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

10/16/18

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: 828054**
T-Mobile Site ID: CT11279D
300 Governors Highway, South Windsor, CT 06074
Latitude: 41° 50′ 0.40″/ Longitude: -72° 36′ 11.00″

Dear Ms. Bachman:

T-Mobile currently maintains 6 antennas at the 165 foot level of the existing 165-foot monopole Tower at 300 Governors Highway, South Windsor, CT 06074. The tower is owned by Crown Castle. The property is owned by Electron Technologies Corp. T-Mobile intends to replace (3) existing panel antennas with (6) proposed panel antennas and to add (3) remote radio units, add (2) hybrid lines and to remove (3) remote radio units, (3) TMAs and (2) line of coax.

This facility was approved by the Town of South Windsor on September 21, 1999, Application: Appl 99-51P. This approval was given without condition.

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 Mathew Galligan – Town Manager, Michele Lipe – Director of Planning, as well as the property owner, and Crown Castle as 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:

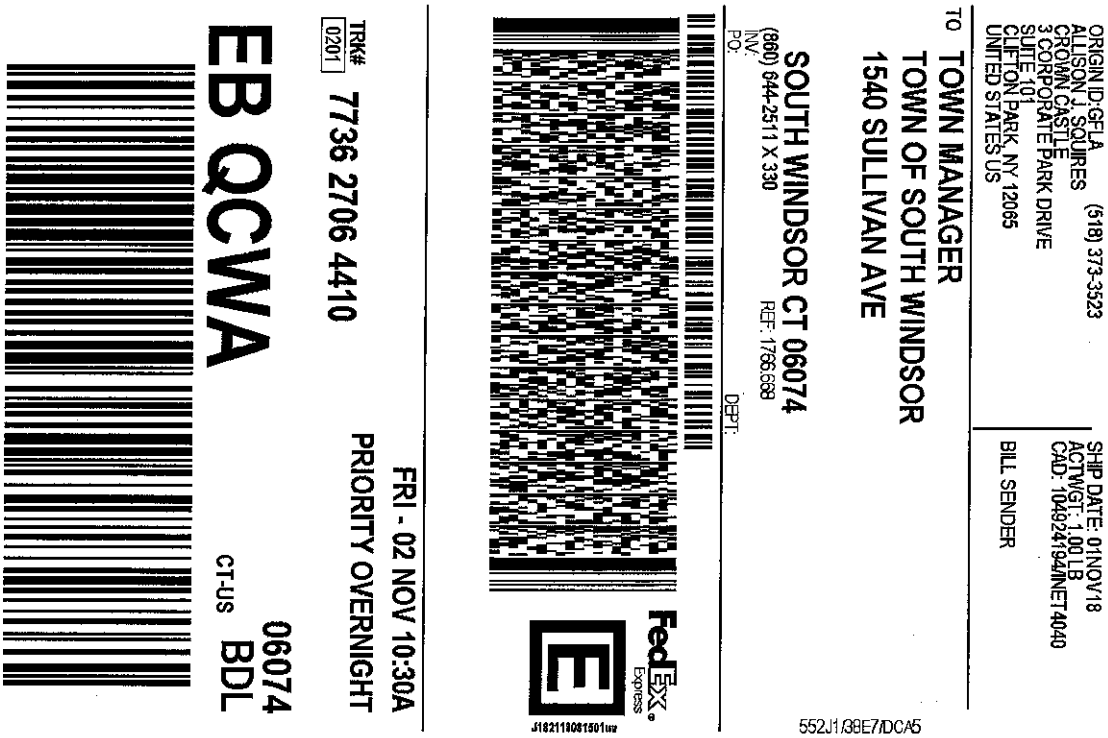
Tab 1: Exhibit-1: Compound plan and elevation depicting the planned changes
Tab 2: Exhibit-2: Structural Modification Report
Tab 3: Exhibit-3: General Power Density Table Report (RF Emissions Analysis Report)

cc:

Mathew Galligan
Town Manager
1540 Sullivan Ave,
South Windsor, CT 06074

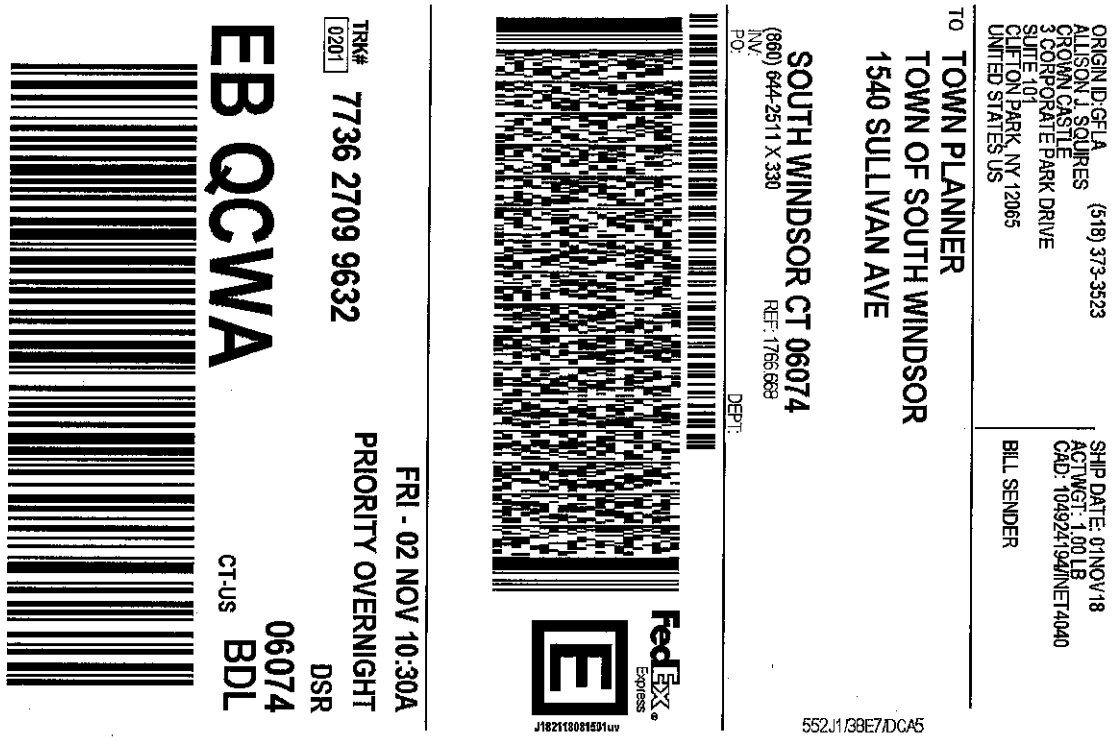
Michele Lipe
Director of Planning
1540 Sullivan Ave,
South Windsor, CT 06074

ELECTRON TECHNOLOGIES CORPORATION
300 GOVERNORS HWY, PO BOX 316, SOUTH WINDSOR, CT 06074



After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

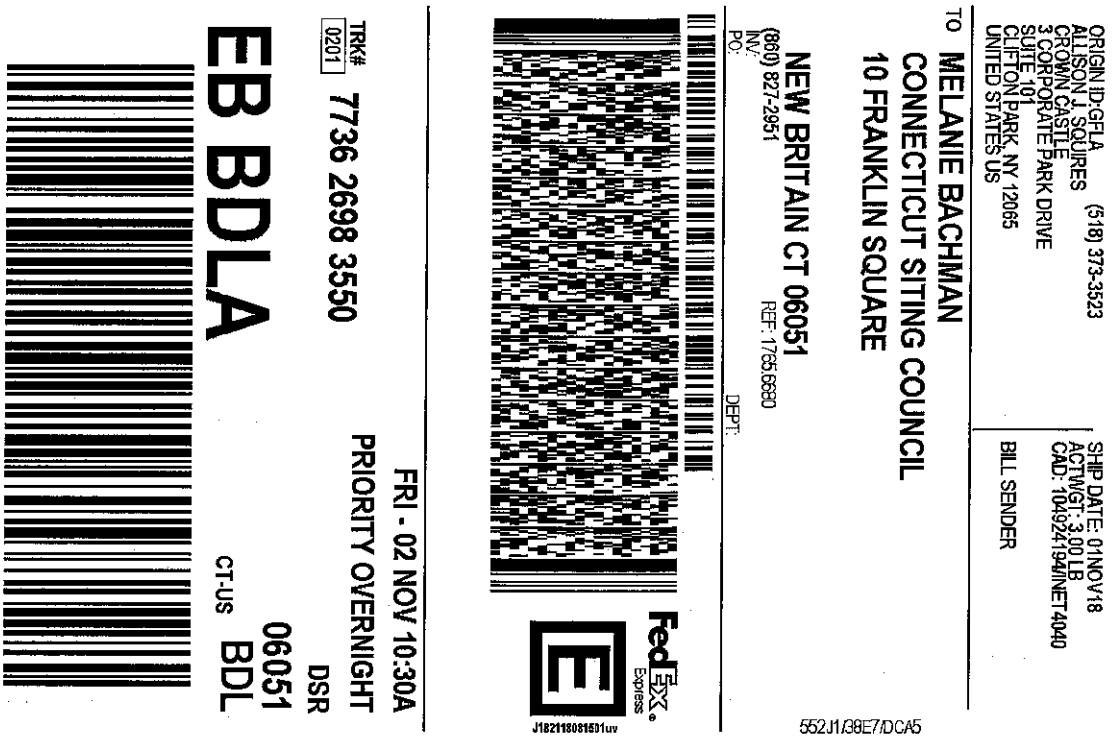


After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.



After printing this label:
1. Use the 'Print' button on this page to print your label to your laser or inkjet printer.
2. Fold the printed page along the horizontal line.
3. Place label in shipping pouch and affix it to your shipment so that the barcode portion of the label can be read and scanned.

Warning: Use only the printed original label for shipping. Using a photocopy of this label for shipping purposes is fraudulent and could result in additional billing charges, along with the cancellation of your FedEx account number.
Use of this system constitutes your agreement to the service conditions in the current FedEx Service Guide, available on fedex.com.FedEx will not be responsible for any claim in excess of $100 per package, whether the result of loss, damage, delay, non-delivery,misdelivery,or misinformation, unless you declare a higher value, pay an additional charge, document your actual loss and file a timely claim.Limitations found in the current FedEx Service Guide apply. Your right to recover from FedEx for any loss, including intrinsic value of the package, loss of sales, income interest, profit, attorney's fees, costs, and other forms of damage whether direct, incidental,consequential, or special is limited to the greater of $100 or the authorized declared value. Recovery cannot exceed actual documented loss.Maximum for items of extraordinary value is $1,000, e.g. jewelry, precious metals, negotiable instruments and other items listed in our ServiceGuide. Written claims must be filed within strict time limits, see current FedEx Service Guide.

Town of South Windsor, CT

Property Listing Report | Map Block Lot 71-22 | Account 36900300

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

Item	Appraised	Assessed
Buildings	605000	423500
Extras	0	0
Improvements	628200	439700
Outbuildings	23200	16200
Land	480700	336500
Total	1108900	776200

Outbuilding and Extra Items

Type	Description
Paving	36700.00 S.F.
Lights	1.00 UNITS
Fence	1080.00 L.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
Total Area	22060	22060

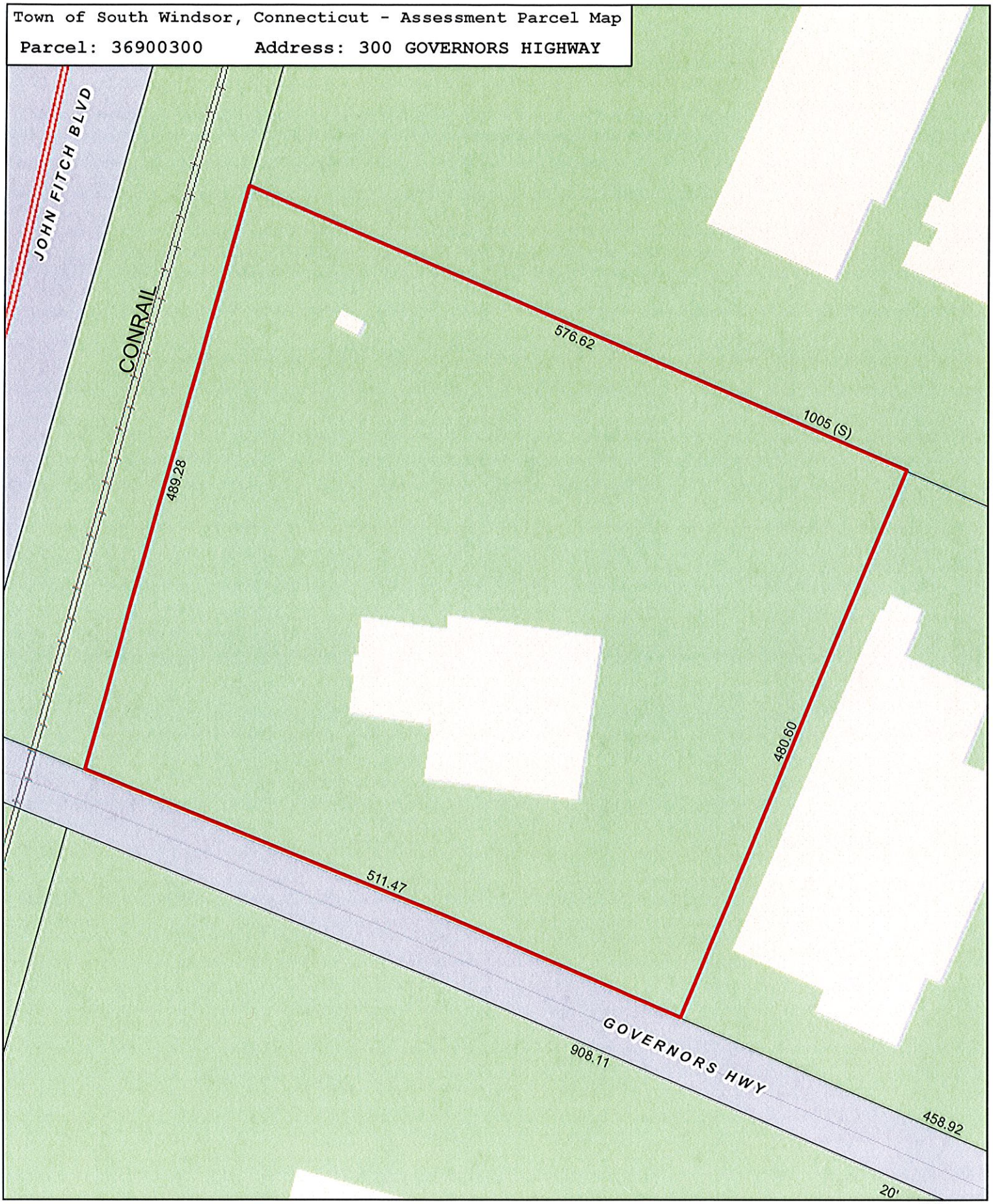
Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
ELECTRON TECHNOLOGIES CORPORATIO	540/ 418	10/4/1988	800000

Report Created On 8/27/2018

Town of South Windsor, Connecticut - Assessment Parcel Map

Parcel: 36900300 Address: 300 GOVERNORS HIGHWAY



Approximate Scale:
1 inch = 100 feet

0 80 160 240 Feet

Map Produced:
July 2012

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

Town of South Windsor
1540 SULLIVAN AVENUE • SOUTH WINDSOR, CT 06074-2786
AREA CODE 860/644-2511
FAX 860/644-3781

CERTIFIED MAIL

September 21, 1999

Mr. Thomas M. Gilligan
Omnipoint Communications, Inc.
100 Filley Street
Bloomfield, CT 06002

Dear Mr. Gilligan:

Re: Appl 99-51P, Omnipoint Communications Services

We are pleased to advise you that the Planning & Zoning Commission voted on September 14, 1999 to approve with modifications the above referenced application for a request for a Special Exception to Section XVI for the construction of a 175 ft. multi-carrier telecommunications monopole on property located at 300 Governor's Highway, I zone as shown on plans prepared by Arcnet, Job No. A 99506823A, dated 5/9/99, as revised. This approval is subject to the following modifications:

1. Prior to commencement of any site work, a meeting must be held with Town Staff.

2. No building permit will be issued until the final mylars have been filed in the Town Clerk's office.

3. An as-built plan is required prior to issuance of a Certificate of Occupancy per Section 8.1.10 of the Zoning Regulations.

4. All plans used in the field by the developer must bear the stamp and authorized signature of the Town of South Windsor.

5. Special Exception approval is granted for five years and must be renewed prior to September 14, 2004. The attached Special Exception form must be completed and filed in the Town Clerk's office. The special exception will take effect upon filing.

Black and white transparent mylars of Sheet S-1 with the above modifications, together with three blueprint copies of the entire set of plans must be submitted to this Commission within 30 days to be stamped and signed.

After the mylars have been signed by the Commission, they will be returned to you for filing in the Office of the Town Clerk. After filing these plans, a copy of the receipt must be submitted to the Planning Department.

Sincerely,

Sue W. Larsen /dlw

Sue W. Larsen, Chairperson
Planning and Zoning Commission

SL/dlw

Attachment

cc: Town Engineer
Chief Building Official
Assessor
Superintendent of Pollution Control
Fire Marshal

T-Mobile
CROWN CASTLE

CBU
828054

SITE ID
CT11279D

SITE NAME
SOUTH WINDSOR/RT 5

SITE ADDRESS
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

CONFIGURATION
67D92DB_2XAIR+1OP

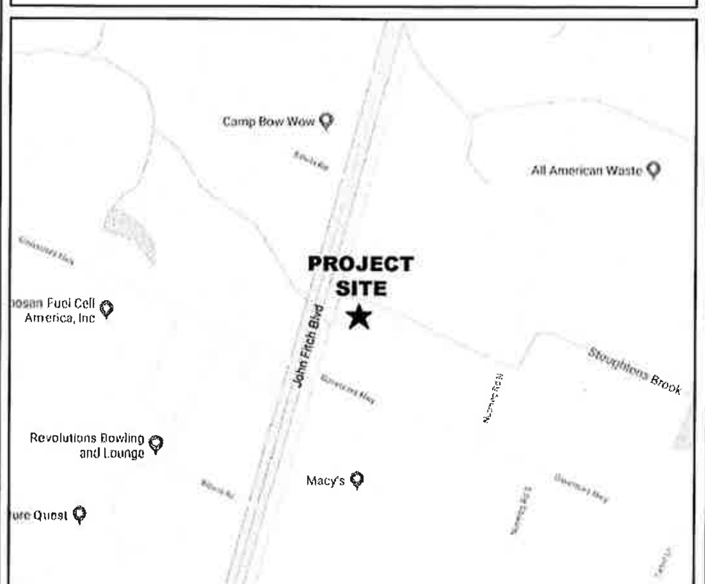
SHEET INDEX

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

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

PROJECT SITE INFORMATION

SITE ID:	CT11279D
SITE NAME:	SOUTH WINDSOR/RT 5
SITE ADDRESS:	300 GOVERNORS HIGHWAY SOUTH WINDSOR, CT 06074
COUNTY:	HARTFORD
SITE COORDINATES:	
LATITUDE:	41° 50' 0.40" N (41.833444°) (NAD 83)
LONGITUDE:	-72° 36' 11.00" W (-72.603056°) (NAD 83)
APPLICANT:	T-MOBILE NORTHEAST LLC 103 MONARCH DRIVE LIVERPOOL, NY 13088

STRUCTURAL ANALYSIS INFORMATION

TOWER ANALYSIS

INFINIGY ENGINEERING HAS NOT EVALUATED THE EXISTING TOWER FOR THIS SITE AND ASSUMES NO RESPONSIBILITY FOR ITS STRUCTURAL INTEGRITY. REFER TO STRUCTURAL ANALYSIS FROM TOWER OWNER PRIOR TO ANY CONSTRUCTION.

ANTENNA MOUNTS

BASED ON THE MOUNT ANALYSIS COMPLETED BY **INFINIGY ENGINEERING, PLLC** DATED **07/24/2018**. THE EXISTING ANTENNA MOUNTS ARE CAPABLE OF SUPPORTING THE PROPOSED EQUIPMENT CONFIGURATION

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 L700 4x2 67D92DB (UPSTATE NY MARKET)
REPLACING (3) EXISTING ANTENNAS WITH (6) NEW MODELS
ADDING (2) HYBRID FIBER CABLES
ADD (3) RRUS
REPLACING (2) COAX
REMOVE (3) TMAs
REMOVE (3) RRUS

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

STATE OF CONNECTICUT, JOHN S. STEVENS, LICENSED PROFESSIONAL ENGINEER
AUG 14 2018

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

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

No	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCO
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title:
CT11279D
SOUTH WINDSOR/RT 5
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

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

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. 24798
LICENSED PROFESSIONAL ENGINEER
AUG 14 2018

No.	Submittal / Revision	Appd.	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCD
Designed: MRL
Checked: AJD

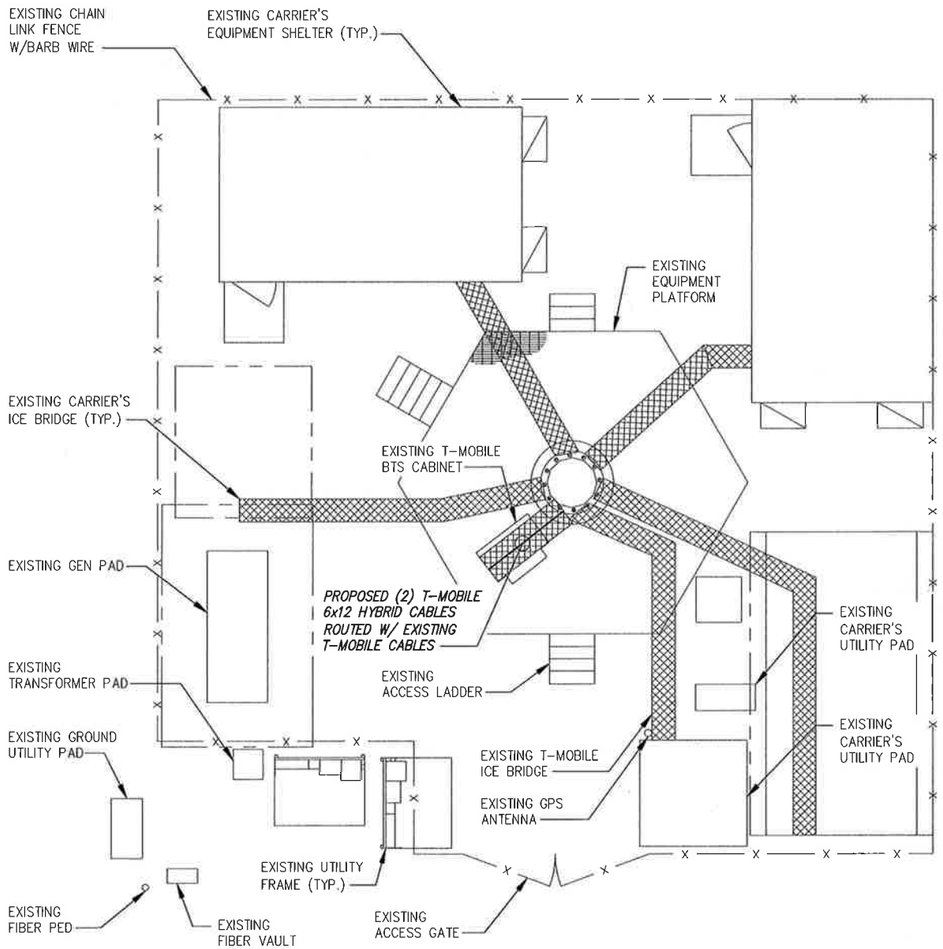
Project Number: 800-007

Project Title: CT11279D
SOUTH WINDSOR/RT 5
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

Prepared For: CROWN CASTLE

Drawing Title: NOTES

Drawing Number: N1



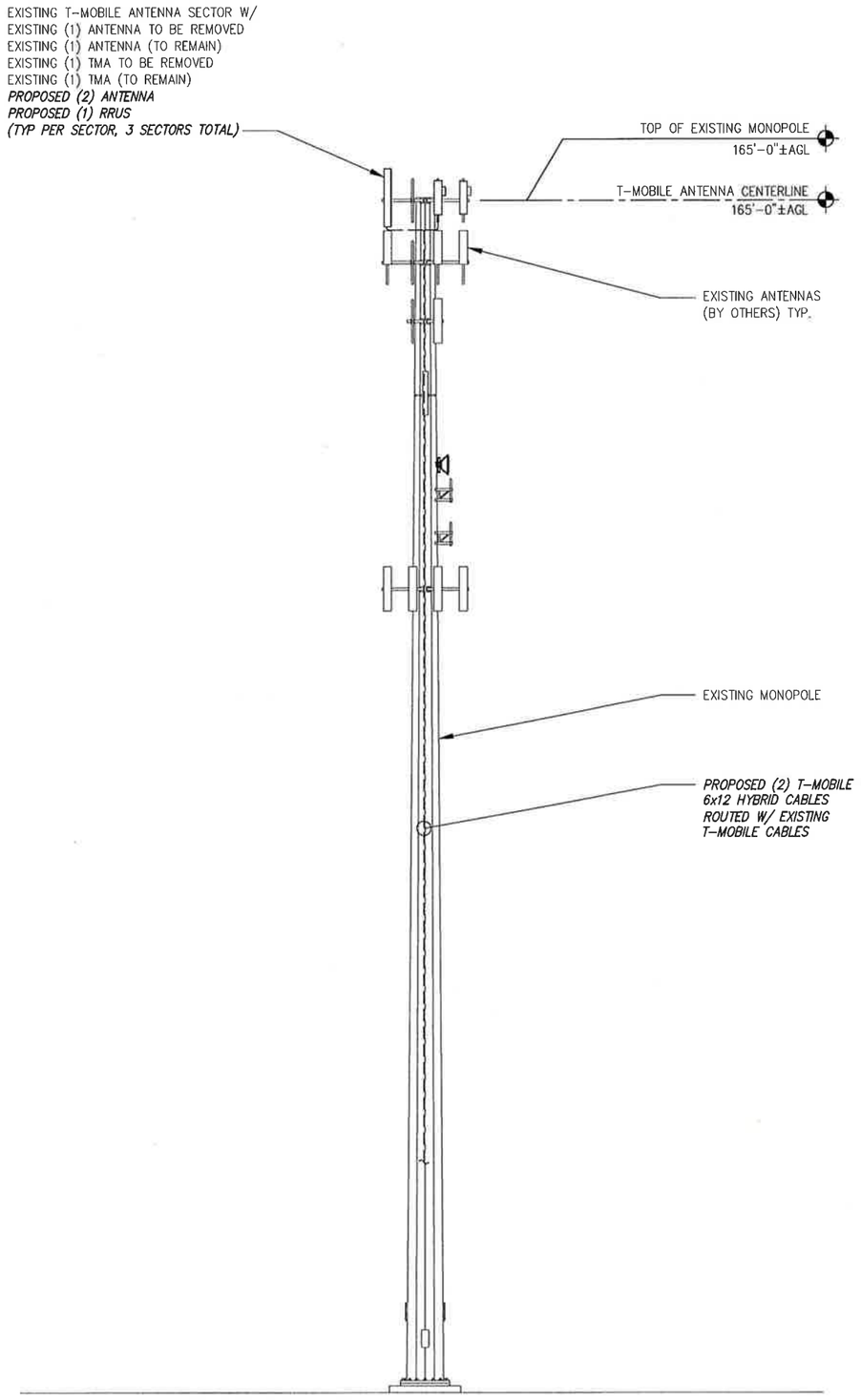
NORTH

1 / C1 PLAN VIEW
SCALE: AS NOTED

GRAPHIC SCALE:

10' 5' 0 5' 10'

SCALE (11x17): 1" = 10'-0"
SCALE (22x34): 1" = 5'-0"



2 / C1 ELEVATION
SCALE: NOT TO SCALE

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
LICENSED PROFESSIONAL ENGINEER
AUG 14 2018

No.	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

Project Title:
CT11279D
SOUTH WINDSOR/RT 5

300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

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	ERICSSON	0°	0	--	165'-0"	GENERIC TWIN STYLE 1B - AWS	180'±	(2) 1-5/8" COAX
	A-2	**APXVAARR24_43-U-NA20**	**RFS**	**0°**	0	--	**165'-0"**	**4449 B71+B12**	**180'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	A-3	**AIR32 B66A/B2A**	**ERICSSON**	**0°**	0	--	**165'-0"**	-	**180'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
BETA	B-1	AIR21	ERICSSON	120°	0	--	165'-0"	GENERIC TWIN STYLE 1B - AWS	185'±	(2) 1-5/8" COAX
	B-2	**APXVAARR24_43-U-NA20**	**RFS**	**120°**	0	--	**165'-0"**	**4449 B71+B12**	**185'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	B-3	**AIR32 B66A/B2A**	**ERICSSON**	**120°**	0	--	**165'-0"**	-	**185'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
GAMMA	C-1	AIR21	ERICSSON	210°	0	--	165'-0"	GENERIC TWIN STYLE 1B - AWS	185'±	(2) 1-5/8" COAX
	C-2	**APXVAARR24_43-U-NA20**	**RFS**	**210°**	0	--	**165'-0"**	**4449 B71+B12**	**185'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**
	C-3	**AIR32 B66A/B2A**	**ERICSSON**	**210°**	0	--	**165'-0"**	-	**185'±**	**(1) 6X12 HYBRID TRUNK CABLE (SHARED)**

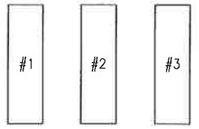
1 C2 RF SYSTEM CHART
SCALE: NOT TO SCALE

KEY

EXISTING
PROPOSED

ANTENNA LOCATION KEY

VIEWED FROM BEHIND

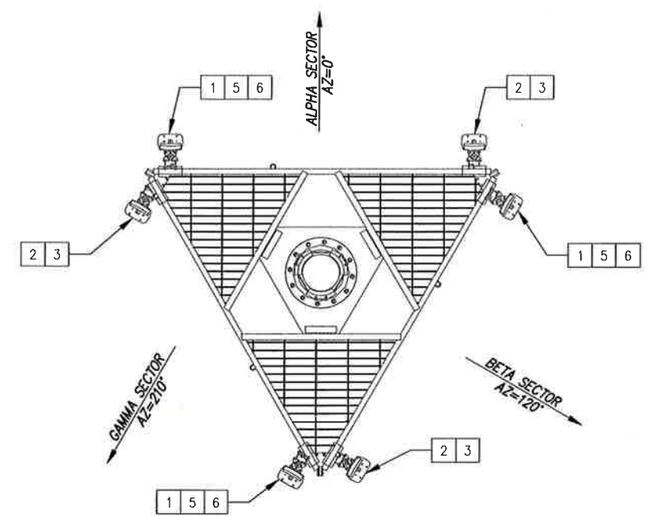


GENERAL NOTES:

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.

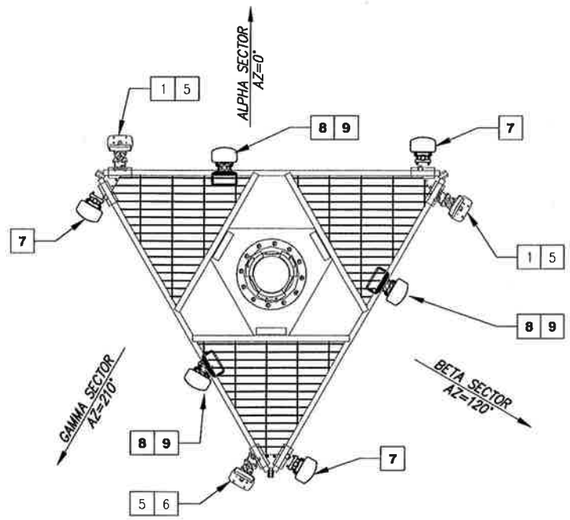
ORIENTATION PLAN KEY

KEY	DESCRIPTION	TYPE	QTY	STATUS
1	AIR21 KRC118023	ANTENNA	3	REMAIN
2	AIR21 KRC118023	ANTENNA	3	REMOVED
3	RRUS-11 B12	RRU	3	REMOVED
5	GENERIC TWIN AWS	TMA	3	REMAIN
6	GENERIC TWIN AWS	TMA	3	REMOVED
7	**AIR32 B66A/B2A**	**ANTENNA**	**3**	**PROPOSED**
8	**APXVAARR24_43-U-NA20**	**ANTENNA**	**3**	**PROPOSED**
9	**4449 B71+B1**	**RRUS**	**3**	**PROPOSED**



NORTH

2 C2 EXISTING ANTENNA ORIENTATION
SCALE: NOT TO SCALE



NORTH

3 C2 PROPOSED ANTENNA ORIENTATION
SCALE: NOT TO SCALE

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
AUG 14 2018

No	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCD
Designed: MRL
Checked: AJD

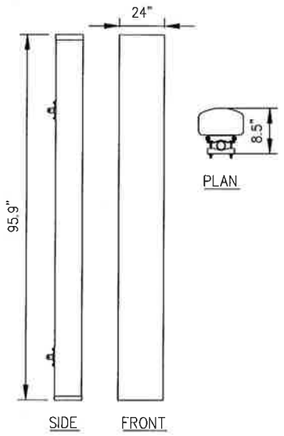
Project Number: 600-007

Project Title:
CT11279D
SOUTH WINDSOR/RT 5
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

Prepared For:
CROWN CASTLE

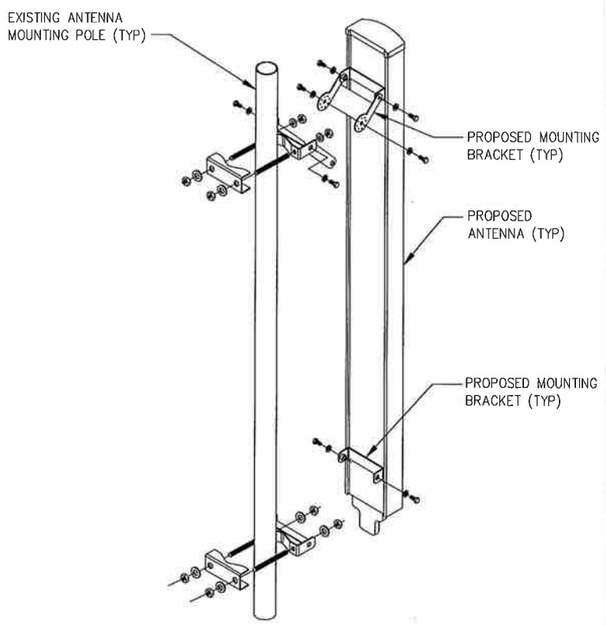
Drawing Title
RF CHART

Drawing Number
C2

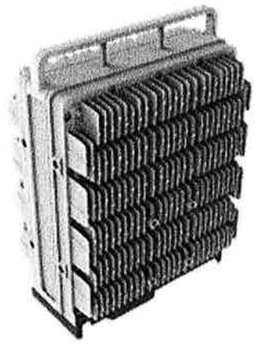


RFS MODEL NO.:	APXVAARR24_43-U-NA20
RADOME MATERIAL:	FIBERGLASS
RADOME COLOR:	LIGHT GREY
DIMENSIONS, HxWxD:	95.9"x24"x8.5"
WEIGHT, W/O MOUNTING KIT:	128 LBS

1 / D1 APX ANTENNA DETAIL
SCALE: NOT TO SCALE



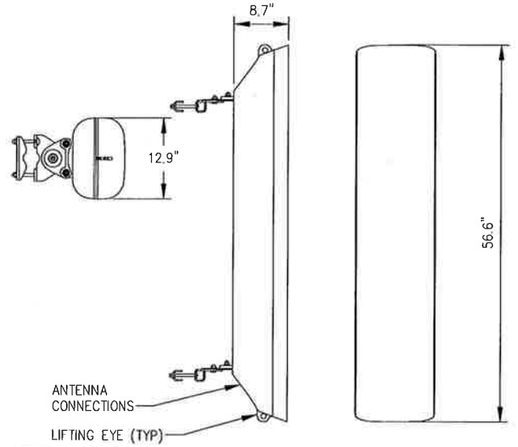
2 / D1 ANTENNA/RRU MOUNTING DETAIL
SCALE: NOT TO SCALE



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



ERICSSON MODEL NO.:	AIR32 B66
RADOME MATERIAL:	FIBERGLASS, UV RESISTANT
RADOME COLOR:	LIGHT GRAY
DIMENSIONS, HxWxD:	56.6"x12.9"x8.7"
WEIGHT, W/ PRE-MOUNTED BRACKETS:	132.2 LBS

4 / D1 ERICSSON ANTENNA DETAIL
SCALE: NOT TO SCALE

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
PROFESSIONAL ENGINEER
LICENSED
AUG 14 2018

No.	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number: 600-007

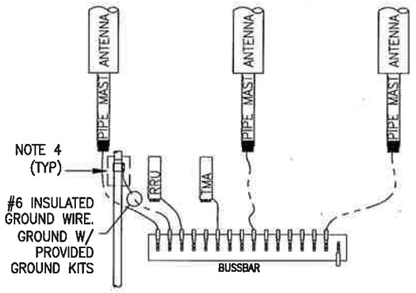
Project Title:
CT11279D
SOUTH WINDSOR/RT 5
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

Prepared For: CROWN CASTLE

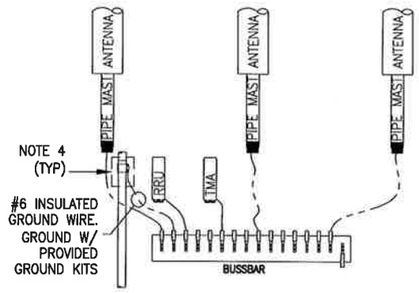
Drawing Title
EQUIPMENT DETAILS

Drawing Number
D1

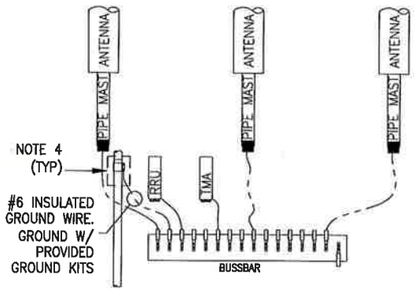
ALPHA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



BETA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)

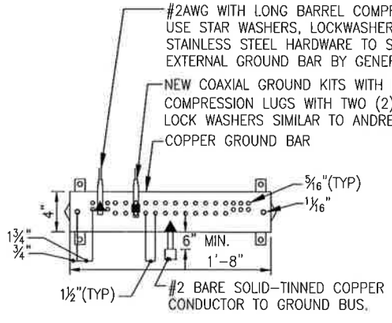


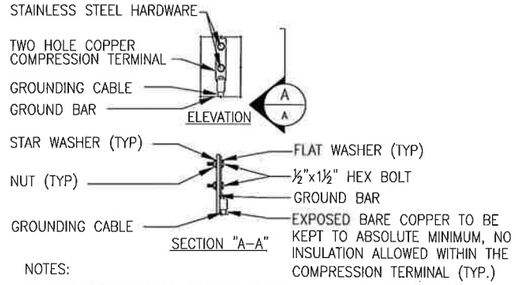
GAMMA SECTOR
(LAYOUT SHOWN GENERICALLY, SEE ANTENNA ORIENTATION)



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

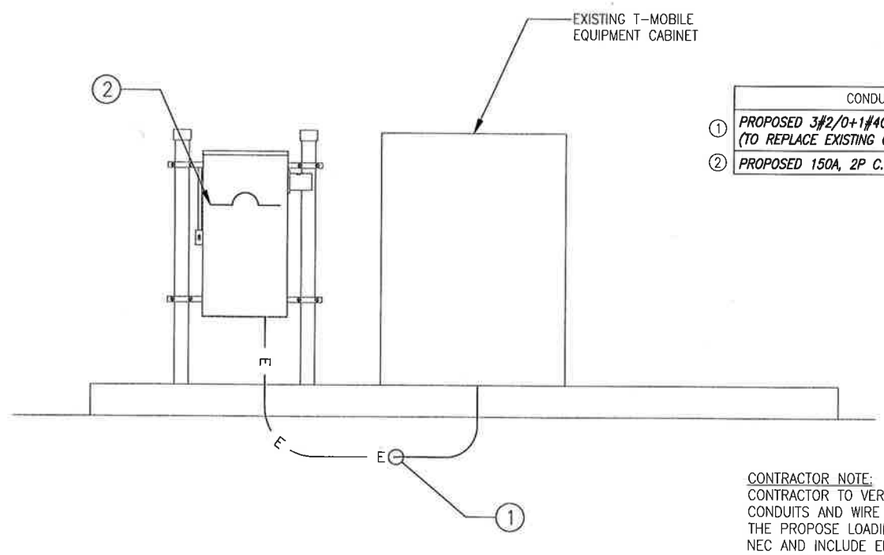




NOTES:
1. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

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.

