Robinson+Cole

KENNETH C. BALDWIN

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Hartford, CT 06103-3597
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kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts and New York

January 17, 2024

Via Electronic Mail

Melanie A. Bachman, Esq.
Executive Director/Staff Attorney
Connecticut Siting Council
10 Franklin Square
New Britain, CT 06051

Re: **Notice of Exempt Modification – Facility Modification**
88 Parsonage Hill Road, North Branford (Northford), Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains an existing wireless telecommunications facility at the above-referenced property address (the "Property"). The facility consists of antennas and remote radio heads ("RRHs") attached to the existing tower and associated equipment on the ground adjacent to the tower. The tower was approved by the Town of North Branford ("Town") in December of 1999. The Siting Council ("Council") approved Cellco's shared use of the tower in March of 2006 (EM-VER-123-007-010-099-060308). A copy of the Town's approval history and the Council's tower share approval are included in Attachment 1.

Cellco now intends to modify its facility by replacing nine (9) existing antennas with nine (9) new antennas and replacing six (6) RRHs with six (6) new RRHs on Cellco's existing antenna platform and mounting assemblies. A set of project plans showing Cellco's proposed facility modifications and specifications for Cellco's new antennas and RRHs are included in Attachment 2.

Please accept this letter as notification pursuant to R.C.S.A. § 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 the North Branford's Chief Elected Official and Land Use Officer. A copy of this letter is being sent to the Property owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's replacement antennas and RRHs will be installed on Cellco's existing antenna mounting structure.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, 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 installation of Cellco's new antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Included in Attachment 3 is a Calculated Radio Frequency Emissions Report demonstrating that the proposed modified facility will comply within FCC Safety Standards. The modified facility will be capable of providing Cellco's 5G wireless service.

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

6. According to the attached Structural Analysis Report ("SA") and Mount Analysis ("MA"), the existing tower, tower foundation and antenna mounts, with certain modifications, can support Cellco's proposed modifications. Copies of the SA and MA are included in Attachment 4.

A copy of the parcel map and Property owner information is included in Attachment 5. A Certificate of Mailing verifying that this filing was sent to municipal officials and the property owner is included in Attachment 6.

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

Sincerely,

Kenneth C. Baldwin

Enclosures
Copy to:
Michael Downes, North Branford Town Manager
David Perkins, North Branford Town Planner
Jean Szwabowski, KW Ochenkowski and JJ Ochenkowski, Sr.
Alex Tyurin, Verizon Wireless

ATTACHMENT 1

TOWN OF NORTH BRANFORD, CT
ZONING PERMIT

Date of Application: 12/5/97

This permit is hereby submitted in accordance with the requirements of Sections 3.1 and 62 of the Town of North Branford's Zoning Regulations for:

✓ new construction
_____ change of use
_____ sign
_____ other (specify): 300' TOWER
_____ swimming pool
_____ addition
_____ excavation/filling

Zoning District _____
Assessor's Map # 51 Lot Frontage 608
Subdivision Name _____ Lot # 7 Lot Area 9.31
Property Location _____ Lot # _____

Property Owner's Name: Veronica Ochenkowski
Owner's Address: 88 Thomas Hill Rd
Owner's Phone No. 484-9544

Property Use:

_____ single family residence
_____ two family residence
_____ commercial (Specify):
_____ industrial (Specify):
✓ other (Specify): 300' TOWER (PER ZBA VARIANCE)

Existing Structures:

Description SINGLE FAMILY DWELLING
Dimensions _____ x _____ x _____ (ht)
Bulk _____
Structures _____
Use _____
Setbacks: Front _____ Rear _____ Side _____
Required Setbacks: From Residence Zone _____ Other _____

Proposed Structures/Signs:

(2) 300 FT. TOWERS
34 x 34 x 300' (ht)
_____ sq. ft.
Front _____ Rear 50 Side 50

Parking Spaces Required:

East Shore Health District Approval:	Permit #	_____	Proposed Date:		
Planning & Zoning Approved Required:	Yes	_____	No	Date:	App. #
Zoning Board of Appeals Approval:	Yes	✓	No	Date: 5/25/68	App. # 68-35
Inland Wetlands & Watercourses Approval:	Yes	_____	No	Date:	App. #
Flood Plain Encroachment Permit Required:	Yes	_____	No	Date:	App. #
Streambelt Protection District:	(Sec 33) Yes	_____	No		
Tempocary Special Use Permit:	(Sec 43) Yes	_____	No		
Special Use Permit:	(Sec 42) Yes	_____	No		

Conditions of Approval: _____

Driveway Bond: Amount of Bond $ N/A Date Posted: _____

This permit is issued based upon the plot plan submitted. Falsification, by misrepresentation or ommission, or failure to couply with the conditions of this permit shall constitute a violation of the north Branford Zoning Regulations.

Signature of Owner _____ Date 12/5/97
Signature of Agent: _____ Date _____
Agent's Address 88 Parrow Dr. N.B.
Agent's Telephone 484-7075

This permit is hereby: _____ Approved _____ Denied

By _____ Zoning Enforcement Officer Date _____

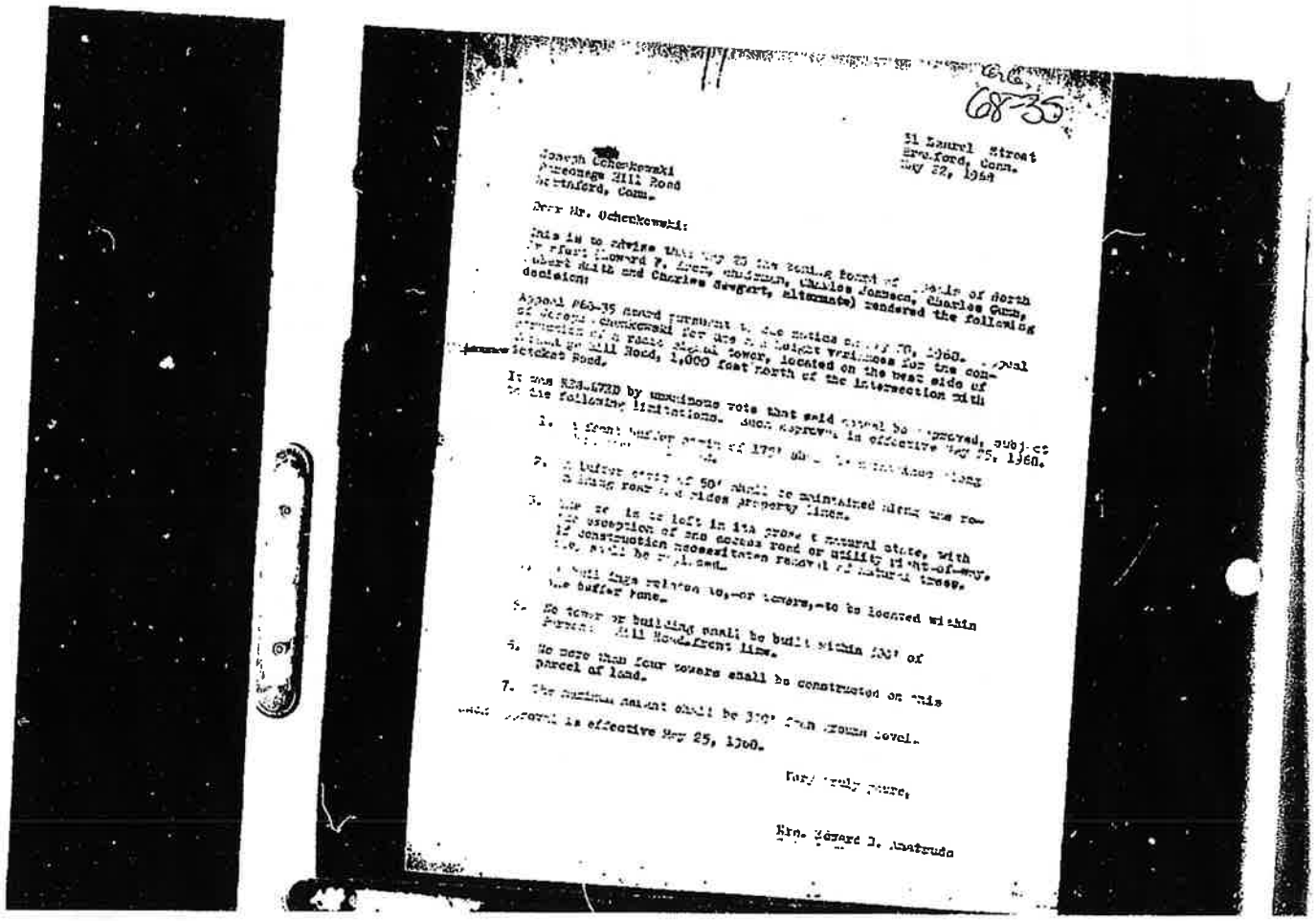
By _____ Inland Wetlands Enforcement Officer Date _____

By _____ Planning and Zoning Administrator Date 1/2/98 Per ZBA #68-35 Attached

By _____ Town Engineer Date _____

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)



6835

51 Laurel Street
Brafford, Conn.
May 22, 1960

Joseph Ochenkowski
Pinecrest Hill Road
Northford, Conn.

Dear Mr. Ochenkowski:

This is to advise that on May 20 the Zoning Board of North
Branford, Howard F. Ives, chairman, Charles Jannaca, Charles Gumb,
Robert Smith and Charles Dewgart, alternate) rendered the following
decision:

Appeal #63-35 heard pursuant to due notice on May 20, 1960.
Joseph Ochenkowski for use of height variance for the con-
struction of a radio amateur tower, located on the west side of
Pinecrest Hill Road, 1,000 feet north of the intersection with
Ticket Road.

It was RESOLVED by unanimous vote that said appeal be approved, subject
to the following limitations. Such approval is effective May 25, 1960.

1. A front buffer strip of 175' shall be maintained along the
[illegible]

2. A buffer strip of 50' shall be maintained along the re-
maining rear and sides property lines.

3. The [illegible] is to be left in its present natural state, with
the exception of one access road or utility right-of-way.
If construction necessitates removal of natural trees,
they shall be replaced.

4. Guy lines relative to, or towers, to be located within
the buffer zone.

5. No tower or building shall be built within 100' of
Pinecrest Hill Roadfront line.

6. No more than four towers shall be constructed on this
parcel of land.

7. The maximum height shall be 300' from ground level.

Said approval is effective May 25, 1960.

Very truly yours,

Mrs. Edward J. Chatrudo

TOWN OF NORTH BRANFORD, CT
ZONING PERMIT

Date of Application: _____

This permit is hereby submitted in accordance with the requirements of Sections 3.1 and 62 of the Town of North Branford's Zoning Regulations for:

_____ new construction
_____ change of use
_____ sign
_____ other (specify): _____
_____ swimming pool
X addition
_____ excavation/filling

Zoning District R-40
Assessor's Map # 51
Subdivision Name _____
Property Location 88 Parsonage Hill Rd.
Lot Frontage _____
Lot # 7
Lot Area _____
Lot # _____

Property Owner Swiatkowski Jean & Ochenkowski Joseph Jr.
Owner's Address 84 Parsonage Hill Rd. Northford, CT 06472
Owner's Phone No. _____

Property Use:

_____ single family residence
_____ two family residence
X commercial (Specify): Wireless Communication facility
_____ industrial (Specify): _____
_____ other (Specify): _____

Existing Structures:

Description Wireless Communication
Dimensions 7' x 16' x 170' (ht)
Bulk _____
Structures _____
Use wireless communication
Setbacks: Front ___ Rear ___ Side ___
Required Setbacks: From Residence Zone _____ Other _____

Proposed Structures/Signs:

Wireless Communication Tower
7 x 116' x 170' (ht)
_____ sq. ft.
_____
_____
Front ___ Rear ___ Side ___

Parking Spaces Required: 0
Proposed 0

East Shore Health District Approval:	Permit # _____					
Planning & Zoning Approved Required:	Yes _____	No ✓	Date: _____	App. # _____		
Zoning Board of Appeals Approval:	Yes _____	No ✓	Date: _____	App. # _____		
Inland Wetlands & Watercourses Approval:	Yes _____	No ✓	Date: _____	App. # _____		
Flood Plain Encroachment Permit Required:	Yes _____	No _____	Date: _____	App. # _____		
Streambelt Protection District: (Sec 33)	Yes _____	No _____				
Temporary Special Use Permit: (Sec 43)	Yes _____	No _____				
Special Use Permit: (Sec 42)	Yes _____	No _____				

CT. Siting Council Approval letter dated 7-18-02

Conditions of Approval: _____

Driveway Bond: Amount of Bond $ _____ Date Posted: _____

This permit is issued based upon the plot plan submitted. Falsification, by misrepresentation or commission, or failure to comply with the conditions of this permit shall constitute a violation of the north Branford Zoning Regulations.

Signature of Owner _____ Date _____
Signature of Agent _____ Date _____
Agent's Address _____
Agent's Telephone _____

This permit is hereby: ✓ Approved _____ Denied

By _____ Date 10-7-02
Zoning Enforcement Officer

By _____ Date 10-25-02
Inland Wetlands Enforcement Officer

By _____ Date 10-25-02
Planning and Zoning Administrator

By _____ Date _____
Town Engineer

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)

TOWN OF NORTH BRANFORD

BUILDING DEPARTMENT
1599 FOXON ROAD
PO BOX 287
NORTH BRANFORD, CT 06471
TELEPHONE: (203) 315-6008
FAX: (203) 315-6025

CERTIFICATE OF CODE COMPLIANCE

NO. 1853

DATE: January 9, 2003

THIS IS TO CERTIFY THAT WORK SPECIFIED BY BUILDING PERMIT # 7043 ISSUED ON 10/30/2002

LOCATED AT 88 Parsonage Hill Road FOR Wireless Communication Facility IS FOUND TO SUBSTANTIALLY COMPLY WITH THE PROVISIONS OF THE BUILDING AND/OR ZONING ORDINANCES OF THE TOWN OF NORTH BRANFORD AND HAS BEEN COMPLETED TO THE SATISFACTION OF THE NORTH BRANFORD BUILDING DEPARTMENT.

A) USE GROUP B IN ACCORDANCE WITH PROVISIONS OF ARTICLE 3

B) FIRE GRADING 2C AS DEFINED IN ARTICLE 4 AND TABLE 401

SPECIAL STIPULATIONS OR CONDITIONS: Per 1999 Connecticut State Building Code.

Joseph D. Natale
INSPECTED BY

BUILDING OFFICIAL

DFS

CC: ASSESSOR'S OFFICE
FILES

North Branford Planning & Zoning Commission
North Branford, Connecticut

4429

ZONING PERMIT

This is to certify that the wireless communication facility

located at 83 Parsonage Hill Road

owned by Jean Szwabowski

has been examined by me as required by the ZONING REGULATION OF THE TOWN OF NORTH BRANFORD, CONNECTICUT and I am satisfied that the same complies with the requirements of said ZONING REGULATIONS and authorize commencement of building construction and site development.

Signed _____
Zoning Enforcement Officer

Date 1-7-03

Signed _____
Planning and Zoning Administrator

Date _____

NOTES:

1. This is not a Building Permit
2. Any Zoning Permit that involves approval of a SITE DEVELOPMENT PLAN or SPECIAL USE PERMIT by the Commission, or other action of the commission, shall be countersigned by the Planning and Zoning Administrator.

