INDUSTRIAL AVE,
ITE 3
AHWAH NJ 07430

ONE: 201.684.0055
X: 201.684.0066

Transcend Wireless

August 12, 2021

Members of the Siting Council
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

RE: Notice of Exempt Modification
7 Hoskins Road, Bloomfield, CT 06002
Latitude: 41.533422
Longitude: -72.4555.82
T-Mobile Site#: CTHA142G - Anchor

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 140' level of the 185' self-support tower located at 7 Hoskins Road, Bloomfield, CT. The self-support tower is owned by CL&P d/b/a Eversource. The property which holds the utility easement is owned by CL&P d/b/a Eversource. T-Mobile now intends to remove nine (9) antennas and replace them with (9) three (3) antennas and replace them with (6) L600/L700/N600/L2100/N2500 antennas. The new antennas support 5G services and will be installed at the 96' level of the self support tower with a new mount.

Planned Modifications:
Tower:
Install New:
(3) APX16DWV-16DWV-S-E-A20 Antennas
(3) APXVAALL24 43-U-NA20 Antennas
(3) Ericsson AIR6449 B41 Antennas
(3) Radio 4449 B71/B85
(3) Radio 4460 B25+B66

Existing to Remain:
(3) 6x24 Hybrid Cables

To Be Removed:
(6) RFS-APXV18-206516S-C-A20 Antennas

(3) Andrew LNX-6515DS-A1M Antennas
(3) Radio 2217 B66A
(3) RRUS11 BA12

Ground Work:
Install (1) Power Enclosure 6160 and (1) Battery Cabinet B160

This tower was originally approved by the Connecticut Siting Council on May 6, 1993 in Do. 158. Documentation on the original approval of the tower is enclosed with the submission. The proposed modification complies with all previous approvals.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Mayor Suzette Debeatham-Brown, Elected Official, and Jose Giner, Director of Planning and Zoning, as well as the property and tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S;A. § 16-50j-72(b)(2).

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

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

3. The proposed modifications 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 Communications Commission safety standard.

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

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

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

Sincerely,

Eric Breun
Transcend Wireless
Cell: 201-658-7728
Email: ebreun@transcendwireless.com

Attachments
cc: Suzette DeBeatham-Brown - Mayor of Bloomfield
Jose Giner - Director of Planning and Zoning
CL&P / Eversource- Property Owner

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
DIRECTOR OF PLANNING AND ZONING
JOSE GINER
800 BLOOMFIELD AVENUE
BLOOMFIELD CT 06002

CT 060 9-02

UPS GROUND

TRACKING #: 1Z V25 742 03 9530 5049

BILLING: P/P

Reference #1: CTHA142G

XOL 21.07.05 NV45 31.0A 07/2021*

ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430

1 LBS

1 OF 1

SHIP TO:
MAYOR SUZETTE DEBEATHAM-BROWN
800 BLOOMFIELD AVENUE
BLOOMFIELD CT 06002

CT 060 9-02

UPS GROUND

TRACKING #: 1Z V25 742 03 9521 5039

BILLING: P/P

Reference #1: CTHA142G

XOL 21.07.05 NV45 31.0A 07/2021*


ERIC BREUN
2016587728
10 INDUSTRIAL AVE
MAHWAH NJ 07430
1 LBS
1 OF 1
SHIP TO:
EVERSOURCE
CHRISTOPHER GELINAS
107 SELDEN STREET
BERLIN CT 06037
CT 061 9-02
UPS GROUND
TRACKING #: 1Z V25 742 03 9541 5055
BILLING: P/P
Reference #1: CTHA142G
XOL 21.07.05 NV45 31.0A 07/2021*
TM

Hello, your package has been delivered.

Delivery Date: Tuesday, 08/10/2021
Delivery Time: 11:11 AM
Left At: DOCK
Signed by: HJJ

TRANSCEND WIRELESS

Tracking Number:	1ZV257420395415055
Ship To:	CHRISTOPHER GELINAS 107 SELDEN STREET BERLIN, CT 06037 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA142G

Hello, your package has been delivered.

Delivery Date: Tuesday, 08/10/2021
Delivery Time: 9:53 AM
Left At: RECEIVER
Signed by: TEUBNER

TRANSCEND WIRELESS

Tracking Number:	1ZV257420395305049
Ship To:	JOSE GINER 800 BLOOMFIELD AVENUE BLOOMFIELD, CT 06002 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA142G

Hello, your package has been delivered.

Delivery Date: Tuesday, 08/10/2021

Delivery Time: 9:53 AM

Left At: RECEIVER

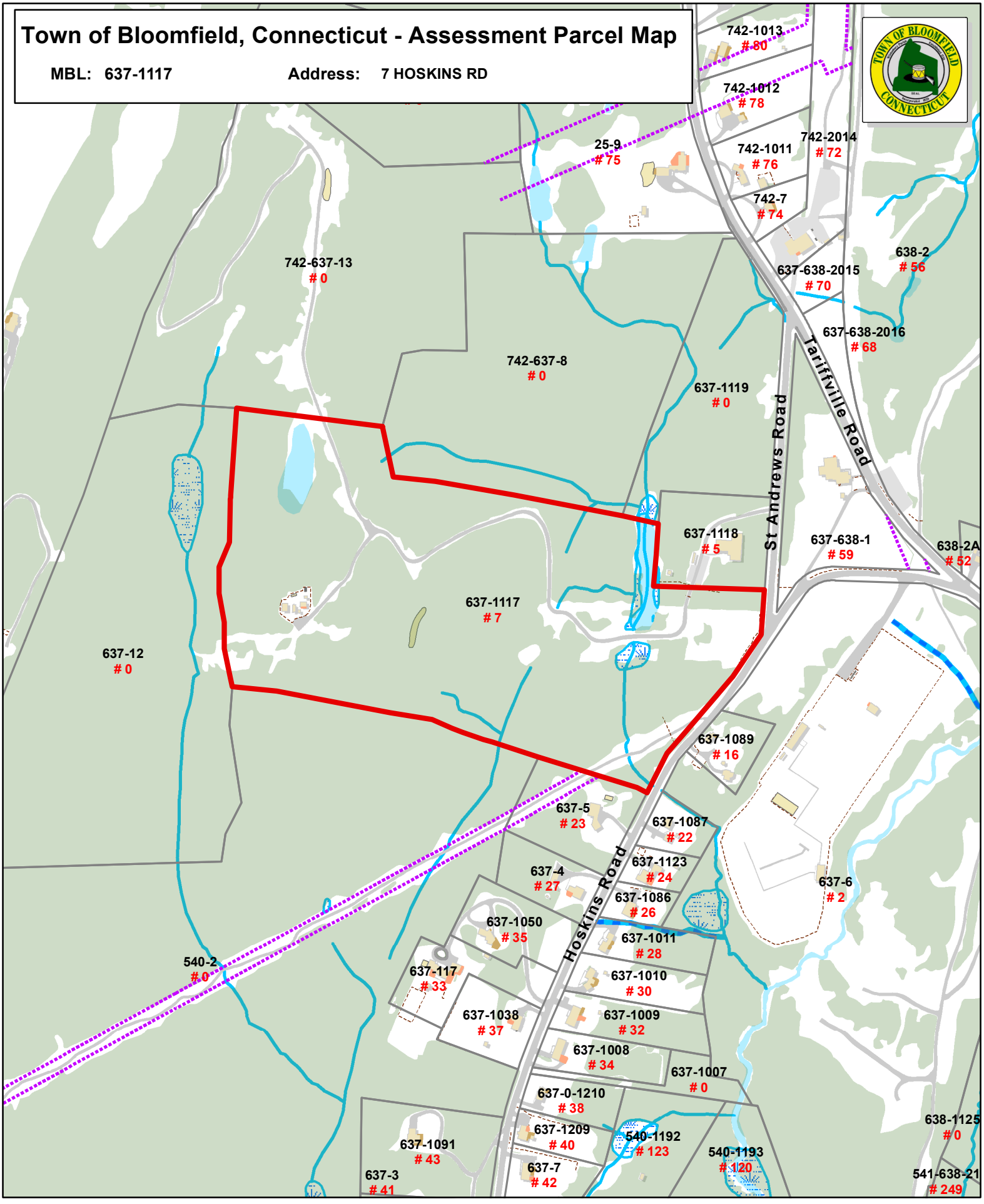
Signed by: TEUBNER

TRANSCEND WIRELESS

Tracking Number:	1ZV257420395215039
Ship To:	MAYOR SUZETTE DEBEATHAM-BROWN 800 BLOOMFIELD AVENUE BLOOMFIELD, CT 06002 US
Number of Packages:	1
UPS Service:	UPS Ground
Package Weight:	1.0 LBS
Reference Number:	CTHA142G

Town of Bloomfield, Connecticut - Assessment Parcel Map

MBL: 637-1117 **Address:** 7 HOSKINS RD



Approximate Scale:

1 inch = 450 feet

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

Map Produced October 2019

Parcels labeled by Unique ID

Town of Bloomfield, CT

Property Listing Report

Map Block Lot	637-1117	Building #	1	PID	8110	Account	R93240

Property Information

Property Location	7 HOSKINS RD
Owner	CONN LIGHT & POWER CO
Co-Owner	ATTN: PROPERTY TAX DEPT
Mailing Address	P O BOX 270 HARTFORD CT 06141
Land Use	201 Comm Land
Land Class	C
Zoning Code	R-80
Census Tract	0000

Site Index	4
Acreage	38.33
Utilities	
Lot Setting/Desc	
Fire District	C
Book / Page	0292/0097

Photo

Sketch

Primary Construction Details

Year Built	1962
Building Desc.	Vacant with OutBldg
Building Style	UNKNOWN
Building Grade	
Stories	
Occupancy	
Exterior Walls	
Exterior Walls 2	NA
Roof Style	
Roof Cover	
Interior Walls	
Interior Walls 2	NA
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	NA
Bsmt Fin Area	0
Rec Rm Area	0
Bsmt Gar	0
Fireplaces	0

(*Industrial / Commercial Details)

Building Use	Vacant
Building Condition	A
Sprinkler %	NA
Heat / AC	NA
Frame Type	NA
Baths / Plumbing	NA
Ceiling / Wall	NA
Rooms / Prtns	NA
Wall Height	NA
First Floor Use	NA
Foundation	POURED CONC.

Report Created On 8/5/2021

Town of Bloomfield, CT

Property Listing Report

Map Block Lot	637-1117	Building #	1	PID	8110	Account	R93240

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	0	0
Extras	0	0
Improvements		
Outbuildings	883200	618240
Land	540800	300830
Total	1424000	919070

Outbuilding and Extra Features

Type	Description
Cell Shed	480 S.F.
Cell Shed	120 S.F.
Cell Tower	4 UNITS

Sub Areas

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

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CONN LIGHT & POWER CO	0292/0097	1900-01-01	0

Report Created On 8/5/2021

ORIGINAL

DOCKET NO. 158 - An application of Springwich Cellular Limited Partnership for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications tower and associated equipment for a proposed site located approximately 0.3 miles west of Hoskins Road, near the intersection of Andrews Road, Bloomfield, Connecticut. : Connecticut : Siting : Council : May 6, 1993

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a cellular telecommunications tower at the proposed site in Bloomfield, Connecticut, including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need as provided by section 16-50k of the Connecticut General Statutes (CGS), be issued to Springwich Cellular Limited Partnership (Springwich), for the construction, operation, and maintenance of a cellular telecommunications tower at the proposed site off Hoskins Road in Bloomfield, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The self-supporting lattice tower shall be no taller than necessary to provide the proposed communications service and in no event shall the tower exceed a total height of 183 feet above ground level with antennas and appurtenances.

2. Prior to the commencement of construction, the Certificate holder shall prepare a Development and Management (D&M) Plan for this site in compliance with sections 16-50j-75 through 16-50j-77 of the Regulations of State Agencies. The D&M Plan shall include detailed plans for the tower, tower foundation, and tower lighting; locations of all antennas to be attached to this tower; location of the security fence; detailed plans for site clearing; and detailed plans for erosion and sediment control. The D&M Plan shall be submitted to the Council for approval prior to the commencement of tower construction.

3. The Certificate holder shall request the tower owner for an engineering analysis of the existing 100-foot repeater tower on Talcott Mountain ridge to determine if the antennas on the repeater tower can be satisfactorily transferred to the new tower and the repeater tower removed. Any such engineering analysis shall be provided to the Council for its review and acceptance prior to the commencement of tower construction.

4. The Certificate holder shall comply with any existing and future radio frequency (RF) standard promulgated by State or federal regulatory agencies. Upon the establishment of any new governmental RF standards, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate holder shall provide the Council a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels originally calculated and provided in the application.

6. The Certificate holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing.

7. If the facility does not initially provide, or permanently ceases to provide cellular or other services following completion of construction, this Decision and Order shall be void, and the tower and all associated equipment shall be dismantled and removed or re-application for any continued or new use shall be made to the Council before any such use is made.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if all construction authorized herein is not completed within three years of the effective date of this Decision and Order or within three years after all appeals to this Decision and Order have been resolved.

Pursuant to CGS section 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in the Hartford Courant.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with section 16-50j-17 of the Regulations of State Agencies.

The party to this proceeding is:

PARTY

Springwich Cellular
Limited Partnership

ITS REPRESENTATIVE

Peter J. Tyrrell
Senior Attorney
Springwich Cellular
Limited Partnership
227 Church Street-Room 1021
New Haven, CT 06506

6930E

CERTIFICATION

The undersigned members of the Connecticut Siting Council (Council) hereby certify that they have heard this case, or read the record thereof, in Docket No. 158, and voted as follows to approve the application of Springwich Cellular Limited Partnership for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance, and operation of a cellular telecommunications tower and associated equipment for a proposed site located approximately 0.3 miles west of Hoskins Road, near the intersection of Andrews Road, Bloomfield, Connecticut:

Council Members	Vote Cast
Mortimer A. Gelston Chairman	YES
Commissioner Clifton A. Leonhardt Designee: Gerald J. Heffernan	YES
Commissioner Timothy R.E. Keeney Designee: Brian Emerick	YES
Harry E. Covey	ABSENT
Daniel P. Lynch, Jr.	YES
Gloria Dibble Pond	YES
Paulann H. Sheets	ABSENT
Colin C. Tait	YES
Dana J. Wright	YES

Dated at New Britain, Connecticut, May 6, 1993.

6902E-2

SITE NAME: CTHA142
SITE ID: CTHA142G
7 HOSKINS RD
BLOOMFIELD, CT 06002

T-MOBILE A&L TEMPLATE (PROVIDED BY RFDS)
67D5998E_1xAIR+1OP+1QP

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67D5A998E HYBRID

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA–222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS IN THE CONTRACT DOCUMENT SET. CONTRACTOR SHALL COORDINATE ALL WORK SHOWN IN THE SET OF DRAWINGS. THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF DRAWINGS TO ALL SUBCONTRACTORS AND ALL RELATED PARTIES. THE SUBCONTRACTORS SHALL EXAMINE ALL THE DRAWINGS AND SPECIFICATIONS FOR THE INFORMATION THAT AFFECTS THEIR WORK.
3. CONTRACTOR SHALL PROVIDE A COMPLETE BUILD–OUT WITH ALL FINISHES, STRUCTURAL, MECHANICAL, AND ELECTRICAL COMPONENTS AND PROVIDE ALL ITEMS AS SHOWN OR INDICATED ON THE DRAWINGS OR IN THE WRITTEN SPECIFICATIONS.
4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTON, PLUMBING, ELECTRICAL, AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS–BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT, AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND ITS COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND 'MISSED' ITEMS ARE TO BE BROUGHT TO THE ATTENTION OF THE T–MOBILE CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON–SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUITS AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1–800–922–4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
19. CONTRACTOR SHALL COMPLY WITH THE OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.

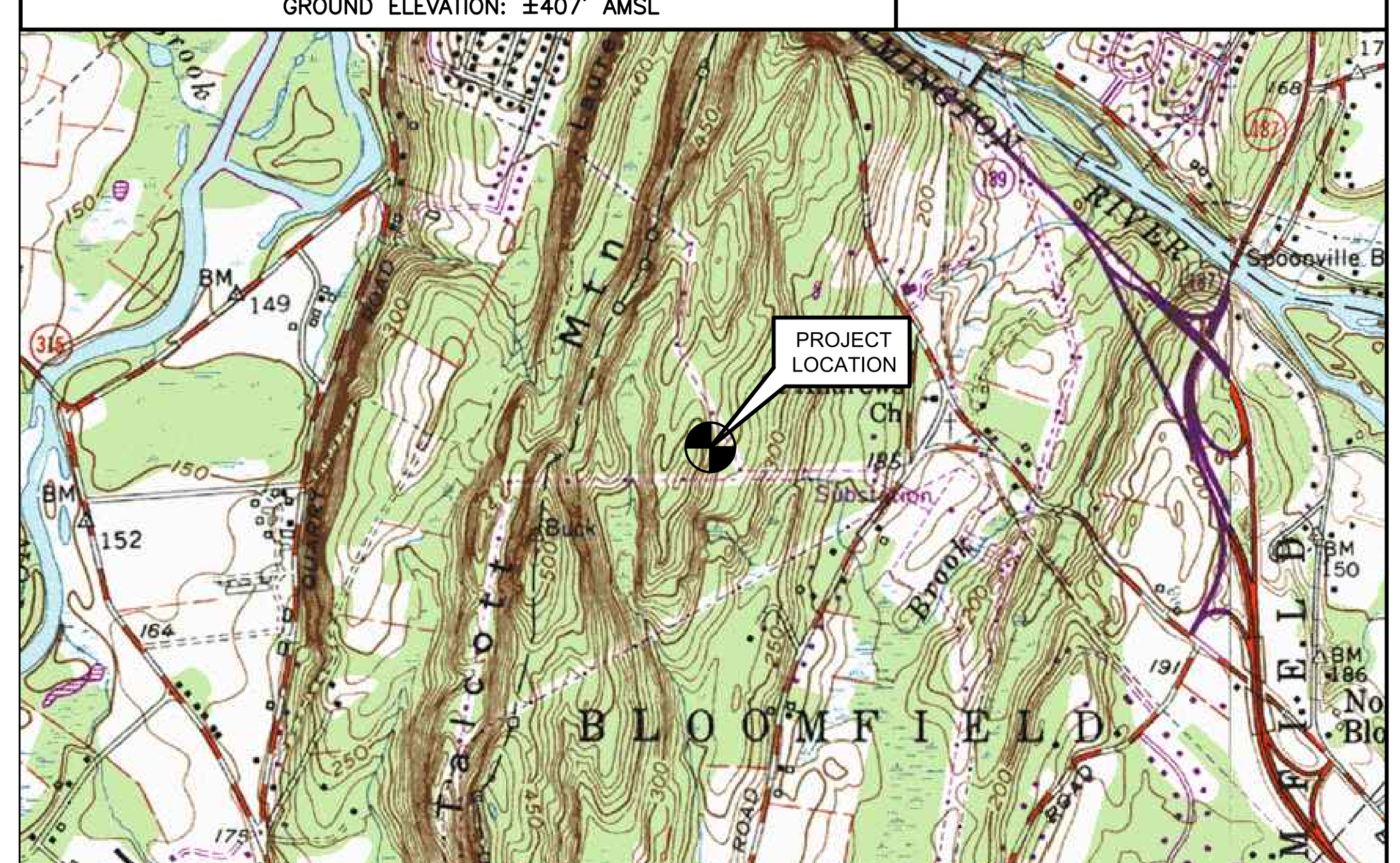
SITE DIRECTIONS

FROM: 35 GRIFFIN ROAD SOUTH, BLOOMFIELD, CT 06002
TO: 7 HOSKINS RD, BLOOMFIELD, CT 06002

1. HEAD WEST ON GRIFFIN ROAD TOWARD TARIFFVILLE RD. — 0.18 MI.
2. TURN RIGHT ONTO TARIFFVILLE RD. — 0.69 MI.
3. TURN SLIGHT LEFT ONTO HOSKINS RD. — 0.56 MI.
4. 7 HOSKINS RD, BLOOMFIELD, CT 06002

SITE COORDINATES: LATITUDE: 41° 53' 34.22" N
LONGITUDE: 72° 45' 55.82" W
GROUND ELEVATION: ±407' AMSL

COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH



VICINITY MAP

NORTH

PROJECT SUMMARY

THE PROPOSED SCOPE OF WORK CONSISTS OF A MODIFICATION TO THE EXISTING UNMANNED TELECOMMUNICATIONS FACILITY INCLUDING THE FOLLOWING:

1. REMOVE EXISTING RFS–APXV18–206516S–C–A20 ANTENNA, TYP. (2) PER SECTOR. TOTAL (6)
2. REMOVE EXISTING ANDREW–LNX–6515DS–A1M ANTENNA, TYP. (1) PER SECTOR. TOTAL (3)
3. REMOVE EXISTING RADIO 2217 B66A, TYP. (1) PER SECTOR. TOTAL (3)
4. REMOVE EXISTING RRUS11 BA12, TYP. (1) PER SECTOR. TOTAL (3)
5. INSTALL (1) ERICSSON AIR6449 B41 ANTENNA. TYP. (1) PER SECTOR. TOTAL (3)
6. INSTALL (1) APXV16DWV–16DWV–S–E–A20 ANTENNA. TYP. (1) PER SECTOR. TOTAL (3)
7. INSTALL (1) APXVAALL24_43–U–NA20 ANTENNA. TYP. (1) PER SECTOR. TOTAL (3)
8. INSTALL (1) T–MOBILE POWER ENCLOSURE 6160
9. INSTALL (1) T–MOBILE BATTERY CABINET B160

PROJECT INFORMATION

SITE NAME:	CTHA142
SITE ID:	CTHA142G
SITE ADDRESS:	7 HOSKINS RD BLOOMFIELD, CT 06002
APPLICANT:	T–MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
CONTACT PERSON:	DAN REID (PROJECT MANAGER) TRANSCEND WIRELESS, LLC (203) 592–8291
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63–2 NORTH BRANFORD RD. BRANFORD, CT 06405 CARLO F. CENTORE, PE (203) 488–0580 EXT. 122
PROJECT COORDINATES:	LATITUDE: 41° 53' 34.22" N LONGITUDE: 72° 45' 55.82" W GROUND ELEVATION: ±407' AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHT. NO.	DESCRIPTION	REV.
T–1	TITLE SHEET	0
N–1	GENERAL NOTES AND SPECIFICATIONS	0
C–1	SITE LOCATION PLAN	0
C–2	COMPOUND PLAN, EQUIPMENT PLAN, AND ELEVATION	0
C–3	ANTENNA PLANS	0
C–4	ANTENNA ELEVATIONS	0
C–5	TYPICAL EQUIPMENT DETAILS	0
E–1	CONDUIT ROUTING AND ELECTRICAL RISER DIAGRAM	0
E–2	TYPICAL ELECTRICAL DETAILS	0
E–3	ELECTRICAL SPECIFICATIONS	0

REV.	DATE	DRAWN BY	CHK'D BY	DESCRIPTION
0	08/03/21	RTS	TJR	CONSTRUCTION DRAWINGS – ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

Transcend Wireless

CENTEK engineering
Centered on Solutions℠
(203) 488-0580
(203) 488-8587 Fax
63-2 North Branford Road
Branford, CT 06405
www.CentekEng.com

T–MOBILE NORTHEAST LLC
SITE NAME: CTHA142
SITE ID: CTHA142G
7 HOSKINS RD
BLOOMFIELD, CT 06002

DATE:	06/23/21
SCALE:	AS NOTED
JOB NO.	21022.20

TITLE SHEET

T–1

NOTES AND SPECIFICATIONS

DESIGN BASIS:

GOVERNING CODE: 2015 INTERNATIONAL BUILDING (IBC) AS MODIFIED BY THE 2018 CONNECTICUT STATE BUILDING CODE.

1. DESIGN CRITERIA:

- RISK CATEGORY II (BASED ON IBC TABLE 1604.5)
- NOMINAL DESIGN SPEED (OTHER STRUCTURE): 97 MPH (Vasd) (EXPOSURE B/ IMPORTANCE FACTOR 1.0 BASED ON ASCE 7-10).

SITE NOTES

1. THE CONTRACTOR SHALL CALL UTILITIES PRIOR TO THE START OF CONSTRUCTION.
2. ACTIVE EXISTING UTILITIES, WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES. THE ENGINEER SHALL BE NOTIFIED IMMEDIATELY, PRIOR TO PROCEEDING, SHOULD ANY UNCOVERED EXISTING UTILITY PRECLUDE COMPLETION OF THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
3. THE AREAS OF THE COMPOUND DISTURBED BY THE WORK SHALL BE RETURNED TO THEIR ORIGINAL CONDITION.
4. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
5. IF ANY FIELD CONDITIONS EXIST WHICH PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL PROCEED WITH AFFECTED WORK AFTER CONFLICT IS SATISFACTORILY RESOLVED.

GENERAL NOTES

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
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4. CONTRACTOR SHALL FURNISH ALL MATERIAL, LABOR AND EQUIPMENT TO COMPLETE THE WORK AND FURNISH A COMPLETED JOB ALL IN ACCORDANCE WITH LOCAL AND STATE GOVERNING AUTHORITIES AND OTHER AUTHORITIES HAVING LAWFUL JURISDICTION OVER THE WORK.
5. CONTRACTOR SHALL SECURE AND PAY FOR ALL PERMITS AND ALL INSPECTIONS REQUIRED AND SHALL ALSO PAY FEES REQUIRED FOR THE GENERAL CONSTRUCTION, PLUMBING, ELECTRICAL AND HVAC. PERMITS SHALL BE PAID FOR BY THE RESPECTIVE SUBCONTRACTORS.
6. CONTRACTOR SHALL MAINTAIN A CURRENT SET OF DRAWINGS AND SPECIFICATIONS ON SITE AT ALL TIMES AND INSURE DISTRIBUTION OF NEW DRAWINGS TO SUBCONTRACTORS AND OTHER RELEVANT PARTIES AS SOON AS THEY ARE MADE AVAILABLE. ALL OLD DRAWINGS SHALL BE MARKED VOID AND REMOVED FROM THE CONTRACT AREA. THE CONTRACTOR SHALL FURNISH AN 'AS-BUILT' SET OF DRAWINGS TO OWNER UPON COMPLETION OF PROJECT.
7. LOCATION OF EQUIPMENT AND WORK SUPPLIED BY OTHERS THAT IS DIAGRAMMATICALLY INDICATED ON THE DRAWINGS, SHALL BE DETERMINED BY THE CONTRACTOR. THE CONTRACTOR SHALL DETERMINE LOCATIONS AND DIMENSIONS SUBJECT TO STRUCTURAL CONDITIONS AND WORK OF THE SUBCONTRACTORS.
8. THE CONTRACTOR IS SOLELY RESPONSIBLE TO DETERMINE CONSTRUCTION PROCEDURE AND SEQUENCE, AND TO ENSURE THE SAFETY OF THE EXISTING STRUCTURES AND IT'S COMPONENT PARTS DURING CONSTRUCTION. THIS INCLUDES THE ADDITION OF WHATEVER SHORING, BRACING, UNDERPINNING, ETC. THAT MAY BE NECESSARY.
9. DRAWINGS INDICATE THE MINIMUM STANDARDS, BUT IF ANY WORK SHOULD BE INDICATED TO BE SUBSTANDARD TO ANY ORDINANCES, LAWS, CODES, RULES, OR REGULATIONS BEARING ON THE WORK, THE CONTRACTOR SHALL INCLUDE IN HIS WORK AND SHALL EXECUTE THE WORK CORRECTLY IN ACCORDANCE WITH SUCH ORDINANCES, LAWS, CODES, RULES OR REGULATIONS WITH NO INCREASE IN COSTS.
10. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
11. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUBCONTRACTORS FOR ANY CONDITION PER MFR.'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
12. ANY AND ALL ERRORS, DISCREPANCIES, AND "MISSED" ITEMS, ARE TO BE BROUGHT TO THE ATTENTION OF THE SITE OWNER'S CONSTRUCTION MANAGER DURING THE BIDDING PROCESS BY THE CONTRACTOR. ALL THESE ITEMS ARE TO BE INCLUDED IN THE BID. NO 'EXTRA' WILL BE ALLOWED FOR MISSED ITEMS.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL ON-SITE SAFETY FROM THE TIME THE JOB IS AWARDED UNTIL ALL WORK IS COMPLETE AND ACCEPTED BY THE OWNER.
14. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE CONSTRUCTION MANAGER FOR REVIEW.
15. THE CONTRACTOR SHALL FIELD VERIFY ALL DIMENSIONS, ELEVATIONS, ANGLES, AND EXISTING CONDITIONS AT THE SITE, PRIOR TO FABRICATION AND/OR INSTALLATION OF ANY WORK IN THE CONTRACT AREA.
16. COORDINATION, LAYOUT, FURNISHING AND INSTALLATION OF CONDUIT AND ALL APPURTENANCES REQUIRED FOR PROPER INSTALLATION OF ELECTRICAL AND TELECOMMUNICATION SERVICE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
17. ALL DAMAGE CAUSED TO ANY EXISTING STRUCTURE SHALL BE THE SOLE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR WILL BE HELD LIABLE FOR ALL REPAIRS REQUIRED FOR EXISTING STRUCTURES IF DAMAGED DURING CONSTRUCTION ACTIVITIES.
18. THE CONTRACTOR SHALL CONTACT 'CALL BEFORE YOU DIG' AT LEAST 48 HOURS PRIOR TO ANY EXCAVATIONS AT 1-800-922-4455. ALL UTILITIES SHALL BE IDENTIFIED AND CLEARLY MARKED. CONTRACTOR SHALL MAINTAIN AND PROTECT MARKED UTILITIES THROUGHOUT PROJECT COMPLETION.
18. CONTRACTOR SHALL COMPLY WITH OWNER'S ENVIRONMENTAL ENGINEER ON ALL METHODS AND PROVISIONS FOR ALL EXCAVATION ACTIVITIES INCLUDING SOIL DISPOSAL. ALL BACKFILL MATERIALS TO BE PROVIDED BY THE CONTRACTOR.
19. THE COUNTY/CITY/TOWN WILL MAKE PERIODIC FIELD OBSERVATION AND INSPECTIONS TO MONITOR THE INSTALLATION, MATERIALS, WORKMANSHIP AND EQUIPMENT INCORPORATED INTO THE PROJECT TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, CONTRACT DOCUMENTS AND APPROVED SHOP DRAWINGS.
20. THE COUNTY/CITY/TOWN MUST BE NOTIFIED (2) WORKING DAYS PRIOR TO CONCEALMENT/BURIAL OF ANY SYSTEM OR MATERIAL THAT WILL PREVENT THE DIRECT INSPECTION OF MATERIALS, METHODS OR WORKMANSHIP. EXAMPLES OF THESE PROCESSES ARE BACKFILLING A GROUND RING OR TOWER FOUNDATION, POURING TOWER FOUNDATIONS, BURYING GROUND RODS, PLATES OR GRIDS, ETC. THE CONTRACTOR MAY PROCEED WITH THE SCHEDULED PROCESS (2) WORKING DAYS AFTER PROVIDING NOTICE UNLESS NOTIFIED OTHERWISE BY THE COUNTY/CITY/TOWN.

STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL IS DESIGNED BY ALLOWABLE STRESS DESIGN (ASD)

   A. STRUCTURAL STEEL (W SHAPES)---ASTM A992 (FY = 50 KSI)
   B. STRUCTURAL STEEL (OTHER SHAPES)---ASTM A36 (FY = 36 KSI)
   C. STRUCTURAL HSS (RECTANGULAR SHAPES)---ASTM A500 GRADE B, (FY = 46 KSI)
   D. STRUCTURAL HSS (ROUND SHAPES)---ASTM A500 GRADE B, (FY = 42 KSI)
   E. PIPE---ASTM A53 (FY = 35 KSI)
   F. CONNECTION BOLTS---ASTM A325-N
   G. U-BOLTS---ASTM A36
   H. ANCHOR RODS----ASTM F 1554
   I. WELDING ELECTRODE---ASTM E 70XX

2. CONTRACTOR TO REVIEW ALL SHOP DRAWINGS AND SUBMIT COPY TO ENGINEER FOR APPROVAL. DRAWINGS MUST BEAR THE CHECKER'S INITIALS BEFORE SUBMITTING TO THE ENGINEER FOR REVIEW. SHOP DRAWINGS SHALL INCLUDE THE FOLLOWING: SECTION PROFILES, SIZES, CONNECTION ATTACHMENTS, REINFORCING, ANCHORAGE, SIZE AND TYPE OF FASTENERS AND ACCESSORIES. INCLUDE ERECTION DRAWINGS, ELEVATIONS AND DETAILS.
3. STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST PROVISIONS OF AISC MANUAL OF STEEL CONSTRUCTION.
4. PROVIDE ALL PLATES, CLIP ANGLES, CLOSURE PIECES, STRAP ANCHORS, MISCELLANEOUS PIECES AND HOLES REQUIRED TO COMPLETE THE STRUCTURE.
5. FIT AND SHOP ASSEMBLE FABRICATIONS IN THE LARGEST PRACTICAL SECTIONS FOR DELIVERY TO SITE.
6. INSTALL FABRICATIONS PLUMB AND LEVEL, ACCURATELY FITTED, AND FREE FROM DISTORTIONS OR DEFECTS.
7. AFTER ERECTION OF STRUCTURES, TOUCHUP ALL WELDS, ABRASIONS AND NON-GALVANIZED SURFACES WITH A 95% ORGANIC ZINC RICH PAINT IN ACCORDANCE WITH ASTM 780.
8. ALL STEEL MATERIAL (EXPOSED TO WEATHER) SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT DIPPED GALVANIZED) COATINGS" ON IRONS AND STEEL PRODUCTS.
9. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC COATING (HOT-DIP) ON IRON AND STEEL HARDWARE".
10. THE ENGINEER SHALL BE NOTIFIED OF ANY INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON CONFORMING MATERIALS OR CONDITIONS TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER REVIEW.
11. CONNECTION ANGLES SHALL HAVE A MINIMUM THICKNESS OF 1/4 INCHES.
12. STRUCTURAL CONNECTION BOLTS SHALL CONFORM TO ASTM A325. ALL BOLTS SHALL BE 3/4" DIAMETER MINIMUM AND SHALL HAVE A MINIMUM OF TWO BOLTS, UNLESS OTHERWISE ON THE DRAWINGS.
13. LOCK WASHER ARE NOT PERMITTED FOR A325 STEEL ASSEMBLIES.
14. SHOP CONNECTIONS SHALL BE WELDED OR HIGH STRENGTH BOLTED.
15. MILL BEARING ENDS OF COLUMNS, STIFFENERS, AND OTHER BEARING SURFACES TO TRANSFER LOAD OVER ENTIRE CROSS SECTION.
16. FABRICATE BEAMS WITH MILL CAMBER UP.
17. LEVEL AND PLUMB INDIVIDUAL MEMBERS OF THE STRUCTURE TO AN ACCURACY OF 1:500, BUT NOT TO EXCEED 1/4" IN THE FULL HEIGHT OF THE COLUMN.
18. COMMENCEMENT OF STRUCTURAL STEEL WORK WITHOUT NOTIFYING THE ENGINEER OF ANY DISCREPANCIES WILL BE CONSIDERED ACCEPTANCE OF PRECEDING WORK.
19. INSPECTION AND TESTING OF ALL WELDING AND HIGH STRENGTH BOLTING SHALL BE PERFORMED BY AN INDEPENDENT TESTING LABORATORY.
20. FOUR COPIES OF ALL INSPECTION TEST REPORTS SHALL BE SUBMITTED TO THE ENGINEER WITHIN TEN (10) WORKING DAYS OF THE DATE OF INSPECTION.

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T-MOBILE NORTHEAST LLC

SITE NAME: CTHA142
SITE ID: CTHA142G
7 HOSKINS RD
BLOOMFIELD, CT 06002

DATE: 06/23/21
SCALE: AS NOTED
JOB NO. 21022.20

GENERAL NOTES AND SPECIFICATIONS

N-1

NOTE:
ALL COAX LENGTHS TO BE MEASURED
AND VERIFIED IN FIELD BEFORE ORDERING

ANTENNA SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) EXISTING COAX
A1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	55.9 x 13 x 3.15	140'	20°	(P) RADIO 4460 B25+B66 (1)		(1) 6x24 HYBRID CABLE
A2	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	140'	20°	(P) RADIO 4449 B71+B85 (1)		
A3	PROPOSED	ERICSSON (AIR6449 B41)	33.1 x 20.6 x 8.6	140'	20°			
B1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	33.1 x 20.6 x 8.6	140'	130°	(P) RADIO 4460 B25+B66 (1)		(1) 6x24 HYBRID CABLE
B2	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	140'	130°	(P) RADIO 4449 B71+B85 (1)		
B3	PROPOSED	ERICSSON (AIR6449 B41)	55.9 x 13 x 3.15	140'	130°			
C1	PROPOSED	RFS (APX16DWV-16DWV-S-E-A20)	33.1 x 20.6 x 8.6	140'	280°	(P) RADIO 4460 B25+B66 (1)		(1) 6x24 HYBRID CABLE
C2	PROPOSED	RFS (APXVAALL24_43-U-NA20)	95.9 x 24 x 8.5	140'	280°			
C3	PROPOSED	ERICSSON (AIR6449 B41)	55.9 x 13 x 3.15	140'	280°	(P) RADIO 4449 B71+B85 (1)		

1 C-1 SITE LOCATION PLAN
SCALE: NOT TO SCALE

TRUE NORTH

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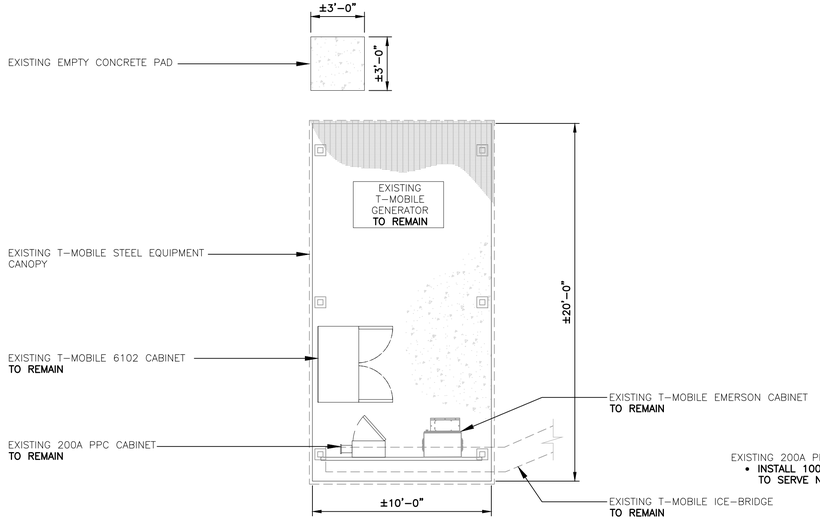
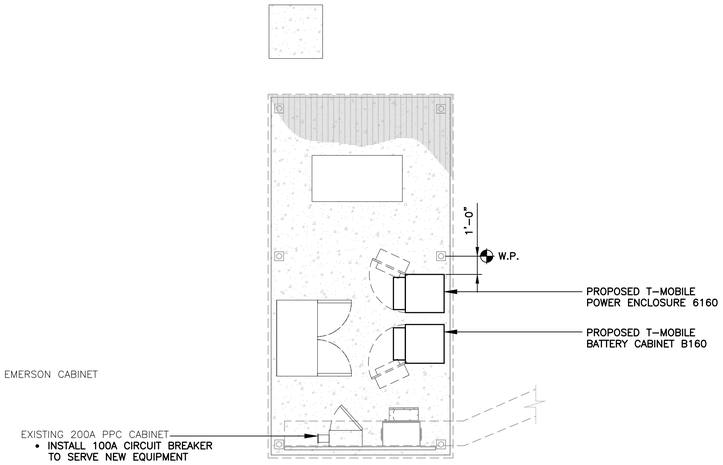
SITE LOCATION PLAN

C-1

Sheet No. 3 of 10



1 C-2 **EXISTING EQUIPMENT PLAN** TRUE NORTH
SCALE: 1/2" = 1'



2 C-2 **PROPOSED EQUIPMENT PLAN** TRUE NORTH
SCALE: 1/2" = 1'

STRUCTURAL COMPLIANCE

ANTENNA MOUNTS

A STRUCTURAL ANALYSIS OF THE ANTENNA MOUNTS WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING..

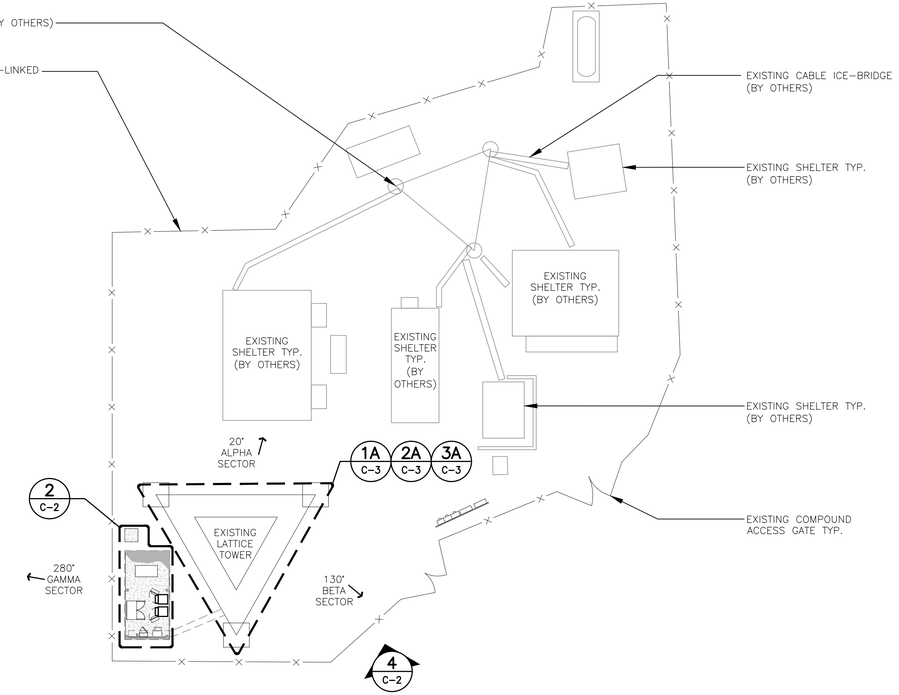
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.20) DATED 07/06/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

TOWER AND TOWER FOUNDATION

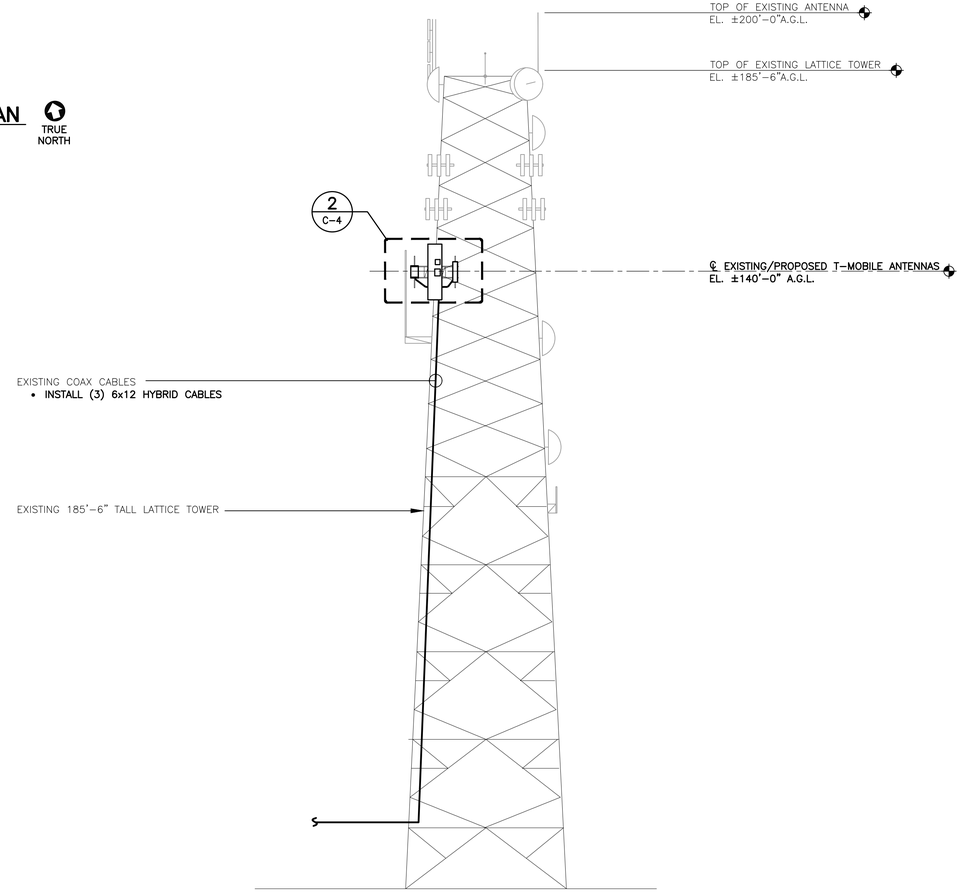
A STRUCTURAL ANALYSIS OF THE TOWER AND TOWER FOUNDATION WAS PERFORMED FOR THE PROPOSED EQUIPMENT INSTALLATION AND THEY WERE FOUND TO BE STRUCTURALLY SUFFICIENT TO ACCOMMODATE THE PROPOSED LOADING.

REFER TO THE STRUCTURAL ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 21022.20) DATED 07/08/21 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

NOTE: NO EQUIPMENT SHALL BE INSTALLED ON THE HOSTING STRUCTURE WITHOUT A PASSING STRUCTURAL ANALYSIS REPORT AND CONTRACTOR PRIOR CONFIRMATION THAT ANY AND ALL REQUISITE MODIFICATIONS HAVE BEEN COMPLETED.