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.

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
AUG 14 2018

No	Submittal / Revision	App'd	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCD
Designed: MRL
Checked: AJD

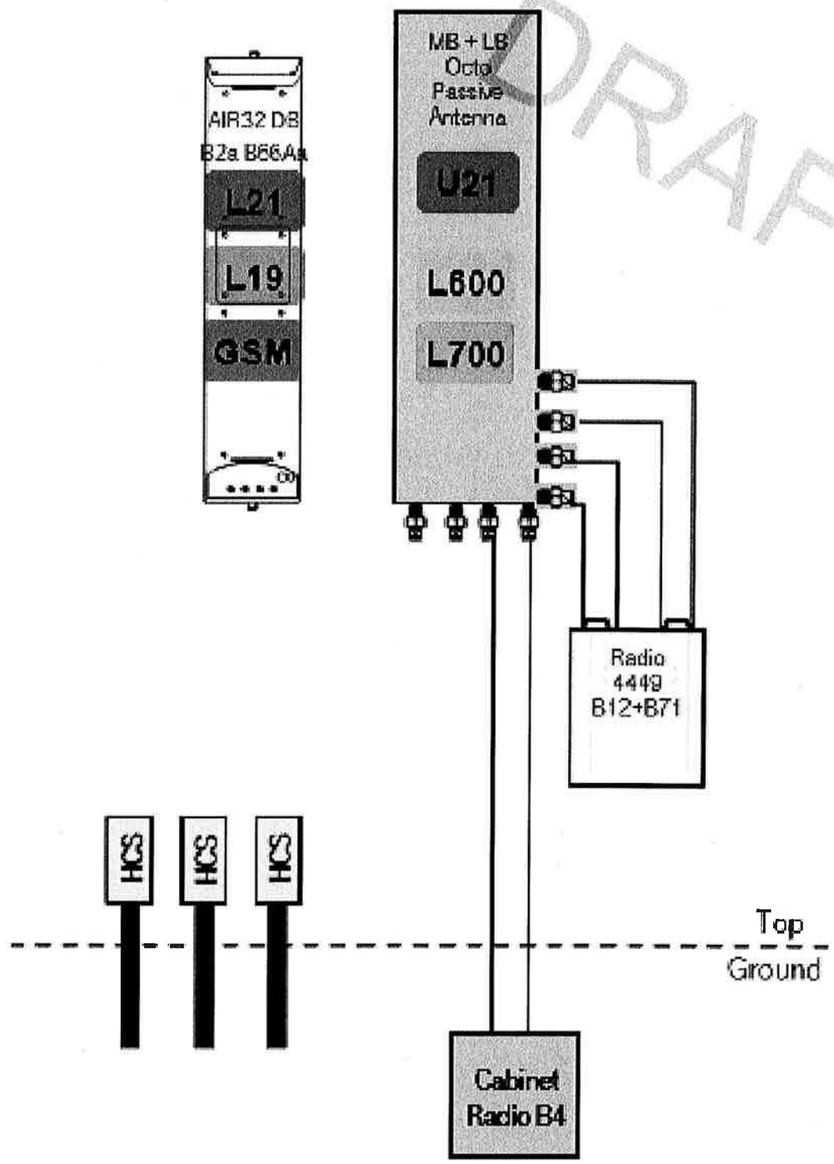
Project Number: 600-007

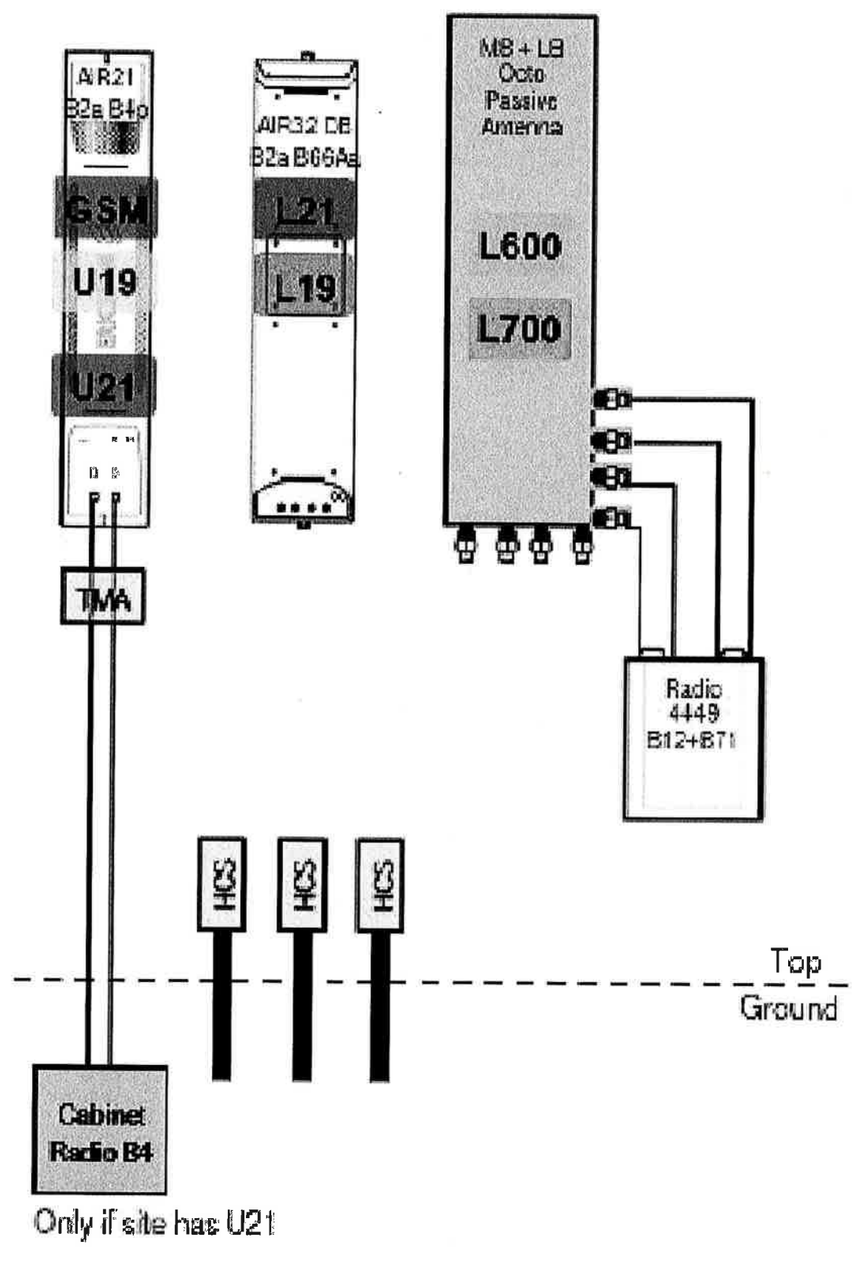
Project Title:
CT11279D
SOUTH WINDSOR/RT 5
300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

Prepared For:
CROWN CASTLE

Drawing Title
RISER AND ONE-LINE DIAGRAMS

Drawing Number
E1





1 / E2 RF PLUMBING DIAGRAM
SCALE: AS NOTED

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
PROFESSIONAL ENGINEER
AUG. 14, 2018

No	Submittal / Revision	Appd	Date
0	ISSUED FOR CONSTRUCTION	SL	08/14/18
A	ISSUED FOR REVIEW	SL	08/03/18

Drawn: RCD
Designed: MRL
Checked: AJD

Project Number:
600-007

Project Title:
CT11279D
SOUTH WINDSOR/RT 5

300 GOVERNORS HIGHWAY
SOUTH WINDSOR, CT 06074

Prepared For:
CROWN CASTLE

Drawing Title
RF PLUMBING DIAGRAM

Drawing Number
E2

PAUL J. FORD & COMPANY

Date: **October 9, 2018**

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

Paul J. Ford and Company
250 East Broad st., Suite 600
Columbus, OH 43215
(614) 221-6679

Subject:	**Structural Analysis Report**	
Carrier Designation:	***T-Mobile* Co-Locate**	
	Carrier Site Number:	CT11279D
	Carrier Site Name:	N/A
Crown Castle Designation:	**Crown Castle BU Number:**	828054
	Crown Castle Site Name:	South Windsor/Rt 5
	Crown Castle JDE Job Number:	512590
	Crown Castle Work Order Number:	1627140
	Crown Castle Order Number:	446059 Rev. 1
Engineering Firm Designation:	**Paul J. Ford and Company Project Number:**	37518-0525.004.7700
Site Data:	**300 Governors Highway, South Windsor, Hartford County, CT** **Latitude *41° 50' 0.4"*, Longitude *-72° 36' 11"*** **169 Foot - Monopole**	

Dear Mr. Bazinet,

Paul J. Ford and Company is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above-mentioned tower.

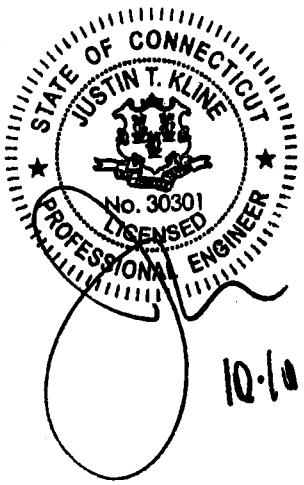
The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation, under the following load case, to be:

LC7: Proposed Equipment Configuration **Sufficient Capacity**

This analysis utilizes an ultimate 3-second gust wind speed of 125 mph from the 2016 Connecticut State Building Code per section 1609.3 and Appendix N. Applicable Standard references and design criteria are listed in Section 2 -Analysis Criteria.

Respectfully submitted by:

Shardul Kadam
Project Engineer I



10-10-18

TABLE OF CONTENTS

1) INTRODUCTION

This tower is a 169 ft Monopole tower designed by ENGINEERED ENDEAVORS, INC.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-H
Risk Category:	II
Wind Speed:	125 mph
Exposure Category:	C
Topographic Factor:	1
Ice Thickness:	2.0 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Configuration

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
165.0	167.0	3	ericsson	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	11 2	1-5/8 1-3/8
	166.0	3	ericsson	AIR 32 B2A/B66AA w/ Mount Pipe		
		3	ericsson	RADIO 4449 B12/B71		
		3	rfs celwave	APXVAARR24_43-U-NA20 w/ Mount Pipe		
	165.0	3	ericsson	KRY 112 144/1		
		1	tower mounts	Platform Mount [LP 601-1]		

Table 2 - Other Considered Equipment

Mounting Level (ft)	Center Line Elevation (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)
156.0	158.0	1	cci antennas	HPA-65R-BUU-H6 w/ Mount Pipe	12 3	1-5/8 3/8
		2	cci antennas	HPA-65R-BUU-H8 w/ Mount Pipe		
		6	communication components inc.	DTMABP7819VG12A		
		3	ericsson	RRUS 11		
		3	ericsson	RRUS12/RRUS A2		
		6	powerwave technologies	7770.00 w/ Mount Pipe		
		1	raycap	DC6-48-60-18-8F		
	156.0	1	tower mounts	Platform Mount [LP 714-1]		
148.0	148.0	3	alcatel lucent	800MHZ RRH	3 1	1-1/4 7/8
		3	alcatel lucent	PCS 1900MHZ 4X45W-65MHZ		
		3	alcatel lucent	RRH2X50-800		
		3	alcatel lucent	TD-RRH8X20-25		
		3	kmw communications	ETCR-654L12H6 w/ Mount Pipe		
		1	tower mounts	T-Arm Mount [TA 702-3]		
138.0	138.0	3	rfs celwave	APXV18-206517-A	6	1-5/8
		1	tower mounts	Pipe Mount [PM 601-3]		
124.0	128.0	2	andrew	VHLP800-11	6 3 1	1/2 1/4 5/16
		3	argus technologies	LLPX310R w/ Mount Pipe		
		2	dragonwave	HORIZON DUO		
		3	samsung telecommunications	WIMAX DAP HEAD		
	124.0	1	tower mounts	Side Arm Mount [SO 701-3]		
118.0	119.0	1	sigfox	CAVITY FILTER	1	1/2
		1	sigfox	CXL 900-3LW		
		1	sigfox	LNA		
	118.0	1	tower mounts	Side Arm Mount [SO 304-1]		
111.0	111.0	3	alcatel lucent	B4 RRH2X60-4R	18 2	1-5/8 1-1/4
		6	andrew	HBXX-6517DS-A2M w/ Mount Pipe		
		6	andrew	LNX-6514DS-A1M w/ Mount Pipe		
		2	raycap	RRFDC-3315-PF-48		
		1	tower mounts	Platform Mount [LP 303-1]		

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
4-GEOTECHNICAL REPORTS	FPA, 99A076AR1, 01/11/2000	3436696	CCISITES
4-POST-MODIFICATION INSPECTION	ETS, 03/13/2013	3773024	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	GPD, 2012712.97, 06/29/2012	3793344	CCISITES
4-POST-MODIFICATION INSPECTION	TEP, 103179, 12/03/2010	3773025	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	Centek Engineering, 10003.CO4, 06/11/2010	3487016	CCISITES
4-POST-MODIFICATION INSPECTION	FDH Velocitel, 15BZLZ1500, 12/03/2015	6000997	CCISITES
4-TOWER REINFORCEMENT DESIGN/DRAWINGS/DATA	PJF, 37513-1535.003.7700 R1, 12/30/2014	5431037	CCISITES
4-TOWER FOUNDATION DRAWINGS/DESIGN/SPECS	EEI, 6255 REV 1, 03/10/2000	3436661	CCISITES
4-TOWER MANUFACTURER DRAWINGS	EEI, 99-1371 REV. 1, 01/31/2000	3436681	CCISITES

3.1) Analysis Method

tnxTower (version 8.0.4.0), 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 and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) For existing modifications: monopole was modified in conformance with the referenced modification drawings.

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

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
169 - 164	Pole	TP16.455x15.5x0.25	Pole	4.0%	Pass
164 - 159	Pole	TP17.409x16.455x0.25	Pole	12.9%	Pass
159 - 154	Pole	TP18.364x17.409x0.25	Pole	25.3%	Pass
154 - 149	Pole	TP19.318x18.364x0.25	Pole	38.0%	Pass
149 - 144	Pole	TP20.273x19.318x0.25	Pole	51.0%	Pass
144 - 139	Pole	TP21.228x20.273x0.25	Pole	62.5%	Pass
139 - 136.66	Pole	TP22.31x21.228x0.25	Pole	67.4%	Pass
136.66 - 131.66	Pole	TP22.115x21.174x0.3125	Pole	65.1%	Pass
131.66 - 126.66	Pole	TP23.055x22.115x0.3125	Pole	72.1%	Pass
126.66 - 121.66	Pole	TP23.996x23.055x0.3125	Pole	79.0%	Pass
121.66 - 116.66	Pole	TP24.937x23.996x0.3125	Pole	84.9%	Pass
116.66 - 111.66	Pole	TP25.877x24.937x0.3125	Pole	90.0%	Pass
111.66 - 111	Pole	TP26.001x25.877x0.3125	Pole	90.6%	Pass
111 - 110.75	Pole + Reinf.	TP26.048x26.001x0.575	Reinf. 6 Tension Rupture	81.5%	Pass
110.75 - 105.75	Pole + Reinf.	TP26.989x26.048x0.5625	Reinf. 6 Tension Rupture	89.0%	Pass
105.75 - 101.5	Pole + Reinf.	TP27.788x26.989x0.55	Reinf. 6 Tension Rupture	94.8%	Pass
101.5 - 101.25	Pole + Reinf.	TP27.835x27.788x0.9875	Reinf. 12 Tension Rupture	64.7%	Pass
101.25 - 101	Pole + Reinf.	TP27.882x27.835x0.9875	Reinf. 12 Tension Rupture	64.9%	Pass
101 - 100.75	Pole + Reinf.	TP27.93x27.882x0.725	Reinf. 12 Tension Rupture	86.4%	Pass
100.75 - 95.75	Pole + Reinf.	TP28.87x27.93x0.7125	Reinf. 12 Tension Rupture	92.5%	Pass
95.75 - 92.16	Pole + Reinf.	TP30.36x28.87x0.7	Reinf. 12 Tension Rupture	96.6%	Pass
92.16 - 86.83	Pole + Reinf.	TP29.924x28.92x0.9375	Reinf. 12 Tension Rupture	79.7%	Pass
86.83 - 81.83	Pole + Reinf.	TP30.865x29.924x0.925	Reinf. 12 Tension Rupture	83.7%	Pass
81.83 - 81.5	Pole + Reinf.	TP30.927x30.865x0.925	Reinf. 12 Tension Rupture	84.0%	Pass
81.5 - 81.25	Pole + Reinf.	TP30.974x30.927x0.95	Reinf. 11 Tension Rupture	71.3%	Pass
81.25 - 76.25	Pole + Reinf.	TP31.915x30.974x0.925	Reinf. 11 Tension Rupture	74.5%	Pass
76.25 - 71.25	Pole + Reinf.	TP32.856x31.915x0.9	Reinf. 11 Tension Rupture	77.6%	Pass
71.25 - 66.25	Pole + Reinf.	TP33.797x32.856x0.875	Reinf. 11 Tension Rupture	80.4%	Pass
66.25 - 61.25	Pole + Reinf.	TP34.738x33.797x0.8625	Reinf. 11 Tension Rupture	83.2%	Pass
61.25 - 56.25	Pole + Reinf.	TP35.679x34.738x0.85	Reinf. 11 Tension Rupture	85.7%	Pass
56.25 - 51.25	Pole + Reinf.	TP36.619x35.679x0.825	Reinf. 11 Tension Rupture	88.1%	Pass
51.25 - 48.66	Pole + Reinf.	TP38.11x36.619x0.825	Reinf. 11 Tension Rupture	89.3%	Pass
48.66 - 42.33	Pole + Reinf.	TP37.546x36.357x1.0375	Reinf. 11 Tension Rupture	75.9%	Pass
42.33 - 37.4	Pole + Reinf.	TP38.473x37.546x1.025	Reinf. 11 Tension Rupture	77.7%	Pass
37.4 - 37.15	Pole + Reinf.	TP38.52x38.473x1.025	Reinf. 7 Tension Rupture	77.8%	Pass
37.15 - 32.15	Pole + Reinf.	TP39.459x38.52x1	Reinf. 7 Tension Rupture	79.6%	Pass

32.15 - 27.15	Pole + Reinf.	TP40.399x39.459x0.975	Reinf. 7 Tension Rupture	81.3%	Pass
27.15 - 22.15	Pole + Reinf.	TP41.338x40.399x0.9625	Reinf. 7 Tension Rupture	82.9%	Pass
22.15 - 19.5	Pole + Reinf.	TP41.836x41.338x0.95	Reinf. 7 Tension Rupture	83.7%	Pass
19.5 - 19.25	Pole + Reinf.	TP41.883x41.836x1.025	Reinf. 7 Tension Rupture	78.3%	Pass
19.25 - 14.25	Pole + Reinf.	TP42.822x41.883x1	Reinf. 7 Tension Rupture	79.7%	Pass
14.25 - 9.25	Pole + Reinf.	TP43.762x42.822x1	Reinf. 7 Tension Rupture	81.0%	Pass
9.25 - 9	Pole + Reinf.	TP43.809x43.762x1	Reinf. 7 Tension Rupture	81.1%	Pass
9 - 8.75	Pole + Reinf.	TP43.856x43.809x1.025	Reinf. 7 Tension Rupture	78.2%	Pass
8.75 - 7	Pole + Reinf.	TP44.185x43.856x1.025	Reinf. 7 Tension Rupture	78.6%	Pass
7 - 6.75	Pole + Reinf.	TP44.232x44.185x0.975	Reinf. 7 Tension Rupture	81.7%	Pass
6.75 - 5	Pole + Reinf.	TP44.561x44.232x0.975	Reinf. 7 Tension Rupture	82.1%	Pass
5 - 4.75	Pole + Reinf.	TP44.607x44.561x1.45	Reinf. 3 Compression	64.9%	Pass
4.75 - 3	Pole + Reinf.	TP44.936x44.607x1.425	Reinf. 3 Compression	65.3%	Pass
3 - 2.75	Pole + Reinf.	TP44.983x44.936x1.45	Reinf. 7 Tension Rupture	57.6%	Pass
2.75 - 2.25	Pole + Reinf.	TP45.077x44.983x1.45	Reinf. 7 Tension Rupture	57.7%	Pass
2.25 - 2	Pole + Reinf.	TP45.124x45.077x1.2	Reinf. 8 Tension Rupture	69.3%	Pass
2 - 0	Pole + Reinf.	TP45.5x45.124x1.175	Reinf. 8 Tension Rupture	69.8%	Pass
				Summary	
			Pole	90.6%	Pass
			Reinforcement	96.6%	Pass
			Overall	96.6%	Pass

Table 5 - Tower Component Stresses vs. Capacity - LC7

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	65.1	Pass
1	Base Foundation	0	83.9	Pass

Structure Rating (max from all components) =	96.6%

Notes:

- All Structural rating are per TIA-222-H Section 15.5

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

4.1) Recommendations

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

APPENDIX A

TNXTOWER OUTPUT

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in Hartford County, Connecticut.
Tower base elevation above sea level: 70.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height 0.00 ft.
Nominal ice thickness of 1.7000 in.
Ice thickness is considered to increase with height.
Ice density of 56.00 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
TIA-222-H Annex S
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.05.
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-H Bracing Resist. Exemption
	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-H 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		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known

Tapered Pole Section Geometry

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L1	169.00-164.00	5.00	0.00	18	15.5000	16.4546	0.2500	1.0000	A572-65 (65 ksi)
L2	164.00-159.00	5.00	0.00	18	16.4546	17.4092	0.2500	1.0000	A572-65 (65 ksi)
L3	159.00-154.00	5.00	0.00	18	17.4092	18.3638	0.2500	1.0000	A572-65 (65 ksi)
L4	154.00-149.00	5.00	0.00	18	18.3638	19.3183	0.2500	1.0000	A572-65 (65 ksi)
L5	149.00-144.00	5.00	0.00	18	19.3183	20.2729	0.2500	1.0000	A572-65 (65 ksi)
L6	144.00-139.00	5.00	0.00	18	20.2729	21.2275	0.2500	1.0000	A572-65 (65 ksi)
L7	139.00-133.33	5.67	3.33	18	21.2275	22.3100	0.2500	1.0000	A572-65 (65 ksi)
L8	133.33-131.66	5.00	0.00	18	21.1742	22.1148	0.3125	1.2500	A572-65 (65 ksi)
L9	131.66-126.66	5.00	0.00	18	22.1148	23.0554	0.3125	1.2500	A572-65 (65 ksi)
L10	126.66-121.66	5.00	0.00	18	23.0554	23.9960	0.3125	1.2500	A572-65 (65 ksi)
L11	121.66-116.66	5.00	0.00	18	23.9960	24.9366	0.3125	1.2500	A572-65 (65 ksi)
L12	116.66-111.66	5.00	0.00	18	24.9366	25.8772	0.3125	1.2500	A572-65 (65 ksi)
L13	111.66-111.00	0.66	0.00	18	25.8772	26.0013	0.3125	1.2500	A572-65 (65 ksi)
L14	111.00-110.75	0.25	0.00	18	26.0013	26.0484	0.5750	2.3000	A572-65 (65 ksi)
L15	110.75-105.75	5.00	0.00	18	26.0484	26.9889	0.5625	2.2500	A572-65 (65 ksi)
L16	105.75-101.50	4.25	0.00	18	26.9889	27.7884	0.5500	2.2000	A572-65 (65 ksi)
L17	101.50-101.25	0.25	0.00	18	27.7884	27.8355	0.9875	3.9500	A572-65 (65 ksi)
L18	101.25-101.00	0.25	0.00	18	27.8355	27.8825	0.9875	3.9500	A572-65 (65 ksi)
L19	101.00-100.75	0.25	0.00	18	27.8825	27.9295	0.7250	2.9000	A572-65 (65 ksi)
L20	100.75-95.75	5.00	0.00	18	27.9295	28.8701	0.7125	2.8500	A572-65 (65 ksi)
L21	95.75-87.83	7.92	4.33	18	28.8701	30.3600	0.7000	2.8000	A572-65 (65 ksi)
L22	87.83-86.83	5.33	0.00	18	28.9205	29.9235	0.9375	3.7500	A572-65 (65 ksi)
L23	86.83-81.83	5.00	0.00	18	29.9235	30.8645	0.9250	3.7000	A572-65 (65 ksi)
L24	81.83-81.50	0.33	0.00	18	30.8645	30.9266	0.9250	3.7000	A572-65 (65 ksi)
L25	81.50-81.25	0.25	0.00	18	30.9266	30.9737	0.9500	3.8000	A572-65 (65 ksi)
L26	81.25-76.25	5.00	0.00	18	30.9737	31.9146	0.9250	3.7000	A572-65 (65 ksi)
L27	76.25-71.25	5.00	0.00	18	31.9146	32.8556	0.9000	3.6000	A572-65 (65 ksi)
L28	71.25-66.25	5.00	0.00	18	32.8556	33.7966	0.8750	3.5000	A572-65 (65 ksi)
L29	66.25-61.25	5.00	0.00	18	33.7966	34.7376	0.8625	3.4500	A572-65 (65 ksi)
L30	61.25-56.25	5.00	0.00	18	34.7376	35.6785	0.8500	3.4000	A572-65 (65 ksi)
L31	56.25-51.25	5.00	0.00	18	35.6785	36.6195	0.8250	3.3000	A572-65 (65 ksi)
L32	51.25-43.33	7.92	5.33	18	36.6195	38.1100	0.8250	3.3000	A572-65 (65 ksi)
L33	43.33-42.33	6.33	0.00	18	36.3569	37.5463	1.0375	4.1500	A572-65

Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
									(65 ksi)
L34	42.33-37.40	4.93	0.00	18	37.5463	38.4726	1.0250	4.1000	A572-65 (65 ksi)
L35	37.40-37.15	0.25	0.00	18	38.4726	38.5196	1.0250	4.1000	A572-65 (65 ksi)
L36	37.15-32.15	5.00	0.00	18	38.5196	39.4591	1.0000	4.0000	A572-65 (65 ksi)
L37	32.15-27.15	5.00	0.00	18	39.4591	40.3986	0.9750	3.9000	A572-65 (65 ksi)
L38	27.15-22.15	5.00	0.00	18	40.3986	41.3381	0.9625	3.8500	A572-65 (65 ksi)
L39	22.15-19.50	2.65	0.00	18	41.3381	41.8360	0.9500	3.8000	A572-65 (65 ksi)
L40	19.50-19.25	0.25	0.00	18	41.8360	41.8830	1.0250	4.1000	A572-65 (65 ksi)
L41	19.25-14.25	5.00	0.00	18	41.8830	42.8225	1.0000	4.0000	A572-65 (65 ksi)
L42	14.25-9.25	5.00	0.00	18	42.8225	43.7620	1.0000	4.0000	A572-65 (65 ksi)
L43	9.25-9.00	0.25	0.00	18	43.7620	43.8089	1.0000	4.0000	A572-65 (65 ksi)
L44	9.00-8.75	0.25	0.00	18	43.8089	43.8559	1.0250	4.1000	A572-65 (65 ksi)
L45	8.75-7.00	1.75	0.00	18	43.8559	44.1847	1.0250	4.1000	A572-65 (65 ksi)
L46	7.00-6.75	0.25	0.00	18	44.1847	44.2317	0.9750	3.9000	A572-65 (65 ksi)
L47	6.75-5.00	1.75	0.00	18	44.2317	44.5605	0.9750	3.9000	A572-65 (65 ksi)
L48	5.00-4.75	0.25	0.00	18	44.5605	44.6075	1.4500	5.8000	A572-65 (65 ksi)
L49	4.75-3.00	1.75	0.00	18	44.6075	44.9363	1.4250	5.7000	A572-65 (65 ksi)
L50	3.00-2.75	0.25	0.00	18	44.9363	44.9833	1.4500	5.8000	A572-65 (65 ksi)
L51	2.75-2.25	0.50	0.00	18	44.9833	45.0772	1.4500	5.8000	A572-65 (65 ksi)
L52	2.25-2.00	0.25	0.00	18	45.0772	45.1242	1.2000	4.8000	A572-65 (65 ksi)
L53	2.00-0.00	2.00		18	45.1242	45.5000	1.1750	4.7000	A572-65 (65 ksi)

Tapered Pole Properties

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
L1	15.7005	12.1009	355.5445	5.4138	7.8740	45.1542	711.5567	6.0516	2.2880	9.152
	16.6699	12.8583	426.5776	5.7526	8.3589	51.0326	853.7164	6.4304	2.4560	9.824
L2	16.6699	12.8583	426.5776	5.7526	8.3589	51.0326	853.7164	6.4304	2.4560	9.824
	17.6392	13.6158	506.4925	6.0915	8.8439	57.2705	1013.6514	6.8092	2.6240	10.496
L3	17.6392	13.6158	506.4925	6.0915	8.8439	57.2705	1013.6514	6.8092	2.6240	10.496
	18.6085	14.3733	595.8124	6.4304	9.3288	63.8682	1192.4089	7.1880	2.7920	11.168
L4	18.6085	14.3733	595.8124	6.4304	9.3288	63.8682	1192.4089	7.1880	2.7920	11.168
	19.5778	15.1307	695.0606	6.7693	9.8137	70.8254	1391.0358	7.5668	2.9600	11.84
L5	19.5778	15.1307	695.0606	6.7693	9.8137	70.8254	1391.0358	7.5668	2.9600	11.84
	20.5471	15.8882	804.7602	7.1081	10.2986	78.1424	1610.5794	7.9456	3.1280	12.512
L6	20.5471	15.8882	804.7602	7.1081	10.2986	78.1424	1610.5794	7.9456	3.1280	12.512
	21.5164	16.6456	925.4345	7.4470	10.7836	85.8189	1852.0868	8.3244	3.2960	13.184
L7	21.5164	16.6456	925.4345	7.4470	10.7836	85.8189	1852.0868	8.3244	3.2960	13.184
	22.6156	17.5046	1076.2196	7.8313	11.3335	94.9593	2153.8554	8.7540	3.4866	13.946
L8	22.0888	20.6922	1137.7489	7.4059	10.7565	105.7730	2276.9949	10.3481	3.1767	10.165
	22.4078	21.6252	1298.6833	7.7398	11.2343	115.5995	2599.0754	10.8146	3.3422	10.695
L9	22.4078	21.6252	1298.6833	7.7398	11.2343	115.5995	2599.0754	10.8146	3.3422	10.695
	23.3629	22.5581	1474.1202	8.0737	11.7122	125.8625	2950.1801	11.2812	3.5078	11.225
L10	23.3629	22.5581	1474.1202	8.0737	11.7122	125.8625	2950.1801	11.2812	3.5078	11.225
	24.3180	23.4911	1664.6854	8.4076	12.1900	136.5619	3331.5612	11.7478	3.6733	11.755
L11	24.3180	23.4911	1664.6854	8.4076	12.1900	136.5619	3331.5612	11.7478	3.6733	11.755

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
	25.2731	24.4240	1871.0044	8.7416	12.6678	147.6978	3744.4707	12.2143	3.8388	12.284
L12	25.2731	24.4240	1871.0044	8.7416	12.6678	147.6978	3744.4707	12.2143	3.8388	12.284
	26.2282	25.3570	2093.7030	9.0755	13.1456	159.2702	4190.1609	12.6809	4.0044	12.814
L13	26.2282	25.3570	2093.7030	9.0755	13.1456	159.2702	4190.1609	12.6809	4.0044	12.814
	26.3542	25.4801	2124.3562	9.1195	13.2087	160.8304	4251.5076	12.7425	4.0262	12.884
L14	26.3137	46.4043	3790.2095	9.0263	13.2087	286.9485	7585.4063	23.2066	3.5642	6.199
	26.3615	46.4902	3811.2799	9.0430	13.2326	288.0227	7627.5747	23.2495	3.5725	6.213
L15	26.3634	45.5018	3733.9174	9.0475	13.2326	282.1764	7472.7479	22.7552	3.5945	6.39
	27.3185	47.1811	4162.7761	9.3814	13.7104	303.6222	8331.0298	23.5950	3.7601	6.685
L16	27.3204	46.1545	4076.0486	9.3858	13.7104	297.2965	8157.4605	23.0816	3.7821	6.876
	28.1323	47.5501	4457.1145	9.6696	14.1165	315.7373	8920.0938	23.7796	3.9228	7.132
L17	28.0648	84.0029	7623.0995	9.5143	14.1165	540.0124	15256.2298	42.0094	3.1528	3.193
	28.1125	84.1503	7663.3002	9.5310	14.1404	541.9429	15336.6839	42.0831	3.1610	3.201
L18	28.1125	84.1503	7663.3002	9.5310	14.1404	541.9429	15336.6839	42.0831	3.1610	3.201
	28.1603	84.2977	7703.6419	9.5477	14.1643	543.8770	15417.4204	42.1568	3.1693	3.209
L19	28.2008	62.4935	5823.0659	9.6409	14.1643	411.1083	11653.7940	31.2527	3.6313	5.009
	28.2485	62.6017	5853.3701	9.6576	14.1882	412.5520	11714.4423	31.3068	3.6396	5.02
L20	28.2505	61.5506	5760.3830	9.6620	14.1882	405.9981	11528.3458	30.7812	3.6616	5.139
	29.2056	63.6777	6378.4737	9.9960	14.6660	434.9152	12765.3403	31.8449	3.8271	5.371
L21	29.2075	62.5884	6274.9201	10.0004	14.6660	427.8544	12558.0969	31.3001	3.8491	5.499
	30.7204	65.8986	7324.1268	10.5293	15.4229	474.8871	14657.8908	32.9556	4.1114	5.873
L22	30.0494	83.2668	8237.5165	9.9339	14.6916	560.6960	16485.8721	41.6413	3.4400	3.669
	30.2405	86.2516	9155.4967	10.2900	15.2012	602.2896	18323.0405	43.1340	3.6165	3.858
L23	30.2425	85.1382	9045.1152	10.2945	15.2012	595.0282	18102.1323	42.5772	3.6385	3.934
	31.1979	87.9009	9954.5110	10.6285	15.6792	634.8877	19922.1205	43.9588	3.8042	4.113
L24	31.1979	87.9009	9954.5110	10.6285	15.6792	634.8877	19922.1205	43.9588	3.8042	4.113
	31.2610	88.0832	10016.5863	10.6506	15.7107	637.5639	20046.3527	44.0500	3.8151	4.124
L25	31.2571	90.3885	10261.6094	10.6417	15.7107	653.1598	20536.7212	45.2028	3.7711	3.97
	31.3049	90.5303	10310.0024	10.6584	15.7346	655.2433	20633.5710	45.2738	3.7794	3.978
L26	31.3088	88.2214	10063.7844	10.6673	15.7346	639.5951	20140.8110	44.1191	3.8234	4.133
	32.2643	90.9840	11039.1419	11.0013	16.2126	680.8976	22092.8094	45.5006	3.9890	4.312
L27	32.2681	88.5964	10766.8022	11.0102	16.2126	664.0996	21547.7716	44.3066	4.0330	4.481
	33.2236	91.2844	11776.8187	11.3442	16.6906	705.5939	23569.1336	45.6509	4.1986	4.665
L28	33.2275	88.8181	11476.5783	11.3531	16.6906	687.6054	22968.2578	44.4175	4.2426	4.849
	34.1830	91.4315	12519.7123	11.6872	17.1687	729.2189	25055.8983	45.7244	4.4082	5.038
L29	34.1849	90.1595	12354.9217	11.6916	17.1687	719.6206	24726.1003	45.0883	4.4302	5.136
	35.1404	92.7355	13444.4598	12.0256	17.6467	761.8692	26906.6102	46.3766	4.5958	5.328
L30	35.1423	91.4252	13264.2854	12.0301	17.6467	751.6591	26546.0244	45.7213	4.6178	5.433
	36.0978	93.9639	14400.2003	12.3641	18.1247	794.5074	28819.3487	46.9909	4.7834	5.628
L31	36.1017	91.2657	14006.7840	12.3730	18.1247	772.8013	28031.9985	45.6415	4.8274	5.851
	37.0571	93.7297	15172.150	12.7070	18.6027	815.5884	30364.265	46.8737	4.9930	6.052

