CROWN CASTLE

Crown Castle
12 Gill Street, Suite 5800
Woburn, MA 01801

January 24, 2017

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

RE: **Notice of Exempt Modification for T-Mobile / L700 Crown Site BU: 822779**
T-Mobile Site ID: CT11240B
Located at: 1875 Nobel Avenue, Bridgeport, CT 06610
Latitude: 41° 12' 37.271" / Longitude: -73° 10' 52.259"

Dear Ms. Bachman,

T-Mobile currently maintains three (3) antennas at the 105-foot level of the existing 120-foot monopole at 1875 Nobel Avenue, Bridgeport, CT. The tower is owned by Crown Castle. The property is owned by The Connecticut Zoological Society. T-Mobile now intends to remove and replace the three (3) existing antennas with three (3) new antennas at the same 105-foot level; add three (3) BiasTs and twelve (12) lines of coaxial cable; and, remove and replace the existing lines of coaxial cable located at the 115' and 105'-foot level.

This facility was approved by the Town of Bridgeport Zoning Department, File Number 2K-07 on March 31, 2000. This approval included the condition(s) that:

1. Stockade fencing not less than 6' high shall be installed to encompass & enclose the proposed equipment area.
2. No equipment shall exceed the height of the fencing required in condition No. 1 above.
3. Arborvitae trees no less than 6' high shall be planted at 6' intervals around the perimeter of the equipment enclosure area.
4. All required fencing & landscape trees are to be maintained at all times.

5. A "Removal Bond" as determined by the City Attorney's Office shall be filed with the Bridgeport Zoning Department prior to the Certificate of an Application for Zoning Compliance.

This modification complies with the aforementioned condition(s).

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16-50j-72(b)(2). In accordance with R.S.C.A. § 16-50j-73, a copy of this letter is being sent to the Honorable Joseph P. Ganim, Mayor for the Town of Bridgeport, the Planning & Economic Department for the Town of Bridgeport, the property owner and the tower owner.

1. The proposed modifications will not result in an increase in the height of the existing tower.

2. The proposed modification will not require the extension of the site boundary.

3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communication Commission safety standard.

5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.

6. The existing structure and its foundation can support the proposed loading.

For the foregoing reasons, T-Mobile respectfully submits that the proposed modifications to the above-referenced telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: Amanda Goodall.

Sincerely,

Amanda Goodall
Real Estate Specialist
12 Gill Street, Suite 5800, Woburn, MA 01801
339-205-7017
Amanda.Goodall@crowncastle.com
Attachments:

Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 4: Exhibit-3: General Power Density Table report (RF Emissions Analysis Report)

cc: Joseph P. Ganim, Mayor
Town of Bridgeport
999 Broad Street
Bridgeport, CT 06604

Thomas F. Gill, Director of OPED
Office of Planning and Economic Development
999 Broad Street
Bridgeport, CT 06604

Crown Castle (Tower Owner)
12 Gill Street, Suite 5800
Woburn, Ma 01801

Connecticut Zoological Society (Property Owner)
1875 Nobel Ave
Bridgeport, CT 06610

1875 Noble Ave

Map data ©2017 Google 200 ft

ZONING DEPARTMENT

DEVELOPMENT ADMINISTRATION

City of Bridgeport

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DATE: March 31, 2000

OUR FILE: # 2K-07

Attorney J. Brendan Sharkey
100 Filley Street
Bloomfield, CT 06002

RE: Site Plan Review
1875 Noble Avenue
Bridgeport, CT

Dear Attorney Sharkey:

At its meeting held on Monday, March 27, 2000, the Planning & Zoning Commission voted to approve conditionally the application submitted by you which sought a Site Plan Review under Sec. 14-2 of the Bridgeport Zoning Regulations to permit the installation of a 120' high flagpole which will house telecommunications antennas & associated equipment within the Beardsley Zoo pavilion in a ZOOLOGICAL PARK ZONE.

The Commission stipulated the following conditions for its approval:

1. Stockade fencing not less that 6' high shall be installed to encompass & enclose the proposed equipment area.
2. No equipment shall exceed the height of the fencing required in condition No. 1 above.
3. Arborvitae trees no less than 6' high shall be planted at 6' intervals around the perimeter of the equipment enclosure area.
4. All required fencing & landscape trees are to be maintained at all times.
5. A "Removal Bond" as determined by the City Attorney's Office shall be filed with the Bridgeport Zoning Department prior to the Certification Of An Application For Zoning Compliance.

The Commission assigned the following reason for its action:

1. As to the Site Plan Review, the project, as approved, complies with the standards of Sec. 14-2-5 of the Bridgeport Zoning Regulations.

Very truly yours,

William A. Shaw, Clerk
Planning & Zoning Commission

WAS:map

CT11-240A

CITY HALL
45 Lyon Terrace
Room No. 206
Bridgeport, Conn.

NO. .....

APPLICATION FOR CERTIFICATE OF ZONING COMPLIANCE

ZONING COMMISSION
CITY OF BRIDGEPORT, CONN.

Applicant Omnipoint Communications, Inc. Date 5/17/00 19.....

Address of Work 1875 Noble Ave (Owner or Tenant Only) 45 Lyons Terrace (Number) East Main St. (Street)

on the corner (North, South, East, West) of Noble Ave side of the above street about ..... feet

..... from Beardsley Zoo. (Street) Lot No. 9-9A-9B-9C.
(North, South, East, West)

Block No. 3000 as shown on Tax Assessor's Maps. C.A.M. Area NO (Yes - No) Wetlands NO (Yes - No)

Dimension of Lot: Entire City Block.

Size of Proposed Building or Addition ..... No. Stories .....

Wood Frame ..... Brick Veneer ..... Masonry .....

Other Work (Describe in Detail) Installation of telecommunication antennas and associated equipment. (flagpole)

Proposed Use of Above (Describe in Detail) Telecommunication antenna for cell phones, as approved by ZBA 1/11/00 PZ. approval 3/27/00

Presently Existing Use Zoo Zone ZP

Previous use and date discontinued (if applicable) .....

..... Is pre-existing right claimed yes (Yes — No)

Signature J. Brendan Sharkey Print Same J. Brendan Sharkey, Esq.

If signed by agent state capacity (attorney, builder, etc.) Attorney for Omnipoint Communications (TheApplicant)

Mailing Address 100 Filley Street, Bloomfield, CT 06002 Phone No. 860/692-7100

INSTRUCTIONS
Fill Out This Application In Ink or Type

A detailed plot plan must be submitted with this application showing the proposed or existing lot and building dimensions and the location of all buildings in relation to the street line, side lot lines and rear lot line. NOTE: *The occupancy and use of land, buildings and structures prior to the issuance of a Certificate of Zoning Compliance is prohibited.* This is not the said certificate. Fees, payable at the time of making application, are not returnable and, are in an amount established by the Zoning Commission.

Fee received 100 Date 5/17/00 19.... By mcd.

PLAN AND APPLICATION	C.A.M. APPROVAL	FINAL INSPECTION
APPROVED FOR ZONING COMPLIANCE ONLY ZONING DEPARTMENT CITY OF BRIDGEPORT, CONN. BY mcd DATE: 10/6/00		

Certificate Issued Date ..... 19.....

Form 144

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T-Mobile

T-MOBILE SITE NUMBER: CT11240B
T-MOBILE SITE NAME: BRIDGEPORT/RT8
SITE TYPE: FLAGPOLE
TOWER HEIGHT: 120'-0"

CROWN CASTLE BU #: 822779
SITE ADDRESS: 1875 NOBLE AVENUE BRIDGEPORT, CT 06610
COUNTY: FAIRFIELD
JURISDICTION: CITY OF BRIDGEPORT

T-MOBILE L700_793D CONFIGURATION

SITE INFORMATION

CROWN CASTLE SITE NAME:	BRIDGEPORT/ RT 8
SITE ADDRESS:	1875 NOBLE AVENUE BRIDGEPORT, CT 06610
COUNTY:	FAIRFIELD
MAP/PARCEL #:	BRID-003000-000009A
AREA OF CONSTRUCTION:	EXISTING
LATITUDE:	41° 12' 37.271"
LONGITUDE:	-73° 10' 52.259"
LAT/LONG TYPE:	NAD83
GROUND ELEVATION:	102.0 FT.
CURRENT ZONING:	ZP-ZOOLOGICAL PARK
JURISDICTION:	CITY OF BRIDGEPORT
OCCUPANCY CLASSIFICATION:	U
TYPE OF CONSTRUCTION:	VB
A.D.A. COMPLIANCE:	FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION
PROPERTY OWNER:	CONNECTICUT ZOOLOGICAL SOCIETY 1875 NOBLE AVE C/O BEARDSLEY ZOO BRIDGEPORT, CT 06610-1646
TOWER OWNER:	CCTMO LLC 2000 CORPORATE DRIVE CANONSBURG, PA 15317
CARRIER/APPLICANT:	T-MOBILE 510 VIRGINIA DRIVE, FT WASHINGTON, PA 19034
CROWN CASTLE APPLICATION ID:	365187
ELECTRIC PROVIDER:	CPL (800) 788-5456
TELCO PROVIDER:	AT&T (866) 620-6900

PROJECT TEAM

CROWN CASTLE A&E FIRM:	CROWN CASTLE 2000 CORPORATE DRIVE CANONSBURG, PA 15317 CROWNAE.APPROVAL@CROWNCASTLE.COM
CROWN CASTLE CONTACTS:	3 CORPORATE PARK DRIVE, SUITE 101 CLIFTON PARK, NY 12065
	TRICIA PELON - PROJECT MANAGER (518) 373-3507
	JASON D'AMICO - CONSTRUCTION MANAGER (860) 209-0104
	WILLIAM STONE - A&E PROJECT MANAGER WILLIAM.STONE@CROWNCASTLE.COM (518) 373-3543

DRAWING INDEX

SHEET #	SHEET DESCRIPTION
T-1	TITLE SHEET
T-2	GENERAL NOTES
C-1	OVERALL AND ENLARGED SITE PLAN
C-2	FINAL ELEVATION AND ANTENNA PLANS
C-3	ANTENNA AND CABLE SCHEDULE
C-4	RFDS
C-5	PLUMBING DIAGRAM
C-6	EQUIPMENT SPECIFICATIONS
E-1	POWER ROUTING DETAIL
G-1	ANTENNA AND UTILITY FRAME GROUNDING DETAILS
G-2	GROUNDING DETAILS
G-3	GROUNDING DETAILS

ALL DRAWINGS CONTAINED HEREIN ARE FORMATTED FOR 11X17. CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.

APPLICABLE CODES/REFERENCE DOCUMENTS

ALL WORK SHALL BE PERFORMED AND MATERIALS INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES. NOTHING IN THESE PLANS IS TO BE CONSTRUED TO PERMIT WORK NOT CONFORMING TO THESE CODES:

CODE TYPE	CODE
BUILDING	2016 CT STATE BUILDING CODE/2012 IBC W/ CT AMENDMENTS
MECHANICAL	2016 CT STATE BUILDING CODE/2012 IMC W/ CT AMENDMENTS
ELECTRICAL	2016 CT STATE BUILDING CODE/2014 NEC W/ CT AMENDMENTS

INSTALLER NOTE:

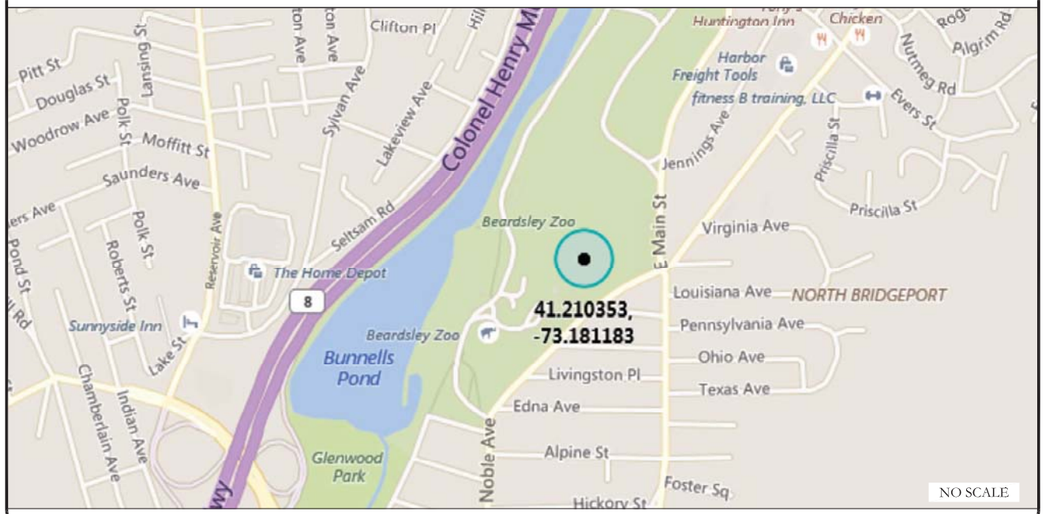
TOWER DOES NOT HAVE CLIMBING FACILITIES – MANLIFT REQUIRED FOR ELEVATED WORK.

REFERENCE DOCUMENTS:

STRUCTURAL ANALYSIS: PAUL J FORD AND COMPANY DATED DECEMBER 9, 2016

MOUNT ANALYSIS: BY OTHERS

LOCATION MAP



APPROVALS

APPROVAL	SIGNATURE	DATE
PROPERTY OWNER OR REP.		
LAND USE PLANNER		
T-MOBILE		
OPERATIONS		
RF		
NETWORK		
BACKHAUL		
CONSTRUCTION MANAGER		

THE PARTIES ABOVE HEREBY APPROVE AND ACCEPT THESE DOCUMENTS AND AUTHORIZE THE CONTRACTOR TO PROCEED WITH THE CONSTRUCTION DESCRIBED HEREIN. ALL CONSTRUCTION DOCUMENTS ARE SUBJECT TO REVIEW BY THE LOCAL BUILDING DEPARTMENT AND ANY CHANGES AND MODIFICATIONS THEY MAY IMPOSE.

PROJECT DESCRIPTION

THE PURPOSE OF THIS PROJECT IS TO ENHANCE BROADBAND CONNECTIVITY AND CAPACITY TO THE EXISTING ELIGIBLE WIRELESS FACILITY.

- REMOVE (3) ANTENNAS
- INSTALL (3) ANTENNAS
- INSTALL (3) BIAS TEEs
- REMOVE (12) 1-5/8" FEEDLINES
- INSTALL (24) 7/8" FEEDLINES
- INSTALL (3) RRUs ON NEW UTILITY FRAME ON EXISTING PAD

DESIGN PACKAGE BASED ON RF DATA SHEET
VERSION: 1.1
ISSUED: 4/21/2016

DESIGN PACKAGE BASED ON THE APPLICATION
ID: 365187
REVISION: 3

NOTE:
PRIOR TO ACCESSING/ENTERING THE SITE YOU MUST CONTACT THE CROWN NOC AT (800) 788-7011 & CROWN CONSTRUCTION MANAGER

CALL CONNECTICUT ONE CALL
(800) 922-4455
CALL 3 WORKING DAYS
BEFORE YOU DIG!

811

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

T-MOBILE SITE NUMBER:
CT11240B

BU #: **822779**
BRIDGEPORT/ RT 8

1875 NOBLE AVENUE
BRIDGEPORT, CT 06610

EXISTING 120'-0" FLAGPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	JRM	PRELIMINARY	LMR
0	01/05/17	JRM	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
1B4005B2547C4FD...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

1/5/2017 | 1:48:17 PM EST

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. COA
#PEC.0001101

SHEET NUMBER: T-1
REVISION: 0

SITE WORK GENERAL NOTES:

1. THE SUBCONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
2. 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 SUBCONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES, SUBCONTRACTOR 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 AND EXCAVATION.
3. ALL SITE WORK TO COMPLY WITH QAS–STD–10068 "INSTALLATION STANDARDS FOR CONSTRUCTION ACTIVITIES ON CROWN CASTLE TOWER SITE" AND LATEST VERSION OF TIA 1019 "STANDARD FOR INSTALLATION, ALTERATION, AND MAINTENANCE OF ANTENNA SUPPORTING STRUCTURES AND ANTENNAS."
4. ALL SITE WORK SHALL BE AS INDICATED ON THE STAMPED CONSTRUCTION DRAWINGS AND PROJECT SPECIFICATIONS.
5. IF NECESSARY, RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
6. 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.
7. THE SUBCONTRACTOR SHALL PROVIDE SITE SIGNAGE IN ACCORDANCE WITH THE TECHNICAL SPECIFICATION FOR SITE SIGNAGE.
8. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
9. 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.
10. THE SUB GRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
11. THE AREAS OF THE OWNERS 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 AS SPECIFIED ON THE PROJECT SPECIFICATIONS.
12. SUBCONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
13. NOTICE TO PROCEED– NO WORK TO COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED AND THE ISSUANCE OF A PURCHASE ORDER.
14. ALL CONSTRUCTION MEANS AND METHODS; INCLUDING BUT NOT LIMITED TO, ERECTION PLANS, RIGGING PLANS, CLIMBING PLANS, AND RESCUE PLANS SHALL BE THE RESPONSIBILITY OF THE GENERAL CONTRACTOR RESPONSIBLE FOR THE EXECUTION OF THE WORK CONTAINED HEREIN AND SHALL MEET ANSI/TIA 1019 (LATEST EDITION), OSHA, AND GENERAL INDUSTRY STANDARDS. ALL RIGGING PLANS SHALL ADHERE TO ANSI/TIA–1019 (LATEST EDITION) INCLUDING THE REQUIRED INVOLVEMENT OF A QUALIFIED ENGINEER FOR CLASS IV CONSTRUCTION.

STRUCTURAL STEEL NOTES:

1. ALL STEEL WORK SHALL BE PAINTED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS AND IN ACCORDANCE WITH ASTM A36 UNLESS OTHERWISE NOTED.
2. BOLTED CONNECTIONS SHALL BE ASTM A325 BEARING TYPE (3/4"ø) CONNECTIONS AND SHALL HAVE MINIMUM OF TWO BOLTS UNLESS NOTED OTHERWISE.
3. NON–STRUCTURAL CONNECTIONS FOR STEEL GRATING MAY USE 5/8"ø ASTM A307 BOLTS UNLESS NOTED OTHERWISE.
4. INSTALLATION OF CONCRETE EXPANSION/WEDGE ANCHOR, SHALL BE PER MANUFACTURER'S 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.

CONCRETE AND REINFORCING STEEL NOTES:

1. 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.
2. ALL CONCRETE SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AT 28 DAYS, UNLESS NOTED OTHERWISE. SLAB FOUNDATION DESIGN ASSUMING ALLOWABLE SOIL BEARING PRESSURE OF 2000 PSF.
3. REINFORCING STEEL SHALL CONFORM TO ASTM A615, GRADE 60, DEFORMED UNLESS NOTED OTHERWISE. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185 WELDED STEEL WIRE FABRIC UNLESS NOTED OTHERWISE. SPLICES SHALL BE CLASS "B" AND ALL HOOKS SHALL BE STANDARD, UNO.
4. 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:
   #6 AND LARGER.....2 IN.
   #5 AND SMALLER & WWF.....1 1/2 IN.
   CONCRETE NOT EXPOSED TO EARTH OR WEATHER OR NOT CAST AGAINST THE GROUND:
   SLAB AND WALLS.....3/4 IN.
   BEAMS AND COLUMNS.....1 1/2 IN.
5. A CHAMFER 3/4" SHALL BE PROVIDED AT ALL EXPOSED EDGES OF CONCRETE, UNLESS NOTED OTHERWISE. IN ACCORDANCE WITH ACI 301 SECTION 4.2.4.

MASONRY NOTES:

1. HOLLOW CONCRETE MASONRY UNITS SHALL MEET A.S.T.M. SPECIFICATION C90, GRADE N. TYPE 1. THE SPECIFIED DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY (F'm) SHALL BE 1500 PSI.
2. MORTAR SHALL MEET THE PROPERTY SPECIFICATION OF A.S.T.M. C270 TYP. "S" MORTAR AND SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI.
3. GROUT SHALL MEET A.S.T.M. SPECIFICATION C475 AND HAVE A MINIMUM 28 DAY COMPRESSIVE STRENGTH OF 2000 PSI.
4. CONCRETE MASONRY SHALL BE LAID IN RUNNING (COMMON) BOND.
5. WALL SHALL RECEIVE TEMPORARY BRACING. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL GROUT IS FULLY CURED.

GENERAL NOTES:

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

CONTRACTOR–	
SUBCONTRACTOR–	GENERAL CONTRACTOR (CONSTRUCTION)
CARRIER–	T–MOBILE
TOWER OWNER–	CROWN CASTLE
OEM–	ORIGINAL EQUIPMENT MANUFACTURER

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR 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 CONTRACTOR AND CROWN CASTLE.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS AND ORDINANCES. SUBCONTRACTOR 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.
4. DRAWINGS PROVIDED HERE ARE NOT TO SCALE AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CAN NOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION FOR APPROVAL BY THE CONTRACTOR AND CROWN CASTLE PRIOR TO PROCEEDING WITH ANY SUCH CHANGE OF INSTALLATION.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWINGS.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR 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.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION. TRASH AND DEBRIS SHOULD BE REMOVED FROM SITE ON A DAILY BASIS.