3 C-2 **PROPOSED COMPOUND PLAN** TRUE NORTH
SCALE: 1/2" = 1'



4 C-2 **SOUTH ELEVATION - PROPOSED**
SCALE: 1" = 5'

GRAPHIC SCALE
5 0 2.5 5 10 20
1" = 5'-0"

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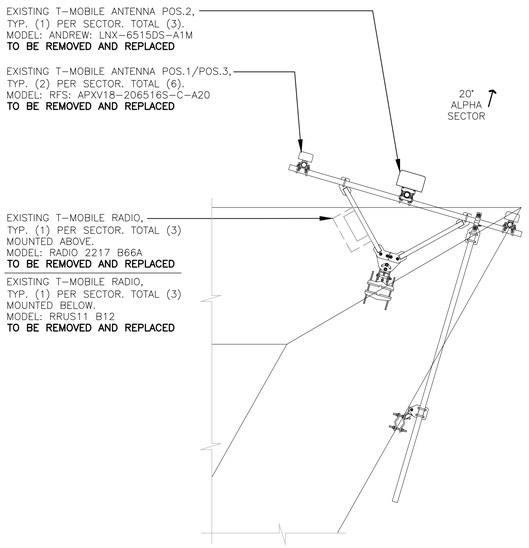
COMPOUND PLAN, EQUIPMENT PLAN, AND ELEVATION

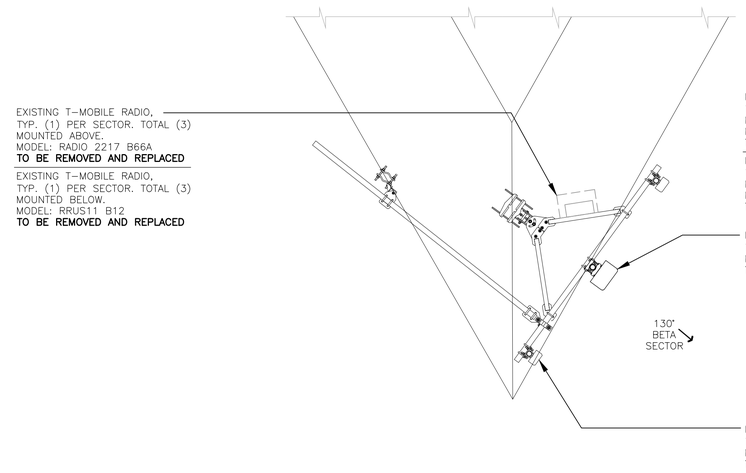
C-2

Sheet No. 4 of 10



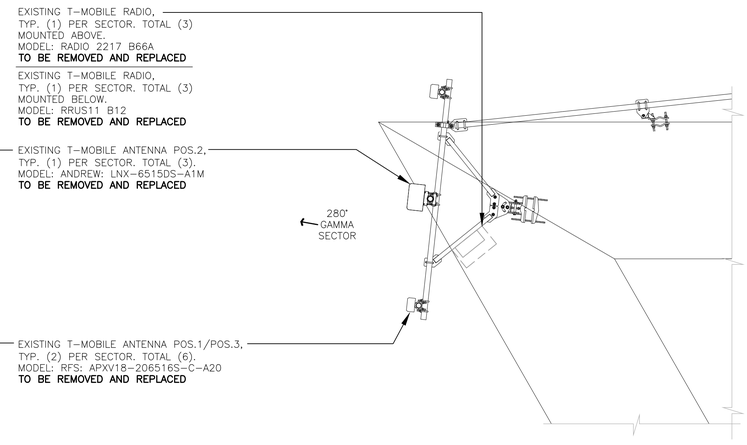
1 C-3 **EXISTING ANTENNA PLAN - ALPHA** TRUE NORTH

SCALE: 3/8" = 1'



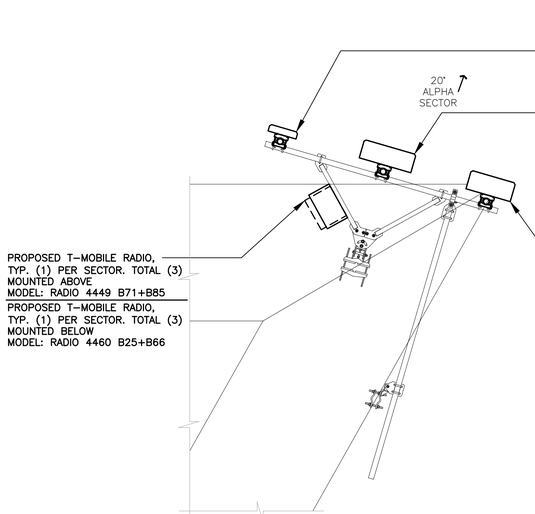
2 C-3 **EXISTING ANTENNA PLAN - BETA** TRUE NORTH

SCALE: 3/8" = 1'



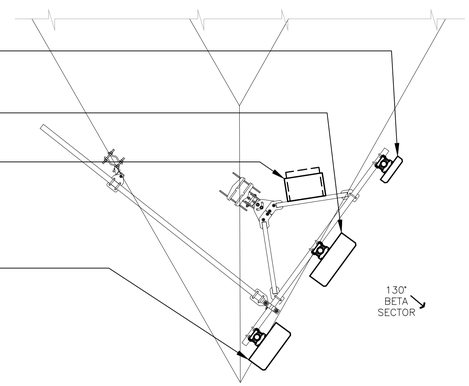
3 C-3 **EXISTING ANTENNA PLAN - GAMMA** TRUE NORTH

SCALE: 3/8" = 1'



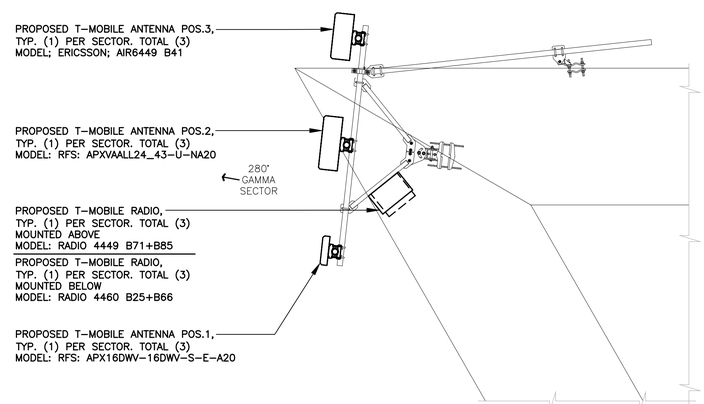
1A C-3 **PROPOSED ANTENNA PLAN - ALPHA** TRUE NORTH

SCALE: 3/8" = 1'



2A C-3 **PROPOSED ANTENNA PLAN - BETA** TRUE NORTH

SCALE: 3/8" = 1'



3A C-3 **PROPOSED ANTENNA PLAN - GAMMA** TRUE NORTH

SCALE: 3/8" = 1'

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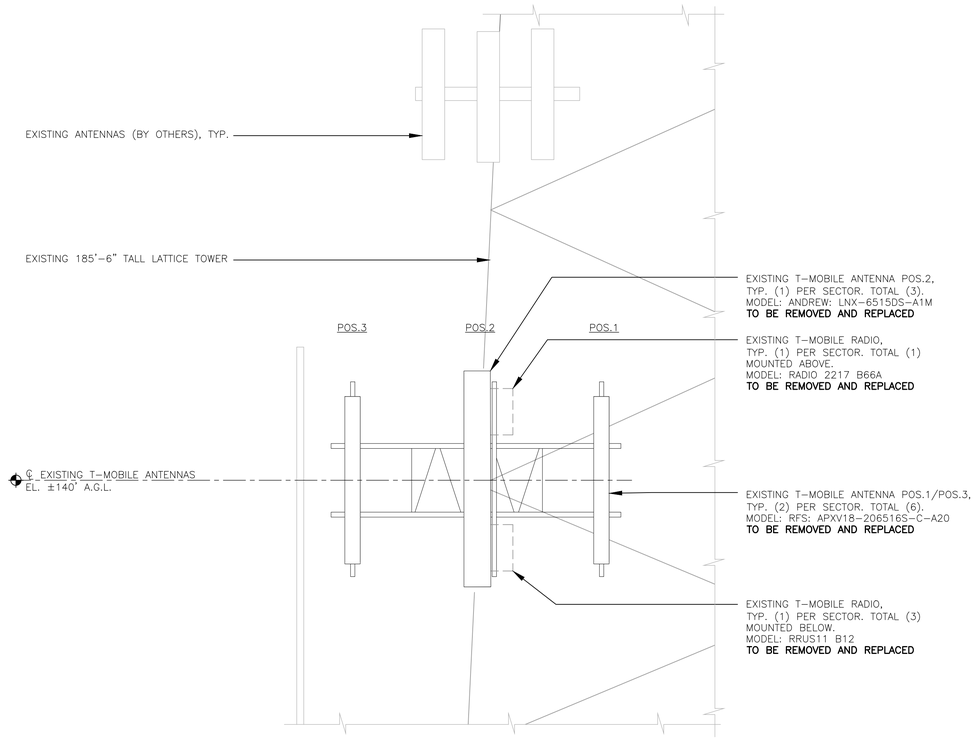
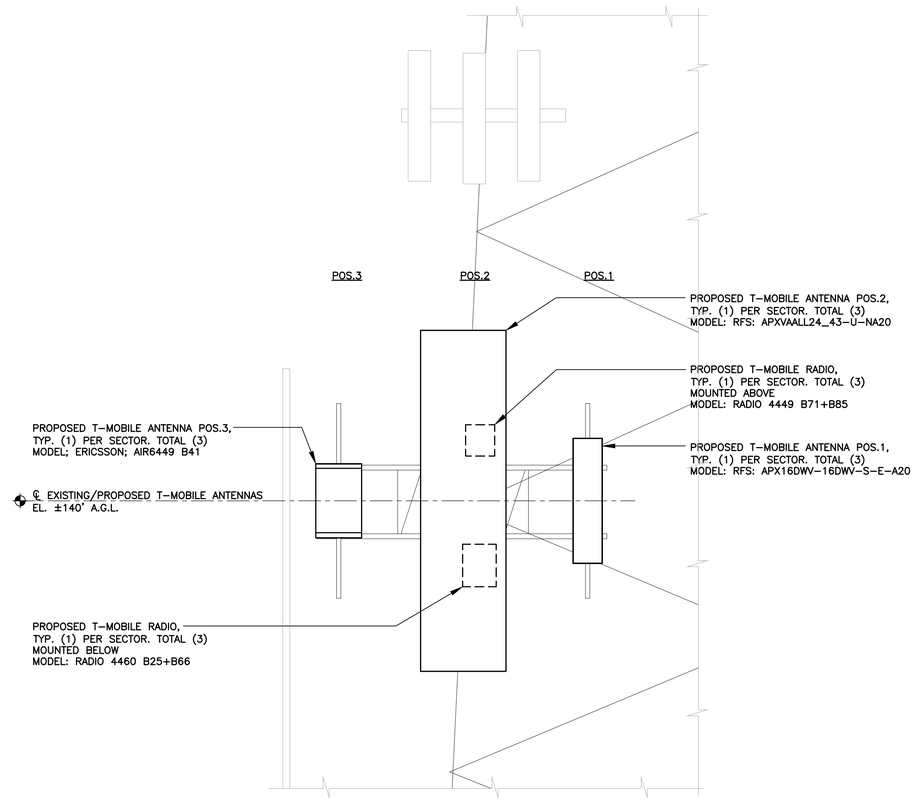
ANTENNA PLANS

C-3

Sheet No. 5 of 10



1 C-4 **ANTENNA ELEVATION - EXISTING**
SCALE: 3/8" = 1'



2 C-4 **ANTENNA ELEVATION - PROPOSED**
SCALE: 3/8" = 1'

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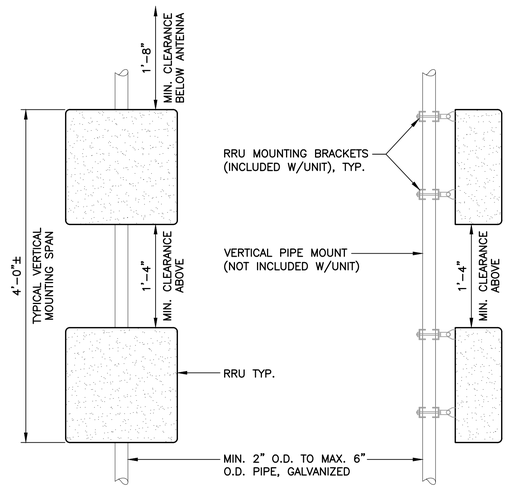
ANTENNA ELEVATIONS

C-4

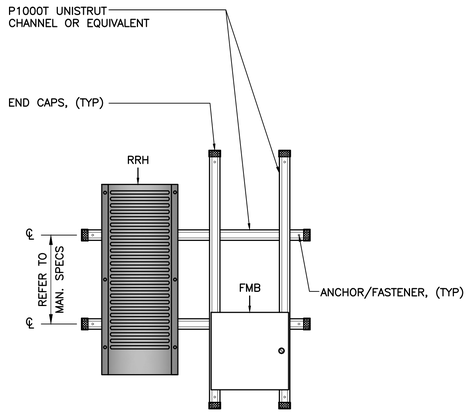
Sheet No. 6 of 10



FRONT ELEVATION SIDE ELEVATION

NOTES: (PIPE MOUNTING)

1. T-MOBILE SHALL SUPPLY RRU, AND RRU POLE-MOUNTING BRACKET. CONTRACTOR SHALL SUPPLY POLE/PIPE AND INSTALL ALL MOUNTING HARDWARE INCLUDING ERICSSON RRU POLE-MOUNTING BRACKET.
2. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.



FRONT ELEVATION

NOTES: (UNISTRUT MOUNTING)

1. INSTALL A MINIMUM OF (2) ANCHORS PER UNISTRUT (± 16"o/c MIN).
2. MOUNT RRU TO UNISTRUT WITH 3/8"ø UNISTRUT BOLTING HARDWARE AND SPRING NUTS. TYPICAL FOUR PER BRACKET.
3. NO PAINTING OF THE RRU OR SOLAR SHIELD IS ALLOWED.

1 C-5 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE

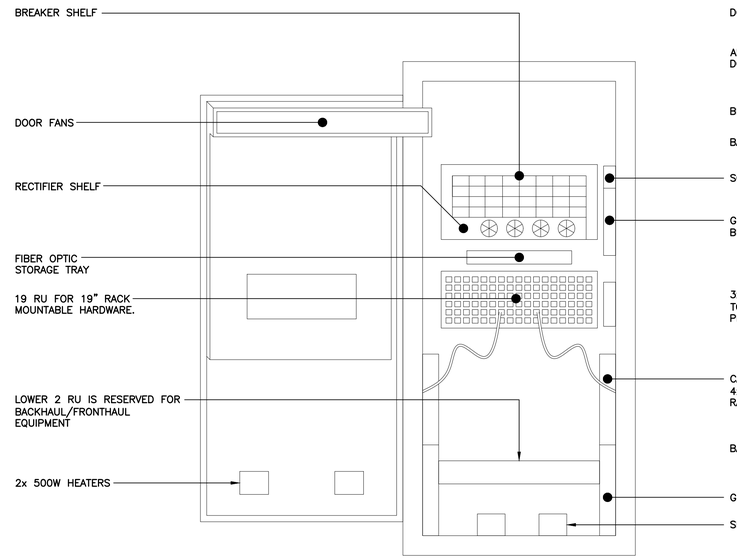
SIDE AIR6449 B41 APX16DWV-16DWV-S-E-A20 APXVAALL24_43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: RFS MODEL: APXVAALL24_43-U-NA20	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: ERICSSON MODEL: AIR6449 B41	33.1"L x 20.6"W x 8.6"D	±104 LBS.
MAKE: RFS MODEL: APX16DWV-16DWV-S-E-A20	55.9"L x 13"W x 3.15"D	±40.7 LBS.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

2 C-5 PROPOSED ANTENNA DETAIL

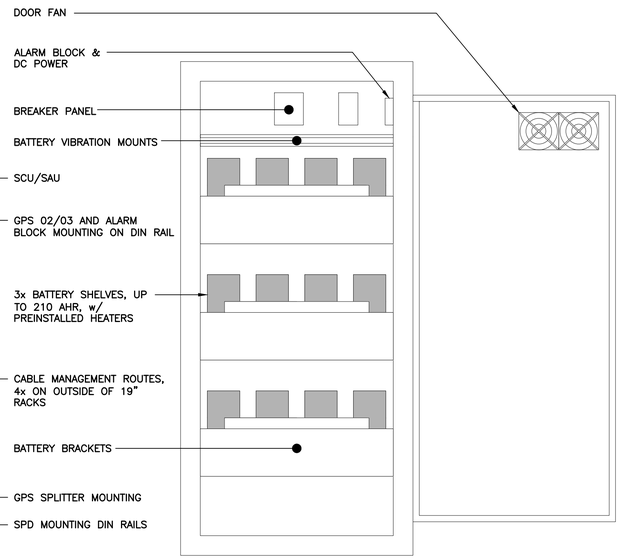
SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: ENCLOSURE 6160 CABINET	62.0"H x 26.0"W x 26.0"D	±1200 LBS

3 C-5 ENCLOSURE 6160 CABINET DETAIL

SCALE: NOT TO SCALE



EQUIPMENT CABINET		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: BATTERY B160 CABINET	62.0"H x 26.0"W x 26.0"D	±1883 LBS

4 C-5 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

RADIO 4460 B25+B66

RADIO 4449 B71+B85

RRU (REMOTE RADIO UNIT)			
EQUIPMENT	DIMENSIONS	WEIGHT	CLEARANCES
MAKE: ERICSSON MODEL: RADIO 4460 B25+B66	19.6"L x 15.7"W x 12.1"D	±109 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.
MAKE: ERICSSON MODEL: RADIO 4449 B71+B85	14.9"L x 13.2"W x 5.4"D	±74 LBS.	BEHIND ANT.: 8" MIN. BELOW ANT.: 20" MIN. BELOW RRU: 16" MIN.

NOTES:
1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T-MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.

5 C-5 PROPOSED RRU DETAIL

SCALE: NOT TO SCALE

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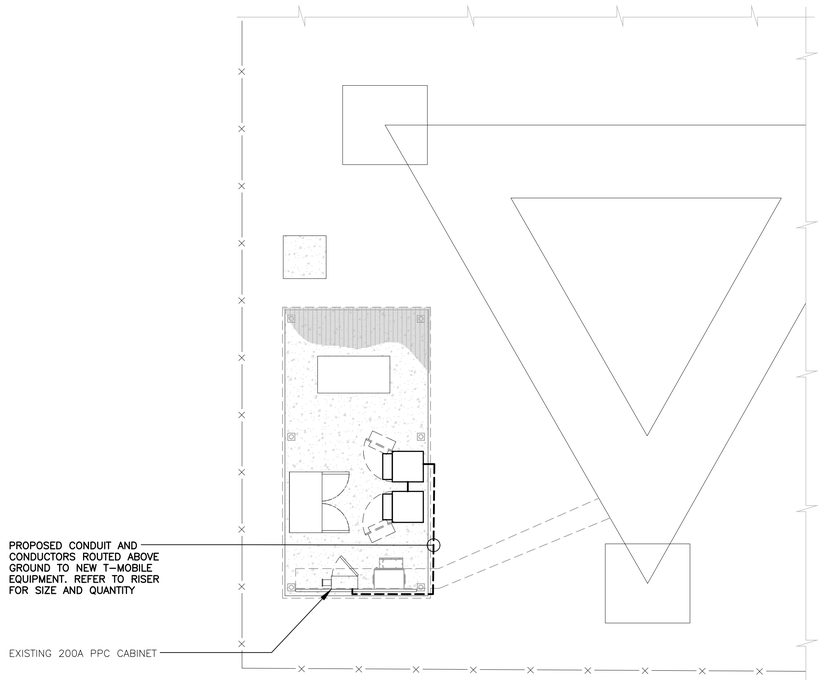
TYPICAL EQUIPMENT DETAILS

C-5

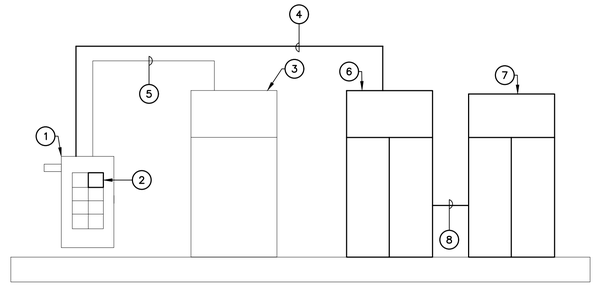
Sheet No. 7 of 10



1 / E-1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1" = 5'

RISER DIAGRAM NOTES

1. EXISTING 200A, PPC CABINET TO REMAIN.
2. NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
3. EXISTING CABINETS TO REMAIN.
4. (3) #1 AWG, (1) #8 AWG GROUND, 1-1/4" CONDUIT.
5. EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
6. NEW T-MOBILE EQUIPMENT CABINET
7. NEW T-MOBILE BATTERY CABINET
8. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.



2 / E-1 **ELECTRICAL POWER RISER DIAGRAM**
SCALE: NOT TO SCALE

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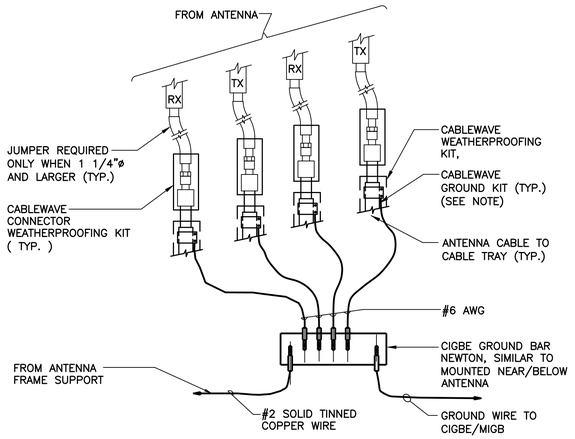
CONDUIT ROUTING AND ELECTRICAL RISER DIAGRAM

E-1

Sheet No. 8 of 10

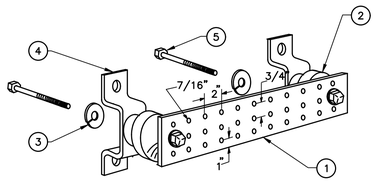


NOTES:

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

1 E-2 CONNECTION OF GROUND WIRES TO GROUND BAR

SCALE: NOT TO SCALE

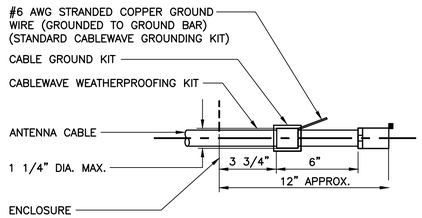


NOTES

1	TINNED COPPER GROUND BAR, 1/4" x 4" x 20", NEWTON INSTRUMENT CO. HOLE CENTERS TO MATCH NEMA DOUBLE LUG CONFIGURATION.
2	INSULATORS, NEWTON INSTRUMENT CAT. NO. 3061-4.
3	5/8" LOCK WASHERS, NEWTON INSTRUMENT CO. CAT. NO. 3015-8.
4	WALL MOUNTING BRACKET, NEWTON INSTRUMENT CO. CAT NO. A-6056.
5	5/8-11 x 1" STAINLESS STEEL TRUSS SPANNER MACHINE SCREWS.

2 E-2 GROUND BAR DETAIL

SCALE: NOT TO SCALE

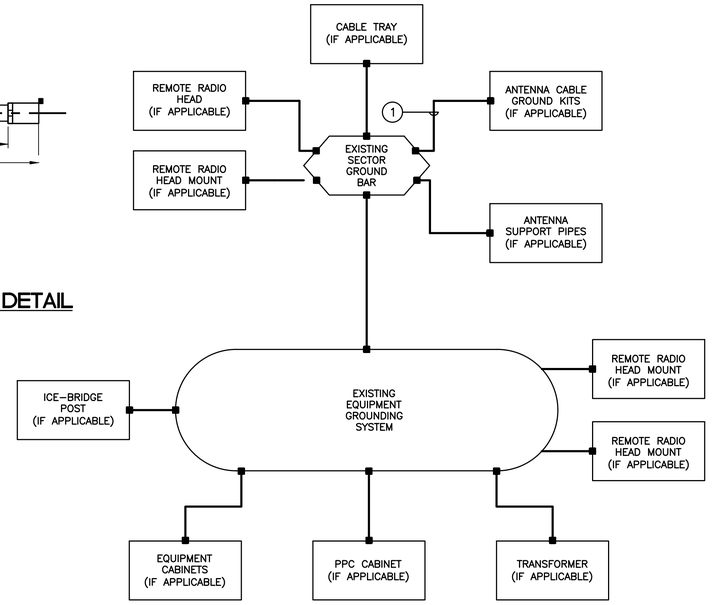


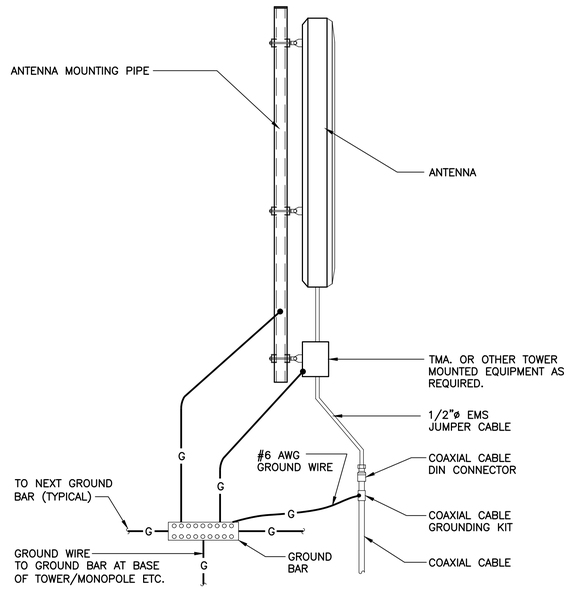
NOTES:

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

3 E-2 ANTENNA CABLE GROUNDING DETAIL

SCALE: NOT TO SCALE



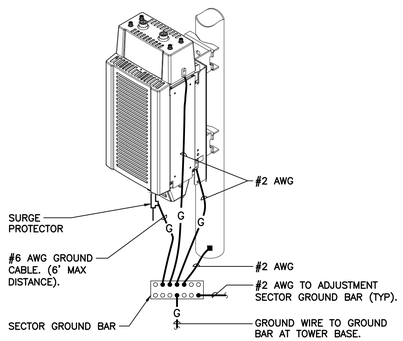


4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

SCALE: NOT TO SCALE

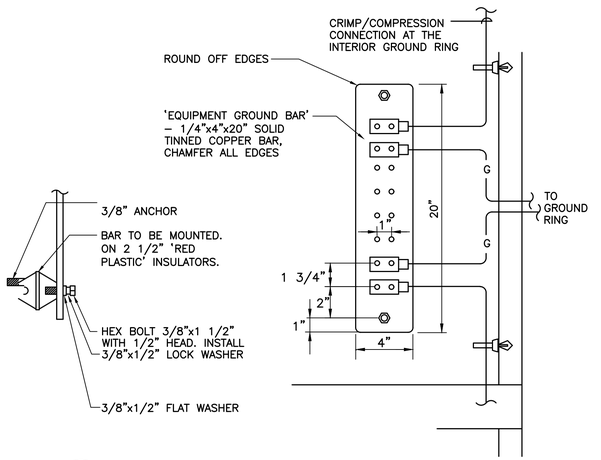
EACH RRH CABINET SHALL BE GROUNDED IN THE FOLLOWING MANNER:

1. AT TOP OF THE CABINET
2. AT RIGHT SIDE OF THE CABINET.



5 E-2 RRH POLE MOUNT GROUNDING

SCALE: NOT TO SCALE



6 E-2 EQUIPMENT GROUND BAR DETAIL

SCALE: NOT TO SCALE

GROUNDING SCHEMATIC NOTES

(1) #6 AWG

GENERAL NOTES:

1. ALL SURGE SUPPRESSION EQUIPMENT SHALL BE BONDED TO GROUND PER MANUFACTURER'S SPECIFICATIONS
2. UNLESS OTHERWISE NOTED OR REQUIRED BY CODE, GROUND CONDUCTORS SHOWN SHALL BE #2 AWG (SOLID TINNED BCW – EXTERIOR; STRANDED GREEN INSULATED – INTERIOR).
3. BOND CABLE TRAY SECTIONS TOGETHER WITH #6 AWG STRANDED GREEN INSULATED JUMPERS.
4. ALL SECTOR GROUND BARS SHALL BE BONDED TOGETHER WITH #2 AWG SOLID TINNED BCW.
5. BOND ALL EQUIPMENT CABINETS AND BATTERY CABINETS TO GROUND PER MANUFACTURER'S SPECIFICATIONS.
6. REFER TO ALL ELECTRICAL AND GROUNDING DETAILS.
7. COORDINATE ALL ROOF MOUNTED EQUIPMENT WITH OWNER.
8. ALL ROOF MOUNTED AMPLIFIERS AND ASSOCIATED EQUIPMENT SHALL BE BONDED TO THE SECTOR GROUND BAR PER MANUFACTURER'S SPECIFICATIONS.
9. ALL GROUNDING SHALL BE IN ACCORDANCE WITH NEC AND OWNER'S REQUIREMENTS.

7 E-2 ELECTRICAL SCHEMATIC DIAGRAM

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TYPICAL ELECTRICAL DETAILS

E-2

Sheet No. 9 of 10

ELECTRICAL SPECIFICATIONS

SECTION 16010

1.02. GENERAL REQUIREMENTS

A. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE MADE IN STRICT ACCORDANCE WITH ALL LOCAL, STATE AND NATIONAL CODES AND REGULATIONS WHICH MAY APPLY AND NOTHING IN THE DRAWINGS OR SPECIFICATIONS SHALL BE INTERPRETED AS AN INFRINGEMENT OF SUCH CODES OR REGULATIONS.

B. THE ELECTRICAL CONTRACTOR IS TO BE RESPONSIBLE FOR THE COMPLETE INSTALLATION AND COORDINATION OF THE ENTIRE ELECTRICAL SERVICE. ALL ACTIVITIES TO BE COORDINATED THROUGH OWNERS REPRESENTATIVE, DESIGN ENGINEER AND OTHER AUTHORITIES HAVING JURISDICTION OF TRADES.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND PAY ALL FEES THAT MAY BE REQUIRED FOR THE ELECTRICAL WORK AND FOR THE SCHEDULING OF ALL INSPECTIONS THAT MAY BE REQUIRED BY THE LOCAL AUTHORITY.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATION WITH THE BUILDING OWNER FOR NEW AND/OR DEMOLITION WORK INVOLVED.

E. NO MATERIAL OTHER THAN THAT CONTAINED IN THE "LATEST LIST OF ELECTRICAL FITTINGS" APPROVED BY THE UNDERWRITERS' LABORATORIES, SHALL BE USED IN ANY PART OF THE WORK. ALL MATERIAL FOR WHICH LABEL SERVICE HAS BEEN ESTABLISHED SHALL BEAR THE U.L. LABEL.

F. THE CONTRACTOR SHALL GUARANTEE ALL NEW WORK FOR A PERIOD OF ONE YEAR FROM THE ACCEPTANCE DATE BY THE OWNER. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING WARRANTIES FROM ALL EQUIPMENT MANUFACTURERS FOR SUBMISSION TO THE OWNER.

G. DRAWINGS INDICATE GENERAL ARRANGEMENT OF WORK INCLUDED IN CONTRACT. CONTRACTOR SHALL, WITHOUT EXTRA CHARGE, MAKE MODIFICATIONS TO THE LAYOUT OF THE WORK TO PREVENT CONFLICT WITH WORK OF OTHER TRADES AND FOR THE PROPER INSTALLATION OF WORK. CHECK ALL DRAWINGS AND VISIT JOB SITE TO VERIFY SPACE AND TYPE OF EXISTING CONDITIONS IN WHICH WORK WILL BE DONE, PRIOR TO SUBMITTAL OF BID.

H. THE ELECTRICAL CONTRACTOR SHALL SUPPLY THREE (3) COMPLETE SETS OF APPROVED DRAWINGS, ENGINEERING DATA SHEETS, MAINTENANCE AND OPERATING INSTRUCTION MANUALS FOR ALL SYSTEMS AND THEIR RESPECTIVE EQUIPMENT. THESE MANUALS SHALL BE INSERTED IN VINYL COVERED 3-RING BINDERS AND TURNED OVER TO OWNER'S REPRESENTATIVE ONE (1) WEEK PRIOR TO FINAL PUNCH LIST.

I. ALL WORK SHALL BE INSTALLED IN A NEAT AND WORKMAN LIKE MANNER AND WILL BE SUBJECT TO THE APPROVAL OF THE OWNER'S REPRESENTATIVE.

J. ALL EQUIPMENT AND MATERIALS TO BE INSTALLED SHALL BE NEW, UNLESS OTHERWISE NOTED.

K. BEFORE FINAL PAYMENT, THE CONTRACTOR SHALL PROVIDE A COMPLETE SET OF PRINTS (AS-BUILTS), LEGIBLY MARKED IN RED PENCIL TO SHOW ALL CHANGES FROM THE ORIGINAL PLANS.

L. PROVIDE TEMPORARY POWER AND LIGHTING IN WORK AREAS AS REQUIRED.

M. SHOP DRAWINGS:

1. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF SHOP DRAWINGS ON ALL EQUIPMENT AND MATERIALS PROPOSED FOR USE ON THIS PROJECT, GIVING ALL DETAILS, WHICH INCLUDE DIMENSIONS, CAPACITIES, ETC.

2. CONTRACTOR SHALL SUBMIT SIX (6) COPIES OF ALL TEST REPORTS CALLED FOR IN THE SPECIFICATIONS AND DRAWINGS.

N. ENTIRE ELECTRICAL INSTALLATION SHALL BE IN ACCORDANCE WITH OWNER'S SPECIFICATIONS, AND REQUIREMENTS OF ALL LOCAL AUTHORITIES HAVING JURISDICTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO COORDINATE WITH APPROPRIATE INDIVIDUALS TO OBTAIN ALL SUCH SPECIFICATIONS AND REQUIREMENTS. NOTHING CONTAINED IN, OR OMITTED FROM, THESE DOCUMENTS SHALL RELIEVE CONTRACTOR FROM THIS OBLIGATION.

SECTION 16111

1.01. CONDUIT

A. MINIMUM CONDUIT SIZE FOR BRANCH CIRCUITS, LOW VOLTAGE CONTROL AND ALARM CIRCUITS SHALL BE 3/4". CONDUITS SHALL BE PROPERLY FASTENED AS REQUIRED BY THE N.E.C.

B. THE INTERIOR OF RACEWAYS/ENCLOSURES INSTALLED UNDERGROUND SHALL BE CONSIDERED TO BE WET LOCATION, INSULATED CONDUCTORS SHALL BE LISTED FOR USE IN WET LOCATIONS. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

C. CONDUIT INSTALLED UNDERGROUND SHALL BE INSTALLED TO MEET MINIMUM COVER REQUIREMENTS OF TABLE 300.5.

D. PROVIDE RIGID GALVANIZED STEEL CONDUIT (RMC) FOR THE FIRST 10 FOOT SECTION WHEN LEAVING A BUILDING OR SECTIONS PASSING THROUGH FLOOR SLABS

E. ONLY LISTED PVC CONDUIT AND FITTINGS ARE PERMITTED FOR THE INSTALLATION OF ELECTRICAL CONDUCTORS, SUITABLE FOR UNDERGROUND APPLICATIONS.

CONDUIT SCHEDULE SECTION 16111

CONDUIT TYPE	NEC REFERENCE	APPLICATION	MIN. BURIAL DEPTH (PER NEC TABLE 300.5) [2][3]
EMT	ARTICLE 358	INTERIOR CIRCUITING, EQUIPMENT ROOMS, SHELTERS	N/A
RMC, RIGID GALV. STEEL	ARTICLE 344, 300.5, 300.50	ALL INTERIOR/ EXTERIOR CIRCUITING, ALL UNDERGROUND INSTALLATIONS.	6 INCHES
PVC, SCHEDULE 40	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE NOT SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
PVC, SCHEDULE 80	ARTICLE 352, 300.5, 300.50	INTERIOR/ EXTERIOR CIRCUITING AND GROUNDING SYSTEMS, UNDERGROUND INSTALLATIONS, WHERE SUBJECT TO PHYSICAL DAMAGE. [1]	18 INCHES
LIQUID TIGHT FLEX. METAL	ARTICLE 350	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	SECTION 16450
FLEX. METAL	ARTICLE 348	SHORT LENGTHS (MAX. 3FT.) WIRING TO VIBRATING EQUIPMENT IN WET LOCATIONS.	N/A

[1] PHYSICAL DAMAGE IS SUBJECT TO THE AUTHORITY HAVING JURISDICTION.

[2] UNDERGROUND CONDUIT INSTALLED UNDER ROADS, HIGHWAYS, DRIVEWAYS, PARKING LOTS SHALL HAVE MINIMUM DEPTH OF 24".

[3] WHERE SOLID ROCK PREVENTS COMPLIANCE WITH MINIMUM COVER DEPTHS, WIRING SHALL BE INSTALLED IN PERMITTED RACEWAY FOR DIRECT BURIAL. THE RACEWAY SHALL BE COVERED BY A MINIMUM OF 2" OF CONCRETE EXTENDING DOWN TO ROCK.

SECTION 16123

1.01. CONDUCTORS

A. ALL CONDUCTORS SHALL BE TYPE THWN (INT. APPLICATION) AND XHHW (EXT. APPLICATION), 75 DEGREE C, 600 VOLT INSULATION, SOFT ANNEALED STRANDED COPPER. #10 AWG AND SMALLER SHALL BE SPLICED USING ACCEPTABLE SOLDERLESS PRESSURE CONNECTORS. #8 AWG AND LARGER SHALL BE SPLICED USING COMPRESSION SPLIT-BOLT TYPE CONNECTORS. #12 AWG SHALL BE THE MINIMUM SIZE CONDUCTOR FOR LINE VOLTAGE BRANCH CIRCUITS. REFER TO PANEL SCHEDULE FOR BRANCH CIRCUIT CONDUCTOR SIZE(S). CONDUCTORS SHALL BE COLOR CODED FOR CONSISTENT PHASE IDENTIFICATION:

	120/208/240V	277/480V
LINE	COLOR	COLOR
A	BLACK	BROWN
B	RED	ORANGE
C	BLUE	YELLOW
N	CONTINUOUS WHITE	GREY
G	CONTINUOUS GREEN	GREEN WITH YELLOW STRIPE

B. MINIMUM BENDING RADIUS FOR CONDUCTORS SHALL BE 12 TIMES THE LARGEST DIAMETER OF BRANCH CIRCUIT CONDUCTOR.

SECTION 16130

1.01. BOXES

A. FURNISH AND INSTALL OUTLET BOXES FOR ALL DEVICES, SWITCHES, RECEPTACLES, ETC.. BOXES TO BE ZINC COATED STEEL.

B. FURNISH AND INSTALL PULL BOXES IN MAIN FEEDERS RUNS WHERE REQUIRED. PULL BOXES SHALL BE GALVANIZED STEEL WITH SCREW REMOVABLE COVERS, SIZE AND QUANTITY AS REQUIRED. PROVIDE WEATHERPROOF CONSTRUCTION IN WET LOCATIONS.

SECTION 16140

1.01. WIRING DEVICES

A. THE FOLLOWING LIST IS PROVIDED TO CONVEY THE QUALITY AND RATING OF WIRING DEVICES WHICH ARE TO BE INSTALLED. A COMPLETE LIST OF ALL DEVICES MUST BE SUBMITTED BEFORE INSTALLATION FOR APPROVAL.

1. 15 MINUTE TIMER SWITCH - INTERMATIC #FF15M (INTERIOR LIGHTS)

2. DUPLEX RECEPTACLE - P&S #2095 (GFCI) SPECIFICATION GRADE

3. SINGLE POLE SWITCH - P&S #CSB20AC2 (20A-120V HARD USE) SPECIFICATION GRADE

4. DUPLEX RECEPTACLE - P&S #5362 (20A-120V HARD USE) SPECIFICATION GRADE

B. PLATES - ALL PLATES USED SHALL BE CORROSION RESISTANT TYPE 304 STAINLESS STEEL. PLATES SHALL BE FROM SAME MANUFACTURER AS SWITCHES AND RECEPTACLES. PROVIDE WEATHERPROOF HOUSING FOR DEVICES LOCATED IN WET LOCATIONS.

C. OTHER MANUFACTURERS OF THE SWITCHES, RECEPTACLES AND PLATES MAY BE SUBMITTED FOR APPROVAL BY THE ENGINEER.

SECTION 16170

1.01. DISCONNECT SWITCHES

A. FUSIBLE AND NON-FUSIBLE, 600V, HEAVY DUTY DISCONNECT SWITCHES SHALL BE AS MANUFACTURED BY SQUARE "D". PROVIDE FUSES AS CALLED FOR ON THE CONTRACT DRAWINGS. AMPERE RATING SHALL BE CONSISTENT WITH LOAD BEING SERVED. DISCONNECT SWITCH COVER SHALL BE MECHANICALLY INTERLOCKED TO PREVENT COVER FROM OPENING WHEN THE SWITCH IS IN THE "ON" POSITION. EXTERIOR APPLICATIONS SHALL BE NEMA 3R CONSTRUCTION WITH PADLOCK FEATURE.

SECTION 16190

1.01. SEISMIC RESTRAINT

A. ALL DEVICES SHALL BE INSTALLED IN ACCORDANCE WITH ZONE 2 SEISMIC REQUIREMENTS.

SECTION 16195

1.01. LABELING AND IDENTIFICATION NOMENCLATURE FOR ELECTRICAL EQUIPMENT

A. CONTRACTOR SHALL FURNISH AND INSTALL NON-METALLIC ENGRAVED BACK-LIT NAMEPLATES ON ALL PANELS AND MAJOR ITEMS OF ELECTRICAL EQUIPMENT.

B. LETTERS TO BE WHITE ON BLACK BACKGROUND WITH LETTERS 1-1/2 INCH HIGH WITH 1/4 INCH MARGIN.

C. IDENTIFICATION NOMENCLATURE SHALL BE IN ACCORDANCE WITH OWNER'S STANDARDS.

SECTION 16450

1.01. GROUNDING

A. ALL NON-CURRENT CARRYING PARTS OF THE ELECTRICAL AND TELEPHONE CONDUIT SYSTEMS SHALL BE MECHANICALLY AND ELECTRICALLY CONNECTED TO PROVIDE AN INDEPENDENT RETURN PATH TO THE EQUIPMENT GROUNDING SOURCES.

B. GROUNDING SYSTEM WILL BE IN ACCORDANCE WITH THE LATEST ACCEPTABLE EDITION OF THE NATIONAL ELECTRICAL CODE AND REQUIREMENTS PER LOCAL INSPECTOR HAVING JURISDICTION.

C. GROUNDING OF PANELBOARDS:

1. PANELBOARD SHALL BE GROUNDED BY TERMINATING THE PANELBOARD FEEDER'S EQUIPMENT GROUND CONDUCTOR TO THE EQUIPMENT GROUND BAR KIT(S) LUGGED TO THE CABINET. ENSURE THAT THE SURFACE BETWEEN THE KIT AND CABINET ARE BARE METAL TO BARE METAL. PRIME AND PAINT OVER TO PREVENT CORROSION.

2. CONDUIT(S) TERMINATING INTO THE PANELBOARD SHALL HAVE GROUNDING TYPE BUSHINGS. THE BUSHINGS SHALL BE BONDED TOGETHER WITH BARE #10 AWG COPPER CONDUCTOR WHICH IN TURN IS TERMINATED INTO THE PANELBOARD'S EQUIPMENT GROUND BAR KIT(S).

D. EQUIPMENT GROUNDING CONDUCTOR:

1. EACH EQUIPMENT GROUND CONDUCTOR SHALL BE SIZED IN ACCORDANCE WITH THE N.E.C. ARTICLE 250-122.

2. THE MINIMUM SIZE OF EQUIPMENT GROUND CONDUCTOR SHALL BE #12 AWG COPPER.

3. EACH FEEDER OR BRANCH CIRCUIT SHALL HAVE EQUIPMENT GROUND CONDUCTOR(S) INSTALLED IN THE SAME RACEWAY(S).

E. CELLULAR GROUNDING SYSTEM:

CONTRACTOR SHALL PROVIDE A CELLULAR GROUNDING SYSTEM WITH THE MAXIMUM AC RESISTANCE TO GROUND OF 10 OHM BETWEEN ANY POINT ON THE GROUNDING SYSTEM AS MEASURED BY 3-POINT GROUNDING TEST. (REFER TO SECTION 16960).

PROVIDE THE CELLULAR GROUNDING SYSTEM AS SPECIFIED ON DRAWINGS, INCLUDING, BUT NOT LIMITED TO:

1. GROUND BARS

2. EXTERIOR GROUNDING (WHERE REQUIRED DUE TO MEASURED AC RESISTANCE GREATER THAN SPECIFIED).

3. ANTENNA GROUND CONNECTIONS AND PLATES.

F. CONTRACTOR, AFTER COMPLETION OF THE COMPLETE GROUNDING SYSTEM BUT PRIOR TO CONCEALMENT/BURIAL OF SAME, SHALL NOTIFY OWNER'S PROJECT ENGINEER WHO WILL HAVE A DESIGN ENGINEER VISIT SITE AND MAKE A VISUAL INSPECTION OF THE GROUNDING GRID AND CONNECTIONS OF THE SYSTEM.

G. ALL EQUIPMENT SHALL BE BONDED TO GROUND AS REQUIRED BY N.E.C., MFG. SPECIFICATIONS, AND OWNER'S SPECIFICATIONS.

SECTION 16470

1.01. DISTRIBUTION EQUIPMENT

A. REFER TO CONTRACT DRAWINGS FOR DETAILS AND SCHEDULES.

SECTION 16477

1.01. FUSES

A. FUSES SHALL BE NONRENEWABLE TYPE AS MANUFACTURED BY "BUSSMAN" OR APPROVED EQUAL. FUSES RATED TO 1/10 AMPERE UP TO 600 AMPERES SHALL BE EQUIVALENT TO BUSSMAN TYPE LPN-RK (250V) UL CLASS RK1, LOW PEAK, DUAL ELEMENT, TIME-DELAY FUSES. FUSES SHALL HAVE SEPARATE SHORT CIRCUIT AND OVERLOAD ELEMENTS AND HAVE AN INTERRUPTING RATING OF 200 KAIC. UPON COMPLETION OF WORK, PROVIDE ONE SPARE SET OF FUSES FOR EACH TYPE INSTALLED.

SECTION 16960

1.01. TESTS BY INDEPENDENT ELECTRICAL TESTING FIRM

A. CONTRACTOR SHALL RETAIN THE SERVICES OF A LOCAL INDEPENDENT ELECTRICAL TESTING FIRM (WITH MINIMUM 5 YEARS COMMERCIAL EXPERIENCE IN THE ELECTRICAL TESTING INDUSTRY) AS SPECIFIED BY OWNER TO PERFORM:

TEST 1: THERMAL OVERLOAD AND MAGNETIC TRIP TEST, AND CABLE INSULATION TEST FOR ALL CIRCUIT BREAKERS RATED 100 AMPS OR GREATER.

TEST 2: RESISTANCE TO GROUND TEST ON THE CELLULAR GROUNDING SYSTEM.

THE TESTING FIRM SHALL INCLUDE THE FOLLOWING INFORMATION WITH THE REPORT:

1. TESTING PROCEDURE INCLUDING THE MAKE AND MODEL OF TEST EQUIPMENT.

2. CERTIFICATION OF TESTING EQUIPMENT CALIBRATION WITHIN SIX (6) MONTHS OF DATE OF TESTING. INCLUDE CERTIFICATION LAB ADDRESS AND TELEPHONE NUMBER.

3. GRAPHICAL DESCRIPTION OF TESTING METHOD ACTUALLY IMPLEMENTED.

B. THESE TESTS SHALL BE PERFORMED IN THE PRESENCE AND TO THE SATISFACTION OF OWNER'S CONSTRUCTION REPRESENTATIVE. TESTING DATA SHALL BE INITIALED AND DATED BY THE CONSTRUCTION REPRESENTATIVE AND INCLUDED WITH THE WRITTEN REPORT/ANALYSIS.

C. THE CONTRACTOR SHALL FORWARD SIX (6) COPIES OF THE INDEPENDENT ELECTRICAL TESTING FIRM'S REPORT/ANALYSIS TO ENGINEER A MINIMUM OF TEN (10) WORKING DAYS PRIOR TO THE JOB TURNOVER.

D. CONTRACTOR TO PROVIDE A MINIMUM OF ONE (1) WEEK NOTICE TO OWNER AND ENGINEER FOR ALL TESTS REQUIRING WITNESSING.

SECTION 16961

1.01. TESTS BY CONTRACTOR

A. ALL TESTS AS REQUIRED UPON COMPLETION OF WORK, SHALL BE MADE BY THIS CONTRACTOR. THESE SHALL BE CONTINUITY AND INSULATION TESTS; TEST TO DETERMINE THE QUALITY OF MATERIALS, ETC. AND SHALL BE MADE IN ACCORDANCE WITH N.E.C. RECOMMENDATIONS. ALL FEEDERS AND BRANCH CIRCUIT WIRING (EXCEPT CLASS 2 SIGNAL CIRCUITS) MUST BE TESTED FREE FROM SHORT CIRCUIT AND GROUND FAULT CONDITIONS AT 500V IN A REASONABLY DRY AMBIENT OF APPROXIMATELY 70 DEGREES F.

B. CONTRACTOR SHALL PERFORM LOAD PHASE BALANCING TESTS. CIRCUITS SHALL BE SO CONNECTED TO THE PANELBOARDS SUCH THAT THE NEW LOAD IS DISTRIBUTED AS EQUALLY AS POSSIBLE BETWEEN EACH LOAD AND NEUTRAL. 10% SHALL BE CONSIDERED AS A REASONABLE AND ACCEPTABLE ALLOWANCE. BRANCH CIRCUITS SHALL BE BALANCED ON THEIR OWN PANELBOARDS; FEEDER LOADS SHALL, IN TURN, BE BALANCED ON THE SERVICE EQUIPMENT. REASONABLE LOAD TEST SHALL BE ARRANGED TO VERIFY LOAD BALANCE IF REQUESTED BY THE ENGINEER.

C. ALL TESTS, UPON REQUEST, SHALL BE REPEATED IN THE PRESENCE OF OWNER'S REPRESENTATIVE. ALL TESTS SHALL BE DOCUMENTED AND TURNED OVER TO OWNER. OWNER SHALL HAVE THE AUTHORITY TO STOP ANY OF THE WORK NOT BEING PROPERLY INSTALLED. ALL SUCH DETECTED WORK SHALL BE REPAIRED OR REPLACED AT NO ADDITIONAL EXPENSE TO THE OWNER AND THE TESTS SHALL BE REPEATED.

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PROFESSIONAL ENGINEER SEAL

T-Mobile

Transcend Wireless

CENTEK engineering
Centered on Solutions
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T-MOBILE NORTHEAST LLC

SITE NAME: CTHA142
SITE ID: CTHA142G
7 HOSKINS RD
BLOOMFIELD, CT 06002

DATE:	06/23/21
SCALE:	AS NOTED
JOB NO.	21022.20

ELECTRICAL SPECIFICATIONS

E-3

Sheet No. 10 of 10

CENTEK engineering
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Structural Analysis Report

Antenna Mount Analysis

Proposed T-Mobile Upgrade

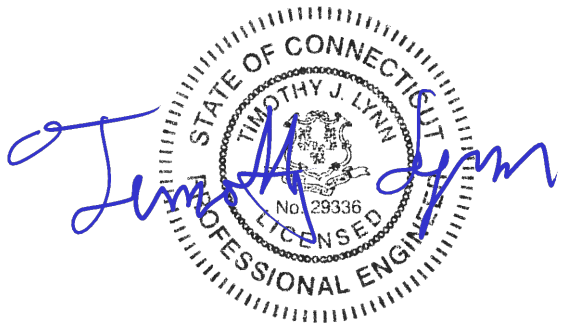
T-Mobile Site #: CTHA142G

7 Hoskins Road
Bloomfield, CT

Centek Project No. 21022.20

Date: July 6, 2021

Max Stress Ratio =85.4%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

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CENTEK engineering

Centered on Solutions℠

July 6, 2021

Mr. Dan Reid
Transcend Wireless
10 Industrial Ave
Mahwah, NJ 07430

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CTHA142G
7 Hoskins Road
Bloomfield, CT 06002

Centek Project No. 21022.20

Dear Mr. Reid,

Centek Engineering, Inc. has reviewed the T-Mobile antenna installation at the above referenced site. The purpose of the review is to determine the structural adequacy of the existing mount, consisting of three (3) 10.5-ft V-Frames to support the equipment configuration. The review considered the effects of wind load, dead load and ice load in accordance with the 2015 International Building Code as modified by the 2018 Connecticut State Building Code (CTBC) including ASCE 7-10 and ANSI/TIA-222-G *Structural Standards for Steel Antenna Towers and Supporting Structures*.

The loads considered in this analysis consist of the following:

- T-Mobile:
  V-Frames: Three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) RFS APX16DWV-16DWV-S-E-A20 panel antennas, three (3) Ericsson AIR6449 B41panel antennas, three (3) Ericsson 4460 remote radio heads and three (3) Ericsson 44449 remote radio heads on the existing mount with a RAD center elevation of 140-ft +/- AGL.

The antenna mount was analyzed per the requirements of the 2015 International Building Code as modified by the 2018 Connecticut State Building Code considering a nominal design wind speed of 97 mph for Bloomfield as required in Appendix N of the 2018 Connecticut State Building Code.

Based on our review of the installation, it is our opinion that the subject antenna mount has sufficient capacity to support the aforementioned antenna configuration.

If there are any questions regarding this matter, please feel free to call.