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
			9				6			
L32	37.0571	93.7297	15172.150	12.7070	18.6027	815.5884	30364.265	46.8737	4.9930	6.052
			9				6			
	38.5706	97.6326	17147.498	13.2362	19.3599	885.7234	34317.559	48.8256	5.2554	6.37
			1				3			
L33	37.7747	116.3077	18330.455	12.5384	18.4693	992.4815	36685.030	58.1649	4.5728	4.408
			3				3			
	37.9655	120.2244	20245.362	12.9606	19.0735	1061.4379	40517.365	60.1236	4.7822	4.609
			9				2			
L34	37.9674	118.8166	20021.994	12.9651	19.0735	1049.7269	40070.334	59.4196	4.8042	4.687
			4				3			
	38.9080	121.8303	21584.488	13.2939	19.5441	1104.3990	43197.378	60.9267	4.9672	4.846
			6				6			
L35	38.9080	121.8303	21584.488	13.2939	19.5441	1104.3990	43197.378	60.9267	4.9672	4.846
			6				6			
	38.9557	121.9831	21665.817	13.3106	19.5680	1107.2084	43360.142	61.0032	4.9755	4.854
			2				9			
L36	38.9596	119.0873	21179.691	13.3195	19.5680	1082.3655	42387.252	59.5550	5.0195	5.019
			7				2			
	39.9136	122.0692	22810.872	13.6530	20.0452	1137.9704	45651.759	61.0462	5.1848	5.185
			4				9			
L37	39.9174	119.0948	22284.000	13.6619	20.0452	1111.6862	44597.323	59.5587	5.2288	5.363
			7				2			
	40.8714	122.0022	23956.178	13.9954	20.5225	1167.3137	47943.878	61.0127	5.3942	5.532
			0				2			
L38	40.8733	120.4763	23671.549	13.9998	20.5225	1153.4447	47374.247	60.2496	5.4162	5.627
			8				3			
	41.8273	123.3464	25403.955	14.3333	20.9997	1209.7269	50841.337	61.6849	5.5815	5.799
			2				5			
L39	41.8292	121.7822	25097.329	14.3378	20.9997	1195.1255	50227.682	60.9027	5.6035	5.898
			1				0			
	42.3348	123.2836	26037.063	14.5145	21.2527	1225.1185	52108.386	61.6535	5.6911	5.991
			3				8			
L40	42.3233	132.7725	27938.307	14.4879	21.2527	1314.5775	55913.377	66.3989	5.5591	5.424
			6				2			
	42.3710	132.9253	28034.891	14.5046	21.2766	1317.6425	56106.671	66.4753	5.5674	5.432
			4				9			
L41	42.3748	129.7626	27401.350	14.5135	21.2766	1287.8661	54838.756	64.8936	5.6114	5.611
			7				9			
	43.3288	132.7445	29334.132	14.8470	21.7538	1348.4594	58706.863	66.3849	5.7768	5.777
			5				6			
L42	43.3288	132.7445	29334.132	14.8470	21.7538	1348.4594	58706.863	66.3849	5.7768	5.777
			5				6			
	44.2828	135.7264	31355.729	15.1805	22.2311	1410.4462	62752.717	67.8761	5.9421	5.942
			2				0			
L43	44.2828	135.7264	31355.729	15.1805	22.2311	1410.4462	62752.717	67.8761	5.9421	5.942
			2				0			
	44.3305	135.8755	31459.176	15.1972	22.2549	1413.5821	62959.747	67.9507	5.9504	5.95
			2				1			
L44	44.3266	139.1911	32189.195	15.1883	22.2549	1446.3847	64420.745	69.6088	5.9064	5.762
			1				6			
	44.3743	139.3439	32295.337	15.2050	22.2788	1449.5997	64633.169	69.6852	5.9146	5.77
			2				5			
L45	44.3743	139.3439	32295.337	15.2050	22.2788	1449.5997	64633.169	69.6852	5.9146	5.77
			2				5			
	44.7082	140.4137	33044.872	15.3217	22.4458	1472.2049	66133.226	70.2202	5.9725	5.827
			6				5			
L46	44.7159	133.7190	31542.298	15.3395	22.4458	1405.2627	63126.100	66.8722	6.0605	6.216
			2				5			
	44.7636	133.8643	31645.281	15.3561	22.4697	1408.3535	63332.202	66.9449	6.0688	6.224
			2				0			
L47	44.7636	133.8643	31645.281	15.3561	22.4697	1408.3535	63332.202	66.9449	6.0688	6.224
			2				0			
	45.0975	134.8819	32372.445	15.4729	22.6367	1430.0842	64787.486	67.4538	6.1267	6.284
			2				9			
L48	45.0242	198.4075	46586.703	15.3042	22.6367	2058.0128	93234.706	99.2226	5.2907	3.649
			2				4			
	45.0719	198.6237	46739.155	15.3209	22.6606	2062.5732	93539.811	99.3307	5.2989	3.654
			3				2			
L49	45.0758	195.3122	46013.177	15.3298	22.6606	2030.5362	92086.901	97.6747	5.3429	3.749

Section	Tip Dia. in	Area in^2	I in^4	r in	C in	I/C in^3	J in^4	It/Q in^2	w in	w/t
			9				2			
	45.4097	196.7995	47072.3268	15.4465	22.8276	2062.0755	94206.5925	98.4184	5.4008	3.79
L50	45.4058	200.1370	47815.6429	15.4376	22.8276	2094.6376	95694.2029	100.0875	5.3568	3.694
	45.4535	200.3532	47970.7630	15.4543	22.8515	2099.2384	96004.6472	100.1957	5.3651	3.7
L51	45.4535	200.3532	47970.7630	15.4543	22.8515	2099.2384	96004.6472	100.1957	5.3651	3.7
	45.5489	200.7856	48282.0089	15.4877	22.8992	2108.4552	96627.5486	100.4119	5.3816	3.711
L52	45.5875	167.1196	40648.3821	15.5764	22.8992	1775.0979	81350.2505	83.5757	5.8216	4.851
	45.6352	167.2985	40779.0746	15.5931	22.9231	1778.9514	81611.8073	83.6652	5.8299	4.858
L53	45.6391	163.9064	39997.7285	15.6020	22.9231	1744.8659	80048.0869	81.9688	5.8739	4.999
	46.0206	165.3079	41032.5467	15.7354	23.1140	1775.2248	82119.0850	82.6696	5.9400	5.055

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 169.00-164.00				1	1	1			
L2 164.00-159.00				1	1	1			
L3 159.00-154.00				1	1	1			
L4 154.00-149.00				1	1	1			
L5 149.00-144.00				1	1	1			
L6 144.00-139.00				1	1	1			
L7 139.00-133.33				1	1	1			
L8 133.33-131.66				1	1	1			
L9 131.66-126.66				1	1	1			
L10 126.66-121.66				1	1	1			
L11 121.66-116.66				1	1	1			
L12 116.66-111.66				1	1	1			
L13 111.66-111.00				1	1	1			
L14 111.00-110.75				1	1	0.936271			
L15 110.75-105.75				1	1	0.942334			
L16 105.75-101.50				1	1	0.951697			
L17 101.50-101.25				1	1	0.894841			
L18 101.25-101.00				1	1	0.893829			
L19 101.00-100.75				1	1	0.916808			
L20 100.75-95.75				1	1	0.915966			
L21 95.75-87.83				1	1	0.920543			
L22 87.83-86.83				1	1	0.912119			

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
L23 86.83-81.83				1	1	0.907746			
L24 81.83-81.50				1	1	0.906706			
L25 81.50-81.25				1	1	0.899386			
L26 81.25-76.25				1	1	0.907211			
L27 76.25-71.25				1	1	0.916495			
L28 71.25-66.25				1	1	0.92727			
L29 66.25-61.25				1	1	0.926308			
L30 61.25-56.25				1	1	0.926118			
L31 56.25-51.25				1	1	0.940381			
L32 51.25-43.33				1	1	0.933854			
L33 43.33-42.33				1	1	0.941952			
L34 42.33-37.40				1	1	0.938586			
L35 37.40-37.15				1	1	0.937868			
L36 37.15-32.15				1	1	0.946368			
L37 32.15-27.15				1	1	0.956053			
L38 27.15-22.15				1	1	0.9547			
L39 22.15-19.50				1	1	0.959994			
L40 19.50-19.25				1	1	0.954729			
L41 19.25-14.25				1	1	0.964453			
L42 14.25-9.25				1	1	0.951503			
L43 9.25-9.00				1	1	0.95087			
L44 9.00-8.75				1	1	0.963488			
L45 8.75-7.00				1	1	0.958934			
L46 7.00-6.75				1	1	0.968915			
L47 6.75-5.00				1	1	0.964507			
L48 5.00-4.75				1	1	0.856655			
L49 4.75-3.00				1	1	0.866584			
L50 3.00-2.75				1	1	0.876449			
L51 2.75-2.25				1	1	0.875119			
L52 2.25-2.00				1	1	0.856349			
L53 2.00-0.00				1	1	0.869367			

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
***											

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
LDF7-50A(1-5/8)	C	No	No	CaAa (Out Of Face)	165.00 - 111.00	1	No Ice	0.20	0.82
							1/2" Ice	0.30	2.33
							1" Ice	0.40	4.46
							2" Ice	0.60	10.55
LDF7-50A(1-5/8)	C	No	No	CaAa (Out Of Face)	165.00 - 111.00	5	No Ice	0.00	0.82
							1/2" Ice	0.00	2.33
							1" Ice	0.00	4.46
							2" Ice	0.00	10.55
LDF7-50A(1-5/8)	C	No	No	CaAa (Out Of Face)	111.00 - 0.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	2.33
							1" Ice	0.00	4.46
							2" Ice	0.00	10.55
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	C	No	No	CaAa (Out Of Face)	165.00 - 111.00	1	No Ice	0.16	1.07
							1/2" Ice	0.26	2.37
							1" Ice	0.36	4.28
							2" Ice	0.56	9.93
MLE HYBRID 9POWER/18FIBER RL 2(1-5/8)	C	No	No	CaAa (Out Of Face)	111.00 - 0.00	1	No Ice	0.00	1.07
							1/2" Ice	0.00	2.37
							1" Ice	0.00	4.28
							2" Ice	0.00	9.93
LDF7-50A(1-5/8)	C	No	No	CaAa (Out Of Face)	165.00 - 0.00	4	No Ice	0.00	0.82
							1/2" Ice	0.00	2.33
							1" Ice	0.00	4.46
							2" Ice	0.00	10.55
HCS 6X12 6AWG(1-3/8)	C	No	No	CaAa (Out Of Face)	165.00 - 0.00	2	No Ice	0.00	1.70
							1/2" Ice	0.00	2.85
							1" Ice	0.00	4.61
							2" Ice	0.00	9.96
**********									
LDF2-50(3/8")	C	No	No	Inside Pole	156.00 - 0.00	2	No Ice	0.00	0.08
							1/2" Ice	0.00	0.08
							1" Ice	0.00	0.08
							2" Ice	0.00	0.08
100266(3/8")	C	No	No	Inside Pole	156.00 - 0.00	1	No Ice	0.00	0.09
							1/2" Ice	0.00	0.09
							1" Ice	0.00	0.09
							2" Ice	0.00	0.09
LDF7-50A(1-5/8")	C	No	No	Inside Pole	156.00 - 0.00	12	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
							2" Ice	0.00	0.82
3" (Nominal) Conduit	C	No	No	Inside Pole	156.00 - 0.00	1	No Ice	0.00	1.49
							1/2" Ice	0.00	1.49
							1" Ice	0.00	1.49
							2" Ice	0.00	1.49
**********									
HB114-1-08U4-M5F(1-1/4)	C	No	No	Inside Pole	148.00 - 0.00	3	No Ice	0.00	1.08
							1/2" Ice	0.00	1.08
							1" Ice	0.00	1.08
							2" Ice	0.00	1.08
HB114-08U3M12-XXXF(7/8)	C	No	No	Inside Pole	148.00 - 0.00	1	No Ice	0.00	0.68
							1/2" Ice	0.00	0.68
							1" Ice	0.00	0.68
							2" Ice	0.00	0.68
**********									
LDF7-50A(1-5/8")	C	No	No	CaAa (Out Of Face)	138.00 - 124.00	1	No Ice	0.20	0.82
							1/2" Ice	0.30	2.33
							1" Ice	0.40	4.46
							2" Ice	0.60	10.54
LDF7-50A(1-5/8")	C	No	No	CaAa (Out Of Face)	124.00 - 0.00	1	No Ice	0.00	0.82
							1/2" Ice	0.00	2.33
							1" Ice	0.00	4.46
							2" Ice	0.00	10.54
LDF7-50A(1-5/8")	C	No	No	CaAa (Out	138.00 - 0.00	5	No Ice	0.00	0.82

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
				Of Face)			1/2" Ice	0.00	2.33
							1" Ice	0.00	4.46
							2" Ice	0.00	10.54
**********									
LDF4-50A(1/2")	C	No	No	CaAa (Out Of Face)	124.00 - 0.00	2	No Ice	0.00	0.15
							1/2" Ice	0.00	0.84
							1" Ice	0.00	2.14
							2" Ice	0.00	6.58
LDF4-50A(1/2")	C	No	No	Inside Pole	124.00 - 0.00	4	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
							2" Ice	0.00	0.15
LDF1-50A(1/4")	C	No	No	Inside Pole	124.00 - 0.00	3	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
9207(5/16")	C	No	No	Inside Pole	124.00 - 0.00	1	No Ice	0.00	0.06
							1/2" Ice	0.00	0.06
							1" Ice	0.00	0.06
							2" Ice	0.00	0.06
2" (Nominal) Conduit	C	No	No	CaAa (Out Of Face)	124.00 - 0.00	1	No Ice	0.24	0.72
							1/2" Ice	0.34	2.48
							1" Ice	0.44	4.84
							2" Ice	0.64	11.41
**********									
EC4-50(1/2)	C	No	No	CaAa (Out Of Face)	118.00 - 0.00	1	No Ice	0.00	0.16
							1/2" Ice	0.00	0.85
							1" Ice	0.00	2.15
							2" Ice	0.00	6.59
**********									
LDF6-50A(1-1/4)	C	No	No	CaAa (Out Of Face)	111.00 - 0.00	1	No Ice	0.16	0.60
							1/2" Ice	0.25	1.85
							1" Ice	0.35	3.72
							2" Ice	0.55	9.27
LDF6-50A(1-1/4)	C	No	No	CaAa (Out Of Face)	111.00 - 0.00	1	No Ice	0.00	0.60
							1/2" Ice	0.00	1.85
							1" Ice	0.00	3.72
							2" Ice	0.00	9.27
HB158-1-08U8-S8J18(1-5/8)	C	No	No	CaAa (Out Of Face)	111.00 - 0.00	2	No Ice	0.20	1.30
							1/2" Ice	0.30	2.81
							1" Ice	0.40	4.94
							2" Ice	0.60	11.02
LDF7-50A(1-5/8)	C	No	No	CaAa (Out Of Face)	111.00 - 0.00	16	No Ice	0.00	0.82
							1/2" Ice	0.00	2.33
							1" Ice	0.00	4.46
							2" Ice	0.00	10.55
***									
1 1/4" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	104.00 - 0.00	2	No Ice	0.21	0.00
							1/2" Ice	0.32	0.00
							1" Ice	0.43	0.00
							2" Ice	0.65	0.00
***									
1" Flat Reinforcement	C	No	No	CaAa (Out Of Face)	113.50 - 98.50	1	No Ice	0.17	0.00
							1/2" Ice	0.28	0.00
							1" Ice	0.39	0.00
							2" Ice	0.61	0.00
***									

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	169.00-164.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.361	0.01
L2	164.00-159.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.803	0.06
L3	159.00-154.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.803	0.09
L4	154.00-149.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.803	0.12
L5	149.00-144.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.803	0.14
L6	144.00-139.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.803	0.14
L7	139.00-133.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.969	0.18
L8	133.33-131.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.933	0.06
L9	131.66-126.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.793	0.17
L10	126.66-121.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.885	0.17
L11	121.66-116.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.990	0.17
L12	116.66-111.66	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.297	0.18
L13	111.66-111.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.505	0.02
L14	111.00-110.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.239	0.01
L15	110.75-105.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	4.776	0.26
L16	105.75-101.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.101	0.22
L17	101.50-101.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.343	0.01
L18	101.25-101.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.343	0.01
L19	101.00-100.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.343	0.01
L20	100.75-95.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.401	0.26
L21	95.75-87.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.545	0.41
L22	87.83-86.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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
		C	0.000	0.000	0.000	1.205	0.05
L23	86.83-81.83	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L24	81.83-81.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.398	0.02
L25	81.50-81.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L26	81.25-76.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L27	76.25-71.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L28	71.25-66.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L29	66.25-61.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L30	61.25-56.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L31	56.25-51.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L32	51.25-43.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	9.545	0.41
L33	43.33-42.33	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	1.205	0.05
L34	42.33-37.40	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	5.941	0.26
L35	37.40-37.15	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L36	37.15-32.15	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L37	32.15-27.15	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L38	27.15-22.15	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L39	22.15-19.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	3.194	0.14
L40	19.50-19.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L41	19.25-14.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L42	14.25-9.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	6.026	0.26
L43	9.25-9.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L44	9.00-8.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L45	8.75-7.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00

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
		C	0.000	0.000	0.000	2.109	0.09
L46	7.00-6.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L47	6.75-5.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.109	0.09
L48	5.00-4.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L49	4.75-3.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.109	0.09
L50	3.00-2.75	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L51	2.75-2.25	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.603	0.03
L52	2.25-2.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.301	0.01
L53	2.00-0.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	2.410	0.10

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
L1	169.00-164.00	A	1.999	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.160	0.14
L2	164.00-159.00	A	1.993	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.788	0.67
L3	159.00-154.00	A	1.986	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.775	0.69
L4	154.00-149.00	A	1.980	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.762	0.73
L5	149.00-144.00	A	1.973	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.749	0.74
L6	144.00-139.00	A	1.966	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.735	0.74
L7	139.00-133.33	A	1.959	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	9.241	1.13
L8	133.33-131.66	A	1.954	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	2.895	0.35
L9	131.66-126.66	A	1.949	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.638	1.04
L10	126.66-121.66	A	1.941	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.707	1.09
L11	121.66-116.66	A	1.933	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.789	1.16
L12	116.66-111.66	A	1.925	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.000	9.857	1.18
L13	111.66-111.00	A	1.920	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.546	0.16
L14	111.00-110.75	A	1.919	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.729	0.11
L15	110.75-105.75	A	1.914	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	14.561	2.17
L16	105.75-101.50	A	1.906	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.500	1.83
L17	101.50-101.25	A	1.902	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.040	0.11
L18	101.25-101.00	A	1.901	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.040	0.11
L19	101.00-100.75	A	1.901	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.040	0.11
L20	100.75-95.75	A	1.896	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	19.146	2.14
L21	95.75-87.83	A	1.883	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	28.104	3.37
L22	87.83-86.83	A	1.874	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.549	0.43
L23	86.83-81.83	A	1.867	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.644	2.11
L24	81.83-81.50	A	1.861	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.162	0.14
L25	81.50-81.25	A	1.861	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.880	0.10
L26	81.25-76.25	A	1.854	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.565	2.09
L27	76.25-71.25	A	1.842	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.489	2.08
L28	71.25-66.25	A	1.829	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.409	2.06
L29	66.25-61.25	A	1.816	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.323	2.04
L30	61.25-56.25	A	1.801	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.231	2.02
L31	56.25-51.25	A	1.785	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	17.132	2.00
L32	51.25-43.33	A	1.762	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	26.913	3.13
L33	43.33-42.33	A	1.745	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	3.398	0.39
L34	42.33-37.40	A	1.732	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.570	1.91
L35	37.40-37.15	A	1.721	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C		0.000	0.000	0.000	0.837	0.10
L36	37.15-32.15	A	1.708	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.655	1.91
L37	32.15-27.15	A	1.682	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.491	1.87
L38	27.15-22.15	A	1.651	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	16.299	1.83
L39	22.15-19.50	A	1.623	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	8.548	0.95
L40	19.50-19.25	A	1.612	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.803	0.09
L41	19.25-14.25	A	1.588	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.910	1.75
L42	14.25-9.25	A	1.533	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	15.565	1.68
L43	9.25-9.00	A	1.495	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.766	0.08
L44	9.00-8.75	A	1.491	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.765	0.08
L45	8.75-7.00	A	1.473	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.317	0.56
L46	7.00-6.75	A	1.453	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.753	0.08
L47	6.75-5.00	A	1.431	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.224	0.54
L48	5.00-4.75	A	1.404	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.738	0.08
L49	4.75-3.00	A	1.372	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.097	0.52
L50	3.00-2.75	A	1.332	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.716	0.07
L51	2.75-2.25	A	1.313	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	1.420	0.14
L52	2.25-2.00	A	1.292	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.703	0.07
L53	2.00-0.00	A	1.198	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	5.393	0.50

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
L1	169.00-164.00	-0.4833	0.2791	-0.7303	0.4216
L2	164.00-159.00	-1.8825	1.0868	-2.5941	1.4977
L3	159.00-154.00	-1.9084	1.1018	-2.6587	1.5350
L4	154.00-149.00	-1.9324	1.1157	-2.7191	1.5699
L5	149.00-144.00	-1.9546	1.1285	-2.7757	1.6026
L6	144.00-139.00	-1.9752	1.1404	-2.8287	1.6331

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
L7	139.00-133.33	-2.6486	1.5292	-3.6381	2.1005
L8	133.33-131.66	-2.7774	1.6035	-3.7893	2.1877
L9	131.66-126.66	-2.8000	1.6166	-3.8348	2.2140
L10	126.66-121.66	-2.9003	1.6745	-3.9308	2.2694
L11	121.66-116.66	-3.0077	1.7365	-4.0273	2.3252
L12	116.66-111.66	-3.2624	1.8836	-4.4039	2.5426
L13	111.66-111.00	-3.6331	2.0976	-4.9136	2.8369
L14	111.00-110.75	-4.2090	2.4301	-5.5389	3.1979
L15	110.75-105.75	-4.2381	2.4469	-5.5927	3.2290
L16	105.75-101.50	-4.9368	2.8503	-6.3676	3.6763
L17	101.50-101.25	-5.3630	3.0963	-6.8178	3.9362
L18	101.25-101.00	-5.3670	3.0986	-6.8244	3.9401
L19	101.00-100.75	-5.3667	3.0985	-6.8274	3.9418
L20	100.75-95.75	-5.1967	3.0003	-6.6457	3.8369
L21	95.75-87.83	-5.1040	2.9468	-6.5744	3.7957
L22	87.83-86.83	-5.1223	2.9574	-6.6047	3.8133
L23	86.83-81.83	-5.1598	2.9790	-6.6591	3.8446
L24	81.83-81.50	-5.1926	2.9980	-6.7140	3.8763
L25	81.50-81.25	-5.1966	3.0002	-6.7203	3.8800
L26	81.25-76.25	-5.2278	3.0183	-6.7726	3.9101
L27	76.25-71.25	-5.2860	3.0518	-6.8690	3.9658
L28	71.25-66.25	-5.3420	3.0842	-6.9608	4.0188
L29	66.25-61.25	-5.3963	3.1156	-7.0481	4.0692
L30	61.25-56.25	-5.4487	3.1458	-7.1304	4.1168
L31	56.25-51.25	-5.4992	3.1750	-7.2075	4.1613
L32	51.25-43.33	-5.5624	3.2114	-7.2995	4.2144
L33	43.33-42.33	-5.5700	3.2158	-7.3112	4.2211
L34	42.33-37.40	-5.5977	3.2319	-7.3256	4.2294
L35	37.40-37.15	-5.6217	3.2457	-7.3558	4.2469
L36	37.15-32.15	-5.6453	3.2593	-7.3837	4.2630
L37	32.15-27.15	-5.6893	3.2847	-7.4308	4.2902
L38	27.15-22.15	-5.7322	3.3095	-7.4676	4.3114
L39	22.15-19.50	-5.7640	3.3278	-7.4866	4.3224
L40	19.50-19.25	-5.7770	3.3354	-7.4924	4.3257
L41	19.25-14.25	-5.7980	3.3475	-7.4959	4.3278
L42	14.25-9.25	-5.8378	3.3704	-7.4814	4.3194
L43	9.25-9.00	-5.8581	3.3822	-7.4561	4.3048
L44	9.00-8.75	-5.8604	3.3835	-7.4530	4.3030
L45	8.75-7.00	-5.8681	3.3879	-7.4372	4.2939
L46	7.00-6.75	-5.8750	3.3919	-7.4167	4.2820
L47	6.75-5.00	-5.8826	3.3963	-7.3914	4.2674
L48	5.00-4.75	-5.8968	3.4045	-7.3660	4.2528
L49	4.75-3.00	-5.9039	3.4086	-7.3228	4.2278
L50	3.00-2.75	-5.9117	3.4131	-7.2641	4.1939
L51	2.75-2.25	-5.9145	3.4147	-7.2354	4.1774
L52	2.25-2.00	-5.9138	3.4143	-7.1979	4.1557
L53	2.00-0.00	-5.9217	3.4189	-7.0360	4.0622

Note: For pole sections, center of pressure calculations do not consider feed line shielding.

Shielding Factor Ka

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

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
**********									
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	A	From Leg	4.00 0.00 2.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	B	From Leg	4.00 0.00 2.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	C	From Leg	4.00 0.00 2.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.33 6.78 7.21 8.12	5.64 6.43 7.13 8.59	0.11 0.17 0.23 0.38
AIR 32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
AIR 32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
AIR 32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.75 7.20 7.65 8.57	6.07 6.87 7.58 9.06	0.15 0.21 0.28 0.44
APXVAARR24_43-U-NA20 w/ Mount Pipe	A	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	0.16 0.30 0.44 0.78
APXVAARR24_43-U-NA20 w/ Mount Pipe	B	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	0.16 0.30 0.44 0.78
APXVAARR24_43-U-NA20 w/ Mount Pipe	C	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	20.48 21.23 21.99 23.44	11.02 12.55 14.10 16.45	0.16 0.30 0.44 0.78
(2) KRY 112 144/1	A	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
KRY 112 144/1	B	From Leg	4.00 0.00 0.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.35 0.43 0.51 0.70	0.17 0.23 0.30 0.46	0.01 0.01 0.02 0.03
RADIO 4449 B12/B71	B	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.16 1.30 1.45 1.76	0.07 0.09 0.11 0.16

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) RADIO 4449 B12/B71	C	From Leg	4.00 0.00 1.00	0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.16 1.30 1.45 1.76	0.07 0.09 0.11 0.16
8-ft Ladder	C	None		0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.00 7.00 9.00 13.00	5.00 7.00 9.00 13.00	0.04 0.07 0.08 0.11
Platform Mount [LP 601-1]	C	None		0.000	165.00	No Ice 1/2" Ice 1" Ice 2" Ice	28.47 33.59 38.71 48.95	28.47 33.59 38.71 48.95	1.12 1.51 1.91 2.69
*********									
(2) 7770.00 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
(2) 7770.00 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
(2) 7770.00 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.75 6.18 6.61 7.49	4.25 5.01 5.71 7.16	0.06 0.10 0.16 0.29
HPA-65R-BUU-H8 w/ Mount Pipe	A	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.21 13.90 14.59 15.91	9.58 11.05 12.50 14.75	0.10 0.20 0.30 0.55
HPA-65R-BUU-H8 w/ Mount Pipe	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.21 13.90 14.59 15.91	9.58 11.05 12.50 14.75	0.10 0.20 0.30 0.55
HPA-65R-BUU-H6 w/ Mount Pipe	C	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	9.90 10.47 11.01 12.11	8.11 9.30 10.21 12.01	0.08 0.16 0.25 0.46
DTMABP7819VG12A	A	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
DTMABP7819VG12A	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
DTMABP7819VG12A	C	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
RRUS 11	A	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice			
RRUS 11	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
RRUS 11	C	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.79 3.00 3.21 3.67	1.19 1.34 1.50 1.84	0.05 0.07 0.10 0.15
DC6-48-60-18-8F	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.92 1.46 1.64 2.04	0.92 1.46 1.64 2.04	0.02 0.04 0.06 0.11
DTMABP7819VG12A	A	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
DTMABP7819VG12A	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
DTMABP7819VG12A	C	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.98 1.10 1.23 1.52	0.34 0.42 0.51 0.71	0.02 0.03 0.04 0.06
RRUS12/RRUS A2	A	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
RRUS12/RRUS A2	B	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
RRUS12/RRUS A2	C	From Face	4.00 0.00 2.00	0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.14 3.36 3.59 4.07	1.84 2.01 2.20 2.59	0.07 0.10 0.13 0.20
Platform Mount [LP 714-1]	C	None		0.000	156.00	No Ice 1/2" Ice 1" Ice 2" Ice	37.47 44.23 50.99 64.51	37.47 44.23 50.99 64.51	1.60 2.04 2.48 3.36
**********									
ETCR-654L12H6 w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.27 13.88 14.45 15.61	6.54 7.71 8.61 10.42	0.10 0.19 0.29 0.52
ETCR-654L12H6 w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	148.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.27 13.88 14.45 15.61	6.54 7.71 8.61 10.42	0.10 0.19 0.29 0.52
ETCR-654L12H6 w/ Mount Pipe	C	From Leg	4.00 0.00	0.000	148.00	No Ice 1/2"	13.27 13.88	6.54 7.71	0.10 0.19

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
			0.00			Ice	14.45	8.61	0.29
						1" Ice	15.61	10.42	0.52
						2" Ice			
800MHZ RRH	A	From Leg	4.00	0.000	148.00	No Ice	2.13	1.77	0.05
			0.00			1/2"	2.32	1.95	0.07
			0.00			Ice	2.51	2.13	0.10
						1" Ice	2.92	2.51	0.16
						2" Ice			
800MHZ RRH	B	From Leg	4.00	0.000	148.00	No Ice	2.13	1.77	0.05
			0.00			1/2"	2.32	1.95	0.07
			0.00			Ice	2.51	2.13	0.10
						1" Ice	2.92	2.51	0.16
						2" Ice			
800MHZ RRH	C	From Leg	4.00	0.000	148.00	No Ice	2.13	1.77	0.05
			0.00			1/2"	2.32	1.95	0.07
			0.00			Ice	2.51	2.13	0.10
						1" Ice	2.92	2.51	0.16
						2" Ice			
PCS 1900MHZ 4X45W-65MHZ	A	From Leg	4.00	0.000	148.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
PCS 1900MHZ 4X45W-65MHZ	B	From Leg	4.00	0.000	148.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
PCS 1900MHZ 4X45W-65MHZ	C	From Leg	4.00	0.000	148.00	No Ice	2.32	2.24	0.06
			0.00			1/2"	2.53	2.44	0.08
			0.00			Ice	2.74	2.65	0.11
						1" Ice	3.19	3.09	0.17
						2" Ice			
RRH2X50-800	A	From Leg	4.00	0.000	148.00	No Ice	1.70	1.28	0.05
			0.00			1/2"	1.86	1.43	0.07
			0.00			Ice	2.03	1.58	0.09
						1" Ice	2.40	1.91	0.14
						2" Ice			
RRH2X50-800	B	From Leg	4.00	0.000	148.00	No Ice	1.70	1.28	0.05
			0.00			1/2"	1.86	1.43	0.07
			0.00			Ice	2.03	1.58	0.09
						1" Ice	2.40	1.91	0.14
						2" Ice			
RRH2X50-800	C	From Leg	4.00	0.000	148.00	No Ice	1.70	1.28	0.05
			0.00			1/2"	1.86	1.43	0.07
			0.00			Ice	2.03	1.58	0.09
						1" Ice	2.40	1.91	0.14
						2" Ice			
TD-RRH8X20-25	A	From Leg	4.00	0.000	148.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			0.00			Ice	4.56	1.90	0.13
						1" Ice	5.10	2.30	0.20
						2" Ice			
TD-RRH8X20-25	B	From Leg	4.00	0.000	148.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			0.00			Ice	4.56	1.90	0.13
						1" Ice	5.10	2.30	0.20
						2" Ice			
TD-RRH8X20-25	C	From Leg	4.00	0.000	148.00	No Ice	4.05	1.53	0.07
			0.00			1/2"	4.30	1.71	0.10
			0.00			Ice	4.56	1.90	0.13
						1" Ice	5.10	2.30	0.20
						2" Ice			
T-Arm Mount [TA 702-3]	C	None		0.000	148.00	No Ice	5.64	5.64	0.34
						1/2"	6.55	6.55	0.43

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
						Ice	7.46	7.46	0.52
						1" Ice	9.28	9.28	0.70
						2" Ice			
*********									
APXV18-206517-A	A	From Face	1.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.17 5.62 6.08 7.02	3.04 3.47 3.91 4.81	0.03 0.05 0.09 0.17
APXV18-206517-A	B	From Face	1.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.17 5.62 6.08 7.02	3.04 3.47 3.91 4.81	0.03 0.05 0.09 0.17
APXV18-206517-A	C	From Face	1.00 0.00 0.00	0.000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice	5.17 5.62 6.08 7.02	3.04 3.47 3.91 4.81	0.03 0.05 0.09 0.17
Pipe Mount [PM 601-3]	C	None		0.000	138.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.39 5.48 6.57 8.75	4.39 5.48 6.57 8.75	0.20 0.24 0.28 0.36
*********									
LLPX310R w/ Mount Pipe	A	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.46 4.79 5.12 5.82	2.85 3.37 3.91 5.01	0.04 0.08 0.12 0.22
LLPX310R w/ Mount Pipe	B	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.46 4.79 5.12 5.82	2.85 3.37 3.91 5.01	0.04 0.08 0.12 0.22
LLPX310R w/ Mount Pipe	C	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.46 4.79 5.12 5.82	2.85 3.37 3.91 5.01	0.04 0.08 0.12 0.22
HORIZON DUO	A	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.47 0.56 0.65 0.86	0.29 0.37 0.44 0.62	0.01 0.01 0.02 0.04
HORIZON DUO	C	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.47 0.56 0.65 0.86	0.29 0.37 0.44 0.62	0.01 0.01 0.02 0.04
WIMAX DAP HEAD	A	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.55 1.70 1.87 2.22	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09
WIMAX DAP HEAD	B	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.55 1.70 1.87 2.22	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09
WIMAX DAP HEAD	C	From Face	3.00 0.00 4.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.55 1.70 1.87 2.22	0.68 0.80 0.92 1.19	0.03 0.04 0.06 0.09

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
2.375" OD x 5' Mount Pipe	A	From Face	3.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.19 1.50 1.81 2.46	1.19 1.50 1.81 2.46	0.02 0.03 0.04 0.08
2.375" OD x 5' Mount Pipe	B	From Face	3.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.19 1.50 1.81 2.46	1.19 1.50 1.81 2.46	0.02 0.03 0.04 0.08
2.375" OD x 5' Mount Pipe	C	From Face	3.00 0.00 0.00	0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.19 1.50 1.81 2.46	1.19 1.50 1.81 2.46	0.02 0.03 0.04 0.08
Side Arm Mount [SO 701-3]	C	None		0.000	124.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.83 3.92 5.01 7.19	2.83 3.92 5.01 7.19	0.20 0.24 0.28 0.36
*********									
CXL 900-3LW	B	From Leg	2.00 0.00 1.00	60.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.33 0.48 0.81	0.14 0.33 0.48 0.81	0.00 0.00 0.01 0.02
LNA	B	From Leg	2.00 0.00 1.00	60.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.14 0.19 0.25 0.39	0.05 0.09 0.13 0.24	0.00 0.00 0.00 0.01
CAVITY FILTER	B	From Leg	2.00 0.00 1.00	60.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.19 0.25 0.32 0.47	0.08 0.12 0.17 0.29	0.00 0.00 0.01 0.02
Side Arm Mount [SO 304-1]	B	From Leg	0.00 0.00 0.00	60.000	118.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.63 1.00 1.37 2.11	0.94 1.45 1.96 2.98	0.02 0.03 0.04 0.06
*********									
(2) HBXX-6517DS-A2M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.77 9.34 9.89 10.99	6.96 8.18 9.14 11.02	0.07 0.14 0.21 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.77 9.34 9.89 10.99	6.96 8.18 9.14 11.02	0.07 0.14 0.21 0.40
(2) HBXX-6517DS-A2M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.77 9.34 9.89 10.99	6.96 8.18 9.14 11.02	0.07 0.14 0.21 0.40
(2) LNX-6514DS-A1M w/ Mount Pipe	A	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.41 8.97 9.50 10.59	7.08 8.27 9.18 11.02	0.06 0.13 0.21 0.39
(2) LNX-6514DS-A1M w/ Mount Pipe	B	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice	8.41 8.97 9.50	7.08 8.27 9.18	0.06 0.13 0.21

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
						1" Ice 2" Ice	10.59	11.02	0.39
(2) LNX-6514DS-A1M w/ Mount Pipe	C	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	8.41 8.97 9.50 10.59	7.08 8.27 9.18 11.02	0.06 0.13 0.21 0.39
B4 RRH2X60-4R	A	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.36 3.61 3.88 4.42	2.00 2.24 2.48 2.97	0.06 0.08 0.11 0.18
B4 RRH2X60-4R	B	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.36 3.61 3.88 4.42	2.00 2.24 2.48 2.97	0.06 0.08 0.11 0.18
B4 RRH2X60-4R	C	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.36 3.61 3.88 4.42	2.00 2.24 2.48 2.97	0.06 0.08 0.11 0.18
(2) RRFDC-3315-PF-48	B	From Leg	4.00 0.00 0.00	0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	3.36 3.60 3.84 4.34	2.19 2.39 2.61 3.05	0.03 0.06 0.09 0.17
Platform Mount [LP 303-1]	C	None		0.000	111.00	No Ice 1/2" Ice 1" Ice 2" Ice	14.66 18.87 23.08 31.50	14.66 18.87 23.08 31.50	1.25 1.48 1.71 2.18