4429

CERTIFICATE OF ZONING COMPLIANCE/NONCONFORMITY

This is to certify that the wireless communication facility

located at 88 Parsonage Hill Road

owned by Jean Szwabowski

has been examined by me as required by the ZONING REGULATIONS OF THE TOWN OF NORTH BRANFORD, CONNECTICUT and I am satisfied that the same complies with the requirements of said ZONING REGULATIONS and may be used and/or occupied because -

____ It conforms to the Zoning Regulations

____ It is a lawfully existing nonconforming parcel, use, building or other structure which may be continued in accordance with the provisions of Paragraphs 5.6.1 - 5.6.5 and Section 5 of the ZONING REGULATIONS; or

____ It is in the process of improvement and completion in accordance with an approved APPLICATION FOR A ZONING PERMIT and is entitled to a temporary PERMIT in accordance with Paragraph 62.7.5 PERMIT terminating on _____

____ Other _____

Signed _____
Zoning Enforcement Officer

Date 1-9-03

Signed _____
Planning and Zoning Administrator

Date _____

Notes:

1. This is not a Certificate of Occupancy

2. Any Certificate that pertains to a use, building structure or site development for which a SITE DEVELOPMENT PLAN or SPECIAL USE PERMIT has been approved by the Commission shall be countersigned by the Planning and Zoning Administrator

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
www.ct.gov/csc

March 24, 2006

Kenneth C. Baldwin, Esq.
Robinson & Cole LLP
280 Trumbull Street
Hartford, CT 06103-3597

RE: **EM-VER-123-007-010-099-060308** - Cellco Partnership d/b/a Verizon Wireless notice of intent to modify existing telecommunications facilities located at 165 Huntington Road, Scotland; 1657 Wilbur Cross Parkway, Berlin; 310 Watertown Road, Bethlehem; and 88 Parsonage Hill Road, Northford (North Branford), Connecticut.

Dear Attorney Baldwin:

At a public meeting held on March 22, 2006, the Connecticut Siting Council (Council) acknowledged your notice to modify these existing telecommunications facilities, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice dated March 8, 2006, including the placement of all necessary equipment and shelters within the tower compounds. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to existing facility sites that would not increase tower heights, extend the boundaries of the tower sites, increase noise levels at the tower site boundaries by six decibels, and increase the total radio frequencies electromagnetic radiation power densities measured at the tower site boundaries to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. These facilities have also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on these towers.

This decision is under the exclusive jurisdiction of the Council. Please be advised that the validity of this action shall expire one year from the date of this letter. Any additional change to any of these facilities will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Pamela B. Katz, P.E.
Chairman

PBK/laf

See Attached List.

I:\siting\forms\exmod\emdcltr.doc

CSC
CONNECTICUT SITING COUNCIL

List Attachment.

c: The Honorable Adam P. Salina, Mayor, Town of Berlin
Hellyn Riggins, Town Planner, Town of Berlin
The Honorable Leo S. Bulvanoski, First Selectman, Town of Bethlehem
Jeffrey Hamel, Chairman, Planning and Zoning, Town of Bethlehem
The Honorable Andrew Esposito III, Mayor, Town of North Branford
Carol Zeeb, Town Planner, Town of North Branford
The Honorable Elizabeth A. Wilson, First Selectman, Town of Scotland
Carl S. Fontneau, Town Planner, Town of Scotland
Berlin Fire Department
Jean Szwabowski, Ochenknowski Towers LLC
Sheila R. Becker, Regional Director of Compliance, SBA, Inc.
Christopher B. Fisher, Esq., Cuddy & Feder LLP
Thomas J. Regan, Esq., Brown Rudnick Berlack Israels LLP
Michele G. Briggs, New Cingular Wireless PCS, LLC
Christine Farrell, T-Mobile, Inc.
Thomas F. Flynn III, Nextel Communications, Inc.

ATTACHMENT 2

VICINITY MAP

SCALE: N.T.S.

APPROXIMATE COORDINATES:	LATITUDE:	N41° 22' 08.70" N41.369083
	LONGITUDE:	W-72° 48' 37.80" W-72.810500

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING IS BASED UPON THE LATEST STRUCTURAL ANALYSIS BY: CENTEK ENGINEERING.

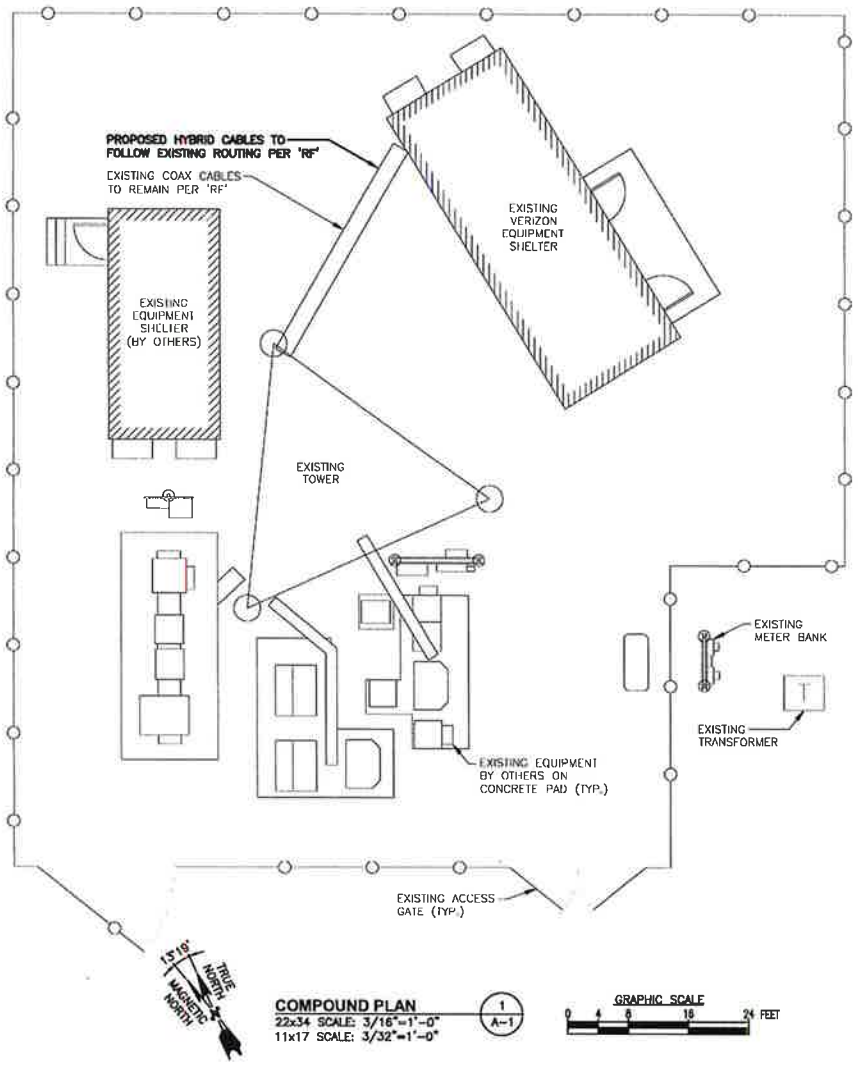
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: TEP NORTHEAST (TEP OPCO.) DATED: JUNE 26, 2023 (REV. 6)

NOTE:

PROPOSED MT6407-77A ANTENNA SIZE AND WEIGHT ARE NOT TO EXCEED:

DIMENSIONS H35.12"xW16.06"xD5.51"
WEIGHT (INCLUDING INTEGRATED RRH) 87.1 LBS



COMPOUND PLAN (1 / A-1)
22x34 SCALE: 3/16"=1'-0"
11x17 SCALE: 3/32"=1'-0"

GRAPHIC SCALE
0 4 8 16 24 FEET

SCOPE

1. (12) EXISTING ANTENNAS TO BE REMOVED PER 'RF' INSTALL (9) PROPOSED ANTENNAS PER 'RF'.
2. INSTALL (3) PROPOSED SIDE-BY-SIDE MOUNTS PER 'RF'.
3. (3) EXISTING DIPLEXERS TO BE REMOVED PER 'RF' INSTALL (3) DIPLEXERS PER 'RF'
4. (6) EXISTING RRHS TO BE REMOVED PER 'RF' INSTALL (6) PROPOSED RRHS PER 'RF'.
5. (1) EXISTING OVP TO BE REMOVED PER 'RF' INSTALL (1) PROPOSED OVP PER 'RF'.
6. EXISTING (3) COAX CABLES TO REMAIN PER 'RF' REMOVE (9) COAX PER 'RF'.
7. (1) EXISTING HYBRID CABLE TO BE REMOVED PER 'RF'. INSTALL (1) PROPOSED HYBRID CABLE PER 'RF'.
8. ALL REPLACEMENT ANTENNAS TO MATCH EXISTING CONDITION & HEIGHTS.
9. RECONFIGURE/RELOCATE EXISTING ANTENNA MOUNTS AS NECESSARY TO ACCOMMODATE HORIZONTAL SEPARATION, PROPOSED AZIMUTHS, AND ANTENNAS CONFIGURATION.

NEW ANTENNA CONFIGURATION

NOTE TO GENERAL CONTRACTOR:

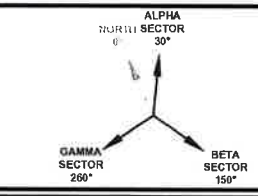
'RF' DESIGN AND EQUIPMENT IS BASED UPON RFDS ISSUED BY VZW DATED: MAY 2, 2023 REVISION #6.

THE CONTRACTOR OF RECORD SHALL CONTACT VZW PRIOR TO ANY AND ALL ORDERING/PURCHASING/INSTALLATION OF EQUIPMENT TO VERIFY THAT THE 'RF' LISTED IN THE DRAWING SET IS CURRENT AND UP TO DATE.

NOTES

1. NORTH SHOWN AS APPROXIMATE.
2. SOME EXISTING & PROPOSED INFORMATION NOT SHOWN FOR CLARITY.
3. ANTENNAS WILL BE CAMOUFLAGED WITH 3M WRAP OR SHERWIN-WILLIAMS PRO INDUSTRIAL DTM ACRYLIC PAINT, AS NEEDED, PER VERIZON WIRELESS AND BUILDING OWNER'S APPROVAL.
4. PRIOR TO COMMENCEMENT OF ANY WORK, PROPOSED ANTENNA INSTALLATION IS PURSUANT TO FINDINGS DICTATED IN STRUCTURAL ANALYSIS. STRUCTURAL ANALYSIS TO VERIFY CAPACITY OF EXISTING STRUCTURE TO ENSURE STRUCTURAL INTEGRITY FOLLOWING INSTALLATION OF PROPOSED ANTENNAS, COAX CABLES AND REQUIRED HARDWARE. COPY OF STRUCTURAL ANALYSIS TO BE SENT TO DESIGN ENGINEER.
5. CONTRACTOR SHALL FIELD VERIFY SCOPE OF WORK, VERIZON WIRELESS ANTENNA MOUNT LOCATION AND ANTENNAS TO BE INSTALLED.
6. CONTRACTOR SHALL NOTIFY ENGINEERS IF FIELD CONDITIONS DIFFER FROM DESIGN.
7. RAD CENTERS MEASURED IN THE FIELD WITH LASER BY TEP NORTHEAST. RAD CENTERS MAY NOT MATCH RF ANTENNA DESIGN SHEET.

ANTENNA ORIENTATION



PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

verizon

TEP NORTHEAST

40 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-5553

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED ENGINEER

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

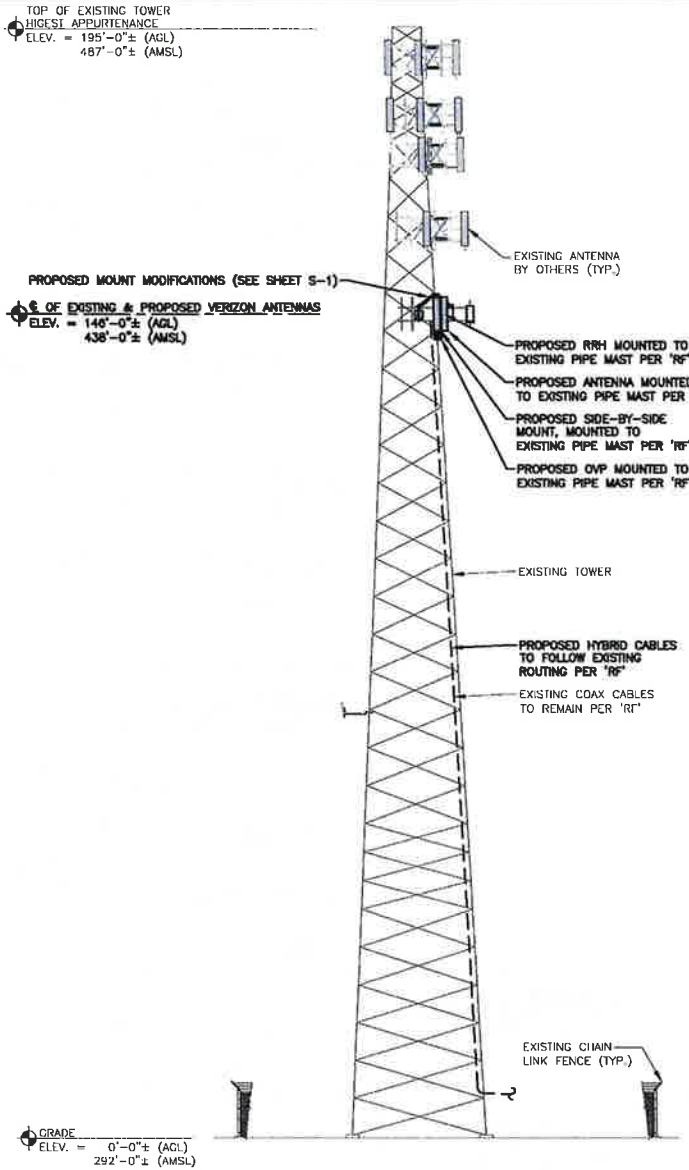
REV.	DATE	DESCRIPTION	BY
2	08/01/23	ISSUED FOR CONSTRUCTION	ES
1	06/26/23	ISSUED FOR CONSTRUCTION	BB
0	06/21/23	ISSUED FOR CONSTRUCTION	DP

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

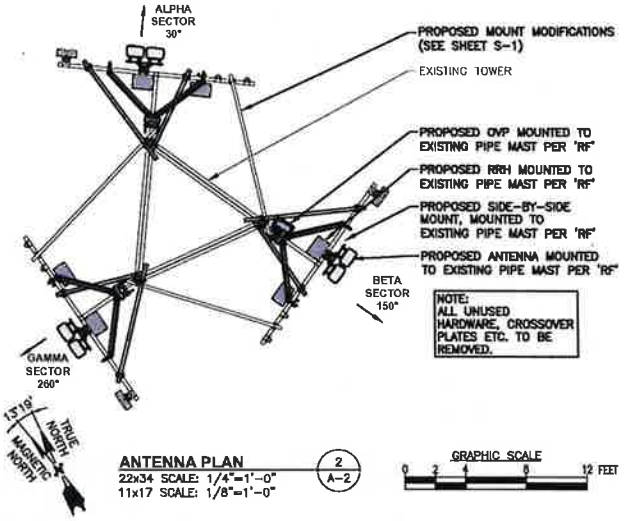
SHEET TITLE
COMPOUND PLAN

SHEET NUMBER
A-1



ELEVATION (1 / A-2)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"

GRAPHIC SCALE
0 5'-4" 10'-8" 21'-4" 32'-0"



ANTENNA PLAN (2 / A-2)
22x34 SCALE: 1/4"=1'-0"
11x17 SCALE: 1/8"=1'-0"