Respectfully Submitted by:

Timothy J. Lynn, PE
Structural Engineer

STATE OF CONNECTICUT
TIMOTHY J. LYNN
No. 29336
LICENSED PROFESSIONAL ENGINEER

Prepared by:

Fernando J. Palacios
Engineer

Section 2 - Calculations

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Subject: Loads on Equipment

Location: Bloomfield,CT

Rev. 0: 07/06/2021

Prepared by: F.J.P.. Checked by: T.J.L.
Job No. 21022.20

Development of Design Heights, Exposure Coefficients, and Velocity Pressures Per TIA-222-G

Wind Speeds

Basic Wind Speed	$V := 97$	mph	(User Input - 2018 CSBC Appendix N)
Basic Wind Speed with Ice	$V_i := 50$	mph	(User Input per Annex B of TIA-222-G)

Input

Structure Type =	$Structure\_Type := Lattice$		(User Input)
Structure Category =	$SC := II$		(User Input)
Exposure Category =	$Exp := B$		(User Input)
Structure Height =	$h := 185.5$	ft	(User Input)
Height to Center of Antennas =	$z := 140$	ft	(User Input)
Radial Ice Thickness =	$t_i := 1.00$	in	(User Input per Annex B of TIA-222-G)
Radial Ice Density =	$Id := 56.00$	pcf	(User Input)
Topographic Factor =	$K_{zt} := 1.0$		(User Input)
	$K_a := 1.0$		(User Input)
Gust Response Factor =	$G_H = 1.115$		(User Input)

Output

Wind Direction Probability Factor =

$$K_d := \begin{cases} 0.95 & \text{if } Structure\_Type = Pole \\ 0.85 & \text{if } Structure\_Type = Lattice \end{cases} = 0.85$$

(Per Table 2-2 of TIA-222-G)

(Per Table 2-3 of TIA-222-G)

Importance Factors =

$$I_{Wind} := \begin{cases} 0.87 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.15 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{Wind\_w\_Ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.00 & \text{if } SC = 3 \end{cases} = 1$$

$$I_{ice} := \begin{cases} 0 & \text{if } SC = 1 \\ 1.00 & \text{if } SC = 2 \\ 1.25 & \text{if } SC = 3 \end{cases} = 1$$

$$K_{iz} := \left(\frac{z}{33}\right)^{0.1} = 1.155$$

Velocity Pressure Coefficient Antennas =

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 2.311$$

$$Kz := 2.01 \cdot \left(\left(\frac{z}{zg}\right)\right)^{\overline{\alpha}} = 1.088$$

Velocity Pressure w/o Ice Antennas = $qz := 0.00256 \cdot K_d \cdot Kz \cdot V^2 \cdot I_{Wind} = 22$ psf

Velocity Pressure with Ice Antennas = $qz_{ice} := 0.00256 \cdot K_d \cdot Kz \cdot V_i^2 \cdot I_{Wind} = 6$ psf

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24_43-U-NA20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24.0$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.5$	in	(User Input)
Antenna Weight =	$WT_{ant} := 150$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.0$		
Antenna Force Coefficient =	$Ca_{ant} = 1.27$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 16$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 503$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 178$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 20$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 167$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 9.2$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 77$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 150$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \cdot 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 2 \cdot 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 589$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 589$	lbs

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson - AIR6449 B41		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 33.1$	in	(User Input)
Antenna Width =	$W_{ant} := 20.5$	in	(User Input)
Antenna Thickness =	$T_{ant} := 8.3$	in	(User Input)
Antenna Weight =	$WT_{ant} := 103$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.6$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 4.7$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 140$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.9$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 57$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.6$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 52$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 27$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 103$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 5632$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 6613$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 214$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 214$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS - APX16DWV-16DWV-S-E-A20		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 55.9$	in	(User Input)
Antenna Width =	$W_{ant} := 13.0$	in	(User Input)
Antenna Thickness =	$T_{ant} := 3.15$	in	(User Input)
Antenna Weight =	$WT_{ant} := 41.8$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 4.3$		
Antenna Force Coefficient =	$Ca_{ant} = 1.28$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5$	sf
Total Antenna Wind Force Front =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 160$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 1.2$	sf
Total Antenna Wind Force Side =	$F_{ant} := qz \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 39$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 7.4$	sf
Total Antenna Wind Force w/ Ice Front =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 63$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.3$	sf
Total Antenna Wind Force w/ Ice Side =	$Fi_{ant} := qz_{ice} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 28$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 42$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2289$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 6000$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 194$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 194$	lbs

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Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4449 B71+B85		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 14.9$	in	(User Input)
RRUS Width =	$W_{RRUS} := 13.2$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 5.4$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 74$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.1$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 1.4$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 41$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 0.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 17$	lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 2.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 19$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 11$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 74$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 1062$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2425$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 79$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 79$	lbs

Development of Wind & Ice Load on RRUS's

RRUS Data:

RRUS Model =	Ericsson 4460 B25+B66		
RRUS Shape =	Flat		(User Input)
RRUS Height =	$L_{RRUS} := 19.6$	in	(User Input)
RRUS Width =	$W_{RRUS} := 15.7$	in	(User Input)
RRUS Thickness =	$T_{RRUS} := 12.1$	in	(User Input)
RRUS Weight =	$WT_{RRUS} := 109$	lbs	(User Input)
Number of RRUS's =	$N_{RRUS} := 1$		
RRUS Aspect Ratio =	$Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.2$		
RRUS Force Coefficient =	$Ca_{RRUS} = 1.2$		

Wind Load (without ice)

Surface Area for One RRUS =	$SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.1$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 64$	lbs
Surface Area for One RRUS =	$SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$	sf
Total RRUS Wind Force =	$F_{RRUS} := qz \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 49$	lbs

Wind Load (with ice)

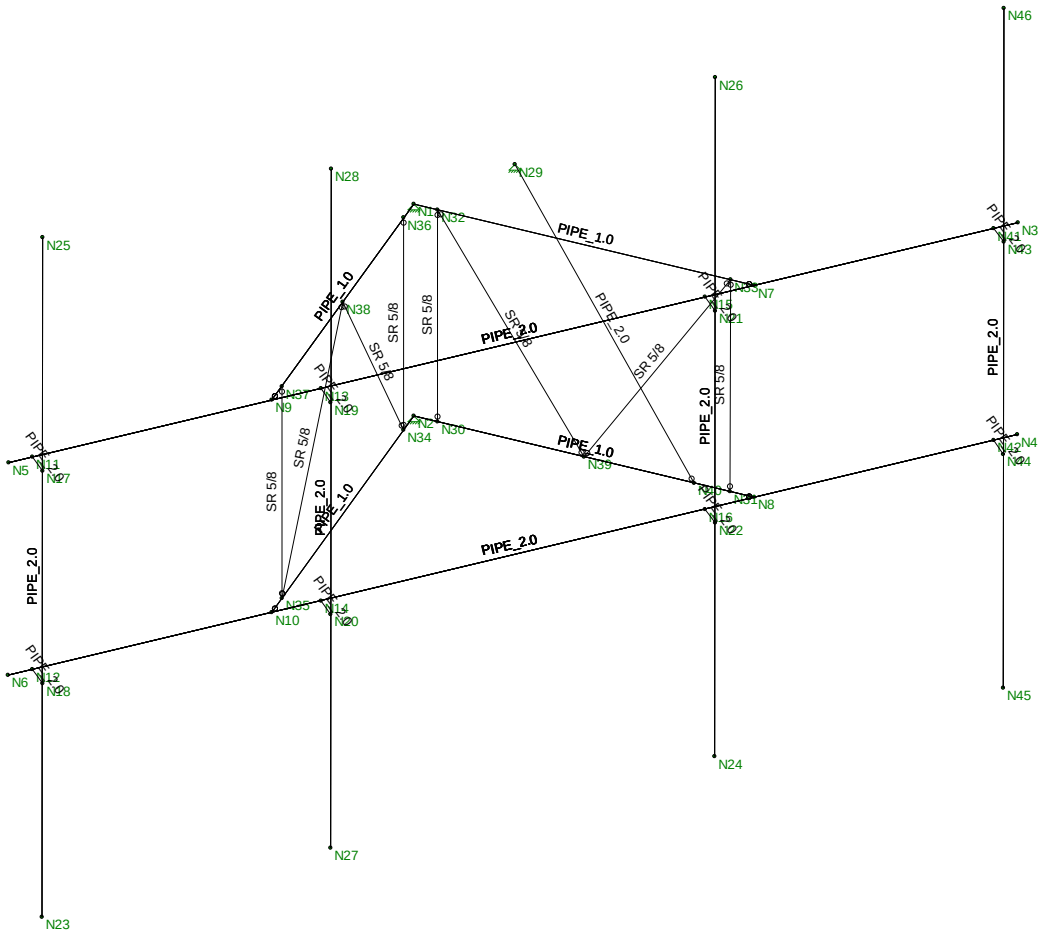
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.4$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 27$	lbs
Surface Area for One RRUS w/ Ice =	$SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.8$	sf
Total RRUS Wind Force w/ Ice =	$Fi_{RRUS} := qz_{ice} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 22$	lbs

Gravity Load (without ice)

Weight of All RRUSs =	$WT_{RRUS} \cdot N_{RRUS} = 109$	lbs

Gravity Loads (ice only)

Volume of Each RRUS =	$V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 3723$	cu in
Volume of Ice on Each RRUS =	$V_{ice} := (L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 4508$	cu in
Weight of Ice on Each RRUS =	$W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 146$	lbs
Weight of Ice on All RRUSs =	$W_{ICERRUS} \cdot N_{RRUS} = 146$	lbs



Envelope Only Solution

Centek		
FJP	CTHA142G - Mount	July 6, 2021 at 8:48 AM
21022.20	Member Framing.pdf	CT11396B_AMA.r3d

(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	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): ASD
Cold Formed Steel Code	AISI S100-10: ASD
Wood Code	AWC NDS-12: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-11
Masonry Code	ACI 530-11: ASD
Aluminum Code	AA ADM1-10: ASD - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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?	No
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

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (/1...	Density[k/ft^3]	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	58	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	58	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Grade B	29000	11154	.3	.65	.49	35	1.5	58	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Ru...	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	(E)Antenna Mast_Pipe 2.0 STD	PIPE_2.0	Beam	Pipe	A53 Grad...	Typical	1.02	.627	.627	1.25
2	(E)Antenna Mast_Pipe 1.0 STD	PIPE_1.0	Beam	Pipe	A53 Grad...	Typical	.469	.083	.083	.166
3	(E)Mount Bar 5/8" dia.	SR 5/8	Beam	Pipe	A36 Gr.36	Typical	.307	.007	.007	.015

Hot Rolled Steel Design Parameters

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
1	M1	(E)Mount ...	2.5						.7	.7		Lateral
2	M2	(E)Mount ...	2.5						.7	.7		Lateral
3	M3	(E)Mount ...	2.5						.7	.7		Lateral
4	M4	(E)Mount ...	2.927						.7	.7		Lateral
5	M5	(E)Mount ...	2.927						.7	.7		Lateral
6	M6	(E)Mount ...	2.5						.7	.7		Lateral
7	M7	(E)Mount ...	2.927						.7	.7		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[ft]	Lbyy[ft]	Lbzz[ft]	Lcomp top[...	Lcomp bot[...	L-torq...	Kyy	Kzz	Cb	Functi...
8	M8	(E)Mount ...	2.927						.7	.7		Lateral
9	M9	(E)Antenna...	.25			Lbyy						Lateral
10	M10	(E)Antenna...	.25			Lbyy						Lateral
11	M11	(E)Antenna...	.25			Lbyy						Lateral
12	M12	(E)Antenna...	.25			Lbyy						Lateral
13	M13	(E)Antenna...	.25			Lbyy						Lateral
14	M14	(E)Antenna...	.25			Lbyy						Lateral
15	M15	(E)Antenna...	.25			Lbyy						Lateral
16	M16	(E)Antenna...	.25			Lbyy						Lateral
17	M17	(E)Antenna...	10.5			Lbyy						Lateral
18	M18	(E)Antenna...	10.5			Lbyy						Lateral
19	PS.4	(E)Antenna...	8			Lbyy						Lateral
20	PS.2	(E)Antenna...	8			Lbyy						Lateral
21	PS.1	(E)Antenna...	8			Lbyy						Lateral
22	M22	(E)Antenna...	5.575			Lbyy						Lateral
23	PS.3	(E)Antenna...	8			Lbyy						Lateral
24	M24	(E)Antenna...	3.543			Lbyy						Lateral
25	M25	(E)Antenna...	3.543			Lbyy						Lateral
26	M26	(E)Antenna...	3.543			Lbyy						Lateral
27	M27	(E)Antenna...	3.543			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N33	N31			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
2	M2	N32	N30			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
3	M3	N34	N36			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
4	M4	N34	N38			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
5	M5	N38	N35			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
6	M6	N35	N37			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
7	M7	N33	N39			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
8	M8	N32	N39			(E)Mount Bar 5/8" dia.	Beam	Pipe	A36 Gr...	Typical
9	M9	N16	N22			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
10	M10	N15	N21			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
11	M11	N14	N20			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
12	M12	N13	N19			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
13	M13	N12	N18			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
14	M14	N11	N17			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
15	M15	N42	N44			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
16	M16	N41	N43			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
17	M17	N6	N4			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
18	M18	N5	N3			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
19	PS.4	N26	N24			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
20	PS.2	N28	N27			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
21	PS.1	N25	N23			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
22	M22	N40	N29			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
23	PS.3	N46	N45			(E)Antenna Mast_Pipe 2.0 STD	Beam	Pipe	A53 Gr...	Typical
24	M24	N2	N8			(E)Antenna Mast_Pipe 1.0 STD	Beam	Pipe	A53 Gr...	Typical
25	M25	N1	N7			(E)Antenna Mast_Pipe 1.0 STD	Beam	Pipe	A53 Gr...	Typical
26	M26	N2	N10			(E)Antenna Mast_Pipe 1.0 STD	Beam	Pipe	A53 Gr...	Typical
27	M27	N1	N9			(E)Antenna Mast_Pipe 1.0 STD	Beam	Pipe	A53 Gr...	Typical

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N1	Reaction	Reaction	Reaction			
2	N2	Reaction	Reaction	Reaction			
3	N29	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Weight of Appurtenances)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.2	Y	-.075	1.083
2	PS.2	Y	-.075	5.917
3	PS.3	Y	-.052	1.667
4	PS.3	Y	-.052	4.417
5	PS.1	Y	-.021	3.417
6	PS.1	Y	-.021	5.333
7	PS.2	Y	-.074	1
8	PS.2	Y	-.109	7

Member Point Loads (BLC 3 : Weight of Ice Only)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.2	Y	-.295	1.083
2	PS.2	Y	-.295	5.917
3	PS.3	Y	-.107	1.667
4	PS.3	Y	-.107	4.417
5	PS.1	Y	-.097	3.417
6	PS.1	Y	-.097	5.333
7	PS.2	Y	-.079	1
8	PS.2	Y	-.146	7

Member Point Loads (BLC 4 : (x) TIA Wind with Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.2	X	.039	1.083
2	PS.2	X	.039	5.917
3	PS.3	X	.014	1.667
4	PS.3	X	.014	4.417
5	PS.1	X	.014	3.417
6	PS.1	X	.014	5.333
7	PS.2	X	.011	1
8	PS.2	X	.022	7

Member Point Loads (BLC 5 : (x) TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.2	X	.089	1.083
2	PS.2	X	.089	5.917
3	PS.3	X	.029	1.667
4	PS.3	X	.029	4.417
5	PS.1	X	.02	3.417
6	PS.1	X	.02	5.333
7	PS.2	X	.017	1
8	PS.2	X	.049	7

Member Point Loads (BLC 6 : (z) TIA Wind with Ice)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.2	Z	.084	1.083
2	PS.2	Z	.084	5.917
3	PS.3	Z	.026	1.667
4	PS.3	Z	.026	4.417
5	PS.1	Z	.032	3.417
6	PS.1	Z	.032	5.333
7	PS.2	Z	.019	1
8	PS.2	Z	.027	7

Member Point Loads (BLC 7 : (z) TIA Wind)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	PS.2	Z	.252	1.083
2	PS.2	Z	.252	5.917
3	PS.3	Z	.07	1.667
4	PS.3	Z	.07	4.417
5	PS.1	Z	.08	3.417
6	PS.1	Z	.08	5.333
7	PS.2	Z	.041	1
8	PS.2	Z	.064	7

Member Distributed Loads (BLC 4 : (x) TIA Wind with Ice)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	PS.4	X	.001	.001	0	0
2	PS.2	X	.001	.001	0	0
3	PS.1	X	.001	.001	0	0
4	M22	X	.001	.001	0	0
5	PS.3	X	.001	.001	0	0
6	M24	X	.0006	.0006	0	0
7	M25	X	.0006	.0006	0	0
8	M26	X	.0006	.0006	0	0
9	M27	X	.0006	.0006	0	0

Member Distributed Loads (BLC 5 : (x) TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	PS.4	X	.005	.005	0	0
2	PS.2	X	.005	.005	0	0
3	PS.1	X	.005	.005	0	0
4	M22	X	.005	.005	0	0
5	PS.3	X	.005	.005	0	0
6	M24	X	.002	.002	0	0
7	M25	X	.002	.002	0	0
8	M26	X	.002	.002	0	0
9	M27	X	.002	.002	0	0

Member Distributed Loads (BLC 6 : (z) TIA Wind with Ice)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M17	Z	.001	.001	0	0
2	M18	Z	.001	.001	0	0
3	M24	Z	.0006	.0006	0	0

Member Distributed Loads (BLC 6 : (z) TIA Wind with Ice) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
4	M25	Z	.0006	.0006	0	0
5	M26	Z	.0006	.0006	0	0
6	M27	Z	.0006	.0006	0	0
7	PS.1	Z	.005	.005	0	3.417
8	PS.1	Z	.005	.005	5.333	0
9	PS.2	Z	.005	.005	0	1.083
10	PS.2	Z	.005	.005	5.917	0
11	PS.3	Z	.005	.005	0	1.667
12	PS.3	Z	.005	.005	4.417	0
13	PS.4	Z	.005	.005	0	0

Member Distributed Loads (BLC 7 : (z) TIA Wind)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,ksf]	Start Location[ft,%]	End Location[ft,%]
1	M17	Z	.005	.005	0	0
2	M18	Z	.005	.005	0	0
3	M24	Z	.002	.002	0	0
4	M25	Z	.002	.002	0	0
5	M26	Z	.002	.002	0	0
6	M27	Z	.002	.002	0	0
7	PS.1	Z	.001	.001	0	3.417
8	PS.1	Z	.001	.001	5.333	0
9	PS.2	Z	.001	.001	0	1.083
10	PS.2	Z	.001	.001	5.917	0
11	PS.3	Z	.001	.001	0	1.667
12	PS.3	Z	.001	.001	4.417	0
13	PS.4	Z	.001	.001	0	0

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	J...	Point	Distribu...	Area(M...	Surface...
1	Self Weight	DL		-1						
2	Weight of Appurtenances	None					8			
3	Weight of Ice Only	None					8			
4	(x) TIA Wind with Ice	None					8	9		
5	(x) TIA Wind	None					8	9		
6	(z) TIA Wind with Ice	None					8	13		
7	(z) TIA Wind	None					8	13		

Load Combinations

	Description	Solve	PDelta	...	B...	Fa...	BLC	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	1.2D + 1.6W (X-directi...	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6W (X-directi...	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6W (Z-directi...	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6W (Z-directi...	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0Di + 1.0Wi (...	Yes	Y		1	1.2	2	1.2	3	1	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	N1	max	-.125	5	1.044	6	2.256	3	0	6	0	6	0	6
2		min	-.892	3	.337	2	-.333	5	0	1	0	1	0	1
3	N2	max	.792	6	1.073	3	-1.695	2	0	6	0	6	0	6
4		min	-.214	2	.231	5	-2.671	6	0	1	0	1	0	1
5	N29	max	-.016	6	.012	1	1.014	2	0	6	0	6	0	6
6		min	-.1	2	.009	2	.209	6	0	1	0	1	0	1
7	Totals:	max	0	6	2.104	6	0	3						
8		min	-.878	1	.661	2	-1.707	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
1	N1	max	0	6	0	6	0	6	-2.568e-3	2	-1.048e-3	6	-1.83e-3	2
2		min	0	1	0	1	0	1	-7.843e-3	6	-6.728e-3	2	-2.529e-3	3
3	N2	max	0	6	0	6	0	6	-2.832e-3	2	4.709e-3	4	-2.155e-3	2
4		min	0	1	0	1	0	1	-8.324e-3	6	8.945e-4	6	-3.611e-3	3
5	N3	max	.211	2	.009	2	.012	6	4.185e-4	5	4.316e-3	5	1.673e-3	6
6		min	.035	6	-.117	6	-.424	2	-2.296e-3	1	-6.483e-3	2	-1.271e-3	2
7	N4	max	.162	1	.008	2	.021	6	-7.913e-4	5	2.793e-3	4	1.604e-3	6
8		min	.038	6	-.115	6	-.355	2	-2.209e-3	1	-6.476e-3	2	-9.204e-4	2
9	N5	max	.211	2	-.077	5	.65	5	1.809e-3	5	-1.722e-3	3	-9.941e-4	6
10		min	.036	6	-.139	3	.092	3	-1.019e-3	3	-1.477e-2	5	-1.592e-3	1
11	N6	max	.163	4	-.071	5	.635	4	1.308e-3	2	-1.955e-3	3	-1.05e-3	6
12		min	.037	6	-.139	3	.117	3	-1.755e-3	6	-1.541e-2	4	-1.901e-3	1
13	N7	max	.211	2	-.009	2	-.038	6	4.121e-5	5	7.293e-4	6	1.193e-3	6
14		min	.035	6	-.038	6	-.212	2	-1.763e-3	1	-6.455e-3	2	-4.545e-4	5
15	N8	max	.161	1	-.008	5	-.033	6	-7.622e-4	3	7.449e-4	6	1.312e-3	6
16		min	.037	6	-.037	3	-.155	1	-1.866e-3	4	-5.545e-3	1	-5.754e-4	2
17	N9	max	.211	2	-.035	2	.209	2	4.778e-3	5	-1.725e-3	3	-3.36e-4	4
18		min	.036	6	-.088	6	.031	6	-1.189e-3	3	-1.075e-2	5	-1.383e-3	2
19	N10	max	.163	4	-.02	5	.171	4	9.236e-4	2	-1.721e-3	3	-5.e-4	3
20		min	.038	6	-.085	3	.046	6	-2.853e-3	4	-1.069e-2	4	-1.302e-3	5
21	N11	max	.211	2	-.073	5	.605	5	1.809e-3	5	-1.722e-3	3	-9.94e-4	6
22		min	.036	6	-.135	3	.087	3	-1.019e-3	3	-1.477e-2	5	-1.591e-3	1
23	N12	max	.163	4	-.066	5	.589	4	1.308e-3	2	-1.955e-3	3	-1.05e-3	6
24		min	.037	6	-.135	3	.112	3	-1.755e-3	6	-1.541e-2	4	-1.901e-3	1
25	N13	max	.211	2	-.026	2	.164	2	5.44e-3	5	-1.793e-3	3	-1.962e-4	6
26		min	.036	6	-.087	6	.014	6	-1.178e-3	3	-9.778e-3	5	-1.736e-3	2
27	N14	max	.162	4	-.012	5	.128	1	8.691e-4	2	-1.618e-3	3	-1.095e-4	3
28		min	.038	6	-.084	3	.029	6	-3.28e-3	4	-9.225e-3	4	-1.074e-3	5
29	N15	max	.211	2	-.012	2	-.041	6	1.006e-5	5	3.408e-4	6	1.273e-4	3
30		min	.035	6	-.035	6	-.192	5	-1.617e-3	1	-6.443e-3	2	-8.578e-4	5
31	N16	max	.161	1	-.009	5	-.031	3	-5.974e-4	3	1.998e-4	6	2.685e-4	6
32		min	.037	6	-.034	3	-.148	4	-2.039e-3	4	-5.421e-3	1	-8.861e-4	2
33	N17	max	.247	5	-.068	5	.605	5	1.536e-3	5	-1.778e-3	3	-5.864e-4	6
34		min	.049	6	-.139	3	.087	3	-9.632e-4	3	-1.482e-2	5	-1.591e-3	2
35	N18	max	.209	4	-.068	5	.589	4	1.366e-3	2	-1.911e-3	3	-6.326e-4	6
36		min	.05	3	-.139	3	.112	3	-1.666e-3	6	-1.535e-2	4	-1.768e-3	2
37	N19	max	.233	2	-.022	5	.164	2	6.192e-3	5	-1.805e-3	3	-8.848e-5	6
38		min	.044	6	-.088	3	.014	6	-1.012e-3	3	-9.713e-3	5	-2.547e-3	2

Envelope Joint Displacements (Continued)

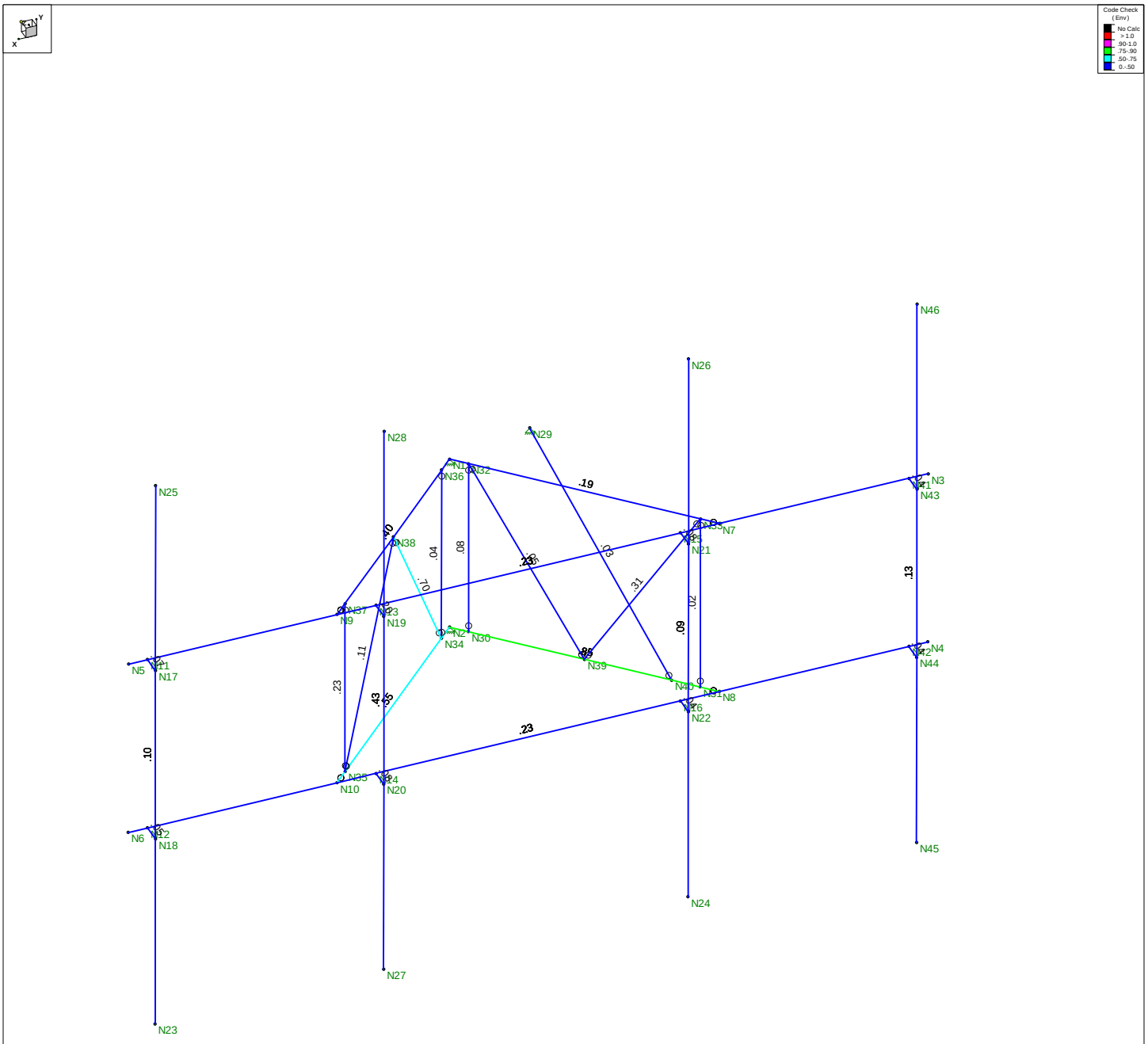
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
39	N20	max	.19	4	-.022	5	.128	1	1.015e-3	2	-1.644e-3	3	9.247e-5	3
40		min	.045	6	-.088	3	.029	6	-3.553e-3	4	-9.289e-3	4	-1.272e-3	5
41	N21	max	.23	2	-.015	5	-.041	6	-3.998e-5	6	3.327e-4	6	8.226e-5	6
42		min	.034	6	-.035	3	-.192	5	-1.663e-3	2	-6.339e-3	2	-1.129e-3	2
43	N22	max	.178	1	-.015	5	-.031	3	-4.869e-4	3	2.078e-4	6	2.136e-4	6
44		min	.037	6	-.035	3	-.148	4	-2.051e-3	5	-5.54e-3	1	-1.187e-3	2
45	N23	max	.161	4	-.068	5	.609	4	1.365e-3	2	-1.911e-3	3	-6.31e-4	6
46		min	.024	3	-.139	3	.145	3	-1.82e-3	6	-1.535e-2	4	-1.514e-3	2
47	N24	max	.148	1	-.015	5	-.009	6	-4.868e-4	3	2.078e-4	6	2.135e-4	6
48		min	.044	6	-.035	3	-.079	4	-2.116e-3	5	-5.54e-3	1	-9.346e-4	2
49	N25	max	.291	2	-.068	5	.658	5	1.602e-3	5	-1.778e-3	3	-5.865e-4	6
50		min	.069	6	-.139	3	.055	3	-9.634e-4	3	-1.482e-2	5	-1.844e-3	2
51	N26	max	.274	2	-.015	5	-.039	6	1.179e-4	6	3.327e-4	6	8.228e-5	6
52		min	.032	6	-.035	3	-.227	2	-1.664e-3	2	-6.339e-3	2	-1.382e-3	2
53	N27	max	.229	1	-.022	5	.297	4	1.012e-3	2	-1.644e-3	3	1.759e-3	1
54		min	.039	6	-.088	3	.075	3	-6.033e-3	4	-9.289e-3	4	-1.268e-3	5
55	N28	max	.387	2	-.022	5	.524	5	1.281e-2	5	-1.805e-3	3	-8.942e-5	6
56		min	.047	6	-.088	3	-.004	3	-1.023e-3	3	-9.713e-3	5	-5.182e-3	2
57	N29	max	0	6	0	6	0	6	-2.22e-4	2	-6.953e-5	6	1.811e-4	3
58		min	0	1	0	1	0	1	-5.703e-4	6	-6.467e-4	1	-1.068e-3	5
59	N30	max	-.002	6	-.001	2	.013	4	-2.71e-3	2	6.564e-3	4	-2.076e-3	2
60		min	-.012	4	-.01	6	.003	6	-7.529e-3	6	1.301e-3	6	-3.518e-3	3
61	N31	max	.095	4	-.007	5	-.019	6	-1.313e-3	5	-6.389e-3	6	1.916e-3	3
62		min	.023	6	-.027	6	-.089	1	-2.386e-3	3	-3.004e-2	1	-8.946e-4	5
63	N32	max	.014	2	-.002	2	-.002	6	-2.464e-3	2	-1.034e-3	6	-1.746e-3	2
64		min	.002	6	-.011	6	-.014	2	-7.031e-3	6	-6.668e-3	2	-2.545e-3	3
65	N33	max	.195	2	-.007	5	-.035	6	-1.25e-3	5	-1.391e-3	6	2.683e-3	6
66		min	.032	6	-.025	6	-.196	2	-2.608e-3	3	-7.573e-3	5	-6.997e-4	2
67	N34	max	-.002	6	-.01	2	0	6	-2.422e-3	2	2.481e-3	4	-1.865e-3	2
68		min	-.008	4	-.025	6	-.007	4	-7.328e-3	6	4.068e-4	6	-2.827e-3	3
69	N35	max	.141	1	-.022	5	.149	4	-1.175e-4	5	-2.425e-3	6	1.252e-3	5
70		min	.033	6	-.056	3	.04	6	-6.194e-3	3	-1.032e-2	4	-5.23e-3	3
71	N36	max	.014	2	-.009	2	.014	2	-2.115e-3	2	-1.062e-3	6	-1.609e-3	2
72		min	.003	6	-.022	6	.002	6	-6.939e-3	6	-6.768e-3	2	-2.005e-3	6
73	N37	max	.196	2	-.024	2	.194	2	-8.588e-4	5	-1.12e-3	6	-3.264e-3	2
74		min	.033	6	-.06	3	.028	6	-5.822e-3	3	-7.11e-3	5	-5.967e-3	4
75	N38	max	.105	2	-.015	5	.103	2	2.057e-3	5	-1.122e-3	6	2.743e-3	3
76		min	.019	6	-.039	3	.014	6	-7.155e-5	3	-7.017e-3	2	-2.934e-4	5
77	N39	max	-.016	6	-.004	2	.094	4	-1.792e-3	2	5.441e-4	2	-1.768e-3	2
78		min	-.089	4	-.018	6	.02	6	-2.365e-3	6	3.897e-5	6	-3.381e-3	6
79	N40	max	.009	4	-.005	2	0	6	-1.394e-3	5	-4.893e-3	6	8.072e-5	3
80		min	.005	3	-.017	6	-.002	2	-1.855e-3	3	-2.293e-2	1	-1.163e-3	2
81	N41	max	.211	2	.005	2	.006	6	4.185e-4	5	4.316e-3	5	1.673e-3	6
82		min	.035	6	-.112	6	-.404	2	-2.296e-3	1	-6.483e-3	2	-1.271e-3	2
83	N42	max	.162	1	.005	2	.016	6	-7.913e-4	5	2.793e-3	4	1.604e-3	6
84		min	.038	6	-.111	6	-.335	2	-2.209e-3	1	-6.476e-3	2	-9.205e-4	2
85	N43	max	.23	2	-.002	2	.006	6	4.767e-4	5	4.217e-3	4	1.091e-3	6
86		min	.029	6	-.113	6	-.404	2	-2.321e-3	1	-6.494e-3	2	-1.586e-3	2
87	N44	max	.181	1	-.002	2	.016	6	-6.746e-4	5	2.893e-3	5	1.034e-3	6
88		min	.032	6	-.113	6	-.335	2	-2.244e-3	1	-6.513e-3	1	-1.14e-3	2
89	N45	max	.155	1	-.002	2	.045	6	-7.403e-4	5	2.893e-3	5	1.034e-3	6
90		min	.066	6	-.113	6	-.262	2	-2.244e-3	1	-6.513e-3	1	-8.945e-4	5

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [...	LC	Y Rotation [...	LC	Z Rotation [...	LC
91	N46	max	.297	2	-.002	2	.008	6	1.19e-3	5	4.217e-3	4	1.095e-3	6
92		min	-.007	6	-.113	6	-.481	1	-2.324e-3	1	-6.494e-3	2	-2.11e-3	2

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

	Me...	Sha...	Code Ch...	Lo...	LC	Shear...	Loc...	Dir	LC	phi*Pnc [k]	phi*Pnt [k]	phi*Mn y...	phi*Mn ...	Cb	Eqn
1	M1	SR ...	.017	0	3	.135	0		1	3.837	9.94	.104	.104	1	H1-1b
2	M2	SR ...	.084	2.5	3	.078	0		1	3.837	9.94	.104	.104	1	H1-1b*
3	M3	SR ...	.038	2.5	6	.054	0		2	3.837	9.94	.104	.104	1	H1-1b
4	M4	SR ...	.697	1.4...	3	.038	0		2	2.8	9.94	.104	.104	1.136	H1-1a
5	M5	SR ...	.106	1.4...	3	.015	0		1	2.8	9.94	.104	.104	1.136	H1-1b
6	M6	SR ...	.228	0	6	.019	0		4	3.837	9.94	.104	.104	1	H1-1a
7	M7	SR ...	.307	1.5...	6	.041	0		4	2.8	9.94	.104	.104	1.136	H1-1a
8	M8	SR ...	.050	1.4...	6	.033	2.9...		1	2.8	9.94	.104	.104	1.136	H1-1b
9	M9	PIP...	.039	0	2	.091	0		5	32.106	32.13	1.872	1.872	1.05	H1-1b
10	M10	PIP...	.077	0	5	.112	0		2	32.106	32.13	1.872	1.872	1.012	H1-1b
11	M11	PIP...	.080	.25	3	.113	0		3	32.106	32.13	1.872	1.872	1.758	H1-1b
12	M12	PIP...	.201	.25	4	.215	0		1	32.106	32.13	1.872	1.872	1.134	H1-1b
13	M13	PIP...	.052	.25	4	.118	0		3	32.106	32.13	1.872	1.872	1.039	H1-1b
14	M14	PIP...	.065	0	4	.115	0		6	32.106	32.13	1.872	1.872	1.046	H1-1b
15	M15	PIP...	.043	.25	4	.162	0		3	32.106	32.13	1.872	1.872	1.133	H1-1b
16	M16	PIP...	.036	.25	4	.164	0		3	32.106	32.13	1.872	1.872	1.32	H1-1b
17	M17	PIP...	.226	2.7...	4	.100	2.8...		4	8.922	32.13	1.872	1.872	1.883	H1-1b
18	M18	PIP...	.227	7.7...	4	.141	2.8...		4	8.922	32.13	1.872	1.872	1.498	H1-1b
19	PS.4	PIP...	.093	2.75	5	.032	5.25		2	14.916	32.13	1.872	1.872	4.195	H1-1b
20	PS.2	PIP...	.433	2.75	5	.063	5.25		5	14.916	32.13	1.872	1.872	3.846	H1-1b
21	PS.1	PIP...	.097	5.25	6	.026	5.25		4	14.916	32.13	1.872	1.872	4.906	H1-1b
22	M22	PIP...	.033	2.7...	1	.002	0		1	22.135	32.13	1.872	1.872	1.136	H1-1b
23	PS.3	PIP...	.129	5.25	6	.043	2.75		4	14.916	32.13	1.872	1.872	4.914	H1-1b
24	M24	PIP...	.854	2.9...	1	.163	3.5...		4	8.759	14.774	.465	.465	2.208	H1-1b
25	M25	PIP...	.193	3.2...	6	.156	0		6	8.759	14.774	.465	.465	2.109	H1-1b
26	M26	PIP...	.554	.221	6	.208	0		3	8.759	14.774	.465	.465	2.095	H1-1a
27	M27	PIP...	.400	3.2...	6	.203	3.3...		6	8.759	14.774	.465	.465	2.178	H1-1b



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Centek		
FJP	CTHA142G - Mount	July 6, 2021 at 8:47 AM
21022.20	Member Unity Check	CT11396B_AMA.r3d

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

185' Existing Lattice Tower

Proposed T-Mobile
Antenna Upgrade

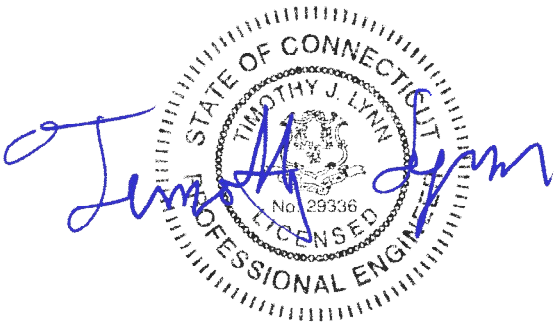
Site Ref: CTHA142G

7 Hoskins Road
Bloomfield, CT

CENTEK Project No. 21022.20

Date: July 8, 2021

Max Stress Ratio = 89.3%



Prepared for:
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Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by T-Mobile on the existing lattice tower located in Bloomfield, Connecticut.

The host tower is a 185-ft, three legged, lattice tower originally designed and manufactured by Sabre Industries project no. 127272 dated 9/26/15. The tower geometry, structure member sizes and foundation information were taken from the aforementioned design documents.

Antenna and appurtenance inventory was taken from a previous structural analysis report prepared by Black & Veatch job no. 405025 dated August 10, 2020, a previous structural analysis report prepared by EFI Global job no. 049.00933-2075086 dated April 1, 2021 and a T-Mobile RFDS.

The tower consists of ten (10) vertical sections consisting of pipe legs conforming to ASTM A572 Gr. 50 and steel angle lateral bracing conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 18-ft 6-in at the top and 37-ft 0-in at the bottom.

Antenna and Appurtenance Summary

The existing and proposed loads considered in the analysis consist of the following:

- Unknown (Existing):
  Antenna: One (1) dBSpectra DS2C03F36D-D antenna, one (1) dBSpectra DS9A09F36D-N antenna, one (1) RFS BA8080-67 dipole antenna, one (1) Kreco CO-41A antenna, one (1) Telewave ANT450F-6 antenna and one (1) TTA pipe mounted to the top of the tower.
  Coax Cable: Two (2) 1-5/8"∅, five (5) 7/8"∅ and one (1) 1/2"∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: Three (3) dBSpectra DS7C09P36D-D antennas mounted on (1) 10-ft V-frame with an elevation of 183-ft AGL.
  Coax Cable: Three (3) 1-5/8"∅ and one (1) 1/2"∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: Two (2) 8-ft microwave dishes pipe mounted with an elevation of 183-ft AGL.
  Coax Cable: Four (4) EW63 cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Decibel DB411-B antenna leg mounted with an elevation of 176-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 4-ft microwave dish pipe mounted with an elevation of 177-ft AGL.
  Coax Cable: One (1) EW90 cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- Unknown (Existing):
  Antenna: One (1) 8-ft microwave dish pipe mounted with an elevation of 172-ft AGL.
  Coax Cable: Two (2) EW63 cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 8-ft microwave dish pipe mounted with an elevation of 171-ft AGL.
  Coax Cable: Two (2) EW63 cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Kathrein PR-900 grid dish pipe mounted with an elevation of 168-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Telewave ANT150F6 antenna mounted one a sidearm with an elevation of 165-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing):
  Antenna: Three (3) Powerwave 7770 panel antennas, four (4) Kathrein 800-10966 panel antennas, two (2) Kathrein 800-10965 panel antennas, two (2) CCI OPA-65R-LCUU-H8 panel antennas, one (1) CCI OPA-65R-LCUU-H6 panel antenna, three (3) Powerwave TT08-19DB111-001 TMAs, three (3) Ericsson 4478 B14 remote radio heads, three (3) Ericsson 4449 B5/B12 remote radio heads, three (3) Ericsson 8843 B2/B66A remote radio heads, three (3) Ericsson RRUS32 remote radio heads, three (3) Ericsson E2 remote radio heads and three (3) Raycap DC6-48-60-18-8F surge arrestors mounted on three (3) 12-ft Sector Frames with a RAD center elevation of ±160-ft above grade level.
  Coax Cable: Six (6) 2-1/4" ∅ cables, three (3) 5/16" ∅ cables and twelve (12) 5/8" ∅ cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Verizon (Existing):
  Antennas: Three (3) Antel BXA-70063-6CF panel antennas, six (6) Antel BXA-171063-12CF panel antennas, six (6) Antel LPA-80080-4CF panel antennas, three (3) Alcatel-Lucent RRH2x40-700 remote radio heads, three (3) Alcatel-Lucent RRH2x40-AWS remote radio heads and one (1) main distribution box mounted on (3) Sector Frames with a RAD center elevation of ±150-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables and two (2) 1-1/4" ∅ fiber cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: Two (2) 6-ft microwave dishes pipe mounted with an elevation of 135-ft AGL.
  Coax Cable: Four (4) EW63 cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- Unknown (Existing):
  Antenna: One (1) Telewave ANT150F6 antenna mounted one a sidearm with an elevation of 125-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Comprod 531-70HD antenna mounted one a sidearm with an elevation of 125-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 8-ft microwave dish pipe mounted with an elevation of 125-ft AGL.
  Coax Cable: Two (2) EW63 cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Comprod 531-70HD antenna mounted one a sidearm with an elevation of 109-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Kreco CO-41A antenna mounted one a sidearm with an elevation of 108-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 8-ft microwave dish pipe mounted with an elevation of 100-ft AGL.
  Coax Cable: Two (2) EW63 cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 3-ft microwave dish pipe mounted with an elevation of 98-ft AGL.
  Coax Cable: One (1) 3/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 3-ft microwave dish pipe mounted with an elevation of 91-ft AGL.
  Coax Cable: One (1) 3/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) Telewave ANT150F2 antenna mounted one a sidearm with an elevation of 87-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- Unknown (Existing):
  Antenna: One (1) Comprod 531-70HD antenna mounted one a sidearm with an elevation of 85-ft AGL.
  Coax Cable: One (1) 7/8"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Unknown (Existing):
  Antenna: One (1) 2'x2' panel antenna mounted one a sidearm with an elevation of 66-ft AGL.
  Coax Cable: One (1) 1/4"∅ cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (Existing to Remain):
  Antennas: Three (3) RFS APXVAALL24_43 panel antennas and three (3) Ericsson 4449 remote radio heads mounted on three (3) 10-ft V-Frames with a RAD center elevation of ±140-ft above grade level.
  Coax Cables: Six (6) 6x12 fiber cables running on a face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (Existing to Remove):
  Antennas: Six (6) RFS APXV18-206516S panel antennas and three (3) Ericsson 2217 remote radio heads mounted on three (3) 10-ft V-Frames with a RAD center elevation of ±140-ft above grade level.
- **T-MOBILE (Proposed):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) RFS APX16DWV-16DWVS panel antennas and three (3) Ericsson 4460 remote radio heads mounted on three (3) 10-ft V-Frames with a RAD center elevation of ±140-ft above grade level.
  Coax Cables: Three (3) 6x24 fiber cables running on a face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

- The tower structure's theoretical capacity not including any assessment of the condition of the tower.
- The tower carries the horizontal and vertical loads due to the weight of antennas, ice load and wind.
- Tower is properly installed and maintained.
- Tower is in plumb condition.
- Tower loading for antennas and mounts as listed in this report.
- All bolts are appropriately tightened providing the necessary connection continuity.
- All welds are fabricated with ER-70S-6 electrodes.
- All members are assumed to be as specified in the original tower design documents.
- All members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
- All member protective coatings are in good condition.
- All tower members were properly designed, detailed, fabricated, installed and have been properly maintained since erection.
- Any deviation from the analyzed antenna loading will require a new analysis for verification of structural adequacy.
- All coax cables should be routed as specified in section 3 of this report.

Analysis

The existing tower was analyzed using a comprehensive computer program entitled tnxTower. The program analyzes the tower, considering the worst case loading condition. The tower is considered as loaded by concentric forces along the tower, and the model assumes that the tower members are subjected to bending, axial, and shear forces.

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-H entitled "Structural Standard for Antenna Support Structures, Antennas and Small Wind Turbine Support Structures", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-H Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-H, gravity loads of the tower structure and its components, and the application of 1.5" radial ice on the tower structure and its components.

Load Cases:	Load Case 1; 130 mph (Risk Cat III) wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 1.50" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-H]*

[1] The 2015 International Building Code as amended by the 2018 Connecticut State Building Code (CSBC).

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower.

- Calculated stresses **were found to be within allowable limits**.

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T7)	80'-0"-93'-4"	89.3%	**PASS**
Leg (T10)	53'-4"-60'-0"	62.4%	**PASS**

- The tower combined deflection is **0.3397 degrees**.

Deflection Criteria	Proposed (degrees)	Allowable (degrees)	Result
Sway (Tilt)	0.3376	0.5	**n/a**
Twist	0.0379	0.5	**n/a**
Combined	0.3397	0.5	**PASS**

Foundation and Anchors

The existing foundation consists of a three (3) 6-ft ∅ x 5.5-ft long reinforced concrete piers concentrically bearing on a 45.5-ft square x 1-ft 6-in thick reinforced concrete mat. The sub grade conditions used in the foundation analysis were derived from a geotechnical report prepared by Design Earth Technology job no. 2014.15 dated October 14, 2014. The base of the tower is connected to the foundation by means of (6) 1.75"∅, ASTM F1554 Grade 105 anchor bolts per leg embedded 6-ft 6-in into the concrete foundation structure.

- The tower reactions developed from the governing Load Case were used in the verification of the foundation and anchor bolts:

Load Effect	Proposed Tower Reactions
Leg Shear	80 kips
Leg Compression	497 kips
Leg Tension	421 kips
Base Moment	14936 ft-kips
Base Shear	139 kips

- The anchor bolts were found to be within allowable limits.

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	35.8%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-H Section 9.4 FS[(1)]	Proposed Loading (FS)[(1)]	Result
Reinforced Concrete Pad and Piers	Overturning	1.0	1.85	**PASS**

Note 1: FS denotes Factor of Safety

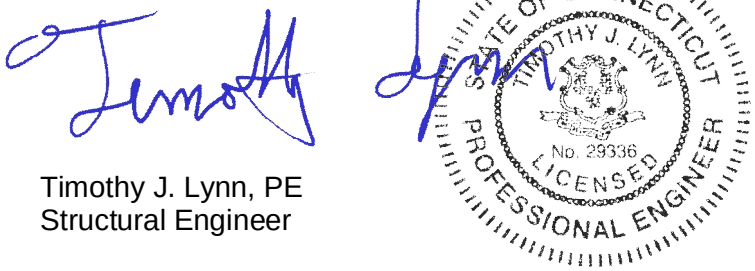
Conclusion

This analysis shows that the subject tower **is adequate** to support the proposed antenna configuration with the below recommendations.

The analysis is based, in part, on the information provided to this office by T-Mobile. If the existing conditions are different than the information in this report, Centek Engineering, Inc. must be contacted for resolution of any potential issues.

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

All engineering services are performed on the basis that the information used is current and correct. This information may consist of, but is not necessarily limited to:

- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or generated by field inspections or measurements of the structure.
- It is the responsibility of the client to ensure that the information provided to Centek Engineering, Inc. and used in the performance of our engineering services is correct and complete. In the absence of information to the contrary, we assume that all structures were constructed in accordance with the drawings and specifications and are in an un-corroded condition and have not deteriorated. It is therefore assumed that its capacity has not significantly changed from the “as new” condition.
- All services will be performed to the codes specified by the client, and we do not imply to meet any other codes or requirements unless explicitly agreed in writing. If wind and ice loads or other relevant parameters are to be different from the minimum values recommended by the codes, the client shall specify the exact requirement. In the absence of information to the contrary, all work will be performed in accordance with the latest revision of ANSI/ASCE10 & ANSI/EIA-222
- All services performed, results obtained, and recommendations made are in accordance with generally accepted engineering principles and practices. Centek Engineering, Inc. is not responsible for the conclusions, opinions and recommendations made by others based on the information we supply.

