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

9/6/18

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

RE: **Notice of Exempt Modification for T-Mobile Crown Site BU: 842870**
T-Mobile Site ID: CT11018F
434 Boston Post Road, Milford, CT 06460
Latitude: 41° 13′ 42.69″ / Longitude: -73° 4′ 12.47″

Dear Ms. Bachman:

T-Mobile currently maintains (9) antennas at the 117-foot level of the existing 150- foot lattice tower at 434 Boston Post Road, Milford, CT 06460. The tower is owned by Crown Castle. The property is owned by The City of Milford. T-Mobile intends to replace (3) panel antennas for (3) proposed panel antennas, swap out (3) RRUs as well as add (2) hybrid fiber line and remove (2) coax.

The facility was approved by the Connecticut Siting Council's Petition No. 487 on October 19, 2000. This approval was given without conditions.

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 Mr. Benjamin G. Blake, Mayor, City of Milford, as the City is the property owner, Mr. David Sulkis, City Planner, City of Milford, and Crown Castle is the tower owner.

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

2. The proposed modifications 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-reference telecommunications facility constitutes an exempt modification under R.C.S.A. § 16-50j-72(b)(2). Please send approval/rejection letter to Attn: William Stone.

Sincerely,

William Stone
Real Estate Specialist
3 Corporate Park Drive, Suite 101
Clifton Park, NY 12065
518-373-3543
William.stone@crowncastle.com

Attachments:

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

cc:

Mr. Benjamin G. Blake, Mayor
City of Milford
1 10 River Street
Milford, CT 06460
(203) 783-3201

David Sulkis, City Planner
City of Milford
70 West River Street
Milford, CT 06460
(203) 783-3245

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Petition No. 487
VoiceStream Wireless
North Branford, Connecticut
Staff Report
October 19, 2000

On October 17, 2000, Connecticut Siting Council (Council) member Dr. William H. Smith and Christina Lepage and Joel Rinebold of the Council staff met with VoiceStream Wireless (VoiceStream) representative Brendan Sharkey west of Route 22, North Branford, Connecticut for inspection of an electric transmission structure. The property and structure is owned by Connecticut Light and Power Co. (CL&P). VoiceStream Wireless, with the agreement of CL&P, proposes to modify the structure by installing antennas and associated equipment for telecommunications use and is petitioning the Council for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need (Certificate) is required for the modification.

VoiceStream proposes the installation of three EMS dual-pol antennas on top of a 3-inch wide pipe mast extension. The antennas will extend approximately 10-feet 8-inches above the existing 91-foot 6-inch transmission line monopole structure (#4955). The height at the top of the antennas will be about 102-feet 2-inches above ground level (AGL) with the centerline at 99-feet 10-inches AGL. This design requires a minimum of six feet above the CL&P shield wire. The structural analysis suggests that the existing guy be replaced and that an additional guy be added to the other side to ensure the capability of the structure to support the proposed equipment.

The Nortel S8000 equipment cabinet will be mounted on a 10'x12' concrete slab in a 15'x20' fenced compound at the base of the tower facing Route 22. A second Nortel S8000 equipment is proposed for future installation if the site begins generating significant traffic and the structure is able to accommodate additional loading. The equipment cabinet does not require any protective structures or air conditioning; therefore no audible noise will be created. Power and telephone service to the site will be provided from an underground conduit to the west side of Route 22 and then routed overhead to an existing utility pole on the east side of the highway.

The Algonquin gas line will serve as access to the site as currently used by CL&P. Trenching for the site will be at a required depth of between 12 and 36 inches, depending on the terrain, and will span from the tower to the western edge of Route 22. CL&P has already contacted Algonquin Gas about the proposed installation.

The proposed site is located directly west of Route 22 in North Branford. The zoning designation of this site is R-80 residential. Land use in the surrounding area is primarily woodland, with some distant single-family residences and the Evergreen Woods senior facility through the woods to the west. The closest residence to the proposed site is approximately 600 feet to the north.

VoiceStream contends that the increase in height of this monopole structure will not result in a substantial environmental effect. The proposed project will prevent the construction of a new tower in the area. VoiceStream also states that the PCS antennas will blend in with the existing transmission line structure and the placement of the associated equipment, which will be directly underneath the existing tower, will limit the disturbance created by construction activities.

The worst-case power density for the telecommunications operations at the site has been calculated to be 2.12% of the applicable standard for uncontrolled environments.

VoiceStream submits that the proposed modification of the structure would not require a Certificate because it will reduce the need for a new telecommunications tower by utilizing an existing structure and contends that the proposed installation will not cause a substantial adverse environmental effect.

Disclaimer: This map is for informational purposes only All information is subject to verification by any user. The City of Milford and its mapping contractors assume no legal responsibility for the information contained herein.

Map Produced: July 2016

City of Milford, CT

Property Listing Report

Map Block Lot 064 930 6 A

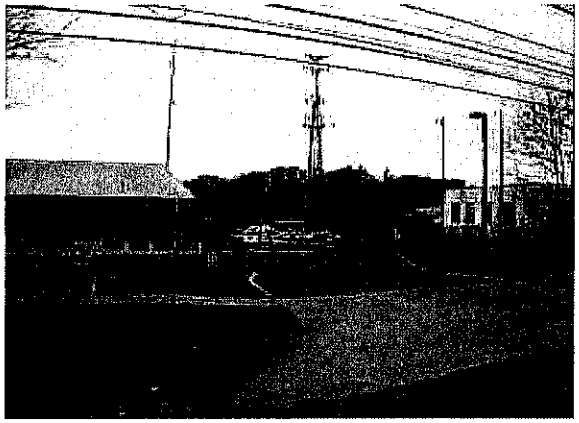
Account 023341

Property Information

Property Location	434 BOSTON POST RD
Owner	CITY OF MILFORD
Co-Owner	C/O AT&T MBLTY-TAX DEPT
Mailing Address	575 MOROSGO DR ATLANTA GA 30324
Land Use	434V CELL TOWER MDL-00
Land Class	I
Zoning Code	
Census Tract	

Neighborhood	D
Acreage	0
Utilities	All Public,Public Sewer
Lot Setting/Desc	
Additional Info	

Photo



Sketch

Primary Construction Details

Year Built		Bedrooms		Exterior Walls	
Stories		Full Bathrooms		Interior Walls	
Building Style		Half Bathrooms		Heating Type	
Building Use		Bath Style		Heating Fuel	
Building Condition		Kitchen Style		AC Type	
Floors		Roof Style		Gross Bldg Area	
Total Rooms		Roof Cover		Total Living Area	

Report Created On 4/24/2018

City of Milford, CT

Property Listing Report | Map Block Lot 064 930 6 A | Account 023341

Valuation Summary (Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings		
Extras	0	
Improvements		
Outbuildings	450000	315000
Land	0	0
Total	450000	315000

Outbuilding and Extra Items

Type	Description
CEL TWR SITE	1 UNITS

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area		0

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CITY OF MILFORD	02435/0430	11/22/1999	

Report Created On 4/24/2018

SHEET INDEX

NO.	DESCRIPTION
T1	TITLE PAGE
N1	NOTES
C1	PLAN & ELEVATION
C2	RF CHART AND ORIENTATION
D1	EQUIPMENT DETAILS
E1	GROUNDING & ELECTRICAL DETAILS
E2	RF PLUMBING DIAGRAM

TOWER OWNER NOTIFICATION

ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE NOTICE TO PROCEED, CONTRACTOR WILL CONTACT THE CROWN CASTLE CONSTRUCTION MANAGER OF RECORD (NOTED ON THE FIRST PAGE ON THIS CONSTRUCTION DRAWING) A MINIMUM OF 48 HOURS PRIOR TO WORK START. UPON ARRIVAL TO THE JOB SITE, CONTRACTOR CREW IS REQUIRED CALL 1-800-788-7011 TO NOTIFY THE CROWN CASTLE NOC WORK HAS BEGUN.

T-Mobile

CROWN CASTLE

CBU

842870

SITE ID

CT11018F

SITE NAME

MILFORD/ I-95/ X37/ JCT

SITE ADDRESS

434 BOSTON POST ROAD
MILFORD, CT 06460

CONFIGURATION

67D92DB_2XAIR+1OP

PROJECT SITE INFORMATION

SITE ID:	CT11018F	
SITE NAME:	MILFORD/ I-95/ X37/ JCT	
SITE ADDRESS:	434 BOSTON POST ROAD MILFORD, CT 06460	
COUNTY:	NEW HAVEN	
SITE COORDINATES:		
LATITUDE:	41° 13' 42.8"	(NAD 83)
LONGITUDE:	73° 04' 12.5"	(NAD 83)
APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088	

STRUCTURAL ANALYSIS INFORMATION

TOWER ANALYSIS

BASED ON THE STRUCTURAL ANALYSIS COMPLETED BY **B+T GROUP** DATED **07/18/2018.** THE EXISTING TOWER IS CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION.

ANTENNA MOUNTS

BASED ON THE MOUNT ANALYSIS COMPLETED BY **INFINIGY** DATED **07/22/18.** THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION WITH THE FOLLOWING MODIFICATIONS:

- **GC TO INSTALL SITE PRO 1 STK-U TIE BACK KIT TO OPOSITE SIDE OF THE EXISTING SECTOR MOUNT. INSTALL NEW APXVAARR24 ANTENNAS ON PIPE POSITION #2 (MIDDLE) AND RELOCATE EXISTING AIR21 ANTENNAS TO POSITIONS #1 AND #3.**

PROJECT TEAM INFORMATION

CLIENT REPRESENTATIVE:	CROWN CASTLE 3 CORPORATE PARK DRIVE SUITE 101 CLIFTON PARK, NY 12065
CLIENT REP. CONTACT:	WILL STONE (518) 373-3543
ENGINEER:	INFINIGY 6865 DEERPATH ROAD SUITE 152 ELKRIDGE, MD 21075
ENGINEER CONTACT:	MATTHEW LIVERETTE (518) 690-0790

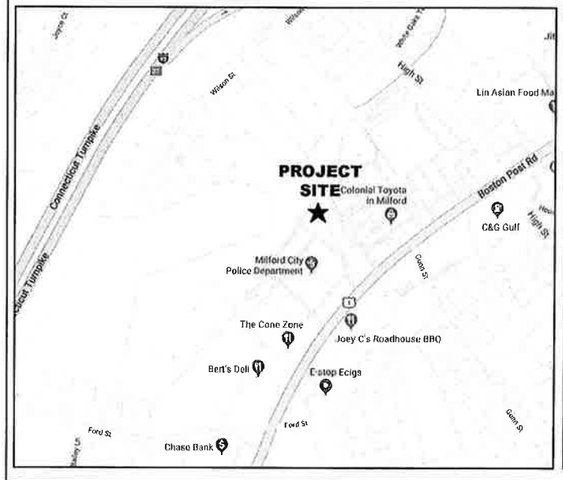
SCOPE OF WORK

SCOPE OF WORK:
TMO L600 67D04G (UPSTATE NY MARKET)
REPLACING (3) EXISTING ANTENNAS WITH NEW MODELS. ADDING (2) HYBRID FIBER CABLE AND (3) RRUS. REMOVING (3) RRUs AND (2) COAX.

811 Know what's below. Call before you dig.

TO OBTAIN LOCATION OF PARTICIPANTS UNDERGROUND FACILITIES BEFORE YOU DIG IN CONNECTICUT, CONTACT CALL BEFORE YOU DIG
TOLL FREE: 1-800-922-4455 OR
www.cbyd.com
CONNECTICUT STATUTE REQUIRES MIN OF 2 WORKING DAYS NOTICE BEFORE YOU EXCAVATE

LOCATION MAP



GENERAL NOTES

- HANDICAP ACCESS REQUIREMENTS ARE NOT REQUIRED.
- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- FACILITY HAS NO PLUMBING OR REFRIGERANTS.
- THIS FACILITY SHALL MEET OR EXCEED ALL FAA AND FCC REGULATORY REQUIREMENTS.
- ALL NEW MATERIAL SHALL BE FURNISHED AND INSTALLED BY CONTRACTOR UNLESS NOTED OTHERWISE. EQUIPMENT, ANTENNAS/RRH AND CABLES FURNISHED BY OWNER AND INSTALLED BY CONTRACTOR.
- THE PROJECT WILL NOT RESULT IN ANY SIGNIFICANT DISTURBANCE OR EFFECT ON STORMWATER DRAINAGE.
- NO SANITARY SEWER, POTABLE WATER, OR TRASH DISPOSAL SERVICE IS REQUIRED
- NO COMMERCIAL SIGNAGE IS PROPOSED

CODE COMPLIANCE

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED WITH ANY LOCAL AMENDMENTS BY THE LOCAL GOVERNING AUTHORITIES:

- INTERNATIONAL BUILDING CODE
- NATIONAL ELECTRICAL CODE
- NATIONAL FIRE PROTECTION ASSOCIATION 101
- NATIONAL FIRE PROTECTION ASSOCIATION 1
- LOCAL BUILDING CODES
- CITY/COUNTY ORDINANCES
- AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATIONS (AISC)
- UNDERWRITERS LABORATORIES APPROVED ELECTRICAL PRODUCTS.
- ANSI EIA/TIA 222 REV. G
- TIA 607
- INSTITUTE FOR ELECTRICAL AND ELECTRONICS ENGINEERS 81
- IEEE C2 (LATEST EDITION)
- TELCORDIA GR-1275
- ANSI T1.311

T-Mobile
T-MOBILE NORTHEAST LLC
103 MONARCH DRIVE
LIVERPOOL, NY 13088

INFINIGY
6865 DEERPATH ROAD SUITE 152
ELKRIDGE, MD 21075
TEL (443) 592-3143

STATE OF CONNECTICUT
JOHN S. STEVENS
No. 24705
LICENSED PROFESSIONAL ENGINEER
JULY 30 2018

No.	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	RWS	08/30/18
A	ISSUED FOR REVIEW	SL	08/08/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title: CT11018F MILFORD/ I-95/ X37/ JCT
434 BOSTON POST ROAD
MILFORD, CT 06460

Prepared For: CROWN CASTLE

Drawing Title: TITLE PAGE

Drawing Number: T1

GENERAL NOTES

PART 1 – GENERAL REQUIREMENTS

1.1 THE WORK SHALL COMPLY WITH APPLICABLE NATIONAL CODES AND STANDARDS, LATEST EDITION, AND PORTIONS THEREOF, INCLUDED BUT NOT LIMITED TO THE FOLLOWING:
- A. GR-63-CORE NEBS REQUIREMENTS: PHYSICAL PROTECTION
- B. GR-78-CORE GENERIC REQUIREMENTS FOR THE PHYSICAL DESIGN AND MANUFACTURE OF TELECOMMUNICATIONS EQUIPMENT.
- C. NATIONAL FIRE PROTECTION ASSOCIATION CODES AND STANDARDS (NFPA) INCLUDING NFPA 70 (NATIONAL ELECTRICAL CODE – "NEC").
- D. AND NFPA 101 (LIFE SAFETY CODE).
- E. AMERICAN SOCIETY FOR TESTING OF MATERIALS (ASTM).
- F. INSTITUTE OF ELECTRONIC AND ELECTRICAL ENGINEERS (IEEE).

1.2 DEFINITIONS:
A: WORK: THE SUM OF TASKS AND RESPONSIBILITIES IDENTIFIED IN THE CONTRACT DOCUMENTS.
B: COMPANY: T-MOBILE CORPORATION
C. ENGINEER: SYNONYMOUS WITH ARCHITECT & ENGINEER AND "A&E". THE DESIGN PROFESSIONAL HAVING PROFESSIONAL RESPONSIBILITY FOR DESIGN OF THE PROJECT.
D: CONTRACTOR: CONSTRUCTION CONTRACTOR; CONSTRUCTION VENDOR; INDIVIDUAL OR ENTITY WHO AFTER EXECUTION OF A CONTRACT IS BOUND TO ACCOMPLISH THE WORK.
E: THIRD PARTY VENDOR OR AGENCY: A VENDOR OR AGENCY ENGAGED SEPARATELY BY THE COMPANY, A&E, OR CONTRACTOR TO PROVIDE MATERIALS OR TO ACCOMPLISH SPECIFIC TASKS RELATED TO BUT NOT INCLUDED IN THE WORK.

1.3 POINT OF CONTACT: COMMUNICATION BETWEEN THE COMPANY AND THE CONTRACTOR SHALL FLOW THROUGH THE SINGLE COMPANY SITE DEVELOPMENT SPECIALIST OR OTHER PROJECT COORDINATOR APPOINTED TO MANAGE THE PROJECT FOR THE COMPANY.

1.4 ON-SITE SUPERVISION: THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, AND PROCEDURES IN ACCORDANCE WITH THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL EMPLOY A COMPETENT SUPERINTENDENT WHO SHALL BE IN ATTENDANCE AT THE SITE AT ALL TIMES DURING PERFORMANCE OF THE WORK.

1.5 DRAWINGS, SPECIFICATIONS AND DETAILS REQUIRED AT JOBSITE: THE CONSTRUCTION CONTRACTOR SHALL MAINTAIN A FULL SET OF THE CONSTRUCTION DRAWINGS, STANDARD CONSTRUCTION DETAILS FOR WIRELESS SITES, AND THE STANDARD CONSTRUCTION SPECIFICATIONS FOR WIRELESS SITES AT THE JOBSITE FROM MOBILIZATION THROUGH CONSTRUCTION COMPLETION.
A. THE JOBSITE DRAWINGS, SPECIFICATIONS AND DETAILS SHALL BE CLEARLY MARKED DAILY IN PENCIL WITH ANY CHANGES IN CONSTRUCTION OVER WHAT IS DEPICTED IN THE DOCUMENTS. AT CONSTRUCTION COMPLETION, THIS JOBSITE MARKUP SET SHALL BE DELIVERED TO THE COMPANY OR COMPANY'S DESIGNATED REPRESENTATIVE TO BE FORWARDED TO THE COMPANY'S A&E VENDOR FOR PRODUCTION OF "AS-BUILT" DRAWINGS.

1.6 USE OF JOB SITE: THE CONTRACTOR SHALL CONFINE ALL CONSTRUCTION AND RELATED OPERATIONS INCLUDING STAGING AND STORAGE OF MATERIALS AND EQUIPMENT, PARKING, TEMPORARY FACILITIES, AND WASTE STORAGE TO THE LEASE PARCEL UNLESS OTHERWISE PERMITTED BY THE CONTRACT DOCUMENTS.

1.7 NOTICE TO PROCEED:
A. NO WORK SHALL COMMENCE PRIOR TO COMPANY'S WRITTEN NOTICE TO PROCEED.
B. UPON RECEIVING NOTICE TO PROCEED, CONTRACTOR SHALL FULLY PERFORM ALL WORK NECESSARY TO PROVIDE T-MOBILE WITH AN OPERATIONAL WIRELESS FACILITY.

PART 2 – EXECUTION

2.1 TEMPORARY UTILITIES AND FACILITIES: THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL TEMPORARY UTILITIES AND FACILITIES NECESSARY EXCEPT AS OTHERWISE INDICATED IN THE CONSTRUCTION DOCUMENTS. TEMPORARY UTILITIES AND FACILITIES INCLUDE, POTABLE WATER, HEAT, HVAC, ELECTRICITY, SANITARY FACILITIES, WASTE DISPOSAL FACILITIES, AND TELEPHONE/COMMUNICATION SERVICES. PROVIDE TEMPORARY UTILITIES AND FACILITIES IN ACCORDANCE WITH OSHA AND THE AUTHORITY HAVING JURISDICTION. CONTRACTOR MAY UTILIZE THE COMPANY ELECTRICAL SERVICE IN THE COMPLETION OF THE WORK WHEN IT BECOMES AVAILABLE. USE OF THE LESSORS OR SITE OWNER'S UTILITIES OR FACILITIES IS EXPRESSLY FORBIDDEN EXCEPT AS OTHERWISE ALLOWED IN THE CONTRACT DOCUMENTS.

2.2 ACCESS TO WORK: THE CONTRACTOR SHALL PROVIDE ACCESS TO THE JOB SITE FOR AUTHORIZED COMPANY PERSONNEL AND AUTHORIZED REPRESENTATIVES OF THE ARCHITECT/ENGINEER DURING ALL PHASES OF THE WORK.

2.3 TESTING: REQUIREMENTS FOR TESTING BY THIS CONTRACTOR SHALL BE AS INDICATED HEREWITH, ON THE CONSTRUCTION DRAWINGS, AND IN THE INDIVIDUAL SECTIONS OF THESE SPECIFICATIONS. SHOULD COMPANY CHOOSE TO ENGAGE ANY THIRD-PARTY TO CONDUCT ADDITIONAL TESTING, THE CONTRACTOR SHALL COOPERATE WITH AND PROVIDE A WORK AREA FOR COMPANY'S TEST AGENCY.

2.4 COMPANY FURNISHED MATERIAL AND EQUIPMENT: ALL HANDLING, STORAGE AND INSTALLATION OF COMPANY FURNISHED MATERIAL AND EQUIPMENT SHALL BE IN ACCORDANCE WITH THE REQUIREMENTS OF THE CONTRACT DOCUMENTS AND WITH THE MANUFACTURER'S INSTRUCTIONS AND RECOMMENDATIONS.
A. CONTRACTOR SHALL PROCURE ALL OTHER REQUIRED WORK RELATED MATERIALS NOT PROVIDED BY T-MOBILE TO SUCCESSFULLY CONSTRUCT A WIRELESS FACILITY.

2.5 DIMENSIONS: VERIFY DIMENSIONS INDICATED ON DRAWINGS WITH FIELD DIMENSIONS BEFORE FABRICATION OR ORDERING OF MATERIALS. DO NOT SCALE DRAWINGS.

2.6 EXISTING CONDITIONS: NOTIFY THE COMPANY REPRESENTATIVE OF EXISTING CONDITIONS DIFFERING FROM THOSE INDICATED ON THE DRAWINGS. DO NOT REMOVE OR ALTER STRUCTURAL COMPONENTS WITHOUT PRIOR WRITTEN APPROVAL FROM THE ARCHITECT AND ENGINEER.

PART 3 – RECEIPT OF MATERIAL & EQUIPMENT

3.1 RECEIPT OF MATERIAL AND EQUIPMENT: CONTRACTOR IS RESPONSIBLE FOR T-MOBILE PROVIDED MATERIAL AND EQUIPMENT AND UPON RECEIPT SHALL:
- A. ACCEPT DELIVERIES AS SHIPPED AND TAKE RECEIPT.
- B. VERIFY COMPLETENESS AND CONDITION OF ALL DELIVERIES.
- C. TAKE RESPONSIBILITY FOR EQUIPMENT AND PROVIDE INSURANCE PROTECTION AS REQUIRED IN AGREEMENT.
- D. RECORD ANY DEFECTS OR DAMAGES AND WITHIN TWENTY-FOUR HOURS AFTER RECEIPT, REPORT TO T-MOBILE OR ITS DESIGNATED PROJECT REPRESENTATIVE OF SUCH.
- E. PROVIDE SECURE AND NECESSARY WEATHER PROTECTED WAREHOUSING.
- F. COORDINATE SAFE AND SECURE TRANSPORTATION OF MATERIAL AND EQUIPMENT, DELIVERING AND OFF-LOADING FROM CONTRACTOR'S WAREHOUSE TO SITE.

PART 4 – GENERAL REQUIREMENTS FOR CONSTRUCTION

4.1 CONTRACTOR SHALL KEEP THE SITE FREE FROM ACCUMULATING WASTE MATERIAL, DEBRIS, AND TRASH. AT THE COMPLETION OF THE WORK, CONTRACTOR SHALL REMOVE FROM THE SITE ALL REMAINING RUBBISH, IMPLEMENTS, TEMPORARY FACILITIES, AND SURPLUS MATERIALS.

4.2 EQUIPMENT ROOMS SHALL AT ALL TIMES BE MAINTAINED "BROOM CLEAN" AND CLEAR OF DEBRIS.

4.3 CONTRACTOR SHALL TAKE ALL REASONABLE PRECAUTIONS TO DISCOVER AND LOCATE ANY HAZARDOUS CONDITION.
A. IN THE EVENT CONTRACTOR ENCOUNTERS ANY HAZARDOUS CONDITION WHICH HAS NOT BEEN ABATED OR OTHERWISE MITIGATED, CONTRACTOR AND ALL OTHER PERSONS SHALL IMMEDIATELY STOP WORK IN THE AFFECTED AREA AND NOTIFY COMPANY IN WRITING. THE WORK IN THE AFFECTED AREA SHALL NOT BE RESUMED EXCEPT BY WRITTEN NOTIFICATION BY COMPANY.
B. CONTRACTOR AGREES TO USE CARE WHILE ON THE SITE AND SHALL NOT TAKE ANY ACTION THAT WILL OR MAY RESULT IN OR CAUSE THE HAZARDOUS CONDITION TO BE FURTHER RELEASED IN THE ENVIRONMENT, OR TO FURTHER EXPOSE INDIVIDUALS TO THE HAZARD.

4.4 CONTRACTOR'S ACTIVITIES SHALL BE RESTRICTED TO THE PROJECT LIMITS. SHOULD AREAS OUTSIDE THE PROJECT LIMITS BE AFFECTED BY CONTRACTOR'S ACTIVITIES, CONTRACTOR SHALL IMMEDIATELY RETURN THEM TO ORIGINAL CONDITION.

4.5 CONDUCT TESTING AS REQUIRED HEREIN.

PART 5 – TESTS AND INSPECTIONS

5.1 TESTS AND INSPECTIONS:
- A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR ALL CONSTRUCTION TESTS, INSPECTIONS AND PROJECT DOCUMENTATION.
- B. CONTRACTOR SHALL COORDINATE TEST AND INSPECTION SCHEDULES WITH COMPANY'S REPRESENTATIVE WHO MUST BE ON SITE TO WITNESS SUCH TESTS AND INSPECTIONS.
- C. WHEN THE USE OF A THIRD PARTY INDEPENDENT TESTING AGENCY IS REQUIRED, THE AGENCY THAT IS SELECTED MUST PERFORM SUCH WORK ON A REGULAR BASIS IN THE STATE WHERE THE PROJECT IS LOCATED AND HAVE A THOROUGH UNDERSTANDING OF LOCAL AVAILABLE MATERIALS, INCLUDING THE SOIL, ROCK, AND GROUNDWATER CONDITIONS.
- D. THE THIRD PARTY TESTING AGENCY IS TO BE FAMILIAR WITH THE APPLICABLE REQUIREMENTS FOR THE TESTS TO BE DONE, EQUIPMENT TO BE USED, AND ASSOCIATED HEALTH AND SAFETY ISSUES.
- E. SITE RESISTANCE TO EARTH TESTING PER EXHIBIT: CELL SITE GROUNDING SYSTEM DESIGN.
- F. ANTENNA AND COAX SWEEP TESTS PER EXHIBIT: ANTENNA TRANSMISSION LINE ACCEPTANCE STANDARDS.
- G. ALL OTHER TESTS REQUIRED BY COMPANY OR JURISDICTION.

PART 6 – TRENCHING AND BACKFILLING

6.1 TRENCHING AND BACKFILLING: THE CONTRACTOR SHALL PERFORM ALL EXCAVATION OF EVERY DESCRIPTION AND OF WHATEVER SUBSTANCES ENCOUNTERED, TO THE DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR AS OTHERWISE SPECIFIED.

A. PROTECTION OF EXISTING UTILITIES: THE CONTRACTOR SHALL CHECK WITH THE LOCAL UTILITIES AND THE RESPECTIVE UTILITY LOCATOR COMPANIES PRIOR TO STARTING EXCAVATION OPERATIONS IN EACH RESPECTIVE AREA TO ASCERTAIN THE LOCATIONS OF KNOWN UTILITY LINES. THE LOCATIONS, NUMBER AND TYPES OF EXISTING UTILITY LINES DETAILED ON THE CONSTRUCTION DRAWINGS ARE APPROXIMATE AND DO NOT REPRESENT EXACT INFORMATION. THE CONTRACTOR SHALL BE RESPONSIBLE FOR REPAIRING ALL LINES DAMAGED DURING EXCAVATION AND ALL ASSOCIATED OPERATIONS. ALL UTILITY LINES UNCOVERED DURING THE EXCAVATION OPERATIONS, SHALL BE PROTECTED FROM DAMAGE DURING EXCAVATION AND ASSOCIATED OPERATIONS. ALL REPAIRS SHALL BE APPROVED BY THE UTILITY COMPANY.

B. HAND DIGGING: UNLESS APPROVED IN WRITING OTHERWISE, ALL DIGGING WITHIN AN EXISTING CELL SITE COMPOUND IS TO BE DONE BY HAND.

C. DURING EXCAVATION, MATERIAL SUITABLE FOR BACKFILLING SHALL BE STOCKPILED IN AN ORDERLY MANNER A SUFFICIENT DISTANCE FROM THE BANKS OF THE TRENCH TO AVOID OVERLOADING AND TO PREVENT SLIDES OR CAVE-INS. ALL EXCAVATED MATERIALS NOT REQUIRED OR SUITABLE FOR BACKFILL SHALL BE REMOVED AND DISPOSED OF AT THE CONTRACTOR'S EXPENSE.

D. GRADING SHALL BE DONE AS MAY BE NECESSARY TO PREVENT SURFACE WATER FROM FLOWING INTO TRENCHES OR OTHER EXCAVATIONS, AND ANY WATER ACCUMULATING THEREIN SHALL BE REMOVED BY PUMPING OR BY OTHER APPROVED METHOD.