ABBREVIATIONS AND SYMBOLS:

ABBREVIATIONS:

AGL	ABOVE GRADE LEVEL
BTS	BASE TRANSCEIVER STATION
(E)	EXISTING
MIN.	MINIMUM
REF	REFERENCE
RF	RADIO FREQUENCY
T.B.D.	TO BE DETERMINED
T.B.R.	TO BE RESOLVED
TYP	TYPICAL
REQ	REQUIRED
EGR	EQUIPMENT GROUND RING
AWG	AMERICAN WIRE GAUGE
MGB	MASTER GROUND BAR
EG	EQUIPMENT GROUND
BCW	BARE COPPER WIRE
SIAD	SMART INTEGRATED ACCESS DEVICE
GEN	GENERATOR
IGR	INTERIOR GROUND RING (HALO)
RBS	RADIO BASE STATION

SYMBOLS:

ES/G	SOLID GROUND BUS BAR
ES/N	SOLID NEUTRAL BUS BAR
	SUPPLEMENTAL GROUND CONDUCTOR
	2–POLE THERMAL–MAGNETIC CIRCUIT BREAKER
	SINGLE–POLE THERMAL–MAGNETIC CIRCUIT BREAKER
	CHEMICAL GROUND ROD
	TEST WELL
	DISCONNECT SWITCH
M	METER
	EXOTHERMIC WELD (CADWELD) (UNLESS OTHERWISE NOTED)
	MECHANICAL CONNECTION
	GROUNDING WIRE

ELECTRICAL INSTALLATION NOTES:

1. ALL ELECTRICAL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE PROJECT SPECIFICATIONS, NEC AND ALL APPLICABLE FEDERAL, STATE, AND LOCAL CODES/ORDINANCES.
2. CONDUIT ROUTINGS ARE SCHEMATIC. SUBCONTRACTOR SHALL INSTALL CONDUITS SO THAT ACCESS TO EQUIPMENT IS NOT BLOCKED AND TRIP HAZARDS ARE ELIMINATED.
3. WIRING, RACEWAY AND SUPPORT METHODS AND MATERIALS SHALL COMPLY WITH THE REQUIREMENTS OF THE NEC. HILTI EPOXY ANCHORS ARE REQUIRED BY CROWN CASTLE.
4. ALL CIRCUITS SHALL BE SEGREGATED AND MAINTAIN MINIMUM CABLE SEPARATION AS REQUIRED BY THE NEC.
5. CABLES SHALL NOT BE ROUTED THROUGH LADDER–STYLE CABLE TRAY RUNGS.
6. 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" PLASTIC ELECTRICAL TAPE WITH UV PROTECTION, OR EQUAL). THE IDENTIFICATION METHOD SHALL CONFORM WITH NEC AND OSHA.
7. ALL ELECTRICAL COMPONENTS SHALL BE CLEARLY LABELED WITH PLASTIC TAPE PER COLOR SCHEDULE. ALL EQUIPMENT SHALL BE LABELED WITH THEIR VOLTAGE RATING, PHASE CONFIGURATION, WIRE CONFIGURATION, POWER OR AMPACITY RATING AND BRANCH CIRCUIT ID NUMBERS (I.E. PANEL BOARD AND CIRCUIT ID'S).
8. PANEL BOARDS (ID NUMBERS) AND INTERNAL CIRCUIT BREAKERS (CIRCUIT ID NUMBERS) SHALL BE CLEARLY LABELED WITH PLASTIC LABELS.
9. ALL TIE WRAPS SHALL BE CUT FLUSH WITH APPROVED CUTTING TOOL TO REMOVE SHARP EDGES.
10. POWER, CONTROL AND EQUIPMENT GROUND WIRING IN TUBING OR CONDUIT SHALL BE SINGLE CONDUCTOR (#14 AWG OR LARGER), 600 V, OIL RESISTANT THHN OR THWN–2, CLASS B STRANDED COPPER CABLE RATED FOR 90° C (WET & DRY) OPERATION LISTED OR LABELED FOR THE LOCATION AND RACEWAY SYSTEM USED UNLESS OTHERWISE SPECIFIED.
11. SUPPLEMENTAL EQUIPMENT GROUND WIRING LOCATED INDOORS SHALL BE SINGLE CONDUCTOR (#6 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.
12. POWER AND CONTROL WIRING, NOT IN TUBING OR CONDUIT, SHALL BE MULTI–CONDUCTOR, TYPE TC CABLE (#14 AWG OR LARGER), 600 V, 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.
13. ALL POWER AND GROUNDING CONNECTIONS SHALL BE CRIMP–STYLE, COMPRESSION WIRE LUGS AND WIRE NUTS BY THOMAS AND BETTS (OR EQUAL). LUGS AND WIRE NUTS SHALL BE RATED FOR OPERATION AT NO LESS THAN 75° C (90° C IF AVAILABLE).
14. RACEWAY AND CABLE TRAY SHALL BE LISTED OR LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
15. 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.
16. ELECTRICAL METALLIC TUBING (EMT), ELECTRICAL NONMETALLIC TUBING (ENT) OR RIGID NONMETALLIC CONDUIT (RIGID PVC, SCHEDULE 40) SHALL BE USED FOR CONCEALED INDOOR LOCATIONS.
17. SCHEDULE 40 PVC UNDERGROUND ON STRAIGHTS AND SCHEDULE 80 PVC FOR ALL ELBOWS/90s AND ALL APPROVED ABOVE GRADE PVC CONDUIT.
18. LIQUID–TIGHT FLEXIBLE METALLIC CONDUIT (LIQUID–TITE FLEX) SHALL BE USED INDOORS AND OUTDOORS, WHERE VIBRATION OCCURS OR FLEXIBILITY IS NEEDED.
19. CONDUIT AND TUBING FITTINGS SHALL BE THREADED OR COMPRESSION–TYPE AND APPROVED FOR THE LOCATION USED. SET SCREW FITTINGS ARE NOT ACCEPTABLE.
20. CABINETS, BOXES AND WIRE WAYS SHALL BE LABELED FOR ELECTRICAL USE IN ACCORDANCE WITH NEMA, UL, ANSI/IEEE AND NEC.
21. WIREWAYS SHALL BE EPOXY–COATED (GRAY) AND INCLUDE A HINGED COVER, DESIGNED TO SWING OPEN DOWNWARDS; SHALL BE PANDUIT TYPE E (OR EQUAL); AND RATED NEMA 1 (OR BETTER).
22. CONDUITS SHALL BE FASTENED SECURELY IN PLACE WITH APPROVED NON–PERFORATED STRAPS AND HANGERS. EXPLOSIVE DEVICES FOR ATTACHING HANGERS TO STRUCTURE WILL NOT BE PERMITTED. CLOSELY FOLLOW THE LINES OF THE STRUCTURE, MAINTAIN CLOSE PROXIMITY TO THE STRUCTURE AND KEEP CONDUITS IN TIGHT ENVELOPES. CHANGES IN DIRECTION TO ROUTE AROUND OBSTACLES SHALL BE MADE WITH CONDUIT OUTLET BODIES. CONDUIT SHALL BE INSTALLED IN A NEAT AND WORKMANLIKE MANNER. PARALLEL AND PERPENDICULAR TO STRUCTURE WALL AND CEILING LINES. ALL CONDUIT SHALL BE FISHED TO CLEAR OBSTRUCTIONS. ENDS OF CONDUITS SHALL BE TEMPORARILY CAPPED FLUSH TO FINISH GRADE TO PREVENT CONCRETE, PLASTER OR DIRT FROM ENTERING. CONDUITS SHALL BE RIGIDLY CLAMPED TO BOXES BY GALVANIZED MALLEABLE IRON BUSHIN ON INSIDE AND GALVANIZED MALLEABLE IRON LOCKNUT ON OUTSIDE AND INSIDE.
23. 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.
24. 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.
25. 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.
26. THE SUBCONTRACTOR SHALL NOTIFY AND OBTAIN NECESSARY AUTHORIZATION FROM THE CONTRACTOR BEFORE COMMENCING WORK ON THE AC POWER DISTRIBUTION PANELS.
27. THE SUBCONTRACTOR SHALL PROVIDE NECESSARY TAGGING ON THE BREAKERS, CABLES AND DISTRIBUTION PANELS IN ACCORDANCE WITH THE APPLICABLE CODES AND STANDARDS TO SAFEGUARD LIFE AND PROPERTY.
28. INSTALL PLASTIC LABEL ON THE METER CENTER TO SHOW "T–MOBILE".
29. ALL CONDUITS THAT ARE INSTALLED ARE TO HAVE A METERED MULE TAPE PULL CORD INSTALLED.

GREENFIELD GROUNDING NOTES:

1. 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 IN ACCORDANCE WITH THE NEC.
2. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL–OF–POTENTAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81) FOR GROUND ELECTRODE SYSTEMS, THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
3. THE SUBCONTRACTOR 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 AND PROVIDE TESTING RESULTS.
4. METAL CONDUIT AND TRAY SHALL BE GROUNDED AND MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
5. 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 BTS EQUIPMENT.
6. EACH CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, 6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS; #2 AWG SOLID TINNED COPPER FOR OUTDOOR BTS.
7. CONNECTIONS TO THE GROUND BUS SHALL NOT BE DOUBLED UP OR STACKED BACK TO BACK CONNECTIONS ON OPPOSITE SIDE OF THE GROUND BUS ARE PERMITTED.
8. ALL EXTERIOR GROUND CONDUCTORS BETWEEN EQUIPMENT/GROUND BARS AND THE GROUND RING SHALL BE #2 AWG SOLID TINNED COPPER UNLESS OTHERWISE INDICATED.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. USE OF 90° BENDS IN THE PROTECTION GROUNDING CONDUCTORS SHALL BE AVOIDED WHEN 45° BENDS CAN BE ADEQUATELY SUPPORTED.
11. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
12. ALL GROUND CONNECTIONS ABOVE GRADE (INTERIOR AND EXTERIOR) SHALL BE FORMED USING HIGH PRESS CRIMPS.
13. COMPRESSION GROUND CONNECTIONS MAY BE REPLACED BY EXOTHERMIC WELD CONNECTIONS.
14. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO THE BRIDGE AND THE TOWER GROUND BAR.
15. APPROVED ANTIOXIDANT COATINGS (I.E. CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
16. ALL EXTERIOR GROUND CONNECTIONS SHALL BE COATED WITH A CORROSION RESISTANT MATERIAL.
17. MISCELLANEOUS ELECTRICAL AND NON–ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
18. BOND ALL METALLIC OBJECTS WITHIN 6 FT. OF MAIN GROUND WIRES WITH 1–#2 AWG TIN–PLATED COPPER GROUND CONDUCTOR.
19. 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., NONMETALLIC CONDUIT PROHIBITED BY LOCAL CODE) THE GROUND CONDUCTOR SHALL BE BONDED TO EACH END OF THE METAL CONDUIT.
20. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK. (ADD TRANSITIONING GROUND STANDARD DETAIL AS WELL).

NEC INSULATOR COLOR CODE

DESCRIPTION	PHASE/CODE LETTER	WIRE COLOR
240/120 1Ø	LEG 1	BLACK
	LEG 2	RED
AC NEUTRAL	N	WHITE
GROUND (EGC)	G	GREEN
VDC POS	+	*RED–POLARITY MARK AT TERMINATION
VDC NEG	–	*BLACK–POLARITY MARK AT TERMINATION
240V OR 208V, 3Ø	PHASE A	BLACK
	PHASE B	RED(ORG. IF HI LEG)
	PHASE C	BLUE
480V, 3Ø	PHASE A	BROWN
	PHASE B	ORANGE
	PHASE C	YELLOW

* SEE NEC 210.5(C)(1) AND (2)

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T-MOBILE SITE NUMBER:
CT11240B

BU #: **822779**
BRIDGEPORT/ RT 8

1875 NOBLE AVENUE
BRIDGEPORT, CT 06610

EXISTING 120'-0" FLAGPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	JRM	PRELIMINARY	LMR
0	01/05/17	JRM	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
1B4065B2547C41D...

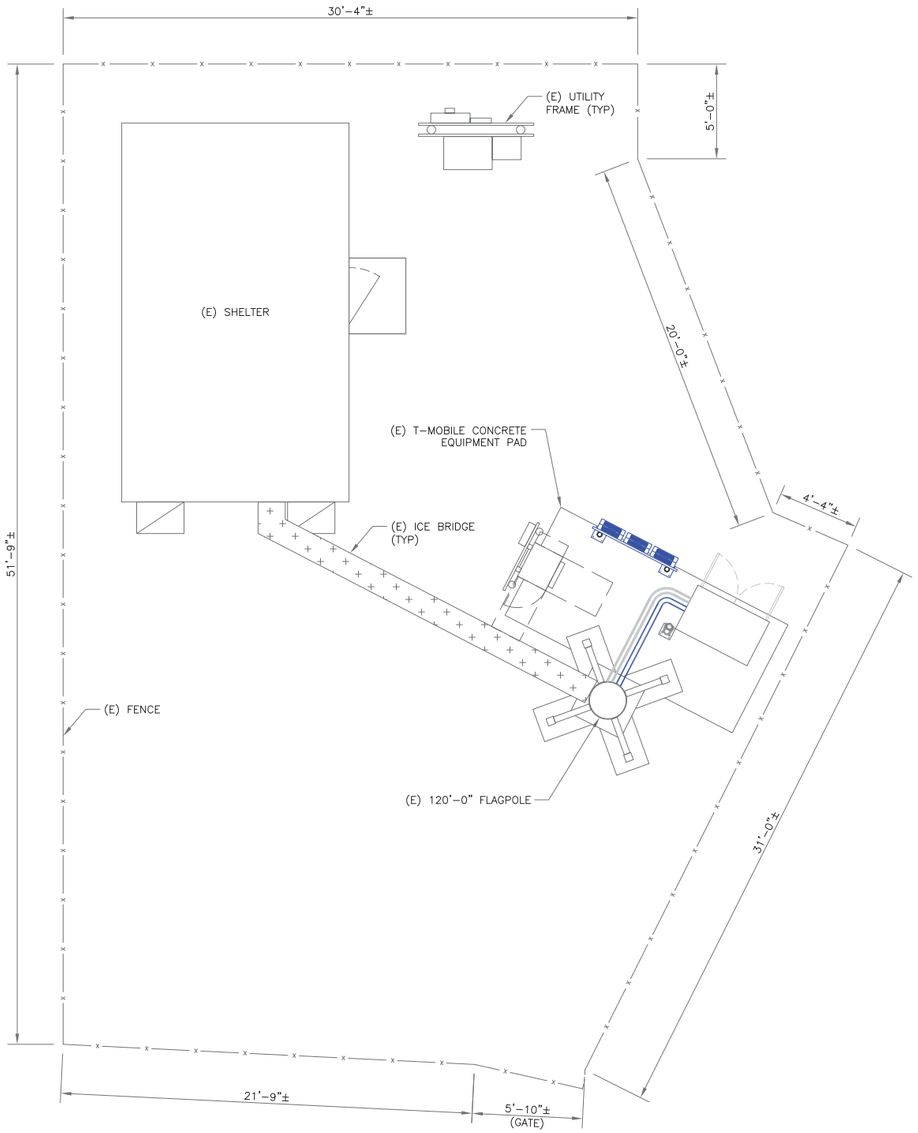
STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

1/5/2017 | 1:48:17 PM EST

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. COA
#PEC.0001101

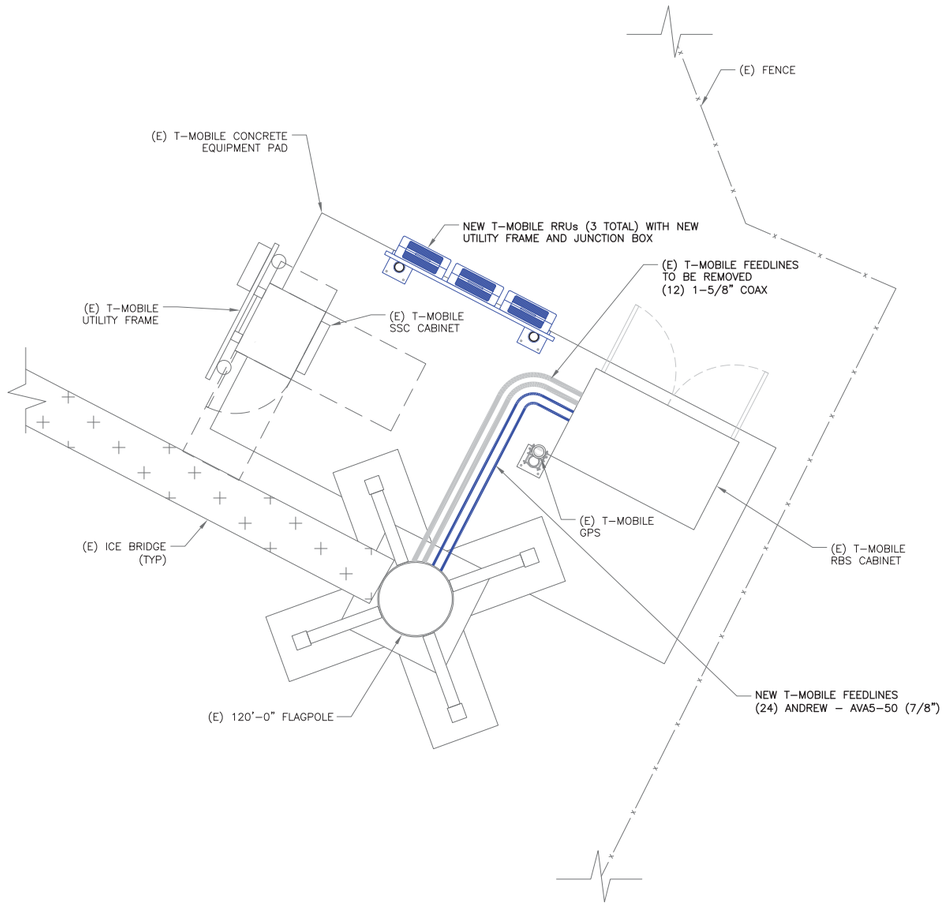
SHEET NUMBER: T-2

REVISION: 0



1 OVERALL SITE PLAN
SCALE: 4' 3' 2' 1' 0 4' 1/4"=1'-0" (FULL SIZE) 1/8"=1'-0" (11x17)

N



2 ENLARGED SITE PLAN
SCALE: 2' 1' 0 2' 1/2"=1'-0" (FULL SIZE) 1/4"=1'-0" (11x17)

N

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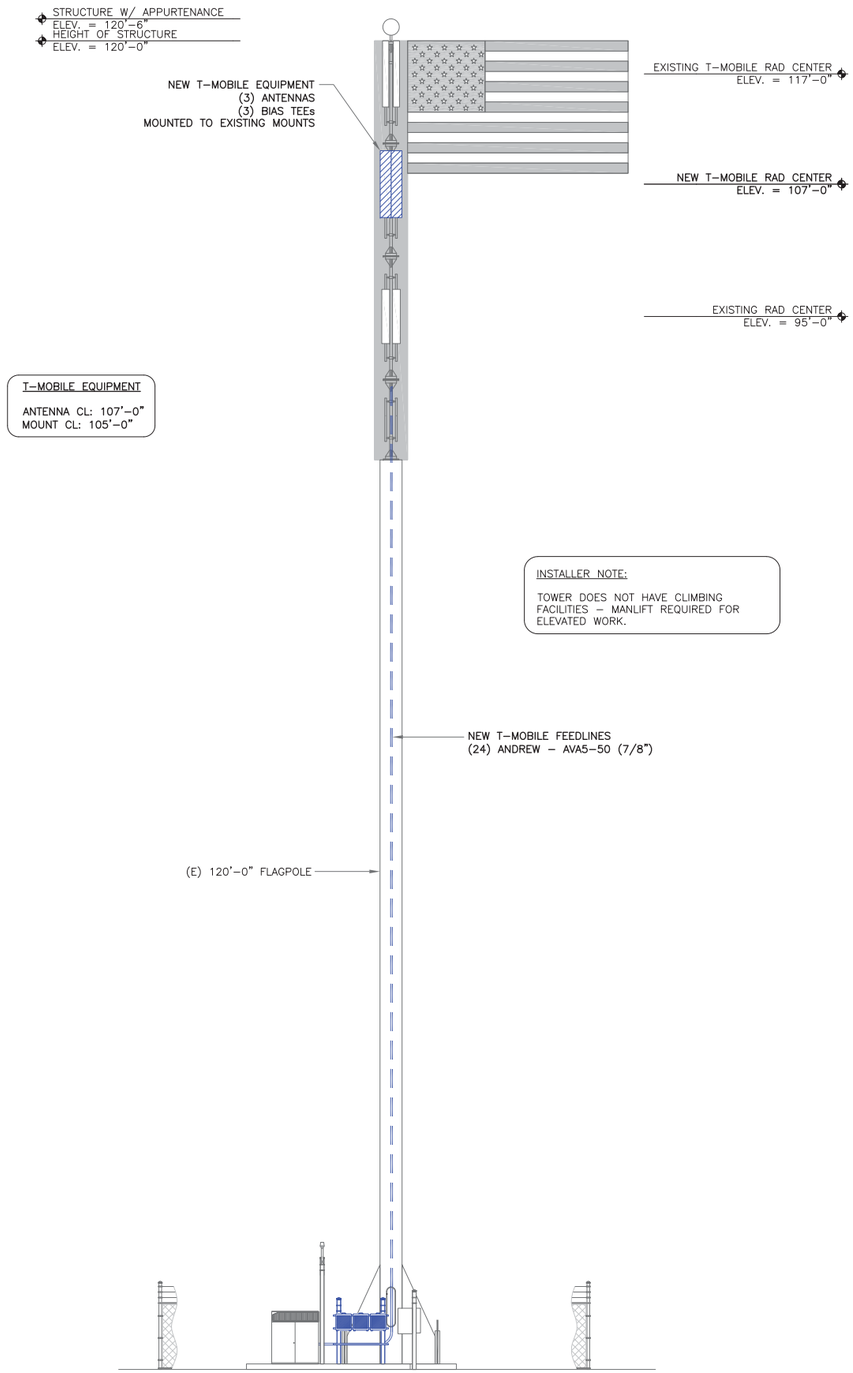
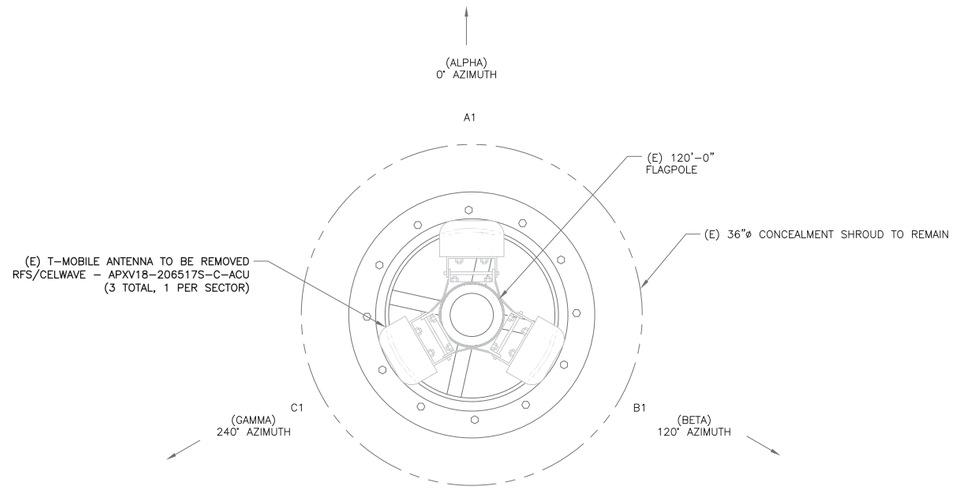
#PEC.0001101

