NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Northeast Site Solutions
Victoria Masse
420 Main Street #2, Sturbridge, MA 01566
860-306-2326
victoria@northeastsitesolutions.com

September 8, 2022

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

RE: Notice of Exempt Modification
135 New Road, Madison, CT 06443
Latitude: 41.29343600
Longitude: -72.57840600
T-Mobile Site#: CT11029I_Anchor & L600

Dear Ms. Bachman:
T-Mobile currently maintains nine (9) antennas at the 159-foot level of the existing 180-foot guyed lattice tower located at 135 New Road, Madison, CT 06443. The tower is owned by Eversource and property is owned by Connecticut Light and Power. T-Mobile now intends to remove nine (9) existing antenna and replace with six (6) new 600/700/1900/2100 MHz antenna. The new antennas would be installed at the 159-foot level of the guyed lattice tower. This modification includes B2, B5 hardware that is both 4G (LTE), and 5G capable.
T-Mobile Planned Modifications:
Remove:
(3) AIR21 KRC118023 Antenna
(6) Coax Line
(3) Ericsson KRY 112 TMA

Remove and Replace:
(3) Andrew LNX-6515DS Antenna (Remove) – (3) RFS APXVAALL24 600/700/1900/2100 MHz Antenna (Replace)
(3) AIR21 KRC118023 Antenna (Remove) – (3) AIR6149 Antenna (Replace)
(3) RRUS11 B12 Radio (Remove) – (3) Radio 4460 B25

Install New:
(3) RRU 4480 B71
(3) Hybrid Line

Existing to Remain: NONE

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This facility was approved by the Town of Madison, they could not locate the original zoning approval date. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to Peggy Lyons, First Selectwoman and Erin Mannix, Town Planner, as well as the property owner and the tower owner.

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,

Victoria Masse

Victoria Masse
Mobile: 860-306-2326
Fax: 413-521-0558
Office: 420 Main Street, Unit 2, Sturbridge MA 01566
Email: victoria@northeastsitesolutions.com

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments:

cc:
Peggy Lyons, First Selectwoman
Madison Town Campus
8 Campus Drive
Madison, CT 06443

Erin Mannix, Town Planner
Madison Town Campus
8 Campus Drive
Madison, CT 06443

Connecticut Light & Power Co – as property owner

Eversource – as tower owner

Exhibit A

Original Facility Approval

Victoria Masse <victoria@northeastsitesolutions.com>

T-Mobile Original Zoning Approval Request for 135 New Road, Madison CT (CT11029I)

Pettola, Maria <pettolam@madisonct.org> Tue, Sep 6, 2022 at 12:57 PM
To: Victoria Masse <victoria@northeastsitesolutions.com>
Cc: "Mannix, Erin" <mannixe@madisonct.org>

Hi Victoria

I can not locate the original approval however I see a “Notice of Intent to Modify” from 2002 where the existing AT&T tower is 180 feet.

It also mentioned it was previously inspected in 1997, so obviously it has been there for quite some time.

Maria Pettola, CZET

Planning & Zoning Department

Town of Madison

8 Campus Drive

Madison, CT 06443

(203) 245-5631

Telecommunication device for the deaf: 203.245.5638

From: Victoria Masse <victoria@northeastsitesolutions.com>
Sent: Thursday, September 1, 2022 5:00 PM
To: Pettola, Maria <pettolam@madisonct.org>
Subject: Re: T-Mobile Original Zoning Approval Request for 135 New Road, Madison CT (CT11029I)

CAUTION: This email originated from outside of the Town of Madison/Madison Public Schools. Do not click links, open attachments, or reply unless you recognize the sender and know the content is safe.

Good Afternoon Maria,

I apologize for the delayed response.

It would be before November 2015, that is the earliest filing I could find on the CT Siting Council website.

Thank you

On Tue, Aug 23, 2022 at 12:28 PM Pettola, Maria <pettolam@madisonct.org> wrote:

> Hi Victoria
>
> Could you give me an approximate date of original approval?
>
> I can't find anything – all I see is modifications in the early 200's
>
> ---
>
> **From:** Victoria Masse <victoria@northeastsitesolutions.com>
> **Sent:** Thursday, August 18, 2022 4:43 PM
> **To:** Pettola, Maria <pettolam@madisonct.org>; DeLaura, John <delauraj@madisonct.org>; Mannix, Erin <mannixe@madisonct.org>
> **Cc:** Denise Sabo <denise@northeastsitesolutions.com>; Matt Bandle <matt@northeastsitesolutions.com>
> **Subject:** T-Mobile Original Zoning Approval Request for 135 New Road, Madison CT (CT11029l)
>
> **CAUTION:** This email originated from outside of the Town of Madison/Madison Public Schools. Do not click links, open attachments, or reply unless you recognize the sender and know the content is safe.
>
> Good Afternoon,
>
> I am reaching out on behalf of T-Mobile regarding their proposed antenna upgrades on an existing tower located at **135 New Road**.
>
> Currently we are working with T-Mobile to file with the Connecticut Siting Council, part of the Siting Council's filing requirements is that we provide the original zoning approval of the tower build. It does not appear that the council has this on their website so that is why I am reaching out to you for this information.
>
> I have attached the property card for your reference.
>
> If you could review your records for any approvals of when this tower was originally approved to be built with the height that the tower was originally approved for that would be greatly appreciated.

Please let me know if you have any questions or need any additional information, I can be reached at 860-306-2326.

--

Thank you

--

Victoria Masse

Zoning & Permitting Specialist

Notary Public

Mobile: 860-306-2326

Office: 420 Main Street Unit 1 Box 2 Sturbridge, MA 01566

Email: victoria@northeastsitesolutions.com

--

Thank you

--

Victoria Masse

Zoning & Permitting Specialist

Notary Public

Mobile: 860-306-2326

Office: 420 Main Street Unit 1 Box 2 Sturbridge, MA 01566

Email: victoria@northeastsitesolutions.com


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Exhibit B

Property Card

135 NEW RD

Location	135 NEW RD	**MBLU**	60/ 8/ / /
Acct#	00379700	**Owner**	CONNECTICUT LIGHT AND POWER CO
Assessment	$4,891,900	**Appraisal**	$7,916,100
PID	3932	**Building Count**	2
Dev. Map	1754 &1773		

Current Value

Appraisal					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2020	$5,424,800	$37,500	$1,054,700	$1,399,100	$7,916,100
Assessment					
Valuation Year	**Building**	**Extra Features**	**Outbuildings**	**Land**	**Total**
2020	$3,797,400	$26,300	$738,300	$329,900	$4,891,900

Parcel Addreses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner	CONNECTICUT LIGHT AND POWER CO	**Sale Price**	$0
Co-Owner		**Book & Page**	0139/0397
Care Of		**Sale Date**	

Ownership History

Ownership History			
Owner	**Sale Price**	**Book & Page**	**Sale Date**
CONNECTICUT LIGHT AND POWER CO	$0	0139/0397	

Building Information

Building 1 : Section 1

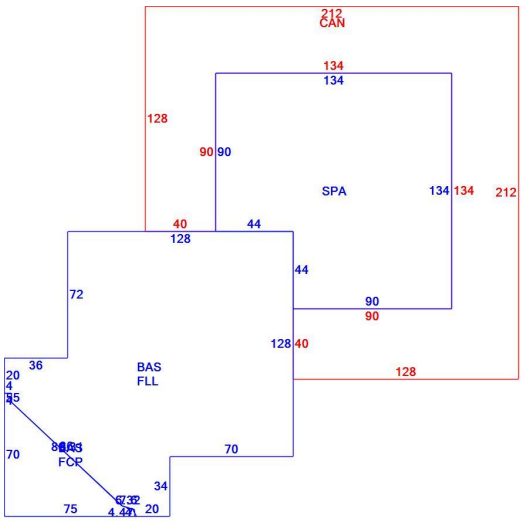
Year Built: 1978
Living Area: 29,609

Building Attributes	
Field	**Description**
Style:	Office Bldg
Model	Commercial
Grade	Good -
Stories:	2
Occupancy	2.00
Exterior Wall 1	Stone/Masonry
Exterior Wall 2	Concr/Cinder
Roof Structure	Flat
Roof Cover	T+G/Rubber
Interior Wall 1	Minim/Masonry
Interior Wall 2	Drywall
Interior Floor 1	Concr-Finished
Interior Floor 2	Carpet
Heating Fuel	Electric
Heating Type	Forced Air-Duc
AC Type	Central
Struct Class	
Bldg Use	Office Building
Total Rooms	
Total Bedrms	00
Total Baths	0
Fireplace	
Xtra Fireplaces	
1st Floor Use:	3400
Heat/AC	Heat A/C Split
Frame Type	Masonary
Baths/Plumbing	Average
Ceiling/Wall	Ceil and Wall
Rooms/Prtns	Average
Wall Height	14.00
% Comn Wall	0.00

Building Photo

(http://images.vgsi.com/photos/MadisonCTPhotos//\01\01\80\17.jpg)

Building Layout



(ParcelSketch.ashx?pid=3932&bid=100358)

Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	21,599	21,599
SPA	Service Production Area	16,020	8,010
CAN	Canopy	21,868	0
FCP	Carport	2,551	0
FLL	Finished Lower Level	19,048	0
		81,086	29,609

Building 2 : Section 1

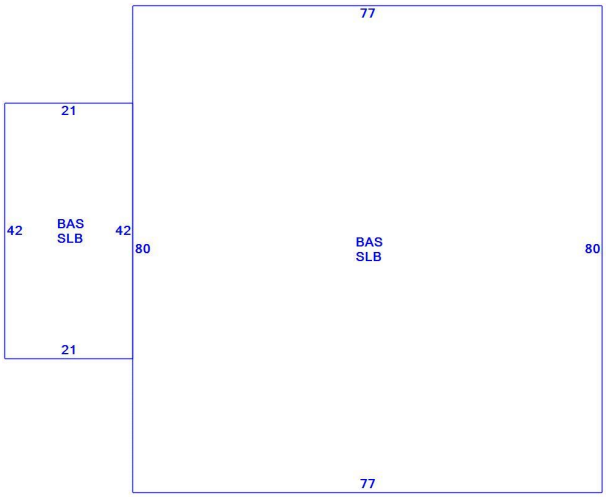
Year Built: 1978
Living Area: 7,042

Building Attributes : Bldg 2 of 2	
Field	**Description**
Style:	Service Shop
Model	Commercial
Grade	Average
Stories:	1
Occupancy	1.00
Exterior Wall 1	Brick/Masonry
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	T+G/Rubber
Interior Wall 1	Minim/Masonry
Interior Wall 2	
Interior Floor 1	Concr-Finished
Interior Floor 2	
Heating Fuel	Electric
Heating Type	Electr Basebrd
AC Type	None
Struct Class	
Bldg Use	Office Building
Total Rooms	
Total Bedrms	00
Total Baths	0
Fireplace	
Xtra Fireplaces	
1st Floor Use:	340I
Heat/AC	None
Frame Type	Masonary
Baths/Plumbing	None
Ceiling/Wall	None
Rooms/Prtns	LIght
Wall Height	24.00
% Comn Wall	0.00

Building Photo

(http://images.vgsi.com/photos/MadisonCTPhotos//\01\01\34\91.jpg)

Building Layout



(ParcelSketch.ashx?pid=3932&bid=100362)

Building Sub-Areas (sq ft)			
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	7,042	7,042
SLB	Slab	7,042	0
		14,084	7,042

Extra Features

Extra Features				
Code	**Description**	**Size**	**Value**	**Bldg #**
LDL1	Load Levelers	1.00 UNITS	$2,500	1
MEZ1	Mezzanine Unf	3960.00 S.F.	$27,600	1
MEZ1	Mezzanine Unf	1600.00 S.F.	$7,400	2

Land

Land Use

Use Code 3400
Description Office Building
Zone RU-2

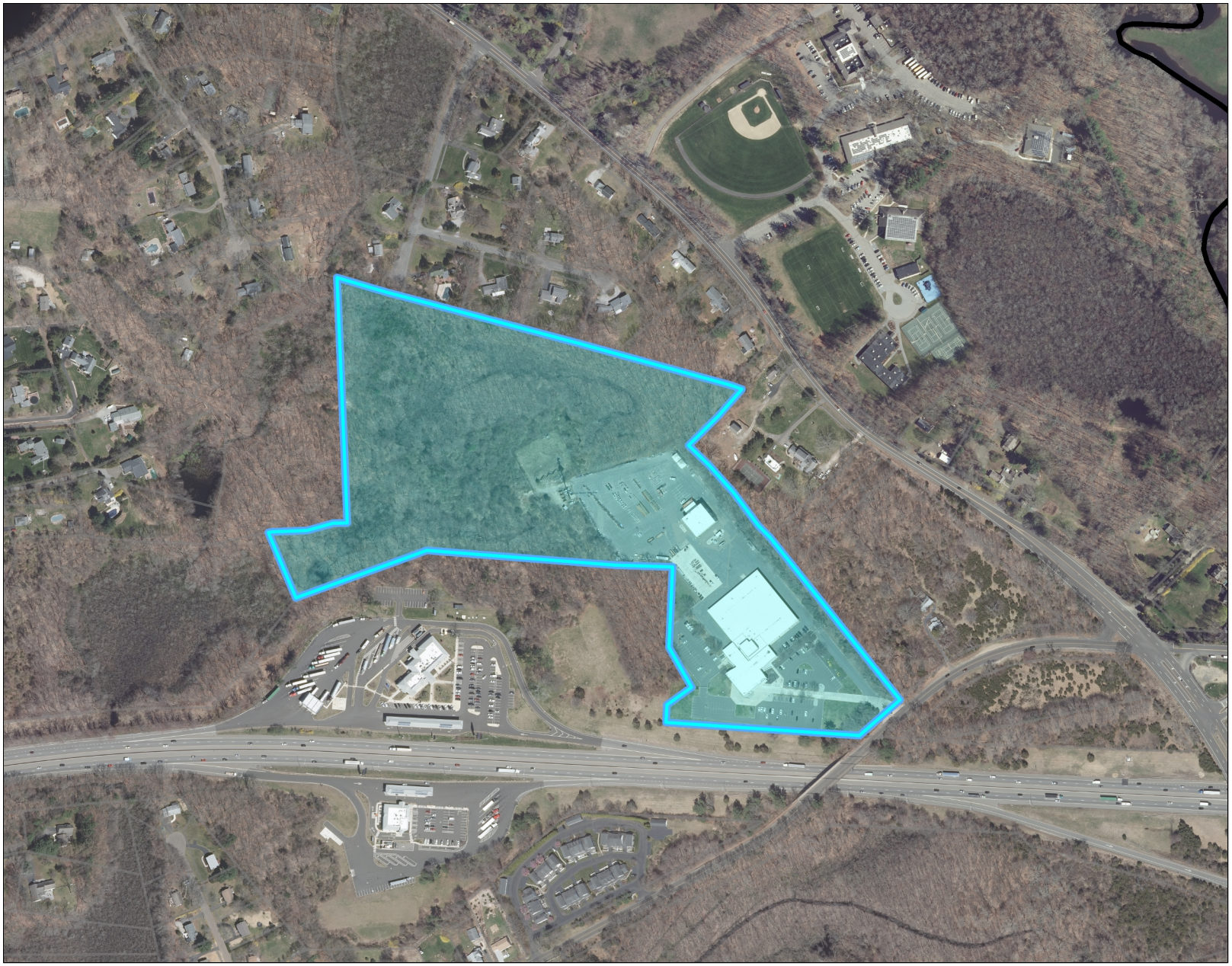
Land Line Valuation

Size (Acres) 37.98

Outbuildings

Outbuildings						
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
PAV1	Paving Asphalt			400000.00 S.F.	$280,000	1
LT12	Lights(4)			26.00 UNITS	$52,000	1
LT10	Lights (2)			3.00 UNITS	$3,000	1
LT9	Lights			18.00 UNITS	$12,600	1
FN3	Fence 6'			6000.00 L.F.	$36,000	1
SHD1	Shed			96.00 S.F.	$600	1
SHD1	Shed			120.00 S.F.	$800	1
SHD6	Pump Sta.			192.00 S.F.	$14,400	1
SHD1	Shed			96.00 S.F.	$600	1
SHD1	Shed			80.00 S.F.	$300	1
CEL	Cell Tower			4.00 UNITS	$654,400	1

South Central Regional COG



Legend

Location

Notes

956 0 478 956

Feet

1: 5,736

N

Exhibit C

Construction Drawings

SITE NAME: MADISON/ I-95/ X61/ JCT_1

SITE ID: CT11029I

135 NEW ROAD

MADISON, CT 06443

T-MOBILE A/L TEMPLATE (PROVIDED BY RFDS)
67E5998E_1xAIR+1OP

T-MOBILE RAN TEMPLATE (PROVIDED BY RFDS)
67E5D998E OUTDOOR

GENERAL NOTES

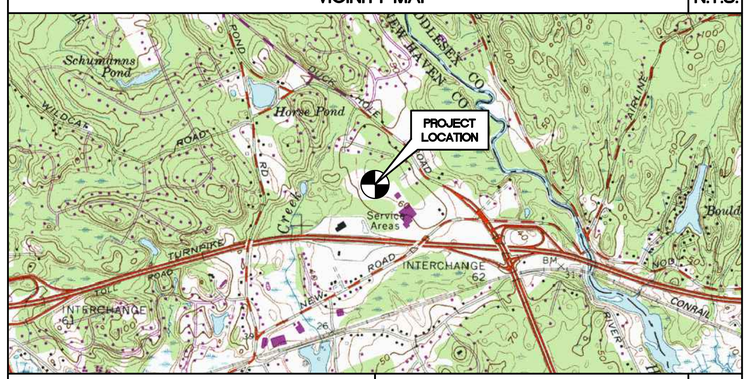
1. ALL WORK SHALL BE IN ACCORDANCE WITH THE 2015 INTERNATIONAL BUILDING CODE AS MODIFIED BY THE 2018 CONNECTICUT SUPPLEMENT, INCLUDING THE TIA/EIA-222 REVISION "G" "STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND SUPPORTING STRUCTURES." 2017 CONNECTICUT FIRE SAFETY CODE, NATIONAL ELECTRICAL CODE AND LOCAL CODES.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. 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.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. 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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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 AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. 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.
23. 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.
24. 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.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. 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.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

SITE LOCATION MAP

N.T.S.

VICINITY MAP

N.T.S.



COORDINATES AND GROUND ELEVATION ARE REFERENCED FROM GOOGLE EARTH.

SITE COORDINATES: LATITUDE: 41°-17'-36.32" N
LONGITUDE: 72°-34'-42.51" W
GROUND ELEVATION: 60'± AMSL

NORTH

PROJECT SUMMARY

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

1. REMOVE ALL COAXIAL LINES
2. REMOVE NORTEL CABINET
3. REMOVE EXISTING 100A ELECTRICAL PANEL
4. REMOVE EXISTING ANDREW: LNX 6515DS-A1M ANTENNAS, TYP. (1) PER SECTOR. TOTAL (3)
5. REMOVE EXISTING ERICSSON: AIR21 KRC18023-1_B2A_B4P ANTENNAS, TYP. (1) PER SECTOR, TOTAL OF (3)
6. REMOVE EXISTING ERICSSON: AIR21 KRC18023-1_B2P_B4A ANTENNAS, TYP. (1) PER SECTOR, TOTAL OF (3)
7. REMOVE EXISTING RRUS11 B12, TYP. (1) PER SECTOR, TOTAL OF (3)
8. REMOVE EXISTING TMAS
9. REMOVE EXISTING ANTENNA MOUNTS
10. INSTALL (3) 6x24 HYBRID CABLES
11. INSTALL ERICSSON: AIR6419 B41 ANTENNA, TYP. (1) PER SECTOR, TOTAL OF (3)
12. INSTALL RFS: APXVAALL24_43-U-NA20 ANTENNA, TYP. (1) PER SECTOR, TOTAL OF (3)
13. INSTALL ERICSSON: RADIO 4460 B25+B66, TYP. (1) PER SECTOR, TOTAL OF (3)
14. INSTALL ERICSSON: RADIO 4480 B71+B85, TYP. (1) PER SECTOR, TOTAL OF (3)
15. INSTALL T-MOBILE 6160 POWER ENCLOSURE
16. INSTALL T-MOBILE B160 BATTERY CABINET
17. INSTALL NEW 200A MINI PPC CABINET
18. INSTALL NEW 100A CIRCUIT BREAKER TO SERVE NEW EQUIPMENT
19. INSTALL SITE PRO: VFA12-HD ANTENNA FRAMES, TYP. (1) PER SECTOR, TOTAL OF (3)

PROJECT INFORMATION

SITE NAME:	MADISON/ I-95/ X61/ JCT_1
SITE ID:	CT11029I
SITE ADDRESS:	135 NEW ROAD MADISON, CT 06443
APPLICANT:	T-MOBILE NORTHEAST, LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT. 06002
CONTACT PERSON:	DEREK WAITE (PROJECT MANAGER) NORTHEAST SITE SOLUTIONS (231) 409-5439
ENGINEER OF RECORD:	CENTEK ENGINEERING, INC. 63-2 NORTH BRANFORD ROAD BRANFORD, CT. 06405 CARLO F. CENTORE, PE (203) 488-0580 EXT. 122
SITE COORDINATES:	LATITUDE: 41°-17'-36.32" N LONGITUDE: 72°-34'-42.51" W GROUND ELEVATION: 60'± AMSL SITE COORDINATES AND GROUND ELEVATION REFERENCED FROM GOOGLE EARTH.

SHEET INDEX

SHEET. NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	0
N-1	NOTES AND SPECIFICATIONS, ANT. SCHEDULE	0
C-1	COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION	0
C-2	ANTENNA PLANS AND ELEVATIONS	0
C-3	TYPICAL EQUIPMENT DETAILS	0
C-4	TYPICAL EQUIPMENT DETAILS	0
E-1	ELECTRICAL DIAGRAM AND CONDUIT ROUTING	0
E-2	TYPICAL ELECTRICAL DETAILS	0
E-3	ELECTRICAL SPECIFICATIONS	0

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
0	09/02/22	JLD	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

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: MADISON/ I-95/ X61/ JCT_1
SITE ID: CT11029I
135 NEW ROAD
MADISON, CT 06443

DATE: 03/23/22
SCALE: AS NOTED
JOB NO. 22006.01

TITLE SHEET

T-1

SHEET NO. 1 OF 9

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)
- ULTIMATE DESIGN SPEED: 130 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.
2. SHOULD ANY FIELD CONDITIONS PRECLUDE COMPLIANCE WITH THE DRAWINGS, THE CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ENGINEER AND SHALL NOT PROCEED WITH ANY AFFECTED WORK.
3. 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.
4. BEFORE BEGINNING THE WORK, THE CONTRACTOR IS RESPONSIBLE FOR MAKING SUCH INVESTIGATIONS CONCERNING PHYSICAL CONDITIONS (SURFACE AND SUBSURFACE) AT OR CONTIGUOUS TO THE SITE, WHICH MAY AFFECT PERFORMANCE AND COST OF THE WORK.
5. ALL DIMENSIONS, ELEVATIONS, AND OTHER REFERENCES TO EXISTING STRUCTURES, SURFACE, AND SUBSURFACE CONDITIONS ARE APPROXIMATE. NO GUARANTEE IS MADE FOR THE ACCURACY OR COMPLETENESS OF THE INFORMATION SHOWN. THE CONTRACTOR SHALL VERIFY AND COORDINATE ALL DIMENSIONS, ELEVATIONS AND ANGLES WITH EXISTING CONDITIONS AND WITH ARCHITECTURAL AND SITE DRAWINGS BEFORE PROCEEDING WITH ANY WORK.
6. AS THE WORK PROGRESSES, THE CONTRACTOR SHALL NOTIFY THE OWNER OF ANY CONDITIONS WHICH ARE IN CONFLICT OR OTHERWISE NOT CONSISTENT WITH THE CONSTRUCTION DOCUMENTS, AND SHALL NOT PROCEED WITH SUCH WORK UNTIL THE CONFLICT IS SATISFACTORILY RESOLVED.
7. 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.
8. 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.
9. 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.
10. 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.
11. 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.
12. 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.
13. ALL EQUIPMENT AND PRODUCTS PURCHASED ARE TO BE REVIEWED BY CONTRACTOR AND ALL APPLICABLE SUB-CONTRACTORS FOR ANY CONDITION PER THE MANUFACTURER'S RECOMMENDATIONS. CONTRACTOR TO SUPPLY THESE ITEMS AT NO COST TO OWNER OR CONSTRUCTION MANAGER.
14. 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.
15. ALL UTILITY WORK SHALL BE IN ACCORDANCE WITH LOCAL UTILITY COMPANY REQUIREMENTS AND SPECIFICATIONS.
16. 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.
17. 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.
18. 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.
19. 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.
20. 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.
21. 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 AND CONFIRMED WITH THE PROJECT MANAGER AND OWNER PRIOR TO THE COMMENCEMENT OF ANY WORK
22. 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.
23. 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.
24. 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.
25. THE COUNTY/CITY/TOWN MAY MAKE PERIODIC FIELD INSPECTIONS TO ENSURE COMPLIANCE WITH THE DESIGN PLANS, SPECIFICATIONS, AND CONTRACT DOCUMENTS.
26. 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.
27. PRIOR TO THE SUBMISSION OF BIDS, THE CONTRACTOR SHALL VISIT THE SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF ENGINEER ON RECORD, PRIOR TO THE COMMENCEMENT OF ANY WORK.

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.

ANTENNA/APPURTENANCE SCHEDULE

SECTOR	EXISTING/PROPOSED	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	(E/P) RRU (QTY)	(E/P) TMA (QTY)	(QTY) PROPOSED HYBRID/COAX
A1	PROPOSED	RFS (APXVAALL24_43-U_NA20)	95.9 x 24 x 8.7	159'	0°	(P) RADIO 4460 B25+B66 (1), (P) RADIO 4480 B71+B85		(3) 6x24 HYBRID CABLE
A2	PROPOSED	ERICSSON (AIR6419 B41)	33 x 16 x 9	159'	0°			
B1	PROPOSED	RFS (APXVAALL24_43-U_NA20)	95.9 x 24 x 8.7	159'	120°	(P) RADIO 4460 B25+B66 (1), (P) RADIO 4480 B71+B85		
B2	PROPOSED	ERICSSON (AIR6419 B41)	33 x 16 x 9	159'	120°			
C1	PROPOSED	RFS (APXVAALL24_43-U_NA20)	95.9 x 24 x 8.7	159'	240°	(P) RADIO 4460 B25+B66 (1), (P) RADIO 4480 B71+B85		
C2	PROPOSED	ERICSSON (AIR6419 B41)	33 x 16 x 9	159'	240°			

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

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T-MOBILE NORTHEAST LLC

SITE NAME: MADISON/ I-95/ X61/ JCT_1
SITE ID: CT11029I
135 NEW ROAD
MADISON, CT 06443

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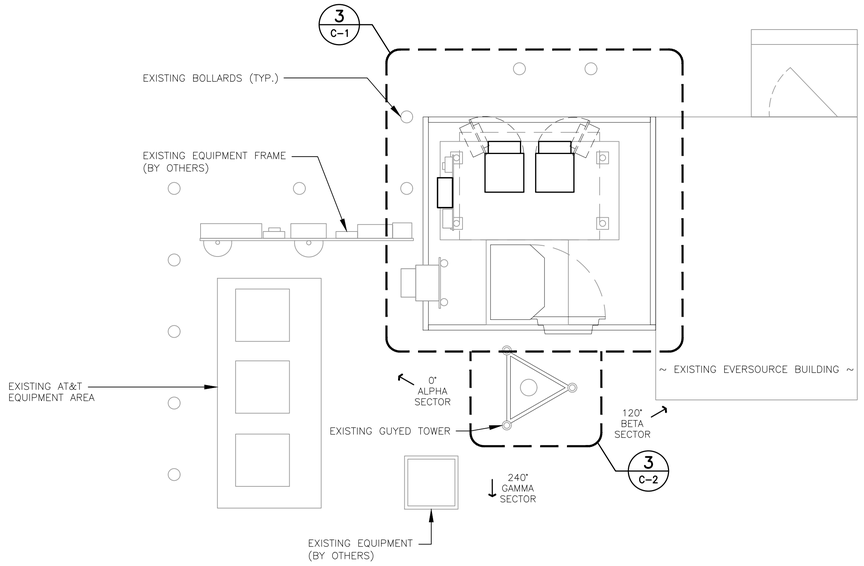
JOB NO. 22006.01

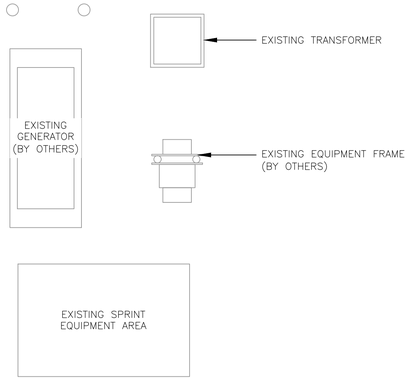
NOTES AND SPECIFICATIONS, ANT. SCHEDULE

N-1

SHEET NO. 2 OF 9



1 C-1 **COMPOUND PLAN - PROPOSED**
SCALE: 1" = 4'
TRUE NORTH



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..

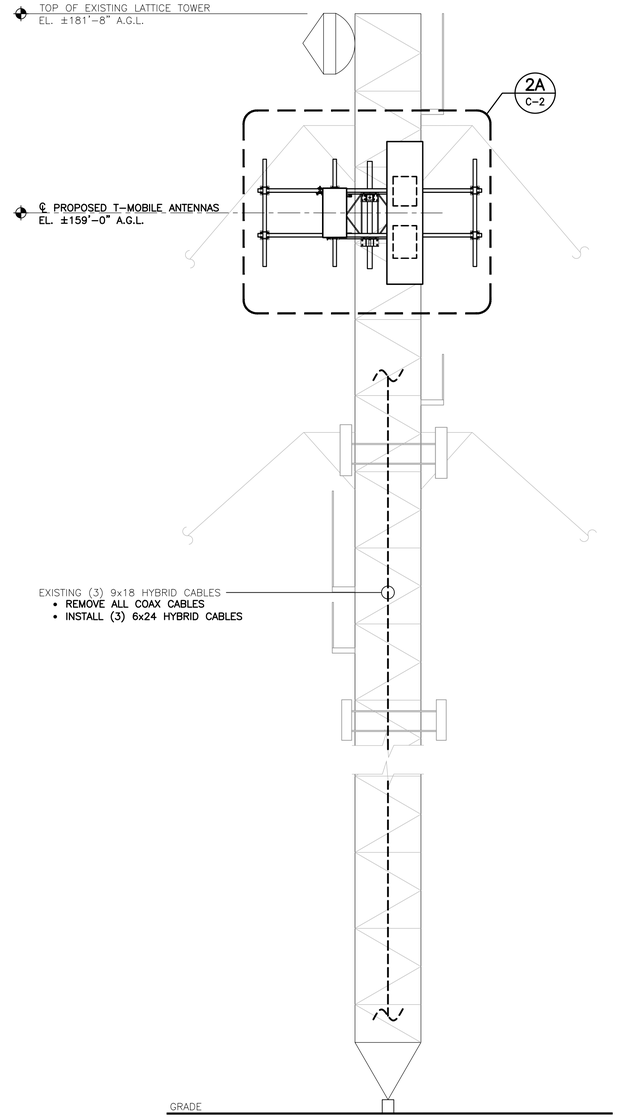
REFER TO THE ANTENNA MOUNT ANALYSIS REPORT PREPARED BY CENTEK ENGINEERING (PROJECT # 22006.01) DATED 04/04/22 FOR ADDITIONAL INFORMATION AND REQUIREMENTS.

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 # 22006.01) DATED 04/04/22 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.



4 C-1 **TOWER ELEVATION - PROPOSED**
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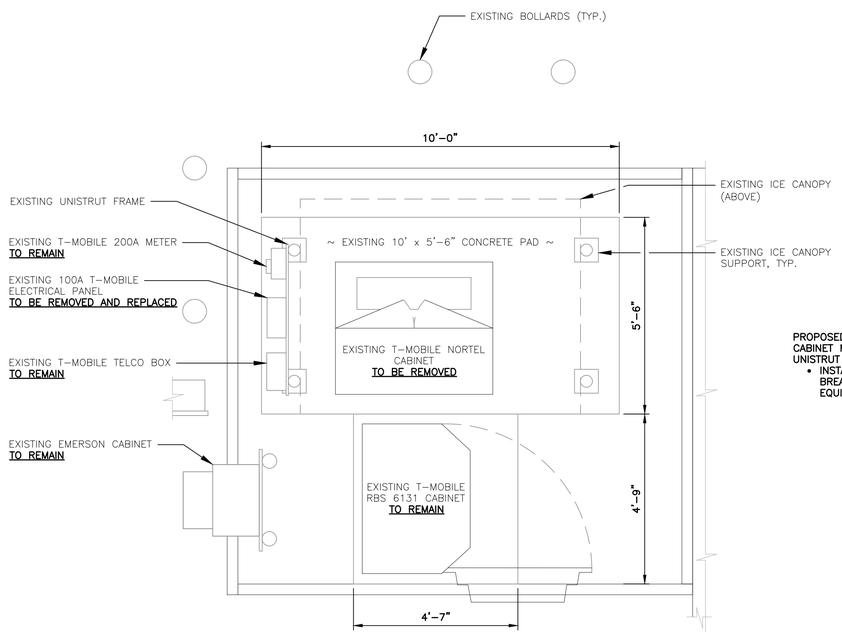
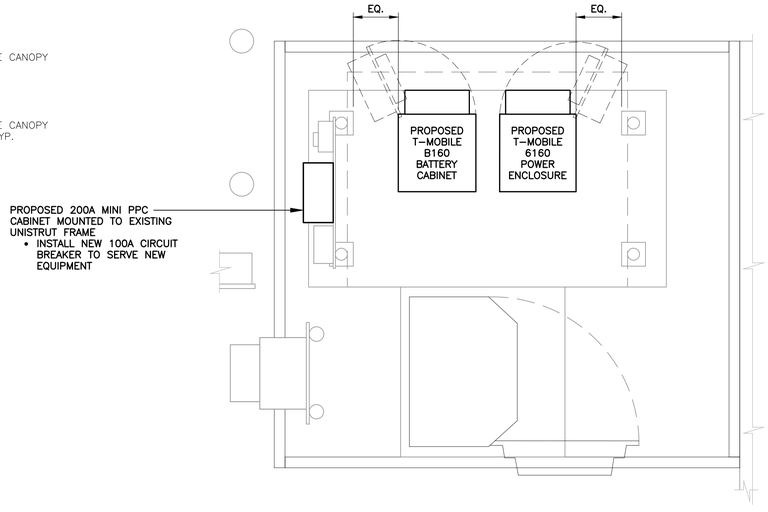


2 C-1 **EQUIPMENT PLAN - EXISTING**
SCALE: 1/2" = 1'
TRUE NORTH



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

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SITE NAME: MADISON/ I-95/ X61/ JCT_1

SITE ID: CT110291

135 NEW ROAD

MADISON, CT 06443

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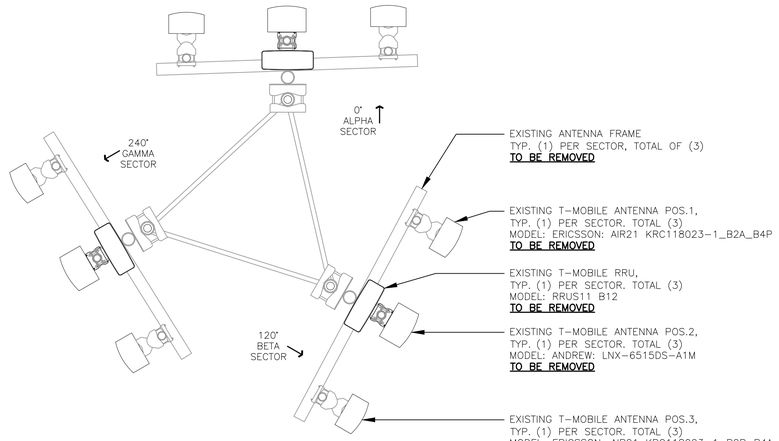
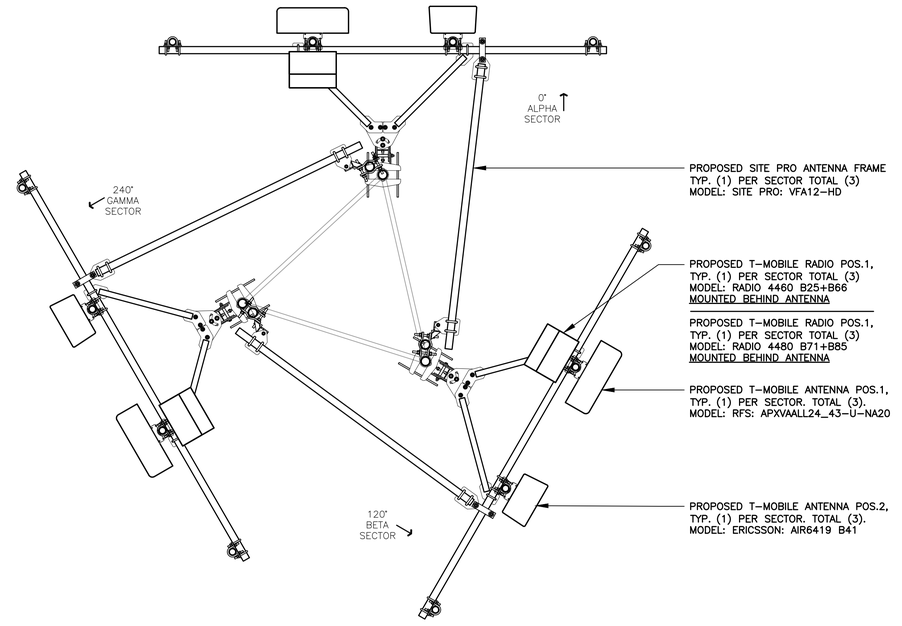
COMPOUND PLAN, EQUIPMENT PLANS, AND ELEVATION

C-1

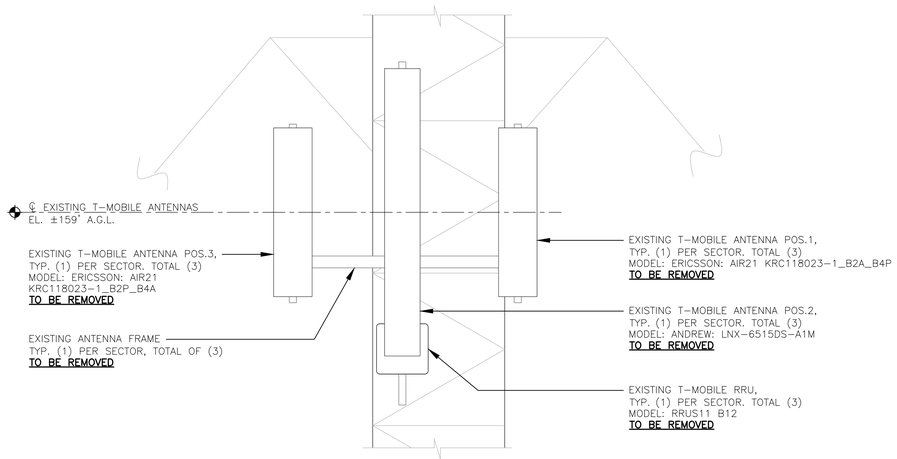
SHEET NO. 3 OF 9



1 / C-2 **ANTENNA ELEVATION - EXISTING**
SCALE: 1/2" = 1'
TRUE NORTH



2 / C-2 **ANTENNA ELEVATION - PROPOSED**
SCALE: 1/2" = 1'
TRUE NORTH



1A / C-2 **ANTENNA ELEVATION - EXISTING**
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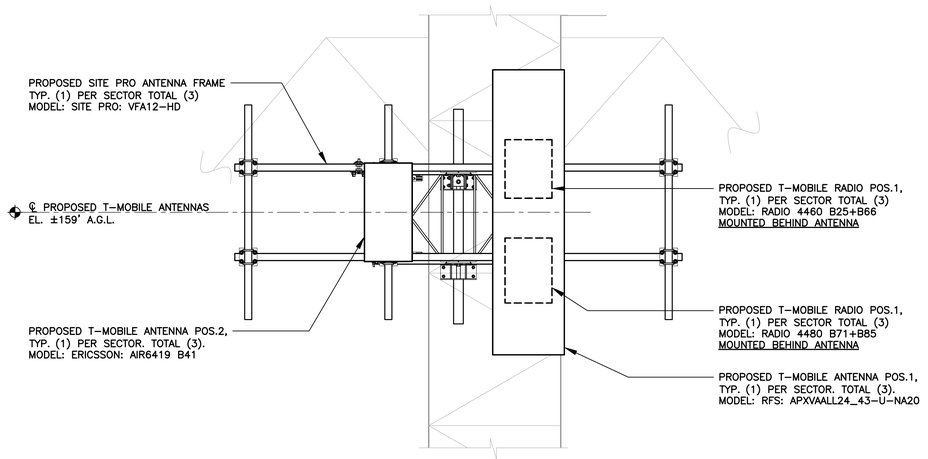

2A / C-2 **ANTENNA ELEVATION - PROPOSED**
SCALE: 1/2" = 1'

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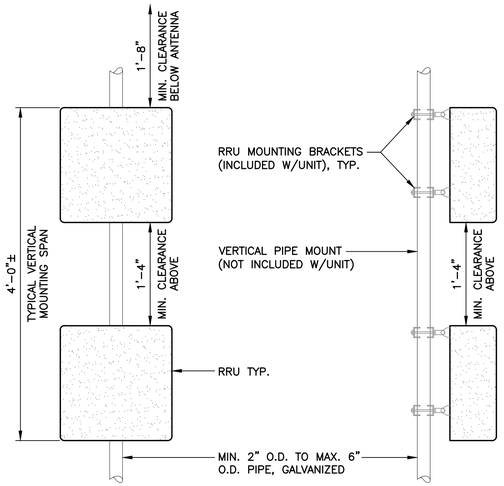
ANTENNA PLANS AND ELEVATIONS

C-2

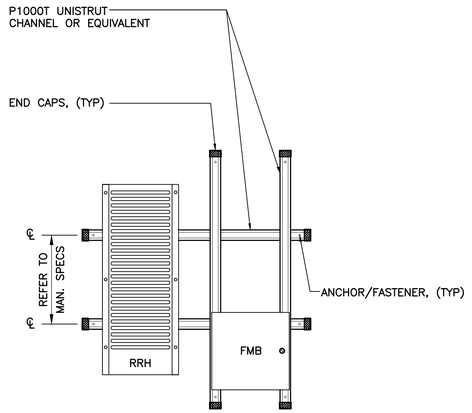
SHEET NO. 4 OF 9



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–3 TYPICAL RRU MOUNTING DETAILS

SCALE: NOT TO SCALE

AIR6419 B41

APXVAALL24_43-U-NA20

ALPHA/BETA/GAMMA ANTENNA		
EQUIPMENT	DIMENSIONS	WEIGHT
MAKE: ERICSSON MODEL: AIR6419 B41	33"L x 16"W x 9"D	±41 LBS.
MAKE: RFS MODEL: APXVAALL24_43-U-NA20	95.9"L x 24.0"W x 8.5"D	±150 LBS.
NOTES: 1. CONTRACTOR TO COORDINATE FINAL EQUIPMENT MODEL SELECTION WITH T–MOBILE CONSTRUCTION MANAGER PRIOR TO ORDERING.		