E. SHEETING AND SHORING SHALL BE DONE AS NECESSARY FOR THE PROTECTION OF THE WORK AND FOR THE SAFETY OF PERSONNEL. UNLESS OTHERWISE INDICATED, EXCAVATION SHALL BE BY OPEN CUT, EXCEPT THAT SHORT SECTIONS OF A TRENCH MAY BE TUNNELED IF, THE CONDUIT CAN BE SAFELY AND PROPERLY INSTALLED AND BACKFILL CAN BE PROPERLY TAMPED IN SUCH TUNNEL SECTIONS. EARTH EXCAVATION SHALL COMPRISE ALL MATERIALS AND SHALL INCLUDE CLAY, SILT, SAND, MUCK, GRAVEL, HARDPAN, LOOSE SHALE, AND LOOSE STONE.

F. TRENCHES SHALL BE OF NECESSARY WIDTH FOR THE PROPER LAYING OF THE CONDUIT OR CABLE, AND THE BANKS SHALL BE AS NEARLY VERTICAL AS PRACTICABLE. THE BOTTOM OF THE TRENCHES SHALL BE ACCURATELY GRADED TO PROVIDE UNIFORM BEARING AND SUPPORT FOR EACH SECTION OF THE CONDUIT OR CABLE ON UNDISTURBED SOIL AT EVERY POINT ALONG ITS ENTIRE LENGTH. EXCEPT WHERE ROCK IS ENCOUNTERED, CARE SHALL BE TAKEN NOT TO EXCAVATE BELOW THE DEPTHS INDICATED. WHERE ROCK EXCAVATIONS ARE NECESSARY, THE ROCK SHALL BE EXCAVATED TO A MINIMUM OVER DEPTH OF 6 INCHES BELOW THE TRENCH DEPTHS INDICATED ON THE CONSTRUCTION DRAWINGS OR SPECIFIED. OVER DEPTHS IN THE ROCK EXCAVATION AND UNAUTHORIZED OVER DEPTHS SHALL BE THOROUGHLY BACK FILLED AND TAMPED TO THE APPROPRIATE GRADE. WHENEVER WET OR OTHERWISE UNSTABLE SOIL THAT IS INCAPABLE OF PROPERLY SUPPORTING THE CONDUIT OR CABLE IS ENCOUNTERED IN THE BOTTOM OF THE TRENCH, SUCH SOLID SHALL BE REMOVED TO A MINIMUM OVER DEPTH OF 6 INCHES AND THE TRENCH BACKFILLED TO THE PROPER GRADE WITH EARTH OF OTHER SUITABLE MATERIAL, AS HEREINAFTER SPECIFIED.

G. BACKFILLING OF TRENCHES. TRENCHES SHALL NOT BE BACKFILLED UNTIL ALL SPECIFIED TESTS HAVE BEEN PERFORMED AND ACCEPTED. WHERE COMPACTED BACKFILL IS NOT INDICATED THE TRENCHES SHALL BE CAREFULLY BACKFILLED WITH SELECT MATERIAL SUCH AS EXCAVATED SOILS THAT ARE FREE OF ROOTS, SOD, RUBBISH OR STONES, DEPOSITED IN 6 INCH LAYERS AND THOROUGHLY AND CAREFULLY RAMMED UNTIL THE CONDUIT OR CABLE HAS A COVER OF NOT LESS THAN 1 FOOT. THE REMAINDER OF THE BACKFILL MATERIAL SHALL BE GRANULAR IN NATURE AND SHALL NOT CONTAIN ROOTS, SOD, RUBBING, OR STONES OF 2-1/2 INCH MAXIMUM DIMENSION. BACKFILL SHALL BE CAREFULLY PLACED IN THE TRENCH AND IN 1 FOOT LAYERS AND EACH LAYER TAMPED. SETTLING THE BACKFILL WITH WATER WILL BE PERMITTED. THE SURFACE SHALL BE GRADED TO A REASONABLE UNIFORMITY AND THE MOUNDING OVER THE TRENCHES LEFT IN A UNIFORM AND NEAT CONDITION.

SYMBOL	DESCRIPTION
	CIRCUIT BREAKER
	NON-FUSIBLE DISCONNECT SWITCH
F	FUSIBLE DISCONNECT SWITCH
	SURFACE MOUNTED PANEL BOARD
T	TRANSFORMER
M	KILOWATT HOUR METER
JB	JUNCTION BOX
PB	PULL BOX TO NEC/TELCO STANDARDS
	UNDERGROUND UTILITIES
	EXOTHERMIC WELD CONNECTION
	MECHANICAL CONNECTION
OR ⊗	GROUND ROD
OR ⊠	GROUND ROD WITH INSPECTION SLEEVE
	GROUND BAR
	120AC DUPLEX RECEPTACLE
G	GROUND CONDUCTOR
	DC POWER AND FIBER OPTIC TRUNK CABLES
E	DC POWER CABLES
# / #	REPRESENTS DETAIL NUMBER / REF. DRAWING NUMBER

ABBREVIATIONS

CIGBE	COAX ISOLATED GROUND BAR EXTERNAL
MIGB	MASTER ISOLATED GROUND BAR
SST	SELF SUPPORTING TOWER
GPS	GLOBAL POSITIONING SYSTEM
TYP.	TYPICAL
DWG	DRAWING
BCW	BARE COPPER WIRE
BFG	BELOW FINISH GRADE
PVC	POLYVINYL CHLORIDE
CAB	CABINET
C	CONDUIT
SS	STAINLESS STEEL
G	GROUND
AWG	AMERICAN WIRE GAUGE
RGS	RIGID GALVANIZED STEEL
AHJ	AUTHORITY HAVING JURISDICTION
TTLNA	TOWER TOP LOW NOISE AMPLIFIER
UNO	UNLESS NOTED OTHERWISE
EMT	ELECTRICAL METALLIC TUBING
AGL	ABOVE GROUND LEVEL

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JOHN S. STEVENS
No. 24705
REGISTERED PROFESSIONAL ENGINEER
AUG 30 2018

No	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	RMS	08/30/18
A	ISSUED FOR REVIEW	SL	08/08/18

Drawn: RGD
Designed: NRL
Checked: AJD

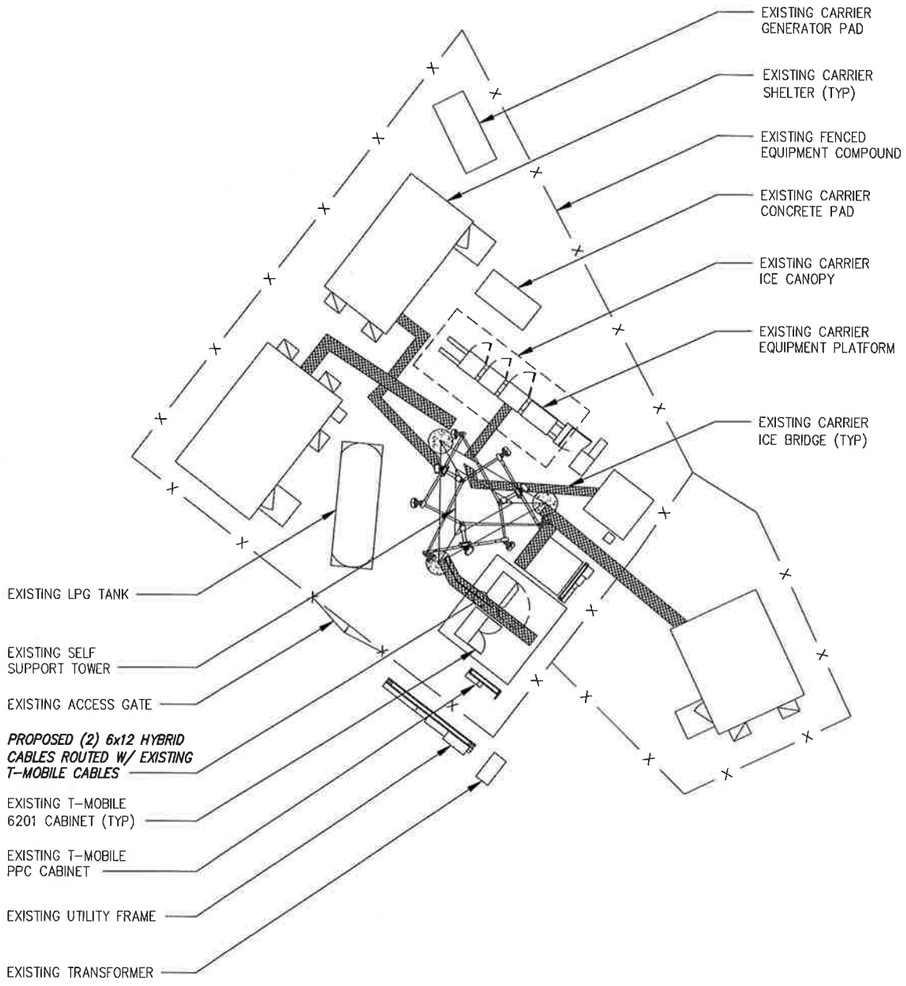
Project Number: 800-007

Project Title:
CT11018F
MILFORD/ I-95/ X37/ JCT
434 BOSTON POST ROAD
MILFORD, CT 06460

Prepared For:
CROWN CASTLE

Drawing Title
NOTES

Drawing Number
N1



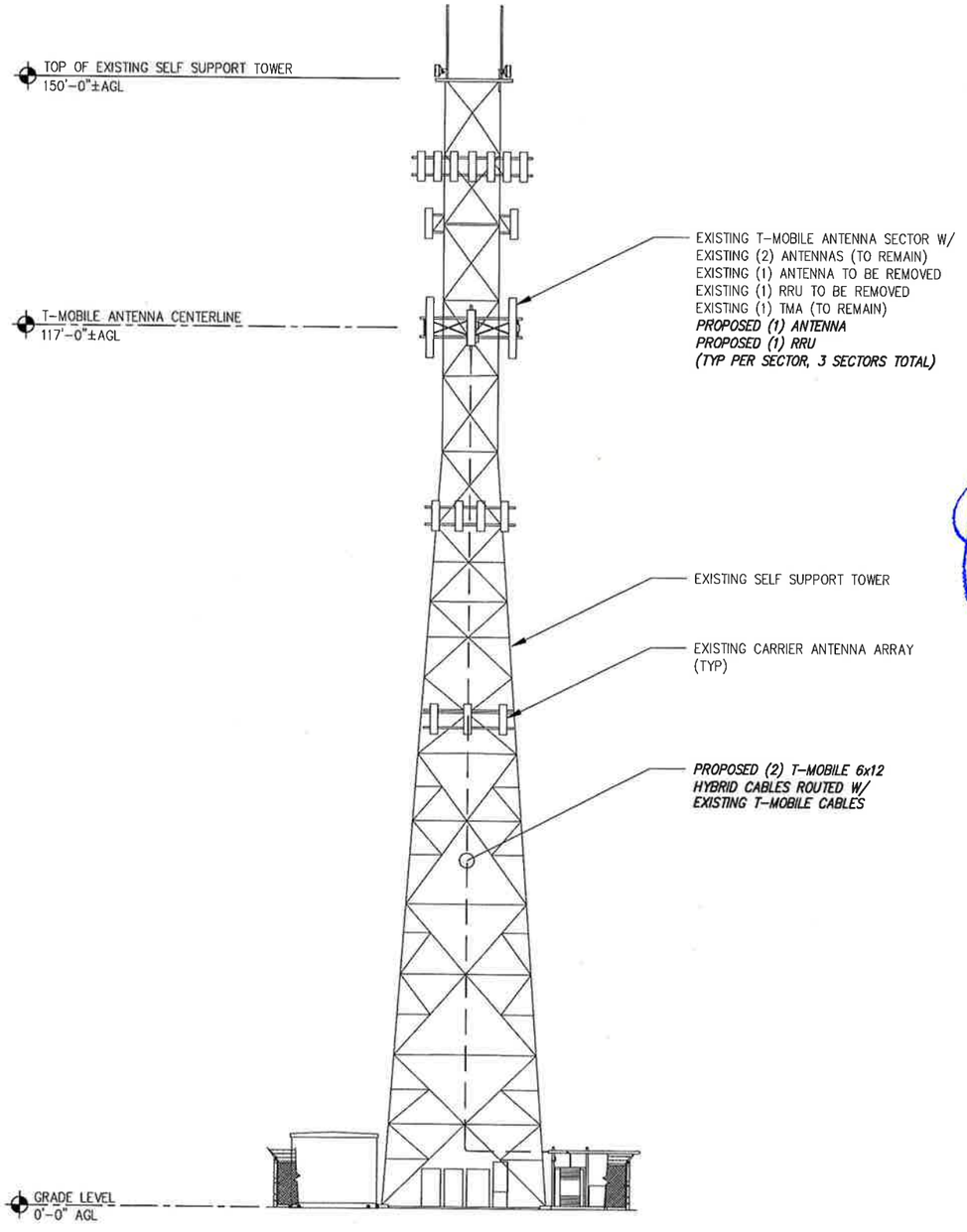
NORTH

1 C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:

20' 10' 0 10' 20'

SCALE (11x17): 1" = 20'-0"
SCALE (22x34): 1" = 10'-0"



2 C1 ELEVATION
SCALE: NOT TO SCALE

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STATE OF CONNECTICUT
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3-0-2018

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Prepared For:
CROWN CASTLE

Drawing Title
PLAN AND ELEVATION

Drawing Number
C1

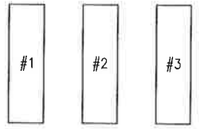
SECTOR	ANTENNA POSITION	ANTENNA MODEL #	VENDOR	AZIMUTH	M-TILT	E-TILT	ANTENNA CENTERLINE	TMA/RRU MODEL #	CABLE LENGTH	CABLE TYPE AND QUANTITY
ALPHA	A-1	AIR21 KRC118023-1_B2A_B4P	ERICSSON	50°	TBD	-	117'-0"	(1) GENERIC TWIN STYLE 1B-AWS	150'± **150'±**	(2) 1-5/8" COAX **(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-2	**APXVAARR24_43-U-NA20**	**RFS**	**50°**	TBD	-	117'-0"	**(1) RRU 4449 B71+B12**	**150'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-3	AIR21 KRC118046-1_B2P_B4A	ERICSSON	50°	TBD	-	117'-0"	-	**150'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
BETA	B-1	AIR21 KRC118023-1_B2A_B4P	ERICSSON	130°	TBD	-	117'-0"	(1) GENERIC TWIN STYLE 1B-AWS	150'± **150'±**	(2) 1-5/8" COAX **(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-2	**APXVAARR24_43-U-NA20**	**RFS**	**130°**	TBD	-	117'-0"	**(1) RRU 4449 B71+B12**	**150'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-3	AIR21 KRC118046-1_B2P_B4A	ERICSSON	130°	TBD	-	117'-0"	-	**150'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
GAMMA	C-1	AIR21 KRC118023-1_B2A_B4P	ERICSSON	270°	TBD	-	117'-0"	(1) GENERIC TWIN STYLE 1B-AWS	150'± **150'±**	(2) 1-5/8" COAX **(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-2	**APXVAARR24_43-U-NA20**	**RFS**	**270°**	TBD	-	117'-0"	**(1) RRU 4449 B71+B12**	**150'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-3	AIR21 KRC118046-1_B2P_B4A	ERICSSON	270°	TBD	-	117'-0"	-	**150'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND



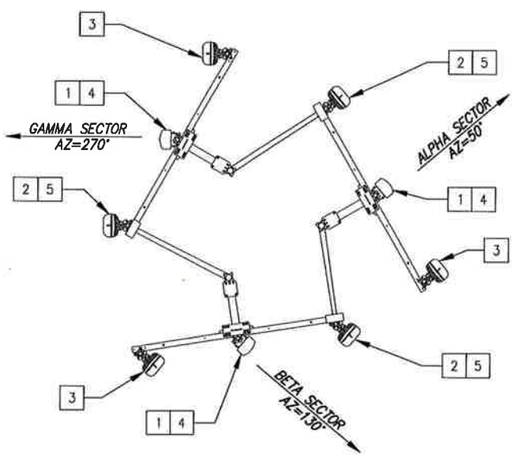
GENERAL NOTES:

1. CONTRACTOR TO VERIFY PROPOSED ANTENNA INFORMATION IS THE MOST CURRENT AT TIME OF CONSTRUCTION.
2. CONTRACTOR TO CONFIRM CABLE LENGTHS FOR ANY PROPOSED CABLES/JUMPERS PRIOR TO CONSTRUCTION.

ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	LNX-6515DS-A1M	ANTENNA	3	REMOVED
2	AIR21 KRC118023-1_B2A_B4P	ANTENNA	3	REMAIN
3	AIR21 KRC118046-1_B2P_B4A	ANTENNA	3	REMAIN
4	RRUS 11-B12	RRU	3	REMOVED
5	GENERIC TWIN STYLE 1B-AWS	TMA	3	REMAIN
6	**APXVAARR24_43-U-NA20**	**ANTENNA**	**3**	**PROPOSED**
7	**RRUS 4449**	**RRU**	**3**	**PROPOSED**
8	**SITE PRO 1 STK-U**	**STIFF ARM KIT**	**3**	**PROPOSED**

1 C2 RF SYSTEM CHART
SCALE: NOT TO SCALE



NORTH

2 C2 EXISTING ANTENNA ORIENTATION
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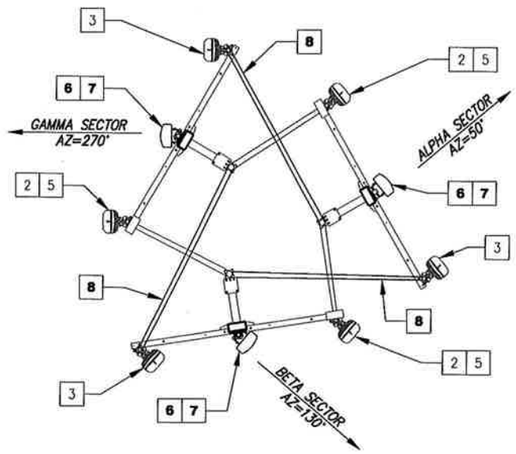

NORTH

3 C2 PROPOSED ANTENNA ORIENTATION
SCALE: NOT TO SCALE

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LICENSED PROFESSIONAL ENGINEER
AUG 30 2018

UNAUTHORIZED ALTERATION OR ADDITION TO THIS DOCUMENT IS A VIOLATION OF APPLICABLE STATE AND/OR LOCAL LAWS

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Checked: AJD

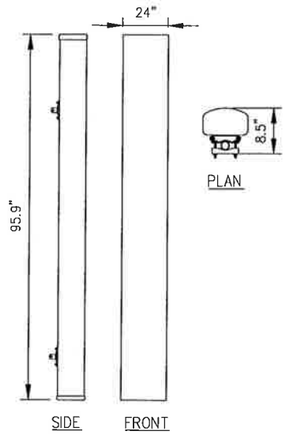
Project Number:
600-007

Project Title:
CT11018F
MILFORD/ I-95/ X37/ JCT
434 BOSTON POST ROAD
MILFORD, CT 06460

Prepared For:
CROWN CASTLE

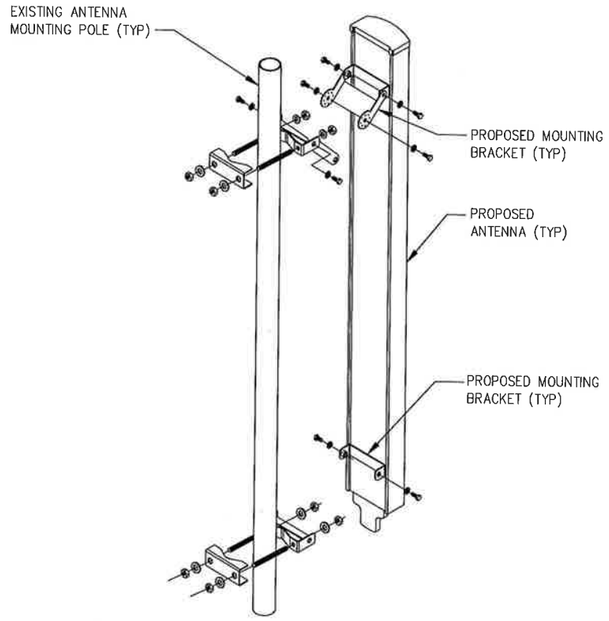
Drawing Title
RF CHART

Drawing Number
C2

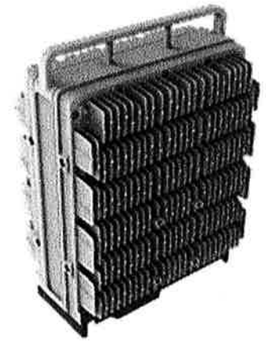


RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.5"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1/D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE



2/D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



ERICSSON 4449 B71+B12 SPECIFICATIONS

- HxWxD, (INCHES) : 17.91"x13.19"x10.63"
- WEIGHT (LBS) : 74.96
- COLOR : GRAY

3/D1 4449 B71+B12 RRU DETAIL
SCALE: NOT TO SCALE

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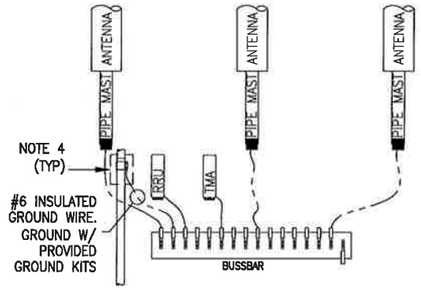
MILFORD/ I-95/ X37/ JCT
434 BOSTON POST ROAD
MILFORD, CT 06460

Prepared For:
CROWN CASTLE

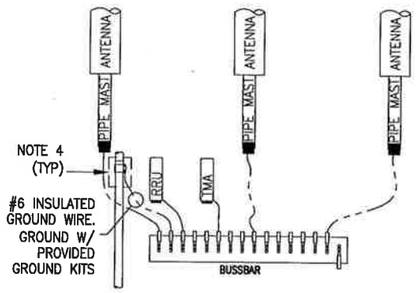
Drawing Title
EQUIPMENT DETAILS

Drawing Number
D1

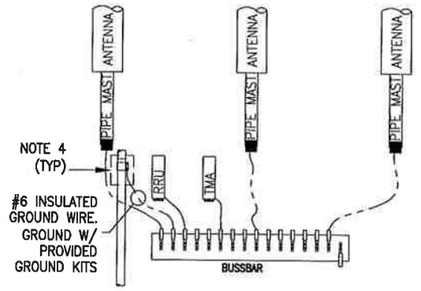
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

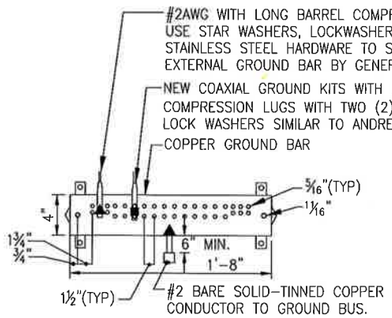


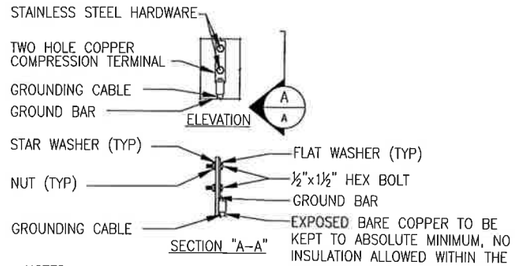
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



NOTES:
1. PROVIDE #2AWG GROUNDING CONDUCTOR, U.O.N.
2. PROVIDE BONDING AND GROUNDING CONDUCTORS WITH GREEN TYPE THWN INSULATION, U.O.N.
3. PROVIDE SOLID TINNED BARE COPPER WIRE (BCW) GROUNDING CONDUCTOR.
4. PROVIDE STANDARD COAX OR HYBRID CABLE GROUNDING KIT OR FIELD FABRICATE TO SUIT CONDITIONS. TOTAL LENGTH OF GROUNDING CONDUCTOR SHALL NOT EXCEED 10'-0".
5. PROVIDE GROUNDING ELECTRODES QUANTITY, TYPE AND SIZE AS INDICATED ON SITE GROUNDING PLAN.
6. LEAVE GROUND WIRE COILED UP ABOVE GRADE. CAP END OF CONDUIT.
7. ADD COAX OR HYBRID CABLE GROUND KIT CONNECTION TO BUSSBAR WHEN LENGTH OF CABLE TRAY (FROM TOWER OR MONOPOLE TO EQUIPMENT) IS GREATER THAN 20'-0".
8. ADD #2/0 GREEN INSULATED CONDUCTOR BETWEEN CABLE TRAY AND GRIPSTRUT/COVER.
9. BUSSBARS ARE TO BE TINNED COPPER BARS (¼"X2"X12") MOUNTED ON INSULATORS, U.O.N.
10. GROUND ALL PROPOSED ANTENNAS, DIPLEXERS, TMAS, AND RRUS PER MANU. SPECS.

1 E1 GROUNDING DIAGRAM
SCALE: NOT TO SCALE

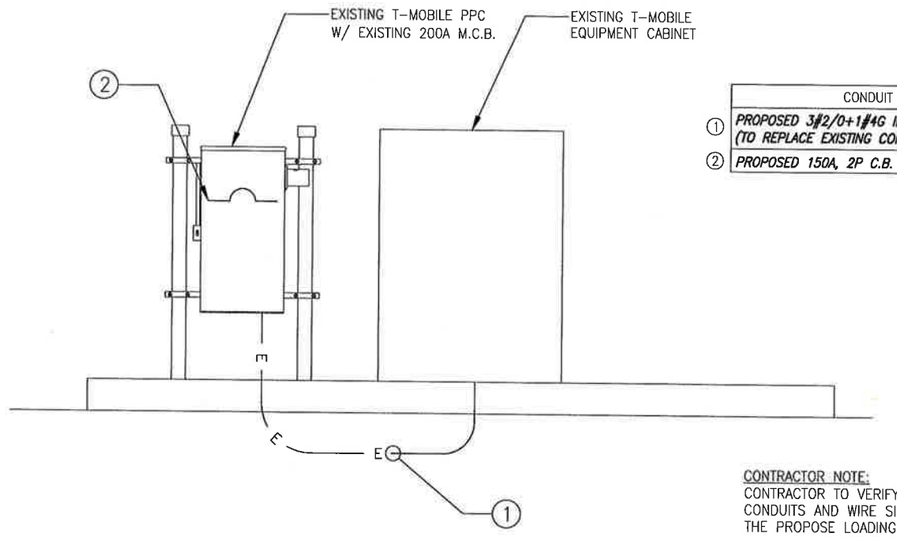




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

NOTES:
1. ALL HARDWARE STAINLESS STEEL COAT ALL SURFACES WITH KOPR-SHIELD BEFORE MATING.
2. FOR GROUND BOND TO STEEL ONLY: INSERT A TOOTH WASHER BETWEEN LUG AND STEEL, COAT ALL SURFACES WITH KOPR-SHIELD.
3. ALL HOLES ARE COUNTERSUNK 1/16".

2 E1 GROUND BAR CONNECTION DETAIL
SCALE: NOT TO SCALE



CONDUIT SCHEDULE
① PROPOSED 3#2/0+1#4G IN 2" CONDUIT (TO REPLACE EXISTING CONDUCTOR AND CONDUIT)
② PROPOSED 150A, 2P C.B.

3 E1 ONE LINE DIAGRAM
SCALE: NOT TO SCALE

CONTRACTOR NOTE:
CONTRACTOR TO VERIFY THAT THE EXISTING CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSE LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.

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Drawn: RCD
Designed: MRL
Checked: A-D

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CT11018F
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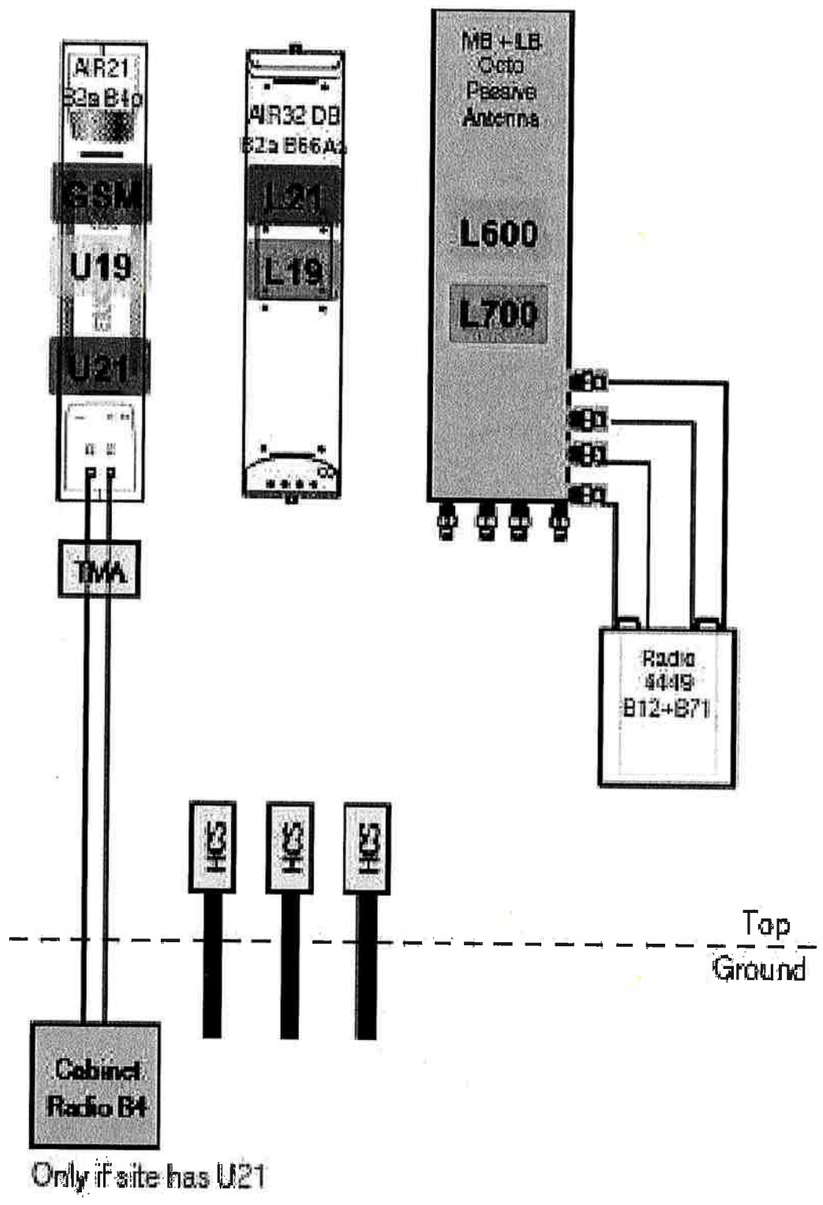
434 BOSTON POST ROAD
MILFORD, CT 06460

Prepared For:
CROWN CASTLE

Drawing Title
GROUNDING & ELECTRICAL DETAILS

Drawing Number
E1

67D920B_2xAIR+1DP.JPG



Notes:

67D92C.JPG

1 / E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

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MILFORD, CT 06460

Prepared For:
CROWN CASTLE

Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

July 18, 2018

Marianne Dunst
Crown Castle
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B+T Group
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Tulsa, OK 74119
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btwo@btgrp.com

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11018F
	Carrier Site Name:	Milford/I-95/X37/Jct.
Crown Castle Designation:	**Crown Castle BU Number:**	842870
	Crown Castle Site Name:	MILFORD
	Crown Castle JDE Job Number:	510430
	Crown Castle Work Order Number:	1586913
	Crown Castle Order Number:	444506 Rev. 0
Engineering Firm Designation:	**B+T Group Project Number:**	91292.009.01
Site Data:	**434 Boston Post Road, Milford, New Haven County, CT** **Latitude *41° 13' 42.69"*, Longitude *-73° 4' 12.47"*** **150 Foot - Self Support Tower**	

Dear Marianne Dunst,

B+T Group 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 1202426, in accordance with order 444506, revision 0.