**

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
VHLP800-11	A	Paraboloid w/o Radome	From Leg	3.00 0.00 4.00	60.000		124.00	2.80	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.53 6.90 7.64	0.02 0.06 0.09 0.17
VHLP800-11	C	Paraboloid w/o Radome	From Leg	3.00 0.00 4.00	10.000		124.00	2.80	No Ice 1/2" Ice 1" Ice 2" Ice	6.16 6.53 6.90 7.64	0.02 0.06 0.09 0.17

Tower Pressures - No Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 169.00-164.00	166.48	1.409	50.74	6.744	A	0.000	6.744	6.744	100.00	0.000	0.000
					B	0.000	6.744		100.00	0.000	0.000
					C	0.000	6.744		100.00	0.000	0.361
L2 164.00-159.00	161.48	1.4	50.41	7.148	A	0.000	7.148	7.148	100.00	0.000	0.000
					B	0.000	7.148		100.00	0.000	0.000
					C	0.000	7.148		100.00	0.000	1.803
L3 159.00-154.00	156.48	1.391	50.08	7.552	A	0.000	7.552	7.552	100.00	0.000	0.000
					B	0.000	7.552		100.00	0.000	0.000
					C	0.000	7.552		100.00	0.000	1.803
L4 154.00-149.00	151.48	1.381	49.74	7.955	A	0.000	7.955	7.955	100.00	0.000	0.000
					B	0.000	7.955		100.00	0.000	0.000
					C	0.000	7.955		100.00	0.000	1.803
L5 149.00-144.00	146.48	1.372	49.39	8.359	A	0.000	8.359	8.359	100.00	0.000	0.000
					B	0.000	8.359		100.00	0.000	0.000
					C	0.000	8.359		100.00	0.000	1.803
L6 144.00-139.00	141.48	1.362	49.03	8.763	A	0.000	8.763	8.763	100.00	0.000	0.000
					B	0.000	8.763		100.00	0.000	0.000
					C	0.000	8.763		100.00	0.000	1.803
L7 139.00-133.33	136.14	1.351	48.63	10.426	A	0.000	10.426	10.426	100.00	0.000	0.000
					B	0.000	10.426		100.00	0.000	0.000
					C	0.000	10.426		100.00	0.000	2.969
L8 133.33-131.66	132.49	1.343	48.35	3.096	A	0.000	3.096	3.096	100.00	0.000	0.000
					B	0.000	3.096		100.00	0.000	0.000
					C	0.000	3.096		100.00	0.000	0.933
L9 131.66-126.66	129.14	1.336	48.09	9.536	A	0.000	9.536	9.536	100.00	0.000	0.000
					B	0.000	9.536		100.00	0.000	0.000
					C	0.000	9.536		100.00	0.000	2.793
L10 126.66-121.66	124.14	1.325	47.70	9.934	A	0.000	9.934	9.934	100.00	0.000	0.000
					B	0.000	9.934		100.00	0.000	0.000
					C	0.000	9.934		100.00	0.000	2.885
L11 121.66-116.66	119.14	1.313	47.29	10.331	A	0.000	10.331	10.331	100.00	0.000	0.000
					B	0.000	10.331		100.00	0.000	0.000
					C	0.000	10.331		100.00	0.000	2.990
L12 116.66-111.66	114.14	1.301	46.86	10.729	A	0.000	10.729	10.729	100.00	0.000	0.000
					B	0.000	10.729		100.00	0.000	0.000
					C	0.000	10.729		100.00	0.000	3.297
L13 111.66-111.00	111.33	1.295	46.61	1.446	A	0.000	1.446	1.446	100.00	0.000	0.000
					B	0.000	1.446		100.00	0.000	0.000
					C	0.000	1.446		100.00	0.000	0.505
L14 111.00-110.75	110.87	1.293	46.57	0.549	A	0.000	0.549	0.549	100.00	0.000	0.000
					B	0.000	0.549		100.00	0.000	0.000
					C	0.000	0.549		100.00	0.000	0.239
L15 110.75-105.75	108.24	1.287	46.34	11.184	A	0.000	11.184	11.184	100.00	0.000	0.000
					B	0.000	11.184		100.00	0.000	0.000
					C	0.000	11.184		100.00	0.000	4.776
L16 105.75-101.50	103.61	1.275	45.92	9.820	A	0.000	9.820	9.820	100.00	0.000	0.000
					B	0.000	9.820		100.00	0.000	0.000
					C	0.000	9.820		100.00	0.000	5.101
L17 101.50-101.25	101.37	1.269	45.70	0.585	A	0.000	0.585	0.585	100.00	0.000	0.000
					B	0.000	0.585		100.00	0.000	0.000
					C	0.000	0.585		100.00	0.000	0.343
L18 101.25-101.00	101.12	1.269	45.68	0.586	A	0.000	0.586	0.586	100.00	0.000	0.000
					B	0.000	0.586		100.00	0.000	0.000
					C	0.000	0.586		100.00	0.000	0.343
L19 101.00-100.75	100.87	1.268	45.66	0.588	A	0.000	0.588	0.588	100.00	0.000	0.000
					B	0.000	0.588		100.00	0.000	0.000
					C	0.000	0.588		100.00	0.000	0.343
L20 100.75-95.75	98.24	1.261	45.40	11.970	A	0.000	11.970	11.970	100.00	0.000	0.000
					B	0.000	11.970		100.00	0.000	0.000
					C	0.000	11.970		100.00	0.000	6.401
L21 95.75-	91.76	1.243	44.76	19.776	A	0.000	19.776	19.776	100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
87.83					B	0.000	19.776		100.00	0.000	0.000
					C	0.000	19.776		100.00	0.000	9.545
L22 87.83-86.83	87.33	1.23	44.29	2.512	A	0.000	2.512	2.512	100.00	0.000	0.000
					B	0.000	2.512		100.00	0.000	0.000
					C	0.000	2.512		100.00	0.000	1.205
L23 86.83-81.83	84.32	1.221	43.97	12.800	A	0.000	12.800	12.800	100.00	0.000	0.000
					B	0.000	12.800		100.00	0.000	0.000
					C	0.000	12.800		100.00	0.000	6.026
L24 81.83-81.50	81.66	1.213	43.67	0.859	A	0.000	0.859	0.859	100.00	0.000	0.000
					B	0.000	0.859		100.00	0.000	0.000
					C	0.000	0.859		100.00	0.000	0.398
L25 81.50-81.25	81.37	1.212	43.64	0.652	A	0.000	0.652	0.652	100.00	0.000	0.000
					B	0.000	0.652		100.00	0.000	0.000
					C	0.000	0.652		100.00	0.000	0.301
L26 81.25-76.25	78.74	1.204	43.34	13.244	A	0.000	13.244	13.244	100.00	0.000	0.000
					B	0.000	13.244		100.00	0.000	0.000
					C	0.000	13.244		100.00	0.000	6.026
L27 76.25-71.25	73.74	1.187	42.74	13.644	A	0.000	13.644	13.644	100.00	0.000	0.000
					B	0.000	13.644		100.00	0.000	0.000
					C	0.000	13.644		100.00	0.000	6.026
L28 71.25-66.25	68.74	1.17	42.11	14.044	A	0.000	14.044	14.044	100.00	0.000	0.000
					B	0.000	14.044		100.00	0.000	0.000
					C	0.000	14.044		100.00	0.000	6.026
L29 66.25-61.25	63.74	1.151	41.45	14.443	A	0.000	14.443	14.443	100.00	0.000	0.000
					B	0.000	14.443		100.00	0.000	0.000
					C	0.000	14.443		100.00	0.000	6.026
L30 61.25-56.25	58.74	1.132	40.74	14.842	A	0.000	14.842	14.842	100.00	0.000	0.000
					B	0.000	14.842		100.00	0.000	0.000
					C	0.000	14.842		100.00	0.000	6.026
L31 56.25-51.25	53.74	1.111	39.99	15.241	A	0.000	15.241	15.241	100.00	0.000	0.000
					B	0.000	15.241		100.00	0.000	0.000
					C	0.000	15.241		100.00	0.000	6.026
L32 51.25-43.33	47.26	1.081	38.92	24.957	A	0.000	24.957	24.957	100.00	0.000	0.000
					B	0.000	24.957		100.00	0.000	0.000
					C	0.000	24.957		100.00	0.000	9.545
L33 43.33-42.33	42.83	1.059	38.12	3.156	A	0.000	3.156	3.156	100.00	0.000	0.000
					B	0.000	3.156		100.00	0.000	0.000
					C	0.000	3.156		100.00	0.000	1.205
L34 42.33-37.40	39.85	1.043	37.55	15.791	A	0.000	15.791	15.791	100.00	0.000	0.000
					B	0.000	15.791		100.00	0.000	0.000
					C	0.000	15.791		100.00	0.000	5.941
L35 37.40-37.15	37.27	1.028	37.02	0.811	A	0.000	0.811	0.811	100.00	0.000	0.000
					B	0.000	0.811		100.00	0.000	0.000
					C	0.000	0.811		100.00	0.000	0.301
L36 37.15-32.15	34.64	1.012	36.46	16.432	A	0.000	16.432	16.432	100.00	0.000	0.000
					B	0.000	16.432		100.00	0.000	0.000
					C	0.000	16.432		100.00	0.000	6.026
L37 32.15-27.15	29.64	0.98	35.28	16.831	A	0.000	16.831	16.831	100.00	0.000	0.000
					B	0.000	16.831		100.00	0.000	0.000
					C	0.000	16.831		100.00	0.000	6.026
L38 27.15-22.15	24.64	0.942	33.93	17.229	A	0.000	17.229	17.229	100.00	0.000	0.000
					B	0.000	17.229		100.00	0.000	0.000
					C	0.000	17.229		100.00	0.000	6.026
L39 22.15-19.50	20.82	0.91	32.75	9.293	A	0.000	9.293	9.293	100.00	0.000	0.000
					B	0.000	9.293		100.00	0.000	0.000
					C	0.000	9.293		100.00	0.000	3.194
L40 19.50-19.25	19.37	0.896	32.26	0.882	A	0.000	0.882	0.882	100.00	0.000	0.000
					B	0.000	0.882		100.00	0.000	0.000
					C	0.000	0.882		100.00	0.000	0.301
L41 19.25-14.25	16.74	0.869	31.28	17.855	A	0.000	17.855	17.855	100.00	0.000	0.000
					B	0.000	17.855		100.00	0.000	0.000
					C	0.000	17.855		100.00	0.000	6.026
L42 14.25-9.25	11.74	0.85	30.61	18.252	A	0.000	18.252	18.252	100.00	0.000	0.000
					B	0.000	18.252		100.00	0.000	0.000
					C	0.000	18.252		100.00	0.000	6.026
L43 9.25-9.00	9.12	0.85	30.61	0.923	A	0.000	0.923	0.923	100.00	0.000	0.000
					B	0.000	0.923		100.00	0.000	0.000
					C	0.000	0.923		100.00	0.000	0.301

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L44 9.00-8.75	8.87	0.85	30.61	0.924	A	0.000	0.924	0.924	100.00	0.000	0.000
					B	0.000	0.924		100.00	0.000	0.000
					C	0.000	0.924		100.00	0.000	0.301
L45 8.75-7.00	7.87	0.85	30.61	6.496	A	0.000	6.496	6.496	100.00	0.000	0.000
					B	0.000	6.496		100.00	0.000	0.000
					C	0.000	6.496		100.00	0.000	2.109
L46 7.00-6.75	6.87	0.85	30.61	0.932	A	0.000	0.932	0.932	100.00	0.000	0.000
					B	0.000	0.932		100.00	0.000	0.000
					C	0.000	0.932		100.00	0.000	0.301
L47 6.75-5.00	5.87	0.85	30.61	6.552	A	0.000	6.552	6.552	100.00	0.000	0.000
					B	0.000	6.552		100.00	0.000	0.000
					C	0.000	6.552		100.00	0.000	2.109
L48 5.00-4.75	4.87	0.85	30.61	0.939	A	0.000	0.939	0.939	100.00	0.000	0.000
					B	0.000	0.939		100.00	0.000	0.000
					C	0.000	0.939		100.00	0.000	0.301
L49 4.75-3.00	3.87	0.85	30.61	6.598	A	0.000	6.598	6.598	100.00	0.000	0.000
					B	0.000	6.598		100.00	0.000	0.000
					C	0.000	6.598		100.00	0.000	2.109
L50 3.00-2.75	2.87	0.85	30.61	0.946	A	0.000	0.946	0.946	100.00	0.000	0.000
					B	0.000	0.946		100.00	0.000	0.000
					C	0.000	0.946		100.00	0.000	0.301
L51 2.75-2.25	2.50	0.85	30.61	1.896	A	0.000	1.896	1.896	100.00	0.000	0.000
					B	0.000	1.896		100.00	0.000	0.000
					C	0.000	1.896		100.00	0.000	0.603
L52 2.25-2.00	2.12	0.85	30.61	0.950	A	0.000	0.950	0.950	100.00	0.000	0.000
					B	0.000	0.950		100.00	0.000	0.000
					C	0.000	0.950		100.00	0.000	0.301
L53 2.00-0.00	1.00	0.85	30.61	7.638	A	0.000	7.638	7.638	100.00	0.000	0.000
					B	0.000	7.638		100.00	0.000	0.000
					C	0.000	7.638		100.00	0.000	2.410

Tower Pressure - With Ice

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 169.00-164.00	166.48	1.409	8.12	1.9986	8.409	A	0.000	8.409	8.409	100.00	0.000	0.000
						B	0.000	8.409		100.00	0.000	0.000
						C	0.000	8.409		100.00	0.000	1.160
L2 164.00-159.00	161.48	1.4	8.07	1.9925	8.808	A	0.000	8.808	8.808	100.00	0.000	0.000
						B	0.000	8.808		100.00	0.000	0.000
						C	0.000	8.808		100.00	0.000	5.788
L3 159.00-154.00	156.48	1.391	8.01	1.9863	9.207	A	0.000	9.207	9.207	100.00	0.000	0.000
						B	0.000	9.207		100.00	0.000	0.000
						C	0.000	9.207		100.00	0.000	5.775
L4 154.00-149.00	151.48	1.381	7.96	1.9799	9.605	A	0.000	9.605	9.605	100.00	0.000	0.000
						B	0.000	9.605		100.00	0.000	0.000
						C	0.000	9.605		100.00	0.000	5.762
L5 149.00-144.00	146.48	1.372	7.90	1.9732	10.004	A	0.000	10.004	10.004	100.00	0.000	0.000
						B	0.000	10.004		100.00	0.000	0.000
						C	0.000	10.004		100.00	0.000	5.749
L6 144.00-139.00	141.48	1.362	7.84	1.9664	10.402	A	0.000	10.402	10.402	100.00	0.000	0.000
						B	0.000	10.402		100.00	0.000	0.000
						C	0.000	10.402		100.00	0.000	5.735
L7 139.00-133.33	136.14	1.351	7.78	1.9588	12.277	A	0.000	12.277	12.277	100.00	0.000	0.000
						B	0.000	12.277		100.00	0.000	0.000
						C	0.000	12.277		100.00	0.000	9.241
L8 133.33-131.66	132.49	1.343	7.74	1.9535	3.641	A	0.000	3.641	3.641	100.00	0.000	0.000
						B	0.000	3.641		100.00	0.000	0.000
						C	0.000	3.641		100.00	0.000	2.895
L9 131.66-126.66	129.14	1.336	7.70	1.9485	11.159	A	0.000	11.159	11.159	100.00	0.000	0.000
						B	0.000	11.159		100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
						C	0.000	11.159		100.00	0.000	8.638
L10 126.66-121.66	124.14	1.325	7.63	1.9408	11.551	A	0.000	11.551	11.551	100.00	0.000	0.000
						B	0.000	11.551		100.00	0.000	0.000
						C	0.000	11.551		100.00	0.000	8.707
L11 121.66-116.66	119.14	1.313	7.57	1.9329	11.942	A	0.000	11.942	11.942	100.00	0.000	0.000
						B	0.000	11.942		100.00	0.000	0.000
						C	0.000	11.942		100.00	0.000	8.789
L12 116.66-111.66	114.14	1.301	7.50	1.9246	12.333	A	0.000	12.333	12.333	100.00	0.000	0.000
						B	0.000	12.333		100.00	0.000	0.000
						C	0.000	12.333		100.00	0.000	9.857
L13 111.66-111.00	111.33	1.295	7.46	1.9198	1.657	A	0.000	1.657	1.657	100.00	0.000	0.000
						B	0.000	1.657		100.00	0.000	0.000
						C	0.000	1.657		100.00	0.000	1.546
L14 111.00-110.75	110.87	1.293	7.45	1.9190	0.629	A	0.000	0.629	0.629	100.00	0.000	0.000
						B	0.000	0.629		100.00	0.000	0.000
						C	0.000	0.629		100.00	0.000	0.729
L15 110.75-105.75	108.24	1.287	7.41	1.9144	12.779	A	0.000	12.779	12.779	100.00	0.000	0.000
						B	0.000	12.779		100.00	0.000	0.000
						C	0.000	12.779		100.00	0.000	14.561
L16 105.75-101.50	103.61	1.275	7.35	1.9061	11.170	A	0.000	11.170	11.170	100.00	0.000	0.000
						B	0.000	11.170		100.00	0.000	0.000
						C	0.000	11.170		100.00	0.000	15.500
L17 101.50-101.25	101.37	1.269	7.31	1.9019	0.664	A	0.000	0.664	0.664	100.00	0.000	0.000
						B	0.000	0.664		100.00	0.000	0.000
						C	0.000	0.664		100.00	0.000	1.040
L18 101.25-101.00	101.12	1.269	7.31	1.9014	0.665	A	0.000	0.665	0.665	100.00	0.000	0.000
						B	0.000	0.665		100.00	0.000	0.000
						C	0.000	0.665		100.00	0.000	1.040
L19 101.00-100.75	100.87	1.268	7.31	1.9010	0.667	A	0.000	0.667	0.667	100.00	0.000	0.000
						B	0.000	0.667		100.00	0.000	0.000
						C	0.000	0.667		100.00	0.000	1.040
L20 100.75-95.75	98.24	1.261	7.26	1.8959	13.550	A	0.000	13.550	13.550	100.00	0.000	0.000
						B	0.000	13.550		100.00	0.000	0.000
						C	0.000	13.550		100.00	0.000	19.146
L21 95.75-87.83	91.76	1.243	7.16	1.8830	22.262	A	0.000	22.262	22.262	100.00	0.000	0.000
						B	0.000	22.262		100.00	0.000	0.000
						C	0.000	22.262		100.00	0.000	28.104
L22 87.83-86.83	87.33	1.23	7.09	1.8738	2.826	A	0.000	2.826	2.826	100.00	0.000	0.000
						B	0.000	2.826		100.00	0.000	0.000
						C	0.000	2.826		100.00	0.000	3.549
L23 86.83-81.83	84.32	1.221	7.03	1.8672	14.356	A	0.000	14.356	14.356	100.00	0.000	0.000
						B	0.000	14.356		100.00	0.000	0.000
						C	0.000	14.356		100.00	0.000	17.644
L24 81.83-81.50	81.66	1.213	6.99	1.8612	0.961	A	0.000	0.961	0.961	100.00	0.000	0.000
						B	0.000	0.961		100.00	0.000	0.000
						C	0.000	0.961		100.00	0.000	1.162
L25 81.50-81.25	81.37	1.212	6.98	1.8606	0.729	A	0.000	0.729	0.729	100.00	0.000	0.000
						B	0.000	0.729		100.00	0.000	0.000
						C	0.000	0.729		100.00	0.000	0.880
L26 81.25-76.25	78.74	1.204	6.93	1.8545	14.790	A	0.000	14.790	14.790	100.00	0.000	0.000
						B	0.000	14.790		100.00	0.000	0.000
						C	0.000	14.790		100.00	0.000	17.565
L27 76.25-71.25	73.74	1.187	6.84	1.8423	15.179	A	0.000	15.179	15.179	100.00	0.000	0.000
						B	0.000	15.179		100.00	0.000	0.000
						C	0.000	15.179		100.00	0.000	17.489
L28 71.25-66.25	68.74	1.17	6.74	1.8294	15.568	A	0.000	15.568	15.568	100.00	0.000	0.000
						B	0.000	15.568		100.00	0.000	0.000
						C	0.000	15.568		100.00	0.000	17.409
L29 66.25-61.25	63.74	1.151	6.63	1.8157	15.956	A	0.000	15.956	15.956	100.00	0.000	0.000
						B	0.000	15.956		100.00	0.000	0.000
						C	0.000	15.956		100.00	0.000	17.323
L30 61.25-56.25	58.74	1.132	6.52	1.8009	16.342	A	0.000	16.342	16.342	100.00	0.000	0.000
						B	0.000	16.342		100.00	0.000	0.000
						C	0.000	16.342		100.00	0.000	17.231
L31 56.25-51.25	53.74	1.111	6.40	1.7850	16.729	A	0.000	16.729	16.729	100.00	0.000	0.000
						B	0.000	16.729		100.00	0.000	0.000
						C	0.000	16.729		100.00	0.000	17.132
L32 51.25-	47.26	1.081	6.23	1.7622	27.283	A	0.000	27.283	27.283	100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	t_Z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	in	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
43.33						B	0.000	27.283		100.00	0.000	0.000
						C	0.000	27.283		100.00	0.000	26.913
L33 43.33-42.33	42.83	1.059	6.10	1.7449	3.450	A	0.000	3.450	3.450	100.00	0.000	0.000
						B	0.000	3.450		100.00	0.000	0.000
						C	0.000	3.450		100.00	0.000	3.398
L34 42.33-37.40	39.85	1.043	6.01	1.7324	17.215	A	0.000	17.215	17.215	100.00	0.000	0.000
						B	0.000	17.215		100.00	0.000	0.000
						C	0.000	17.215		100.00	0.000	16.570
L35 37.40-37.15	37.27	1.028	5.92	1.7208	0.883	A	0.000	0.883	0.883	100.00	0.000	0.000
						B	0.000	0.883		100.00	0.000	0.000
						C	0.000	0.883		100.00	0.000	0.837
L36 37.15-32.15	34.64	1.012	5.83	1.7083	17.855	A	0.000	17.855	17.855	100.00	0.000	0.000
						B	0.000	17.855		100.00	0.000	0.000
						C	0.000	17.855		100.00	0.000	16.655
L37 32.15-27.15	29.64	0.98	5.64	1.6818	18.233	A	0.000	18.233	18.233	100.00	0.000	0.000
						B	0.000	18.233		100.00	0.000	0.000
						C	0.000	18.233		100.00	0.000	16.491
L38 27.15-22.15	24.64	0.942	5.43	1.6511	18.605	A	0.000	18.605	18.605	100.00	0.000	0.000
						B	0.000	18.605		100.00	0.000	0.000
						C	0.000	18.605		100.00	0.000	16.299
L39 22.15-19.50	20.82	0.91	5.24	1.6235	10.010	A	0.000	10.010	10.010	100.00	0.000	0.000
						B	0.000	10.010		100.00	0.000	0.000
						C	0.000	10.010		100.00	0.000	8.548
L40 19.50-19.25	19.37	0.896	5.16	1.6118	0.949	A	0.000	0.949	0.949	100.00	0.000	0.000
						B	0.000	0.949		100.00	0.000	0.000
						C	0.000	0.949		100.00	0.000	0.803
L41 19.25-14.25	16.74	0.869	5.01	1.5885	19.179	A	0.000	19.179	19.179	100.00	0.000	0.000
						B	0.000	19.179		100.00	0.000	0.000
						C	0.000	19.179		100.00	0.000	15.910
L42 14.25-9.25	11.74	0.85	4.90	1.5331	19.530	A	0.000	19.530	19.530	100.00	0.000	0.000
						B	0.000	19.530		100.00	0.000	0.000
						C	0.000	19.530		100.00	0.000	15.565
L43 9.25-9.00	9.12	0.85	4.90	1.4949	0.985	A	0.000	0.985	0.985	100.00	0.000	0.000
						B	0.000	0.985		100.00	0.000	0.000
						C	0.000	0.985		100.00	0.000	0.766
L44 9.00-8.75	8.87	0.85	4.90	1.4908	0.986	A	0.000	0.986	0.986	100.00	0.000	0.000
						B	0.000	0.986		100.00	0.000	0.000
						C	0.000	0.986		100.00	0.000	0.765
L45 8.75-7.00	7.87	0.85	4.90	1.4730	6.925	A	0.000	6.925	6.925	100.00	0.000	0.000
						B	0.000	6.925		100.00	0.000	0.000
						C	0.000	6.925		100.00	0.000	5.317
L46 7.00-6.75	6.87	0.85	4.90	1.4532	0.993	A	0.000	0.993	0.993	100.00	0.000	0.000
						B	0.000	0.993		100.00	0.000	0.000
						C	0.000	0.993		100.00	0.000	0.753
L47 6.75-5.00	5.87	0.85	4.90	1.4305	6.970	A	0.000	6.970	6.970	100.00	0.000	0.000
						B	0.000	6.970		100.00	0.000	0.000
						C	0.000	6.970		100.00	0.000	5.224
L48 5.00-4.75	4.87	0.85	4.90	1.4041	0.997	A	0.000	0.997	0.997	100.00	0.000	0.000
						B	0.000	0.997		100.00	0.000	0.000
						C	0.000	0.997		100.00	0.000	0.738
L49 4.75-3.00	3.87	0.85	4.90	1.3722	6.998	A	0.000	6.998	6.998	100.00	0.000	0.000
						B	0.000	6.998		100.00	0.000	0.000
						C	0.000	6.998		100.00	0.000	5.097
L50 3.00-2.75	2.87	0.85	4.90	1.3319	1.002	A	0.000	1.002	1.002	100.00	0.000	0.000
						B	0.000	1.002		100.00	0.000	0.000
						C	0.000	1.002		100.00	0.000	0.716
L51 2.75-2.25	2.50	0.85	4.90	1.3134	2.005	A	0.000	2.005	2.005	100.00	0.000	0.000
						B	0.000	2.005		100.00	0.000	0.000
						C	0.000	2.005		100.00	0.000	1.420
L52 2.25-2.00	2.12	0.85	4.90	1.2922	1.004	A	0.000	1.004	1.004	100.00	0.000	0.000
						B	0.000	1.004		100.00	0.000	0.000
						C	0.000	1.004		100.00	0.000	0.703
L53 2.00-0.00	1.00	0.85	4.90	1.1982	8.038	A	0.000	8.038	8.038	100.00	0.000	0.000
						B	0.000	8.038		100.00	0.000	0.000
						C	0.000	8.038		100.00	0.000	5.393

Tower Pressure - Service

G_H = 1.100

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L1 169.00-164.00	166.48	1.409	10.46	6.744	A	0.000	6.744	6.744	100.00	0.000	0.000
					B	0.000	6.744		100.00	0.000	0.000
					C	0.000	6.744		100.00	0.000	0.361
L2 164.00-159.00	161.48	1.4	10.39	7.148	A	0.000	7.148	7.148	100.00	0.000	0.000
					B	0.000	7.148		100.00	0.000	0.000
					C	0.000	7.148		100.00	0.000	1.803
L3 159.00-154.00	156.48	1.391	10.32	7.552	A	0.000	7.552	7.552	100.00	0.000	0.000
					B	0.000	7.552		100.00	0.000	0.000
					C	0.000	7.552		100.00	0.000	1.803
L4 154.00-149.00	151.48	1.381	10.25	7.955	A	0.000	7.955	7.955	100.00	0.000	0.000
					B	0.000	7.955		100.00	0.000	0.000
					C	0.000	7.955		100.00	0.000	1.803
L5 149.00-144.00	146.48	1.372	10.18	8.359	A	0.000	8.359	8.359	100.00	0.000	0.000
					B	0.000	8.359		100.00	0.000	0.000
					C	0.000	8.359		100.00	0.000	1.803
L6 144.00-139.00	141.48	1.362	10.11	8.763	A	0.000	8.763	8.763	100.00	0.000	0.000
					B	0.000	8.763		100.00	0.000	0.000
					C	0.000	8.763		100.00	0.000	1.803
L7 139.00-133.33	136.14	1.351	10.03	10.426	A	0.000	10.426	10.426	100.00	0.000	0.000
					B	0.000	10.426		100.00	0.000	0.000
					C	0.000	10.426		100.00	0.000	2.969
L8 133.33-131.66	132.49	1.343	9.97	3.096	A	0.000	3.096	3.096	100.00	0.000	0.000
					B	0.000	3.096		100.00	0.000	0.000
					C	0.000	3.096		100.00	0.000	0.933
L9 131.66-126.66	129.14	1.336	9.91	9.536	A	0.000	9.536	9.536	100.00	0.000	0.000
					B	0.000	9.536		100.00	0.000	0.000
					C	0.000	9.536		100.00	0.000	2.793
L10 126.66-121.66	124.14	1.325	9.83	9.934	A	0.000	9.934	9.934	100.00	0.000	0.000
					B	0.000	9.934		100.00	0.000	0.000
					C	0.000	9.934		100.00	0.000	2.885
L11 121.66-116.66	119.14	1.313	9.75	10.331	A	0.000	10.331	10.331	100.00	0.000	0.000
					B	0.000	10.331		100.00	0.000	0.000
					C	0.000	10.331		100.00	0.000	2.990
L12 116.66-111.66	114.14	1.301	9.66	10.729	A	0.000	10.729	10.729	100.00	0.000	0.000
					B	0.000	10.729		100.00	0.000	0.000
					C	0.000	10.729		100.00	0.000	3.297
L13 111.66-111.00	111.33	1.295	9.61	1.446	A	0.000	1.446	1.446	100.00	0.000	0.000
					B	0.000	1.446		100.00	0.000	0.000
					C	0.000	1.446		100.00	0.000	0.505
L14 111.00-110.75	110.87	1.293	9.60	0.549	A	0.000	0.549	0.549	100.00	0.000	0.000
					B	0.000	0.549		100.00	0.000	0.000
					C	0.000	0.549		100.00	0.000	0.239
L15 110.75-105.75	108.24	1.287	9.55	11.184	A	0.000	11.184	11.184	100.00	0.000	0.000
					B	0.000	11.184		100.00	0.000	0.000
					C	0.000	11.184		100.00	0.000	4.776
L16 105.75-101.50	103.61	1.275	9.47	9.820	A	0.000	9.820	9.820	100.00	0.000	0.000
					B	0.000	9.820		100.00	0.000	0.000
					C	0.000	9.820		100.00	0.000	5.101
L17 101.50-101.25	101.37	1.269	9.42	0.585	A	0.000	0.585	0.585	100.00	0.000	0.000
					B	0.000	0.585		100.00	0.000	0.000
					C	0.000	0.585		100.00	0.000	0.343
L18 101.25-101.00	101.12	1.269	9.42	0.586	A	0.000	0.586	0.586	100.00	0.000	0.000
					B	0.000	0.586		100.00	0.000	0.000
					C	0.000	0.586		100.00	0.000	0.343
L19 101.00-100.75	100.87	1.268	9.41	0.588	A	0.000	0.588	0.588	100.00	0.000	0.000
					B	0.000	0.588		100.00	0.000	0.000
					C	0.000	0.588		100.00	0.000	0.343
L20 100.75-95.75	98.24	1.261	9.36	11.970	A	0.000	11.970	11.970	100.00	0.000	0.000
					B	0.000	11.970		100.00	0.000	0.000
					C	0.000	11.970		100.00	0.000	6.401
L21 95.75-	91.76	1.243	9.23	19.776	A	0.000	19.776	19.776	100.00	0.000	0.000

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
87.83					B	0.000	19.776		100.00	0.000	0.000
					C	0.000	19.776		100.00	0.000	9.545
L22 87.83-86.83	87.33	1.23	9.13	2.512	A	0.000	2.512	2.512	100.00	0.000	0.000
					B	0.000	2.512		100.00	0.000	0.000
					C	0.000	2.512		100.00	0.000	1.205
L23 86.83-81.83	84.32	1.221	9.06	12.800	A	0.000	12.800	12.800	100.00	0.000	0.000
					B	0.000	12.800		100.00	0.000	0.000
					C	0.000	12.800		100.00	0.000	6.026
L24 81.83-81.50	81.66	1.213	9.00	0.859	A	0.000	0.859	0.859	100.00	0.000	0.000
					B	0.000	0.859		100.00	0.000	0.000
					C	0.000	0.859		100.00	0.000	0.398
L25 81.50-81.25	81.37	1.212	9.00	0.652	A	0.000	0.652	0.652	100.00	0.000	0.000
					B	0.000	0.652		100.00	0.000	0.000
					C	0.000	0.652		100.00	0.000	0.301
L26 81.25-76.25	78.74	1.204	8.93	13.244	A	0.000	13.244	13.244	100.00	0.000	0.000
					B	0.000	13.244		100.00	0.000	0.000
					C	0.000	13.244		100.00	0.000	6.026
L27 76.25-71.25	73.74	1.187	8.81	13.644	A	0.000	13.644	13.644	100.00	0.000	0.000
					B	0.000	13.644		100.00	0.000	0.000
					C	0.000	13.644		100.00	0.000	6.026
L28 71.25-66.25	68.74	1.17	8.68	14.044	A	0.000	14.044	14.044	100.00	0.000	0.000
					B	0.000	14.044		100.00	0.000	0.000
					C	0.000	14.044		100.00	0.000	6.026
L29 66.25-61.25	63.74	1.151	8.54	14.443	A	0.000	14.443	14.443	100.00	0.000	0.000
					B	0.000	14.443		100.00	0.000	0.000
					C	0.000	14.443		100.00	0.000	6.026
L30 61.25-56.25	58.74	1.132	8.40	14.842	A	0.000	14.842	14.842	100.00	0.000	0.000
					B	0.000	14.842		100.00	0.000	0.000
					C	0.000	14.842		100.00	0.000	6.026
L31 56.25-51.25	53.74	1.111	8.24	15.241	A	0.000	15.241	15.241	100.00	0.000	0.000
					B	0.000	15.241		100.00	0.000	0.000
					C	0.000	15.241		100.00	0.000	6.026
L32 51.25-43.33	47.26	1.081	8.02	24.957	A	0.000	24.957	24.957	100.00	0.000	0.000
					B	0.000	24.957		100.00	0.000	0.000
					C	0.000	24.957		100.00	0.000	9.545
L33 43.33-42.33	42.83	1.059	7.86	3.156	A	0.000	3.156	3.156	100.00	0.000	0.000
					B	0.000	3.156		100.00	0.000	0.000
					C	0.000	3.156		100.00	0.000	1.205
L34 42.33-37.40	39.85	1.043	7.74	15.791	A	0.000	15.791	15.791	100.00	0.000	0.000
					B	0.000	15.791		100.00	0.000	0.000
					C	0.000	15.791		100.00	0.000	5.941
L35 37.40-37.15	37.27	1.028	7.63	0.811	A	0.000	0.811	0.811	100.00	0.000	0.000
					B	0.000	0.811		100.00	0.000	0.000
					C	0.000	0.811		100.00	0.000	0.301
L36 37.15-32.15	34.64	1.012	7.52	16.432	A	0.000	16.432	16.432	100.00	0.000	0.000
					B	0.000	16.432		100.00	0.000	0.000
					C	0.000	16.432		100.00	0.000	6.026
L37 32.15-27.15	29.64	0.98	7.27	16.831	A	0.000	16.831	16.831	100.00	0.000	0.000
					B	0.000	16.831		100.00	0.000	0.000
					C	0.000	16.831		100.00	0.000	6.026
L38 27.15-22.15	24.64	0.942	7.00	17.229	A	0.000	17.229	17.229	100.00	0.000	0.000
					B	0.000	17.229		100.00	0.000	0.000
					C	0.000	17.229		100.00	0.000	6.026
L39 22.15-19.50	20.82	0.91	6.75	9.293	A	0.000	9.293	9.293	100.00	0.000	0.000
					B	0.000	9.293		100.00	0.000	0.000
					C	0.000	9.293		100.00	0.000	3.194
L40 19.50-19.25	19.37	0.896	6.65	0.882	A	0.000	0.882	0.882	100.00	0.000	0.000
					B	0.000	0.882		100.00	0.000	0.000
					C	0.000	0.882		100.00	0.000	0.301
L41 19.25-14.25	16.74	0.869	6.45	17.855	A	0.000	17.855	17.855	100.00	0.000	0.000
					B	0.000	17.855		100.00	0.000	0.000
					C	0.000	17.855		100.00	0.000	6.026
L42 14.25-9.25	11.74	0.85	6.31	18.252	A	0.000	18.252	18.252	100.00	0.000	0.000
					B	0.000	18.252		100.00	0.000	0.000
					C	0.000	18.252		100.00	0.000	6.026
L43 9.25-9.00	9.12	0.85	6.31	0.923	A	0.000	0.923	0.923	100.00	0.000	0.000
					B	0.000	0.923		100.00	0.000	0.000
					C	0.000	0.923		100.00	0.000	0.301