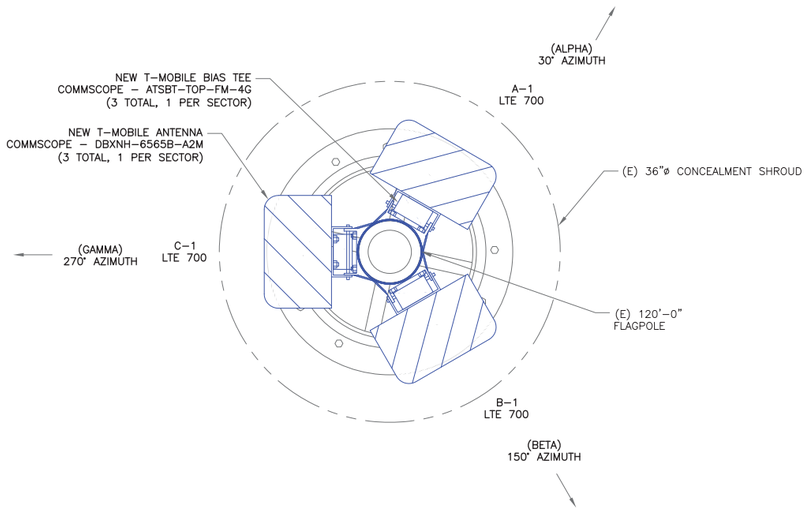
SHEET NUMBER: C-1
REVISION: 0



1 FINAL ELEVATION
SCALE: NOT TO SCALE



2 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



3 FINAL ANTENNA LAYOUT
SCALE: NOT TO SCALE

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#PEC.0001101

SHEET NUMBER: C-2

REVISION: 0

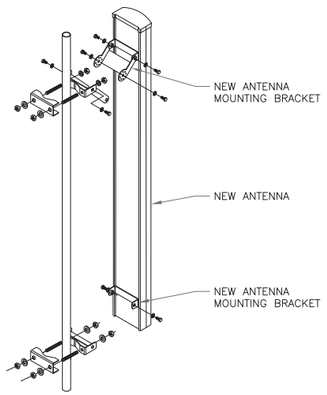
ANTENNA SCHEDULE

SECTOR	POS.	TECHNOLOGY	RAD CENTER	AZIMUTH	ANTENNA MANUFACTURER	ANTENNA MODEL	MECH. TILT	ELECT. TILT	TOWER MOUNTED EQUIPMENT	FEEDLINE TYPE
ALPHA	A1	LTE 700	107'-0"	30°	COMMSCOPE	DBXNH-6565B-A2M	0°	7°/7°	(1) COMMSCOPE - ATSBT-TOP-FM-4G	COAX
BETA	B1	LTE 700	107'-0"	150°	COMMSCOPE	DBXNH-6565B-A2M	0°	10°/20°	(1) COMMSCOPE - ATSBT-TOP-FM-4G	COAX
GAMMA	C1	LTE 700	107'-0"	270°	COMMSCOPE	DBXNH-6565B-A2M	0°	10°/20°	(1) COMMSCOPE - ATSBT-TOP-FM-4G	COAX

CABLE SCHEDULE

STATUS	CABLE TYPE	SIZE	QUANTITY
NEW	COAX	7/8"	24
FINAL CABLE QUANTITY			24

1 ANTENNA AND CABLE SCHEDULE
SCALE: NOT TO SCALE



NOTE:
ALL PIPES BRACKETS AND MISCELLANEOUS HARDWARE TO BE GALVANIZED UNLESS NOTED OTHERWISE

2 ANTENNA MOUNTING DETAIL
SCALE: NOT TO SCALE

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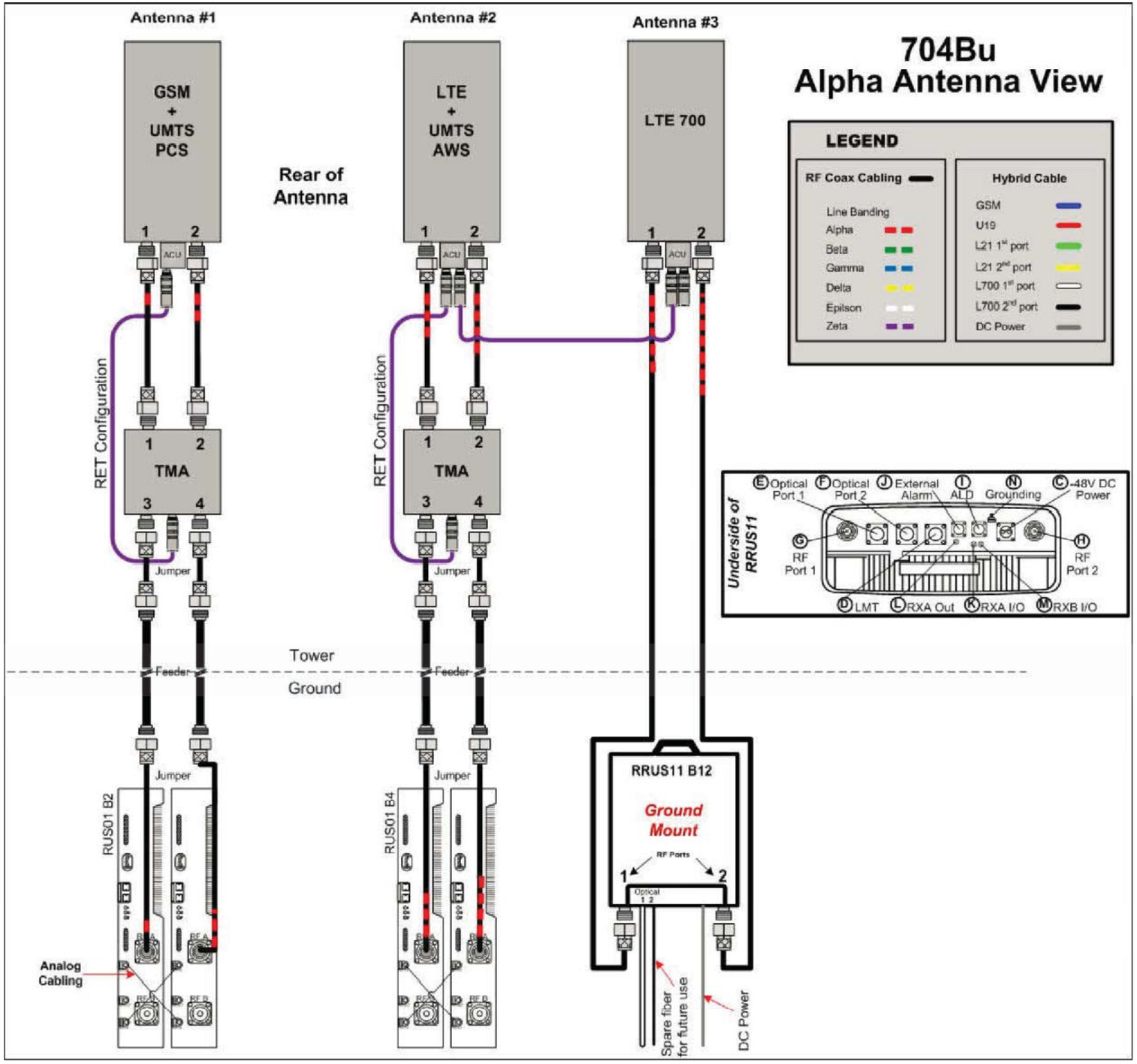
SHEET NUMBER: C-3
REVISION: 0



1 PLUMBING DIAGRAM
SCALE: NOT TO SCALE

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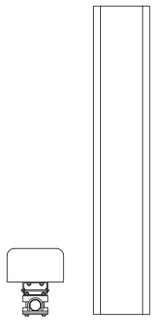
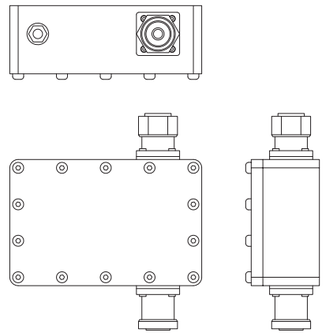
SHEET NUMBER: C-5
REVISION: 0



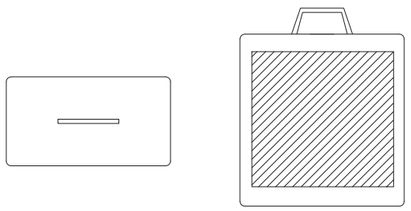
COMMSCOPE – DBXNH–6565B–A2M
WEIGHT (WITHOUT MOUNTING HARDWARE): 46.3 LBS
SIZE (HxWxD): 72.70x11.90x7.10 IN.
MOUNTING HARDWARE P/N: DB380 OR DB5083
RATED WIND VELOCITY: 149.8 MPH

1 COMMSCOPE – DBXNH–6565B–A2M
SCALE: NOT TO SCALE



COMMSCOPE – ATSBT–TOP–FM–4G
WEIGHT: 1.7 LBS
SIZE (HxWxD): 3.7x5.63x2.0 IN.

2 COMMSCOPE – ATSBT–TOP–FM–4G
SCALE: NOT TO SCALE



ERICSSON – RRUS 11 B12
WEIGHT (FULLY EQUIPPED): 50.7 LBS
SIZE (HxWxD): 19.7x17x7.2 IN.

3 ERICSSON – RRUS 11 B12
SCALE: NOT TO SCALE

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1/5/2017 | 1:48:17 PM EST

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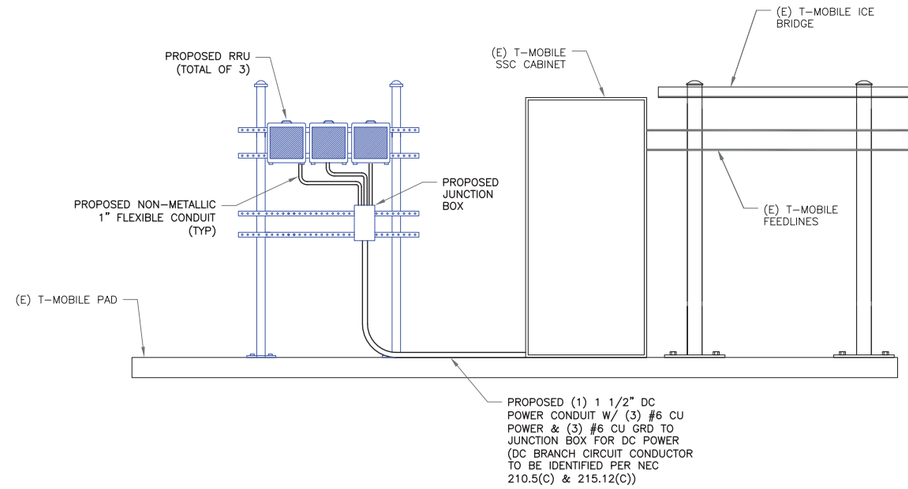
Crown Castle USA, Inc. COA
#PEC.0001101

SHEET NUMBER: C-6
REVISION: 0

EXISTING T–MOBILE EQUIPMENT SHOWN FOR SCHEMATIC PURPOSES ONLY. CONTRACTOR SHALL FIELD VERIFY EQUIPMENT LOCATIONS AND ROUTING DISTANCES PRIOR TO START OF CONSTRUCTION.



GENERAL ELECTRICAL NOTES:

1. REFER TO SPECIFICATIONS DRAWINGS IN THIS SET FOR ELECTRICAL SPECIFICATIONS.
2. REFER TO ELECTRICAL DETAILS WHICH ARE APPLICABLE FOR THE TYPE OF ELECTRICAL AND TELEPHONE SERVICES. VERIFY REQUIREMENTS. FOR ELECTRICAL AND TELEPHONE SERVICES WITH LOCAL UTILITIES BEFORE BIDDING AND INCLUDE IN SCOPE OF WORK.
3. CONTRACTOR TO FIELD VERIFY ALL DIMENSIONS PRIOR TO CONSTRUCTION.
4. CONDUIT TO BE PLACED IN UTILITY EASEMENT AND/OR T–MOBILE AREA PER CROWN APPROVED UTILITY ROUTING PLAN.
5. IF POWER AND CONDUIT ARE PLACED IN THE SAME TRENCH, PER NEC CODE, A MINIMUM OF 12" SEPARATION IS REQUIRED BETWEEN THE POWER AND FIBER CONDUIT.
6. SWEEPING 90'S TO BE INSTALLED AT ALL TURNS AND BENDS (NO HARD 90'S).
7. ALL GROUNDS THAT TRANSITION FROM BELOW GRADE TO ABOVE GRADE MUST BE #2 TINNED SOLID IN 3/4" LIQUID TIGHT CONDUIT FROM 24" BELOW GRADE TO WITHIN 3" TO 6" OF CAD–WELD TERMINATION POINT. THE EXPOSED END OF THE LIQUID TIGHT CONDUIT MUST BE SEALED WITH SILICONE CAULK.
8. SEE SHEET T–2, COMMENTS UNDER ELECTRICAL INSTALLATION NOTES #17 & #18.

1 POWER ROUTING DETAIL
SCALE: NOT TO SCALE

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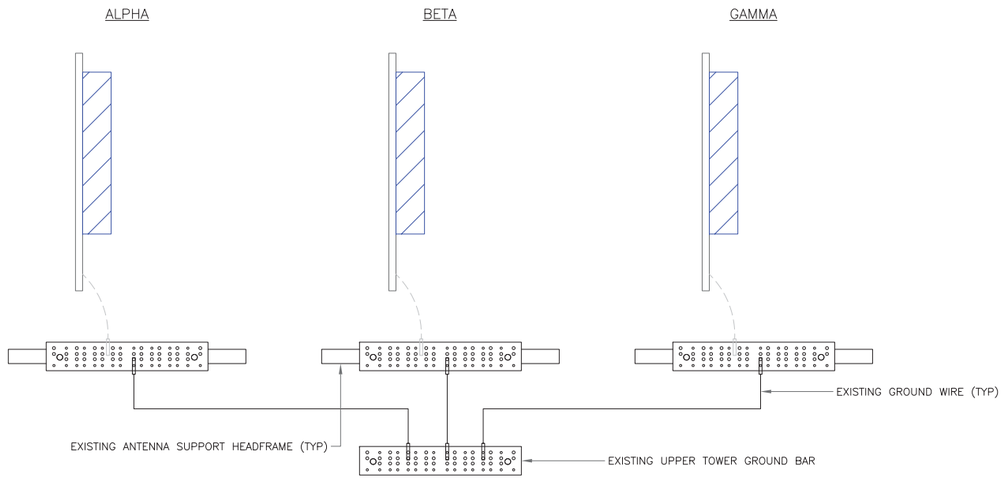
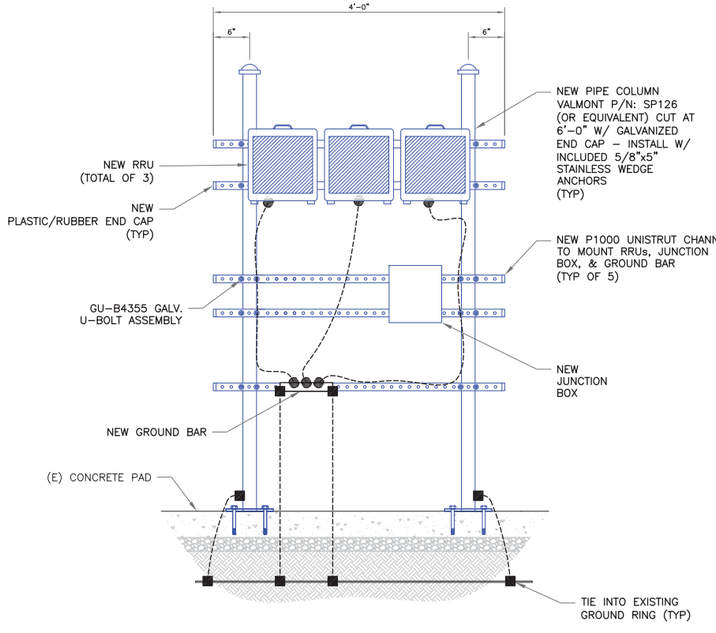
Crown Castle USA, Inc. COA
#PEC.0001101

SHEET NUMBER: E-1

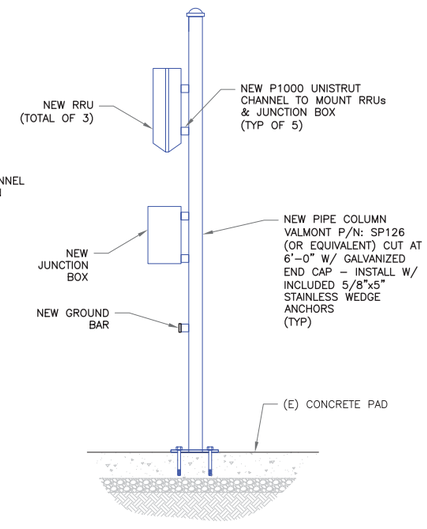
REVISION: 0



1 ANTENNA GROUND DIAGRAM
SCALE: NOT TO SCALE



2 RRU POST ELEVATION DETAIL
SCALE: NOT TO SCALE



3 RRU POST SIDE VIEW DETAIL
SCALE: NOT TO SCALE

GROUNDING LEGEND

- ■ – EXOTHERMIC WELD (CAD WELD)
- ● – MECHANICAL CONNECTION
- ----- – #2 SOLID COPPER TINNED WIRE UNLESS NOTED OTHERWISE

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

T-MOBILE SITE NUMBER:
CT11240B

BU #: **822779**
BRIDGEPORT/ RT 8

1875 NOBLE AVENUE
BRIDGEPORT, CT 06610

EXISTING 120'-0" FLAGPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	JRM	PRELIMINARY	LMR
0	01/05/17	JRM	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
1B4005B2547C41D...

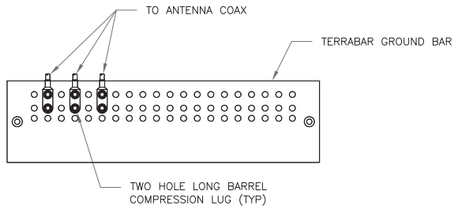
STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

1/5/2017 | 1:48:17 PM EST

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. COA
#PEC.0001101

SHEET NUMBER: G-1

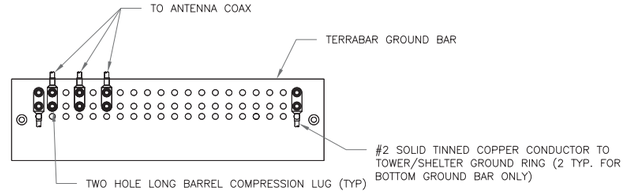
REVISION: 0



NOTES:

1. DOUBLING UP "OR STACKING" OF CONNECTIONS IS NOT PERMITTED.
2. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
3. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL.