2 C–3 PROPOSED ANTENNA DETAIL

SCALE: NOT TO SCALE

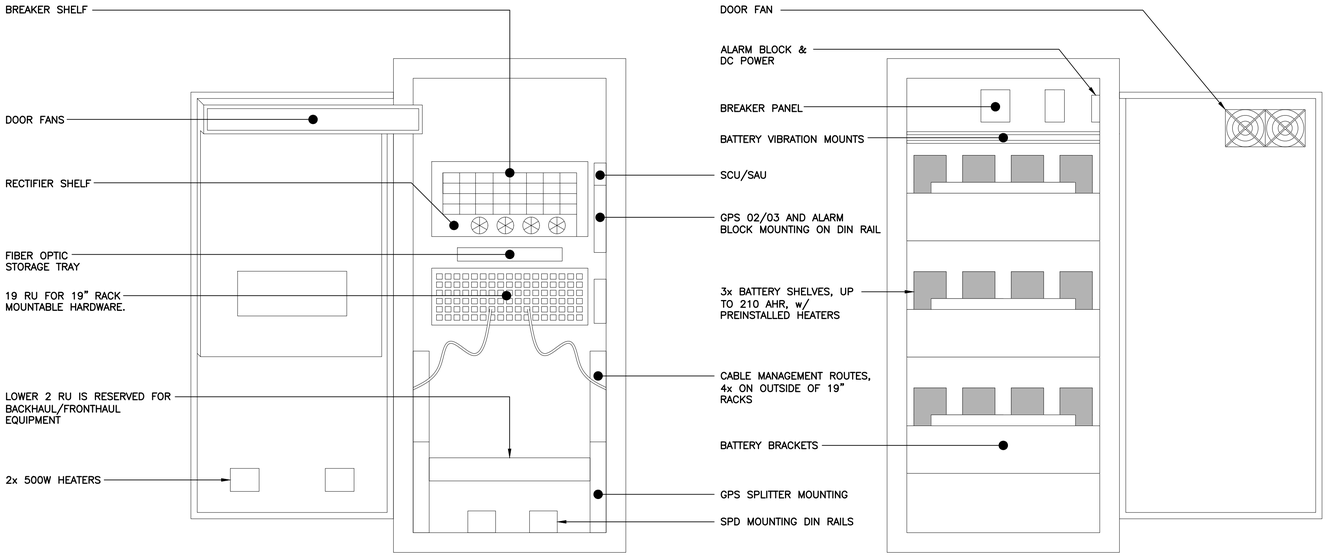
RADIO 4460 B25+B66

RADIO 4480 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 4480 B71+B85	21.8"L x 15.7"W x 7.5"D	±84 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.			

3 C–3 PROPOSED RRU 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

4 C–3 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

5 C–3 BATTERY B160 CABINET DETAIL

SCALE: NOT TO SCALE

VERTIV MINI PPC CABINET					
EQUIPMENT	PHASE	VOLTAGE	LOAD CENTER	AMP	DIMENSIONS
MAKE: VERTIV CATALOG: CACA75214090	1–PHASE	120/240	30 POSITIONS	200	39"H x 20"L x 10"W

6 C–3 30 POSITION MINI PPC CABINET

SCALE: NOT TO SCALE

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SITE ID: CT110291

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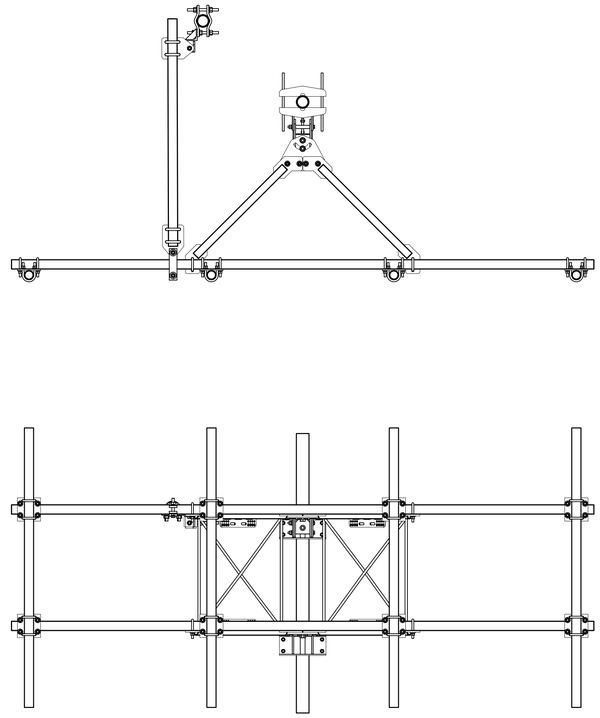
TYPICAL EQUIPMENT DETAILS

C-3

SHEET NO. 5 OF 9



SITE PRO - VFA12-HD

1 / C-4 **SITE PRO ANTENNA FRAME DETAIL**
SCALE: NOT TO SCALE

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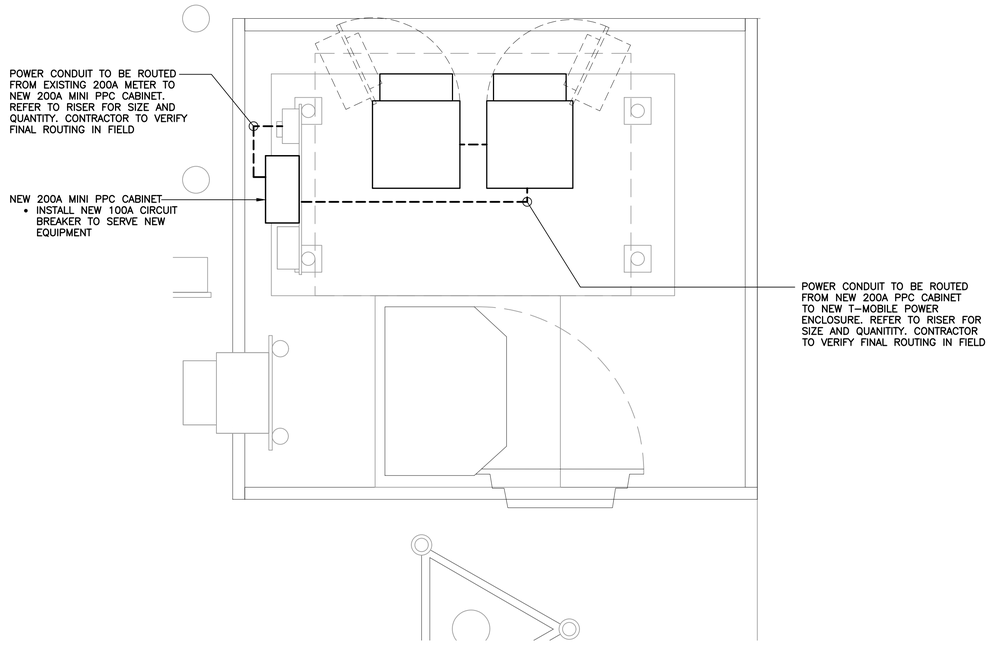
TYPICAL EQUIPMENT DETAILS

C-4

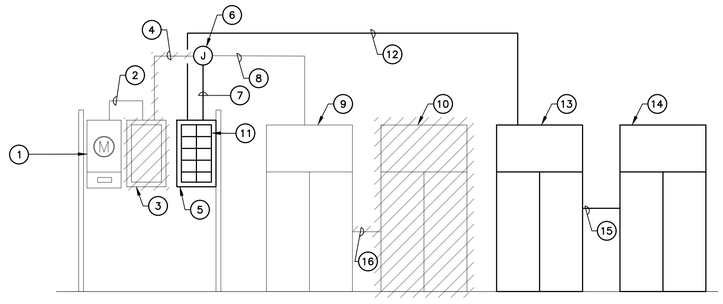
SHEET NO. 6 OF 9



1 / E–1 **ELECTRICAL CONDUIT ROUTING PLAN**
SCALE: 1/4" = 1'

RISER DIAGRAM NOTES

1. EXISTING 200A, METER TO REMAIN. CONTRACTOR TO VERIFY SIZE OF INCOMING SERVICE.
2. EXISTING CONDUITS AND CONDUCTORS TO REMAIN.
3. EXISTING 100A ELECTRICAL PANEL TO BE REMOVED AND REPLACED
4. SECTION OF EXISTING CONDUITS AND CONDUCTORS TO BE REMOVED.
5. NEW 200A MINI PPC CABINET.
6. JUNCTION BOX SIZED PER N.E.C. AS REQUIRED.
7. EXTEND EXISTING CONDUITS AND CONDUCTORS TO NEW PPC CABINET
8. SECTION OF CONDUITS AND CONDUCTORS TO REMAIN.
9. EXISTING CABINET TO REMAIN.
10. EXISTING CABINET TO BE REMOVED
11. NEW 100A/2P CIRCUIT BREAKER TO SERVE NEW EQUIPMENT CABINET.
12. (3) #1 AWG, (1) #8 AWG GROUND, 1–1/2" CONDUIT.
13. NEW T–MOBILE EQUIPMENT CABINET
14. NEW T–MOBILE BATTERY CABINET
15. DC CONDUIT AND CONDUCTORS FOR BATTERY CABINET CONNECTION PER MANUFACTURERS SPECIFICATIONS.
16. EXISTING CONDUITS AND CONDUCTORS TO BE REMOVED



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

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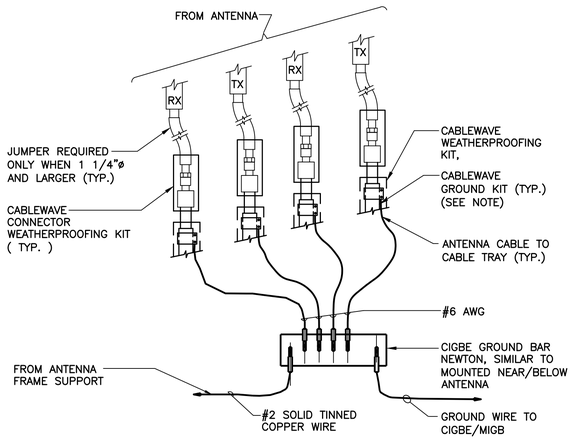
ELECTRICAL DIAGRAM AND CONDUIT ROUTING

E-1

SHEET NO. 7 OF 9

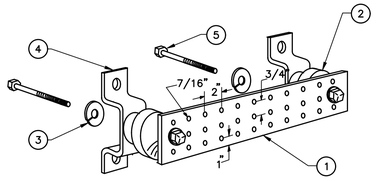


NOTES:

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

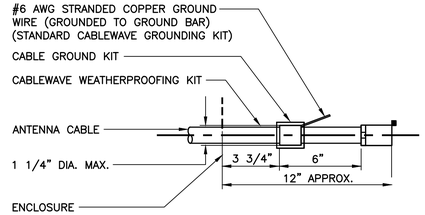


NOTES

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

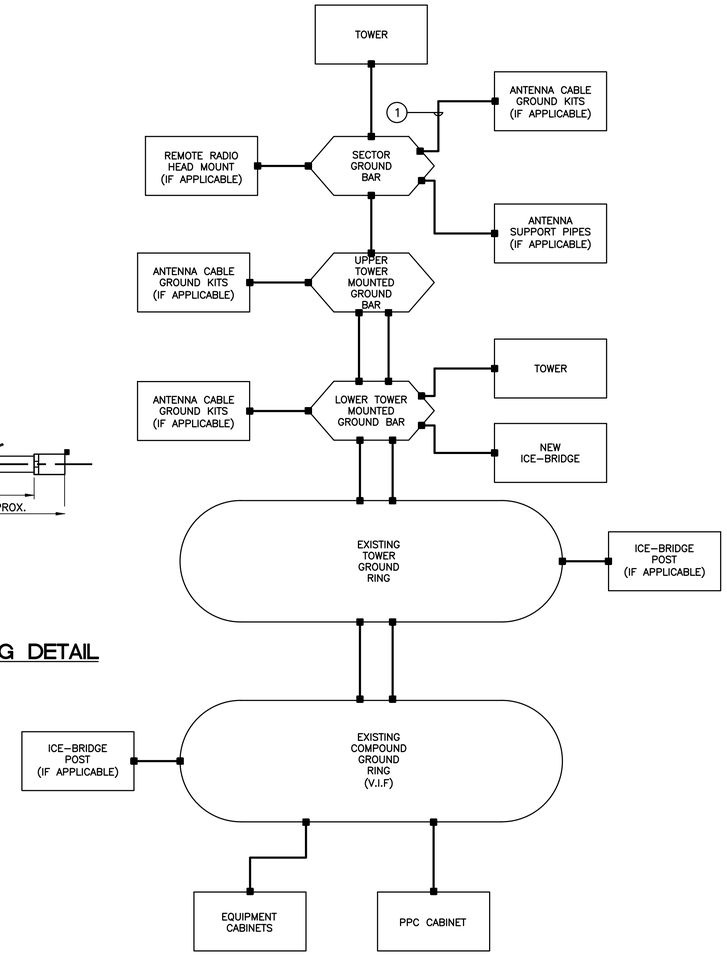


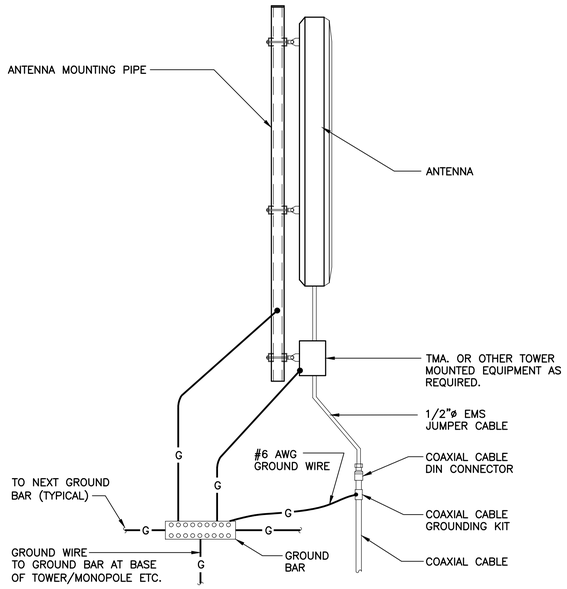
NOTES:

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

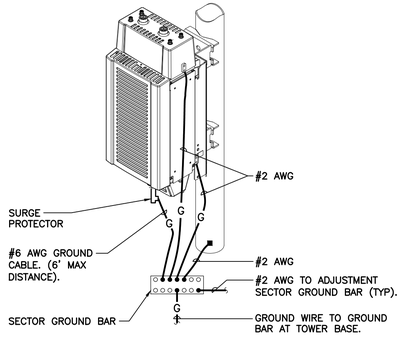




4 E-2 TYPICAL ANTENNA GROUNDING DETAIL

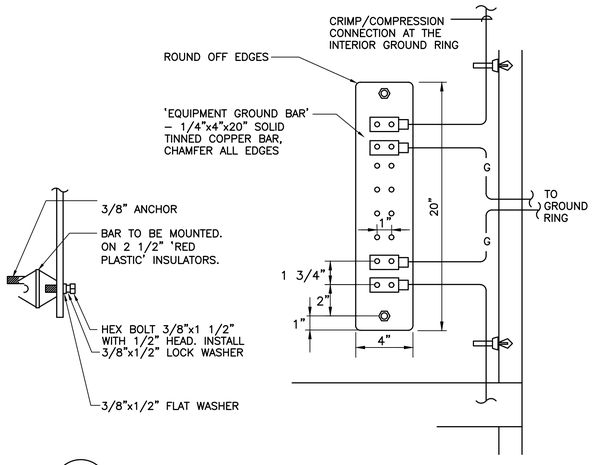
SCALE: NOT TO SCALE

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

#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 TOWER 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

SCALE: NOT TO SCALE

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TYPICAL ELECTRICAL DETAILS

E-2

SHEET NO. 8 OF 9

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. THE 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. CONDUITS

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.	N/A
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 CONNECTED TO THE PANELBOARDS SO 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.

REV.	DATE	DRAWN BY	CHECKED BY	DESCRIPTION
0	09/02/22	JLD	TJR	CONSTRUCTION DRAWINGS - ISSUED FOR CONSTRUCTION

PROFESSIONAL ENGINEER SEAL

T-Mobile

NSS NORTHEAST SITE SOLUTIONS

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: MADISON/ I-95/ X61/ JCT_1
SITE ID: CT11029I
135 NEW ROAD
MADISON, CT 06443

DATE:	03/23/22
SCALE:	AS NOTED
JOB NO.	22006.01

ELECTRICAL SPECIFICATIONS

E-3

SHEET NO. 9 OF 9

Exhibit D

Structural Analysis Report

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

180-ft Existing ROHN Guyed Lattice Tower

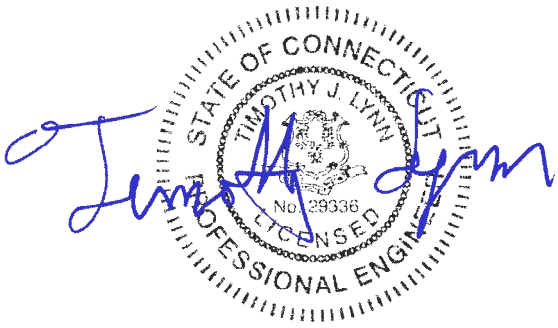
Proposed T-Mobile Antenna Upgrade

Site Ref: CT11029I

135 New Road
Madison, CT 06443

CENTEK Project No. 22006.01

Date: April 4, 2022



Prepared for:
T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

63-2 North Branford Road, Branford, CT 06405 203.488.0580 Fax 203.488.8587 www.CentekEng.com

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- ANTENNA AND APPURTENANCE SUMMARY
- PRIMARY ASSUMPTIONS USED IN THE ANALYSIS
- ANALYSIS
- TOWER LOADING
- TOWER CAPACITY
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- CONCLUSION

SECTION 2 – CONDITIONS & SOFTWARE

- STANDARD ENGINEERING CONDITIONS
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SECTION 3 – CALCULATIONS

- tnxTower INPUT/OUTPUT SUMMARY
- tnxTower FEED LINE PLAN
- tnxTower FEED LINE DISTRIBUTION
- tnxTower GUY TENSION AND ANCHOR REACTIONS
- tnxTower DETAILED OUTPUT
- GUY ANCHOR FOUNDATION ANALYSIS
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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 guyed lattice tower located in Madison, Connecticut.

The host tower is a 180-ft, three legged, Model 80 guyed lattice tower originally designed and manufactured by UNR-ROHN. The tower geometry and structure member size information were obtained from a previous structural analysis report prepared by Centek project no. 22003.00 dated February 23, 2022.

Antenna and appurtenance inventory were obtained from the aforementioned structural analysis report and a RF data sheet.

The tower consists of nine (9) vertical sections consisting of ROHN steel pipe legs conforming to ASTM A572-50. Diagonal and horizontal lateral support bracing consists of a combination of steel angle and pipe construction conforming to ASTM A36 and A53 Gr. B 35ksi. All connections are bolted. The width of the tower face is 3.41-ft at the top and bottom with a 5-ft tall tapered base section.

Antenna and Appurtenance Summary

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

- EVERSOURCE (Existing):
  Antenna: One (1) dbspectra DS2C03F36D-D Omni-directional whip antenna mounted on a standoff to a leg of the existing tower with an elevation of ±177-ft above grade level.
  Coax Cable: Two (2) 7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- EVERSOURCE (Existing):
  Antenna: Two (2) 20-ft and one (1) 14-ft Omni-directional whip antennas mounted to a leg of the existing tower with an elevation of ±180-ft above grade level.
  Coax Cable: One (1) 1-5/8" ∅ and one (1) 7/8" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- EVERSOURCE (Existing):
  Antenna: One (1) 8.5-ft ∅ Microwave dish antenna with radome mounted to the leg of the existing tower with a RAD center elevation of ±175-ft above grade level.
  Coax Cable: One (1) Elliptical coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- EVERSOURCE (Existing):
  Antenna: One (1) 20-ft Omni-directional whip antenna pipe mounted with RAD center elevation of ±147-ft above grade level.
  Coax Cable: Two (2) 7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- EVERSOURCE (Existing):
  Antenna: Two (2) 2-ft Omni-directional whip antennas mounted on a 2-ft stand-off with RAD center elevations of ±143-ft and 141-ft above grade level.
  Coax Cable: Two (2) 7/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.

- SPRINT (Existing):
  Antennas: Three (3) RFS APXVSPP18C panel antennas, three (3) RRH2x50-800 radio heads and three (3) 1900MHz 4X45 Remote Radio Heads mounted to three (3) existing 6-ft x 12-ft ROHN boom gates with a RAD center elevation of ±126-ft above grade level.
  Cables: Three (3) 1-1/4" ∅ Hybriflex cables running on the face of the existing tower as specified in Section 3 of this report.

- SPRINT (Existing):
  Antenna: One (1) GPS antenna mounted on a 2-ft stand-off with a RAD center elevation of ±88-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

- AT&T (Existing):
  Antennas: Three (3) Commscope SBNHH-1D65A panel antennas, three (3) CCI DMP65R-BU4D panel antennas, three (3) Ericsson B2/B66A 8843 and three (3) Ericsson B5/B12 4449 remote radio heads mounted to three (3) 12-ft V-Frames with a RAD center elevation of 78-ft above grade level.
  Surge Arrestor: One (1) Raycap DC6-48-60-18-8F Surge Arrestor mounted to the leg of the existing tower with a RAD center elevation of 72-ft above grade level.
  Coax Cables: One (1) 5/8" ∅ fiber optic cable and two (2) #8 DC control cables running on the face of the existing tower as specified in Section 3 of this report.

- T-MOBILE (Existing to Remove):
  Antennas: Three (3) Andrew LNX-6515DS panel antennas, six (6) Ericsson AIR 21 panel antennas, three (3) Ericsson KRY 112 144/1 TMAs and three (3) Ericsson RRUS-11 remote radio heads mounted on three (3) T-frames with a RAD center elevation of 159-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables, one (1) 1-1/4" ∅ lmu bundle and one (1) 1-5/8" ∅ fiber cable running on the face of the existing tower as specified in Section 3 of this report.

- **T-MOBILE (Proposed):**
  Antennas: Three (3) RFS APXVAALL24_43 panel antennas, three (3) Ericsson AIR6419 panel antennas, three (3) Ericsson 4460 RRHs and three (3) Ericsson 4480 RRHs mounted on three (3) V-Frame (SitePro p/n VFA-12HD) with a RAD center elevation of 159-ft above grade level.
  Coax Cables: Three (3) 6x24 hybrid cables running on the 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 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 1.0" radial ice on the tower structure and its components.

Load Cases:	Load Case 1; 140 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/ 1.00" 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

- Calculated stresses were found to be within allowable limits.

Tower Section	Elevation (ATB)	Stress Ratio (percentage of capacity)	Result
Leg (T8)	20'-0"-40'-0"	66.1%	**PASS**
Diagonal (T2)	140'-0"-160'-0"	74.2%	**PASS**
Guy A @ 184-ft radius (T1)	127'-8"	52.6%	**PASS**

- The tower combined deflection is **0.3538 degrees**.

Deflection Criteria	Proposed (degrees)
Sway (Tilt)	0.1790
Twist	0.3052
Combined	0.3538

Note 1: *Tower deflection calculated utilizing the service wind load combination and nominal wind speed of 108 mph.*

Foundations and Anchorage

The existing guy anchorage foundation system consists of three (3) inner and three (3) outer reinforced concrete guy anchor foundations and one pad and pier type base foundation, located below existing grade. The properties used in the analysis of the existing anchor foundations were obtained from the aforementioned structural analysis report prepared by Centek Engineering, Inc.

- The worst case tower base and guy anchor reactions developed from the governing Load Case were used in the verification of the anchorage foundations:

Tower Guy Reactions		
Vector	**Proposed Reactions Guy Anchor A at Radius of 150-ft**	**Proposed Reactions Guy Anchor A at Radius of 184-ft**
Horizontal (In Plane of GW)	**12.0 kips**	**30.0 kips**
Horizontal (Out of Plane of GW)	**0.5 kips**	**1.0 kips**
Vertical	**5.0 kips**	**24.0 kips**
Resultant Force at end of Guy Wire	**13.0 kips**	**38.0 kips**
Tower Base Reactions		
Vector	**Proposed Reaction**	
Horizontal Shear	**1.0 kips**	
Axial Compression	**116.0 kips**	

Foundation	**Design Limit**	**TIA-222-H Section 9.4 FS**[1]	**Proposed Loading (FS)**[1]	**Result**
Reinf. Conc. Anchor Block (A) at 150-ft radius.	Uplift	1.0	7.9	**PASS**
	Sliding	1.0	4.1	**PASS**
Reinf. Conc. Anchor Block (A) at 184-ft radius.	Uplift	1.0	2.8	**PASS**
	Sliding	1.0	2.9	**PASS**
		Ultimate	**Proposed**	
Base Foundation	Bearing	16.0 ksf [2]	5.1 ksf	**PASS**

Note 1: FS denotes 'Factor of Safety'.
Note 2: Based on soil boring prepared by Clarence Welti dated 6/16/97 which indicated weathered rock.

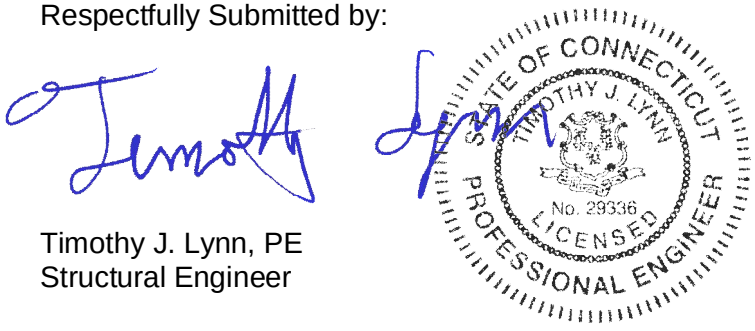
C o n c l u s i o n

This analysis shows that the subject tower **is adequate** to support the proposed equipment upgrade.

The analysis is based, in part on the information provided to this office by Eversource and 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.

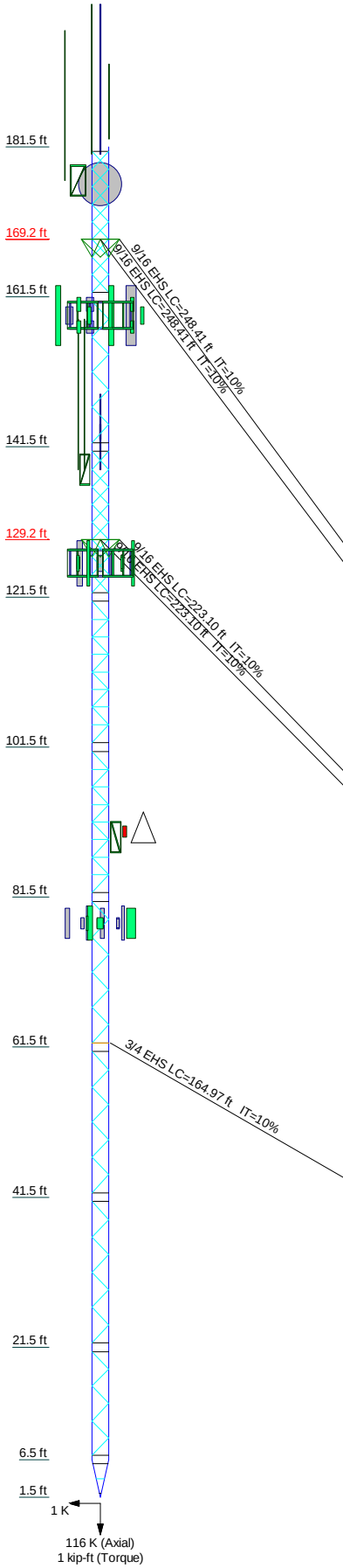
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

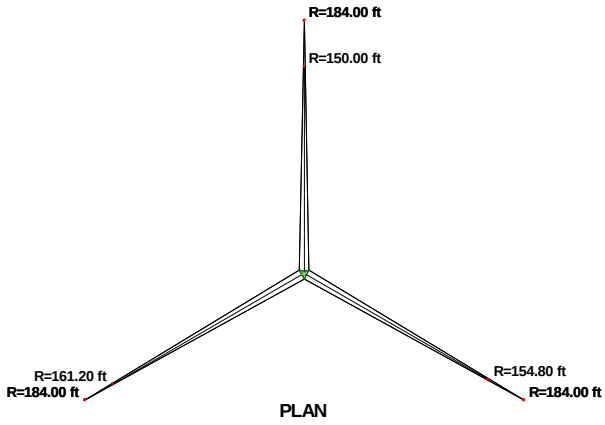
tnxTower, is an integrated structural analysis and design software package for Designed specifically for the telecommunications industry, RISATower, formerly ERITower, automates much of the tower analysis and design required by the TIA/EIA 222 Standard.

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	
Legs					P2.5x.203						3.41
Leg Grade					A572-50						
Diagonals	L1 3/4x1 3/4x3/16	ROHN TS1.5x16 ga	L2x2x3/16	L2 1/2x2 1/2x1/2	ROHN TS1.5x16 ga	L2 1/2x2 1/2x1/2		ROHN TS1.5x16 ga	L2 1/2x2 1/2x1/2	N.A.	
Diagonal Grade	A36	A53-B-35	A36		A53-B-35	A36		A53-B-35	A36	N.A.	
Top Girts	L1 3/4x1 3/4x3/16	ROHN TS1.5x16 ga	L2x2x3/16	L2 1/2x2 1/2x1/2	ROHN TS1.5x16 ga	L2 1/2x2 1/2x1/2		ROHN TS1.5x16 ga	L2 1/2x2 1/2x1/2	A	
Bottom Girts	L1 3/4x1 3/4x3/16	ROHN TS1.5x16 ga	L2x2x3/16	L2 1/2x2 1/2x1/2	ROHN TS1.5x16 ga	L2 1/2x2 1/2x1/2		ROHN TS1.5x16 ga	L2 1/2x2 1/2x1/2	A	
Horizontals		N.A.		L2 1/2x2 1/2x1/2				N.A.		A	
Top Guy Pull-Offs		N.A.	N.A.			4 1/2x3/8		N.A.			
Face Width (ft)							72 @ 2.34635				
# Panels @ (ft)	13	0.5	1.4	1.8	1.0	1.3	1.1	0.5	1.0	0.4	3 @ 2
Weight (K)									7 @ 2.29514		10.3





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' x 2" Dia Omni (Eversource)	180.5	3-ft Side Arm (Eversource)	138.5
14' x 3" Dia Omni (Eversource)	180.5	FD-RRH 2x50 800 (Sprint)	126
20' x 2" Dia Omni (Eversource)	180.5	FD-RRH 2x50 800 (Sprint)	126
DS2C03F36D-D (Eversource)	177	FD-RRH 4x45 1900 (Sprint)	126
SitePro USF-4U (Eversource)	177	FD-RRH 4x45 1900 (Sprint)	126
8.5 Dishw/radome (NU)	176.5	FD-RRH 4x45 1900 (Sprint)	126
AIR6419 (T-Mobile - Proposed)	159	Rohn 6' x 12' Boom Gate (1) (Sprint)	126
APXVAALL24-43 (T-Mobile - Proposed)	159	Rohn 6' x 12' Boom Gate (1) (Sprint)	126
		Rohn 6' x 12' Boom Gate (1) (Sprint)	126
AIR6419 (T-Mobile - Proposed)	159	APXVSPP18-C-A20 (Sprint)	126
APXVAALL24-43 (T-Mobile - Proposed)	159	APXVSPP18-C-A20 (Sprint)	126
		APXVSPP18-C-A20 (Sprint)	126
AIR6419 (T-Mobile - Proposed)	159	FD-RRH 2x50 800 (Sprint)	126
APXVAALL24-43 (T-Mobile - Proposed)	159	3' GPS Stand-off Mount (Sprint)	89.5
4480 B71+B85 (T-Mobile - Proposed)	159	GPS (Sprint)	89.5
4480 B71+B85 (T-Mobile - Proposed)	159	8843 B2/B66A (ATI)	78
4480 B71+B85 (T-Mobile - Proposed)	159	8843 B2/B66A (ATI)	78
4460 B25+B66 (T-Mobile - Proposed)	159	8843 B2/B66A (ATI)	78
4460 B25+B66 (T-Mobile - Proposed)	159	4449 B5/B12 (ATI)	78
4460 B25+B66 (T-Mobile - Proposed)	159	4449 B5/B12 (ATI)	78
SitePro VFA12-HD (T-Mobile - Proposed)	159	4449 B5/B12 (ATI)	78
		SBNHH-1D65A (ATI)	78
SitePro VFA12-HD (T-Mobile - Proposed)	159	SBNHH-1D65A (ATI)	78
		SBNHH-1D65A (ATI)	78
SitePro VFA12-HD (T-Mobile - Proposed)	159	DMP65R-BU4D (ATI)	78
		DMP65R-BU4D (ATI)	78
3"x20-ft Omni (Eversource)	148.5	DC6-48-60-18-8F Surge Arrestor (ATI)	78
20-ft x 1.9in Support Pipe (Eversource)	148.5	DMP65R-BU4D (ATI)	78
1.5"x2'omni (Eversource)	144.5	12' V-Frame (ATI)	78
2-ft Stand Off (Eversource)	143.5	12' V-Frame (ATI)	78
1.5"x2'omni (Eversource)	142.5	12' V-Frame (ATI)	78

SYMBOL LIST

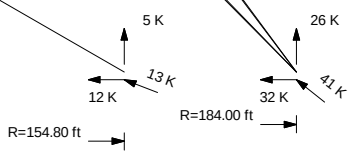
MARK	SIZE	MARK	SIZE
A	C12x20.7		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A53-B-35	35 ksi	63 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 140 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 108 mph wind.
6. Tower Risk Category III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 74.2%



ALL REACTIONS ARE FACTORED

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

Job: 22006.01 - CT11029I			
Project: 180' Guyed Lattice Tower - 125 New Rd., Madison, CT			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-H	Date: 04/04/22	Scale: NTS	
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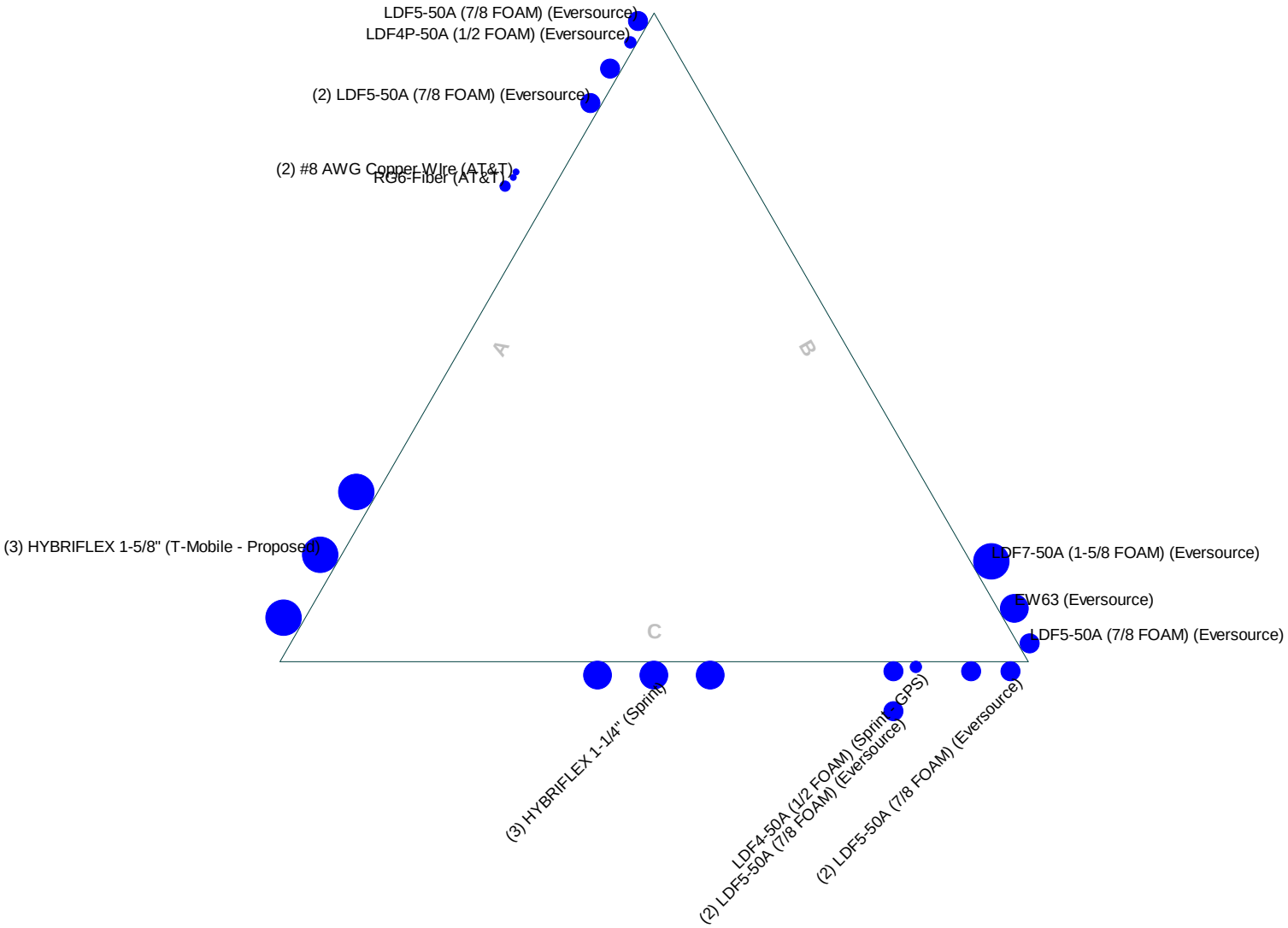
Feed Line Plan

Round Flat App In Face App Out Face



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Phone: (203) 488-0580
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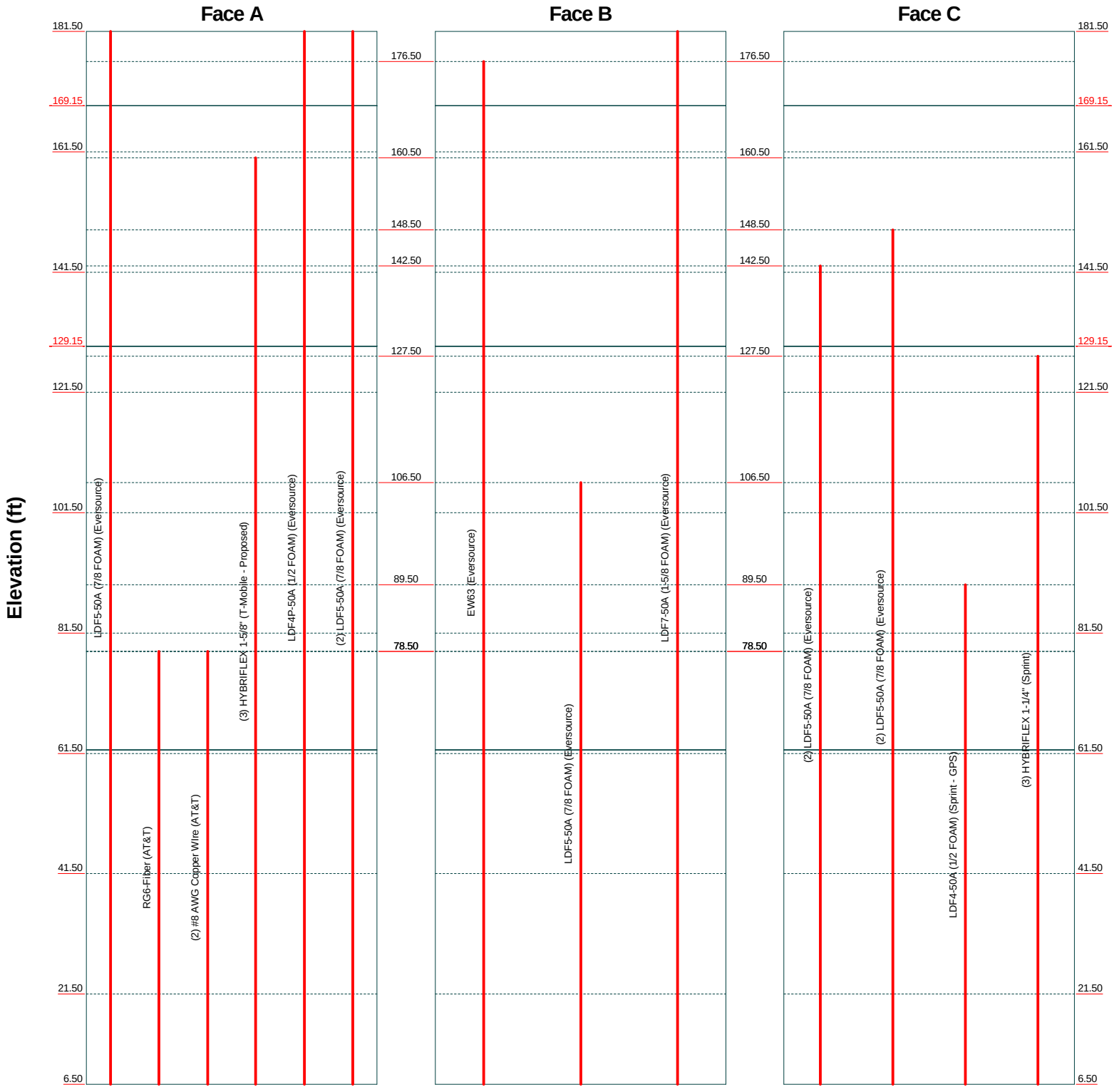
Job: ***22006.01 - CT11029I***		
Project: ***180' Guyed Lattice Tower - 125 New Rd., Madison, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 04/04/22	Scale: NTS
Path: J:\Jobs\22000\600.WI\01_CT11029I\05_Structural\Tower\Backup Documentation\ER\180-ft Guyed Lattice Tower_Madison_CT.eri		Dwg No. E-7

Feed Line Distribution Chart
6'6" - 181'6"

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



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Job:	***22006.01 - CT11029I***		
Project:	***180' Guyed Lattice Tower - 125 New Rd., Madison, CT***		
Client: T-Mobile		Drawn by: TJL	App'd:
Code: TIA-222-H		Date: 04/04/22	Scale: NTS
Path: J:\Jobs\22000\600.WI\01_CT11029I\05_Structural\Tower\Backup Documentation\ER\180-ft Guyed Lattice Tower_Madison_CT.eri			Dwg No. E-7