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
L44 9.00-8.75	8.87	0.85	6.31	0.924	A	0.000	0.924	0.924	100.00	0.000	0.000
					B	0.000	0.924		100.00	0.000	0.000
					C	0.000	0.924		100.00	0.000	0.301
L45 8.75-7.00	7.87	0.85	6.31	6.496	A	0.000	6.496	6.496	100.00	0.000	0.000
					B	0.000	6.496		100.00	0.000	0.000
					C	0.000	6.496		100.00	0.000	2.109
L46 7.00-6.75	6.87	0.85	6.31	0.932	A	0.000	0.932	0.932	100.00	0.000	0.000
					B	0.000	0.932		100.00	0.000	0.000
					C	0.000	0.932		100.00	0.000	0.301
L47 6.75-5.00	5.87	0.85	6.31	6.552	A	0.000	6.552	6.552	100.00	0.000	0.000
					B	0.000	6.552		100.00	0.000	0.000
					C	0.000	6.552		100.00	0.000	2.109
L48 5.00-4.75	4.87	0.85	6.31	0.939	A	0.000	0.939	0.939	100.00	0.000	0.000
					B	0.000	0.939		100.00	0.000	0.000
					C	0.000	0.939		100.00	0.000	0.301
L49 4.75-3.00	3.87	0.85	6.31	6.598	A	0.000	6.598	6.598	100.00	0.000	0.000
					B	0.000	6.598		100.00	0.000	0.000
					C	0.000	6.598		100.00	0.000	2.109
L50 3.00-2.75	2.87	0.85	6.31	0.946	A	0.000	0.946	0.946	100.00	0.000	0.000
					B	0.000	0.946		100.00	0.000	0.000
					C	0.000	0.946		100.00	0.000	0.301
L51 2.75-2.25	2.50	0.85	6.31	1.896	A	0.000	1.896	1.896	100.00	0.000	0.000
					B	0.000	1.896		100.00	0.000	0.000
					C	0.000	1.896		100.00	0.000	0.603
L52 2.25-2.00	2.12	0.85	6.31	0.950	A	0.000	0.950	0.950	100.00	0.000	0.000
					B	0.000	0.950		100.00	0.000	0.000
					C	0.000	0.950		100.00	0.000	0.301
L53 2.00-0.00	1.00	0.85	6.31	7.638	A	0.000	7.638	7.638	100.00	0.000	0.000
					B	0.000	7.638		100.00	0.000	0.000
					C	0.000	7.638		100.00	0.000	2.410

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 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

Comb. No.	Description
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L1	169 - 164	Pole	Max Tension	48	0.00	0.00	0.00
			Max. Compression	26	-9.30	0.65	-1.01
			Max. Mx	20	-2.33	12.25	-0.47
			Max. My	14	-2.35	0.29	-12.40
			Max. Vy	20	-6.67	12.25	-0.47
			Max. Vx	14	6.65	0.29	-12.40
			Max. Torque	10			-0.47
L2	164 - 159	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-10.49	1.18	-1.32
			Max. Mx	20	-2.62	46.74	-0.54
			Max. My	14	-2.63	0.41	-46.75
			Max. Vy	20	-7.11	46.74	-0.54
			Max. Vx	14	7.09	0.41	-46.75
			Max. Torque	10			-0.53
L3	159 - 154	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-20.41	1.32	-0.95
			Max. Mx	20	-5.23	102.77	-0.52
			Max. My	14	-5.27	0.48	-102.23
			Max. Vy	20	-13.69	102.77	-0.52
			Max. Vx	14	13.58	0.48	-102.23
			Max. Torque	10			-0.57
L4	154 - 149	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-21.72	2.00	-1.35
			Max. Mx	20	-5.67	172.37	-0.61
			Max. My	14	-5.71	0.64	-171.26
			Max. Vy	20	-14.14	172.37	-0.61
			Max. Vx	14	14.03	0.64	-171.26
			Max. Torque	2			0.26
L5	149 - 144	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-27.55	2.74	-1.78
			Max. Mx	20	-7.32	256.01	-0.71
			Max. My	14	-7.36	0.83	-254.32
			Max. Vy	20	-17.54	256.01	-0.71
			Max. Vx	14	17.42	0.83	-254.32
			Max. Torque	24			0.33
L6	144 - 139	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-28.93	3.51	-2.24
			Max. Mx	20	-7.90	344.83	-0.82
			Max. My	14	-7.94	1.02	-342.56
			Max. Vy	20	-17.99	344.83	-0.82
			Max. Vx	14	17.87	1.02	-342.56
			Max. Torque	24			0.42
L7	139 - 133.33	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-30.61	3.97	-2.51
			Max. Mx	20	-8.42	388.29	-0.87
			Max. My	14	-8.46	1.12	-385.73
			Max. Vy	20	-19.02	388.29	-0.87
			Max. Vx	14	18.91	1.12	-385.73
			Max. Torque	24			0.47
L8	133.33 - 131.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-32.80	5.00	-3.11
			Max. Mx	20	-9.31	484.90	-0.99
			Max. My	14	-9.35	1.35	-481.74
			Max. Vy	20	-19.59	484.90	-0.99
			Max. Vx	14	19.48	1.35	-481.74
			Max. Torque	24			0.60
L9	131.66 - 126.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-34.96	6.66	-3.41
			Max. Mx	20	-10.03	585.20	-1.56
			Max. My	14	-10.10	2.06	-581.02
			Max. Vy	8	20.84	-583.66	-0.03
			Max. Vx	14	20.50	2.06	-581.02
			Max. Torque	14			-2.92
L10	126.66 - 121.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-38.54	7.95	-4.16
			Max. Mx	20	-11.31	695.51	-3.03
			Max. My	14	-11.37	4.89	-689.65
			Max. Vy	8	22.34	-693.80	0.95
			Max. Vx	14	22.00	4.89	-689.65
			Max. Torque	14			-3.08
L11	121.66 - 116.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-40.65	9.03	-5.00
			Max. Mx	20	-12.20	808.50	-4.51
			Max. My	14	-12.26	7.69	-801.03
			Max. Vy	8	22.91	-806.75	1.94
			Max. Vx	14	22.56	7.69	-801.03
			Max. Torque	14			-3.16
L12	116.66 - 111.66	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.70	10.32	-5.77
			Max. Mx	20	-13.11	924.29	-5.98
			Max. My	14	-13.16	10.51	-915.10
			Max. Vy	8	23.42	-922.40	2.93
			Max. Vx	14	23.07	10.51	-915.10
			Max. Torque	14			-3.27
L13	111.66 - 111	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-42.97	10.50	-5.87
			Max. Mx	20	-13.24	939.76	-6.18
			Max. My	14	-13.29	10.88	-930.35
			Max. Vy	8	23.48	-937.86	3.06
			Max. Vx	14	23.14	10.88	-930.35
			Max. Torque	14			-3.29
L14	111 - 110.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-51.14	9.14	-6.80
			Max. Mx	20	-15.53	946.68	-6.38
			Max. My	14	-15.59	10.78	-937.66
			Max. Vy	8	28.93	-945.39	2.96
			Max. Vx	14	28.52	10.78	-937.66
			Max. Torque	14			-3.29
L15	110.75 - 105.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-54.58	11.48	-8.17
			Max. Mx	20	-16.84	1093.06	-7.71
			Max. My	14	-16.90	13.52	-1082.04
			Max. Vy	8	29.59	-1091.44	3.70
			Max. Vx	14	29.20	13.52	-1082.04
			Max. Torque	15			-2.72
L16	105.75 -	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
	101.5						
			Max. Compression	26	-57.53	13.53	-9.36
			Max. Mx	20	-17.99	1220.20	-8.83
			Max. My	14	-18.05	15.84	-1207.47
			Max. Vy	8	30.20	-1218.28	4.33
			Max. Vx	14	29.81	15.84	-1207.47
			Max. Torque	15			-2.97
L17	101.5 - 101.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.73	13.66	-9.44
			Max. Mx	20	-18.10	1227.76	-8.91
			Max. My	14	-18.16	15.98	-1214.93
			Max. Vy	8	30.24	-1225.82	4.36
			Max. Vx	14	29.84	15.98	-1214.93
			Max. Torque	15			-2.98
L18	101.25 - 101	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-57.94	13.78	-9.51
			Max. Mx	20	-18.20	1235.33	-8.97
			Max. My	14	-18.26	16.12	-1222.40
			Max. Vy	8	30.28	-1233.38	4.40
			Max. Vx	14	29.88	16.12	-1222.40
			Max. Torque	15			-3.00
L19	101 - 100.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-58.12	13.90	-9.58
			Max. Mx	20	-18.27	1242.91	-9.04
			Max. My	14	-18.33	16.26	-1229.88
			Max. Vy	8	30.33	-1240.94	4.43
			Max. Vx	14	29.92	16.26	-1229.88
			Max. Torque	15			-3.02
L20	100.75 - 95.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-61.85	16.37	-11.02
			Max. Mx	20	-19.84	1396.57	-10.37
			Max. My	14	-19.90	19.00	-1381.52
			Max. Vy	8	31.10	-1394.23	5.17
			Max. Vx	14	30.70	19.00	-1381.52
			Max. Torque	15			-3.34
L21	95.75 - 87.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-64.53	18.19	-12.08
			Max. Mx	20	-21.00	1509.23	-11.33
			Max. My	14	-21.05	20.98	-1492.73
			Max. Vy	8	31.63	-1506.61	5.69
			Max. Vx	14	31.23	20.98	-1492.73
			Max. Torque	15			-3.56
L22	87.83 - 86.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-70.30	20.92	-13.67
			Max. Mx	20	-24.11	1680.50	-12.76
			Max. My	14	-24.16	23.92	-1661.84
			Max. Vy	8	32.58	-1677.47	6.47
			Max. Vx	14	32.18	23.92	-1661.84
			Max. Torque	15			-3.90
L23	86.83 - 81.83	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.44	23.52	-15.19
			Max. Mx	20	-26.12	1845.38	-14.11
			Max. My	14	-26.17	26.70	-1824.69
			Max. Vy	8	33.34	-1841.96	7.19
			Max. Vx	14	32.93	26.70	-1824.69
			Max. Torque	15			-4.22
L24	81.83 - 81.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-74.71	23.70	-15.29
			Max. Mx	20	-26.27	1856.40	-14.20
			Max. My	14	-26.32	26.88	-1835.57
			Max. Vy	8	33.38	-1852.95	7.24
			Max. Vx	14	32.98	26.88	-1835.57
			Max. Torque	15			-4.24
L25	81.5 - 81.25	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-74.92	23.83	-15.37
			Max. Mx	20	-26.37	1864.76	-14.27
			Max. My	14	-26.42	27.02	-1843.83
			Max. Vy	8	33.42	-1861.28	7.27
			Max. Vx	14	33.01	27.02	-1843.83
			Max. Torque	15			-4.25
L26	81.25 - 76.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-79.11	26.48	-16.91
			Max. Mx	20	-28.44	2033.85	-15.62
			Max. My	14	-28.48	29.80	-2010.88
			Max. Vy	8	34.17	-2029.95	8.00
			Max. Vx	14	33.77	29.80	-2010.88
			Max. Torque	15			-4.58
L27	76.25 - 71.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-83.31	29.17	-18.48
			Max. Mx	20	-30.55	2206.63	-16.98
			Max. My	14	-30.59	32.59	-2181.62
			Max. Vy	8	34.90	-2202.31	8.71
			Max. Vx	14	34.50	32.59	-2181.62
			Max. Torque	15			-4.90
L28	71.25 - 66.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-87.52	31.91	-20.07
			Max. Mx	20	-32.69	2383.03	-18.34
			Max. My	14	-32.73	35.38	-2355.98
			Max. Vy	8	35.61	-2378.26	9.42
			Max. Vx	14	35.21	35.38	-2355.98
			Max. Torque	15			-5.24
L29	66.25 - 61.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-91.75	34.68	-21.68
			Max. Mx	20	-34.86	2562.96	-19.70
			Max. My	14	-34.90	38.18	-2533.86
			Max. Vy	8	36.31	-2557.73	10.13
			Max. Vx	14	35.91	38.18	-2533.86
			Max. Torque	15			-5.57
L30	61.25 - 56.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-95.99	37.48	-23.31
			Max. Mx	20	-37.06	2746.31	-21.06
			Max. My	14	-37.10	40.97	-2715.17
			Max. Vy	8	36.99	-2740.61	10.83
			Max. Vx	14	36.59	40.97	-2715.17
			Max. Torque	15			-5.91
L31	56.25 - 51.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-100.24	40.30	-24.95
			Max. Mx	20	-39.30	2933.00	-22.43
			Max. My	14	-39.33	43.77	-2899.82
			Max. Vy	8	37.64	-2926.81	11.53
			Max. Vx	14	37.24	43.77	-2899.82
			Max. Torque	15			-6.25
L32	51.25 - 43.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-102.44	41.78	-25.80
			Max. Mx	20	-40.47	3030.98	-23.14
			Max. My	14	-40.49	45.22	-2996.73
			Max. Vy	8	37.97	-3024.52	11.88
			Max. Vx	14	37.57	45.22	-2996.73
			Max. Torque	15			-6.43
L33	43.33 - 42.33	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-110.83	45.39	-27.89
			Max. Mx	20	-45.79	3274.69	-24.87
			Max. My	14	-45.82	48.76	-3237.86
			Max. Vy	8	38.96	-3267.60	12.75
			Max. Vx	14	38.56	48.76	-3237.86

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Torque	15			-6.87
L34	42.33 - 37.4	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-115.49	48.17	-29.51
			Max. Mx	20	-48.50	3468.38	-26.22
			Max. My	14	-48.52	51.52	-3429.54
			Max. Vy	8	39.57	-3460.78	13.43
			Max. Vx	14	39.18	51.52	-3429.54
			Max. Torque	15			-7.20
L35	37.4 - 37.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-115.72	48.32	-29.60
			Max. Mx	20	-48.66	3478.29	-26.29
			Max. My	14	-48.68	51.67	-3439.34
			Max. Vy	8	39.59	-3470.66	13.46
			Max. Vx	14	39.19	51.67	-3439.34
			Max. Torque	15			-7.22
L36	37.15 - 32.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-120.44	51.14	-31.23
			Max. Mx	20	-51.43	3677.89	-27.66
			Max. My	14	-51.45	54.46	-3636.90
			Max. Vy	8	40.19	-3669.73	14.14
			Max. Vx	14	39.79	54.46	-3636.90
			Max. Torque	15			-7.56
L37	32.15 - 27.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-125.15	53.95	-32.86
			Max. Mx	20	-54.24	3880.35	-29.02
			Max. My	14	-54.26	57.25	-3837.33
			Max. Vy	8	40.75	-3871.65	14.81
			Max. Vx	14	40.35	57.25	-3837.33
			Max. Torque	15			-7.89
L38	27.15 - 22.15	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-129.84	56.74	-34.47
			Max. Mx	20	-57.08	4085.50	-30.39
			Max. My	14	-57.10	60.04	-4040.44
			Max. Vy	8	41.26	-4076.24	15.47
			Max. Vx	14	40.87	60.04	-4040.44
			Max. Torque	15			-8.23
L39	22.15 - 19.5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-132.33	58.20	-35.31
			Max. Mx	20	-58.60	4195.25	-31.11
			Max. My	14	-58.61	61.51	-4149.13
			Max. Vy	8	41.53	-4185.70	15.82
			Max. Vx	14	41.14	61.51	-4149.13
			Max. Torque	15			-8.40
L40	19.5 - 19.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-132.57	58.34	-35.40
			Max. Mx	20	-58.77	4205.64	-31.18
			Max. My	14	-58.78	61.65	-4159.42
			Max. Vy	8	41.53	-4196.06	15.85
			Max. Vx	14	41.14	61.65	-4159.42
			Max. Torque	15			-8.41
L41	19.25 - 14.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-137.39	61.05	-36.96
			Max. Mx	20	-61.80	4414.66	-32.54
			Max. My	14	-61.81	64.43	-4366.42
			Max. Vy	8	42.01	-4404.50	16.50
			Max. Vx	14	41.62	64.43	-4366.42
			Max. Torque	15			-8.73
L42	14.25 - 9.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-142.16	63.66	-38.47
			Max. Mx	20	-64.87	4625.93	-33.89
			Max. My	14	-64.88	67.20	-4575.68
			Max. Vy	8	42.45	-4615.19	17.14
			Max. Vx	14	42.06	67.20	-4575.68
			Max. Torque	15			-9.05
L43	9.25 - 9	Pole	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	26	-142.40	63.79	-38.55
			Max. Mx	20	-65.04	4636.56	-33.96
			Max. My	14	-65.05	67.33	-4586.20
			Max. Vy	8	42.46	-4625.78	17.18
			Max. Vx	14	42.06	67.33	-4586.20
			Max. Torque	15			-9.06
L44	9 - 8.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-142.64	63.92	-38.62
			Max. Mx	20	-65.20	4647.18	-34.03
			Max. My	14	-65.21	67.47	-4596.73
			Max. Vy	8	42.48	-4636.38	17.21
			Max. Vx	14	42.09	67.47	-4596.73
			Max. Torque	15			-9.08
L45	8.75 - 7	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-144.32	64.78	-39.12
			Max. Mx	20	-66.30	4721.73	-34.50
			Max. My	14	-66.30	68.44	-4670.57
			Max. Vy	8	42.66	-4710.71	17.43
			Max. Vx	14	42.28	68.44	-4670.57
			Max. Torque	15			-9.19
L46	7 - 6.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-144.56	64.90	-39.19
			Max. Mx	20	-66.48	4732.40	-34.57
			Max. My	14	-66.48	68.58	-4681.14
			Max. Vy	8	42.65	-4721.35	17.46
			Max. Vx	14	42.26	68.58	-4681.14
			Max. Torque	15			-9.21
L47	6.75 - 5	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-146.19	65.75	-39.68
			Max. Mx	20	-67.54	4807.25	-35.04
			Max. My	14	-67.54	69.54	-4755.29
			Max. Vy	8	42.84	-4795.99	17.68
			Max. Vx	14	42.45	69.54	-4755.29
			Max. Torque	15			-9.32
L48	5 - 4.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-146.46	65.87	-39.75
			Max. Mx	20	-67.76	4817.96	-35.11
			Max. My	14	-67.76	69.68	-4765.91
			Max. Vy	8	42.83	-4806.68	17.72
			Max. Vx	14	42.44	69.68	-4765.91
			Max. Torque	15			-9.34
L49	4.75 - 3	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-148.34	66.67	-40.21
			Max. Mx	20	-69.11	4893.14	-35.58
			Max. My	14	-69.11	70.64	-4840.39
			Max. Vy	8	43.03	-4881.64	17.94
			Max. Vx	14	42.64	70.64	-4840.39
			Max. Torque	15			-9.45
L50	3 - 2.75	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-148.62	66.79	-40.28
			Max. Mx	20	-69.32	4903.91	-35.65
			Max. My	14	-69.32	70.78	-4851.05
			Max. Vy	8	43.02	-4892.38	17.97
			Max. Vx	14	42.64	70.78	-4851.05
			Max. Torque	15			-9.47
L51	2.75 - 2.25	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-149.16	67.01	-40.41
			Max. Mx	20	-69.72	4925.46	-35.79
			Max. My	14	-69.72	71.06	-4872.40
			Max. Vy	8	43.08	-4913.86	18.03
			Max. Vx	14	42.69	71.06	-4872.40
			Max. Torque	15			-9.50
L52	2.25 - 2	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-149.39	67.12	-40.47
			Max. Mx	20	-69.89	4936.24	-35.85
			Max. My	14	-69.89	71.19	-4883.08
			Max. Vy	8	43.10	-4924.62	18.06
			Max. Vx	14	42.71	71.19	-4883.08
			Max. Torque	15			-9.52

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
L53	2 - 0	Pole	Max Tension	1	0.00	0.00	0.00
			Max. Compression	26	-151.22	67.91	-40.92
			Max. Mx	20	-71.23	5022.71	-36.39
			Max. My	14	-71.23	72.29	-4968.76
			Max. Vy	8	43.30	-5010.85	18.31
			Max. Vx	14	42.91	72.29	-4968.76
			Max. Torque	15			-9.65

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Pole	Max. Vert	26	151.22	-0.00	0.00
	Max. H_x	21	53.43	43.26	-0.23
	Max. H_z	2	71.24	-0.38	42.87
	Max. M_x	2	4956.77	-0.38	42.87
	Max. M_z	8	5010.85	-43.28	0.16
	Max. Torsion	24	9.41	21.52	36.89
	Min. Vert	9	53.43	-43.28	0.16
	Min. H_x	8	71.24	-43.28	0.16
	Min. H_z	15	53.43	0.48	-42.89
	Min. M_x	14	-4968.76	0.48	-42.89
	Min. M_z	20	-5022.71	43.26	-0.23
	Min. Torsion	15	-9.65	0.48	-42.89

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	59.37	0.00	-0.00	3.71	5.66	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	71.24	0.38	-42.87	-4956.77	-45.04	-7.77
0.9 Dead+1.0 Wind 0 deg - No Ice	53.43	0.38	-42.87	-4899.02	-46.27	-7.77
1.2 Dead+1.0 Wind 30 deg - No Ice	71.24	21.87	-37.10	-4288.20	-2534.02	-3.91
0.9 Dead+1.0 Wind 30 deg - No Ice	53.43	21.87	-37.10	-4238.40	-2505.66	-3.92
1.2 Dead+1.0 Wind 60 deg - No Ice	71.24	37.58	-21.48	-2483.15	-4353.26	0.12
0.9 Dead+1.0 Wind 60 deg - No Ice	53.43	37.58	-21.48	-2454.80	-4303.29	0.10
1.2 Dead+1.0 Wind 90 deg - No Ice	71.24	43.28	-0.16	-18.31	-5010.85	4.32
0.9 Dead+1.0 Wind 90 deg - No Ice	53.43	43.28	-0.16	-19.26	-4953.03	4.30
1.2 Dead+1.0 Wind 120 deg - No Ice	71.24	37.57	21.12	2442.14	-4350.72	7.76
0.9 Dead+1.0 Wind 120 deg - No Ice	53.43	37.57	21.12	2411.95	-4300.78	7.75
1.2 Dead+1.0 Wind 150 deg - No Ice	71.24	21.63	36.84	4263.25	-2500.43	9.43
0.9 Dead+1.0 Wind 150 deg - No Ice	53.43	21.63	36.84	4211.42	-2472.46	9.42
1.2 Dead+1.0 Wind 180 deg - No Ice	71.24	-0.48	42.89	4968.76	72.29	9.64
0.9 Dead+1.0 Wind 180 deg - No Ice	53.43	-0.48	42.89	4908.58	69.73	9.65
1.2 Dead+1.0 Wind 210 deg - No Ice	71.24	-21.80	37.12	4301.40	2538.60	6.08
0.9 Dead+1.0 Wind 210 deg - No Ice	53.43	-21.80	37.12	4249.12	2506.70	6.09

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 240 deg - No Ice	71.24	-37.52	21.56	2502.30	4359.02	0.86
0.9 Dead+1.0 Wind 240 deg - No Ice	53.43	-37.52	21.56	2471.41	4305.49	0.88
1.2 Dead+1.0 Wind 270 deg - No Ice	71.24	-43.26	0.23	36.39	5022.71	-4.24
0.9 Dead+1.0 Wind 270 deg - No Ice	53.43	-43.26	0.23	34.81	4961.32	-4.23
1.2 Dead+1.0 Wind 300 deg - No Ice	71.24	-37.55	-21.11	-2432.05	4361.92	-7.20
0.9 Dead+1.0 Wind 300 deg - No Ice	53.43	-37.55	-21.11	-2404.30	4308.35	-7.19
1.2 Dead+1.0 Wind 330 deg - No Ice	71.24	-21.52	-36.89	-4259.93	2499.10	-9.41
0.9 Dead+1.0 Wind 330 deg - No Ice	53.43	-21.52	-36.89	-4210.45	2467.65	-9.41
1.2 Dead+1.0 Ice+1.0 Temp	151.22	0.00	-0.00	40.92	67.91	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	151.22	0.08	-12.66	-1474.37	56.76	-3.57
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	151.22	6.41	-10.96	-1270.60	-702.03	-1.90
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	151.22	11.05	-6.34	-718.33	-1256.91	0.09
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	151.22	12.73	-0.03	35.97	-1458.20	2.10
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	151.22	11.04	6.27	789.35	-1256.25	3.63
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	151.22	6.36	10.91	1345.09	-694.65	4.25
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	151.22	-0.10	12.66	1556.88	82.07	3.94
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	151.22	-6.40	10.96	1353.38	835.99	2.34
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	151.22	-11.03	6.35	802.39	1391.10	0.10
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	151.22	-12.73	0.05	47.87	1593.68	-2.09
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	151.22	-11.04	-6.26	-707.20	1391.61	-3.52
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	151.22	-6.34	-10.91	-1264.40	827.35	-4.25
Dead+Wind 0 deg - Service	59.37	0.08	-8.84	-1013.12	-4.77	-1.61
Dead+Wind 30 deg - Service	59.37	4.51	-7.65	-876.31	-515.11	-0.81
Dead+Wind 60 deg - Service	59.37	7.75	-4.43	-506.22	-888.15	0.02
Dead+Wind 90 deg - Service	59.37	8.92	-0.03	-0.82	-1022.76	0.89
Dead+Wind 120 deg - Service	59.37	7.75	4.35	503.67	-887.61	1.61
Dead+Wind 150 deg - Service	59.37	4.46	7.60	877.03	-508.20	1.96
Dead+Wind 180 deg - Service	59.37	-0.10	8.84	1021.65	19.28	2.01
Dead+Wind 210 deg - Service	59.37	-4.49	7.65	884.88	524.97	1.27
Dead+Wind 240 deg - Service	59.37	-7.73	4.44	516.01	898.25	0.19
Dead+Wind 270 deg - Service	59.37	-8.92	0.05	10.39	1034.08	-0.88
Dead+Wind 300 deg - Service	59.37	-7.74	-4.35	-495.73	898.81	-1.49
Dead+Wind 330 deg - Service	59.37	-4.44	-7.60	-870.47	516.84	-1.96

Solution Summary

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
1	0.00	-59.37	0.00	-0.00	59.37	0.00	0.002%
2	0.38	-71.24	-42.87	-0.38	71.24	42.87	0.001%
3	0.38	-53.43	-42.87	-0.38	53.43	42.87	0.001%
4	21.87	-71.24	-37.10	-21.87	71.24	37.10	0.000%
5	21.87	-53.43	-37.10	-21.87	53.43	37.10	0.000%
6	37.58	-71.24	-21.48	-37.58	71.24	21.48	0.000%
7	37.58	-53.43	-21.48	-37.58	53.43	21.48	0.000%
8	43.28	-71.24	-0.16	-43.28	71.24	0.16	0.002%
9	43.28	-53.43	-0.16	-43.28	53.43	0.16	0.002%
10	37.57	-71.24	21.12	-37.57	71.24	-21.12	0.000%
11	37.57	-53.43	21.12	-37.57	53.43	-21.12	0.000%
12	21.63	-71.24	36.84	-21.63	71.24	-36.84	0.000%
13	21.63	-53.43	36.84	-21.63	53.43	-36.84	0.000%
14	-0.48	-71.24	42.89	0.48	71.24	-42.89	0.000%
15	-0.48	-53.43	42.89	0.48	53.43	-42.89	0.000%
16	-21.80	-71.24	37.12	21.80	71.24	-37.12	0.000%
17	-21.80	-53.43	37.12	21.80	53.43	-37.12	0.000%
18	-37.52	-71.24	21.56	37.52	71.24	-21.56	0.000%
19	-37.52	-53.43	21.56	37.52	53.43	-21.56	0.000%
20	-43.26	-71.24	0.23	43.26	71.24	-0.23	0.001%
21	-43.26	-53.43	0.23	43.26	53.43	-0.23	0.001%
22	-37.55	-71.24	-21.11	37.55	71.24	21.11	0.000%
23	-37.55	-53.43	-21.11	37.55	53.43	21.11	0.000%
24	-21.52	-71.24	-36.89	21.52	71.24	36.89	0.000%
25	-21.52	-53.43	-36.89	21.52	53.43	36.89	0.000%
26	0.00	-151.22	0.00	-0.00	151.22	0.00	0.000%
27	0.08	-151.22	-12.66	-0.08	151.22	12.66	0.000%
28	6.41	-151.22	-10.96	-6.41	151.22	10.96	0.000%
29	11.05	-151.22	-6.34	-11.05	151.22	6.34	0.000%
30	12.73	-151.22	-0.03	-12.73	151.22	0.03	0.000%
31	11.04	-151.22	6.27	-11.04	151.22	-6.27	0.000%
32	6.36	-151.22	10.91	-6.36	151.22	-10.91	0.000%
33	-0.10	-151.22	12.66	0.10	151.22	-12.66	0.000%
34	-6.40	-151.22	10.96	6.40	151.22	-10.96	0.000%
35	-11.03	-151.22	6.35	11.03	151.22	-6.35	0.000%
36	-12.73	-151.22	0.05	12.73	151.22	-0.05	0.000%
37	-11.04	-151.22	-6.26	11.04	151.22	6.26	0.000%
38	-6.34	-151.22	-10.91	6.34	151.22	10.91	0.000%
39	0.08	-59.37	-8.84	-0.08	59.37	8.84	0.004%
40	4.51	-59.37	-7.65	-4.51	59.37	7.65	0.001%
41	7.75	-59.37	-4.43	-7.75	59.37	4.43	0.001%
42	8.92	-59.37	-0.03	-8.92	59.37	0.03	0.004%
43	7.75	-59.37	4.35	-7.75	59.37	-4.35	0.001%
44	4.46	-59.37	7.60	-4.46	59.37	-7.60	0.001%
45	-0.10	-59.37	8.84	0.10	59.37	-8.84	0.001%
46	-4.49	-59.37	7.65	4.49	59.37	-7.65	0.001%
47	-7.73	-59.37	4.44	7.73	59.37	-4.44	0.001%
48	-8.92	-59.37	0.05	8.92	59.37	-0.05	0.004%
49	-7.74	-59.37	-4.35	7.74	59.37	4.35	0.001%
50	-4.44	-59.37	-7.60	4.44	59.37	7.60	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000690
2	Yes	22	0.00000001	0.00010190
3	Yes	21	0.00000001	0.00013794
4	Yes	28	0.00000001	0.00000000
5	Yes	27	0.00000001	0.00000000
6	Yes	28	0.00000001	0.00000000
7	Yes	27	0.00000001	0.00000000
8	Yes	21	0.00001680	0.00011147

9	Yes	20	0.00001959	0.00014694
10	Yes	28	0.00000001	0.00000000
11	Yes	27	0.00000001	0.00000000
12	Yes	28	0.00000001	0.00000000
13	Yes	27	0.00000001	0.00000000
14	Yes	24	0.00000001	0.00011391
15	Yes	24	0.00000001	0.00008290
16	Yes	28	0.00000001	0.00000000
17	Yes	27	0.00000001	0.00000000
18	Yes	28	0.00000001	0.00000000
19	Yes	27	0.00000001	0.00000000
20	Yes	22	0.00000001	0.00014180
21	Yes	22	0.00000001	0.00010403
22	Yes	28	0.00000001	0.00000000
23	Yes	27	0.00000001	0.00000000
24	Yes	28	0.00000001	0.00000000
25	Yes	27	0.00000001	0.00000000
26	Yes	18	0.00000001	0.00014998
27	Yes	25	0.00000001	0.00011146
28	Yes	26	0.00000001	0.00009553
29	Yes	26	0.00000001	0.00009685
30	Yes	25	0.00000001	0.00010844
31	Yes	26	0.00000001	0.00010651
32	Yes	26	0.00000001	0.00009904
33	Yes	25	0.00000001	0.00011983
34	Yes	26	0.00000001	0.00011838
35	Yes	26	0.00000001	0.00011565
36	Yes	25	0.00000001	0.00011812
37	Yes	26	0.00000001	0.00010355
38	Yes	26	0.00000001	0.00011115
39	Yes	17	0.00014516	0.00014717
40	Yes	20	0.00000001	0.00011173
41	Yes	20	0.00000001	0.00011652
42	Yes	17	0.00014514	0.00009124
43	Yes	20	0.00000001	0.00013271
44	Yes	20	0.00000001	0.00010304
45	Yes	19	0.00000001	0.00008856
46	Yes	20	0.00000001	0.00013810
47	Yes	20	0.00000001	0.00011831
48	Yes	17	0.00014512	0.00010229
49	Yes	20	0.00000001	0.00010581
50	Yes	20	0.00000001	0.00013677

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		*°*	*°*
L1	169 - 164	33.19	47	2.076	0.007
L2	164 - 159	31.01	47	2.075	0.007
L3	159 - 154	28.85	47	2.055	0.007
L4	154 - 149	26.72	47	2.017	0.007
L5	149 - 144	24.64	47	1.955	0.006
L6	144 - 139	22.63	47	1.871	0.006
L7	139 - 133.33	20.72	47	1.769	0.006
L8	136.66 - 131.66	19.87	47	1.716	0.006
L9	131.66 - 126.66	18.10	47	1.643	0.006
L10	126.66 - 121.66	16.44	47	1.530	0.005
L11	121.66 - 116.66	14.90	47	1.411	0.005
L12	116.66 - 111.66	13.49	47	1.286	0.004
L13	111.66 - 111	12.21	47	1.157	0.003
L14	111 - 110.75	12.05	47	1.141	0.003
L15	110.75 - 105.75	11.99	47	1.137	0.003
L16	105.75 - 101.5	10.84	47	1.061	0.003
L17	101.5 - 101.25	9.93	47	0.994	0.003
L18	101.25 - 101	9.88	47	0.991	0.003
L19	101 - 100.75	9.82	47	0.989	0.003
L20	100.75 - 95.75	9.77	47	0.986	0.003
L21	95.75 - 87.83	8.77	47	0.922	0.003
L22	92.16 - 86.83	8.10	47	0.875	0.002
L23	86.83 - 81.83	7.14	47	0.839	0.002

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L24	81.83 - 81.5	6.29	47	0.784	0.002
L25	81.5 - 81.25	6.24	47	0.781	0.002
L26	81.25 - 76.25	6.19	47	0.778	0.002
L27	76.25 - 71.25	5.41	47	0.724	0.002
L28	71.25 - 66.25	4.68	47	0.669	0.002
L29	66.25 - 61.25	4.01	47	0.613	0.002
L30	61.25 - 56.25	3.40	47	0.556	0.002
L31	56.25 - 51.25	2.84	47	0.500	0.001
L32	51.25 - 43.33	2.35	47	0.443	0.001
L33	48.66 - 42.33	2.12	47	0.414	0.001
L34	42.33 - 37.4	1.59	47	0.377	0.001
L35	37.4 - 37.15	1.22	47	0.330	0.001
L36	37.15 - 32.15	1.21	47	0.328	0.001
L37	32.15 - 27.15	0.89	47	0.280	0.001
L38	27.15 - 22.15	0.62	47	0.232	0.001
L39	22.15 - 19.5	0.40	47	0.185	0.000
L40	19.5 - 19.25	0.31	47	0.159	0.000
L41	19.25 - 14.25	0.30	47	0.157	0.000
L42	14.25 - 9.25	0.16	47	0.113	0.000
L43	9.25 - 9	0.06	47	0.069	0.000
L44	9 - 8.75	0.06	47	0.067	0.000
L45	8.75 - 7	0.06	47	0.065	0.000
L46	7 - 6.75	0.04	47	0.050	0.000
L47	6.75 - 5	0.03	47	0.048	0.000
L48	5 - 4.75	0.02	47	0.033	0.000
L49	4.75 - 3	0.02	47	0.031	0.000
L50	3 - 2.75	0.01	47	0.021	0.000
L51	2.75 - 2.25	0.01	47	0.019	0.000
L52	2.25 - 2	0.00	47	0.016	0.000
L53	2 - 0	0.00	47	0.014	0.000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
165.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	47	31.45	2.076	0.007	29676
156.00	(2) 7770.00 w/ Mount Pipe	47	27.56	2.035	0.007	6942
148.00	ETCR-654L12H6 w/ Mount Pipe	47	24.23	1.939	0.006	3720
138.00	APXV18-206517-A	47	20.36	1.746	0.006	3095
128.00	VHLP800-11	47	16.88	1.563	0.006	2532
124.00	LLPX310R w/ Mount Pipe	47	15.61	1.466	0.005	2386
118.00	CXL 900-3LW	47	13.86	1.319	0.004	2285
111.00	(2) HBXX-6517DS-A2M w/ Mount Pipe	47	12.05	1.141	0.003	2815

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	169 - 164	160.57	20	10.060	0.036
L2	164 - 159	150.09	20	10.053	0.036
L3	159 - 154	139.66	20	9.965	0.035
L4	154 - 149	129.37	20	9.784	0.034
L5	149 - 144	119.32	20	9.482	0.033
L6	144 - 139	109.64	20	9.079	0.032
L7	139 - 133.33	100.42	20	8.586	0.031
L8	136.66 - 131.66	96.29	20	8.331	0.030
L9	131.66 - 126.66	87.76	20	7.977	0.029
L10	126.66 - 121.66	79.72	20	7.429	0.027
L11	121.66 - 116.66	72.26	18	6.849	0.023
L12	116.66 - 111.66	65.43	18	6.244	0.019
L13	111.66 - 111	59.24	18	5.622	0.016

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L14	111 - 110.75	58.47	18	5.539	0.016
L15	110.75 - 105.75	58.18	18	5.522	0.016
L16	105.75 - 101.5	52.60	18	5.154	0.015
L17	101.5 - 101.25	48.17	18	4.826	0.013
L18	101.25 - 101	47.92	18	4.814	0.013
L19	101 - 100.75	47.67	18	4.803	0.013
L20	100.75 - 95.75	47.41	18	4.788	0.013
L21	95.75 - 87.83	42.57	18	4.478	0.012
L22	92.16 - 86.83	39.30	18	4.250	0.012
L23	86.83 - 81.83	34.65	18	4.073	0.011
L24	81.83 - 81.5	30.52	18	3.809	0.010
L25	81.5 - 81.25	30.26	18	3.792	0.010
L26	81.25 - 76.25	30.06	18	3.779	0.010
L27	76.25 - 71.25	26.25	18	3.516	0.009
L28	71.25 - 66.25	22.71	18	3.248	0.009
L29	66.25 - 61.25	19.46	18	2.975	0.008
L30	61.25 - 56.25	16.48	18	2.702	0.007
L31	56.25 - 51.25	13.80	18	2.429	0.006
L32	51.25 - 43.33	11.40	18	2.152	0.006
L33	48.66 - 42.33	10.27	18	2.010	0.005
L34	42.33 - 37.4	7.72	18	1.830	0.005
L35	37.4 - 37.15	5.95	18	1.603	0.004
L36	37.15 - 32.15	5.86	18	1.591	0.004
L37	32.15 - 27.15	4.32	18	1.360	0.003
L38	27.15 - 22.15	3.02	18	1.127	0.003
L39	22.15 - 19.5	1.96	18	0.896	0.002
L40	19.5 - 19.25	1.49	18	0.774	0.002
L41	19.25 - 14.25	1.45	18	0.763	0.002
L42	14.25 - 9.25	0.77	18	0.547	0.001
L43	9.25 - 9	0.31	18	0.334	0.001
L44	9 - 8.75	0.29	18	0.324	0.001
L45	8.75 - 7	0.27	18	0.314	0.001
L46	7 - 6.75	0.17	18	0.243	0.001
L47	6.75 - 5	0.16	18	0.232	0.001
L48	5 - 4.75	0.09	18	0.159	0.000
L49	4.75 - 3	0.08	18	0.152	0.000
L50	3 - 2.75	0.03	18	0.100	0.000
L51	2.75 - 2.25	0.03	18	0.093	0.000
L52	2.25 - 2	0.02	18	0.079	0.000
L53	2 - 0	0.01	18	0.070	0.000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
165.00	ERICSSON AIR 21 B2A B4P w/ Mount Pipe	20	152.19	10.060	0.036	7114
156.00	(2) 7770.00 w/ Mount Pipe	20	133.46	9.869	0.034	1544
148.00	ETCR-654L12H6 w/ Mount Pipe	20	117.35	9.409	0.033	811
138.00	APXV18-206517-A	20	98.65	8.472	0.031	666
128.00	VHLP800-11	20	81.82	7.590	0.028	540
124.00	LLPX310R w/ Mount Pipe	20	75.67	7.120	0.025	507
118.00	CXL 900-3LW	18	67.20	6.405	0.020	483
111.00	(2) HBXX-6517DS-A2M w/ Mount Pipe	18	58.47	5.539	0.016	591