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

LC7: Existing + Reserved + Proposed Equipment **Sufficient Capacity**
Note: See Table 1 and Table 2 for the proposed and existing/reserved loading, respectively.

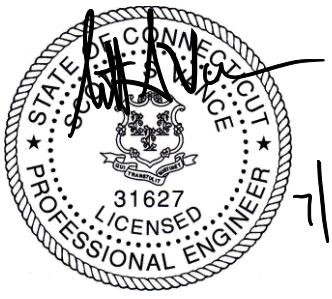
This analysis has been performed in accordance with the 2016 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category C and Risk Category II were used in this analysis.

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

We at *B+T Group* 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.

Structural analysis prepared by: Jacob Johnson, E.I.T.

Respectfully submitted by: B&T Engineering, Inc.
COA: CA 1170 Expires: 09/19/2019



7/18/18

Scott S. Vance, P.E.

tnxTower Report - version 7.0.5.1

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 150 ft. Self-Support tower designed by PiRod Inc. in March of 2000. The tower was originally designed for a wind speed of 85 mph per TIA/EIA-222-F. This tower has been modified by GPD Group in 2012 and those modifications were incorporated in this analysis.

2) ANALYSIS CRITERIA

The structural analysis was performed for this tower in accordance with the requirements of TIA-222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 97 mph with no ice, 50 mph with 0.75-inch ice thickness and 60 mph under service loads, exposure category C with topographic category 1 and crest height of 0 feet.

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
114.0	112.0	3	Ericsson	RADIO 4449 B12/B71	2	1-3/8	--
		3	Rfs Celwave	APXVAARR24_43-U-NA20			
		3	Site Pro	STK-U			

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
150.0	160.0	2	Sinclair	SC226-SFXSNM	6 1	5/8 3/8	1
	151.0	2	Radiowaves	HPLPD1-18			
	150.0	1	--	Platform Mount [LP 405-1]			
141.0	141.0	3	Andrew	SBNHH-1D65A	2 1	7/8 3/8	2
		3	Cci Antennas	OPA-65R-LCUU-H4			
		1	Commscope	WCS-IMFQ-AMT			
		3	Ericsson	RRUS 32 B2			
		3	Ericsson	RRUS 32 B30			
		3	Powerwave Tech	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		3	Ericsson	RRUS 11 B2	12 2 1	1-5/8 5/8 3/8	1
		3	Powerwave Tech	7020.00			
		3	Powerwave Tech	7770.00			
		3	Powerwave Tech	LGP21401			
		1	Raycap	DC6-48-60-18-8F			
		1	--	Sector Mount [SM 410-3]			
130.0	130.0	2	Terrawave	M5160160P10006	2	7/8	1
		2	--	Side Arm Mount [SO 301-1]			
118.0	128.0	1	Sinclair	SC229-SFXLDF	2	7/8	1
		1	Sinclair	SC320			
	118.0	2	--	Side Arm Mount [SO 306-1]			
114.0	114.0	1	--	Sector Mount [SM 307-3]	11	1-5/8	1
	112.0	3	Ericsson	ERICSSON AIR 21 B2A B4P			
		3	Ericsson	ERICSSON AIR 21 B4A B2P			
		3	Ericsson	KRY 112 71			

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
114.0	112.0	**3**	**Commscope**	**LNX-6515DS-VTM**	**7**	**1-5/8**	**3**
		3	**Ericsson**	**RRUS 11 B12**			
103.0	103.0	3	Alcatel Lucent	800MHZ 2X50W RRH W/FILTER	--	--	1
		3	Alcatel Lucent	PCS 1900MHZ 2X40W			
		1	--	Pipe Mount [PM 601-3]			
100.0	103.0	3	Alcatel Lucent	RRH2X50-800	3 1	1-1/4 7/8	2
		3	Alcatel Lucent	TD-RRH8X20-25			
	100.0	3	Commscope	DT465B-2XR			
		3	Site Pro	STK-U Stiff Arm Kit			
		3	Rfs Celwave	APXVSPP18-C-A20	--	--	1
		1	--	Sector Mount [SM 406-3]			
88.0	90.0	6	Antel	BXA-171063/8CF	12	1-5/8	1
		6	Antel	LPA-80063/4CF			
		1	Rfs Celwave	DB-T1-6Z-8AB-0Z			
		6	Rfs Celwave	FD9R6004/2C-3L			
		3	Swedcom	SWCP 2x5514			
	88.0	1	--	Sector Mount [SM 408-3]			
65.0	65.0	3	Rfs Celwave	APXV18-206517S-C	6	1-5/8	4
50.0	50.0	1	Pctel	GPS-TMG-HR-26NCM	1	1/2	1

Notes:
1) Existing Equipment
2) Reserved Equipment
3) Equipment To Be Removed; Not Considered in This Analysis
4) Abandoned Equipment considered In This Analysis

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)
150	150	4	Celwave	PD201	7	1 5/8
		3	Scala	PR950		
		1	Generic	LP Platform		
140	140	12	Allgon	7184	12	1 5/8
		3	Generic	T-Frames		
125	125	1	Celwave	PD201	1	1 5/8
		1	Generic	3' Stand off		
115	115	1	Celwave	PD201	2	1 5/8
		1	Celwave	PD220-DT		
		2	Generic	3' Stand off		

3) ANALYSIS PROCEDURE

Table 4 - Documents Provided

Document	Remarks	Reference	Source
Online Order Information	T-Mobile Co-Locate, Rev# 0	444506	CCI Sites
Tower Manufacturer Drawing	PiRod Inc., Eng. File No. A-116849-Q-92250	4480661	CCI Sites

Document	Remarks	Reference	Source
Tower Modification Drawing	GPD Group, Job No. 2012762.86,	4713244	CCI Sites
Post Modification Inspection	GPD Group, Job No. 2012858.01,	4713239	CCI Sites
Mount Analysis Report	Infinigy	Date:06/22/2018	--
Foundation Drawing	PiRod Inc., Eng. File No. A-116849-Q-92250	4480652	CCI Sites
Geotech Report	Clarence Welti Associates, Date: 01/17/2000	5359323	CCI Sites
Antenna Configuration	Crown CAD Package	Date: 06/08/2018	CCI Sites

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) Mount areas and weights are assumed based on photographs provided.
5) The existing base plate grout was considered in this analysis. Grout must be maintained and inspected periodically, and must be replaced if damaged or cracked. Refer to crown document ENG-BUL-10122, Tower Base Plate Grout Inspection and Classification.

This analysis may be affected if any assumptions are not valid or have been made in error. B+T Group 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
T1	150 - 147.583	Leg	1 1/2	2	-7.035	51.350	13.7	Pass
T2	147.583 - 130	Leg	1 1/2	14	-24.120	51.350	47.0	Pass
T3	130 - 110	Leg	2	71	-63.605	111.705	56.9	Pass
T4	110 - 100	Leg	Pirod 105244	135	-70.470	142.493	49.5	Pass
T5	100 - 80	Leg	Pirod 105216	146	-111.739	142.493	78.4	Pass
T6	80 - 60	Leg	Pirod 105217	169	-169.065	214.859	78.7	Pass
T7	60 - 40	Leg	Pirod 105218	187	-212.472	300.681	70.7	Pass
T8	40 - 20	Leg	Pirod 105218	202	-253.562	300.681	84.3	Pass
T9	20 - 0	Leg	Pirod 105219	217	-291.572	399.868	72.9	Pass
T1	150 - 147.583	Diagonal	3/4	8	-1.602	5.311	30.2	Pass
T2	147.583 - 130	Diagonal	3/4	22	-3.107	4.879	63.7	Pass
T3	130 - 110	Diagonal	7/8	79	-5.503	7.820	70.4	Pass
T4	110 - 100	Diagonal	L2 1/2x2 1/2x3/16	140	-9.335	13.558	68.8 75.7 (b)	Pass
T5	100 - 80	Diagonal	L2 1/2x2 1/2x3/8	155	-15.439	20.328	75.9	Pass
T6	80 - 60	Diagonal	L3x3x3/16	173	-8.869	14.947	59.3 76.4 (b)	Pass

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T7	60 - 40	Diagonal	L3x3x3/16	189	-8.729	12.112	72.1 75.1 (b)	Pass
T8	40 - 20	Diagonal	L3x3x5/16	208	-9.315	15.594	59.7	Pass
T9	20 - 0	Diagonal	L3x3x5/16	223	-10.716	12.868	83.3	Pass
T2	147.583 - 130	Horizontal	7/8	35	-0.325	5.109	6.4	Pass
T3	130 - 110	Horizontal	3/4	127	-0.722	2.563	28.2	Pass
T5	100 - 80	Horizontal	L3x3x3/16	160	-9.361	17.168	54.5 99.4 (b)	Pass
T1	150 - 147.583	Top Girt	5x1/2	4	-1.180	9.674	12.2	Pass
T2	147.583 - 130	Top Girt	7/8	18	-0.113	5.917	1.9	Pass
T3	130 - 110	Top Girt	7/8	74	-1.304	4.878	26.7	Pass
T4	110 - 100	Top Girt	L3x3x3/16	137	0.880	28.679	3.1 7.5 (b)	Pass
T5	100 - 80	Top Girt	L3x3x3/16	151	-6.215	19.238	32.3 66.5 (b)	Pass
T6	80 - 60	Top Girt	L3x3x3/16	171	-6.909	13.961	49.5 72.0 (b)	Pass
T2	147.583 - 130	Bottom Girt	7/8	19	-1.225	4.831	25.4	Pass
T3	130 - 110	Bottom Girt	7/8	76	-1.604	3.967	40.4	Pass
							Summary	
						Leg (T8)	84.3	Pass
						Diagonal (T9)	83.3	Pass
						Horizontal (T5)	99.4	Pass
						Top Girt (T6)	72.0	Pass
						Bottom Girt (T3)	40.4	Pass
						Bolt Checks	99.4	Pass
						Rating =	99.4	Pass

Table 6 - Tower Component Stresses vs. Capacity – LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	Base	55.0	Pass
1	Base Foundation (Structure)	Base	14.9	Pass
1	Base Foundation (Soil Interaction)	Base	42.0	Pass

Structure Rating (max from all components) =	99.4%

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

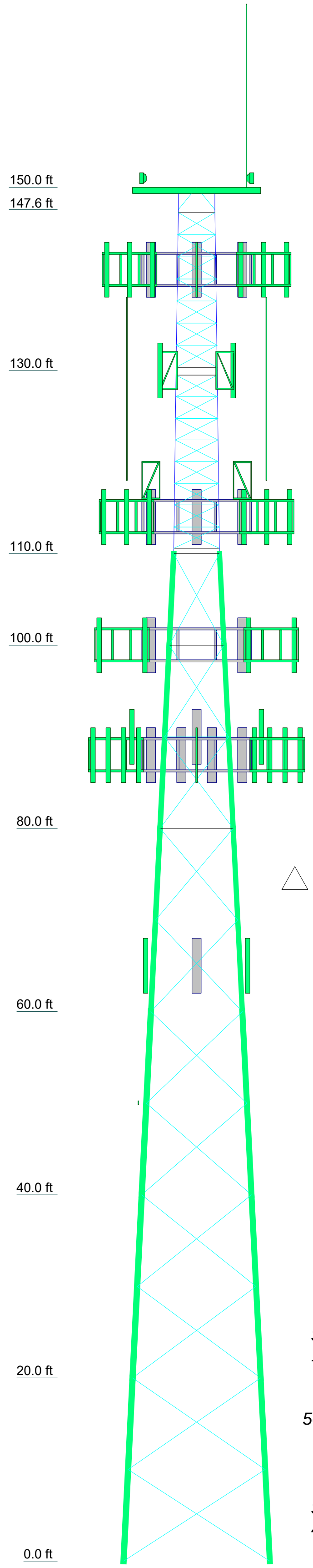
4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Bottom Girts	Horizontals	Face Width (ft)	# Panels @ (ft)	Weight (K)
T1	SR 1 1/2	A572-50	SR 3/4	A572-50	B	C	C	4		0.2
T2	SR 1 1/2	A572-50	SR 3/4	A572-50	SR 7/8	SR 7/8	SR 7/8	4.0625	8 @ 2.41667	0.7
T3	SR 2	A572-50	SR 7/8	A572-50	SR 7/8	SR 7/8	SR 3/4	4.5	8 @ 2.36458	1.3
T4	Pirod 105244	A572-50	A	A36	L3x3x3/16	N.A.	N.A.	5	11 @ 10	1.1
T5	Pirod 105216	A572-50	L2 1/2x2 1/2x3/8	A36	L3x3x3/16	N.A.	L3x3x3/16	6	11 @ 10	2.6
T6	Pirod 105217	A572-50	L3x3x3/16	A36	L3x3x3/16	N.A.	N.A.	8	11 @ 10	2.6
T7	Pirod 105218	A572-50	L3x3x3/16	A36	N.A.	N.A.	N.A.	10	11 @ 10	3.0
T8	Pirod 105218	A572-50	L3x3x5/16	A36	N.A.	N.A.	N.A.	12	11 @ 10	3.5
T9	Pirod 105219	A572-50	L3x3x5/16	A36	N.A.	N.A.	N.A.	14	11 @ 10	4.2
								16		19.2



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	C	N.A.
B	5x1/2		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven 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'
8. TOWER RATING: 99.4%

ALL REACTIONS
ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 303 K
SHEAR: 32 K

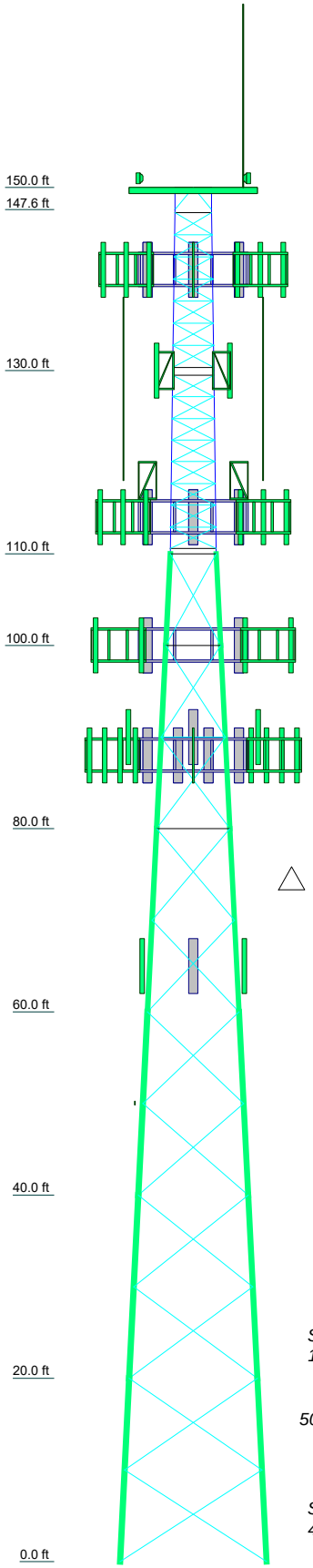
UPLIFT: -267 K
SHEAR: 29 K

AXIAL 161 K
SHEAR 15 K
MOMENT 1285 kip-ft
TORQUE 1 kip-ft
50 mph WIND - 0.750 in ICE

AXIAL 51 K
SHEAR 49 K
MOMENT 3958 kip-ft
TORQUE 3 kip-ft
REACTIONS - 97 mph WIND

B+T Group 1717 S. Boulder, Suite 300, Tulsa, OK 74119, Phone: (918) 587-4630, FAX: (918) 295-0265	Job: **91292.009.01 - MILFORD, CT (BU# 842870)**
	Project:
	Client: Crown Castle; Drawn by: Vinayak; App'd:
	Code: TIA-222-G; Date: 07/14/18; Scale: NTS
	Path: C:\Users\Q7\Desktop\Compile_91292_842870_Milford----Vinayak----Akshay---QCD\Tnx_009_01\91292_009_01_MILFORD_CT.eri; Dwg No. E-1

Section	T1										
Legs	T2 SR 1 1/2	T3 SR 2	T4 Pirod 105244	T5 Pirod 105216	T6 Pirod 105217	T7	T8 Pirod 105218	T9 Pirod 105219			
Leg Grade	A572-50										
Diagonals	SR 3/4	SR 7/8	A	L2 1/2x2 1/2x3/8	L3x3x3/16	L3x3x3/16	L3x3x5/16				
Diagonal Grade	A572-50				A36						
Top Girts	B	SR 7/8	L3x3x3/16				N.A.				
Bottom Girts	C	SR 7/8				N.A.					
Horizontals	C	SR 7/8	SR 3/4	N.A.	L3x3x3/16		N.A.				
Face Width (ft)	4	4.0625	4.5	5	6	8	10	12	14	16	
# Panels @ (ft)	8 @ 2.41667		8 @ 2.36458			11 @ 10					
Weight (K)	0.2	0.7	1.3	1.1	2.6	2.6	3.0	3.5	4.2	19.2	



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
6' x 2" Mount Pipe (E-Photo)	150	APXVAARR24_43-U-NA20 (P)	114
(3) 6' x 2" Mount Pipe (E-Photo)	150	RADIO 4449 B12/B71 (P)	114
(3) 6' x 2" Mount Pipe (E-Photo)	150	RADIO 4449 B12/B71 (P)	114
SC226-SFXSNM (E-CL per TIA)	150	RADIO 4449 B12/B71 (P)	114
SC226-SFXSNM (E-CL per TIA)	150	Sector Mount [SM 307-3] (4 M.P. / Sec. Inc.-2 tie back included)	114
1' x 6" x 3" (E-Camera)	150	ERICSSON AIR 21 B4A B2P (E)	114
Platform Mount [LP 405-1] (E)	150	ERICSSON AIR 21 B4A B2P (E)	114
HPLPD1-18 (E-Per photo)	150	PCS 1900MHZ 2X40W (E)	103
HPLPD1-18 (E-Per photo)	150	800MHZ 2X50W RRH W/FILTER (E)	103
7770.00 w/ Mount Pipe (E)	141	800MHZ 2X50W RRH W/FILTER (E)	103
LGP21401 (E)	141	800MHZ 2X50W RRH W/FILTER (E)	103
LGP21401 (E)	141	(2) 4' x 2" Pipe Mount (E-For TMA As per photo)	103
LGP21401 (E)	141	(2) 4' x 2" Pipe Mount (E-For TMA As per photo)	103
7020.00 (E)	141	(2) 4' x 2" Pipe Mount (E-For TMA As per photo)	103
7020.00 (E)	141	Pipe Mount [PM 601-3] (E-For TME)	103
7020.00 (E)	141	PCS 1900MHZ 2X40W (E)	103
RRUS 11 B2 (E)	141	PCS 1900MHZ 2X40W (E)	103
RRUS 11 B2 (E)	141	APXVSPP18-C-A20 w/ Mount Pipe (E)	100
RRUS 11 B2 (E)	141	DT465B-2XR w/ Mount Pipe (R)	100
DC6-48-60-18-8F (E)	141	DT465B-2XR w/ Mount Pipe (R)	100
SBNHH-1D65A w/ Mount Pipe (R)	141	DT465B-2XR w/ Mount Pipe (R)	100
SBNHH-1D65A w/ Mount Pipe (R)	141	RRH2X50-800 (R)	100
SBNHH-1D65A w/ Mount Pipe (R)	141	RRH2X50-800 (R)	100
OPA-65R-LCUU-H4 w/ Mount Pipe (R)	141	RRH2X50-800 (R)	100
OPA-65R-LCUU-H4 w/ Mount Pipe (R)	141	TD-RRH8X20-25 (R)	100
OPA-65R-LCUU-H4 w/ Mount Pipe (R)	141	TD-RRH8X20-25 (R)	100
LGP21401 (R)	141	TD-RRH8X20-25 (R)	100
LGP21401 (R)	141	Sector Mount [SM 406-3] (E)	100
LGP21401 (R)	141	10' horizontal x 2" Pipe Mount (R-STK-U STIFF Arm)	100
RRUS 32 B2 (R)	141	10' horizontal x 2" Pipe Mount (R-STK-U STIFF Arm)	100
RRUS 32 B2 (R)	141	10' horizontal x 2" Pipe Mount (R-STK-U STIFF Arm)	100
RRUS 32 B2 (R)	141	APXVSPP18-C-A20 w/ Mount Pipe (E)	100
RRUS 32 B30 (R)	141	APXVSPP18-C-A20 w/ Mount Pipe (E)	100
RRUS 32 B30 (R)	141	(2) BXA-171063/8CF w/ Mount Pipe (E)	88
RRUS 32 B30 (R)	141	SWCP 2x5514 w/ Mount Pipe (E)	88
WCS-IMFQ-AMT (R)	141	SWCP 2x5514 w/ Mount Pipe (E)	88
DC6-48-60-18-8F (R)	141	SWCP 2x5514 w/ Mount Pipe (E)	88
6' x 2" Mount Pipe (E)	141	(2) LPA-80063/4CF w/ Mount Pipe (E)	88
6' x 2" Mount Pipe (E)	141	(2) LPA-80063/4CF w/ Mount Pipe (E)	88
6' x 2" Mount Pipe (E)	141	(2) LPA-80063/4CF w/ Mount Pipe (E)	88
Sector Mount [SM 410-3] (1Existing Mount with Mount Mod)	141	(2) FD9R6004/2C-3L (E)	88
Pipe Mount [PM 601-3] (P-Mount Attachmen-Per Previous SA)	141	(2) FD9R6004/2C-3L (E)	88
7770.00 w/ Mount Pipe (E)	141	(2) FD9R6004/2C-3L (E)	88
7770.00 w/ Mount Pipe (E)	141	DB-T1-6Z-8AB-0Z (E)	88
Side Arm Mount [SO 301-1] (E)	130	Sector Mount [SM 408-3] (E)	88
Side Arm Mount [SO 301-1] (E)	130	Pipe Mount [PM 601-3] (E-Mount Attacment)	88
M5160160P10006 (E)	130	(2) BXA-171063/8CF w/ Mount Pipe (E)	88
M5160160P10006 (E)	130	(2) BXA-171063/8CF w/ Mount Pipe (E)	88
Side Arm Mount [SO 306-1] (E)	118	APXV18-206517S-C w/ Mount Pipe (AB-Leg connected)	65
Side Arm Mount [SO 306-1] (E)	118	APXV18-206517S-C w/ Mount Pipe (AB-Leg connected)	65
10' horizontal x 2" Pipe Mount (E-Tie Back as per photo)	118	APXV18-206517S-C w/ Mount Pipe (AB-Leg connected)	65
10' horizontal x 2" Pipe Mount (E-Tie Back as per photo)	118	GPS-TMG-HR-26NCM (E)	50
SC320 (E)	118	4' x 2" Pipe Mount (E)	50
SC229-SFXLDF (E)	118		
ERICSSON AIR 21 B4A B2P (E)	114		
ERICSSON AIR 21 B2A B4P (E)	114		
ERICSSON AIR 21 B2A B4P (E)	114		
ERICSSON AIR 21 B2A B4P (E)	114		
KRY 112 71 (E)	114		
KRY 112 71 (E)	114		
KRY 112 71 (E)	114		
APXVAARR24_43-U-NA20 (P)	114		
APXVAARR24_43-U-NA20 (P)	114		

ALL RE
ARE FA

MAX. C
DOV
SHE

UPL
SHE

A
1

SHEAR
15 K

TORQU
50 mph WIN
A
5

SHEAR
49 K

TORQU
REACTIONS

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	L2 1/2x2 1/2x3/16	C	N.A.
B	5x1/2		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

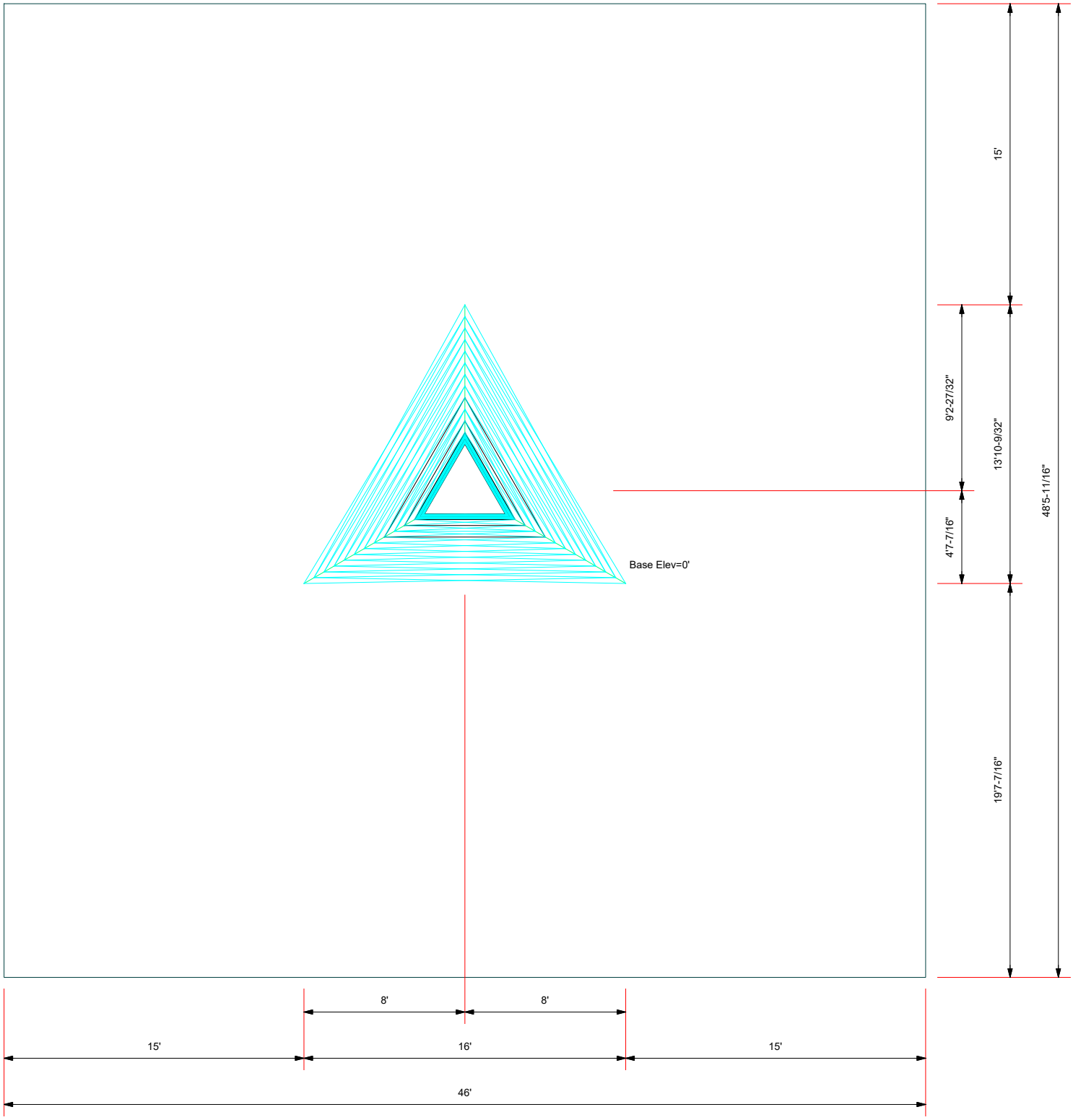
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut

B+T Group
1717 S. Boulder, Suite 300
Tulsa, OK 74119
Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 91292.009.01 - MILFORD, CT (BU# 842870)			
Project:			
Client: Crown Castle	Drawn by: Vinayak	App'd:	
Code: TIA-222-G	Date: 07/14/18	Scale: NTS	
Path: C:\Users\Q7\Desktop\Complete_91292_842870_Milford-----Vinayak-----Akshay---QCD\Tnx_009_01\91292_009_01_MILFORD_CT.eri		Dwg No. E-1	