GRAPHIC SCALE
0 2 4 8 12 FEET

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING IS BASED UPON THE LATEST STRUCTURAL ANALYSIS BY: CENTEK ENGINEERING.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: TEP NORTHEAST (TEP OPCO.)
DATED: JUNE 26, 2023 (REV. 6)

NOTE:
PROPOSED MT6407-77A ANTENNA SIZE AND WEIGHT ARE NOT TO EXCEED:

DIMENSIONS H35.12"xW16.06"xD5.51"
WEIGHT (INCLUDING INTEGRATED RRH) 87.1 LBS

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.
verizon

TEP NORTHEAST
45 BEECHWOOD DRIVE, NORTH ANDOVER, MA 01845
TEL: (978) 557-1553

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 21179
LICENSED PROFESSIONAL ENGINEER

CHECKED BY: JX
APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
3	08/11/23	ISSUED FOR CONSTRUCTION	ES
1	06/26/23	ISSUED FOR CONSTRUCTION	RG
0	06/21/23	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

SHEET TITLE
ELEVATION & ANTENNA PLAN

SHEET NUMBER
A-2

STRUCTURAL NOTES:

1. DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
2. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
3. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL. BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
7. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
8. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
9. FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
12. UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
13. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
15. LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
16. WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
17. ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

GENERAL: WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

NOTES:

1. REQUIRED FOR ANY NEW SHOP FABRICATED FRP OR STEEL.
2. PROVIDED BY MANUFACTURER, REQUIRED IF HIGH STRENGTH BOLTS OR STEEL.
3. PROVIDED BY GENERAL CONTRACTOR; PROOF OF MATERIALS.
4. HIGH WIND ZONE INSPECTION CATB 120MPH OR CAT C,D 110MPH INSPECT FRAMING OF WALLS, ANCHORING, FASTENING SCHEDULE.
5. ADHESIVE FOR REBAR AND ANCHORS SHALL HAVE BEEN TESTED IN ACCORDANCE WITH ACI 355.4 AND ICC-ES AC308 FOR CRACKED CONCRETE AND SEISMIC APPLICATIONS. DESIGN ADHESIVE BOND STRENGTH HAS BEEN BASED ON ACI 355.4 TEMPERATURE CATEGORY B WITH INSTALLATIONS INTO DRY HOLES DRILLED USING A CARBIDE BIT INTO CRACKED CONCRETE THAT HAS CURED FOR AT LEAST 21 DAYS. ADHESIVE ANCHORS REQUIRING CERTIFIED INSTALLATIONS SHALL BE INSTALLED BY A CERTIFIED ADHESIVE ANCHOR INSTALLER PER ACI 318-11 D.9.2.2. INSTALLATIONS REQUIRING CERTIFIED INSTALLERS SHALL BE INSPECTED PER ACI 318-11 D.8.2.4.
6. AS REQUIRED; FOR ANY FIELD CHANGES TO THE ITEMS IN THIS TABLE.

NOTES:

1. ALL CONNECTIONS TO BE SHOP WELDED & FIELD BOLTED USING 3/4"ø A325-X BOLTS, UNLESS OTHERWISE NOTIFIED.
2. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED BEFORE ORDERING MATERIAL.
3. SHOP DRAWING ENGINEER REVIEW & APPROVAL REQUIRED PRIOR TO STEEL FABRICATION.
4. VERIFICATION OF EXISTING ROOF CONSTRUCTION IS REQUIRED PRIOR TO THE INSTALLATION OF THE ROOF PLATFORM. ENGINEER OF RECORD IS TO APPROVE EXISTING CONDITIONS IN ORDER TO MOVE FORWARD.
5. CENTERLINE OF PROPOSED STEEL PLATFORM SUPPORT COLUMNS TO BE CENTRALLY LOCATED OVER THE EXISTING BUILDING COLUMNS.
6. EXISTING BRICK MASONRY COLUMNS/BEARING TO BE REPAIRED/REPLACED AT ALL PROPOSED PLATFORM SUPPORT POINTS. ENGINEER OF RECORD TO REVIEW AND APPROVE.

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

verizon

TEP NORTHEAST

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED
PROFESSIONAL ENGINEER

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	09/01/22	ISSUED FOR CONSTRUCTION	ES
1	08/26/22	ISSUED FOR CONSTRUCTION	RB
0	08/01/22	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

SHEET TITLE
STRUCTURAL NOTES & SPECIAL INSPECTIONS

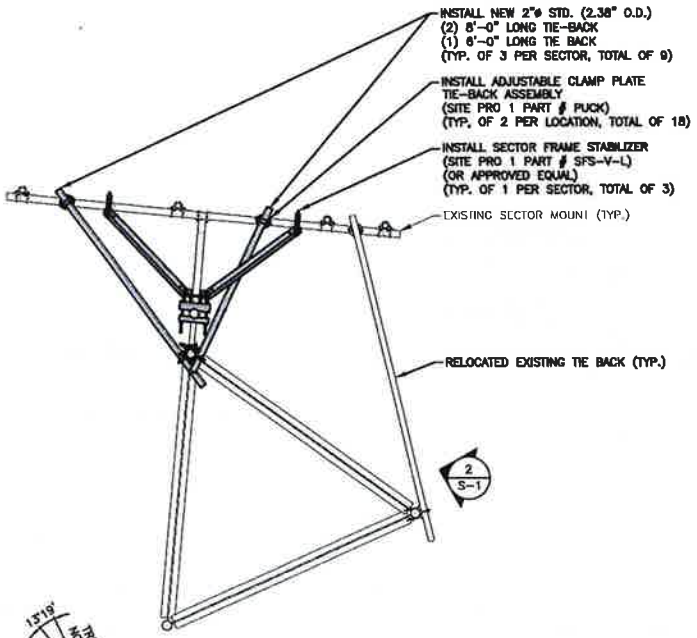
SHEET NUMBER
SN-1

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING IS BASED UPON THE LATEST STRUCTURAL ANALYSIS BY: CENTEK ENGINEERING.

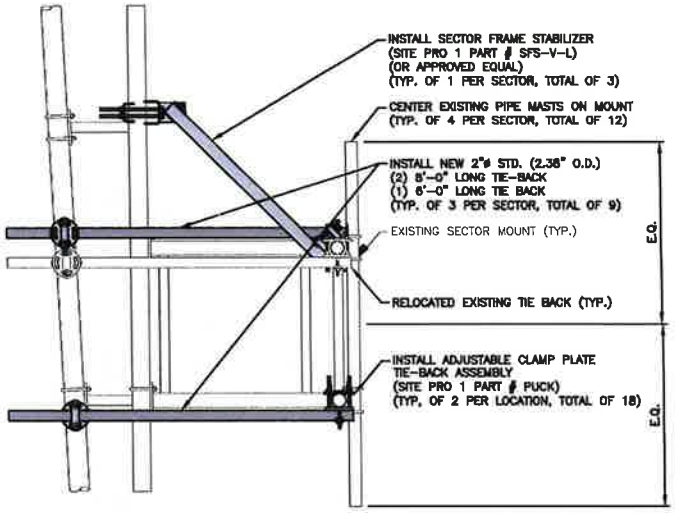
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: TEP NORTHEAST (TEP OPCO.) DATED: JUNE 26, 2023 (REV. 6)



MOUNT MODIFICATION PLAN (1 / S-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

GRAPHIC SCALE
0 2 4 8 FEET



MOUNT MODIFICATION ELEVATION (2 / S-1)
22x34 SCALE: 1/2"=1'-0"
11x17 SCALE: 1/4"=1'-0"

GRAPHIC SCALE
0 2 4 8 FEET

PREPARED FOR: CELLCO PARTNERSHIP D.B.A.

verizon

TEP NORTHEAST

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
2	08/01/23	ISSUED FOR CONSTRUCTION	ES
1	06/28/23	ISSUED FOR CONSTRUCTION	RD
0	06/21/23	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

SHEET TITLE
STRUCTURAL DETAILS

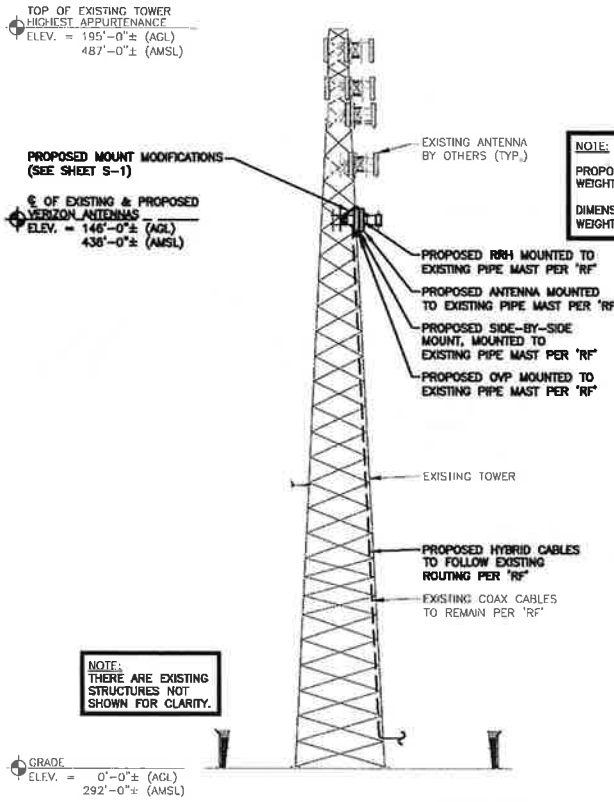
SHEET NUMBER
S-1

BILL OF MATERIALS

SITE NAME: NORTHFORD CT

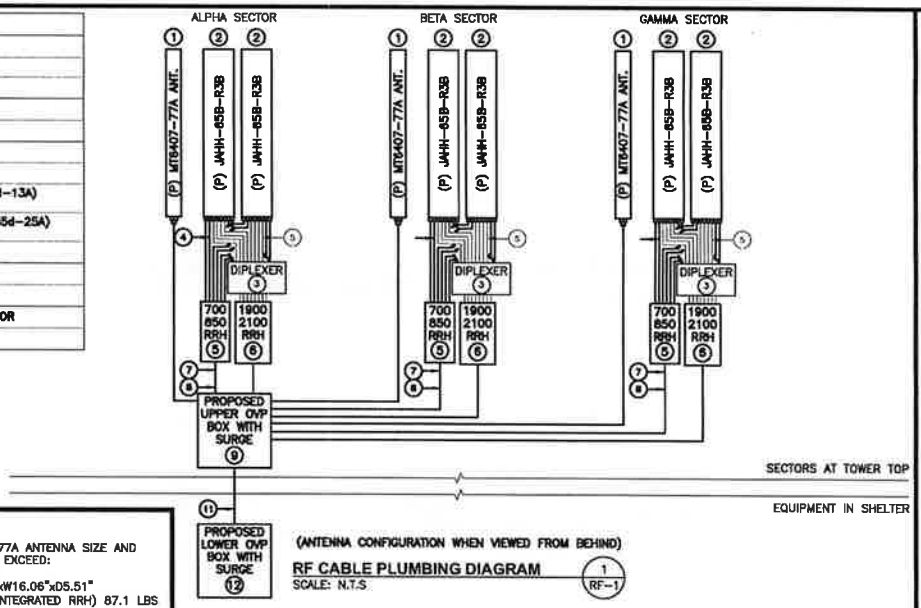
ITEM	DESCRIPTION	QTY	LENGTH	COMMENTS
①	PROPOSED SAMSUNG MT8407-77A ANTENNA W/INTEGRAL RRH	3		MOUNTED TO EXISTING PIPE MAST
②	PROPOSED COMMSCOPE JAHH-65B-R3B ANTENNA	6		MOUNTED TO EXISTING PIPE MAST
③	PROPOSED DIPLEXER COMMSCOPE CBC78T-DS-43-2X	3		MOUNTED TO EXISTING PIPE MAST
④	PROPOSED 1/2" TOP COAX JUMPERS	18	15 FT.	ROUTE FROM RRH TO ANTENNA
⑤	EXISTING 1/2" TOP COAX JUMPERS	18	15 FT.	ROUTE FROM RRH TO ANTENNA
⑥	PROPOSED LTE 700/850 RRH	3		SAMSUNG RRH B5/B13 RRH ORAN (RF4440d-13A) PIPE MOUNTED
⑥	PROPOSED PCS/AWS 1900/2100 RRH	3		SAMSUNG RRH B2/B66A RRH ORAN (RF4435d-25A) PIPE MOUNTED
⑦	PROPOSED SAMSUNG FIBER JUMPER CABLE	9	15 FT.	ROUTE FROM OVP TO RRH
⑧	PROPOSED SAMSUNG POWER JUMPER CABLE	9	15 FT.	ROUTE FROM OVP TO RRH
⑨	PROPOSED UPPER OVP	1		MOUNTED TO PIPE MAST
⑩	PROPOSED 6X12 HYBRID CABLE	1	235 FT.	ROUTE FROM EQUIPMENT TO ANTENNA SECTOR
⑪	PROPOSED LOWER OVP	1		RACK MOUNTED INSIDE CABINET

THE ABOVE RF-BOM SHEET IS BASED ON INFORMATION LISTED ON ANTENNA RECOMMENDATION SHEET DATED 05/02/23



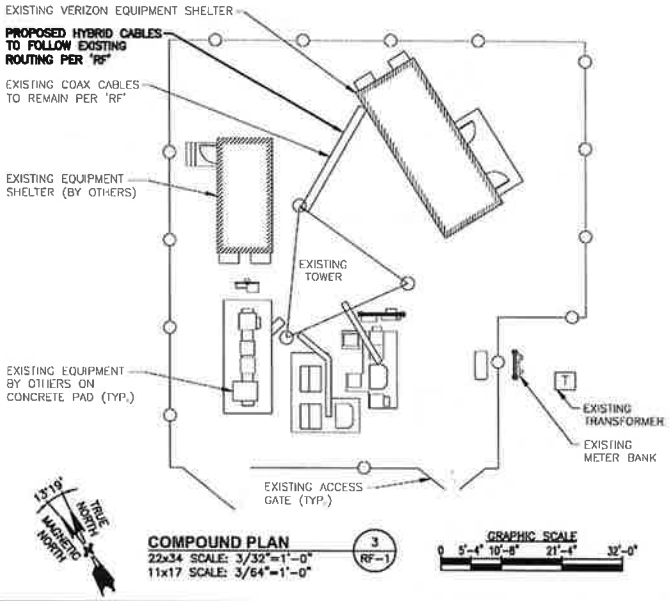
ELEVATION (2 / RF-1)
22x34 SCALE: 1/16"=1'-0"
11x17 SCALE: 1/32"=1'-0"
GRAPHIC SCALE 0 8 16 32 48 FEET

NOTE:
PROPOSED MT8407-77A ANTENNA SIZE AND WEIGHT ARE NOT TO EXCEED:
DIMENSIONS H35.12"xW16.06"xD5.51"
WEIGHT (INCLUDING INTEGRATED RRH) 87.1 LBS



(ANTENNA CONFIGURATION WHEN VIEWED FROM BEHIND)

RF CABLE PLUMBING DIAGRAM (1 / RF-1)
SCALE: N.T.S



COMPOUND PLAN (3 / RF-1)
22x34 SCALE: 3/32"=1'-0"
11x17 SCALE: 3/64"=1'-0"
GRAPHIC SCALE 0 5'-4" 10'-8" 21'-4" 32'-0"