Compression Checks

Pole Design Data

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u
	ft		ft	ft		in^2	K
L1	169 - 164 (1)	TP16.4546x15.5x0.25	5.00	0.00	0.0	12.8583	-2.34
L2	164 - 159 (2)	TP17.4092x16.4546x0.25	5.00	0.00	0.0	13.6158	-2.61
L3	159 - 154 (3)	TP18.3638x17.4092x0.25	5.00	0.00	0.0	14.3733	-5.23
L4	154 - 149 (4)	TP19.3183x18.3638x0.25	5.00	0.00	0.0	15.1307	-5.67
L5	149 - 144 (5)	TP20.2729x19.3183x0.25	5.00	0.00	0.0	15.8882	-7.32
L6	144 - 139 (6)	TP21.2275x20.2729x0.25	5.00	0.00	0.0	16.6456	-7.90
L7	139 - 133.33 (7)	TP22.31x21.2275x0.25	5.67	0.00	0.0	17.0001	-8.42
L8	133.33 - 131.66 (8)	TP22.1148x21.1742x0.3125	5.00	0.00	0.0	21.6252	-9.31
L9	131.66 - 126.66 (9)	TP23.0554x22.1148x0.3125	5.00	0.00	0.0	22.5581	-10.03
L10	126.66 - 121.66 (10)	TP23.996x23.0554x0.3125	5.00	0.00	0.0	23.4911	-11.30
L11	121.66 - 116.66 (11)	TP24.9366x23.996x0.3125	5.00	0.00	0.0	24.4240	-12.19
L12	116.66 - 111.66 (12)	TP25.8772x24.9366x0.3125	5.00	0.00	0.0	25.3570	-13.10
L13	111.66 - 111 (13)	TP26.0013x25.8772x0.3125	0.66	0.00	0.0	25.4801	-13.23
L14	111 - 110.75 (14)	TP26.0484x26.0013x0.575	0.25	0.00	0.0	46.4902	-15.53
L15	110.75 - 105.75 (15)	TP26.9889x26.0484x0.5625	5.00	0.00	0.0	47.1811	-16.84
L16	105.75 - 101.5 (16)	TP27.7884x26.9889x0.55	4.25	0.00	0.0	47.5501	-17.99
L17	101.5 - 101.25 (17)	TP27.8355x27.7884x0.9875	0.25	0.00	0.0	84.1503	-18.10
L18	101.25 - 101 (18)	TP27.8825x27.8355x0.9875	0.25	0.00	0.0	84.2977	-18.19
L19	101 - 100.75 (19)	TP27.9295x27.8825x0.725	0.25	0.00	0.0	62.6017	-18.27
L20	100.75 - 95.75 (20)	TP28.8701x27.9295x0.7125	5.00	0.00	0.0	63.6777	-19.84
L21	95.75 - 87.83 (21)	TP30.36x28.8701x0.7	7.92	0.00	0.0	64.0888	-21.00
L22	87.83 - 86.83 (22)	TP29.9235x28.9205x0.9375	5.33	0.00	0.0	86.2516	-24.11
L23	86.83 - 81.83 (23)	TP30.8645x29.9235x0.925	5.00	0.00	0.0	87.9009	-26.12
L24	81.83 - 81.5 (24)	TP30.9266x30.8645x0.925	0.33	0.00	0.0	88.0832	-26.27
L25	81.5 - 81.25 (25)	TP30.9737x30.9266x0.95	0.25	0.00	0.0	90.5303	-26.37
L26	81.25 - 76.25 (26)	TP31.9146x30.9737x0.925	5.00	0.00	0.0	90.9840	-28.44
L27	76.25 - 71.25 (27)	TP32.8556x31.9146x0.9	5.00	0.00	0.0	91.2844	-30.54
L28	71.25 - 66.25 (28)	TP33.7966x32.8556x0.875	5.00	0.00	0.0	91.4314	-32.69
L29	66.25 - 61.25 (29)	TP34.7376x33.7966x0.8625	5.00	0.00	0.0	92.7355	-34.86
L30	61.25 - 56.25 (30)	TP35.6785x34.7376x0.85	5.00	0.00	0.0	93.9639	-37.06
L31	56.25 - 51.25 (31)	TP36.6195x35.6785x0.825	5.00	0.00	0.0	93.7297	-39.30

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K
L32	51.25 - 43.33 (32)	TP38.11x36.6195x0.825	7.92	0.00	0.0	95.0060	-40.46
L33	43.33 - 42.33 (33)	TP37.5463x36.3569x1.0375	6.33	0.00	0.0	120.2240	-45.79
L34	42.33 - 37.4 (34)	TP38.4726x37.5463x1.025	4.93	0.00	0.0	121.8300	-48.50
L35	37.4 - 37.15 (35)	TP38.5196x38.4726x1.025	0.25	0.00	0.0	121.9830	-48.66
L36	37.15 - 32.15 (36)	TP39.4591x38.5196x1	5.00	0.00	0.0	122.0690	-51.43
L37	32.15 - 27.15 (37)	TP40.3986x39.4591x0.975	5.00	0.00	0.0	122.0020	-54.24
L38	27.15 - 22.15 (38)	TP41.3381x40.3986x0.9625	5.00	0.00	0.0	123.3460	-57.08
L39	22.15 - 19.5 (39)	TP41.836x41.3381x0.95	2.65	0.00	0.0	123.2840	-58.60
L40	19.5 - 19.25 (40)	TP41.883x41.836x1.025	0.25	0.00	0.0	132.9250	-58.77
L41	19.25 - 14.25 (41)	TP42.8225x41.883x1	5.00	0.00	0.0	132.7450	-61.80
L42	14.25 - 9.25 (42)	TP43.762x42.8225x1	5.00	0.00	0.0	135.7260	-64.87
L43	9.25 - 9 (43)	TP43.8089x43.762x1	0.25	0.00	0.0	135.8760	-65.04
L44	9 - 8.75 (44)	TP43.8559x43.8089x1.025	0.25	0.00	0.0	139.3440	-65.20
L45	8.75 - 7 (45)	TP44.1847x43.8559x1.025	1.75	0.00	0.0	140.4140	-66.30
L46	7 - 6.75 (46)	TP44.2317x44.1847x0.975	0.25	0.00	0.0	133.8640	-66.48
L47	6.75 - 5 (47)	TP44.5605x44.2317x0.975	1.75	0.00	0.0	134.8820	-67.54
L48	5 - 4.75 (48)	TP44.6075x44.5605x1.45	0.25	0.00	0.0	198.6240	-67.76
L49	4.75 - 3 (49)	TP44.9363x44.6075x1.425	1.75	0.00	0.0	196.7990	-69.11
L50	3 - 2.75 (50)	TP44.9833x44.9363x1.45	0.25	0.00	0.0	200.3530	-69.32
L51	2.75 - 2.25 (51)	TP45.0772x44.9833x1.45	0.50	0.00	0.0	200.7860	-69.72
L52	2.25 - 2 (52)	TP45.1242x45.0772x1.2	0.25	0.00	0.0	167.2990	-69.89
L53	2 - 0 (53)	TP45.5x45.1242x1.175	2.00	0.00	0.0	165.3080	-71.23

Pole Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
L1	169 - 164 (1)	TP16.4546x15.5x0.25	12.51	0.00
L2	164 - 159 (2)	TP17.4092x16.4546x0.25	46.96	0.00
L3	159 - 154 (3)	TP18.3638x17.4092x0.25	102.85	0.00
L4	154 - 149 (4)	TP19.3183x18.3638x0.25	172.37	0.00
L5	149 - 144 (5)	TP20.2729x19.3183x0.25	256.01	0.00
L6	144 - 139 (6)	TP21.2275x20.2729x0.25	344.83	0.00
L7	139 - 133.33 (7)	TP22.31x21.2275x0.25	388.29	0.00
L8	133.33 - 131.66 (8)	TP22.1148x21.1742x0.3125	484.90	0.00
L9	131.66 - 126.66 (9)	TP23.0554x22.1148x0.3125	585.21	0.00
L10	126.66 - 121.66 (10)	TP23.996x23.0554x0.3125	695.54	0.00
L11	121.66 -	TP24.9366x23.996x0.312	808.88	0.00

Section No.	Elevation ft	Size	M_{ux} kip-ft	M_{uy} kip-ft
	116.66 (11)	5		
L12	116.66 - 111.66 (12)	TP25.8772x24.9366x0.3125	924.99	0.00
L13	111.66 - 111 (13)	TP26.0013x25.8772x0.3125	940.51	0.00
L14	111 - 110.75 (14)	TP26.0484x26.0013x0.575	947.57	0.00
L15	110.75 - 105.75 (15)	TP26.9889x26.0484x0.5625	1094.06	0.00
L16	105.75 - 101.5 (16)	TP27.7884x26.9889x0.55	1221.28	0.00
L17	101.5 - 101.25 (17)	TP27.8355x27.7884x0.9875	1228.85	0.00
L18	101.25 - 101 (18)	TP27.8825x27.8355x0.9875	1236.43	0.00
L19	101 - 100.75 (19)	TP27.9295x27.8825x0.725	1244.02	0.00
L20	100.75 - 95.75 (20)	TP28.8701x27.9295x0.7125	1397.78	0.00
L21	95.75 - 87.83 (21)	TP30.36x28.8701x0.7	1510.52	0.00
L22	87.83 - 86.83 (22)	TP29.9235x28.9205x0.9375	1681.91	0.00
L23	86.83 - 81.83 (23)	TP30.8645x29.9235x0.925	1846.91	0.00
L24	81.83 - 81.5 (24)	TP30.9266x30.8645x0.925	1857.93	0.00
L25	81.5 - 81.25 (25)	TP30.9737x30.9266x0.95	1866.29	0.00
L26	81.25 - 76.25 (26)	TP31.9146x30.9737x0.925	2035.49	0.00
L27	76.25 - 71.25 (27)	TP32.8556x31.9146x0.9	2208.39	0.00
L28	71.25 - 66.25 (28)	TP33.7966x32.8556x0.875	2384.91	0.00
L29	66.25 - 61.25 (29)	TP34.7376x33.7966x0.8625	2564.95	0.00
L30	61.25 - 56.25 (30)	TP35.6785x34.7376x0.85	2748.43	0.00
L31	56.25 - 51.25 (31)	TP36.6195x35.6785x0.825	2935.23	0.00
L32	51.25 - 43.33 (32)	TP38.11x36.6195x0.825	3033.27	0.00
L33	43.33 - 42.33 (33)	TP37.5463x36.3569x1.0375	3277.13	0.00
L34	42.33 - 37.4 (34)	TP38.4726x37.5463x1.025	3470.94	0.00
L35	37.4 - 37.15 (35)	TP38.5196x38.4726x1.025	3480.85	0.00
L36	37.15 - 32.15 (36)	TP39.4591x38.5196x1	3680.57	0.00
L37	32.15 - 27.15 (37)	TP40.3986x39.4591x0.975	3883.16	0.00
L38	27.15 - 22.15 (38)	TP41.3381x40.3986x0.9625	4088.43	0.00
L39	22.15 - 19.5 (39)	TP41.836x41.3381x0.95	4198.25	0.00
L40	19.5 - 19.25 (40)	TP41.883x41.836x1.025	4208.65	0.00
L41	19.25 - 14.25 (41)	TP42.8225x41.883x1	4417.78	0.00
L42	14.25 - 9.25 (42)	TP43.762x42.8225x1	4629.18	0.00
L43	9.25 - 9 (43)	TP43.8089x43.762x1	4639.81	0.00
L44	9 - 8.75 (44)	TP43.8559x43.8089x1.025	4650.44	0.00
L45	8.75 - 7 (45)	TP44.1847x43.8559x1.025	4725.03	0.00
L46	7 - 6.75 (46)	TP44.2317x44.1847x0.975	4735.71	0.00

Section No.	Elevation	Size	M_{ux}	M_{uy}
	ft		kip-ft	kip-ft
		5		
L47	6.75 - 5 (47)	TP44.5605x44.2317x0.975	4810.61	0.00
L48	5 - 4.75 (48)	TP44.6075x44.5605x1.45	4821.32	0.00
L49	4.75 - 3 (49)	TP44.9363x44.6075x1.425	4896.55	0.00
L50	3 - 2.75 (50)	TP44.9833x44.9363x1.45	4907.32	0.00
L51	2.75 - 2.25 (51)	TP45.0772x44.9833x1.45	4928.88	0.00
L52	2.25 - 2 (52)	TP45.1242x45.0772x1.2	4939.67	0.00
L53	2 - 0 (53)	TP45.5x45.1242x1.175	5026.19	0.00

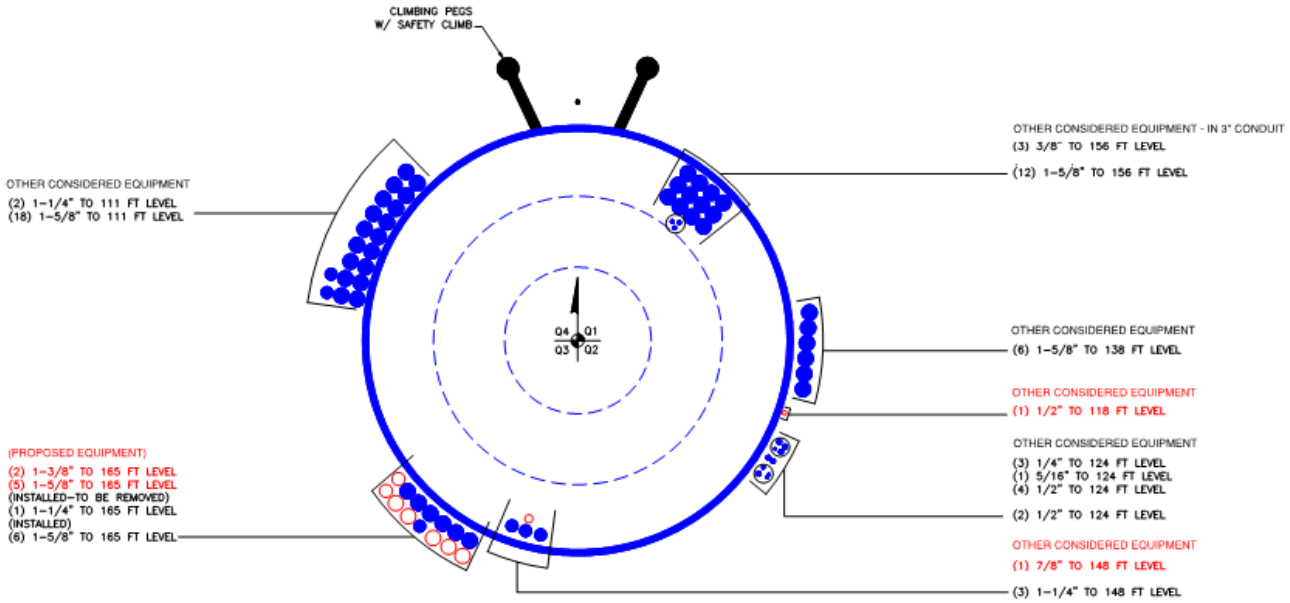
Pole Shear Design Data

Section No.	Elevation	Size	Actual V_u	Actual T_u
	ft		K	kip-ft
L1	169 - 164 (1)	TP16.4546x15.5x0.25	6.66	0.00
L2	164 - 159 (2)	TP17.4092x16.4546x0.25	7.11	0.23
L3	159 - 154 (3)	TP18.3638x17.4092x0.25	13.67	0.06
L4	154 - 149 (4)	TP19.3183x18.3638x0.25	14.14	0.07
L5	149 - 144 (5)	TP20.2729x19.3183x0.25	17.54	0.11
L6	144 - 139 (6)	TP21.2275x20.2729x0.25	17.99	0.15
L7	139 - 133.33 (7)	TP22.31x21.2275x0.25	19.02	0.18
L8	133.33 - 131.66 (8)	TP22.1148x21.1742x0.3125	19.59	0.24
L9	131.66 - 126.66 (9)	TP23.0554x22.1148x0.3125	20.83	0.72
L10	126.66 - 121.66 (10)	TP23.996x23.0554x0.3125	22.39	1.78
L11	121.66 - 116.66 (11)	TP24.9366x23.996x0.3125	22.96	1.69
L12	116.66 - 111.66 (12)	TP25.8772x24.9366x0.3125	23.47	1.69
L13	111.66 - 111 (13)	TP26.0013x25.8772x0.3125	23.53	1.69
L14	111 - 110.75 (14)	TP26.0484x26.0013x0.575	28.94	1.69
L15	110.75 - 105.75 (15)	TP26.9889x26.0484x0.5625	29.60	0.87
L16	105.75 - 101.5 (16)	TP27.7884x26.9889x0.55	30.21	0.87
L17	101.5 - 101.25 (17)	TP27.8355x27.7884x0.9875	30.26	0.87
L18	101.25 - 101 (18)	TP27.8825x27.8355x0.9875	30.31	0.87
L19	101 - 100.75 (19)	TP27.9295x27.8825x0.725	30.34	0.87
L20	100.75 - 95.75 (20)	TP28.8701x27.9295x0.7125	31.10	0.87
L21	95.75 - 87.83 (21)	TP30.36x28.8701x0.7	31.63	0.87
L22	87.83 - 86.83 (22)	TP29.9235x28.9205x0.9375	32.58	0.87
L23	86.83 - 81.83 (23)	TP30.8645x29.9235x0.925	33.34	0.87
L24	81.83 - 81.5 (24)	TP30.9266x30.8645x0.925	33.39	0.87
L25	81.5 - 81.25 (25)	TP30.9737x30.9266x0.95	33.43	0.87
L26	81.25 - 76.25 (26)	TP31.9146x30.9737x0.925	34.17	0.87
L27	76.25 - 71.25 (27)	TP32.8556x31.9146x0.9	34.90	0.87
L28	71.25 - 66.25	TP33.7966x32.8556x0.87	35.62	0.87

Section No.	Elevation ft	Size	Actual V_u K	Actual T_u kip-ft
	(28)	5		
L29	66.25 - 61.25	TP34.7376x33.7966x0.86	36.31	0.87
	(29)	25		
L30	61.25 - 56.25	TP35.6785x34.7376x0.85	36.99	0.87
	(30)			
L31	56.25 - 51.25	TP36.6195x35.6785x0.82	37.64	0.87
	(31)	5		
L32	51.25 - 43.33	TP38.11x36.6195x0.825	37.97	0.87
	(32)			
L33	43.33 - 42.33	TP37.5463x36.3569x1.03	38.96	0.87
	(33)	75		
L34	42.33 - 37.4	TP38.4726x37.5463x1.02	39.57	0.86
	(34)	5		
L35	37.4 - 37.15	TP38.5196x38.4726x1.02	39.59	0.86
	(35)	5		
L36	37.15 - 32.15	TP39.4591x38.5196x1	40.19	0.86
	(36)			
L37	32.15 - 27.15	TP40.3986x39.4591x0.97	40.74	0.86
	(37)	5		
L38	27.15 - 22.15	TP41.3381x40.3986x0.96	41.26	0.86
	(38)	25		
L39	22.15 - 19.5	TP41.836x41.3381x0.95	41.53	0.86
	(39)			
L40	19.5 - 19.25	TP41.883x41.836x1.025	41.53	0.86
	(40)			
L41	19.25 - 14.25	TP42.8225x41.883x1	42.01	0.86
	(41)			
L42	14.25 - 9.25	TP43.762x42.8225x1	42.45	0.86
	(42)			
L43	9.25 - 9 (43)	TP43.8089x43.762x1	42.45	0.86
L44	9 - 8.75 (44)	TP43.8559x43.8089x1.02	42.47	0.86
		5		
L45	8.75 - 7 (45)	TP44.1847x43.8559x1.02	42.66	0.86
		5		
L46	7 - 6.75 (46)	TP44.2317x44.1847x0.97	42.65	0.86
		5		
L47	6.75 - 5 (47)	TP44.5605x44.2317x0.97	42.83	0.86
		5		
L48	5 - 4.75 (48)	TP44.6075x44.5605x1.45	42.82	0.86
L49	4.75 - 3 (49)	TP44.9363x44.6075x1.42	43.02	0.86
		5		
L50	3 - 2.75 (50)	TP44.9833x44.9363x1.45	43.02	0.86
L51	2.75 - 2.25	TP45.0772x44.9833x1.45	43.07	0.86
	(51)			
L52	2.25 - 2 (52)	TP45.1242x45.0772x1.2	43.09	0.86
L53	2 - 0 (53)	TP45.5x45.1242x1.175	43.29	0.86

APPENDIX B

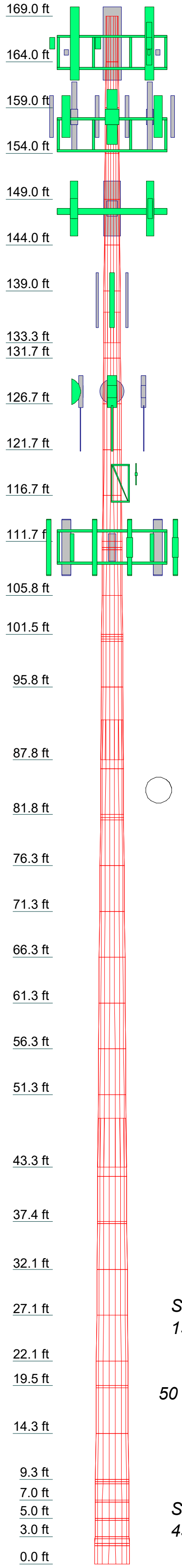
BASE LEVEL DRAWING



APPENDIX C

ADDITIONAL CALCULATIONS

Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	5.00	18	0.2500		15.5000	16.4546		0.2
2	5.00	18	0.2500		16.4546	17.4092		0.2
3	5.00	18	0.2500		17.4092	18.3638		0.2
4	5.00	18	0.2500		18.3638	19.3183		0.3
5	5.00	18	0.2500		19.3183	20.2729		0.3
6	5.00	18	0.2500		20.2729	21.2275		0.3
7	[illegible]	18	[illegible]	3.33	[illegible]	[illegible]		0.3
8	[illegible]	18	[illegible]		[illegible]	[illegible]		0.4
9	5.00	18	[illegible]		[illegible]	[illegible]		0.4
10	5.00	18	0.3125		23.0554	23.9960		0.4
11	5.00	18	0.3125		23.9960	24.9366		0.4
12	[illegible]	18	[illegible]		[illegible]	[illegible]		0.4
13–14	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
15	[illegible]	18	[illegible]		[illegible]	[illegible]		0.7
16	[illegible]	18	[illegible]		[illegible]	[illegible]		0.6
17–19	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
20	[illegible]	18	[illegible]		[illegible]	[illegible]		1.0
21	[illegible]	18	[illegible]	4.33	28.8701	30.3600		1.6
22	[illegible]	18	[illegible]		[illegible]	[illegible]		1.4
23	[illegible]	18	[illegible]		[illegible]	[illegible]		1.3
24–25	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
26	[illegible]	18	[illegible]		[illegible]	[illegible]		1.4
27	5.00	18	0.9000		31.9146	32.8556	A572-65	1.4
28	5.00	18	0.8750		32.8556	33.7966		1.4
29	5.00	18	0.8625		33.7966	34.7376		1.4
30	5.00	18	0.8500		34.7376	35.6785		1.5
31	5.00	18	0.8250		35.6785	36.6195		1.5
32	[illegible]	18	[illegible]	5.33	36.6195	38.1100		2.4
33	[illegible]	18	[illegible]		[illegible]	[illegible]		2.4
34	[illegible]	18	[illegible]		[illegible]	[illegible]		1.9
35	[illegible]	18	[illegible]		[illegible]	[illegible]		0.1
36	[illegible]	18	[illegible]		[illegible]	[illegible]		1.9
37	5.00	18	0.9750		39.4591	40.3986		2.0
38	5.00	18	0.9625		40.3986	41.3381		2.0
39–40	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
41	[illegible]	18	[illegible]		[illegible]	[illegible]		2.2
42	[illegible]	18	[illegible]		[illegible]	[illegible]		2.2
43–53	[illegible]	[illegible]	[illegible]		[illegible]	[illegible]		[illegible]
								42.31



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	800MHZ RRH	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	800MHZ RRH	148
ERICSSON AIR 21 B2A B4P w/ Mount Pipe	165	PCS 1900MHZ 4X45W-65MHZ	148
AIR 32 B2A/B66AA w/ Mount Pipe	165	PCS 1900MHZ 4X45W-65MHZ	148
AIR 32 B2A/B66AA w/ Mount Pipe	165	PCS 1900MHZ 4X45W-65MHZ	148
AIR 32 B2A/B66AA w/ Mount Pipe	165	RRH2X50-800	148
APXVAARR24_43-U-NA20 w/ Mount Pipe	165	RRH2X50-800	148
APXVAARR24_43-U-NA20 w/ Mount Pipe	165	RRH2X50-800	148
APXVAARR24_43-U-NA20 w/ Mount Pipe	165	TD-RRH8X20-25	148
(2) KRY 112 144/1	165	TD-RRH8X20-25	148
KRY 112 144/1	165	TD-RRH8X20-25	148
RADIO 4449 B12/B71	165	T-Arm Mount [TA 702-3]	148
(2) RADIO 4449 B12/B71	165	APXV18-206517-A	138
8-ft Ladder	165	APXV18-206517-A	138
Platform Mount [LP 601-1]	165	APXV18-206517-A	138
(2) 7770.00 w/ Mount Pipe	156	Pipe Mount [PM 601-3]	138
(2) 7770.00 w/ Mount Pipe	156	LLPX310R w/ Mount Pipe	124
(2) 7770.00 w/ Mount Pipe	156	LLPX310R w/ Mount Pipe	124
HPA-65R-BUU-H8 w/ Mount Pipe	156	LLPX310R w/ Mount Pipe	124
HPA-65R-BUU-H8 w/ Mount Pipe	156	HORIZON DUO	124
HPA-65R-BUU-H6 w/ Mount Pipe	156	HORIZON DUO	124
DTMABP7819VG12A	156	WIMAX DAP HEAD	124
DTMABP7819VG12A	156	WIMAX DAP HEAD	124
DTMABP7819VG12A	156	WIMAX DAP HEAD	124
RRUS 11	156	2.375" OD x 5' Mount Pipe	124
RRUS 11	156	2.375" OD x 5' Mount Pipe	124
RRUS 11	156	2.375" OD x 5' Mount Pipe	124
DC6-48-60-18-8F	156	Side Arm Mount [SO 701-3]	124
DTMABP7819VG12A	156	VHLP800-11	124
DTMABP7819VG12A	156	VHLP800-11	124
DTMABP7819VG12A	156	CAVITY FILTER	118
RRUS12/RRUS A2	156	Side Arm Mount [SO 304-1]	118
RRUS12/RRUS A2	156	CXL 900-3LW	118
RRUS12/RRUS A2	156	LNA	118
Platform Mount [LP 714-1]	156	(2) HBXX-6517DS-A2M w/ Mount Pipe	111
ETCR-654L12H6 w/ Mount Pipe	148	(2) LNX-6514DS-A1M w/ Mount Pipe	111
ETCR-654L12H6 w/ Mount Pipe	148	(2) LNX-6514DS-A1M w/ Mount Pipe	111
ETCR-654L12H6 w/ Mount Pipe	148	(2) LNX-6514DS-A1M w/ Mount Pipe	111
800MHZ RRH	148	B4 RRH2X60-4R	111
		B4 RRH2X60-4R	111
		B4 RRH2X60-4R	111
		(2) RRFDC-3315-PF-48	111
		Platform Mount [LP 303-1]	111
		(2) HBXX-6517DS-A2M w/ Mount Pipe	111
		(2) HBXX-6517DS-A2M w/ Mount Pipe	111

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure C to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.70 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TIA-222-H Annex S

ALL REACTIONS ARE FACTORED

AXIAL 151 K
SHEAR 13 K
MOMENT 1606 kip-ft
TORQUE 4 kip-ft
50 mph WIND - 1.7000 in ICE

AXIAL 71 K
SHEAR 43 K
MOMENT 5026 kip-ft
TORQUE 10 kip-ft
REACTIONS - 125 mph WIND

Paul J. Ford and Company
250 East Broad st., Suite 600
Columbus, OH 43215
Phone: (614) 221-6679
FAX:

Job: **165-Ft Monopole / South Windsor/Rt 5**	
Project: **PJF# 37518-0525.003.7805 / BU# 828054**	
Client: Crown Castle	Drawn by: skadam
App'd:	
Code: TIA-222-H	Date: 10/08/18
Scale: NTS	
Path:	Dwg No. E-1

CCIpole

per TIA-222- H

Site BU: 828054

Work Order: _____

Pole Geometry

	Pole Height Above Base (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Bend Radius (in)	Pole Material
1	169	35.67	3.33	18	15.5	22.31	0.25	Auto	A572-65
2	136.66	48.83	4.33	18	21.17	30.36	0.3125	Auto	A572-65
3	92.16	48.83	5.33	18	28.92	38.11	0.375	Auto	A572-65
4	48.66	48.66	0	18	36.36	45.5	0.375	Auto	A572-65

Reinforcement Configuration

	Bottom Effective Elevation (ft)	Top Effective Elevation (ft)	Type	Model	Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1	2.25	19.5	plate	I-065125; (1) (1.1875)	4		o				o					o				o			
2	19.5	44.58	plate	I-060100; (1) (1.1875)	4		o				o					o				o			
3	3	5	plate	FP 1.25 x 8_1	4		o				o					o				o			
4	81.5	88.5	plate	I-045100; (1) (1.1875)	3			o						o						o			
5	0	3	plate	FP 1.25 x 6_1	6	o			o			o			o			o			o		
6	101	111	plate	I-060100; (1) (1.1875)	3			o						o						o			
7	0	37.4	plate	6 x 1.25; (1) (1.1875)	4	o						o			o						o		
8	0	7	plate	6 x 1.25; (1) (1.1875)	2				o									o					
9	9	37.4	plate	6 x 1.25; (1) (1.1875)	2				o									o					
10	7	9	plate	FP 4 x 1.25_1	4			o		o							o		o				
11	37.4	81.5	plate	6 x 1.25; (1) (1.1875)	6	o			o			o			o			o			o		
12	81.5	101.5	plate	4 x 1.25; (1) (1.1875)	6	o			o			o			o			o			o		
13																							

Reinforcement Details

	B (in)	H (in)	Gross Area (in^2)	Pole Face to Centroid (in)	Bottom Termination Length (in)	Top Termination Length (in)	L_u (in)	Net Area (in^2)	Bolt Hole Size (in)	Reinforcement Material
1	6.5	1.25	8.125	0.625	n/a	33.000	19.000	6.563	1.1875	A572-65
2	6	1	6	0.5	33.000	33.000	16.000	4.750	1.1875	A572-65
3	1.25	8	10	4	n/a	n/a	0.000	10.000	0.0000	A572-65
4	4.5	1	4.5	0.5	18.000	18.000	20.000	3.250	1.1875	A572-65
5	1.25	6	7.5	3	n/a	n/a	0.000	7.500	0.0000	A572-65
6	6	1	6	0.5	33.000	33.000	16.000	4.750	1.1875	A572-65
7	6	1.25	7.5	0.625	36.000	36.000	12.000	5.938	1.1875	A572-65
8	6	1.25	7.5	0.625	36.000	36.000	12.000	5.938	1.1875	A572-65
9	6	1.25	7.5	0.625	36.000	36.000	12.000	5.938	1.1875	A572-65
10	4	1.25	5	0.625	n/a	n/a	12.000	5.000	0.0000	A572-65
11	6	1.25	7.5	0.625	36.000	36.000	12.000	5.938	1.1875	A572-65
12	4	1.25	5	0.625	30.000	30.000	18.000	3.438	1.1875	A572-65

TNX Geometry Input

Increment (ft): 5

	Section Height (ft)	Section Length (ft)	Lap Splice Length (ft)	Number of Sides	Top Diameter (in)	Bottom Diameter (in)	Wall Thickness (in)	Tapered Pole Grade	Weight Multiplier
1	169 - 164	5		18	15.500	16.455	0.25	A572-65	1.000
2	164 - 159	5		18	16.455	17.409	0.25	A572-65	1.000
3	159 - 154	5		18	17.409	18.364	0.25	A572-65	1.000
4	154 - 149	5		18	18.364	19.318	0.25	A572-65	1.000
5	149 - 144	5		18	19.318	20.273	0.25	A572-65	1.000
6	144 - 139	5		18	20.273	21.228	0.25	A572-65	1.000
7	139 - 136.66	5.67	3.33	18	21.228	22.310	0.25	A572-65	1.000
8	136.66 - 131.66	5		18	21.174	22.115	0.3125	A572-65	1.000
9	131.66 - 126.66	5		18	22.115	23.055	0.3125	A572-65	1.000
10	126.66 - 121.66	5		18	23.055	23.996	0.3125	A572-65	1.000
11	121.66 - 116.66	5		18	23.996	24.937	0.3125	A572-65	1.000
12	116.66 - 111.66	5		18	24.937	25.877	0.3125	A572-65	1.000
13	111.66 - 111	0.66		18	25.877	26.001	0.3125	A572-65	1.000
14	111 - 110.75	0.25		18	26.001	26.048	0.575	A572-65	0.936
15	110.75 - 105.75	5		18	26.048	26.989	0.5625	A572-65	0.942
16	105.75 - 101.5	4.25		18	26.989	27.788	0.55	A572-65	0.952
17	101.5 - 101.25	0.25		18	27.788	27.835	0.9875	A572-65	0.895
18	101.25 - 101	0.25		18	27.835	27.882	0.9875	A572-65	0.894
19	101 - 100.75	0.25		18	27.882	27.930	0.725	A572-65	0.917
20	100.75 - 95.75	5		18	27.930	28.870	0.7125	A572-65	0.916
21	95.75 - 92.16	7.92	4.33	18	28.870	30.360	0.7	A572-65	0.921
22	92.16 - 86.83	5.33		18	28.920	29.924	0.9375	A572-65	0.912
23	86.83 - 81.83	5		18	29.924	30.865	0.925	A572-65	0.908
24	81.83 - 81.5	0.33		18	30.865	30.927	0.925	A572-65	0.907
25	81.5 - 81.25	0.25		18	30.927	30.974	0.95	A572-65	0.899
26	81.25 - 76.25	5		18	30.974	31.915	0.925	A572-65	0.907
27	76.25 - 71.25	5		18	31.915	32.856	0.9	A572-65	0.916
28	71.25 - 66.25	5		18	32.856	33.797	0.875	A572-65	0.927
29	66.25 - 61.25	5		18	33.797	34.738	0.8625	A572-65	0.926
30	61.25 - 56.25	5		18	34.738	35.679	0.85	A572-65	0.926
31	56.25 - 51.25	5		18	35.679	36.619	0.825	A572-65	0.940
32	51.25 - 48.66	7.92	5.33	18	36.619	38.110	0.825	A572-65	0.934
33	48.66 - 42.33	6.33		18	36.357	37.546	1.0375	A572-65	0.942
34	42.33 - 37.4	4.93		18	37.546	38.473	1.025	A572-65	0.939
35	37.4 - 37.15	0.25		18	38.473	38.520	1.025	A572-65	0.938
36	37.15 - 32.15	5		18	38.520	39.459	1	A572-65	0.946
37	32.15 - 27.15	5		18	39.459	40.399	0.975	A572-65	0.956
38	27.15 - 22.15	5		18	40.399	41.338	0.9625	A572-65	0.955
39	22.15 - 19.5	2.65		18	41.338	41.836	0.95	A572-65	0.960
40	19.5 - 19.25	0.25		18	41.836	41.883	1.025	A572-65	0.955
41	19.25 - 14.25	5		18	41.883	42.822	1	A572-65	0.964
42	14.25 - 9.25	5		18	42.822	43.762	1	A572-65	0.952
43	9.25 - 9	0.25		18	43.762	43.809	1	A572-65	0.951
44	9 - 8.75	0.25		18	43.809	43.856	1.025	A572-65	0.963
45	8.75 - 7	1.75		18	43.856	44.185	1.025	A572-65	0.959
46	7 - 6.75	0.25		18	44.185	44.232	0.975	A572-65	0.969
47	6.75 - 5	1.75		18	44.232	44.561	0.975	A572-65	0.965
48	5 - 4.75	0.25		18	44.561	44.607	1.45	A572-65	0.857
49	4.75 - 3	1.75		18	44.607	44.936	1.425	A572-65	0.867
50	3 - 2.75	0.25		18	44.936	44.983	1.45	A572-65	0.876
51	2.75 - 2.25	0.5		18	44.983	45.077	1.45	A572-65	0.875
52	2.25 - 2	0.25		18	45.077	45.124	1.2	A572-65	0.856
53	2 - 0	2		18	45.124	45.500	1.175	A572-65	0.869