Plot Plan
Total Area - 0.05 Acres



B+T Group
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Phone: (918) 587-4630
FAX: (918) 295-0265

Job: 91292.009.01 - MILFORD, CT (BU# 842870)			
Project:			
Client: Crown Castle	Drawn by: Vinayak	App'd:	
Code: TIA-222-G	Date: 07/14/18	Scale: NTS	
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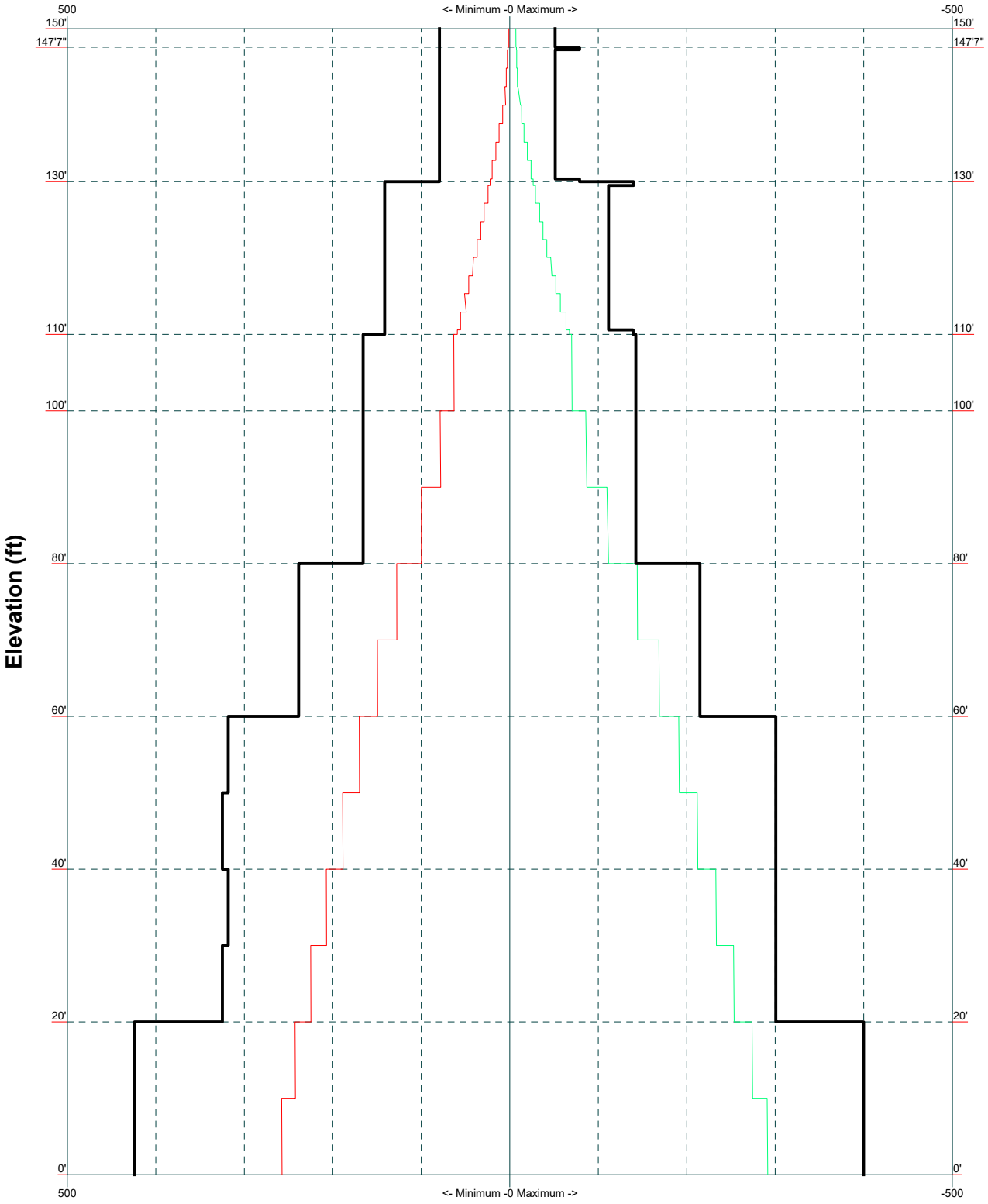
TIA-222-G - 97 mph/50 mph 0.750 in Ice Exposure C

Leg Capacity ——— **Leg Compression (K)**



B+T GRP

B+T Group
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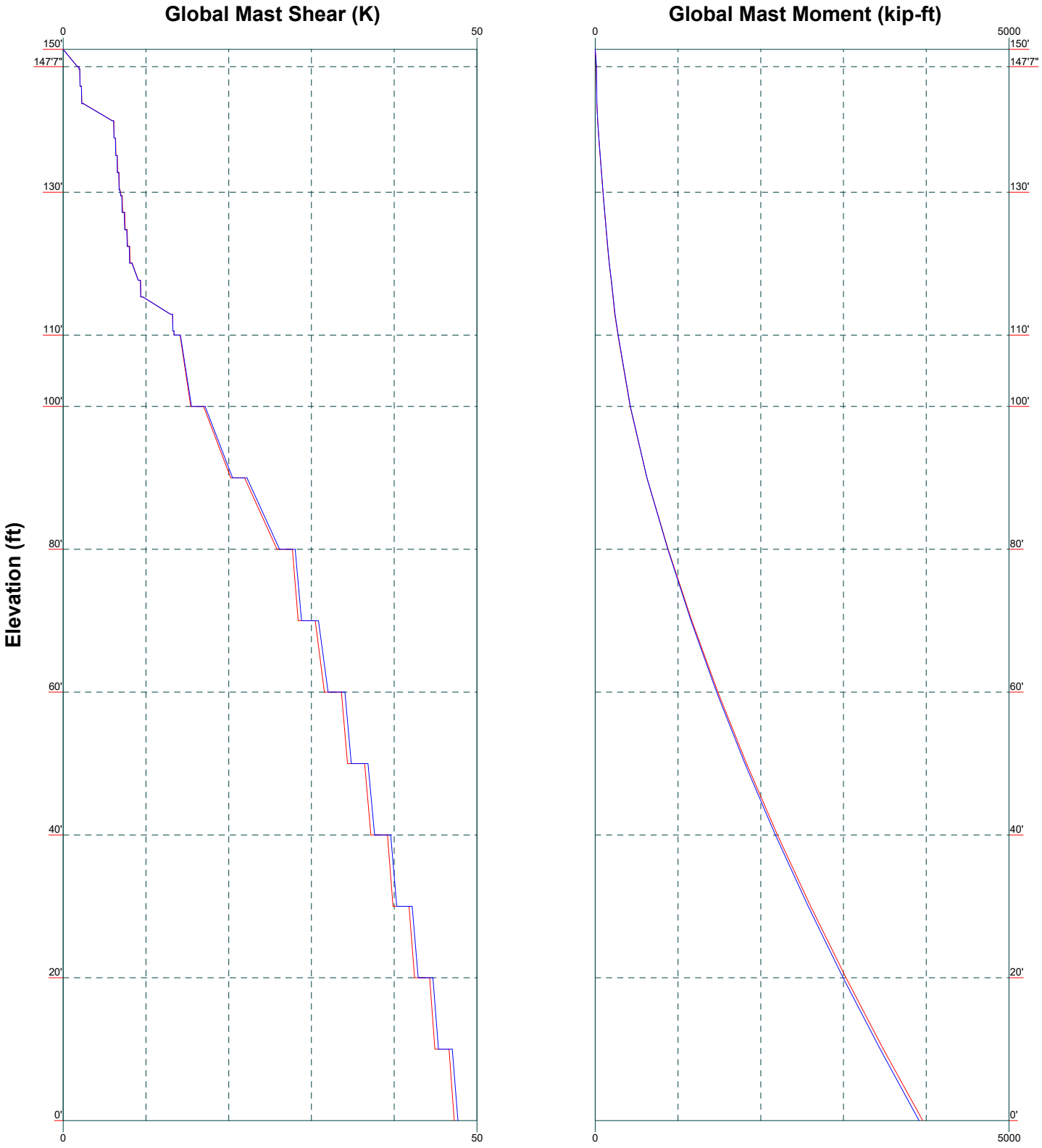
Job: ***91292.009.01 - MILFORD, CT (BU# 842870)***			
Project:			
Client: Crown Castle	Drawn by: Vinayak	App'd:	
Code: TIA-222-G	Date: 07/14/18	Scale: NTS	
Path: C:\Users\Q7\Desktop\Compile_91292_842870_Milford-----Vinayak-----Akshay---QCD\Tnx_009_01\91292_009_01_MILFORD_CT.eri		Dwg No. E-3	

TIA-222-G - 97 mph/50 mph 0.750 in Ice Exposure C

Maximum Values

Vx Vz Mx Mz



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Job: 91292.009.01 - MILFORD, CT (BU# 842870)			
Project:			
Client: Crown Castle	Drawn by: Vinayak	App'd:	
Code: TIA-222-G	Date: 07/14/18	Scale: NTS	
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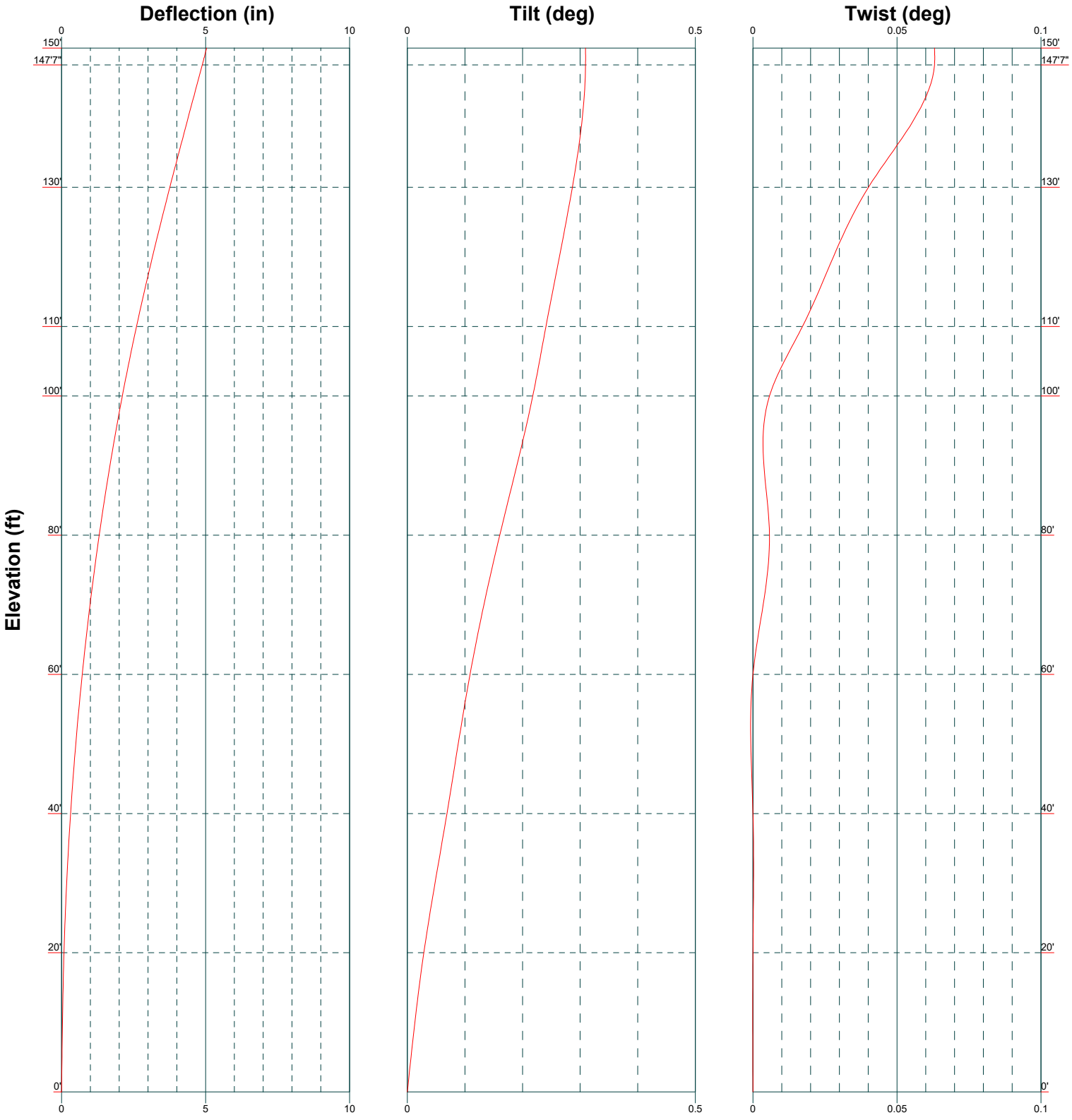
TIA-222-G - Service - 60 mph

Maximum Values



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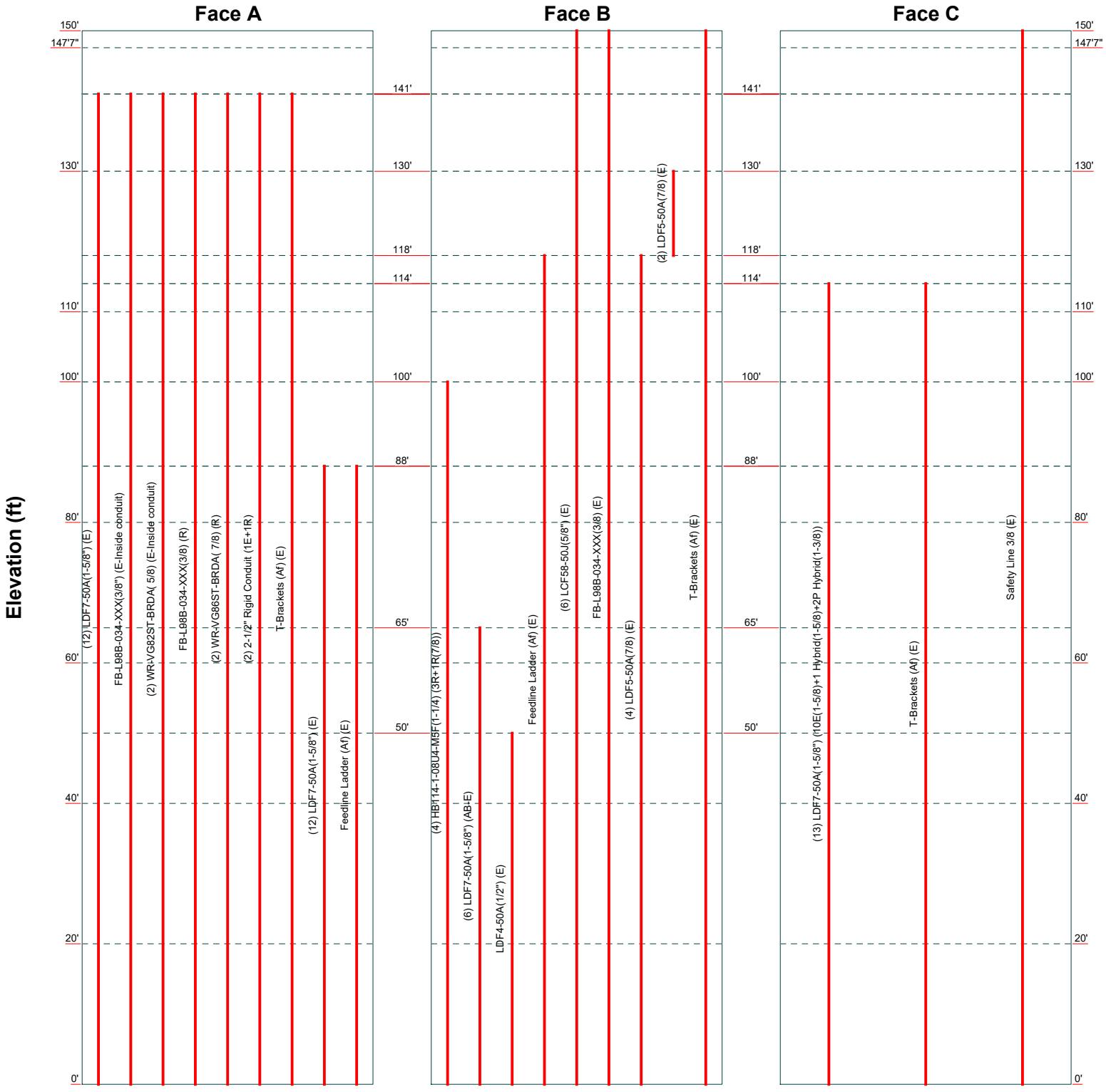
Job: 91292.009.01 - MILFORD, CT (BU# 842870)			
Project:			
Client: Crown Castle	Drawn by: Vinayak	App'd:	
Code: TIA-222-G	Date: 07/14/18	Scale: NTS	
Path: C:\Users\Q7\Desktop\Compile_91292_842870_Milford-----Vinayak-----Akshay---QCD\Tnx_009_01\91292_009_01_MILFORD_CT.eri		Dwg No. E-5	

Feed Line Distribution Chart
0' - 150'

Round | Flat | App In Face | App Out Face | Truss Leg



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Job:	***91292.009.01 - MILFORD, CT (BU# 842870)***		
Project:			
Client: Crown Castle		Drawn by: Vinayak	App'd:
Code: TIA-222-G		Date: 07/14/18	Scale: NTS
Path: C:\Users\Q7\Desktop\Compile_91292_842870_Milford-----Vinayak-----Akshay---QCD\Tnx_009_01\91292_009_01_MILFORD_CT.eri			Dwg No. E-7

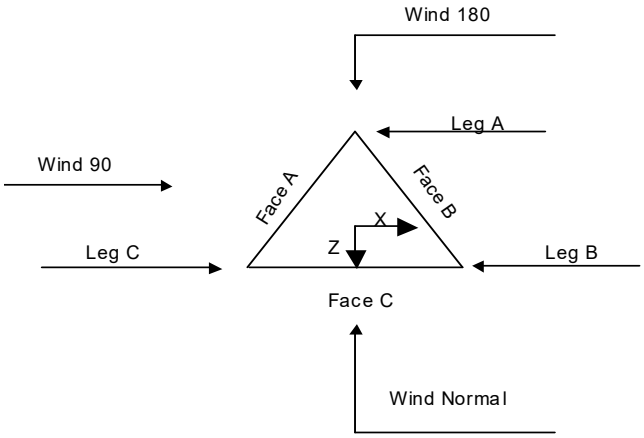
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 150' above the ground line.
The base of the tower is set at an elevation of 0' above the ground line.
The face width of the tower is 4' at the top and 16' at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Basic wind speed of 97 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0'.
Nominal ice thickness of 0.750 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °F.
Deflections calculated using a wind speed of 60 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
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		



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	150'-147'7"			4'	1	2'5"
T2	147'7"-130'			4'3/4"	1	17'7"
T3	130'-110'			4'6"	1	20'
T4	110'-100'			5'	1	10'
T5	100'-80'			6'	1	20'
T6	80'-60'			8'	1	20'
T7	60'-40'			10'	1	20'
T8	40'-20'			12'	1	20'
T9	20'-0'			14'	1	20'

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	150'-147'7"	2'5"	K Brace Down	No	Yes	0.000	0.000
T2	147'7"-130'	2'5"	X Brace	No	Steps	4.000	4.000
T3	130'-110'	2'4-3/8"	X Brace	No	Steps	6.000	7.000
T4	110'-100'	10'	X Brace	No	No	0.000	0.000
T5	100'-80'	10'	X Brace	No	Yes	0.000	0.000
T6	80'-60'	10'	X Brace	No	No	0.000	0.000

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T7	60'-40'	10'	X Brace	No	No	0.000	0.000
T8	40'-20'	10'	X Brace	No	No	0.000	0.000
T9	20'-0'	10'	X Brace	No	No	0.000	0.000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 150'-147'7"	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T2 147'7"-130'	Solid Round	1 1/2	A572-50 (50 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T3 130'-110'	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-100'	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T5 100'-80'	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/8	A36 (36 ksi)
T6 80'-60'	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T7 60'-40'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T8 40'-20'	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T9 20'-0'	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T2 147'7"-130'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T4 110'-100'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T5 100'-80'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)
T6 80'-60'	Equal Angle	L3x3x3/16	A36 (36 ksi)	Equal Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 150'-147'7"	None	Flat Bar		A36 (36 ksi)	Flat Bar	5x1/2	A36 (36 ksi)
T2 147'7"-130'	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 130'-110'	None	Flat Bar		A36 (36 ksi)	Solid Round	3/4	A572-50 (50 ksi)
T5 100'-80'	None	Flat Bar		A36 (36 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

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
T1 150'-147'7"	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T2 147'7"-130'	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T3 130'-110'	0.000	0.000	A36 (36 ksi)	1	1	1	Mid-Pt	Mid-Pt	Mid-Pt
T4 110'-100'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T5 100'-80'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T6 80'-60'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T7 60'-40'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T8 40'-20'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt
T9 20'-0'	0.000	0.000	A36 (36 ksi)	1.03	1	1.05	Mid-Pt	Mid-Pt	Mid-Pt

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1 150'-147'7"	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 147'7"-130'	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 130'-110'	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 110'-100'	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T5 100'-80'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T6 80'-60'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T7 60'-40'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T8 40'-20'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T9 20'-0'	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

[1]*Note: K factors are applied to member segment lengths. K-braces without inner supporting members will have the K factor in the out-of-plane direction applied to the overall length.*

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 110'-100'	1	0.5	0.85	1	0.5	0.85
T5 100'-80'	1	0.5	0.85	1	0.5	0.85
T6 80'-60'	1	0.5	0.85	1	0.5	0.85
T7 60'-40'	1	0.5	0.85	1	0.5	0.85
T8 40'-20'	1	0.5	0.85	1	0.5	0.85
T9 20'-0'	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 150'-147'7"	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
T2 147'7"-130'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
T3 130'-110'	0.000	1	0.000	1	0.000	1	0.000	1	0.000	0.75	0.000	1	0.000	0.75
T4 110'-100'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T5 100'-80'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T6 80'-60'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T7 60'-40'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T8 40'-20'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75
T9 20'-0'	0.000	1	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75	0.000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 150'-147'7"	Sleeve DS	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T2 147'7"-130'	Sleeve DS	0.625 A325N	5	0.625 A325N	0	0.625 A325N	0	0.000 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T3 130'-110'	Flange	1.000 A325N	6	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T4 110'-100'	Flange	1.000 A325N	6	1.000 A325N	1	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T5 100'-80'	Flange	1.000 A325N	6	1.000 A325N	1	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	1.000 A325N	1	0.625 A325N	0
T6 80'-60'	Flange	1.000 A325N	6	1.000 A325N	1	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T7 60'-40'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T8 40'-20'	Flange	1.000 A325N	6	1.000 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0
T9 20'-0'	Flange	1.250 A687	0	1.250 A325N	1	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0	0.625 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
Face A												
LDF7-50A(1-5/8") (E)	A	No	Ar (CaAa)	141' - 0'	-15.000	0.4	12	4	0.850 2.000	1.980		0.001
FB-L98B-034-XXX(3/8") (E-Inside conduit)	A	No	Ar (CaAa)	141' - 0'	-4.000	0.38	1	1	0.394	0.394		0.000
WR-VG82ST-BRDA(5/8) (E-Inside conduit)	A	No	Ar (CaAa)	141' - 0'	-4.000	0.37	2	2	0.645	0.645		0.000
FB-L98B-034-XXX(3/8) (R)	A	No	Ar (CaAa)	141' - 0'	-15.000	0.35	1	1	0.394	0.394		0.000
WR-VG86ST-BRDA(7/8) (R)	A	No	Ar (CaAa)	141' - 0'	-15.000	0.36	2	2	0.850 0.750	0.880		0.001
2-1/2" Rigid Conduit (1E+1R)	A	No	Ar (CaAa)	141' - 0'	-4.000	0.38	2	2	2.500	2.500		0.003
T-Brackets (Af) (E)	A	No	Af (CaAa)	141' - 0'	-15.000	0.42	1	1	1.000	1.000		0.008
V												
LDF7-50A(1-5/8")	A	No	Ar (CaAa)	88' - 0'	0.000	-0.1	12	12	0.750 0.500	1.980		0.001

Description	Face or Leg	Allow Shield	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
(E) Feedline Ladder (Af) (E) **V**	A	No	Af (CaAa)	88' - 0'	0.000	-0.1	1	1	3.000	3.000		0.008
Face B HB114-1-08U4-M5F(1-1/4) (3R+1R(7/8)) **V**	B	No	Ar (CaAa)	100' - 0'	-2.000	-0.22	4	4	0.850 0.750	1.540		0.001
LDF7-50A(1-5/8") (AB-E) **V**	B	No	Ar (CaAa)	65' - 0'	-2.000	-0.3	6	6	0.850 0.750	1.980		0.001
LDF4-50A(1/2") (E) **V**	B	No	Ar (CaAa)	50' - 0'	-1.000	-0.2	1	1	0.630	0.630		0.000
Feedline Ladder (Af) (E) **V**	B	No	Af (CaAa)	118' - 0'	-2.000	-0.28	1	1	3.000	3.000		0.008
Face C LCF58-50J(5/8") (E)	B	No	Ar (CaAa)	150' - 0'	-2.000	0.475	6	4	0.750 1.500	0.840		0.000
FB-L98B-034-XXX(3/8) (E)	B	No	Ar (CaAa)	150' - 0'	-2.000	0.42	1	1	0.394	0.394		0.000
LDF5-50A(7/8) (E)	B	No	Ar (CaAa)	118' - 0'	-2.000	0.44	4	4	0.850 0.750	1.090		0.000
LDF5-50A(7/8) (E) **V**	B	No	Ar (CaAa)	130' - 118'	-2.000	0.44	2	2	0.850 0.750	1.090		0.000
LDF7-50A(1-5/8") (10E(1-5/8)+1 Hybrid(1-5/8) +2P Hybrid(1-3/8)) **V**	C	No	Ar (CaAa)	114' - 0'	-7.000	0.42	13	6	0.850 0.750	1.980		0.001
T-Brackets (Af) (E)	B	No	Af (CaAa)	150' - 0'	-2.000	0.47	1	1	1.000	1.000		0.008
T-Brackets (Af) (E)	C	No	Af (CaAa)	114' - 0'	-2.500	0.44	1	1	1.000	1.000		0.008
Safety Line 3/8 (E) **V**	C	No	Ar (CaAa)	150' - 0'	0.000	0.5	1	1	0.375	0.375		0.000

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 klf
V							
V							
V							
V							

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
T1	150'-147'7"	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	1.716	0.000	0.024
		C	0.000	0.000	0.091	0.000	0.001
T2	147'7"-130'	A	0.000	0.000	37.690	0.000	0.290
		B	0.000	0.000	12.485	0.000	0.175
		C	0.000	0.000	0.659	0.000	0.004
T3	130'-110'	A	0.000	0.000	68.528	0.000	0.527
		B	0.000	0.000	24.305	0.000	0.285
		C	0.000	0.000	11.713	0.000	0.081
T4	110'-100'	A	0.000	0.000	34.264	0.000	0.263
		B	0.000	0.000	16.460	0.000	0.197
		C	0.000	0.000	27.782	0.000	0.193
T5	100'-80'	A	0.000	0.000	91.536	0.000	0.672
		B	0.000	0.000	45.241	0.000	0.498
		C	0.000	0.000	55.563	0.000	0.386
T6	80'-60'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	51.181	0.000	0.522
		C	0.000	0.000	55.563	0.000	0.386
T7	60'-40'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	69.631	0.000	0.597
		C	0.000	0.000	55.563	0.000	0.386
T8	40'-20'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	70.261	0.000	0.599
		C	0.000	0.000	55.563	0.000	0.386
T9	20'-0'	A	0.000	0.000	126.048	0.000	0.891
		B	0.000	0.000	70.261	0.000	0.599
		C	0.000	0.000	55.563	0.000	0.386

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
T1	150'-147'7"	A	1.744	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	5.591	0.000	0.096
		C		0.000	0.000	0.933	0.000	0.011
T2	147'7"-130'	A	1.732	0.000	0.000	77.468	0.000	1.452
		B		0.000	0.000	40.519	0.000	0.696
		C		0.000	0.000	6.749	0.000	0.082
T3	130'-110'	A	1.707	0.000	0.000	139.854	0.000	2.611
		B		0.000	0.000	75.499	0.000	1.190
		C		0.000	0.000	20.786	0.000	0.391
T4	110'-100'	A	1.684	0.000	0.000	69.476	0.000	1.292
		B		0.000	0.000	45.059	0.000	0.750
		C		0.000	0.000	36.645	0.000	0.787

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
T5	100'-80'	A	1.658	0.000	0.000	180.302	0.000	3.243
		B		0.000	0.000	121.886	0.000	1.940
		C		0.000	0.000	72.908	0.000	1.557
T6	80'-60'	A	1.617	0.000	0.000	241.827	0.000	4.196
		B		0.000	0.000	133.100	0.000	2.071
		C		0.000	0.000	72.299	0.000	1.531
T7	60'-40'	A	1.564	0.000	0.000	239.180	0.000	4.094
		B		0.000	0.000	172.418	0.000	2.562
		C		0.000	0.000	71.508	0.000	1.497
T8	40'-20'	A	1.486	0.000	0.000	235.331	0.000	3.947
		B		0.000	0.000	172.897	0.000	2.494
		C		0.000	0.000	70.356	0.000	1.448
T9	20'-0'	A	1.331	0.000	0.000	227.699	0.000	3.663
		B		0.000	0.000	166.406	0.000	2.279
		C		0.000	0.000	68.072	0.000	1.355