PREPARED FOR: CTTI CO PARTNERSHIP D.B.A.
verizon

CHECKED BY: JX
APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
1	08/30/23	ISSUED FOR CONSTRUCTION	RD
0	08/21/23	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

SHEET TITLE
RF PLUMBING DIAGRAM & BILL OF MATERIALS

SHEET NUMBER
RF-1

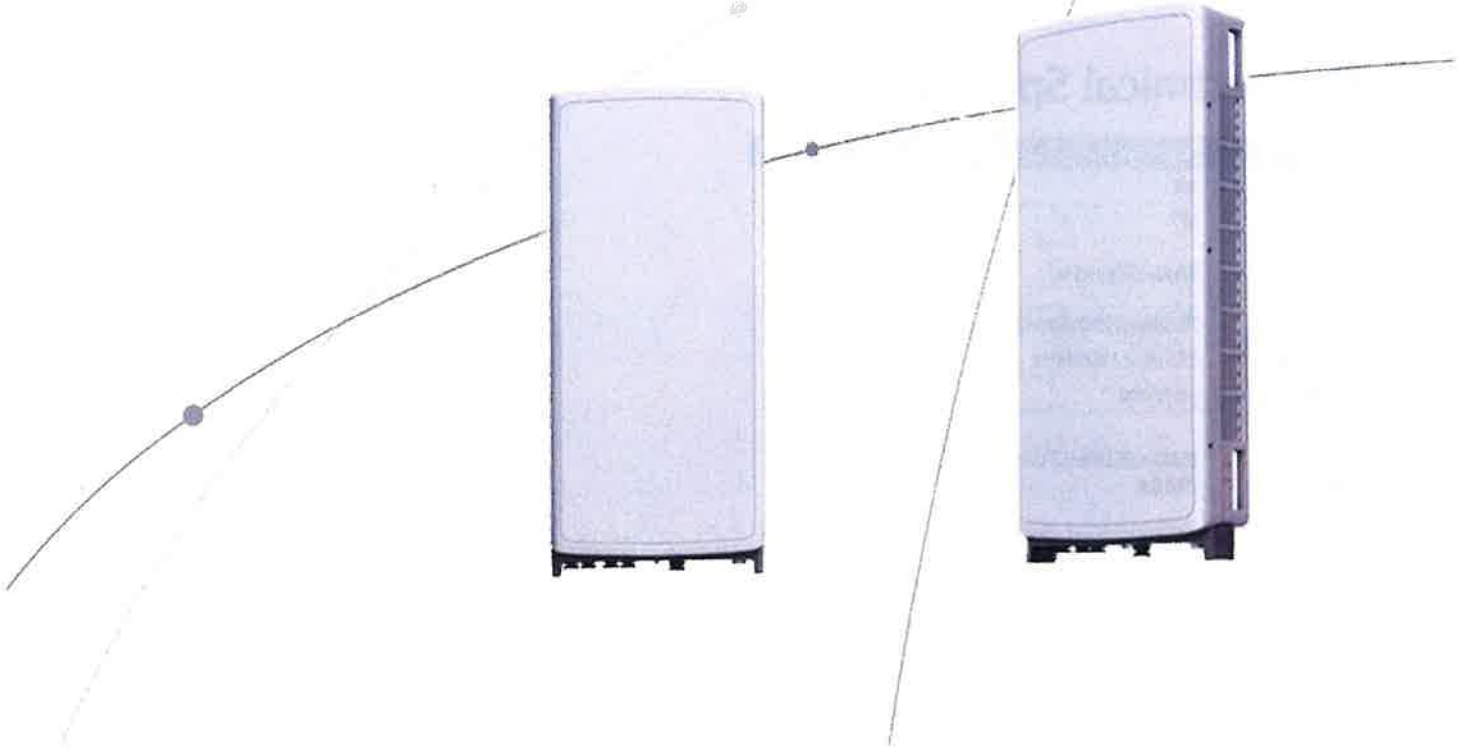
SAMSUNG

SAMSUNG C-Band 64T64R Massive MIMO Radio

for High Capacity and Wide Coverage

Samsung C-Band 64T64R Massive MIMO Radio enables mobile operators to increase coverage range, boost data speeds and ultimately offer enriched 5G experiences to users in the U.S..

Model Code : MT6407-77A

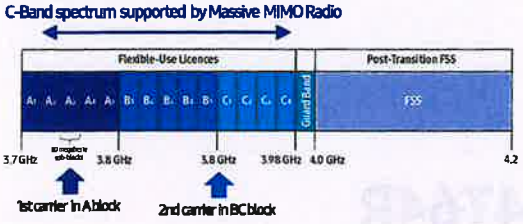


Points of Differentiation

Wide Bandwidth

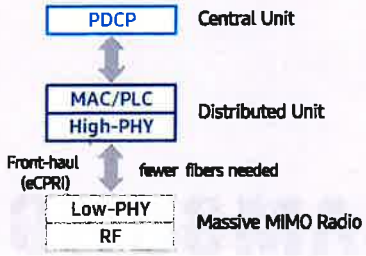
With capability to support up to 2 CC carrier configuration, Samsung C-Band massive MIMO Radio supports 200 MHz bandwidth in the C-Band spectrum.

Samsung C-Band massive MIMO Radio covers the entire C-Band 280 MHz spectrum, so it can meet the operator's needs in current A block and future B/C blocks



Future Proof Product

Samsung C-Band 64T64R Massive MIMO radio supports not only CPRI but also eCPRI as front-haul interface.
It enables operators can cut down on OPEX/CAPEX by reducing front-haul bandwidth through low layer split and using ethernet based higher efficient line.



Enhanced Performance

C-Band massive MIMO Radio creates sharp beams and extends networks' coverage on the critical mid-band spectrum using a large number of antenna elements and high output power to boost data speeds.

This helps operators reduce their CAPEX as they now need less products to cover the same area than before.

Furthermore, as C-Band massive MIMO Radio supports MU-MIMO(Multi-user MIMO) , it enables to increase user throughput by minimizing interference.

Well Matched Design

Samsung C-Band Massive MIMO radio utilizes 64 antennas, supports up to 280MHz bandwidth, and delivers a 200W output power. despite the above advanced performance, the Radio has a compact size of 50.9L and 79.4lbs. This makes it easy to install the Radio.

It is designed to look solid and compact, with a low profile appearance so that, when installed, harmonizes well with the surrounding environment.

Technical Specifications

Item	Specification
Tech	NR
Band	n77
Frequency Band	3700 - 3980 MHz
EIRP	78.5dBm (53.0 dBm+25.5 dBi)
IBW/OBW	280 MHz / 200 MHz
Installation	Pole/Wall
Size/ Weight	16.06 x 35.06 x 5.51 inch (50.86L)/ 79.4 lbs

SAMSUNG

About Samsung Electronics Co., Ltd.

Samsung inspires the world and shapes the future with transformative ideas and technologies. The company is redefining the worlds of TVs, smartphones, wearable devices, tablets, digital appliances, network systems, and memory, system LSI, foundry and LED solutions.

129 Samsung-ro, Yeongtong-gu, Suwon-si Gyeonggi-do, Korea

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JAHH-65B-R3B

8-port sector antenna, 2x 698–787, 2x 824-894 and 4x 1695–2360 MHz, 65° HPBW, 3x RET and low bands have diplexers. Internal SBT's on first LB(Port 1) and first HB(Port 5).

- Internal SBT on low and high band allow remote RET control from the radio over the RF jumper cable
- One RET for 700MHz, one RET for 850MHz, and one RET for both high bands to ensure same tilt level for 4x Rx or 4x MIMO
- Internal filter on low band and interleaved dipole technology providing for attractive, low wind load mechanical package
- Separate RS-485 RET input/output for low and high band

General Specifications

Antenna Type	Sector
Band	Multiband
Color	Light gray
Effective Projective Area (EPA), frontal	0.28 m^2 | 3.014 ft^2
Effective Projective Area (EPA), lateral	0.24 m^2 | 2.583 ft^2
Grounding Type	RF connector body grounded to reflector and mounting bracket
Performance Note	Outdoor usage | Wind loading figures are validated by wind tunnel measurements described in white paper WP-112534-EN
Radome Material	Fiberglass, UV resistant
Radiator Material	Aluminum | Low loss circuit board
Reflector Material	Aluminum
RF Connector Interface	4.3-10 Female
RF Connector Location	Bottom
RF Connector Quantity, high band	4
RF Connector Quantity, low band	4
RF Connector Quantity, total	8

Remote Electrical Tilt (RET) Information, General

RET Interface	8-pin DIN Female | 8-pin DIN Male
RET Interface, quantity	2 female | 2 male

Dimensions

Width	350 mm | 13.78 in

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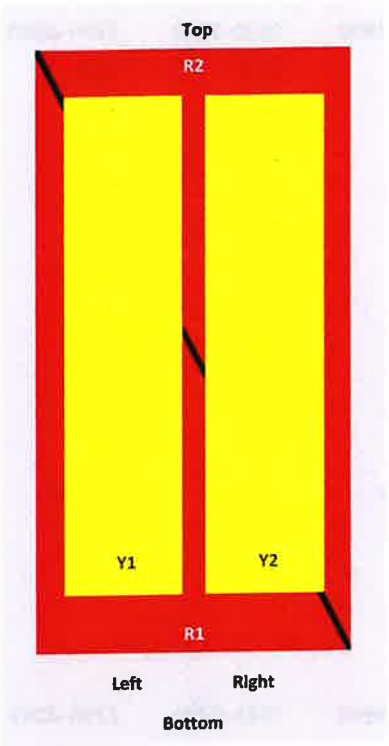
JAHH-65B-R3B

Length	1828 mm | 71.969 in
Depth	208 mm | 8.189 in

Array Layout

JAHH-65A-R3B JAHH-65B-R3B JAHH-65C-R3B



Array	Freq (MHz)	Conns	RET (SRET)	AISG RET UID
R1	698-798	1-2	1	ANxxxxxxxxxxxxxxx1
R2	824-894	3-4	2	ANxxxxxxxxxxxxxxx2
Y1	1695-2360	5-6	3	ANxxxxxxxxxxxxxxx3
Y2	1695-2360	7-8		

View from the front of the antenna

(Sizes of colored boxes are not true depictions of array sizes)

Electrical Specifications

Impedance	50 ohm
Operating Frequency Band	1695 – 2360 MHz | 698 – 787 MHz | 824 – 894 MHz
Polarization	±45°

Remote Electrical Tilt (RET) Information, Electrical

Protocol	3GPP/AISG 2.0 (Single RET)
Power Consumption, idle state, maximum	2 W

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JAHH-65B-R3B

Power Consumption, normal conditions, maximum	13 W
Input Voltage	10–30 Vdc
Internal Bias Tee	Port 1 | Port 5
Internal RET	High band (1) | Low band (2)

Electrical Specifications

Frequency Band, MHz	**698–787**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain, dBi	14.5	15.8	18	18.4	18.5	18.8
Beamwidth, Horizontal, degrees	67	65	63	63	65	68
Beamwidth, Vertical, degrees	12.4	10.5	5.7	5.2	4.9	4.4
Beam Tilt, degrees	2–14	2–14	0–10	0–10	0–10	0–10
USLS (First Lobe), dB	18	18	20	20	21	23
Front-to-Back Ratio at 180°, dB	32	34	31	35	36	38
Isolation, Cross Polarization, dB	25	25	25	25	25	25
Isolation, Inter-band, dB	30	30	30	30	30	30
VSWR | Return loss, dB	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0	1.5 | 14.0
PIM, 3rd Order, 2 x 20 W, dBc	-153	-153	-153	-153	-153	-153
Input Power per Port at 50° C, maximum, watts	200	200	300	300	300	250

Electrical Specifications, BASTA

Frequency Band, MHz	**698–787**	**824–894**	**1695–1880**	**1850–1990**	**1920–2200**	**2300–2360**
Gain by all Beam Tilts, average, dBi	14.3	14.9	17.6	18.1	18.2	18.5
Gain by all Beam Tilts Tolerance, dB	±0.3	±0.5	±0.6	±0.4	±0.5	±0.6
Gain by Beam Tilt, average, dBi	2 ° | 14.3 8 ° | 14.3 14 ° | 14.3	2 ° | 15.0 8 ° | 14.9 14 ° | 15.4	0 ° | 17.2 5 ° | 17.6 10 ° | 17.6	0 ° | 17.6 5 ° | 18.2 10 ° | 18.2	0 ° | 17.7 5 ° | 18.3 10 ° | 18.3	0 ° | 17.9 5 ° | 18.7 10 ° | 18.7
Beamwidth, Horizontal Tolerance, degrees	±1.2	±1.4	±4	±2.4	±2.9	±2.7
Beamwidth, Vertical Tolerance, degrees	±0.9	±0.5	±0.3	±0.2	±0.3	±0.1
USLS, beampeak to 20° above beampeak, dB	18	17	17	18	19	18
Front-to-Back Total Power at 180° ± 30°, dB	25	24	26	29	27	29
CPR at Boresight, dB	22	23	20	21	21	24

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COMMSCOPE®

JAHH-65B-R3B

CPR at Sector, dB	11	12	11	11	11	8

Mechanical Specifications

Wind Loading at Velocity, frontal	301.0 N @ 150 km/h | 67.7 lbf @ 150 km/h
Wind Loading at Velocity, lateral	254.0 N @ 150 km/h | 57.1 lbf @ 150 km/h
Wind Loading at Velocity, maximum	143.4 lbf @ 150 km/h | 638.0 N @ 150 km/h
Wind Speed, maximum	241 km/h | 149.75 mph

Packaging and Weights

Width, packed	456 mm | 17.953 in
Depth, packed	357 mm | 14.055 in
Length, packed	1975 mm | 77.756 in
Net Weight, without mounting kit	29.2 kg | 64.375 lb
Weight, gross	42.5 kg | 93.696 lb

Regulatory Compliance/Certifications

Agency	**Classification**
CHINA-ROHS	Above maximum concentration value
ISO 9001:2015	Designed, manufactured and/or distributed under this quality management system
ROHS	Compliant/Exempted

Included Products

BSAMNT-3	—	Wide Profile Antenna Downtilt Mounting Kit for 2.4 - 4.5 in (60 - 115 mm) OD round members. Kit contains one scissor top bracket set and one bottom bracket set.

* Footnotes

Performance Note	Severe environmental conditions may degrade optimum performance

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COMMSCOPE®

SAMSUNG

AWS/PCS MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This AWS/PCS 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code	RF4439d-25A

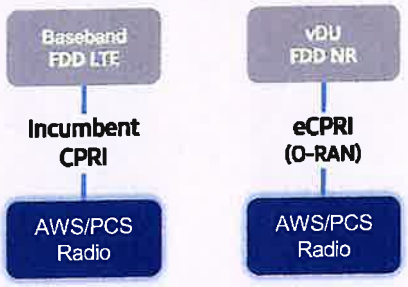
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

Samsung's AWS/PCS macro radio can support each incumbent CPRI interface as well as advanced eCPRI interfaces. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

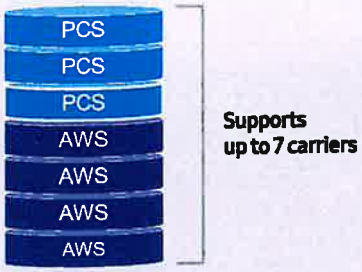
A standardized O-RAN radio can help in implementing cost-effective networks, which are capable of sending more data without compromising additional investments.

Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.

Optimum Spectrum Utilization

The number of required carriers varies according to site (region). Supporting many carriers is essential for using all frequencies that the operator has available.