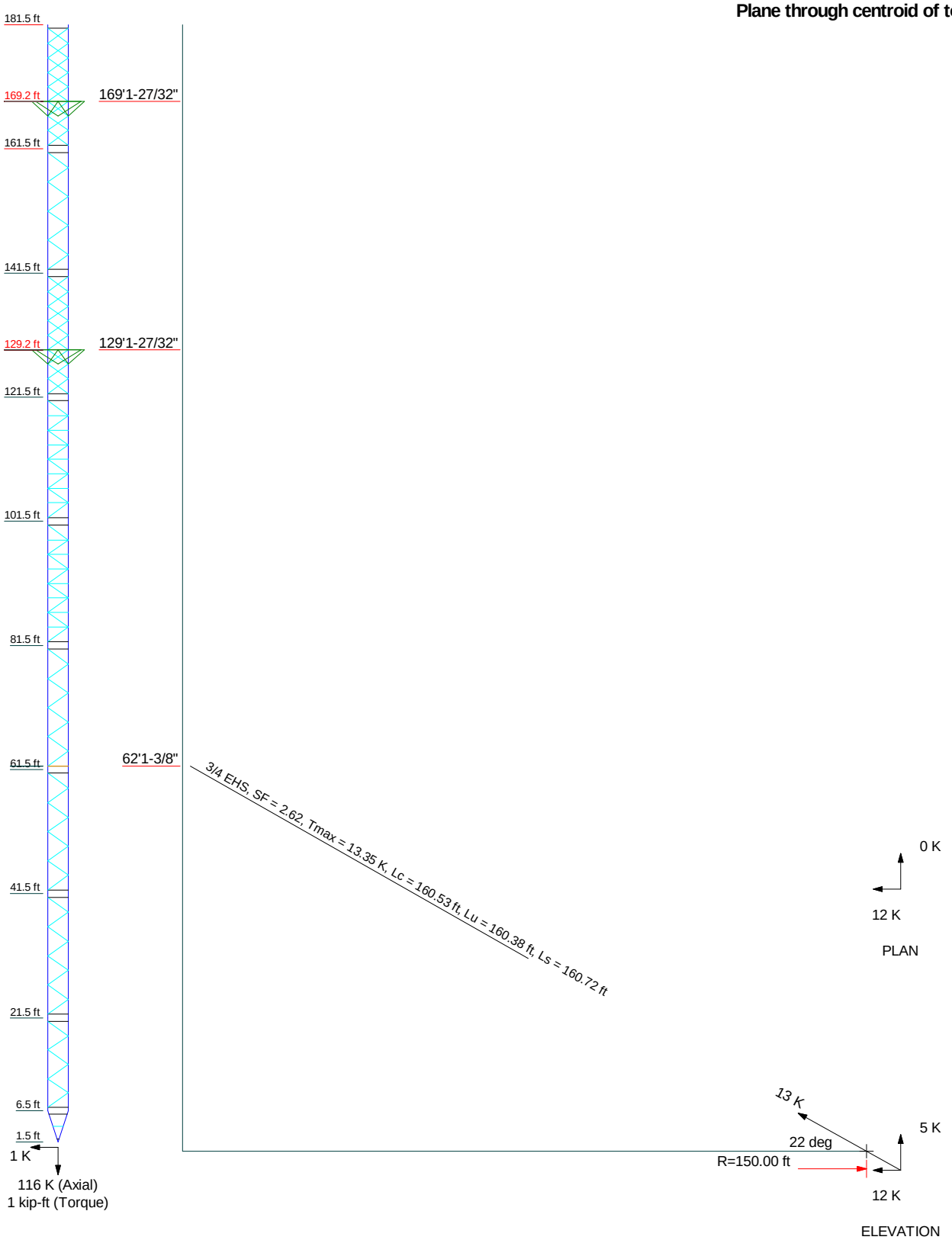
Guy Tensions and Tower Reactions

TIA-222-H - 140 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'A'@150 ft Azimuth 0 deg Elev 0 ft

Plane through centroid of tower



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

Job: ***22006.01 - CT11029I***		
Project: ***180' Guyed Lattice Tower - 125 New Rd., Madison, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 04/04/22	Scale: NTS
Path: J:\Jobs\22006600.WI\01_CT11029I\05_Structural\Tower\Backup Documentation\ER\180-ft Guyed Lattice Tower_Madison_CT.eri		Dwg No. E-6

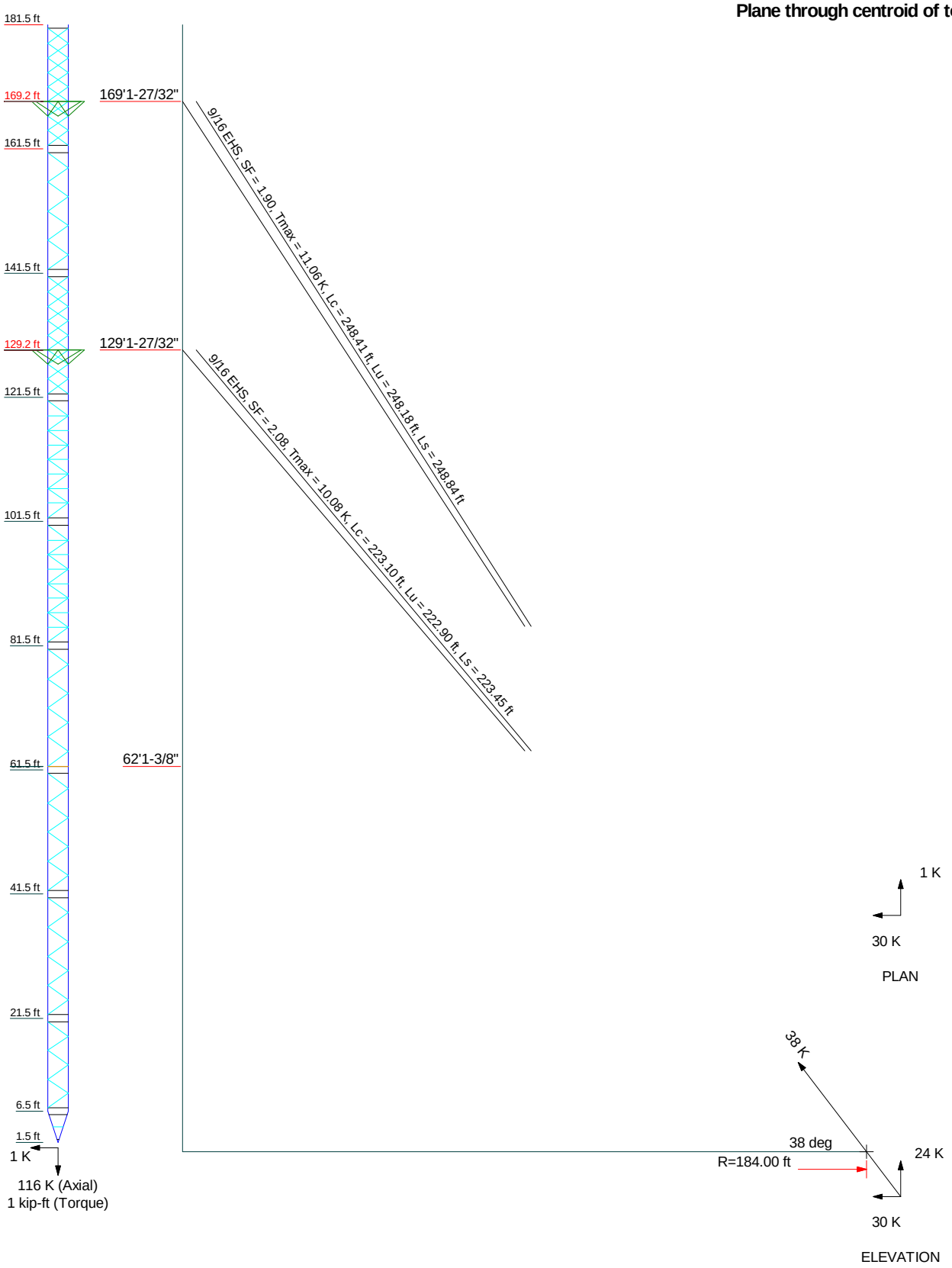
Guy Tensions and Tower Reactions

TIA-222-H - 140 mph/50 mph 1.0000 in Ice Exposure B

Maximum Values

Anchor 'C'@184 ft Azimuth 240 deg Elev 0 ft

Plane through centroid of tower



Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Job: ***22006.01 - CT11029I***		
	Project: ***180' Guyed Lattice Tower - 125 New Rd., Madison, CT***		
	Client: T-Mobile	Drawn by: TJL	App'd:
	Code: TIA-222-H	Date: 04/04/22	Scale: NTS
	Path: J:\Jobs\22000\600.WI\01_CT11029I\05_Structural\Tower\Backup Documentation\ER\180-ft Guyed Lattice Tower_Madison_CT.eri		Dwg No. E-6

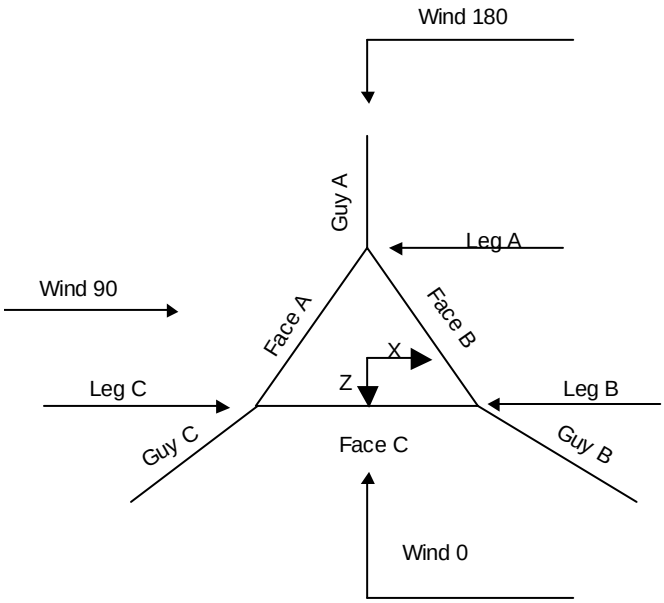
Tower Input Data

The main tower is a 3x guyed tower with an overall height of 181.50 ft above the ground line.
The base of the tower is set at an elevation of 1.50 ft above the ground line.
The face width of the tower is 3.41 ft at the top and tapered at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

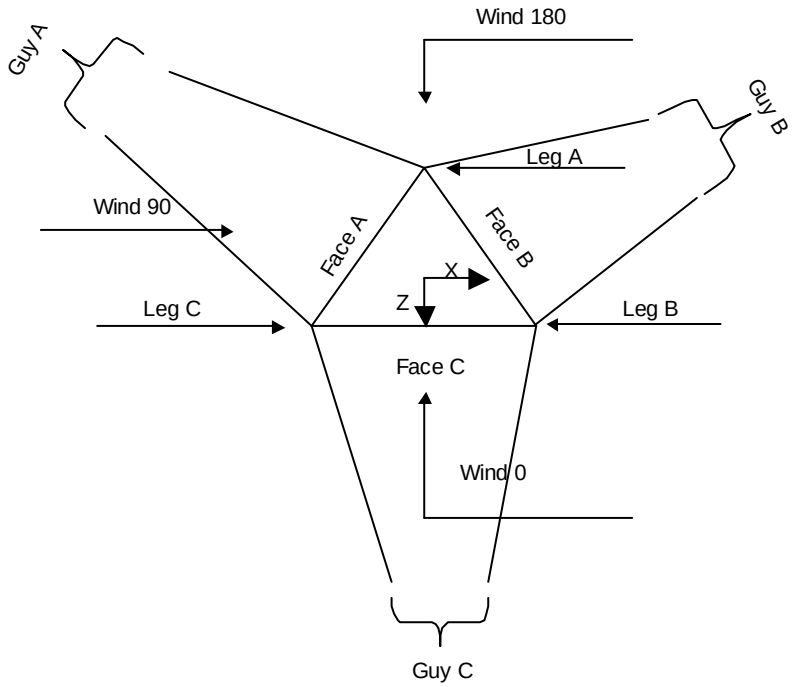
Tower is located in New Haven County, Connecticut.
Tower base elevation above sea level: 1.50 ft.
Basic wind speed of 140 mph.
Risk Category III.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 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 108 mph.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Safety factor used in guy 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



Corner & Starmount Guyed Tower



Face Guyed

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	181.50-161.50			3.41	1	20.00
T2	161.50-141.50			3.41	1	20.00
T3	141.50-121.50			3.41	1	20.00
T4	121.50-101.50			3.41	1	20.00
T5	101.50-81.50			3.41	1	20.00
T6	81.50-61.50			3.41	1	20.00
T7	61.50-41.50			3.41	1	20.00
T8	41.50-21.50			3.41	1	20.00
T9	21.50-6.50			3.41	1	15.00
T10	6.50-1.50			3.41	1	5.00

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
T1	181.50-161.50	2.35	X Brace	No	Yes	7.3750	7.3750
T2	161.50-141.50	2.35	K Brace Left	No	Yes	7.3750	7.3750
T3	141.50-121.50	2.35	X Brace	No	Yes	7.3750	7.3750
T4	121.50-101.50	2.35	K Brace Left	No	Yes	7.3750	7.3750
T5	101.50-81.50	2.35	K Brace Left	No	Yes	7.3750	7.3750
T6	81.50-61.50	2.35	K Brace Left	No	Yes	7.3750	7.3750
T7	61.50-41.50	2.35	K Brace Left	No	Yes	7.3750	7.3750
T8	41.50-21.50	2.35	K Brace Left	No	Yes	7.3750	7.3750
T9	21.50-6.50	2.30	K Brace Left	No	Yes	7.3750	7.3750
T10	6.50-1.50	2.00	X Brace	No	Yes	6.0000	6.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 181.50-161.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 161.50-141.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-35 (35 ksi)
T3 141.50-121.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 121.50-101.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T5 101.50-81.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-35 (35 ksi)
T6 81.50-61.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T7 61.50-41.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T8 41.50-21.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-35 (35 ksi)
T9 21.50-6.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T10 6.50-1.50	Pipe	P2.5x.203	A572-50 (50 ksi)	Equal Angle		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 181.50-161.50	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)	Equal Angle	L1 3/4x1 3/4x3/16	A36 (36 ksi)
T2 161.50-141.50	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-35 (35 ksi)
T3 141.50-121.50	Equal Angle	L2x2x3/16	A36 (36 ksi)	Equal Angle	L2x2x3/16	A36 (36 ksi)
T4 121.50-101.50	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T5 101.50-81.50	Pipe	ROHN TS1.5x16 ga	A36	Pipe	ROHN TS1.5x16 ga	A53-B-35

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T6 81.50-61.50	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T7 61.50-41.50	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-35 (35 ksi)
T8 41.50-21.50	Pipe	ROHN TS1.5x16 ga	A36 (36 ksi)	Pipe	ROHN TS1.5x16 ga	A53-B-35 (35 ksi)
T9 21.50-6.50	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A36 (36 ksi)
T10 6.50-1.50	Channel	C12x20.7	A36 (36 ksi)	Channel	C12x20.7	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
T4 121.50-101.50	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A572-50 (50 ksi)
T5 101.50-81.50	None	Flat Bar		A36 (36 ksi)	Equal Angle	L2 1/2x2 1/2x1/2	A572-50 (50 ksi)
T10 6.50-1.50	None	Channel		A36 (36 ksi)	Channel	C12x20.7	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 181.50-161.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T2 161.50-141.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T3 141.50-121.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T4 121.50-101.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T5 101.50-81.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T6 81.50-61.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T7 61.50-41.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T8 41.50-21.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T9 21.50-6.50	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T10 6.50-1.50	0.00	0.0000	A36	1	1	1	0.0000	36.0000	36.0000

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
			(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	No	1	1	1	1	1	1	1	1
181.50-161.50				1	1	1	1	1	1	1
T2	Yes	No	1	1	1	1	1	1	1	1
161.50-141.50				1	1	1	1	1	1	1
T3	Yes	No	1	1	1	1	1	1	1	1
141.50-121.50				1	1	1	1	1	1	1
T4	Yes	No	1	1	1	1	1	1	1	1
121.50-101.50				1	1	1	1	1	1	1
T5	Yes	No	1	1	1	1	1	1	1	1
101.50-81.50				1	1	1	1	1	1	1
T6	Yes	No	1	1	1	1	1	1	1	1
81.50-61.50				1	1	1	1	1	1	1
T7	Yes	No	1	1	1	1	1	1	1	1
61.50-41.50				1	1	1	1	1	1	1
T8	Yes	No	1	1	1	1	1	1	1	1
41.50-21.50				1	1	1	1	1	1	1
T9 21.50-6.50	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1
T10 6.50-1.50	Yes	No	1	1	1	1	1	1	1	1
				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
181.50-161.50														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
161.50-141.50														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
141.50-121.50														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
121.50-101.50														

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 101.50-81.50	0.0000	1	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 81.50-61.50	0.0000	1	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 61.50-41.50	0.0000	1	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 41.50-21.50	0.0000	1	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 21.50-6.50	0.0000	1	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 6.50-1.50	0.0000	1	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 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 181.50-161.50	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 161.50-141.50	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 141.50-121.50	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 121.50-101.50	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 101.50-81.50	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 81.50-61.50	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 61.50-41.50	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 41.50-21.50	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 21.50-6.50	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 6.50-1.50	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 181.50-161.50	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 161.50-141.50	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 141.50-121.50	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 121.50-101.50	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T5 101.50-81.50	Flange	0.7500 A325N	4	0.5000 A325X	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	1	0.6250 A325N	0
T6 81.50-61.50	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T7 61.50-41.50	Flange	0.7500 A325N	4	0.6250 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 41.50-21.50	Flange	0.7500 A325N	4	0.5000 A325N	1	0.5000 A325N	1	0.5000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 21.50-6.50	Flange	0.7500 A325N	4	0.6250 A325N	1	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 6.50-1.50	Flange	0.7500 A325N	4	0.0000 A325N	0	0.0000 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Guy Data

Guy Elevation ft	Guy Grade		Guy Size	Initial Tension K	%	Guy Modulus ksi	Guy Weight plf	L_u ft	Anchor Radius ft	Anchor Azimuth Adj. °	Anchor Elevation ft	End Fitting Efficiency %
169.154	EHS	A	9/16	3.50	10%	21000	0.671	248.21	184.00	0.0000	0.00	100%
		B	9/16	3.50	10%	21000	0.671	248.21	184.00	0.0000	0.00	100%
		C	9/16	3.50	10%	21000	0.671	248.21	184.00	0.0000	0.00	100%
129.154	EHS	A	9/16	3.50	10%	21000	0.671	222.92	184.00	0.0000	0.00	100%
		B	9/16	3.50	10%	21000	0.671	222.92	184.00	0.0000	0.00	100%
		C	9/16	3.50	10%	21000	0.671	222.92	184.00	0.0000	0.00	100%
62.1146	EHS	A	3/4	5.83	10%	19000	1.155	160.39	150.00	0.0000	0.00	100%
		B	3/4	5.83	10%	19000	1.155	164.83	154.80	0.0000	0.00	100%
		C	3/4	5.83	10%	19000	1.155	170.77	161.20	0.0000	0.00	100%

Guy Data *(cont'd)*

Guy Elevation ft	Mount Type	Torque-Arm Spread ft	Torque-Arm Leg Angle °	Torque-Arm Style	Torque-Arm Grade	Torque-Arm Type	Torque-Arm Size
169.154	Torque Arm	7.33	30.0000	Bat Ear	A53-B-35 (35 ksi)	Pipe	P4x.237
129.154	Torque Arm	7.33	30.0000	Bat Ear	A53-B-35 (35 ksi)	Pipe	P4x.237
62.1146	Corner						

Guy Data *(cont'd)*

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
169.15	A572-50 (50 ksi)	Solid Round				A36 (36 ksi)	Solid Round	
129.15	A572-50	Solid Round				A36	Solid Round	

Guy Elevation ft	Diagonal Grade	Diagonal Type	Upper Diagonal Size	Lower Diagonal Size	Is Strap.	Pull-Off Grade	Pull-Off Type	Pull-Off Size
62.11	(50 ksi) A572-50 (50 ksi)	Solid Round			Yes	(36 ksi) A36 (36 ksi)	Flat Bar	4 1/2x3/8

Guy Data *(cont'd)*

Guy Elevation ft	Cable Weight A K	Cable Weight B K	Cable Weight C K	Cable Weight D K	Tower Intercept A ft	Tower Intercept B ft	Tower Intercept C ft	Tower Intercept D ft
169.154	0.17	0.17	0.17		5.82 4.2 sec/pulse	5.82 4.2 sec/pulse	5.82 4.2 sec/pulse	
129.154	0.15	0.15	0.15		4.71 3.7 sec/pulse	4.71 3.7 sec/pulse	4.71 3.7 sec/pulse	
62.1146	0.19	0.19	0.20		2.54 2.7 sec/pulse	2.68 2.8 sec/pulse	2.87 2.9 sec/pulse	

Guy Data *(cont'd)*

Guy Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Torque Arm K_x	Torque Arm K_y	Pull Off K_x	Pull Off K_y	Diagonal K_x	Diagonal K_y
169.154	No	No	1	1	1	1	1	1
129.154	No	No	1	1	1	1	1	1
62.1146	No	No			1	1	1	1

Guy Data *(cont'd)*

Guy Elevation ft	Torque-Arm Bolt Size in	Torque-Arm Number	Torque-Arm Net Width Deduct in	Torque-Arm U	Pull Off Bolt Size in	Pull Off Number	Pull Off Net Width Deduct in	Pull Off U	Diagonal Bolt Size in	Diagonal Number	Diagonal Net Width Deduct in	Diagonal U
169.154	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
129.154	0.0000 A325N	0	0.0000	1	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	0	0.0000	0.75
62.1146	0.6250 A325N	0	0.0000	0.75	0.6250 A325N	4	0.0000	1	0.0000 A325N	0	0.0000	1

Guy Pressures

Guy Elevation ft	Guy Location	z ft	q_z psf	q_z Ice psf	Ice Thickness in
169.154	A	84.58	40	5	1.2635
	B	84.58	40	5	1.2635
	C	84.58	40	5	1.2635
129.154	A	64.58	37	5	1.2299
	B	64.58	37	5	1.2299
	C	64.58	37	5	1.2299
62.1146	A	31.06	30	4	1.1430
	B	31.06	30	4	1.1430
	C	31.06	30	4	1.1430

Guy-Mast Forces (Excluding Wind) - No Ice

Guy Elevation ft	Guy Location	Chord Angle °	Guy Tension Top / Bottom K	F_x K	F_y K	F_z K	M_x kip-ft	M_y kip-ft	M_z kip-ft
169.154	A	42.9174	3.61 / 3.50	-0.05	2.51	-2.60	-5.30	9.66	-9.19
	A	42.9174	3.61 / 3.50	0.05	2.51	-2.60	-5.30	-9.66	9.19
	B	42.9174	3.61 / 3.50	2.28	2.51	1.26	10.61	9.66	0.00
	B	42.9174	3.61 / 3.50	2.23	2.51	1.35	-5.30	-9.66	-9.19
	C	42.9174	3.61 / 3.50	-2.23	2.51	1.35	-5.30	9.66	9.19
	C	42.9174	3.61 / 3.50	-2.28	2.51	1.26	10.61	-9.66	0.00
			Sum:	0.00	15.03	0.00	-0.00	0.00	0.00
129.154	A	35.3728	3.59 / 3.50	-0.06	2.13	-2.89	-4.50	10.71	-7.79
	A	35.3728	3.59 / 3.50	0.06	2.13	-2.89	-4.50	-10.71	7.79
	B	35.3728	3.59 / 3.50	2.53	2.13	1.39	9.00	10.71	0.00
	B	35.3728	3.59 / 3.50	2.47	2.13	1.49	-4.50	-10.71	-7.79
	C	35.3728	3.59 / 3.50	-2.47	2.13	1.49	-4.50	10.71	7.79
	C	35.3728	3.59 / 3.50	-2.53	2.13	1.39	9.00	-10.71	0.00
			Sum:	0.00	12.76	0.00	-0.00	0.00	0.00
62.1146	A	22.7631	5.90 / 5.83	0.00	2.36	-5.41	-4.65	0.00	0.00
	B	22.1181	5.90 / 5.83	4.71	2.30	2.72	2.27	0.00	-3.93
	C	21.3103	5.90 / 5.83	-4.73	2.23	2.73	2.20	-0.00	3.80
			Sum:	**-0.03**	6.90	**0.04**	**-0.19**	0.00	**-0.13**

Guy-Mast Forces (Excluding Wind) - Ice

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
169.154	A	42.9174	6.67 6.08	-0.09	4.77	-4.66	-10.10	17.28	-17.50
	A	42.9174	6.67 6.08	0.09	4.77	-4.66	-10.10	-17.28	17.50
	B	42.9174	6.67 6.08	4.08	4.77	2.25	20.20	17.28	0.00
	B	42.9174	6.67 6.08	3.99	4.77	2.41	-10.10	-17.28	-17.50
	C	42.9174	6.67 6.08	-3.99	4.77	2.41	-10.10	17.28	17.50
	C	42.9174	6.67 6.08	-4.08	4.77	2.25	20.20	-17.28	0.00
			Sum:	0.00	28.63	0.00	-0.00	0.00	0.00
129.154	A	35.3728	6.50 6.07	-0.10	4.01	-5.12	-8.50	18.98	-14.72
	A	35.3728	6.50 6.07	0.10	4.01	-5.12	-8.50	-18.98	14.72
	B	35.3728	6.50 6.07	4.48	4.01	2.47	16.99	18.98	0.00
	B	35.3728	6.50 6.07	4.38	4.01	2.65	-8.50	-18.98	-14.72
	C	35.3728	6.50 6.07	-4.38	4.01	2.65	-8.50	18.98	14.72
	C	35.3728	6.50 6.07	-4.48	4.01	2.47	16.99	-18.98	0.00
			Sum:	0.00	24.08	0.00	-0.00	0.00	0.00
62.1146	A	22.7631	8.92 8.68	0.00	3.71	-8.11	-7.30	0.00	0.00
	B	22.1181	8.96 8.73	7.09	3.64	4.09	3.59	0.00	-6.21
	C	21.3103	9.02 8.79	-7.18	3.56	4.15	3.50	-0.00	6.07
			Sum:	**-0.09**	10.91	**0.13**	**-0.21**	0.00	**-0.14**

Guy-Mast Forces (Excluding Wind) - Service

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top / Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
169.154	A	42.9174	3.61 3.50	-0.05	2.51	-2.60	-5.30	9.66	-9.19
	A	42.9174	3.61 3.50	0.05	2.51	-2.60	-5.30	-9.66	9.19
	B	42.9174	3.61 3.50	2.28	2.51	1.26	10.61	9.66	0.00
	B	42.9174	3.61 3.50	2.23	2.51	1.35	-5.30	-9.66	-9.19
	C	42.9174	3.61 3.50	-2.23	2.51	1.35	-5.30	9.66	9.19
	C	42.9174	3.61 3.50	-2.28	2.51	1.26	10.61	-9.66	0.00
			Sum:	0.00	15.03	0.00	-0.00	0.00	0.00

Guy Elevation	Guy Location	Chord Angle	Guy Tension Top Bottom K	F_x	F_y	F_z	M_x	M_y	M_z
ft		°		K	K	K	kip-ft	kip-ft	kip-ft
129.154	A	35.3728	3.59 3.50	-0.06	2.13	-2.89	-4.50	10.71	-7.79
	A	35.3728	3.59 3.50	0.06	2.13	-2.89	-4.50	-10.71	7.79
	B	35.3728	3.59 3.50	2.53	2.13	1.39	9.00	10.71	0.00
	B	35.3728	3.59 3.50	2.47	2.13	1.49	-4.50	-10.71	-7.79
	C	35.3728	3.59 3.50	-2.47	2.13	1.49	-4.50	10.71	7.79
	C	35.3728	3.59 3.50	-2.53	2.13	1.39	9.00	-10.71	0.00
			Sum:	0.00	12.76	0.00	-0.00	0.00	0.00
62.1146	A	22.7631	5.90 5.83	0.00	2.36	-5.41	-4.65	0.00	0.00
	B	22.1181	5.90 5.83	4.71	2.30	2.72	2.27	0.00	-3.93
	C	21.3103	5.90 5.83	-4.73	2.23	2.73	2.20	-0.00	3.80
			Sum:	**-0.03**	6.90	**0.04**	**-0.19**	0.00	**-0.13**

Guy-Tensioning Information

Guy Elevation		H	V	Temperature At Time Of Tensioning: 0 F Initial Tension	0 F Intercept	20 F Initial Tension	20 F Intercept	40 F Initial Tension	40 F Intercept	60 F Initial Tension	60 F Intercept	80 F Initial Tension	80 F Intercept	100 F Initial Tension	100 F Intercept	120 F Initial Tension	120 F Intercept
ft		ft	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft	K	ft
169.154	A	181.92	169.15	4.289	4.76	4.022	5.07	3.759	5.42	3.500	5.82	3.247	6.26	3.001	6.77	2.764	7.34
	B	181.92	169.15	4.289	4.76	4.022	5.07	3.759	5.42	3.500	5.82	3.247	6.26	3.001	6.77	2.764	7.34
	C	181.92	169.15	4.289	4.76	4.022	5.07	3.759	5.42	3.500	5.82	3.247	6.26	3.001	6.77	2.764	7.34
129.154	A	181.92	129.15	4.481	3.69	4.149	3.98	3.821	4.32	3.500	4.71	3.188	5.17	2.887	5.70	2.602	6.31
	B	181.92	129.15	4.481	3.69	4.149	3.98	3.821	4.32	3.500	4.71	3.188	5.17	2.887	5.70	2.602	6.31
	C	181.92	129.15	4.481	3.69	4.149	3.98	3.821	4.32	3.500	4.71	3.188	5.17	2.887	5.70	2.602	6.31
62.1146	A	148.03	62.11	7.848	1.89	7.166	2.06	6.493	2.28	5.830	2.54	5.183	2.85	4.560	3.24	3.970	3.71
	B	152.83	62.11	7.861	1.99	7.174	2.18	6.496	2.40	5.830	2.68	5.181	3.01	4.557	3.42	3.968	3.92
	C	159.23	62.11	7.875	2.13	7.183	2.33	6.500	2.58	5.830	2.87	5.179	3.23	4.554	3.67	3.968	4.21

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
LDF5-50A (7/8 FOAM) (Eversource)	C	No	No	Ar (CaAa)	142.50 - 6.50	0.0000	-0.32	2	1	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM) (Eversource)	C	No	No	Ar (CaAa)	148.50 - 6.50	0.0000	-0.45	2	2	1.0900	1.0900		0.33
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	89.50 - 6.50	0.0000	-0.35	1	1	0.6300	0.6300		0.15

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
(Sprint - GPS)													
EW63 (Eversource)	B	No	No	Ar (CaAa)	176.50 - 6.50	0.0000	0.43	1	1	1.5742	1.5742		0.51
LDF5-50A (7/8 FOAM) (Eversource)	B	No	No	Ar (CaAa)	106.50 - 6.50	0.0000	0.48	1	1	1.0900	1.0900		0.33
LDF7-50A (1-5/8 FOAM) (Eversource)	B	No	No	Ar (CaAa)	181.50 - 6.50	0.0000	0.36	1	1	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM) (Eversource)	A	No	No	Ar (CaAa)	181.50 - 6.50	0.0000	0.48	1	1	1.0900	1.0900		0.33
RG6-Fiber (AT&T)	A	No	No	Ar (CaAa)	78.50 - 6.50	2.0000	0.2	1	1	0.0000	0.6250		0.50
#8 AWG Copper WIre (AT&T)	A	No	No	Ar (CaAa)	78.50 - 6.50	2.0000	0.22	2	2	0.0000	0.3400		0.05
HYBRIFLEX 1-1/4" (Sprint)	C	No	No	Ar (CaAa)	127.50 - 6.50	0.0000	0	3	3	1.5400	1.5400		1.30
HYBRIFLEX 1-5/8" (T-Mobile - Proposed)	A	No	No	Ar (CaAa)	160.50 - 6.50	0.0000	-0.35	3	3	1.9800	1.9800		1.90
LDF4P-50A (1/2 FOAM) (Eversource)	A	No	No	Ar (CaAa)	181.50 - 6.50	0.0000	0.45	1	1	0.6300	0.6300		0.15
LDF5-50A (7/8 FOAM) (Eversource)	A	No	No	Ar (CaAa)	181.50 - 6.50	0.0000	0.38	2	2	1.0900	1.0900		0.33

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	181.50-161.50	A	0.000	0.000	7.800	0.000	0.02
		B	0.000	0.000	6.321	0.000	0.02
		C	0.000	0.000	0.000	0.000	0.00
T2	161.50-141.50	A	0.000	0.000	19.086	0.000	0.13
		B	0.000	0.000	7.108	0.000	0.03
		C	0.000	0.000	1.744	0.000	0.01
T3	141.50-121.50	A	0.000	0.000	19.680	0.000	0.14
		B	0.000	0.000	7.108	0.000	0.03
		C	0.000	0.000	11.492	0.000	0.05
T4	121.50-101.50	A	0.000	0.000	19.680	0.000	0.14
		B	0.000	0.000	7.653	0.000	0.03
		C	0.000	0.000	17.960	0.000	0.10
T5	101.50-81.50	A	0.000	0.000	19.680	0.000	0.14
		B	0.000	0.000	9.288	0.000	0.03
		C	0.000	0.000	18.464	0.000	0.11
T6	81.50-61.50	A	0.000	0.000	21.898	0.000	0.15
		B	0.000	0.000	9.288	0.000	0.03
		C	0.000	0.000	19.220	0.000	0.11
T7	61.50-41.50	A	0.000	0.000	22.290	0.000	0.15
		B	0.000	0.000	9.288	0.000	0.03

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		C	0.000	0.000	19.220	0.000	0.11
T8	41.50-21.50	A	0.000	0.000	22.290	0.000	0.15
		B	0.000	0.000	9.288	0.000	0.03
		C	0.000	0.000	19.220	0.000	0.11
T9	21.50-6.50	A	0.000	0.000	16.718	0.000	0.11
		B	0.000	0.000	6.966	0.000	0.02
		C	0.000	0.000	14.415	0.000	0.08
T10	6.50-1.50	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

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	181.50-161.50	A	1.356	0.000	0.000	32.009	0.000	0.31
		B		0.000	0.000	15.814	0.000	0.21
		C		0.000	0.000	0.000	0.000	0.00
T2	161.50-141.50	A	1.339	0.000	0.000	63.617	0.000	0.74
		B		0.000	0.000	17.823	0.000	0.23
		C		0.000	0.000	7.042	0.000	0.06
T3	141.50-121.50	A	1.321	0.000	0.000	64.892	0.000	0.75
		B		0.000	0.000	17.672	0.000	0.23
		C		0.000	0.000	43.316	0.000	0.42
T4	121.50-101.50	A	1.299	0.000	0.000	64.432	0.000	0.74
		B		0.000	0.000	19.343	0.000	0.24
		C		0.000	0.000	62.397	0.000	0.65
T5	101.50-81.50	A	1.273	0.000	0.000	63.890	0.000	0.73
		B		0.000	0.000	24.570	0.000	0.30
		C		0.000	0.000	64.423	0.000	0.66
T6	81.50-61.50	A	1.242	0.000	0.000	77.531	0.000	0.82
		B		0.000	0.000	24.198	0.000	0.29
		C		0.000	0.000	67.482	0.000	0.68
T7	61.50-41.50	A	1.202	0.000	0.000	78.758	0.000	0.81
		B		0.000	0.000	23.716	0.000	0.28
		C		0.000	0.000	66.510	0.000	0.66
T8	41.50-21.50	A	1.145	0.000	0.000	76.894	0.000	0.77
		B		0.000	0.000	23.024	0.000	0.26
		C		0.000	0.000	65.113	0.000	0.62
T9	21.50-6.50	A	1.056	0.000	0.000	55.512	0.000	0.54
		B		0.000	0.000	16.466	0.000	0.18
		C		0.000	0.000	47.219	0.000	0.43
T10	6.50-1.50	A	0.931	0.000	0.000	0.000	0.000	0.00
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	181.50-161.50	1.3590	-1.6786	1.2050	-2.9681
T2	161.50-141.50	-0.8852	-0.3324	-1.1625	-1.5953

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T3	141.50-121.50	0.3772	1.1044	0.7571	0.8479
T4	121.50-101.50	0.4417	1.8186	0.8383	1.7451
T5	101.50-81.50	0.9171	2.2637	1.4519	2.2151
T6	81.50-61.50	0.7759	1.8903	1.2053	1.6114
T7	61.50-41.50	0.7960	1.9328	1.1521	1.5521
T8	41.50-21.50	0.9459	2.2071	1.1861	1.6759
T9	21.50-6.50	0.7629	1.8673	1.0299	1.6401
T10	6.50-1.50	0.0000	0.0000	0.0000	0.0000

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	5	EW63	161.50 - 176.50	0.6000	0.4339
T1	7	LDF7-50A (1-5/8 FOAM)	161.50 - 181.50	0.6000	0.4339
T1	8	LDF5-50A (7/8 FOAM)	161.50 - 181.50	0.6000	0.4339
T1	14	LDF4P-50A (1/2 FOAM)	161.50 - 181.50	0.6000	0.4339
T1	15	LDF5-50A (7/8 FOAM)	161.50 - 181.50	0.6000	0.4339
T2	1	LDF5-50A (7/8 FOAM)	141.50 - 142.50	0.6000	0.5941
T2	2	LDF5-50A (7/8 FOAM)	141.50 - 148.50	0.6000	0.5941
T2	5	EW63	141.50 - 161.50	0.6000	0.5941
T2	7	LDF7-50A (1-5/8 FOAM)	141.50 - 161.50	0.6000	0.5941
T2	8	LDF5-50A (7/8 FOAM)	141.50 - 161.50	0.6000	0.5941
T2	12	HYBRIFLEX 1-5/8"	141.50 - 160.50	0.6000	0.5941
T2	14	LDF4P-50A (1/2 FOAM)	141.50 - 161.50	0.6000	0.5941
T2	15	LDF5-50A (7/8 FOAM)	141.50 - 161.50	0.6000	0.5941
T3	1	LDF5-50A (7/8 FOAM)	121.50 - 141.50	0.6000	0.4230
T3	2	LDF5-50A (7/8 FOAM)	121.50 - 141.50	0.6000	0.4230
T3	5	EW63	121.50 - 141.50	0.6000	0.4230
T3	7	LDF7-50A (1-5/8 FOAM)	121.50 - 141.50	0.6000	0.4230
T3	8	LDF5-50A (7/8 FOAM)	121.50 - 141.50	0.6000	0.4230
T3	11	HYBRIFLEX 1-1/4"	121.50 - 127.50	0.6000	0.4230
T3	12	HYBRIFLEX 1-5/8"	121.50 - 141.50	0.6000	0.4230
T3	14	LDF4P-50A (1/2 FOAM)	121.50 - 141.50	0.6000	0.4230

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	15	LDF5-50A (7/8 FOAM)	121.50 - 141.50	0.6000	0.4230
T4	1	LDF5-50A (7/8 FOAM)	101.50 - 121.50	0.6000	0.4381
T4	2	LDF5-50A (7/8 FOAM)	101.50 - 121.50	0.6000	0.4381
T4	5	EW63	101.50 - 121.50	0.6000	0.4381
T4	6	LDF5-50A (7/8 FOAM)	101.50 - 106.50	0.6000	0.4381
T4	7	LDF7-50A (1-5/8 FOAM)	101.50 - 121.50	0.6000	0.4381
T4	8	LDF5-50A (7/8 FOAM)	101.50 - 121.50	0.6000	0.4381
T4	11	HYBRIFLEX 1-1/4"	101.50 - 121.50	0.6000	0.4381
T4	12	HYBRIFLEX 1-5/8"	101.50 - 121.50	0.6000	0.4381
T4	14	LDF4P-50A (1/2 FOAM)	101.50 - 121.50	0.6000	0.4381
T4	15	LDF5-50A (7/8 FOAM)	101.50 - 121.50	0.6000	0.4381
T5	1	LDF5-50A (7/8 FOAM)	81.50 - 101.50	0.6000	0.4830
T5	2	LDF5-50A (7/8 FOAM)	81.50 - 101.50	0.6000	0.4830
T5	4	LDF4-50A (1/2 FOAM)	81.50 - 89.50	0.6000	0.4830
T5	5	EW63	81.50 - 101.50	0.6000	0.4830
T5	6	LDF5-50A (7/8 FOAM)	81.50 - 101.50	0.6000	0.4830
T5	7	LDF7-50A (1-5/8 FOAM)	81.50 - 101.50	0.6000	0.4830
T5	8	LDF5-50A (7/8 FOAM)	81.50 - 101.50	0.6000	0.4830
T5	11	HYBRIFLEX 1-1/4"	81.50 - 101.50	0.6000	0.4830
T5	12	HYBRIFLEX 1-5/8"	81.50 - 101.50	0.6000	0.4830
T5	14	LDF4P-50A (1/2 FOAM)	81.50 - 101.50	0.6000	0.4830
T5	15	LDF5-50A (7/8 FOAM)	81.50 - 101.50	0.6000	0.4830
T6	1	LDF5-50A (7/8 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	2	LDF5-50A (7/8 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	4	LDF4-50A (1/2 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	5	EW63	61.50 - 81.50	0.6000	0.5445
T6	6	LDF5-50A (7/8 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	7	LDF7-50A (1-5/8 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	8	LDF5-50A (7/8 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	9	RG6-Fiber	61.50 - 78.50	0.6000	0.5445
T6	10	#8 AWG Copper WIre	61.50 - 78.50	0.6000	0.5445
T6	11	HYBRIFLEX 1-1/4"	61.50 - 81.50	0.6000	0.5445
T6	12	HYBRIFLEX 1-5/8"	61.50 - 81.50	0.6000	0.5445
T6	14	LDF4P-50A (1/2 FOAM)	61.50 - 81.50	0.6000	0.5445
T6	15	LDF5-50A (7/8 FOAM)	61.50 - 81.50	0.6000	0.5445
T7	1	LDF5-50A (7/8 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	2	LDF5-50A (7/8 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	4	LDF4-50A (1/2 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	5	EW63	41.50 - 61.50	0.6000	0.5812
T7	6	LDF5-50A (7/8 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	7	LDF7-50A (1-5/8 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	8	LDF5-50A (7/8 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	9	RG6-Fiber	41.50 - 61.50	0.6000	0.5812
T7	10	#8 AWG Copper WIre	41.50 - 61.50	0.6000	0.5812
T7	11	HYBRIFLEX 1-1/4"	41.50 - 61.50	0.6000	0.5812
T7	12	HYBRIFLEX 1-5/8"	41.50 - 61.50	0.6000	0.5812
T7	14	LDF4P-50A (1/2 FOAM)	41.50 - 61.50	0.6000	0.5812
T7	15	LDF5-50A (7/8 FOAM)	41.50 - 61.50	0.6000	0.5812
T8	1	LDF5-50A (7/8 FOAM)	21.50 - 41.50	0.6000	0.6000
T8	2	LDF5-50A (7/8 FOAM)	21.50 - 41.50	0.6000	0.6000
T8	4	LDF4-50A (1/2 FOAM)	21.50 - 41.50	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T8	5	EW63	21.50 - 41.50	0.6000	0.6000
T8	6	LDF5-50A (7/8 FOAM)	21.50 - 41.50	0.6000	0.6000
T8	7	LDF7-50A (1-5/8 FOAM)	21.50 - 41.50	0.6000	0.6000
T8	8	LDF5-50A (7/8 FOAM)	21.50 - 41.50	0.6000	0.6000
T8	9	RG6-Fiber	21.50 - 41.50	0.6000	0.6000
T8	10	#8 AWG Copper WIre	21.50 - 41.50	0.6000	0.6000
T8	11	HYBRIFLEX 1-1/4"	21.50 - 41.50	0.6000	0.6000
T8	12	HYBRIFLEX 1-5/8"	21.50 - 41.50	0.6000	0.6000
T8	14	LDF4P-50A (1/2 FOAM)	21.50 - 41.50	0.6000	0.6000
T8	15	LDF5-50A (7/8 FOAM)	21.50 - 41.50	0.6000	0.6000
T9	1	LDF5-50A (7/8 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	2	LDF5-50A (7/8 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	4	LDF4-50A (1/2 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	5	EW63	6.50 - 21.50	0.6000	0.5868
T9	6	LDF5-50A (7/8 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	7	LDF7-50A (1-5/8 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	8	LDF5-50A (7/8 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	9	RG6-Fiber	6.50 - 21.50	0.6000	0.5868
T9	10	#8 AWG Copper WIre	6.50 - 21.50	0.6000	0.5868
T9	11	HYBRIFLEX 1-1/4"	6.50 - 21.50	0.6000	0.5868
T9	12	HYBRIFLEX 1-5/8"	6.50 - 21.50	0.6000	0.5868
T9	14	LDF4P-50A (1/2 FOAM)	6.50 - 21.50	0.6000	0.5868
T9	15	LDF5-50A (7/8 FOAM)	6.50 - 21.50	0.6000	0.5868