TNX Section Forces

Increment (ft):	5	TNX Output		
	Section Height (ft)	P_u (K)	M_{ux} (kip-ft)	V_u (K)
1	169 - 164	2.34	12.51	6.66
2	164 - 159	2.61	46.96	7.11
3	159 - 154	5.23	102.85	13.67
4	154 - 149	5.67	172.37	14.14
5	149 - 144	7.32	256.01	17.54
6	144 - 139	7.90	344.83	17.99
7	139 - 136.66	8.42	388.29	19.02
8	136.66 - 131.66	9.31	484.90	19.59
9	131.66 - 126.66	10.03	585.21	20.83
10	126.66 - 121.66	11.30	695.54	22.39
11	121.66 - 116.66	12.19	808.88	22.96
12	116.66 - 111.66	13.10	924.99	23.47
13	111.66 - 111	13.23	940.51	23.53
14	111 - 110.75	15.53	947.57	28.94
15	110.75 - 105.75	16.84	1094.05	29.60
16	105.75 - 101.5	17.99	1221.28	30.21
17	101.5 - 101.25	18.10	1228.85	30.26
18	101.25 - 101	18.19	1236.43	30.31
19	101 - 100.75	18.27	1244.02	30.34
20	100.75 - 95.75	19.84	1397.78	31.10
21	95.75 - 92.16	21.00	1510.51	31.63
22	92.16 - 86.83	24.11	1681.91	32.58
23	86.83 - 81.83	26.12	1846.90	33.34
24	81.83 - 81.5	26.27	1857.93	33.39
25	81.5 - 81.25	26.37	1866.29	33.43
26	81.25 - 76.25	28.44	2035.49	34.17
27	76.25 - 71.25	30.54	2208.39	34.90
28	71.25 - 66.25	32.68	2384.91	35.62
29	66.25 - 61.25	34.86	2564.95	36.31
30	61.25 - 56.25	37.06	2748.43	36.99
31	56.25 - 51.25	39.30	2935.23	37.64
32	51.25 - 48.66	40.46	3033.27	37.97
33	48.66 - 42.33	45.79	3277.14	38.96
34	42.33 - 37.4	48.50	3470.95	39.57
35	37.4 - 37.15	48.66	3480.85	39.59
36	37.15 - 32.15	51.43	3680.58	40.19
37	32.15 - 27.15	54.24	3883.16	40.74
38	27.15 - 22.15	57.08	4088.43	41.26
39	22.15 - 19.5	58.60	4198.25	41.53
40	19.5 - 19.25	58.77	4208.65	41.53
41	19.25 - 14.25	61.80	4417.79	42.01
42	14.25 - 9.25	64.87	4629.18	42.45
43	9.25 - 9	65.04	4639.81	42.45
44	9 - 8.75	65.20	4650.45	42.47
45	8.75 - 7	66.30	4725.03	42.66
46	7 - 6.75	66.48	4735.71	42.65
47	6.75 - 5	67.54	4810.60	42.83
48	5 - 4.75	67.76	4821.33	42.82
49	4.75 - 3	69.11	4896.55	43.02
50	3 - 2.75	69.32	4907.32	43.02
51	2.75 - 2.25	69.72	4928.88	43.07
52	2.25 - 2	69.89	4939.67	43.09
53	2 - 0	71.23	5026.19	43.29

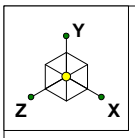
Analysis Results

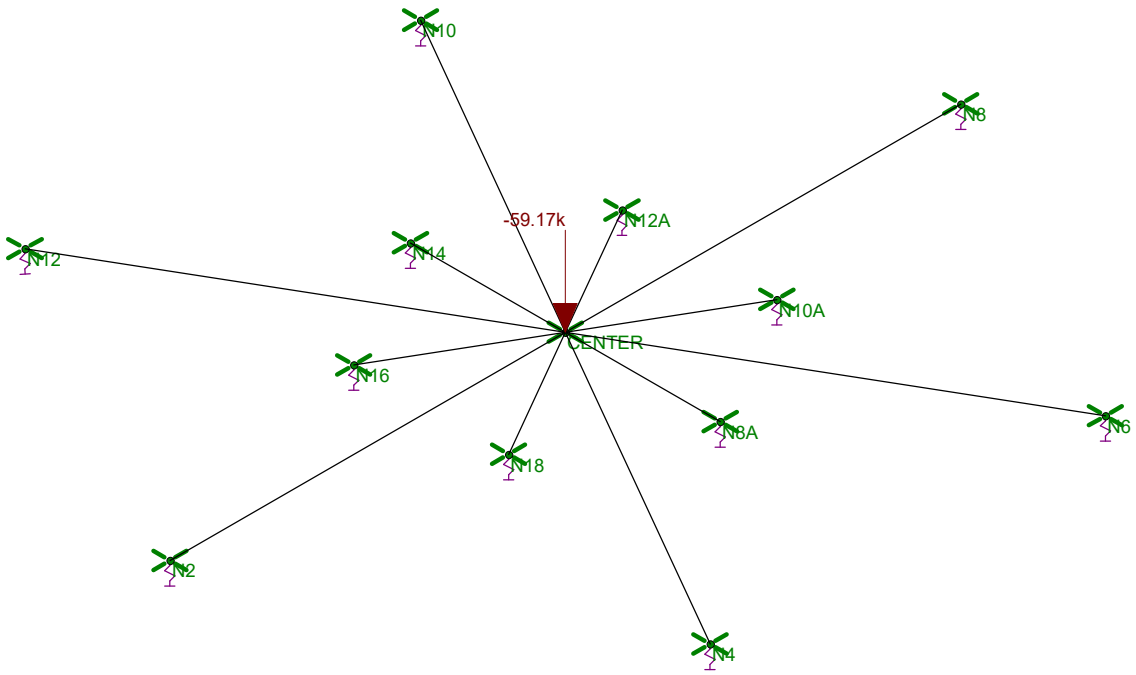
Elevation (ft)	Component Type	Size	Critical Element	% Capacity	Pass / Fail
169 - 164	Pole	TP16.455x15.5x0.25	Pole	4.0%	Pass
164 - 159	Pole	TP17.409x16.455x0.25	Pole	12.9%	Pass
159 - 154	Pole	TP18.364x17.409x0.25	Pole	25.3%	Pass
154 - 149	Pole	TP19.318x18.364x0.25	Pole	38.0%	Pass
149 - 144	Pole	TP20.273x19.318x0.25	Pole	51.0%	Pass
144 - 139	Pole	TP21.228x20.273x0.25	Pole	62.5%	Pass
139 - 136.66	Pole	TP22.31x21.228x0.25	Pole	67.4%	Pass
136.66 - 131.66	Pole	TP22.115x21.174x0.3125	Pole	65.1%	Pass
131.66 - 126.66	Pole	TP23.055x22.115x0.3125	Pole	72.1%	Pass
126.66 - 121.66	Pole	TP23.996x23.055x0.3125	Pole	79.0%	Pass
121.66 - 116.66	Pole	TP24.937x23.996x0.3125	Pole	84.9%	Pass
116.66 - 111.66	Pole	TP25.877x24.937x0.3125	Pole	90.0%	Pass
111.66 - 111	Pole	TP26.001x25.877x0.3125	Pole	90.6%	Pass
111 - 110.75	Pole + Reinf.	TP26.048x26.001x0.575	Reinf. 6 Tension Rupture	81.5%	Pass
110.75 - 105.75	Pole + Reinf.	TP26.989x26.048x0.5625	Reinf. 6 Tension Rupture	89.0%	Pass
105.75 - 101.5	Pole + Reinf.	TP27.788x26.989x0.55	Reinf. 6 Tension Rupture	94.8%	Pass
101.5 - 101.25	Pole + Reinf.	TP27.835x27.788x0.9875	Reinf. 12 Tension Rupture	64.7%	Pass
101.25 - 101	Pole + Reinf.	TP27.882x27.835x0.9875	Reinf. 12 Tension Rupture	64.9%	Pass
101 - 100.75	Pole + Reinf.	TP27.93x27.882x0.725	Reinf. 12 Tension Rupture	86.4%	Pass
100.75 - 95.75	Pole + Reinf.	TP28.87x27.93x0.7125	Reinf. 12 Tension Rupture	92.5%	Pass
95.75 - 92.16	Pole + Reinf.	TP30.36x28.87x0.7	Reinf. 12 Tension Rupture	96.6%	Pass
92.16 - 86.83	Pole + Reinf.	TP29.924x28.92x0.9375	Reinf. 12 Tension Rupture	79.7%	Pass
86.83 - 81.83	Pole + Reinf.	TP30.865x29.924x0.925	Reinf. 12 Tension Rupture	83.7%	Pass
81.83 - 81.5	Pole + Reinf.	TP30.927x30.865x0.925	Reinf. 12 Tension Rupture	84.0%	Pass
81.5 - 81.25	Pole + Reinf.	TP30.974x30.927x0.95	Reinf. 11 Tension Rupture	71.3%	Pass
81.25 - 76.25	Pole + Reinf.	TP31.915x30.974x0.925	Reinf. 11 Tension Rupture	74.5%	Pass
76.25 - 71.25	Pole + Reinf.	TP32.856x31.915x0.9	Reinf. 11 Tension Rupture	77.6%	Pass
71.25 - 66.25	Pole + Reinf.	TP33.797x32.856x0.875	Reinf. 11 Tension Rupture	80.4%	Pass
66.25 - 61.25	Pole + Reinf.	TP34.738x33.797x0.8625	Reinf. 11 Tension Rupture	83.2%	Pass
61.25 - 56.25	Pole + Reinf.	TP35.679x34.738x0.85	Reinf. 11 Tension Rupture	85.7%	Pass
56.25 - 51.25	Pole + Reinf.	TP36.619x35.679x0.825	Reinf. 11 Tension Rupture	88.1%	Pass
51.25 - 48.66	Pole + Reinf.	TP38.11x36.619x0.825	Reinf. 11 Tension Rupture	89.3%	Pass
48.66 - 42.33	Pole + Reinf.	TP37.546x36.357x1.0375	Reinf. 11 Tension Rupture	75.9%	Pass
42.33 - 37.4	Pole + Reinf.	TP38.473x37.546x1.025	Reinf. 11 Tension Rupture	77.7%	Pass
37.4 - 37.15	Pole + Reinf.	TP38.52x38.473x1.025	Reinf. 7 Tension Rupture	77.8%	Pass
37.15 - 32.15	Pole + Reinf.	TP39.459x38.52x1	Reinf. 7 Tension Rupture	79.6%	Pass
32.15 - 27.15	Pole + Reinf.	TP40.399x39.459x0.975	Reinf. 7 Tension Rupture	81.3%	Pass
27.15 - 22.15	Pole + Reinf.	TP41.338x40.399x0.9625	Reinf. 7 Tension Rupture	82.9%	Pass
22.15 - 19.5	Pole + Reinf.	TP41.836x41.338x0.95	Reinf. 7 Tension Rupture	83.7%	Pass
19.5 - 19.25	Pole + Reinf.	TP41.883x41.836x1.025	Reinf. 7 Tension Rupture	78.3%	Pass
19.25 - 14.25	Pole + Reinf.	TP42.822x41.883x1	Reinf. 7 Tension Rupture	79.7%	Pass
14.25 - 9.25	Pole + Reinf.	TP43.762x42.822x1	Reinf. 7 Tension Rupture	81.0%	Pass
9.25 - 9	Pole + Reinf.	TP43.809x43.762x1	Reinf. 7 Tension Rupture	81.1%	Pass
9 - 8.75	Pole + Reinf.	TP43.856x43.809x1.025	Reinf. 7 Tension Rupture	78.2%	Pass
8.75 - 7	Pole + Reinf.	TP44.185x43.856x1.025	Reinf. 7 Tension Rupture	78.6%	Pass
7 - 6.75	Pole + Reinf.	TP44.232x44.185x0.975	Reinf. 7 Tension Rupture	81.7%	Pass
6.75 - 5	Pole + Reinf.	TP44.561x44.232x0.975	Reinf. 7 Tension Rupture	82.1%	Pass
5 - 4.75	Pole + Reinf.	TP44.607x44.561x1.45	Reinf. 3 Compression	64.9%	Pass
4.75 - 3	Pole + Reinf.	TP44.936x44.607x1.425	Reinf. 3 Compression	65.3%	Pass
3 - 2.75	Pole + Reinf.	TP44.983x44.936x1.45	Reinf. 7 Tension Rupture	57.6%	Pass
2.75 - 2.25	Pole + Reinf.	TP45.077x44.983x1.45	Reinf. 7 Tension Rupture	57.7%	Pass
2.25 - 2	Pole + Reinf.	TP45.124x45.077x1.2	Reinf. 8 Tension Rupture	69.3%	Pass
2 - 0	Pole + Reinf.	TP45.5x45.124x1.175	Reinf. 8 Tension Rupture	69.8%	Pass
				Summary	
			Pole	90.6%	Pass
			Reinforcement	96.6%	Pass
			Overall	96.6%	Pass

Additional Calculations

Section Elevation (ft)	Moment of Inertia (in^4)			Area (in^2)			% Capacity*											
	Pole	Reinf.	Total	Pole	Reinf.	Total	Pole	R1	R2	R3	R4	R5	R6	R7	R8	R9	R10	R11	R12
169 - 164	426	n/a	426	12.86	n/a	12.86	4.0%												
164 - 159	506	n/a	506	13.62	n/a	13.62	12.9%												
159 - 154	596	n/a	596	14.37	n/a	14.37	25.3%												
154 - 149	695	n/a	695	15.13	n/a	15.13	38.0%												
149 - 144	804	n/a	804	15.89	n/a	15.89	51.0%												
144 - 139	925	n/a	925	16.65	n/a	16.65	62.5%												
139 - 136.66	985	n/a	985	17.00	n/a	17.00	67.4%												
136.66 - 131.66	1298	n/a	1298	21.62	n/a	21.62	65.1%												
131.66 - 126.66	1474	n/a	1474	22.56	n/a	22.56	72.1%												
126.66 - 121.66	1664	n/a	1664	23.49	n/a	23.49	79.0%												
121.66 - 116.66	1870	n/a	1870	24.42	n/a	24.42	84.9%												
116.66 - 111.66	2093	n/a	2093	25.36	n/a	25.36	90.0%												
111.66 - 111	2124	n/a	2124	25.48	n/a	25.48	90.6%												
111 - 110.75	2135	1674	3809	25.53	18.00	43.53	50.4%						81.5%						
110.75 - 105.75	2378	1790	4168	26.46	18.00	44.46	55.1%						89.0%						
105.75 - 101.5	2598	1892	4491	27.25	18.00	45.25	58.8%						94.8%						
101.5 - 101.25	2612	5093	7705	27.30	48.00	75.30	34.6%						55.7%						64.7%
101.25 - 101	2625	5109	7734	27.35	48.00	75.35	34.7%						56.0%						64.9%
101 - 100.75	2639	3215	5853	27.39	30.00	57.39	46.2%												86.4%
100.75 - 95.75	2918	3424	6342	28.32	30.00	58.32	49.5%												92.5%
95.75 - 92.16	3129	3578	6708	28.99	30.00	58.99	51.7%												96.6%
92.16 - 86.83	3878	5292	9170	35.17	43.50	78.67	42.7%				75.3%								79.7%
86.83 - 81.83	4261	5615	9876	36.29	43.50	79.79	44.9%				79.1%								83.7%
81.83 - 81.5	4287	5636	9923	36.36	43.50	79.86	45.1%				79.4%								84.0%
81.5 - 81.25	4307	5911	10218	36.42	45.00	81.42	44.0%											71.3%	
81.25 - 76.25	4716	6257	10974	37.54	45.00	82.54	46.1%											74.5%	
76.25 - 71.25	5151	6613	11765	38.66	45.00	83.66	48.0%											77.6%	
71.25 - 66.25	5612	6979	12591	39.78	45.00	84.78	49.8%											80.4%	
66.25 - 61.25	6099	7355	13455	40.90	45.00	85.90	51.6%											83.2%	
61.25 - 56.25	6614	7741	14356	42.02	45.00	87.02	53.2%											85.7%	
56.25 - 51.25	7157	8137	15295	43.14	45.00	88.14	55.0%											88.1%	
51.25 - 48.66	7450	8346	15796	43.72	45.00	88.72	55.9%											89.3%	
48.66 - 42.33	7721	12538	20258	44.24	69.00	113.24	48.4%		73.6%									75.9%	
42.33 - 37.4	8312	13139	21452	45.34	69.00	114.34	49.9%		75.4%									77.7%	
37.4 - 37.15	8343	13170	21513	45.40	69.00	114.40	50.0%		75.5%					77.8%		73.6%			
37.15 - 32.15	8975	13796	22771	46.52	69.00	115.52	51.5%		77.3%					79.6%		75.3%			
32.15 - 27.15	9638	14436	24074	47.64	69.00	116.64	53.0%		78.9%					81.3%		77.0%			
27.15 - 22.15	10332	15091	25423	48.75	69.00	117.75	54.4%		80.5%					82.9%		78.5%			
22.15 - 19.5	10714	15444	26158	49.35	69.00	118.35	55.2%		81.3%					83.7%		79.3%			
19.5 - 19.25	10750	17315	28066	49.40	77.50	126.90	51.6%	74.5%						78.3%		73.0%			
19.25 - 14.25	11497	18072	29569	50.52	77.50	128.02	52.9%	75.9%						79.7%		74.4%			
14.25 - 9.25	12277	18845	31122	51.64	77.50	129.14	54.2%	77.2%						81.0%		75.7%			
9.25 - 9	12317	18884	31201	51.70	77.50	129.20	54.3%	77.3%						81.1%		75.8%			
9 - 8.75	12357	20125	32482	51.75	82.50	134.25	52.4%	74.4%						78.2%			64.2%		
8.75 - 7	12640	20418	33058	52.14	82.50	134.64	52.8%	74.9%						78.6%			64.6%		
7 - 6.75	12680	19237	31918	52.20	77.50	129.70	54.9%	77.8%						81.7%	76.4%				
6.75 - 5	12968	19515	32482	52.59	77.50	130.09	55.3%	78.3%						82.1%	76.8%				
5 - 4.75	13009	33772	46781	52.65	117.50	170.15	38.8%	55.6%		64.9%				59.6%	52.5%				
4.75 - 3	13301	34230	47531	53.04	117.50	170.54	39.1%	55.9%		65.3%				60.0%	52.8%				
3 - 2.75	13343	34565	47909	53.09	122.50	175.59	39.0%	55.4%				51.7%		57.6%	55.0%				
2.75 - 2.25	13428	34700	48127	53.20	122.50	175.70	39.1%	55.5%				51.8%		57.7%	55.1%				
2.25 - 2	13470	26940	40410	53.26	90.00	143.26	46.3%					62.1%		69.3%	69.3%				
2 - 0	13812	27354	41166	53.71	90.00	143.71	46.7%					62.5%		69.8%	69.8%				

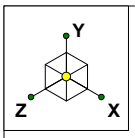
Note: Section capacity checked in 5 degree increments.
Rating per TIA-222-H Section 15.5.

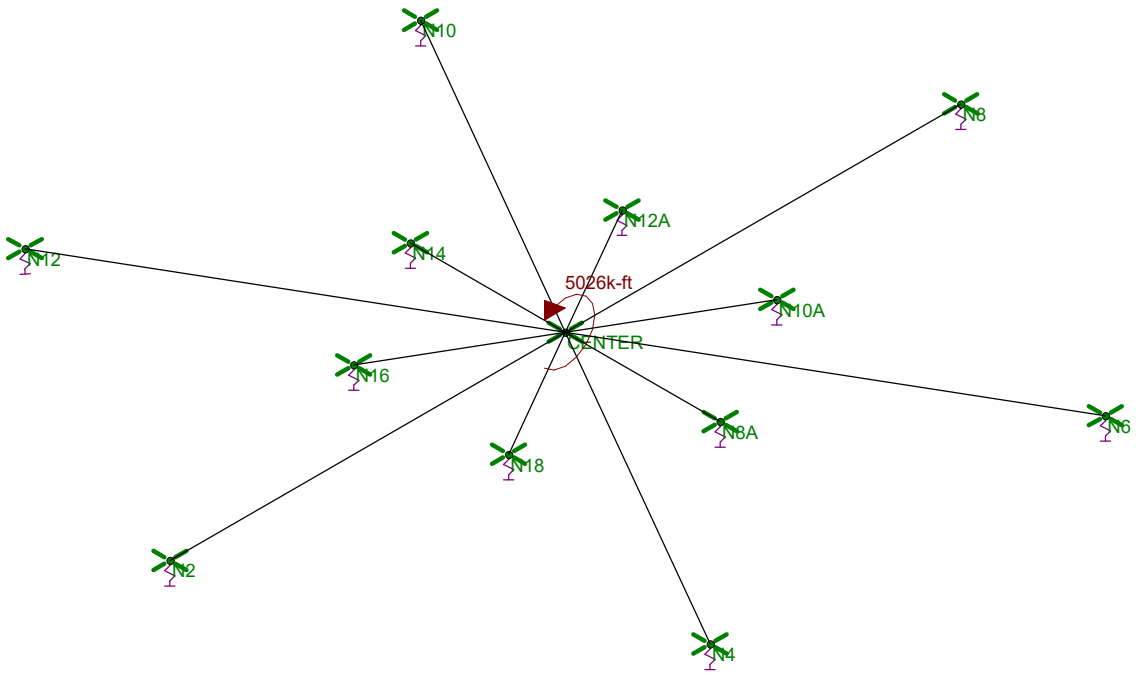




Loads: BLC 1, Dead
Envelope Only Solution

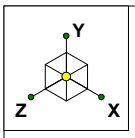
Paul J. Ford and Company	BU 828054 / South Windsor- Rt 5	SK - 1
KAT/SSK		Oct 8, 2018 at 10:17 AM
37518-0525.004.7700		375418-0525.003_Composite Fou...

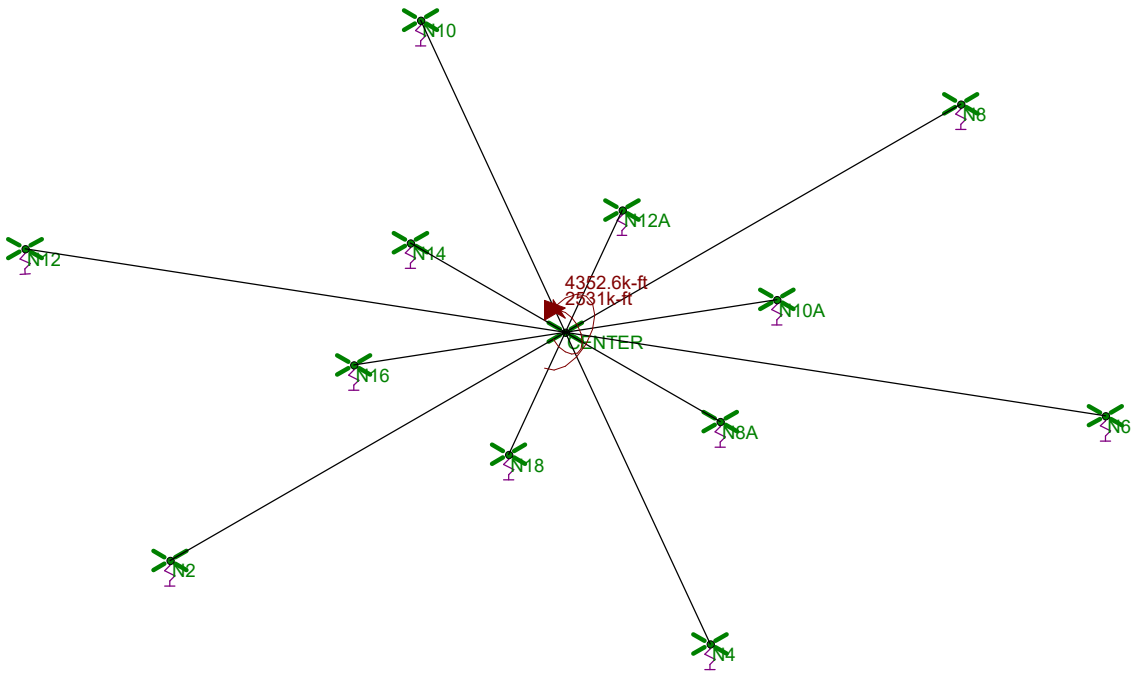




Loads: BLC 2, Wind 0
Envelope Only Solution

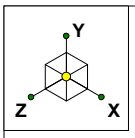
Paul J. Ford and Company	BU 828054 / South Windsor- Rt 5	SK - 2
KAT/SSK		Oct 8, 2018 at 10:17 AM
37518-0525.004.7700		375418-0525.003_Composite Fou...

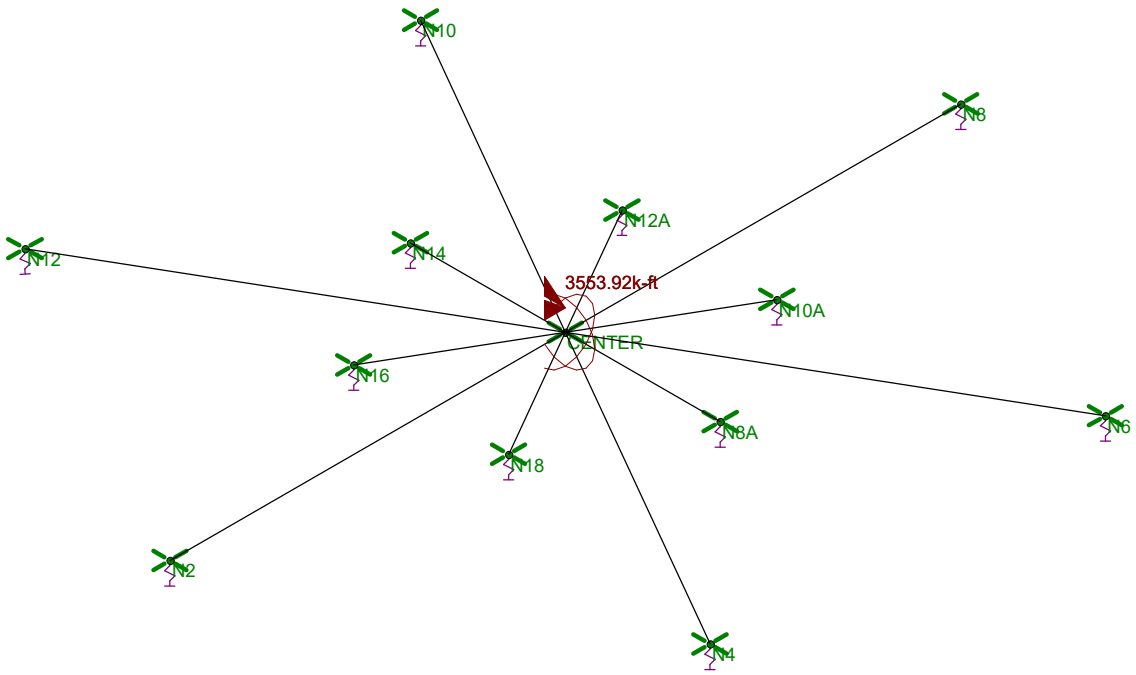




Loads: BLC 3, Wind 30
Envelope Only Solution

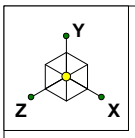
Paul J. Ford and Company	BU 828054 / South Windsor- Rt 5	SK - 3
KAT/SSK		Oct 8, 2018 at 10:17 AM
37518-0525.004.7700		375418-0525.003_Composite Fou...

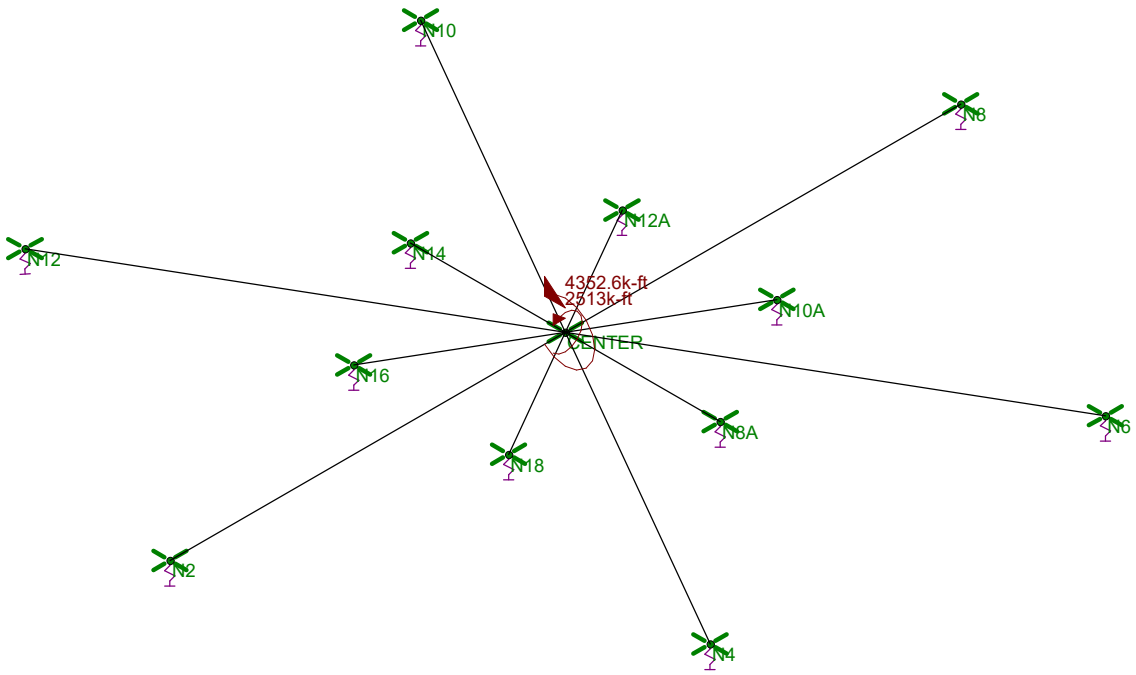




Loads: BLC 4, Wind 45
Envelope Only Solution

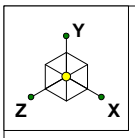
Paul J. Ford and Company	BU 828054 / South Windsor- Rt 5	SK - 4
KAT/SSK		Oct 8, 2018 at 10:18 AM
37518-0525.004.7700		375418-0525.003_Composite Fou...

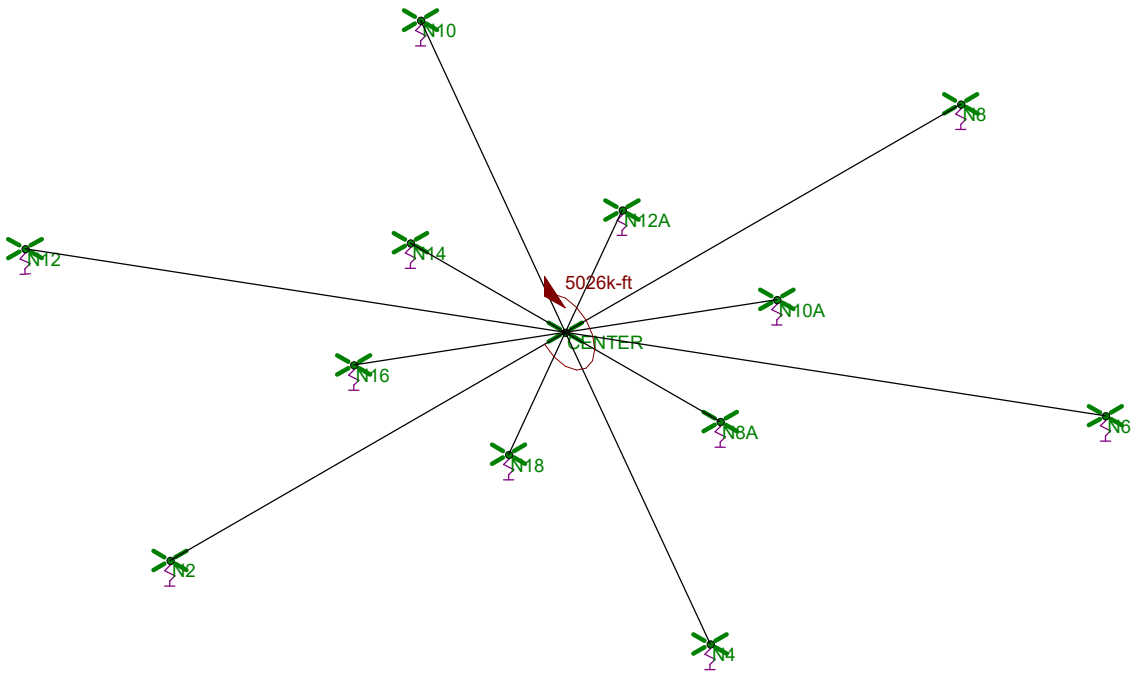




Loads: BLC 5, Wind 60
Envelope Only Solution

Paul J. Ford and Company	BU 828054 / South Windsor- Rt 5	SK - 5
KAT/SSK		Oct 8, 2018 at 10:18 AM
37518-0525.004.7700		375418-0525.003_Composite Fou...





Loads: BLC 6, Wind 90
Envelope Only Solution

Paul J. Ford and Company	BU 828054 / South Windsor- Rt 5	SK - 6
KAT/SSK		Oct 8, 2018 at 10:18 AM
37518-0525.004.7700		375418-0525.003_Composite Fou...