The new AWS/PCS dual-band radio can support up to 3 carriers in the PCS (1.9GHz) band and 4 carriers in the AWS (2.1GHz) band, respectively.



Brand New Features in a Compact Size

Samsung's AWS/PCS macro radio offers several features, such as dual connectivity for baseband for both CDU and vDU, O-RAN capability, more carriers and an enlarged PCS spectrum, combined into an incumbent radio volume of 36.8L.

+

- **2 FH connectivity**
- **O-RAN capability**
- **More carriers and spectrum**

Same as an incumbent radio volume

Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B25(PCS), B66(AWS)
Frequency Band	DL: 1930 – 1995MHz, UL: 1850 – 1915MHz DL: 2110 – 2200MHz, UL: 1710 – 1780MHz
RF Power	(B25) 4 × 40W or 2 × 60W (B66) 4 × 60W or 2 × 80W
IBW/OBW	(B25) 65MHz / 30MHz (B66) DL 90MHz, UL 70MHz / 60MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 10.04inch (36.8L) / 74.7lb

SAMSUNG

700/850MHZ MACRO RADIO

DUAL-BAND AND HIGH POWER FOR MACRO COVERAGE

Samsung's future proof dual-band radio is designed to help effectively increase the coverage areas in wireless networks. This 700/850MHz 4T4R dual-band radio has 4Tx/4Rx to 2Tx/2Rx RF chains options and a total output power of 320W, making it ideal for macro sites.

Model Code RF4440d-13A

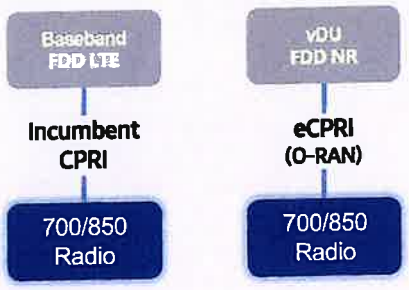
Homepage
samsungnetworks.com

Youtube
www.youtube.com/samsung5g

Points of Differentiation

Continuous Migration

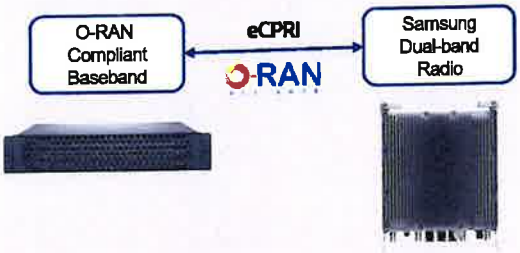
Samsung's 700/850MHz macro radio can support each incumbent CPRI interface as well as an advanced eCPRI interface. This feature provides installable options for both legacy LTE networks and added NR networks.



O-RAN Compliant

A standardized O-RAN radio can help when implementing cost-effective networks because it is capable of sending more data without compromising additional investments.

Samsung's state-of-the-art O-RAN technology will help accelerate the effort toward constructing a solid O-RAN ecosystem.



Optimum Spectrum Utilization

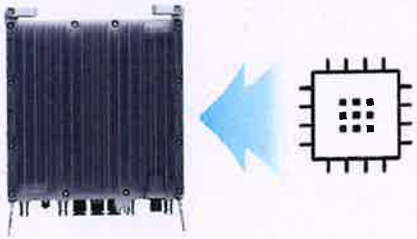
The number of required carriers varies according to site (region). The ability to support many carriers is essential for using all frequencies that the operator has available.

The new 700/850MHz dual-band radio can support up to 2 carriers in the B13 (700MHz) band and 3 carriers in the B5 (850MHz) band, respectively.

Secured Integrity

Access to sensitive data is allowed only to authorized software.

The Samsung radio's CPU can protect root of trust, which is credential information to verify SW integrity, and secure storage provides access control to sensitive data by using dedicated hardware (TPM).



Technical Specifications

Item	Specification
Tech	LTE / NR
Brand	B13(700MHz), B5(850MHz)
Frequency Band	DL: 746 – 756MHz, UL: 777 – 787MHz DL: 869 – 894MHz, UL: 824 – 849MHz
RF Power	(B13) 4 × 40W or 2 × 60W (B5) 4 × 40W or 2 × 60W
IBW/OBW	(B13) 10MHz / 10MHz (B5) 25MHz / 25MHz
Installation	Pole, Wall
Size/ Weight	14.96 x 14.96 x 9.05inch (33.2L) / 70.33 lb

ATTACHMENT 3

C Squared Systems, LLC
65 Dartmouth Drive
Auburn, NH 03032
(603) 644-2800
support@csquaredsystems.com

Calculated Radio Frequency Emissions Report

verizon

Northford CT

88 Parsonage Road, Northford, CT 06472

January 12, 2024

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of Verizon's antenna arrays to be mounted at 146' on an existing guyed tower located at 88 Parsonage Road in Northford, CT. The coordinates of the tower are 41° 22' 4.99" N, 72° 48' 37.99" W.

Verizon is proposing the following:

1) Install six (6) multi-band antennas, two (2) per sector to support its commercial LTE network.
2) Install three (3) C-Band antenna, one (1) per sector.

This report considers the planned antenna configuration for Verizon[1] as well as existing antenna configuration for AT&T[2], DISH[3] and T-Mobile[4] to derive the resulting % MPE of its proposed modification.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

In 1985, the FCC established rules to regulate radio frequency (RF) exposure from FCC licensed antenna facilities. In 1996, the FCC updated these rules, which were further amended in August 1997 by OET Bulletin 65 Edition 97-01. These new rules include Maximum Permissible Exposure (MPE) limits for transmitters operating between 300 kHz and 100 GHz. The FCC MPE limits are based upon those recommended by the National Council on Radiation Protection and Measurements (NCRP), developed by the Institute of Electrical and Electronics Engineers, Inc., (IEEE) and adopted by the American National Standards Institute (ANSI).

The FCC general population/uncontrolled limits set the maximum exposure to which most people may be subjected. General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the attached "FCC Limits for Maximum Permissible Exposure (MPE)" in Attachment C of this report.

Higher exposure limits are permitted under the occupational/controlled exposure category, but only for persons who are exposed as a consequence of their employment and who have been made fully aware of the potential for exposure, and they must be able to exercise control over their exposure. General population/uncontrolled limits are five times more stringent than the levels that are acceptable for occupational, or radio frequency trained individuals. Attachment C contains excerpts from OET Bulletin 65 and defines the Maximum Exposure Limit.

Finally, it should be noted that the MPE limits adopted by the FCC for both general population/uncontrolled exposure and for occupational/controlled exposure incorporate a substantial margin of safety and have been established to be well below levels generally accepted as having the potential to cause adverse health effects.

---

[1] As referenced to Verizon's Radio Frequency Design Sheet updated 5/2/2023.

[2] As referenced to AT&T's Connecticut Siting Council Notice of Exempt Modification – 88 Parsonage Hill Road, North Branford, Connecticut, dated November 9, 2022.

[3] As referenced to DISH's Connecticut Siting Council Tower Share Application – 88 Parsonage Hill Road, North Branford, Connecticut, dated August 31, 2022.

[4] As referenced to T-Mobile's Connecticut Siting Council Exempt Modification Application – 88 Parsonage Hill Road, North Branford, Connecticut, dated September 1, 2022.

3. RF Exposure Prediction Methods

The emission field calculation results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left(\frac{\text{GRF}^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2}\right) \text{X Off Beam Loss}$$

Where:

EIRP = Effective Isotropic Radiated Power

R = Radial Distance = $\sqrt{(H^2 + V^2)}$

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor (GRF) of 1.6

These calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings, etc.) that would normally attenuate the signal are not taken into account. The calculations assume even terrain in the area of study and do not take into account actual terrain elevations which could attenuate the signal. As a result, the predicted signal levels reported below are much higher than the actual signal levels will be from the final installations.

4. Antenna Inventory

Table 1 below outlines Verizon's proposed antenna configuration for the site. The associated data sheets and antenna patterns for these specific antenna models are included in Attachments C.

Operator	Sector	TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
Verizon	Alpha	750	160	14.5	4509	JAHH-65B-R3B	67	0	5.99	162
		850	160	15.8	6083		65			
		1900	160	18.4	11069		63			
		2100	240	18.5	16991		65			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	162
	Beta	750	160	14.5	4509	JAHH-65B-R3B	67	0	5.99	162
		850	160	15.8	6083		65			
		1900	160	18.4	11069		63			
		2100	240	18.5	16991		65			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	162
	Gamma	750	160	14.5	4509	JAHH-65B-R3B	67	0	5.99	162
		850	160	15.8	6083		65			
		1900	160	18.4	11069		63			
		2100	240	18.5	16991		65			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	162

Table 1: Proposed Antenna Inventory[5][6]

[5] Antenna heights are in reference to Verizon's Radio Frequency Design Sheet updated 5/2/2023.

[6] Transmit power assumes 0 dB of cable loss.

5. Calculation Results

The calculated power density results are shown in Figure 1 below. For completeness, the calculations for this analysis range from 0 feet horizontal distance (directly below the antennas) to a value of 3,000 feet horizontal distance from the site. In addition to the other worst-case scenario considerations that were previously mentioned, the power density calculations to each horizontal distance point away from the antennas was completed using a local maximum off beam antenna gain (within ± 5 degrees of the true mathematical angle) to incorporate a realistic worst-case scenario.

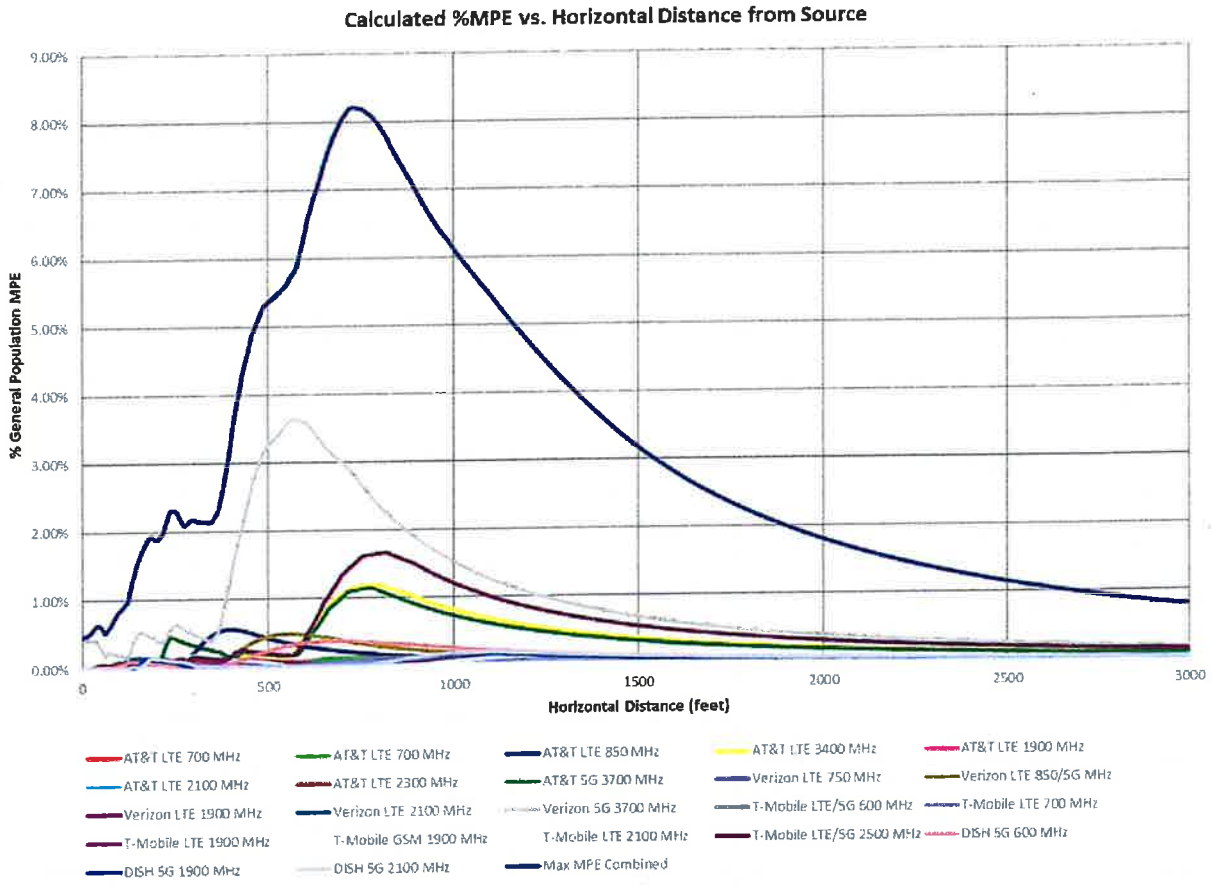


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (8.22% of the General Population limit) is calculated to occur at a horizontal distance of 730 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1000 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 730 feet from the site (reference Figure 1).

As stated in Section 3, all calculations assume that the antennas are operating at 100 percent capacity, that all antenna channels are transmitting simultaneously, and that the radio transmitters are operating at full power. Obstructions (trees, buildings etc.) that would normally attenuate the signal are not taken into account. In addition, a six foot height offset was considered in this analysis to account for average human height. As a result, the predicted signal levels are significantly higher than the actual signal levels will be from the final configuration. The results presented in Figure 1 and Table 2 assume level ground elevation from the base of the tower out to the horizontal distances calculated.

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
AT&T 5G 3700 MHz	1	108.4	171.5	730	0.011117	1.000	1.11%
AT&T LTE 1900 MHz	4	30.0	173.0	730	0.000473	1.000	0.05%
AT&T LTE 2100 MHz	4	30.0	173.0	730	0.000292	1.000	0.03%
AT&T LTE 2300 MHz	4	18.8	173.0	730	0.000328	1.000	0.03%
AT&T LTE 3400 MHz	1	108.4	174.5	730	0.011669	1.000	1.17%
AT&T LTE 700 MHz	4	30.0	173.0	730	0.000616	0.467	0.13%
AT&T LTE 700 MHz	4	30.0	173.0	730	0.000618	0.467	0.13%
AT&T LTE 850 MHz	4	30.0	173.0	730	0.000564	0.567	0.10%
DISH 5G 1900 MHz	4	40.0	162.0	730	0.000156	1.000	0.02%
DISH 5G 2100 MHz	4	40.0	162.0	730	0.000111	1.000	0.01%
DISH 5G 600 MHz	4	61.5	162.0	730	0.001486	0.400	0.37%
T-Mobile GSM 1900 MHz	1	15.0	180.0	730	0.000006	1.000	0.00%
T-Mobile LTE 1900 MHz	4	40.0	180.0	730	0.000068	1.000	0.01%
T-Mobile LTE 2100 MHz	4	40.0	180.0	730	0.000111	1.000	0.01%
T-Mobile LTE 700 MHz	2	20.0	180.0	730	0.000208	0.467	0.04%
T-Mobile LTE/5G 2500 MHz	8	20.0	180.0	730	0.015008	1.000	1.50%
T-Mobile LTE/5G 600 MHz	2	40.0	180.0	730	0.000403	0.400	0.10%
Verizon 5G 3700 MHz	1	200.0	146.0	730	0.028164	1.000	2.82%
Verizon LTE 1900 MHz	1	160.0	146.0	730	0.000127	1.000	0.01%
Verizon LTE 2100 MHz	1	240.0	146.0	730	0.000176	1.000	0.02%
Verizon LTE 750 MHz	1	160.0	146.0	730	0.001032	0.500	0.21%
Verizon LTE 850/5G MHz	1	160.0	146.0	730	0.001990	0.567	0.35%
						Total	**8.22%**

Table 2: Maximum Percent of General Population Exposure Values[7]

[7] In the case where antenna pattern data was unavailable from the manufacturer, generic antenna pattern was used based on the frequency, bandwidth and gain of the antenna

6. Conclusion

The above analysis verifies that RF exposure levels from the site with Verizon's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all transmitters is calculated to be **8.22%** of the FCC limit (General Population/Uncontrolled). This maximum cumulative percent of MPE value is calculated to occur 730 feet away from the site.