Discrete Tower Loads

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
GPS	B	From Leg	3.50	0.0000	89.50	No Ice	1.00	1.00	0.01
(Sprint)			0.00			1/2" Ice	1.50	1.50	0.01
			0.00			1" Ice	2.00	2.00	0.02
3' GPS Stand-off Mount	B	From Leg	1.50	0.0000	89.50	No Ice	2.45	2.45	0.05
(Sprint)			0.00			1/2" Ice	3.98	3.98	0.07
			0.00			1" Ice	5.51	5.51	0.10
APXVSPP18-C-A20	A	From Leg	3.00	0.0000	126.00	No Ice	8.02	5.28	0.06
(Sprint)			-4.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	B	From Leg	3.00	0.0000	126.00	No Ice	8.02	5.28	0.06
(Sprint)			-4.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
APXVSPP18-C-A20	C	From Leg	3.00	0.0000	126.00	No Ice	8.02	5.28	0.06
(Sprint)			-4.00			1/2" Ice	8.48	5.74	0.11
			0.00			1" Ice	8.94	6.20	0.16
FD-RRH 2x50 800	A	From Leg	3.00	0.0000	126.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	B	From Leg	3.00	0.0000	126.00	No Ice	2.06	1.93	0.06
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 2x50 800	C	From Leg	3.00	0.0000	126.00	No Ice	2.06	1.93	0.06

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
(Sprint)			0.00			1/2" Ice	2.24	2.11	0.09
			0.00			1" Ice	2.43	2.29	0.11
FD-RRH 4x45 1900	A	From Leg	3.00	0.0000	126.00	No Ice	2.32	2.38	0.06
(Sprint)			0.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 4x45 1900	B	From Leg	3.00	0.0000	126.00	No Ice	2.32	2.38	0.06
(Sprint)			0.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
FD-RRH 4x45 1900	C	From Leg	3.00	0.0000	126.00	No Ice	2.32	2.38	0.06
(Sprint)			0.00			1/2" Ice	2.52	2.59	0.08
			0.00			1" Ice	2.74	2.80	0.11
Rohn 6' x 12' Boom Gate (1)	A	From Leg	2.00	0.0000	126.00	No Ice	16.60	16.60	0.56
(Sprint)			0.00			1/2" Ice	19.80	19.80	0.70
			0.00			1" Ice	23.00	23.00	0.84
Rohn 6' x 12' Boom Gate (1)	B	From Leg	2.00	0.0000	126.00	No Ice	16.60	16.60	0.56
(Sprint)			0.00			1/2" Ice	19.80	19.80	0.70
			0.00			1" Ice	23.00	23.00	0.84
Rohn 6' x 12' Boom Gate (1)	C	From Leg	2.00	0.0000	126.00	No Ice	16.60	16.60	0.56
(Sprint)			0.00			1/2" Ice	19.80	19.80	0.70
			0.00			1" Ice	23.00	23.00	0.84
1.5"x2'omni	A	From Leg	3.00	0.0000	144.50	No Ice	0.25	0.25	0.01
(Eversource)			0.00			1/2" Ice	0.38	0.38	0.01
			1.00			1" Ice	0.51	0.51	0.01
1.5"x2'omni	A	From Leg	3.00	0.0000	142.50	No Ice	0.25	0.25	0.01
(Eversource)			0.00			1/2" Ice	0.38	0.38	0.01
			-1.00			1" Ice	0.51	0.51	0.01
2-ft Stand Off	A	From Leg	1.00	0.0000	143.50	No Ice	1.07	1.07	0.02
(Eversource)			0.00			1/2" Ice	1.62	1.62	0.03
			0.00			1" Ice	2.17	2.17	0.04
3"x20-ft Omni	C	From Leg	3.00	0.0000	148.50	No Ice	3.56	3.56	0.02
(Eversource)			0.00			1/2" Ice	7.13	7.13	0.05
			0.00			1" Ice	10.70	10.70	0.07
3-ft Side Arm	C	From Leg	1.50	0.0000	138.50	No Ice	0.66	0.66	0.01
(Eversource)			0.00			1/2" Ice	1.14	1.14	0.03
			0.00			1" Ice	1.62	1.62	0.04
20-ft x 1.9in Support Pipe	C	From Leg	1.50	0.0000	148.50	No Ice	3.80	3.80	0.05
(Eversource)			0.00			1/2" Ice	5.82	5.82	0.08
			0.00			1" Ice	7.84	7.84	0.11
20' x 2" Dia Omni	A	From Leg	0.00	0.0000	180.50	No Ice	4.00	4.00	0.02
(Eversource)			0.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
14' x 3" Dia Omni	B	From Leg	0.00	0.0000	180.50	No Ice	4.20	4.20	0.04
(Eversource)			0.00			1/2" Ice	5.63	5.63	0.07
			7.00			1" Ice	7.08	7.08	0.11
20' x 2" Dia Omni	C	From Leg	0.00	0.0000	180.50	No Ice	4.00	4.00	0.02
(Eversource)			0.00			1/2" Ice	6.03	6.03	0.05
			10.00			1" Ice	8.07	8.07	0.09
SBNHH-1D65A	A	From Face	3.00	0.0000	78.00	No Ice	5.88	3.86	0.04
(AT&T)			2.00			1/2" Ice	6.25	4.22	0.08
			0.00			1" Ice	6.62	4.57	0.12
SBNHH-1D65A	B	From Face	3.00	0.0000	78.00	No Ice	5.88	3.86	0.04
(AT&T)			2.00			1/2" Ice	6.25	4.22	0.08
			0.00			1" Ice	6.62	4.57	0.12
SBNHH-1D65A	C	From Face	3.00	0.0000	78.00	No Ice	5.88	3.86	0.04
(AT&T)			2.00			1/2" Ice	6.25	4.22	0.08
			0.00			1" Ice	6.62	4.57	0.12
DMP65R-BU4D	A	From Face	3.00	0.0000	78.00	No Ice	8.00	3.51	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
(AT&T)			-6.00			1/2" Ice	8.38	3.81	0.12
			0.00			1" Ice	8.77	4.12	0.17
DMP65R-BU4D	B	From Face	3.00	0.0000	78.00	No Ice	8.00	3.51	0.07
(AT&T)			-6.00			1/2" Ice	8.38	3.81	0.12
			0.00			1" Ice	8.77	4.12	0.17
DMP65R-BU4D	C	From Face	3.00	0.0000	78.00	No Ice	8.00	3.51	0.07
(AT&T)			-6.00			1/2" Ice	8.38	3.81	0.12
			0.00			1" Ice	8.77	4.12	0.17
8843 B2/B66A	A	From Face	3.00	0.0000	78.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
8843 B2/B66A	B	From Face	3.00	0.0000	78.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
8843 B2/B66A	C	From Face	3.00	0.0000	78.00	No Ice	1.64	1.35	0.07
(AT&T)			0.00			1/2" Ice	1.80	1.50	0.09
			0.00			1" Ice	1.97	1.65	0.11
4449 B5/B12	A	From Face	3.00	0.0000	78.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
4449 B5/B12	B	From Face	3.00	0.0000	78.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
4449 B5/B12	C	From Face	3.00	0.0000	78.00	No Ice	1.97	1.41	0.07
(AT&T)			0.00			1/2" Ice	2.14	1.56	0.09
			0.00			1" Ice	2.33	1.73	0.11
DC6-48-60-18-8F Surge	C	From Leg	1.00	0.0000	78.00	No Ice	1.91	1.91	0.02
Arrestor			0.00			1/2" Ice	2.10	2.10	0.04
(AT&T)			0.00			1" Ice	2.29	2.29	0.06
12' V-Frame	A	From Leg	2.00	0.0000	78.00	No Ice	9.22	12.97	0.30
(AT&T)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00			1" Ice	9.22	12.97	0.50
12' V-Frame	B	From Leg	2.00	0.0000	78.00	No Ice	9.22	12.97	0.30
(AT&T)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00			1" Ice	9.22	12.97	0.50
12' V-Frame	C	From Leg	2.00	0.0000	78.00	No Ice	9.22	12.97	0.30
(AT&T)			0.00			1/2" Ice	9.22	12.97	0.40
			0.00			1" Ice	9.22	12.97	0.50
AIR6419	A	From Leg	4.00	0.0000	159.00	No Ice	3.66	1.66	0.07
(T-Mobile - Proposed)			-6.00			1/2" Ice	3.91	1.85	0.09
			0.00			1" Ice	4.16	2.05	0.12
APXVAALL24-43	A	From Leg	4.00	0.0000	159.00	No Ice	20.24	8.89	0.15
(T-Mobile - Proposed)			6.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
AIR6419	B	From Leg	4.00	0.0000	159.00	No Ice	3.66	1.66	0.07
(T-Mobile - Proposed)			-6.00			1/2" Ice	3.91	1.85	0.09
			0.00			1" Ice	4.16	2.05	0.12
APXVAALL24-43	B	From Leg	4.00	0.0000	159.00	No Ice	20.24	8.89	0.15
(T-Mobile - Proposed)			6.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
AIR6419	C	From Leg	4.00	0.0000	159.00	No Ice	3.66	1.66	0.07
(T-Mobile - Proposed)			-6.00			1/2" Ice	3.91	1.85	0.09
			0.00			1" Ice	4.16	2.05	0.12
APXVAALL24-43	C	From Leg	4.00	0.0000	159.00	No Ice	20.24	8.89	0.15
(T-Mobile - Proposed)			6.00			1/2" Ice	20.89	9.49	0.27
			0.00			1" Ice	21.54	10.09	0.39
4480 B71+B85	A	From Leg	4.00	0.0000	159.00	No Ice	2.85	1.38	0.08

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
(T-Mobile - Proposed)			-2.00			1/2" Ice	3.06	1.54	0.11
			1.50			1" Ice	3.28	1.71	0.13
4480 B71+B85	B	From Leg	4.00	0.0000	159.00	No Ice	2.85	1.38	0.08
(T-Mobile - Proposed)			-2.00			1/2" Ice	3.06	1.54	0.11
			1.50			1" Ice	3.28	1.71	0.13
4480 B71+B85	C	From Leg	4.00	0.0000	159.00	No Ice	2.85	1.38	0.08
(T-Mobile - Proposed)			-2.00			1/2" Ice	3.06	1.54	0.11
			1.50			1" Ice	3.28	1.71	0.13
4460 B25+B66	A	From Leg	4.00	0.0000	159.00	No Ice	2.56	1.98	0.11
(T-Mobile - Proposed)			-2.00			1/2" Ice	2.76	2.16	0.13
			-1.50			1" Ice	2.97	2.34	0.16
4460 B25+B66	B	From Leg	4.00	0.0000	159.00	No Ice	2.56	1.98	0.11
(T-Mobile - Proposed)			-2.00			1/2" Ice	2.76	2.16	0.13
			-1.50			1" Ice	2.97	2.34	0.16
4460 B25+B66	C	From Leg	4.00	0.0000	159.00	No Ice	2.56	1.98	0.11
(T-Mobile - Proposed)			-2.00			1/2" Ice	2.76	2.16	0.13
			-1.50			1" Ice	2.97	2.34	0.16
SitePro VFA12-HD	A	From Leg	2.00	0.0000	159.00	No Ice	21.00	21.00	0.75
(T-Mobile - Proposed)			0.00			1/2" Ice	25.00	25.00	0.90
			0.00			1" Ice	29.00	29.00	1.05
SitePro VFA12-HD	B	From Leg	2.00	0.0000	159.00	No Ice	21.00	21.00	0.75
(T-Mobile - Proposed)			0.00			1/2" Ice	25.00	25.00	0.90
			0.00			1" Ice	29.00	29.00	1.05
SitePro VFA12-HD	C	From Leg	2.00	0.0000	159.00	No Ice	21.00	21.00	0.75
(T-Mobile - Proposed)			0.00			1/2" Ice	25.00	25.00	0.90
			0.00			1" Ice	29.00	29.00	1.05
DS2C03F36D-D	C	From Leg	6.00	0.0000	177.00	No Ice	7.30	7.30	0.08
(Eversource)			0.00			1/2" Ice	9.77	9.77	0.13
			10.00			1" Ice	12.25	12.25	0.20
SitePro USF-4U	C	From Leg	3.00	0.0000	177.00	No Ice	5.75	5.75	0.16
(Eversource)			0.00			1/2" Ice	8.00	8.00	0.21
			0.00			1" Ice	10.25	10.25	0.26

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight K
8.5 Dishw/radome	A	Paraboloid w/o	From	0.00	0.0000		176.50	8.50	No Ice	56.75	0.07
(NU)		Radome	Leg	0.00					1/2" Ice	57.56	0.30
				0.00					1" Ice	58.37	0.52

Tower Pressures - No Ice

$G_H = 0.850$

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	171.50	1.153	49	72.992	A	9.904	9.583	9.583	49.18	7.800	0.000
181.50-161.50					B	9.904	9.583		49.18	6.321	0.000
					C	9.904	9.583		49.18	0.000	0.000
T2	151.50	1.113	47	72.992	A	0.000	14.224	9.583	67.37	19.086	0.000
161.50-141.50					B	0.000	14.224		67.37	7.108	0.000
					C	0.000	14.224		67.37	1.744	0.000
T3	131.50	1.069	46	72.992	A	11.319	9.583	9.583	45.85	19.680	0.000
141.50-121.50					B	11.319	9.583		45.85	7.108	0.000
					C	11.319	9.583		45.85	11.492	0.000
T4	111.50	1.019	43	72.992	A	12.359	9.583	9.583	43.68	19.680	0.000
121.50-101.50					B	12.359	9.583		43.68	7.653	0.000
					C	12.359	9.583		43.68	17.960	0.000
T5	91.50	0.963	41	72.992	A	4.624	14.224	9.583	50.85	19.680	0.000
101.50-81.50					B	4.624	14.224		50.85	9.288	0.000
					C	4.624	14.224		50.85	18.464	0.000
T6 81.50-61.50	71.50	0.898	38	72.992	A	8.924	9.583	9.583	51.78	21.898	0.000
					B	8.924	9.583		51.78	9.288	0.000
					C	8.924	9.583		51.78	19.220	0.000
T7 61.50-41.50	51.50	0.818	35	72.992	A	6.414	10.376	9.583	57.08	22.290	0.000
					B	6.414	10.376		57.08	9.288	0.000
					C	6.414	10.376		57.08	19.220	0.000
T8 41.50-21.50	31.50	0.71	30	72.992	A	0.000	14.224	9.583	67.37	22.290	0.000
					B	0.000	14.224		67.37	9.288	0.000
					C	0.000	14.224		67.37	19.220	0.000
T9 21.50-6.50	14.00	0.7	30	54.744	A	6.098	7.188	7.188	54.10	16.718	0.000
					B	6.098	7.188		54.10	6.966	0.000
					C	6.098	7.188		54.10	14.415	0.000
T10 6.50-1.50	4.00	0.7	30	9.791	A	4.396	2.575	2.575	36.94	0.000	0.000
					B	4.396	2.575		36.94	0.000	0.000
					C	4.396	2.575		36.94	0.000	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	171.50	1.153	6	1.3560	77.512	A	9.904	33.973	18.624	42.44	32.009	0.000
181.50-161.50						B	9.904	33.973		42.44	15.814	0.000
						C	9.904	33.973		42.44	0.000	0.000
T2	151.50	1.113	6	1.3393	77.456	A	0.000	31.441	18.512	58.88	63.617	0.000
161.50-141.50						B	0.000	31.441		58.88	17.823	0.000
						C	0.000	31.441		58.88	7.042	0.000
T3	131.50	1.069	6	1.3205	77.393	A	11.319	33.334	18.387	41.18	64.892	0.000
141.50-121.50						B	11.319	33.334		41.18	17.672	0.000
						C	11.319	33.334		41.18	43.316	0.000
T4	111.50	1.019	6	1.2989	77.321	A	12.359	31.085	18.243	41.99	64.432	0.000
121.50-101.50						B	12.359	31.085		41.99	19.343	0.000
						C	12.359	31.085		41.99	62.397	0.000
T5 101.50-81.50	91.50	0.963	5	1.2735	77.237	A	4.624	35.305	18.073	45.26	63.890	0.000
						B	4.624	35.305		45.26	24.570	0.000
						C	4.624	35.305		45.26	64.423	0.000
T6 81.50-61.50	71.50	0.898	5	1.2424	77.133	A	8.924	26.211	17.866	50.85	77.531	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
						B	8.924	26.211		50.85	24.198	0.000
						C	8.924	26.211		50.85	67.482	0.000
T7 61.50-41.50	51.50	0.818	4	1.2023	76.999	A	6.414	25.832	17.599	54.58	78.758	0.000
						B	6.414	25.832		54.58	23.716	0.000
						C	6.414	25.832		54.58	66.510	0.000
T8 41.50-21.50	31.50	0.71	4	1.1447	76.807	A	0.000	28.939	17.214	59.49	76.894	0.000
						B	0.000	28.939		59.49	23.024	0.000
						C	0.000	28.939		59.49	65.113	0.000
T9 21.50-6.50	14.00	0.7	4	1.0555	57.383	A	6.098	17.614	12.465	52.57	55.512	0.000
						B	6.098	17.614		52.57	16.466	0.000
						C	6.098	17.614		52.57	47.219	0.000
T10 6.50-1.50	4.00	0.7	4	0.9312	10.611	A	4.396	4.925	4.243	45.52	0.000	0.000
						B	4.396	4.925		45.52	0.000	0.000
						C	4.396	4.925		45.52	0.000	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	171.50	1.153	29	72.992	A	9.904	9.583	9.583	49.18	7.800	0.000
181.50-161.50					B	9.904	9.583		49.18	6.321	0.000
					C	9.904	9.583		49.18	0.000	0.000
T2	151.50	1.113	28	72.992	A	0.000	14.224	9.583	67.37	19.086	0.000
161.50-141.50					B	0.000	14.224		67.37	7.108	0.000
					C	0.000	14.224		67.37	1.744	0.000
T3	131.50	1.069	27	72.992	A	11.319	9.583	9.583	45.85	19.680	0.000
141.50-121.50					B	11.319	9.583		45.85	7.108	0.000
					C	11.319	9.583		45.85	11.492	0.000
T4	111.50	1.019	26	72.992	A	12.359	9.583	9.583	43.68	19.680	0.000
121.50-101.50					B	12.359	9.583		43.68	7.653	0.000
					C	12.359	9.583		43.68	17.960	0.000
T5	91.50	0.963	24	72.992	A	4.624	14.224	9.583	50.85	19.680	0.000
101.50-81.50					B	4.624	14.224		50.85	9.288	0.000
					C	4.624	14.224		50.85	18.464	0.000
T6 81.50-61.50	71.50	0.898	23	72.992	A	8.924	9.583	9.583	51.78	21.898	0.000
					B	8.924	9.583		51.78	9.288	0.000
					C	8.924	9.583		51.78	19.220	0.000
T7 61.50-41.50	51.50	0.818	21	72.992	A	6.414	10.376	9.583	57.08	22.290	0.000
					B	6.414	10.376		57.08	9.288	0.000
					C	6.414	10.376		57.08	19.220	0.000
T8 41.50-21.50	31.50	0.71	18	72.992	A	0.000	14.224	9.583	67.37	22.290	0.000
					B	0.000	14.224		67.37	9.288	0.000
					C	0.000	14.224		67.37	19.220	0.000
T9 21.50-6.50	14.00	0.7	18	54.744	A	6.098	7.188	7.188	54.10	16.718	0.000
					B	6.098	7.188		54.10	6.966	0.000
					C	6.098	7.188		54.10	14.415	0.000
T10 6.50-1.50	4.00	0.7	18	9.791	A	4.396	2.575	2.575	36.94	0.000	0.000
					B	4.396	2.575		36.94	0.000	0.000
					C	4.396	2.575		36.94	0.000	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 ft^2	F K	w plf	Ctrl. Face
T1	0.05	0.81	A	0.267	2.388	49	1	1	15.552	1.91	95.30	C
181.50-161.50		TA 0.52	B	0.267	2.388		1	1	15.552			
			C	0.267	2.388		1	1	15.552			
T2	0.16	0.46	A	0.195	2.613	47	1	1	8.159	1.54	76.82	C
161.50-141.50			B	0.195	2.613		1	1	8.159			
			C	0.195	2.613		1	1	8.159			
T3	0.21	0.88	A	0.286	2.333	46	1	1	17.019	2.43	121.40	C
141.50-121.50		TA 0.52	B	0.286	2.333		1	1	17.019			
			C	0.286	2.333		1	1	17.019			
T4	0.27	1.81	A	0.301	2.294	43	1	1	18.100	2.54	126.96	C
121.50-101.50			B	0.301	2.294		1	1	18.100			
			C	0.301	2.294		1	1	18.100			
T5	0.28	1.00	A	0.258	2.413	41	1	1	12.974	2.09	104.38	C
101.50-81.50			B	0.258	2.413		1	1	12.974			
			C	0.258	2.413		1	1	12.974			
T6	0.29	1.32	A	0.254	2.427	38	1	1	14.539	2.13	106.65	C
81.50-61.50			B	0.254	2.427		1	1	14.539			
			C	0.254	2.427		1	1	14.539			
T7	0.29	1.13	A	0.23	2.499	35	1	1	12.436	1.82	91.22	C
61.50-41.50			B	0.23	2.499		1	1	12.436			
			C	0.23	2.499		1	1	12.436			
T8	0.29	0.46	A	0.195	2.613	30	1	1	8.159	1.33	66.70	C
41.50-21.50			B	0.195	2.613		1	1	8.159			
			C	0.195	2.613		1	1	8.159			
T9 21.50-6.50	0.22	0.98	A	0.243	2.46	30	1	1	10.290	1.22	81.49	C
			B	0.243	2.46		1	1	10.290			
			C	0.243	2.46		1	1	10.290			
T10 6.50-1.50	0.00	0.41	A	0.712	1.777	30	1	1	6.507	0.29	58.69	C
			B	0.712	1.777		1	1	6.507			
			C	0.712	1.777		1	1	6.507			
Sum Weight:	2.05	10.31								17.30		

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	0.05	0.81	A	0.267	2.388	49	0.8	1	13.572	1.71	85.42	C
181.50-161.50		TA 0.52	B	0.267	2.388		0.8	1	13.572			
			C	0.267	2.388		0.8	1	13.572			
T2	0.16	0.46	A	0.195	2.613	47	0.8	1	8.159	1.54	76.82	C
161.50-141.50			B	0.195	2.613		0.8	1	8.159			
			C	0.195	2.613		0.8	1	8.159			
T3	0.21	0.88	A	0.286	2.333	46	0.8	1	14.756	2.22	111.17	C
141.50-121.50		TA 0.52	B	0.286	2.333		0.8	1	14.756			
			C	0.286	2.333		0.8	1	14.756			
T4	0.27	1.81	A	0.301	2.294	43	0.8	1	15.628	2.33	116.48	C
121.50-101.50			B	0.301	2.294		0.8	1	15.628			
			C	0.301	2.294		0.8	1	15.628			

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
T5	0.28	1.00	A	0.258	2.413	41	0.8	1	12.049	2.01	100.48	C
101.50-81.50			B	0.258	2.413		0.8	1	12.049			
			C	0.258	2.413		0.8	1	12.049			
T6	0.29	1.32	A	0.254	2.427	38	0.8	1	12.754	1.99	99.60	C
81.50-61.50			B	0.254	2.427		0.8	1	12.754			
			C	0.254	2.427		0.8	1	12.754			
T7	0.29	1.13	A	0.23	2.499	35	0.8	1	11.153	1.73	86.47	C
61.50-41.50			B	0.23	2.499		0.8	1	11.153			
			C	0.23	2.499		0.8	1	11.153			
T8	0.29	0.46	A	0.195	2.613	30	0.8	1	8.159	1.33	66.70	C
41.50-21.50			B	0.195	2.613		0.8	1	8.159			
			C	0.195	2.613		0.8	1	8.159			
T9 21.50-6.50	0.22	0.98	A	0.243	2.46	30	0.8	1	9.071	1.15	76.42	C
			B	0.243	2.46		0.8	1	9.071			
			C	0.243	2.46		0.8	1	9.071			
T10 6.50-1.50	0.00	0.41	A	0.712	1.777	30	0.8	1	5.628	0.25	50.76	C
			B	0.712	1.777		0.8	1	5.628			
			C	0.712	1.777		0.8	1	5.628			
Sum Weight:	2.05	10.31								16.26		

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	0.05	0.81	A	0.267	2.388	49	0.85	1	14.067	1.76	87.89	C
181.50-161.50		TA 0.52	B	0.267	2.388		0.85	1	14.067			
			C	0.267	2.388		0.85	1	14.067			
T2	0.16	0.46	A	0.195	2.613	47	0.85	1	8.159	1.54	76.82	C
161.50-141.50			B	0.195	2.613		0.85	1	8.159			
			C	0.195	2.613		0.85	1	8.159			
T3	0.21	0.88	A	0.286	2.333	46	0.85	1	15.322	2.27	113.73	C
141.50-121.50		TA 0.52	B	0.286	2.333		0.85	1	15.322			
			C	0.286	2.333		0.85	1	15.322			
T4	0.27	1.81	A	0.301	2.294	43	0.85	1	16.246	2.38	119.10	C
121.50-101.50			B	0.301	2.294		0.85	1	16.246			
			C	0.301	2.294		0.85	1	16.246			
T5	0.28	1.00	A	0.258	2.413	41	0.85	1	12.281	2.03	101.45	C
101.50-81.50			B	0.258	2.413		0.85	1	12.281			
			C	0.258	2.413		0.85	1	12.281			
T6	0.29	1.32	A	0.254	2.427	38	0.85	1	13.200	2.03	101.36	C
81.50-61.50			B	0.254	2.427		0.85	1	13.200			
			C	0.254	2.427		0.85	1	13.200			
T7	0.29	1.13	A	0.23	2.499	35	0.85	1	11.474	1.75	87.65	C
61.50-41.50			B	0.23	2.499		0.85	1	11.474			
			C	0.23	2.499		0.85	1	11.474			
T8	0.29	0.46	A	0.195	2.613	30	0.85	1	8.159	1.33	66.70	C
41.50-21.50			B	0.195	2.613		0.85	1	8.159			
			C	0.195	2.613		0.85	1	8.159			
T9 21.50-6.50	0.22	0.98	A	0.243	2.46	30	0.85	1	9.375	1.17	77.68	C
			B	0.243	2.46		0.85	1	9.375			
			C	0.243	2.46		0.85	1	9.375			
T10 6.50-1.50	0.00	0.41	A	0.712	1.777	30	0.85	1	5.847	0.26	52.74	C

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
			B	0.712	1.777		0.85	1	5.847			
			C	0.712	1.777		0.85	1	5.847			
Sum Weight:	2.05	10.31								16.52		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.52	2.62	A	0.566	1.829	6	1	1	34.460	0.45	22.33	C
181.50-161.50		TA 0.99	B	0.566	1.829		1	1	34.460			
			C	0.566	1.829		1	1	34.460			
T2	1.03	1.43	A	0.406	2.052	6	1	1	20.085	0.48	24.13	C
161.50-141.50			B	0.406	2.052		1	1	20.085			
			C	0.406	2.052		1	1	20.085			
T3	1.40	2.75	A	0.577	1.82	6	1	1	35.633	0.58	29.18	C
141.50-121.50		TA 0.97	B	0.577	1.82		1	1	35.633			
			C	0.577	1.82		1	1	35.633			
T4	1.63	3.68	A	0.562	1.833	6	1	1	34.748	0.60	30.10	C
121.50-101.50			B	0.562	1.833		1	1	34.748			
			C	0.562	1.833		1	1	34.748			
T5	1.69	2.44	A	0.517	1.879	5	1	1	29.136	0.57	28.64	C
101.50-81.50			B	0.517	1.879		1	1	29.136			
			C	0.517	1.879		1	1	29.136			
T6	1.78	2.66	A	0.456	1.965	5	1	1	26.275	0.60	29.84	C
81.50-61.50			B	0.456	1.965		1	1	26.275			
			C	0.456	1.965		1	1	26.275			
T7	1.74	2.26	A	0.419	2.028	4	1	1	23.064	0.55	27.41	C
61.50-41.50			B	0.419	2.028		1	1	23.064			
			C	0.419	2.028		1	1	23.064			
T8	1.66	1.24	A	0.377	2.112	4	1	1	18.130	0.45	22.55	C
41.50-21.50			B	0.377	2.112		1	1	18.130			
			C	0.377	2.112		1	1	18.130			
T9 21.50-6.50	1.15	1.77	A	0.413	2.038	4	1	1	17.408	0.34	22.75	C
			B	0.413	2.038		1	1	17.408			
			C	0.413	2.038		1	1	17.408			
T10 6.50-1.50	0.00	0.71	A	0.879	1.895	4	1	1	9.065	0.06	11.12	C
			B	0.879	1.895		1	1	9.065			
			C	0.879	1.895		1	1	9.065			
Sum Weight:	12.59	23.52								4.68		

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	0.52	2.62	A	0.566	1.829	6	0.8	1	32.479	0.43	21.36	C

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
181.50-161.50		TA 0.99	B	0.566	1.829		0.8	1	32.479			
			C	0.566	1.829		0.8	1	32.479			
T2	1.03	1.43	A	0.406	2.052	6	0.8	1	20.085	0.48	24.13	C
161.50-141.50			B	0.406	2.052		0.8	1	20.085			
			C	0.406	2.052		0.8	1	20.085			
T3	1.40	2.75	A	0.577	1.82	6	0.8	1	33.370	0.56	28.16	C
141.50-121.50		TA 0.97	B	0.577	1.82		0.8	1	33.370			
			C	0.577	1.82		0.8	1	33.370			
T4	1.63	3.68	A	0.562	1.833	6	0.8	1	32.276	0.58	29.04	C
121.50-101.50			B	0.562	1.833		0.8	1	32.276			
			C	0.562	1.833		0.8	1	32.276			
T5	1.69	2.44	A	0.517	1.879	5	0.8	1	28.211	0.57	28.26	C
101.50-81.50			B	0.517	1.879		0.8	1	28.211			
			C	0.517	1.879		0.8	1	28.211			
T6	1.78	2.66	A	0.456	1.965	5	0.8	1	24.491	0.58	29.11	C
81.50-61.50			B	0.456	1.965		0.8	1	24.491			
			C	0.456	1.965		0.8	1	24.491			
T7	1.74	2.26	A	0.419	2.028	4	0.8	1	21.782	0.54	26.91	C
61.50-41.50			B	0.419	2.028		0.8	1	21.782			
			C	0.419	2.028		0.8	1	21.782			
T8	1.66	1.24	A	0.377	2.112	4	0.8	1	18.130	0.45	22.55	C
41.50-21.50			B	0.377	2.112		0.8	1	18.130			
			C	0.377	2.112		0.8	1	18.130			
T9 21.50-6.50	1.15	1.77	A	0.413	2.038	4	0.8	1	16.188	0.33	22.21	C
			B	0.413	2.038		0.8	1	16.188			
			C	0.413	2.038		0.8	1	16.188			
T10 6.50-1.50	0.00	0.71	A	0.879	1.895	4	0.8	1	8.186	0.05	10.04	C
			B	0.879	1.895		0.8	1	8.186			
			C	0.879	1.895		0.8	1	8.186			
Sum Weight:	12.59	23.52								4.57		

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	0.52	2.62	A	0.566	1.829	6	0.85	1	32.974	0.43	21.61	C
181.50-161.50		TA 0.99	B	0.566	1.829		0.85	1	32.974			
			C	0.566	1.829		0.85	1	32.974			
T2	1.03	1.43	A	0.406	2.052	6	0.85	1	20.085	0.48	24.13	C
161.50-141.50			B	0.406	2.052		0.85	1	20.085			
			C	0.406	2.052		0.85	1	20.085			
T3	1.40	2.75	A	0.577	1.82	6	0.85	1	33.936	0.57	28.42	C
141.50-121.50		TA 0.97	B	0.577	1.82		0.85	1	33.936			
			C	0.577	1.82		0.85	1	33.936			
T4	1.63	3.68	A	0.562	1.833	6	0.85	1	32.894	0.59	29.30	C
121.50-101.50			B	0.562	1.833		0.85	1	32.894			
			C	0.562	1.833		0.85	1	32.894			
T5	1.69	2.44	A	0.517	1.879	5	0.85	1	28.442	0.57	28.35	C
101.50-81.50			B	0.517	1.879		0.85	1	28.442			
			C	0.517	1.879		0.85	1	28.442			
T6	1.78	2.66	A	0.456	1.965	5	0.85	1	24.937	0.59	29.30	C
81.50-61.50			B	0.456	1.965		0.85	1	24.937			

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
			C	0.456	1.965		0.85	1	24.937			
T7	1.74	2.26	A	0.419	2.028	4	0.85	1	22.102	0.54	27.04	C
61.50-41.50			B	0.419	2.028		0.85	1	22.102			
			C	0.419	2.028		0.85	1	22.102			
T8	1.66	1.24	A	0.377	2.112	4	0.85	1	18.130	0.45	22.55	C
41.50-21.50			B	0.377	2.112		0.85	1	18.130			
			C	0.377	2.112		0.85	1	18.130			
T9 21.50-6.50	1.15	1.77	A	0.413	2.038	4	0.85	1	16.493	0.34	22.35	C
			B	0.413	2.038		0.85	1	16.493			
			C	0.413	2.038		0.85	1	16.493			
T10 6.50-1.50	0.00	0.71	A	0.879	1.895	4	0.85	1	8.406	0.05	10.31	C
			B	0.879	1.895		0.85	1	8.406			
			C	0.879	1.895		0.85	1	8.406			
Sum Weight:	12.59	23.52								4.60		

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	0.05	0.81	A	0.267	2.388	29	1	1	15.552	1.13	56.71	C
181.50-161.50		TA 0.52	B	0.267	2.388		1	1	15.552			
			C	0.267	2.388		1	1	15.552			
T2	0.16	0.46	A	0.195	2.613	28	1	1	8.159	0.91	45.71	C
161.50-141.50			B	0.195	2.613		1	1	8.159			
			C	0.195	2.613		1	1	8.159			
T3	0.21	0.88	A	0.286	2.333	27	1	1	17.019	1.44	72.25	C
141.50-121.50		TA 0.52	B	0.286	2.333		1	1	17.019			
			C	0.286	2.333		1	1	17.019			
T4	0.27	1.81	A	0.301	2.294	26	1	1	18.100	1.51	75.55	C
121.50-101.50			B	0.301	2.294		1	1	18.100			
			C	0.301	2.294		1	1	18.100			
T5	0.28	1.00	A	0.258	2.413	24	1	1	12.974	1.24	62.11	C
101.50-81.50			B	0.258	2.413		1	1	12.974			
			C	0.258	2.413		1	1	12.974			
T6	0.29	1.32	A	0.254	2.427	23	1	1	14.539	1.27	63.47	C
81.50-61.50			B	0.254	2.427		1	1	14.539			
			C	0.254	2.427		1	1	14.539			
T7	0.29	1.13	A	0.23	2.499	21	1	1	12.436	1.09	54.28	C
61.50-41.50			B	0.23	2.499		1	1	12.436			
			C	0.23	2.499		1	1	12.436			
T8	0.29	0.46	A	0.195	2.613	18	1	1	8.159	0.79	39.70	C
41.50-21.50			B	0.195	2.613		1	1	8.159			
			C	0.195	2.613		1	1	8.159			
T9 21.50-6.50	0.22	0.98	A	0.243	2.46	18	1	1	10.290	0.73	48.50	C
			B	0.243	2.46		1	1	10.290			
			C	0.243	2.46		1	1	10.290			
T10 6.50-1.50	0.00	0.41	A	0.712	1.777	18	1	1	6.507	0.17	34.93	C
			B	0.712	1.777		1	1	6.507			
			C	0.712	1.777		1	1	6.507			
Sum Weight:	2.05	10.31								10.30		

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	0.05	0.81	A	0.267	2.388	29	0.8	1	13.572	1.02	50.83	C
181.50-161.50		TA 0.52	B	0.267	2.388		0.8	1	13.572			
			C	0.267	2.388		0.8	1	13.572			
T2	0.16	0.46	A	0.195	2.613	28	0.8	1	8.159	0.91	45.71	C
161.50-141.50			B	0.195	2.613		0.8	1	8.159			
			C	0.195	2.613		0.8	1	8.159			
T3	0.21	0.88	A	0.286	2.333	27	0.8	1	14.756	1.32	66.16	C
141.50-121.50		TA 0.52	B	0.286	2.333		0.8	1	14.756			
			C	0.286	2.333		0.8	1	14.756			
T4	0.27	1.81	A	0.301	2.294	26	0.8	1	15.628	1.39	69.32	C
121.50-101.50			B	0.301	2.294		0.8	1	15.628			
			C	0.301	2.294		0.8	1	15.628			
T5	0.28	1.00	A	0.258	2.413	24	0.8	1	12.049	1.20	59.80	C
101.50-81.50			B	0.258	2.413		0.8	1	12.049			
			C	0.258	2.413		0.8	1	12.049			
T6	0.29	1.32	A	0.254	2.427	23	0.8	1	12.754	1.19	59.27	C
81.50-61.50			B	0.254	2.427		0.8	1	12.754			
			C	0.254	2.427		0.8	1	12.754			
T7	0.29	1.13	A	0.23	2.499	21	0.8	1	11.153	1.03	51.46	C
61.50-41.50			B	0.23	2.499		0.8	1	11.153			
			C	0.23	2.499		0.8	1	11.153			
T8	0.29	0.46	A	0.195	2.613	18	0.8	1	8.159	0.79	39.70	C
41.50-21.50			B	0.195	2.613		0.8	1	8.159			
			C	0.195	2.613		0.8	1	8.159			
T9 21.50-6.50	0.22	0.98	A	0.243	2.46	18	0.8	1	9.071	0.68	45.48	C
			B	0.243	2.46		0.8	1	9.071			
			C	0.243	2.46		0.8	1	9.071			
T10 6.50-1.50	0.00	0.41	A	0.712	1.777	18	0.8	1	5.628	0.15	30.21	C
			B	0.712	1.777		0.8	1	5.628			
			C	0.712	1.777		0.8	1	5.628			
Sum Weight:	2.05	10.31								9.68		

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 ft^2	F K	w plf	Ctrl. Face
T1	0.05	0.81	A	0.267	2.388	29	0.85	1	14.067	1.05	52.30	C
181.50-161.50		TA 0.52	B	0.267	2.388		0.85	1	14.067			
			C	0.267	2.388		0.85	1	14.067			
T2	0.16	0.46	A	0.195	2.613	28	0.85	1	8.159	0.91	45.71	C
161.50-141.50			B	0.195	2.613		0.85	1	8.159			
			C	0.195	2.613		0.85	1	8.159			
T3	0.21	0.88	A	0.286	2.333	27	0.85	1	15.322	1.35	67.68	C
141.50-121.50		TA 0.52	B	0.286	2.333		0.85	1	15.322			
			C	0.286	2.333		0.85	1	15.322			
T4	0.27	1.81	A	0.301	2.294	26	0.85	1	16.246	1.42	70.87	C
121.50-101.50			B	0.301	2.294		0.85	1	16.246			

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
			C	0.301	2.294		0.85	1	16.246			
T5	0.28	1.00	A	0.258	2.413	24	0.85	1	12.281	1.21	60.38	C
101.50-81.50			B	0.258	2.413		0.85	1	12.281			
			C	0.258	2.413		0.85	1	12.281			
T6	0.29	1.32	A	0.254	2.427	23	0.85	1	13.200	1.21	60.32	C
81.50-61.50			B	0.254	2.427		0.85	1	13.200			
			C	0.254	2.427		0.85	1	13.200			
T7	0.29	1.13	A	0.23	2.499	21	0.85	1	11.474	1.04	52.16	C
61.50-41.50			B	0.23	2.499		0.85	1	11.474			
			C	0.23	2.499		0.85	1	11.474			
T8	0.29	0.46	A	0.195	2.613	18	0.85	1	8.159	0.79	39.70	C
41.50-21.50			B	0.195	2.613		0.85	1	8.159			
			C	0.195	2.613		0.85	1	8.159			
T9 21.50-6.50	0.22	0.98	A	0.243	2.46	18	0.85	1	9.375	0.69	46.23	C
			B	0.243	2.46		0.85	1	9.375			
			C	0.243	2.46		0.85	1	9.375			
T10 6.50-1.50	0.00	0.41	A	0.712	1.777	18	0.85	1	5.847	0.16	31.39	C
			B	0.712	1.777		0.85	1	5.847			
			C	0.712	1.777		0.85	1	5.847			
Sum Weight:	2.05	10.31								9.83		

Discrete Appurtenance Pressures - No Ice $G_H = 0.850$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Torque Arm Face C	180.0000	0.00	0.00	2.61	168.50	1.147	49	2.32	3.86
Torque Arm Face B	60.0000	0.00	2.26	-1.30	168.50	1.147	49	2.32	3.86
Torque Arm Face A	300.0000	0.00	-2.26	-1.30	168.50	1.147	49	2.32	3.86
Torque Arm Face C	180.0000	0.00	0.00	2.61	128.50	1.062	45	2.36	3.94
Torque Arm Face B	60.0000	0.00	2.26	-1.30	128.50	1.062	45	2.36	3.94
Torque Arm Face A	300.0000	0.00	-2.26	-1.30	128.50	1.062	45	2.36	3.94
GPS	120.0000	0.01	4.74	2.73	89.50	0.957	41	1.00	1.00
3' GPS Stand-off Mount	120.0000	0.05	3.00	1.73	89.50	0.957	41	2.45	2.45
APXVSPP18-C-A20	0.0000	0.06	-4.00	-4.97	126.00	1.056	45	8.02	5.28
APXVSPP18-C-A20	120.0000	0.06	6.30	-0.98	126.00	1.056	45	8.02	5.28
APXVSPP18-C-A20	240.0000	0.06	-2.30	5.95	126.00	1.056	45	8.02	5.28
FD-RRH 2x50 800	0.0000	0.06	0.00	-4.97	126.00	1.056	45	2.06	1.93
FD-RRH 2x50 800	120.0000	0.06	4.30	2.48	126.00	1.056	45	2.06	1.93
FD-RRH 2x50 800	240.0000	0.06	-4.30	2.48	126.00	1.056	45	2.06	1.93
FD-RRH 4x45 1900	0.0000	0.06	0.00	-4.97	126.00	1.056	45	2.32	2.38
FD-RRH 4x45 1900	120.0000	0.06	4.30	2.48	126.00	1.056	45	2.32	2.38
FD-RRH 4x45 1900	240.0000	0.06	-4.30	2.48	126.00	1.056	45	2.32	2.38
Rohn 6' x 12' Boom Gate (1)	0.0000	0.56	0.00	-3.97	126.00	1.056	45	16.60	16.60
Rohn 6' x 12' Boom Gate (1)	120.0000	0.56	3.44	1.98	126.00	1.056	45	16.60	16.60
Rohn 6' x 12' Boom Gate (1)	240.0000	0.56	-3.44	1.98	126.00	1.056	45	16.60	16.60
1.5"x2'omni	0.0000	0.01	0.00	-4.97	145.50	1.100	47	0.25	0.25
1.5"x2'omni	0.0000	0.01	0.00	-4.97	141.50	1.091	47	0.25	0.25
2-ft Stand Off	0.0000	0.02	0.00	-2.97	143.50	1.096	47	1.07	1.07
3"x20-ft Omni	240.0000	0.02	-4.30	2.48	148.50	1.106	47	3.56	3.56
3-ft Side Arm	240.0000	0.01	-3.00	1.73	138.50	1.085	46	0.66	0.66

