:	70.28 %

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general public exposure to RF Emissions.

The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general public exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector 1:	3.23 %
Sector 2:	3.23 %
Sector 3 :	3.23 %
T-Mobile Total:	9.68 %
Site Total:	70.28 %
Site Compliance Status:	COMPLIANT

The anticipated composite MPE value for this site assuming all carriers present is **70.28%** of the allowable FCC established general public limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.



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