7. Statement of Certification

I certify to the best of my knowledge that the statements in this report are true and accurate. The calculations follow guidelines set forth in ANSI/IEEE Std. C95.3, ANSI/IEEE Std. C95.1 and FCC OET Bulletin 65 Edition 97-01.

Report Prepared By: Ram Acharya
RF Engineer
C Squared Systems, LLC

January 10, 2024
Date

Reviewed/Approved By: Martin Lavin
Senior RF Engineer
C Squared Systems, LLC

January 12, 2024
Date

Attachment A: References

OET Bulletin 65 - Edition 97-01 - August 1997 Federal Communications Commission Office of Engineering & Technology

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

Attachment B: FCC Limits for Maximum Permissible Exposure (MPE)

(A) Limits for Occupational/Controlled Exposure[8]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-1500	-	-	f/300	6
1500-100,000	-	-	5	6

(B) Limits for General Population/Uncontrolled Exposure[9]

Frequency Range (MHz)	Electric Field Strength (E) (V/m)	Magnetic Field Strength (E) (A/m)	Power Density (S) (mW/cm^2)	Averaging Time $\|E\|^2$, $\|H\|^2$ or S (minutes)
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-1500	-	-	f/1500	30
1500-100,000	-	-	1.0	30

f = frequency in MHz * Plane-wave equivalent power density

Table 3: FCC Limits for Maximum Permissible Exposure

[8] Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure.

[9] General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure.

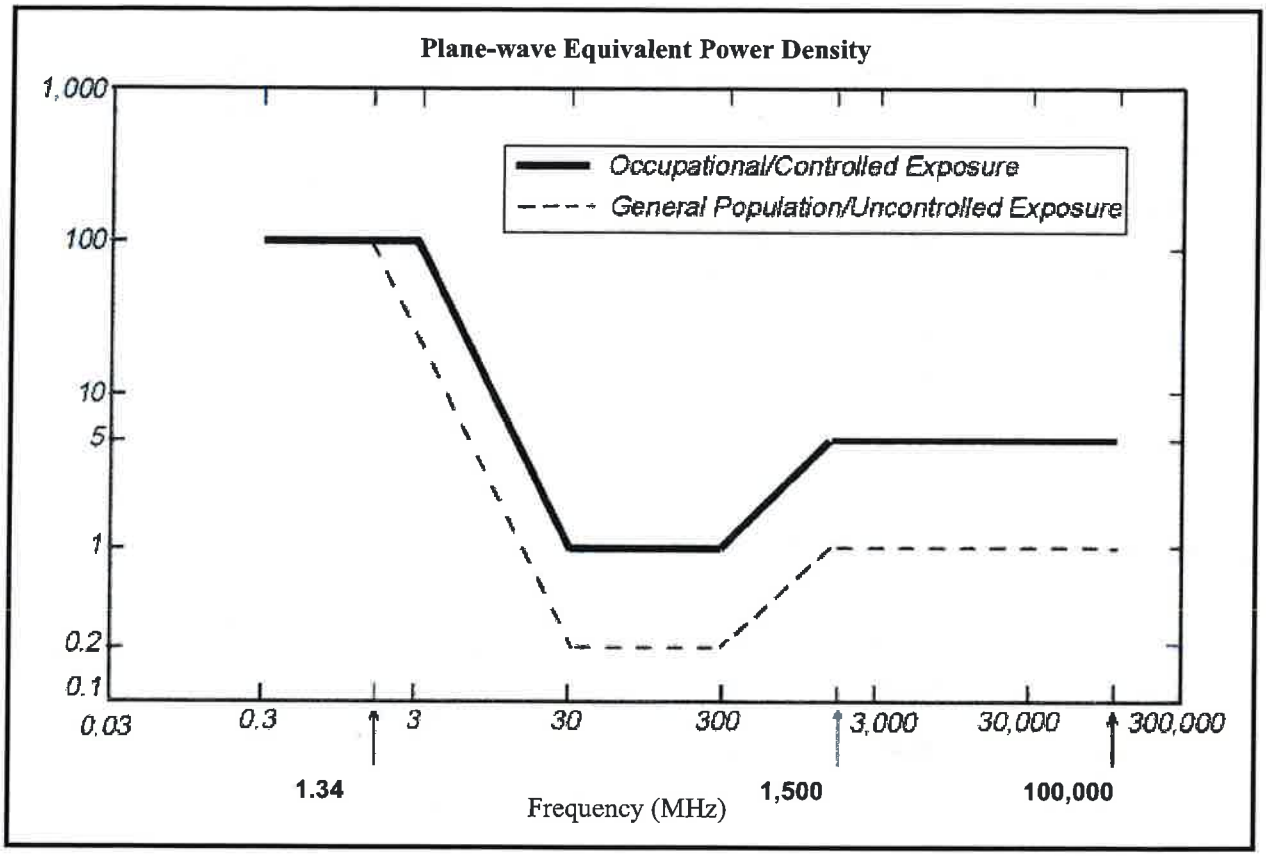
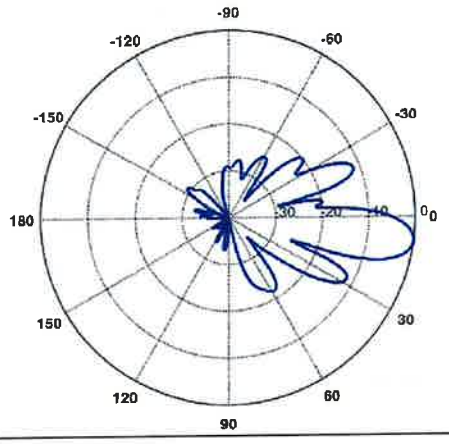


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data Sheets and Electrical Patterns

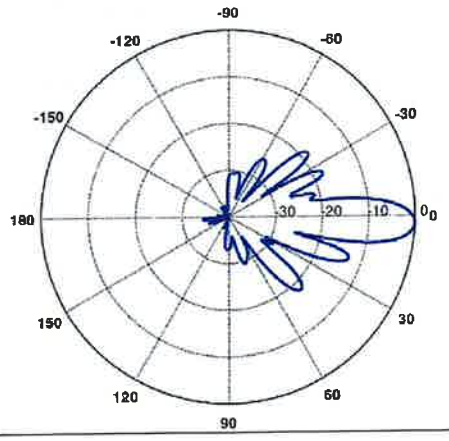
LTE 750 MHz

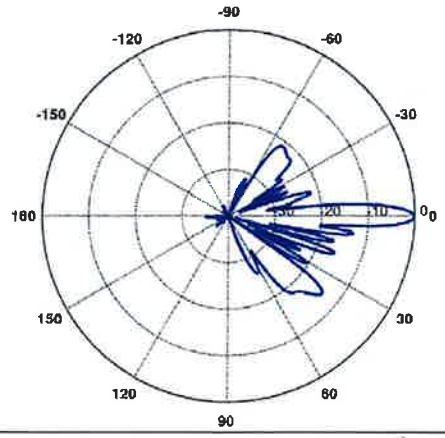
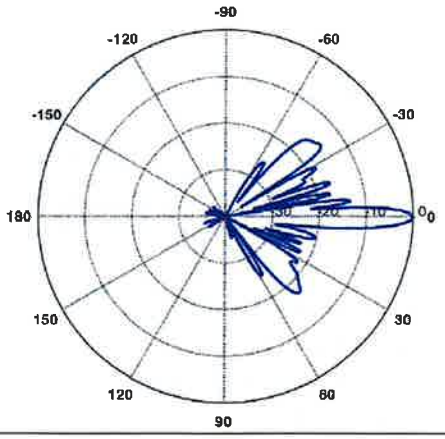
Manufacturer:	COMMSCOPE
Model #:	JAHH-65B-R3B
Frequency Band:	698-787 MHz
Gain:	14.5 dBi
Vertical Beamwidth:	12.4°
Horizontal Beamwidth:	67°
Polarization:	±45°
Dimensions (L x W x D):	71.96" x 13.78" x 8.2"



LTE 850 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-65B-R3B
Frequency Band:	824-894 MHz
Gain:	15.8 dBi
Vertical Beamwidth:	5.7°
Horizontal Beamwidth:	63°
Polarization:	±45°
Dimensions (L x W x D):	71.96" x 13.78" x 8.2"



LTE 1900 MHz Manufacturer: COMMSCOPE Model #: JAHH-65B-R3B Frequency Band: 1850-1990 MHz Gain: 18.4 dBi Vertical Beamwidth: 4.9° Horizontal Beamwidth: 65° Polarization: ±45° Dimensions (L x W x D): 71.96" x 13.78" x 8.2"	
LTE 2100 MHz Manufacturer: COMMSCOPE Model #: JAHH-65B-R3B Frequency Band: 1920-2200 MHz Gain: 18.5 dBi Vertical Beamwidth: 4.9° Horizontal Beamwidth: 65° Polarization: ±45° Dimensions (L x W x D): 71.96" x 13.78" x 8.2"	

ATTACHMENT 4

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

195' Existing Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

Site Ref: Northford

88 Parsonage Hill Road
North Branford, CT

Centek Project No. 22027.13

~~Date: September 7, 2022~~

Rev 2: July 3, 2023

Max Stress Ratio = 68%

Prepared for:

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

Table of Contents

Introduction

The purpose of this report is to summarize the results of the non-linear, P-Δ structural analysis of the antenna upgrade proposed by Verizon on the existing lattice tower located in Northford (North Branford), Connecticut.

The host tower is a 195-ft, three legged, lattice tower originally designed and manufactured by Central Tower project no. F-722 dated 4/9/99. The tower geometry, structure member sizes and foundation information were taken from the aforementioned design documents.

Antenna and appurtenance inventory was taken from a previous structural analysis prepared by Centek; job no. 22146.00 dated November 7, 2022 and an RF data sheet dated 4/26/22.

The tower consists of ten (10) vertical sections consisting of solid round pipe legs conforming to ASTM A529 Gr. 50 and steel angle lateral bracing conforming to ASTM A36. The vertical tower sections are connected by bolted flange plates with the diagonal and horizontal bracing to pipe legs consisting of bolted connections. The width of the tower face is 5-ft 0-in at the top and 23-ft 6-in at the bottom.

Antenna and Appurtenance Summary

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

- T-MOBILE (Existing/Reserved):
  Antennas: Three (3) Ericsson AIR6419 panel antennas, three (3) RFS APXVAALL24_43 panel antennas, three (3) Ericsson 4460 remote radio heads and three (3) Ericsson 4480 remote radio heads mounted on three (3) SitePro VFA12-HD V-Frames with a RAD center elevation of ±180-ft above grade level.
  Coax Cables: Three (3) 6x24 hybrid cables running on a face of the existing tower as specified in Section 3 of this report.
- AT&T (Existing/Reserved):
  Antenna: Three (3) CCI DMP65R-BU6DA panel antennas, three (3) CCI TPA-65R-BU6D panel antennas, three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR6419 panel antennas, three (3) Ericsson 4415 B30 remote radio heads, three (3) Ericsson 4478 B14 remote radio heads, three (3) Ericsson 4449 B5/B12 remote radio heads, three (3) Ericsson 8843 B2/B66A remote radio heads and three (3) Raycap DC6-48-60-18-8F surge arrestors mounted on three (3) 12-ft T-Frames with a RAD center elevation of ±172-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables, three (3) fiber cable and six (6) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Dish (Reserved):
  Antennas: Three (3) JMA MX08FR0665-21 panel antennas, three (3) Fujitsu TA08025-B605 remote radio heads, three (3) Fujitsu TA08025-B604 remote radio heads and one (1) main distribution box mounted on three (3) existing 12-ft T-Frames with a RAD center elevation of ±162-ft above grade level.
  Coax Cable: One (1) 1-3/4" ∅ hybrid cable running on a face of the existing tower as specified in Section 3 of this report.

- Verizon (Existing to Remain):
  Coax Cable: Three (3) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **Verizon (Existing to Remove):**
  Antennas: Three (3) Andrew LNX-6513DS panel antennas, three (3) Antel BXA-171063-12CF panel antennas, three (3) Antel BXA-171085/8BF panel antennas, three (3) Antel BXA-70063/6CF panel antennas, three (3) RFS diplexers, three (3) Alcatel-Lucent RRH2x40-AWS remote radio heads, three (3) Alcatel-Lucent RRH2x60-700 and one (1) main distribution box mounted on (3) 12-ft T-Frames with a RAD center elevation of ±146-ft above grade level.
  Coax Cable: One (1) 1-5/8" ∅ fiber cable and nine (9) 1-5/8" ∅ coax cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **VERIZON (PROPOSED):**
  Antennas: Six (6) Commscope JAHH-65B-R3B panel antennas, three (3) Samsung MT6407-77A panel antennas, three (3) Samsung RF4439-25A (B2/B66A) remote radio heads, three (3) Samsung RF4440d-13A (B5/B13) remote radio heads, three (3) Commscope CBC78T-DS-43 diplexers and one (1) OVP box mounted on (3) 12-ft T-Frames with a RAD center elevation of ±146-ft above grade level.
  Coax Cable: Two (2) 1-5/8" ∅ fiber cables running on a leg/face of the existing tower as specified in Section 3 of this report
  Mount Modifications: Install three (3) SitePro SFS-V-L sector frame stabilizer kits per the mount analysis report prepared by TEP Group dated June 26, 2023.

Primary Assumptions Used in the Analysis

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

Analysis

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

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-H entitled "Structural Standard for Antenna Support Structures and Antennas", 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 P 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 1.00" radial ice on the tower structure and its components.

Load Cases:	Load Case 1; 125 mph (Ultimate) wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix P of the 2022 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 2021 International Building Code as amended by the 2022 Connecticut State Building Code (CSBC).

Tower Capacity

Calculated stresses were found to be within allowable limits.

Tower Section	Elevation	Stress Ratio (%of capacity)	Result
Diagonal (T2)	155'-0"-175'-0"	67.5%	**PASS**
Leg (T9)	20'-0"-40'-0"	57.1%	**PASS**

Foundation and Anchors

The existing foundation consists of a three (3) 3-ft ∅ x 4-ft long reinforced concrete piers concentrically bearing on a 34-ft square x 2-ft 6-in thick reinforced concrete mat. The sub grade conditions used in the foundation analysis were derived from the aforementioned design documents. The base of the tower is connected to the foundation by means of (8) 1.375"∅, ASTM A449 anchor bolts per leg embedded 5-ft 10-in into the concrete foundation structure.