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	150'-147'7"	1.766	1.212	1.301	1.151
T2	147'7"-130'	2.203	-1.740	1.483	-0.252
T3	130'-110'	1.526	-1.898	1.259	-0.755
T4	110'-100'	-0.371	-0.769	0.349	-0.582
T5	100'-80'	-1.169	-1.395	-0.316	-0.960
T6	80'-60'	-2.352	-1.986	-1.339	-1.423
T7	60'-40'	-2.556	-3.106	-1.437	-2.279
T8	40'-20'	-3.026	-3.681	-1.688	-2.777
T9	20'-0'	-3.472	-4.192	-2.001	-3.249

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	25	LCF58-50J(5/8")	147.58 - 150.00	0.6000	0.3569
T1	26	FB-L98B-034-XXX(3/8)	147.58 - 150.00	0.6000	0.3569
T1	36	T-Brackets (Af)	147.58 - 150.00	0.6000	0.3569
T1	38	Safety Line 3/8	147.58 - 150.00	0.6000	0.3569
T2	2	LDF7-50A(1-5/8")	130.00 - 141.00	0.6000	0.5032
T2	3	FB-L98B-034-XXX(3/8")	130.00 - 141.00	0.0000	0.0000
T2	4	WR-VG82ST-BRDA(5/8)	130.00 - 141.00	0.0000	0.0000
T2	5	FB-L98B-034-XXX(3/8)	130.00 - 141.00	0.6000	0.5032

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	6	WR-VG86ST-BRDA(7/8)	130.00 - 141.00	0.6000	0.5032
T2	7	2-1/2" Rigid Conduit	130.00 - 141.00	0.6000	0.5032
T2	8	T-Brackets (Af)	130.00 - 141.00	0.6000	0.5032
T2	25	LCF58-50J(5/8")	130.00 - 147.58	0.6000	0.5032
T2	26	FB-L98B-034-XXX(3/8)	130.00 - 147.58	0.6000	0.5032
T2	36	T-Brackets (Af)	130.00 - 147.58	0.6000	0.5032
T2	38	Safety Line 3/8	130.00 - 147.58	0.6000	0.5032
T3	2	LDF7-50A(1-5/8")	110.00 - 130.00	0.6000	0.5136
T3	3	FB-L98B-034-XXX(3/8")	110.00 - 130.00	0.0000	0.0000
T3	4	WR-VG82ST-BRDA(5/8)	110.00 - 130.00	0.0000	0.0000
T3	5	FB-L98B-034-XXX(3/8)	110.00 - 130.00	0.6000	0.5136
T3	6	WR-VG86ST-BRDA(7/8)	110.00 - 130.00	0.6000	0.5136
T3	7	2-1/2" Rigid Conduit	110.00 - 130.00	0.6000	0.5136
T3	8	T-Brackets (Af)	110.00 - 130.00	0.6000	0.5136
T3	22	Feedline Ladder (Af)	110.00 - 118.00	0.6000	0.5136
T3	25	LCF58-50J(5/8")	110.00 - 130.00	0.6000	0.5136
T3	26	FB-L98B-034-XXX(3/8)	110.00 - 130.00	0.6000	0.5136
T3	29	LDF5-50A(7/8)	110.00 - 118.00	0.6000	0.5136
T3	30	LDF5-50A(7/8)	118.00 - 130.00	0.6000	0.5136
T3	33	LDF7-50A(1-5/8")	110.00 - 114.00	0.6000	0.5136
T3	36	T-Brackets (Af)	110.00 - 130.00	0.6000	0.5136
T3	37	T-Brackets (Af)	110.00 - 114.00	0.6000	0.5136
T3	38	Safety Line 3/8	110.00 - 130.00	0.6000	0.5136
T4	2	LDF7-50A(1-5/8")	100.00 - 110.00	0.6000	0.2879
T4	3	FB-L98B-034-XXX(3/8")	100.00 - 110.00	0.0000	0.0000
T4	4	WR-VG82ST-BRDA(5/8)	100.00 - 110.00	0.0000	0.0000
T4	5	FB-L98B-034-XXX(3/8)	100.00 - 110.00	0.6000	0.2879
T4	6	WR-VG86ST-BRDA(7/8)	100.00 - 110.00	0.6000	0.2879
T4	7	2-1/2" Rigid Conduit	100.00 - 110.00	0.6000	0.2879
T4	8	T-Brackets (Af)	100.00 - 110.00	0.6000	0.2879
T4	22	Feedline Ladder (Af)	100.00 - 110.00	0.6000	0.2879

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	25	LCF58-50J(5/8")	100.00 - 110.00	0.6000	0.2879
T4	26	FB-L98B-034-XXX(3/8)	100.00 - 110.00	0.6000	0.2879
T4	29	LDF5-50A(7/8)	100.00 - 110.00	0.6000	0.2879
T4	33	LDF7-50A(1-5/8")	100.00 - 110.00	0.6000	0.2879
T4	36	T-Brackets (Af)	100.00 - 110.00	0.6000	0.2879
T4	37	T-Brackets (Af)	100.00 - 110.00	0.6000	0.2879
T4	38	Safety Line 3/8	100.00 - 110.00	0.6000	0.2879
T5	2	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.3979
T5	3	FB-L98B-034-XXX(3/8")	80.00 - 100.00	0.0000	0.0000
T5	4	WR-VG82ST-BRDA(5/8)	80.00 - 100.00	0.0000	0.0000
T5	5	FB-L98B-034-XXX(3/8)	80.00 - 100.00	0.6000	0.3979
T5	6	WR-VG86ST-BRDA(7/8)	80.00 - 100.00	0.6000	0.3979
T5	7	2-1/2" Rigid Conduit	80.00 - 100.00	0.6000	0.3979
T5	8	T-Brackets (Af)	80.00 - 100.00	0.6000	0.3979
T5	10	LDF7-50A(1-5/8")	80.00 - 88.00	0.6000	0.3979
T5	11	Feedline Ladder (Af)	80.00 - 88.00	0.6000	0.3979
T5	16	HB114-1-08U4-M5F(1-1/4)	80.00 - 100.00	0.6000	0.3979
T5	22	Feedline Ladder (Af)	80.00 - 100.00	0.6000	0.3979
T5	25	LCF58-50J(5/8")	80.00 - 100.00	0.6000	0.3979
T5	26	FB-L98B-034-XXX(3/8)	80.00 - 100.00	0.6000	0.3979
T5	29	LDF5-50A(7/8)	80.00 - 100.00	0.6000	0.3979
T5	33	LDF7-50A(1-5/8")	80.00 - 100.00	0.6000	0.3979
T5	36	T-Brackets (Af)	80.00 - 100.00	0.6000	0.3979
T5	37	T-Brackets (Af)	80.00 - 100.00	0.6000	0.3979
T5	38	Safety Line 3/8	80.00 - 100.00	0.6000	0.3979
T6	2	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.5006
T6	3	FB-L98B-034-XXX(3/8")	60.00 - 80.00	0.0000	0.0000
T6	4	WR-VG82ST-BRDA(5/8)	60.00 - 80.00	0.0000	0.0000
T6	5	FB-L98B-034-XXX(3/8)	60.00 - 80.00	0.6000	0.5006
T6	6	WR-VG86ST-BRDA(7/8)	60.00 - 80.00	0.6000	0.5006
T6	7	2-1/2" Rigid Conduit	60.00 - 80.00	0.6000	0.5006
T6	8	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5006
T6	10	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.5006
T6	11	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5006
T6	16	HB114-1-08U4-M5F(1-1/4)	60.00 - 80.00	0.6000	0.5006
T6	18	LDF7-50A(1-5/8")	60.00 - 65.00	0.6000	0.5006
T6	22	Feedline Ladder (Af)	60.00 - 80.00	0.6000	0.5006
T6	25	LCF58-50J(5/8")	60.00 - 80.00	0.6000	0.5006
T6	26	FB-L98B-034-XXX(3/8)	60.00 - 80.00	0.6000	0.5006
T6	29	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.5006
T6	33	LDF7-50A(1-5/8")	60.00 - 80.00	0.6000	0.5006
T6	36	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5006
T6	37	T-Brackets (Af)	60.00 - 80.00	0.6000	0.5006
T6	38	Safety Line 3/8	60.00 - 80.00	0.6000	0.5006
T7	2	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	3	FB-L98B-034-XXX(3/8")	40.00 - 60.00	0.0000	0.0000
T7	4	WR-VG82ST-BRDA(5/8)	40.00 - 60.00	0.0000	0.0000
T7	5	FB-L98B-034-XXX(3/8)	40.00 - 60.00	0.6000	0.5840
T7	6	WR-VG86ST-BRDA(7/8)	40.00 - 60.00	0.6000	0.5840
T7	7	2-1/2" Rigid Conduit	40.00 - 60.00	0.6000	0.5840
T7	8	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5840
T7	10	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	11	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5840
T7	16	HB114-1-08U4-M5F(1-1/4)	40.00 - 60.00	0.6000	0.5840
T7	18	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	20	LDF4-50A(1/2")	40.00 - 50.00	0.6000	0.5840
T7	22	Feedline Ladder (Af)	40.00 - 60.00	0.6000	0.5840
T7	25	LCF58-50J(5/8")	40.00 - 60.00	0.6000	0.5840
T7	26	FB-L98B-034-XXX(3/8)	40.00 - 60.00	0.6000	0.5840
T7	29	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.5840
T7	33	LDF7-50A(1-5/8")	40.00 - 60.00	0.6000	0.5840
T7	36	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5840
T7	37	T-Brackets (Af)	40.00 - 60.00	0.6000	0.5840
T7	38	Safety Line 3/8	40.00 - 60.00	0.6000	0.5840
T8	2	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	3	FB-L98B-034-XXX(3/8")	20.00 - 40.00	0.0000	0.0000
T8	4	WR-VG82ST-BRDA(5/8)	20.00 - 40.00	0.0000	0.0000
T8	5	FB-L98B-034-XXX(3/8)	20.00 - 40.00	0.6000	0.6000
T8	6	WR-VG86ST-BRDA(7/8)	20.00 - 40.00	0.6000	0.6000
T8	7	2-1/2" Rigid Conduit	20.00 - 40.00	0.6000	0.6000
T8	8	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	10	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	11	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T8	16	HB114-1-08U4-M5F(1-1/4)	20.00 - 40.00	0.6000	0.6000
T8	18	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	20	LDF4-50A(1/2")	20.00 - 40.00	0.6000	0.6000
T8	22	Feedline Ladder (Af)	20.00 - 40.00	0.6000	0.6000
T8	25	LCF58-50J(5/8")	20.00 - 40.00	0.6000	0.6000
T8	26	FB-L98B-034-XXX(3/8)	20.00 - 40.00	0.6000	0.6000
T8	29	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.6000
T8	33	LDF7-50A(1-5/8")	20.00 - 40.00	0.6000	0.6000
T8	36	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	37	T-Brackets (Af)	20.00 - 40.00	0.6000	0.6000
T8	38	Safety Line 3/8	20.00 - 40.00	0.6000	0.6000
T9	2	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	3	FB-L98B-034-XXX(3/8")	0.00 - 20.00	0.0000	0.0000
T9	4	WR-VG82ST-BRDA(5/8)	0.00 - 20.00	0.0000	0.0000
T9	5	FB-L98B-034-XXX(3/8)	0.00 - 20.00	0.6000	0.6000
T9	6	WR-VG86ST-BRDA(7/8)	0.00 - 20.00	0.6000	0.6000
T9	7	2-1/2" Rigid Conduit	0.00 - 20.00	0.6000	0.6000
T9	8	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	10	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	11	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T9	16	HB114-1-08U4-M5F(1-1/4)	0.00 - 20.00	0.6000	0.6000
T9	18	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	20	LDF4-50A(1/2")	0.00 - 20.00	0.6000	0.6000
T9	22	Feedline Ladder (Af)	0.00 - 20.00	0.6000	0.6000
T9	25	LCF58-50J(5/8")	0.00 - 20.00	0.6000	0.6000
T9	26	FB-L98B-034-XXX(3/8)	0.00 - 20.00	0.6000	0.6000
T9	29	LDF5-50A(7/8)	0.00 - 20.00	0.6000	0.6000
T9	33	LDF7-50A(1-5/8")	0.00 - 20.00	0.6000	0.6000
T9	36	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	37	T-Brackets (Af)	0.00 - 20.00	0.6000	0.6000
T9	38	Safety Line 3/8	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

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
V									
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	150'	No Ice	1.425	1.425	0.022
(E-Photo)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
(3) 6' x 2" Mount Pipe	B	From Leg	4.000	0.000	150'	No Ice	1.425	1.425	0.022
(E-Photo)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
(3) 6' x 2" Mount Pipe	C	From Leg	4.000	0.000	150'	No Ice	1.425	1.425	0.022
(E-Photo)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
SC226-SFXSNM	B	From Leg	4.000	0.000	150'	No Ice	5.748	5.748	0.032
(E-CL per TIA)			0'			1/2" Ice	7.776	7.776	0.340
			10'			1" Ice	9.804	9.804	0.661
SC226-SFXSNM	B	From Leg	4.000	0.000	150'	No Ice	5.748	5.748	0.032
(E-CL per TIA)			0'			1/2" Ice	7.776	7.776	0.340
			10'			1" Ice	9.804	9.804	0.661
1' x 6" x 3"	C	From Leg	4.000	0.000	150'	No Ice	0.600	0.317	0.033
(E-Camera)			0'			1/2" Ice	0.704	0.401	0.038
			0'			1" Ice	0.815	0.492	0.044
Platform Mount [LP 405-1]	C	None		0.000	150'	No Ice	20.800	20.800	1.800
(E)						1/2" Ice	28.100	28.100	2.066
						1" Ice	35.400	35.400	2.332
V									
7770.00 w/ Mount Pipe	A	From Leg	4.000	0.000	141'	No Ice	5.746	4.254	0.055
(E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	B	From Leg	4.000	0.000	141'	No Ice	5.746	4.254	0.055
(E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
7770.00 w/ Mount Pipe	C	From Leg	4.000	0.000	141'	No Ice	5.746	4.254	0.055
(E)			0'			1/2" Ice	6.179	5.014	0.103
			0'			1" Ice	6.607	5.711	0.157
LGP21401	A	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401	B	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401	C	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(E)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
7020.00	A	From Leg	4.000	0.000	141'	No Ice	0.102	0.175	0.002
(E)			0'			1/2" Ice	0.147	0.239	0.005
			0'			1" Ice	0.199	0.311	0.009
7020.00	B	From Leg	4.000	0.000	141'	No Ice	0.102	0.175	0.002
(E)			0'			1/2" Ice	0.147	0.239	0.005
			0'			1" Ice	0.199	0.311	0.009
7020.00	C	From Leg	4.000	0.000	141'	No Ice	0.102	0.175	0.002
(E)			0'			1/2" Ice	0.147	0.239	0.005
			0'			1" Ice	0.199	0.311	0.009
RRUS 11 B2	A	From Leg	4.000	0.000	141'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			0'			1" Ice	3.259	1.485	0.095
RRUS 11 B2	B	From Leg	4.000	0.000	141'	No Ice	2.833	1.182	0.051
(E)			0'			1/2" Ice	3.043	1.330	0.072
			0'			1" Ice	3.259	1.485	0.095
RRUS 11 B2	C	From Leg	4.000	0.000	141'	No Ice	2.833	1.182	0.051

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0'			1/2" Ice	3.043	1.330	0.072
			0'			1" Ice	3.259	1.485	0.095
DC6-48-60-18-8F	B	From Leg	4.000	0.000	141'	No Ice	1.212	1.212	0.033
(E)			0'			1/2" Ice	1.892	1.892	0.055
			0'			1" Ice	2.105	2.105	0.080
SBNHH-1D65A w/ Mount Pipe	A	From Leg	4.000	0.000	141'	No Ice	5.954	5.190	0.061
			0'			1/2" Ice	6.390	5.961	0.114
(R)			0'			1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe	B	From Leg	4.000	0.000	141'	No Ice	5.954	5.190	0.061
			0'			1/2" Ice	6.390	5.961	0.114
(R)			0'			1" Ice	6.820	6.658	0.174
SBNHH-1D65A w/ Mount Pipe	C	From Leg	4.000	0.000	141'	No Ice	5.954	5.190	0.061
			0'			1/2" Ice	6.390	5.961	0.114
(R)			0'			1" Ice	6.820	6.658	0.174
OPA-65R-LCUU-H4 w/ Mount Pipe	A	From Leg	4.000	0.000	141'	No Ice	6.175	4.548	0.075
			0'			1/2" Ice	6.575	5.158	0.128
(R)			0'			1" Ice	6.982	5.779	0.187
OPA-65R-LCUU-H4 w/ Mount Pipe	B	From Leg	4.000	0.000	141'	No Ice	6.175	4.548	0.075
			0'			1/2" Ice	6.575	5.158	0.128
(R)			0'			1" Ice	6.982	5.779	0.187
OPA-65R-LCUU-H4 w/ Mount Pipe	C	From Leg	4.000	0.000	141'	No Ice	6.175	4.548	0.075
			0'			1/2" Ice	6.575	5.158	0.128
(R)			0'			1" Ice	6.982	5.779	0.187
LGP21401	A	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(R)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401	B	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(R)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
LGP21401	C	From Leg	4.000	0.000	141'	No Ice	1.104	0.207	0.014
(R)			0'			1/2" Ice	1.239	0.274	0.021
			0'			1" Ice	1.381	0.348	0.030
RRUS 32 B2	A	From Leg	4.000	0.000	141'	No Ice	2.731	1.668	0.053
(R)			0'			1/2" Ice	2.953	1.855	0.074
			0'			1" Ice	3.182	2.049	0.098
RRUS 32 B2	B	From Leg	4.000	0.000	141'	No Ice	2.731	1.668	0.053
(R)			0'			1/2" Ice	2.953	1.855	0.074
			0'			1" Ice	3.182	2.049	0.098
RRUS 32 B2	C	From Leg	4.000	0.000	141'	No Ice	2.731	1.668	0.053
(R)			0'			1/2" Ice	2.953	1.855	0.074
			0'			1" Ice	3.182	2.049	0.098
RRUS 32 B30	A	From Leg	4.000	0.000	141'	No Ice	2.692	1.573	0.060
(R)			0'			1/2" Ice	2.912	1.756	0.080
			0'			1" Ice	3.138	1.945	0.104
RRUS 32 B30	B	From Leg	4.000	0.000	141'	No Ice	2.692	1.573	0.060
(R)			0'			1/2" Ice	2.912	1.756	0.080
			0'			1" Ice	3.138	1.945	0.104
RRUS 32 B30	C	From Leg	4.000	0.000	141'	No Ice	2.692	1.573	0.060
(R)			0'			1/2" Ice	2.912	1.756	0.080
			0'			1" Ice	3.138	1.945	0.104
WCS-IMFQ-AMT	C	From Leg	4.000	0.000	141'	No Ice	0.989	0.644	0.030
(R)			0'			1/2" Ice	1.114	0.748	0.039
			0'			1" Ice	1.246	0.860	0.051
DC6-48-60-18-8F	A	From Leg	4.000	0.000	141'	No Ice	1.212	1.212	0.033
(R)			0'			1/2" Ice	1.892	1.892	0.055
			0'			1" Ice	2.105	2.105	0.080
6' x 2" Mount Pipe	A	From Leg	4.000	0.000	141'	No Ice	1.425	1.425	0.022

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	B	From Leg	4.000	0.000	141'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
6' x 2" Mount Pipe	C	From Leg	4.000	0.000	141'	No Ice	1.425	1.425	0.022
(E)			0'			1/2" Ice	1.925	1.925	0.033
			0'			1" Ice	2.294	2.294	0.048
Sector Mount [SM 410-3]	C	None		0.000	141'	No Ice	23.960	23.960	1.100
(1Existing Mount with Mount Mod)						1/2" Ice	34.060	34.060	1.600
						1" Ice	44.160	44.160	2.099
Pipe Mount [PM 601-3]	C	None		0.000	141'	No Ice	4.390	4.390	0.195
(P-Mount Attachmen-Per Previous SA)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
V									
M5160160P10006	B	From Leg	2.000	0.000	130'	No Ice	0.917	0.294	0.002
(E)			0'			1/2" Ice	1.049	0.408	0.007
			0'			1" Ice	1.187	0.530	0.014
M5160160P10006	C	From Leg	2.000	0.000	130'	No Ice	0.917	0.294	0.002
(E)			0'			1/2" Ice	1.049	0.408	0.007
			0'			1" Ice	1.187	0.530	0.014
Side Arm Mount [SO 301-1]	B	From Leg	1.000	0.000	130'	No Ice	1.000	0.900	0.023
(E)			0'			1/2" Ice	1.390	1.420	0.033
			0'			1" Ice	1.780	1.940	0.042
Side Arm Mount [SO 301-1]	C	From Leg	1.000	0.000	130'	No Ice	1.000	0.900	0.023
(E)			0'			1/2" Ice	1.390	1.420	0.033
			0'			1" Ice	1.780	1.940	0.042
V									
SC320	B	From Leg	6.000	0.000	118'	No Ice	6.380	6.380	0.025
(E)			0'			1/2" Ice	8.613	8.613	0.071
			10'			1" Ice	10.862	10.862	0.131
SC229-SFXLDF	C	From Leg	6.000	0.000	118'	No Ice	5.950	5.950	0.032
(E)			0'			1/2" Ice	7.967	7.967	0.075
			10'			1" Ice	10.000	10.000	0.130
Side Arm Mount [SO 306-1]	B	From Leg	3.000	0.000	118'	No Ice	0.980	2.180	0.042
(E)			0'			1/2" Ice	1.700	3.800	0.062
			0'			1" Ice	2.420	5.420	0.083
Side Arm Mount [SO 306-1]	C	From Leg	3.000	0.000	118'	No Ice	0.980	2.180	0.042
(E)			0'			1/2" Ice	1.700	3.800	0.062
			0'			1" Ice	2.420	5.420	0.083
10' horizontal x 2" Pipe Mount	B	From Face	1.000	0.000	118'	No Ice	2.000	2.000	0.100
(E-Tie Back as per photo)			0'			1/2" Ice	3.025	3.025	0.116
			0'			1" Ice	4.067	4.067	0.137
10' horizontal x 2" Pipe Mount	C	From Face	1.000	0.000	118'	No Ice	2.000	2.000	0.100
(E-Tie Back as per photo)			0'			1/2" Ice	3.025	3.025	0.116
			0'			1" Ice	4.067	4.067	0.137
V									
ERICSSON AIR 21 B4A B2P	A	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
(E)			0'			1/2" Ice	6.462	4.649	0.133
			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B4A B2P	B	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
(E)			0'			1/2" Ice	6.462	4.649	0.133
			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B4A B2P	C	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092
(E)			0'			1/2" Ice	6.462	4.649	0.133
			-2'			1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B2A	A	From Leg	4.000	0.000	114'	No Ice	6.092	4.297	0.092

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
B4P			0'				1/2" Ice	6.462	4.649	0.133
(E)			-2'				1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B2A	B	From Leg	4.000		0.000	114'	No Ice	6.092	4.297	0.092
B4P			0'				1/2" Ice	6.462	4.649	0.133
(E)			-2'				1" Ice	6.838	5.005	0.180
ERICSSON AIR 21 B2A	C	From Leg	4.000		0.000	114'	No Ice	6.092	4.297	0.092
B4P			0'				1/2" Ice	6.462	4.649	0.133
(E)			-2'				1" Ice	6.838	5.005	0.180
KRY 112 71	A	From Leg	4.000		0.000	114'	No Ice	0.583	0.398	0.013
(E)			0'				1/2" Ice	0.688	0.488	0.018
			-2'				1" Ice	0.799	0.586	0.025
KRY 112 71	B	From Leg	4.000		0.000	114'	No Ice	0.583	0.398	0.013
(E)			0'				1/2" Ice	0.688	0.488	0.018
			-2'				1" Ice	0.799	0.586	0.025
KRY 112 71	C	From Leg	4.000		0.000	114'	No Ice	0.583	0.398	0.013
(E)			0'				1/2" Ice	0.688	0.488	0.018
			-2'				1" Ice	0.799	0.586	0.025
APXVAARR24_43-U-NA20	A	From Leg	4.000		0.000	114'	No Ice	20.243	8.889	0.128
(P)			0'				1/2" Ice	20.890	9.487	0.241
			-2'				1" Ice	21.544	10.092	0.362
APXVAARR24_43-U-NA20	B	From Leg	4.000		0.000	114'	No Ice	20.243	8.889	0.128
(P)			0'				1/2" Ice	20.890	9.487	0.241
			-2'				1" Ice	21.544	10.092	0.362
APXVAARR24_43-U-NA20	C	From Leg	4.000		0.000	114'	No Ice	20.243	8.889	0.128
(P)			0'				1/2" Ice	20.890	9.487	0.241
			-2'				1" Ice	21.544	10.092	0.362
RADIO 4449 B12/B71	A	From Leg	4.000		0.000	114'	No Ice	1.650	1.300	0.075
(P)			0'				1/2" Ice	1.810	1.445	0.092
			-2'				1" Ice	1.978	1.597	0.112
RADIO 4449 B12/B71	B	From Leg	4.000		0.000	114'	No Ice	1.650	1.300	0.075
(P)			0'				1/2" Ice	1.810	1.445	0.092
			-2'				1" Ice	1.978	1.597	0.112
RADIO 4449 B12/B71	C	From Leg	4.000		0.000	114'	No Ice	1.650	1.300	0.075
(P)			0'				1/2" Ice	1.810	1.445	0.092
			-2'				1" Ice	1.978	1.597	0.112
Sector Mount [SM 307-3]	C	None			0.000	114'	No Ice	26.220	26.220	1.620
(4 M.P. / Sec. Inc.-2 tie back included)							1/2" Ice	36.280	36.280	2.148
V							1" Ice	46.340	46.340	2.676
PCS 1900MHZ 2X40W	A	From Leg	4.000		0.000	103'	No Ice	2.351	1.278	0.044
(E)			0'				1/2" Ice	2.547	1.434	0.062
			0'				1" Ice	2.751	1.598	0.084
PCS 1900MHZ 2X40W	B	From Leg	4.000		0.000	103'	No Ice	2.351	1.278	0.044
(E)			0'				1/2" Ice	2.547	1.434	0.062
			0'				1" Ice	2.751	1.598	0.084
PCS 1900MHZ 2X40W	C	From Leg	4.000		0.000	103'	No Ice	2.351	1.278	0.044
(E)			0'				1/2" Ice	2.547	1.434	0.062
			0'				1" Ice	2.751	1.598	0.084
800MHZ 2X50W RRH W/FILTER	A	From Leg	4.000		0.000	103'	No Ice	2.058	1.932	0.064
			0'				1/2" Ice	2.240	2.109	0.086
(E)			0'				1" Ice	2.429	2.293	0.111
800MHZ 2X50W RRH W/FILTER	B	From Leg	4.000		0.000	103'	No Ice	2.058	1.932	0.064
			0'				1/2" Ice	2.240	2.109	0.086
(E)			0'				1" Ice	2.429	2.293	0.111
800MHZ 2X50W RRH W/FILTER	C	From Leg	4.000		0.000	103'	No Ice	2.058	1.932	0.064
			0'				1/2" Ice	2.240	2.109	0.086
(E)			0'				1" Ice	2.429	2.293	0.111

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
(2) 4' x 2" Pipe Mount	A	From Leg	1.000	0.000	103'	No Ice	0.785	0.785	0.029
(E-For TMA As per photo)			0'			1/2" Ice	1.028	1.028	0.035
			0'			1" Ice	1.281	1.281	0.044
(2) 4' x 2" Pipe Mount	B	From Leg	1.000	0.000	103'	No Ice	0.785	0.785	0.029
(E-For TMA As per photo)			0'			1/2" Ice	1.028	1.028	0.035
			0'			1" Ice	1.281	1.281	0.044
(2) 4' x 2" Pipe Mount	C	From Leg	1.000	0.000	103'	No Ice	0.785	0.785	0.029
(E-For TMA As per photo)			0'			1/2" Ice	1.028	1.028	0.035
			0'			1" Ice	1.281	1.281	0.044
Pipe Mount [PM 601-3]	C	None		0.000	103'	No Ice	4.390	4.390	0.195
(E-For TME)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
V									
APXVSPP18-C-A20 w/	A	From Leg	4.000	0.000	100'	No Ice	8.262	6.946	0.083
Mount Pipe			0'			1/2" Ice	8.822	8.127	0.151
(E)			0'			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	B	From Leg	4.000	0.000	100'	No Ice	8.262	6.946	0.083
Mount Pipe			0'			1/2" Ice	8.822	8.127	0.151
(E)			0'			1" Ice	9.346	9.021	0.227
APXVSPP18-C-A20 w/	C	From Leg	4.000	0.000	100'	No Ice	8.262	6.946	0.083
Mount Pipe			0'			1/2" Ice	8.822	8.127	0.151
(E)			0'			1" Ice	9.346	9.021	0.227
DT465B-2XR w/ Mount Pipe	A	From Leg	4.000	0.000	100'	No Ice	9.336	7.634	0.084
(R)			0'			1/2" Ice	9.905	8.820	0.160
			0'			1" Ice	10.439	9.718	0.245
DT465B-2XR w/ Mount Pipe	B	From Leg	4.000	0.000	100'	No Ice	9.336	7.634	0.084
(R)			0'			1/2" Ice	9.905	8.820	0.160
			0'			1" Ice	10.439	9.718	0.245
DT465B-2XR w/ Mount Pipe	C	From Leg	4.000	0.000	100'	No Ice	9.336	7.634	0.084
(R)			0'			1/2" Ice	9.905	8.820	0.160
			0'			1" Ice	10.439	9.718	0.245
RRH2X50-800	A	From Leg	4.000	0.000	100'	No Ice	1.701	1.282	0.053
(R)			0'			1/2" Ice	1.864	1.428	0.070
			3'			1" Ice	2.035	1.580	0.090
RRH2X50-800	B	From Leg	4.000	0.000	100'	No Ice	1.701	1.282	0.053
(R)			0'			1/2" Ice	1.864	1.428	0.070
			3'			1" Ice	2.035	1.580	0.090
RRH2X50-800	C	From Leg	4.000	0.000	100'	No Ice	1.701	1.282	0.053
(R)			0'			1/2" Ice	1.864	1.428	0.070
			3'			1" Ice	2.035	1.580	0.090
TD-RRH8X20-25	A	From Leg	4.000	0.000	100'	No Ice	4.045	1.535	0.070
(R)			0'			1/2" Ice	4.298	1.714	0.097
			3'			1" Ice	4.557	1.901	0.128
TD-RRH8X20-25	B	From Leg	4.000	0.000	100'	No Ice	4.045	1.535	0.070
(R)			0'			1/2" Ice	4.298	1.714	0.097
			3'			1" Ice	4.557	1.901	0.128
TD-RRH8X20-25	C	From Leg	4.000	0.000	100'	No Ice	4.045	1.535	0.070
(R)			0'			1/2" Ice	4.298	1.714	0.097
			3'			1" Ice	4.557	1.901	0.128
Sector Mount [SM 406-3]	C	None		0.000	100'	No Ice	19.830	19.830	0.923
(E)						1/2" Ice	29.410	29.410	1.326
						1" Ice	38.990	38.990	1.729
10' horizontal x 2" Pipe	A	From Leg	4.000	0.000	100'	No Ice	2.000	2.000	0.100
Mount			0'			1/2" Ice	3.025	3.025	0.116
(R-STK-U STIFF Arm)			0'			1" Ice	4.067	4.067	0.137
10' horizontal x 2" Pipe	B	From Leg	4.000	0.000	100'	No Ice	2.000	2.000	0.100
Mount			0'			1/2" Ice	3.025	3.025	0.116