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	None
RISAConnection Code	None
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	None
Aluminum Code	None - Building

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	Yes
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-10
Seismic Base Elevation (ft)	Not Entered
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	5
Risk Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	1
Cd X	1
Rho Z	1
Rho X	1

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(d...	Section/Sha...	Type	Design List	Material	Design Ru...
1	M1	CENTER	N2			RIGID	None	None	RIGID	Typical
2	M2	CENTER	N4			RIGID	None	None	RIGID	Typical
3	M3	CENTER	N6			RIGID	None	None	RIGID	Typical
4	M4	CENTER	N8			RIGID	None	None	RIGID	Typical
5	M5	CENTER	N10			RIGID	None	None	RIGID	Typical
6	M6	CENTER	N12			RIGID	None	None	RIGID	Typical
7	M7	CENTER	N8A			RIGID	None	None	RIGID	Typical
8	M8	CENTER	N10A			RIGID	None	None	RIGID	Typical
9	M9	CENTER	N12A			RIGID	None	None	RIGID	Typical
10	M10	CENTER	N14			RIGID	None	None	RIGID	Typical
11	M11	CENTER	N16			RIGID	None	None	RIGID	Typical
12	M12	CENTER	N18			RIGID	None	None	RIGID	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M1						Yes			None
2	M2						Yes			None
3	M3						Yes			None
4	M4						Yes			None
5	M5						Yes			None
6	M6						Yes			None
7	M7						Yes			None
8	M8						Yes			None
9	M9						Yes			None
10	M10						Yes			None
11	M11						Yes			None
12	M12						Yes			None

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	CENTER	0	0	0	0	
2	N2	0	0	12.49995	0	
3	N4	10.824885	0	6.249975	0	
4	N6	10.824885	0	-6.249975	0	
5	N8	-0.	0	-12.49995	0	
6	N10	-10.824885	0	-6.249975	0	
7	N12	-10.824885	0	6.249975	0	
8	N8A	4.895638	0	0	0	
9	N10A	2.447819	0	-4.239899	0	
10	N12A	-2.447819	0	-4.239899	0	
11	N14	-4.895638	0	0.	0	
12	N16	-2.447819	0	4.239899	0	
13	N18	2.447819	0	4.239899	0	

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	Dead	None		-1		1				
2	WInd 0	None				1				
3	Wind 30	None				2				
4	Wind 45	None				2				
5	Wind 60	None				2				
6	Wind 90	None				1				

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2 Dead + Wind 0	Yes	Y		1	1.2	2	1																
2	0.9 Dead + Wind 0	Yes	Y		1	.9	2	1																
3	1.2 Dead + Wind 30	Yes	Y		1	1.2	3	1																
4	0.9 Dead + Wind 30	Yes	Y		1	.9	3	1																
5	1.2 Dead + Wind 45	Yes	Y		1	1.2	4	1																
6	0.9 Dead + Wind 45	Yes	Y		1	.9	4	1																
7	1.2 Dead + Wind 60	Yes	Y		1	1.2	5	1																
8	0.9 Dead + Wind 60	Yes	Y		1	.9	5	1																
9	1.2 Dead + Wind 90	Yes	Y		1	1.2	6	1																
10	0.9 Dead + Wind 90	Yes	Y		1	.9	6	1																
11	1.2 Dead + Wind 180	Yes	Y		1	1.2	2	-1																
12	0.9 Dead + Wind 180	Yes	Y		1	.9	2	-1																
13	1.2 Dead + Wind 210	Yes	Y		1	1.2	3	-1																
14	0.9 Dead + Wind 210	Yes	Y		1	.9	3	-1																
15	1.2 Dead + Wind 225	Yes	Y		1	1.2	4	-1																
16	0.9 Dead + Wind 225	Yes	Y		1	.9	4	-1																
17	1.2 Dead + Wind 240	Yes	Y		1	1.2	5	-1																
18	0.9 Dead + Wind 240	Yes	Y		1	.9	5	-1																
19	1.2 Dead + Wind 270	Yes	Y		1	1.2	6	-1																
20	0.9 Dead + Wind 270	Yes	Y		1	.9	6	-1																

Envelope Joint Reactions

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N14	max	0	1	120.827	9	0	1	0	1	0	1	0	1
2		min	0	1	-105.09	20	0	1	0	1	0	1	0	1
3	N16	max	0	1	121.023	3	0	1	0	1	0	1	0	1

Envelope Joint Reactions (Continued)

	Joint		X [k]	LC	Y [k]	LC	Z [k]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
4		min	0	1	-105.286	14	0	1	0	1	0	1	0	1
5	N18	max	0	1	105.84	1	0	1	0	1	0	1	0	1
6		min	0	1	-90.104	12	0	1	0	1	0	1	0	1
7	N8A	max	0	1	120.827	19	0	1	0	1	0	1	0	1
8		min	0	1	-105.09	10	0	1	0	1	0	1	0	1
9	N10A	max	0	1	121.023	13	0	1	0	1	0	1	0	1
10		min	0	1	-105.286	4	0	1	0	1	0	1	0	1
11	N12A	max	0	1	105.84	11	0	1	0	1	0	1	0	1
12		min	0	1	-90.104	2	0	1	0	1	0	1	0	1
13	N10	max	0	1	80.983	9	0	1	0	1	0	1	0	1
14		min	0	1	-76.01	20	0	1	0	1	0	1	0	1
15	N8	max	0	1	93.069	11	0	1	0	1	0	1	0	1
16		min	0	1	-88.096	2	0	1	0	1	0	1	0	1
17	N6	max	0	1	93.07	17	0	1	0	1	0	1	0	1
18		min	0	1	-88.098	8	0	1	0	1	0	1	0	1
19	N4	max	0	1	80.983	19	0	1	0	1	0	1	0	1
20		min	0	1	-76.01	10	0	1	0	1	0	1	0	1
21	N2	max	0	1	93.069	1	0	1	0	1	0	1	0	1
22		min	0	1	-88.096	12	0	1	0	1	0	1	0	1
23	N12	max	0	1	93.07	7	0	1	0	1	0	1	0	1
24		min	0	1	-88.098	18	0	1	0	1	0	1	0	1
25	CENTER	max	0	1	0	1	0	1	0	1	0	1	0	1
26		min	0	1	0	1	0	1	0	1	0	1	0	1
27	Totals:	max	0	1	71.004	19	0	1						
28		min	0	1	53.253	10	0	1						

Joint Loads and Enforced Displacements (BLC 1 : Dead)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CENTER	L	Y	-59.17

Joint Loads and Enforced Displacements (BLC 2 : Wind 0)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CENTER	L	Mx	5026

Joint Loads and Enforced Displacements (BLC 3 : Wind 30)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CENTER	L	Mx	4352.6
2	CENTER	L	Mz	2531

Joint Loads and Enforced Displacements (BLC 4 : Wind 45)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CENTER	L	Mx	3553.92
2	CENTER	L	Mz	3553.92

Joint Loads and Enforced Displacements (BLC 5 : Wind 60)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CENTER	L	Mx	2513
2	CENTER	L	Mz	4352.6

Joint Loads and Enforced Displacements (BLC 6 : Wind 90)

	Joint Label	L,D,M	Direction	Magnitude[(k,k-ft), (in,rad), (k*s^2/ft, k*s^2*ft)]
1	CENTER	L	Mz	5026

PAUL J. FORD & COMPANY

Date:	10/8/2018
Job #:	37518-0525.004.7700

Applied Reactions for RISA 3D		
TNX Moment =	5026	k-ft
TNX Axial =	71	kips
TNX Shear =	43	kips
Total Unfactored Axial =	**59.17**	**kips**
Side Bending Moment =	**5026**	**k-ft**
Corner Bending Moment (Mx) =	**3553.9**	**k-ft**
Corner Bending Moment (Mz)=	**3553.9**	**k-ft**

Micropile Spring Constant		
Number of Piles =	6	
B.C. =	117.5	in
Ag =	4.03	in^2
E =	29000	ksi
Lu =	10	ft
k = An*E / Lu =	973.92	k/in

Helical Anchor Spring Constant		
Number of Piles =	6	
B.C. =	300	in
Ag =	8.28	in^2
E =	29000	ksi
Lu =	65	ft
k = An*E / Lu =	307.85	k/in

Micropile Capacity		
Max Tension from RISA =	121.023	kips
Anchor Type =	Micropile	
Ultimate Load, Pu' =	418	kips
An =		in^2
Capacity (Kips)= 0.8*Pu =	334.4	
Ratio = 121.023 / 334.4 =	**36.2%**	

Helical Anchor Capacity		
Max Tension from RISA =	88.098	kips
Anchors per	2	
Helical Anchor Type =	RD4500.337	
Design Torque =	21000	ft-lbs
Ultimate Capacity =	140	kips
Installed Torque =	15000	ft-lbs
Installed Capacity =	100	kips
Total Capacity =	105	kips
Ratio = 88.098 / 105 =	**83.9%**	

			Load Distribution
Micropile Effective Moment =	42661	k-in	35.0%
Anchor Effective Moment =	79288	k-in	65.0%
Total Effective Moment =	121949	k-in	

Reaction for Helical Load transfer at Base plate:

Moment =	**3267.8**	**k-ft**
Axial =	**46.2**	**kips**
Shear =	**43.0**	**kips**

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

v4.5.1 - Effective 09-27-18

Date: 10/9/2018
PJF Project: 37518-0525.004.7700
Client Ref. # BU 828054
Site Name: Site Name
Description: Description
Owner: Owner
Engineer: SSK

Asymmetric Anchor Rod Analysis

Moment =	3268	k-ft	TIA Ref.	H		η =	N/A	for Base Plates, Rev. G Sect. 4.9.9
Axial =	46.2	kips (+Comp, -Tension)	ASIF =	N/A		Threads =	N-Included	for Flange Plates, Rev. G & H
Shear =	43.0	kips	Max Ratio =	100.0%		lar =	0.00	in, for Base Plates, Rev. H Sect 4.9.9 (Max of Original Items)
Anchor Qty =	12		Location =	Base Plate		Grout =	0.00	psi, for Base Plates, Rev. H Sect 4.9.9 (Note)

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

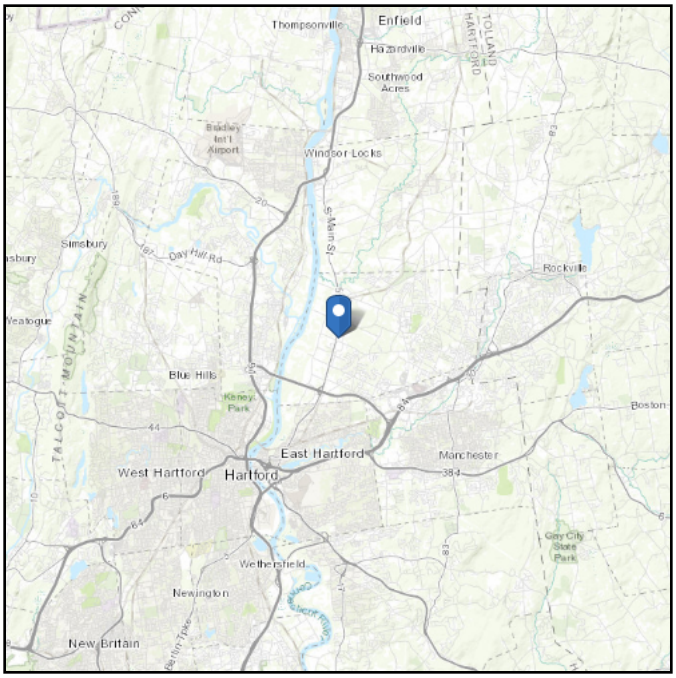
Item	Nominal Anchor Dia, in	Spec	Fy, ksi	Fu, ksi	Location, degrees	Anchor Circle, in	Type	Area Override, in^2	Area, in^2	Max Net Comp, kips	Max Net Tension, kips	Tension Override, kips	Comp Override, kips	Tension Cap, kips	Comp Cap, kips	Capacity Ratio
1	2.250	A354 Gr BC	109	125	6.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
2	2.250	A354 Gr BC	109	125	53.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
3	2.250	A354 Gr BC	109	125	66.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
4	2.250	A354 Gr BC	109	125	113.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
5	2.250	A354 Gr BC	109	125	126.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
6	2.250	A354 Gr BC	109	125	173.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
7	2.250	A354 Gr BC	109	125	186.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
8	2.250	A354 Gr BC	109	125	233.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
9	2.250	A354 Gr BC	109	125	246.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
10	2.250	A354 Gr BC	109	125	293.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
11	2.250	A354 Gr BC	109	125	306.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
12	2.250	A354 Gr BC	109	125	353.5	54.00		0.00	3.98	241.85	241.85	0.00	0.00	304.47	354.00	65.1%
									47.71							

ASCE 7 Hazards Report

Address:
No Address at This Location

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

Elevation: 70.37 ft (NAVD 88)
Latitude: 41.833444
Longitude: -72.603056



Wind

Results:

Wind Speed:	122 Vmph
10-year MRI	76 Vmph
25-year MRI	86 Vmph
50-year MRI	93 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: Wed Oct 03 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.

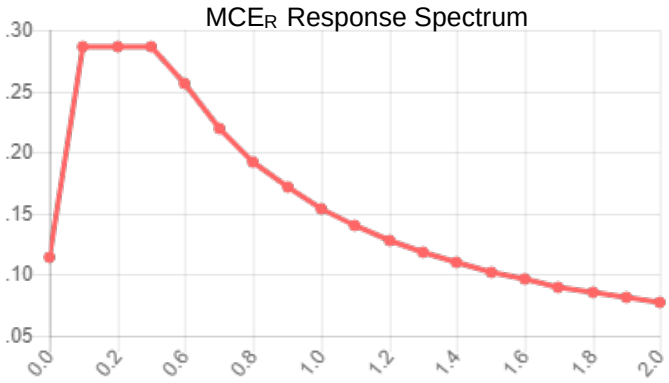
Seismic

Site Soil Class: D - Stiff Soil

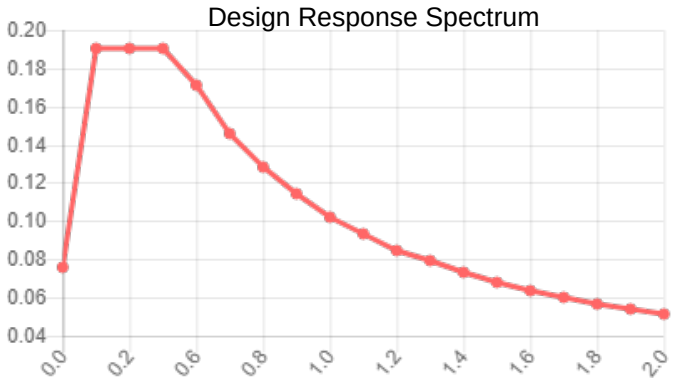
Results:

S_S :	0.179	S_{DS} :	0.190
S_1 :	0.064	S_{D1} :	0.102
F_a :	1.600	T_L :	6.000
F_v :	2.400	PGA :	0.089
S_{MS} :	0.286	PGA_M :	0.143
S_{M1} :	0.154	F_{PGA} :	1.600
		I_e :	1

Seismic Design Category B



Sa(g) vs T(s)



Sa(g) vs T(s)

Data Accessed: Wed Oct 03 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:	1.00 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph
Data Source:	Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8
Date Accessed:	Wed Oct 03 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: **July 24, 2018**

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless
Infinigy Engineering, PLLC
1033 Watervliet Shaker Road
Albany, NY 12205
518-690-0790
structural@infinigy.com

Christine Trotta
Crown Castle
3 Corporate Dr., St 101
Clifton Park, NY 12065

Subject:	**Mount Structural Analysis**	
Carrier Designation:	**T-Mobile Change-Out**	
	Carrier Site Number:	CT11279D
	Carrier Site Name:	CT11279D
Crown Castle Designation:	**Crown Castle BU Number:**	828054
	Crown Castle Site Name:	South Windsor/Rt 5
	Crown Castle JDE Job Number:	512590
	Crown Castle Application Number:	446059, Rev. 0
Engineering Frim Designation:	**Infinigy Report Designation:**	600-005
Site Data:	**300 Governors Highway, South Windsor, Hartford County, CT 06074**	
	Latitude 41°50'0.40" Longitude -72°36'11.0"	
Structure Information:	**Tower Height & Type:**	**165 Foot Monopole**
	Mount Elevation:	**165 ft**
	Mount Type:	**12.5 ft Platform**

Dear Christine Trotta,

Infinigy Engineering, PLLC is pleased to submit this **"Mount Structural Analysis Report"** to determine the structural integrity of T-Mobile's antenna mounting system with the proposed appurtenance and equipment addition 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 existing and proposed loading to be:

Platform **Sufficient**

This analysis has been performed in accordance with the 2012 International Building Code and 2016 Connecticut State Building Code and the Infinigy Engineering, PLLC wind speed requirement of a 95 mph nominal 3-second gust wind speed as required for use in the 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: Dmitriy Albul, P.E.

Respectfully Submitted by:

Joseph R. Johnston
JUL 24 2018

STATE OF CONNECTICUT
JOSEPH R. JOHNSTON
29460
LICENSED PROFESSIONAL ENGINEER

Joe Johnston, P.E.
VP Structural Engineering / Principal

TABLE OF CONTENTS

1) INTRODUCTION

The existing mount consists of a 12.5 ft wide Platform at the 165 ft elevation**.** The existing and proposed antenna loading was obtained from the Application provided by CCI, Application Number 446059, Revision 0 and the Mount Photos.

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 wind gust wind speed of 95 mph with no ice, 50 mph with 1.00 inch escalated ice thickness, Exposure Category C and Topographic Category 1. In addition, the Platform been analyzed for a load combination consisting of a 500-pound man live load using a 3-second wind gustwind speed of 30 mph.

Table 1 - Proposed Equipment Loading Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
165.0	166.0	3	RFS	APXVAARR24_43-U-NA20	-	1
		3	Ericsson	AIR 32 B2A/B66AA		
		3	Ericsson	Radio 4449 B12/B71		

Notes:
1) Proposed Equipment

Table 2 – Existing Antenna and Cable Information

Mount Centerline (ft)	Antenna Centerline (ft)	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
165.0	166.0	3	Ericsson	AIR 21 B2A B4P	12.5 ft Platform	1
		3	Ericsson	KRY 112 144/1		
		3	Ericsson	AIR 21 B4A B12P-B5P 8FT	-	2
		3	Ericsson	RRUS 11 B12		

Notes:

1) Existing Equipment to Remain
2) Existing Equipment to be Removed

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Reference	Source
Crown Application	T-Mobile Application	446059, Rev. 0	CCI Sites
Structural Analysis	Paul J. Ford and Company	828054	CCI Sites
Mount Photos	Photos	828054	CCI Sites
Mount Design	Design Drawings	12.5' Platform	EEI

3.1) Analysis Method

RISA-3D (Version 16.0.5), 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 4 - Mount Component Stresses vs. Capacity (Platform)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1,2	Frame Rail	165.0	60.3	Pass
	Arm		70.0	Pass
	Mount Pipe		89.5	Pass

Structure Rating (max from all components) =	89.5%

Notes:

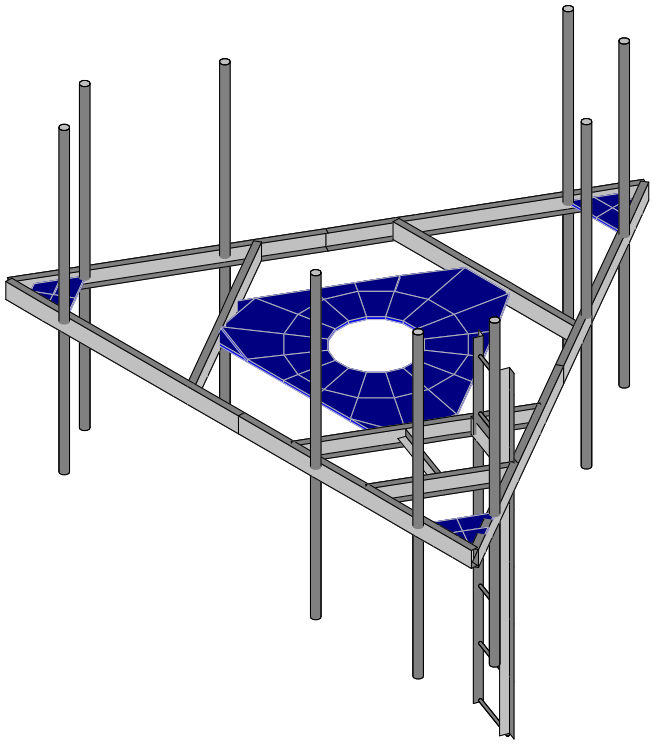
1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.
2) All sectors are typical

4.1) Recommendations

The Platform have sufficient capacity to support the proposed loading. No modifications are required at this time.

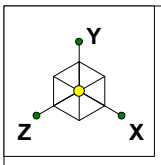
APPENDIX A

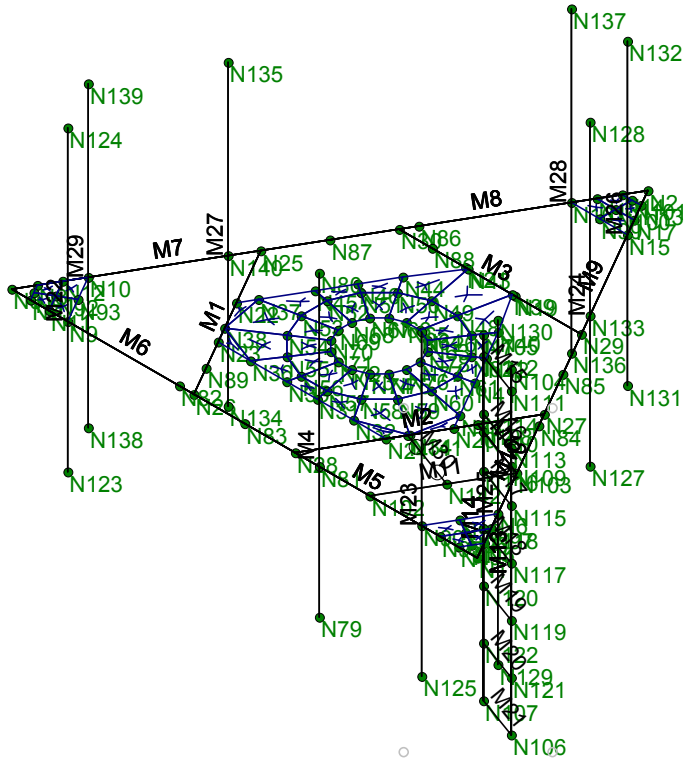
WIRE FRAME AND RENDERED MODELS



Envelope Only Solution

Infinigy Engineering PLLC	South Windsor/Rt 5	Rendered Model
DVA		July 19, 2018 at 4:55 PM
600-005		South Windsor_Rt 5.r3d





Envelope Only Solution

Infinigy Engineering PLLC	South Windsor/Rt 5	Wire Frame Model
DVA		July 19, 2018 at 4:55 PM
600-005		South Windsor_Rt 5.r3d

APPENDIX B

SOFTWARE INPUT CALCULATIONS

Site Name:	South Windsor/Rt 5
Client:	Crown Castle
Carrier:	T-Mobile
Engineer:	DVA
Date:	7/23/2018

INFINIGY
FROM ZERO TO INFINIGY
the solutions are endless

INFINIGY WIND LOAD CALCULATOR 3.0.2

Site Information Inputs:

Adopted Building Code:	2012 IBC
Structure Load Standard:	TIA-222-G
Antenna Load Standard:	TIA-222-G
Structure Risk Category:	II
Structure Type:	Mount - Platform
Number of Sectors:	3
Structure Shape 1:	Flat

Rooftop Inputs:

Rooftop Wind Speed-Up?:	No

Wind Loading Inputs:

Design Wind Velocity:	95	mph (nominal 3-second gust)
Wind Centerline 1 (z_1):	165.0	ft
Side Face Angle (θ):	60	degrees
Exposure Category:	C	
Topographic Category:	1	

Wind with No Ice		
q_z (psf)	Gh	F_{ST} (psf)
30.87	1.00	**61.73**

Wind with Ice		
q_z (psf)	Gh	F_{ST} (psf)
8.55	1.00	**26.54**

Ice Loading Inputs:

Is Ice Loading Needed?:	Yes	
Ice Wind Velocity:	50	mph (nominal 3-second gust)
Base Ice Thickness:	1.00	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 32 B2A/B66AA	165.0	3	1.00	Flat	Flat	30.87	6.51	200.94	145.46	159.33	187.07
Ericsson AIR 21 B2A B4P	165.0	3	1.00	Flat	Flat	30.87	6.09	188.04	132.62	146.48	174.18
RFS APXVAARR24_43-U-NA20	165.0	3	1.00	Flat	Flat	30.87	20.24	624.84	274.36	361.98	537.22
Ericsson RADIO 4449 B12/B71	165.0	3	1.00	Flat	Flat	30.87	1.64	50.72	35.57	39.36	46.94
Ericsson KRY 112 144/1	165.0	3	1.00	Flat	Flat	30.87	0.35	10.83	4.97	6.43	9.36

APPENDIX C

SOFTWARE ANALYSIS OUTPUT

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rules
1	M1	N25	N26			Channel	Beam	Channel	A36 Gr.36	Typical
2	M2	N27	N28		180	Channel	Beam	Channel	A36 Gr.36	Typical
3	M3	N29	N30			Channel	Beam	Channel	A36 Gr.36	Typical
4	M4	N79	N80			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
5	M5	N1	N83			Frame Rail	Beam	Channel	A36 Gr.36	Typical
6	M6	N83	N3			Frame Rail	Beam	Channel	A36 Gr.36	Typical
7	M7	N3	N87			Frame Rail	Beam	Channel	A36 Gr.36	Typical
8	M8	N87	N2			Frame Rail	Beam	Channel	A36 Gr.36	Typical
9	M9	N2	N85			Frame Rail	Beam	Channel	A36 Gr.36	Typical
10	M10	N85	N1			Frame Rail	Beam	Channel	A36 Gr.36	Typical
11	M11	N102	N103			Channel	Beam	Channel	A36 Gr.36	Typical
12	M12	N103	N108			Channel	Beam	Channel	A36 Gr.36	Typical
13	M13	N106	N104		70	Angle	Column	Single Angle	A36 Gr.36	Typical
14	M14	N107	N105		340	Angle	Column	Single Angle	A36 Gr.36	Typical
15	M15	N112	N111			Solid Rod	Beam	BAR	A36 Gr.36	Typical
16	M16	N114	N113			Solid Rod	Beam	BAR	A36 Gr.36	Typical
17	M17	N116	N115			Solid Rod	Beam	BAR	A36 Gr.36	Typical
18	M18	N118	N117			Solid Rod	Beam	BAR	A36 Gr.36	Typical
19	M19	N120	N119			Solid Rod	Beam	BAR	A36 Gr.36	Typical
20	M20	N122	N121			Solid Rod	Beam	BAR	A36 Gr.36	Typical
21	M21	N107	N106			Solid Rod	Beam	BAR	A36 Gr.36	Typical
22	M22	N123	N124			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
23	M23	N125	N126			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
24	M24	N127	N128			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
25	M25	N129	N130			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
26	M26	N131	N132			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
27	M27	N134	N135			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
28	M28	N136	N137			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
29	M29	N138	N139			Mount Pipe	Column	Pipe	A53 Gr.B	Typical
30	M30	N142	N141		270	Angle 1	Beam	Single Angle	A36 Gr.36	Typical

Material Takeoff

	Material	Size	Pieces	Length[in]	Weight[K]
1	Hot Rolled Steel				
2	A36 Gr.36	0.75" SR	7	105	0
3	A36 Gr.36	C5x9	11	681.8	.5
4	A36 Gr.36	L2x2x4	1	21.1	0
5	A36 Gr.36	L2.5x2.5x4	2	204	0
6	A53 Gr.B	PIPE_2.0	9	864	.2
7	Total HR Steel		30	1875.9	.8

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
1	Self Weight	DL		-1			27		3	
2	Wind Load AZI 000	WLZ					27		1	
3	Wind Load AZI 090	WLX					27		1	
4	Ice Weight	OL1					27	30	3	
5	Wind + Ice Load AZI 000	OL2					27		1	
6	Wind + Ice Load AZI 090	OL3					27		1	
7	Service Live 1	LL				2				
8	BLC 1 Transient Area Loads	None						60		
9	BLC 2 Transient Area Loads	None						27		
10	BLC 3 Transient Area Loads	None						24		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distribut..	Area(M...	Surface...
11	BLC 4 Transient Area Loads	None						60		
12	BLC 5 Transient Area Loads	None						27		
13	BLC 6 Transient Area Loads	None						24		

Load Combinations

	Description	Solve	PDe...	SRSS	B...	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 000	Yes	Y		DL	1.2	W...	1.6																
3	1.2D + 1.6W AZI 030	Yes	Y		DL	1.2	W...	1.3...	W...	.8														
4	1.2D + 1.6W AZI 060	Yes	Y		DL	1.2	W...	.8	W...	1.3...														
5	1.2D + 1.6W AZI 090	Yes	Y		DL	1.2			W...	1.6														
6	1.2D + 1.6W AZI 120	Yes	Y		DL	1.2	W...	-.8	W...	1.3...														
7	1.2D + 1.6W AZI 150	Yes	Y		DL	1.2	W...	-1....	W...	.8														
8	1.2D + 1.6W AZI 180	Yes	Y		DL	1.2	W...	-1.6																
9	1.2D + 1.6W AZI 210	Yes	Y		DL	1.2	W...	-1....	W...	-.8														
10	1.2D + 1.6W AZI 240	Yes	Y		DL	1.2	W...	-.8	W...	-1....														
11	1.2D + 1.6W AZI 270	Yes	Y		DL	1.2			W...	-1.6														
12	1.2D + 1.6W AZI 300	Yes	Y		DL	1.2	W...	.8	W...	-1....														
13	1.2D + 1.6W AZI 330	Yes	Y		DL	1.2	W...	1.3...	W...	-.8														
14	0.9D + 1.6W AZI 000	Yes	Y		DL	.9	W...	1.6																
15	0.9D + 1.6W AZI 030	Yes	Y		DL	.9	W...	1.3...	W...	.8														
16	0.9D + 1.6W AZI 060	Yes	Y		DL	.9	W...	.8	W...	1.3...														
17	0.9D + 1.6W AZI 090	Yes	Y		DL	.9			W...	1.6														
18	0.9D + 1.6W AZI 120	Yes	Y		DL	.9	W...	-.8	W...	1.3...														
19	0.9D + 1.6W AZI 150	Yes	Y		DL	.9	W...	-1....	W...	.8														
20	0.9D + 1.6W AZI 180	Yes	Y		DL	.9	W...	-1.6																
21	0.9D + 1.6W AZI 210	Yes	Y		DL	.9	W...	-1....	W...	-.8														
22	0.9D + 1.6W AZI 240	Yes	Y		DL	.9	W...	-.8	W...	-1....														
23	0.9D + 1.6W AZI 270	Yes	Y		DL	.9			W...	-1.6														
24	0.9D + 1.6W AZI 300	Yes	Y		DL	.9	W...	.8	W...	-1....														
25	0.9D + 1.6W AZI 330	Yes	Y		DL	.9	W...	1.3...	W...	-.8														
26	1.2D + 1.0Di	Yes	Y		DL	1.2	O...	1																
27	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	1														
28	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.866	O...	.5												
29	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.5	O...	.866												
30	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1			O...	1												
31	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.5	O...	.866												
32	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.8...	O...	.5												
33	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-1														
34	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.8...	O...	-.5												
35	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	-.5	O...	-.8...												
36	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1			O...	-1												
37	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.5	O...	-.8...												
38	1.2D + 1.0Di + 1.0Wi ...	Yes	Y		DL	1.2	O...	1	O...	.866	O...	-.5												
39	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.1														
40	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.086	W...	.05												
41	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.05	W...	.086												
42	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5			W...	.1												
43	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.05	W...	.086												
44	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...	W...	.05												
45	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.1														
46	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.0...	W...	-.05												
47	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	-.05	W...	-.0...												
48	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5			W...	-.1												
49	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.05	W...	-.0...												

Load Combinations (Continued)

	Description	Solve	PDe...	SRSS	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
50	1.2D + 1.5L + 1.0WL (...	Yes	Y		DL	1.2	LL	1.5	W...	.086	W...	-.05												

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-in]	LC	MY [k-in]	LC	MZ [k-in]	LC
1	N65	max	1081.629	17	3301.376	27	946.647	13	25.444	27	0	1	-.154	19
2		min	-1082.867	11	186.332	20	-949.377	19	1.89	20	0	1	-4.224	38
3	N63	max	1228.508	3	594.169	27	1399.825	15	17.379	38	0	1	9.219	27
4		min	-1226.785	21	-228.872	45	-1399.944	9	1.306	19	0	1	.359	20
5	N77	max	1203.733	3	559.742	35	2142.946	15	3.543	35	0	1	21.404	36
6		min	-1202.615	21	-159.024	17	-2140.61	9	.058	16	0	1	1.942	17
7	N75	max	948.791	5	4675.555	35	1285.905	15	-1.719	16	0	1	27.304	35
8		min	-947.163	23	446.915	16	-1284.257	9	-17.818	35	0	1	2.737	16
9	N73	max	1417.807	18	163.263	21	122.385	16	-1.187	15	0	1	3.545	33
10		min	-1412.94	12	-569.537	28	-122.292	10	-17.686	34	0	1	.291	14
11	N71	max	988.861	17	1208.899	31	102.924	15	-.869	24	0	1	-1.073	25
12		min	-987.694	11	-105.148	24	-103.336	9	-15.973	31	0	1	-13.258	32
13	N69	max	647.399	18	2441.071	31	1012.685	13	-.491	23	0	1	-1.354	24
14		min	-649.626	12	28.676	24	-1009.958	19	-5.94	30	0	1	-22.935	31
15	N67	max	1058.206	19	-33.799	16	1642.59	12	7.203	29	0	1	-.274	22
16		min	-1060.957	13	-1306.269	35	-1641.485	18	.183	22	0	1	-10.747	29
17	Totals:	max	7064.962	5	10305.788	37	7292.139	2						
18		min	-7064.962	23	2636.364	18	-7292.139	8						

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M4	PIPE_2.0	.895	42	8	.063	42		8	14916....	32130	22.459	22.459	1...	H1-1b
2	M27	PIPE_2.0	.785	42	5	.056	42		5	14916....	32130	22.459	22.459	1...	H1-1b
3	M24	PIPE_2.0	.785	42	11	.056	42		11	14916....	32130	22.459	22.459	1...	H1-1b
4	M1	C5x9	.700	0	6	.327	37.889	y	32	39740....	85536	22.909	142.236	1...	H1-1b
5	M8	C5x9	.603	15.625	13	.128	57.031	z	10	25061....	85536	22.909	142.236	1...	H1-1b
6	M7	C5x9	.597	59.375	7	.796	58.594	z	10	25061....	85536	22.909	142.236	1...	H1-1b
7	M3	C5x9	.597	0	13	.339	22	y	27	39740....	85536	22.909	142.236	1...	H1-1b
8	M5	C5x9	.554	58.594	8	.811	58.594	z	2	25061....	85536	22.909	142.236	2...	H1-1b
9	M10	C5x9	.525	15.625	8	.108	57.031	z	6	25061....	85536	22.909	142.236	1...	H1-1b
10	M2	C5x9	.497	58.667	9	.936	20.778	y	36	39740....	85536	22.909	142.236	1...	H1-1b
11	M9	C5x9	.477	59.375	3	.797	58.594	z	6	25061....	85536	22.909	142.236	1...	H1-1b
12	M6	C5x9	.407	15.625	30	.134	57.031	z	2	25061....	85536	22.909	142.236	1...	H1-1b
13	M11	C5x9	.398	0	3	.042	18.056	z	3	65448....	85536	22.909	142.236	1...	H1-1b
14	M22	PIPE_2.0	.317	42	8	.034	42		8	14916....	32130	22.459	22.459	1...	H1-1b
15	M25	PIPE_2.0	.304	42	11	.033	42		11	14916....	32130	22.459	22.459	2...	H1-1b
16	M28	PIPE_2.0	.303	42	11	.033	42		11	14916....	32130	22.459	22.459	2...	H1-1b
17	M23	PIPE_2.0	.278	42	8	.025	42		8	14916....	32130	22.459	22.459	1...	H1-1b
18	M29	PIPE_2.0	.266	42	5	.024	42		5	14916....	32130	22.459	22.459	2...	H1-1b
19	M26	PIPE_2.0	.266	42	11	.024	42		11	14916....	32130	22.459	22.459	2...	H1-1b
20	M12	C5x9	.251	0	8	.074	18.027	z	13	77457....	85536	22.909	142.236	1...	H1-1b
21	M13	L2.5x2.5x4	.125	74.375	2	.025	75.438	z	35	6003.1...	38556	13.363	29.148	2...	H2-1
22	M14	L2.5x2.5x4	.112	74.375	10	.024	75.438	y	29	6003.1...	38556	13.363	30.142	3...	H2-1
23	M18	0.75" SR	.072	0	10	.018	15		4	10219....	14313....	2.147	2.147	2...	H1-1b
24	M17	0.75" SR	.061	0	10	.016	15		4	10219....	14313....	2.147	2.147	2...	H1-1b
25	M30	L2x2x4	.058	10.772	4	.024	21.105	z	38	26152....	30585.6	8.291	18.922	1...	H2-1
26	M19	0.75" SR	.052	0	10	.010	15		4	10219....	14313....	2.147	2.147	2...	H1-1b
27	M20	0.75" SR	.037	0	10	.006	0		27	10219....	14313....	2.147	2.147	2...	H1-1b
28	M15	0.75" SR	.033	15	10	.017	15		10	10219....	14313....	2.147	2.147	2...	H1-1b
29	M21	0.75" SR	.031	0	10	.006	0		37	10219....	14313....	2.147	2.147	2...	H1-1b

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

	Member	Shape	Code Check	Loc[in]	LC	Shear Check	Loc[in]	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
30	M16	0.75" SR	.022	0	29	.017	15		35	10219....	14313....	2.147	2.147	2...	H1-1b

APPENDIX D

REFERENCE DOCUMENTS

Date:	7/24/2018
Client	Crown
Carrier	T-Mobile
Engineer:	ATE
Site:	828054
Job #:	600-005

Code:	LRFD	
Axial:	10305.79	lbs
Shear:	7292.14	lbs

Bolt Capacity (5/8" A325 Bolt)				
	Ult Load / Bolt	Factored Load (ϕ=0.75)	# of Bolts	Factor Joint Capacity
Axial (lb)	13106.7	9830.0	2	19660
Shear(lb)	8013.3	6010.0	2	12020

Interaction Check	
T /ϕT_n	52.4%
V /ϕVn	60.7%
≤1.0	64.3%
	OK

EBI Consulting
environmental | engineering | due diligence

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

T-Mobile Existing Facility

Site ID: CT11279D

South Windsor/RT 5
300 Governors Highway
South Windsor, CT 06074

August 24, 2018

EBI Project Number: 6218005828

Site Compliance Summary	
Compliance Status:	COMPLIANT
Site total MPE% of FCC general population allowable limit:	11.82 %

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

EBI Consulting
environmental | engineering | due diligence

August 24, 2018

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

Emissions Analysis for Site: **CT11279D – South Windsor/RT 5**

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **300 Governors Highway, South Windsor, 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 frequency bands 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 **300 Governors Highway, South Windsor, 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) 1 GSM channels (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 15 Watts per Channel.

2) 1 UMTS channel (PCS Band - 1900 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

3) 1 UMTS channel (AWS Band – 2100 MHz) was considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

5) 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.

6) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 40 Watts per Channel.

7) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 20 Watts per Channel.

8) 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.

9) 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.

10) The antennas used in this modeling are the **Ericsson AIR32 B66A/B2A** & **Ericsson AIR21 B2A/B4P** 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.

11) The antenna mounting height centerline of the proposed antennas is **165 feet** above ground level (AGL).

12) 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.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	**1**	Antenna #:	**1**	Antenna #:	**1**
Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A	Make / Model:	Ericsson AIR32 B66A/B2A
Gain:	15.9 dBd	Gain:	15.9 dBd	Gain:	15.9 dBd
Height (AGL):	165 feet	Height (AGL):	165 feet	Height (AGL):	165 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	4	Channel Count	4	Channel Count	4
Total TX Power(W):	200	Total TX Power(W):	200	Total TX Power(W):	200
ERP (W):	7,780.90	ERP (W):	7,780.90	ERP (W):	7,780.90
Antenna A1 MPE%	**1.11**	Antenna B1 MPE%	**1.11**	Antenna C1 MPE%	**1.11**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
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):	165 feet	Height (AGL):	165 feet	Height (AGL):	165 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	3	Channel Count	3	Channel Count	3
Total TX Power(W):	95	Total TX Power(W):	95	Total TX Power(W):	95
ERP (W):	3,695.93	ERP (W):	3,695.93	ERP (W):	3,695.93
Antenna A2 MPE%	**0.53**	Antenna B2 MPE%	**0.53**	Antenna C2 MPE%	**0.53**
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):	165 feet	Height (AGL):	165 feet	Height (AGL):	165 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):	2,443.03	ERP (W):	2,443.03	ERP (W):	2,443.03
Antenna A3 MPE%	**0.82**	Antenna B3 MPE%	**0.82**	Antenna C3 MPE%	**0.82**

Site Composite MPE%	
Carrier	**MPE%**
T-Mobile (Per Sector Max)	**2.46 %**
Sigfox	**0.03** %
Verizon Wireless	**4.98** %
Clearwire	**0.12** %
Sprint	**2.48** %
AT&T	**1.75** %
Site Total MPE %:	**11.82 %**

T-Mobile Sector A Total:	2.46 %
T-Mobile Sector B Total:	2.46 %
T-Mobile Sector C Total:	2.46 %
Site Total:	11.82 %

T-Mobile Maximum MPE 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 LTE	2	1,556.18	165	4.43	PCS - 1900 MHz	1000.00	0.44%
T-Mobile AWS - 2100 MHz LTE	2	2,334.27	165	6.65	AWS - 2100 MHz	1000.00	0.67%
T-Mobile PCS - 1900 MHz GSM	1	583.57	165	0.85	PCS - 1900 MHz	1000.00	0.09%
T-Mobile PCS - 1900 MHz UMTS	1	1,556.18	165	2.21	PCS - 1900 MHz	1000.00	0.22%
T-Mobile AWS - 2100 MHz UMTS	1	1,556.18	165	2.21	AWS - 2100 MHz	1000.00	0.22%
T-Mobile 600 MHz LTE	2	788.97	165	2.24	600 MHz	400.00	0.56%
T-Mobile 700 MHz LTE	2	432.54	165	1.23	700 MHz	467.00	0.26%
						Total:	**2.46%**

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:	2.46 %
Sector B:	2.46 %
Sector C:	2.46 %
T-Mobile Maximum MPE % (Per Sector):	2.46 %
Site Total:	11.82 %
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **11.82%** 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.