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

Load Effect	Proposed Tower Reactions
Leg Shear	38,282 lbs
Leg Compression	367,694 lbs
Leg Tension	304,167 lbs
Base Moment	6,938,980 ft-lbs
Base Shear	61,922 lbs

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

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	36.1%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-H Required FS[1]	Proposed Loading (FS)[1]	Result
Reinforced Concrete Pad and Piers	Overturning	1.0	1.87	**PASS**

Note 1: FS denotes Factor of Safety

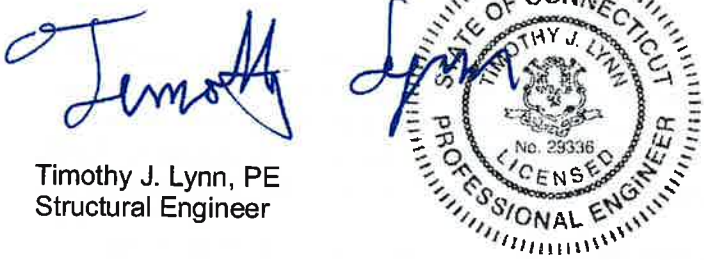
Conclusion

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

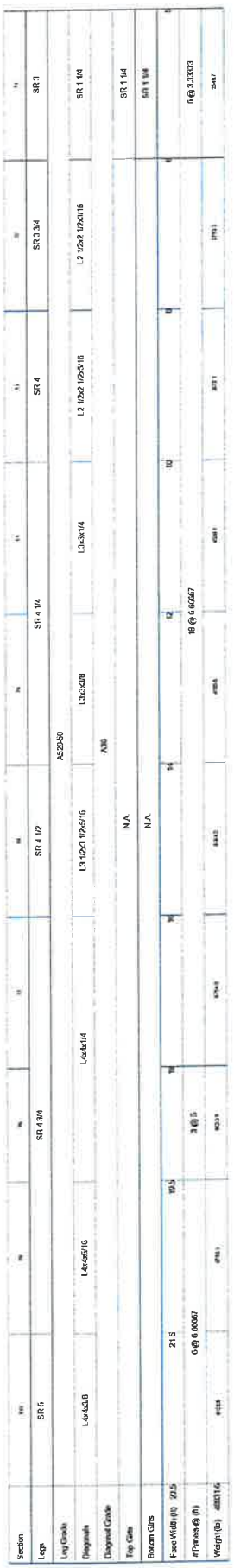
- Information supplied by the client regarding the structure itself, its foundations, the soil conditions, the antenna and feed line loading on the structure and its components, or other relevant information.
- Information from the field and/or drawings in the possession of Centek Engineering, Inc. or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

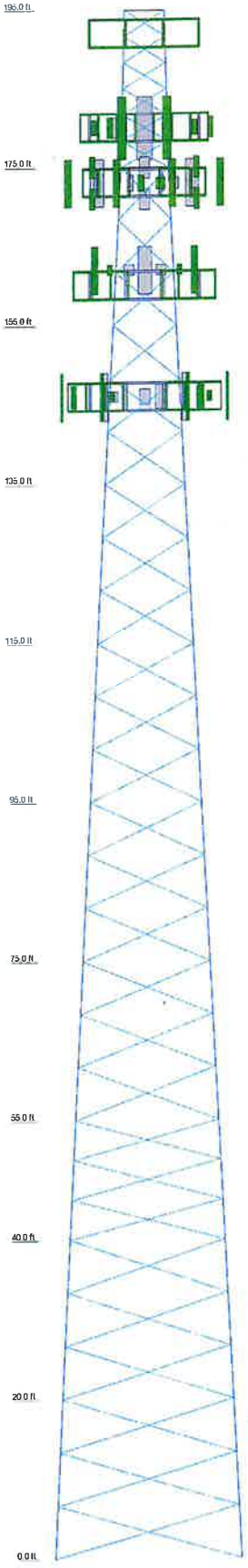
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-H standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 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.





DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Top Triangular Mount (Empty)	192	8843 B2/B66A (ATI)	173
SitePro VFA12-HD (T-Mobile)	180	4415 B30 (ATI)	173
SitePro VFA12-HD (T-Mobile)	180	4415 B30 (ATI)	173
SitePro VFA12-HD (T-Mobile)	180	4415 B30 (ATI)	173
AIR6419 (T-Mobile)	180	MX08FRO665 21 (Dish)	162
APXVAALL24-43 (T-Mobile)	180	MX08FRO665 21 (Dish)	162
AIR6419 (T-Mobile)	180	MX08FRO665 21 (Dish)	162
APXVAALL24-43 (T-Mobile)	180	TA08025-B604 (Dish)	162
AIR6419 (T-Mobile)	180	TA08025-B604 (Dish)	162
APXVAALL24-43 (T-Mobile)	180	TA08025-B604 (Dish)	162
4460 B25+B66 (T-Mobile)	180	TA08025-B605 (Dish)	162
4460 B25+B66 (T-Mobile)	180	TA08025-B605 (Dish)	162
4460 B25+B66 (T-Mobile)	180	TA08025-B605 (Dish)	162
4480 B71+B85 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Dish)	160
4480 B71+B85 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Dish)	160
4480 B71+B85 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Dish)	160
Pirod 12' T-Frame Sector Mount (1) (ATI)	173	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
Pirod 12' T-Frame Sector Mount (1) (ATI)	173	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
Pirod 12' T-Frame Sector Mount (1) (ATI)	173	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
TPA65R-BU6D (ATI)	173	SitePro SFS-V-L (Verizon)	146
AIR6419 (ATI)	173	SitePro SFS-V-L (Verizon)	146
AIR6419 (ATI)	173	SitePro SFS-V-L (Verizon)	146
DMP65R-BU6D (ATI)	173	(2) JAHH-65B-R3B (Verizon - Proposed)	146
TPA65R-BU6D (ATI)	173	MT6407-77A (Verizon - Proposed)	146
AIR6419 (ATI)	173	(2) JAHH-65B-R3B (Verizon - Proposed)	146
AIR6419 (ATI)	173	MT6407-77A (Verizon - Proposed)	146
DMP65R-BU6D (ATI)	173	(2) JAHH-65B-R3B (Verizon - Proposed)	146
TPA65R-BU6D (ATI)	173	MT6407-77A (Verizon - Proposed)	146
AIR6419 (ATI)	173	RF4439d-25A (B2/B66A RRH) (Verizon - Proposed)	146
AIR6419 (ATI)	173	RF4439d-25A (B2/B66A RRH) (Verizon - Proposed)	146
DMP65R-BU6D (ATI)	173	RF4439d-25A (B2/B66A RRH) (Verizon - Proposed)	146
DC6-48-60-18-8F Surge Arrestor (ATI)	173	RF4449d-13A (B5/B13 RRH) (Verizon - Proposed)	146
DC6-48-60-18-8F Surge Arrestor (ATI)	173	RF4449d-13A (B5/B13 RRH) (Verizon - Proposed)	146
DC6-48-60-18-8F Surge Arrestor (ATI)	173	RF4449d-13A (B5/B13 RRH) (Verizon - Proposed)	146
4478 B14 (ATI)	173	CBC78T-DS-43 (Verizon - Proposed)	146
4478 B14 (ATI)	173	CBC78T-DS-43 (Verizon - Proposed)	146
4478 B14 (ATI)	173	CBC78T-DS-43 (Verizon - Proposed)	146
4449 B5/B12 (ATI)	173	RR220C-3315 PF-48 (Verizon - Proposed)	146
4449 B5/B12 (ATI)	173		
4449 B5/B12 (ATI)	173		
8843 B2/B66A (ATI)	173		
8843 B2/B66A (ATI)	173		

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A529-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

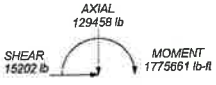
TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-H Standard.
2. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
3. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Risk Category II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 67.5%

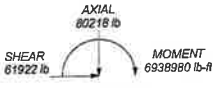
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 367694 lb
SHEAR: 38282 lb

UPLIFT: -304167 lb
SHEAR: 32215 lb



TORQUE 15420 lb-ft
50 mph WIND - 1.0000 in ICE



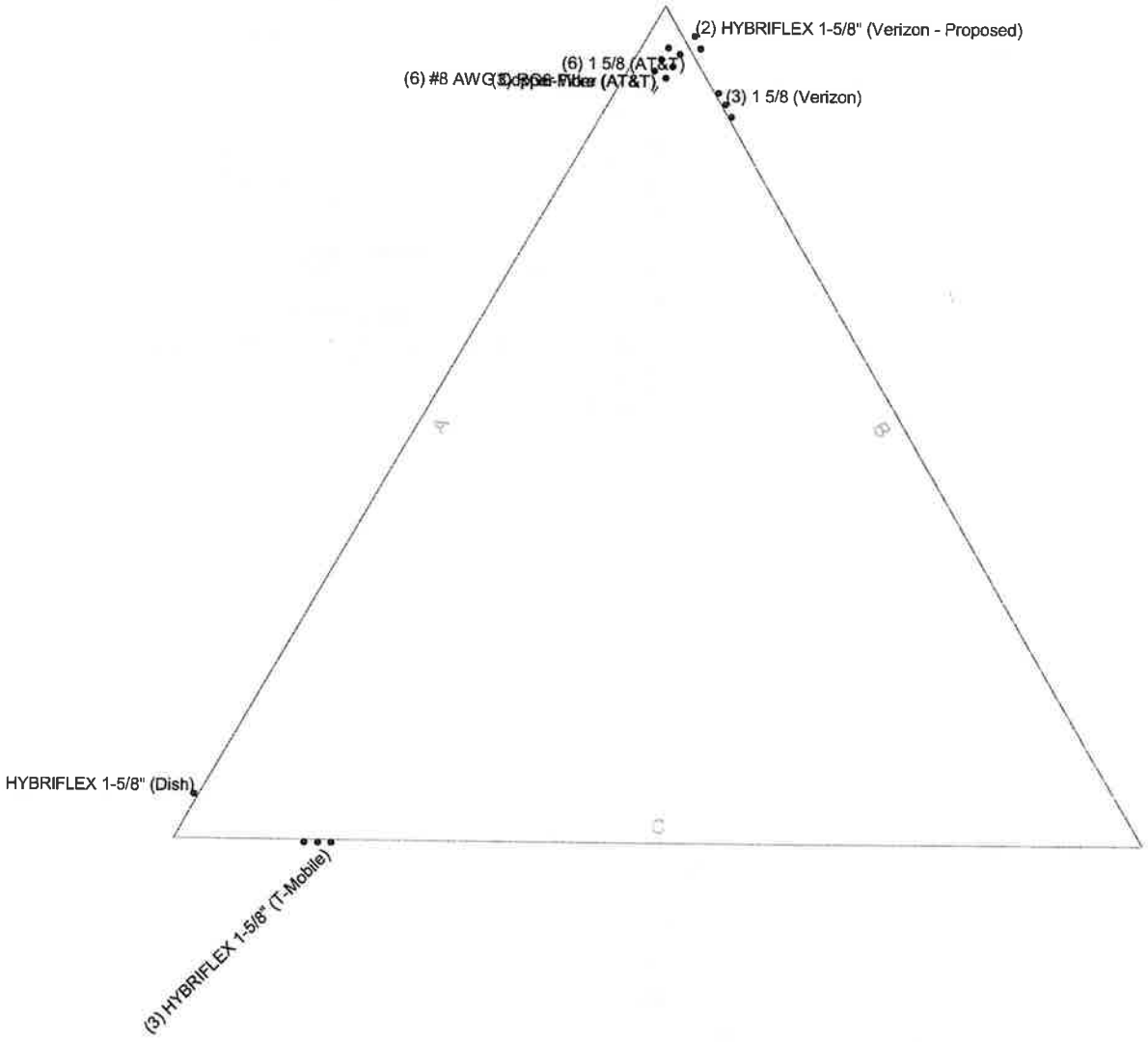
TORQUE 37190 lb-ft
REACTIONS - 125 mph WIND

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

Job: 22027.13 - Northford			
Project: 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT			
Client: Verizon	Drawn by: TJL	App'd:	
Code: TIA-222-H	Date: 05/22/23	Scale: NTS	
Path:		Dwg No. E-1	

Feed Line Plan

_____ Round _____ Flat _____ App In Face App Out Face

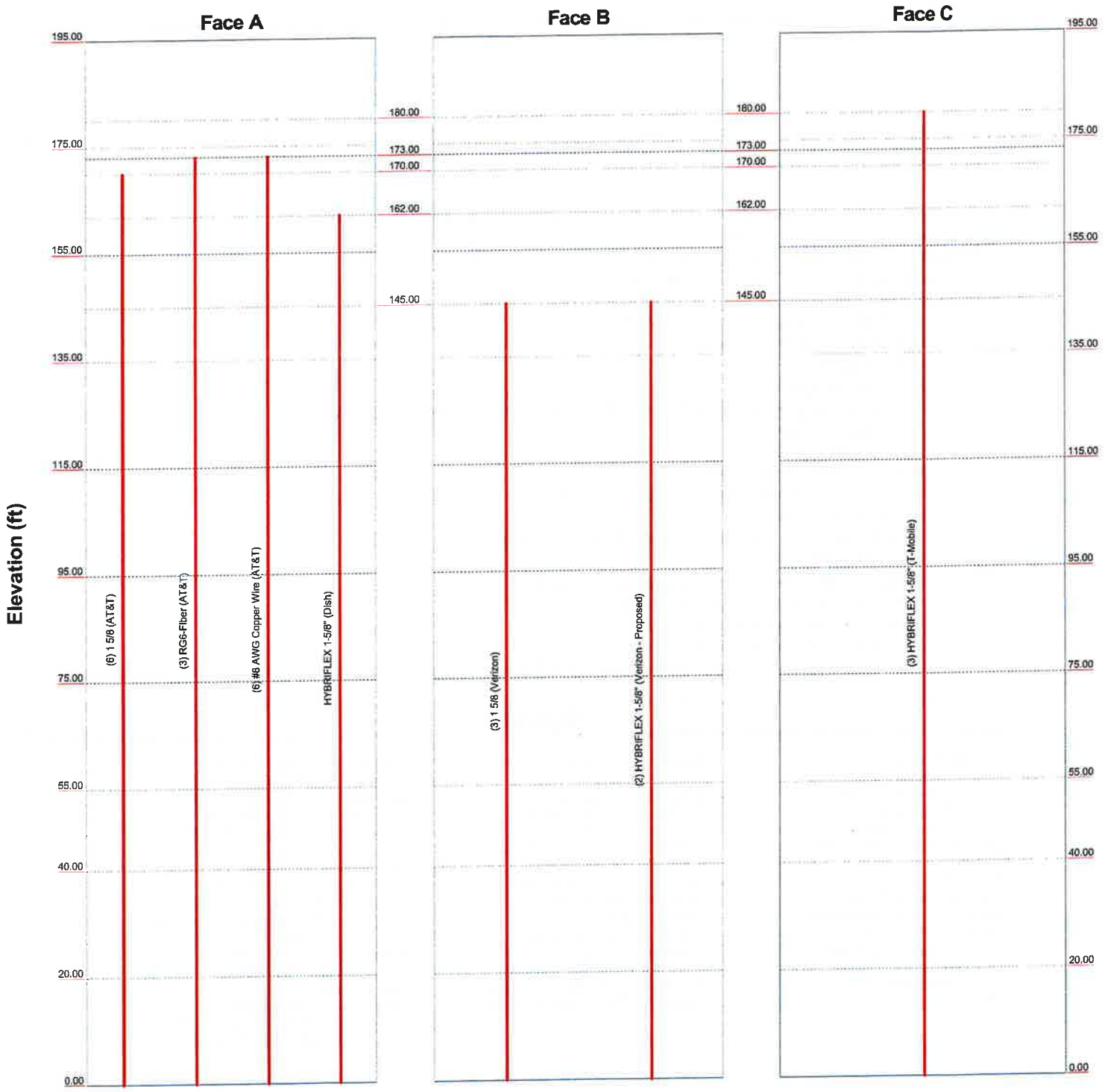


Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: ***22027.13 - Northford***		
Project: ***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***		
Client: Verizon	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 05/22/23	Scale: NTS
Path:		Dwg No. E-7