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
(R-STK-U STIFF Arm)			0'			1" Ice	4.067	4.067	0.137
10' horizontal x 2" Pipe	C	From Leg	4.000	0.000	100'	No Ice	2.000	2.000	0.100
Mount			0'			1/2" Ice	3.025	3.025	0.116
(R-STK-U STIFF Arm)			0'			1" Ice	4.067	4.067	0.137
V									
(2) BXA-171063/8CF w/	A	From Leg	4.000	0.000	88'	No Ice	3.140	3.510	0.029
Mount Pipe			0'			1/2" Ice	3.515	4.130	0.062
(E)			2'			1" Ice	3.892	4.757	0.100
(2) BXA-171063/8CF w/	B	From Leg	4.000	0.000	88'	No Ice	3.140	3.510	0.029
Mount Pipe			0'			1/2" Ice	3.515	4.130	0.062
(E)			2'			1" Ice	3.892	4.757	0.100
(2) BXA-171063/8CF w/	C	From Leg	4.000	0.000	88'	No Ice	3.140	3.510	0.029
Mount Pipe			0'			1/2" Ice	3.515	4.130	0.062
(E)			2'			1" Ice	3.892	4.757	0.100
SWCP 2x5514 w/ Mount	A	From Leg	4.000	0.000	88'	No Ice	6.524	6.531	0.039
Pipe			0'			1/2" Ice	6.949	7.240	0.104
(E)			2'			1" Ice	7.375	7.920	0.174
SWCP 2x5514 w/ Mount	B	From Leg	4.000	0.000	88'	No Ice	6.524	6.531	0.039
Pipe			0'			1/2" Ice	6.949	7.240	0.104
(E)			2'			1" Ice	7.375	7.920	0.174
SWCP 2x5514 w/ Mount	C	From Leg	4.000	0.000	88'	No Ice	6.524	6.531	0.039
Pipe			0'			1/2" Ice	6.949	7.240	0.104
(E)			2'			1" Ice	7.375	7.920	0.174
(2) LPA-80063/4CF w/	A	From Leg	4.000	0.000	88'	No Ice	6.385	6.603	0.038
Mount Pipe			0'			1/2" Ice	6.784	7.232	0.104
(E)			2'			1" Ice	7.192	7.876	0.176
(2) LPA-80063/4CF w/	B	From Leg	4.000	0.000	88'	No Ice	6.385	6.603	0.038
Mount Pipe			0'			1/2" Ice	6.784	7.232	0.104
(E)			2'			1" Ice	7.192	7.876	0.176
(2) LPA-80063/4CF w/	C	From Leg	4.000	0.000	88'	No Ice	6.385	6.603	0.038
Mount Pipe			0'			1/2" Ice	6.784	7.232	0.104
(E)			2'			1" Ice	7.192	7.876	0.176
(2) FD9R6004/2C-3L	A	From Leg	4.000	0.000	88'	No Ice	0.314	0.076	0.003
(E)			0'			1/2" Ice	0.386	0.119	0.005
			2'			1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	B	From Leg	4.000	0.000	88'	No Ice	0.314	0.076	0.003
(E)			0'			1/2" Ice	0.386	0.119	0.005
			2'			1" Ice	0.466	0.169	0.009
(2) FD9R6004/2C-3L	C	From Leg	4.000	0.000	88'	No Ice	0.314	0.076	0.003
(E)			0'			1/2" Ice	0.386	0.119	0.005
			2'			1" Ice	0.466	0.169	0.009
DB-T1-6Z-8AB-0Z	C	From Leg	4.000	0.000	88'	No Ice	4.800	2.000	0.044
(E)			0'			1/2" Ice	5.070	2.193	0.080
			2'			1" Ice	5.348	2.393	0.120
Sector Mount [SM 408-3]	C	None		0.000	88'	No Ice	22.450	22.450	1.019
(E)						1/2" Ice	33.500	33.500	1.475
						1" Ice	44.550	44.550	1.930
Pipe Mount [PM 601-3]	C	None		0.000	88'	No Ice	4.390	4.390	0.195
(E-Mount Attacment)						1/2" Ice	5.480	5.480	0.237
						1" Ice	6.570	6.570	0.280
V									
APXV18-206517S-C w/	A	From Leg	1.000	0.000	65'	No Ice	5.404	4.700	0.052
Mount Pipe			0'			1/2" Ice	5.960	5.860	0.097
(AB-Leg connected)			0'			1" Ice	6.481	6.734	0.150
APXV18-206517S-C w/	B	From Leg	1.000	0.000	65'	No Ice	5.404	4.700	0.052
Mount Pipe			0'			1/2" Ice	5.960	5.860	0.097
(AB-Leg connected)			0'			1" Ice	6.481	6.734	0.150

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
APXV18-206517S-C w/ Mount Pipe (AB-Leg connected) **V**	C	From Leg	1.000 0' 0'	0.000	65'	No Ice 1/2" Ice 1" Ice	5.404 5.960 6.481	4.700 5.860 6.734	0.052 0.097 0.150
GPS-TMG-HR-26NCM (E)	C	From Leg	1.000 0' 0'	0.000	50'	No Ice 1/2" Ice 1" Ice	0.133 0.183 0.239	0.133 0.183 0.239	0.001 0.002 0.005
4' x 2" Pipe Mount (E) **V**	C	From Leg	0.500 0' 0'	0.000	50'	No Ice 1/2" Ice 1" Ice	0.785 1.028 1.281	0.785 1.028 1.281	0.029 0.035 0.044

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
HPLPD1-18 (E-Per photo)	B	Paraboloid w/Shroud (HP)	From Leg	4.000 0' 1'	-27.000		150'	1.140	No Ice 1/2" Ice 1" Ice	1.021 1.175 1.330	0.017 0.023 0.029
HPLPD1-18 (E-Per photo) **V**	C	Paraboloid w/Shroud (HP)	From Leg	4.000 0' 1'	-11.000		150'	1.140	No Ice 1/2" Ice 1" Ice	1.021 1.175 1.330	0.017 0.023 0.029

Truss-Leg Properties

Section Designation	Area in^2	Area Ice in^2	Self Weight K	Ice Weight K	Equiv. Diameter in	Equiv. Diameter Ice in	Leg Area in^2
Pirod 105244	1026.861	3133.364	0.563	1.051	7.131	21.759	3.682
Pirod 105216	1998.089	6426.986	0.505	2.151	6.938	22.316	3.682
Pirod 105217	2130.748	6462.604	0.619	2.174	7.398	22.440	5.301
Pirod 105218	2263.469	6487.303	0.755	2.188	7.859	22.525	7.216
Pirod 105218	2263.469	6418.467	0.755	2.147	7.859	22.286	7.216
Pirod 105219	2441.869	6353.817	0.944	2.107	8.479	22.062	9.425

Load Combinations

Comb. No.	Description
1	Dead Only

Comb. No.	Description
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
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
T1	150 - 147.583	Leg	Max Tension	33	0.984	0.029	-0.014
			Max. Compression	31	-7.035	-0.051	0.007
			Max. Mx	18	-2.269	-0.129	-0.071
			Max. My	4	-1.049	-0.006	0.112

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	18	0.061	0.000	0.000
			Max. Vx	4	-0.056	0.000	0.000
		Diagonal	Max Tension	19	1.568	0.000	0.000
			Max. Compression	6	-1.602	0.000	0.000
			Max. Mx	26	-0.029	0.006	0.000
			Max. Vy	26	-0.007	0.000	0.000
		Top Girt	Max Tension	7	1.157	0.000	0.000
			Max. Compression	18	-1.180	0.019	-0.000
			Max. Mx	27	0.204	-0.095	-0.001
			Max. My	27	0.204	-0.095	-0.001
			Max. Vy	27	0.072	-0.095	-0.001
			Max. Vx	27	-0.000	0.000	0.000
T2	147.583 - 130	Leg	Max Tension	7	22.116	-0.243	-0.033
			Max. Compression	10	-26.503	0.245	0.004
			Max. Mx	19	-23.331	-0.527	-0.100
			Max. My	4	-2.877	-0.004	0.558
			Max. Vy	18	-2.319	0.246	0.032
			Max. Vx	4	2.363	0.010	-0.230
		Diagonal	Max Tension	21	2.962	0.000	0.000
			Max. Compression	20	-3.107	0.000	0.000
			Max. Mx	31	0.683	-0.006	0.000
			Max. My	18	-2.749	-0.001	-0.001
			Max. Vy	31	0.010	-0.006	0.000
			Max. Vx	18	0.000	0.000	0.000
		Horizontal	Max Tension	14	0.527	0.000	0.000
			Max. Compression	3	-0.325	0.000	0.000
			Max. Mx	26	0.401	0.020	0.000
			Max. Vy	26	-0.018	0.000	0.000
		Top Girt	Max Tension	27	0.172	0.000	0.000
			Max. Compression	23	-0.113	0.000	0.000
			Max. Mx	26	0.076	0.017	0.000
			Max. Vy	26	-0.016	0.000	0.000
		Bottom Girt	Max Tension	14	1.345	0.000	0.000
			Max. Compression	3	-1.225	0.000	0.000
			Max. Mx	26	0.055	0.020	0.000
			Max. Vy	26	-0.018	0.000	0.000
T3	130 - 110	Leg	Max Tension	7	59.282	-2.218	-0.276
			Max. Compression	10	-67.463	2.207	-0.115
			Max. Mx	6	58.206	-2.220	-0.275
			Max. My	4	-5.351	-0.008	-1.768
			Max. Vy	14	4.858	-2.219	0.168
			Max. Vx	4	3.784	-0.008	-1.768
		Diagonal	Max Tension	21	5.368	0.000	0.000
			Max. Compression	20	-5.503	0.000	0.000
			Max. Mx	31	1.132	-0.008	0.000
			Max. My	18	-3.702	-0.001	-0.001
			Max. Vy	31	0.013	-0.008	0.000
			Max. Vx	18	0.000	-0.001	-0.001
		Horizontal	Max Tension	14	0.849	0.000	0.000
			Max. Compression	3	-0.722	0.000	0.000
			Max. Mx	26	0.294	0.021	0.000
			Max. Vy	26	-0.017	0.000	0.000
		Top Girt	Max Tension	18	1.324	0.000	0.000
			Max. Compression	7	-1.304	0.000	0.000
			Max. Mx	26	0.042	0.020	0.000
			Max. Vy	26	0.018	0.000	0.000
		Bottom Girt	Max Tension	14	1.737	0.000	0.000
			Max. Compression	3	-1.604	0.000	0.000
			Max. Mx	26	0.169	0.024	0.000
			Max. Vy	26	-0.020	0.000	0.000
T4	110 - 100	Leg	Max Tension	7	63.264	-2.218	-0.275

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	10	-70.470	4.520	-0.104
			Max. Mx	10	-70.470	4.520	-0.104
			Max. My	4	-4.916	0.030	-4.642
			Max. Vy	14	0.502	-4.473	0.143
			Max. Vx	8	-0.563	0.001	4.286
		Diagonal	Max Tension	7	8.074	0.058	-0.011
			Max. Compression	18	-9.335	0.000	0.000
			Max. Mx	4	3.682	0.062	-0.007
			Max. My	18	-9.314	-0.045	0.014
			Max. Vy	30	0.030	0.052	0.002
			Max. Vx	29	0.003	0.000	0.000
		Top Girt	Max Tension	14	0.880	0.000	0.000
			Max. Compression	11	-0.552	0.000	0.000
			Max. Mx	26	0.541	-0.053	0.000
			Max. My	26	0.562	0.000	0.002
			Max. Vy	26	-0.042	0.000	0.000
			Max. Vx	26	-0.001	0.000	0.000
T5	100 - 80	Leg	Max Tension	7	99.899	-4.739	0.069
			Max. Compression	18	-111.739	5.126	-0.068
			Max. Mx	18	-111.739	5.126	-0.068
			Max. My	8	-5.834	-0.116	5.292
			Max. Vy	14	-1.040	-4.473	0.143
			Max. Vx	12	-1.291	-0.139	-5.261
		Diagonal	Max Tension	5	13.169	0.000	0.000
			Max. Compression	4	-15.439	0.000	0.000
			Max. Mx	18	0.294	0.137	0.008
			Max. My	18	-13.258	-0.053	0.013
			Max. Vy	29	0.049	0.087	0.009
			Max. Vx	29	0.004	0.000	0.000
		Horizontal	Max Tension	6	11.613	0.000	0.000
			Max. Compression	11	-9.361	0.000	0.000
			Max. Mx	26	3.890	-0.102	0.000
			Max. My	26	3.733	0.000	0.003
			Max. Vy	26	0.058	0.000	0.000
			Max. Vx	26	-0.002	0.000	0.000
		Top Girt	Max Tension	6	7.763	0.000	0.000
			Max. Compression	11	-6.215	0.000	0.000
			Max. Mx	26	2.643	-0.075	0.000
			Max. My	26	2.528	0.000	0.002
			Max. Vy	26	-0.050	0.000	0.000
			Max. Vx	26	-0.001	0.000	0.000
T6	80 - 60	Leg	Max Tension	7	149.734	-4.267	-0.003
			Max. Compression	2	-169.065	5.581	0.018
			Max. Mx	18	-169.039	5.589	0.003
			Max. My	4	-10.334	-0.356	-7.488
			Max. Vy	10	-0.376	5.576	-0.018
			Max. Vx	20	0.649	-0.375	-7.463
		Diagonal	Max Tension	20	8.931	0.000	0.000
			Max. Compression	21	-8.869	0.000	0.000
			Max. Mx	18	7.203	0.121	0.010
			Max. My	20	-8.628	-0.059	0.019
			Max. Vy	31	-0.054	0.117	-0.013
			Max. Vx	30	0.004	0.000	0.000
		Top Girt	Max Tension	6	8.413	0.000	0.000
			Max. Compression	19	-6.909	0.000	0.000
			Max. Mx	26	2.646	-0.130	0.000
			Max. My	26	2.548	0.000	0.004
			Max. Vy	26	0.065	0.000	0.000
			Max. Vx	26	0.002	0.000	0.000
T7	60 - 40	Leg	Max Tension	7	188.835	-4.863	0.018
			Max. Compression	2	-212.472	6.490	0.020

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	18	-212.332	6.501	0.023
			Max. My	24	-12.258	0.070	6.024
			Max. Vy	10	-0.292	6.482	-0.039
			Max. Vx	20	0.291	0.062	-6.002
		Diagonal	Max Tension	8	8.771	0.000	0.000
			Max. Compression	8	-8.828	0.000	0.000
			Max. Mx	27	2.123	0.111	0.013
			Max. My	35	-2.606	0.064	0.014
			Max. Vy	29	0.060	0.102	-0.013
			Max. Vx	35	-0.004	0.000	0.000
T8	40 - 20	Leg	Max Tension	7	225.024	-4.711	0.040
			Max. Compression	2	-253.562	5.871	0.014
			Max. Mx	18	-232.882	6.501	0.023
			Max. My	24	-12.922	0.070	6.024
			Max. Vy	33	0.502	-4.444	-0.005
			Max. Vx	20	-0.380	-0.204	-5.932
		Diagonal	Max Tension	8	9.125	0.000	0.000
			Max. Compression	16	-9.315	0.000	0.000
			Max. Mx	27	2.741	0.164	0.019
			Max. My	28	2.948	0.141	-0.019
			Max. Vy	29	0.080	0.144	-0.019
			Max. Vx	28	0.004	0.000	0.000
T9	20 - 0	Leg	Max Tension	7	257.756	-5.370	0.041
			Max. Compression	2	-291.572	0.000	0.000
			Max. Mx	27	-141.965	5.942	-0.013
			Max. My	20	-16.238	-0.401	-9.129
			Max. Vy	33	-0.813	-4.444	-0.005
			Max. Vx	20	-1.033	-0.401	-9.129
		Diagonal	Max Tension	17	10.084	0.000	0.000
			Max. Compression	18	-10.716	0.000	0.000
			Max. Mx	27	1.302	0.174	0.018
			Max. My	28	4.592	0.133	-0.024
			Max. Vy	37	0.081	0.170	0.018
			Max. Vx	28	0.005	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	302.370	27.862	-16.223
	Max. H_x	18	302.370	27.862	-16.223
	Max. H_z	7	-267.282	-25.034	14.525
	Min. Vert	7	-267.282	-25.034	14.525
	Min. H_x	7	-267.282	-25.034	14.525
	Min. H_z	18	302.370	27.862	-16.223
Leg B	Max. Vert	10	300.794	-27.840	-16.095
	Max. H_x	23	-267.231	25.034	14.438
	Max. H_z	23	-267.231	25.034	14.438
	Min. Vert	23	-267.231	25.034	14.438
	Min. H_x	10	300.794	-27.840	-16.095
	Min. H_z	10	300.794	-27.840	-16.095
Leg A	Max. Vert	2	302.795	-0.101	32.209
	Max. H_x	21	13.141	1.667	1.066
	Max. H_z	2	302.795	-0.101	32.209
	Min. Vert	15	-265.686	0.076	-28.861
	Min. H_x	8	18.686	-1.687	1.517

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
	Min. H_z	15	-265.686	0.076	-28.861

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	42.853	0.000	0.000	-11.719	5.419	0.000
1.2 Dead+1.6 Wind 0 deg - No Ice	51.423	0.068	-48.537	-3958.133	-1.651	-2.546
0.9 Dead+1.6 Wind 0 deg - No Ice	38.567	0.068	-48.537	-3954.617	-3.277	-2.546
1.2 Dead+1.6 Wind 30 deg - No Ice	51.423	24.110	-41.641	-3393.907	-1953.238	-2.386
0.9 Dead+1.6 Wind 30 deg - No Ice	38.567	24.110	-41.641	-3390.391	-1954.864	-2.386
1.2 Dead+1.6 Wind 60 deg - No Ice	51.423	40.988	-23.663	-1953.888	-3354.527	-2.192
0.9 Dead+1.6 Wind 60 deg - No Ice	38.567	40.988	-23.663	-1950.372	-3356.153	-2.192
1.2 Dead+1.6 Wind 90 deg - No Ice	51.423	48.109	-0.062	-21.406	-3899.809	-1.660
0.9 Dead+1.6 Wind 90 deg - No Ice	38.567	48.109	-0.062	-17.891	-3901.434	-1.660
1.2 Dead+1.6 Wind 120 deg - No Ice	51.423	42.057	24.208	1950.661	-3412.231	-0.033
0.9 Dead+1.6 Wind 120 deg - No Ice	38.567	42.057	24.208	1954.177	-3413.857	-0.033
1.2 Dead+1.6 Wind 150 deg - No Ice	51.423	24.011	41.589	3360.004	-1941.863	1.559
0.9 Dead+1.6 Wind 150 deg - No Ice	38.567	24.011	41.589	3363.520	-1943.489	1.559
1.2 Dead+1.6 Wind 180 deg - No Ice	51.423	-0.054	47.239	3856.067	12.608	2.347
0.9 Dead+1.6 Wind 180 deg - No Ice	38.567	-0.054	47.239	3859.583	10.982	2.347
1.2 Dead+1.6 Wind 210 deg - No Ice	51.423	-24.111	41.631	3364.146	1966.290	2.367
0.9 Dead+1.6 Wind 210 deg - No Ice	38.567	-24.111	41.631	3367.662	1964.664	2.367
1.2 Dead+1.6 Wind 240 deg - No Ice	51.423	-42.110	24.304	1961.573	3431.149	2.496
0.9 Dead+1.6 Wind 240 deg - No Ice	38.567	-42.110	24.304	1965.088	3429.524	2.496
1.2 Dead+1.6 Wind 270 deg - No Ice	51.423	-48.112	0.058	-7.464	3913.132	1.627
0.9 Dead+1.6 Wind 270 deg - No Ice	38.567	-48.112	0.058	-3.948	3911.506	1.627
1.2 Dead+1.6 Wind 300 deg - No Ice	51.423	-40.945	-23.569	-1943.246	3363.103	-0.134
0.9 Dead+1.6 Wind 300 deg - No Ice	38.567	-40.945	-23.569	-1939.731	3361.478	-0.134
1.2 Dead+1.6 Wind 330 deg - No Ice	51.423	-24.021	-41.586	-3387.599	1956.391	-1.592
0.9 Dead+1.6 Wind 330 deg - No Ice	38.567	-24.021	-41.586	-3384.083	1954.766	-1.592
1.2 Dead+1.0 Ice+1.0 Temp	160.980	0.000	0.000	-50.083	9.075	0.000

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
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	160.980	0.014	-14.962	-1284.629	7.287	0.297
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	160.980	7.487	-12.961	-1122.161	-610.519	0.533
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	160.980	12.850	-7.428	-666.236	-1056.394	0.573
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	160.980	14.952	-0.013	-51.665	-1227.258	0.449
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	160.980	12.945	7.468	565.579	-1058.678	0.303
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	160.980	7.467	12.951	1020.811	-608.120	0.076
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	160.980	-0.011	14.839	1180.296	10.343	-0.288
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	160.980	-7.488	12.958	1021.580	628.681	-0.538
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	160.980	-12.955	7.487	567.860	1078.047	-0.551
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	160.980	-14.952	0.012	-48.690	1245.489	-0.458
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	160.980	-12.842	-7.409	-664.023	1073.701	-0.329
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	160.980	-7.470	-12.950	-1120.842	626.656	-0.084
Dead+Wind 0 deg - Service	42.853	0.016	-11.607	-954.876	3.469	-0.609
Dead+Wind 30 deg - Service	42.853	5.766	-9.958	-819.951	-463.220	-0.571
Dead+Wind 60 deg - Service	42.853	9.802	-5.659	-475.595	-798.314	-0.524
Dead+Wind 90 deg - Service	42.853	11.505	-0.015	-13.475	-928.708	-0.397
Dead+Wind 120 deg - Service	42.853	10.057	5.789	458.111	-812.113	-0.008
Dead+Wind 150 deg - Service	42.853	5.742	9.945	795.131	-460.499	0.373
Dead+Wind 180 deg - Service	42.853	-0.013	11.296	913.756	6.879	0.561
Dead+Wind 210 deg - Service	42.853	-5.766	9.955	796.121	474.068	0.566
Dead+Wind 240 deg - Service	42.853	-10.070	5.812	460.720	824.364	0.597
Dead+Wind 270 deg - Service	42.853	-11.505	0.014	-10.141	939.622	0.389
Dead+Wind 300 deg - Service	42.853	-9.791	-5.636	-473.050	808.092	-0.032
Dead+Wind 330 deg - Service	42.853	-5.744	-9.945	-818.442	471.701	-0.381

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.000	-42.853	0.000	0.000	42.853	0.000	0.000%
2	0.068	-51.423	-48.537	-0.068	51.423	48.537	0.000%
3	0.068	-38.567	-48.537	-0.068	38.567	48.537	0.000%
4	24.110	-51.423	-41.641	-24.110	51.423	41.641	0.000%
5	24.110	-38.567	-41.641	-24.110	38.567	41.641	0.000%
6	40.988	-51.423	-23.663	-40.988	51.423	23.663	0.000%
7	40.988	-38.567	-23.663	-40.988	38.567	23.663	0.000%
8	48.109	-51.423	-0.062	-48.109	51.423	0.062	0.000%
9	48.109	-38.567	-0.062	-48.109	38.567	0.062	0.000%
10	42.057	-51.423	24.208	-42.057	51.423	-24.208	0.000%
11	42.057	-38.567	24.208	-42.057	38.567	-24.208	0.000%
12	24.011	-51.423	41.589	-24.011	51.423	-41.589	0.000%
13	24.011	-38.567	41.589	-24.011	38.567	-41.589	0.000%
14	-0.054	-51.423	47.239	0.054	51.423	-47.239	0.000%
15	-0.054	-38.567	47.239	0.054	38.567	-47.239	0.000%
16	-24.111	-51.423	41.631	24.111	51.423	-41.631	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
17	-24.111	-38.567	41.631	24.111	38.567	-41.631	0.000%
18	-42.110	-51.423	24.304	42.110	51.423	-24.304	0.000%
19	-42.110	-38.567	24.304	42.110	38.567	-24.304	0.000%
20	-48.112	-51.423	0.058	48.112	51.423	-0.058	0.000%
21	-48.112	-38.567	0.058	48.112	38.567	-0.058	0.000%
22	-40.945	-51.423	-23.569	40.945	51.423	23.569	0.000%
23	-40.945	-38.567	-23.569	40.945	38.567	23.569	0.000%
24	-24.021	-51.423	-41.586	24.021	51.423	41.586	0.000%
25	-24.021	-38.567	-41.586	24.021	38.567	41.586	0.000%
26	0.000	-160.980	0.000	-0.000	160.980	0.000	0.000%
27	0.014	-160.980	-14.962	-0.014	160.980	14.962	0.000%
28	7.487	-160.980	-12.961	-7.487	160.980	12.961	0.000%
29	12.850	-160.980	-7.428	-12.850	160.980	7.428	0.000%
30	14.952	-160.980	-0.013	-14.952	160.980	0.013	0.000%
31	12.945	-160.980	7.468	-12.945	160.980	-7.468	0.000%
32	7.467	-160.980	12.951	-7.467	160.980	-12.951	0.000%
33	-0.011	-160.980	14.839	0.011	160.980	-14.839	0.000%
34	-7.488	-160.980	12.958	7.488	160.980	-12.958	0.000%
35	-12.955	-160.980	7.487	12.955	160.980	-7.487	0.000%
36	-14.952	-160.980	0.012	14.952	160.980	-0.012	0.000%
37	-12.842	-160.980	-7.409	12.842	160.980	7.409	0.000%
38	-7.470	-160.980	-12.950	7.470	160.980	12.950	0.000%
39	0.016	-42.853	-11.607	-0.016	42.853	11.607	0.000%
40	5.766	-42.853	-9.958	-5.766	42.853	9.958	0.000%
41	9.802	-42.853	-5.659	-9.802	42.853	5.659	0.000%
42	11.505	-42.853	-0.015	-11.505	42.853	0.015	0.000%
43	10.057	-42.853	5.789	-10.057	42.853	-5.789	0.000%
44	5.742	-42.853	9.945	-5.742	42.853	-9.945	0.000%
45	-0.013	-42.853	11.296	0.013	42.853	-11.296	0.000%
46	-5.766	-42.853	9.955	5.766	42.853	-9.955	0.000%
47	-10.070	-42.853	5.812	10.070	42.853	-5.812	0.000%
48	-11.505	-42.853	0.014	11.505	42.853	-0.014	0.000%
49	-9.791	-42.853	-5.636	9.791	42.853	5.636	0.000%
50	-5.744	-42.853	-9.945	5.744	42.853	9.945	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 147.583	5.038	39	0.308	0.065
T2	147.583 - 130	4.883	39	0.307	0.062
T3	130 - 110	3.759	39	0.286	0.039
T4	110 - 100	2.602	39	0.242	0.017
T5	100 - 80	2.109	39	0.216	0.008
T6	80 - 60	1.307	39	0.158	0.004
T7	60 - 40	0.717	39	0.108	0.001
T8	40 - 20	0.313	39	0.070	0.000
T9	20 - 0	0.083	39	0.030	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
151'	HPLPD1-18	39	5.038	0.308	0.065	409333
150'	6' x 2" Mount Pipe	39	5.038	0.308	0.065	409333
141'	7770.00 w/ Mount Pipe	39	4.458	0.303	0.052	124829
130'	M5160160P10006	39	3.759	0.286	0.039	34166
118'	SC320	39	3.040	0.261	0.026	21866
114'	ERICSSON AIR 21 B4A B2P	39	2.816	0.251	0.022	19589
103'	PCS 1900MHZ 2X40W	39	2.250	0.224	0.010	18624
100'	APXVSPP18-C-A20 w/ Mount Pipe	39	2.109	0.216	0.008	19046
88'	(2) BXA-171063/8CF w/ Mount Pipe	39	1.600	0.181	0.004	21115
65'	APXV18-206517S-C w/ Mount Pipe	39	0.847	0.119	0.002	25331
50'	GPS-TMG-HR-26NCM	39	0.493	0.089	0.000	27184