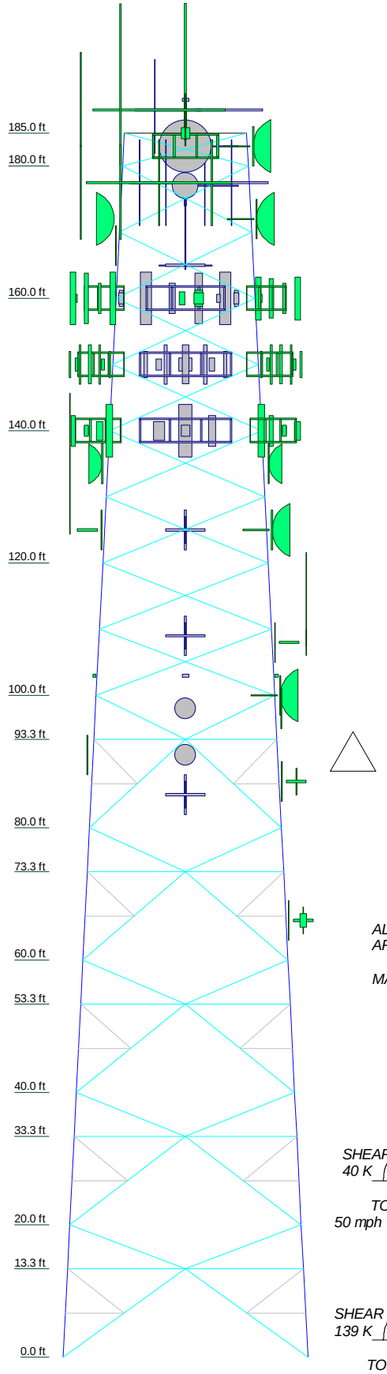
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, tnxTower, formerly RISA Tower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

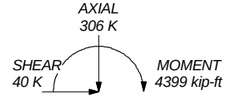
Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	T11	T12	T13	T14	T15	
Legs	P6x.28				P8x.322				P8x.5		P10x.365		P10x.5		P12x.5	
Leg Grade	A572-50															
Diagonals	A	L4x4x1/4		L5x5x5/16		L5x5x3/8	B	L6x4x1/2		L6x6x3/8			L6x6x1/2			
Diagonal Grade	A36															
Top Girts	C						N.A.									
Horizontals	N.A.						L4x4x5/16	N.A.	L4x4x5/16	N.A.	L5x5x5/16	N.A.	L5x5x5/16	N.A.	L5x5x5/16	
Red. Horizontals	N.A.						L3x3x1/4	N.A.	L3x3x1/4	N.A.	L3x3x5/16	N.A.	L3x3x5/16	N.A.	L4x3 1/2x5/16	
Red. Diagonals	N.A.						L3x3x1/4	N.A.	L3x3x1/4	N.A.	L3x3x5/16	N.A.	L3x3x5/16	N.A.	L4x3 1/2x5/16	
Inner Bracing	N.A.						L3x3x1/4	N.A.	L3x3x1/4	N.A.	L3 1/2x3 1/2x1/4	N.A.	L3 1/2x3 1/2x1/4	N.A.	L3 1/2x3 1/2x1/4	
Face Width (ft)	18.5	19	21	23	25	27	27.6667	29	29.6667	31	31.6667	33	33.6667	35	35.6667	37
# Panels @ (ft)	1 @ 5	8 @ 10				1 @ 6.67	1 @ 13.33	1 @ 6.67	1 @ 13.33	1 @ 6.67	1 @ 13.33	1 @ 6.67	1 @ 13.33	1 @ 6.67	1 @ 13.33	
Weight (K)	1.5	2.9	4.1	4.4	5.8	1.9	4.4	2.3	5.0	2.3	5.4	2.7	6.8	3.5	7.6	60.7



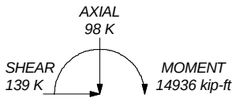
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 497 K
SHEAR: 80 K

UPLIFT: -421 K
SHEAR: 70 K



TORQUE 64 kip-ft
50 mph WIND - 1.5000 in ICE



TORQUE 155 kip-ft
REACTIONS - 130 mph WIND

DESIGNED APPURTENANCE LOADING

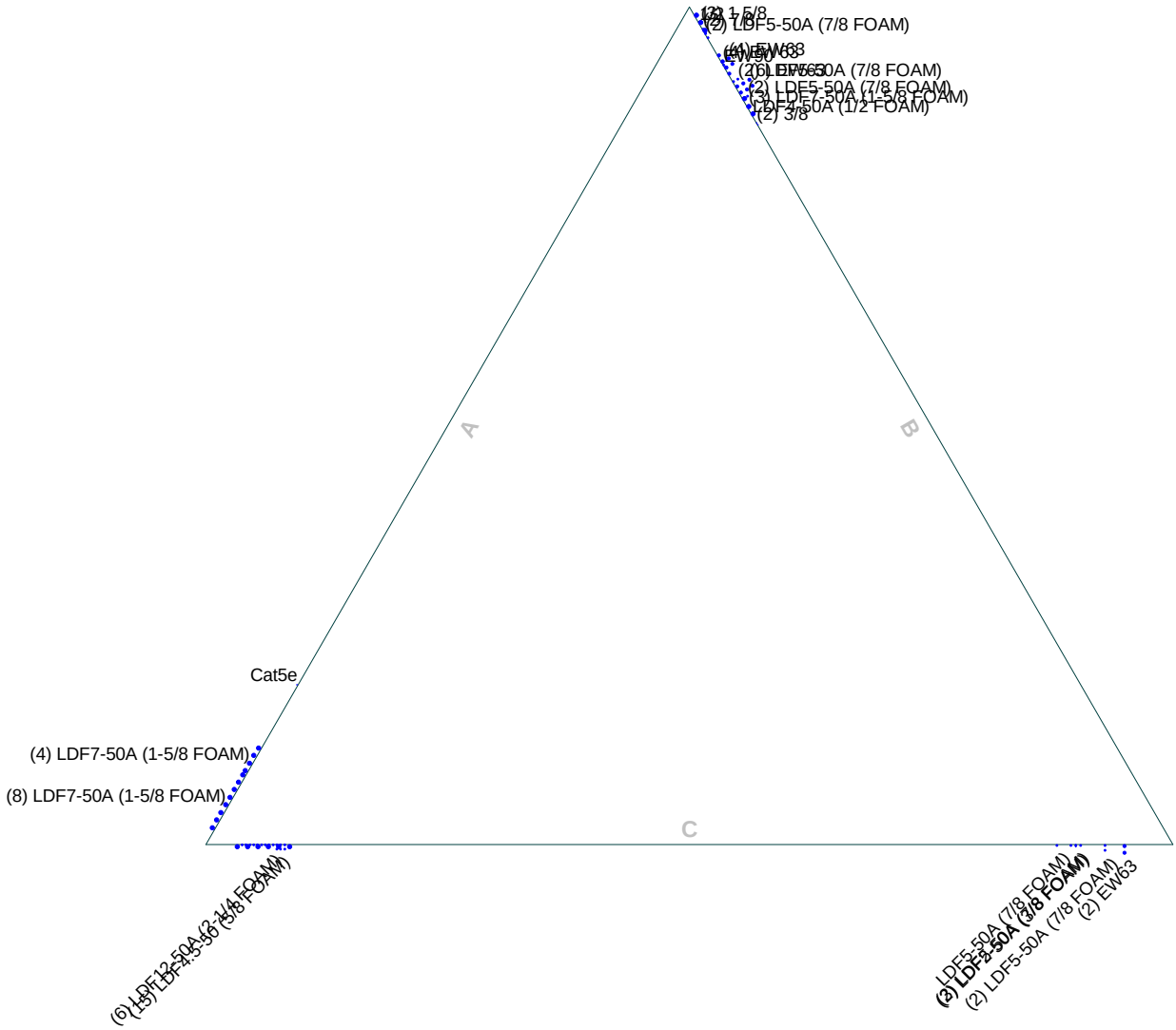
TYPE	ELEVATION	TYPE	ELEVATION
6'x4" Pipe Mount	185	LPA-80080-4CF (Verizon)	150
Light Beacon	185	BXA-171063-12CF (Verizon)	150
CO-41A	185	BXA-70063/6CF (Verizon)	150
DS9A09F36D-N	185	BXA-171063-12CF (Verizon)	150
Tower Top Amplifier	185	LPA-80080-4CF (Verizon)	150
ANT450F6	185	LPA-80080-4CF (Verizon)	150
20' 8 Bay Di-Pole	185	BXA-171063-12CF (Verizon)	150
6'x4" Pipe Mount	183	BXA-70063/6CF (Verizon)	150
8' x 2" Horz. Pipe	183	BXA-171063-12CF (Verizon)	150
6'x4" Pipe Mount	183	LPA-80080-4CF (Verizon)	150
8' x 2" Horz. Pipe	183	LPA-80080-4CF (Verizon)	150
DS2C03F36D-D	183	BXA-171063-12CF (Verizon)	150
DS7C09P36U-D	183	BXA-70063/6CF (Verizon)	150
DS7C09P36U-D	183	BXA-171063-12CF (Verizon)	150
DS7C09P36U-D	183	LPA-80080-4CF (Verizon)	150
SitePro VFA10-HD	183	RRH2x40-07-L (Verizon)	150
8' Dish	183	RRH2x40-07-L (Verizon)	150
8' Dish	183	RRH2x40-07-L (Verizon)	150
20' Horz. 4x4x1/4"	182	RRH2x40-AWS (Verizon)	150
20' Horz. 4x4x1/4"	182	RRH2x40-AWS (Verizon)	150
20' Horz. 4x4x1/4"	182	RRH2x40-AWS (Verizon)	150
DB411-B	181	DB-T1-6Z-8AB-0Z (Verizon)	150
6'x4" Pipe Mount	177	Pirod 12' T-Frame Sector Mount (1) (Verizon)	150
8' x 2" Horz. Pipe	177	Pirod 12' T-Frame Sector Mount (1) (Verizon)	150
4' Dish	177	Pirod 12' T-Frame Sector Mount (1) (Verizon)	150
6'x4" Pipe Mount	172	AIR6449 (T-Mobile - Proposed)	140
8' x 2" Horz. Pipe	172	APXVAALL24-43 (T-Mobile)	140
8' Dish	172	APX16DWV-16DWVS-E-A20 (T-Mobile - Proposed)	140
8' Dish	172	AIR6449 (T-Mobile - Proposed)	140
13'x2" Pipe	171	APX16DWV-16DWVS-E-A20 (T-Mobile - Proposed)	140
13'x2" Pipe	171	AIR6449 (T-Mobile - Proposed)	140
13'x2" Pipe	171	APXVAALL24-43 (T-Mobile)	140
13'x2" Pipe	171	4449 B12,B71 (T-Mobile)	140
13'x2" Pipe	171	4460 B25+B66 (T-Mobile - Proposed)	140
13'x2" Pipe	171	4460 B25+B66 (T-Mobile - Proposed)	140
22' Horz. 4x4x1/4	171	4460 B25+B66 (T-Mobile - Proposed)	140
22' Horz. 4x4x1/4	171	SitePro VFA10-HD (T-Mobile)	140
22' Horz. 4x4x1/4	171	APX16DWV-16DWVS-E-A20 (T-Mobile - Proposed)	140
6'x2" Pipe Mount	168	SitePro VFA10-HD (T-Mobile)	140
PR-900	168	SitePro VFA10-HD (T-Mobile)	140
8' x 2" Horz. Pipe	165	4449 B12,B71 (T-Mobile)	140
6' Standoff Arm	165	4449 B12,B71 (T-Mobile)	140
ANT150F6	165	APXVAALL24-43 (T-Mobile)	140
8843 B2/B66A (ATI)	160	6'x4" Pipe Mount	135
8843 B2/B66A (ATI)	160	6'x4" Pipe Mount	135
RRUS-32 (ATI)	160	6' Dish	135
RRUS-32 (ATI)	160	6' Dish	135
RRUS-32 (ATI)	160	ANT150F6	125
RRUS-E2 (ATI)	160	6'x4" Pipe Mount	125
RRUS-E2 (ATI)	160	8' x 2" Horz. Pipe	125
RRUS-E2 (ATI)	160	6'x3" Pipe Mount	125
Pirod 12' T-Frame Sector Mount (1) (ATI)	160	4' x 2.875" Pipe Mount	125
Pirod 12' T-Frame Sector Mount (1) (ATI)	160	6' Standoff Arm	125
Pirod 12' T-Frame Sector Mount (1) (ATI)	160	531-70HD	125
80010966 (ATI)	160	6'x3" Pipe Mount	125
TT08-19DB111-001 TMA (ATI)	160	6' Standoff Arm	125
TT08-19DB111-001 TMA (ATI)	160	8' Dish	125
TT08-19DB111-001 TMA (ATI)	160	6'x3" Pipe Mount	109
DC6-48-60-18-8F Surge Arrestor (ATI)	160	4' x 2.875" Pipe Mount	109
DC6-48-60-18-8F Surge Arrestor (ATI)	160	6' Standoff Arm	109
80010966 (ATI)	160	531-70HD	109
80010966 (ATI)	160	6'x3" Pipe Mount	108
7770.00 (ATI)	160	4' x 2.875" Pipe Mount	108
OPA-65R-LCUU-H8 (ATI)	160	6' Standoff Arm	108
DC6-48-60-18-8F Surge Arrestor (ATI)	160	CO-41A	108
4478 B14 (ATI)	160	Light Beacon	103
4478 B14 (ATI)	160	Light Beacon	103
80010965 (ATI)	160	Light Beacon	103
80010966 (ATI)	160	6'x4" Pipe Mount	100
80010965 (ATI)	160	8' x 2" Horz. Pipe	100
7770.00 (ATI)	160	8' Dish	100
4449 B5/B12 (ATI)	160	6'x4" Pipe Mount	98
4449 B5/B12 (ATI)	160	SC3-W100AB	98
8843 B2/B66A (ATI)	160	6'x4" Pipe Mount	91
4478 B14 (ATI)	160	SC3-W100AB	91
4449 B5/B12 (ATI)	160	4' x 2.875" Pipe Mount	87
7770.00 (ATI)	160	6' Standoff Arm	87
OPA-65R-LCUU-H8 (ATI)	160	6'x3" Pipe Mount	87
OPA-65R-LCUU-H6 (ATI)	160	ANT150F2	87

Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: **21022.20 - CTHA142G**		
Project: ***185' Lattice Tower - Bloomfield, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 07/08/21	Scale: NTS
Path: J:\jobs\21022200 WB30 CTHA142G\05 Structural\Tower Analysis\Backup Documentation\ER Files\185-ft Saber Lattice Tower.eri		Dwg No. E-1

Feed Line Plan

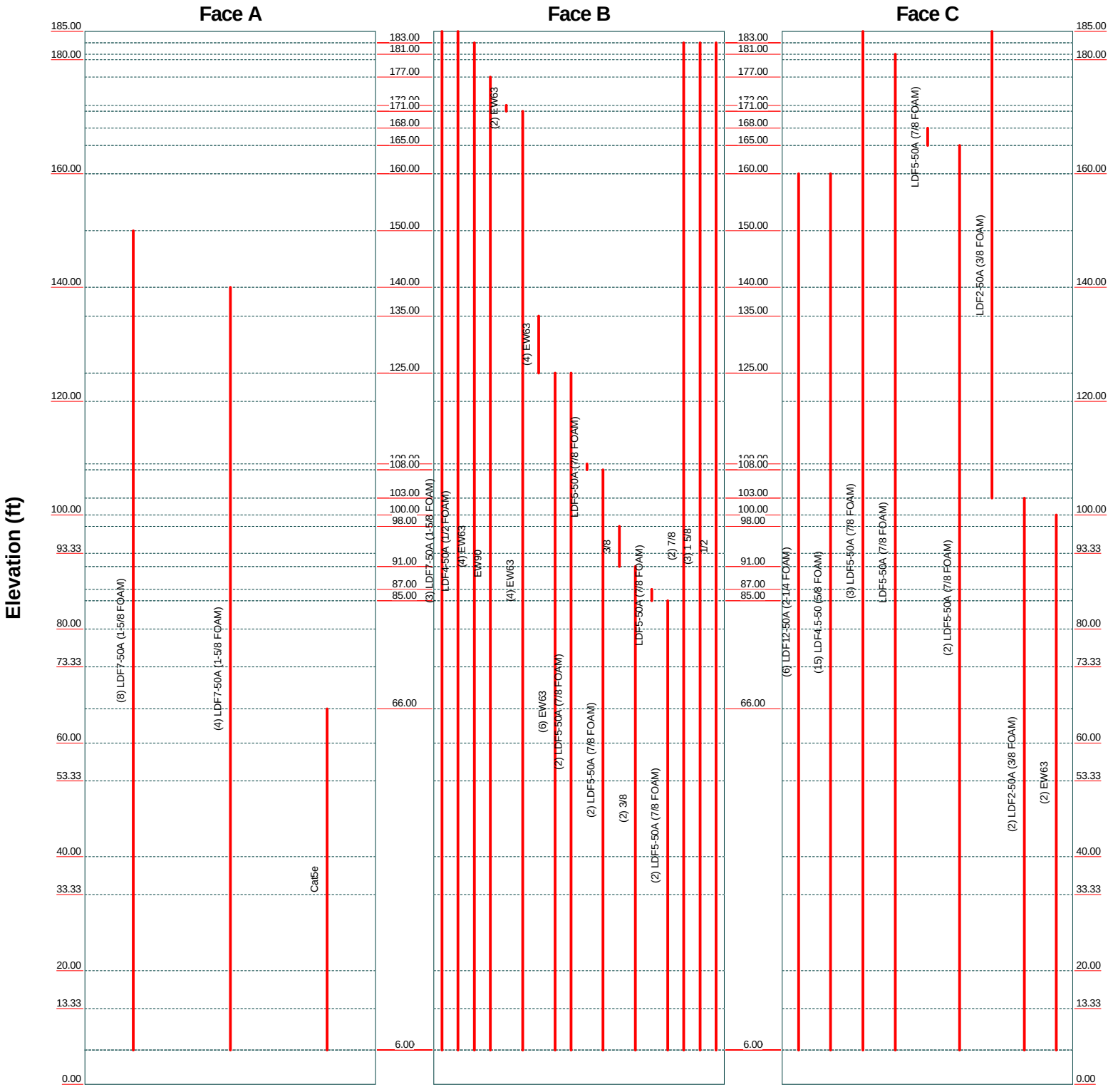
Round Flat App In Face App Out Face



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***21022.20 - CTHA142G***		
	Project: ***185' Lattice Tower - Bloomfield, CT***		
	Client: T-Mobile	Drawn by: TJL	App'd:
	Code: TIA-222-H	Date: 07/08/21	Scale: NTS
	Path: J:\Jobs\21022000.W\20_CTHA142G\05_Structural\Tower Analysis\Backup Documentation\ER Files\185-ft Sabre Lattice Tower.eri		Dwg No. E-7

Feed Line Distribution Chart
0' - 185'

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



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Client: T-Mobile		Drawn by: TJL	App'd:
Code: TIA-222-H		Date: 07/08/21	Scale: NTS
Path: J:\Jobs\21022000 WI\20_CTHA142G\05_Structural\Tower Analysis\Backup Documentation\ER Files\185-ft Sabre Lattice Tower.erl			Dwg No. E-7

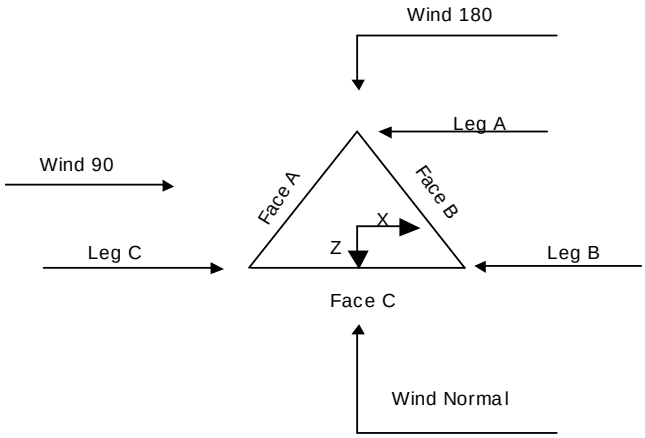
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 185.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 18.50 ft at the top and 37.00 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 405.00 ft.
Basic wind speed of 130 mph.
Risk Category III.
Exposure Category B.
Crest Height: 200.00 ft.
Rigorous Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Feature: Continuous Ridge.
Slope Distance L: 1698.00 ft.
Distance from Crest x: 397.00 ft.
Horizontal Distance Downwind: No.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
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 tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

Consider Moments - Legs	Distribute Leg Loads As Uniform	Use ASCE 10 X-Brace Ly Rules
Consider Moments - Horizontals	Assume Legs Pinned	√ Calculate Redundant Bracing Forces
Consider Moments - Diagonals	√ Assume Rigid Index Plate	Ignore Redundant Members in FEA
Use Moment Magnification	√ Use Clear Spans For Wind Area	√ SR Leg Bolts Resist Compression
√ Use Code Stress Ratios	√ Use Clear Spans For KL/r	√ All Leg Panels Have Same Allowable
√ Use Code Safety Factors - Guys	Retension Guys To Initial Tension	Offset Girt At Foundation
Escalate Ice	Bypass Mast Stability Checks	√ Consider Feed Line Torque
Always Use Max Kz	√ Use Azimuth Dish Coefficients	Include Angle Block Shear Check
Use Special Wind Profile	√ Project Wind Area of Appurt.	Use TIA-222-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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	185.00-180.00			18.50	1	5.00
T2	180.00-160.00			19.00	1	20.00
T3	160.00-140.00			21.00	1	20.00
T4	140.00-120.00			23.00	1	20.00
T5	120.00-100.00			25.00	1	20.00
T6	100.00-93.33			27.00	1	6.67
T7	93.33-80.00			27.67	1	13.33
T8	80.00-73.33			29.00	1	6.67
T9	73.33-60.00			29.67	1	13.33
T10	60.00-53.33			31.00	1	6.67
T11	53.33-40.00			31.67	1	13.33
T12	40.00-33.33			33.00	1	6.67
T13	33.33-20.00			33.67	1	13.33
T14	20.00-13.33			35.00	1	6.67
T15	13.33-0.00			35.67	1	13.33

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	185.00-180.00	5.00	X Brace	No	No	0.0000	0.0000
T2	180.00-160.00	10.00	X Brace	No	No	0.0000	0.0000
T3	160.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T4	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T5	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T6	100.00-93.33	6.67	K Brace Up	No	Yes	0.0000	0.0000
T7	93.33-80.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T8	80.00-73.33	6.67	K Brace Up	No	Yes	0.0000	0.0000
T9	73.33-60.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T10	60.00-53.33	6.67	K Brace Up	No	Yes	0.0000	0.0000
T11	53.33-40.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T12	40.00-33.33	6.67	K Brace Up	No	Yes	0.0000	0.0000
T13	33.33-20.00	13.33	K1 Down	No	Yes	0.0000	0.0000
T14	20.00-13.33	6.67	K Brace Up	No	Yes	0.0000	0.0000
T15	13.33-0.00	13.33	K1 Down	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 185.00-180.00	Pipe	P6x.28	A572-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T2 180.00-160.00	Pipe	P6x.28	A572-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T3 160.00-140.00	Pipe	P6x.28	A572-50 (50 ksi)	Single Angle	L5x5x5/16	A36 (36 ksi)
T4 140.00-120.00	Pipe	P6x.28	A572-50 (50 ksi)	Single Angle	L5x5x5/16	A36 (36 ksi)
T5 120.00-100.00	Pipe	P8x.322	A572-50 (50 ksi)	Single Angle	L5x5x3/8	A36 (36 ksi)
T6 100.00-93.33	Pipe	P8x.322	A572-50 (50 ksi)	Single Angle	L6x6x3/8	A36 (36 ksi)
T7 93.33-80.00	Pipe	P8x.322	A572-50 (50 ksi)	Single Angle	L6x4x1/2	A36 (36 ksi)
T8 80.00-73.33	Pipe	P8x.5	A572-50 (50 ksi)	Single Angle	L6x6x3/8	A36 (36 ksi)
T9 73.33-60.00	Pipe	P8x.5	A572-50 (50 ksi)	Single Angle	L6x6x3/8	A36 (36 ksi)
T10 60.00-53.33	Pipe	P10x.365	A572-50 (50 ksi)	Single Angle	L6x6x3/8	A36 (36 ksi)
T11 53.33-40.00	Pipe	P10x.365	A572-50 (50 ksi)	Single Angle	L6x6x3/8	A36 (36 ksi)
T12 40.00-33.33	Pipe	P10x.5	A572-50 (50 ksi)	Single Angle	L6x6x3/8	A36 (36 ksi)
T13 33.33-20.00	Pipe	P10x.5	A572-50 (50 ksi)	Single Angle	L6x6x1/2	A36 (36 ksi)
T14 20.00-13.33	Pipe	P12x.5	A572-50 (50 ksi)	Single Angle	L6x6x1/2	A36 (36 ksi)
T15 13.33-0.00	Pipe	P12x.5	A572-50 (50 ksi)	Single Angle	L6x6x1/2	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 185.00-180.00	Single Angle	L5x5x5/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T6 100.00-93.33	None	Single Angle		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T7 93.33-80.00	None	Single Angle		A36 (36 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T8 80.00-73.33	None	Single Angle		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T9 73.33-60.00	None	Single Angle		A36 (36 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T10 60.00-53.33	None	Single Angle		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T11 53.33-40.00	None	Single Angle		A36 (36 ksi)	Single Angle	L5x5x5/16	A36 (36 ksi)
T12 40.00-33.33	None	Single Angle		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T13 33.33-20.00	None	Single Angle		A36 (36 ksi)	Single Angle	L5x5x5/16	A36 (36 ksi)
T14 20.00-13.33	None	Single Angle		A36 (36 ksi)	Single Angle	L1x1x1/8	A36 (36 ksi)
T15 13.33-0.00	None	Single Angle		A36 (36 ksi)	Single Angle	L5x5x5/16	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T7 93.33-80.00	Single Angle		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T9 73.33-60.00	Single Angle		A36 (36 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T11 53.33-40.00	Single Angle		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T13 33.33-20.00	Single Angle		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)
T15 13.33-0.00	Single Angle		A36 (36 ksi)	Single Angle	L3 1/2x3 1/2x1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Bracing Grade		Redundant Type	Redundant Size	K Factor
T7	A36	Horizontal (1)	Single Angle	L3x3x1/4	1
93.33-80.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x1/4	1
T9	A36	Horizontal (1)	Single Angle	L3x3x1/4	1
73.33-60.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x1/4	1
T11	A36	Horizontal (1)	Single Angle	L3x3x5/16	1
53.33-40.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x5/16	1
T13	A36	Horizontal (1)	Single Angle	L3x3x5/16	1
33.33-20.00	(36 ksi)	Diagonal (1)	Single Angle	L3x3x5/16	1
T15	A36	Horizontal (1)	Single Angle	L4x3 1/2x5/16	1
13.33-0.00	(36 ksi)	Diagonal (1)	Single Angle	L4x3 1/2x5/16	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1	0.00	0.0000	A36	1	1	1	30.0000	30.0000	36.0000
185.00-180.00			(36 ksi)						
T2	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
180.00-160.00			(36 ksi)						
T3	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
160.00-140.00			(36 ksi)						
T4	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
140.00-120.00			(36 ksi)						
T5	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
120.00-100.00			(36 ksi)						
T6	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
100.00-93.33			(36 ksi)						
T7 93.33-80.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T8 80.00-73.33	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T9 73.33-60.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						
T10	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
60.00-53.33			(36 ksi)						
T11	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
53.33-40.00			(36 ksi)						
T12	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
40.00-33.33			(36 ksi)						
T13	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
33.33-20.00			(36 ksi)						
T14	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
20.00-13.33			(36 ksi)						
T15 13.33-0.00	0.00	0.0000	A36	1	1	1	36.0000	36.0000	36.0000
			(36 ksi)						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
185.00-180.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
180.00-160.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
160.00-140.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
100.00-93.33				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
93.33-80.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
80.00-73.33				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
73.33-60.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
60.00-53.33				1	1	1	1	1	1	1
T11	Yes	Yes	1	1	1	1	1	1	1	1
53.33-40.00				1	1	1	1	1	1	1
T12	Yes	Yes	1	1	1	1	1	1	1	1
40.00-33.33				1	1	1	1	1	1	1
T13	Yes	Yes	1	1	1	1	1	1	1	1
33.33-20.00				1	1	1	1	1	1	1
T14	Yes	Yes	1	1	1	1	1	1	1	1
20.00-13.33				1	1	1	1	1	1	1
T15	Yes	Yes	1	1	1	1	1	1	1	1
13.33-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
185.00-180.00														
T2	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
180.00-160.00														
T3	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
160.00-140.00														
T4	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
140.00-120.00														

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T5 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 100.00-93.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 93.33-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 80.00-73.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 73.33-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 60.00-53.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T11 53.33-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T12 40.00-33.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T13 33.33-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T14 20.00-13.33	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T15 13.33-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 185.00-180.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 180.00-160.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 160.00-140.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 140.00-120.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 120.00-100.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 100.00-93.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 93.33-80.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 80.00-73.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 73.33-60.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-53.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 53.33-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 40.00-33.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 33.33-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 20.00-13.33	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 13.33-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1	Flange	1.2500	6	0.7500	1	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0
185.00-180.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	Flange	1.2500	6	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
180.00-160.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	Flange	1.2500	6	0.7500	1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-140.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	Flange	1.2500	8	0.6250	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
140.00-120.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	Flange	1.5000	8	0.7500	2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
120.00-100.00		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6	Flange	0.0000	0	1.0000	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
100.00-93.33		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T7 93.33-80.00	Flange	1.5000	8	1.0000	2	0.6250	0	0.0000	0	0.6250	0	1.0000	2	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T8 80.00-73.33	Flange	0.0000	0	0.8750	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T9 73.33-60.00	Flange	1.5000	8	0.8750	2	0.6250	0	0.0000	0	0.6250	0	0.8750	2	0.6250	0
		A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T10	Flange	0.0000	0	0.8750	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
60.00-53.33		A325N		A325N		A325N		A325N		A325X		A325N		A325X	
T11	Flange	1.5000	8	0.8750	2	0.6250	0	0.0000	0	0.6250	0	0.8750	2	0.6250	0
53.33-40.00		A325N		A325N		A325N		A325N		A325X		A325N		A325X	
T12	Flange	0.0000	0	1.0000	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
40.00-33.33		A325N		A325N		A325N		A325N		A325X		A325N		A325X	
T13	Flange	1.5000	8	1.0000	2	0.6250	0	0.0000	0	0.6250	0	1.0000	2	0.6250	0
33.33-20.00		A325N		A325N		A325N		A325N		A325X		A325N		A325X	
T14	Flange	0.0000	0	1.0000	2	0.6250	0	0.0000	0	0.6250	0	0.6250	0	0.6250	0
20.00-13.33		A325N		A325N		A325N		A325N		A325X		A325N		A325X	
T15 13.33-0.00	Flange	1.7500	6	1.0000	2	0.6250	0	0.0000	0	0.6250	0	1.0000	2	0.6250	0
		F1554-105		A325N		A325N		A325N		A325X		A325N		A325X	

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
185.00-180.00	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T2	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
180.00-160.00	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T3	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
160.00-140.00	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T4	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
140.00-120.00	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T5	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
120.00-100.00	A325N		A325N		A325N		A325N		A325N		A325N		A325N	
T6	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0	0.6250	0
100.00-93.33	A325N		A325N		A325N		A325N		A325N		A325N		A325N	

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T7 93.33-80.00	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 80.00-73.33	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 73.33-60.00	0.8750 A325N	1	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 60.00-53.33	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 53.33-40.00	0.8750 A325N	1	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 40.00-33.33	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 33.33-20.00	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 20.00-13.33	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 13.33-0.00	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
LDF12-50A (2-1/4 FOAM)	C	No	No	Ar (CaAa)	160.00 - 6.00	0.0000	0.44	6	6	2.3500	2.3500		1.22
LDF4.5-50 (5/8 FOAM)	C	No	No	Ar (CaAa)	160.00 - 6.00	0.0000	0.44	15	12	0.8700	0.8700		0.15
LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	150.00 - 6.00	0.0000	-0.45	8	8	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	140.00 - 6.00	0.0000	-0.4	4	4	1.9800	1.9800		0.82
LDF7-50A (1-5/8 FOAM)	B	No	No	Ar (CaAa)	185.00 - 6.00	0.0000	-0.38	3	3	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	185.00 - 6.00	0.0000	-0.4	3	3	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	181.00 - 6.00	0.0000	-0.38	1	1	1.0900	1.0900		0.33
LDF4-50A (1/2 FOAM)	B	No	No	Ar (CaAa)	185.00 - 6.00	0.0000	-0.37	1	1	0.6300	0.6300		0.15
EW63	B	No	No	Ar (CaAa)	183.00 - 6.00	0.0000	-0.43	4	4	1.5742	1.5742		0.51
EW90	B	No	No	Ar (CaAa)	177.00 - 6.00	0.0000	-0.43	1	1	0.9869	0.9869		0.32
EW63	B	No	No	Ar (CaAa)	172.00 - 171.00	0.0000	-0.43	2	2	1.5742	1.5742		0.51
EW63	B	No	No	Ar (CaAa)	171.00 - 6.00	0.0000	-0.43	4	2	1.5742	1.5742		0.51
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	168.00 - 165.00	0.0000	-0.43	1	1	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	165.00 - 6.00	0.0000	-0.43	2	1	1.0900	1.0900		0.33
EW63	B	No	No	Ar (CaAa)	135.00 -	0.0000	-0.4	4	2	1.5742	1.5742		0.51

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
					125.00								
EW63	B	No	No	Ar (CaAa)	125.00 - 6.00	0.0000	-0.4	6	2	1.5742	1.5742		0.51
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	125.00 - 6.00	0.0000	-0.465	2	2	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	109.00 - 108.00	0.0000	-0.41	1	1	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	108.00 - 6.00	0.0000	-0.41	2	1	1.0900	1.0900		0.33
LDF2-50A (3/8 FOAM)	C	No	No	Ar (CaAa)	185.00 - 103.00	0.0000	-0.4	1	1	0.4400	0.4400		0.08
LDF2-50A (3/8 FOAM)	C	No	No	Ar (CaAa)	103.00 - 6.00	0.0000	-0.4	2	1	0.4400	0.4400		0.08
EW63	C	No	No	Ar (CaAa)	100.00 - 6.00	0.0000	-0.45	2	1	1.5742	1.5742		0.51
3/8	B	No	No	Ar (CaAa)	98.00 - 91.00	0.0000	-0.36	1	1	0.5000	0.5000		0.40
3/8	B	No	No	Ar (CaAa)	91.00 - 6.00	0.0000	-0.36	2	2	0.5000	0.5000		0.40
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	87.00 - 85.00	0.0000	-0.39	1	1	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	B	No	No	Ar (CaAa)	85.00 - 6.00	0.0000	-0.39	2	1	1.0900	1.0900		0.33
Cat5e	A	No	No	Ar (CaAa)	66.00 - 6.00	0.0000	-0.31	1	1	0.3600	0.3600		0.06
7/8	B	No	No	Ar (CaAa)	183.00 - 6.00	0.0000	-0.47	2	2	1.1100	1.1100		0.54
1 5/8	B	No	No	Ar (CaAa)	183.00 - 6.00	0.0000	-0.48	3	3	1.9800	1.9800		1.04
1/2	B	No	No	Ar (CaAa)	183.00 - 6.00	0.0000	-0.48	1	1	0.5800	0.5800		0.25

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	185.00-180.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	7.796	0.000	0.03
		C	0.000	0.000	1.964	0.000	0.01
T2	180.00-160.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	52.133	0.000	0.21
		C	0.000	0.000	11.017	0.000	0.03
T3	160.00-140.00	A	0.000	0.000	15.840	0.000	0.07
		B	0.000	0.000	57.781	0.000	0.23
		C	0.000	0.000	68.260	0.000	0.23
T4	140.00-120.00	A	0.000	0.000	47.520	0.000	0.20
		B	0.000	0.000	69.891	0.000	0.27
		C	0.000	0.000	68.260	0.000	0.23
T5	120.00-100.00	A	0.000	0.000	47.520	0.000	0.20
		B	0.000	0.000	82.857	0.000	0.31
		C	0.000	0.000	68.392	0.000	0.23
T6	100.00-93.33	A	0.000	0.000	15.848	0.000	0.07
		B	0.000	0.000	28.712	0.000	0.11
		C	0.000	0.000	25.158	0.000	0.08
T7	93.33-80.00	A	0.000	0.000	31.672	0.000	0.13
		B	0.000	0.000	59.426	0.000	0.22
		C	0.000	0.000	50.279	0.000	0.17

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
T8	80.00-73.33	A	0.000	0.000	15.848	0.000	0.07
		B	0.000	0.000	30.599	0.000	0.12
		C	0.000	0.000	25.158	0.000	0.08
T9	73.33-60.00	A	0.000	0.000	31.888	0.000	0.13
		B	0.000	0.000	61.153	0.000	0.23
		C	0.000	0.000	50.279	0.000	0.17
T10	60.00-53.33	A	0.000	0.000	16.088	0.000	0.07
		B	0.000	0.000	30.599	0.000	0.12
		C	0.000	0.000	25.158	0.000	0.08
T11	53.33-40.00	A	0.000	0.000	32.152	0.000	0.13
		B	0.000	0.000	61.153	0.000	0.23
		C	0.000	0.000	50.279	0.000	0.17
T12	40.00-33.33	A	0.000	0.000	16.088	0.000	0.07
		B	0.000	0.000	30.599	0.000	0.12
		C	0.000	0.000	25.158	0.000	0.08
T13	33.33-20.00	A	0.000	0.000	32.152	0.000	0.13
		B	0.000	0.000	61.153	0.000	0.23
		C	0.000	0.000	50.279	0.000	0.17
T14	20.00-13.33	A	0.000	0.000	16.088	0.000	0.07
		B	0.000	0.000	30.599	0.000	0.12
		C	0.000	0.000	25.158	0.000	0.08
T15	13.33-0.00	A	0.000	0.000	17.680	0.000	0.07
		B	0.000	0.000	33.627	0.000	0.13
		C	0.000	0.000	27.648	0.000	0.09

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	185.00-180.00	A	2.203	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	29.445	0.000	0.45
		C		0.000	0.000	10.025	0.000	0.14
T2	180.00-160.00	A	2.194	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	191.393	0.000	2.96
		C		0.000	0.000	55.755	0.000	0.81
T3	160.00-140.00	A	2.178	0.000	0.000	43.301	0.000	0.78
		B		0.000	0.000	205.417	0.000	3.20
		C		0.000	0.000	212.670	0.000	3.52
T4	140.00-120.00	A	2.159	0.000	0.000	134.590	0.000	2.33
		B		0.000	0.000	235.851	0.000	3.70
		C		0.000	0.000	212.031	0.000	3.49
T5	120.00-100.00	A	2.136	0.000	0.000	134.310	0.000	2.31
		B		0.000	0.000	273.998	0.000	4.30
		C		0.000	0.000	212.580	0.000	3.47
T6	100.00-93.33	A	2.118	0.000	0.000	44.717	0.000	0.77
		B		0.000	0.000	97.441	0.000	1.52
		C		0.000	0.000	82.081	0.000	1.32
T7	93.33-80.00	A	2.102	0.000	0.000	89.236	0.000	1.52
		B		0.000	0.000	207.652	0.000	3.17
		C		0.000	0.000	163.567	0.000	2.61
T8	80.00-73.33	A	2.083	0.000	0.000	44.576	0.000	0.76
		B		0.000	0.000	108.432	0.000	1.63
		C		0.000	0.000	81.573	0.000	1.29
T9	73.33-60.00	A	2.061	0.000	0.000	91.599	0.000	1.53
		B		0.000	0.000	215.532	0.000	3.23
		C		0.000	0.000	162.388	0.000	2.56
T10	60.00-53.33	A	2.035	0.000	0.000	47.338	0.000	0.78

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
		B		0.000	0.000	107.150	0.000	1.59
		C		0.000	0.000	80.876	0.000	1.26
T11	53.33-40.00	A	2.004	0.000	0.000	94.264	0.000	1.54
		B		0.000	0.000	212.435	0.000	3.13
		C		0.000	0.000	160.705	0.000	2.48
T12	40.00-33.33	A	1.963	0.000	0.000	46.951	0.000	0.76
		B		0.000	0.000	105.216	0.000	1.53
		C		0.000	0.000	79.825	0.000	1.21
T13	33.33-20.00	A	1.909	0.000	0.000	93.251	0.000	1.48
		B		0.000	0.000	207.374	0.000	2.96
		C		0.000	0.000	157.955	0.000	2.35
T14	20.00-13.33	A	1.829	0.000	0.000	46.230	0.000	0.71
		B		0.000	0.000	101.612	0.000	1.41
		C		0.000	0.000	77.867	0.000	1.13
T15	13.33-0.00	A	1.676	0.000	0.000	49.905	0.000	0.73
		B		0.000	0.000	107.160	0.000	1.42
		C		0.000	0.000	83.126	0.000	1.13

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	185.00-180.00	2.5999	-9.1993	6.3443	-15.9220
T2	180.00-160.00	6.2491	-25.7820	13.2121	-39.1363
T3	160.00-140.00	-17.0062	-4.7676	-15.4415	-11.7496
T4	140.00-120.00	-25.3127	-3.8934	-26.7517	-9.5476
T5	120.00-100.00	-24.7660	-8.5584	-26.3057	-15.9041
T6	100.00-93.33	-23.3627	-8.4635	-21.5937	-15.7305
T7	93.33-80.00	-21.9623	-9.0923	-20.2658	-17.9628
T8	80.00-73.33	-23.8282	-10.8017	-21.4913	-21.4670
T9	73.33-60.00	-22.7372	-10.3066	-21.4068	-20.5249
T10	60.00-53.33	-24.4882	-10.9245	-23.6294	-21.5089
T11	53.33-40.00	-22.7079	-10.2198	-22.8245	-20.5467
T12	40.00-33.33	-25.3575	-11.3331	-25.1213	-22.1395
T13	33.33-20.00	-23.4664	-10.5788	-24.3030	-20.9535
T14	20.00-13.33	-25.7659	-11.5085	-26.7162	-22.0850
T15	13.33-0.00	-14.9185	-6.8427	-18.7978	-14.6505

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	5	LDF7-50A (1-5/8 FOAM)	180.00 - 185.00	0.6000	0.5110
T1	6	LDF5-50A (7/8 FOAM)	180.00 - 185.00	0.6000	0.5110
T1	7	LDF5-50A (7/8 FOAM)	180.00 - 181.00	0.6000	0.5110
T1	8	LDF4-50A (1/2 FOAM)	180.00 - 185.00	0.6000	0.5110

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	9	EW63	180.00 - 183.00	0.6000	0.5110
T1	20	LDF2-50A (3/8 FOAM)	180.00 - 185.00	0.6000	0.5110
T1	28	7/8	180.00 - 183.00	0.6000	0.5110
T1	29	1 5/8	180.00 - 183.00	0.6000	0.5110
T1	30	1/2	180.00 - 183.00	0.6000	0.5110
T2	5	LDF7-50A (1-5/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T2	6	LDF5-50A (7/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T2	7	LDF5-50A (7/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T2	8	LDF4-50A (1/2 FOAM)	160.00 - 180.00	0.6000	0.6000
T2	9	EW63	160.00 - 180.00	0.6000	0.6000
T2	10	EW90	160.00 - 177.00	0.6000	0.6000
T2	11	EW63	171.00 - 172.00	0.6000	0.6000
T2	12	EW63	160.00 - 171.00	0.6000	0.6000
T2	13	LDF5-50A (7/8 FOAM)	165.00 - 168.00	0.6000	0.6000
T2	14	LDF5-50A (7/8 FOAM)	160.00 - 165.00	0.6000	0.6000
T2	20	LDF2-50A (3/8 FOAM)	160.00 - 180.00	0.6000	0.6000
T2	28	7/8	160.00 - 180.00	0.6000	0.6000
T2	29	1 5/8	160.00 - 180.00	0.6000	0.6000
T2	30	1/2	160.00 - 180.00	0.6000	0.6000
T3	1	LDF12-50A (2-1/4 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	2	LDF4.5-50 (5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	3	LDF7-50A (1-5/8 FOAM)	140.00 - 150.00	0.6000	0.6000
T3	5	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	6	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	7	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	8	LDF4-50A (1/2 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	9	EW63	140.00 - 160.00	0.6000	0.6000
T3	10	EW90	140.00 - 160.00	0.6000	0.6000
T3	12	EW63	140.00 - 160.00	0.6000	0.6000
T3	14	LDF5-50A (7/8 FOAM)	140.00 - 160.00	0.6000	0.6000
T3	20	LDF2-50A (3/8 FOAM)	140.00 - 160.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	28	7/8	140.00 - 160.00	0.6000	0.6000
T3	29	1 5/8	140.00 - 160.00	0.6000	0.6000
T3	30	1/2	140.00 - 160.00	0.6000	0.6000
T4	1	LDF12-50A (2-1/4 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	2	LDF4.5-50 (5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	3	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	4	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	5	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	6	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	7	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	8	LDF4-50A (1/2 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	9	EW63	120.00 - 140.00	0.6000	0.6000
T4	10	EW90	120.00 - 140.00	0.6000	0.6000
T4	12	EW63	120.00 - 140.00	0.6000	0.6000
T4	14	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	15	EW63	125.00 - 135.00	0.6000	0.6000
T4	16	EW63	120.00 - 125.00	0.6000	0.6000
T4	17	LDF5-50A (7/8 FOAM)	120.00 - 125.00	0.6000	0.6000
T4	20	LDF2-50A (3/8 FOAM)	120.00 - 140.00	0.6000	0.6000
T4	28	7/8	120.00 - 140.00	0.6000	0.6000
T4	29	1 5/8	120.00 - 140.00	0.6000	0.6000
T4	30	1/2	120.00 - 140.00	0.6000	0.6000
T5	1	LDF12-50A (2-1/4 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	2	LDF4.5-50 (5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	3	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	4	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	5	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	6	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	7	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	8	LDF4-50A (1/2 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	9	EW63	100.00 - 120.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	10	EW90	100.00 - 120.00	0.6000	0.6000
T5	12	EW63	100.00 - 120.00	0.6000	0.6000
T5	14	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	16	EW63	100.00 - 120.00	0.6000	0.6000
T5	17	LDF5-50A (7/8 FOAM)	100.00 - 120.00	0.6000	0.6000
T5	18	LDF5-50A (7/8 FOAM)	108.00 - 109.00	0.6000	0.6000
T5	19	LDF5-50A (7/8 FOAM)	100.00 - 108.00	0.6000	0.6000
T5	20	LDF2-50A (3/8 FOAM)	103.00 - 120.00	0.6000	0.6000
T5	21	LDF2-50A (3/8 FOAM)	100.00 - 103.00	0.6000	0.6000
T5	28	7/8	100.00 - 120.00	0.6000	0.6000
T5	29	1 5/8	100.00 - 120.00	0.6000	0.6000
T5	30	1/2	100.00 - 120.00	0.6000	0.6000
T6	1	LDF12-50A (2-1/4 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	2	LDF4.5-50 (5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	3	LDF7-50A (1-5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	4	LDF7-50A (1-5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	5	LDF7-50A (1-5/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	6	LDF5-50A (7/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	7	LDF5-50A (7/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	8	LDF4-50A (1/2 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	9	EW63	93.33 - 100.00	0.6000	0.6000
T6	10	EW90	93.33 - 100.00	0.6000	0.6000
T6	12	EW63	93.33 - 100.00	0.6000	0.6000
T6	14	LDF5-50A (7/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	16	EW63	93.33 - 100.00	0.6000	0.6000
T6	17	LDF5-50A (7/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	19	LDF5-50A (7/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	21	LDF2-50A (3/8 FOAM)	93.33 - 100.00	0.6000	0.6000
T6	22	EW63	93.33 - 100.00	0.6000	0.6000
T6	23	3/8	93.33 - 98.00	0.6000	0.6000
T6	28	7/8	93.33 - 100.00	0.6000	0.6000
T6	29	1 5/8	93.33 - 100.00	0.6000	0.6000
T6	30	1/2	93.33 - 100.00	0.6000	0.6000
T7	1	LDF12-50A (2-1/4 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	2	LDF4.5-50 (5/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	3	LDF7-50A (1-5/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	4	LDF7-50A (1-5/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	5	LDF7-50A (1-5/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	6	LDF5-50A (7/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	7	LDF5-50A (7/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	8	LDF4-50A (1/2 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	9	EW63	80.00 - 93.33	0.6000	0.6000
T7	10	EW90	80.00 - 93.33	0.6000	0.6000
T7	12	EW63	80.00 - 93.33	0.6000	0.6000
T7	14	LDF5-50A (7/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	16	EW63	80.00 - 93.33	0.6000	0.6000
T7	17	LDF5-50A (7/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	19	LDF5-50A (7/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	21	LDF2-50A (3/8 FOAM)	80.00 - 93.33	0.6000	0.6000
T7	22	EW63	80.00 - 93.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	23	3/8	91.00 - 93.33	0.6000	0.6000
T7	24	3/8	80.00 - 91.00	0.6000	0.6000
T7	25	LDF5-50A (7/8 FOAM)	85.00 - 87.00	0.6000	0.6000
T7	26	LDF5-50A (7/8 FOAM)	80.00 - 85.00	0.6000	0.6000
T7	28	7/8	80.00 - 93.33	0.6000	0.6000
T7	29	1 5/8	80.00 - 93.33	0.6000	0.6000
T7	30	1/2	80.00 - 93.33	0.6000	0.6000
T8	1	LDF12-50A (2-1/4 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	2	LDF4.5-50 (5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	3	LDF7-50A (1-5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	4	LDF7-50A (1-5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	5	LDF7-50A (1-5/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	6	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	7	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	8	LDF4-50A (1/2 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	9	EW63	73.33 - 80.00	0.6000	0.6000
T8	10	EW90	73.33 - 80.00	0.6000	0.6000
T8	12	EW63	73.33 - 80.00	0.6000	0.6000
T8	14	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	16	EW63	73.33 - 80.00	0.6000	0.6000
T8	17	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	19	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	21	LDF2-50A (3/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	22	EW63	73.33 - 80.00	0.6000	0.6000
T8	24	3/8	73.33 - 80.00	0.6000	0.6000
T8	26	LDF5-50A (7/8 FOAM)	73.33 - 80.00	0.6000	0.6000
T8	28	7/8	73.33 - 80.00	0.6000	0.6000
T8	29	1 5/8	73.33 - 80.00	0.6000	0.6000
T8	30	1/2	73.33 - 80.00	0.6000	0.6000
T9	1	LDF12-50A (2-1/4 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	2	LDF4.5-50 (5/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	3	LDF7-50A (1-5/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	4	LDF7-50A (1-5/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	5	LDF7-50A (1-5/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	6	LDF5-50A (7/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	7	LDF5-50A (7/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	8	LDF4-50A (1/2 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	9	EW63	60.00 - 73.33	0.6000	0.6000
T9	10	EW90	60.00 - 73.33	0.6000	0.6000
T9	12	EW63	60.00 - 73.33	0.6000	0.6000
T9	14	LDF5-50A (7/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	16	EW63	60.00 - 73.33	0.6000	0.6000
T9	17	LDF5-50A (7/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	19	LDF5-50A (7/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	21	LDF2-50A (3/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	22	EW63	60.00 - 73.33	0.6000	0.6000
T9	24	3/8	60.00 - 73.33	0.6000	0.6000
T9	26	LDF5-50A (7/8 FOAM)	60.00 - 73.33	0.6000	0.6000
T9	27	Cat5e	60.00 - 66.00	0.6000	0.6000
T9	28	7/8	60.00 - 73.33	0.6000	0.6000
T9	29	1 5/8	60.00 - 73.33	0.6000	0.6000
T9	30	1/2	60.00 - 73.33	0.6000	0.6000
T10	1	LDF12-50A (2-1/4 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	2	LDF4.5-50 (5/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	3	LDF7-50A (1-5/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	4	LDF7-50A (1-5/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	5	LDF7-50A (1-5/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	6	LDF5-50A (7/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	7	LDF5-50A (7/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	8	LDF4-50A (1/2 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	9	EW63	53.33 - 60.00	0.6000	0.6000
T10	10	EW90	53.33 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	12	EW63	53.33 - 60.00	0.6000	0.6000
T10	14	LDF5-50A (7/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	16	EW63	53.33 - 60.00	0.6000	0.6000
T10	17	LDF5-50A (7/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	19	LDF5-50A (7/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	21	LDF2-50A (3/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	22	EW63	53.33 - 60.00	0.6000	0.6000
T10	24	3/8	53.33 - 60.00	0.6000	0.6000
T10	26	LDF5-50A (7/8 FOAM)	53.33 - 60.00	0.6000	0.6000
T10	27	Cat5e	53.33 - 60.00	0.6000	0.6000
T10	28	7/8	53.33 - 60.00	0.6000	0.6000
T10	29	1 5/8	53.33 - 60.00	0.6000	0.6000
T10	30	1/2	53.33 - 60.00	0.6000	0.6000
T11	1	LDF12-50A (2-1/4 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	2	LDF4.5-50 (5/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	3	LDF7-50A (1-5/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	4	LDF7-50A (1-5/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	5	LDF7-50A (1-5/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	6	LDF5-50A (7/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	7	LDF5-50A (7/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	8	LDF4-50A (1/2 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	9	EW63	40.00 - 53.33	0.6000	0.6000
T11	10	EW90	40.00 - 53.33	0.6000	0.6000
T11	12	EW63	40.00 - 53.33	0.6000	0.6000
T11	14	LDF5-50A (7/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	16	EW63	40.00 - 53.33	0.6000	0.6000
T11	17	LDF5-50A (7/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	19	LDF5-50A (7/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	21	LDF2-50A (3/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	22	EW63	40.00 - 53.33	0.6000	0.6000
T11	24	3/8	40.00 - 53.33	0.6000	0.6000
T11	26	LDF5-50A (7/8 FOAM)	40.00 - 53.33	0.6000	0.6000
T11	27	Cat5e	40.00 - 53.33	0.6000	0.6000
T11	28	7/8	40.00 - 53.33	0.6000	0.6000
T11	29	1 5/8	40.00 - 53.33	0.6000	0.6000
T11	30	1/2	40.00 - 53.33	0.6000	0.6000
T12	1	LDF12-50A (2-1/4 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	2	LDF4.5-50 (5/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	3	LDF7-50A (1-5/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	4	LDF7-50A (1-5/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	5	LDF7-50A (1-5/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	6	LDF5-50A (7/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	7	LDF5-50A (7/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	8	LDF4-50A (1/2 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	9	EW63	33.33 - 40.00	0.6000	0.6000
T12	10	EW90	33.33 - 40.00	0.6000	0.6000
T12	12	EW63	33.33 - 40.00	0.6000	0.6000
T12	14	LDF5-50A (7/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	16	EW63	33.33 - 40.00	0.6000	0.6000
T12	17	LDF5-50A (7/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	19	LDF5-50A (7/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	21	LDF2-50A (3/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	22	EW63	33.33 - 40.00	0.6000	0.6000
T12	24	3/8	33.33 - 40.00	0.6000	0.6000
T12	26	LDF5-50A (7/8 FOAM)	33.33 - 40.00	0.6000	0.6000
T12	27	Cat5e	33.33 - 40.00	0.6000	0.6000
T12	28	7/8	33.33 - 40.00	0.6000	0.6000
T12	29	1 5/8	33.33 - 40.00	0.6000	0.6000
T12	30	1/2	33.33 - 40.00	0.6000	0.6000
T13	1	LDF12-50A (2-1/4 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	2	LDF4.5-50 (5/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	3	LDF7-50A (1-5/8 FOAM)	20.00 - 33.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T13	4	LDF7-50A (1-5/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	5	LDF7-50A (1-5/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	6	LDF5-50A (7/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	7	LDF5-50A (7/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	8	LDF4-50A (1/2 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	9	EW63	20.00 - 33.33	0.6000	0.6000
T13	10	EW90	20.00 - 33.33	0.6000	0.6000
T13	12	EW63	20.00 - 33.33	0.6000	0.6000
T13	14	LDF5-50A (7/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	16	EW63	20.00 - 33.33	0.6000	0.6000
T13	17	LDF5-50A (7/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	19	LDF5-50A (7/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	21	LDF2-50A (3/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	22	EW63	20.00 - 33.33	0.6000	0.6000
T13	24	3/8	20.00 - 33.33	0.6000	0.6000
T13	26	LDF5-50A (7/8 FOAM)	20.00 - 33.33	0.6000	0.6000
T13	27	Cat5e	20.00 - 33.33	0.6000	0.6000
T13	28	7/8	20.00 - 33.33	0.6000	0.6000
T13	29	1 5/8	20.00 - 33.33	0.6000	0.6000
T13	30	1/2	20.00 - 33.33	0.6000	0.6000
T14	1	LDF12-50A (2-1/4 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	2	LDF4.5-50 (5/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	3	LDF7-50A (1-5/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	4	LDF7-50A (1-5/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	5	LDF7-50A (1-5/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	6	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	7	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	8	LDF4-50A (1/2 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	9	EW63	13.33 - 20.00	0.6000	0.6000
T14	10	EW90	13.33 - 20.00	0.6000	0.6000
T14	12	EW63	13.33 - 20.00	0.6000	0.6000
T14	14	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	16	EW63	13.33 - 20.00	0.6000	0.6000
T14	17	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	19	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	21	LDF2-50A (3/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	22	EW63	13.33 - 20.00	0.6000	0.6000
T14	24	3/8	13.33 - 20.00	0.6000	0.6000
T14	26	LDF5-50A (7/8 FOAM)	13.33 - 20.00	0.6000	0.6000
T14	27	Cat5e	13.33 - 20.00	0.6000	0.6000
T14	28	7/8	13.33 - 20.00	0.6000	0.6000
T14	29	1 5/8	13.33 - 20.00	0.6000	0.6000
T14	30	1/2	13.33 - 20.00	0.6000	0.6000
T15	1	LDF12-50A (2-1/4 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	2	LDF4.5-50 (5/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	3	LDF7-50A (1-5/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	4	LDF7-50A (1-5/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	5	LDF7-50A (1-5/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	6	LDF5-50A (7/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	7	LDF5-50A (7/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	8	LDF4-50A (1/2 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	9	EW63	6.00 - 13.33	0.6000	0.6000
T15	10	EW90	6.00 - 13.33	0.6000	0.6000
T15	12	EW63	6.00 - 13.33	0.6000	0.6000
T15	14	LDF5-50A (7/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	16	EW63	6.00 - 13.33	0.6000	0.6000
T15	17	LDF5-50A (7/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	19	LDF5-50A (7/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	21	LDF2-50A (3/8 FOAM)	6.00 - 13.33	0.6000	0.6000
T15	22	EW63	6.00 - 13.33	0.6000	0.6000
T15	24	3/8	6.00 - 13.33	0.6000	0.6000
T15	26	LDF5-50A (7/8 FOAM)	6.00 - 13.33	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	27	Cat5e	6.00 - 13.33	0.6000	0.6000
T15	28	7/8	6.00 - 13.33	0.6000	0.6000
T15	29	1 5/8	6.00 - 13.33	0.6000	0.6000
T15	30	1/2	6.00 - 13.33	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
AIR6449	A	From Leg	4.00	0.0000	140.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			-4.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
						2" Ice	6.90	3.36	0.28
APXVAALL24-43	A	From Leg	0.00	0.0000	140.00	No Ice	20.24	8.89	0.15
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
						2" Ice	22.87	11.33	0.66
APX16DWV-16DWVS-E-A20	A	From Leg	4.00	0.0000	140.00	No Ice	6.46	2.15	0.04
			4.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile - Proposed)			0.00			1" Ice	7.21	2.84	0.11
						2" Ice	8.00	3.55	0.20
AIR6449	B	From Leg	4.00	0.0000	140.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			-4.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
						2" Ice	6.90	3.36	0.28
APXVAALL24-43	B	From Leg	0.00	0.0000	140.00	No Ice	20.24	8.89	0.15
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
						2" Ice	22.87	11.33	0.66
APX16DWV-16DWVS-E-A20	B	From Leg	4.00	0.0000	140.00	No Ice	6.46	2.15	0.04
			4.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile - Proposed)			0.00			1" Ice	7.21	2.84	0.11
						2" Ice	8.00	3.55	0.20
AIR6449	C	From Leg	4.00	0.0000	140.00	No Ice	5.65	2.42	0.10
(T-Mobile - Proposed)			-4.00			1/2" Ice	5.96	2.64	0.14
			0.00			1" Ice	6.26	2.87	0.18
						2" Ice	6.90	3.36	0.28
APXVAALL24-43	C	From Leg	0.00	0.0000	140.00	No Ice	20.24	8.89	0.15
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
						2" Ice	22.87	11.33	0.66
APX16DWV-16DWVS-E-A20	C	From Leg	4.00	0.0000	140.00	No Ice	6.46	2.15	0.04
			4.00			1/2" Ice	6.83	2.49	0.07
(T-Mobile - Proposed)			0.00			1" Ice	7.21	2.84	0.11
						2" Ice	8.00	3.55	0.20
4449 B12,B71	A	From Leg	4.00	0.0000	140.00	No Ice	1.65	1.16	0.08
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
						2" Ice	2.34	1.75	0.16
4449 B12,B71	B	From Leg	4.00	0.0000	140.00	No Ice	1.65	1.16	0.08