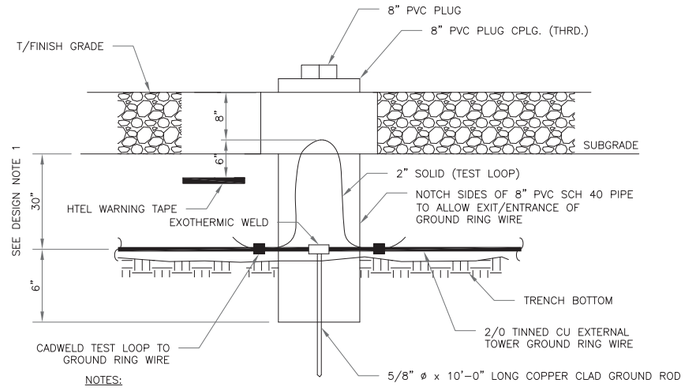
1 ANTENNA GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. EXTERIOR ANTIOXIDANT JOINT COMPOUND TO BE USED ON ALL EXTERIOR CONNECTIONS.
2. GROUND BAR SHALL NOT BE ISOLATED FROM TOWER. MOUNT DIRECTLY TO TOWER STEEL (TOWER ONLY).
3. INSTALL GROUND BARS AT 75 FT. INTERVAL MAXIMUM.
4. GROUND BAR SHALL BE ISOLATED FROM BUILDING OR SHELTER.

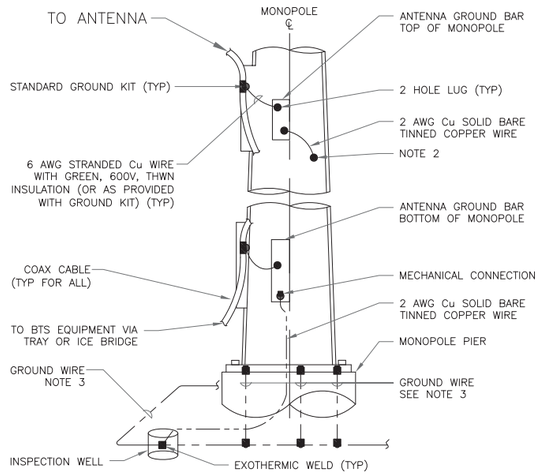
2 TOWER/SHELTER GROUND BAR DETAIL
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

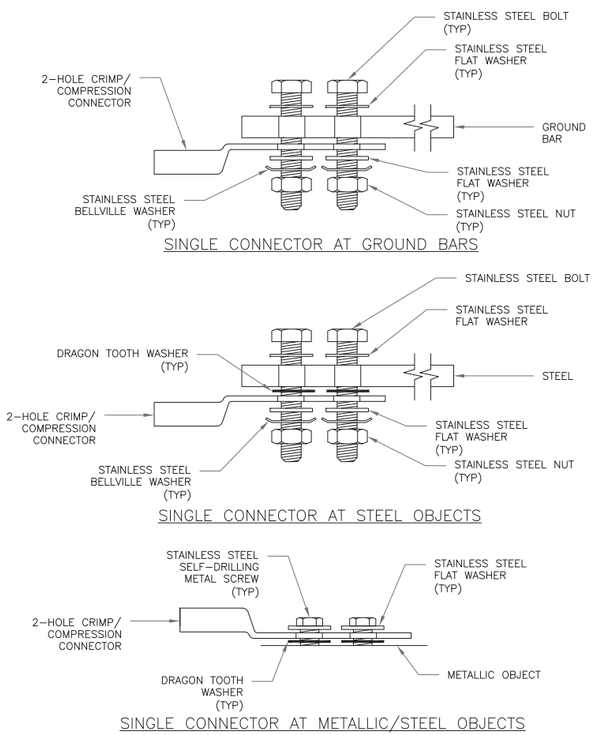
3 INSPECTION PORT DETAIL
SCALE: NOT TO SCALE



NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF MONOPOLE, ANTENNA LOCATION AND CONNECTION ORIENTATION. COAXIAL CABLES EXCEEDING 200 FEET IN/ON THE POLE SHALL HAVE GROUND KITS AT THE MIDPOINT. PROVIDE AS REQUIRED.
2. ONLY MECHANICAL CONNECTIONS ARE ALLOWED TO BE MADE TO CROWN CASTLE TOWERS. ALL MECHANICAL CONNECTIONS SHALL BE TREATED WITH AN ANTI-OXIDANT COATING.
3. ALL TOWER GROUNDING SYSTEMS SHALL COMPLY WITH THE REQUIREMENTS OF ANSI/TIA 222. FOR TOWERS BEING BUILT TO REV G OF THE STANDARD, THE WIRE SIZE OF THE BURIED GROUND RING AND CONNECTIONS BETWEEN THE TOWER AND THE BURIED GROUND RING SHALL BE 2/0 AWG. STRANDED IN ADDITION, THE MINIMUM LENGTH OF THE GROUND RODS SHALL BE INCREASED FROM 8 FEET TO 10 FEET.

4 TYPICAL ANTENNA CABLE GROUNDING
SCALE: NOT TO SCALE

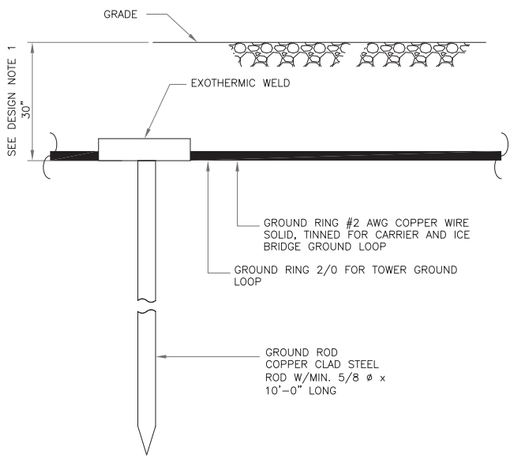


SINGLE CONNECTOR AT GROUND BARS

SINGLE CONNECTOR AT STEEL OBJECTS

SINGLE CONNECTOR AT METALLIC/STEEL OBJECTS

5 HARDWARE DETAIL FOR EXTERIOR CONNECTIONS
SCALE: NOT TO SCALE



NOTES:

1. GROUND ROD SHALL BE DRIVEN VERTICALLY, NOT TO EXCEED 45 DEGREES FROM THE VERTICAL
2. GROUND WIRE SHALL BE MIN. 30" BELOW GRADE OR 6" BELOW FROST LINE. (WHICH EVER IS GREATER) AS PER N.E.C. ARTICLE 250-50(D)

6 GROUND ROD DETAIL
SCALE: NOT TO SCALE

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

T-MOBILE SITE NUMBER:
CT11240B

BU #: **822779**
BRIDGEPORT/ RT 8

1875 NOBLE AVENUE
BRIDGEPORT, CT 06610

EXISTING 120'-0" FLAGPOLE

ISSUED FOR:

REV	DATE	DRWN	DESCRIPTION	DES./QA
A	12/21/16	JRM	PRELIMINARY	LMR
0	01/05/17	JRM	CONSTRUCTION	JPL

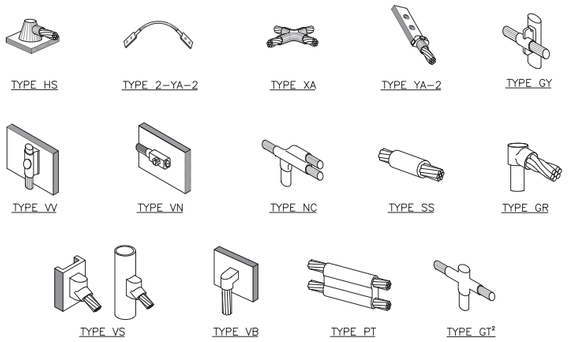
DocuSigned by:
Justin Linette
1B4005B2347C41F...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED
PROFESSIONAL ENGINEER

1/5/2017 | 1:48:17 PM EST

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. COA
#PEC.0001101

SHEET NUMBER: G-2
REVISION: 0

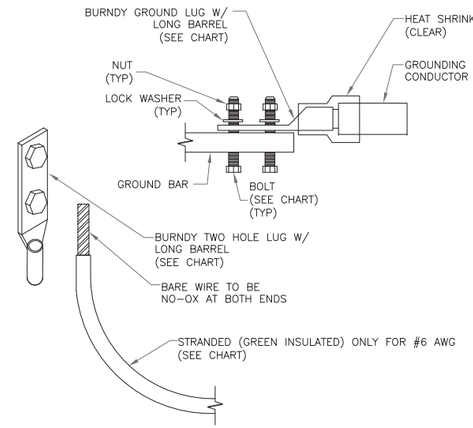


NOTE:

1. ERICO EXOTHERMIC "MOLD TYPES" SHOWN HERE ARE EXAMPLES. CONSULT WITH CONSTRUCTION MANAGER FOR SPECIFIC MOLDS TO BE USED FOR THIS PROJECT.
2. MOLD TYPE ONLY TO BE USED BELOW GRADE WHEN CONNECTING GROUND RING TO GROUND ROD.

1 CADWELD GROUNDING CONNECTIONS
SCALE: NOT TO SCALE

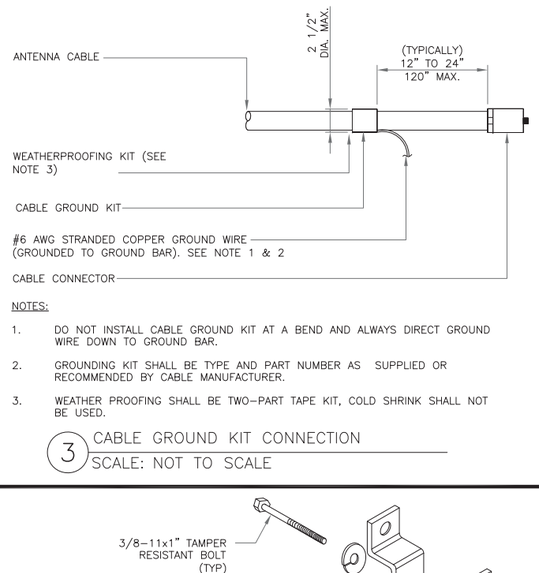
WIRE SIZE	BURNDY LUG	BOLT SIZE
#6 AWG GREEN INSULATED	YA6C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG SOLID TINNED	YA3C-2TC38	3/8" - 16 NC S 2 BOLT
#2 AWG STRANDED	YA2C-2TC38	3/8" - 16 NC S 2 BOLT
#2/0 AWG STRANDED	YA26-2TC38	3/8" - 16 NC S 2 BOLT
#4/0 AWG STRANDED	YA28-2N	1/2" - 16 NC S 2 BOLT



NOTES:

1. ALL GROUNDING LUGS ARE TO BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS. ALL HARDWARE BOLTS, NUTS, LOCK WASHERS SHALL BE STAINLESS STEEL. ALL HARDWARE ARE TO BE AS FOLLOWS: BOLT, FLAT WASHER,GROUND BAR, GROUND LUG, FLAT WASHER AND NUT.

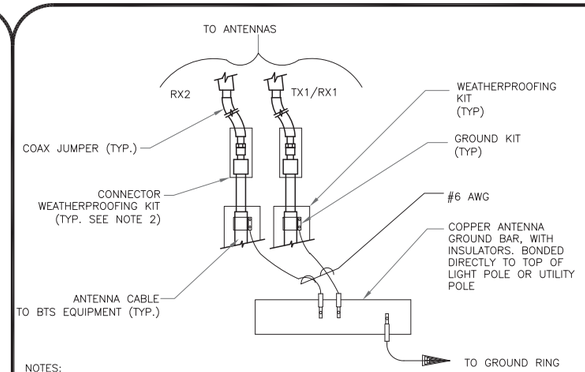
2 MECHANICAL LUG CONNECTION
SCALE: NOT TO SCALE



NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO GROUND BAR.
2. GROUNDING KIT SHALL BE TYPE AND PART NUMBER AS SUPPLIED OR RECOMMENDED BY CABLE MANUFACTURER.
3. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT, COLD SHRINK SHALL NOT BE USED.

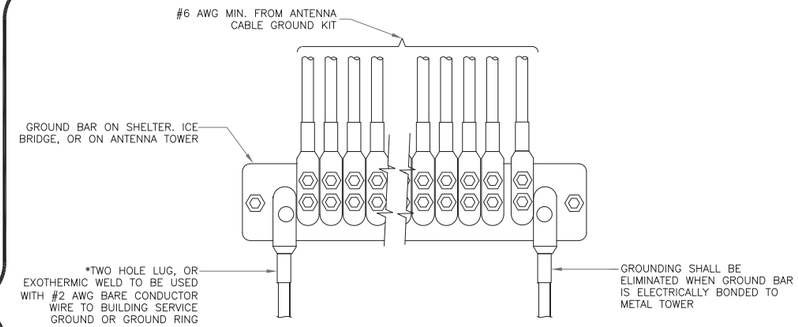
3 CABLE GROUND KIT CONNECTION
SCALE: NOT TO SCALE



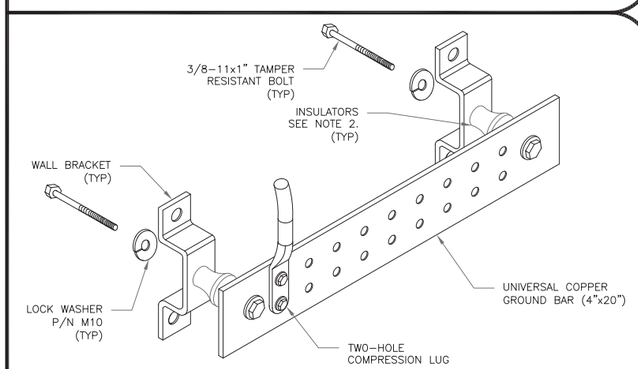
NOTES:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO ANTENNA GROUND BAR.
2. WEATHER PROOFING SHALL BE TWO-PART TAPE KIT. COLD SHRINK SHALL NOT BE USED.

4 GROUND CABLE CONNECTION
SCALE: NOT TO SCALE



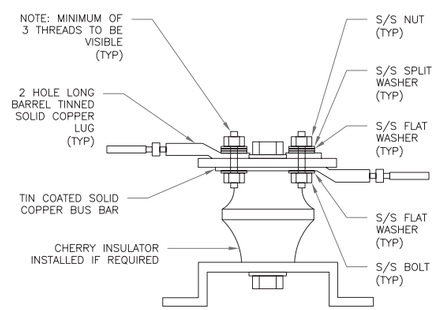
5 GROUNDWIRE INSTALLATION
SCALE: NOT TO SCALE



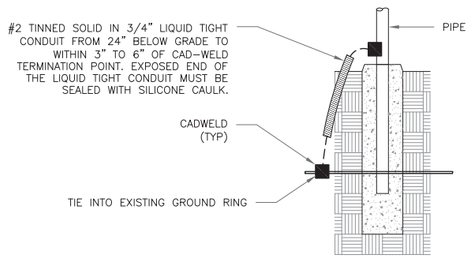
NOTES:

1. DOWN LEAD (HOME RUN) CONDUCTORS ARE NOT TO BE INSTALLED ON CROWN CASTLE TOWER, PER THE GROUNDING DOWN CONDUCTOR POLICY QAS-STD-10091. NO MODIFICATION OR DRILLING TO TOWER STEEL IS ALLOWED IN ANY FORM OR FASHION, CAD-WELDING ON THE TOWER AND/OR IN THE AIR ARE NOT PERMITTED.
2. OMIT INSULATOR WHEN MOUNTING TO TOWER STEEL OR PLATFORM STEEL USE INSULATORS WHEN ATTACHING TO BUILDING OR SHELTERS.

6 GROUND BAR DETAIL
SCALE: NOT TO SCALE



7 LUG DETAIL
SCALE: NOT TO SCALE



8 TRANSITIONING GROUND DETAIL
SCALE: NOT TO SCALE

T-Mobile
510 VIRGINIA DRIVE,
FT WASHINGTON, PA 19034

CROWN CASTLE
3 CORPORATE PARK DRIVE, SUITE 101
CLIFTON PARK, NY 12065

T-MOBILE SITE NUMBER:
CT11240B

BU #: **822779**
BRIDGEPORT/ RT 8

1875 NOBLE AVENUE
BRIDGEPORT, CT 06610

EXISTING 120'-0" FLAGPOLE

ISSUED FOR:

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A	12/21/16	JRM	PRELIMINARY	LMR
0	01/05/17	JRM	CONSTRUCTION	JPL

DocuSigned by:
Justin Linette
1B4005B2547C41D...

STATE OF CONNECTICUT
JUSTIN PETER LINETTE
No. 31965
LICENSED PROFESSIONAL ENGINEER

1/5/2017 | 1:48:17 PM EST

Justin Peter Linette, P.E.
Professional Engineer License: #31965
Crown Castle USA, Inc. COA
#PEC.0001101

SHEET NUMBER: G-3
REVISION: 0

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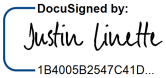
Justin Linette justin.linette@crowncastle.com Crown Castle International Corp. Security Level: Email, Account Authentication (None)	DocuSigned by:  1B4005B2547C41D... Using IP Address: 64.213.130.241	Sent: 1/5/2017 | 12:37:24 PM Viewed: 1/5/2017 | 1:46:32 PM Signed: 1/5/2017 | 1:48:17 PM

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Completed	Security Checked	1/5/2017 | 1:48:17 PM

PJF PAUL J. FORD & COMPANY

Date: **December 08, 2016**

Andrew Bazinet
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
585.370.4766

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

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11240B
	Carrier Site Name:	Bridgeport/Rt8
Crown Castle Designation:	**Crown Castle BU Number:**	822779
	Crown Castle Site Name:	Bridgeport/ Rt 8
	Crown Castle JDE Job Number:	401123
	Crown Castle Work Order Number:	1333893
	Crown Castle Application Number:	365187 Rev. 3
Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-3608.002.7805
Site Data:	**1875 Noble Avenue, Bridgeport, Fairfield County, CT** **Latitude *41° 12' 37.271"*, Longitude *-73° 10' 52.259"*** **120 Foot - Monopole Tower**	

Dear Andrew Bazinet,

Paul J Ford and Company is pleased to submit this **"Structural Analysis 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 978607, in accordance with application 365187, revision 3.

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:

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table I and Table II for the proposed and existing/reserved loading, respectively.

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 were used in this analysis.

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:

Seth Tschanen, E.I.
Structural Designer

STATE OF CONNECTICUT
JUSTIN T. KLINE
No. 30301
LICENSED
PROFESSIONAL ENGINEER

DEC 0 9 2016

tnxTower Report - version 7.0.5.1

Date: **December 08, 2016**

Andrew Bazinet
Crown Castle
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
585.370.4766

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

Subject: **Structural Analysis Report**

Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11240B
	Carrier Site Name:	Bridgeport/Rt8
Crown Castle Designation:	**Crown Castle BU Number:**	822779
	Crown Castle Site Name:	Bridgeport/ Rt 8
	Crown Castle JDE Job Number:	401123
	Crown Castle Work Order Number:	1333893
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Engineering Firm Designation:	**Paul J Ford and Company Project Number:**	37516-3608.002.7805
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Seth Tschanen, E.I.
Structural Designer

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1) INTRODUCTION

This tower is a 120 ft Monopole tower designed by PIROD MANUFACTURES INC. in June of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F.

2) ANALYSIS CRITERIA

This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the ANSI/TIA-222-G-2005 Standard, "Structural Standard for Antenna Supporting Structures and Antennas", with ANSI/TIA-222-G-1-2007 and ANSI/TIA-222-G-2-2009 Addenda per Exception #5 of Section 1609.1.1. Risk Category II, Exposure Category C and Topographic Category 1 were used in this analysis.

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
115.0	117.0	--	--	--	12	7/8	--
105.0	107.0	3	commscope	DBXNH-6565B-A2M	12	7/8	--
	102.0	3	commscope	ATSBT-TOP-FM-4G			

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
115.0	117.0	--	--	--	6	1 5/8	3
		3	rfs celwave	APXV18-206517S-C-ACU	--	--	1
105.0	107.0	3	rfs celwave	APXV18-206517S-C-ACU	6	1 5/8	3
95.0	96.0	--	--	--	6 2	1 1/4 3/8	1
		3	commscope	DHHTT65B-3XR	1 1 4	1/8 7/8 17/64	2
	92.0	3	nokia	FWHR			
	91.0	1	box enclosures and assembly	BEN-92P			

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed

Table 3 - Design 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)
--	--	--	--	--	--	--

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FDH Velocitel, 15BZKS1600, 10/7/15	3584592	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 61158.32797, 4/29/16	6261360	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	Pirod, A-116835, 6/1/00	3914232	CCISITES
4-TOWER MANUFACTURER DRAWINGS	Pirod, A-116835, 6/1/00	3584593	CCISITES

3.1) Analysis Method

tnxTower (version 7.0.5.1), 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 modified in conformance with the referenced 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 5 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
L1	120 - 110	Pole	P10.75x0.349	1	-0.63	431.06	11.5	Pass
L2	110 - 100	Pole	P10.75x0.349	2	-1.73	431.06	32.0	Pass
L3	100 - 90	Pole	P10.75x0.349	3	-3.05	431.06	61.2	Pass
L4	90 - 82	Pole	P10.75x0.349	4	-4.04	431.06	90.3	Pass
L5	82 - 60	Pole	P24x0.375	5	-7.20	1052.07	36.6	Pass
L6	60 - 30	Pole	P24x0.375	6	-11.20	1052.07	69.7	Pass
L7	30 - 8.5	Pole	P24x0.375	7	-14.21	1052.07	97.2	Pass
L8	8.5 - 0	Pole	P24x0.5	8	-15.72	1313.94	82.8	Pass
							Summary	
						Pole (L7)	97.2	Pass
						Rating =	97.2	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	17.5	Pass
1	Base Plate	0	19.9	Pass
1	Base Foundation	0	60.1	Pass
1	Flange Connection	110	9.9	Pass
1	Flange Connection	100	27.6	Pass
1	Flange Connection	90	53.0	Pass
1	Flange Connection	82	92.1	Pass
1	Flange Connection	60	63.1	Pass
1	Flange Connection	30	96.8	Pass

Structure Rating (max from all components) =	97.2%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

4.1) Recommendations

The monopole and its foundation have sufficient capacity to carry the proposed loading configuration. No modifications are required at this time.