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	150 - 147.583	21.007	19	1.279	0.273
T2	147.583 - 130	20.355	19	1.277	0.258
T3	130 - 110	15.646	19	1.194	0.162
T4	110 - 100	10.815	2	1.007	0.073
T5	100 - 80	8.766	2	0.899	0.033
T6	80 - 60	5.429	2	0.655	0.015
T7	60 - 40	2.980	2	0.450	0.004
T8	40 - 20	1.301	2	0.291	0.002
T9	20 - 0	0.344	19	0.126	0.001

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
151'	HPLPD1-18	19	21.007	1.279	0.273	30280
150'	6' x 2" Mount Pipe	19	21.007	1.279	0.273	30280
141'	7770.00 w/ Mount Pipe	19	18.574	1.260	0.219	23886
130'	M5160160P10006	19	15.646	1.194	0.162	8421
118'	SC320	19	12.644	1.088	0.107	5334
114'	ERICSSON AIR 21 B4A B2P	2	11.710	1.048	0.090	4772
103'	PCS 1900MHZ 2X40W	2	9.353	0.932	0.043	4501
100'	APXVSPP18-C-A20 w/ Mount Pipe	2	8.766	0.899	0.033	4591
88'	(2) BXA-171063/8CF w/ Mount Pipe	2	6.649	0.753	0.017	5068
65'	APXV18-206517S-C w/ Mount Pipe	2	3.517	0.495	0.007	6091
50'	GPS-TMG-HR-26NCM	2	2.049	0.369	0.002	6541

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load K	Ratio Load / Allowable	Allowable Ratio	Criteria
T2	147.583	Leg	A325N	0.625	5	5.301	24.851	0.213 ✔	1	Bolt DS
T3	130	Leg	A325N	1.000	6	9.880	53.014	0.186 ✔	1	Bolt Tension
T4	110	Leg	A325N	1.000	6	10.544	53.014	0.199 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	8.074	10.663	0.757 ✔	1	Member Block Shear
		Top Girt	A325N	1.000	1	0.880	11.682	0.075 ✔	1	Member Block Shear
T5	100	Leg	A325N	1.000	6	16.650	53.014	0.314 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	13.169	21.326	0.617 ✔	1	Member Block Shear
		Horizontal	A325N	1.000	1	11.613	11.682	0.994 ✔	1	Member Block Shear
		Top Girt	A325N	1.000	1	7.763	11.682	0.665 ✔	1	Member Block Shear
T6	80	Leg	A325N	1.000	6	24.956	53.014	0.471 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	8.931	11.682	0.764 ✔	1	Member Block Shear
		Top Girt	A325N	1.000	1	8.413	11.682	0.720 ✔	1	Member Block Shear
T7	60	Leg	A325N	1.000	6	31.468	53.014	0.594 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	8.771	11.682	0.751 ✔	1	Member Block Shear
T8	40	Leg	A325N	1.000	6	37.504	53.014	0.707 ✔	1	Bolt Tension
		Diagonal	A325N	1.000	1	9.125	19.471	0.469 ✔	1	Member Block Shear
T9	20	Diagonal	A325N	1.250	1	10.084	23.701	0.425 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	1 1/2	2'5"	2'5"	77.3 K=1.00	1.767	-7.035	51.350	0.137 [1] ✔
T2	147.583 - 130	1 1/2	17'7-1/32"	2'5"	77.3 K=1.00	1.767	-24.120	51.350	0.470 [1] ✔
T3	130 - 110	2	20'1/32"	2'4-3/8"	56.8 K=1.00	3.142	-63.605	111.705	0.569 [1] ✔
T4	110 - 100	Pirod 105244	10'7/32"	10'7/32"	45.4 K=1.00	3.682	-70.470	142.493	0.495 [1] ✔
T5	100 - 80	Pirod 105216	20'13/32"	10'7/32"	45.4 K=1.00	3.682	-111.739	142.493	0.784 [1] ✔
T6	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8 K=1.00	5.301	-169.065	214.859	0.787 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	7.216	-212.472	300.681	0.707 [1] ✔
T8	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4 K=1.00	7.216	-253.562	300.681	0.843 [1] ✔
T9	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4 K=1.00	9.425	-291.572	399.868	0.729 [1] ✔

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	110 - 100	0.5	1'5-25/32"	121.0	165.670	0.196	0.566	3.389	0.168 ✔
T5	100 - 80	0.5	1'5-25/32"	121.0	165.670	0.196	1.293	3.292	0.394 ✔
T6	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.653	3.335	0.196 ✔
T7	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.306	3.378	0.091 ✔
T8	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.502	3.378	0.149 ✔
T9	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.035	6.958	0.149 ✔

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	3/4	3'1-7/8"	3'23/32"	137.1 K=0.70	0.442	-1.602	5.311	0.302 [1] ✔
T2	147.583 - 130	3/4	5'7/8"	2'5-25/32"	143.0 K=0.90	0.442	-3.107	4.879	0.637 [1] ✔
T3	130 - 110	7/8	5'5-29/32"	2'8-1/32"	131.8 K=0.90	0.601	-5.503	7.820	0.704 [1] ✔
T4	110 - 100	L2 1/2x2 1/2x3/16	11'5"	4'11-25/32"	120.8 K=1.00	0.902	-9.335	13.558	0.688 [1] ✔
T5	100 - 80	L2 1/2x2 1/2x3/8	12'6-1/32"	5'7-17/32"	138.7 K=1.00	1.730	-15.439	20.328	0.759 [1] ✔
T6	80 - 60	L3x3x3/16	13'9-9/16"	6'3-15/16"	127.4 K=1.00	1.090	-8.869	14.947	0.593 [1] ✔
T7	60 - 40	L3x3x3/16	15'2-29/32"	7'31/32"	142.6 K=1.00	1.090	-8.729	12.112	0.721 [1] ✔
T8	40 - 20	L3x3x5/16	16'9-5/8"	7'10-19/32"	160.6 K=1.00	1.780	-9.315	15.594	0.597 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T9	20 - 0	L3x3x5/16	18'5-3/8"	8'8-1/8"	176.8 K=1.00	1.780	-10.716	12.868	0.833 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'4-7/16"	4'2-15/16"	163.1 K=0.70	0.601	-0.325	5.109	0.064 [1] ✔
T3	130 - 110	3/4	4'6-7/8"	4'4-7/8"	197.3 K=0.70	0.442	-0.722	2.563	0.282 [1] ✔
T5	100 - 80	L3x3x3/16	7'	5'7"	116.2 K=1.03	1.090	-9.361	17.168	0.545 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	5x1/2	4'	2'10-7/8"	241.6 K=1.00	2.500	-1.180	9.674	0.122 [1] ✔
		KL/R > 200 (C) - 4							
T2	147.583 - 130	7/8	4'27/32"	3'11-11/32"	151.5 K=0.70	0.601	-0.113	5.917	0.019 [1] ✔
T3	130 - 110	7/8	4'6-5/32"	4'4-5/32"	166.9 K=0.70	0.601	-1.304	4.878	0.267 [1] ✔
T4	110 - 100	L3x3x3/16	5'	4'5"	104.5 K=1.17	1.090	-0.552	19.587	0.028 [1] ✔
T5	100 - 80	L3x3x3/16	6'	4'7"	106.1 K=1.15	1.090	-6.215	19.238	0.323 [1] ✔
T6	80 - 60	L3x3x3/16	8'	6'7"	132.6 K=1.00	1.090	-6.909	13.961	0.495 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'5-29/32"	4'4-13/32"	167.7 K=0.70	0.601	-1.225	4.831	0.254 [1] ✔
T3	130 - 110	7/8	4'11-13/16"	4'9-13/16"	185.0 K=0.70	0.601	-1.604	3.967	0.404 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	1 1/2	2'5"	2'5"	77.3	1.767	0.984	79.522	0.012 [1] ✔
T2	147.583 - 130	1 1/2	17'7-1/32"	4"	10.7	1.767	22.116	79.522	0.278 [1] ✔
T3	130 - 110	2	20'1/32"	7"	14.0	3.142	59.282	141.372	0.419 [1] ✔
T4	110 - 100	Pirod 105244	10'7/32"	10'7/32"	45.4	3.682	63.264	165.670	0.382 [1] ✔
T5	100 - 80	Pirod 105216	20'13/32"	10'7/32"	45.4	3.682	99.899	165.670	0.603 [1] ✔
T6	80 - 60	Pirod 105217	20'13/32"	10'7/32"	37.8	5.301	149.734	238.565	0.628 [1] ✔
T7	60 - 40	Pirod 105218	20'13/32"	10'7/32"	32.4	7.216	188.807	324.713	0.581 [1] ✔
T8	40 - 20	Pirod 105218	20'13/32"	10'7/32"	32.4	7.216	225.024	324.713	0.693 [1] ✔
T9	20 - 0	Pirod 105219	20'13/32"	10'7/32"	28.4	9.425	257.756	424.115	0.608 [1] ✔

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	110 - 100	0.5	1'5-25/32"	121.0	165.670	0.196	0.566	3.389	0.168 ✔
T5	100 - 80	0.5	1'5-25/32"	121.0	165.670	0.196	1.293	3.292	0.394 ✔
T6	80 - 60	0.5	1'5-21/32"	120.0	238.565	0.196	0.653	3.335	0.196 ✔

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T7	60 - 40	0.5	1'5-1/2"	119.0	324.713	0.196	0.306	3.378	0.091 ✓
T8	40 - 20	0.5	1'5-1/2"	119.0	324.713	0.196	0.502	3.378	0.149 ✓
T9	20 - 0	0.625	1'5-11/32"	94.4	424.115	0.307	1.035	6.958	0.149 ✓

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	3/4	3'1-7/8"	3'23/32"	195.8	0.442	1.568	19.880	0.079 [1] ✓
T2	147.583 - 130	3/4	5'7/8"	2'5-25/32"	158.9	0.442	2.962	19.880	0.149 [1] ✓
T3	130 - 110	7/8	5'5-29/32"	2'8-1/32"	146.4	0.601	5.368	27.059	0.198 [1] ✓
T4	110 - 100	L2 1/2x2 1/2x3/16	11'5"	4'11-25/32"	80.1	0.518	8.074	22.546	0.358 [1] ✓
T5	100 - 80	L2 1/2x2 1/2x3/8	12'6-1/32"	5'7-17/32"	93.0	0.981	13.169	42.678	0.309 [1] ✓
T6	80 - 60	L3x3x3/16	13'9-9/16"	6'3-15/16"	83.5	0.659	8.931	28.679	0.311 [1] ✓
T7	60 - 40	L3x3x3/16	14'6-1/32"	6'8-23/32"	88.6	0.659	8.771	28.679	0.306 [1] ✓
T8	40 - 20	L3x3x5/16	16'1/8"	7'5-15/16"	100.3	1.071	9.125	46.603	0.196 [1] ✓
T9	20 - 0	L3x3x5/16	18'5-3/8"	8'8-1/8"	116.2	1.013	10.084	44.054	0.229 [1] ✓

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'4-7/16"	4'2-15/16"	232.9	0.601	0.527	27.059	0.019 [1] ✓
T3	130 - 110	3/4	4'6-7/8"	4'4-7/8"	281.9	0.442	0.849	19.880	0.043 [1] ✓
T5	100 - 80	L3x3x3/16	7'	5'7"	76.7	0.659	11.613	28.679	0.405 [1] ✓

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	150 - 147.583	5x1/2	4'	2'10-7/8"	241.6	2.500	1.157	81.000	0.014 [1] ✔
T2	147.583 - 130	7/8	4'27/32"	3'11-11/32"	216.5	0.601	0.172	27.059	0.006 [1] ✔
T3	130 - 110	7/8	4'6-5/32"	4'4-5/32"	238.4	0.601	1.324	27.059	0.049 [1] ✔
T4	110 - 100	L3x3x3/16	5'	4'5"	61.8	0.659	0.880	28.679	0.031 [1] ✔
T5	100 - 80	L3x3x3/16	6'	4'7"	63.9	0.659	7.763	28.679	0.271 [1] ✔
T6	80 - 60	L3x3x3/16	8'	6'7"	89.5	0.659	8.413	28.679	0.293 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	147.583 - 130	7/8	4'5-29/32"	4'4-13/32"	239.5	0.601	1.345	27.059	0.050 [1] ✔
T3	130 - 110	7/8	4'11-13/16"	4'9-13/16"	264.3	0.601	1.737	27.059	0.064 [1] ✔

[1] P_u / ϕP_n controls

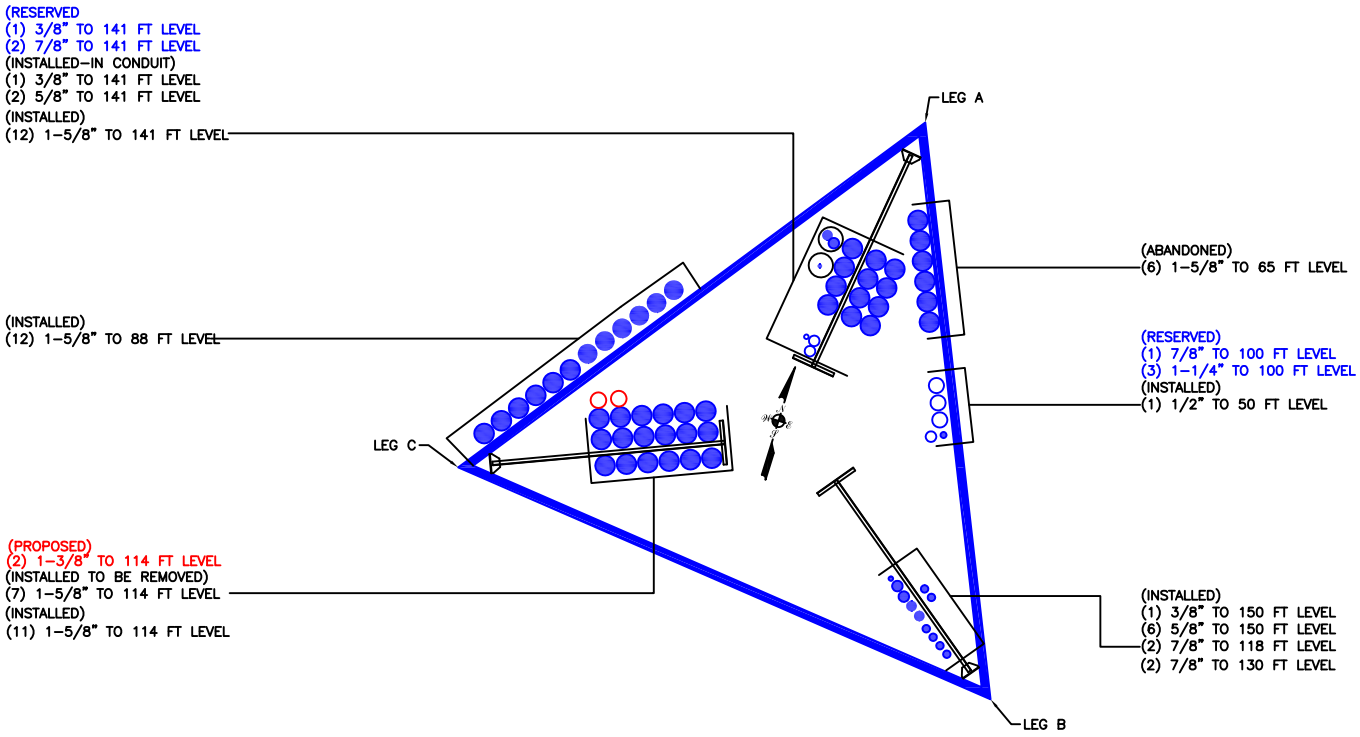
Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	150 - 147.583	Leg	1 1/2	2	-7.035	51.350	13.7	Pass
T2	147.583 - 130	Leg	1 1/2	14	-24.120	51.350	47.0	Pass
T3	130 - 110	Leg	2	71	-63.605	111.705	56.9	Pass
T4	110 - 100	Leg	Pirod 105244	135	-70.470	142.493	49.5	Pass
T5	100 - 80	Leg	Pirod 105216	146	-111.739	142.493	78.4	Pass
T6	80 - 60	Leg	Pirod 105217	169	-169.065	214.859	78.7	Pass
T7	60 - 40	Leg	Pirod 105218	187	-212.472	300.681	70.7	Pass
T8	40 - 20	Leg	Pirod 105218	202	-253.562	300.681	84.3	Pass
T9	20 - 0	Leg	Pirod 105219	217	-291.572	399.868	72.9	Pass
T1	150 - 147.583	Diagonal	3/4	8	-1.602	5.311	30.2	Pass
T2	147.583 - 130	Diagonal	3/4	22	-3.107	4.879	63.7	Pass
T3	130 - 110	Diagonal	7/8	79	-5.503	7.820	70.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T4	110 - 100	Diagonal	L2 1/2x2 1/2x3/16	140	-9.335	13.558	68.8	Pass
							75.7 (b)	
T5	100 - 80	Diagonal	L2 1/2x2 1/2x3/8	155	-15.439	20.328	75.9	Pass
T6	80 - 60	Diagonal	L3x3x3/16	173	-8.869	14.947	59.3	Pass
							76.4 (b)	
T7	60 - 40	Diagonal	L3x3x3/16	189	-8.729	12.112	72.1	Pass
							75.1 (b)	
T8	40 - 20	Diagonal	L3x3x5/16	208	-9.315	15.594	59.7	Pass
T9	20 - 0	Diagonal	L3x3x5/16	223	-10.716	12.868	83.3	Pass
T2	147.583 - 130	Horizontal	7/8	35	-0.325	5.109	6.4	Pass
T3	130 - 110	Horizontal	3/4	127	-0.722	2.563	28.2	Pass
T5	100 - 80	Horizontal	L3x3x3/16	160	-9.361	17.168	54.5	Pass
							99.4 (b)	
T1	150 - 147.583	Top Girt	5x1/2	4	-1.180	9.674	12.2	Pass
T2	147.583 - 130	Top Girt	7/8	18	-0.113	5.917	1.9	Pass
T3	130 - 110	Top Girt	7/8	74	-1.304	4.878	26.7	Pass
T4	110 - 100	Top Girt	L3x3x3/16	137	0.880	28.679	3.1	Pass
							7.5 (b)	
T5	100 - 80	Top Girt	L3x3x3/16	151	-6.215	19.238	32.3	Pass
							66.5 (b)	
T6	80 - 60	Top Girt	L3x3x3/16	171	-6.909	13.961	49.5	Pass
							72.0 (b)	
T2	147.583 - 130	Bottom Girt	7/8	19	-1.225	4.831	25.4	Pass
T3	130 - 110	Bottom Girt	7/8	76	-1.604	3.967	40.4	Pass
							Summary	
						Leg (T8)	84.3	Pass
						Diagonal (T9)	83.3	Pass
						Horizontal (T5)	99.4	Pass
						Top Girt (T6)	72.0	Pass
						Bottom Girt (T3)	40.4	Pass
						Bolt Checks	99.4	Pass
						RATING =	**99.4**	**Pass**

APPENDIX B

BASE LEVEL DRAWING



BUSINESS UNIT: 842870

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9

V7.3

Site Data	
BU#:	**842870**
Site Name:	**MILFORD,CT**
App #:	**444506 Rev# 0**

No. of Mods:	**0**

Reactions		
Eta Factor, η	**0.55**	Detail Type
Uplift, Pu:	**267**	kips
Shear, Vu:	**29**	kips

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Data				
	Existing			
Qty:	**6**			
Diam:	**1.25**			in
Rod Material:	**A687**			
Strength (Fu):	125			ksi
Yield (Fy):	105			ksi
Net Area (An):	5.81			in^2

Anchor Rod Results:	Existing			
Rod Vu:	4.83			k
Max Rod (Cu+ Vu/ŕ):	53.29			k
Design Axial, Φ*Fu*Anet:	96.9			k
Anchor Rod Stress Ratio:	**55.0%**			

If Applicable;

$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut exceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

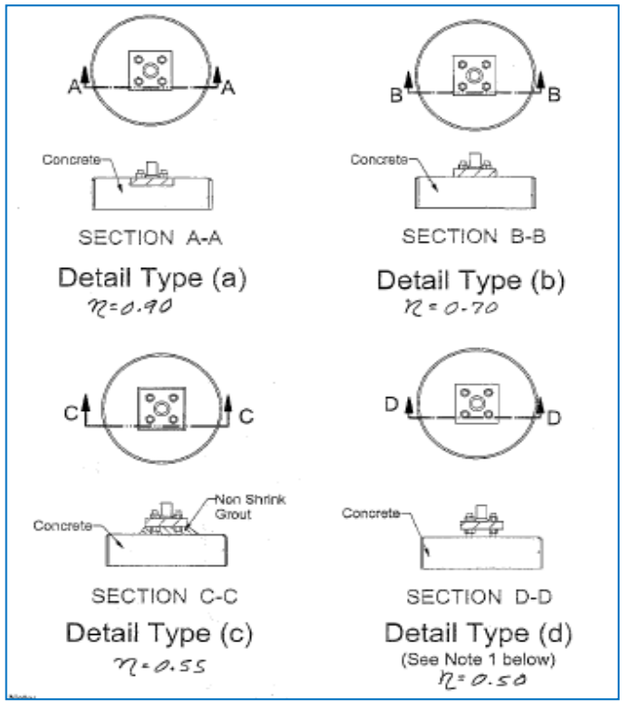


Figure 4-4 of TIA-222-G

Eccentric Load Calculations		
MOI=	1	in^4
e=	0	in
Distance to Extreme fibre, y_0=	0.0	in
Eccentric load on Existing=	0.000	kips

Maximum Acceptable Ratio: **105** %

Governing Stress Ratio: **55.0%** **Pass**

SST Unit Base Foundation

BU # :	842870
Site Name:	MILFORD,CT
App. Number:	444506 Rev# 0

TIA-222 Revision: G

Tower Centroid Offset?:	☑
Block Foundation?:	☐

Superstructure Analysis Reactions

Global Moment, **M**:	3958	ft-kips
Global Axial, **P**:	51	kips
Global Shear, **V**:	49	kips
Leg Compression, $\mathbf{P_{comp}}$:	303	kips
Leg Comp. Shear, $\mathbf{V_{u\_comp}}$:	32	kips
Leg Uplift, $\mathbf{P_{uplift}}$:	267	kips
Leg Uplift. Shear, $\mathbf{V_{u\_uplift}}$:	29	kips
Tower Height, **H**:	150	ft
Base Face Width, **BW**:	16	ft
BP Dist. Above Fdn, $\mathbf{bp_{dist}}$:	2	in

Foundation Analysis Checks

	Capacity	Demand	Rating	Check
Lateral (Sliding) (kips)	491.81	49.00	**10.0%**	**Pass**
Bearing Pressure (ksf)	9.00	1.87	**20.8%**	**Pass**
*Overturning (kip*ft)*	10470.19	4397.50	**42.0%**	**Pass**
*Pier Flexure (Comp.) (kip*ft)*	1654.89	104.00	**6.3%**	**Pass**
*Pier Flexure (Tension) (kip*ft)*	843.98	94.25	**11.2%**	**Pass**
Pier Compression (kip)	7592.08	312.30	**4.1%**	**Pass**
*Pad Flexure (kip*ft)*	10669.80	445.29	**4.2%**	**Pass**
Pad Shear - 1-way (kips)	1245.03	61.05	**4.9%**	**Pass**
Pad Shear - 2-way (ksi)	0.16	0.02	**14.9%**	**Pass**

Soil Rating:	**42.0%**
Structural Rating:	**14.9%**

Pier Properties

Pier Shape:	Circular	
Pier Diameter, **dpier**:	4.5	ft
Ext. Above Grade, **E**:	0.50	ft
Pier Rebar Size, **Sc**:	8	
Pier Rebar Quantity, **mc**:	16	
Pier Tie/Spiral Size, **St**:	4	
Pier Tie/Spiral Quantity, **mt**:	7	
Pier Reinforcement Type:	Tie	
Pier Clear Cover, $\mathbf{cc_{pier}}$:	3	in

Pad Properties

Depth, **D**:	6.50	ft
Pad Width, **W**:	29.50	ft
Pad Thickness, **T**:	3.75	ft
Pad Rebar Size (Bottom), **Sp**:	9	
Pad Rebar Quantity (Bottom), **mp**:	58	
Pad Clear Cover, $\mathbf{cc_{pad}}$:	0.5	in

Material Properties

Rebar Grade, **Fy**:	60000	psi
Concrete Compressive Strength, **F'c**:	3000	psi
Dry Concrete Density, δ**c**:	150	pcf

Soil Properties

Total Soil Unit Weight, γ:	125	pcf
Ultimate Gross Bearing, Qult:	12.000	ksf
Cohesion, **Cu**:	0.000	ksf
Friction Angle, φ:	34	degrees
SPT Blow Count, $\mathbf{N_{blows}}$:		
Base Friction, μ:	0.6	
Neglected Depth, **N**:	3.3	ft
Foundation Bearing on Rock?	No	

<-- Toggle between Gross and Net

Version 2.6.5

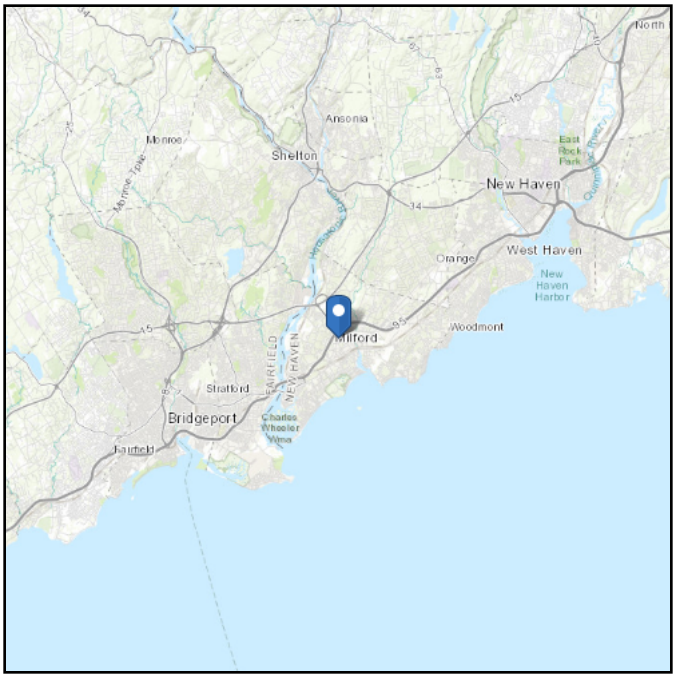
Groundwater Depth, **gw**:	7	ft

ASCE 7 Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-10
Risk Category: II
Soil Class: D - Stiff Soil

Elevation: 68.18 ft (NAVD 88)
Latitude: 41.228525
Longitude: -73.070131



Wind

Results:

Wind Speed:	124 Vmph
10-year MRI	77 Vmph
25-year MRI	87 Vmph
50-year MRI	94 Vmph
100-year MRI	100 Vmph
Data Source:	ASCE/SEI 7-10, Fig. 26.5-1A and Figs. CC-1–CC-4, incorporating errata of March 12, 2014
Date Accessed:	Tue Jun 12 2018

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-10 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Mountainous terrain, gorges, ocean promontories, and special wind regions should be examined for unusual wind conditions.

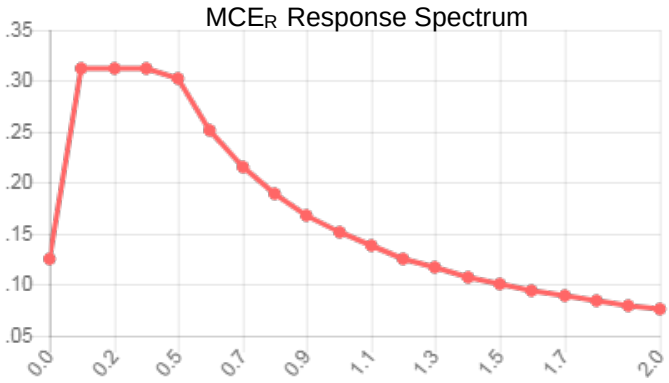
Seismic

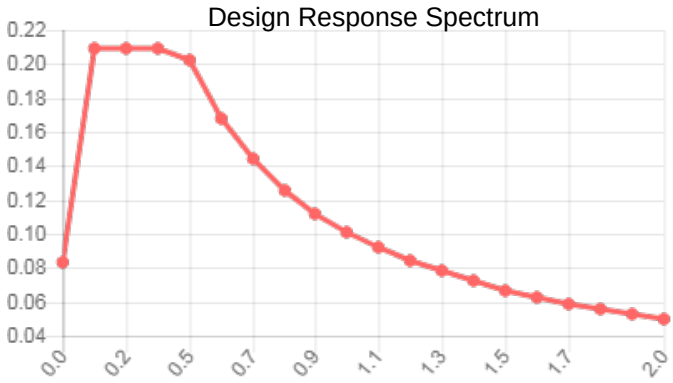
Site Soil Class: D - Stiff Soil

Results:

S_S :	0.195	S_{DS} :	0.209
S_1 :	0.063	S_{D1} :	0.101
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.104
S_{MS} :	0.313	PGA_M :	0.166
S_{M1} :	0.151	F_{PGA} :	1.592
		I_e :	1

Seismic Design Category B





Data Accessed: Tue Jun 12 2018

Date Source: USGS Seismic Design Maps based on ASCE/SEI 7-10, incorporating Supplement 1 and errata of March 31, 2013, and ASCE/SEI 7-10 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-10 Ch. 21 are available from USGS.