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
						2" Ice	2.34	1.75	0.16
4449 B12,B71	C	From Leg	4.00	0.0000	140.00	No Ice	1.65	1.16	0.08
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	0.10
			0.00			1" Ice	1.98	1.44	0.11
						2" Ice	2.34	1.75	0.16
4460 B25+B66	A	From Leg	4.00	0.0000	140.00	No Ice	2.56	1.98	0.11
(T-Mobile - Proposed)			0.00			1/2" Ice	2.76	2.16	0.13
			0.00			1" Ice	2.97	2.34	0.16
						2" Ice	3.41	2.74	0.23
4460 B25+B66	B	From Leg	4.00	0.0000	140.00	No Ice	2.56	1.98	0.11
(T-Mobile - Proposed)			0.00			1/2" Ice	2.76	2.16	0.13
			0.00			1" Ice	2.97	2.34	0.16
						2" Ice	3.41	2.74	0.23
4460 B25+B66	C	From Leg	4.00	0.0000	140.00	No Ice	2.56	1.98	0.11
(T-Mobile - Proposed)			0.00			1/2" Ice	2.76	2.16	0.13
			0.00			1" Ice	2.97	2.34	0.16
						2" Ice	3.41	2.74	0.23
SitePro VFA10-HD	A	From Leg	2.00	0.0000	140.00	No Ice	17.00	17.00	0.60
(T-Mobile)			0.00			1/2" Ice	21.00	21.00	0.75
			0.00			1" Ice	25.00	25.00	0.90
						2" Ice	33.00	33.00	1.20
SitePro VFA10-HD	B	From Leg	2.00	0.0000	140.00	No Ice	17.00	17.00	0.60
(T-Mobile)			0.00			1/2" Ice	21.00	21.00	0.75
			0.00			1" Ice	25.00	25.00	0.90
						2" Ice	33.00	33.00	1.20
SitePro VFA10-HD	C	From Leg	2.00	0.0000	140.00	No Ice	17.00	17.00	0.60
(T-Mobile)			0.00			1/2" Ice	21.00	21.00	0.75
			0.00			1" Ice	25.00	25.00	0.90
						2" Ice	33.00	33.00	1.20
80010966	A	From Leg	4.00	0.0000	160.00	No Ice	17.36	7.50	0.13
(AT&T)			-6.00			1/2" Ice	17.99	8.09	0.22
			0.00			1" Ice	18.63	8.69	0.32
						2" Ice	19.92	9.90	0.54
7770.00	A	From Leg	4.00	0.0000	160.00	No Ice	5.51	2.93	0.04
(AT&T)			-2.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
						2" Ice	6.99	4.35	0.20
OPA-65R-LCUU-H8	A	From Leg	4.00	0.0000	160.00	No Ice	12.98	7.52	0.09
(AT&T)			2.00			1/2" Ice	13.56	8.09	0.16
			0.00			1" Ice	14.15	8.67	0.24
						2" Ice	15.35	9.85	0.43
80010966	A	From Leg	4.00	0.0000	160.00	No Ice	17.36	7.50	0.13
(AT&T)			6.00			1/2" Ice	17.99	8.09	0.22
			0.00			1" Ice	18.63	8.69	0.32
						2" Ice	19.92	9.90	0.54
80010965	B	From Leg	4.00	0.0000	160.00	No Ice	13.81	5.83	0.11
(AT&T)			-6.00			1/2" Ice	14.35	6.32	0.19
			0.00			1" Ice	14.89	6.82	0.27
						2" Ice	15.99	7.84	0.46
7770.00	B	From Leg	4.00	0.0000	160.00	No Ice	5.51	2.93	0.04
(AT&T)			-2.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
						2" Ice	6.99	4.35	0.20
OPA-65R-LCUU-H6	B	From Leg	4.00	0.0000	160.00	No Ice	9.66	5.52	0.07
(AT&T)			2.00			1/2" Ice	10.13	5.97	0.13

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	10.61	6.43	0.20
						2" Ice	11.58	7.38	0.35
80010965	B	From Leg	4.00	0.0000	160.00	No Ice	13.81	5.83	0.11
(AT&T)			6.00			1/2" Ice	14.35	6.32	0.19
			0.00			1" Ice	14.89	6.82	0.27
						2" Ice	15.99	7.84	0.46
80010966	C	From Leg	4.00	0.0000	160.00	No Ice	17.36	7.50	0.13
(AT&T)			-6.00			1/2" Ice	17.99	8.09	0.22
			0.00			1" Ice	18.63	8.69	0.32
						2" Ice	19.92	9.90	0.54
7770.00	C	From Leg	4.00	0.0000	160.00	No Ice	5.51	2.93	0.04
(AT&T)			-2.00			1/2" Ice	5.87	3.27	0.07
			0.00			1" Ice	6.23	3.63	0.11
						2" Ice	6.99	4.35	0.20
OPA-65R-LCUU-H8	C	From Leg	4.00	0.0000	160.00	No Ice	12.98	7.52	0.09
(AT&T)			2.00			1/2" Ice	13.56	8.09	0.16
			0.00			1" Ice	14.15	8.67	0.24
						2" Ice	15.35	9.85	0.43
80010966	C	From Leg	4.00	0.0000	160.00	No Ice	17.36	7.50	0.13
(AT&T)			6.00			1/2" Ice	17.99	8.09	0.22
			0.00			1" Ice	18.63	8.69	0.32
						2" Ice	19.92	9.90	0.54
TT08-19DB111-001 TMA	A	From Leg	4.00	0.0000	160.00	No Ice	0.79	0.64	0.02
(AT&T)			5.00			1/2" Ice	0.91	0.75	0.03
			0.00			1" Ice	1.04	0.87	0.04
						2" Ice	1.32	1.13	0.06
TT08-19DB111-001 TMA	B	From Leg	4.00	0.0000	160.00	No Ice	0.79	0.64	0.02
(AT&T)			5.00			1/2" Ice	0.91	0.75	0.03
			0.00			1" Ice	1.04	0.87	0.04
						2" Ice	1.32	1.13	0.06
TT08-19DB111-001 TMA	C	From Leg	4.00	0.0000	160.00	No Ice	0.79	0.64	0.02
(AT&T)			5.00			1/2" Ice	0.91	0.75	0.03
			0.00			1" Ice	1.04	0.87	0.04
						2" Ice	1.32	1.13	0.06
DC6-48-60-18-8F Surge	A	From Face	0.50	0.0000	160.00	No Ice	1.91	1.91	0.02
Arrestor			0.50			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
						2" Ice	2.71	2.71	0.12
DC6-48-60-18-8F Surge	B	From Face	0.50	0.0000	160.00	No Ice	1.91	1.91	0.02
Arrestor			0.50			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
						2" Ice	2.71	2.71	0.12
DC6-48-60-18-8F Surge	C	From Face	0.50	0.0000	160.00	No Ice	1.91	1.91	0.02
Arrestor			0.50			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
						2" Ice	2.71	2.71	0.12
4478 B14	A	From Face	4.00	0.0000	160.00	No Ice	1.84	1.06	0.06
(AT&T)			-2.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
						2" Ice	2.57	1.66	0.14
4478 B14	B	From Face	4.00	0.0000	160.00	No Ice	1.84	1.06	0.06
(AT&T)			-2.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09
						2" Ice	2.57	1.66	0.14
4478 B14	C	From Face	4.00	0.0000	160.00	No Ice	1.84	1.06	0.06
(AT&T)			-2.00			1/2" Ice	2.01	1.20	0.08
			0.00			1" Ice	2.19	1.34	0.09

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	2.57	1.66	0.14
4449 B5/B12	A	From Face	4.00	0.0000	160.00	No Ice	1.97	1.41	0.07
(AT&T)			-2.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
						2" Ice	2.72	2.07	0.16
4449 B5/B12	B	From Face	4.00	0.0000	160.00	No Ice	1.97	1.41	0.07
(AT&T)			-2.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
						2" Ice	2.72	2.07	0.16
4449 B5/B12	C	From Face	4.00	0.0000	160.00	No Ice	1.97	1.41	0.07
(AT&T)			-2.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
						2" Ice	2.72	2.07	0.16
8843 B2/B66A	A	From Face	4.00	0.0000	160.00	No Ice	1.64	1.35	0.07
(AT&T)			-2.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
						2" Ice	2.32	1.99	0.16
8843 B2/B66A	B	From Face	4.00	0.0000	160.00	No Ice	1.64	1.35	0.07
(AT&T)			-2.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
						2" Ice	2.32	1.99	0.16
8843 B2/B66A	C	From Face	4.00	0.0000	160.00	No Ice	1.64	1.35	0.07
(AT&T)			-2.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
						2" Ice	2.32	1.99	0.16
RRUS-32	A	From Face	4.00	0.0000	160.00	No Ice	3.31	2.42	0.08
(AT&T)			-2.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
						2" Ice	4.33	3.32	0.21
RRUS-32	B	From Face	4.00	0.0000	160.00	No Ice	3.31	2.42	0.08
(AT&T)			-2.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
						2" Ice	4.33	3.32	0.21
RRUS-32	C	From Face	4.00	0.0000	160.00	No Ice	3.31	2.42	0.08
(AT&T)			-2.00			1/2" Ice	3.56	2.64	0.10
			0.00			1" Ice	3.81	2.86	0.14
						2" Ice	4.33	3.32	0.21
RRUS-E2	A	From Face	4.00	0.0000	160.00	No Ice	3.15	1.29	0.06
(AT&T)			-2.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
						2" Ice	4.07	1.95	0.17
RRUS-E2	B	From Face	4.00	0.0000	160.00	No Ice	3.15	1.29	0.06
(AT&T)			-2.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
						2" Ice	4.07	1.95	0.17
RRUS-E2	C	From Face	4.00	0.0000	160.00	No Ice	3.15	1.29	0.06
(AT&T)			-2.00			1/2" Ice	3.36	1.44	0.08
			0.00			1" Ice	3.59	1.60	0.11
						2" Ice	4.07	1.95	0.17
Pirod 12' T-Frame Sector Mount (1)	A	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(AT&T)			0.00			1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
Pirod 12' T-Frame Sector Mount (1)	B	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	0.47
			0.00			1/2" Ice	18.40	18.40	0.60
(AT&T)			0.00			1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00

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
Pirod 12' T-Frame Sector Mount (1) (AT&T)	C	From Leg	2.00 0.00 0.00	0.0000	160.00	No Ice 1/2" Ice 1" Ice 2" Ice	13.60 18.40 23.20 32.80	13.60 18.40 23.20 32.80	0.47 0.60 0.73 1.00
LPA-80080-4CF (Verizon)	A	From Leg	4.00 -6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.62 2.92 3.23 3.85	5.40 5.73 6.06 6.75	0.01 0.05 0.08 0.17
BXA-171063-12CF (Verizon)	A	From Leg	4.00 -3.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	3.62 4.06 4.50 5.42	0.02 0.04 0.08 0.16
BXA-70063/6CF (Verizon)	A	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.57 8.02 8.47 9.40	4.16 4.60 5.04 5.95	0.01 0.05 0.10 0.22
BXA-171063-12CF (Verizon)	A	From Leg	4.00 3.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	3.62 4.06 4.50 5.42	0.02 0.04 0.08 0.16
LPA-80080-4CF (Verizon)	A	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.62 2.92 3.23 3.85	5.40 5.73 6.06 6.75	0.01 0.05 0.08 0.17
LPA-80080-4CF (Verizon)	B	From Leg	4.00 -6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.62 2.92 3.23 3.85	5.40 5.73 6.06 6.75	0.01 0.05 0.08 0.17
BXA-171063-12CF (Verizon)	B	From Leg	4.00 -3.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	3.62 4.06 4.50 5.42	0.02 0.04 0.08 0.16
BXA-70063/6CF (Verizon)	B	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.57 8.02 8.47 9.40	4.16 4.60 5.04 5.95	0.01 0.05 0.10 0.22
BXA-171063-12CF (Verizon)	B	From Leg	4.00 3.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	3.62 4.06 4.50 5.42	0.02 0.04 0.08 0.16
LPA-80080-4CF (Verizon)	B	From Leg	4.00 6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.62 2.92 3.23 3.85	5.40 5.73 6.06 6.75	0.01 0.05 0.08 0.17
LPA-80080-4CF (Verizon)	C	From Leg	4.00 -6.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.62 2.92 3.23 3.85	5.40 5.73 6.06 6.75	0.01 0.05 0.08 0.17
BXA-171063-12CF (Verizon)	C	From Leg	4.00 -3.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.79 5.24 5.70 6.64	3.62 4.06 4.50 5.42	0.02 0.04 0.08 0.16
BXA-70063/6CF (Verizon)	C	From Leg	4.00 0.00 0.00	0.0000	150.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.57 8.02 8.47 9.40	4.16 4.60 5.04 5.95	0.01 0.05 0.10 0.22
BXA-171063-12CF	C	From Leg	4.00	0.0000	150.00	No Ice	4.79	3.62	0.02

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
(Verizon)			3.00			1/2" Ice	5.24	4.06	0.04
			0.00			1" Ice	5.70	4.50	0.08
						2" Ice	6.64	5.42	0.16
LPA-80080-4CF	C	From Leg	4.00	0.0000	150.00	No Ice	2.62	5.40	0.01
(Verizon)			6.00			1/2" Ice	2.92	5.73	0.05
			0.00			1" Ice	3.23	6.06	0.08
						2" Ice	3.85	6.75	0.17
RRH2x40-07-L	A	From Leg	4.00	0.0000	150.00	No Ice	1.82	1.52	0.06
(Verizon)			-4.00			1/2" Ice	1.99	1.69	0.08
			0.00			1" Ice	2.18	1.86	0.10
						2" Ice	2.57	2.23	0.15
RRH2x40-07-L	B	From Leg	4.00	0.0000	150.00	No Ice	1.82	1.52	0.06
(Verizon)			-4.00			1/2" Ice	1.99	1.69	0.08
			0.00			1" Ice	2.18	1.86	0.10
						2" Ice	2.57	2.23	0.15
RRH2x40-07-L	C	From Leg	4.00	0.0000	150.00	No Ice	1.82	1.52	0.06
(Verizon)			-4.00			1/2" Ice	1.99	1.69	0.08
			0.00			1" Ice	2.18	1.86	0.10
						2" Ice	2.57	2.23	0.15
RRH2x40-AWS	A	From Leg	4.00	0.0000	150.00	No Ice	2.16	1.42	0.04
(Verizon)			4.00			1/2" Ice	2.36	1.59	0.06
			0.00			1" Ice	2.57	1.77	0.08
						2" Ice	3.00	2.14	0.13
RRH2x40-AWS	B	From Leg	4.00	0.0000	150.00	No Ice	2.16	1.42	0.04
(Verizon)			4.00			1/2" Ice	2.36	1.59	0.06
			0.00			1" Ice	2.57	1.77	0.08
						2" Ice	3.00	2.14	0.13
RRH2x40-AWS	C	From Leg	4.00	0.0000	150.00	No Ice	2.16	1.42	0.04
(Verizon)			4.00			1/2" Ice	2.36	1.59	0.06
			0.00			1" Ice	2.57	1.77	0.08
						2" Ice	3.00	2.14	0.13
DB-T1-6Z-8AB-0Z	A	From Leg	4.00	0.0000	150.00	No Ice	4.80	2.00	0.04
(Verizon)			0.00			1/2" Ice	5.07	2.19	0.08
			0.00			1" Ice	5.35	2.39	0.12
						2" Ice	5.93	2.81	0.21
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	150.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon)			0.00			1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	150.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon)			0.00			1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	150.00	No Ice	13.60	13.60	0.47
Mount (1)			0.00			1/2" Ice	18.40	18.40	0.60
(Verizon)			0.00			1" Ice	23.20	23.20	0.73
						2" Ice	32.80	32.80	1.00
6'x4" Pipe Mount	A	From Leg	1.00	0.0000	185.00	No Ice	1.66	1.66	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			2.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
Light Beacon	A	From Leg	0.00	0.0000	185.00	No Ice	0.60	0.25	0.05
			0.00			1/2" Ice	0.70	0.31	0.06
			5.00			1" Ice	0.81	0.39	0.06
						2" Ice	1.06	0.55	0.09
13'x2" Pipe	A	From Face	0.00	0.0000	171.00	No Ice	3.09	3.09	0.05
			4.00			1/2" Ice	4.42	4.42	0.07

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
			6.50			1" Ice	5.76	5.76	0.10
						2" Ice	8.50	8.50	0.19
13'x2" Pipe	A	From Face	0.00	0.0000	171.00	No Ice	3.09	3.09	0.05
			-4.00			1/2" Ice	4.42	4.42	0.07
			6.50			1" Ice	5.76	5.76	0.10
						2" Ice	8.50	8.50	0.19
CO-41A	A	From Face	0.00	0.0000	185.00	No Ice	2.27	2.27	0.01
			0.00			1/2" Ice	3.71	3.71	0.03
			4.00			1" Ice	5.16	5.16	0.06
						2" Ice	8.12	8.12	0.14
13'x2" Pipe	B	From Face	0.00	0.0000	171.00	No Ice	3.09	3.09	0.05
			4.00			1/2" Ice	4.42	4.42	0.07
			6.50			1" Ice	5.76	5.76	0.10
						2" Ice	8.50	8.50	0.19
13'x2" Pipe	B	From Face	0.00	0.0000	171.00	No Ice	3.09	3.09	0.05
			-4.00			1/2" Ice	4.42	4.42	0.07
			6.50			1" Ice	5.76	5.76	0.10
						2" Ice	8.50	8.50	0.19
DS9A09F36D-N	C	From Face	0.00	0.0000	185.00	No Ice	5.76	5.76	0.05
			0.00			1/2" Ice	7.72	7.72	0.09
			10.00			1" Ice	9.69	9.69	0.15
						2" Ice	13.68	13.68	0.29
Tower Top Amplifier	C	From Face	0.00	0.0000	185.00	No Ice	2.67	1.03	0.04
			0.00			1/2" Ice	2.87	1.17	0.06
			0.00			1" Ice	3.08	1.32	0.08
						2" Ice	3.53	1.64	0.13
13'x2" Pipe	C	From Face	0.00	0.0000	171.00	No Ice	3.09	3.09	0.05
			4.00			1/2" Ice	4.42	4.42	0.07
			6.50			1" Ice	5.76	5.76	0.10
						2" Ice	8.50	8.50	0.19
13'x2" Pipe	C	From Face	0.00	0.0000	171.00	No Ice	3.09	3.09	0.05
			-4.00			1/2" Ice	4.42	4.42	0.07
			6.50			1" Ice	5.76	5.76	0.10
						2" Ice	8.50	8.50	0.19
ANT450F6	C	From Face	0.00	0.0000	185.00	No Ice	1.86	1.86	0.02
			0.00			1/2" Ice	2.67	2.67	0.04
			2.00			1" Ice	3.30	3.30	0.05
						2" Ice	4.28	4.28	0.11
20' 8 Bay Di-Pole	A	From Face	0.00	0.0000	185.00	No Ice	4.00	4.00	0.06
			0.00			1/2" Ice	6.00	6.00	0.10
			8.00			1" Ice	8.00	8.00	0.14
						2" Ice	12.00	12.00	0.23
DB411-B	C	From Leg	0.00	0.0000	181.00	No Ice	1.50	1.50	0.03
			0.00			1/2" Ice	2.70	2.70	0.03
			-5.00			1" Ice	3.90	3.90	0.04
						2" Ice	6.30	6.30	0.06
20' Horz. 4x4x1/4"	A	From Face	0.00	0.0000	182.00	No Ice	8.00	0.13	0.24
			4.00			1/2" Ice	9.36	0.18	0.31
			6.50			1" Ice	10.73	0.24	0.40
						2" Ice	13.48	0.37	0.63
20' Horz. 4x4x1/4"	B	From Face	0.00	0.0000	182.00	No Ice	8.00	0.13	0.24
			4.00			1/2" Ice	9.36	0.18	0.31
			6.50			1" Ice	10.73	0.24	0.40
						2" Ice	13.48	0.37	0.63
20' Horz. 4x4x1/4"	C	From Face	0.00	0.0000	182.00	No Ice	8.00	0.13	0.24
			4.00			1/2" Ice	9.36	0.18	0.31
			6.50			1" Ice	10.73	0.24	0.40

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
						2" Ice	13.48	0.37	0.63
22' Horz. 4x4x1/4	A	From Face	0.00	0.0000	171.00	No Ice	8.80	0.13	0.27
			4.00			1/2" Ice	10.29	0.18	0.35
			6.50			1" Ice	11.79	0.24	0.44
						2" Ice	14.81	0.37	0.69
22' Horz. 4x4x1/4	B	From Face	0.00	0.0000	171.00	No Ice	8.80	0.13	0.27
			4.00			1/2" Ice	10.29	0.18	0.35
			6.50			1" Ice	11.79	0.24	0.44
						2" Ice	14.81	0.37	0.69
22' Horz. 4x4x1/4	C	From Face	0.00	0.0000	171.00	No Ice	8.80	0.13	0.27
			4.00			1/2" Ice	10.29	0.18	0.35
			6.50			1" Ice	11.79	0.24	0.44
						2" Ice	14.81	0.37	0.69
6'x4" Pipe Mount	A	From Leg	1.00	0.0000	183.00	No Ice	1.66	1.66	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
8' x 2" Horz. Pipe	A	From Leg	0.50	0.0000	183.00	No Ice	1.90	0.05	0.03
			4.00			1/2" Ice	2.45	0.08	0.05
			0.00			1" Ice	3.01	0.11	0.07
						2" Ice	4.15	0.21	0.14
6'x4" Pipe Mount	B	From Leg	1.00	0.0000	183.00	No Ice	1.66	1.66	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
8' x 2" Horz. Pipe	B	From Leg	0.50	0.0000	183.00	No Ice	1.90	0.05	0.03
			4.00			1/2" Ice	2.45	0.08	0.05
			0.00			1" Ice	3.01	0.11	0.07
						2" Ice	4.15	0.21	0.14
6'x4" Pipe Mount	B	From Leg	1.00	0.0000	172.00	No Ice	1.66	1.66	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
8' x 2" Horz. Pipe	B	From Leg	0.50	0.0000	172.00	No Ice	1.90	0.05	0.03
			4.00			1/2" Ice	2.45	0.08	0.05
			0.00			1" Ice	3.01	0.11	0.07
						2" Ice	4.15	0.21	0.14
6'x4" Pipe Mount	A	From Leg	1.00	0.0000	177.00	No Ice	1.66	1.66	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
8' x 2" Horz. Pipe	A	From Leg	0.50	0.0000	177.00	No Ice	1.90	0.05	0.03
			4.00			1/2" Ice	2.45	0.08	0.05
			0.00			1" Ice	3.01	0.11	0.07
						2" Ice	4.15	0.21	0.14
8' x 2" Horz. Pipe	A	From Leg	0.50	0.0000	165.00	No Ice	1.90	0.05	0.03
			0.00			1/2" Ice	2.45	0.08	0.05
			0.00			1" Ice	3.01	0.11	0.07
						2" Ice	4.15	0.21	0.14
6' Standoff Arm	A	From Leg	3.00	0.0000	165.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
						2" Ice	4.15	0.37	0.17
ANT150F6	A	From Leg	6.00	0.0000	165.00	No Ice	5.87	5.87	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			10.00			1" Ice	10.21	10.21	0.14
						2" Ice	14.63	14.63	0.30

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
6'x2" Pipe Mount	C	From Leg	0.50 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.20 1.80 2.17 2.93	1.20 1.80 2.17 2.93	0.02 0.03 0.04 0.08
DS2C03F36D-D	C	From Leg	4.00 -6.00 9.30	0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice	7.30 9.77 12.25 17.27	7.30 9.77 12.25 17.27	0.08 0.13 0.20 0.38
DS7C09P36U-D	C	From Leg	4.00 6.00 7.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.28 5.73 7.21 10.21	4.28 5.73 7.21 10.21	0.08 0.11 0.15 0.25
DS7C09P36U-D	C	From Leg	4.00 6.00 -7.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.28 5.73 7.21 10.21	4.28 5.73 7.21 10.21	0.08 0.11 0.15 0.25
DS7C09P36U-D	C	From Leg	4.00 -6.00 -7.00	0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.28 5.73 7.21 10.21	4.28 5.73 7.21 10.21	0.08 0.11 0.15 0.25
SitePro VFA10-HD	C	None		0.0000	183.00	No Ice 1/2" Ice 1" Ice 2" Ice	17.00 21.00 25.00 33.00	17.00 21.00 25.00 33.00	0.60 0.75 0.90 1.20
6'x4" Pipe Mount	B	From Leg	1.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.69 2.46 2.83 3.61	1.69 2.46 2.83 3.61	0.05 0.07 0.09 0.15
6'x4" Pipe Mount	C	From Leg	1.00 0.00 0.00	0.0000	135.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.69 2.46 2.83 3.61	1.69 2.46 2.83 3.61	0.05 0.07 0.09 0.15
6'x3" Pipe Mount	A	From Leg	0.50 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.77 2.13 2.50 3.27	1.77 2.13 2.50 3.27	0.03 0.05 0.07 0.11
4' x 2.875" Pipe Mount	A	From Leg	0.50 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	0.97 1.22 1.48 2.02	0.97 1.22 1.48 2.02	0.02 0.03 0.04 0.08
6' Standoff Arm	A	From Leg	3.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.40 2.83 3.26 4.15	0.13 0.18 0.24 0.37	0.05 0.07 0.10 0.17
531-70HD	A	From Leg	6.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.00 6.90 7.80 9.60	6.00 6.90 7.80 9.60	0.04 0.05 0.06 0.08
6'x4" Pipe Mount	B	From Leg	1.00 0.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.70 2.46 2.83 3.61	1.70 2.46 2.83 3.61	0.05 0.07 0.09 0.15
8' x 2" Horz. Pipe	B	From Leg	0.50 4.00 0.00	0.0000	125.00	No Ice 1/2" Ice 1" Ice 2" Ice	1.90 2.45 3.01 4.15	0.05 0.08 0.11 0.21	0.03 0.05 0.07 0.14
6'x3" Pipe Mount	C	From Leg	0.50	0.0000	125.00	No Ice	1.77	1.77	0.03

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
						2" Ice	3.27	3.27	0.11
6' Standoff Arm	C	From Leg	3.00	0.0000	125.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
						2" Ice	4.15	0.37	0.17
ANT150F6	C	From Leg	6.00	0.0000	125.00	No Ice	5.87	5.87	0.05
			0.00			1/2" Ice	8.03	8.03	0.09
			10.00			1" Ice	10.21	10.21	0.14
						2" Ice	14.63	14.63	0.30
6'x3" Pipe Mount	A	From Leg	0.50	0.0000	109.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
						2" Ice	3.27	3.27	0.11
4' x 2.875" Pipe Mount	A	From Leg	6.00	0.0000	109.00	No Ice	0.97	0.97	0.02
			0.00			1/2" Ice	1.22	1.22	0.03
			0.00			1" Ice	1.48	1.48	0.04
						2" Ice	2.02	2.02	0.08
6' Standoff Arm	A	From Leg	3.00	0.0000	109.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
						2" Ice	4.15	0.37	0.17
531-70HD	A	From Leg	6.00	0.0000	109.00	No Ice	6.00	6.00	0.04
			0.00			1/2" Ice	6.90	6.90	0.05
			2.00			1" Ice	7.80	7.80	0.06
						2" Ice	9.60	9.60	0.08
6'x3" Pipe Mount	B	From Leg	0.50	0.0000	108.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
						2" Ice	3.27	3.27	0.11
4' x 2.875" Pipe Mount	B	From Leg	6.00	0.0000	108.00	No Ice	0.97	0.97	0.02
			0.00			1/2" Ice	1.22	1.22	0.03
			0.00			1" Ice	1.48	1.48	0.04
						2" Ice	2.02	2.02	0.08
6' Standoff Arm	B	From Leg	3.00	0.0000	108.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
						2" Ice	4.15	0.37	0.17
CO-41A	B	From Leg	6.00	0.0000	108.00	No Ice	2.27	2.27	0.01
			0.00			1/2" Ice	3.71	3.71	0.03
			6.50			1" Ice	5.16	5.16	0.06
						2" Ice	8.12	8.12	0.14
Light Beacon	A	From Leg	0.50	0.0000	103.00	No Ice	0.60	0.25	0.05
			0.00			1/2" Ice	0.70	0.31	0.06
			0.00			1" Ice	0.81	0.39	0.06
						2" Ice	1.06	0.55	0.09
Light Beacon	B	From Leg	0.50	0.0000	103.00	No Ice	0.60	0.25	0.05
			0.00			1/2" Ice	0.70	0.31	0.06
			0.00			1" Ice	0.81	0.39	0.06
						2" Ice	1.06	0.55	0.09
Light Beacon	C	From Leg	0.50	0.0000	103.00	No Ice	0.60	0.25	0.05
			0.00			1/2" Ice	0.70	0.31	0.06
			0.00			1" Ice	0.81	0.39	0.06
						2" Ice	1.06	0.55	0.09
6'x4" Pipe Mount	B	From Leg	1.00	0.0000	100.00	No Ice	1.73	1.73	0.05
			0.00			1/2" Ice	2.46	2.46	0.07

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
8' x 2" Horz. Pipe	B	From Leg	0.50	0.0000	100.00	No Ice	1.90	0.05	0.03
			4.00			1/2" Ice	2.45	0.08	0.05
			0.00			1" Ice	3.01	0.11	0.07
						2" Ice	4.15	0.21	0.14
6'x4" Pipe Mount	B	From Leg	1.00	0.0000	98.00	No Ice	1.73	1.73	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
6'x4" Pipe Mount	C	From Leg	1.00	0.0000	91.00	No Ice	1.74	1.74	0.05
			0.00			1/2" Ice	2.46	2.46	0.07
			0.00			1" Ice	2.83	2.83	0.09
						2" Ice	3.61	3.61	0.15
6'x3" Pipe Mount	A	From Leg	0.50	0.0000	85.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
						2" Ice	3.27	3.27	0.11
4' x 2.875" Pipe Mount	A	From Leg	6.00	0.0000	85.00	No Ice	0.97	0.97	0.02
			0.00			1/2" Ice	1.22	1.22	0.03
			0.00			1" Ice	1.48	1.48	0.04
						2" Ice	2.02	2.02	0.08
6' Standoff Arm	A	From Leg	3.00	0.0000	85.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
						2" Ice	4.15	0.37	0.17
531-70HD	A	From Leg	6.00	0.0000	85.00	No Ice	6.00	6.00	0.04
			0.00			1/2" Ice	6.90	6.90	0.05
			2.00			1" Ice	7.80	7.80	0.06
						2" Ice	9.60	9.60	0.08
6'x3" Pipe Mount	B	From Leg	0.50	0.0000	87.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
						2" Ice	3.27	3.27	0.11
4' x 2.875" Pipe Mount	B	From Leg	3.00	0.0000	87.00	No Ice	0.97	0.97	0.02
			0.00			1/2" Ice	1.22	1.22	0.03
			0.00			1" Ice	1.48	1.48	0.04
						2" Ice	2.02	2.02	0.08
6' Standoff Arm	B	From Leg	3.00	0.0000	87.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10
						2" Ice	4.15	0.37	0.17
ANT150F2	B	From Leg	3.00	0.0000	87.00	No Ice	1.30	1.30	0.02
			0.00			1/2" Ice	1.60	1.60	0.02
			3.50			1" Ice	1.90	1.90	0.03
						2" Ice	2.50	2.50	0.04
6'x3" Pipe Mount	B	From Leg	0.50	0.0000	66.00	No Ice	1.77	1.77	0.03
			0.00			1/2" Ice	2.13	2.13	0.05
			0.00			1" Ice	2.50	2.50	0.07
						2" Ice	3.27	3.27	0.11
4' x 2.875" Pipe Mount	B	From Leg	3.00	0.0000	66.00	No Ice	0.97	0.97	0.02
			0.00			1/2" Ice	1.22	1.22	0.03
			0.00			1" Ice	1.48	1.48	0.04
						2" Ice	2.02	2.02	0.08
6' Standoff Arm	B	From Leg	3.00	0.0000	66.00	No Ice	2.40	0.13	0.05
			0.00			1/2" Ice	2.83	0.18	0.07
			0.00			1" Ice	3.26	0.24	0.10

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	4.15	0.37	0.17
2'x2' Panel	B	From Leg	3.00 0.00 0.00	0.0000	66.00	No Ice 1/2" Ice 1" Ice 2" Ice	4.80 5.07 5.35 5.93	0.72 0.87 1.03 1.36	0.02 0.05 0.07 0.14
PR-900	C	From Leg	1.00 0.00 0.00	0.0000	168.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.35 11.43 16.51 26.67	6.35 11.43 16.51 26.67	0.04 0.05 0.06 0.08

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
8' Dish	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		183.00	8.00	No Ice 1/2" Ice 1" Ice 2" Ice	50.27 51.32 52.37 54.48	0.10 0.26 0.49 0.95
8' Dish	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		183.00	8.00	No Ice 1/2" Ice 1" Ice 2" Ice	50.27 51.32 52.37 54.48	0.10 0.26 0.49 0.95
8' Dish	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		172.00	8.00	No Ice 1/2" Ice 1" Ice 2" Ice	50.27 51.32 52.37 54.48	0.10 0.26 0.49 0.95
8' Dish	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		172.00	8.00	No Ice 1/2" Ice 1" Ice 2" Ice	50.27 51.32 52.37 54.48	0.10 0.26 0.49 0.95
4' Dish	A	Paraboloid w/Radome	From Leg	1.00 0.00 0.00	0.0000		177.00	4.00	No Ice 1/2" Ice 1" Ice 2" Ice	12.57 13.10 13.62 14.68	0.08 0.14 0.21 0.34
6' Dish	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		135.00	6.00	No Ice 1/2" Ice 1" Ice 2" Ice	28.27 29.07 29.87 31.47	0.08 0.10 0.12 0.16
6' Dish	C	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		135.00	6.00	No Ice 1/2" Ice 1" Ice 2" Ice	28.27 29.07 29.87 31.47	0.08 0.10 0.12 0.16
8' Dish	B	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		125.00	8.00	No Ice 1/2" Ice 1" Ice 2" Ice	50.27 51.32 52.37 54.48	0.10 0.26 0.49 0.95
8' Dish	B	Paraboloid w/o Radome	From Leg	1.00 0.00	0.0000		100.00	8.00	No Ice 1/2" Ice	50.27 51.32	0.10 0.26

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
				0.00					1" Ice	52.37	0.49
									2" Ice	54.48	0.95
SC3-W100AB	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		98.00	3.27	No Ice 1/2" Ice 1" Ice	8.40 8.83 9.27	0.04 0.09 0.13
									2" Ice	10.13	0.22
SC3-W100AB	A	Paraboloid w/o Radome	From Leg	1.00 0.00 0.00	0.0000		91.00	3.27	No Ice 1/2" Ice 1" Ice	8.40 8.83 9.27	0.04 0.09 0.13
									2" Ice	10.13	0.22

Tower Pressures - No Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg % %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	182.50	1.174	52	96.514	A	18.465	5.530	5.530	23.05	0.000	0.000
185.00-180.00					B	18.465	5.530		23.05	7.796	0.000
					C	18.465	5.530		23.05	1.964	0.000
T2	170.00	1.15	52	411.055	A	28.995	22.120	22.120	43.28	0.000	0.000
180.00-160.00					B	28.995	22.120		43.28	52.133	0.000
					C	28.995	22.120		43.28	11.017	0.000
T3	150.00	1.11	51	451.055	A	39.270	22.120	22.120	36.03	15.840	0.000
160.00-140.00					B	39.270	22.120		36.03	57.781	0.000
					C	39.270	22.120		36.03	68.260	0.000
T4	130.00	1.065	50	491.055	A	42.340	22.120	22.120	34.32	47.520	0.000
140.00-120.00					B	42.340	22.120		34.32	69.891	0.000
					C	42.340	22.120		34.32	68.260	0.000
T5	110.00	1.016	48	534.393	A	45.148	28.798	28.798	38.94	47.520	0.000
120.00-100.00					B	45.148	28.798		38.94	82.857	0.000
					C	45.148	28.798		38.94	68.392	0.000
T6	96.67	0.979	47	187.113	A	14.658	9.604	9.604	39.58	15.848	0.000
100.00-93.33					B	14.658	9.604		39.58	28.712	0.000
					C	14.658	9.604		39.58	25.158	0.000
T7 93.33-80.00	86.67	0.949	46	387.276	A	35.903	19.194	19.194	34.84	31.672	0.000
					B	35.903	19.194		34.84	59.426	0.000
					C	35.903	19.194		34.84	50.279	0.000
T8 80.00-73.33	76.67	0.916	45	200.453	A	15.566	9.604	9.604	38.16	15.848	0.000
					B	15.566	9.604		38.16	30.599	0.000
					C	15.566	9.604		38.16	25.158	0.000
T9 73.33-60.00	66.67	0.88	43	413.936	A	37.768	19.194	19.194	33.70	31.888	0.000
					B	37.768	19.194		33.70	61.153	0.000
					C	37.768	19.194		33.70	50.279	0.000
T10	56.67	0.84	42	214.976	A	16.388	11.970	11.970	42.21	16.088	0.000
60.00-53.33					B	16.388	11.970		42.21	30.599	0.000
					C	16.388	11.970		42.21	25.158	0.000
T11	46.67	0.795	40	442.960	A	41.946	23.923	23.923	36.32	32.152	0.000
53.33-40.00					B	41.946	23.923		36.32	61.153	0.000
					C	41.946	23.923		36.32	50.279	0.000
T12	36.67	0.742	38	228.316	A	17.315	11.970	11.970	40.87	16.088	0.000
40.00-33.33					B	17.315	11.970		40.87	30.599	0.000
					C	17.315	11.970		40.87	25.158	0.000

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
T13	26.67	0.7	36	469.620	A	44.027	23.923	23.923	35.21	32.152	0.000
33.33-20.00					B	44.027	23.923		35.21	61.153	0.000
					C	44.027	23.923		35.21	50.279	0.000
T14	16.67	0.7	36	242.769	A	18.160	14.197	14.197	43.88	16.088	0.000
20.00-13.33					B	18.160	14.197		43.88	30.599	0.000
					C	18.160	14.197		43.88	25.158	0.000
T15 13.33-0.00	6.67	0.7	37	498.504	A	48.957	28.373	28.373	36.69	17.680	0.000
					B	48.957	28.373		36.69	33.627	0.000
					C	48.957	28.373		36.69	27.648	0.000

Tower Pressure - With Ice

$G_H = 0.850$

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
T1	182.50	1.174	8	2.2027	98.352	A	18.465	29.625	9.207	19.15	0.000	0.000
185.00-180.00						B	18.465	29.625		19.15	29.445	0.000
						C	18.465	29.625		19.15	10.025	0.000
T2	170.00	1.15	8	2.1940	418.378	A	28.995	68.579	36.771	37.69	0.000	0.000
180.00-160.00						B	28.995	68.579		37.69	191.393	0.000
						C	28.995	68.579		37.69	55.755	0.000
T3	150.00	1.11	8	2.1782	458.325	A	39.270	70.881	36.666	33.29	43.301	0.000
160.00-140.00						B	39.270	70.881		33.29	205.417	0.000
						C	39.270	70.881		33.29	212.670	0.000
T4	130.00	1.065	7	2.1594	498.262	A	42.340	73.112	36.540	31.65	134.590	0.000
140.00-120.00						B	42.340	73.112		31.65	235.851	0.000
						C	42.340	73.112		31.65	212.031	0.000
T5	110.00	1.016	7	2.1364	541.523	A	45.148	81.646	43.064	33.96	134.310	0.000
120.00-100.00						B	45.148	81.646		33.96	273.998	0.000
						C	45.148	81.646		33.96	212.580	0.000
T6 100.00-93.33	96.67	0.979	7	2.1179	189.471	A	14.658	24.669	14.321	36.41	44.717	0.000
						B	14.658	24.669		36.41	97.441	0.000
						C	14.658	24.669		36.41	82.081	0.000
T7 93.33-80.00	86.67	0.949	7	2.1017	391.951	A	35.903	62.247	28.548	29.09	89.236	0.000
						B	35.903	62.247		29.09	207.652	0.000
						C	35.903	62.247		29.09	163.567	0.000
T8 80.00-73.33	76.67	0.916	7	2.0831	202.772	A	15.566	25.052	14.243	35.07	44.576	0.000
						B	15.566	25.052		35.07	108.432	0.000
						C	15.566	25.052		35.07	81.573	0.000
T9 73.33-60.00	66.67	0.88	6	2.0614	418.522	A	37.768	63.232	28.368	28.09	91.599	0.000
						B	37.768	63.232		28.09	215.532	0.000
						C	37.768	63.232		28.09	162.388	0.000
T10 60.00-53.33	56.67	0.84	6	2.0354	217.242	A	16.388	27.622	16.503	37.50	47.338	0.000
						B	16.388	27.622		37.50	107.150	0.000
						C	16.388	27.622		37.50	80.876	0.000
T11 53.33-40.00	46.67	0.795	6	2.0037	447.417	A	41.946	68.236	32.841	29.81	94.264	0.000
						B	41.946	68.236		29.81	212.435	0.000
						C	41.946	68.236		29.81	160.705	0.000
T12 40.00-33.33	36.67	0.742	6	1.9634	230.501	A	17.315	27.675	16.343	36.33	46.951	0.000
						B	17.315	27.675		36.33	105.216	0.000
						C	17.315	27.675		36.33	79.825	0.000
T13 33.33-20.00	26.67	0.7	5	1.9093	473.867	A	44.027	67.865	32.421	28.97	93.251	0.000
						B	44.027	67.865		28.97	207.374	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	44.027	67.865		28.97	157.955	0.000
T14 20.00-13.33	16.67	0.7	5	1.8290	244.805	A	18.160	29.343	18.271	38.46	46.230	0.000
						B	18.160	29.343		38.46	101.612	0.000
						C	18.160	29.343		38.46	77.867	0.000
T15 13.33-0.00	6.67	0.7	5	1.6758	502.232	A	48.957	68.251	35.832	30.57	49.905	0.000
						B	48.957	68.251		30.57	107.160	0.000
						C	48.957	68.251		30.57	83.126	0.000