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

There is a pole section.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Fairfield County, Connecticut.
2) ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
3) Basic wind speed of 97 mph.
4) Structure Class II.
5) Exposure Category C.
6) Topographic Category 1.
7) Crest Height 0.0000 ft.
8) Nominal ice thickness of 0.7500 in.
9) Ice thickness is considered to increase with height.
10) Ice density of 56.00 pcf.
11) A wind speed of 50 mph is used in combination with ice.
12) Temperature drop of 50 °F.
13) Deflections calculated using a wind speed of 60 mph.
14) A non-linear (P-delta) analysis was used.
15) Pressures are calculated at each section.
16) Stress ratio used in pole design is 1.
17) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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

Pole Section Geometry

Section	*Elevation*	*Section Length*	*Pole Size*	*Pole Grade*	*Socket Length*
	ft	*ft*			*ft*
L1	120.0000-110.0000	10.0000	P10.75x0.349	A500-42 (42 ksi)	
L2	110.0000-100.0000	10.0000	P10.75x0.349	A500-42 (42 ksi)	
L3	100.0000-90.0000	10.0000	P10.75x0.349	A500-42 (42 ksi)	
L4	90.0000-82.0000	8.0000	P10.75x0.349	A500-42 (42 ksi)	
L5	82.0000-60.0000	22.0000	P24x0.375	A53-B-42 (42 ksi)	
L6	60.0000-30.0000	30.0000	P24x0.375	A53-B-42 (42 ksi)	
L7	30.0000-8.5000	21.5000	P24x0.375	A53-B-42	

Section	Elevation ft	Section Length ft	Pole Size	Pole Grade	Socket Length ft
L8	8.5000-0.0000	8.5000	P24x0.5	(42 ksi) Reinf 39.55 ksi (40 ksi)	

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 120.0000-110.0000				1	0	1			
L2 110.0000-100.0000				1	0	1			
L3 100.0000-90.0000				1	0	1			
L4 90.0000-82.0000				1	0	1			
L5 82.0000-60.0000				1	1	1			
L6 60.0000-30.0000				1	1	1			
L7 30.0000-8.5000				1	1	1			
L8 8.5000-0.0000				1	1	1			

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
AVA5-50(7/8)	C	No	Inside Pole	115.0000 - 0.0000	12	No Ice	0.0000	0.30
						1/2" Ice	0.0000	0.30
						1" Ice	0.0000	0.30
***								
AVA5-50(7/8)	C	No	Inside Pole	105.0000 - 0.0000	12	No Ice	0.0000	0.30
						1/2" Ice	0.0000	0.30
						1" Ice	0.0000	0.30
***								
LDF6-50A(1-1/4")	C	No	Inside Pole	95.0000 - 0.0000	6	No Ice	0.0000	0.66
						1/2" Ice	0.0000	0.66
						1" Ice	0.0000	0.66
9833(3/8")	C	No	Inside Pole	95.0000 - 0.0000	2	No Ice	0.0000	0.07
						1/2" Ice	0.0000	0.07
						1" Ice	0.0000	0.07
7919A(17/64")	C	No	Inside Pole	95.0000 - 0.0000	4	No Ice	0.0000	0.03
						1/2" Ice	0.0000	0.03
						1" Ice	0.0000	0.03
004U8X-32125E2G(1/8)	C	No	Inside Pole	95.0000 - 0.0000	1	No Ice	0.0000	0.01
						1/2" Ice	0.0000	0.01
						1" Ice	0.0000	0.01
TYPE SOOW 12/9(7/8")	C	No	Inside Pole	95.0000 - 0.0000	1	No Ice	0.0000	0.51
						1/2" Ice	0.0000	0.51
						1" Ice	0.0000	0.51
1" Rigid Conduit (3/4" EMT)	C	No	Inside Pole	95.0000 - 0.0000	5	No Ice	0.0000	0.46
						1/2" Ice	0.0000	0.46
						1" Ice	0.0000	0.46

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.0000-110.0000	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	0.000	0.02
L2	110.0000-100.0000	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	0.000	0.05
L3	100.0000-90.0000	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	0.000	0.11
L4	90.0000-82.0000	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	0.000	0.11
L5	82.0000-60.0000	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	0.000	0.31
L6	60.0000-30.0000	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	0.000	0.43
L7	30.0000-8.5000	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	0.000	0.31
L8	8.5000-0.0000	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	0.000	0.12

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	120.0000-110.0000	A	1.699	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	0.000	0.02
L2	110.0000-100.0000	A	1.684	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	0.000	0.05
L3	100.0000-90.0000	A	1.667	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	0.000	0.11
L4	90.0000-82.0000	A	1.651	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	0.000	0.11
L5	82.0000-60.0000	A	1.619	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	0.000	0.31
L6	60.0000-30.0000	A	1.547	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	0.000	0.43
L7	30.0000-8.5000	A	1.421	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	0.000	0.31
L8	8.5000-0.0000	A	1.222	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	0.000	0.12

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L1	120.0000-110.0000	0.0000	0.0000	0.0000	0.0000
L2	110.0000-100.0000	0.0000	0.0000	0.0000	0.0000
L3	100.0000-90.0000	0.0000	0.0000	0.0000	0.0000
L4	90.0000-82.0000	0.0000	0.0000	0.0000	0.0000
L5	82.0000-60.0000	0.0000	0.0000	0.0000	0.0000
L6	60.0000-30.0000	0.0000	0.0000	0.0000	0.0000
L7	30.0000-8.5000	0.0000	0.0000	0.0000	0.0000
L8	8.5000-0.0000	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice

User Defined Loads

Description	Elevation	Offset From Centroid	Azimuth Angle		Weight	F_x	F_z	Wind Force	C_AA_C
	ft	ft	°		K	K	K	K	ft^2
Flag	120.0000	0.00	0.00	No Ice	0.02	0.00	0.00	0.48	**14.5606**
				Ice	0.25	0.00	0.00	0.08	**8.8835**
				Service	0.02	0.00	0.00	0.11	**9.7996**

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement		C_AA_A Front	C_AA_A Side	Weight
			ft ft ft	°	ft		ft^2	ft^2	K
***									
***									
***									
APXV18-206517S-C-ACU	A	From Leg	0.5000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.03 0.05 0.09
APXV18-206517S-C-ACU	B	From Leg	0.5000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.03 0.05 0.09
APXV18-206517S-C-ACU	C	From Leg	0.5000 0.00 2.00	0.00	115.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.03 0.05 0.09
***									
DBXNH-6565B-A2M	A	From Leg	0.5000 0.00 2.00	0.00	105.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.05 0.10 0.15
DBXNH-6565B-A2M	B	From Leg	0.5000 0.00 2.00	0.00	105.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.05 0.10 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
DBXNH-6565B-A2M	C	From Leg	0.5000 0.00 2.00	0.00	105.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.05 0.10 0.15
ATSBT-TOP-FM-4G	A	From Leg	0.5000 0.00 -3.00	0.00	105.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.00 0.00 0.01
ATSBT-TOP-FM-4G	B	From Leg	0.5000 0.00 -3.00	0.00	105.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.00 0.00 0.01
ATSBT-TOP-FM-4G	C	From Leg	0.5000 0.00 -3.00	0.00	105.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.00 0.00 0.01
***									
DHHTT65B-3XR	A	From Leg	0.5000 0.00 1.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.05 0.10 0.16
DHHTT65B-3XR	B	From Leg	0.5000 0.00 1.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.05 0.10 0.16
DHHTT65B-3XR	C	From Leg	0.5000 0.00 1.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.05 0.10 0.16
FWHR	A	From Leg	0.5000 0.00 -3.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.03 0.04 0.05
FWHR	B	From Leg	0.5000 0.00 -3.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.03 0.04 0.05
FWHR	C	From Leg	0.5000 0.00 -3.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.03 0.04 0.05
BEN-92P	C	From Leg	4.0000 0.00 -4.00	0.00	95.0000	No Ice 1/2" Ice 1" Ice	0.0000 0.0000 0.0000	0.0000 0.0000 0.0000	0.00 0.01 0.02
***									
Canister Load1	C	None		0.00	120.0000	No Ice 1/2" Ice 1" Ice	9.0000 18.5000 19.0000	9.0000 18.5000 19.0000	0.09 0.21 0.32
Canister Load2	C	None		0.00	110.0000	No Ice 1/2" Ice 1" Ice	18.0000 37.0000 38.0000	18.0000 37.0000 38.0000	0.40 0.63 0.86
Canister Load3	C	None		0.00	100.0000	No Ice 1/2" Ice 1" Ice	18.0000 37.0000 38.0000	18.0000 37.0000 38.0000	0.40 0.63 0.86
Canister Load4	C	None		0.00	90.0000	No Ice 1/2" Ice 1" Ice	16.2000 33.3000 34.2000	16.2000 33.3000 34.2000	0.39 0.59 0.79
Canister Load5	C	None		0.00	82.0000	No Ice 1/2" Ice	7.2000 14.8000 15.2000	7.2000 14.8000 15.2000	0.29 0.38 0.47

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Truck Ball	C	None		0.00	120.7500	1" Ice	0.8836	0.8836	0.05
						No Ice	1.3783	1.3783	0.07
						1/2" Ice	1.5272	1.5272	0.09
						1" Ice			

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.0000-110.0000	115.0000	1.303	29.826	8.958	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 110.0000-100.0000	105.0000	1.279	29.260	8.958	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L3 100.0000-90.0000	95.0000	1.252	28.650	8.958	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L4 90.0000-82.0000	86.0000	1.226	28.056	7.167	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L5 82.0000-60.0000	71.0000	1.178	26.946	44.000	A	0.000	44.000	44.000	100.00	0.000	0.000
					B	0.000	44.000		100.00	0.000	0.000
					C	0.000	44.000		100.00	0.000	0.000
L6 60.0000-30.0000	45.0000	1.07	24.479	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	0.000
L7 30.0000-8.5000	19.2500	0.895	20.472	43.000	A	0.000	43.000	43.000	100.00	0.000	0.000
					B	0.000	43.000		100.00	0.000	0.000
					C	0.000	43.000		100.00	0.000	0.000
L8 8.5000-0.0000	4.2500	0.85	19.450	17.000	A	0.000	17.000	17.000	100.00	0.000	0.000
					B	0.000	17.000		100.00	0.000	0.000
					C	0.000	17.000		100.00	0.000	0.000

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
L1 120.0000-110.0000	115.0000	1.303	7.925	1.6995	11.791	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000		0.00	0.000	0.000
						C	0.000	0.000		0.00	0.000	0.000
L2 110.0000-100.0000	105.0000	1.279	7.774	1.6841	11.765	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000		0.00	0.000	0.000
						C	0.000	0.000		0.00	0.000	0.000
L3 100.0000-90.0000	95.0000	1.252	7.612	1.6673	11.737	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000		0.00	0.000	0.000
						C	0.000	0.000		0.00	0.000	0.000
L4 90.0000-82.0000	86.0000	1.226	7.454	1.6508	9.368	A	0.000	0.000	0.000	0.00	0.000	0.000
						B	0.000	0.000		0.00	0.000	0.000
						C	0.000	0.000		0.00	0.000	0.000
L5 82.0000-60.0000	71.0000	1.178	7.160	1.6194	49.938	A	0.000	49.938	49.938	100.00	0.000	0.000
						B	0.000	49.938		100.00	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	0.000	49.938		100.00	0.000	0.000
L6 60.0000-30.0000	45.0000	1.07	6.504	1.5473	67.736	A	0.000	67.736	67.736	100.00	0.000	0.000
						B	0.000	67.736		100.00	0.000	0.000
						C	0.000	67.736		100.00	0.000	0.000
L7 30.0000-8.5000	19.2500	0.895	5.440	1.4213	48.093	A	0.000	48.093	48.093	100.00	0.000	0.000
						B	0.000	48.093		100.00	0.000	0.000
						C	0.000	48.093		100.00	0.000	0.000
L8 8.5000-0.0000	4.2500	0.85	5.168	1.2220	18.731	A	0.000	18.731	18.731	100.00	0.000	0.000
						B	0.000	18.731		100.00	0.000	0.000
						C	0.000	18.731		100.00	0.000	0.000

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 120.0000-110.0000	115.0000	1.303	10.210	8.958	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L2 110.0000-100.0000	105.0000	1.279	10.017	8.958	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L3 100.0000-90.0000	95.0000	1.252	9.808	8.958	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L4 90.0000-82.0000	86.0000	1.226	9.604	7.167	A	0.000	0.000	0.000	0.00	0.000	0.000
					B	0.000	0.000		0.00	0.000	0.000
					C	0.000	0.000		0.00	0.000	0.000
L5 82.0000-60.0000	71.0000	1.178	9.225	44.000	A	0.000	44.000	44.000	100.00	0.000	0.000
					B	0.000	44.000		100.00	0.000	0.000
					C	0.000	44.000		100.00	0.000	0.000
L6 60.0000-30.0000	45.0000	1.07	8.380	60.000	A	0.000	60.000	60.000	100.00	0.000	0.000
					B	0.000	60.000		100.00	0.000	0.000
					C	0.000	60.000		100.00	0.000	0.000
L7 30.0000-8.5000	19.2500	0.895	7.008	43.000	A	0.000	43.000	43.000	100.00	0.000	0.000
					B	0.000	43.000		100.00	0.000	0.000
					C	0.000	43.000		100.00	0.000	0.000
L8 8.5000-0.0000	4.2500	0.85	6.659	17.000	A	0.000	17.000	17.000	100.00	0.000	0.000
					B	0.000	17.000		100.00	0.000	0.000
					C	0.000	17.000		100.00	0.000	0.000

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 60 deg - No Ice
7	0.9 Dead+1.6 Wind 60 deg - No Ice
8	1.2 Dead+1.6 Wind 90 deg - No Ice
9	0.9 Dead+1.6 Wind 90 deg - No Ice
10	1.2 Dead+1.6 Wind 120 deg - No Ice
11	0.9 Dead+1.6 Wind 120 deg - No Ice
12	1.2 Dead+1.6 Wind 150 deg - No Ice
13	0.9 Dead+1.6 Wind 150 deg - No Ice
14	1.2 Dead+1.6 Wind 180 deg - No Ice
15	0.9 Dead+1.6 Wind 180 deg - No Ice
16	1.2 Dead+1.6 Wind 210 deg - No Ice

Comb. No.	Description
17	0.9 Dead+1.6 Wind 210 deg - No Ice
18	1.2 Dead+1.6 Wind 240 deg - No Ice
19	0.9 Dead+1.6 Wind 240 deg - No Ice
20	1.2 Dead+1.6 Wind 270 deg - No Ice
21	0.9 Dead+1.6 Wind 270 deg - No Ice
22	1.2 Dead+1.6 Wind 300 deg - No Ice
23	0.9 Dead+1.6 Wind 300 deg - No Ice
24	1.2 Dead+1.6 Wind 330 deg - No Ice
25	0.9 Dead+1.6 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	120 - 110	Pole	Max Tension	20	0.00	-0.00	0.00
			Max. Compression	26	-2.08	0.00	-0.00
			Max. Mx	20	-0.63	13.49	-0.00
			Max. My	14	-0.63	0.00	-13.49
			Max. Vy	20	-1.38	13.49	-0.00
			Max. Vx	14	1.38	0.00	-13.49
			Max. Torque	32			0.00
L2	110 - 100	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-4.94	0.00	-0.00
			Max. Mx	20	-1.73	37.55	-0.00
			Max. My	14	-1.73	0.00	-37.55
			Max. Vy	20	-2.44	37.55	-0.00
			Max. Vx	14	2.44	0.00	-37.55
			Max. Torque	32			0.00
L3	100 - 90	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-8.06	0.12	-0.07
			Max. Mx	20	-3.05	71.91	-0.01
			Max. My	14	-3.05	0.01	-71.90
			Max. Vy	20	-3.46	65.00	-0.01
			Max. Vx	14	3.46	0.01	-64.99
			Max. Torque	38			0.00
L4	90 - 82	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-9.92	0.12	-0.07
			Max. Mx	20	-4.04	106.18	-0.01
			Max. My	14	-4.04	0.01	-106.17
			Max. Vy	20	-4.30	76.20	-0.01
			Max. Vx	14	4.30	0.01	-76.20
			Max. Torque	38			0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L5	82 - 60	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-14.56	0.12	-0.07
			Max. Mx	20	-7.20	223.58	-0.01
			Max. My	14	-7.20	0.01	-223.57
			Max. Vy	20	-6.03	223.58	-0.01
			Max. Vx	14	6.03	0.01	-223.57
			Max. Torque	38			0.00
L6	60 - 30	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-19.93	0.12	-0.07
			Max. Mx	20	-11.20	427.97	-0.01
			Max. My	14	-11.20	0.01	-427.97
			Max. Vy	20	-7.55	427.97	-0.01
			Max. Vx	14	7.55	0.01	-427.97
			Max. Torque	38			0.00
L7	30 - 8.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-23.69	0.12	-0.07
			Max. Mx	20	-14.21	597.60	-0.01
			Max. My	14	-14.21	0.01	-597.59
			Max. Vy	20	-8.20	597.60	-0.01
			Max. Vx	14	8.20	0.01	-597.59
			Max. Torque	38			0.00
L8	8.5 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-25.44	0.12	-0.07
			Max. Mx	20	-15.72	668.06	-0.01
			Max. My	14	-15.72	0.01	-668.06
			Max. Vy	20	-8.40	668.06	-0.01
			Max. Vx	14	8.40	0.01	-668.06
			Max. Torque	38			0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	25.44	0.00	-0.00
	Max. H_x	21	11.79	8.39	0.00
	Max. H_z	3	11.79	-0.00	8.39
	Max. M_x	2	668.05	-0.00	8.39
	Max. M_z	8	668.04	-8.39	0.00
	Max. Torsion	38	0.00	1.44	2.50
	Min. Vert	21	11.79	8.39	0.00
	Min. H_x	9	11.79	-8.39	0.00
	Min. H_z	15	11.79	-0.00	-8.39
	Min. M_x	14	-668.06	-0.00	-8.39
	Min. M_z	20	-668.06	8.39	0.00
	Min. Torsion	32	-0.00	-1.44	-2.50

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	13.11	0.00	0.00	0.00	0.01	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	15.73	0.00	-8.39	-668.05	0.01	-0.00
0.9 Dead+1.6 Wind 0 deg - No Ice	11.79	0.00	-8.39	-657.63	0.01	-0.00
1.2 Dead+1.6 Wind 30 deg - No Ice	15.73	4.19	-7.27	-578.82	-334.17	-0.00
0.9 Dead+1.6 Wind 30 deg - No Ice	11.79	4.19	-7.27	-569.77	-328.95	-0.00
1.2 Dead+1.6 Wind 60 deg - No Ice	15.73	7.27	-4.19	-334.18	-578.81	-0.00
0.9 Dead+1.6 Wind 60 deg -	11.79	7.27	-4.19	-328.95	-569.76	-0.00