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
20-ft x 1.9in Support Pipe	240.0000	0.05	-3.00	1.73	148.50	1.106	47	3.80	3.80
20' x 2" Dia Omni	0.0000	0.02	0.00	-1.97	190.50	1.188	51	4.00	4.00
14' x 3" Dia Omni	120.0000	0.04	1.71	0.98	187.50	1.183	50	4.20	4.20
20' x 2" Dia Omni	240.0000	0.02	-1.71	0.98	190.50	1.188	51	4.00	4.00
SBNHH-1D65A	300.0000	0.04	-2.45	-3.72	78.00	0.921	39	5.88	3.86
SBNHH-1D65A	60.0000	0.04	4.45	-0.26	78.00	0.921	39	5.88	3.86
SBNHH-1D65A	180.0000	0.04	-2.00	3.98	78.00	0.921	39	5.88	3.86
DMP65R-BU4D	300.0000	0.07	-6.45	3.20	78.00	0.921	39	8.00	3.51
DMP65R-BU4D	60.0000	0.07	0.45	-7.19	78.00	0.921	39	8.00	3.51
DMP65R-BU4D	180.0000	0.07	6.00	3.98	78.00	0.921	39	8.00	3.51
8843 B2/B66A	300.0000	0.07	-3.45	-1.99	78.00	0.921	39	1.64	1.35
8843 B2/B66A	60.0000	0.07	3.45	-1.99	78.00	0.921	39	1.64	1.35
8843 B2/B66A	180.0000	0.07	0.00	3.98	78.00	0.921	39	1.64	1.35
4449 B5/B12	300.0000	0.07	-3.45	-1.99	78.00	0.921	39	1.97	1.41
4449 B5/B12	60.0000	0.07	3.45	-1.99	78.00	0.921	39	1.97	1.41
4449 B5/B12	180.0000	0.07	0.00	3.98	78.00	0.921	39	1.97	1.41
DC6-48-60-18-8F Surge Arrestor	240.0000	0.02	-2.57	1.48	78.00	0.921	39	1.91	1.91
12' V-Frame	0.0000	0.30	0.00	-3.97	78.00	0.921	39	9.22	12.97
12' V-Frame	120.0000	0.30	3.44	1.98	78.00	0.921	39	9.22	12.97
12' V-Frame	240.0000	0.30	-3.44	1.98	78.00	0.921	39	9.22	12.97
AIR6419	0.0000	0.07	-6.00	-5.97	159.00	1.128	48	3.66	1.66
APXVAALL24-43	0.0000	0.15	6.00	-5.97	159.00	1.128	48	20.24	8.89
AIR6419	120.0000	0.07	8.17	-2.21	159.00	1.128	48	3.66	1.66
APXVAALL24-43	120.0000	0.15	2.17	8.18	159.00	1.128	48	20.24	8.89
AIR6419	240.0000	0.07	-2.17	8.18	159.00	1.128	48	3.66	1.66
APXVAALL24-43	240.0000	0.15	-8.17	-2.21	159.00	1.128	48	20.24	8.89
4480 B71+B85	0.0000	0.08	-2.00	-5.97	160.50	1.131	48	2.85	1.38
4480 B71+B85	120.0000	0.08	6.17	1.25	160.50	1.131	48	2.85	1.38
4480 B71+B85	240.0000	0.08	-4.17	4.72	160.50	1.131	48	2.85	1.38
4460 B25+B66	0.0000	0.11	-2.00	-5.97	157.50	1.125	48	2.56	1.98
4460 B25+B66	120.0000	0.11	6.17	1.25	157.50	1.125	48	2.56	1.98
4460 B25+B66	240.0000	0.11	-4.17	4.72	157.50	1.125	48	2.56	1.98
SitePro VFA12-HD	0.0000	0.75	0.00	-3.97	159.00	1.128	48	21.00	21.00
SitePro VFA12-HD	120.0000	0.75	3.44	1.98	159.00	1.128	48	21.00	21.00
SitePro VFA12-HD	240.0000	0.75	-3.44	1.98	159.00	1.128	48	21.00	21.00
DS2C03F36D-D	240.0000	0.08	-6.90	3.98	187.00	1.182	50	7.30	7.30
SitePro USF-4U	240.0000	0.16	-4.30	2.48	177.00	1.163	50	5.75	5.75
	Sum Weight:	7.88							

Discrete Appurtenance Pressures - With Ice $G_H = 0.850$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
Torque Arm Face C	180.0000	0.00	0.00	2.61	168.50	1.147	6	4.12	6.88	1.3560
Torque Arm Face B	60.0000	0.00	2.26	-1.30	168.50	1.147	6	4.12	6.88	1.3560
Torque Arm Face A	300.0000	0.00	-2.26	-1.30	168.50	1.147	6	4.12	6.88	1.3560
Torque Arm Face C	180.0000	0.00	0.00	2.61	128.50	1.062	6	4.08	6.82	1.3205
Torque Arm Face B	60.0000	0.00	2.26	-1.30	128.50	1.062	6	4.08	6.82	1.3205
Torque Arm Face A	300.0000	0.00	-2.26	-1.30	128.50	1.062	6	4.08	6.82	1.3205
GPS	120.0000	0.02	4.74	2.73	89.50	0.957	5	2.27	2.27	1.2707
3' GPS Stand-off Mount	120.0000	0.11	3.00	1.73	89.50	0.957	5	6.34	6.34	1.2707
APXVSPP18-C-A20	0.0000	0.20	-4.00	-4.97	126.00	1.056	6	9.24	6.49	1.3149
APXVSPP18-C-A20	120.0000	0.20	6.30	-0.98	126.00	1.056	6	9.24	6.49	1.3149
APXVSPP18-C-A20	240.0000	0.20	-2.30	5.95	126.00	1.056	6	9.24	6.49	1.3149

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2	t_z in
FD-RRH 2x50 800	0.0000	0.13	0.00	-4.97	126.00	1.056	6	2.55	2.42	1.3149
FD-RRH 2x50 800	120.0000	0.13	4.30	2.48	126.00	1.056	6	2.55	2.42	1.3149
FD-RRH 2x50 800	240.0000	0.13	-4.30	2.48	126.00	1.056	6	2.55	2.42	1.3149
FD-RRH 4x45 1900	0.0000	0.13	0.00	-4.97	126.00	1.056	6	2.88	2.95	1.3149
FD-RRH 4x45 1900	120.0000	0.13	4.30	2.48	126.00	1.056	6	2.88	2.95	1.3149
FD-RRH 4x45 1900	240.0000	0.13	-4.30	2.48	126.00	1.056	6	2.88	2.95	1.3149
Rohn 6' x 12' Boom Gate (1)	0.0000	0.93	0.00	-3.97	126.00	1.056	6	25.02	25.02	1.3149
Rohn 6' x 12' Boom Gate (1)	120.0000	0.93	3.44	1.98	126.00	1.056	6	25.02	25.02	1.3149
Rohn 6' x 12' Boom Gate (1)	240.0000	0.93	-3.44	1.98	126.00	1.056	6	25.02	25.02	1.3149
1.5"x2'omni	0.0000	0.01	0.00	-4.97	145.50	1.100	6	0.60	0.60	1.3339
1.5"x2'omni	0.0000	0.01	0.00	-4.97	141.50	1.091	6	0.60	0.60	1.3302
2-ft Stand Off	0.0000	0.04	0.00	-2.97	143.50	1.096	6	2.54	2.54	1.3321
3"x20-ft Omni	240.0000	0.08	-4.30	2.48	148.50	1.106	6	13.10	13.10	1.3367
3-ft Side Arm	240.0000	0.05	-3.00	1.73	138.50	1.085	6	1.93	1.93	1.3274
20-ft x 1.9in Support Pipe	240.0000	0.13	-3.00	1.73	148.50	1.106	6	9.20	9.20	1.3367
20' x 2" Dia Omni	0.0000	0.14	0.00	-1.97	190.50	1.188	6	9.60	9.60	1.3704
14' x 3" Dia Omni	120.0000	0.15	1.71	0.98	187.50	1.183	6	8.14	8.14	1.3682
20' x 2" Dia Omni	240.0000	0.14	-1.71	0.98	190.50	1.188	6	9.60	9.60	1.3704
SBNHH-1D65A	300.0000	0.15	-2.45	-3.72	78.00	0.921	5	6.81	4.75	1.2533
SBNHH-1D65A	60.0000	0.15	4.45	-0.26	78.00	0.921	5	6.81	4.75	1.2533
SBNHH-1D65A	180.0000	0.15	-2.00	3.98	78.00	0.921	5	6.81	4.75	1.2533
DMP65R-BU4D	300.0000	0.21	-6.45	3.20	78.00	0.921	5	8.97	4.28	1.2533
DMP65R-BU4D	60.0000	0.21	0.45	-7.19	78.00	0.921	5	8.97	4.28	1.2533
DMP65R-BU4D	180.0000	0.21	6.00	3.98	78.00	0.921	5	8.97	4.28	1.2533
8843 B2/B66A	300.0000	0.12	-3.45	-1.99	78.00	0.921	5	2.06	1.74	1.2533
8843 B2/B66A	60.0000	0.12	3.45	-1.99	78.00	0.921	5	2.06	1.74	1.2533
8843 B2/B66A	180.0000	0.12	0.00	3.98	78.00	0.921	5	2.06	1.74	1.2533
4449 B5/B12	300.0000	0.12	-3.45	-1.99	78.00	0.921	5	2.43	1.81	1.2533
4449 B5/B12	60.0000	0.12	3.45	-1.99	78.00	0.921	5	2.43	1.81	1.2533
4449 B5/B12	180.0000	0.12	0.00	3.98	78.00	0.921	5	2.43	1.81	1.2533
DC6-48-60-18-8F Surge Arrestor	240.0000	0.08	-2.57	1.48	78.00	0.921	5	2.40	2.40	1.2533
12' V-Frame	0.0000	0.55	0.00	-3.97	78.00	0.921	5	9.22	12.97	1.2533
12' V-Frame	120.0000	0.55	3.44	1.98	78.00	0.921	5	9.22	12.97	1.2533
12' V-Frame	240.0000	0.55	-3.44	1.98	78.00	0.921	5	9.22	12.97	1.2533
AIR6419	0.0000	0.14	-6.00	-5.97	159.00	1.128	6	4.35	2.19	1.3458
APXVAALL24-43	0.0000	0.48	6.00	-5.97	159.00	1.128	6	22.00	10.52	1.3458
AIR6419	120.0000	0.14	8.17	-2.21	159.00	1.128	6	4.35	2.19	1.3458
APXVAALL24-43	120.0000	0.48	2.17	8.18	159.00	1.128	6	22.00	10.52	1.3458
AIR6419	240.0000	0.14	-2.17	8.18	159.00	1.128	6	4.35	2.19	1.3458
APXVAALL24-43	240.0000	0.48	-8.17	-2.21	159.00	1.128	6	22.00	10.52	1.3458
4480 B71+B85	0.0000	0.15	-2.00	-5.97	160.50	1.131	6	3.44	1.84	1.3471
4480 B71+B85	120.0000	0.15	6.17	1.25	160.50	1.131	6	3.44	1.84	1.3471
4480 B71+B85	240.0000	0.15	-4.17	4.72	160.50	1.131	6	3.44	1.84	1.3471
4460 B25+B66	0.0000	0.19	-2.00	-5.97	157.50	1.125	6	3.12	2.48	1.3445
4460 B25+B66	120.0000	0.19	6.17	1.25	157.50	1.125	6	3.12	2.48	1.3445
4460 B25+B66	240.0000	0.19	-4.17	4.72	157.50	1.125	6	3.12	2.48	1.3445
SitePro VFA12-HD	0.0000	1.15	0.00	-3.97	159.00	1.128	6	31.77	31.77	1.3458
SitePro VFA12-HD	120.0000	1.15	3.44	1.98	159.00	1.128	6	31.77	31.77	1.3458
SitePro VFA12-HD	240.0000	1.15	-3.44	1.98	159.00	1.128	6	31.77	31.77	1.3458
DS2C03F36D-D	240.0000	0.26	-6.90	3.98	187.00	1.182	6	14.10	14.10	1.3678
SitePro USF-4U	240.0000	0.29	-4.30	2.48	177.00	1.163	6	11.87	11.87	1.3603
	Sum Weight:	15.51								

Discrete Appurtenance Pressures - Service $G_H = 0.850$

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
Torque Arm Face C	180.0000	0.00	0.00	2.61	168.50	1.147	29	2.32	3.86
Torque Arm Face B	60.0000	0.00	2.26	-1.30	168.50	1.147	29	2.32	3.86
Torque Arm Face A	300.0000	0.00	-2.26	-1.30	168.50	1.147	29	2.32	3.86
Torque Arm Face C	180.0000	0.00	0.00	2.61	128.50	1.062	27	2.36	3.94
Torque Arm Face B	60.0000	0.00	2.26	-1.30	128.50	1.062	27	2.36	3.94
Torque Arm Face A	300.0000	0.00	-2.26	-1.30	128.50	1.062	27	2.36	3.94
GPS	120.0000	0.01	4.74	2.73	89.50	0.957	24	1.00	1.00
3' GPS Stand-off Mount	120.0000	0.05	3.00	1.73	89.50	0.957	24	2.45	2.45
APXVSPP18-C-A20	0.0000	0.06	-4.00	-4.97	126.00	1.056	27	8.02	5.28
APXVSPP18-C-A20	120.0000	0.06	6.30	-0.98	126.00	1.056	27	8.02	5.28
APXVSPP18-C-A20	240.0000	0.06	-2.30	5.95	126.00	1.056	27	8.02	5.28
FD-RRH 2x50 800	0.0000	0.06	0.00	-4.97	126.00	1.056	27	2.06	1.93
FD-RRH 2x50 800	120.0000	0.06	4.30	2.48	126.00	1.056	27	2.06	1.93
FD-RRH 2x50 800	240.0000	0.06	-4.30	2.48	126.00	1.056	27	2.06	1.93
FD-RRH 4x45 1900	0.0000	0.06	0.00	-4.97	126.00	1.056	27	2.32	2.38
FD-RRH 4x45 1900	120.0000	0.06	4.30	2.48	126.00	1.056	27	2.32	2.38
FD-RRH 4x45 1900	240.0000	0.06	-4.30	2.48	126.00	1.056	27	2.32	2.38
Rohn 6' x 12' Boom Gate (1)	0.0000	0.56	0.00	-3.97	126.00	1.056	27	16.60	16.60
Rohn 6' x 12' Boom Gate (1)	120.0000	0.56	3.44	1.98	126.00	1.056	27	16.60	16.60
Rohn 6' x 12' Boom Gate (1)	240.0000	0.56	-3.44	1.98	126.00	1.056	27	16.60	16.60
1.5"x2'omni	0.0000	0.01	0.00	-4.97	145.50	1.100	28	0.25	0.25
1.5"x2'omni	0.0000	0.01	0.00	-4.97	141.50	1.091	28	0.25	0.25
2-ft Stand Off	0.0000	0.02	0.00	-2.97	143.50	1.096	28	1.07	1.07
3"x20-ft Omni	240.0000	0.02	-4.30	2.48	148.50	1.106	28	3.56	3.56
3-ft Side Arm	240.0000	0.01	-3.00	1.73	138.50	1.085	28	0.66	0.66
20-ft x 1.9in Support Pipe	240.0000	0.05	-3.00	1.73	148.50	1.106	28	3.80	3.80
20' x 2" Dia Omni	0.0000	0.02	0.00	-1.97	190.50	1.188	30	4.00	4.00
14' x 3" Dia Omni	120.0000	0.04	1.71	0.98	187.50	1.183	30	4.20	4.20
20' x 2" Dia Omni	240.0000	0.02	-1.71	0.98	190.50	1.188	30	4.00	4.00
SBNHH-1D65A	300.0000	0.04	-2.45	-3.72	78.00	0.921	23	5.88	3.86
SBNHH-1D65A	60.0000	0.04	4.45	-0.26	78.00	0.921	23	5.88	3.86
SBNHH-1D65A	180.0000	0.04	-2.00	3.98	78.00	0.921	23	5.88	3.86
DMP65R-BU4D	300.0000	0.07	-6.45	3.20	78.00	0.921	23	8.00	3.51
DMP65R-BU4D	60.0000	0.07	0.45	-7.19	78.00	0.921	23	8.00	3.51
DMP65R-BU4D	180.0000	0.07	6.00	3.98	78.00	0.921	23	8.00	3.51
8843 B2/B66A	300.0000	0.07	-3.45	-1.99	78.00	0.921	23	1.64	1.35
8843 B2/B66A	60.0000	0.07	3.45	-1.99	78.00	0.921	23	1.64	1.35
8843 B2/B66A	180.0000	0.07	0.00	3.98	78.00	0.921	23	1.64	1.35
4449 B5/B12	300.0000	0.07	-3.45	-1.99	78.00	0.921	23	1.97	1.41
4449 B5/B12	60.0000	0.07	3.45	-1.99	78.00	0.921	23	1.97	1.41
4449 B5/B12	180.0000	0.07	0.00	3.98	78.00	0.921	23	1.97	1.41
DC6-48-60-18-8F Surge Arrestor	240.0000	0.02	-2.57	1.48	78.00	0.921	23	1.91	1.91
12' V-Frame	0.0000	0.30	0.00	-3.97	78.00	0.921	23	9.22	12.97
12' V-Frame	120.0000	0.30	3.44	1.98	78.00	0.921	23	9.22	12.97
12' V-Frame	240.0000	0.30	-3.44	1.98	78.00	0.921	23	9.22	12.97
AIR6419	0.0000	0.07	-6.00	-5.97	159.00	1.128	29	3.66	1.66
APXVAALL24-43	0.0000	0.15	6.00	-5.97	159.00	1.128	29	20.24	8.89
AIR6419	120.0000	0.07	8.17	-2.21	159.00	1.128	29	3.66	1.66
APXVAALL24-43	120.0000	0.15	2.17	8.18	159.00	1.128	29	20.24	8.89
AIR6419	240.0000	0.07	-2.17	8.18	159.00	1.128	29	3.66	1.66
APXVAALL24-43	240.0000	0.15	-8.17	-2.21	159.00	1.128	29	20.24	8.89
4480 B71+B85	0.0000	0.08	-2.00	-5.97	160.50	1.131	29	2.85	1.38
4480 B71+B85	120.0000	0.08	6.17	1.25	160.50	1.131	29	2.85	1.38

Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	z ft	K_z	q_z psf	C_AA_C Front ft^2	C_AA_C Side ft^2
4480 B71+B85	240.0000	0.08	-4.17	4.72	160.50	1.131	29	2.85	1.38
4460 B25+B66	0.0000	0.11	-2.00	-5.97	157.50	1.125	29	2.56	1.98
4460 B25+B66	120.0000	0.11	6.17	1.25	157.50	1.125	29	2.56	1.98
4460 B25+B66	240.0000	0.11	-4.17	4.72	157.50	1.125	29	2.56	1.98
SitePro VFA12-HD	0.0000	0.75	0.00	-3.97	159.00	1.128	29	21.00	21.00
SitePro VFA12-HD	120.0000	0.75	3.44	1.98	159.00	1.128	29	21.00	21.00
SitePro VFA12-HD	240.0000	0.75	-3.44	1.98	159.00	1.128	29	21.00	21.00
DS2C03F36D-D	240.0000	0.08	-6.90	3.98	187.00	1.182	30	7.30	7.30
SitePro USF-4U	240.0000	0.16	-4.30	2.48	177.00	1.163	30	5.75	5.75
	Sum Weight:	7.88							

Dish Pressures - No Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
176.50	8.5 Dishw/radome	0.0000	0.07	0.00	-1.97	1.162	56.75	50
		Sum Weight:	0.07					

Dish Pressures - With Ice

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf	t_z in
176.50	8.5 Dishw/radome	0.0000	0.60	0.00	-1.97	1.162	58.67	6	1.1826
		Sum Weight:	0.60						

Dish Pressures - Service

Elevation ft	Dish Description	Aiming Azimuth °	Weight K	$Offset_x$ ft	$Offset_z$ ft	K_z	A_A ft^2	q_z psf
176.50	8.5 Dishw/radome	0.0000	0.07	0.00	-1.97	1.162	56.75	30
		Sum Weight:	0.07					

Force Totals (Does not include forces on guys)

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Leg Weight	3.14			
Bracing Weight	7.17			
Total Member Self-Weight	10.31			
Guy Weight	2.47			
Total Weight	22.78			

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Torques kip-ft
Wind 0 deg - No Ice		0.00	-32.04	-3.18
Wind 30 deg - No Ice		15.30	-26.74	-4.64
Wind 60 deg - No Ice		25.76	-15.33	-2.92
Wind 90 deg - No Ice		29.56	-0.03	0.02
Wind 120 deg - No Ice		26.14	18.70	5.95
Wind 150 deg - No Ice		14.29	28.61	5.91
Wind 180 deg - No Ice		0.00	32.19	3.18
Wind 210 deg - No Ice		-14.29	28.61	-0.41
Wind 240 deg - No Ice		-26.14	18.70	-2.77
Wind 270 deg - No Ice		-29.56	-0.03	-0.02
Wind 300 deg - No Ice		-25.76	-15.33	-0.26
Wind 330 deg - No Ice		-15.30	-26.74	-0.86
Member Ice	13.21			
Guy Ice	9.11			
Total Weight Ice	63.81			
Wind 0 deg - Ice		0.00	-7.30	-0.84
Wind 30 deg - Ice		3.57	-6.21	-0.73
Wind 60 deg - Ice		6.09	-3.58	-0.17
Wind 90 deg - Ice		7.00	-0.00	0.49
Wind 120 deg - Ice		6.11	4.00	1.42
Wind 150 deg - Ice		3.43	6.46	1.39
Wind 180 deg - Ice		0.00	7.35	0.84
Wind 210 deg - Ice		-3.43	6.46	0.06
Wind 240 deg - Ice		-6.11	4.00	-0.58
Wind 270 deg - Ice		-7.00	-0.00	-0.49
Wind 300 deg - Ice		-6.09	-3.58	-0.67
Wind 330 deg - Ice		-3.57	-6.21	-0.72
Total Weight	22.78			
Wind 0 deg - Service		0.00	-19.07	-1.89
Wind 30 deg - Service		9.11	-15.91	-2.76
Wind 60 deg - Service		15.33	-9.12	-1.74
Wind 90 deg - Service		17.59	-0.02	0.01
Wind 120 deg - Service		15.56	11.13	3.54
Wind 150 deg - Service		8.51	17.02	3.52
Wind 180 deg - Service		0.00	19.15	1.89
Wind 210 deg - Service		-8.51	17.02	-0.24
Wind 240 deg - Service		-15.56	11.13	-1.65
Wind 270 deg - Service		-17.59	-0.02	-0.01
Wind 300 deg - Service		-15.33	-9.12	-0.15
Wind 330 deg - Service		-9.11	-15.91	-0.51

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy
3	1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy
4	1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy
5	1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy
6	1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy
7	1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy
8	1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy
9	1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy

Comb. No.	Description
10	1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy
11	1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy
12	1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy
13	1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy
14	1.2 Dead+1.0 Ice+1.0 Temp+Guy
15	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy
16	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy
17	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy
18	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy
19	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy
20	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy
21	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy
22	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy
23	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy
24	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy
25	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy
26	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy
27	Dead+Wind 0 deg - Service+Guy
28	Dead+Wind 30 deg - Service+Guy
29	Dead+Wind 60 deg - Service+Guy
30	Dead+Wind 90 deg - Service+Guy
31	Dead+Wind 120 deg - Service+Guy
32	Dead+Wind 150 deg - Service+Guy
33	Dead+Wind 180 deg - Service+Guy
34	Dead+Wind 210 deg - Service+Guy
35	Dead+Wind 240 deg - Service+Guy
36	Dead+Wind 270 deg - Service+Guy
37	Dead+Wind 300 deg - Service+Guy
38	Dead+Wind 330 deg - Service+Guy

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	181.5 - 161.5	Leg	Max Tension	8	17.92	0.03	-0.08
			Max. Compression	10	-16.18	0.34	-0.10
			Max. Mx	11	-1.46	1.55	0.01
			Max. My	2	-6.71	0.08	1.42
			Max. Vy	5	-2.01	-1.47	0.03
			Max. Vx	2	1.70	0.08	1.42
		Diagonal	Max Tension	9	3.21	0.00	0.00
			Max. Compression	7	-3.36	0.00	0.00
			Max. Mx	8	2.31	-0.04	-0.00
			Max. My	3	-2.42	-0.01	0.02
			Max. Vy	8	-0.02	0.00	0.00
			Max. Vx	3	-0.01	-0.01	0.02
		Top Girt	Max Tension	2	0.07	0.00	0.00
			Max. Compression	8	-0.14	0.00	0.00
			Max. Mx	25	-0.05	-0.01	0.00
			Max. My	7	0.05	0.00	-0.00
			Max. Vy	25	-0.02	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
		Bottom Girt	Max Tension	11	0.83	0.00	0.00
			Max. Compression	5	-0.82	0.00	0.00
			Max. Mx	25	-0.14	-0.01	0.00
			Max. My	7	0.78	0.00	-0.00
			Max. Vy	25	-0.02	0.00	0.00
			Max. Vx	7	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
		Guy A	Bottom Tension	8	10.94		
			Top Tension	8	11.06		
			Top Cable Vert	8	7.64		
			Top Cable Norm	8	7.99		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-7.31		
			Bot Cable Norm	8	8.14		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	12	9.51		
			Top Tension	12	9.62		
			Top Cable Vert	12	6.67		
			Top Cable Norm	12	6.94		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-6.34		
			Bot Cable Norm	12	7.09		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	4	9.70		
			Top Tension	4	9.81		
			Top Cable Vert	4	6.79		
			Top Cable Norm	4	7.08		
			Top Cable Tan	4	0.01		
			Bot Cable Vert	4	-6.47		
			Bot Cable Norm	4	7.23		
			Bot Cable Tan	4	0.00		
		Torque Arm Top	Max Tension	3	12.04	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	16	9.48	0.04	0.00
			Max. My	7	6.82	0.00	-0.00
			Max. Vy	16	-0.04	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
		Torque Arm Bottom	Max Tension	6	1.91	0.00	0.00
			Max. Compression	8	-16.55	0.00	0.00
			Max. Mx	19	-9.41	0.05	0.00
			Max. My	7	-14.77	0.00	-0.00
			Max. Vy	19	-0.04	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
T2	161.5 - 141.5	Leg	Max Tension	11	0.23	-0.23	0.42
			Max. Compression	6	-18.71	-0.65	0.14
			Max. Mx	5	-17.30	1.52	0.51
			Max. My	2	-12.34	-0.24	-1.60
			Max. Vy	5	-2.01	-0.23	0.01
			Max. Vx	2	1.70	-0.20	0.37
		Diagonal	Max Tension	3	3.09	0.00	0.00
			Max. Compression	3	-3.69	0.00	0.00
			Max. Mx	19	0.37	0.01	0.00
			Max. My	20	0.21	0.00	-0.00
			Max. Vy	19	-0.01	0.00	0.00
			Max. Vx	20	-0.00	0.00	0.00
		Top Girt	Max Tension	11	2.13	0.00	0.00
			Max. Compression	5	-2.18	0.00	0.00
			Max. Mx	25	0.02	0.01	0.00
			Max. My	7	-0.69	0.00	0.00
			Max. Vy	25	-0.01	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
		Bottom Girt	Max Tension	3	1.58	0.00	0.00
			Max. Compression	8	-1.49	0.00	0.00
			Max. Mx	14	0.02	0.01	0.00
			Max. My	7	-1.32	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
T3	141.5 - 121.5	Leg	Max Tension	8	11.06	0.02	-0.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	10	-29.46	0.45	-0.23
			Max. Mx	4	-11.60	-0.88	0.53
			Max. My	2	-14.11	-0.31	0.91
			Max. Vy	11	1.26	0.74	-0.01
			Max. Vx	2	1.32	0.17	0.84
		Diagonal	Max Tension	3	3.22	0.00	0.00
			Max. Compression	9	-3.17	0.00	-0.01
			Max. Mx	8	2.06	-0.07	-0.00
			Max. My	3	-1.76	-0.01	0.02
			Max. Vy	8	-0.04	0.00	0.00
			Max. Vx	3	-0.01	-0.01	0.02
		Top Girt	Max Tension	2	0.73	0.00	0.00
			Max. Compression	4	-0.37	0.00	0.00
			Max. Mx	14	0.23	-0.01	0.00
			Max. My	6	-0.14	0.00	0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Bottom Girt	Max Tension	10	0.74	0.00	0.00
			Max. Compression	4	-0.22	0.00	0.00
			Max. Mx	14	0.37	-0.01	0.00
			Max. My	6	-0.01	0.00	0.00
			Max. Vy	14	0.02	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Guy A	Bottom Tension	8	9.99		
			Top Tension	8	10.08		
			Top Cable Vert	8	5.93		
			Top Cable Norm	8	8.15		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-5.67		
			Bot Cable Norm	8	8.23		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	12	9.82		
			Top Tension	12	9.90		
			Top Cable Vert	12	5.83		
			Top Cable Norm	12	8.01		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-5.57		
			Bot Cable Norm	12	8.08		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	4	9.81		
			Top Tension	4	9.90		
			Top Cable Vert	4	5.82		
			Top Cable Norm	4	8.00		
			Top Cable Tan	4	0.00		
			Bot Cable Vert	4	-5.56		
			Bot Cable Norm	4	8.08		
			Bot Cable Tan	4	0.00		
		Torque Arm Top	Max Tension	6	10.76	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	24	7.96	0.04	0.00
			Max. My	6	5.15	0.00	-0.00
			Max. Vy	24	0.04	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Torque Arm Bottom	Max Tension	10	3.02	0.00	0.00
			Max. Compression	8	-14.15	0.00	0.00
			Max. Mx	19	-7.87	0.04	0.00
			Max. My	7	-12.02	0.00	-0.00
			Max. Vy	19	-0.04	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
T4	121.5 - 101.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-32.10	-0.08	-0.20

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	11	-12.38	-0.81	-0.15
			Max. My	8	-16.26	-0.05	0.85
			Max. Vy	11	1.25	-0.04	-0.08
			Max. Vx	2	1.31	0.09	0.03
		Diagonal	Max Tension	5	3.44	0.00	0.00
			Max. Compression	11	-4.12	0.00	0.00
			Max. Mx	19	0.24	-0.03	0.00
			Max. My	6	-1.00	0.00	0.00
			Max. Vy	19	0.03	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Horizontal	Max Tension	8	1.09	0.00	0.00
			Max. Compression	2	-0.34	0.00	0.00
			Max. Mx	22	0.77	-0.02	0.00
			Max. My	7	0.28	0.00	0.00
			Max. Vy	22	0.03	0.00	0.00
			Max. Vx	7	-0.00	0.00	0.00
		Top Girt	Max Tension	10	1.96	0.00	0.00
			Max. Compression	4	-1.71	0.00	0.00
			Max. Mx	18	0.03	-0.02	0.00
			Max. My	6	1.62	0.00	0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Bottom Girt	Max Tension	4	0.78	0.00	0.00
			Max. Compression	10	-0.40	0.00	0.00
			Max. Mx	23	0.28	-0.02	0.00
			Max. My	7	-0.14	0.00	0.00
			Max. Vy	23	0.03	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
T5	101.5 - 81.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	4	-32.76	0.17	0.20
			Max. Mx	11	-6.55	-0.44	-0.06
			Max. My	9	-20.64	-0.09	0.40
			Max. Vy	11	-0.85	0.08	-0.02
			Max. Vx	2	-0.75	-0.08	0.22
		Diagonal	Max Tension	13	1.37	0.00	0.00
			Max. Compression	3	-2.03	0.00	0.00
			Max. Mx	18	0.18	0.01	0.00
			Max. My	17	-0.54	0.00	-0.00
			Max. Vy	18	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Horizontal	Max Tension	9	0.60	0.00	0.00
			Max. Compression	6	-0.03	0.00	0.00
			Max. Mx	17	0.40	-0.02	0.00
			Max. My	6	-0.03	0.00	-0.00
			Max. Vy	17	-0.03	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Top Girt	Max Tension	10	0.51	0.00	0.00
			Max. Compression	4	-0.25	0.00	0.00
			Max. Mx	17	0.13	0.01	0.00
			Max. Vy	17	-0.01	0.00	0.00
			Max. Vx	7	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	0.71	0.00	0.00
			Max. Compression	11	-0.56	0.00	0.00
			Max. Mx	23	-0.05	0.01	0.00
			Max. My	10	0.52	0.00	0.00
			Max. Vy	23	-0.01	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
T6	81.5 - 61.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-38.48	0.10	0.11
			Max. Mx	5	-35.99	-0.97	0.00
			Max. My	2	-35.83	0.18	0.95

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	11	1.37	0.88	0.06
			Max. Vx	8	-1.33	-0.08	-0.88
		Diagonal	Max Tension	5	4.63	0.00	0.00
			Max. Compression	5	-4.62	0.00	0.00
			Max. Mx	18	0.98	-0.03	0.00
			Max. My	10	-0.13	0.00	-0.00
			Max. Vy	18	0.03	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Top Girt	Max Tension	11	0.92	0.00	0.00
			Max. Compression	5	-0.72	0.00	0.00
			Max. Mx	14	0.17	-0.02	0.00
			Max. My	10	-0.48	0.00	-0.00
			Max. Vy	14	-0.03	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Bottom Girt	Max Tension	5	3.77	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	2.58	-0.02	0.00
			Max. My	10	2.46	0.00	-0.00
			Max. Vy	14	-0.03	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Guy A	Bottom Tension	8	13.28		
			Top Tension	8	13.35		
			Top Cable Vert	8	5.26		
			Top Cable Norm	8	12.27		
			Top Cable Tan	8	0.00		
			Bot Cable Vert	8	-5.03		
			Bot Cable Norm	8	12.29		
			Bot Cable Tan	8	0.00		
		Guy B	Bottom Tension	12	13.40		
			Top Tension	12	13.47		
			Top Cable Vert	12	5.17		
			Top Cable Norm	12	12.44		
			Top Cable Tan	12	0.00		
			Bot Cable Vert	12	-4.94		
			Bot Cable Norm	12	12.46		
			Bot Cable Tan	12	0.00		
		Guy C	Bottom Tension	4	13.24		
			Top Tension	4	13.31		
			Top Cable Vert	4	4.94		
			Top Cable Norm	4	12.36		
			Top Cable Tan	4	0.00		
			Bot Cable Vert	4	-4.70		
			Bot Cable Norm	4	12.38		
			Bot Cable Tan	4	0.00		
		Top Guy Pull-Off	Max Tension	5	2.83	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	14	1.94	0.02	0.00
			Max. My	10	1.84	0.00	0.00
			Max. Vy	14	-0.03	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
T7	61.5 - 41.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-38.48	0.06	-0.11
			Max. Mx	11	-8.52	-0.79	-0.06
			Max. My	8	-6.81	0.13	0.75
			Max. Vy	11	1.36	0.05	-0.00
			Max. Vx	8	-1.32	0.03	-0.06
		Diagonal	Max Tension	13	3.04	0.00	0.00
			Max. Compression	7	-3.30	0.00	0.00
			Max. Mx	20	-1.07	-0.03	0.00
			Max. My	6	0.23	0.00	0.00
			Max. Vy	20	-0.03	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. Vx	6	0.00	0.00	0.00
		Top Girt	Max Tension	6	1.75	0.00	0.00
			Max. Compression	4	-1.46	0.00	0.00
			Max. Mx	14	0.11	0.01	0.00
			Max. My	10	1.65	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Bottom Girt	Max Tension	9	0.84	0.00	0.00
			Max. Compression	6	-0.73	0.00	0.00
			Max. Mx	14	0.08	0.01	0.00
			Max. My	10	-0.54	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
T8	41.5 - 21.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	21	-39.28	0.10	0.11
			Max. Mx	11	-22.61	-0.39	-0.06
			Max. My	8	-23.51	0.07	0.40
			Max. Vy	11	0.56	0.08	-0.08
			Max. Vx	8	-0.62	0.07	0.02
		Diagonal	Max Tension	9	1.48	0.00	0.00
			Max. Compression	7	-1.65	0.00	0.00
			Max. Mx	22	-0.14	0.01	0.00
			Max. My	17	-0.03	0.00	-0.00
			Max. Vy	22	-0.01	0.00	0.00
			Max. Vx	17	0.00	0.00	0.00
		Top Girt	Max Tension	7	0.76	0.00	0.00
			Max. Compression	9	-0.64	0.00	0.00
			Max. Mx	14	0.09	0.01	0.00
			Max. My	10	0.56	0.00	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	-0.00	0.00	0.00
		Bottom Girt	Max Tension	10	0.25	0.00	0.00
			Max. Compression	6	-0.12	0.00	0.00
			Max. Mx	14	0.06	0.01	0.00
			Max. Vy	14	-0.01	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
T9	21.5 - 6.5	Leg	Max Tension	1	0.00	0.00	0.00
			Max. Compression	25	-39.47	-0.09	-0.00
			Max. Mx	18	-38.95	-2.15	1.05
			Max. My	22	-39.02	0.15	-2.39
			Max. Vy	24	-4.22	2.01	1.29
			Max. Vx	21	4.82	0.14	-2.39
		Diagonal	Max Tension	5	1.04	0.00	0.00
			Max. Compression	10	-1.44	0.00	0.00
			Max. Mx	22	0.06	-0.03	0.00
			Max. My	6	0.42	0.00	0.00
			Max. Vy	22	0.03	0.00	0.00
			Max. Vx	6	-0.00	0.00	0.00
		Top Girt	Max Tension	6	0.30	0.00	0.00
			Max. Compression	10	-0.13	0.00	0.00
			Max. Mx	14	0.12	-0.02	0.00
			Max. My	10	-0.13	0.00	-0.00
			Max. Vy	14	-0.03	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
		Bottom Girt	Max Tension	23	3.15	0.00	0.00
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	23	2.95	-0.02	0.00
			Max. My	10	2.50	0.00	-0.00
			Max. Vy	23	-0.03	0.00	0.00
			Max. Vx	10	0.00	0.00	0.00
T10	6.5 - 1.5	Leg	Max Tension	1	0.00	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	24	-42.08	-0.28	-0.07
			Max. Mx	23	-36.44	-3.00	0.09
			Max. My	10	-26.40	-0.68	-0.38
			Max. Vy	23	9.91	-2.95	0.17
			Max. Vx	10	1.27	-0.68	-0.38
		Horizontal	Max Tension	4	0.02	-0.50	-0.04
			Max. Compression	7	-0.01	0.02	0.02
			Max. Mx	10	0.01	-0.68	-0.06
			Max. My	10	0.01	-0.68	-0.06
			Max. Vy	10	0.57	-0.66	-0.04
			Max. Vx	10	0.07	-0.64	-0.05
		Top Girt	Max Tension	23	6.09	-1.99	-0.04
			Max. Compression	1	0.00	0.00	0.00
			Max. Mx	16	6.05	-2.15	-0.06
			Max. My	6	4.15	-1.72	-0.07
			Max. Vy	6	-0.34	-1.58	-0.05
			Max. Vx	4	-0.04	-1.65	-0.07
		Bottom Girt	Max Tension	1	0.00	0.00	0.00
			Max. Compression	15	-2.34	-0.78	-0.01
			Max. Mx	10	-1.55	-1.10	0.04
			Max. My	10	-1.55	-0.05	0.09
			Max. Vy	10	3.77	-1.10	0.04
			Max. Vx	10	0.44	-0.89	-0.06

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Mast	Max. Vert	23	116.08	0.33	-0.17
	Max. H_x	11	71.69	1.05	0.02
	Max. H_z	2	74.20	-0.00	1.13
	Max. M_x	1	0.00	0.00	0.00
	Max. M_z	1	0.00	0.00	0.00
	Max. Torsion	10	0.92	0.95	-0.60
	Min. Vert	1	54.97	0.00	0.00
	Min. H_x	5	71.40	-1.05	0.02
	Min. H_z	8	72.66	0.01	-1.07
	Min. M_x	1	0.00	0.00	0.00
	Min. M_z	1	0.00	0.00	0.00
	Min. Torsion	6	-0.73	-0.95	-0.60
Guy C @ 184 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.80	-0.62	0.36
	Max. H_x	10	-0.80	-0.62	0.36
	Max. H_z	4	-23.63	-26.09	15.08
	Min. Vert	4	-23.63	-26.09	15.08
	Min. H_x	4	-23.63	-26.09	15.08
	Min. H_z	10	-0.80	-0.62	0.36
Guy B @ 184 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.81	0.63	0.36
	Max. H_x	12	-23.64	26.10	15.07
	Max. H_z	12	-23.64	26.10	15.07
	Min. Vert	12	-23.64	26.10	15.07
	Min. H_x	6	-0.81	0.63	0.36
	Min. H_z	6	-0.81	0.63	0.36

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Guy A @ 184 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.80	-0.00	-0.71
	Max. H_x	11	-12.29	0.92	-15.48
	Max. H_z	2	-0.80	-0.00	-0.71
	Min. Vert	8	-25.53	0.01	-32.24
	Min. H_x	5	-12.28	-0.92	-15.47
	Min. H_z	8	-25.53	0.01	-32.24
Guy C @ 161.2 ft Elev 0 ft Azimuth 240 deg	Max. Vert	10	-0.27	-0.76	0.44
	Max. H_x	10	-0.27	-0.76	0.44
	Max. H_z	4	-4.70	-10.72	6.19
	Min. Vert	4	-4.70	-10.72	6.19
	Min. H_x	4	-4.70	-10.72	6.19
	Min. H_z	10	-0.27	-0.76	0.44
Guy B @ 154.8 ft Elev 0 ft Azimuth 120 deg	Max. Vert	6	-0.25	0.69	0.40
	Max. H_x	12	-4.94	10.79	6.23
	Max. H_z	12	-4.94	10.79	6.23
	Min. Vert	12	-4.94	10.79	6.23
	Min. H_x	6	-0.25	0.69	0.40
	Min. H_z	6	-0.25	0.69	0.40
Guy A @ 150 ft Elev 0 ft Azimuth 0 deg	Max. Vert	2	-0.25	-0.00	-0.74
	Max. H_x	11	-2.72	0.17	-6.70
	Max. H_z	2	-0.25	-0.00	-0.74
	Min. Vert	8	-5.03	0.00	-12.29
	Min. H_x	5	-2.69	-0.17	-6.64
	Min. H_z	8	-5.03	0.00	-12.29

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	54.97	-0.00	-0.00	0.00	0.00	-0.00
1.2 Dead+1.0 Wind 0 deg - No Ice+1.0 Guy	74.20	0.00	-1.13	0.00	0.00	0.16
1.2 Dead+1.0 Wind 30 deg - No Ice+1.0 Guy	72.61	0.55	-0.89	0.00	0.00	0.53
1.2 Dead+1.0 Wind 60 deg - No Ice+1.0 Guy	71.06	0.91	-0.53	0.00	0.00	0.65
1.2 Dead+1.0 Wind 90 deg - No Ice+1.0 Guy	71.40	1.05	-0.02	0.00	0.00	0.63
1.2 Dead+1.0 Wind 120 deg - No Ice+1.0 Guy	74.32	0.95	0.60	0.00	0.00	0.73
1.2 Dead+1.0 Wind 150 deg - No Ice+1.0 Guy	73.11	0.47	0.95	0.00	0.00	0.46
1.2 Dead+1.0 Wind 180 deg - No Ice+1.0 Guy	72.66	-0.01	1.07	0.00	0.00	-0.16
1.2 Dead+1.0 Wind 210 deg - No Ice+1.0 Guy	73.26	-0.49	0.95	0.00	0.00	-0.75
1.2 Dead+1.0 Wind 240 deg - No Ice+1.0 Guy	74.59	-0.95	0.60	0.00	0.00	-0.92