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	15 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Tue Jun 12 2018

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 50-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Date: **June 22, 2018**

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Albany, NY 12205
518-690-0790
structural@infinigy.com

Patricia Pelon
Crown Castle
3 Corporate Dr., St 101
Clifton Park, NY 12065

Subject:	**Mount Structural Analysis**	
Carrier Designation:	***T-Mobile PCS Co-locate***	
	Carrier Site Number:	CT11018F
	Carrier Site Name:	Milford
Crown Castle Designation:	**Crown Castle BU Number:**	842870
	Crown Castle Site Name:	NY BUF-026 CCI
	Crown Castle JDE Job Number:	510430
	Crown Castle PO Number:	-
	Crown Castle Application Number:	444506 Rev. 1
Engineering Firm Designation:	**Infinigy Report Designation:**	600-005
Site Data:	**434 Boston Post Road, Milford, New Haven County, CT** **Latitude 41° 13' 42.69" Longitude -73° 4' 12.47"**	
Structure Information:	**Tower Height & Type:**	**150 Foot Self-Support Tower**
	Mount Elevation:	**114 ft**
	Mount Type:	**12 ft Sector Mount**

Dear Patricia Pelon,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural integrity of T-Mobile's antenna existing mounting system with the proposed appurtenance on the abovementioned supporting tower structure. Analysis of the existing supporting tower structure is to be completed by others and therefore is not part of this analysis. Analysis of the antenna mounting system as a tie-off point for fall protection or rigging is not part of this document.

Based upon our analysis, we have determined the adequacy of the antenna mounting system that will support the proposed loading to be:

Sector Frame **Sufficient w/ Modification**

This analysis has been performed in accordance with the 2015 International Building Code with 2016 New York State Uniform Code Supplement and the Infinigy Engineering, PLLC wind speed requirement of a 93 mph nominal 3-second gust wind speed as required for use in the ANSI/TIA-222-G Standard per Exception #5 of Section 1609.1. Exposure Category C and Risk Category II were used in this analysis.

We at Infinigy Engineering, PLLC 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.

Mount structural analysis prepared by: Justin S. Lee

Respectfully Submitted by:

Joseph R. Johnston, P.E.
VP Structural Engineering / Principal

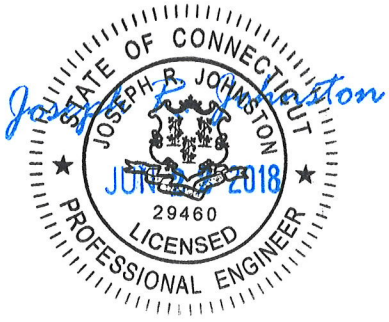


TABLE OF CONTENTS

1) INTRODUCTION

The existing mount consists of (3) *12* ft wide Sector Mounts at the **114** ft elevation**.** The proposed antenna loading was obtained from the Application provided by CCI, Application Number 444506, Revision 1 and the Mount Mapping performed by Infinigy.

2) ANALYSIS CRITERIA

The structural analysis was performed in accordance with the requirements of TIA 222-G Structural Standards for Steel Antenna Towers and Antenna Supporting Structures using a 3-second gust wind speed of 93 mph with no ice, 50 mph with 0.75 inch escalated ice thickness, Exposure Category C and Topographic Category 1. In addition, the mounts have been analyzed for various live loading conditions consisting of a 250-pound man live load applied individually at the midpoint and cantilevered ends of horizontal members as well as a 500-pound man live load applied individually at mount pipe locations using a 3-second gust wind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
114.0	112.0	3	RFS	APXVAARR24	Sector	1
		3	Ericsson	Radio 4449 B12/B71		

Notes:
1) Proposed equipment

Table 2 - Existing Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
114.0	112.0	3	Ericsson	AIR 21 B2A B4P	Sector	1
		3	Ericsson	AIR 21 B4A B2P		
		3	Ericsson	KRY 112 71		

Notes:
1) Existing equipment

3) ANALYSIS PROCEDURE

Table 2 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	444506, Rev.1	CCI Sites
Mount Photos	Infinigy Engineering	-	On File
Reinforcing Kit	SitePro1 Drawing	STK-U	On File

3.1) Analysis Method

RISA-3D (Version 16.0.4), a commercially available analysis software package, was used to create a three-dimensional model of the antenna mounting system and calculate member stresses for various loading cases.

Infinigy Mount Analysis Tool 3.0.2, a tool internally developed by Infinigy, was used to calculate member loading for various load cases. Selected output from the analysis is included in Appendix B.

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed and maintained in good condition in accordance with its original design and manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.
4) Steel grades have been assumed as follows:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM A500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Crown Castle should be notified to determine the effect on the structural integrity of the antenna mounting system.

4) ANALYSIS RESULTS

Table 3 - Mount Component Stresses vs. Capacity (Sector Frame)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1,2	Face Horizontal	114	93%	Pass
	Mount Pipe		18%	Pass
	Stand-off		66%	Pass
	Bracing		45%	Pass
	Tie-back		25%	Pass

Max. Tieback End Reaction	**596.6 lb**

Structure Rating (max from all components) =	**93%**

Notes:

1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

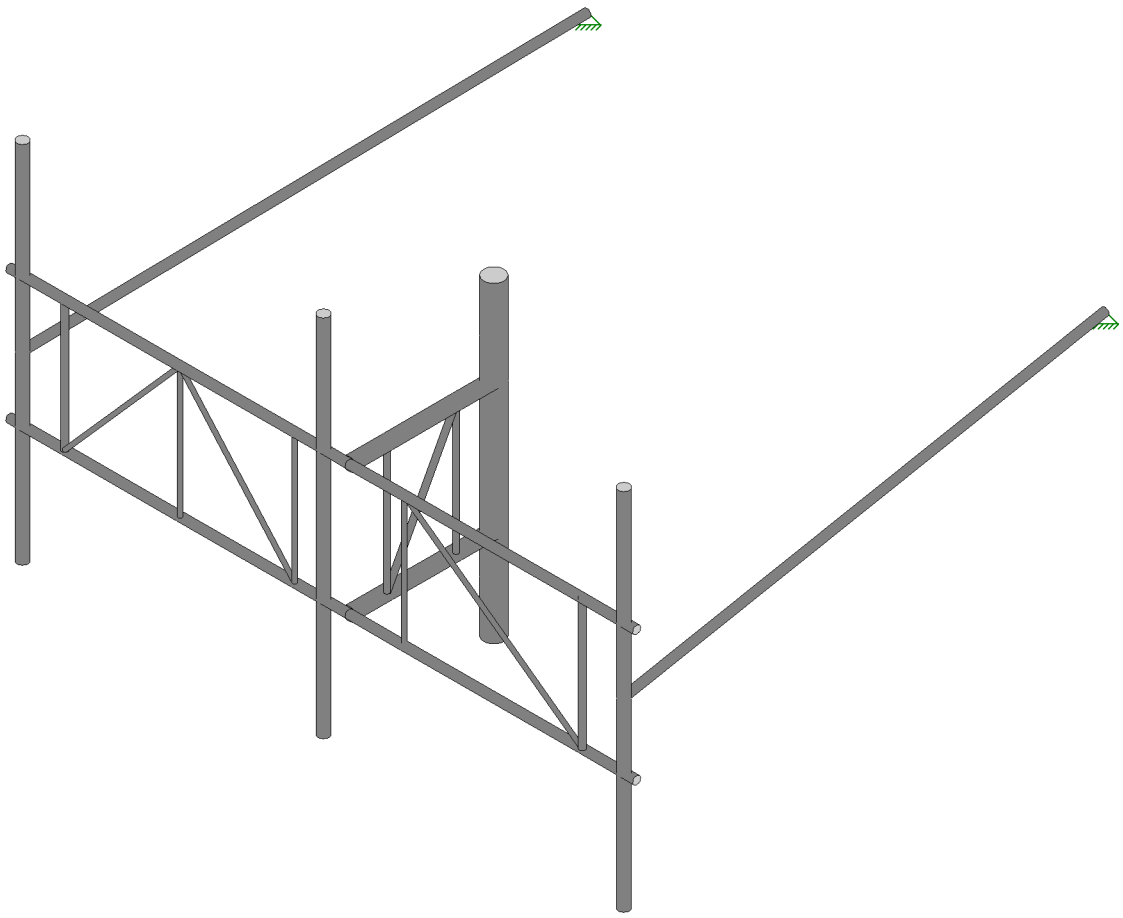
4.1) Recommendations

The mount has **sufficient capacity with modifications** to carry the proposed loading configuration. The following modifications are required:

- Reposition connection point of the existing tie-back to center of the mount pipe, as shown in Appendix A.
- Install **Site Pro 1 STK-U** tie-back kit to the opposite side of the existing sector mount, as shown in Appendix A. Install kit as symmetrically as possible to the repositioned existing tie-back.
- Install new APXVAARR24 antennas on pipe position #2 (middle) and relocate existing AIR 21 antennas to position #1 & #3 to maximize structural capacity.

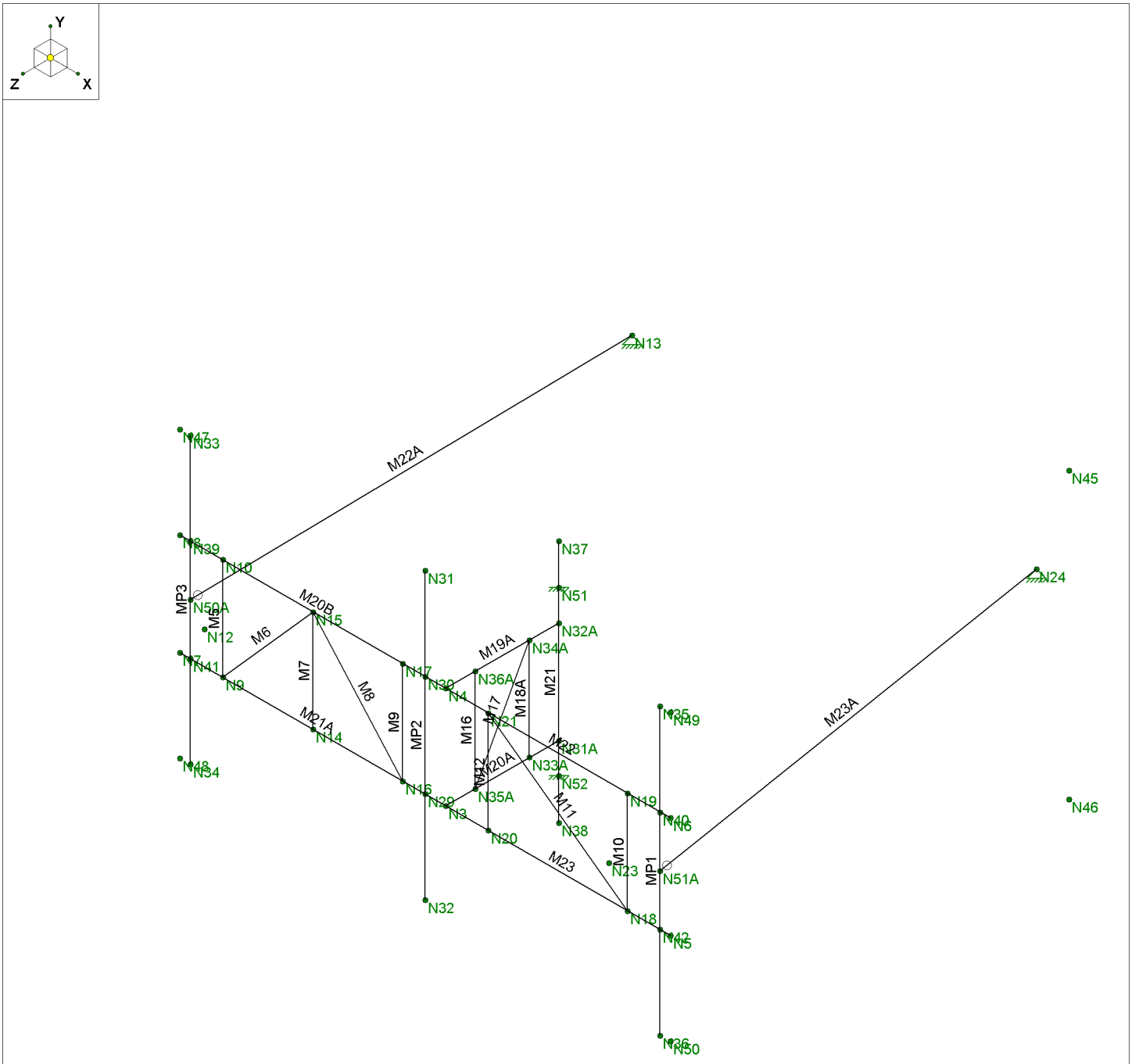
APPENDIX A

WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Infinigy Engineering, PLLC	842870	Rendered Model
JSL		
600-005		842870_REINFORCED.r3d



Envelope Only Solution

Infinigy Engineering, PLLC	842870	Wire Frame Model
JSL		
600-005		842870_REINFORCED.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	Milford
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	JSL
Date:	2018-06-20

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2015 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Mount - T-Arm
Number of Sectors:	3
Structure Shape 1:	Flat

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	93	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	114.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	C	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
27.34	1.00	**54.68**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
7.91	1.00	**23.92**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (nominal 3-second gust)
Base Ice Thickness:	0.75	in

Input Appurtenance Information and Load Placements:

Appurtenance Name	Elevation (ft)	Total Quantity	Ka	Front Shape	Side Shape	q_z (psf)	EPA (ft^2)	Fz (lbs)	Fx (lbs)	Fz(60) (lbs)	Fx(30) (lbs)
Ericsson AIR 21 B2A/B4P	114.0	3	1.00	Flat	Flat	27.34	6.12	167.22	118.32	130.55	155.00
Ericsson AIR 21 B4A/B2P	114.0	3	1.00	Flat	Flat	27.34	6.12	167.22	118.32	130.55	155.00
APXVAARR24	114.0	3	1.00	Flat	Flat	27.34	20.24	553.38	242.99	320.59	475.79
Ericsson KRY 112 71	114.0	3	1.00	Flat	Flat	27.34	0.58	15.95	10.88	12.15	14.68
RRU 4449 B12/B71	114.0	3	1.00	Flat	Flat	27.34	1.65	45.11	35.54	37.93	42.71

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Sha...	Type	Design List	Material	Design Ru...
1	M5	N10	N9			1.25" S.R.	None	None	A36 Gr....	Typical
2	M6	N9	N15			0.75" S.R.	None	None	A36 Gr....	Typical
3	M7	N14	N15			0.75" S.R.	None	None	A36 Gr....	Typical
4	M8	N16	N15			0.75" S.R.	None	None	A36 Gr....	Typical
5	M9	N16	N17			0.75" S.R.	None	None	A36 Gr....	Typical
6	M10	N19	N18			1.25" S.R.	None	None	A36 Gr....	Typical
7	M11	N18	N21			0.75" S.R.	None	None	A36 Gr....	Typical
8	M12	N20	N21			0.75" S.R.	None	None	A36 Gr....	Typical
9	MP2	N32	N31			2" STD Pipe	None	None	A53 Gr.B	Typical
10	MP3	N34	N33			2" STD Pipe	None	None	A53 Gr.B	Typical
11	MP1	N36	N35			2" STD Pipe	None	None	A53 Gr.B	Typical
12	M16	N36A	N35A			1" S.R.	None	None	A36 Gr....	Typical
13	M17	N35A	N34A			1" S.R.	None	None	A36 Gr....	Typical
14	M18A	N34A	N33A			1" S.R.	None	None	A36 Gr....	Typical
15	M19A	N4	N32A			2.5" STD Pi...	None	None	A53 Gr.B	Typical
16	M20A	N3	N31A			2.5" STD Pi...	None	None	A53 Gr.B	Typical
17	M21	N37	N38			4" STD Pipe	None	None	A53 Gr.B	Typical
18	M20B	N8	N4			1.25" STD ...	None	None	A53 Gr.B	Typical
19	M21A	N7	N3			1.25" STD ...	None	None	A53 Gr.B	Typical
20	M22	N6	N4			1.25" STD ...	None	None	A53 Gr.B	Typical
21	M23	N5	N3			1.25" STD ...	None	None	A53 Gr.B	Typical
22	M22A	N13	N50A			1.25" STD ...	None	None	A53 Gr.B	Typical
23	M23A	N24	N51A			1.25" STD ...	None	None	A53 Gr.B	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	SR 0.75" Bar	6	220.9	0
3	A36 Gr.36	SR 1" Bar	3	94	0
4	A36 Gr.36	SR 1.25" Bar	2	60	0
5	A53 Gr.B	PIPE_1.25	6	532	0
6	A53 Gr.B	PIPE_2.0	3	252	0
7	A53 Gr.B	PIPE_2.5	2	66.6	0
8	A53 Gr.B	PIPE_4.0	1	72	0
9	Total HR Steel		23	1297.5	.3

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(M...	Surface...
1	Self Weight	DL		-1			8			
2	Wind Load AZI 000	WLZ					8		1	
3	Wind Load AZI 090	WLX					8		1	
4	Ice Weight	OL1					8	21		
5	Wind + Ice Load AZI 000	OL2					8		1	
6	Wind + Ice Load AZI 090	OL3					8		1	
7	Service Live 1	LL				1				
8	Seismic Load AZI 000	ELZ								
9	Seismic Load AZI 090	ELX								
10	BLC 2 Transient Area Loads	None						21		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(M...	Surface...
11	BLC 3 Transient Area Loads	None						19		
12	BLC 5 Transient Area Loads	None						21		
13	BLC 6 Transient Area Loads	None						19		

Load Combinations

	Description	Solve	PDelta	S...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		DL	1.4																				
2	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	1.6																		
3	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	1....	...	.8																
4	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	.8	...	1....																
5	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2			...	1.6																
6	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	-.8	...	1....																
7	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	-1....	...	.8																
8	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	-1.6																		
9	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	-1....	...	-.8																
10	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	-.8	...	-1....																
11	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2			...	-1.6																
12	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	.8	...	-1....																
13	1.2D + 1.6W AZI ...	Yes	Y		DL	1.2	WLZ	1....	...	-.8																
14	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	1.6																		
15	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	1....	...	.8																
16	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	.8	...	1....																
17	0.9D + 1.6W AZI ...	Yes	Y		DL	.9			...	1.6																
18	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	-.8	...	1....																
19	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	-1....	...	.8																
20	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	-1.6																		
21	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	-1....	...	-.8																
22	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	-.8	...	-1....																
23	0.9D + 1.6W AZI ...	Yes	Y		DL	.9			...	-1.6																
24	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	.8	...	-1....																
25	0.9D + 1.6W AZI ...	Yes	Y		DL	.9	WLZ	1....	...	-.8																
26	1.2D + 1.0Di	Yes	Y		DL	1.2	OL1	1																		
27	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	1																
28	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	.866	O...	.5														
29	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	.5	O...	.866														
30	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1			O...	1														
31	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	-.5	O...	.866														
32	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	-.8...	O...	.5														
33	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	-1																
34	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	-.8...	O...	-.5														
35	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	-.5	O...	-.8...														
36	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1			O...	-1														
37	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	.5	O...	-.8...														
38	1.2D + 1.0Di + 1.0...	Yes	Y		DL	1.2	OL1	1	O...	.866	O...	-.5														
39	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	.104																
40	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	.09	...	.052														
41	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	.052	...	.09														
42	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5			...	.104														
43	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	-.0...	...	.09														
44	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	-.09	...	.052														

Load Combinations (Continued)

	Description	Solve	PDelta	S...	BLC	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
45	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	-.1...																
46	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	-.09	...	-.0...														
47	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	-.0...	...	-.09														
48	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5			...	-.1...														
49	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	.052	...	-.09														
50	1.2D + 1.5L + 1.0...	Yes	Y		DL	1.2	LL	1.5	...	.09	...	-.0...														
51	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	1																		
52	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	.866	E...	.5																
53	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	.5	E...	.866																
54	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2			E...	1																
55	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	-.5	E...	.866																
56	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	-.8...	E...	.5																
57	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	-1																		
58	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	-.8...	E...	-.5																
59	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	-.5	E...	-.8...																
60	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2			E...	-1																
61	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	.5	E...	-.8...																
62	(1.2+0.2Sds) + 1....	Yes	Y		DL	1.2	ELZ	.866	E...	-.5																
63	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	1																		
64	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	.866	E...	.5																
65	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	.5	E...	.866																
66	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9			E...	1																
67	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	-.5	E...	.866																
68	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	-.8...	E...	.5																
69	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	-1																		
70	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	-.8...	E...	-.5																
71	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	-.5	E...	-.8...																
72	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9			E...	-1																
73	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	.5	E...	-.8...																
74	(0.9-0.2Sds) + 1.0...	Yes	Y		DL	.9	ELZ	.866	E...	-.5																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N13	max	73.855	6	72.874	8	594.486	14	0	1	0	1	0	1
2		min	-72.777	24	-50.171	14	-596.637	8	0	1	0	1	0	1
3	N24	max	67.65	4	60.606	8	495.044	2	0	1	0	1	0	1
4		min	-68.277	22	-38.115	14	-493.553	20	0	1	0	1	0	1
5	N52	max	719.952	17	967.303	27	1821.69	27	707.298	27	1621.517	17	575.537	11
6		min	-1134.442	11	170.784	20	-376.403	20	-241.426	20	-2095.047	11	-476.315	17
7	N51	max	1175.607	5	1168.4...	35	197.923	14	584.538	33	2146.684	5	587.843	5
8		min	-760.024	23	343.55	15	-1774.18	33	-213.04	14	-1658.047	23	-489.212	23
9	Totals:	max	1949.245	17	2132.1...	26	2603.223	14						
10		min	-1949.245	11	657.647	24	-2603.223	8						

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn y...	phi*Mn z...	Cb	Eqn
1	M21A	PIPE_1.25	.933	78.25	36	.344	78.25		33	6788.737	19687.5	800.625	800.625	4....	H3-6
2	M20B	PIPE_1.25	.741	78.25	29	.335	78.25		27	6788.737	19687.5	800.625	800.625	4....	H3-6
3	M19A	PIPE_2.5	.656	33.321	5	.191	33.321		30	49982.5...	50715	3596.25	3596.25	1	H1-1b

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn y...	phi*Mn z...	Cb	Eqn
4	M20A	PIPE_2.5	.633	33.321	11	.170	33.321		37	49982.5...	50715	3596.25	3596.25	1	H1-1b
5	M8	SR 0.75" Bar	.446	0	38	.036	39.945		10	2265.295	14320.8	184.32	184.32	1....	H1-1a
6	M22	PIPE_1.25	.307	66.25	4	.074	66.25		27	9179.16	19687.5	800.625	800.625	1....	H1-1b
7	M23	PIPE_1.25	.296	66.25	10	.071	3.451		2	9179.16	19687.5	800.625	800.625	1....	H1-1b
8	M22A	PIPE_1.25	.248	59.474	2	.011	121....		11	2816.844	19687.5	800.625	800.625	1....	H1-1a
9	M23A	PIPE_1.25	.226	60.739	12	.011	121....		5	2816.844	19687.5	800.625	800.625	1....	H1-1b
10	M16	SR 1" Bar	.183	30	28	.092	30		28	11923.4...	25446.8...	424.112	424.112	2....	H1-1b
11	MP3	PIPE_2.0	.180	42	2	.029	42		2	29810.2...	32130	1871.625	1871.625	1	H1-1b
12	M12	SR 0.75" Bar	.171	0	29	.037	30		38	4016.218	14320.8	184.32	184.32	2....	H1-1b
13	MP1	PIPE_2.0	.163	42	2	.025	42		2	29810.2...	32130	1871.625	1871.625	1	H1-1b
14	M21	PIPE_4.0	.132	12	5	.271	12		5	91394.4...	93240	10631.25	10631.25	1	H3-6
15	M17	SR 1" Bar	.130	34	36	.055	0		36	9592.869	25446.8...	424.112	424.112	2....	H1-1b
16	M18A	SR 1" Bar	.111	30	27	.053	30		28	11923.4...	25446.8...	424.112	424.112	2....	H1-1b*
17	M11	SR 0.75" Bar	.101	0	30	.024	0		12	1400.464	14320.8	184.32	184.32	2....	H1-1b
18	MP2	PIPE_2.0	.090	27.125	27	.079	27.125		38	29810.2...	32130	1871.625	1871.625	1	H1-1b
19	M6	SR 0.75" Bar	.067	0	37	.032	0		9	2246.639	14320.8	184.32	184.32	3....	H1-1b
20	M9	SR 0.75" Bar	.065	0	38	.014	0		37	4016.218	14320.8	184.32	184.32	2....	H1-1b
21	M5	SR 1.25" Bar	.065	30	38	.005	30		38	35219.0...	39760.7...	828.348	828.348	1	H1-1b
22	M7	SR 0.75" Bar	.040	0	2	.002	0		2	4016.218	14320.8	184.32	184.32	2....	H1-1b
23	M10	SR 1.25" Bar	.039	0	2	.002	30		6	35219.0...	39760.7...	828.348	828.348	1	H1-1b

APPENDIX D

REFERENCE DOCUMENTS

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: CT11018F

Milford/ I-95/ X37/ Jct.
434 Boston Post Road
Milford, CT 06460

August 2, 2018

EBI Project Number: 6218005374

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	24.25 %

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

EBI Consulting
environmental | engineering | due diligence

August 2, 2018

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

Emissions Analysis for Site: **CT11018F – Milford/ I-95/ X37/ Jct.**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **434 Boston Post Road, Milford, 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 population 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 population 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 limits for the 600 MHz and 700 MHz Band are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$ respectively. The general population exposure limit for the 1900 MHz (PCS) and 2100 MHz (AWS) frequency 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 **434 Boston Post Road, Milford, 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 for directional panel antennas, 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) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 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.

8) 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 for directional panel antennas, 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.

9) The antennas used in this modeling are the **Ericsson AIR21 B2A/B4P** & **Ericsson AIR21 B4A/B2P** for 1900 MHz (PCS) and 2100 MHz (AWS) channels and the **RFS APXVAARR24_43-U-NA20** for 600 MHz and 700 MHz channels. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, 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.

10) The antenna mounting height centerline of the proposed antennas is **112 feet** above ground level (AGL).

11) 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.

12) All calculations were done with respect to uncontrolled / general population threshold limits.

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T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P	Make / Model:	Ericsson AIR21 B2A/B4P
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	112 feet	Height (AGL):	112 feet	Height (AGL):	112 feet
Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)	Frequency Bands	1900 MHz (PCS)
Channel Count	6	Channel Count	6	Channel Count	6
Total TX Power(W):	240	Total TX Power(W):	240	Total TX Power(W):	240
ERP (W):	9,337.08	ERP (W):	9,337.08	ERP (W):	9,337.08
Antenna A1 MPE%	**2.99**	Antenna B1 MPE%	**2.99**	Antenna C1 MPE%	**2.99**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P	Make / Model:	Ericsson AIR21 B4A/B2P
Gain:	5.9 dBd	Gain:	5.9 dBd	Gain:	5.9 dBd
Height (AGL):	112 feet	Height (AGL):	112 feet	Height (AGL):	112 feet
Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)	Frequency Bands	1900 MHz (PCS) / 2100 MHz (AWS)
Channel Count	2	Channel Count	2	Channel Count	2
Total TX Power(W):	120	Total TX Power(W):	120	Total TX Power(W):	120
ERP (W):	4,668.54	ERP (W):	4,668.54	ERP (W):	4,668.54
Antenna A2 MPE%	**1.49**	Antenna B2 MPE%	**1.49**	Antenna C2 MPE%	**1.49**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd	Gain:	12.95 / 13.35 dBd
Height (AGL):	112 feet	Height (AGL):	112 feet	Height (AGL):	112 feet
Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz	Frequency Bands	600 MHz / 700 MHz
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):	2,481.08	ERP (W):	2,481.08	ERP (W):	2,481.08
Antenna A3 MPE%	**1.84**	Antenna B3 MPE%	**1.84**	Antenna C3 MPE%	**1.84**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**6.32 %**
Town Antennas	**0.30 %**
MetroPCS	**1.96 %**
XM Satellite Radio	**2.85 %**
Sprint	**5.56 %**
Verizon Wireless	**5.73 %**
AT&T	**1.53 %**
Site Total MPE %:	**24.25 %**

T-Mobile Sector A Total:	6.32 %
T-Mobile Sector B Total:	6.32 %
T-Mobile Sector C Total:	6.32 %
Site Total:	24.25 %

T-Mobile Max Power Values (Per Sector)

T-Mobile _Frequency Band / Technology (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 - 1900 MHz UMTS	2	1,167.14	112	7.47	PCS - 1900 MHz	1000.00	0.75%
T-Mobile PCS - 1900 MHz GSM	2	1,167.14	112	7.47	PCS - 1900 MHz	1000.00	0.75%
T-Mobile PCS - 1900 MHz LTE	2	2,334.27	112	14.94	PCS - 1900 MHz	1000.00	1.49%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	112	14.94	AWS - 2100 MHz	1000.00	1.49%
T-Mobile 600 MHz LTE	2	591.73	112	3.79	600 MHz	400.00	0.95%
T-Mobile 700 MHz LTE	2	648.82	112	4.15	700 MHz	467.00	0.89%
						Total:	**6.32%**

Summary

All calculations performed for this analysis yielded results that were **within** the allowable limits for general population 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 population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	6.32 %
Sector B:	6.32 %
Sector C:	6.32 %
T-Mobile Maximum MPE % (Per Sector):	6.32 %
Site Total:	24.25 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **24.25%** of the allowable FCC established general population 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.