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
No Ice						
1.2 Dead+1.6 Wind 90 deg - No Ice	15.73	8.39	-0.00	0.01	-668.04	0.00
0.9 Dead+1.6 Wind 90 deg - No Ice	11.79	8.39	-0.00	0.00	-657.63	0.00
1.2 Dead+1.6 Wind 120 deg - No Ice	15.73	7.27	4.19	334.19	-578.81	0.00
0.9 Dead+1.6 Wind 120 deg - No Ice	11.79	7.27	4.19	328.96	-569.76	0.00
1.2 Dead+1.6 Wind 150 deg - No Ice	15.73	4.19	7.27	578.83	-334.17	0.00
0.9 Dead+1.6 Wind 150 deg - No Ice	11.79	4.19	7.27	569.78	-328.95	0.00
1.2 Dead+1.6 Wind 180 deg - No Ice	15.73	0.00	8.39	668.06	0.01	0.00
0.9 Dead+1.6 Wind 180 deg - No Ice	11.79	0.00	8.39	657.64	0.01	0.00
1.2 Dead+1.6 Wind 210 deg - No Ice	15.73	-4.19	7.27	578.83	334.19	0.00
0.9 Dead+1.6 Wind 210 deg - No Ice	11.79	-4.19	7.27	569.78	328.97	0.00
1.2 Dead+1.6 Wind 240 deg - No Ice	15.73	-7.27	4.19	334.19	578.83	-0.00
0.9 Dead+1.6 Wind 240 deg - No Ice	11.79	-7.27	4.19	328.96	569.78	-0.00
1.2 Dead+1.6 Wind 270 deg - No Ice	15.73	-8.39	-0.00	0.01	668.06	-0.00
0.9 Dead+1.6 Wind 270 deg - No Ice	11.79	-8.39	-0.00	0.00	657.65	-0.00
1.2 Dead+1.6 Wind 300 deg - No Ice	15.73	-7.27	-4.19	-334.18	578.83	-0.00
0.9 Dead+1.6 Wind 300 deg - No Ice	11.79	-7.27	-4.19	-328.95	569.78	-0.00
1.2 Dead+1.6 Wind 330 deg - No Ice	15.73	-4.19	-7.27	-578.82	334.19	-0.00
0.9 Dead+1.6 Wind 330 deg - No Ice	11.79	-4.19	-7.27	-569.77	328.97	-0.00
1.2 Dead+1.0 Ice+1.0 Temp	25.44	-0.00	0.00	0.07	0.12	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	25.44	0.00	-2.89	-233.61	0.15	-0.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	25.44	1.44	-2.50	-202.27	-116.68	-0.00
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	25.44	2.50	-1.44	-116.75	-202.21	-0.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	25.44	2.89	-0.00	0.09	-233.55	0.00
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	25.44	2.50	1.44	116.92	-202.21	0.00
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	25.44	1.44	2.50	202.48	-116.70	0.00
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	25.44	0.00	2.89	233.79	0.15	0.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	25.44	-1.44	2.50	202.48	117.00	0.00
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	25.44	-2.50	1.44	116.94	202.54	-0.00
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	25.44	-2.89	-0.00	0.09	233.85	-0.00
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	25.44	-2.50	-1.44	-116.76	202.54	-0.00
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	25.44	-1.44	-2.50	-202.30	117.00	-0.00
Dead+Wind 0 deg - Service	13.11	0.00	-1.74	-134.79	0.01	-0.00
Dead+Wind 30 deg - Service	13.11	0.87	-1.51	-116.73	-67.39	-0.00
Dead+Wind 60 deg - Service	13.11	1.51	-0.87	-67.39	-116.73	-0.00
Dead+Wind 90 deg - Service	13.11	1.74	-0.00	0.01	-134.78	0.00
Dead+Wind 120 deg - Service	13.11	1.51	0.87	67.40	-116.73	0.00
Dead+Wind 150 deg -	13.11	0.87	1.51	116.74	-67.39	0.00

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 180 deg - Service	13.11	0.00	1.74	134.80	0.01	0.00
Dead+Wind 210 deg - Service	13.11	-0.87	1.51	116.74	67.41	0.00
Dead+Wind 240 deg - Service	13.11	-1.51	0.87	67.40	116.74	-0.00
Dead+Wind 270 deg - Service	13.11	-1.74	-0.00	0.01	134.80	-0.00
Dead+Wind 300 deg - Service	13.11	-1.51	-0.87	-67.39	116.74	-0.00
Dead+Wind 330 deg - Service	13.11	-0.87	-1.51	-116.73	67.41	-0.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-13.11	0.00	0.00	13.11	0.00	0.000%
2	0.00	-15.73	-8.39	-0.00	15.73	8.39	0.019%
3	0.00	-11.79	-8.39	-0.00	11.79	8.39	0.021%
4	4.19	-15.73	-7.27	-4.19	15.73	7.27	0.001%
5	4.19	-11.79	-7.27	-4.19	11.79	7.27	0.001%
6	7.27	-15.73	-4.19	-7.27	15.73	4.19	0.001%
7	7.27	-11.79	-4.19	-7.27	11.79	4.19	0.001%
8	8.39	-15.73	0.00	-8.39	15.73	0.00	0.019%
9	8.39	-11.79	0.00	-8.39	11.79	0.00	0.021%
10	7.27	-15.73	4.19	-7.27	15.73	-4.19	0.001%
11	7.27	-11.79	4.19	-7.27	11.79	-4.19	0.001%
12	4.19	-15.73	7.27	-4.19	15.73	-7.27	0.001%
13	4.19	-11.79	7.27	-4.19	11.79	-7.27	0.001%
14	0.00	-15.73	8.39	-0.00	15.73	-8.39	0.019%
15	0.00	-11.79	8.39	-0.00	11.79	-8.39	0.021%
16	-4.19	-15.73	7.27	4.19	15.73	-7.27	0.001%
17	-4.19	-11.79	7.27	4.19	11.79	-7.27	0.001%
18	-7.27	-15.73	4.19	7.27	15.73	-4.19	0.001%
19	-7.27	-11.79	4.19	7.27	11.79	-4.19	0.001%
20	-8.39	-15.73	0.00	8.39	15.73	0.00	0.019%
21	-8.39	-11.79	0.00	8.39	11.79	0.00	0.021%
22	-7.27	-15.73	-4.19	7.27	15.73	4.19	0.001%
23	-7.27	-11.79	-4.19	7.27	11.79	4.19	0.001%
24	-4.19	-15.73	-7.27	4.19	15.73	7.27	0.001%
25	-4.19	-11.79	-7.27	4.19	11.79	7.27	0.001%
26	0.00	-25.44	0.00	0.00	25.44	-0.00	0.000%
27	0.00	-25.44	-2.89	-0.00	25.44	2.89	0.004%
28	1.44	-25.44	-2.50	-1.44	25.44	2.50	0.005%
29	2.50	-25.44	-1.44	-2.50	25.44	1.44	0.005%
30	2.89	-25.44	0.00	-2.89	25.44	0.00	0.004%
31	2.50	-25.44	1.44	-2.50	25.44	-1.44	0.005%
32	1.44	-25.44	2.50	-1.44	25.44	-2.50	0.004%
33	0.00	-25.44	2.89	-0.00	25.44	-2.89	0.004%
34	-1.44	-25.44	2.50	1.44	25.44	-2.50	0.004%
35	-2.50	-25.44	1.44	2.50	25.44	-1.44	0.004%
36	-2.89	-25.44	0.00	2.89	25.44	0.00	0.004%
37	-2.50	-25.44	-1.44	2.50	25.44	1.44	0.004%
38	-1.44	-25.44	-2.50	1.44	25.44	2.50	0.004%
39	0.00	-13.11	-1.74	-0.00	13.11	1.74	0.006%
40	0.87	-13.11	-1.51	-0.87	13.11	1.51	0.006%
41	1.51	-13.11	-0.87	-1.51	13.11	0.87	0.006%
42	1.74	-13.11	0.00	-1.74	13.11	0.00	0.006%
43	1.51	-13.11	0.87	-1.51	13.11	-0.87	0.006%
44	0.87	-13.11	1.51	-0.87	13.11	-1.51	0.006%
45	0.00	-13.11	1.74	-0.00	13.11	-1.74	0.006%
46	-0.87	-13.11	1.51	0.87	13.11	-1.51	0.006%
47	-1.51	-13.11	0.87	1.51	13.11	-0.87	0.006%
48	-1.74	-13.11	0.00	1.74	13.11	0.00	0.006%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
49	-1.51	-13.11	-0.87	1.51	13.11	0.87	0.006%
50	-0.87	-13.11	-1.51	0.87	13.11	1.51	0.006%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	26	0.00013365	0.00008909
3	Yes	25	0.00012273	0.00009930
4	Yes	35	0.00000001	0.00011497
5	Yes	34	0.00000001	0.00011712
6	Yes	35	0.00000001	0.00011498
7	Yes	34	0.00000001	0.00011712
8	Yes	26	0.00013365	0.00008909
9	Yes	25	0.00012273	0.00009930
10	Yes	35	0.00000001	0.00011500
11	Yes	34	0.00000001	0.00011714
12	Yes	35	0.00000001	0.00011498
13	Yes	34	0.00000001	0.00011712
14	Yes	26	0.00013365	0.00008910
15	Yes	25	0.00012273	0.00009930
16	Yes	35	0.00000001	0.00011501
17	Yes	34	0.00000001	0.00011715
18	Yes	35	0.00000001	0.00011501
19	Yes	34	0.00000001	0.00011714
20	Yes	26	0.00013365	0.00008910
21	Yes	25	0.00012273	0.00009930
22	Yes	35	0.00000001	0.00011499
23	Yes	34	0.00000001	0.00011713
24	Yes	35	0.00000001	0.00011501
25	Yes	34	0.00000001	0.00011714
26	Yes	6	0.00000001	0.00000001
27	Yes	31	0.00011549	0.00003375
28	Yes	30	0.00014999	0.00008261
29	Yes	30	0.00014999	0.00008265
30	Yes	31	0.00011548	0.00003373
31	Yes	30	0.00015000	0.00008290
32	Yes	31	0.00011529	0.00006394
33	Yes	31	0.00011550	0.00003380
34	Yes	31	0.00011530	0.00006429
35	Yes	31	0.00011530	0.00006426
36	Yes	31	0.00011551	0.00003382
37	Yes	31	0.00011529	0.00006406
38	Yes	31	0.00011529	0.00006418
39	Yes	25	0.00014723	0.00002768
40	Yes	25	0.00014712	0.00002370
41	Yes	25	0.00014712	0.00002370
42	Yes	25	0.00014723	0.00002768
43	Yes	25	0.00014712	0.00002371
44	Yes	25	0.00014712	0.00002370
45	Yes	25	0.00014724	0.00002769
46	Yes	25	0.00014712	0.00002371
47	Yes	25	0.00014712	0.00002371
48	Yes	25	0.00014724	0.00002769
49	Yes	25	0.00014712	0.00002371
50	Yes	25	0.00014712	0.00002371

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 110	18.48	48	1.37	0.00
L2	110 - 100	15.62	48	1.35	0.00
L3	100 - 90	12.87	48	1.27	0.00
L4	90 - 82	10.40	48	1.08	0.00
L5	82 - 60	8.79	48	0.83	0.00
L6	60 - 30	5.19	47	0.72	0.00
L7	30 - 8.5	1.42	47	0.44	0.00
L8	8.5 - 0	0.11	47	0.12	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.7500	Truck Ball	48	18.48	1.37	0.00	24457
120.0000	Canister Load1	48	18.48	1.37	0.00	24457
115.0000	APXV18-206517S-C-ACU	48	17.05	1.37	0.00	24457
110.0000	Canister Load2	48	15.62	1.35	0.00	11881
105.0000	DBXNH-6565B-A2M	48	14.23	1.32	0.00	7298
100.0000	Canister Load3	48	12.87	1.27	0.00	4711
95.0000	DHHTT65B-3XR	48	11.58	1.19	0.00	2720
90.0000	Canister Load4	48	10.40	1.08	0.00	2087
82.0000	Canister Load5	48	8.79	0.83	0.00	4158

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	120 - 110	93.38	20	7.07	0.00
L2	110 - 100	78.71	20	6.94	0.00
L3	100 - 90	64.62	20	6.47	0.00
L4	90 - 82	52.04	20	5.47	0.00
L5	82 - 60	43.93	20	4.15	0.00
L6	60 - 30	25.88	18	3.63	0.00
L7	30 - 8.5	7.08	18	2.21	0.00
L8	8.5 - 0	0.54	18	0.60	0.00

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.7500	Truck Ball	20	93.38	7.07	0.00	4395
120.0000	Canister Load1	20	93.38	7.07	0.00	4395
115.0000	APXV18-206517S-C-ACU	20	86.01	7.03	0.00	4395
110.0000	Canister Load2	20	78.71	6.94	0.00	2150
105.0000	DBXNH-6565B-A2M	20	71.55	6.76	0.00	1347
100.0000	Canister Load3	20	64.62	6.47	0.00	885
95.0000	DHHTT65B-3XR	20	58.04	6.08	0.00	521
90.0000	Canister Load4	20	52.04	5.47	0.00	402
82.0000	Canister Load5	20	43.93	4.15	0.00	805

Compression Checks

Pole Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
L1	120 - 110 (1)	P10.75x0.349	10.0000	0.0000	0.0	11.4038	-0.63	431.06	0.001
L2	110 - 100 (2)	P10.75x0.349	10.0000	0.0000	0.0	11.4038	-1.73	431.06	0.004
L3	100 - 90 (3)	P10.75x0.349	10.0000	0.0000	0.0	11.4038	-3.05	431.06	0.007
L4	90 - 82 (4)	P10.75x0.349	8.0000	0.0000	0.0	11.4038	-4.04	431.06	0.009
L5	82 - 60 (5)	P24x0.375	22.0000	0.0000	0.0	27.8325	-7.20	1052.07	0.007
L6	60 - 30 (6)	P24x0.375	30.0000	0.0000	0.0	27.8325	-11.20	1052.07	0.011
L7	30 - 8.5 (7)	P24x0.375	21.5000	0.0000	0.0	27.8325	-14.21	1052.07	0.014
L8	8.5 - 0 (8)	P24x0.5	8.5000	0.0000	0.0	36.9137	-15.72	1313.94	0.012

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
L1	120 - 110 (1)	P10.75x0.349	13.49	118.97	0.113	0.00	118.97	0.000
L2	110 - 100 (2)	P10.75x0.349	37.57	118.97	0.316	0.00	118.97	0.000
L3	100 - 90 (3)	P10.75x0.349	71.94	118.97	0.605	0.00	118.97	0.000
L4	90 - 82 (4)	P10.75x0.349	106.23	118.97	0.893	0.00	118.97	0.000
L5	82 - 60 (5)	P24x0.375	223.70	623.72	0.359	0.00	623.72	0.000
L6	60 - 30 (6)	P24x0.375	428.19	623.72	0.687	0.00	623.72	0.000
L7	30 - 8.5 (7)	P24x0.375	597.88	623.72	0.959	0.00	623.72	0.000
L8	8.5 - 0 (8)	P24x0.5	668.38	819.18	0.816	0.00	819.18	0.000

Pole Shear Design Data

Section No.	Elevation ft	Size	Actual V_u K	ϕV_n K	Ratio $\frac{V_u}{\phi V_n}$	Actual T_u kip-ft	ϕT_n kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	120 - 110 (1)	P10.75x0.349	1.38	215.53	0.006	0.00	180.95	0.000
L2	110 - 100 (2)	P10.75x0.349	2.45	215.53	0.011	0.00	180.95	0.000
L3	100 - 90 (3)	P10.75x0.349	3.46	215.53	0.016	0.00	180.95	0.000
L4	90 - 82 (4)	P10.75x0.349	4.27	215.53	0.020	0.00	180.95	0.000
L5	82 - 60 (5)	P24x0.375	6.03	526.03	0.011	0.00	1019.71	0.000
L6	60 - 30 (6)	P24x0.375	7.56	526.03	0.014	0.00	1019.71	0.000
L7	30 - 8.5 (7)	P24x0.375	8.20	526.03	0.016	0.00	1019.71	0.000
L8	8.5 - 0 (8)	P24x0.5	8.40	656.97	0.013	0.00	1260.33	0.000

Pole Interaction Design Data

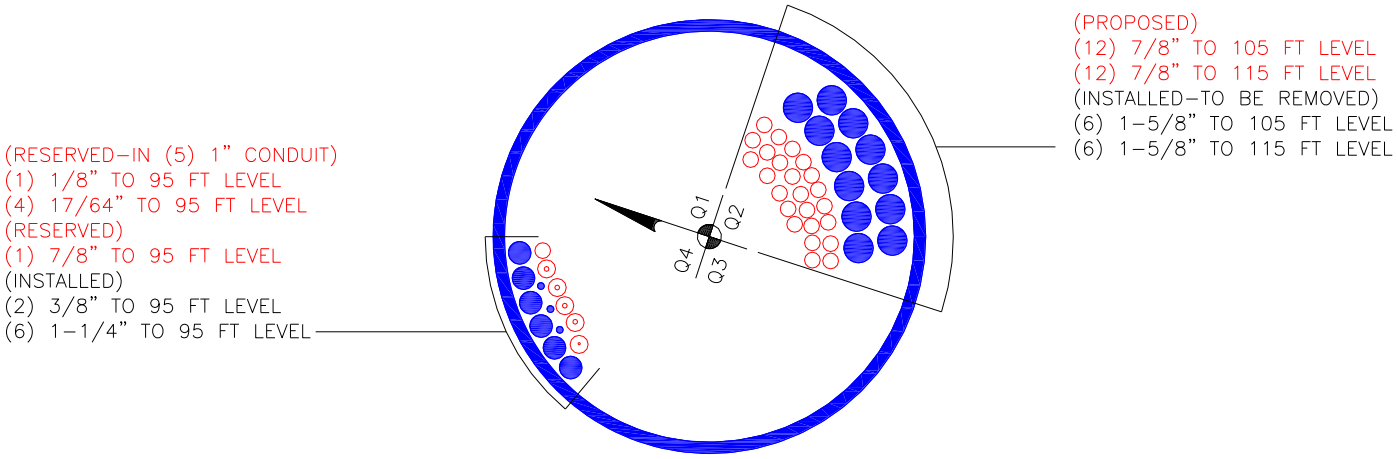
Section No.	Elevation ft	Ratio P_u / ϕP_n	Ratio M_{ux} / ϕM_{nx}	Ratio M_{uy} / ϕM_{ny}	Ratio V_u / ϕV_n	Ratio T_u / ϕT_n	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	120 - 110 (1)	0.001	0.113	0.000	0.006	0.000	0.115 ✔	1.000	4.8.2 ✔
L2	110 - 100 (2)	0.004	0.316	0.000	0.011	0.000	0.320 ✔	1.000	4.8.2 ✔
L3	100 - 90 (3)	0.007	0.605	0.000	0.016	0.000	0.612 ✔	1.000	4.8.2 ✔
L4	90 - 82 (4)	0.009	0.893	0.000	0.020	0.000	0.903 ✔	1.000	4.8.2 ✔
L5	82 - 60 (5)	0.007	0.359	0.000	0.011	0.000	0.366 ✔	1.000	4.8.2 ✔
L6	60 - 30 (6)	0.011	0.687	0.000	0.014	0.000	0.697 ✔	1.000	4.8.2 ✔
L7	30 - 8.5 (7)	0.014	0.959	0.000	0.016	0.000	0.972 ✔	1.000	4.8.2 ✔
L8	8.5 - 0 (8)	0.012	0.816	0.000	0.013	0.000	0.828 ✔	1.000	4.8.2 ✔

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
L1	120 - 110	Pole	P10.75x0.349	1	-0.63	431.06	11.5	Pass
L2	110 - 100	Pole	P10.75x0.349	2	-1.73	431.06	32.0	Pass
L3	100 - 90	Pole	P10.75x0.349	3	-3.05	431.06	61.2	Pass
L4	90 - 82	Pole	P10.75x0.349	4	-4.04	431.06	90.3	Pass
L5	82 - 60	Pole	P24x0.375	5	-7.20	1052.07	36.6	Pass
L6	60 - 30	Pole	P24x0.375	6	-11.20	1052.07	69.7	Pass
L7	30 - 8.5	Pole	P24x0.375	7	-14.21	1052.07	97.2	Pass
L8	8.5 - 0	Pole	P24x0.5	8	-15.72	1313.94	82.8	Pass
							Summary	
						Pole (L7)	97.2	Pass
						RATING =	**97.2**	**Pass**

APPENDIX B

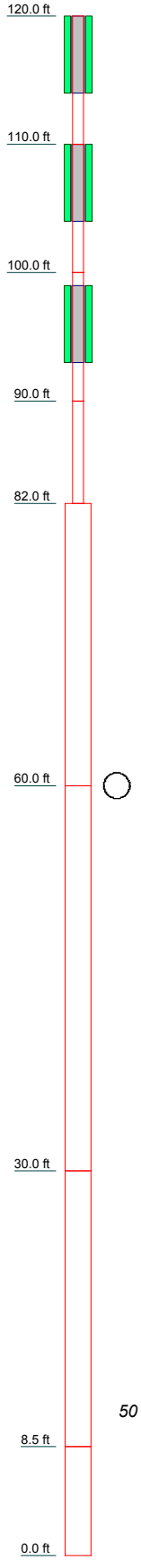
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Size	Length (ft)	Grade	Weight (K)
1	P10.75x0.349	10.0000	A500-42	0.4
2	P10.75x0.349	10.0000		0.4
3	P10.75x0.349	10.0000		0.4
4	P10.75x0.349	8.0000		0.3
5	P24x0.375	22.0000		2.1
6	P24x0.375	30.0000	A53-B-42	2.8
7	P24x0.375	21.5000		2.0
8	P24x0.5	8.5000	Reinf 39.55 ksi	1.1
				9.5