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.0 Wind 270 deg - No Ice+1.0 Guy	71.69	-1.05	-0.02	0.00	0.00	-0.65
1.2 Dead+1.0 Wind 300 deg - No Ice+1.0 Guy	71.30	-0.91	-0.52	0.00	0.00	-0.51
1.2 Dead+1.0 Wind 330 deg - No Ice+1.0 Guy	72.72	-0.55	-0.89	0.00	0.00	-0.26
1.2 Dead+1.0 Ice+1.0 Temp+Guy	114.62	-0.02	-0.02	0.00	0.00	-0.02
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.93	-0.02	-0.38	0.00	0.00	0.07
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.45	0.14	-0.32	0.00	0.00	0.19
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.04	0.27	-0.18	0.00	0.00	0.20
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.49	0.33	-0.00	0.00	0.00	0.15
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp+1.0 Guy	116.01	0.29	0.17	0.00	0.00	0.13
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.60	0.17	0.28	0.00	0.00	0.06
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.21	-0.02	0.31	0.00	0.00	-0.11
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.64	-0.20	0.28	0.00	0.00	-0.25
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp+1.0 Guy	116.08	-0.33	0.17	0.00	0.00	-0.26
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.58	-0.36	-0.00	0.00	0.00	-0.18
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.12	-0.30	-0.18	0.00	0.00	-0.14
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp+1.0 Guy	115.50	-0.17	-0.32	0.00	0.00	-0.07
Dead+Wind 0 deg - Service+Guy	56.88	0.00	-0.79	0.00	0.00	0.12
Dead+Wind 30 deg - Service+Guy	58.17	0.34	-0.63	0.00	0.00	0.35
Dead+Wind 60 deg - Service+Guy	58.97	0.59	-0.34	0.00	0.00	0.41
Dead+Wind 90 deg - Service+Guy	58.05	0.71	0.02	0.00	0.00	0.38
Dead+Wind 120 deg - Service+Guy	57.10	0.67	0.42	0.00	0.00	0.39
Dead+Wind 150 deg - Service+Guy	58.64	0.36	0.62	0.00	0.00	0.24
Dead+Wind 180 deg - Service+Guy	59.65	-0.01	0.69	0.00	0.00	-0.12
Dead+Wind 210 deg - Service+Guy	58.71	-0.37	0.62	0.00	0.00	-0.44
Dead+Wind 240 deg - Service+Guy	57.24	-0.68	0.42	0.00	0.00	-0.52
Dead+Wind 270 deg - Service+Guy	58.24	-0.71	0.02	0.00	0.00	-0.39
Dead+Wind 300 deg - Service+Guy	59.12	-0.59	-0.34	0.00	0.00	-0.31
Dead+Wind 330 deg - Service+Guy	58.25	-0.34	-0.63	0.00	0.00	-0.16

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-22.78	0.00	0.00	22.78	-0.00	0.002%
2	-0.00	-27.14	-35.71	0.00	27.14	35.70	0.005%
3	17.12	-26.84	-29.89	-17.12	26.84	29.89	0.003%
4	28.92	-26.54	-17.16	-28.92	26.54	17.16	0.004%
5	33.19	-26.84	-0.03	-33.19	26.84	0.03	0.005%
6	29.31	-27.14	20.54	-29.31	27.14	-20.54	0.005%
7	16.12	-26.84	31.77	-16.12	26.84	-31.77	0.003%
8	0.00	-26.54	35.85	-0.01	26.54	-35.85	0.002%
9	-16.11	-26.84	31.76	16.11	26.84	-31.76	0.003%
10	-29.30	-27.14	20.53	29.30	27.14	-20.53	0.005%
11	-33.19	-26.84	-0.03	33.19	26.84	0.03	0.005%
12	-28.92	-26.54	-17.17	28.92	26.54	17.17	0.004%
13	-17.13	-26.84	-29.90	17.13	26.84	29.90	0.003%
14	0.00	-67.87	0.00	-0.00	67.87	0.00	0.001%
15	-0.00	-68.06	-9.76	0.00	68.06	9.76	0.004%
16	4.79	-67.87	-8.33	-4.79	67.87	8.33	0.003%
17	8.21	-67.67	-4.80	-8.21	67.67	4.80	0.002%
18	9.44	-67.87	-0.00	-9.44	67.87	0.00	0.003%
19	8.24	-68.06	5.24	-8.24	68.06	-5.24	0.004%
20	4.66	-67.87	8.58	-4.66	67.87	-8.58	0.003%
21	0.00	-67.67	9.81	-0.00	67.67	-9.81	0.002%
22	-4.66	-67.87	8.58	4.66	67.87	-8.58	0.003%
23	-8.24	-68.06	5.23	8.23	68.06	-5.23	0.004%
24	-9.44	-67.87	-0.01	9.44	67.87	0.01	0.003%
25	-8.21	-67.67	-4.81	8.21	67.67	4.81	0.002%
26	-4.79	-67.87	-8.34	4.79	67.87	8.33	0.003%
27	-0.00	-22.96	-21.25	0.00	22.96	21.25	0.002%
28	10.19	-22.78	-17.79	-10.19	22.78	17.79	0.003%
29	17.21	-22.60	-10.21	-17.21	22.60	10.21	0.005%
30	19.75	-22.78	-0.02	-19.75	22.78	0.02	0.002%
31	17.44	-22.96	12.22	-17.44	22.96	-12.22	0.002%
32	9.59	-22.78	18.91	-9.59	22.78	-18.91	0.003%
33	0.00	-22.60	21.34	-0.00	22.60	-21.33	0.003%
34	-9.59	-22.78	18.90	9.59	22.78	-18.90	0.003%
35	-17.44	-22.96	12.22	17.44	22.96	-12.22	0.002%
36	-19.75	-22.78	-0.02	19.75	22.78	0.02	0.002%
37	-17.21	-22.60	-10.22	17.21	22.60	10.22	0.004%
38	-10.19	-22.78	-17.80	10.19	22.78	17.79	0.003%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	8	0.00000001	0.00004863
2	Yes	16	0.00009570	0.00008577
3	Yes	16	0.00000001	0.00003834
4	Yes	12	0.00000001	0.00006815
5	Yes	15	0.00000001	0.00007322
6	Yes	16	0.00009761	0.00008500
7	Yes	16	0.00000001	0.00003843
8	Yes	11	0.00000001	0.00005124
9	Yes	16	0.00000001	0.00004014
10	Yes	16	0.00009724	0.00008541
11	Yes	15	0.00000001	0.00007191
12	Yes	12	0.00000001	0.00006217

13	Yes	16	0.00000001	0.00003810
14	Yes	8	0.00000001	0.00006212
15	Yes	11	0.00000001	0.00007630
16	Yes	11	0.00000001	0.00005549
17	Yes	11	0.00000001	0.00004194
18	Yes	11	0.00000001	0.00006521
19	Yes	11	0.00000001	0.00008626
20	Yes	11	0.00000001	0.00006545
21	Yes	11	0.00000001	0.00004006
22	Yes	11	0.00000001	0.00005876
23	Yes	11	0.00000001	0.00007997
24	Yes	11	0.00000001	0.00006078
25	Yes	11	0.00000001	0.00003921
26	Yes	11	0.00000001	0.00005620
27	Yes	12	0.00000001	0.00006092
28	Yes	12	0.00000001	0.00004712
29	Yes	10	0.00000001	0.00007751
30	Yes	12	0.00000001	0.00004723
31	Yes	12	0.00000001	0.00006320
32	Yes	12	0.00000001	0.00004547
33	Yes	10	0.00000001	0.00004841
34	Yes	12	0.00000001	0.00004435
35	Yes	12	0.00000001	0.00006220
36	Yes	12	0.00000001	0.00004679
37	Yes	10	0.00000001	0.00007155
38	Yes	12	0.00000001	0.00004706

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	181.5 - 161.5	4.302	33	0.1790	0.3052
T2	161.5 - 141.5	3.681	33	0.1393	0.2679
T3	141.5 - 121.5	3.113	33	0.1228	0.1457
T4	121.5 - 101.5	2.804	29	0.0620	0.1194
T5	101.5 - 81.5	2.700	29	0.0779	0.1174
T6	81.5 - 61.5	2.255	35	0.1659	0.1461
T7	61.5 - 41.5	1.581	35	0.1495	0.1454
T8	41.5 - 21.5	1.134	35	0.1061	0.1377
T9	21.5 - 6.5	0.661	35	0.1386	0.0820
T10	6.5 - 1.5	0.177	35	0.1640	0.0685

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.50	20' x 2" Dia Omni	33	4.270	0.1763	0.3048	90134
177.00	DS2C03F36D-D	33	4.161	0.1670	0.3030	90134
176.50	8.5 Dishw/radome	33	4.146	0.1657	0.3027	90134
169.15	Guy	33	3.918	0.1535	0.2933	36502
159.00	AIR6419	33	3.604	0.1338	0.2547	27808
148.50	3"x20-ft Omni	33	3.294	0.1301	0.1857	23639
144.50	1.5"x2'omni	33	3.187	0.1283	0.1610	19411
143.50	2-ft Stand Off	33	3.162	0.1269	0.1555	18685

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
142.50	1.5"x2'omni	33	3.137	0.1251	0.1504	18115
138.50	3-ft Side Arm	33	3.046	0.1128	0.1344	17276
129.15	Guy	33	2.875	0.0764	0.1193	17449
126.00	APXVSPP18-C-A20	33	2.831	0.0715	0.1186	17526
89.50	GPS	35	2.467	0.1357	0.1249	9708
78.00	SBNHH-1D65A	35	2.141	0.1717	0.1500	19303
62.11	Guy	35	1.599	0.1512	0.1455	10319

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	181.5 - 161.5	8.851	10	0.3470	0.6065
T2	161.5 - 141.5	7.882	10	0.2686	0.5402
T3	141.5 - 121.5	7.056	2	0.2393	0.2986
T4	121.5 - 101.5	6.539	6	0.0960	0.2459
T5	101.5 - 81.5	6.162	6	0.1717	0.2487
T6	81.5 - 61.5	5.052	6	0.3411	0.2673
T7	61.5 - 41.5	3.512	6	0.3241	0.2635
T8	41.5 - 21.5	2.434	10	0.2501	0.2485
T9	21.5 - 6.5	1.367	10	0.2961	0.1460
T10	6.5 - 1.5	0.361	10	0.3366	0.1216

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
180.50	20' x 2" Dia Omni	10	8.802	0.3419	0.6061	54573
177.00	DS2C03F36D-D	10	8.631	0.3242	0.6042	54573
176.50	8.5 Dishw/radome	10	8.606	0.3219	0.6038	54573
169.15	Guy	10	8.249	0.2906	0.5883	22101
159.00	AIR6419	10	7.764	0.2646	0.5146	16344
148.50	3"x20-ft Omni	2	7.319	0.2548	0.3781	15393
144.50	1.5"x2'omni	2	7.164	0.2486	0.3289	11888
143.50	2-ft Stand Off	2	7.127	0.2463	0.3180	11319
142.50	1.5"x2'omni	2	7.091	0.2432	0.3079	10873
138.50	3-ft Side Arm	2	6.955	0.2224	0.2761	10173
129.15	Guy	2	6.693	0.1448	0.2459	10270
126.00	APXVSPP18-C-A20	2	6.622	0.1198	0.2446	10314
89.50	GPS	6	5.592	0.2879	0.2491	6020
78.00	SBNHH-1D65A	6	4.785	0.3525	0.2721	13669
62.11	Guy	6	3.554	0.3265	0.2636	5931

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	181.5	Leg	A325N	0.7500	4	0.00	30.10	0.000 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3.21	6.20	0.518 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.14	8.84	0.016 ✓	1	Bolt Shear
T2	161.5	Leg	A325N	0.7500	4	1.33	30.10	0.044 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3.09	4.17	0.742 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	2.13	3.83	0.554 ✓	1	Member Bearing
T3	141.5	Leg	A325N	0.7500	4	1.33	30.10	0.044 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	3.22	6.20	0.519 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.73	6.20	0.118 ✓	1	Member Bearing
T4	121.5	Leg	A325N	0.7500	4	2.27	30.10	0.075 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4.12	13.81	0.299 ✓	1	Bolt Shear
		Horizontal	A325N	0.6250	1	1.09	13.81	0.079 ✓	1	Bolt Shear
		Top Girt	A325N	0.6250	1	1.96	13.81	0.142 ✓	1	Bolt Shear
T5	101.5	Leg	A325N	0.7500	4	2.68	30.10	0.089 ✓	1	Bolt Tension
		Diagonal	A325X	0.5000	1	1.37	4.17	0.329 ✓	1	Member Bearing
		Horizontal	A325N	0.6250	1	0.60	13.81	0.044 ✓	1	Bolt Shear
		Top Girt	A325N	0.5000	1	0.57	3.83	0.148 ✓	1	Member Bearing
T6	81.5	Leg	A325N	0.7500	4	2.58	30.10	0.086 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	4.63	13.81	0.336 ✓	1	Bolt Shear
		Top Girt	A325N	0.6250	1	0.92	13.81	0.067 ✓	1	Bolt Shear
		Top Guy Pull-Off@62.1146	A325N	0.6250	4	0.71	13.81	0.051 ✓	1	Bolt Shear
T7	61.5	Leg	A325N	0.7500	4	3.21	30.10	0.107 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	3.30	13.81	0.239 ✓	1	Bolt Shear
		Top Girt	A325N	0.5000	1	1.75	3.83	0.456 ✓	1	Member Bearing
T8	41.5	Leg	A325N	0.7500	4	3.11	30.10	0.103 ✓	1	Bolt Tension
		Diagonal	A325N	0.5000	1	1.48	4.17	0.355 ✓	1	Member Bearing
		Top Girt	A325N	0.5000	1	0.76	3.83	0.199 ✓	1	Member Bearing
T9	21.5	Leg	A325N	0.7500	4	3.27	30.10	0.109 ✓	1	Bolt Tension
		Diagonal	A325N	0.6250	1	1.44	13.81	0.104 ✓	1	Bolt Shear
		Top Girt	A325N	0.6250	1	0.68	13.81	0.050 ✓	1	Bolt Shear
T10	6.5	Leg	A325N	0.7500	4	3.18	30.10	0.105 ✓	1	Bolt Tension

Guy Design Data

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.

Section No.	Elevation ft	Size	Initial Tension K	Breaking Load K	Actual T_u K	Allowable ϕT_n K	Required S.F.	Actual S.F.
T1	169.15 (A) (406)	9/16 EHS	3.50	35.00	10.58	21.00	1.000	1.985 ✔
	169.15 (A) (407)	9/16 EHS	3.50	35.00	11.06	21.00	1.000	1.899 ✔
	169.15 (B) (400)	9/16 EHS	3.50	35.00	9.48	21.00	1.000	2.215 ✔
	169.15 (B) (401)	9/16 EHS	3.50	35.00	9.62	21.00	1.000	2.183 ✔
	169.15 (C) (394)	9/16 EHS	3.50	35.00	9.81	21.00	1.000	2.141 ✔
	169.15 (C) (395)	9/16 EHS	3.50	35.00	9.22	21.00	1.000	2.278 ✔
T3	129.15 (A) (424)	9/16 EHS	3.50	35.00	9.90	21.00	1.000	2.122 ✔
	129.15 (A) (425)	9/16 EHS	3.50	35.00	10.08	21.00	1.000	2.084 ✔
	129.15 (B) (418)	9/16 EHS	3.50	35.00	9.90	21.00	1.000	2.121 ✔
	129.15 (B) (419)	9/16 EHS	3.50	35.00	9.78	21.00	1.000	2.148 ✔
	129.15 (C) (412)	9/16 EHS	3.50	35.00	9.90	21.00	1.000	2.122 ✔
	129.15 (C) (413)	9/16 EHS	3.50	35.00	9.85	21.00	1.000	2.132 ✔
T6	62.11 (A) (435)	3/4 EHS	5.83	58.30	13.35	34.98	1.000	2.620 ✔
	62.11 (B) (434)	3/4 EHS	5.83	58.30	13.47	34.98	1.000	2.596 ✔
	62.11 (C) (430)	3/4 EHS	5.83	58.30	13.31	34.98	1.000	2.628 ✔

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	181.5 - 161.5	P2.5x.203	20.00	2.35	29.7 K=1.00	1.7040	-16.18	71.89	0.225 [1] ✔
T2	161.5 - 141.5	P2.5x.203	20.00	2.35	59.4 K=2.00	1.7040	-18.71	59.23	0.316 [1] ✔
T3	141.5 - 121.5	P2.5x.203	20.00	2.35	29.7 K=1.00	1.7040	-29.46	71.89	0.410 [1] ✔
T4	121.5 - 101.5	P2.5x.203	20.00	2.35	29.7 K=1.00	1.7040	-31.32	71.89	0.436 [1] ✔
T5	101.5 - 81.5	P2.5x.203	20.00	2.35	29.7 K=1.00	1.7040	-32.76	71.89	0.456 [1] ✔
T6	81.5 - 61.5	P2.5x.203	20.00	2.35	59.4 K=2.00	1.7040	-36.00	59.23	0.608 [1] ✔
T7	61.5 - 41.5	P2.5x.203	20.00	2.35	59.4 K=2.00	1.7040	-38.08	59.23	0.643 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	41.5 - 21.5	P2.5x.203	20.00	2.35	59.4 K=2.00	1.7040	-39.17	59.23	0.661 [1] ✔
T9	21.5 - 6.5	P2.5x.203	15.00	2.30	58.1 K=2.00	1.7040	-39.47	59.89	0.659 [1] ✔
T10	6.5 - 1.5	P2.5x.203	5.37	2.15	27.2 K=1.00	1.7040	-42.08	72.64	0.579 [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	181.5 - 161.5	L1 3/4x1 3/4x3/16	4.14	1.82	77.7 K=1.22	0.6211	-3.36	18.12	0.185 [1] ✔
T2	161.5 - 141.5	ROHN TS1.5x16 ga	4.14	3.85	90.5 K=1.00	0.2627	-3.69	5.44	0.678 [1] ✔
T3	141.5 - 121.5	L2x2x3/16	4.14	1.82	71.6 K=1.29	0.7150	-3.17	21.59	0.147 [1] ✔
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	4.14	3.61	104.5 K=1.17	2.2500	-4.12	53.21	0.077 [1] ✔
T5	101.5 - 81.5	ROHN TS1.5x16 ga	4.14	3.85	90.5 K=1.00	0.2627	-2.03	5.44	0.373 [1] ✔
T6	81.5 - 61.5	L2 1/2x2 1/2x1/2	4.14	3.61	104.5 K=1.17	2.2500	-4.62	53.21	0.087 [1] ✔
T7	61.5 - 41.5	L2 1/2x2 1/2x1/2	4.14	3.61	104.5 K=1.17	2.2500	-3.30	53.21	0.062 [1] ✔
T8	41.5 - 21.5	ROHN TS1.5x16 ga	4.14	3.85	90.5 K=1.00	0.2627	-1.65	5.44	0.303 [1] ✔
T9	21.5 - 6.5	L2 1/2x2 1/2x1/2	4.11	3.58	104.1 K=1.18	2.2500	-1.44	53.38	0.027 [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 $\frac{P_u}{\phi P_n}$
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	3.41	2.93	96.1 K=1.33	2.2500	-0.56	67.12	0.008 [1] ✔
T5	101.5 - 81.5	L2 1/2x2 1/2x1/2	3.41	2.93	96.1 K=1.33	2.2500	-0.57	67.12	0.008 [1] ✔
T10	6.5 - 1.5	C12x20.7	1.70	1.47	22.0 K=1.00	6.0900	-0.77	192.35	0.004 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$

[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	181.5 - 161.5	L1 3/4x1 3/4x3/16	3.41	2.96	111.7 K=1.08	0.6211	-0.14	13.58	0.011 [1] ✔
T2	161.5 - 141.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-2.18	6.35	0.343 [1] ✔
T3	141.5 - 121.5	L2x2x3/16	3.41	2.96	105.1 K=1.17	0.7150	-0.51	16.80	0.030 [1] ✔
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	3.41	2.93	96.1 K=1.33	2.2500	-1.71	57.47	0.030 [1] ✔
T5	101.5 - 81.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-0.57	6.35	0.089 [1] ✔
T6	81.5 - 61.5	L2 1/2x2 1/2x1/2	3.41	2.93	96.1 K=1.33	2.2500	-0.72	57.47	0.012 [1] ✔
T7	61.5 - 41.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-1.46	6.35	0.229 [1] ✔
T8	41.5 - 21.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-0.68	6.35	0.107 [1] ✔
T9	21.5 - 6.5	L2 1/2x2 1/2x1/2	3.41	2.93	96.1 K=1.33	2.2500	-0.68	57.47	0.012 [1] ✔
T10	6.5 - 1.5	C12x20.7	3.07	2.83	42.5 K=1.00	6.0900	-0.77	179.42	0.004 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	181.5 - 161.5	L1 3/4x1 3/4x3/16	3.41	3.17	115.4 K=1.04	0.6211	-0.82	13.00	0.063 [1] ✔
T2	161.5 - 141.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-1.49	6.23	0.240 [1] ✔
T3	141.5 - 121.5	L2x2x3/16	3.41	3.17	108.3 K=1.12	0.7150	-0.51	16.25	0.031 [1] ✔
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	3.41	3.17	99.1 K=1.27	2.2500	-0.56	56.01	0.010 [1] ✔
T5	101.5 - 81.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-0.57	6.23	0.091 [1] ✔
T6	81.5 - 61.5	L2 1/2x2 1/2x1/2	3.41	3.17	99.1	2.2500	-0.67	56.01	0.012 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T7	61.5 - 41.5	ROHN TS1.5x16 ga	3.41	3.17	K=1.27 74.6 K=1.00	0.2627	-0.73	6.23	✔ 0.118 [1] ✔
T8	41.5 - 21.5	ROHN TS1.5x16 ga	3.41	3.17	74.6 K=1.00	0.2627	-0.68	6.23	0.109 [1] ✔
T9	21.5 - 6.5	L2 1/2x2 1/2x1/2	3.41	3.17	99.1 K=1.27	2.2500	-0.68	56.01	0.012 [1] ✔
T10	6.5 - 1.5	C12x20.7	0.34	0.10	1.5 K=1.00	6.0900	-2.34	197.29	0.012 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	181.5 - 161.5 (398)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.67	94.40	0.155 [1] ✔
T1	181.5 - 161.5 (399)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-16.48	94.40	0.175 [1] ✔
T1	181.5 - 161.5 (404)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.54	94.40	0.154 [1] ✔
T1	181.5 - 161.5 (405)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.53	94.40	0.154 [1] ✔
T1	181.5 - 161.5 (410)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.58	94.40	0.154 [1] ✔
T1	181.5 - 161.5 (411)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-16.55	94.40	0.175 [1] ✔
T3	141.5 - 121.5 (416)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-13.88	94.40	0.147 [1] ✔
T3	141.5 - 121.5 (417)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.01	94.40	0.148 [1] ✔
T3	141.5 - 121.5 (422)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-13.97	94.40	0.148 [1] ✔
T3	141.5 - 121.5 (423)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.11	94.40	0.149 [1] ✔
T3	141.5 - 121.5 (428)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-13.87	94.40	0.147 [1] ✔
T3	141.5 - 121.5 (429)	P4x.237	4.36	4.21	33.5 K=1.00	3.1741	-14.15	94.40	0.150 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	181.5 - 161.5	P2.5x.203	20.00	2.35	29.7	1.7040	17.92	76.68	0.234 [1] ✔
T2	161.5 - 141.5	P2.5x.203	20.00	2.35	29.7	1.7040	0.23	76.68	0.003 [1] ✔
T3	141.5 - 121.5	P2.5x.203	20.00	2.35	29.7	1.7040	11.06	76.68	0.144 [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	181.5 - 161.5	L1 3/4x1 3/4x3/16	4.14	1.82	43.0	0.3779	3.21	16.44	0.195 [1] ✔
T2	161.5 - 141.5	ROHN TS1.5x16 ga	4.14	3.85	90.5	0.2627	3.09	8.28	0.373 [1] ✔
T3	141.5 - 121.5	L2x2x3/16	4.14	1.82	37.4	0.4484	3.22	19.50	0.165 [1] ✔
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	4.14	3.61	62.5	1.4063	3.44	61.17	0.056 [1] ✔
T5	101.5 - 81.5	ROHN TS1.5x16 ga	4.14	3.85	90.5	0.2627	1.37	8.28	0.166 [1] ✔
T6	81.5 - 61.5	L2 1/2x2 1/2x1/2	4.14	3.61	62.5	1.4063	4.63	61.17	0.076 [1] ✔
T7	61.5 - 41.5	L2 1/2x2 1/2x1/2	4.14	3.61	62.5	1.4063	3.04	61.17	0.050 [1] ✔
T8	41.5 - 21.5	ROHN TS1.5x16 ga	4.14	3.85	90.5	0.2627	1.48	8.28	0.179 [1] ✔
T9	21.5 - 6.5	L2 1/2x2 1/2x1/2	4.11	3.58	62.1	1.4063	1.04	61.17	0.017 [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 $\frac{P_u}{\phi P_n}$
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	3.41	2.93	51.5	1.4063	1.09	68.55	0.016 [1] ✔
T5	101.5 - 81.5	L2 1/2x2 1/2x1/2	3.41	2.93	51.5	1.4063	0.60	68.55	0.009 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T10	6.5 - 1.5	C12x20.7	1.70	1.47	22.0	6.0900	0.77	197.32	0.004 [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	181.5 - 161.5	L1 3/4x1 3/4x3/16	3.41	2.96	70.9	0.3779	0.07	16.44	0.004 [1]
T2	161.5 - 141.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	2.13	8.51	0.250 [1]
T3	141.5 - 121.5	L2x2x3/16	3.41	2.96	61.7	0.4484	0.73	19.50	0.038 [1]
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	3.41	2.93	51.5	1.4063	1.96	61.17	0.032 [1]
T5	101.5 - 81.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	0.57	8.51	0.067 [1]
T6	81.5 - 61.5	L2 1/2x2 1/2x1/2	3.41	2.93	51.5	1.4063	0.92	61.17	0.015 [1]
T7	61.5 - 41.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	1.75	8.51	0.206 [1]
T8	41.5 - 21.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	0.76	8.51	0.090 [1]
T9	21.5 - 6.5	L2 1/2x2 1/2x1/2	3.41	2.93	51.5	1.4063	0.68	61.17	0.011 [1]
T10	6.5 - 1.5	C12x20.7	3.07	2.83	42.5	6.0900	6.09	197.32	0.031 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	181.5 - 161.5	L1 3/4x1 3/4x3/16	3.41	3.17	70.9	0.6211	0.83	20.12	0.041 [1]
T2	161.5 - 141.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	1.58	8.28	0.191 [1]
T3	141.5 - 121.5	L2x2x3/16	3.41	3.17	61.7	0.7150	0.74	23.17	0.032 [1]
T4	121.5 - 101.5	L2 1/2x2 1/2x1/2	3.41	3.17	51.5	2.2500	0.78	72.90	0.011 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T5	101.5 - 81.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	0.71	8.28	0.086 [1]
T6	81.5 - 61.5	L2 1/2x2 1/2x1/2	3.41	3.17	51.5	2.2500	3.77	72.90	0.052 [1]
T7	61.5 - 41.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	0.84	8.28	0.101 [1]
T8	41.5 - 21.5	ROHN TS1.5x16 ga	3.41	3.17	74.6	0.2627	0.68	8.28	0.082 [1]
T9	21.5 - 6.5	L2 1/2x2 1/2x1/2	3.41	3.17	51.5	2.2500	3.15	72.90	0.043 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off 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 $\frac{P_u}{\phi P_n}$
T6	81.5 - 61.5	4 1/2x3/8	3.41	3.17	351.4	1.6875	2.83	54.67	0.052 [1]

[1] P_u / ϕP_n controls

Top Guy Pull-Off Bending Design Data

Section No.	Elevation ft	Size	M_{ux} kip-ft	ϕM_{nx} kip-ft	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	M_{uy} kip-ft	ϕM_{ny} kip-ft	Ratio $\frac{M_{uy}}{\phi M_{ny}}$
T6	81.5 - 61.5	4 1/2x3/8	0.00	5.13	0.000	0.00	0.43	0.000

Top Guy Pull-Off Interaction Design Data

Section No.	Elevation ft	Size	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
T6	81.5 - 61.5	4 1/2x3/8	0.052	0.000	0.000	0.052 [1]	1.000	4.8.1

[1] P_u / ϕP_n controls

Torque-Arm Top Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	181.5 - 161.5 (396)	P4x.237	3.67	3.55	28.2	3.1741	11.82	99.98	0.118 [1] ✔
T1	181.5 - 161.5 (397)	P4x.237	3.67	3.55	28.2	3.1741	11.10	99.98	0.111 [1] ✔
T1	181.5 - 161.5 (402)	P4x.237	3.67	3.55	28.2	3.1741	11.33	99.98	0.113 [1] ✔
T1	181.5 - 161.5 (403)	P4x.237	3.67	3.55	28.2	3.1741	12.04	99.98	0.120 [1] ✔
T1	181.5 - 161.5 (408)	P4x.237	3.67	3.55	28.2	3.1741	11.36	99.98	0.114 [1] ✔
T1	181.5 - 161.5 (409)	P4x.237	3.67	3.55	28.2	3.1741	11.67	99.98	0.117 [1] ✔
T3	141.5 - 121.5 (414)	P4x.237	3.67	3.55	28.2	3.1741	10.76	99.98	0.108 [1] ✔
T3	141.5 - 121.5 (415)	P4x.237	3.67	3.55	28.2	3.1741	9.98	99.98	0.100 [1] ✔
T3	141.5 - 121.5 (420)	P4x.237	3.67	3.55	28.2	3.1741	10.15	99.98	0.102 [1] ✔
T3	141.5 - 121.5 (421)	P4x.237	3.67	3.55	28.2	3.1741	10.62	99.98	0.106 [1] ✔
T3	141.5 - 121.5 (426)	P4x.237	3.67	3.55	28.2	3.1741	10.53	99.98	0.105 [1] ✔
T3	141.5 - 121.5 (427)	P4x.237	3.67	3.55	28.2	3.1741	10.18	99.98	0.102 [1] ✔

[1] P_u / ϕP_n controls

Torque-Arm Bottom Design Data

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	181.5 - 161.5 (398)	P4x.237	4.36	4.21	33.5	3.1741	1.80	99.98	0.018 [1] ✔
T1	181.5 - 161.5 (399)	P4x.237	4.36	4.21	33.5	3.1741	1.38	99.98	0.014 [1] ✔
T1	181.5 - 161.5 (404)	P4x.237	4.36	4.21	33.5	3.1741	1.07	99.98	0.011 [1] ✔
T1	181.5 - 161.5 (405)	P4x.237	4.36	4.21	33.5	3.1741	1.15	99.98	0.012 [1] ✔
T1	181.5 - 161.5 (410)	P4x.237	4.36	4.21	33.5	3.1741	1.91	99.98	0.019 [1] ✔
T1	181.5 - 161.5 (411)	P4x.237	4.36	4.21	33.5	3.1741	1.59	99.98	0.016 [1] ✔
T3	141.5 - 121.5 (416)	P4x.237	4.36	4.21	33.5	3.1741	2.77	99.98	0.028 [1] ✔
T3	141.5 - 121.5 (417)	P4x.237	4.36	4.21	33.5	3.1741	2.82	99.98	0.028 [1] ✔
T3	141.5 - 121.5	P4x.237	4.36	4.21	33.5	3.1741	2.94	99.98	0.029 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
	(422)								✔
T3	141.5 - 121.5	P4x.237	4.36	4.21	33.5	3.1741	3.02	99.98	0.030 [1]
	(423)								✔
T3	141.5 - 121.5	P4x.237	4.36	4.21	33.5	3.1741	2.86	99.98	0.029 [1]
	(428)								✔
T3	141.5 - 121.5	P4x.237	4.36	4.21	33.5	3.1741	2.98	99.98	0.030 [1]
	(429)								✔

[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	181.5 - 161.5	Leg	P2.5x.203	3	17.92	76.68	23.4	Pass
T2	161.5 - 141.5	Leg	P2.5x.203	58	-18.71	59.23	31.6	Pass
T3	141.5 - 121.5	Leg	P2.5x.203	91	-29.46	71.89	41.0	Pass
T4	121.5 - 101.5	Leg	P2.5x.203	149	-31.32	71.89	43.6	Pass
T5	101.5 - 81.5	Leg	P2.5x.203	202	-32.76	71.89	45.6	Pass
T6	81.5 - 61.5	Leg	P2.5x.203	257	-36.00	59.23	60.8	Pass
T7	61.5 - 41.5	Leg	P2.5x.203	291	-38.08	59.23	64.3	Pass
T8	41.5 - 21.5	Leg	P2.5x.203	323	-39.17	59.23	66.1	Pass
T9	21.5 - 6.5	Leg	P2.5x.203	356	-39.47	59.89	65.9	Pass
T10	6.5 - 1.5	Leg	P2.5x.203	383	-42.08	72.64	57.9	Pass
T1	181.5 - 161.5	Diagonal	L1 3/4x1 3/4x3/16	22	3.21	16.44	19.5 51.8 (b)	Pass
T2	161.5 - 141.5	Diagonal	ROHN TS1.5x16 ga	69	-3.69	5.44	67.8 74.2 (b)	Pass
T3	141.5 - 121.5	Diagonal	L2x2x3/16	115	3.22	19.50	16.5 51.9 (b)	Pass
T4	121.5 - 101.5	Diagonal	L2 1/2x2 1/2x1/2	199	-4.12	53.21	7.7 29.9 (b)	Pass
T5	101.5 - 81.5	Diagonal	ROHN TS1.5x16 ga	213	-2.03	5.44	37.3	Pass
T6	81.5 - 61.5	Diagonal	L2 1/2x2 1/2x1/2	268	-4.62	53.21	8.7 33.6 (b)	Pass
T7	61.5 - 41.5	Diagonal	L2 1/2x2 1/2x1/2	320	-3.30	53.21	6.2 23.9 (b)	Pass
T8	41.5 - 21.5	Diagonal	ROHN TS1.5x16 ga	353	-1.65	5.44	30.3 35.5 (b)	Pass
T9	21.5 - 6.5	Diagonal	L2 1/2x2 1/2x1/2	364	-1.44	53.38	2.7 10.4 (b)	Pass
T4	121.5 - 101.5	Horizontal	L2 1/2x2 1/2x1/2	197	1.09	68.55	1.6 7.9 (b)	Pass
T5	101.5 - 81.5	Horizontal	L2 1/2x2 1/2x1/2	251	0.60	68.55	0.9 4.4 (b)	Pass
T10	6.5 - 1.5	Horizontal	C12x20.7	391	-0.77	192.35	0.9	Pass
T1	181.5 - 161.5	Top Girt	L1 3/4x1 3/4x3/16	4	-0.14	13.58	1.1 1.6 (b)	Pass
T2	161.5 - 141.5	Top Girt	ROHN TS1.5x16 ga	61	-2.18	6.35	34.3 55.4 (b)	Pass
T3	141.5 - 121.5	Top Girt	L2x2x3/16	94	0.73	19.50	3.8 11.8 (b)	Pass
T4	121.5 - 101.5	Top Girt	L2 1/2x2 1/2x1/2	151	1.96	61.17	3.2 14.2 (b)	Pass
T5	101.5 - 81.5	Top Girt	ROHN TS1.5x16 ga	207	-0.57	6.35	8.9	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							14.8 (b)	
T6	81.5 - 61.5	Top Girt	L2 1/2x2 1/2x1/2	260	0.92	61.17	1.5	Pass
							6.7 (b)	
T7	61.5 - 41.5	Top Girt	ROHN TS1.5x16 ga	292	-1.46	6.35	22.9	Pass
							45.6 (b)	
T8	41.5 - 21.5	Top Girt	ROHN TS1.5x16 ga	326	-0.68	6.35	10.7	Pass
							19.9 (b)	
T9	21.5 - 6.5	Top Girt	L2 1/2x2 1/2x1/2	358	-0.68	57.47	1.2	Pass
							5.0 (b)	
T10	6.5 - 1.5	Top Girt	C12x20.7	386	6.09	197.32	3.1	Pass
T1	181.5 - 161.5	Bottom Girt	L1 3/4x1 3/4x3/16	8	-0.82	13.00	6.3	Pass
T2	161.5 - 141.5	Bottom Girt	ROHN TS1.5x16 ga	66	-1.49	6.23	24.0	Pass
T3	141.5 - 121.5	Bottom Girt	L2x2x3/16	98	0.74	23.17	3.2	Pass
T4	121.5 - 101.5	Bottom Girt	L2 1/2x2 1/2x1/2	154	0.78	72.90	1.1	Pass
T5	101.5 - 81.5	Bottom Girt	ROHN TS1.5x16 ga	210	-0.57	6.23	9.1	Pass
T6	81.5 - 61.5	Bottom Girt	L2 1/2x2 1/2x1/2	264	3.77	72.90	5.2	Pass
T7	61.5 - 41.5	Bottom Girt	ROHN TS1.5x16 ga	296	-0.73	6.23	11.8	Pass
T8	41.5 - 21.5	Bottom Girt	ROHN TS1.5x16 ga	329	-0.68	6.23	10.9	Pass
T9	21.5 - 6.5	Bottom Girt	L2 1/2x2 1/2x1/2	361	3.15	72.90	4.3	Pass
T10	6.5 - 1.5	Bottom Girt	C12x20.7	388	-2.34	197.29	5.7	Pass
T1	181.5 - 161.5	Guy A@169.154	9/16	407	11.06	21.00	52.6	Pass
T3	141.5 - 121.5	Guy A@129.154	9/16	425	10.08	21.00	48.0	Pass
T6	81.5 - 61.5	Guy A@62.1146	3/4	435	13.35	34.98	38.2	Pass
T1	181.5 - 161.5	Guy B@169.154	9/16	401	9.62	21.00	45.8	Pass
T3	141.5 - 121.5	Guy B@129.154	9/16	418	9.90	21.00	47.2	Pass
T6	81.5 - 61.5	Guy B@62.1146	3/4	434	13.47	34.98	38.5	Pass
T1	181.5 - 161.5	Guy C@169.154	9/16	394	9.81	21.00	46.7	Pass
T3	141.5 - 121.5	Guy C@129.154	9/16	412	9.90	21.00	47.1	Pass
T6	81.5 - 61.5	Guy C@62.1146	3/4	430	13.31	34.98	38.1	Pass
T6	81.5 - 61.5	Top Guy Pull-Off@62.1146	4 1/2x3/8	433	2.83	54.67	5.2	Pass
T1	181.5 - 161.5	Torque Arm Top@169.154	P4x.237	403	12.04	99.98	12.0	Pass
T3	141.5 - 121.5	Torque Arm Top@129.154	P4x.237	414	10.76	99.98	10.8	Pass
T1	181.5 - 161.5	Torque Arm Bottom@169.154	P4x.237	411	-16.55	94.40	17.5	Pass
T3	141.5 - 121.5	Torque Arm Bottom@129.154	P4x.237	429	-14.15	94.40	15.0	Pass

	Summary	
Leg (T8)	66.1	Pass
Diagonal (T2)	74.2	Pass
Horizontal (T4)	7.9	Pass
Top Girt (T2)	55.4	Pass
Bottom Girt (T2)	24.0	Pass
Guy A (T1)	52.6	Pass
Guy B (T3)	47.2	Pass
Guy C (T3)	47.1	Pass
Top Guy Pull-Off (T6)	5.2	Pass
Torque Arm Top (T1)	12.0	Pass
Torque Arm Bottom (T1)	17.5	Pass
Bolt Checks	74.2	Pass
RATING =	**74.2**	**Pass**

Element Map

Section No.	*Section Elevation ft*	*Component Type*	*Element List*
T1	181.50-161.50	Leg	1-3
		Diagonal	10-57
		Top Girt	4-6
		Bottom Girt	7-9
		Guy A	406-407
		Guy B	400-401
		Guy C	394-395
		Torque Arm Top	396-397,402-403,408-409
		Torque Arm Bottom	398-399,404-405,410-411
T2	161.50-141.50	Leg	58-60
		Diagonal	67-90
		Top Girt	61-63
		Bottom Girt	64-66
T3	141.50-121.50	Leg	91-93
		Diagonal	100-147
		Top Girt	94-96
		Bottom Girt	97-99
		Guy A	424-425
		Guy B	418-419
		Guy C	412-413
		Torque Arm Top	414-415,420-421,426-427
		Torque Arm Bottom	416-417,422-423,428-429
T4	121.50-101.50	Leg	148-150
		Diagonal	157-159,163-165,169-171,175-177,181-183,187-189,193-195,199-201
		Horizontal	160-162,166-168,172-174,178-180,184-186,190-192,196-198
		Top Girt	151-153
		Bottom Girt	154-156
T5	101.50-81.50	Leg	202-204
		Diagonal	211-213,217-219,223-225,229-231,235-237,241-243,247-249,253-255
		Horizontal	214-216,220-222,226-228,232-234,238-240,244-246,250-252
		Top Girt	205-207
		Bottom Girt	208-210
T6	81.50-61.50	Leg	256-258
		Diagonal	265-288
		Top Girt	259-261
		Bottom Girt	262-264
		Guy A	435
		Guy B	434
		Guy C	430
		Top Guy Pull-Off	431-433
T7	61.50-41.50	Leg	289-291
		Diagonal	298-321
		Top Girt	292-294
		Bottom Girt	295-297
T8	41.50-21.50	Leg	322-324
		Diagonal	331-354
		Top Girt	325-327
		Bottom Girt	328-330
T9	21.50-6.50	Leg	355-357
		Diagonal	364-381
		Top Girt	358-360
		Bottom Girt	361-363

Section No.	*Section Elevation ft*	*Component Type*	*Element List*
T10	6.50-1.50	Leg Horizontal Top Girt Bottom Girt	382-384 391-393 385-387 388-390 Total number of elements: 435

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63-2 North Branford Road P: (203) 488-0580
Branford, CT 06405 F: (203) 488-8587

Job :	T-Mobile ~ CT11029I: 180-ft Guyed Lattice Tower	Project No.	22006.01	Sheet	1	of	2
Address:	125 New Road Madison, CT	Computed by	TJL	Date		4/4/22	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

CHECK UPLIFT RESISTANCE

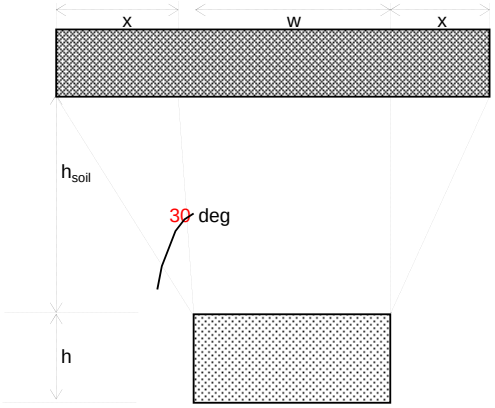
ANCHOR (A) AT 184.0 ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	24	kips
Sliding =	30	kips
Wdepth =	50	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	4.5	ft
h =	3	ft
d =	9.5	ft
Vol. =	128.25	ft^3
Vol.sub =	0.00	ft^3
Wc =	*19.24*	kips
Ø =	*0.90*	
	17.31	



Foundation Section

SOIL PARAMETERS:

γ_{soil} =	110	pcf
$\gamma_{soil.sub}$ =	47.6	pcf
h_{soil} =	5.8	ft
x =	*3.35*	ft

Soil Weight (Wr):

B1 =	42.75
B2 =	42.75
B3 =	181.37

W.soil =	66.39	kips
W.soil.sub =	0.00	kips
Total =	*66.39*	kips
Ø =	*0.75*	
	49.79	

SF AGAINST SLIDING

2.80 **>** *1* ***OK***

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

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

Job :	T-Mobile ~ CT11029I: 180-ft Guyed Lattice Tower	Project No.	22006.01	Sheet	1	of	2
Address:	125 New Road Madison, CT	Computed by	TJL	Date		4/4/22	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

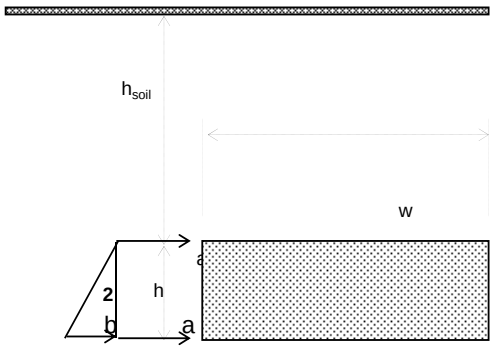
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	110	pcf
$\gamma soil$ =	47.6	pcf
h_{soil} =	5.8	ft
h =	3	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.5	ft
h =	3.0	ft
d =	9.5	ft