Tower Pressure - Service

$G_H = 0.850$

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
T1	182.50	1.174	11	96.514	A	18.465	5.530	5.530	23.05	0.000	0.000
185.00-180.00					B	18.465	5.530		23.05	7.796	0.000
					C	18.465	5.530		23.05	1.964	0.000
T2	170.00	1.15	11	411.055	A	28.995	22.120	22.120	43.28	0.000	0.000
180.00-160.00					B	28.995	22.120		43.28	52.133	0.000
					C	28.995	22.120		43.28	11.017	0.000
T3	150.00	1.11	11	451.055	A	39.270	22.120	22.120	36.03	15.840	0.000
160.00-140.00					B	39.270	22.120		36.03	57.781	0.000
					C	39.270	22.120		36.03	68.260	0.000
T4	130.00	1.065	11	491.055	A	42.340	22.120	22.120	34.32	47.520	0.000
140.00-120.00					B	42.340	22.120		34.32	69.891	0.000
					C	42.340	22.120		34.32	68.260	0.000
T5	110.00	1.016	10	534.393	A	45.148	28.798	28.798	38.94	47.520	0.000
120.00-100.00					B	45.148	28.798		38.94	82.857	0.000
					C	45.148	28.798		38.94	68.392	0.000
T6	96.67	0.979	10	187.113	A	14.658	9.604	9.604	39.58	15.848	0.000
100.00-93.33					B	14.658	9.604		39.58	28.712	0.000
					C	14.658	9.604		39.58	25.158	0.000
T7 93.33-80.00	86.67	0.949	10	387.276	A	35.903	19.194	19.194	34.84	31.672	0.000
					B	35.903	19.194		34.84	59.426	0.000
					C	35.903	19.194		34.84	50.279	0.000
T8 80.00-73.33	76.67	0.916	10	200.453	A	15.566	9.604	9.604	38.16	15.848	0.000
					B	15.566	9.604		38.16	30.599	0.000
					C	15.566	9.604		38.16	25.158	0.000
T9 73.33-60.00	66.67	0.88	9	413.936	A	37.768	19.194	19.194	33.70	31.888	0.000
					B	37.768	19.194		33.70	61.153	0.000
					C	37.768	19.194		33.70	50.279	0.000
T10	56.67	0.84	9	214.976	A	16.388	11.970	11.970	42.21	16.088	0.000
60.00-53.33					B	16.388	11.970		42.21	30.599	0.000
					C	16.388	11.970		42.21	25.158	0.000
T11	46.67	0.795	9	442.960	A	41.946	23.923	23.923	36.32	32.152	0.000
53.33-40.00					B	41.946	23.923		36.32	61.153	0.000
					C	41.946	23.923		36.32	50.279	0.000
T12	36.67	0.742	8	228.316	A	17.315	11.970	11.970	40.87	16.088	0.000
40.00-33.33					B	17.315	11.970		40.87	30.599	0.000
					C	17.315	11.970		40.87	25.158	0.000
T13	26.67	0.7	8	469.620	A	44.027	23.923	23.923	35.21	32.152	0.000
33.33-20.00					B	44.027	23.923		35.21	61.153	0.000
					C	44.027	23.923		35.21	50.279	0.000

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
T14	16.67	0.7	8	242.769	A	18.160	14.197	14.197	43.88	16.088	0.000
20.00-13.33					B	18.160	14.197		43.88	30.599	0.000
					C	18.160	14.197		43.88	25.158	0.000
T15 13.33-0.00	6.67	0.7	8	498.504	A	48.957	28.373	28.373	36.69	17.680	0.000
					B	48.957	28.373		36.69	33.627	0.000
					C	48.957	28.373		36.69	27.648	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	52	1	1	21.091	2.56	511.46	C
185.00-180.00			B	0.249	2.442		1	1	21.091			
			C	0.249	2.442		1	1	21.091			
T2	0.24	2.91	A	0.124	2.868	52	1	1	37.978	6.47	323.64	C
180.00-160.00			B	0.124	2.868		1	1	37.978			
			C	0.124	2.868		1	1	37.978			
T3	0.53	4.13	A	0.136	2.823	51	1	1	48.379	9.58	478.75	C
160.00-140.00			B	0.136	2.823		1	1	48.379			
			C	0.136	2.823		1	1	48.379			
T4	0.70	4.36	A	0.131	2.842	50	1	1	51.397	10.85	542.31	C
140.00-120.00			B	0.131	2.842		1	1	51.397			
			C	0.131	2.842		1	1	51.397			
T5	0.74	5.82	A	0.138	2.815	48	1	1	57.038	11.43	571.64	C
120.00-100.00			B	0.138	2.815		1	1	57.038			
			C	0.138	2.815		1	1	57.038			
T6	0.26	1.91	A	0.13	2.848	47	1	1	18.583	3.78	566.15	C
100.00-93.33			B	0.13	2.848		1	1	18.583			
			C	0.13	2.848		1	1	18.583			
T7	0.53	4.42	A	0.142	2.8	46	1	1	43.864	8.10	607.44	C
93.33-80.00			B	0.142	2.8		1	1	43.864			
			C	0.142	2.8		1	1	43.864			
T8	0.27	2.29	A	0.126	2.863	45	1	1	19.472	3.75	562.66	C
80.00-73.33			B	0.126	2.863		1	1	19.472			
			C	0.126	2.863		1	1	19.472			
T9	0.53	5.01	A	0.138	2.818	43	1	1	45.686	7.92	594.26	C
73.33-60.00			B	0.138	2.818		1	1	45.686			
			C	0.138	2.818		1	1	45.686			
T10	0.27	2.31	A	0.132	2.839	42	1	1	21.292	3.68	552.44	C
60.00-53.33			B	0.132	2.839		1	1	21.292			
			C	0.132	2.839		1	1	21.292			
T11	0.53	5.42	A	0.149	2.776	40	1	1	51.946	7.84	587.90	C
53.33-40.00			B	0.149	2.776		1	1	51.946			
			C	0.149	2.776		1	1	51.946			
T12	0.27	2.68	A	0.128	2.853	38	1	1	22.199	3.42	512.27	C
40.00-33.33			B	0.128	2.853		1	1	22.199			
			C	0.128	2.853		1	1	22.199			
T13	0.53	6.80	A	0.145	2.791	36	1	1	53.979	7.25	544.12	C
33.33-20.00			B	0.145	2.791		1	1	53.979			
			C	0.145	2.791		1	1	53.979			
T14	0.27	3.51	A	0.133	2.834	36	1	1	23.987	3.44	516.02	C
20.00-13.33			B	0.133	2.834		1	1	23.987			
			C	0.133	2.834		1	1	23.987			
T15	0.29	7.62	A	0.155	2.753	37	1	1	60.911	6.74	505.82	C
13.33-0.00			B	0.155	2.753		1	1	60.911			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		1	1 OTM	60.911 8549.00 kip-ft	96.81		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	52	0.825	1	17.860	2.21	441.10	C
185.00-180.00			B	0.249	2.442		0.825	1	17.860			
			C	0.249	2.442		0.825	1	17.860			
T2	0.24	2.91	A	0.124	2.868	52	0.825	1	32.904	5.83	291.56	C
180.00-160.00			B	0.124	2.868		0.825	1	32.904			
			C	0.124	2.868		0.825	1	32.904			
T3	0.53	4.13	A	0.136	2.823	51	0.825	1	41.506	8.74	436.86	C
160.00-140.00			B	0.136	2.823		0.825	1	41.506			
			C	0.136	2.823		0.825	1	41.506			
T4	0.70	4.36	A	0.131	2.842	50	0.825	1	43.987	9.96	497.96	C
140.00-120.00			B	0.131	2.842		0.825	1	43.987			
			C	0.131	2.842		0.825	1	43.987			
T5	0.74	5.82	A	0.138	2.815	48	0.825	1	49.137	10.52	526.21	C
120.00-100.00			B	0.138	2.815		0.825	1	49.137			
			C	0.138	2.815		0.825	1	49.137			
T6	0.26	1.91	A	0.13	2.848	47	0.825	1	16.018	3.49	522.51	C
100.00-93.33			B	0.13	2.848		0.825	1	16.018			
			C	0.13	2.848		0.825	1	16.018			
T7	0.53	4.42	A	0.142	2.8	46	0.825	1	37.581	7.41	555.97	C
93.33-80.00			B	0.142	2.8		0.825	1	37.581			
			C	0.142	2.8		0.825	1	37.581			
T8	0.27	2.29	A	0.126	2.863	45	0.825	1	16.748	3.46	518.20	C
80.00-73.33			B	0.126	2.863		0.825	1	16.748			
			C	0.126	2.863		0.825	1	16.748			
T9	0.53	5.01	A	0.138	2.818	43	0.825	1	39.077	7.23	542.72	C
73.33-60.00			B	0.138	2.818		0.825	1	39.077			
			C	0.138	2.818		0.825	1	39.077			
T10	0.27	2.31	A	0.132	2.839	42	0.825	1	18.424	3.40	509.01	C
60.00-53.33			B	0.132	2.839		0.825	1	18.424			
			C	0.132	2.839		0.825	1	18.424			
T11	0.53	5.42	A	0.149	2.776	40	0.825	1	44.606	7.14	535.89	C
53.33-40.00			B	0.149	2.776		0.825	1	44.606			
			C	0.149	2.776		0.825	1	44.606			
T12	0.27	2.68	A	0.128	2.853	38	0.825	1	19.169	3.14	470.66	C
40.00-33.33			B	0.128	2.853		0.825	1	19.169			
			C	0.128	2.853		0.825	1	19.169			
T13	0.53	6.80	A	0.145	2.791	36	0.825	1	46.274	6.59	494.71	C
33.33-20.00			B	0.145	2.791		0.825	1	46.274			
			C	0.145	2.791		0.825	1	46.274			
T14	0.27	3.51	A	0.133	2.834	36	0.825	1	20.809	3.16	474.18	C
20.00-13.33			B	0.133	2.834		0.825	1	20.809			
			C	0.133	2.834		0.825	1	20.809			
T15	0.29	7.62	A	0.155	2.753	37	0.825	1	52.344	6.00	450.35	C
13.33-0.00			B	0.155	2.753		0.825	1	52.344			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		0.825	1 OTM	52.344 7792.55 kip-ft	88.28		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	52	0.8	1	17.398	2.16	431.05	C
185.00-180.00			B	0.249	2.442		0.8	1	17.398			
			C	0.249	2.442		0.8	1	17.398			
T2	0.24	2.91	A	0.124	2.868	52	0.8	1	32.179	5.74	286.97	C
180.00-160.00			B	0.124	2.868		0.8	1	32.179			
			C	0.124	2.868		0.8	1	32.179			
T3	0.53	4.13	A	0.136	2.823	51	0.8	1	40.525	8.62	430.87	C
160.00-140.00			B	0.136	2.823		0.8	1	40.525			
			C	0.136	2.823		0.8	1	40.525			
T4	0.70	4.36	A	0.131	2.842	50	0.8	1	42.929	9.83	491.62	C
140.00-120.00			B	0.131	2.842		0.8	1	42.929			
			C	0.131	2.842		0.8	1	42.929			
T5	0.74	5.82	A	0.138	2.815	48	0.8	1	48.008	10.39	519.72	C
120.00-100.00			B	0.138	2.815		0.8	1	48.008			
			C	0.138	2.815		0.8	1	48.008			
T6	0.26	1.91	A	0.13	2.848	47	0.8	1	15.651	3.44	516.27	C
100.00-93.33			B	0.13	2.848		0.8	1	15.651			
			C	0.13	2.848		0.8	1	15.651			
T7	0.53	4.42	A	0.142	2.8	46	0.8	1	36.684	7.31	548.62	C
93.33-80.00			B	0.142	2.8		0.8	1	36.684			
			C	0.142	2.8		0.8	1	36.684			
T8	0.27	2.29	A	0.126	2.863	45	0.8	1	16.359	3.41	511.85	C
80.00-73.33			B	0.126	2.863		0.8	1	16.359			
			C	0.126	2.863		0.8	1	16.359			
T9	0.53	5.01	A	0.138	2.818	43	0.8	1	38.132	7.14	535.35	C
73.33-60.00			B	0.138	2.818		0.8	1	38.132			
			C	0.138	2.818		0.8	1	38.132			
T10	0.27	2.31	A	0.132	2.839	42	0.8	1	18.015	3.35	502.80	C
60.00-53.33			B	0.132	2.839		0.8	1	18.015			
			C	0.132	2.839		0.8	1	18.015			
T11	0.53	5.42	A	0.149	2.776	40	0.8	1	43.557	7.04	528.46	C
53.33-40.00			B	0.149	2.776		0.8	1	43.557			
			C	0.149	2.776		0.8	1	43.557			
T12	0.27	2.68	A	0.128	2.853	38	0.8	1	18.736	3.10	464.72	C
40.00-33.33			B	0.128	2.853		0.8	1	18.736			
			C	0.128	2.853		0.8	1	18.736			
T13	0.53	6.80	A	0.145	2.791	36	0.8	1	45.174	6.50	487.65	C
33.33-20.00			B	0.145	2.791		0.8	1	45.174			
			C	0.145	2.791		0.8	1	45.174			
T14	0.27	3.51	A	0.133	2.834	36	0.8	1	20.355	3.12	468.20	C
20.00-13.33			B	0.133	2.834		0.8	1	20.355			
			C	0.133	2.834		0.8	1	20.355			
T15	0.29	7.62	A	0.155	2.753	37	0.8	1	51.120	5.90	442.42	C
13.33-0.00			B	0.155	2.753		0.8	1	51.120			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		0.8	1 OTM	51.120 7684.49 kip-ft	87.06		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	52	0.85	1	18.322	2.26	451.15	C
185.00-180.00			B	0.249	2.442		0.85	1	18.322			
			C	0.249	2.442		0.85	1	18.322			
T2	0.24	2.91	A	0.124	2.868	52	0.85	1	33.629	5.92	296.14	C
180.00-160.00			B	0.124	2.868		0.85	1	33.629			
			C	0.124	2.868		0.85	1	33.629			
T3	0.53	4.13	A	0.136	2.823	51	0.85	1	42.488	8.86	442.84	C
160.00-140.00			B	0.136	2.823		0.85	1	42.488			
			C	0.136	2.823		0.85	1	42.488			
T4	0.70	4.36	A	0.131	2.842	50	0.85	1	45.046	10.09	504.29	C
140.00-120.00			B	0.131	2.842		0.85	1	45.046			
			C	0.131	2.842		0.85	1	45.046			
T5	0.74	5.82	A	0.138	2.815	48	0.85	1	50.266	10.65	532.70	C
120.00-100.00			B	0.138	2.815		0.85	1	50.266			
			C	0.138	2.815		0.85	1	50.266			
T6	0.26	1.91	A	0.13	2.848	47	0.85	1	16.384	3.53	528.74	C
100.00-93.33			B	0.13	2.848		0.85	1	16.384			
			C	0.13	2.848		0.85	1	16.384			
T7	0.53	4.42	A	0.142	2.8	46	0.85	1	38.479	7.51	563.32	C
93.33-80.00			B	0.142	2.8		0.85	1	38.479			
			C	0.142	2.8		0.85	1	38.479			
T8	0.27	2.29	A	0.126	2.863	45	0.85	1	17.137	3.50	524.55	C
80.00-73.33			B	0.126	2.863		0.85	1	17.137			
			C	0.126	2.863		0.85	1	17.137			
T9	0.53	5.01	A	0.138	2.818	43	0.85	1	40.021	7.33	550.08	C
73.33-60.00			B	0.138	2.818		0.85	1	40.021			
			C	0.138	2.818		0.85	1	40.021			
T10	0.27	2.31	A	0.132	2.839	42	0.85	1	18.834	3.44	515.21	C
60.00-53.33			B	0.132	2.839		0.85	1	18.834			
			C	0.132	2.839		0.85	1	18.834			
T11	0.53	5.42	A	0.149	2.776	40	0.85	1	45.655	7.24	543.32	C
53.33-40.00			B	0.149	2.776		0.85	1	45.655			
			C	0.149	2.776		0.85	1	45.655			
T12	0.27	2.68	A	0.128	2.853	38	0.85	1	19.601	3.18	476.61	C
40.00-33.33			B	0.128	2.853		0.85	1	19.601			
			C	0.128	2.853		0.85	1	19.601			
T13	0.53	6.80	A	0.145	2.791	36	0.85	1	47.375	6.69	501.77	C
33.33-20.00			B	0.145	2.791		0.85	1	47.375			
			C	0.145	2.791		0.85	1	47.375			
T14	0.27	3.51	A	0.133	2.834	36	0.85	1	21.263	3.20	480.15	C
20.00-13.33			B	0.133	2.834		0.85	1	21.263			
			C	0.133	2.834		0.85	1	21.263			
T15	0.29	7.62	A	0.155	2.753	37	0.85	1	53.568	6.11	458.27	C
13.33-0.00			B	0.155	2.753		0.85	1	53.568			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		0.85	1 OTM	53.568 7900.62 kip-ft	89.50		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.59	5.51	A	0.489	1.915	8	1	1	38.583	0.62	124.07	C
185.00-180.00			B	0.489	1.915		1	1	38.583			
			C	0.489	1.915		1	1	38.583			
T2	3.77	9.98	A	0.233	2.489	8	1	1	68.845	2.08	104.23	C
180.00-160.00			B	0.233	2.489		1	1	68.845			
			C	0.233	2.489		1	1	68.845			
T3	7.49	12.68	A	0.24	2.467	8	1	1	80.573	3.04	151.92	C
160.00-140.00			B	0.24	2.467		1	1	80.573			
			C	0.24	2.467		1	1	80.573			
T4	9.52	13.35	A	0.232	2.494	7	1	1	84.800	3.50	174.79	C
140.00-120.00			B	0.232	2.494		1	1	84.800			
			C	0.232	2.494		1	1	84.800			
T5	10.09	15.55	A	0.234	2.486	7	1	1	92.607	3.64	182.16	C
120.00-100.00			B	0.234	2.486		1	1	92.607			
			C	0.234	2.486		1	1	92.607			
T6	3.61	4.95	A	0.208	2.571	7	1	1	28.864	1.23	184.52	C
100.00-93.33			B	0.208	2.571		1	1	28.864			
			C	0.208	2.571		1	1	28.864			
T7	7.30	12.27	A	0.25	2.436	7	1	1	72.323	2.61	195.80	C
93.33-80.00			B	0.25	2.436		1	1	72.323			
			C	0.25	2.436		1	1	72.323			
T8	3.68	5.41	A	0.2	2.595	7	1	1	29.959	1.23	184.22	C
80.00-73.33			B	0.2	2.595		1	1	29.959			
			C	0.2	2.595		1	1	29.959			
T9	7.32	13.41	A	0.241	2.464	6	1	1	74.628	2.54	190.61	C
73.33-60.00			B	0.241	2.464		1	1	74.628			
			C	0.241	2.464		1	1	74.628			
T10	3.63	5.60	A	0.203	2.587	6	1	1	32.269	1.18	177.33	C
60.00-53.33			B	0.203	2.587		1	1	32.269			
			C	0.203	2.587		1	1	32.269			
T11	7.14	14.51	A	0.246	2.449	6	1	1	81.802	2.42	181.49	C
53.33-40.00			B	0.246	2.449		1	1	81.802			
			C	0.246	2.449		1	1	81.802			
T12	3.50	5.97	A	0.195	2.612	6	1	1	33.191	1.07	160.82	C
40.00-33.33			B	0.195	2.612		1	1	33.191			
			C	0.195	2.612		1	1	33.191			
T13	6.79	15.73	A	0.236	2.48	5	1	1	83.506	2.18	163.90	C
33.33-20.00			B	0.236	2.48		1	1	83.506			
			C	0.236	2.48		1	1	83.506			
T14	3.25	6.75	A	0.194	2.616	5	1	1	34.987	1.04	155.95	C
20.00-13.33			B	0.194	2.616		1	1	34.987			
			C	0.194	2.616		1	1	34.987			
T15	3.28	15.99	A	0.233	2.488	5	1	1	88.618	1.69	126.87	C
13.33-0.00			B	0.233	2.488		1	1	88.618			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	80.96	157.67	C	0.233	2.488		1	1 OTM	88.618 2693.40 kip-ft	30.08		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.59	5.51	A	0.489	1.915	8	0.825	1	35.352	0.58	115.90	C
185.00-180.00			B	0.489	1.915		0.825	1	35.352			
			C	0.489	1.915		0.825	1	35.352			
T2	3.77	9.98	A	0.233	2.489	8	0.825	1	63.771	2.00	100.11	C
180.00-160.00			B	0.233	2.489		0.825	1	63.771			
			C	0.233	2.489		0.825	1	63.771			
T3	7.49	12.68	A	0.24	2.467	8	0.825	1	73.700	2.93	146.50	C
160.00-140.00			B	0.24	2.467		0.825	1	73.700			
			C	0.24	2.467		0.825	1	73.700			
T4	9.52	13.35	A	0.232	2.494	7	0.825	1	77.390	3.38	169.03	C
140.00-120.00			B	0.232	2.494		0.825	1	77.390			
			C	0.232	2.494		0.825	1	77.390			
T5	10.09	15.55	A	0.234	2.486	7	0.825	1	84.707	3.52	176.22	C
120.00-100.00			B	0.234	2.486		0.825	1	84.707			
			C	0.234	2.486		0.825	1	84.707			
T6	3.61	4.95	A	0.208	2.571	7	0.825	1	26.298	1.19	178.69	C
100.00-93.33			B	0.208	2.571		0.825	1	26.298			
			C	0.208	2.571		0.825	1	26.298			
T7	7.30	12.27	A	0.25	2.436	7	0.825	1	66.040	2.52	189.17	C
93.33-80.00			B	0.25	2.436		0.825	1	66.040			
			C	0.25	2.436		0.825	1	66.040			
T8	3.68	5.41	A	0.2	2.595	7	0.825	1	27.235	1.19	178.26	C
80.00-73.33			B	0.2	2.595		0.825	1	27.235			
			C	0.2	2.595		0.825	1	27.235			
T9	7.32	13.41	A	0.241	2.464	6	0.825	1	68.019	2.45	183.95	C
73.33-60.00			B	0.241	2.464		0.825	1	68.019			
			C	0.241	2.464		0.825	1	68.019			
T10	3.63	5.60	A	0.203	2.587	6	0.825	1	29.401	1.14	171.47	C
60.00-53.33			B	0.203	2.587		0.825	1	29.401			
			C	0.203	2.587		0.825	1	29.401			
T11	7.14	14.51	A	0.246	2.449	6	0.825	1	74.461	2.33	174.71	C
53.33-40.00			B	0.246	2.449		0.825	1	74.461			
			C	0.246	2.449		0.825	1	74.461			
T12	3.50	5.97	A	0.195	2.612	6	0.825	1	30.161	1.04	155.19	C
40.00-33.33			B	0.195	2.612		0.825	1	30.161			
			C	0.195	2.612		0.825	1	30.161			
T13	6.79	15.73	A	0.236	2.48	5	0.825	1	75.801	2.10	157.41	C
33.33-20.00			B	0.236	2.48		0.825	1	75.801			
			C	0.236	2.48		0.825	1	75.801			
T14	3.25	6.75	A	0.194	2.616	5	0.825	1	31.809	1.00	150.24	C
20.00-13.33			B	0.194	2.616		0.825	1	31.809			
			C	0.194	2.616		0.825	1	31.809			
T15	3.28	15.99	A	0.233	2.488	5	0.825	1	80.051	1.59	119.45	C
13.33-0.00			B	0.233	2.488		0.825	1	80.051			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	80.96	157.67	C	0.233	2.488		0.825	1 OTM	80.051 2595.88 kip-ft	28.97		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.59	5.51	A	0.489	1.915	8	0.8	1	34.890	0.57	114.74	C
185.00-180.00			B	0.489	1.915		0.8	1	34.890			
			C	0.489	1.915		0.8	1	34.890			
T2	3.77	9.98	A	0.233	2.489	8	0.8	1	63.046	1.99	99.52	C
180.00-160.00			B	0.233	2.489		0.8	1	63.046			
			C	0.233	2.489		0.8	1	63.046			
T3	7.49	12.68	A	0.24	2.467	8	0.8	1	72.718	2.91	145.73	C
160.00-140.00			B	0.24	2.467		0.8	1	72.718			
			C	0.24	2.467		0.8	1	72.718			
T4	9.52	13.35	A	0.232	2.494	7	0.8	1	76.332	3.36	168.21	C
140.00-120.00			B	0.232	2.494		0.8	1	76.332			
			C	0.232	2.494		0.8	1	76.332			
T5	10.09	15.55	A	0.234	2.486	7	0.8	1	83.578	3.51	175.38	C
120.00-100.00			B	0.234	2.486		0.8	1	83.578			
			C	0.234	2.486		0.8	1	83.578			
T6	3.61	4.95	A	0.208	2.571	7	0.8	1	25.932	1.19	177.85	C
100.00-93.33			B	0.208	2.571		0.8	1	25.932			
			C	0.208	2.571		0.8	1	25.932			
T7	7.30	12.27	A	0.25	2.436	7	0.8	1	65.143	2.51	188.23	C
93.33-80.00			B	0.25	2.436		0.8	1	65.143			
			C	0.25	2.436		0.8	1	65.143			
T8	3.68	5.41	A	0.2	2.595	7	0.8	1	26.846	1.18	177.40	C
80.00-73.33			B	0.2	2.595		0.8	1	26.846			
			C	0.2	2.595		0.8	1	26.846			
T9	7.32	13.41	A	0.241	2.464	6	0.8	1	67.075	2.44	182.99	C
73.33-60.00			B	0.241	2.464		0.8	1	67.075			
			C	0.241	2.464		0.8	1	67.075			
T10	3.63	5.60	A	0.203	2.587	6	0.8	1	28.991	1.14	170.63	C
60.00-53.33			B	0.203	2.587		0.8	1	28.991			
			C	0.203	2.587		0.8	1	28.991			
T11	7.14	14.51	A	0.246	2.449	6	0.8	1	73.413	2.32	173.74	C
53.33-40.00			B	0.246	2.449		0.8	1	73.413			
			C	0.246	2.449		0.8	1	73.413			
T12	3.50	5.97	A	0.195	2.612	6	0.8	1	29.728	1.03	154.38	C
40.00-33.33			B	0.195	2.612		0.8	1	29.728			
			C	0.195	2.612		0.8	1	29.728			
T13	6.79	15.73	A	0.236	2.48	5	0.8	1	74.701	2.09	156.48	C
33.33-20.00			B	0.236	2.48		0.8	1	74.701			
			C	0.236	2.48		0.8	1	74.701			
T14	3.25	6.75	A	0.194	2.616	5	0.8	1	31.355	1.00	149.42	C
20.00-13.33			B	0.194	2.616		0.8	1	31.355			
			C	0.194	2.616		0.8	1	31.355			
T15	3.28	15.99	A	0.233	2.488	5	0.8	1	78.827	1.58	118.39	C
13.33-0.00			B	0.233	2.488		0.8	1	78.827			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	80.96	157.67	C	0.233	2.488		0.8	1 OTM	78.827 2581.95 kip-ft	28.81		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.59	5.51	A	0.489	1.915	8	0.85	1	35.814	0.59	117.07	C
185.00-180.00			B	0.489	1.915		0.85	1	35.814			
			C	0.489	1.915		0.85	1	35.814			
T2	3.77	9.98	A	0.233	2.489	8	0.85	1	64.496	2.01	100.70	C
180.00-160.00			B	0.233	2.489		0.85	1	64.496			
			C	0.233	2.489		0.85	1	64.496			
T3	7.49	12.68	A	0.24	2.467	8	0.85	1	74.682	2.95	147.27	C
160.00-140.00			B	0.24	2.467		0.85	1	74.682			
			C	0.24	2.467		0.85	1	74.682			
T4	9.52	13.35	A	0.232	2.494	7	0.85	1	78.449	3.40	169.85	C
140.00-120.00			B	0.232	2.494		0.85	1	78.449			
			C	0.232	2.494		0.85	1	78.449			
T5	10.09	15.55	A	0.234	2.486	7	0.85	1	85.835	3.54	177.07	C
120.00-100.00			B	0.234	2.486		0.85	1	85.835			
			C	0.234	2.486		0.85	1	85.835			
T6	3.61	4.95	A	0.208	2.571	7	0.85	1	26.665	1.20	179.52	C
100.00-93.33			B	0.208	2.571		0.85	1	26.665			
			C	0.208	2.571		0.85	1	26.665			
T7	7.30	12.27	A	0.25	2.436	7	0.85	1	66.938	2.53	190.12	C
93.33-80.00			B	0.25	2.436		0.85	1	66.938			
			C	0.25	2.436		0.85	1	66.938			
T8	3.68	5.41	A	0.2	2.595	7	0.85	1	27.624	1.19	179.11	C
80.00-73.33			B	0.2	2.595		0.85	1	27.624			
			C	0.2	2.595		0.85	1	27.624			
T9	7.32	13.41	A	0.241	2.464	6	0.85	1	68.963	2.46	184.90	C
73.33-60.00			B	0.241	2.464		0.85	1	68.963			
			C	0.241	2.464		0.85	1	68.963			
T10	3.63	5.60	A	0.203	2.587	6	0.85	1	29.810	1.15	172.31	C
60.00-53.33			B	0.203	2.587		0.85	1	29.810			
			C	0.203	2.587		0.85	1	29.810			
T11	7.14	14.51	A	0.246	2.449	6	0.85	1	75.510	2.34	175.68	C
53.33-40.00			B	0.246	2.449		0.85	1	75.510			
			C	0.246	2.449		0.85	1	75.510			
T12	3.50	5.97	A	0.195	2.612	6	0.85	1	30.594	1.04	155.99	C
40.00-33.33			B	0.195	2.612		0.85	1	30.594			
			C	0.195	2.612		0.85	1	30.594			
T13	6.79	15.73	A	0.236	2.48	5	0.85	1	76.902	2.11	158.34	C
33.33-20.00			B	0.236	2.48		0.85	1	76.902			
			C	0.236	2.48		0.85	1	76.902			
T14	3.25	6.75	A	0.194	2.616	5	0.85	1	32.263	1.01	151.06	C
20.00-13.33			B	0.194	2.616		0.85	1	32.263			
			C	0.194	2.616		0.85	1	32.263			
T15	3.28	15.99	A	0.233	2.488	5	0.85	1	81.275	1.61	120.51	C
13.33-0.00			B	0.233	2.488		0.85	1	81.275			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	80.96	157.67	C	0.233	2.488		0.85	1 OTM	81.275 2609.81 kip-ft	29.13		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	11	1	1	21.689	0.56	111.72	C
185.00-180.00			B	0.249	2.442		1	1	21.689			
			C	0.249	2.442		1	1	21.689			
T2	0.24	2.91	A	0.124	2.868	11	1	1	41.472	1.47	73.64	C
180.00-160.00			B	0.124	2.868		1	1	41.472			
			C	0.124	2.868		1	1	41.472			
T3	0.53	4.13	A	0.136	2.823	11	1	1	51.796	2.13	106.42	C
160.00-140.00			B	0.136	2.823		1	1	51.796			
			C	0.136	2.823		1	1	51.796			
T4	0.70	4.36	A	0.131	2.842	11	1	1	54.858	2.40	119.94	C
140.00-120.00			B	0.131	2.842		1	1	54.858			
			C	0.131	2.842		1	1	54.858			
T5	0.74	5.82	A	0.138	2.815	10	1	1	60.292	2.52	125.76	C
120.00-100.00			B	0.138	2.815		1	1	60.292			
			C	0.138	2.815		1	1	60.292			
T6	0.26	1.91	A	0.13	2.848	10	1	1	19.717	0.83	124.71	C
100.00-93.33			B	0.13	2.848		1	1	19.717			
			C	0.13	2.848		1	1	19.717			
T7	0.53	4.42	A	0.142	2.8	10	1	1	46.096	1.78	133.29	C
93.33-80.00			B	0.142	2.8		1	1	46.096			
			C	0.142	2.8		1	1	46.096			
T8	0.27	2.29	A	0.126	2.863	10	1	1	20.663	0.83	124.00	C
80.00-73.33			B	0.126	2.863		1	1	20.663			
			C	0.126	2.863		1	1	20.663			
T9	0.53	5.01	A	0.138	2.818	9	1	1	48.045	1.74	130.51	C
73.33-60.00			B	0.138	2.818		1	1	48.045			
			C	0.138	2.818		1	1	48.045			
T10	0.27	2.31	A	0.132	2.839	9	1	1	22.283	0.81	120.87	C
60.00-53.33			B	0.132	2.839		1	1	22.283			
			C	0.132	2.839		1	1	22.283			
T11	0.53	5.42	A	0.149	2.776	9	1	1	53.956	1.71	128.27	C
53.33-40.00			B	0.149	2.776		1	1	53.956			
			C	0.149	2.776		1	1	53.956			
T12	0.27	2.68	A	0.128	2.853	8	1	1	23.338	0.75	112.45	C
40.00-33.33			B	0.128	2.853		1	1	23.338			
			C	0.128	2.853		1	1	23.338			
T13	0.53	6.80	A	0.145	2.791	8	1	1	56.276	1.59	119.04	C
33.33-20.00			B	0.145	2.791		1	1	56.276			
			C	0.145	2.791		1	1	56.276			
T14	0.27	3.51	A	0.133	2.834	8	1	1	24.810	0.75	112.23	C
20.00-13.33			B	0.133	2.834		1	1	24.810			
			C	0.133	2.834		1	1	24.810			
T15	0.29	7.62	A	0.155	2.753	8	1	1	62.422	1.46	109.83	C
13.33-0.00			B	0.155	2.753		1	1	62.422			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		1	1 OTM	62.422 1891.39 kip-ft	21.31		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	11	0.825	1	18.458	0.48	96.74	C
185.00-180.00			B	0.249	2.442		0.825	1	18.458			
			C	0.249	2.442		0.825	1	18.458			
T2	0.24	2.91	A	0.124	2.868	11	0.825	1	36.398	1.34	66.81	C
180.00-160.00			B	0.124	2.868		0.825	1	36.398			
			C	0.124	2.868		0.825	1	36.398			
T3	0.53	4.13	A	0.136	2.823	11	0.825	1	44.924	1.95	97.50	C
160.00-140.00			B	0.136	2.823		0.825	1	44.924			
			C	0.136	2.823		0.825	1	44.924			
T4	0.70	4.36	A	0.131	2.842	11	0.825	1	47.448	2.21	110.49	C
140.00-120.00			B	0.131	2.842		0.825	1	47.448			
			C	0.131	2.842		0.825	1	47.448			
T5	0.74	5.82	A	0.138	2.815	10	0.825	1	52.391	2.32	116.08	C
120.00-100.00			B	0.138	2.815		0.825	1	52.391			
			C	0.138	2.815		0.825	1	52.391			
T6	0.26	1.91	A	0.13	2.848	10	0.825	1	17.152	0.77	115.41	C
100.00-93.33			B	0.13	2.848		0.825	1	17.152			
			C	0.13	2.848		0.825	1	17.152			
T7	0.53	4.42	A	0.142	2.8	10	0.825	1	39.813	1.63	122.33	C
93.33-80.00			B	0.142	2.8		0.825	1	39.813			
			C	0.142	2.8		0.825	1	39.813			
T8	0.27	2.29	A	0.126	2.863	10	0.825	1	17.938	0.76	114.53	C
80.00-73.33			B	0.126	2.863		0.825	1	17.938			
			C	0.126	2.863		0.825	1	17.938			
T9	0.53	5.01	A	0.138	2.818	9	0.825	1	41.436	1.59	119.53	C
73.33-60.00			B	0.138	2.818		0.825	1	41.436			
			C	0.138	2.818		0.825	1	41.436			
T10	0.27	2.31	A	0.132	2.839	9	0.825	1	19.415	0.74	111.62	C
60.00-53.33			B	0.132	2.839		0.825	1	19.415			
			C	0.132	2.839		0.825	1	19.415			
T11	0.53	5.42	A	0.149	2.776	9	0.825	1	46.615	1.56	117.19	C
53.33-40.00			B	0.149	2.776		0.825	1	46.615			
			C	0.149	2.776		0.825	1	46.615			
T12	0.27	2.68	A	0.128	2.853	8	0.825	1	20.308	0.69	103.59	C
40.00-33.33			B	0.128	2.853		0.825	1	20.308			
			C	0.128	2.853		0.825	1	20.308			
T13	0.53	6.80	A	0.145	2.791	8	0.825	1	48.571	1.45	108.52	C
33.33-20.00			B	0.145	2.791		0.825	1	48.571			
			C	0.145	2.791		0.825	1	48.571			
T14	0.27	3.51	A	0.133	2.834	8	0.825	1	21.632	0.69	103.32	C
20.00-13.33			B	0.133	2.834		0.825	1	21.632			
			C	0.133	2.834		0.825	1	21.632			
T15	0.29	7.62	A	0.155	2.753	8	0.825	1	53.855	1.31	98.02	C
13.33-0.00			B	0.155	2.753		0.825	1	53.855			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		0.825	1 OTM	53.855 1730.25 kip-ft	19.50		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	11	0.8	1	17.996	0.47	94.59	C
185.00-180.00			B	0.249	2.442		0.8	1	17.996			
			C	0.249	2.442		0.8	1	17.996			
T2	0.24	2.91	A	0.124	2.868	11	0.8	1	35.673	1.32	65.83	C
180.00-160.00			B	0.124	2.868		0.8	1	35.673			
			C	0.124	2.868		0.8	1	35.673			
T3	0.53	4.13	A	0.136	2.823	11	0.8	1	43.942	1.92	96.22	C
160.00-140.00			B	0.136	2.823		0.8	1	43.942			
			C	0.136	2.823		0.8	1	43.942			
T4	0.70	4.36	A	0.131	2.842	11	0.8	1	46.390	2.18	109.14	C
140.00-120.00			B	0.131	2.842		0.8	1	46.390			
			C	0.131	2.842		0.8	1	46.390			
T5	0.74	5.82	A	0.138	2.815	10	0.8	1	51.262	2.29	114.70	C
120.00-100.00			B	0.138	2.815		0.8	1	51.262			
			C	0.138	2.815		0.8	1	51.262			
T6	0.26	1.91	A	0.13	2.848	10	0.8	1	16.785	0.76	114.08	C
100.00-93.33			B	0.13	2.848		0.8	1	16.785			
			C	0.13	2.848		0.8	1	16.785			
T7	0.53	4.42	A	0.142	2.8	10	0.8	1	38.915	1.61	120.76	C
93.33-80.00			B	0.142	2.8		0.8	1	38.915			
			C	0.142	2.8		0.8	1	38.915			
T8	0.27	2.29	A	0.126	2.863	10	0.8	1	17.549	0.75	113.17	C
80.00-73.33			B	0.126	2.863		0.8	1	17.549			
			C	0.126	2.863		0.8	1	17.549			
T9	0.53	5.01	A	0.138	2.818	9	0.8	1	40.491	1.57	117.96	C
73.33-60.00			B	0.138	2.818		0.8	1	40.491			
			C	0.138	2.818		0.8	1	40.491			
T10	0.27	2.31	A	0.132	2.839	9	0.8	1	19.005	0.74	110.30	C
60.00-53.33			B	0.132	2.839		0.8	1	19.005			
			C	0.132	2.839		0.8	1	19.005			
T11	0.53	5.42	A	0.149	2.776	9	0.8	1	45.566	1.54	115.60	C
53.33-40.00			B	0.149	2.776		0.8	1	45.566			
			C	0.149	2.776		0.8	1	45.566			
T12	0.27	2.68	A	0.128	2.853	8	0.8	1	19.875	0.68	102.33	C
40.00-33.33			B	0.128	2.853		0.8	1	19.875			
			C	0.128	2.853		0.8	1	19.875			
T13	0.53	6.80	A	0.145	2.791	8	0.8	1	47.470	1.43	107.02	C
33.33-20.00			B	0.145	2.791		0.8	1	47.470			
			C	0.145	2.791		0.8	1	47.470			
T14	0.27	3.51	A	0.133	2.834	8	0.8	1	21.178	0.68	102.04	C
20.00-13.33			B	0.133	2.834		0.8	1	21.178			
			C	0.133	2.834		0.8	1	21.178			
T15	0.29	7.62	A	0.155	2.753	8	0.8	1	52.631	1.28	96.33	C
13.33-0.00			B	0.155	2.753		0.8	1	52.631			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		0.8	1 OTM	52.631 1707.23 kip-ft	19.24		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F K	w plf	Ctrl. Face
T1	0.04	1.53	A	0.249	2.442	11	0.85	1	18.920	0.49	98.88	C
185.00-180.00			B	0.249	2.442		0.85	1	18.920			
			C	0.249	2.442		0.85	1	18.920			
T2	0.24	2.91	A	0.124	2.868	11	0.85	1	37.122	1.36	67.79	C
180.00-160.00			B	0.124	2.868		0.85	1	37.122			
			C	0.124	2.868		0.85	1	37.122			
T3	0.53	4.13	A	0.136	2.823	11	0.85	1	45.906	1.98	98.77	C
160.00-140.00			B	0.136	2.823		0.85	1	45.906			
			C	0.136	2.823		0.85	1	45.906			
T4	0.70	4.36	A	0.131	2.842	11	0.85	1	48.507	2.24	111.84	C
140.00-120.00			B	0.131	2.842		0.85	1	48.507			
			C	0.131	2.842		0.85	1	48.507			
T5	0.74	5.82	A	0.138	2.815	10	0.85	1	53.520	2.35	117.46	C
120.00-100.00			B	0.138	2.815		0.85	1	53.520			
			C	0.138	2.815		0.85	1	53.520			
T6	0.26	1.91	A	0.13	2.848	10	0.85	1	17.518	0.78	116.74	C
100.00-93.33			B	0.13	2.848		0.85	1	17.518			
			C	0.13	2.848		0.85	1	17.518			
T7	0.53	4.42	A	0.142	2.8	10	0.85	1	40.711	1.65	123.89	C
93.33-80.00			B	0.142	2.8		0.85	1	40.711			
			C	0.142	2.8		0.85	1	40.711			
T8	0.27	2.29	A	0.126	2.863	10	0.85	1	18.328	0.77	115.88	C
80.00-73.33			B	0.126	2.863		0.85	1	18.328			
			C	0.126	2.863		0.85	1	18.328			
T9	0.53	5.01	A	0.138	2.818	9	0.85	1	42.380	1.61	121.10	C
73.33-60.00			B	0.138	2.818		0.85	1	42.380			
			C	0.138	2.818		0.85	1	42.380			
T10	0.27	2.31	A	0.132	2.839	9	0.85	1	19.824	0.75	112.94	C
60.00-53.33			B	0.132	2.839		0.85	1	19.824			
			C	0.132	2.839		0.85	1	19.824			
T11	0.53	5.42	A	0.149	2.776	9	0.85	1	47.664	1.58	118.77	C
53.33-40.00			B	0.149	2.776		0.85	1	47.664			
			C	0.149	2.776		0.85	1	47.664			
T12	0.27	2.68	A	0.128	2.853	8	0.85	1	20.740	0.70	104.86	C
40.00-33.33			B	0.128	2.853		0.85	1	20.740			
			C	0.128	2.853		0.85	1	20.740			
T13	0.53	6.80	A	0.145	2.791	8	0.85	1	49.672	1.47	110.02	C
33.33-20.00			B	0.145	2.791		0.85	1	49.672			
			C	0.145	2.791		0.85	1	49.672			
T14	0.27	3.51	A	0.133	2.834	8	0.85	1	22.086	0.70	104.59	C
20.00-13.33			B	0.133	2.834		0.85	1	22.086			
			C	0.133	2.834		0.85	1	22.086			
T15	0.29	7.62	A	0.155	2.753	8	0.85	1	55.079	1.33	99.70	C
13.33-0.00			B	0.155	2.753		0.85	1	55.079			

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F K	w plf	Ctrl. Face
Sum Weight:	5.98	60.73	C	0.155	2.753		0.85	1 OTM	55.079 1753.27 kip-ft	19.76		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	19.42					
Bracing Weight	41.31					
Total Member Self-Weight	60.73			-14.57	24.08	
Total Weight	81.42			-14.57	24.08	
Wind 0 deg - No Ice		-8.51	-139.03	-15011.18	1184.11	-155.12
Wind 30 deg - No Ice		64.62	-107.12	-11422.70	-7003.56	-148.50
Wind 45 deg - No Ice		91.46	-85.51	-9097.23	-9934.62	-132.69
Wind 60 deg - No Ice		108.86	-61.63	-6659.12	-11747.49	-104.00
Wind 90 deg - No Ice		128.37	-2.04	-358.76	-13792.85	-38.11
Wind 120 deg - No Ice		120.48	69.22	7435.68	-12948.42	16.33
Wind 135 deg - No Ice		94.33	94.55	10186.16	-10110.84	47.70
Wind 150 deg - No Ice		62.57	112.44	12175.86	-6608.98	67.00
Wind 180 deg - No Ice		1.26	125.41	13565.42	-139.24	123.70
Wind 210 deg - No Ice		-60.24	109.56	11790.17	6354.11	152.90
Wind 225 deg - No Ice		-93.50	85.65	9145.38	10227.77	132.65
Wind 240 deg - No Ice		-124.33	61.61	6407.31	13535.45	138.80
Wind 270 deg - No Ice		-131.33	-7.86	-1138.83	14248.41	84.50
Wind 300 deg - No Ice		-113.63	-65.84	-7220.54	12441.41	-19.70
Wind 315 deg - No Ice		-96.76	-89.61	-9646.13	10695.87	-74.61
Wind 330 deg - No Ice		-72.47	-110.24	-11840.76	8113.49	-117.79
Member Ice	96.94					
Total Weight Ice	289.98			-172.88	240.36	
Wind 0 deg - Ice		-1.39	-39.88	-4375.36	429.55	-51.89
Wind 30 deg - Ice		19.22	-32.58	-3574.69	-1789.17	-63.27
Wind 45 deg - Ice		27.23	-26.30	-2914.35	-2637.09	-63.08
Wind 60 deg - Ice		32.89	-18.79	-2147.27	-3219.80	-57.98
Wind 90 deg - Ice		38.34	-0.30	-224.18	-3786.33	-38.18
Wind 120 deg - Ice		34.53	19.93	1924.70	-3392.84	-11.62
Wind 135 deg - Ice		27.63	27.70	2744.62	-2661.23	4.13
Wind 150 deg - Ice		18.94	33.47	3358.97	-1732.21	18.16
Wind 180 deg - Ice		0.23	37.99	3830.19	210.26	46.88
Wind 210 deg - Ice		-18.51	32.98	3293.38	2157.58	63.93
Wind 225 deg - Ice		-27.55	26.34	2582.18	3156.61	63.03
Wind 240 deg - Ice		-35.11	18.66	1753.58	3955.54	63.51
Wind 270 deg - Ice		-38.82	-1.29	-356.75	4332.08	45.58
Wind 300 deg - Ice		-33.68	-19.52	-2243.85	3807.63	11.10
Wind 315 deg - Ice		-28.12	-27.00	-3007.66	3237.33	-8.38
Wind 330 deg - Ice		-20.53	-33.11	-3645.44	2446.34	-26.22
Total Weight	81.42			-14.57	24.08	
Wind 0 deg - Service		-1.81	-30.35	-3271.83	241.92	-32.87
Wind 30 deg - Service		14.13	-23.45	-2497.21	-1540.32	-31.45
Wind 45 deg - Service		20.00	-18.73	-1989.73	-2180.47	-28.10
Wind 60 deg - Service		23.82	-13.49	-1454.58	-2578.76	-22.02
Wind 90 deg - Service		28.08	-0.43	-74.37	-3024.67	-8.06

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 120 deg - Service		26.30	15.11	1624.10	-2834.58	3.44
Wind 135 deg - Service		20.61	20.66	2225.78	-2218.01	10.08
Wind 150 deg - Service		13.70	24.59	2661.74	-1456.26	14.15
Wind 180 deg - Service		0.27	27.45	2967.95	-39.98	26.18
Wind 210 deg - Service		-13.20	23.97	2579.58	1381.34	32.39
Wind 225 deg - Service		-20.44	18.76	2004.08	2222.28	28.09
Wind 240 deg - Service		-27.12	13.49	1405.03	2938.99	29.43
Wind 270 deg - Service		-28.71	-1.67	-240.54	3101.08	17.94
Wind 300 deg - Service		-24.84	-14.39	-1574.17	2705.94	-4.16
Wind 315 deg - Service		-21.13	-19.61	-2106.65	2322.00	-15.81
Wind 330 deg - Service		-15.80	-24.12	-2586.26	1756.12	-24.97

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 45 deg - No Ice
7	0.9 Dead+1.0 Wind 45 deg - No Ice
8	1.2 Dead+1.0 Wind 60 deg - No Ice
9	0.9 Dead+1.0 Wind 60 deg - No Ice
10	1.2 Dead+1.0 Wind 90 deg - No Ice
11	0.9 Dead+1.0 Wind 90 deg - No Ice
12	1.2 Dead+1.0 Wind 120 deg - No Ice
13	0.9 Dead+1.0 Wind 120 deg - No Ice
14	1.2 Dead+1.0 Wind 135 deg - No Ice
15	0.9 Dead+1.0 Wind 135 deg - No Ice
16	1.2 Dead+1.0 Wind 150 deg - No Ice
17	0.9 Dead+1.0 Wind 150 deg - No Ice
18	1.2 Dead+1.0 Wind 180 deg - No Ice
19	0.9 Dead+1.0 Wind 180 deg - No Ice
20	1.2 Dead+1.0 Wind 210 deg - No Ice
21	0.9 Dead+1.0 Wind 210 deg - No Ice
22	1.2 Dead+1.0 Wind 225 deg - No Ice
23	0.9 Dead+1.0 Wind 225 deg - No Ice
24	1.2 Dead+1.0 Wind 240 deg - No Ice
25	0.9 Dead+1.0 Wind 240 deg - No Ice
26	1.2 Dead+1.0 Wind 270 deg - No Ice
27	0.9 Dead+1.0 Wind 270 deg - No Ice
28	1.2 Dead+1.0 Wind 300 deg - No Ice
29	0.9 Dead+1.0 Wind 300 deg - No Ice
30	1.2 Dead+1.0 Wind 315 deg - No Ice
31	0.9 Dead+1.0 Wind 315 deg - No Ice
32	1.2 Dead+1.0 Wind 330 deg - No Ice
33	0.9 Dead+1.0 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp

Comb. No.	Description
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	185 - 180	Leg	Max Tension	29	0.51	0.00	0.00
			Max. Compression	46	-5.19	0.18	0.05
			Max. Mx	16	-0.18	2.33	0.72
			Max. My	12	-1.11	-0.98	2.84
			Max. Vy	28	1.49	-1.86	0.01
			Max. Vx	2	-1.53	-0.69	1.54
		Diagonal	Max Tension	18	2.18	0.00	0.00
			Max. Compression	12	-2.15	0.00	0.00
			Max. Mx	43	-0.72	0.29	-0.03
			Max. My	35	0.67	0.28	0.04
			Max. Vy	44	0.15	0.29	-0.03
			Max. Vx	35	0.01	0.00	0.00
		Top Girt	Max Tension	3	0.18	0.00	0.00
			Max. Compression	48	-0.88	0.00	0.00
			Max. Mx	34	-0.76	-1.60	0.00
			Max. My	46	-0.81	0.00	0.05
			Max. Vy	34	0.35	0.00	0.00
			Max. Vx	46	-0.01	0.00	0.00
T2	180 - 160	Leg	Max Tension	29	13.56	-0.26	-0.17
			Max. Compression	2	-19.80	0.35	0.08
			Max. Mx	26	3.11	1.92	0.30
			Max. My	8	-5.03	0.75	2.01
			Max. Vy	8	1.90	-1.45	-0.06
			Max. Vx	12	-2.07	-0.13	1.78
		Diagonal	Max Tension	16	7.44	0.00	0.00
			Max. Compression	2	-8.08	0.00	0.00
			Max. Mx	37	1.37	0.44	-0.05

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	46	0.24	0.40	-0.06
			Max. Vy	50	0.19	0.44	0.06
			Max. Vx	46	-0.01	0.00	0.00
T3	160 - 140	Leg	Max Tension	29	42.90	-0.16	0.02
			Max. Compression	2	-56.92	0.85	0.31
			Max. Mx	8	35.99	-0.94	-0.05
			Max. My	24	13.74	-0.30	-0.94
			Max. Vy	18	-2.59	-0.42	-0.08
			Max. Vx	10	2.52	-0.10	0.26
		Diagonal	Max Tension	4	13.62	0.00	0.00
			Max. Compression	14	-13.73	0.00	0.00
			Max. Mx	49	3.06	0.64	0.08
			Max. My	46	0.53	0.61	-0.09
			Max. Vy	49	0.26	0.64	0.08
			Max. Vx	46	-0.01	0.00	0.00
T4	140 - 120	Leg	Max Tension	29	84.65	-2.12	0.33
			Max. Compression	2	-107.45	1.14	-0.83
			Max. Mx	29	84.65	-2.12	0.33
			Max. My	32	-19.80	0.38	2.71
			Max. Vy	8	-2.26	-0.94	-0.05
			Max. Vx	32	2.25	0.10	0.89
		Diagonal	Max Tension	26	18.93	0.00	0.00
			Max. Compression	10	-18.70	0.00	0.00
			Max. Mx	49	3.43	0.75	-0.09
			Max. My	46	0.37	0.71	-0.10
			Max. Vy	48	0.28	0.74	0.09
			Max. Vx	46	-0.01	0.00	0.00
T5	120 - 100	Leg	Max Tension	29	135.49	-0.99	0.02
			Max. Compression	2	-164.80	-0.48	0.14
			Max. Mx	2	-164.09	1.80	0.29
			Max. My	32	-27.11	-0.48	3.90
			Max. Vy	12	0.62	1.79	0.04
			Max. Vx	32	-0.84	-0.48	3.90
		Diagonal	Max Tension	20	21.78	0.00	0.00
			Max. Compression	20	-21.44	0.00	0.00
			Max. Mx	35	3.06	0.91	0.11
			Max. My	37	-4.74	0.82	0.13
			Max. Vy	50	0.32	0.90	-0.11
			Max. Vx	47	-0.02	0.00	0.00
T6	100 - 93.33	Leg	Max Tension	29	164.84	-0.38	-0.03
			Max. Compression	2	-197.09	1.43	-0.04
			Max. Mx	35	-101.74	-1.55	-0.02
			Max. My	32	-30.39	-0.48	3.90
			Max. Vy	2	-0.46	1.43	-0.04
			Max. Vx	16	-0.72	-0.48	-3.88
		Diagonal	Max Tension	26	24.60	0.00	0.00
			Max. Compression	2	-25.36	0.00	0.00
			Max. Mx	50	6.77	-1.15	0.00
			Max. My	46	2.12	0.00	0.04
			Max. Vy	50	-0.31	0.00	0.00
			Max. Vx	46	-0.01	0.00	0.00
T7	93.33 - 80	Leg	Max Tension	29	163.01	-1.20	-0.01
			Max. Compression	2	-196.84	-5.41	-0.11
			Max. Mx	2	-196.84	-5.41	-0.11
			Max. My	26	-32.20	-1.20	-3.10
			Max. Vy	2	1.80	5.07	0.02
			Max. Vx	24	0.95	1.13	-3.08
		Diagonal	Max Tension	21	30.51	0.40	0.01
			Max. Compression	2	-32.12	0.00	0.00
			Max. Mx	30	26.80	0.58	-0.02
			Max. My	44	-10.95	0.09	-0.13

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	48	0.19	0.33	-0.07
			Max. Vx	44	-0.02	0.00	0.00
		Horizontal	Max Tension	25	1.00	0.20	-0.01
			Max. Compression	6	-1.15	0.23	-0.01
			Max. Mx	48	0.02	0.73	-0.02
			Max. My	40	-0.23	0.72	-0.02
			Max. Vy	48	-0.26	0.73	-0.02
			Max. Vx	35	0.01	0.72	-0.02
		Redund Horz 1 Bracing	Max Tension	24	1.61	0.00	0.00
			Max. Compression	11	-1.40	0.00	0.00
			Max. Mx	46	0.23	-0.13	0.00
			Max. My	47	0.66	0.00	0.00
			Max. Vy	46	-0.08	0.00	0.00
			Max. Vx	47	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	10	1.24	0.00	0.00
			Max. Compression	25	-1.00	0.00	0.00
			Max. Mx	50	0.06	-0.17	0.00
			Max. My	46	0.42	0.00	0.01
			Max. Vy	50	0.07	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	48	-0.05	0.00	0.00
			Max. Mx	34	-0.04	-0.53	0.00
			Max. My	48	-0.05	0.00	0.00
			Max. Vy	34	0.15	0.00	0.00
			Max. Vx	48	-0.00	0.00	0.00
T8	80 - 73.33	Leg	Max Tension	29	220.42	3.79	-0.06
			Max. Compression	2	-260.63	3.38	0.16
			Max. Mx	2	-260.24	-5.41	-0.11
			Max. My	26	-39.70	-1.20	-3.10
			Max. Vy	2	-1.44	3.38	0.16
			Max. Vx	2	0.47	1.16	3.09
		Diagonal	Max Tension	20	26.81	0.00	0.00
			Max. Compression	21	-26.15	0.00	0.00
			Max. Mx	50	8.23	-1.29	0.00
			Max. My	46	2.34	0.00	0.04
			Max. Vy	50	0.32	0.00	0.00
			Max. Vx	46	-0.01	0.00	0.00
T9	73.33 - 60	Leg	Max Tension	29	218.85	-2.88	0.03
			Max. Compression	2	-260.64	-6.59	-0.16
			Max. Mx	2	-260.64	-6.59	-0.16
			Max. My	32	-40.20	-1.52	5.66
			Max. Vy	12	1.88	4.55	0.04
			Max. Vx	32	-1.46	-1.52	5.66
		Diagonal	Max Tension	21	32.84	0.00	0.00
			Max. Compression	20	-33.72	0.00	0.00
			Max. Mx	20	15.31	0.40	-0.03
			Max. My	44	-11.46	0.26	-0.11
			Max. Vy	49	0.21	0.39	-0.09
			Max. Vx	37	0.02	0.00	0.00
		Horizontal	Max Tension	3	1.40	0.21	-0.01
			Max. Compression	18	-1.48	0.26	-0.01
			Max. Mx	48	0.20	0.82	-0.02
			Max. My	40	-0.25	0.81	-0.02
			Max. Vy	48	-0.27	0.82	-0.02
			Max. Vx	35	0.01	0.81	-0.02
		Redund Horz 1 Bracing	Max Tension	28	1.90	0.00	0.00
			Max. Compression	3	-1.79	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. Mx	34	0.46	-0.15	0.00
			Max. My	46	0.70	0.00	0.00
			Max. Vy	34	0.08	0.00	0.00
			Max. Vx	46	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	1.41	0.00	0.00
			Max. Compression	29	-1.13	0.00	0.00
			Max. Mx	50	0.31	-0.19	0.00
			Max. My	46	0.68	0.00	0.01
			Max. Vy	50	-0.08	0.00	0.00
			Max. Vx	46	-0.00	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	48	-0.05	0.00	0.00
			Max. Mx	34	-0.04	-0.60	0.00
			Max. My	35	-0.04	0.00	-0.00
			Max. Vy	34	0.16	0.00	0.00
			Max. Vx	35	0.00	0.00	0.00
T10	60 - 53.33	Leg	Max Tension	29	274.75	4.34	0.03
			Max. Compression	2	-322.83	5.06	0.13
			Max. Mx	2	-322.46	-6.59	-0.16
			Max. My	32	-46.17	-1.52	5.66
			Max. Vy	2	-1.89	5.06	0.13
			Max. Vx	2	0.66	1.24	5.45
		Diagonal	Max Tension	20	28.87	0.00	0.00
			Max. Compression	21	-28.50	0.00	0.00
			Max. Mx	50	8.67	-1.44	0.00
			Max. My	46	2.60	0.00	0.05
			Max. Vy	50	0.34	0.00	0.00
			Max. Vx	46	-0.01	0.00	0.00
T11	53.33 - 40	Leg	Max Tension	29	272.58	-4.33	0.03
			Max. Compression	2	-322.20	-10.27	-0.09
			Max. Mx	2	-322.20	-10.27	-0.09
			Max. My	32	-47.44	-2.06	5.27
			Max. Vy	2	2.98	8.71	-0.29
			Max. Vx	32	-1.53	-2.06	5.27
		Diagonal	Max Tension	21	35.33	0.33	0.02
			Max. Compression	20	-36.79	0.00	0.00
			Max. Mx	30	29.29	0.50	-0.03
			Max. My	35	-11.78	0.24	0.12
			Max. Vy	49	0.22	0.45	-0.09
			Max. Vx	44	-0.02	0.00	0.00
		Horizontal	Max Tension	3	1.80	0.33	-0.01
			Max. Compression	18	-1.93	0.37	-0.01
			Max. Mx	48	0.42	1.10	-0.03
			Max. My	48	0.39	1.10	-0.03
			Max. Vy	48	-0.34	1.10	-0.03
			Max. Vx	35	0.01	1.06	-0.03
		Redund Horz 1 Bracing	Max Tension	28	2.66	0.00	0.00
			Max. Compression	3	-2.48	0.00	0.00
			Max. Mx	46	0.46	-0.18	0.00
			Max. My	47	1.31	0.00	0.01
			Max. Vy	46	-0.09	0.00	0.00
			Max. Vx	47	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	1.84	0.00	0.00
			Max. Compression	29	-1.55	0.00	0.00
			Max. Mx	50	-0.18	-0.22	0.00
			Max. My	46	0.38	0.00	0.01
			Max. Vy	50	0.09	0.00	0.00
			Max. Vx	46	-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
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	36	-0.05	0.00	0.00
			Max. Mx	34	-0.05	-0.75	0.00
			Max. My	35	-0.05	0.00	-0.00
			Max. Vy	34	-0.19	0.00	0.00
			Max. Vx	35	0.00	0.00	0.00
T12	40 - 33.33	Leg	Max Tension	29	330.48	7.31	0.04
			Max. Compression	2	-387.74	7.82	0.32
			Max. Mx	2	-387.26	-10.27	-0.09
			Max. My	32	-53.66	-2.06	5.27
			Max. Vy	2	-2.83	7.82	0.32
			Max. Vx	2	0.45	2.36	5.18
		Diagonal	Max Tension	20	30.61	0.00	0.00
			Max. Compression	21	-29.97	0.00	0.00
			Max. Mx	50	8.69	-1.57	0.00
			Max. My	46	2.01	0.00	0.05
			Max. Vy	50	0.35	0.00	0.00
			Max. Vx	46	-0.01	0.00	0.00
T13	33.33 - 20	Leg	Max Tension	29	328.12	-6.67	0.05
			Max. Compression	2	-387.29	-13.98	-0.38
			Max. Mx	2	-387.29	-13.98	-0.38
			Max. My	32	-55.32	-3.06	9.50
			Max. Vy	2	3.64	9.50	-0.35
			Max. Vx	32	-2.12	-3.06	9.50
		Diagonal	Max Tension	21	37.27	0.00	0.00
			Max. Compression	20	-38.72	0.00	0.00
			Max. Mx	28	31.49	0.59	0.04
			Max. My	46	-13.52	0.32	-0.14
			Max. Vy	49	0.26	0.53	-0.11
			Max. Vx	46	-0.02	0.00	0.00
		Horizontal	Max Tension	3	2.54	0.35	-0.01
			Max. Compression	30	-2.62	0.42	-0.01
			Max. Mx	48	0.62	1.25	-0.04
			Max. My	48	0.59	1.25	-0.04
			Max. Vy	48	-0.35	1.25	-0.04
			Max. Vx	46	0.01	1.24	-0.04
		Redund Horz 1 Bracing	Max Tension	28	3.48	0.00	0.00
			Max. Compression	3	-3.19	0.00	0.00
			Max. Mx	44	-0.78	-0.19	0.00
			Max. My	38	-0.39	0.00	0.01
			Max. Vy	44	0.09	0.00	0.00
			Max. Vx	38	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	2.32	0.00	0.00
			Max. Compression	29	-1.95	0.00	0.00
			Max. Mx	50	0.69	-0.23	0.00
			Max. My	46	1.34	0.00	0.01
			Max. Vy	50	0.09	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	46	-0.05	0.00	0.00
			Max. Mx	34	-0.05	-0.81	0.00
			Max. My	35	-0.05	0.00	-0.00
			Max. Vy	34	0.19	0.00	0.00
			Max. Vx	35	0.00	0.00	0.00
T14	20 - 13.33	Leg	Max Tension	29	384.78	9.44	0.03
			Max. Compression	2	-452.65	9.82	0.21
			Max. Mx	2	-452.08	-13.98	-0.38
			Max. My	32	-61.28	-3.06	9.50
			Max. Vy	2	-3.70	9.82	0.21

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	32	0.90	-3.06	9.50
		Diagonal	Max Tension	20	32.30	0.00	0.00
			Max. Compression	21	-31.80	0.00	0.00
			Max. Mx	35	8.87	-1.91	0.00
			Max. My	45	1.47	0.00	0.06
			Max. Vy	35	0.41	0.00	0.00
			Max. Vx	45	-0.01	0.00	0.00
T15	13.33 - 0	Leg	Max Tension	29	382.92	-8.12	0.05
			Max. Compression	2	-453.50	-0.00	0.00
			Max. Mx	2	-452.95	10.58	-0.59
			Max. My	32	-62.87	2.07	-5.13
			Max. Vy	2	1.73	10.58	-0.59
			Max. Vx	32	1.63	1.18	4.63
		Diagonal	Max Tension	21	38.85	0.00	0.00
			Max. Compression	20	-40.34	0.00	0.00
			Max. Mx	20	17.54	0.56	-0.05
			Max. My	44	-13.52	0.39	-0.15
			Max. Vy	49	0.25	0.54	-0.11
			Max. Vx	44	-0.02	0.00	0.00
		Horizontal	Max Tension	3	2.47	0.41	-0.01
			Max. Compression	28	-2.60	0.47	-0.01
			Max. Mx	48	-0.33	1.14	-0.03
			Max. My	39	-1.27	1.11	-0.03
			Max. Vy	48	-0.33	1.14	-0.03
			Max. Vx	39	0.01	1.11	-0.03
		Redund Horz 1 Bracing	Max Tension	30	2.16	0.00	0.00
			Max. Compression	3	-2.19	0.00	0.00
			Max. Mx	44	0.36	-0.23	0.00
			Max. My	36	0.38	0.00	0.01
			Max. Vy	44	0.10	0.00	0.00
			Max. Vx	36	-0.00	0.00	0.00
		Redund Diag 1 Bracing	Max Tension	2	1.74	0.00	0.00
			Max. Compression	31	-1.10	0.00	0.00
			Max. Mx	35	0.33	-0.27	0.00
			Max. My	46	0.83	0.00	0.01
			Max. Vy	35	0.10	0.00	0.00
			Max. Vx	46	0.00	0.00	0.00
		Inner Bracing	Max Tension	1	0.00	0.00	0.00
			Max. Compression	47	-0.05	0.00	0.00
			Max. Mx	34	-0.05	-0.81	0.00
			Max. My	48	-0.05	0.00	0.00
			Max. Vy	34	0.18	0.00	0.00
			Max. Vx	48	-0.00	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	494.53	68.18	-40.90
	Max. H_x	24	494.53	68.18	-40.90
	Max. H_z	7	-382.44	-53.60	37.25
	Min. Vert	9	-393.31	-57.07	34.70
	Min. H_x	9	-393.31	-57.07	34.70
	Min. H_z	24	494.53	68.18	-40.90

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg B	Max. Vert	12	494.52	-69.19	-39.62
	Max. H_x	29	-420.68	61.09	34.93
	Max. H_z	31	-411.43	58.48	36.41
	Min. Vert	29	-420.68	61.09	34.93
	Min. H_x	12	494.52	-69.19	-39.62
	Min. H_z	14	461.01	-62.70	-39.90
Leg A	Max. Vert	2	497.24	-1.61	79.82
	Max. H_x	25	-173.46	16.41	-31.50
	Max. H_z	2	497.24	-1.61	79.82
	Min. Vert	19	-395.23	1.81	-66.97
	Min. H_x	10	43.91	-15.33	4.41
	Min. H_z	19	-395.23	1.81	-66.97

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	81.49	0.00	0.00	-14.58	23.02	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	97.78	-8.51	-139.03	-14888.73	1189.86	-155.18
0.9 Dead+1.0 Wind 0 deg - No Ice	73.34	-8.51	-139.03	-14878.40	1182.45	-155.16
1.2 Dead+1.0 Wind 30 deg - No Ice	97.78	64.62	-107.12	-11323.59	-6941.63	-148.62
0.9 Dead+1.0 Wind 30 deg - No Ice	73.34	64.62	-107.12	-11314.70	-6945.76	-148.59
1.2 Dead+1.0 Wind 45 deg - No Ice	97.78	91.46	-85.51	-9017.71	-9849.89	-132.77
0.9 Dead+1.0 Wind 45 deg - No Ice	73.34	91.46	-85.51	-9009.75	-9852.85	-132.76
1.2 Dead+1.0 Wind 60 deg - No Ice	97.78	108.86	-61.63	-6605.06	-11645.34	-104.08
0.9 Dead+1.0 Wind 60 deg - No Ice	73.34	108.86	-61.63	-6598.04	-11647.60	-104.06
1.2 Dead+1.0 Wind 90 deg - No Ice	97.78	128.37	-2.04	-362.41	-13672.35	-38.16
0.9 Dead+1.0 Wind 90 deg - No Ice	73.34	128.37	-2.04	-357.85	-13673.81	-38.15
1.2 Dead+1.0 Wind 120 deg - No Ice	97.78	120.48	69.22	7369.98	-12836.17	16.29
0.9 Dead+1.0 Wind 120 deg - No Ice	73.34	120.48	69.22	7371.42	-12837.97	16.29
1.2 Dead+1.0 Wind 135 deg - No Ice	97.78	94.33	94.55	10097.64	-10021.43	47.70
0.9 Dead+1.0 Wind 135 deg - No Ice	73.34	94.33	94.55	10097.98	-10024.35	47.69
1.2 Dead+1.0 Wind 150 deg - No Ice	97.78	62.57	112.44	12072.14	-6546.35	67.04
0.9 Dead+1.0 Wind 150 deg - No Ice	73.34	62.57	112.44	12071.70	-6550.70	67.00
1.2 Dead+1.0 Wind 180 deg - No Ice	97.78	1.26	125.41	13448.73	-135.77	123.78
0.9 Dead+1.0 Wind 180 deg - No Ice	73.34	1.26	125.41	13447.73	-142.63	123.76
1.2 Dead+1.0 Wind 210 deg - No Ice	97.78	-60.24	109.56	11685.72	6298.39	153.01

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
0.9 Dead+1.0 Wind 210 deg - No Ice	73.34	-60.24	109.56	11685.42	6288.99	152.99
1.2 Dead+1.0 Wind 225 deg - No Ice	97.78	-93.50	85.65	9059.92	10150.78	132.74
0.9 Dead+1.0 Wind 225 deg - No Ice	73.34	-93.50	85.65	9060.68	10139.80	132.71
1.2 Dead+1.0 Wind 240 deg - No Ice	97.78	-124.33	61.61	6339.70	13431.39	138.89
0.9 Dead+1.0 Wind 240 deg - No Ice	73.34	-124.33	61.61	6341.56	13419.11	138.87
1.2 Dead+1.0 Wind 270 deg - No Ice	97.78	-131.33	-7.86	-1143.86	14135.74	84.54
0.9 Dead+1.0 Wind 270 deg - No Ice	73.34	-131.33	-7.86	-1138.96	14123.21	84.50
1.2 Dead+1.0 Wind 300 deg - No Ice	97.78	-113.63	-65.84	-7167.28	12347.57	-19.69
0.9 Dead+1.0 Wind 300 deg - No Ice	73.34	-113.63	-65.84	-7160.02	12335.71	-19.69
1.2 Dead+1.0 Wind 315 deg - No Ice	97.78	-96.76	-89.61	-9567.31	10619.66	-74.62
0.9 Dead+1.0 Wind 315 deg - No Ice	73.34	-96.76	-89.61	-9559.12	10608.48	-74.61
1.2 Dead+1.0 Wind 330 deg - No Ice	97.78	-72.47	-110.24	-11742.10	8060.81	-117.79
0.9 Dead+1.0 Wind 330 deg - No Ice	73.34	-72.47	-110.24	-11733.04	8050.64	-117.78
1.2 Dead+1.0 Ice+1.0 Temp	306.28	-0.00	0.00	-176.74	246.05	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	306.28	-1.39	-39.88	-4350.13	436.31	-52.05
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	306.28	19.22	-32.58	-3553.40	-1769.23	-63.49
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	306.28	27.23	-26.30	-2897.68	-2611.50	-63.29
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	306.28	32.89	-18.79	-2136.98	-3189.60	-58.17
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	306.28	38.34	-0.30	-228.39	-3751.85	-38.31
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	306.28	34.53	19.93	1906.14	-3361.69	-11.66
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	306.28	27.63	27.70	2720.35	-2634.97	4.15
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	306.28	18.94	33.47	3330.57	-1711.86	18.25
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	306.28	0.23	37.99	3798.13	215.89	47.04
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	306.28	-18.51	32.98	3264.64	2148.53	64.16
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	306.28	-27.55	26.34	2557.78	3142.74	63.25
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	306.28	-35.11	18.66	1734.17	3936.46	63.71
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	306.28	-38.82	-1.29	-361.69	4309.59	45.70
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	306.28	-33.68	-19.52	-2234.04	3789.51	11.13
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	306.28	-28.12	-27.00	-2991.43	3223.88	-8.38
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	306.28	-20.53	-33.11	-3624.49	2438.86	-26.29
Dead+Wind 0 deg - Service	81.49	-1.81	-30.35	-3257.26	270.53	-32.87
Dead+Wind 30 deg - Service	81.49	14.13	-23.45	-2487.85	-1498.92	-31.48

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
Dead+Wind 45 deg - Service	81.49	20.00	-18.73	-1984.80	-2134.00	-28.12
Dead+Wind 60 deg - Service	81.49	23.82	-13.49	-1455.27	-2528.37	-22.04
Dead+Wind 90 deg - Service	81.49	28.08	-0.43	-87.98	-2970.18	-8.07
Dead+Wind 120 deg - Service	81.49	26.30	15.11	1596.49	-2781.99	3.44
Dead+Wind 135 deg - Service	81.49	20.61	20.66	2192.99	-2170.54	10.08
Dead+Wind 150 deg - Service	81.49	13.70	24.59	2625.52	-1414.85	14.15
Dead+Wind 180 deg - Service	81.49	0.27	27.45	2928.83	-11.81	26.18
Dead+Wind 210 deg - Service	81.49	-13.20	23.97	2543.19	1396.31	32.42
Dead+Wind 225 deg - Service	81.49	-20.44	18.76	1972.02	2232.38	28.12
Dead+Wind 240 deg - Service	81.49	-27.12	13.49	1377.10	2943.05	29.45
Dead+Wind 270 deg - Service	81.49	-28.71	-1.67	-254.38	3103.18	17.94
Dead+Wind 300 deg - Service	81.49	-24.84	-14.39	-1575.05	2712.25	-4.16
Dead+Wind 315 deg - Service	81.49	-21.13	-19.61	-2101.86	2332.18	-15.81
Dead+Wind 330 deg - Service	81.49	-15.80	-24.12	-2577.04	1771.55	-24.96

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-81.49	0.00	0.00	81.49	0.00	0.000%
2	-8.51	-97.78	-139.03	8.51	97.78	139.03	0.000%
3	-8.51	-73.34	-139.03	8.51	73.34	139.03	0.000%
4	64.62	-97.78	-107.12	-64.62	97.78	107.12	0.000%
5	64.62	-73.34	-107.12	-64.62	73.34	107.12	0.000%
6	91.46	-97.78	-85.51	-91.46	97.78	85.51	0.000%
7	91.46	-73.34	-85.51	-91.46	73.34	85.51	0.000%
8	108.86	-97.78	-61.63	-108.86	97.78	61.63	0.000%
9	108.86	-73.34	-61.63	-108.86	73.34	61.63	0.000%
10	128.37	-97.78	-2.04	-128.37	97.78	2.04	0.000%
11	128.37	-73.34	-2.04	-128.37	73.34	2.04	0.000%
12	120.48	-97.78	69.22	-120.48	97.78	-69.22	0.000%
13	120.48	-73.34	69.22	-120.48	73.34	-69.22	0.000%
14	94.33	-97.78	94.55	-94.33	97.78	-94.55	0.000%
15	94.33	-73.34	94.55	-94.33	73.34	-94.55	0.000%
16	62.57	-97.78	112.44	-62.57	97.78	-112.44	0.000%
17	62.57	-73.34	112.44	-62.57	73.34	-112.44	0.000%
18	1.26	-97.78	125.41	-1.26	97.78	-125.41	0.000%
19	1.26	-73.34	125.41	-1.26	73.34	-125.41	0.000%
20	-60.24	-97.78	109.56	60.24	97.78	-109.56	0.000%
21	-60.24	-73.34	109.56	60.24	73.34	-109.56	0.000%
22	-93.50	-97.78	85.65	93.50	97.78	-85.65	0.000%
23	-93.50	-73.34	85.65	93.50	73.34	-85.65	0.000%
24	-124.33	-97.78	61.61	124.33	97.78	-61.61	0.000%
25	-124.33	-73.34	61.61	124.33	73.34	-61.61	0.000%
26	-131.33	-97.78	-7.86	131.33	97.78	7.86	0.000%
27	-131.33	-73.34	-7.86	131.33	73.34	7.86	0.000%
28	-113.63	-97.78	-65.84	113.63	97.78	65.84	0.000%
29	-113.63	-73.34	-65.84	113.63	73.34	65.84	0.000%
30	-96.76	-97.78	-89.61	96.76	97.78	89.61	0.000%
31	-96.76	-73.34	-89.61	96.76	73.34	89.61	0.000%
32	-72.47	-97.78	-110.24	72.47	97.78	110.24	0.000%
33	-72.47	-73.34	-110.24	72.47	73.34	110.24	0.000%
34	0.00	-306.28	0.00	0.00	306.28	0.00	0.000%
35	-1.39	-306.28	-39.88	1.39	306.28	39.88	0.000%
36	19.22	-306.28	-32.58	-19.22	306.28	32.58	0.000%
37	27.23	-306.28	-26.30	-27.23	306.28	26.30	0.000%
38	32.89	-306.28	-18.79	-32.89	306.28	18.79	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
39	38.34	-306.28	-0.30	-38.34	306.28	0.30	0.000%
40	34.53	-306.28	19.93	-34.53	306.28	-19.93	0.000%
41	27.63	-306.28	27.70	-27.63	306.28	-27.70	0.000%
42	18.94	-306.28	33.47	-18.94	306.28	-33.47	0.000%
43	0.23	-306.28	37.99	-0.23	306.28	-37.99	0.000%
44	-18.51	-306.28	32.98	18.51	306.28	-32.98	0.000%
45	-27.55	-306.28	26.34	27.55	306.28	-26.34	0.000%
46	-35.11	-306.28	18.66	35.11	306.28	-18.66	0.000%
47	-38.82	-306.28	-1.29	38.82	306.28	1.29	0.000%
48	-33.68	-306.28	-19.52	33.68	306.28	19.52	0.000%
49	-28.12	-306.28	-27.00	28.12	306.28	27.00	0.000%
50	-20.53	-306.28	-33.11	20.53	306.28	33.11	0.000%
51	-1.81	-81.49	-30.35	1.81	81.49	30.35	0.000%
52	14.13	-81.49	-23.45	-14.13	81.49	23.45	0.000%
53	20.00	-81.49	-18.73	-20.00	81.49	18.73	0.000%
54	23.82	-81.49	-13.49	-23.82	81.49	13.49	0.000%
55	28.08	-81.49	-0.43	-28.08	81.49	0.43	0.000%
56	26.30	-81.49	15.11	-26.30	81.49	-15.11	0.000%
57	20.61	-81.49	20.66	-20.61	81.49	-20.66	0.000%
58	13.70	-81.49	24.59	-13.70	81.49	-24.59	0.000%
59	0.27	-81.49	27.45	-0.27	81.49	-27.45	0.000%
60	-13.20	-81.49	23.97	13.20	81.49	-23.97	0.000%
61	-20.44	-81.49	18.76	20.44	81.49	-18.76	0.000%
62	-27.12	-81.49	13.49	27.12	81.49	-13.49	0.000%
63	-28.71	-81.49	-1.67	28.71	81.49	1.67	0.000%
64	-24.84	-81.49	-14.39	24.84	81.49	14.39	0.000%
65	-21.13	-81.49	-19.61	21.13	81.49	19.61	0.000%
66	-15.80	-81.49	-24.12	15.80	81.49	24.12	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000323
3	Yes	4	0.00000001	0.00000246
4	Yes	4	0.00000001	0.00000304
5	Yes	4	0.00000001	0.00000228
6	Yes	4	0.00000001	0.00000271
7	Yes	4	0.00000001	0.00000202
8	Yes	4	0.00000001	0.00000240
9	Yes	4	0.00000001	0.00000179
10	Yes	4	0.00000001	0.00000289
11	Yes	4	0.00000001	0.00000217
12	Yes	4	0.00000001	0.00000324
13	Yes	4	0.00000001	0.00000246
14	Yes	4	0.00000001	0.00000301
15	Yes	4	0.00000001	0.00000227
16	Yes	4	0.00000001	0.00000287
17	Yes	4	0.00000001	0.00000208
18	Yes	4	0.00000001	0.00000242
19	Yes	4	0.00000001	0.00000180
20	Yes	4	0.00000001	0.00000308
21	Yes	4	0.00000001	0.00000231
22	Yes	4	0.00000001	0.00000297
23	Yes	4	0.00000001	0.00000225

24	Yes	4	0.00000001	0.00000319
25	Yes	4	0.00000001	0.00000242
26	Yes	4	0.00000001	0.00000278
27	Yes	4	0.00000001	0.00000207
28	Yes	4	0.00000001	0.00000278
29	Yes	4	0.00000001	0.00000207
30	Yes	4	0.00000001	0.00000274
31	Yes	4	0.00000001	0.00000204
32	Yes	4	0.00000001	0.00000267
33	Yes	4	0.00000001	0.00000200
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000193
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000232

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	1.904	51	0.0740	0.0080
T2	180 - 160	1.825	51	0.0740	0.0078
T3	160 - 140	1.502	51	0.0729	0.0075
T4	140 - 120	1.185	51	0.0683	0.0070
T5	120 - 100	0.884	51	0.0594	0.0061
T6	100 - 93.33	0.619	51	0.0505	0.0049
T7	93.33 - 80	0.542	51	0.0468	0.0047
T8	80 - 73.33	0.413	51	0.0392	0.0041
T9	73.33 - 60	0.351	51	0.0362	0.0038
T10	60 - 53.33	0.244	51	0.0300	0.0031
T11	53.33 - 40	0.194	51	0.0262	0.0027

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T12	40 - 33.33	0.118	51	0.0185	0.0019
T13	33.33 - 20	0.083	51	0.0153	0.0016
T14	20 - 13.33	0.037	51	0.0089	0.0009
T15	13.33 - 0	0.019	56	0.0059	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	6'x4" Pipe Mount	51	1.904	0.0740	0.0080	275819
183.00	8' Dish	51	1.873	0.0740	0.0079	275819
182.00	20' Horz. 4x4x1/4"	51	1.857	0.0740	0.0079	275819
181.00	DB411-B	51	1.841	0.0740	0.0079	275819
177.00	4' Dish	51	1.777	0.0740	0.0078	278614
172.00	8' Dish	51	1.697	0.0738	0.0077	519344
171.00	13'x2" Pipe	51	1.680	0.0738	0.0077	633288
168.00	6'x2" Pipe Mount	51	1.632	0.0736	0.0076	Inf
165.00	8' x 2" Horz. Pipe	51	1.583	0.0734	0.0076	Inf
160.00	80010966	51	1.502	0.0729	0.0075	462571
150.00	LPA-80080-4CF	51	1.342	0.0711	0.0073	387398
140.00	AIR6449	51	1.185	0.0683	0.0070	344229
135.00	6' Dish	51	1.107	0.0663	0.0068	256251
125.00	8' Dish	51	0.957	0.0617	0.0064	159527
109.00	6'x3" Pipe Mount	51	0.732	0.0547	0.0054	104415
108.00	6'x3" Pipe Mount	51	0.719	0.0543	0.0053	102350
103.00	Light Beacon	51	0.655	0.0520	0.0050	92444
100.00	8' Dish	51	0.619	0.0505	0.0049	79498
98.00	SC3-W100AB	51	0.595	0.0495	0.0048	66645
91.00	SC3-W100AB	51	0.518	0.0454	0.0046	58456
87.00	6'x3" Pipe Mount	51	0.479	0.0430	0.0044	113239
85.00	6'x3" Pipe Mount	51	0.460	0.0419	0.0043	224949
66.00	6'x3" Pipe Mount	51	0.290	0.0330	0.0034	153319

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	185 - 180	8.704	2	0.3376	0.0379
T2	180 - 160	8.343	2	0.3377	0.0373
T3	160 - 140	6.866	2	0.3325	0.0357
T4	140 - 120	5.417	2	0.3118	0.0333
T5	120 - 100	4.043	2	0.2714	0.0288
T6	100 - 93.33	2.829	2	0.2309	0.0233
T7	93.33 - 80	2.479	2	0.2138	0.0222
T8	80 - 73.33	1.890	2	0.1791	0.0192
T9	73.33 - 60	1.605	2	0.1653	0.0179
T10	60 - 53.33	1.115	2	0.1373	0.0144
T11	53.33 - 40	0.887	2	0.1198	0.0128
T12	40 - 33.33	0.542	2	0.0847	0.0092
T13	33.33 - 20	0.379	2	0.0701	0.0074

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T14	20 - 13.33	0.171	2	0.0405	0.0045
T15	13.33 - 0	0.085	3	0.0271	0.0030

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
185.00	6'x4" Pipe Mount	2	8.704	0.3376	0.0379	61295
183.00	8' Dish	2	8.560	0.3377	0.0376	61295
182.00	20' Horz. 4x4x1/4"	2	8.488	0.3377	0.0375	61295
181.00	DB411-B	2	8.416	0.3377	0.0374	61295
177.00	4' Dish	2	8.124	0.3375	0.0370	62141
172.00	8' Dish	2	7.756	0.3369	0.0365	118034
171.00	13'x2" Pipe	2	7.682	0.3367	0.0365	143840
168.00	6'x2" Pipe Mount	2	7.459	0.3359	0.0363	334870
165.00	8' x 2" Horz. Pipe	2	7.237	0.3348	0.0360	342218
160.00	80010966	2	6.866	0.3325	0.0357	103908
150.00	LPA-80080-4CF	2	6.135	0.3248	0.0347	87067
140.00	AIR6449	2	5.417	0.3118	0.0333	77278
135.00	6' Dish	2	5.064	0.3027	0.0324	56791
125.00	8' Dish	2	4.375	0.2819	0.0302	34847
109.00	6'x3" Pipe Mount	2	3.350	0.2501	0.0255	22900
108.00	6'x3" Pipe Mount	2	3.289	0.2481	0.0252	22459
103.00	Light Beacon	2	2.997	0.2378	0.0239	20329
100.00	8' Dish	2	2.829	0.2309	0.0233	17451
98.00	SC3-W100AB	2	2.720	0.2260	0.0229	14582
91.00	SC3-W100AB	2	2.368	0.2075	0.0218	12720
87.00	6'x3" Pipe Mount	2	2.189	0.1966	0.0209	24720
85.00	6'x3" Pipe Mount	2	2.103	0.1914	0.0204	49416
66.00	6'x3" Pipe Mount	2	1.327	0.1507	0.0160	33770

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	185	Leg	A325N	1.2500	6	0.29	87.22	0.003 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	2.18	12.62	0.173 ✔	1	Member Bearing
		Top Girt	A325N	0.7500	1	0.88	19.88	0.044 ✔	1	Bolt Shear
T2	180	Leg	A325N	1.2500	6	2.26	87.22	0.026 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	7.44	12.62	0.590 ✔	1	Member Bearing
T3	160	Leg	A325N	1.2500	6	7.07	87.22	0.081 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	1	13.63	15.77	0.864 ✔	1	Member Bearing
T4	140	Leg	A325N	1.2500	8	10.58	87.22	0.121 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	9.46	13.81	0.686 ✔	1	Bolt Shear

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T5	120	Leg	A325N	1.5000	8	16.94	126.47	0.134 ✔	1	Bolt Tension
		Diagonal	A325N	0.7500	2	10.89	19.88	0.548 ✔	1	Bolt Shear
T6	100	Diagonal	A325N	1.0000	2	12.30	33.60	0.366 ✔	1	Member Bearing
T7	93.33	Leg	A325N	1.5000	8	20.33	126.47	0.161 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	16.06	35.34	0.454 ✔	1	Bolt Shear
		Horizontal	A325N	1.0000	2	1.71	28.00	0.061 ✔	1	Member Bearing
		Redund Horz 1 Bracing	A325N	1.0000	1	3.41	16.97	0.201 ✔	1	Member Bearing
		Redund Diag 1 Bracing	A325N	1.0000	1	2.31	16.97	0.136 ✔	1	Member Bearing
T8	80	Diagonal	A325N	0.8750	2	13.41	27.06	0.495 ✔	1	Bolt Shear
T9	73.33	Leg	A325N	1.5000	8	27.32	126.47	0.216 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	2	16.86	27.06	0.623 ✔	1	Bolt Shear
		Horizontal	A325N	0.8750	2	2.26	24.47	0.092 ✔	1	Member Bearing
		Redund Horz 1 Bracing	A325N	0.8750	1	4.52	14.79	0.306 ✔	1	Member Bearing
		Redund Diag 1 Bracing	A325N	0.8750	1	2.96	14.79	0.200 ✔	1	Member Bearing
T10	60	Diagonal	A325N	0.8750	2	14.44	27.06	0.533 ✔	1	Bolt Shear
T11	53.33	Leg	A325N	1.5000	8	34.02	126.47	0.269 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	2	18.39	27.06	0.680 ✔	1	Bolt Shear
		Horizontal	A325N	0.8750	2	2.79	24.47	0.114 ✔	1	Member Bearing
		Redund Horz 1 Bracing	A325N	0.8750	1	5.59	18.49	0.302 ✔	1	Member Bearing
		Redund Diag 1 Bracing	A325N	0.8750	1	3.56	18.49	0.193 ✔	1	Member Bearing
T12	40	Diagonal	A325N	1.0000	2	15.30	33.60	0.455 ✔	1	Member Bearing
T13	33.33	Leg	A325N	1.5000	8	40.96	126.47	0.324 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	19.36	35.34	0.548 ✔	1	Bolt Shear
		Horizontal	A325N	1.0000	2	3.36	28.00	0.120 ✔	1	Member Bearing
		Redund Horz 1 Bracing	A325N	1.0000	1	6.72	21.21	0.317 ✔	1	Member Bearing
		Redund Diag 1 Bracing	A325N	1.0000	1	4.18	21.21	0.197 ✔	1	Member Bearing
T14	20	Diagonal	A325N	1.0000	2	16.15	35.34	0.457 ✔	1	Bolt Shear
T15	13.33	Leg	F1554-105	1.7500	6	63.74	178.07	0.358 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	20.17	35.34	0.571 ✔	1	Bolt Shear
		Horizontal	A325N	1.0000	2	3.93	28.00	0.140 ✔	1	Member Bearing
		Redund Horz 1 Bracing	A325N	1.0000	1	7.86	21.21	0.371 ✔	1	Member Bearing
		Redund Diag 1 Bracing	A325N	1.0000	1	4.79	21.21	0.226 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	P6x.28	5.01	5.01	26.8 K=1.00	5.5813	-5.19	238.34	0.022 [1] ✔
T2	180 - 160	P6x.28	20.03	10.02	53.5 K=1.00	5.5813	-19.80	203.69	0.097 [1] ✔
T3	160 - 140	P6x.28	20.03	10.02	53.5 K=1.00	5.5813	-56.92	203.69	0.279 [1] ✔
T4	140 - 120	P6x.28	20.03	10.02	53.5 K=1.00	5.5813	-107.45	203.69	0.528 [1] ✔
T5	120 - 100	P8x.322	20.03	10.02	40.9 K=1.00	8.3993	-164.80	334.42	0.493 [1] ✔
T6	100 - 93.33	P8x.322	6.68	6.68	27.3 K=1.00	8.3993	-197.09	357.93	0.551 [1] ✔
T7	93.33 - 80	P8x.322	13.35	6.68	27.3 K=1.00	8.3993	-196.84	357.96	0.550 [1] ✔
T8	80 - 73.33	P8x.5	6.68	6.68	27.9 K=1.00	12.7627	-260.63	542.64	0.480 [1] ✔
T9	73.33 - 60	P8x.5	13.35	6.68	27.8 K=1.00	12.7627	-260.64	542.69	0.480 [1] ✔
T10	60 - 53.33	P10x.365	6.68	6.68	21.8 K=1.00	11.9083	-322.83	517.53	0.624 [1] ✔
T11	53.33 - 40	P10x.365	13.35	6.68	21.8 K=1.00	11.9083	-322.20	517.56	0.623 [1] ✔
T12	40 - 33.33	P10x.5	6.68	6.68	22.1 K=1.00	16.1007	-387.74	699.12	0.555 [1] ✔
T13	33.33 - 20	P10x.5	13.35	6.68	22.1 K=1.00	16.1007	-387.29	699.16	0.554 [1] ✔
T14	20 - 13.33	P12x.5	6.68	6.68	18.5 K=1.00	19.2423	-452.65	844.51	0.536 [1] ✔
T15	13.33 - 0	P12x.5	13.35	6.68	18.5 K=1.00	19.2423	-453.50	844.54	0.537 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L3 1/2x3 1/2x1/4	19.41	9.41	162.7 K=1.00	1.6900	-2.15	18.27	0.118 [1] ✔
T2	180 - 160	L4x4x1/4	22.81	11.24	169.7 K=1.00	1.9400	-8.08	19.29	0.419 [1] ✔
T3	160 - 140	L5x5x5/16	24.62	12.15	146.7	3.0300	-13.73	40.32	0.341 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T4	140 - 120	L5x5x5/16	26.46	13.01	148.2 K=1.00	3.0300	-18.70	39.46	0.474 [1] ✔
T5	120 - 100	L5x5x3/8	28.33	13.82	156.2 K=0.94	3.6100	-21.44	42.34	0.506 [1] ✔
T6	100 - 93.33	L6x6x3/8	15.06	14.07	133.5 K=0.93	4.3600	-25.36	70.03	0.362 [1] ✔
T7	93.33 - 80	L6x4x1/2	19.70	18.63	194.4 K=0.94	4.7500	-32.12	35.98	0.893 [1] ✔
T8	80 - 73.33	L6x6x3/8	15.96	15.05	139.5 K=1.00	4.3600	-26.15	64.12	0.408 [1] ✔
T9	73.33 - 60	L6x6x3/8	20.45	19.45	124.2 K=0.92	4.3600	-33.72	80.62	0.418 [1] ✔
T10	60 - 53.33	L6x6x3/8	16.88	15.87	144.6 K=1.00	4.3600	-28.50	59.68	0.478 [1] ✔
T11	53.33 - 40	L6x6x3/8	21.22	20.12	128.4 K=0.90	4.3600	-36.79	75.67	0.486 [1] ✔
T12	40 - 33.33	L6x6x3/8	17.80	16.73	150.0 K=1.00	4.3600	-29.97	55.49	0.540 [1] ✔
T13	33.33 - 20	L6x6x1/2	22.00	20.86	134.6 K=0.89	5.7500	-38.72	90.90	0.426 [1] ✔
T14	20 - 13.33	L6x6x1/2	18.73	17.58	156.1 K=1.00	5.7500	-31.80	67.51	0.471 [1] ✔
T15	13.33 - 0	L6x6x1/2	22.81	21.57	139.1 K=0.87	5.7500	-40.34	85.00	0.475 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L4x4x5/16	27.67	13.18	181.0 K=0.91	2.4000	-3.41	20.97	0.163 [1] ✔
T9	73.33 - 60	L4x4x5/16	29.67	14.21	192.9 K=0.89	2.4000	-4.52	18.46	0.245 [1] ✔
T11	53.33 - 40	L5x5x5/16	31.67	15.13	167.7 K=0.92	3.0300	-5.59	30.82	0.181 [1] ✔
T13	33.33 - 20	L5x5x5/16	33.67	16.09	176.6 K=0.91	3.0300	-6.72	27.79	0.242 [1] ✔
T15	13.33 - 0	L5x5x5/16	35.67	17.01	185.1 K=0.90	3.0300	-7.86	25.32	0.311 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L5x5x5/16	18.50	17.68	213.4 K=1.00	3.0300	-0.88	19.04	0.046 [1] ✔
		KL/R > 200 (C) - 6							

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L3x3x1/4	6.92	6.22	126.2 K=1.00	1.4400	-3.41	25.89	0.132 [1] ✔
T9	73.33 - 60	L3x3x1/4	7.42	6.76	136.9 K=1.00	1.4400	-4.52	21.98	0.206 [1] ✔
T11	53.33 - 40	L3x3x5/16	7.92	7.17	146.0 K=1.00	1.7800	-5.59	23.90	0.234 [1] ✔
T13	33.33 - 20	L3x3x5/16	8.42	7.64	155.6 K=1.00	1.7800	-6.72	21.05	0.319 [1] ✔
T15	13.33 - 0	L4x3 1/2x5/16	8.92	8.05	132.4 K=1.00	2.2500	-7.86	36.76	0.214 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L3x3x1/4	9.37	8.53	172.8 K=1.00	1.4400	-2.31	13.80	0.168 [1] ✔
T9	73.33 - 60	L3x3x1/4	9.73	8.93	181.1 K=1.00	1.4400	-2.96	12.57	0.236 [1] ✔
T11	53.33 - 40	L3x3x5/16	10.10	9.20	187.4 K=1.00	1.7800	-3.56	14.50	0.246 [1] ✔
T13	33.33 - 20	L3x3x5/16	10.48	9.56	194.9 K=1.00	1.7800	-4.18	13.42	0.312 [1] ✔
T15	13.33 - 0	L4x3 1/2x5/16	10.87	9.86	162.1 K=1.00	2.2500	-4.79	24.50	0.196 [1] ✔

[1] P_u / ϕP_n controls

Inner Bracing Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L3x3x1/4	13.83	13.83	280.4 K=1.00	1.4400	-0.05	5.24	0.009 [1] ✔
T9	73.33 - 60	KL/R > 250 (C) - 106 L3x3x1/4	14.83	14.83	300.7 K=1.00	1.4400	-0.05	4.56	0.010 [1] ✔
T11	53.33 - 40	KL/R > 250 (C) - 142 L3 1/2x3 1/2x1/4	15.83	15.83	273.8 K=1.00	1.6900	-0.05	6.45	0.008 [1] ✔
T13	33.33 - 20	KL/R > 250 (C) - 180 L3 1/2x3 1/2x1/4	16.83	16.83	291.1 K=1.00	1.6900	-0.05	5.71	0.009 [1] ✔
T15	13.33 - 0	KL/R > 250 (C) - 215 L3 1/2x3 1/2x1/4	17.83	17.83	308.4 K=1.00	1.6900	-0.05	5.09	0.011 [1] ✔
		KL/R > 250 (C) - 251							

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	P6x.28	5.01	5.01	26.8	5.5813	0.51	251.16	0.002 [1] ✔
T2	180 - 160	P6x.28	20.03	10.02	53.5	5.5813	13.56	251.16	0.054 [1] ✔
T3	160 - 140	P6x.28	20.03	10.02	53.5	5.5813	42.42	251.16	0.169 [1] ✔
T4	140 - 120	P6x.28	20.03	10.02	53.5	5.5813	84.65	251.16	0.337 [1] ✔
T5	120 - 100	P8x.322	20.03	10.02	40.9	8.3993	135.49	377.97	0.358 [1] ✔
T6	100 - 93.33	P8x.322	6.68	6.68	27.3	8.3993	164.85	377.97	0.436 [1] ✔
T7	93.33 - 80	P8x.322	13.35	6.68	27.3	8.3993	163.01	377.97	0.431 [1] ✔
T8	80 - 73.33	P8x.5	6.68	6.68	27.9	12.7627	220.42	574.32	0.384 [1] ✔
T9	73.33 - 60	P8x.5	13.35	6.68	27.8	12.7627	218.85	574.32	0.381 [1] ✔
T10	60 - 53.33	P10x.365	6.68	6.68	21.8	11.9083	274.75	535.87	0.513 [1] ✔
T11	53.33 - 40	P10x.365	13.35	6.68	21.8	11.9083	272.58	535.87	0.509 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T12	40 - 33.33	P10x.5	6.68	6.68	22.1	16.1007	330.48	724.53	0.456 [1]
T13	33.33 - 20	P10x.5	13.35	6.68	22.1	16.1007	328.12	724.53	0.453 [1]
T14	20 - 13.33	P12x.5	6.68	6.68	18.5	19.2423	384.77	865.90	0.444 [1]
T15	13.33 - 0	P12x.5	13.35	6.68	18.5	19.2423	382.92	865.90	0.442 [1]