ALL REACTIONS ARE FACTORED

AXIAL 25 K

SHEAR 3 K — *MOMENT 234 kip-ft*

TORQUE 0 kip-ft

50 mph WIND - 0.7500 in ICE

AXIAL 16 K

SHEAR 8 K — *MOMENT 668 kip-ft*

TORQUE 0 kip-ft

REACTIONS - 97 mph WIND

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Truck Ball	120.75	DBXNH-6565B-A2M	105
Canister Load1	120	Canister Load3	100
Flag	120	FWHR	95
APXV18-206517S-C-ACU	115	BEN-92P	95
APXV18-206517S-C-ACU	115	DHHTT65B-3XR	95
APXV18-206517S-C-ACU	115	DHHTT65B-3XR	95
Canister Load2	110	FWHR	95
ATSBT-TOP-FM-4G	105	DHHTT65B-3XR	95
ATSBT-TOP-FM-4G	105	FWHR	95
DBXNH-6565B-A2M	105	Canister Load4	90
ATSBT-TOP-FM-4G	105	Canister Load5	82
DBXNH-6565B-A2M	105		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A500-42	42 ksi	58 ksi	Reinf 39.55 ksi	40 ksi	50 ksi
A53-B-42	42 ksi	63 ksi			

TOWER DESIGN NOTES

1. Tower is located in Fairfield County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class II.
7. Topographic Category 1 with Crest Height of 0.0000 ft
8. TOWER RATING: 97.2%

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

Job: 120' Monopole / Bridgeport, CT			
Project: 37516-3608.002.7805 / BU 822779			
Client: Crown Castle	Drawn by: Seth Tschanen	App'd:	
Code: TIA-222-G	Date: 12/08/16	Scale: NTS	
Path:		Dwg No. E-1	

PAUL J. FORD & COMPANY
250 E Broad St, Ste 600 • Columbus, OH 43215
Phone 614.221.6679 www.pauljford.com

v4.4 - Effective 7-12-13

Date: 12/8/2016
PJF Project: 37516-3608.001.7805
Client Ref. # BU 822779
Site Name: Bridgeport
Description: 120' Monopole
Owner: Crown Castle
Engineer: SJT

Asymmetric Anchor Rod Analysis

Moment =	668	k-ft	TIA Ref.	G	Location =	Base Plate	
Axial =	16.0	kips	ASIF =	N/A	η =	0.50	for BP, Rev. G Sect. 4.9.9
Shear =	8.0	kips	Max Ratio =	100.0%	Threads =	N/A	for FP, Rev. G
Anchor Qty =	24						

**** 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	1.000	A687	105	125	0.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
2	1.000	A687	105	125	18.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
3	1.000	A687	105	125	36.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
4	1.000	A687	105	125	54.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
5	1.000	A687	105	125	72.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
6	1.000	A687	105	125	90.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
7	1.000	A687	105	125	108.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
8	1.000	A687	105	125	126.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
9	1.000	A687	105	125	144.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
10	1.000	A687	105	125	162.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
11	1.000	A687	105	125	180.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
12	1.000	A687	105	125	198.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
13	1.000	A687	105	125	216.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
14	1.000	A687	105	125	234.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
15	1.000	A687	105	125	252.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
16	1.000	A687	105	125	270.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
17	1.000	A687	105	125	288.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
18	1.000	A687	105	125	306.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
19	1.000	A687	105	125	324.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
20	1.000	A687	105	125	342.0	27.00	0.00	0.79	10.02	8.89	10.58	0.00	60.60	17.5%
21		Other	0	0	0.0	96.00	1.64	1.64	71.38	69.02	71.38	118.72	118.72	60.1%
22		Other	0	0	90.0	96.00	1.64	1.64	71.38	69.02	71.38	118.72	118.72	60.1%
23		Other	0	0	180.0	96.00	1.64	1.64	71.38	69.02	71.38	118.72	118.72	60.1%
24		Other	0	0	270.0	96.00	1.64	1.64	71.38	69.02	71.38	118.72	118.72	60.1%
								22.27						

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

TIA Rev G Assumption: Clear space between bottom of leveling nut and top of concrete **not** exceeding (1)*(Rod Diameter)

Site Data

BU#:	*822779*
Site Name:	*Bridgeport / Rt 8*
App #:	
Pole Manufacturer:	*Other*

Reactions		
Mu:	106.4	ft-kips
Axial, Pu:	11.3	kips
Shear, Vu:	5.6	kips
Eta Factor, η	0.5	TIA G (Fig. 4-4)

If No stiffeners, Criteria: AISC LRFD <-Only Applcable to Unstiffened Cases

Anchor Rod Data		
Qty:	20	
Diam:	1	in
Rod Material:	Other	
Strength (Fu):	125	ksi
Yield (Fy):	105	ksi
Bolt Circle:	27	in

Anchor Rod Results

Max Rod (Cu+ Vu/ή):	10.6	Kips	Rigid
Allowable Axial, Φ*Fu*Anet:	60.6	Kips	AISC LRFD
Anchor Rod Stress Ratio:	17.5%	**Pass**	φ*Tn

Plate Data		
Diam:	30.375	in
Thick:	1.25	in
Grade:	36	ksi
Single-Rod B-eff:	3.77	in

Base Plate Results Flexural Check

Base Plate Stress:	6.4	ksi	Rigid
Allowable Plate Stress:	32.4	ksi	AISC LRFD
Base Plate Stress Ratio:	19.9%	**Pass**	φ*Fy
			Y.L. Length: 12.37

Stiffener Data (Welding at both sides)		
Config:	2	*
Weld Type:	Both	
Groove Depth:	0.25	in **
Groove Angle:	45	degrees
Fillet H. Weld:	0.3125	in
Fillet V. Weld:	0.3125	in
Width:	3	in
Height:	5	in
Thick:	0.625	in
Notch:	0.5	in
Grade:	36	ksi
Weld str.:	70	ksi

b/Le>2, Stiffeners are not fully effective

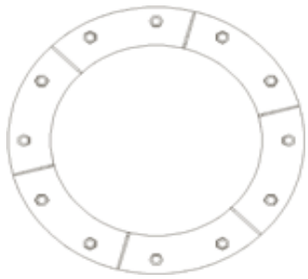
Stiffener Results

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:	24	in
Thick:	0.375	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	63	ksi
Reinf. Fillet Weld	0	"0" if None



* 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

Factored Foundation Loads:

	LC1	LC2	
Factored Axial Load (+Comp, -Ten) =	**11.3**	**8.475**	kips
Factored Horiz. Load at Top of Pier =	**5.6**	**5.6**	kips
Factored OTM at Top of Pier =	**106.4**	**106.4**	kips

LRFD Resistance and Load Factors:

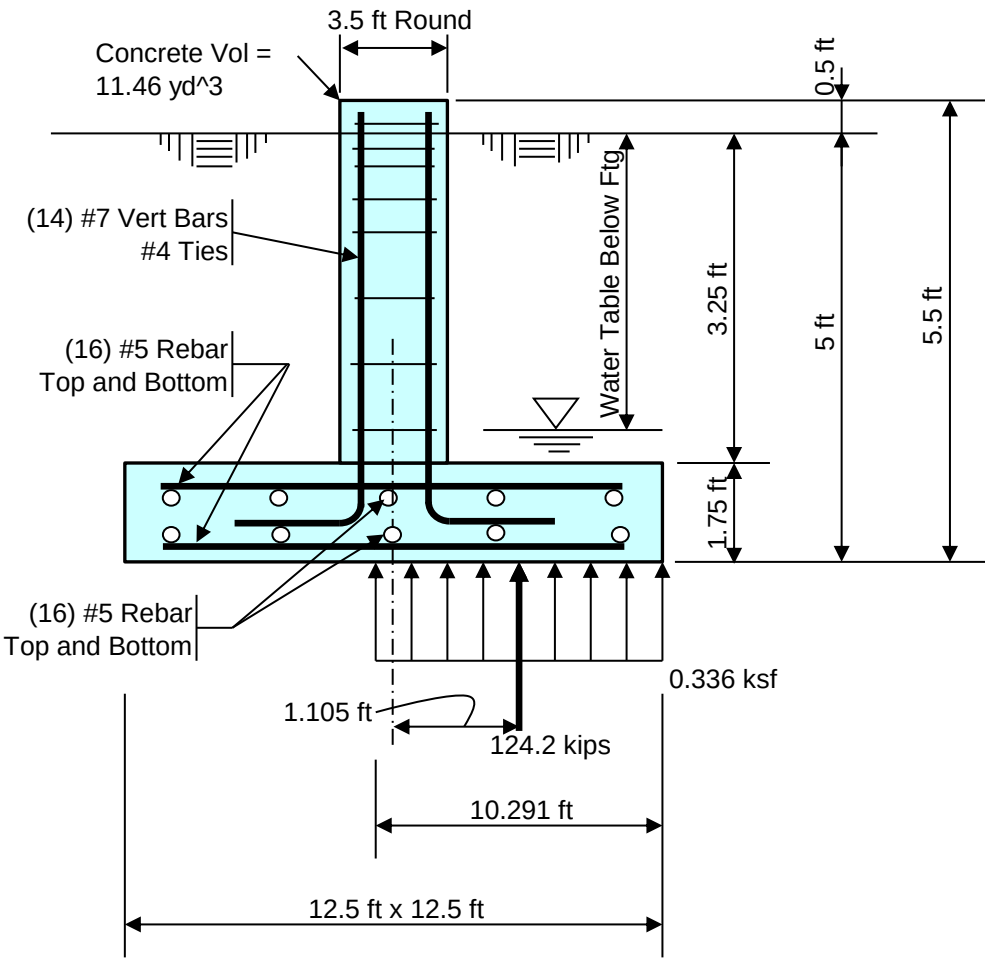
	Φ	Dead Load Factors	
Soil Bearing =	**0.75**		
Soil Weight =	**0.75**	1.2	0.9
Concrete Weight =	**0.75**	1.2	0.9

Soil Properties:

Depth to Water Table = **99** ft

Uplift Cone from **Top** of footing

Layer Thk ft	Soil Density pcf	Cohesion ksf	Friction Angle degrees	Ult Bearing ksf	Depth ft
2	**100**	**0**	**34**		**2.00**
2	**100**	**0**	**34**		**4.00**
2	**125**	**0**	**34**	**30**	**6.00**



Dimensions:

Pier Shape =	**Round**	
Pier Width =	**3.5**	ft Diameter
Pier Height above Grade =	**0.5**	ft
Depth to Bottom of Footing =	**5**	ft
Footing Thickness =	**1.75**	ft
Footing Width, B =	**12.5**	ft
Footing Length, L =	**12.5**	ft

Concrete:

Concrete Strength =	**3**	ksi
Rebar Strength =	**60**	ksi

Total Pad Reinf Stl =	**9.92**	in^2 >= 5.67 in^2 = Min Stl, OK
Total Pier Reinf Stl =	**8.40**	in^2 >= 6.93 in^2 = Min Stl, OK
Footing Thickness =	**1.75**	ft >= 1.37 ft = Min Ftg Thk, OK

Summary Results:

	Required		Available		
Maximum Net Soil Bearing =	**0.336**	ksf	**22.500**	ksf	Stress Ratio = **1.5%** in Soil Bearing
Uplift =	**0.0**	kips	**85.5**	kips	Stress Ratio = **0.0%** in Uplift
Punching Shear Stress =	**0.012**	ksi	**0.164**	ksi	Stress Ratio = **7.5%** in Punching Shear
Bending Shear Stress =	**15.7**	kips	**210.3**	kips	Stress Ratio = **7.5%** in Bending Shear
Bending Moment =	**51.915**	k-ft	**372.2**	k-ft	Stress Ratio = **13.9%** in Bending Moment
Conc Pier Reinforcing Steel =	**127.4**	k-ft	**641.5**	k-ft	Stress Ratio = **19.9%** in Pier Rebar

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Reactions		
Mu	13.49	ft-kips
Axial, Pu:	0.63	kips
Shear, Vu:	1.38	kips
Elevation:	110	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	14.75		

Plate Data		
Diam:	17.75	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.22	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	10.75	in
Thick:	0.349	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	5.41	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.218	in	
Min PL "treq" for actual **T w/ Pry**:	0.290	in	
Min PL "t1" for actual **T w/o Pry**:	0.384	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	5.41	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	9.9%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	1.5	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	4.5%	**Pass**	Comp. Y.L. Length:
No Prying			10.10
Tension Side Stress Ratio, (treq/t)^2:	2.1%	**Pass**	

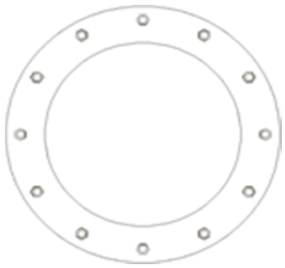
n/a

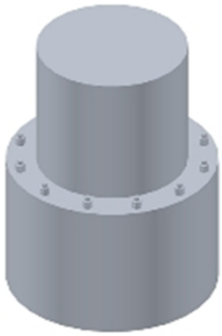
Stiffener Results

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





* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Reactions		
Mu	13.49	ft-kips
Axial, Pu:	0.63	kips
Shear, Vu:	1.38	kips
Elevation:	110	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	14.75		

Plate Data		
Diam:	17.75	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.22	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	10.75	in
Thick:	0.349	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	5.41	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.218	in	
Min PL "treq" for actual **T w/ Pry**:	0.290	in	
Min PL "t1" for actual **T w/o Pry**:	0.384	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	5.41	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	9.9%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	1.5	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	4.5%	**Pass**	Comp. Y.L. Length:
No Prying			10.10
Tension Side Stress Ratio, (treq/t)^2:	2.1%	**Pass**	

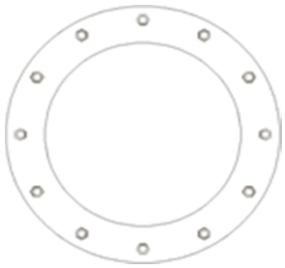
n/a

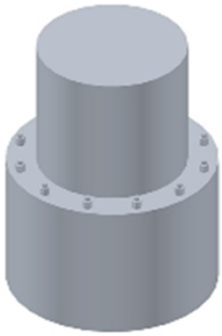
Stiffener Results

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





* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Reactions		
Mu	37.57	ft-kips
Axial, Pu:	1.73	kips
Shear, Vu:	2.45	kips
Elevation:	100	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	14.75		

Plate Data		
Diam:	17.75	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.22	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	10.75	in
Thick:	0.349	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	15.07	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.218	in	
Min PL "treq" for actual **T w/ Pry**:	0.484	in	
Min PL "t1" for actual **T w/o Pry**:	0.640	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	15.07	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	27.6%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	4.1	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	12.6%	**Pass**	Comp. Y.L. Length:
No Prying			10.10
Tension Side Stress Ratio, (treq/t)^2:	5.9%	**Pass**	

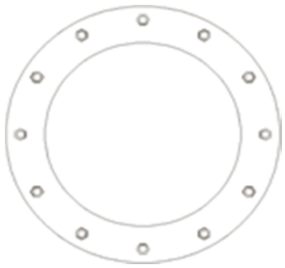
n/a

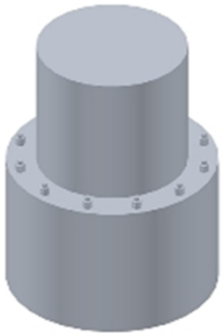
Stiffener Results

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





* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Reactions		
Mu	37.57	ft-kips
Axial, Pu:	1.73	kips
Shear, Vu:	2.45	kips
Elevation:	100	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	14.75		

Plate Data		
Diam:	17.75	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.22	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	10.75	in
Thick:	0.349	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn,**B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	15.07	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.218	in	
Min PL "treq" for actual **T w/ Pry**:	0.484	in	
Min PL "t1" for actual **T w/o Pry**:	0.640	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	15.07	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	27.6%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	4.1	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	12.6%	**Pass**	Comp. Y.L. Length:
No Prying			10.10
Tension Side Stress Ratio, (treq/t)^2:	5.9%	**Pass**	

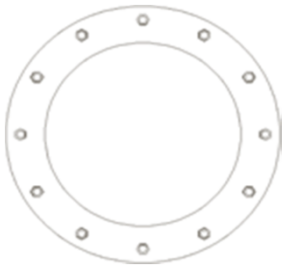
n/a

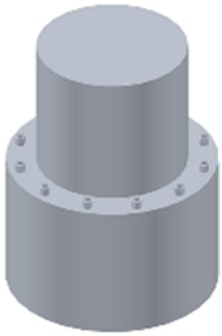
Stiffener Results

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





* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Reactions		
Mu	71.94	ft-kips
Axial, Pu:	3.05	kips
Shear, Vu:	3.46	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	14.75		

Plate Data		
Diam:	17.75	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.22	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	10.75	in
Thick:	0.349	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	28.88	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.218	in	
Min PL "treq" for actual **T w/ Pry**:	0.670	in	
Min PL "t1" for actual **T w/o Pry**:	0.886	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	28.88	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	53.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	7.8	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	24.1%	**Pass**	Comp. Y.L. Length:
No Prying			10.10
Tension Side Stress Ratio, (treq/t)^2:	11.2%	**Pass**	

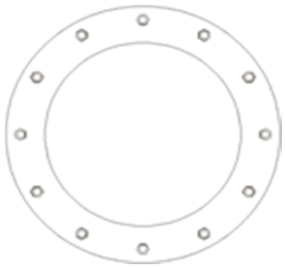
n/a

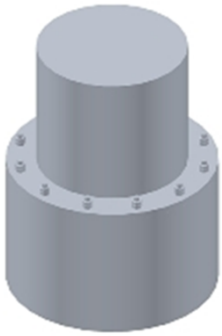
Stiffener Results

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





* 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

Stiffened or Unstiffened, Exterior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Reactions		
Mu	71.94	ft-kips
Axial, Pu:	3.05	kips
Shear, Vu:	3.46	kips
Elevation:	90	feet

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Pole Manufacturer:	Other

If No stiffeners, Criteria: TIA G <-Only Applcable to Unstiffened Cases

Bolt Data			
Qty:	8		
Diameter (in.):	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle (in.):	14.75		

Plate Data		
Diam:	17.75	in
Thick, t:	2	in
Grade (Fy):	36	ksi
Strength, Fu:	58	ksi
Single-Rod B-eff:	4.22	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Diam:	10.75	in
Thick:	0.349	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi
Reinf. Fillet Weld	0	"0" if None

Flange Bolt Results

			Rigid
Bolt Tension Capacity, φ*Tn, **B1**:	54.54	kips	φ*Tn
Adjusted φ*Tn (due to Vu=Vu/Qty), **B**:	54.54	kips	φTn[(1-(Vu/φVn)^2]^0.5
Max Bolt directly applied Tu:	28.88	Kips	
Min. PL "tc" for **B** cap. **w/o** Pry:	1.218	in	
Min PL "treq" for actual **T w/ Pry**:	0.670	in	
Min PL "t1" for actual **T w/o Pry**:	0.886	in	
T allowable w/o Prying:	54.54	kips	α'<0 case
Prying Force, q:	0.00	kips	
Total Bolt Tension=Tu+q:	28.88	kips	
Non-Prying Bolt Stress Ratio, Tu/B:	53.0%	**Pass**	

Exterior Flange Plate Results Flexural Check

			Rigid
Compression Side Plate Stress:	7.8	ksi	TIA G
Allowable Plate Stress:	32.4	ksi	φ*Fy
Compression Plate Stress Ratio:	24.1%	**Pass**	Comp. Y.L. Length:
No Prying			10.10
Tension Side Stress Ratio, (treq/t)^2:	11.2%	**Pass**	

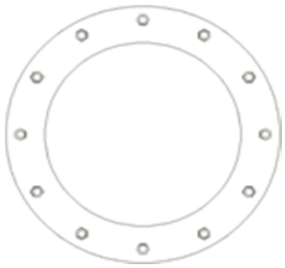
n/a

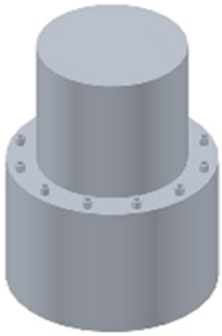
Stiffener Results

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





* 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

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Job Number:	37516-3608.002.7805	**Page:**	1 / 1
By:	SJT	**Date:**	12/8/2016
Site Number:	822779	**Version:**	0.6
Site Name:	BRIDGEPORT/ RT 8	**Effective:**	2/1/2016

CODE:	TIA-222-G
ASIF:	1.00

EEI FLANGE CONCEALMENT CALCULATIONS (82 Ft)

EEI Kit Number	Custom	
Flange Elevation	82.00	ft

STIFFENER INFORMATION

		Overrides
Stiffener Quantity	4	4
Width (in)	6.75	6.75
Height (in)	13.5	13.50
Thickness (in)	0.75	0.75
Horizontal Fillet Weld	0.375	0.375
Vertical Fillet Weld	0.375	0.375
Stiffener Grade (ksi)	36	36

RING PLATE INFORMATION

Thickness (in)	2.5	2.50
ID (in)	18	18.00
OD (in)	25	25.00
Ring Plate Grade (ksi)	36	36

BOLT INFORMATION

Bolt Quantity	8	8
Size (in)	1	1.00
Bolt Circle (in)	21	21.0
Bolt Specification	A325	A325

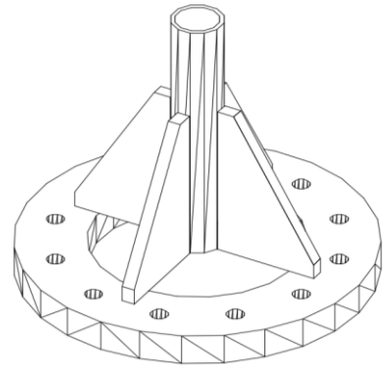
SPINE INFORMATION

Size	HSS10.75	HSS10.75
Pipe Grade	A500-42	A500-42
Fy (ksi)	42	42
Fu (ksi)	60	60
Pipe OD (in)	10.75	10.75
Pipe Thickness (in)	0.349	0.349