Foundation Elevation View

K_p = 3.00

HORIZONTAL FORCES

		1.91	ksf
		2.90	ksf
RESIST TO SLIDING =		68.66	k
SOIL & CONCRETE WEIGHT =	Wr + Wc =	67.10	k
UPLIFT REACTIONS =		-24	k
SUM =		43.10	k
COEF. OF FRICTION, (0.45) =		19.40	k
RESIST TO SLIDING =		68.66	k
SUM =		88.05	k

SF AGAINST SLIDING

SF = 2.9 > 1 OK

GUY ANCHORS AGAINST SLIDING ARE ADEQUATE

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

Job :	T-Mobile ~ CT11029I: 180-ft Guyed Lattice Tower	Project No.	22006.01	Sheet	1	of	2
Address:	125 New Road Madison, CT	Computed by	TJL	Date		4/4/22	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

CHECK UPLIFT RESISTANCE

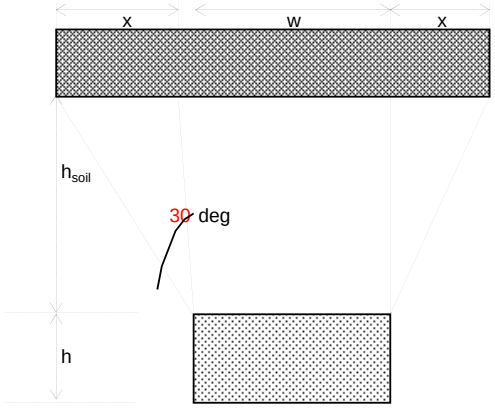
ANCHOR (A) AT 150.0 ft RADIUS

RESULTS FROM COMPUTER ANALYSIS:

Uplift =	5	kips
Sliding =	12	kips
Wdepth =	50	ft

CONCRETE PARAMETERS:

γ_{conc} =	150	pcf
$\gamma_{conc.sub}$ =	87.6	pcf
w =	4.5	ft
h =	2.5	ft
d =	6.5	ft
Vol. =	73.13	ft^3
Vol.sub =	0.00	ft^3
Wc =	*10.97*	kips
Ø =	*0.90*	
	9.87	



Foundation Section

SOIL PARAMETERS:

γ_{soil} =	110	pcf
$\gamma_{soil.sub}$ =	47.6	pcf
h_{soil} =	5	ft
x =	*2.89*	ft

Soil Weight (Wr):

B1 =	29.25
B2 =	29.25
B3 =	126.09

W.soil =	39.61	kips
W.soil.sub =	0.00	kips
Total =	*39.61*	kips
Ø =	*0.75*	
	29.71	

SF AGAINST SLIDING

7.92 **>** *1* ***OK***

GUY ANCHORS AGAINST UPLIFT ARE ADEQUATE

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

Job :	T-Mobile ~ CT11029I: 180-ft Guyed Lattice Tower	Project No.	22006.01	Sheet	1	of	2
Address:	125 New Road Madison, CT	Computed by	TJL	Date		4/4/22	
Description:	Guy Anchor Evaluation	Checked by	CFC	Date			

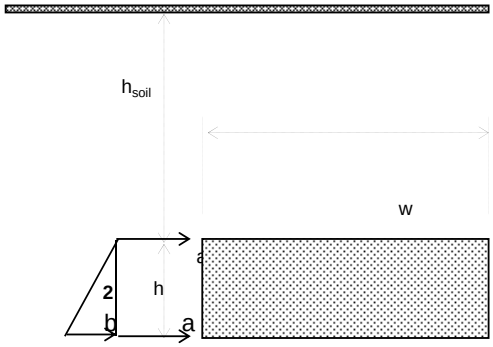
CHECK SLIDING RESISTANCE

SOIL PARAMETERS

$\gamma soil$ =	110	pcf
$\gamma soil$ =	47.6	pcf
h_{soil} =	5	ft
h =	2.5	ft
ϕ =	30	degrees

ANCHOR PARAMETERS

w =	4.5	ft
h =	2.5	ft
d =	6.5	ft



Foundation Elevation View

κ_p = 3.00

HORIZONTAL FORCES

		1.65	ksf
		2.48	ksf
RESIST TO SLIDING =		33.52	k
SOIL & CONCRETE WEIGHT =	Wr + Wc =	39.58	k
UPLIFT REACTIONS =		-5	k
SUM =		34.58	k
COEF. OF FRICTION, (0.45) =		15.56	k
RESIST TO SLIDING =		33.52	k
SUM =		49.08	k

SF AGAINST SLIDING

SF = 4.1 > 1 OK

GUY ANCHORS AGAINST SLIDING ARE ADEQUATE

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

Subject:	Base Foundation Analysis
Location:	180-ft Guyed Lattice Tower Madison, CT
Rev. 0: 4/4/22	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22006.01

Guyed Tower Base Foundation:

Input Data:

Tower Data

Shear Force =	Shear := 1·kip	(User Input from tnxTower)	
Axial Force =	Axial := 116·kip	(User Input from tnxTower)	
Tower Height =	H_t := 180·ft	(User Input)	

Footing Data:

Overall Depth of Footing =	D_f := 7.7·ft	(User Input)	
Length of Pier =	L_p := 5.7·ft	(User Input)	
Extension of Pier Above Grade =	L_{pag} := 1.5·ft	(User Input)	
Diameter of Pier =	D_p := 2.0·ft	(User Input)	
Width of Pad =	W_{pad} := 4.7·ft	(User Input)	
Length of Pad =	L_{pad} := 5.3·ft	(User Input)	
Thickness of Pad =	t_{pad} := 2.0·ft	(User Input)	

Material Properties:

Concrete Compressive Strength =	f_c := 3000·psi	(User Input)	
Steel Reinforcment Yield Strength =	f_y := 60000·psi	(User Input)	
Internal Friction Angle of Soil =	Φ_s := 30·deg	(User Input)	
Ultimate Soil Bearing Capacity =	q_s := 16000·psf	(User Input)	Weathered Bedrock
Unit Weight of Soil =	γ_{soil} := 120·pcf	(User Input)	
Unit Weight of Concrete =	γ_{conc} := 150·pcf	(User Input)	
Foundation Bouyancy =	Bouyancy := 0	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	n := 0·ft	(User Input)	
Cohesion of Clay Type Soil =	c := 0·ksf	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	Z := 2	(User Input)	
Coefficient of Friction Between Concrete =	μ := 0.45	(User Input)	

Calculated Factors:

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

Stability of Footing:

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

Adjusted Soil Unit Weight = $\gamma_s := if\left(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}\right) = 120 \cdot pcf$

Passive Pressure = $P_{top} := 0$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 2.772 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.386 \cdot ksf$

$A_p := D_p \cdot L_p = 11.4$

Soil Shear Resistance = $Sl_1 := P_{ave} \cdot A_p = 15.8 \cdot kip$

Weight of Concrete = $WT_c := \left(D_p^2 \cdot L_p + W_{pad} \cdot L_{pad} \cdot t_{pad}\right) \cdot \gamma_c = 10.89 \cdot kip$

Total Weight = $WT_{tot} := WT_c + Axial = 126.89 \cdot kip$

Soil/Concrete Friction Resistance = $Sl_2 := \mu \cdot WT_{tot} = 57.1 \cdot kips$

Total Sliding Resistance = $Sl_{tot} := Sl_1 + Sl_2 = 72.9 \cdot kips$

Sliding Resistance Ratio = $Sliding\_Resistance_{ratio} := \frac{0.75Sl_{tot}}{Shear} = 54.68$

$Sliding\_Resistance\_Check := if\left[\left(\frac{Shear}{0.75Sl_{tot}} < 1.0\right), "Okay", "No\ Good"\right]$

Sliding_Resistance_Check = "Okay"

Bearing Pressure Caused by Footing:

Maximum Pressure in Mat = $P_{max} := \frac{WT_{tot}}{W_{pad} \cdot L_{pad}} = 5.09 \cdot ksf$

$Max\_Pressure\_Check := if\left(P_{max} < 0.6q_s, "Okay", "No\ Good"\right)$

Max_Pressure_Check = "Okay"

RAN Template:	A&L Template:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Section 1 - Site Information

Site ID: CT11029I
Status: Final
Version: 7
Project Type: Anchor
Approved: 1/21/2022 11:59:26 AM
Approved By: Pratik.Patil30@T-Mobile.com
Last Modified: 1/21/2022 11:59:26 AM
Last Modified By: Pratik.Patil30@T-Mobile.com

Site Name: Madison/ I-95/ X61/ Jct_1
Site Class: Guyed Tower
Site Type: Structure Non Building
Plan Year: 2021
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: <undefined>

Latitude: 41.29343600
Longitude: -72.57840600
Address: 135 New Road
City, State: Madison, CT
Region: NORTHEAST

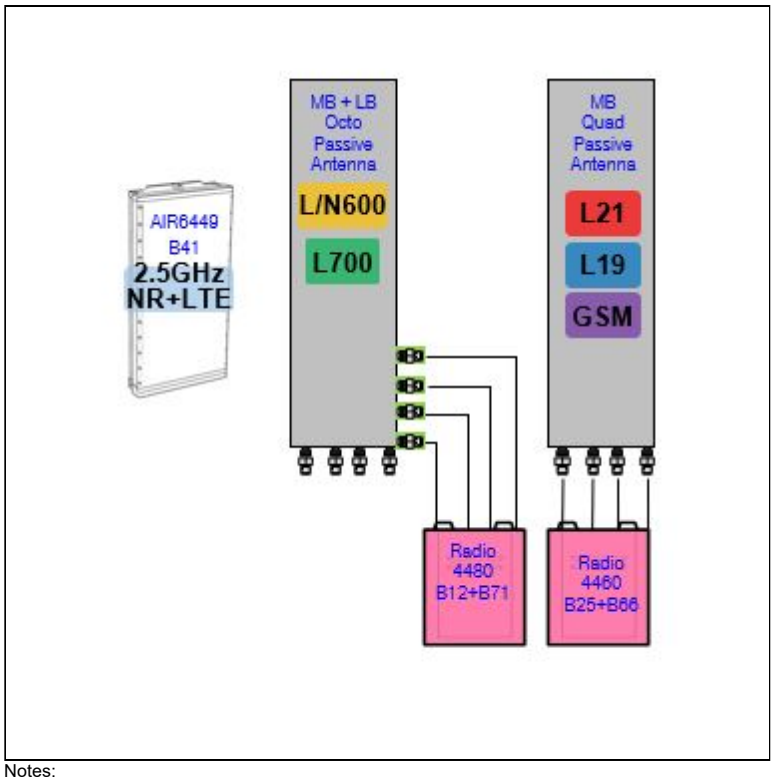
RAN Template: 67E5D998E Outdoor			**AL Template:** 67E5998E_1xAIR+1OP	
Sector Count: 3	**Antenna Count:** 6	**Coax Line Count:** 0	**TMA Count:** 0	**RRU Count:** 6

Section 2 - Existing Template Images

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

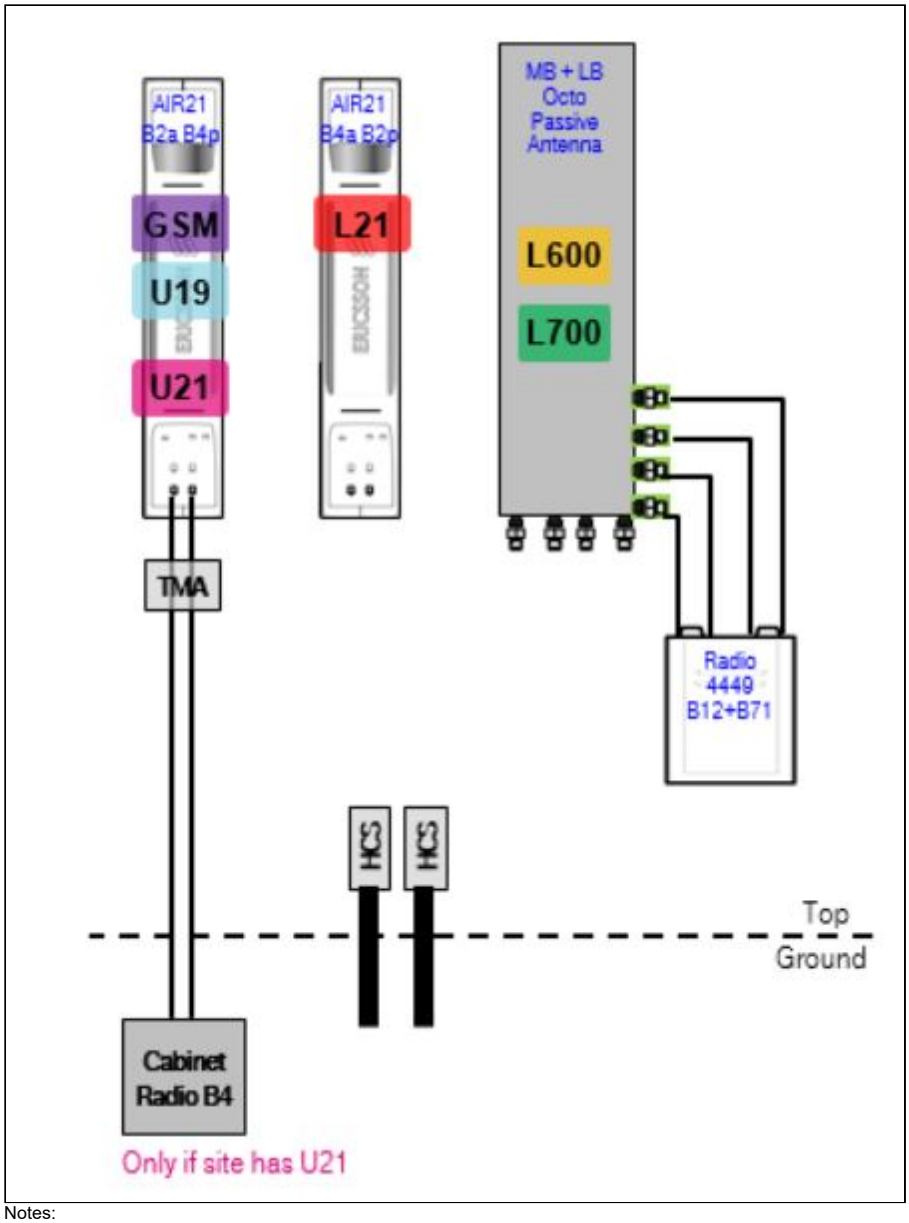
Section 3 - Proposed Template Images

67E5A998E.JPG



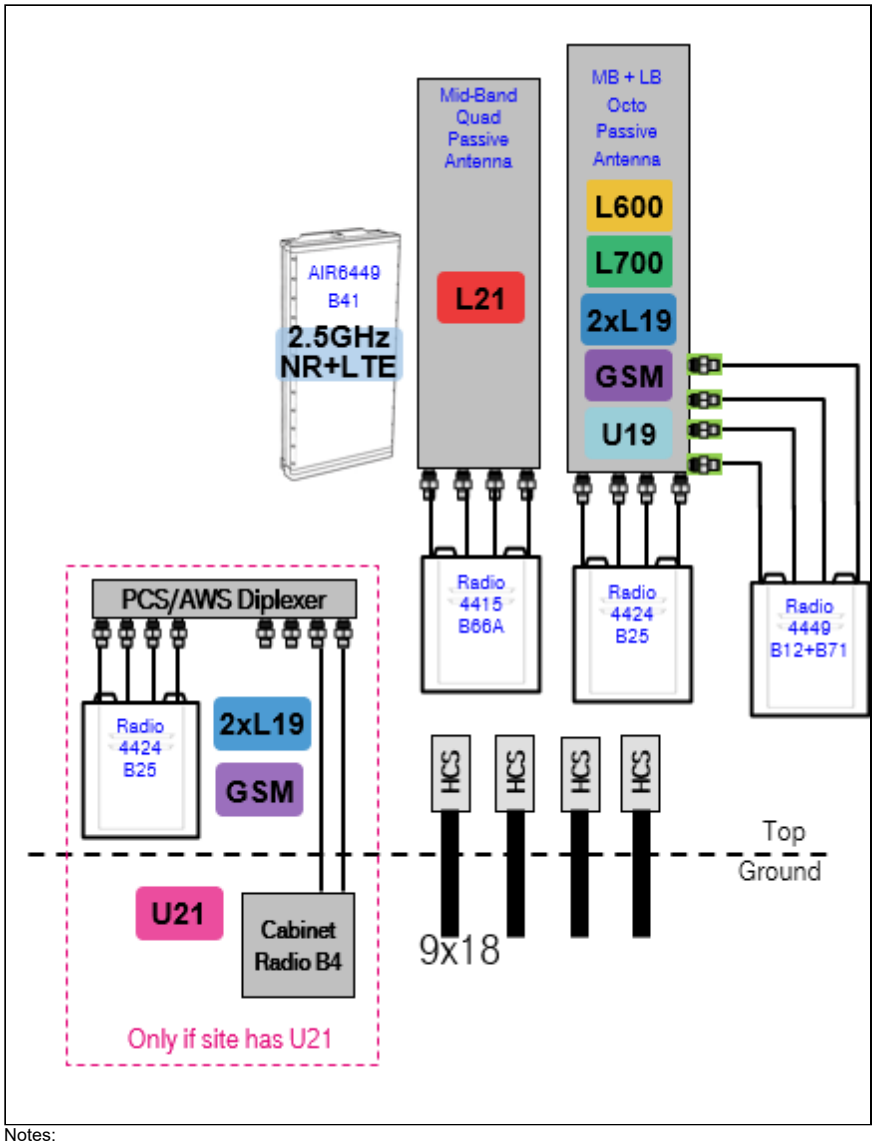
Notes:

67D02C.JPG



Notes:

67D5998C_1xAIR+1QP+1OP.PNG


Mid-Band
Quad
Passive
Antenna
L21
MB + LB
Octo
Passive
Antenna
L600
L700
2xL19
GSM
U19
AIR6449
B41
2.5GHz
NR+LTE
Radio
4415
B66A
Radio
4424
B25
Radio
4449
B12+B71
PCS/AWS Diplexer
Radio
4424
B25
2xL19
GSM
U21
Cabinet
Radio B4
HCS
HCS
HCS
HCS
Top
Ground
9x18
Only if site has U21

Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 792Cu Outdoor

Enclosure	1	2
Enclosure Type	RBS 6131	S8000 Outdoor
Baseband	DUW30 (U2100); DUG20 (G1900); BB 6630 (L1900, L700, L2100)	
Hybrid Cable System	Ericsson 9x18 HCS *Select Length*	
Radio	RU22 **(x 6)** (U2100)	

Proposed RAN Equipment

Template: 67E5D998E Outdoor

Enclosure	1	2	3
Enclosure Type	RBS 6131	Enclosure 6160 AC V1	B160
Baseband	DUG20 (G1900); BB 6648 (L600, N600, L700); BB 6630 (L1900, L2100); DUW30 (U2100)	RP 6651 (L2500); RP 6651 (N2500)	
Hybrid Cable System	Ericsson Hybrid Trunk 6/24 4AWG 100m **(x 2)**	PSU 4813 vR4A (Kit) **(x 2)** Ericsson Hybrid Trunk 6/24 4AWG 100m	
Transport System		CSR IXRe V2 (Gen2)	

RAN Scope of Work:

Existing 6131. Update LB to have 6131.

Remove Nortel cabinet.

Upgrade power to 200 A.

Remove and return all cabinet radios from existing base station cabinet.

Add (1) Enclosure 6160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB 6648 for L600/N600, L700, (MMBB - Mixed Mode Baseband) to new Enclosure 6160.

Add (1) RP 6651 for N2500 to new Enclosure 6160.

Add (1) RP 6651 for L2500 to new Enclosure 6160.

Add (2) PSU4813 Voltage Booster to new Enclosure 6160.

Add (1) Battery Cabinet B160.

Existing : (3) 9x18

Remove all Coax, remove (3) 9x18

Add (3) 6X24 HCS terminating at the Enclosure 6160 and Connect DC for the AIR6419 B41 to the PSU4813 Voltage Booster.

RAN Template:	A&L Template:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Section 6 - A&L Equipment

Existing Template: 792Cu_2xAIR+1DP
Proposed Template: 67E5998E_1xAIR+1OP

Sector 1 (Existing) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1		2	3	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	0		0	0	
M. Tilt	0		0	0	
Height	159		159	159	
Ports	P1	P2	P3	P4	P5
Active Tech.	L1900 G1900	U2100	L700	L2100	
Dark Tech.					
Restricted Tech.					
Decomm. Tech.	U1900				
E. Tilt	2	2	2	2	
Cables	Fiber Jumper - 15 ft. **(x2)**	1-5/8" Coax - 175 ft. **(x2)**	Fiber Jumper - 15 ft.	Fiber Jumper - 15 ft.	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)			
Diplexers / Combiners					
Radio			RRUS11 B12 (At Antenna)		
Sector Equipment					

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				AIR 6419 B41 (Active Antenna - Massive MIMO)	
Azimuth	0				0	
M. Tilt	0				0	
Height	159				159	
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	**P6**
Active Tech.	L600 N600 L700	L600 N600 L700	U2100 G1900 L1900 L2100	U2100 G1900 L1900 L2100	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Remove all TMAs.

Remove all antennas.

Remove all coaxial lines.

Add (1) Low-Band/Mid-Band Octo in Position 2

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both Carriers), U2100 and GSM to Position 1 at antenna.

Add (1) Radio 4480 B71+B85 for L600, L700, and N600 to Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo Antenna.

Install (1) AIR6419 B41 for L2500 and N2500 in Position 2.

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:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro				
Antenna	1		2	3	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	120		120	120	
M. Tilt			0		
Height	159		159	159	
Ports	P1	P2	P3	P4	P5
Active Tech.	L1900 G1900	U2100	L700	L2100	
Dark Tech.					
Restricted Tech.					
Decomm. Tech.	U1900				
E. Tilt	2	2	2	2	
Cables	Fiber Jumper - 15 ft. **(x2)**	1-5/8" Coax - 175 ft. **(x2)**	Fiber Jumper - 15 ft.	Fiber Jumper - 15 ft.	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)			
Diplexers / Combiners					
Radio			RRUS11 B12 (At Antenna)		
Sector Equipment					

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				AIR 6419 B41 (Active Antenna - Massive MIMO)	
Azimuth	120				120	
M. Tilt	0				0	
Height	159				159	
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L600 N600 L700	L600 N600 L700	U2100 G1900 L1900 L2100	U2100 G1900 L1900 L2100	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Remove all TMAs.

Remove all antennas.

Remove all coaxial lines.

Add (1) Low-Band/Mid-Band Octo in Position 2

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both Carriers), U2100 and GSM to Position 1 at antenna.

Add (1) Radio 4480 B71+B85 for L600, L700, and N600 to Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo Antenna.

Install (1) AIR6419 B41 for L2500 and N2500 in Position 2.

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:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Sector 3 (Existing) view from behind					
Coverage Type	A - Outdoor Macro				
Antenna	1		2	3	
Antenna Model	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)	
Azimuth	240		240	240	
M. Tilt			0		
Height	159		159	159	
Ports	P1	P2	P3	P4	P5
Active Tech.	L1900 G1900	U2100	L700	L2100	
Dark Tech.					
Restricted Tech.					
Decomm. Tech.	U1900				
E. Tilt	2	2	2	2	
Cables	Fiber Jumper - 15 ft. **(x2)**	1-5/8" Coax - 175 ft. **(x2)**	Fiber Jumper - 15 ft.	Fiber Jumper - 15 ft.	
TMAs		Generic Twin Style 1B - AWS (AtAntenna)			
Diplexers / Combiners					
Radio			RRUS11 B12 (At Antenna)		
Sector Equipment					

Unconnected Equipment:

Scope of Work:

RAN Template:	A&L Template:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	1				2	
Antenna Model	RFS - APXVAALL24_43-U-NA20 (Octo)				AIR 6419 B41 (Active Antenna - Massive MIMO)	
Azimuth	240				240	
M. Tilt	0				0	
Height	159				159	
Ports	P1	P2	P3	P4	P5	P6
Active Tech.	L600 N600 L700	L600 N600 L700	U2100 G1900 L1900 L2100	U2100 G1900 L1900 L2100	L2500 N2500	L2500 N2500
Dark Tech.						
Restricted Tech.						
Decomm. Tech.						
E. Tilt	2	2	2	2	2	2
Cables	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Coax Jumper **(x2)** Fiber Jumper	Fiber Jumper **(x2)**	Fiber Jumper **(x2)**
TMAs						
Diplexers / Combiners						
Radio	Radio 4480 B71+B85 (At Antenna)	SHARED Radio 4480 B71+B85 (At Antenna)	Radio 4460 B25+B66 (At Antenna)	SHARED Radio 4460 B25+B66 (At Antenna)		
Sector Equipment						

Unconnected Equipment:

Scope of Work:

Remove all TMAs.

Remove all antennas.

Remove all coaxial lines.

Add (1) Low-Band/Mid-Band Octo in Position 2

Add (1) Radio 4460 B25+B66 for L2100, L1900 (Both Carriers), U2100 and GSM to Position 1 at antenna.

Add (1) Radio 4480 B71+B85 for L600, L700, and N600 to Position 1 at antenna, and connect its ports to the Low-Band ports of the Octo Antenna.

Install (1) AIR6419 B41 for L2500 and N2500 in Position 2.

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:
67E5D998E Outdoor	67E5998E_1xAIR+1OP

CT11029I_Anchor_7

Print Name: Preliminary (RFDS_For_Scoping)
PORs: L600_5G POPs
Anchor_Phase 3

Section 7 - Power Systems Equipment

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

	Proposed Power Systems Equipment
Enclosure	1
Enclosure Type	Enclosure 6160 AC V1

Exhibit E

Mount Analysis

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

Antenna Mount Analysis

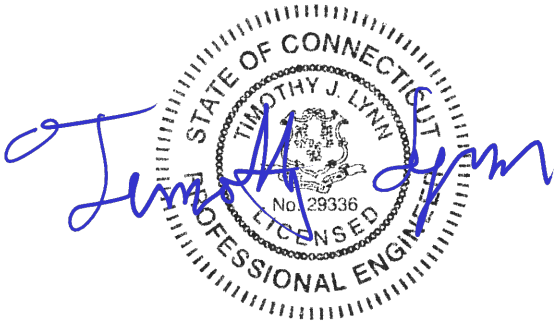
T-Mobile Site #: CT11029I

135 New Road
Madison, CT

Centek Project No. 22006.01

Date: April 4, 2022

Max Stress Ratio = 54%



Prepared for:

T-Mobile USA
35 Griffin Road
Bloomfield, CT 06002

Table of Contents

SECTION 1 – REPORT

- ANTENNA AND APPURTENANCE SUMMARY
- STRUCTURE LOADING
- CONCLUSION

SECTION 2 – CALCULATIONS

- WIND LOAD ON APPURTENANCES
- RISA3D OUTPUT REPORT
- MOUNT CONNECTION

CENTEK engineering

Centered on Solutions℠

April 4, 2022

Mr. Derek Waite
Northeast Site Solutions
199 Brickyard Road
Farmington, CT 06032

Re: Structural Letter ~ Antenna Mount
T-Mobile – Site Ref: CT11029I
135 New Road
Madison, CT

Centek Project No. 22006.01

Dear Mr. Waite,

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 **proposed mount, consisting of three (3) V-frame sector mounts (SitePro P/N: VFA12-HD)** to support the proposed 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) Ericsson AIR6419 panel antennas, three (3) RFS APXVAALL24_43-U-NA20 panel antennas, three (3) Ericsson 4480 B71+B85 remote radio heads and three (3) Ericsson 4460 B25+B66 remote radio heads mounted on three (3) V-Frames with a RAD center elevation of 159-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 101 mph for Madison as required in Appendix N of the 2018 Connecticut State Building Code.

A structural analysis of tower and foundation needs to be completed prior to any work.

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

Section 2 - Calculations

CENTEK engineering
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Subject: TIA-222-G Loads

Location: Madison, CT

Rev. 0: 4/4/22

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 22006.01

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

Wind Speeds

Basic Wind Speed: $V := 101$ mph (User Input - 2016 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 = $Exp := C$ (User Input)

Structure Height = $h := 180$ ft (User Input)

Height to Center of Antennas = $z_{Ant} := 159$ ft (User Input)

Radial Ice Thickness = $t_i := 0.75$ in (User Input per Annex B of TIA-222-G)

Radial Ice Density = $Id := 56.00$ pcf (User Input)

Topograpic Factor = $K_{zt} := 1.0$ (User Input)

$K_a := 1.0$ (User Input)

Gust Response Factor = $G_H = 0.85$ (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)

Importance Factors =

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

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

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

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

$$K_{iz} := \left(\frac{z_{Ant}}{33}\right)^{0.1} = 1.17$$

$$t_{iz} := 2.0 \cdot t_i \cdot I_{ice} \cdot K_{iz} \cdot K_{zt}^{0.35} = 1.755$$

Velocity Pressure Coefficient Antennas =

$$Kz_{Ant} := 2.01\left(\left(\frac{z_{Ant}}{zg}\right)\right)^{\frac{2}{\alpha}} = 1.395$$

Velocity Pressure w/o Ice Antennas =

$$qz_{Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V^2 \cdot I_{Wind} = 30.974$$

Velocity Pressure with Ice Antennas =

$$qz_{ice.Ant} := 0.00256 \cdot K_d \cdot Kz_{Ant} \cdot V_i^2 \cdot I_{Wind} = 7.591$$

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Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	RFS APXVAALL24-43		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 95.9$	in	(User Input)
Antenna Width =	$W_{ant} := 24$	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 =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 533$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 5.7$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 189$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 19$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 155$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 8.3$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 68$	lbs

Gravity Load (without ice)

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

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 2 \times 10^4$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 1 \times 10^4$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 431$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 431$	lbs

Development of Wind & Ice Load on Antennas

Antenna Data:

Antenna Model =	Ericsson AIR6419		
Antenna Shape =	Flat		(User Input)
Antenna Height =	$L_{ant} := 36.3$	in	(User Input)
Antenna Width =	$W_{ant} := 20.9$	in	(User Input)
Antenna Thickness =	$T_{ant} := 9.0$	in	(User Input)
Antenna Weight =	$WT_{ant} := 83$	lbs	(User Input)
Number of Antennas =	$N_{ant} := 1$		(User Input)
Antenna Aspect Ratio =	$Ar_{ant} := \frac{L_{ant}}{W_{ant}} = 1.7$		
Antenna Force Coefficient =	$Ca_{ant} = 1.2$		

Wind Load (without ice)

Surface Area for One Antenna =	$SA_{antF} := \frac{L_{ant} \cdot W_{ant}}{144} = 5.3$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antF} = 166$	lbs
Surface Area for One Antenna =	$SA_{antS} := \frac{L_{ant} \cdot T_{ant}}{144} = 2.3$	sf
Total Antenna Wind Force =	$F_{ant} := qz_{Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{antS} = 72$	lbs

Wind Load (with ice)

Surface Area for One Antenna w/ Ice =	$SA_{ICEantF} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (W_{ant} + 2 \cdot t_{iz})}{144} = 6.7$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantF} = 52$	lbs
Surface Area for One Antenna w/ Ice =	$SA_{ICEantS} := \frac{(L_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz})}{144} = 3.5$	sf
Total Antenna Wind Force w/ Ice =	$Fi_{ant} := qz_{ice.Ant} \cdot G_H \cdot Ca_{ant} \cdot K_a \cdot SA_{ICEantS} = 27$	lbs

Gravity Load (without ice)

Weight of All Antennas =	$WT_{ant} \cdot N_{ant} = 83$	lbs

Gravity Loads (ice only)

Volume of Each Antenna =	$V_{ant} := L_{ant} \cdot W_{ant} \cdot T_{ant} = 6828$	cu in
Volume of Ice on Each Antenna =	$V_{ice} := (L_{ant} + 2 \cdot t_{iz})(W_{ant} + 2 \cdot t_{iz}) \cdot (T_{ant} + 2 \cdot t_{iz}) - V_{ant} = 5330$	cu in
Weight of Ice on Each Antenna =	$W_{ICEant} := \frac{V_{ice}}{1728} \cdot Id = 173$	lbs
Weight of Ice on All Antennas =	$W_{ICEant} \cdot N_{ant} = 173$	lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4460

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 = $N_{RRUS} := 1$ (User Input)

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 = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 68$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.6$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 52$ lbs

Wind Load (with ice)

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSF} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (W_{RRUS} + 2 \cdot t_{iz})}{144} = 3.1$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 24$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 2.5$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 19$ 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 = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 3240$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 104$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 104$ lbs

Development of Wind & Ice Load on RRUS

RRUS Data:

RRUS Model = Ericsson 4480

RRUS Shape = Flat (User Input)

RRUS Height = $L_{RRUS} := 21.8$ in (User Input)

RRUS Width = $W_{RRUS} := 15.7$ in (User Input)

RRUS Thickness = $T_{RRUS} := 7.5$ in (User Input)

RRUS Weight = $WT_{RRUS} := 84$ lbs (User Input)

Number of RRUS's = $N_{RRUS} := 1$ (User Input)

RRUS Aspect Ratio = $Ar_{RRUS} := \frac{L_{RRUS}}{W_{RRUS}} = 1.4$

RRUS Force Coefficient = $Ca_{RRUS} = 1.2$

Wind Load (without ice)

Surface Area for One RRUS = $SA_{RRUSF} := \frac{L_{RRUS} \cdot W_{RRUS}}{144} = 2.4$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSF} = 75$ lbs

Surface Area for One RRUS = $SA_{RRUSS} := \frac{L_{RRUS} \cdot T_{RRUS}}{144} = 1.1$ sf

Total RRUS Wind Force = $F_{RRUS} := qz_{Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{RRUSS} = 36$ 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 = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSF} = 26$ lbs

Surface Area for One RRUS w/ Ice = $SA_{ICERRUSS} := \frac{(L_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz})}{144} = 1.9$ sf

Total RRUS Wind Force w/ Ice = $Fi_{RRUS} := qz_{ice.Ant} \cdot G_H \cdot Ca_{RRUS} \cdot K_a \cdot SA_{ICERRUSS} = 15$ lbs

Gravity Load (without ice)

Weight of All RRUSs = $WT_{RRUS} \cdot N_{RRUS} = 84$ lbs

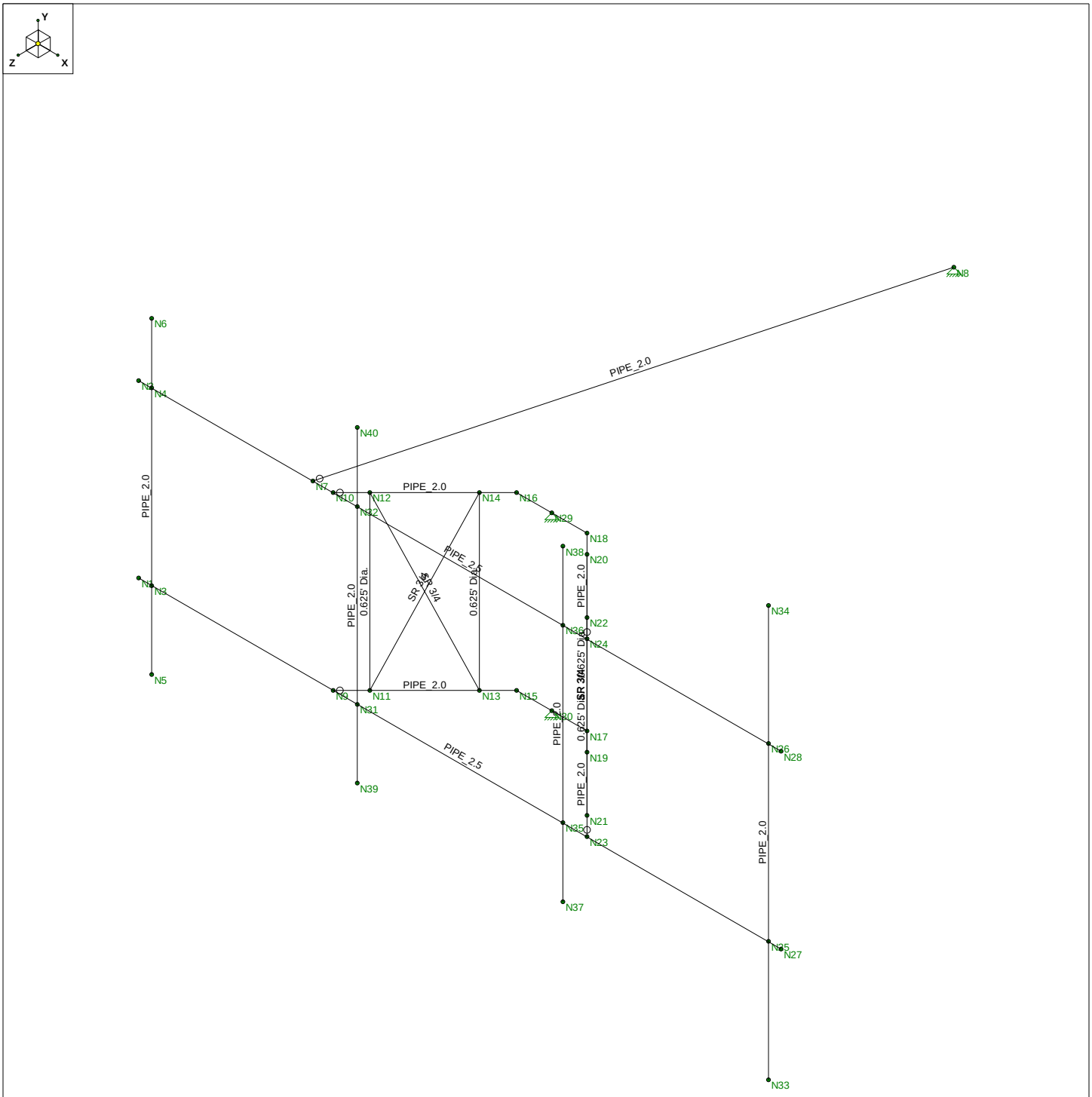
Gravity Loads (ice only)

Volume of Each RRUS = $V_{RRUS} := L_{RRUS} \cdot W_{RRUS} \cdot T_{RRUS} = 2567$ cu in

Volume of Ice on Each RRUS = $V_{ice} := (L_{RRUS} + 2 \cdot t_{iz})(W_{RRUS} + 2 \cdot t_{iz}) \cdot (T_{RRUS} + 2 \cdot t_{iz}) - V_{RRUS} = 2787$ cu in

Weight of Ice on Each RRUS = $W_{ICERRUS} := \frac{V_{ice}}{1728} \cdot Id = 90$ lbs

Weight of Ice on All RRUSs = $W_{ICERRUS} \cdot N_{RRUS} = 90$ lbs



Envelope Only Solution

Centek Engineering		
TJL	CT11029I	Apr 4, 2022 at 11:09 AM
22006.01	Member Framing	Mount.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 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
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
Footing Overturning Safety Factor	1
Optimize for OTM/Sliding	No
Check Concrete Bearing	No
Footing Concrete Weight (k/ft^3)	150.001
Footing Concrete f'c (ksi)	4
Footing Concrete Ec (ksi)	3644
Lambda	1
Footing Steel fy (ksi)	60
Minimum Steel	0.0018
Maximum Steel	0.0075
Footing Top Bar	#3
Footing Top Bar Cover (in)	2
Footing Bottom Bar	#3
Footing Bottom Bar Cover (in)	3.5
Pedestal Bar	#3
Pedestal Bar Cover (in)	1.5
Pedestal Ties	#3

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\...	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	Antenna Mast_2.0 STD...	PIPE_2.0	Column	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
2	Horizontal_2.5 STD Pipe	PIPE_2.5	Beam	Pipe	A53 Grade B	Typical	1.61	1.45	1.45	2.89
3	Outrigger_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
4	Stabilizer_2.0 STD Pipe	PIPE_2.0	Beam	Pipe	A53 Grade B	Typical	1.02	.627	.627	1.25
5	0.625" Dia. Bar	0.625' Dia.	Column	BAR	A36 Gr.36	Typical	.307	.007	.007	.015
6	0.75"Dia. Bar	SR 3/4	Column	BAR	A36 Gr.36	Typical	.442	.016	.016	.031

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	Horizontal_2.5 STD...	12.5	Segment		Lbyy						Lateral
2	M2	Horizontal_2.5 STD...	12.5	Segment		Lbyy						Lateral
3	M3	Stabilizer_2.0 STD ...	10.18			Lbyy						Lateral
4	M4	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
5	M5	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
6	M6	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
7	M7	Outrigger_2.0 STD ...	2.521	Segment	Segment	Lbyy						Lateral
8	M8	0.625" Dia. Bar	3.333									Lateral
9	M9	0.625" Dia. Bar	3.333									Lateral
10	M10	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
11	M11	0.625" Dia. Bar	3.333									Lateral
12	M12	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
13	M13	0.625" Dia. Bar	3.333									Lateral
14	M14	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
15	M15	0.75"Dia. Bar	3.659	1.83	1.83	Lbyy						Lateral
16	M16	Antenna Mast_2.0 ...	6			Lbyy						Lateral
17	M17	Antenna Mast_2.0 ...	8			Lbyy						Lateral
18	M18	Antenna Mast_2.0 ...	6			Lbyy						Lateral
19	M21	Antenna Mast_2.0 ...	6			Lbyy						Lateral

Member Primary Data

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
1	M1	N2	N28			Horizontal_2.5 STD Pipe	Beam	Pipe	A53 Grade B	Typical
2	M2	N1	N27			Horizontal_2.5 STD Pipe	Beam	Pipe	A53 Grade B	Typical
3	M3	N7	N8			Stabilizer_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
4	M4	N10	N16			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
5	M5	N9	N15			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
6	M6	N24	N18			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
7	M7	N23	N17			Outrigger_2.0 STD Pipe	Beam	Pipe	A53 Grade B	Typical
8	M8	N12	N11			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
9	M9	N14	N13			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
10	M10	N12	N13			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
11	M11	N22	N21			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
12	M12	N14	N11			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
13	M13	N20	N19			0.625" Dia. Bar	Column	BAR	A36 Gr.36	Typical
14	M14	N22	N19			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
15	M15	N20	N21			0.75"Dia. Bar	Column	BAR	A36 Gr.36	Typical
16	M16	N6	N5			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical
17	M17	N34	N33			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	K Joint	Rotate(...	Section/Shape	Type	Design List	Material	Design ...
18	M18	N37	N38			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical
19	M19	N15	N17			RIGID	None	None	RIGID	Typical
20	M20	N16	N18			RIGID	None	None	RIGID	Typical
21	M21	N39	N40			Antenna Mast_2.0 STD Pi...	Column	Pipe	A53 Grade B	Typical