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L3 1/2x3 1/2x1/4	19.41	9.41	105.1	1.6900	2.18	54.76	0.040 [1]
T2	180 - 160	L4x4x1/4	22.81	11.24	109.2	1.9400	7.44	62.86	0.118 [1]
T3	160 - 140	L5x5x5/16	24.62	12.15	93.9	3.0300	13.63	98.17	0.139 [1]
T4	140 - 120	L5x5x5/16	26.46	13.01	100.9	3.0300	18.93	98.17	0.193 [1]
T5	120 - 100	L5x5x3/8	28.33	13.82	108.0	3.6100	21.78	116.96	0.186 [1]
T6	100 - 93.33	L6x6x3/8	15.06	14.07	93.6	4.3600	24.60	141.26	0.174 [1]
T7	93.33 - 80	L6x4x1/2	19.70	18.63	200.5	4.7500	30.51	153.90	0.198 [1]
T8	80 - 73.33	L6x6x3/8	15.96	15.05	99.4	4.3600	26.81	141.26	0.190 [1]
T9	73.33 - 60	L6x6x3/8	20.45	19.45	127.5	4.3600	32.84	141.26	0.232 [1]
T10	60 - 53.33	L6x6x3/8	16.88	15.87	104.6	4.3600	28.87	141.26	0.204 [1]
T11	53.33 - 40	L6x6x3/8	21.22	20.12	131.7	4.3600	35.33	141.26	0.250 [1]
T12	40 - 33.33	L6x6x3/8	17.80	16.73	110.5	4.3600	30.61	141.26	0.217 [1]
T13	33.33 - 20	L6x6x1/2	22.00	20.86	138.3	5.7500	37.27	186.30	0.200 [1]
T14	20 - 13.33	L6x6x1/2	18.73	17.58	117.2	5.7500	32.30	186.30	0.173 [1]
T15	13.33 - 0	L6x6x1/2	22.81	21.57	142.9	5.7500	38.85	186.30	0.209 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L4x4x5/16	27.67	13.18	130.4	2.4000	3.41	77.76	0.044 [1] ✔
T9	73.33 - 60	L4x4x5/16	29.67	14.21	140.1	2.4000	4.52	77.76	0.058 [1] ✔
T11	53.33 - 40	L5x5x5/16	31.67	15.13	117.6	3.0300	5.59	98.17	0.057 [1] ✔
T13	33.33 - 20	L5x5x5/16	33.67	16.09	125.2	3.0300	6.72	98.17	0.068 [1] ✔
T15	13.33 - 0	L5x5x5/16	35.67	17.01	132.2	3.0300	7.86	98.17	0.080 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	185 - 180	L5x5x5/16	18.50	17.68	137.2	3.0300	0.18	98.17	0.002 [1] ✔

[1] P_u / ϕP_n controls

Redundant Horizontal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L3x3x1/4	6.92	6.22	84.6	0.8691	3.41	37.80	0.090 [1] ✔
T9	73.33 - 60	L3x3x1/4	7.42	6.76	91.1	0.8925	4.52	38.82	0.116 [1] ✔
T11	53.33 - 40	L3x3x5/16	7.92	7.17	97.2	1.1006	5.59	47.88	0.117 [1] ✔
T13	33.33 - 20	L3x3x5/16	8.42	7.64	103.7	1.0713	6.72	46.60	0.144 [1] ✔
T15	13.33 - 0	L4x3 1/2x5/16	8.92	8.05	94.5	1.4238	7.86	61.94	0.127 [1] ✔

[1] P_u / ϕP_n controls

Redundant Diagonal (1) Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	93.33 - 80	L3x3x1/4	9.37	8.53	114.3	0.8691	2.31	37.80	0.061 [1] ✔
T9	73.33 - 60	L3x3x1/4	9.73	8.93	119.2	0.8925	2.96	38.82	0.076 [1] ✔
T11	53.33 - 40	L3x3x5/16	10.10	9.20	123.7	1.1006	3.56	47.88	0.074 [1] ✔
T13	33.33 - 20	L3x3x5/16	10.48	9.56	128.8	1.0713	4.18	46.60	0.090 [1] ✔
T15	13.33 - 0	L4x3 1/2x5/16	10.87	9.86	114.9	1.4238	4.79	61.94	0.077 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	185 - 180	Leg	P6x.28	1	-5.19	238.34	2.2	Pass
T2	180 - 160	Leg	P6x.28	15	-19.80	203.69	9.7	Pass
T3	160 - 140	Leg	P6x.28	30	-56.92	203.69	27.9	Pass
T4	140 - 120	Leg	P6x.28	45	-107.45	203.69	52.8	Pass
T5	120 - 100	Leg	P8x.322	60	-164.80	334.42	49.3	Pass
T6	100 - 93.33	Leg	P8x.322	75	-197.09	357.93	55.1	Pass
T7	93.33 - 80	Leg	P8x.322	87	-196.84	357.96	55.0	Pass
T8	80 - 73.33	Leg	P8x.5	111	-260.63	542.64	48.0	Pass
T9	73.33 - 60	Leg	P8x.5	123	-260.64	542.69	48.0	Pass
T10	60 - 53.33	Leg	P10x.365	147	-322.83	517.53	62.4	Pass
T11	53.33 - 40	Leg	P10x.365	159	-322.20	517.56	62.3	Pass
T12	40 - 33.33	Leg	P10x.5	183	-387.74	699.12	55.5	Pass
T13	33.33 - 20	Leg	P10x.5	195	-387.29	699.16	55.4	Pass
T14	20 - 13.33	Leg	P12x.5	219	-452.65	844.51	53.6	Pass
T15	13.33 - 0	Leg	P12x.5	231	-453.50	844.54	53.7	Pass
T1	185 - 180	Diagonal	L3 1/2x3 1/2x1/4	8	-2.15	18.27	11.8 17.3 (b)	Pass
T2	180 - 160	Diagonal	L4x4x1/4	19	-8.08	19.29	41.9 59.0 (b)	Pass
T3	160 - 140	Diagonal	L5x5x5/16	33	-13.73	40.32	34.1 86.4 (b)	Pass
T4	140 - 120	Diagonal	L5x5x5/16	47	-18.70	39.46	47.4 68.6 (b)	Pass
T5	120 - 100	Diagonal	L5x5x3/8	66	-21.44	42.34	50.6 54.8 (b)	Pass
T6	100 - 93.33	Diagonal	L6x6x3/8	84	-25.36	70.03	36.2 36.6 (b)	Pass
T7	93.33 - 80	Diagonal	L6x4x1/2	100	-32.12	35.98	89.3	Pass
T8	80 - 73.33	Diagonal	L6x6x3/8	119	-26.15	64.12	40.8 49.5 (b)	Pass
T9	73.33 - 60	Diagonal	L6x6x3/8	139	-33.72	80.62	41.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	øP$_{allow}$ K	% Capacity	Pass Fail
							62.3 (b)	
T10	60 - 53.33	Diagonal	L6x6x3/8	155	-28.50	59.68	47.8	Pass
							53.3 (b)	
T11	53.33 - 40	Diagonal	L6x6x3/8	175	-36.79	75.67	48.6	Pass
							68.0 (b)	
T12	40 - 33.33	Diagonal	L6x6x3/8	191	-29.97	55.49	54.0	Pass
T13	33.33 - 20	Diagonal	L6x6x1/2	211	-38.72	90.90	42.6	Pass
							54.8 (b)	
T14	20 - 13.33	Diagonal	L6x6x1/2	227	-31.80	67.51	47.1	Pass
T15	13.33 - 0	Diagonal	L6x6x1/2	247	-40.34	85.00	47.5	Pass
							57.1 (b)	
T7	93.33 - 80	Horizontal	L4x4x5/16	79	-3.41	20.97	16.3	Pass
T9	73.33 - 60	Horizontal	L4x4x5/16	115	-4.52	18.46	24.5	Pass
T11	53.33 - 40	Horizontal	L5x5x5/16	151	-5.59	30.82	18.1	Pass
T13	33.33 - 20	Horizontal	L5x5x5/16	187	-6.72	27.79	24.2	Pass
T15	13.33 - 0	Horizontal	L5x5x5/16	223	-7.86	25.32	31.1	Pass
T1	185 - 180	Top Girt	L5x5x5/16	6	-0.88	19.04	4.6	Pass
T7	93.33 - 80	Redund Horz 1 Bracing	L3x3x1/4	98	-3.41	25.89	13.2	Pass
							20.1 (b)	
T9	73.33 - 60	Redund Horz 1 Bracing	L3x3x1/4	137	-4.52	21.98	20.6	Pass
							30.6 (b)	
T11	53.33 - 40	Redund Horz 1 Bracing	L3x3x5/16	170	-5.59	23.90	23.4	Pass
							30.2 (b)	
T13	33.33 - 20	Redund Horz 1 Bracing	L3x3x5/16	206	-6.72	21.05	31.9	Pass
T15	13.33 - 0	Redund Horz 1 Bracing	L4x3 1/2x5/16	245	-7.86	36.76	21.4	Pass
							37.1 (b)	
T7	93.33 - 80	Redund Diag 1 Bracing	L3x3x1/4	99	-2.31	13.80	16.8	Pass
T9	73.33 - 60	Redund Diag 1 Bracing	L3x3x1/4	135	-2.96	12.57	23.6	Pass
T11	53.33 - 40	Redund Diag 1 Bracing	L3x3x5/16	171	-3.56	14.50	24.6	Pass
T13	33.33 - 20	Redund Diag 1 Bracing	L3x3x5/16	207	-4.18	13.42	31.2	Pass
T15	13.33 - 0	Redund Diag 1 Bracing	L4x3 1/2x5/16	243	-4.79	24.50	19.6	Pass
							22.6 (b)	
T7	93.33 - 80	Inner Bracing	L3x3x1/4	106	-0.05	5.24	1.1	Pass
T9	73.33 - 60	Inner Bracing	L3x3x1/4	142	-0.05	4.56	1.1	Pass
T11	53.33 - 40	Inner Bracing	L3 1/2x3 1/2x1/4	179	-0.05	6.45	1.1	Pass
T13	33.33 - 20	Inner Bracing	L3 1/2x3 1/2x1/4	216	-0.05	5.71	1.1	Pass
T15	13.33 - 0	Inner Bracing	L3 1/2x3 1/2x1/4	250	-0.05	5.09	1.1	Pass
							Summary	
						Leg (T10)	62.4	Pass
						Diagonal (T7)	89.3	Pass
						Horizontal (T15)	31.1	Pass
						Top Girt (T1)	4.6	Pass
						Redund Horz 1 Bracing (T15)	37.1	Pass
						Redund Diag 1 Bracing (T13)	31.2	Pass
						Inner Bracing (T13)	1.1	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
						Bolt Checks	86.4	Pass
						RATING =	**89.3**	**Pass**

CENTEK engineering
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Branford, CT 06405 F: (203) 488-8587

Subject:	FOUNDATION ANALYSIS
Location:	Bloomfield, CT
Rev. 0: 7/8/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 21022.20

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 14936 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 139 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 98 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 497 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 421 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 185 \cdot ft$	(User Input)	
Tower Width =	$W_t := 37 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 1$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.5 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 5.5 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 6.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 1.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 45.5 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 4500 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 20000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 100 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 7$	(User Input)	
Bar Diameter =	$d_{bpier} := 0.875 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 34$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 0.5 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 10$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.27 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 75$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 10$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.27 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 75$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.601 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 1.267 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 1.267 \cdot in^2$

Coefficient of Lateral Soil Pressure = $K_p := \frac{1 + \sin(\Phi_s)}{1 - \sin(\Phi_s)} = 3$

Load Factor = $LF := 1$

Stability of Footing:

Adjusted Concrete Unit Weight = $\gamma_c := if(Bouyancy = 1, \gamma_{conc} - 62.4pcf, \gamma_{conc}) = 150 \cdot pcf$

Adjusted Soil Unit Weight = $\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 100 \cdot pcf$

Passive Pressure = $P_{pn} := K_p \cdot \gamma_s \cdot n + c \cdot 2 \cdot \sqrt{K_p} = 0 \cdot ksf$

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.5 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.5 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.95 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.725 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 1.5 \cdot ft$

$A_p := W_f \cdot T_p = 68.25 \cdot ft^2$

Ultimate Shear = $S_u := P_{ave} \cdot A_p = 117.731 \cdot kip$

Weight of Concrete = $WT_c := \left[\left(W_f^2 \cdot T_f\right) + (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4} L_p\right)\right] \cdot \gamma_c = 535.785 \cdot kip$

Weight of Soil Above Footing = $WT_{s1} := \left[\left[W_f^2 - (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4}\right)\right] \cdot \left(|L_p - L_{pag} - n|\right)\right] \cdot \gamma_s = 992.71 \cdot kip$

Tower Offset = $X_{t1} := \left[\frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{2}\right]$ $X_{t2} := \frac{W_f}{2} - \frac{(W_t \cdot \cos(30 \cdot deg))}{3}$

$X_t := if(Pos_t = 1, X_{t1}, X_{t2}) = 6.729$

$X_{off1} := \frac{W_f}{2} - \left[\frac{(W_t \cdot \cos(30 \cdot deg))}{3} + X_t\right] = 5.34$ $X_{off2} := 0$

$X_{off} := if(Pos_t = 1, X_{off1}, X_{off2})$ $X_{off} = 5.34 \cdot ft$

Total Weight = $WT_{tot} := 0.9WT_c + 0.75WT_{s1} = 1226.7 \cdot kip$

Resisting Moment = $M_r := (WT_{tot}) \cdot \frac{W_f}{2} + 0.9WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75\left(S_u \cdot \frac{T_p}{3}\right) = 29488 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 15909 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.85$

Factor of Safety Required = $FS_{req} := 1$ $OverTurning\_Moment\_Check := if(FS \geq FS_{req}, "Okay", "No Good")$

$OverTurning\_Moment\_Check = "Okay"$

Shear Capacity in Pier:

Shear Resistance of Pier = $S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 669.765 \cdot kips$

$Shear\_Check := if(S_p > S_t, "Okay", "No Good")$

Shear_Check = "Okay"

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 1626 \cdot kip$

Area of the Mat = $A_{mat} := W_f^2 = 2.07 \times 10^3$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 1.57 \times 10^4 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.799 \cdot ksf$

$Max\_Pressure\_Check := if(P_{max} < 0.75q_s, "Okay", "No Good")$

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.228 \cdot ksf$

$Min\_Pressure\_Check := if[(P_{min} \geq 0) \cdot (P_{min} < 0.75q_s), "Okay", "No Good"]$

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 13.463$

Distance to Kern = $X_k := \frac{W_f}{6} = 7.583$

Since Resultant Force is Not in Kern, Area to which Pressure is Applied Must be Reduced.

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 9.781$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 1.838 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 1.838 \cdot ksf$

$Pressure\_Check := if(q_{adj} < 0.75q_s, "Okay", "No Good")$

Pressure_Check = "Okay"

Concrete Bearing Capacity:

Strength Reduction Factor = $\Phi_c := 0.65$ (ACI-2008 9.3.2.2)

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 1.012 \times 10^4 \cdot kips$ (ACI-2008 10.14)

$Bearing\_Check := if(P_b > LF \cdot C_t, "Okay", "No Good")$

Bearing_Check = "Okay"

Shear Strength of Concrete:

Beam Shear: (Critical section located at a distance d from the face of Pier) (ACI 11.3.1.1)

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 13.73 \cdot in$

$FL := LF \cdot \frac{C_t}{W_f^2} = 0.24 \cdot ksf$

$V_{req} := FL \cdot (X_t - .5 \cdot d_p - d) \cdot W_f = 28.229 \cdot kips$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d = 855 \cdot kip$ (ACI-2008 11.2.1.1)

$Beam\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Beam_Shear_Check = "Okay"

Punching Shear: (Critical Section Located at a distance of d/2 from the face of pier) (ACI 11.11.1.2)

Critical Perimeter of Punching Shear = $b_o := (d_p + d) \cdot \pi = 22.4$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot (d_p + d)^2}{4} = 40.1$

Required Shear Strength = $V_{req} := FL \cdot (W_f^2 - A_{bo}) = 487 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 843.4 \cdot kip$ (ACI-2008 11.11.2.1)

$Punching\_Shear\_Check := if(V_{req} < V_{Avail}, "Okay", "No Good")$

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

Strength Reduction Factor = $\phi_m := .90$ (ACI-2008 9.3.2.1)

Maximum Moment in Pad = $M_{max} := 1450 \cdot kip \cdot ft$ (User Input)

Design Moment = $M_n := \frac{LF \cdot M_{max}}{\phi_m} = 1.611 \times 10^3 \cdot kips \cdot ft$

$$\beta := \begin{cases} 0.85 \text{ if } 2500 \cdot psi \le f_c \le 4000 \cdot psi \\ 0.65 \text{ if } f_c > 8000 \cdot psi \\ \left[0.85 - \left[\frac{\left(\frac{f_c}{psi} - 4000\right)}{1000}\right] \cdot 0.5\right] \text{ otherwise} \end{cases} = 0.6 \quad \text{(ACI-200810.2.7.3)}$$

$b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p = 456.515 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 23.468 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 1.142 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 24.487 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.04688 \cdot in$

Required Reinforcement for Temperature and Shrinkage:

$$\rho_{sh} := \begin{cases} .0018 & \text{if } f_y \geq 60000 \cdot psi \\ .0020 & \text{otherwise} \end{cases} = 0.0018 \qquad \text{(ACI-2008 7.12.2.1)}$$

Check Bottom Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 24.5 \cdot in^2$$

$$As_{prov} := A_{bbot} \cdot NB_{bot} = 95 \cdot in^2$$

$$Pad\_Reinforcement\_Bot := if\left(As_{prov} > As, \text{"Okay"}, \text{"No Good"}\right)$$

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 24.5 \cdot in^2$$

$$As_{prov} := A_{btop} \cdot NB_{top} = 95 \cdot in^2$$

$$Pad\_Reinforcement\_Top := if\left(As_{prov} > As, \text{"Okay"}, \text{"No Good"}\right)$$

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 6.01 \cdot in$$

Spacing or Cover Dimension =

$$c := if\left(Cvr_{pad} < \frac{B_{sPad}}{2}, Cvr_{pad}, \frac{B_{sPad}}{2}\right) = 3 \cdot in$$

Transverse Reinforcement Index =

$$k_{tr} := 0 \qquad \text{(ACI-2008 12.2.3)}$$

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 36.1 \cdot in$$

Minimum Development Length =

$$L_{dbmin} := 12 \cdot in \qquad \text{(ACI-2008 12.2.1)}$$

$$L_{dbtCheck} := if\left(L_{dbt} \geq L_{dbmin}, \text{"Use L.dbt"}, \text{"Use L.dbmin"}\right) = \text{"Use L.dbt"}$$

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 48 \cdot in$$

$$Lpad\_Check := if\left(L_{Pad} > L_{dbt}, \text{"Okay"}, \text{"No Good"}\right)$$

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := \frac{\pi \cdot d_p^2}{4} = 4071.5 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 20.36 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 20.44 \cdot in^2$

$Steel\_Area\_Check := if(A_{sprov} > A_{smin}, "Okay", "No Good")$

Steel_Area_Check = "Okay"

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 5.778 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 66 \cdot in$

Maximum Moment in Pier = $M_p := S_t \cdot (L_p) \cdot LF = 9174 \cdot in \cdot kips$

Pier Check evaluated from outside program and results are listed below;

$(D \ N \ n \ P_u \ M_{xu}) := \left(d_p \cdot 12 \ \ NB_{pier} \ \ BS_{pier} \ \ \frac{C_t \cdot 1.333}{kips} \ \ \frac{M_p}{in \cdot kips}\right)$

$(D \ N \ n \ P_u \ M_{xu}) = (72 \ \ 34 \ \ 7 \ \ 662.501 \ \ 9.174 \times 10^3)$

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) := (0 \ \ 0 \ \ 0 \ \ 0)$

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) := \phi P'_n(D, N, n, P_u, M_{xu})^T$

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) = (4.721 \times 10^3 \ \ 6.537 \times 10^4 \ \ -50.193 \ \ 5.01 \times 10^{-3})$

$Axial\_Load\_Check := if(\phi P_n \geq P_u, "Okay", "No Good")$

Axial_Load_Check = "Okay"

$Bending\_Check := if(\phi M_{xn} \geq M_{xu}, "Okay", "No Good")$

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 63 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 15 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 2.889 \cdot in$

Transverse Reinforcement =

$k_{tr} := 0$ (ACI-2008 12.2.3)

$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 17.78 \cdot in$

Minimum Development Length =

$L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 10.957 \cdot in$ (ACI 12.2.1)

Pier reinforcement bars are standard 90 degree hooks and therefore developement in the pad is computed as follows:

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right) = 17.778 \cdot in$

$L_{tension\_Check} := if\left(L_{pier} + L_{pad} > L_{dbt}, "Okay", "No Good"\right)$

$L_{tension\_Check} = "Okay"$

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 15.652 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 15.75 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 15.75 \cdot in$

$L_{compression\_Check} := if\left(L_{pier} + L_{pad} > L_{dbc}, "Okay", "No Good"\right)$

$L_{compression\_Check} = "Okay"$

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 1 - Site Information

Site ID: CTHA142G
Status: Draft
Version: 5
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 6/15/2021 3:8:54 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

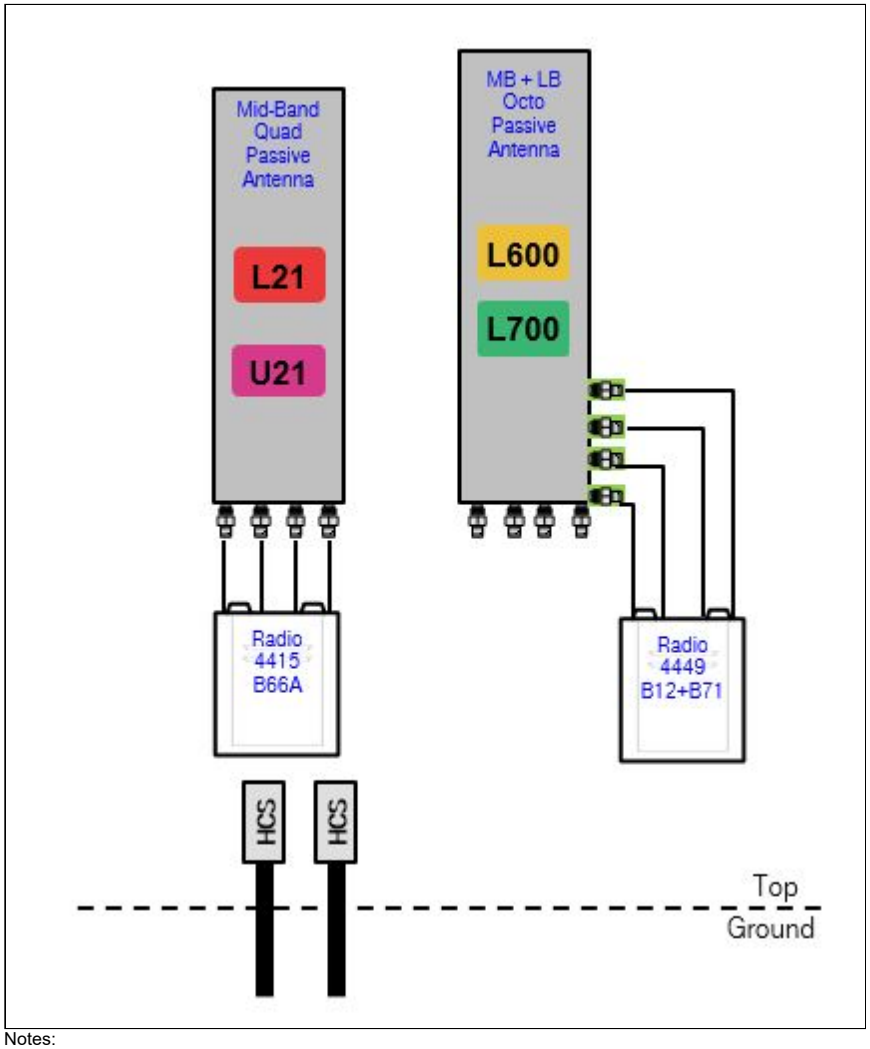
Site Name: CTHA142
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Eversource

Latitude: 41.89263319
Longitude: -72.76570517
Address: 7 Hoskins Rd
City, State: Bloomfield, CT
Region: NORTHEAST

RAN Template: 67D5A998E Hybrid			AL Template: 67D5998E_1xAIR+1OP+1QP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

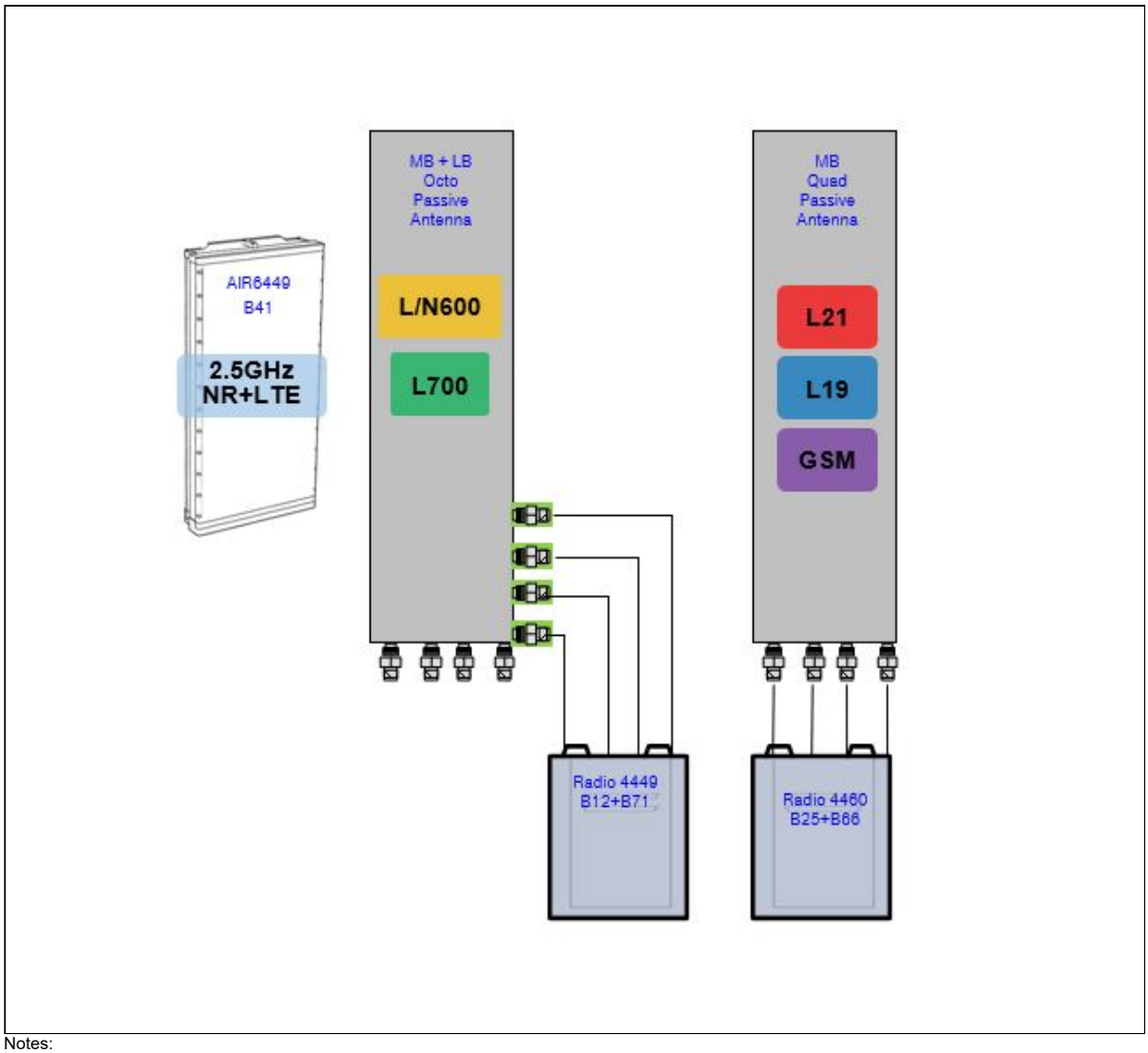
67D07B.JPG



Notes:

Section 3 - Proposed Template Images

67D5998E_1xAIR+1OP+1QP.JPG



Notes:

Section 4 - Siteplan Images

----- This section is intentionally blank. -----

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 67D07B 6102 MUAC

Enclosure	1
Enclosure Type	RBS 6102
Baseband	DUW30 (U2100); BB 5216 (L2100); BB 6630 (L700, L600, N600)
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length* **(x 4)**; Ericsson 6x12 HCS *Select Length & AWG* **(x 2)**

Proposed RAN Equipment

Template: 67D5A998E Hybrid

Enclosure	1	2	3
Enclosure Type	RBS 6102	Enclosure 6160	B160
Baseband	DUW30 (U2100); BB 6648 (L2100, L1900); BB 6630 (L700, L600, N600)	BB 6648 (L2500, N2500)	
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length* **(x 5)**; Ericsson 6x12 HCS *Select Length & AWG*	Ericsson Hybrid Trunk 6/24 4AWG 60m **(x 3)**; PSU 4813	
Transport System		CSR IXRe V2 (Gen2)	

RAN Scope of Work:

Location of new cabinets to be determined.

Replace BB5216 with (1) BB6648 for L2100 and L1900 (both carriers) in existing base station cabinet.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6648 for L2500 and N2500 (MMBB - Mixed Mode Baseband) to new Enclosure 6160.

Add (1) PSU4813 Voltage Booster to new Enclosure 6160.

Add (3) 6X24 HCS ([1] per sector) terminating at the Enclosure 6160. Connect DC for the AIR6449 B41 to the PSU4813 Voltage Booster.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 6 - A&L Equipment

Existing Template: 67D07B_1QP+1OP
Proposed Template: 67D5998E_1xAIR+1OP+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1	2				3	4
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APXV18-206516S-C-A20 (Dual)
Azimuth	20	20					20
M. Tilt	0	0					0
Height	140	140					140
Ports	P1	P2	P3	P4	P5		P6
Active Tech.	U2100 L2100	L700 L600 N600	L700 L600 N600				
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2				
Cables							
TMAs							
Diplexers / Combiners							
Radio	Radio 2217 B66A (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts per Sector. Empty Position 3 ***
Replace LB/MB Quad in Position 2 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 2 with (1) Radio 4449 B71+B12 for L600 and L700.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	20		20				20	
M. Tilt	0		0				0	
Height	140		140				140	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 U2100	L2100 L1900 U2100	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt								
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Replace Mid-Band Dual in Position 1 with (1) Mid-Band Quad.

Replace Radio 2217 B66 with (1) Radio 4460 B25+B66 for L2100, L1900 (both carriers), and U2100 in Position 1 at antenna.

Remove Mid-Band Dual in Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1	2				3	4
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APXV18-206516S-C-A20 (Dual)
Azimuth	130	130					130
M. Tilt	0	0					0
Height	140	140					140
Ports	P1	P2	P3	P4	P5		P6
Active Tech.	U2100 L2100	L700 L600 N600	L700 L600 N600				
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2				
Cables							
TMAs							
Diplexers / Combiners							
Radio	Radio 2217 B66A (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts per Sector. Empty Position 3 ***
Replace LB/MB Quad in Position 2 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 2 with (1) Radio 4449 B71+B12 for L600 and L700.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	130		130				130	
M. Tilt	0		0				0	
Height	140		140				140	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 U2100	L2100 L1900 U2100	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt								
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Replace Mid-Band Dual in Position 1 with (1) Mid-Band Quad.

Replace Radio 2217 B66 with (1) Radio 4460 B25+B66 for L2100, L1900 (both carriers), and U2100 in Position 1 at antenna.

Remove Mid-Band Dual in Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	**1**	**2**				**3**	**4**
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APXV18-206516S-C-A20 (Dual)
Azimuth	280	280					280
M. Tilt	0	0					0
Height	140	140					140
Ports	**P1**	**P2**	**P3**	**P4**	**P5**		**P6**
Active Tech.	U2100 L2100	L700 L600 N600	L700 L600 N600				
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2				
Cables							
TMAs							
Diplexers / Combiners							
Radio	Radio 2217 B66A (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts per Sector. Empty Position 3 ***
Replace LB/MB Quad in Position 2 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 2 with (1) Radio 4449 B71+B12 for L600 and L700.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	280		280				280	
M. Tilt	0		0				0	
Height	140		140				140	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 U2100	L2100 L1900 U2100	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt								
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Replace Mid-Band Dual in Position 1 with (1) Mid-Band Quad.

Replace Radio 2217 B66 with (1) Radio 4460 B25+B66 for L2100, L1900 (both carriers), and U2100 in Position 1 at antenna.

Remove Mid-Band Dual in Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
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	Proposed Power Systems Equipment
Enclosure	**1**
Enclosure Type	Enclosure 6160

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 1 - Site Information

Site ID: CTHA142G
Status: Draft
Version: 5
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 6/15/2021 3:8:54 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

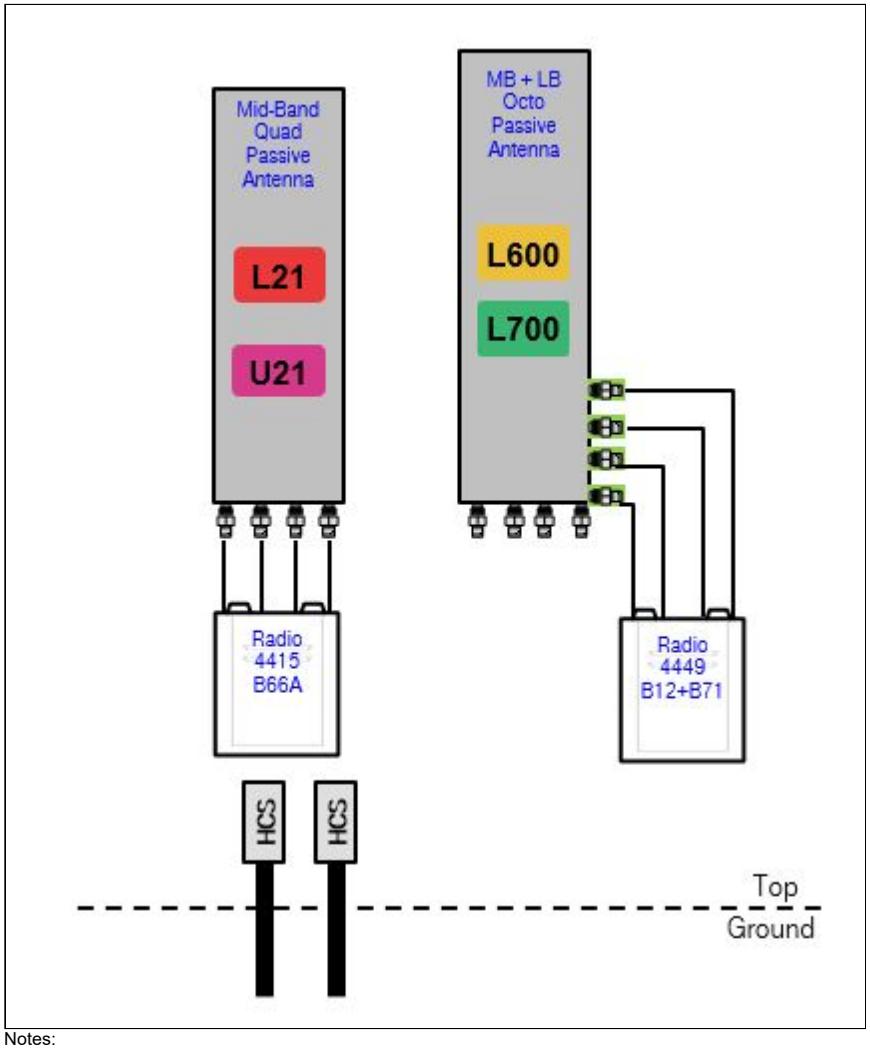
Site Name: CTHA142
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Eversource

Latitude: 41.89263319
Longitude: -72.76570517
Address: 7 Hoskins Rd
City, State: Bloomfield, CT
Region: NORTHEAST

RAN Template: 67D5A998E Hybrid			AL Template: 67D5998E_1xAIR+1OP+1QP	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

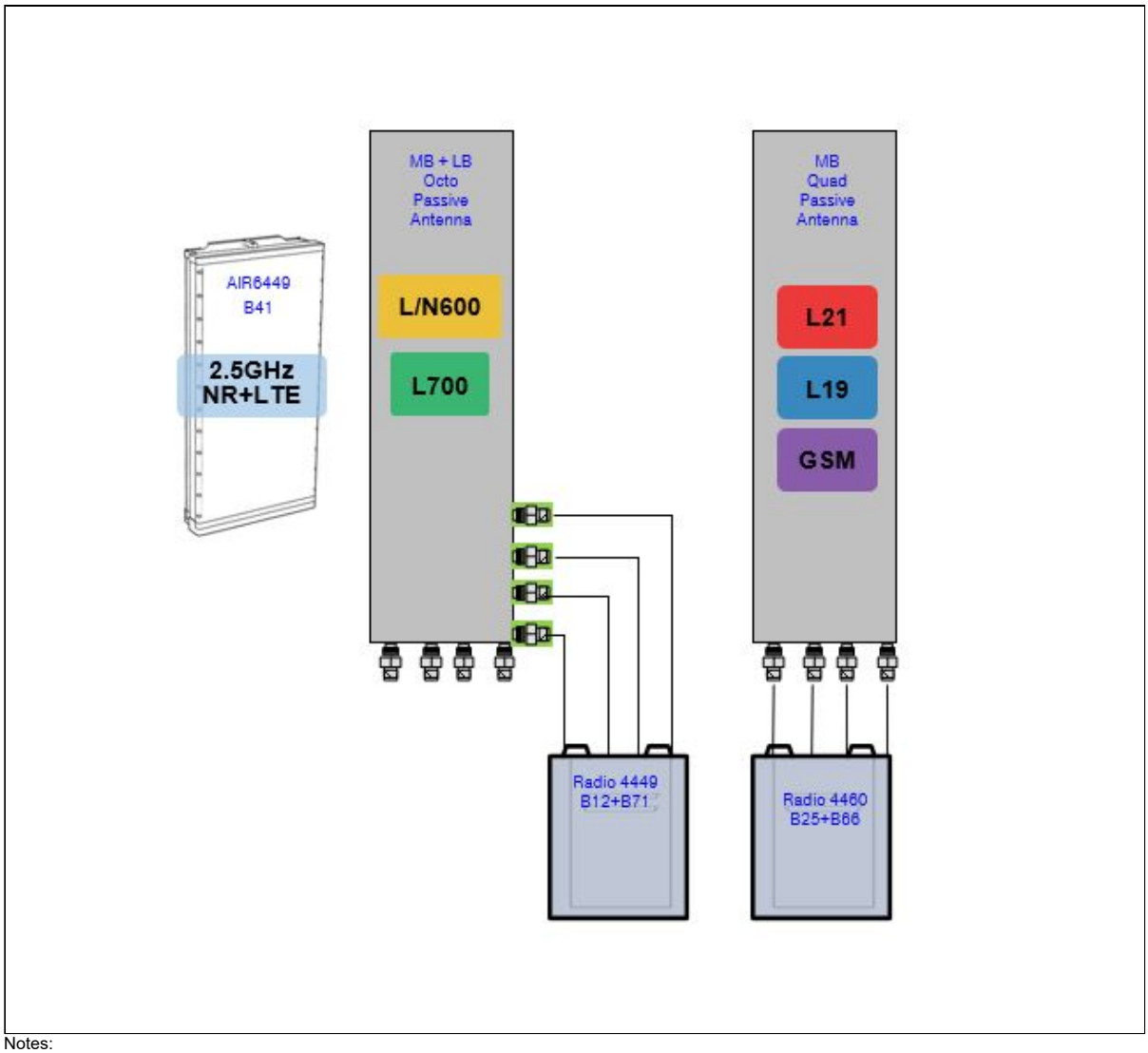
67D07B.JPG



Notes:

Section 3 - Proposed Template Images

67D5998E_1xAIR+1OP+1QP.JPG



Notes:

Section 4 - Siteplan Images

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RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 67D07B 6102 MUAC

Enclosure	1
Enclosure Type	RBS 6102
Baseband	DUW30 (U2100); BB 5216 (L2100); BB 6630 (L700, L600, N600)
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length* **(x 4)**; Ericsson 6x12 HCS *Select Length & AWG* **(x 2)**

Proposed RAN Equipment

Template: 67D5A998E Hybrid

Enclosure	1	2	3
Enclosure Type	RBS 6102	Enclosure 6160	B160
Baseband	DUW30 (U2100); BB 6648 (L2100, L1900); BB 6630 (L700, L600, N600)	BB 6648 (L2500, N2500)	
Hybrid Cable System	Ericsson 6x12 HCS *Select AWG & Length* **(x 5)**; Ericsson 6x12 HCS *Select Length & AWG*	Ericsson Hybrid Trunk 6/24 4AWG 60m **(x 3)**; PSU 4813	
Transport System		CSR IXRe V2 (Gen2)	

RAN Scope of Work:

Location of new cabinets to be determined.

Replace BB5216 with (1) BB6648 for L2100 and L1900 (both carriers) in existing base station cabinet.

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6648 for L2500 and N2500 (MMBB - Mixed Mode Baseband) to new Enclosure 6160.

Add (1) PSU4813 Voltage Booster to new Enclosure 6160.

Add (3) 6X24 HCS ([1] per sector) terminating at the Enclosure 6160. Connect DC for the AIR6449 B41 to the PSU4813 Voltage Booster.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 6 - A&L Equipment

Existing Template: 67D07B_1QP+1OP
Proposed Template: 67D5998E_1xAIR+1OP+1QP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1	2				3	4
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APXV18-206516S-C-A20 (Dual)
Azimuth	20	20					20
M. Tilt	0	0					0
Height	140	140					140
Ports	P1	P2	P3	P4	P5		P6
Active Tech.	U2100 L2100	L700 L600 N600	L700 L600 N600				
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2				
Cables							
TMAs							
Diplexers / Combiners							
Radio	Radio 2217 B66A (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts per Sector. Empty Position 3 ***
Replace LB/MB Quad in Position 2 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 2 with (1) Radio 4449 B71+B12 for L600 and L700.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	20		20				20	
M. Tilt	0		0				0	
Height	140		140				140	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 U2100	L2100 L1900 U2100	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt								
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Replace Mid-Band Dual in Position 1 with (1) Mid-Band Quad.

Replace Radio 2217 B66 with (1) Radio 4460 B25+B66 for L2100, L1900 (both carriers), and U2100 in Position 1 at antenna.

Remove Mid-Band Dual in Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	1	2				3	4
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APXV18-206516S-C-A20 (Dual)
Azimuth	130	130					130
M. Tilt	0	0					0
Height	140	140					140
Ports	P1	P2	P3	P4	P5		P6
Active Tech.	U2100 L2100	L700 L600 N600	L700 L600 N600				
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2				
Cables							
TMAs							
Diplexers / Combiners							
Radio	Radio 2217 B66A (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts per Sector. Empty Position 3 ***
Replace LB/MB Quad in Position 2 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 2 with (1) Radio 4449 B71+B12 for L600 and L700.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	130		130				130	
M. Tilt	0		0				0	
Height	140		140				140	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 U2100	L2100 L1900 U2100	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt								
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Replace Mid-Band Dual in Position 1 with (1) Mid-Band Quad.

Replace Radio 2217 B66 with (1) Radio 4460 B25+B66 for L2100, L1900 (both carriers), and U2100 in Position 1 at antenna.

Remove Mid-Band Dual in Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro						
Antenna	**1**	**2**				**3**	**4**
Antenna Model	RFS - APXV18-206516S-C-A20 (Dual)	RFS - APXVAALL24_43-U-NA20 (Octo)				Empty Antenna Mount (Empty mount)	RFS - APXV18-206516S-C-A20 (Dual)
Azimuth	280	280					280
M. Tilt	0	0					0
Height	140	140					140
Ports	**P1**	**P2**	**P3**	**P4**	**P5**		**P6**
Active Tech.	U2100 L2100	L700 L600 N600	L700 L600 N600				
Dark Tech.							
Restricted Tech.							
Decomm. Tech.							
E. Tilt	2	2	2				
Cables							
TMAs							
Diplexers / Combiners							
Radio	Radio 2217 B66A (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment							

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts per Sector. Empty Position 3 ***
Replace LB/MB Quad in Position 2 with (1) LB/MB Octo.
Replace RRUS11 B12 in Position 2 with (1) Radio 4449 B71+B12 for L600 and L700.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro							
Antenna	1		2				3	
Antenna Model	RFS - APX16DWV-16DWV-S-E-A20 (Quad)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)	
Azimuth	280		280				280	
M. Tilt	0		0				0	
Height	140		140				140	
Ports	P1	P2	P3	P4	P5	P6	P7	P8
Active Tech.	L2100 L1900 U2100	L2100 L1900 U2100	L700 L600 N600	L700 L600 N600			L2500 N2500	L2500 N2500
Dark Tech.								
Restricted Tech.								
Decomm. Tech.								
E. Tilt								
Cables	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper **(x2)**	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper			Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs								
Diplexers / Combiners								
Radio	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)	Radio 4449 B71+B85 (At Antenna)	SHARED Radio 4449 B71+B85 (At Antenna)				
Sector Equipment								

Unconnected Equipment:

Scope of Work:

Replace Mid-Band Dual in Position 1 with (1) Mid-Band Quad.

Replace Radio 2217 B66 with (1) Radio 4460 B25+B66 for L2100, L1900 (both carriers), and U2100 in Position 1 at antenna.

Remove Mid-Band Dual in Position 3.

Install (1) AIR6449 B41 for L2500 and N2500 in Position 3.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A998E Hybrid	67D5998E_1xAIR+1OP+1QP

CTHA142G_Anchor_5_draft

Print Name: Preliminary (RFDS_for_Scoping)

Section 7 - Power Systems Equipment

Existing Power Systems Equipment
----- This section is intentionally blank. -----

	Proposed Power Systems Equipment
Enclosure	**1**
Enclosure Type	Enclosure 6160

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: CTHA142G

CTHA142
7 Hoskins Road
Bloomfield, Connecticut 06002

July 19, 2021

EBI Project Number: 6221003831

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**20.18%**

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July 19, 2021

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

Emissions Analysis for Site: CTHA142G - CTHA142

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **7 Hoskins Road** in **Bloomfield, Connecticut** 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 ($\mu W/cm^2$). 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), 2100 MHz (AWS) and 11 GHz 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 7 Hoskins Road in Bloomfield, Connecticut 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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 power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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

1) 2 LTE channels (600 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

2) 1 NR channel (600 MHz Band) was considered for each sector of the proposed installation. This Channel has a transmit power of 80 Watts.

3) 2 LTE channels (700 MHz Band) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

4) 2 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

5) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

6) 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.

7) 1 LTE Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

8) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

9) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

10) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

11) 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.

12) 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

13) The antennas used in this modeling are the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 2100 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 2100 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APX16DWV-16DWV-S-E-A20 for the 1900 MHz / 2100 MHz / 2100 MHz channel(s), the RFS APXVAALL24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s) in Sector C. 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 manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, 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.

14) The antenna mounting height centerline of the proposed antennas is 140 feet above ground level (AGL).

15) 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.

16) 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:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20	Make / Model:	RFS APX16DWV-16DWV-S-E-A20
Frequency Bands:	1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 2100 MHz / 2100 MHz
Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd	Gain:	15.9 dBd / 15.9 dBd / 15.9 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	6	Channel Count:	6	Channel Count:	6
Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts	Total TX Power (W):	300 Watts
ERP (W):	11,671.35	ERP (W):	11,671.35	ERP (W):	11,671.35
Antenna A1 MPE %:	**2.34%**	Antenna B1 MPE %:	**2.34%**	Antenna C1 MPE %:	**2.34%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	5	Channel Count:	5	Channel Count:	5
Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts	Total TX Power (W):	200 Watts
ERP (W):	4,151.83	ERP (W):	4,151.83	ERP (W):	4,151.83
Antenna A2 MPE %:	**1.98%**	Antenna B2 MPE %:	**1.98%**	Antenna C2 MPE %:	**1.98%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	140 feet	Height (AGL):	140 feet	Height (AGL):	140 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A3 MPE %:	**7.28%**	Antenna B3 MPE %:	**7.28%**	Antenna C3 MPE %:	**7.28%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	11.59%
Eversource Energy	0.27%
DESPP-DSET	1.1%
Cingular	4.72%
Verizon	2.5%
Site Total MPE % :	20.18%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	11.59%
T-Mobile Sector B Total:	11.59%
T-Mobile Sector C Total:	11.59%
Site Total MPE % :	20.18%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 1900 MHz LTE	2	2334.27	140.0	9.35	1900 MHz LTE	1000	0.93%
T-Mobile 2100 MHz UMTS	2	1167.14	140.0	4.67	2100 MHz UMTS	1000	0.47%
T-Mobile 2100 MHz LTE	2	2334.27	140.0	9.35	2100 MHz LTE	1000	0.93%
T-Mobile 600 MHz LTE	2	591.73	140.0	2.37	600 MHz LTE	400	0.59%
T-Mobile 600 MHz NR	1	1577.94	140.0	3.16	600 MHz NR	400	0.79%
T-Mobile 700 MHz LTE	2	695.22	140.0	2.78	700 MHz LTE	467	0.60%
T-Mobile 2500 MHz LTE 1C & 2C Traffic	1	11044.63	140.0	22.11	2500 MHz LTE 1C & 2C Traffic	1000	2.21%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	140.0	2.15	2500 MHz LTE 1C & 2C Broadcast	1000	0.22%
T-Mobile 2500 MHz NR Traffic	1	22089.26	140.0	44.23	2500 MHz NR Traffic	1000	4.42%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	140.0	4.30	2500 MHz NR Broadcast	1000	0.43%
						Total:	**11.59%**

• NOTE: Totals may vary by approximately 0.01% due to summation of remainders in calculations.

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:	11.59%
Sector B:	11.59%
Sector C:	11.59%
T-Mobile Maximum MPE % (Sector A):	11.59%
Site Total:	20.18%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **20.18%** 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.