FLANGE CONNECTION REACTIONS

Moment	106.2	kip*ft
Shear	4.0	kips
Axial	4.3	kips

Max Allowable Capacity	105%
Electrode (ksi)	E70



FLANGE CONNECTION RESULTS

Bolts	54.6% Passing
Ring Plate	69.4% Passing
Weld - Stiffener & Ring Plate	92.1% Passing
Weld - Spine & Stiffener	44.4% Passing
Spine Wall Tear Out / Punching Shear	32.8% Passing
Max Tension In Stiffeners	59.6 kips
Max Compression in Stiffeners	61.8 kips
Stiffener Bending	38.6% Passing
Stiffener Shear	67.8% Passing
Stiffener Combined Shear & Bending	78.3% Passing

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Manufacturer:	Other

Bolt Data			
Qty:	8		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	21	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	5.50	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Reactions		
Moment:	106.23	ft-kips
Axial:	4.04	kips
Shear:	4.27	kips
Exterior Flange Run, T+q:	0	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 82 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	29.8	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	54.5	Kips
Bolt Stress Ratio:	54.7%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	30.9	Kips, Ext. Cu=Interior Cu
Plate Stress:	16.2	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	49.9%	**Pass**

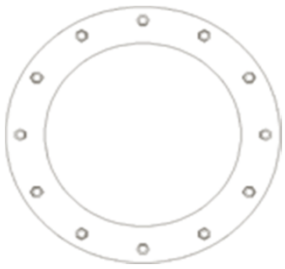
n/a

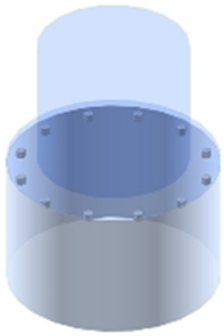
Stiffener Results

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





* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Manufacturer:	Other

Bolt Data			
Qty:	21		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	21	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.48	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Reactions		
Moment:	223.7	ft-kips
Axial:	7.2	kips
Shear:	6.03	kips
Exterior Flange Run, T+q:		kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 60 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	24.0	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	54.5	Kips
Bolt Stress Ratio:	44.0%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	24.7	Kips, Ext. Cu=Interior Cu
Plate Stress:	20.4	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	63.1%	**Pass**

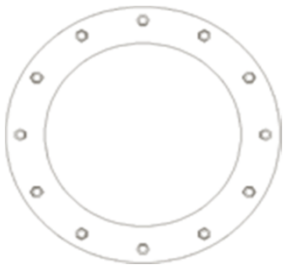
n/a

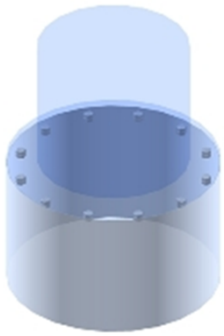
Stiffener Results

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





* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Manufacturer:	Other

Bolt Data			
Qty:	21		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	21	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	3.48	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Reactions		
Moment:	223.7	ft-kips
Axial:	7.2	kips
Shear:	6.03	kips
Exterior Flange Run, T+q:	0	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 60 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	24.0	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	54.5	Kips
Bolt Stress Ratio:	44.0%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	24.7	Kips, Ext. Cu=Interior Cu
Plate Stress:	20.4	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	63.1%	**Pass**

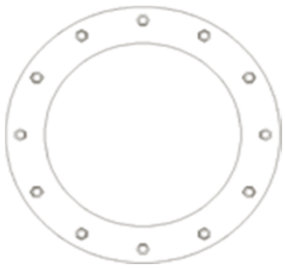
n/a

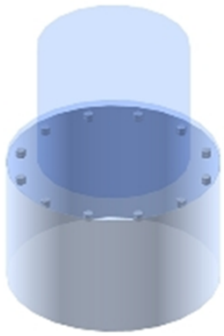
Stiffener Results

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





* 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

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v4.4 - Effective 7-12-13

Date: 12/8/2016
PJF Project: 37516-3608.002.7805
Client Ref. # BU 822779
Site Name: Bridgeport
Description: 30' Flange
Owner: Crown Castle
Engineer: SJT

Asymmetric Bolt Analysis

Moment =	428	k-ft	TIA Ref.	G	Location =	Flange Plate	
Axial =	11.2	kips	ASIF =	N/A	η =	N/A	for BP, Rev. G Sect. 4.9.9
Shear =	7.6	kips	Max Ratio =	100.0%	Threads =	X-Excluded	for FP, Rev. G
Anchor Qty =	20						

**** For Flange Plates: Prying action is not considered in the bolt loads. ****

Item	Nominal Bolt Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Bolt 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	1.000	A325	92	120	0.0	21.00	0.00	0.79	26.36	25.64	25.64	0.00	54.54	47.0%
2	1.000	A325	92	120	22.5	21.00	0.00	0.79	22.97	22.26	22.26	0.00	54.54	40.8%
3	1.000	A325	92	120	45.0	21.00	0.00	0.79	22.76	22.04	22.04	0.00	54.54	40.4%
4	1.000	A325	92	120	67.5	21.00	0.00	0.79	25.90	25.18	25.18	0.00	54.54	46.2%
5	1.000	A325	92	120	90.0	21.00	0.00	0.79	29.94	29.23	29.23	0.00	54.54	53.6%
6	1.000	A325	92	120	112.5	21.00	0.00	0.79	32.60	31.89	31.89	0.00	54.54	58.5%
7	1.000	A325	92	120	135.0	21.00	0.00	0.79	32.75	32.04	32.04	0.00	54.54	58.7%
8	1.000	A325	92	120	157.5	21.00	0.00	0.79	30.34	29.62	29.62	0.00	54.54	54.3%
9	1.000	A325	92	120	180.0	21.00	0.00	0.79	26.36	25.64	25.64	0.00	54.54	47.0%
10	1.000	A325	92	120	202.5	21.00	0.00	0.79	22.97	22.26	22.26	0.00	54.54	40.8%
11	1.000	A325	92	120	225.0	21.00	0.00	0.79	22.76	22.04	22.04	0.00	54.54	40.4%
12	1.000	A325	92	120	247.5	21.00	0.00	0.79	25.90	25.18	25.18	0.00	54.54	46.2%
13	1.000	A325	92	120	270.0	21.00	0.00	0.79	29.94	29.23	29.23	0.00	54.54	53.6%
14	1.000	A325	92	120	292.5	21.00	0.00	0.79	32.60	31.89	31.89	0.00	54.54	58.5%
15	1.000	A325	92	120	315.0	21.00	0.00	0.79	32.75	32.04	32.04	0.00	54.54	58.7%
16	1.000	A325	92	120	337.5	21.00	0.00	0.79	30.34	29.62	29.62	0.00	54.54	54.3%
17	0.000	CCI 4 x 0.75 (65 ksi)	65	80	0.0	24.75	3.00	3.00	118.40	115.67	118.40	122.34	122.34	96.8%
18	0.000	CCI 4 x 0.75 (65 ksi)	65	80	70.0	24.75	3.00	3.00	118.40	115.67	118.40	122.34	122.34	96.8%
19	0.000	CCI 4 x 0.75 (65 ksi)	65	80	180.0	24.75	3.00	3.00	118.40	115.67	118.40	122.34	122.34	96.8%
20	0.000	CCI 4 x 0.75 (65 ksi)	65	80	250.0	24.75	3.00	3.00	118.40	115.67	118.40	122.34	122.34	96.8%
								24.57						

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Manufacturer:	Other

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	21	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Reactions		
Moment:	226.8	ft-kips
Axial:	5.7	kips
Shear:	3.9	kips
Exterior Flange Run, T+q:		kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 30 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	32.0	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	54.5	Kips
Bolt Stress Ratio:	58.8%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	32.8	Kips, Ext. Cu=Interior Cu
Plate Stress:	20.7	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	63.8%	**Pass**

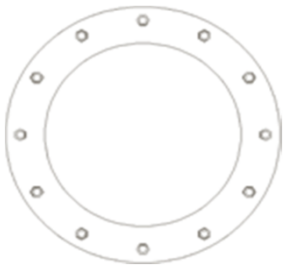
n/a

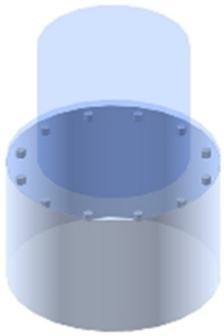
Stiffener Results

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





* 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

Stiffened or Unstiffened, Interior Flange Plate - Any Bolt Material TIA Rev G

Site Data

BU#: *822779*
Site Name: *Bridgeport*
App #:

Manufacturer:	Other

Bolt Data			
Qty:	16		
Diam:	1	Bolt Fu:	120
Bolt Material:	A325	Bolt Fy:	92
N/A:	0	<-- Disregard	
N/A:	0	<-- Disregard	
Circle:	21	in	

Plate Data		
Plate Outer Diam:	23.25	in
Plate Inner Diam:	18.25	in (Hole @ Ctr)
Thick:	1.25	in
Grade:	36	ksi
Effective Width:	4.57	in

Stiffener Data (Welding at Both Sides)		
Config:	0	*
Weld Type:	0	
Groove Depth:	0	in **
Groove Angle:	0	degrees
Fillet H. Weld:	0	<-- Disregard
Fillet V. Weld:	0	in
Width:	0	in
Height:	0	in
Thick:	0	in
Notch:	0	in
Grade:	0	ksi
Weld str.:	0	ksi

Pole Data		
Pole OuterDiam:	24	in
Thick:	0.375	in
Pole Inner Diam:	23.25	in
Grade:	42	ksi
# of Sides:	0	"0" IF Round
Fu	60	ksi

Reactions		
Moment:	226.8	ft-kips
Axial:	5.7	kips
Shear:	3.9	kips
Exterior Flange Run, T+q:	0	kips

Bolt Threads:
X-Excluded
φVn=φ(0.55*Ab*Fu)
φ=0.75, φ*Vn (kips):
38.88

Elevation: 30 feet

Interior Flange Bolt Results

Maximum Bolt Tension, Tu:	32.0	Kips, Ext. Tu=Interior Tu
Adjusted φ*Tn (due to Vu=Vu/Qty)	54.5	Kips
Bolt Stress Ratio:	58.8%	**Pass**

Interior Flange Plate Results Flexural Check

Controlling Bolt Axial Force:	32.8	Kips, Ext. Cu=Interior Cu
Plate Stress:	20.7	ksi
Allowable Plate Stress, φ*Fy:	32.4	ksi
Plate Stress Ratio:	63.8%	**Pass**

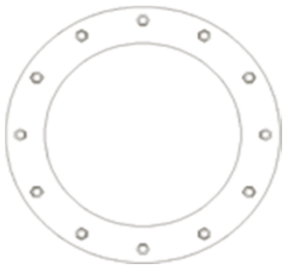
n/a

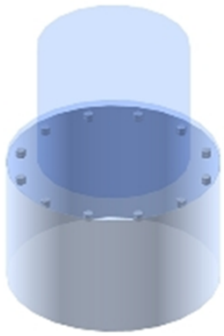
Stiffener Results

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





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

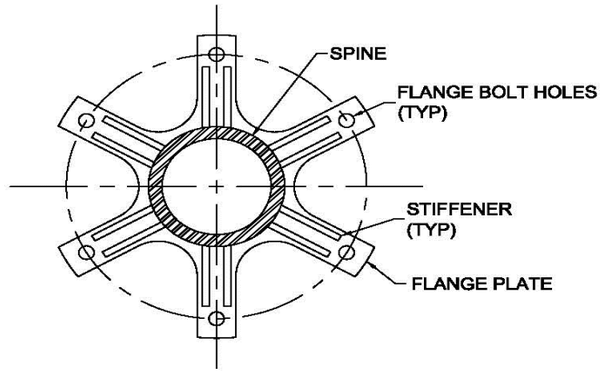
** Note: for complete joint penetration groove welds the groove depth must be exactly 1/2 the stiffener thickness for calculation purposes

CCI Flagpole Tool

Site Data	
BU#:	822779
Site Name:	Bridgeport
App #:	

Code		
Code:	TIA-222-G	
Ice Thickness:	0.5	in
Windspeed (V):	125	mph
Ice Wind Speed (V):	50	mph
Exposure Category:	C	
Topographic Feature:	N/A	
Structure Class:	II	

Tower Information		
Total Tower Height:	120	ft
Base Tower Height:	82	ft
Total Canister Length:	38	ft
Number of Canister Assembly Sections:	4	



FLANGE PLATE
(TYPE 3: SOLIDITY RATIO 0.5)

Canister Section Number *:	Canister Assembly Length (ft):	Canister Assembly Diameter (in):	Number of Sides Canister Section	Plate Type:	Mating Flange Plate Thickness (in)**:	Mating Flange Plate Diameter (in):	Solidity Ratio	Plate Weight (Kip):	Canister Weight (Kip)
1	10	36	Round	3	0.75	36	0.5	0.216	0.188
2	10	36	Round	3	0.75	36	0.5	0.216	0.188
3	10	36	Round	3	0.75	36	0.5	0.216	0.188
4	8	36	Round	3	0.75	36	0.5	0.216	0.151

* Sections are numbered from the top of the tower down

** Mating Flange Plate Thickness at the bottom of canister section

Flag on Tower:	Yes	
Flag Width:	18	ft
Flag Height:	12	ft
Flag Elevation(z):	120	ft

Truck Ball on Tower:	Yes	
Diameter of Ball:	18	in

Geometry : Base Tower + Spine

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Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material	Delete
120	10		0	10.75	10.75	0.349	n/a	A500-42	[x]
110	10		0	10.75	10.75	0.349	n/a	A500-42	[x]
100	10		0	10.75	10.75	0.349	n/a	A500-42	[x]
90	8		0	10.75	10.75	0.349	n/a	A500-42	[x]

82	22		0	24	24	0.375	n/a	A53-B-42	[x]
60	30		0	24	24	0.375	n/a	A53-B-42	[x]
30	30		0	24	24	0.375	n/a	A53-B-42	[x]

Discrete Loads: Truck Ball	Apply C_aA_A at Elevation(z) (ft)	C_aA_A No Ice (ft^2)	C_aA_A 1/2" Ice (ft^2)	C_aA_A 1" Ice (ft^2)	C_aA_A 2" Ice (ft^2)	C_aA_A 4" Ice (ft^2)	Weight No Ice (Kip)	Weight 1/2" Ice (Kip)
	120.75	0.884	1.378	1.527	1.848	2.581	0.05	0.067

Discrete Loads : C_FA_F for Canister Assembly								
Canister Loading	Apply C_FA_F at Elevation(z) (ft)	C_FA_F No Ice (ft^2)	C_FA_F 1/2" Ice (ft^2)	C_FA_F 1" Ice (ft^2)	C_FA_F 2" Ice (ft^2)	C_FA_F 4" Ice (ft^2)	Canister Assembly Weight No Ice (Kip)	Canister Assembly Weight 1/2" Ice (Kip)
Canister Load 1	120	9.000	18.500	19.000	20.000	22.000	0.094	0.206
Canister Load 2	110	18.000	37.000	38.000	40.000	44.000	0.405	0.628
Canister Load 3	100	18.000	37.000	38.000	40.000	44.000	0.405	0.628
Canister Load 4	90	16.200	33.300	34.200	36.000	39.600	0.386	0.587
Canister Load 5	82	7.200	14.800	15.200	16.000	17.600	0.292	0.381

User Forces: Flag Force Calculation Per ANSI/NAAMM FP 1001-07	
$Wind_{FORCE}$=	0.482 Kip
Weight=	0.023 Kip
$Wind_{FORCE, ICE}$=	0.078 Kip
Weight $_{ICE}$=	0.252 Kip
$W_{FORCE, SERVICE WIND}$=	0.111 Kip
Weight=	0.023 Kip

←Flag force should be included at the top of the flag attachment elevation. If the attachment of the flag to the halyard distributes forces equally to the pole, apply flag forces accordingly in tnx file.

Deflection Check Required:	**Yes**	Import Deflection Results
3% Spine Deflection Check		
Allowable (3%) Horizontal Spine Deflection (inches)	Actual Deflection ***(inches)	Sufficient/ Insufficient
13.680	9.707	Sufficient

*** Relative deflection under service level wind speed

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

T-Mobile Existing Facility

Site ID: CT11240B

Bridgeport/ Rt 8
1875 Noble Avenue
Bridgeport, CT 06610

January 11, 2017

EBI Project Number: 6217000098

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general public allowable limit:	5.07 %

21 B Street · Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

EBI Consulting
environmental | engineering | due diligence

January 11, 2017

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

Emissions Analysis for Site: **CT11240B – Bridgeport/ Rt 8**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **1875 Noble Avenue, Bridgeport, 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 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ 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 ($\mu W/cm^2$). The general population exposure limit for the 700 MHz Band is approximately 467 $\mu W/cm^2$, and the general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) bands is 1000 $\mu W/cm^2$. 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 **1875 Noble Avenue, Bridgeport, 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 (PCS Band - 1900 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 (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

4) 1 LTE channel (700 MHz Band) was considered for each sector of the proposed installation. This channel has a transmit power of 30 Watts.

5) Since all radios are ground mounted there are additional cabling losses accounted for. For each ground mounted RF path the following losses were calculated. 1.11 dB of additional cable loss for all ground mounted 700 MHz LTE Channels, 2.13 dB of additional cable loss for all ground mounted 1900 MHz UMTS and GSM channels and 1.97 dB of additional cable loss for all ground mounted 1900 MHz LTE channels. This is based on manufacturers Specifications for 127 & 117 feet of 7/8" coax cable since one antenna is located at 117 feet and the other at 107 feet above ground level.

6) 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.

7) For the following calculations the sample point was the top of a 6-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.

8) The antennas used in this modeling are the **RFS APXV18-206517S-C-ACU** for 1900 MHz (PCS) channels and the **Commscope DBXNH-6565B-A2M** for 1900 MHz (PCS) & 700 MHz channels. This is based on feedback from the carrier with regards to anticipated antenna selection. The **RFS APXV18-206517S-C-ACU** has a maximum gain of **16.7 dBd** at its main lobe at 1900 MHz. The **Commscope DBXNH-6565B-A2M** has a maximum gain of **13.1 dBd** at its main lobe at 700 MHz and a maximum gain of **17 dBd** at its main lobe at 1900 MHz. 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.

9) The antenna mounting height centerline of the proposed antennas are **107 & 117 feet** above ground level (AGL).

10) 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.

11) 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:	RFS APXV18-206517S-C-ACU	Make / Model:	RFS APXV18-206517S-C-ACU	Make / Model:	RFS APXV18-206517S-C-ACU
Gain:	16.7 dBd	Gain:	16.7 dBd	Gain:	16.7 dBd
Height (AGL):	117	Height (AGL):	117	Height (AGL):	117
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	4	Channel Count	4	Channel Count	4
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	3,437.01	ERP (W):	3,437.01	ERP (W):	3,437.01
Antenna A1 MPE%	1.00	Antenna B1 MPE%	1.00	Antenna C1 MPE%	1.00
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Commscope DBXNH-6565B-A2M	Make / Model:	Commscope DBXNH-6565B-A2M	Make / Model:	Commscope DBXNH-6565B-A2M
Gain:	17 dBd	Gain:	17 dBd	Gain:	17 dBd
Height (AGL):	107	Height (AGL):	107	Height (AGL):	107
Frequency Bands	1900 MHz (PCS) / 700 MHz	Frequency Bands	1900 MHz (PCS) / 700 MHz	Frequency Bands	1900 MHz (PCS) / 700 MHz
Channel Count	3	Channel Count	3	Channel Count	3
Total TX Power(W):	150	Total TX Power(W):	150	Total TX Power(W):	150
ERP (W):	4,295.41	ERP (W):	4,295.41	ERP (W):	4,295.41
Antenna A2 MPE%	1.41	Antenna B2 MPE%	1.41	Antenna C2 MPE%	1.41

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.41 %**
Clearwire	0.24 %
Nextel	1.23 %
Sprint	1.19 %
Site Total MPE %:	**5.07 %**

T-Mobile Sector A Total:	2.41 %
T-Mobile Sector B Total:	2.41 %
T-Mobile Sector C Total:	2.41 %
Site Total:	5.07 %

T-Mobile _per sector	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile PCS - 1950 MHz UMTS	2	859.25	117	5.01	PCS - 1950 MHz	1000	0.50%
T-Mobile PCS - 1900 MHz GSM	2	859.25	117	5.01	PCS - 1900 MHz	1000	0.50%
T-Mobile PCS - 1950 MHz LTE	2	1,910.52	117	11.15	PCS - 1950 MHz	1000	1.11%
T-Mobile 700 MHz LTE	1	474.37	117	1.38	700 MHz	1000	0.30%
						Total:	**2.41%**

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 A:	2.41 %
Sector B:	2.41 %
Sector C:	2.41 %
T-Mobile Per Sector Maximum:	2.41 %
Site Total:	5.07 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **5.07%** 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.