Joint Coordinates and Temperatures

	Label	X [ft]	Y [ft]	Z [ft]	Temp [F]	Detach From Diap...
1	N1	0	0.	-0.	0	
2	N2	0	3.333334	-0.	0	
3	N3	.25	0.	-0.	0	
4	N4	.25	3.333334	-0.	0	
5	N5	.25	-1.5	0	0	
6	N6	.25	4.5	0	0	
7	N7	3.390625	3.333334	-0.	0	
8	N8	6.025403	3.333334	-9.833125	0	
9	N9	3.78125	0.	-0.	0	
10	N10	3.78125	3.333334	-0.	0	
11	N11	4.138628	0.	-0.357378	0	
12	N12	4.138628	3.333334	-0.357378	0	
13	N13	5.206335	0.	-1.425085	0	
14	N14	5.206335	3.333334	-1.425085	0	
15	N15	5.563713	0.	-1.782463	0	
16	N16	5.563713	3.333334	-1.782463	0	
17	N17	6.936287	0.	-1.782463	0	
18	N18	6.936287	3.333334	-1.782463	0	
19	N19	7.293665	0.	-1.425085	0	
20	N20	7.293665	3.333334	-1.425085	0	
21	N21	8.361372	0.	-0.357378	0	
22	N22	8.361372	3.333334	-0.357378	0	
23	N23	8.71875	0.	-0.	0	
24	N24	8.71875	3.333334	-0.	0	
25	N25	12.25	0.	-0.	0	
26	N26	12.25	3.333334	-0.	0	
27	N27	12.5	0.	-0.	0	
28	N28	12.5	3.333334	-0.	0	
29	N29	6.25	3.333334	-1.782463	0	
30	N30	6.25	0.	-1.782463	0	
31	N31	4.25	0.	-0.	0	
32	N32	4.25	3.333334	-0.	0	
33	N33	12.25	-2.333333	0	0	
34	N34	12.25	5.666667	0	0	
35	N35	8.25	0.	-0.	0	
36	N36	8.25	3.333334	-0.	0	
37	N37	8.25	-1.333333	-0.	0	
38	N38	8.25	4.666667	-0.	0	
39	N39	4.25	-1.333333	-0.	0	
40	N40	4.25	4.666667	-0.	0	

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	N8	Reaction	Reaction	Reaction			
2	N15						
3	N16						
4	N13						
5	N14						
6	N17						
7	N18						
8	N19						
9	N20						
10	N29	Reaction	Reaction	Reaction			
11	N30	Reaction	Reaction	Reaction			

Member Point Loads (BLC 2 : Equipment Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	Y	-.075	.5
2	M17	Y	-.075	7.5
3	M16	Y	-.042	.5
4	M16	Y	-.042	3.5
5	M17	Y	-.109	1.5
6	M17	Y	-.084	5

Member Point Loads (BLC 3 : Ice Weight)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	Y	-.216	.5
2	M17	Y	-.216	7.5
3	M16	Y	-.087	.5
4	M16	Y	-.087	3.5
5	M17	Y	-.104	1.5
6	M17	Y	-.09	5

Member Point Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	X	.034	.5
2	M17	X	.034	7.5
3	M16	X	.014	.5
4	M16	X	.014	3.5
5	M17	X	.024	1.5
6	M17	X	0	5
7	M17	X	.026	5
8	M17	X	.075	5

Member Point Loads (BLC 5 : Wind X)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	X	.095	.5
2	M17	X	.095	7.5
3	M16	X	.036	.5
4	M16	X	.036	3.5
5	M17	X	.068	1.5

Member Point Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	Z	.078	.5
2	M17	Z	.078	7.5
3	M16	Z	.026	.5
4	M16	Z	.026	3.5

Member Point Loads (BLC 7 : Wind Z)

	Member Label	Direction	Magnitude[k,k-ft]	Location[ft,%]
1	M17	Z	.267	.5
2	M17	Z	.267	7.5
3	M16	Z	.083	.5
4	M16	Z	.083	3.5

Member Distributed Loads (BLC 4 : Wind w/ Ice X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M3	X	.002	.002	0	0
2	M4	X	.002	.002	0	0
3	M5	X	.002	.002	0	0
4	M6	X	.002	.002	0	0
5	M7	X	.002	.002	0	0
6	M8	X	.002	.002	0	0
7	M9	X	.002	.002	0	0
8	M10	X	.002	.002	0	0
9	M11	X	.002	.002	0	0
10	M12	X	.002	.002	0	0
11	M13	X	.002	.002	0	0
12	M14	X	.002	.002	0	0
13	M15	X	.002	.002	0	0
14	M16	X	.002	.002	0	0
15	M17	X	.002	.002	0	0
16	M18	X	.002	.002	0	0
17	M21	X	.002	.002	0	0

Member Distributed Loads (BLC 5 : Wind X)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M3	X	.008	.008	0	0
2	M4	X	.008	.008	0	0
3	M5	X	.008	.008	0	0
4	M6	X	.008	.008	0	0
5	M7	X	.008	.008	0	0
6	M8	X	.008	.008	0	0
7	M9	X	.008	.008	0	0
8	M10	X	.008	.008	0	0
9	M11	X	.008	.008	0	0
10	M12	X	.008	.008	0	0
11	M13	X	.008	.008	0	0
12	M14	X	.008	.008	0	0
13	M15	X	.008	.008	0	0
14	M16	X	.008	.008	0	0
15	M17	X	.008	.008	0	0

Member Distributed Loads (BLC 5 : Wind X) (Continued)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
16	M18	X	.008	.008	0	0
17	M21	X	.008	.008	0	0

Member Distributed Loads (BLC 6 : Wind w/ Ice Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M1	Z	.002	.002	0	0
2	M2	Z	.002	.002	0	0
3	M4	Z	.002	.002	0	0
4	M5	Z	.002	.002	0	0
5	M6	Z	.002	.002	0	0
6	M7	Z	.002	.002	0	0
7	M8	Z	.002	.002	0	0
8	M9	Z	.002	.002	0	0
9	M10	Z	.002	.002	0	0
10	M11	Z	.002	.002	0	0
11	M12	Z	.002	.002	0	0
12	M13	Z	.002	.002	0	0
13	M14	Z	.002	.002	0	0
14	M15	Z	.002	.002	0	0
15	M18	Z	.002	.002	0	0
16	M21	Z	.002	.002	0	0

Member Distributed Loads (BLC 7 : Wind Z)

	Member Label	Direction	Start Magnitude[k/ft,F,ksf]	End Magnitude[k/ft,F,k...	Start Location[ft..	End Location[ft,...
1	M1	Z	.008	.008	0	0
2	M2	Z	.008	.008	0	0
3	M4	Z	.008	.008	0	0
4	M5	Z	.008	.008	0	0
5	M6	Z	.008	.008	0	0
6	M7	Z	.008	.008	0	0
7	M8	Z	.008	.008	0	0
8	M9	Z	.008	.008	0	0
9	M10	Z	.008	.008	0	0
10	M11	Z	.008	.008	0	0
11	M12	Z	.008	.008	0	0
12	M13	Z	.008	.008	0	0
13	M14	Z	.008	.008	0	0
14	M15	Z	.008	.008	0	0
15	M18	Z	.008	.008	0	0
16	M21	Z	.008	.008	0	0

Basic Load Cases

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib..	Area(...	Surfa...
1	Self Weight	None		-1						
2	Equipment Weight	None					6			
3	Ice Weight	None					6			
4	Wind w/ Ice X	None					8	17		
5	Wind X	None					5	17		
6	Wind w/ Ice Z	None					4	16		

Basic Load Cases (Continued)

	BLC Description	Category	X Gra...	Y Gra...	Z Gra...	Joint	Point	Distrib...	Area(...	Surfa...
7	Wind Z	None					4	16		

Load Combinations

	Description	Sol...	PD...	SR...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...	BLC	Fact...
1	1.2D + 1.6..	Yes	Y		1	1.2	2	1.2	5	1.6														
2	0.9D + 1.6..	Yes	Y		1	.9	2	.9	5	1.6														
3	1.2D + 1.0..	Yes	Y		1	1.2	2	1.2	3	1	4	1												
4	1.2D + 1.6..	Yes	Y		1	1.2	2	1.2	7	1.6														
5	0.9D + 1.6..	Yes	Y		1	.9	2	.9	7	1.6														
6	1.2D + 1.0..	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	N8	max	.169	1	.022	4	1.478	4	0	6	0	6	0	6
2		min	-.397	4	.016	2	-.875	1	0	1	0	1	0	1
3	N29	max	-.02	5	.847	3	.535	2	0	6	0	6	0	6
4		min	-1.635	1	.286	5	-3.042	4	0	1	0	1	0	1
5	N30	max	1.37	6	.852	6	.882	3	0	6	0	6	0	6
6		min	-.151	2	.359	2	-.63	5	0	1	0	1	0	1
7	Totals:	max	0	6	1.713	3	0	2						
8		min	-1.478	1	.684	2	-2.081	4						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
1	N1	max	.032	2	.057	4	.177	5	5.593e-03	4	1.014e-02	5	3.435e-04	2
2		min	-.152	4	-.003	2	-.07	3	-1.104e-03	2	-7.793e-04	3	-1.467e-03	4
3	N2	max	.032	1	.057	4	.44	5	6.262e-03	4	1.169e-02	5	3.44e-04	2
4		min	-.052	5	-.003	2	-.015	3	-1.184e-03	2	-6.394e-04	3	-1.526e-03	4
5	N3	max	.032	2	.053	4	.147	5	5.593e-03	4	1.014e-02	5	3.434e-04	2
6		min	-.152	4	-.002	2	-.068	3	-1.104e-03	2	-7.793e-04	3	-1.467e-03	4
7	N4	max	.032	1	.053	4	.405	5	6.262e-03	4	1.169e-02	5	3.44e-04	2
8		min	-.052	5	-.002	2	-.013	3	-1.184e-03	2	-6.394e-04	3	-1.526e-03	4
9	N5	max	.039	2	.053	4	.068	2	5.593e-03	4	1.014e-02	5	4.147e-04	2
10		min	-.178	4	-.002	2	-.112	6	-1.104e-03	2	-7.793e-04	3	-1.467e-03	4
11	N6	max	.029	1	.053	4	.495	4	6.555e-03	4	1.169e-02	5	1.838e-04	2
12		min	-.031	5	-.002	2	-.025	2	-1.184e-03	2	-6.394e-04	3	-1.527e-03	4
13	N7	max	.032	1	.056	6	.013	1	3.837e-03	4	1.02e-02	5	3.196e-04	1
14		min	-.052	5	.017	2	-.022	5	-5.185e-04	2	-1.048e-03	1	-5.225e-04	5
15	N8	max	0	6	0	6	0	6	1.934e-03	4	5.664e-03	1	8.108e-04	1
16		min	0	1	0	1	0	1	1.074e-03	2	-4.59e-04	5	-1.097e-03	5
17	N9	max	.031	2	.055	6	.044	2	2.161e-03	4	4.092e-03	5	7.435e-05	2
18		min	-.152	4	.017	5	-.2	4	-2.799e-04	2	-1.007e-03	3	-6.869e-04	4
19	N10	max	.032	1	.055	6	.019	1	3.536e-03	4	9.191e-03	5	8.799e-05	2
20		min	-.052	5	.017	5	-.069	5	-4.357e-04	2	-9.249e-04	1	-5.748e-04	4
21	N11	max	.026	2	.06	6	.039	2	2.312e-03	4	1.328e-03	2	-1.458e-04	2
22		min	-.119	4	.018	2	-.168	4	-8.091e-05	2	-7.588e-03	4	-8.929e-04	6
23	N12	max	.02	1	.06	6	.008	2	2.688e-03	4	2.515e-03	1	8.428e-05	2

Envelope Joint Displacements (Continued)

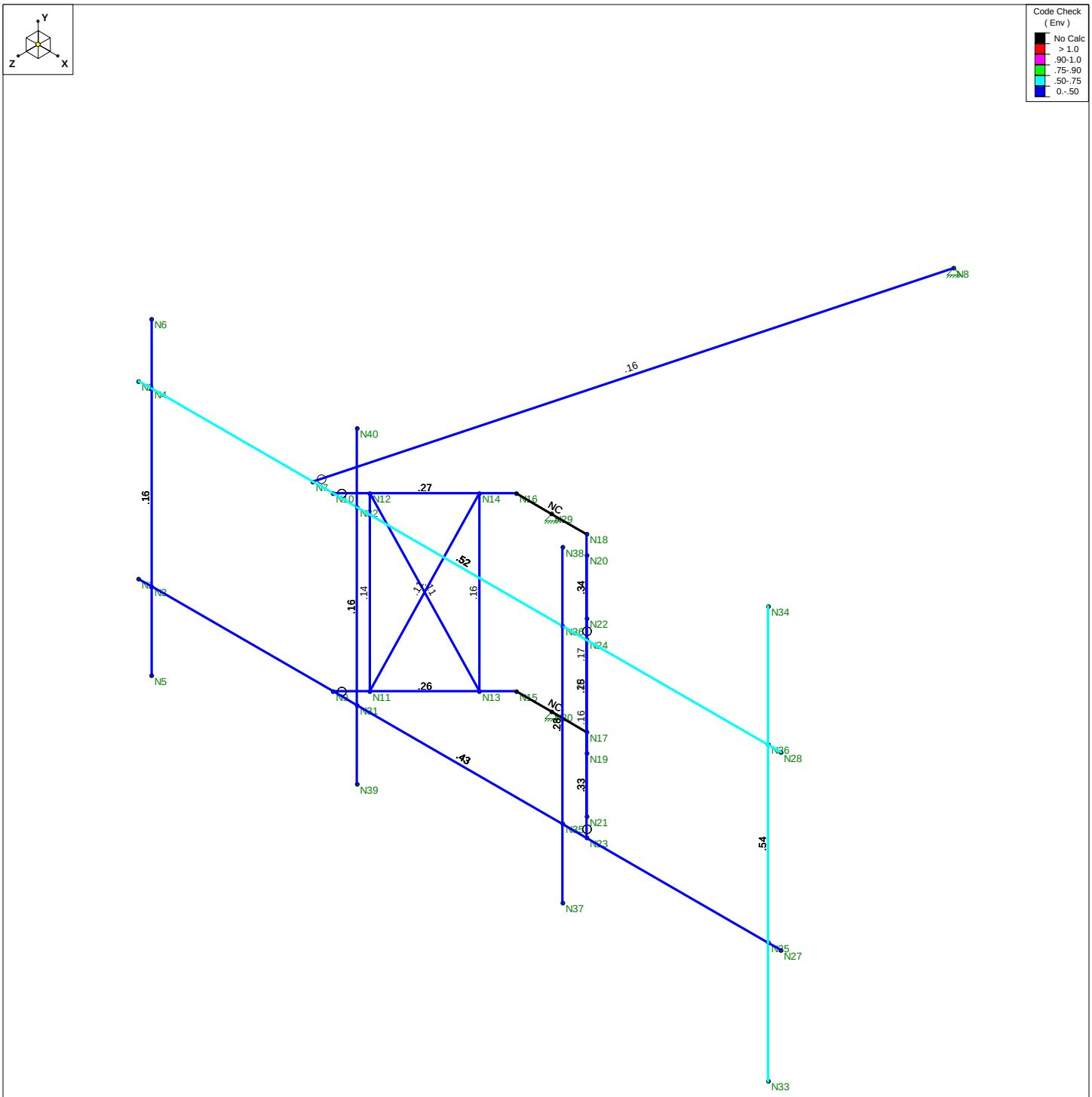
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
24		min	-.041	5	.018	2	-.059	4	-2.294e-04	2	-2.392e-03	5	-1.268e-03	4
25	N13	max	.007	2	.057	6	.02	2	1.342e-03	4	1.589e-03	2	-8.437e-04	2
26		min	-.027	4	.011	2	-.076	4	2.048e-04	2	-6.507e-03	4	-3.671e-03	6
27	N14	max	-.001	2	.057	6	-.011	2	1.384e-03	4	2.818e-04	2	-6.958e-04	2
28		min	-.011	4	.011	2	-.032	4	1.019e-04	2	-2.352e-03	4	-3.695e-03	6
29	N15	max	0	6	.043	6	.013	1	6.377e-04	6	1.606e-03	1	-1.041e-03	2
30		min	0	1	.009	2	-.05	5	2.628e-04	2	-6.042e-03	5	-5.198e-03	6
31	N16	max	0	6	.043	6	-.01	2	6.791e-04	6	-1.156e-03	2	-1.049e-03	2
32		min	0	1	.009	2	-.022	4	3.073e-04	2	-2.648e-03	4	-5.193e-03	6
33	N17	max	0	6	-.009	2	.05	5	6.377e-04	6	1.606e-03	1	-1.041e-03	2
34		min	0	1	-.043	6	-.013	1	2.628e-04	2	-6.042e-03	5	-5.198e-03	6
35	N18	max	0	6	-.009	2	.022	4	6.791e-04	6	-1.156e-03	2	-1.049e-03	2
36		min	0	1	-.043	6	.01	2	3.073e-04	2	-2.648e-03	4	-5.193e-03	6
37	N19	max	.007	2	-.014	2	.077	4	-1.031e-05	2	1.586e-03	2	-1.041e-03	2
38		min	-.028	4	-.064	6	-.02	2	-1.003e-03	4	-6.717e-03	4	-4.232e-03	6
39	N20	max	-.001	2	-.014	2	.034	4	2.29e-04	2	3.333e-04	2	-8.365e-04	2
40		min	-.011	4	-.064	6	.011	2	-7.447e-04	6	-2.631e-03	4	-4.128e-03	6
41	N21	max	.026	2	-.023	2	.17	4	-1.362e-04	2	1.339e-03	2	-1.522e-03	2
42		min	-.12	4	-.074	6	-.039	2	-3.514e-03	4	-7.517e-03	4	-4.31e-03	6
43	N22	max	.021	1	-.023	2	.066	4	2.418e-06	2	2.621e-03	1	-7.645e-04	5
44		min	-.043	5	-.075	6	-.01	2	-2.397e-03	6	-2.524e-03	5	-3.922e-03	6
45	N23	max	.031	2	-.03	5	.203	4	5.045e-04	2	1.815e-03	2	-2.31e-03	2
46		min	-.153	4	-.085	6	-.044	2	-4.794e-03	4	-1.962e-02	4	-6.572e-03	6
47	N24	max	.033	1	-.027	2	.077	5	1.175e-03	5	1.508e-03	2	-1.557e-03	2
48		min	-.053	5	-.085	6	-.021	1	-3.052e-04	6	-1.736e-02	4	-6.618e-03	6
49	N25	max	.031	2	-.145	2	1.338	4	6.588e-04	2	1.66e-03	2	-6.722e-04	2
50		min	-.153	4	-.487	6	-.117	2	-1.109e-02	4	-3.028e-02	4	-7.353e-03	6
51	N26	max	.034	1	-.146	2	1.187	4	4.732e-03	5	1.641e-03	2	-3.25e-03	2
52		min	-.053	5	-.487	6	-.088	2	-9.522e-04	3	-3.049e-02	4	-7.355e-03	6
53	N27	max	.031	2	-.147	2	1.429	4	6.588e-04	2	1.66e-03	2	-6.722e-04	2
54		min	-.153	4	-.509	6	-.122	2	-1.109e-02	4	-3.028e-02	4	-7.353e-03	6
55	N28	max	.034	1	-.155	2	1.278	4	4.732e-03	5	1.641e-03	2	-3.25e-03	2
56		min	-.053	5	-.509	6	-.093	2	-9.522e-04	3	-3.049e-02	4	-7.355e-03	6
57	N29	max	0	6	0	6	0	6	6.791e-04	6	-1.156e-03	2	-1.049e-03	2
58		min	0	1	0	1	0	1	3.073e-04	2	-2.648e-03	4	-5.193e-03	6
59	N30	max	0	6	0	6	0	6	6.377e-04	6	1.606e-03	1	-1.041e-03	2
60		min	0	1	0	1	0	1	2.628e-04	2	-6.042e-03	5	-5.198e-03	6
61	N31	max	.031	2	.052	3	.04	2	1.64e-03	4	2.516e-03	5	-7.164e-05	2
62		min	-.152	4	.013	5	-.218	4	-2.546e-04	2	-1.048e-03	3	-8.82e-04	4
63	N32	max	.032	1	.052	3	.023	1	3.205e-03	4	7.28e-03	5	-1.206e-04	2
64		min	-.052	5	.013	5	-.115	5	-3.786e-04	2	-4.574e-04	1	-8.49e-04	6
65	N33	max	.071	2	-.146	2	1.796	4	6.582e-04	2	1.66e-03	2	2.123e-03	2
66		min	-.284	6	-.487	6	-.135	2	-1.817e-02	4	-3.028e-02	4	-7.321e-03	6
67	N34	max	.245	3	-.146	2	1.467	5	1.186e-02	5	1.641e-03	2	-3.631e-03	5
68		min	.048	5	-.487	6	-.071	1	-9.593e-04	3	-3.049e-02	4	-7.92e-03	3
69	N35	max	.031	2	-.017	5	.101	4	4.544e-04	2	1.835e-03	2	-1.59e-03	2
70		min	-.153	4	-.054	3	-.034	2	-4.194e-03	4	-1.677e-02	4	-4.723e-03	6
71	N36	max	.033	1	-.017	5	-.008	6	7.635e-04	5	1.461e-03	2	-1.085e-03	2
72		min	-.053	5	-.054	3	-.013	1	-4.066e-04	6	-1.399e-02	5	-4.753e-03	6
73	N37	max	.006	2	-.017	5	.168	4	4.544e-04	2	1.835e-03	2	-1.54e-03	2
74		min	-.191	4	-.054	3	-.041	2	-4.244e-03	4	-1.677e-02	4	-4.723e-03	6
75	N38	max	.1	3	-.017	5	.002	5	8.135e-04	5	1.461e-03	2	-1.135e-03	2

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation [rad]	LC	Y Rotation [rad]	LC	Z Rotation [rad]	LC
76		min	-.02	5	-.054	3	-.014	6	-3.988e-04	6	-1.399e-02	5	-4.754e-03	6
77	N39	max	.031	2	.052	3	.044	2	1.589e-03	4	2.516e-03	5	-2.158e-05	2
78		min	-.166	4	.013	5	-.244	4	-2.545e-04	2	-1.048e-03	3	-8.82e-04	4
79	N40	max	.038	3	.052	3	.027	3	3.255e-03	4	7.28e-03	5	-1.707e-04	2
80		min	-.04	5	.013	5	-.065	5	-3.786e-04	2	-4.574e-04	1	-8.49e-04	6

Envelope AISC 15th(360-16): LRFD Steel Code Checks

	Memb...	Shape	Code Check	L...	LC	Sh...	L...	Dir	...	phi*P...	phi*Pn...	phi*Mn y-y [k-ft]	phi*...	Cb	Eqn
1	M1	PIPE_2.5	.523	8....	4	.160	3....		4	14.559	50.715	3.596	3.596	2....	H1..
2	M2	PIPE_2.5	.433	8....	4	.159	8....		4	14.559	50.715	3.596	3.596	2....	H1..
3	M3	PIPE_2.0	.161	0	4	.007	1...		1	9.492	32.13	1.872	1.872	1....	H1..
4	M4	PIPE_2.0	.267	2....	3	.102	2....		3	32.032	32.13	1.872	1.872	1....	H1..
5	M5	PIPE_2.0	.259	2....	6	.095	2....		3	32.032	32.13	1.872	1.872	1....	H1..
6	M6	PIPE_2.0	.336	2....	6	.125	.4...		3	32.032	32.13	1.872	1.872	1....	H1..
7	M7	PIPE_2.0	.333	2....	6	.142	.4...		6	32.032	32.13	1.872	1.872	1....	H1..
8	M8	0.625' Dia.	.144	3....	5	.029	3....		4	1.058	9.94	.104	.104	2....	H1..
9	M9	0.625' Dia.	.162	0	4	.024	0		4	1.058	9.94	.104	.104	2....	H1..
10	M10	SR 3/4	.109	0	1	.023	0		4	6.954	14.314	.179	.179	1	H1..
11	M11	0.625' Dia.	.156	0	5	.029	3....		6	1.058	9.94	.104	.104	1....	H1..
12	M12	SR 3/4	.114	0	1	.028	0		4	6.954	14.314	.179	.179	2....	H1..
13	M13	0.625' Dia.	.170	0	1	.023	0		4	1.058	9.94	.104	.104	2....	H1..
14	M14	SR 3/4	.277	0	6	.025	0		4	6.954	14.314	.179	.179	2....	H1..
15	M15	SR 3/4	.153	3....	6	.020	3....		4	6.954	14.314	.179	.179	2....	H1..
16	M16	PIPE_2.0	.164	4.5	6	.050	3....		4	20.867	32.13	1.872	1.872	1....	H1..
17	M17	PIPE_2.0	.540	2....	3	.064	2....		3	14.916	32.13	1.872	1.872	4....	H1..
18	M18	PIPE_2.0	.278	1....	3	.063	4....		6	20.867	32.13	1.872	1.872	1....	H1..
19	M21	PIPE_2.0	.164	1....	4	.105	1....		4	20.867	32.13	1.872	1.872	1....	H1..



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Centek Engineering		
TJL	CT11029I	Apr 4, 2022 at 11:09 AM
22006.01	Unity Check	Mount.R3D

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

Subject: Connection to Host Building

Location: Madison, CT

Rev. 0: 4/4/22

Prepared by: T.J.L. Checked by: C.F.C.
Job No. 22006.01

Antenna Mount Connection:

Anchor Data:

A307 Thru-Bolt =

Number of Anchor Bolts = $N := 4$ (User Input)

Diameter of Bolts = $D := 0.625in$ (User Input)

Design Tension = $T_{design} := 10.4 \cdot kips$ (User Input)

Design Shear = $V_{design} := 6.23 \cdot kips$ (User Input)

Design Reactions:

Shear X = $F_x := 1.7 \cdot kips$ (User Input)

Shear Y = $F_y := 0.9 \cdot kips$ (User Input)

Shear Z = $F_z := 3.1 \cdot kips$ (User Input)

Anchor Check:

Max Tension Force = $T_{Max} := \frac{F_z}{N} = 775lb$

Max Shear Force = $V_{Max} := \frac{F_y + F_x}{N} = 650lb$

Condition 1 = $Condition1 := if\left(\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}} \le 1.0, "OK", "NG"\right) = "OK"$

% of Capacity = $\max\left[\frac{T_{Max}}{T_{design}}, \frac{V_{Max}}{V_{design}}, \left(\frac{\frac{T_{Max}}{T_{design}} + \frac{V_{Max}}{V_{design}}}{1.0}\right)\right] = 17.9 \cdot \%$

Exhibit F

Power Density/RF Emissions Report

Fox Hill Telecom

Radio Frequency Emissions Analysis Report

T-Mobile

Site ID: CT11029I

Madison/ I-95/ X61/ Jct_1
135 New Road
Madison, CT 6443

August 22, 2022

Fox Hill Telecom Project Number: 221608

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**31.47 %**

Fox Hill Telecom

August 22, 2022

T-MOBILE
Attn: RF Manager
35 Griffin Road South
Bloomfield, CT 06009

Emissions Analysis for Site: **CT11029I – Madison/ I-95/ X61/ Jct_1**

Fox Hill Telecom, Inc ("Fox Hill") was directed to analyze the proposed upgrades to the T-MOBILE facility located at **135 New Road, Madison, CT**, for the purpose of determining whether the emissions from the Proposed T-MOBILE Antenna Installation located on this property are within specified federal limits.

All information used in this report was analyzed as a percentage of current Maximum Permissible Exposure (% MPE) as listed in the FCC OET Bulletin 65 Edition 97-01and ANSI/IEEE Std C95.1. The FCC regulates Maximum Permissible Exposure in units of microwatts per square centimeter (μW/cm2). The number of $\mu W/cm^2$ calculated at each sample point is called the power density. The exposure limit for power density varies depending upon the frequencies being utilized. Wireless Carriers and Paging Services use different frequency bands each with different exposure limits, therefore it is necessary to report results and limits in terms of percent MPE rather than power density.

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

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

General population 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 & 700 MHz 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 2500 MHz (BRS) 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 performed for the proposed upgrades to the T-MOBILE antenna facility located at **135 New Road, Madison, CT**, using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-MOBILE is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was focused at the base of the tower. For this report the sample point is the top of a 6-foot person standing at the base of the tower.

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. All power values expressed and analyzed are maximum power levels expected to be used on all radios.

All emissions values for additional carriers were taken from the Connecticut Siting Council (CSC) active MPE database. Values in this database are provided by the individual carriers themselves

For each sector the following channel counts, frequency bands and power levels were utilized as shown in *Table 1*:

Technology	Frequency Band	Channel Count	Transmit Power per Channel (W)
LTE / 5G NR	600 MHz	2	40
LTE	700 MHz	2	20
LTE	1900 MHz (PCS)	4	40
GSM	1900 MHz (PCS)	1	15
LTE	2100 MHz (AWS)	4	40
LTE / 5G NR	2500 MHz (BRS)	8	20

Table 1: Channel Data Table

The following antennas listed in *Table 2* were used in the modeling for transmission in the 600 MHz, 700 MHz, 1900 MHz (PCS), 2100 MHz (AWS) and 2500 MHz (BRS) frequency bands. This is based on feedback from the carrier with regards to anticipated antenna selection. Maximum gain values for all antennas are listed in the Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufactures supplied specifications, minus 10 dB for directional panel antennas, was used for all calculations. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

Sector	Antenna Number	Antenna Make / Model	Antenna Centerline (ft)
A	1	RFS APXVAALL24_43-U-NA20	159
A	2	Commscope VV-65A-R1	159
A	3	Ericsson AIR6419 B41	159
B	1	RFS APXVAALL24_43-U-NA20	159
B	2	Commscope VV-65A-R1	159
B	3	Ericsson AIR6419 B41	159
C	1	RFS APXVAALL24_43-U-NA20	159
C	2	Commscope VV-65A-R1	159
C	3	Ericsson AIR6419 B41	159

Table 2: Antenna Data

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

RESULTS

Per the calculations completed for the proposed T-MOBILE configurations *Table 3* shows resulting emissions power levels and percentages of the FCC's allowable general population limit.

Antenna ID	Antenna Make / Model	Frequency Bands	Antenna Gain (dBd)	Channel Count	Total TX Power (W)	ERP (W)	MPE %
Antenna A1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.03
Antenna A2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	9	335	12,724.61	1.95
Antenna A3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	3.47
						Sector A Composite MPE%	**6.45**
Antenna B1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.03
Antenna B2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	9	335	12,724.61	1.95
Antenna B3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	3.47
						Sector B Composite MPE%	**6.45**
Antenna C1	RFS APXVAALL24_43-U-NA20	600 MHz / 700 MHz	13.65 / 13.85	4	120	2,824.56	1.03
Antenna C2	Commscope VV-65A-R1	1900 MHz (PCS) / 2100 MHz (AWS)	15.55 / 16.05	9	335	12,724.61	1.95
Antenna C3	Ericsson AIR6419 B41	2500 MHz (BRS)	21.5	8	160	22,600.60	3.47
						Sector C Composite MPE%	**6.45**

Table 3: T-MOBILE Emissions Levels

The Following table (*table 4*) shows all additional carriers on site and their MPE% as recorded in the CSC active MPE database for this facility along with the newly calculated maximum T-MOBILE MPE contributions per this report. FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. For this site, all three sectors have the same configuration yielding the same results on all three sectors. *Table 5* below shows a summary for each T-MOBILE Sector as well as the composite MPE value for the site.

Site Composite MPE%	
Carrier	**MPE%**
T-MOBILE – Max Per Sector Value	**6.45 %**
AT&T	3.07 %
Sprint	0.52 %
Verizon Wireless	6.61 %
Eversource	1.45 %
Unidentified Antennas	13.37 %
Site Total MPE %:	**31.47 %**

Table 4: All Carrier MPE Contributions

T-MOBILE Sector A Total:	6.45 %
T-MOBILE Sector B Total:	6.45 %
T-MOBILE Sector C Total:	6.45 %
Site Total:	31.47 %

Table 5: Site MPE Summary

FCC OET 65 specifies that for carriers utilizing directional antennas that the highest recorded sector value be used for composite site MPE values due to their greatly reduced emissions contributions in the directions of the adjacent sectors. *Table 6* below details a breakdown by frequency band and technology for the MPE power values for the maximum calculated T-MOBILE sector(s). For this site, all three sectors have the same configuration yielding the same results on all three sectors.

T-MOBILE _ Frequency Band / Technology Max Power Values (Per Sector)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density ($\mu W/cm^2$)	Frequency (MHz)	Allowable MPE ($\mu W/cm^2$)	Calculated % MPE
T-Mobile 600 MHz LTE / 5G NR	2	926.96	159	2.85	600 MHz	400	0.71%
T-Mobile 700 MHz LTE	2	485.32	159	1.49	700 MHz	467	0.32%
T-Mobile 1900 MHz (PCS) LTE	4	1,435.69	159	8.82	1900 MHz (PCS)	1000	0.88%
T-Mobile 1900 MHz (PCS) GSM	1	538.38	159	0.83	1900 MHz (PCS)	1000	0.08%
T-Mobile 2100 MHz (AWS) LTE	4	1,610.87	159	9.90	2100 MHz (AWS)	1000	0.99%
T-Mobile 2500 MHz (BRS) LTE / 5G NR	8	2,825.08	159	34.71	2500 MHz (BRS)	1000	3.47%
						Total:	**6.45 %**

Table 6: T-MOBILE Maximum Sector MPE Power Values

Summary

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

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

T-MOBILE Sector	Power Density Value (%)
Sector A:	6.45 %
Sector B:	6.45 %
Sector C:	6.45 %
T-MOBILE Maximum Total (per sector):	6.45 %
Site Total:	31.47 %
Site Compliance Status:	**COMPLIANT**

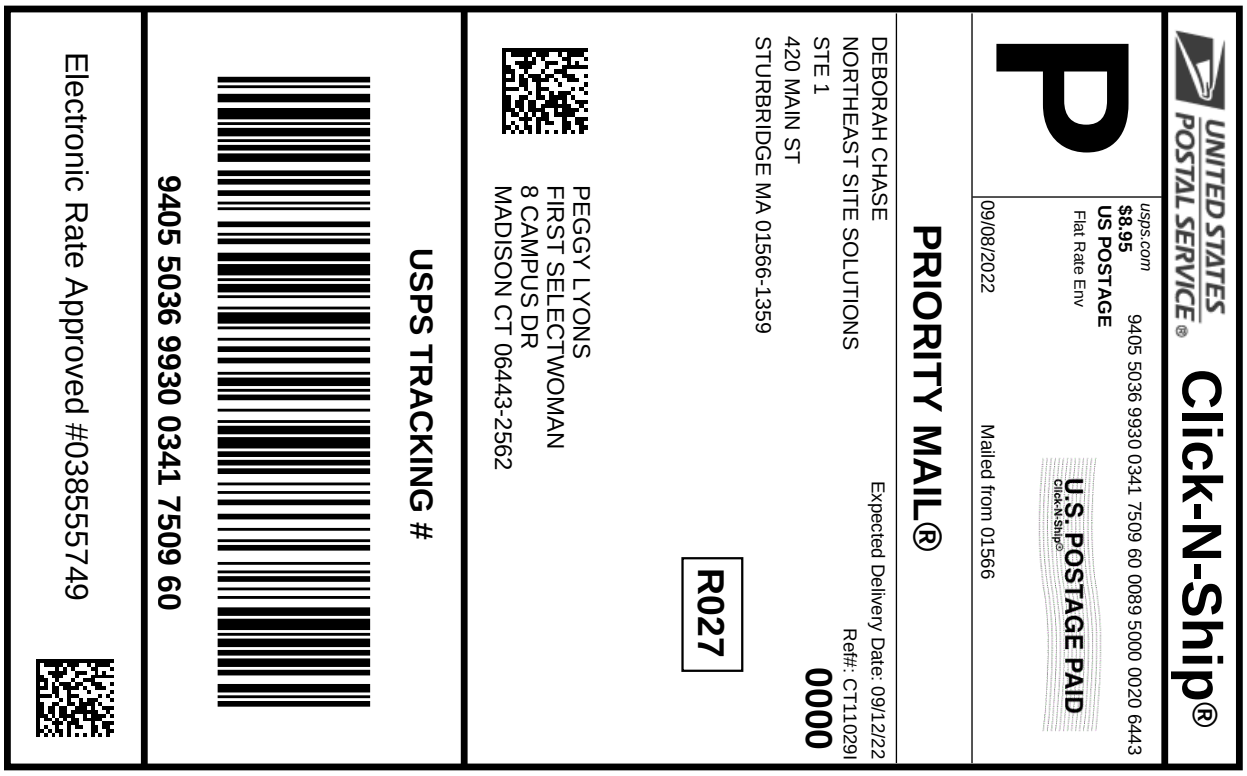
The anticipated composite MPE value for this site assuming all carriers present is **31.47 %** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

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.

Scott Heffernan
Principal RF Engineer
Fox Hill Telecom, Inc
Holden, MA 01520
(978)660-3998

Exhibit G

Recipient Mailings



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FIRST SELECTWOMAN
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R027

ERIN MANNIX
TOWN PLANNER
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TOWN PLANNER
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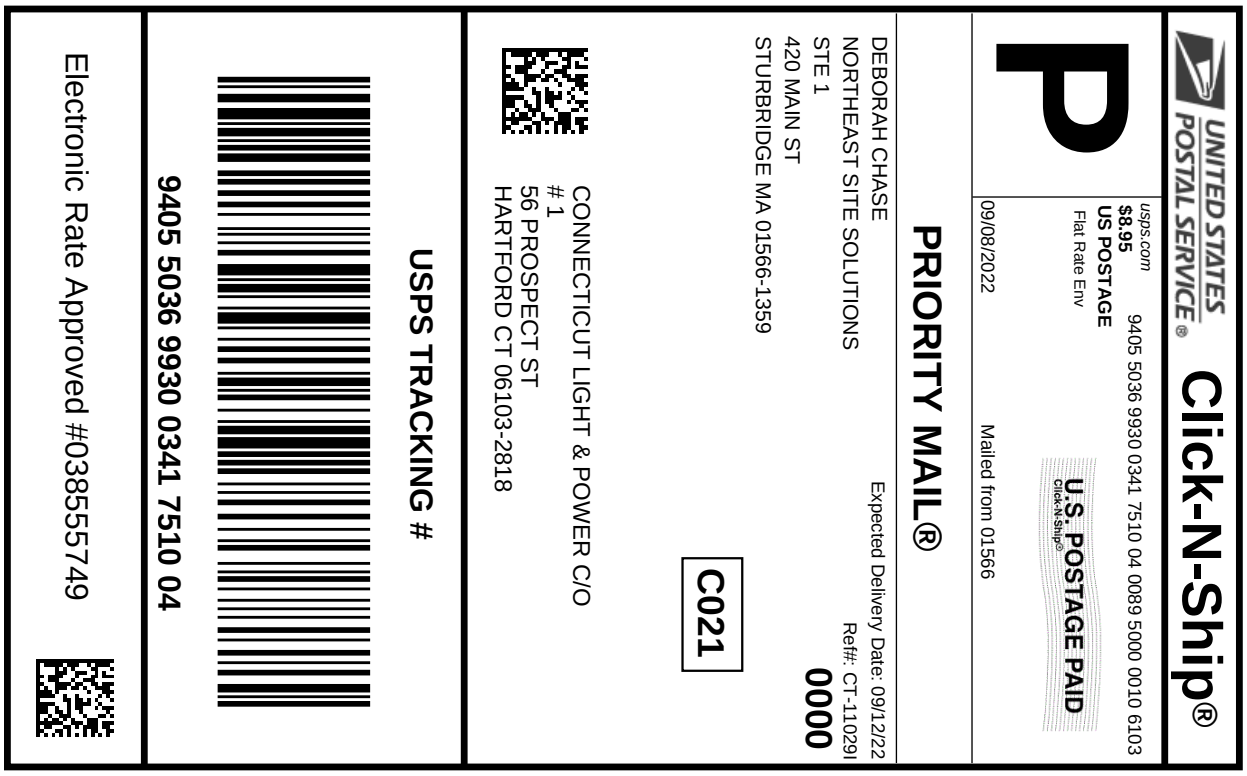

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Priority Mail® Postage:	**$8.95**
Total:	**$8.95**

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NORTHEAST SITE SOLUTIONS
STE 1
420 MAIN ST
STURBRIDGE MA 01566-1359
Ref#: CT-11029I

To: CONNECTICUT LIGHT & POWER C/O EVERSOURCE
1
56 PROSPECT ST
HARTFORD CT 06103-2818

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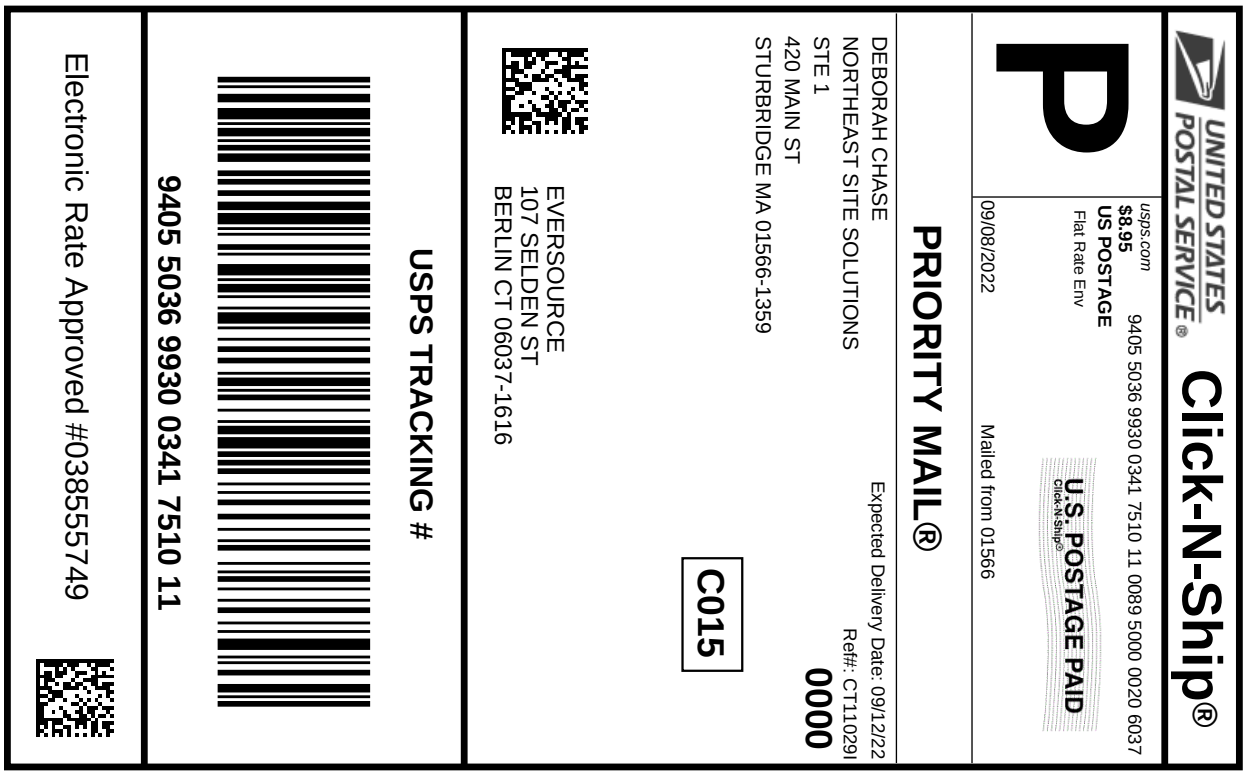

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Trans. #:	571394195
Print Date:	09/08/2022
Ship Date:	09/08/2022
Expected Delivery Date:	09/12/2022

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Total:	**$8.95**

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To: EVERSOURCE
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UNITED STATES POSTAL SERVICE.

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FARMINGTON, CT 06032-9998
(800)275-8777

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Product	Qty	Unit Price	Price
Prepaid Mail Berlin, CT 06037 Weight: 0 lb 9.80 oz Acceptance Date: Fri 09/09/2022 Tracking #: 9405 5036 9930 0341 7510 11	1		$0.00
Prepaid Mail Madison, CT 06443 Weight: 0 lb 9.80 oz Acceptance Date: Fri 09/09/2022 Tracking #: 9405 5036 9930 0341 7509 60	1		$0.00
Prepaid Mail Madison, CT 06443 Weight: 0 lb 9.80 oz Acceptance Date: Fri 09/09/2022 Tracking #: 9405 5036 9930 0341 7509 84	1		$0.00
Prepaid Mail Hartford, CT 06103 Weight: 0 lb 9.80 oz Acceptance Date: Fri 09/09/2022 Tracking #: 9405 5036 9930 0341 7510 04	1		$0.00
Grand Total:			$0.00

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