Feed Line Distribution Chart
0' - 195'

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



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

Job: 22027.13 - Northford		
Project: 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT		
Client: Verizon	Drawn by: TJL	App'd:
Code: TIA-222-H	Date: 05/22/23	Scale: NTS
Path:		Dwg No. E-7

tnxTower	Job	Page
	22027.13 - Northford	1 of 40
Centek Engineering Inc. 63-2 North Branford Rd. Branford, CT 06405 Phone: (203) 488-0580 FAX: (203) 488-8587	Project 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT	Date 13:42:20 05/22/23
	Client Verizon	Designed by TJL

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 195.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 23.50 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 0.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category C.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 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 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

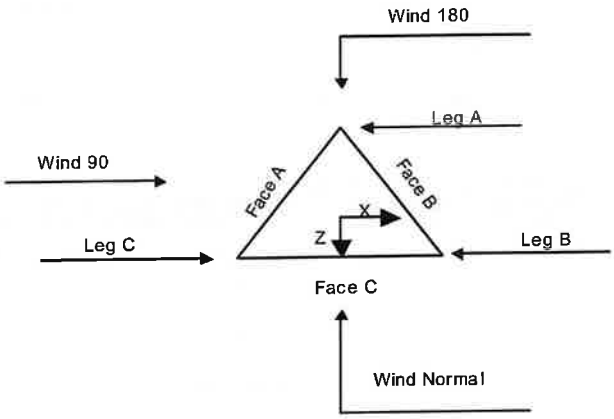
Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Use Special Wind Profile
√ Include Bolts In Member Capacity
Leg Bolts Are At Top Of Section
Secondary Horizontal Braces Leg
Use Diamond Inner Bracing (4 Sided)
√ SR Members Have Cut Ends
SR Members Are Concentric

Distribute Leg Loads As Uniform
Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
Retension Guys To Initial Tension
Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurt.
Autocalc Torque Arm Areas
Add IBC .6D+W Combination
√ Sort Capacity Reports By Component
Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs

Use ASCE 10 X-Brace Ly Rules
√ Calculate Redundant Bracing Forces
Ignore Redundant Members in FEA
√ SR Leg Bolts Resist Compression
√ All Leg Panels Have Same Allowable
Offset Girt At Foundation
√ Consider Feed Line Torque
Include Angle Block Shear Check
Use TIA-222-H Bracing Resist. Exemption
Use TIA-222-H Tension Splice Exemption

Poles

Include Shear-Torsion Interaction
Always Use Sub-Critical Flow
Use Top Mounted Sockets
Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	Assembly Database	Description	Section Width	Number of Sections	Section Length
	ft			ft		ft
T1	195.00-175.00			5.00	1	20.00
T2	175.00-155.00			6.00	1	20.00
T3	155.00-135.00			8.00	1	20.00
T4	135.00-115.00			10.00	1	20.00
T5	115.00-95.00			12.00	1	20.00
T6	95.00-75.00			14.00	1	20.00
T7	75.00-55.00			16.00	1	20.00
T8	55.00-40.00			18.00	1	15.00
T9	40.00-20.00			19.50	1	20.00
T10	20.00-0.00			21.50	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation	Diagonal Spacing	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset	Bottom Girt Offset
	ft	ft				in	in
T1	195.00-175.00	3.33	X Brace	No	Yes	0.0000	0.0000
T2	175.00-155.00	6.67	X Brace	No	No	0.0000	0.0000
T3	155.00-135.00	6.67	X Brace	No	No	0.0000	0.0000
T4	135.00-115.00	6.67	X Brace	No	No	0.0000	0.0000
T5	115.00-95.00	6.67	X Brace	No	No	0.0000	0.0000

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
T6	95.00-75.00	6.67	X Brace	No	No	0.0000	0.0000
T7	75.00-55.00	6.67	X Brace	No	No	0.0000	0.0000
T8	55.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 195.00-175.00	Solid Round	3	A529-50 (50 ksi)	Solid Round	1 1/4	A36 (36 ksi)
T2 175.00-155.00	Solid Round	3 3/4	A529-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 155.00-135.00	Solid Round	4	A529-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x5/16	A36 (36 ksi)
T4 135.00-115.00	Solid Round	4 1/4	A529-50 (50 ksi)	Single Angle	L3x3x1/4	A36 (36 ksi)
T5 115.00-95.00	Solid Round	4 1/4	A529-50 (50 ksi)	Single Angle	L3x3x3/8	A36 (36 ksi)
T6 95.00-75.00	Solid Round	4 1/2	A529-50 (50 ksi)	Single Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 75.00-55.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T8 55.00-40.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x1/4	A36 (36 ksi)
T9 40.00-20.00	Solid Round	4 3/4	A529-50 (50 ksi)	Single Angle	L4x4x5/16	A36 (36 ksi)
T10 20.00-0.00	Solid Round	5	A529-50 (50 ksi)	Single Angle	L4x4x3/8	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 195.00-175.00	Solid Round	1 1/4	A36 (36 ksi)	Solid Round	1 1/4	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

Tower Elevation	Gusset Area (per face)	Gusset Thickness	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals	Double Angle Stitch Bolt Spacing Horizontals	Double Angle Stitch Bolt Spacing Redundants
ft	ft^2	in					in	in	in
T1 195.00-175.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T2 175.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 155.00-135.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 135.00-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 115.00-95.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 95.00-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 75.00-55.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 55.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Brace Diags X	K Brace Diags Y	Single Diags X	Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
ft																	
T1 195.00-175.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 175.00-155.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 155.00-135.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 135.00-115.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 115.00-95.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 95.00-75.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T7 75.00-55.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T8 55.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T9 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
T10 20.00-0.00	Yes	Yes	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		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 195.00-175.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 175.00-155.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 155.00-135.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 135.00-115.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 115.00-95.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 95.00-75.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 75.00-55.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 55.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 195.00-175.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 175.00-155.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 155.00-135.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 135.00-115.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 115.00-95.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 95.00-75.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 75.00-55.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 55.00-40.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 40.00-20.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 20.00-0.00	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg 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.
T1 195.00-175.00	Flange	1.1250 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.00-155.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 155.00-135.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 135.00-115.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 115.00-95.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 95.00-75.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 75.00-55.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 55.00-40.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T9 40.00-20.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T10 20.00-0.00	Flange	1.3750 A449	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon)	B	No	No	Ar (CaAa)	145.00 - 0.00	0.0000	-0.38	3	3	1.9800	1.9800		1.04
1 5/8 (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	-10.0000	0.45	6	3	1.9800	1.9800		1.04
RG6-Fiber (AT&T)	A	No	No	Ar (CaAa)	173.00 - 0.00	-10.0000	0.42	3	3	0.5000	0.5000		1.00
#8 AWG Copper WIre (AT&T)	A	No	No	Ar (CaAa)	173.00 - 0.00	-10.0000	0.42	6	6	0.2500	0.1285		0.05
HYBRIFLEX 1-5/8" (T-Mobile)	C	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.35	3	3	1.9800	1.9800		1.90
HYBRIFLEX 1-5/8" (Verizon - Proposed)	B	No	No	Ar (CaAa)	145.00 - 0.00	2.0000	-0.45	2	2	1.9800	1.9800		1.90
HYBRIFLEX 1-5/8" (Dish)	A	No	No	Ar (CaAa)	162.00 - 0.00	0.0000	-0.45	1	1	1.9800	1.9800		1.90

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 lb
T1	195.00-175.00	A	0.000	0.000	0.000	0.000	0.00
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	2.970	0.000	28.50
T2	175.00-155.00	A	0.000	0.000	23.294	0.000	166.30
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	11.880	0.000	114.00
T3	155.00-135.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	9.900	0.000	69.20
		C	0.000	0.000	11.880	0.000	114.00
T4	135.00-115.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	19.800	0.000	138.40
		C	0.000	0.000	11.880	0.000	114.00
T5	115.00-95.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	19.800	0.000	138.40
		C	0.000	0.000	11.880	0.000	114.00
T6	95.00-75.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	19.800	0.000	138.40
		C	0.000	0.000	11.880	0.000	114.00
T7	75.00-55.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	19.800	0.000	138.40
		C	0.000	0.000	11.880	0.000	114.00
T8	55.00-40.00	A	0.000	0.000	24.197	0.000	171.60
		B	0.000	0.000	14.850	0.000	103.80
		C	0.000	0.000	8.910	0.000	85.50
T9	40.00-20.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	19.800	0.000	138.40
		C	0.000	0.000	11.880	0.000	114.00
T10	20.00-0.00	A	0.000	0.000	32.262	0.000	228.80
		B	0.000	0.000	19.800	0.000	138.40
		C	0.000	0.000	11.880	0.000	114.00

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 lb
T1	195.00-175.00	A	1.188	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	8.141	0.000	106.61
T2	175.00-155.00	A	1.175	0.000	0.000	54.721	0.000	805.49
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	32.479	0.000	423.33
T3	155.00-135.00	A	1.160	0.000	0.000	71.884	0.000	1087.97
		B		0.000	0.000	27.830	0.000	320.85
		C		0.000	0.000	32.383	0.000	419.88
T4	135.00-115.00	A	1.142	0.000	0.000	71.464	0.000	1078.02
		B		0.000	0.000	55.437	0.000	634.96
		C		0.000	0.000	32.274	0.000	415.99
T5	115.00-95.00	A	1.123	0.000	0.000	70.978	0.000	1066.59
		B		0.000	0.000	55.178	0.000	627.22
		C		0.000	0.000	32.149	0.000	411.51
T6	95.00-75.00	A	1.099	0.000	0.000	70.402	0.000	1053.10
		B		0.000	0.000	54.870	0.000	618.06
		C		0.000	0.000	31.999	0.000	406.20
T7	75.00-55.00	A	1.070	0.000	0.000	69.687	0.000	1036.53
		B		0.000	0.000	54.490	0.000	606.78
		C		0.000	0.000	31.814	0.000	399.67
T8	55.00-40.00	A	1.037	0.000	0.000	51.658	0.000	763.43

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 lb
		B		0.000	0.000	40.543	0.000	445.56
		C		0.000	0.000	23.704	0.000	294.22
T9	40.00-20.00	A	0.991	0.000	0.000	67.736	0.000	992.03
		B		0.000	0.000	53.450	0.000	576.34
		C		0.000	0.000	31.310	0.000	382.00
T10	20.00-0.00	A	0.887	0.000	0.000	75.291	0.000	776.02
		B		0.000	0.000	37.549	0.000	449.30
		C		0.000	0.000	22.530	0.000	300.54

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	195.00-175.00	-1.4242	1.2318	-1.9274	1.6671
T2	175.00-155.00	-2.7645	-4.9666	-4.3301	-5.7465
T3	155.00-135.00	-3.8339	-10.5335	-5.4128	-13.1096
T4	135.00-115.00	-3.6966	-14.2613	-5.2264	-19.0318
T5	115.00-95.00	-4.2808	-15.8541	-6.1360	-21.4642
T6	95.00-75.00	-4.4350	-16.0636	-6.6581	-22.7748
T7	75.00-55.00	-4.4895	-16.0159	-7.0222	-23.6811
T8	55.00-40.00	-4.1124	-14.6093	-6.7418	-22.6281
T9	40.00-20.00	-4.9695	-17.3242	-7.8966	-26.1325
T10	20.00-0.00	-5.1797	-17.8788	-7.1646	-28.0963

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	7	HYBRIFLEX 1-5/8"	175.00 - 180.00	0.6000	0.6000
T2	2	1 5/8	155.00 - 170.00	0.6000	0.6000
T2	5	RG6-Fiber	155.00 - 173.00	0.6000	0.6000
T2	6	#8 AWG Copper WIre	155.00 - 173.00	0.6000	0.6000
T2	7	HYBRIFLEX 1-5/8"	155.00 - 175.00	0.6000	0.6000
T2	10	HYBRIFLEX 1-5/8"	155.00 - 162.00	1.0000	1.0000
T3	1	1 5/8	135.00 - 145.00	0.6000	0.6000
T3	2	1 5/8	135.00 - 155.00	0.6000	0.6000
T3	5	RG6-Fiber	135.00 - 155.00	0.6000	0.6000
T3	6	#8 AWG Copper WIre	135.00 - 155.00	0.6000	0.6000
T3	7	HYBRIFLEX 1-5/8"	135.00 - 155.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	9	HYBRIFLEX 1-5/8"	135.00 - 145.00	0.6000	0.6000
T3	10	HYBRIFLEX 1-5/8"	135.00 - 155.00	1.0000	1.0000
T4	1	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	2	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	5	RG6-Fiber	115.00 - 135.00	0.6000	0.6000
T4	6	#8 AWG Copper WIre	115.00 - 135.00	0.6000	0.6000
T4	7	HYBRIFLEX 1-5/8"	115.00 - 135.00	0.6000	0.6000
T4	9	HYBRIFLEX 1-5/8"	115.00 - 135.00	0.6000	0.6000
T4	10	HYBRIFLEX 1-5/8"	115.00 - 135.00	1.0000	1.0000
T5	1	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	2	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	5	RG6-Fiber	95.00 - 115.00	0.6000	0.6000
T5	6	#8 AWG Copper WIre	95.00 - 115.00	0.6000	0.6000
T5	7	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T5	9	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T5	10	HYBRIFLEX 1-5/8"	95.00 - 115.00	1.0000	1.0000
T6	1	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	2	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	5	RG6-Fiber	75.00 - 95.00	0.6000	0.6000
T6	6	#8 AWG Copper WIre	75.00 - 95.00	0.6000	0.6000
T6	7	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T6	9	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T6	10	HYBRIFLEX 1-5/8"	75.00 - 95.00	1.0000	1.0000
T7	1	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	2	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	5	RG6-Fiber	55.00 - 75.00	0.6000	0.6000
T7	6	#8 AWG Copper WIre	55.00 - 75.00	0.6000	0.6000
T7	7	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T7	9	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T7	10	HYBRIFLEX 1-5/8"	55.00 - 75.00	1.0000	1.0000
T8	1	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	2	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	5	RG6-Fiber	40.00 - 55.00	0.6000	0.6000
T8	6	#8 AWG Copper WIre	40.00 - 55.00	0.6000	0.6000
T8	7	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T8	9	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T8	10	HYBRIFLEX 1-5/8"	40.00 - 55.00	1.0000	1.0000
T9	1	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	2	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	5	RG6-Fiber	20.00 - 40.00	0.6000	0.6000
T9	6	#8 AWG Copper WIre	20.00 - 40.00	0.6000	0.6000
T9	7	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T9	9	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T9	10	HYBRIFLEX 1-5/8"	20.00 - 40.00	1.0000	1.0000
T10	1	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	2	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	5	RG6-Fiber	0.00 - 20.00	0.6000	0.6000
T10	6	#8 AWG Copper WIre	0.00 - 20.00	0.6000	0.6000
T10	7	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000
T10	9	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000
T10	10	HYBRIFLEX 1-5/8"	0.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Top Triangular Mount (Empty)	C	From Face	2.00	0.00	0.0000	192.00	No Ice	75.30	75.30	2500.00
				0.00			1/2" Ice	86.60	86.60	2875.00
				0.00			1" Ice	97.90	97.90	3250.00
SitePro VFA12-HD (T-Mobile)	A	From Leg	2.00	0.00	0.0000	180.00	No Ice	21.00	21.00	750.00
				0.00			1/2" Ice	25.00	25.00	900.00
				0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD (T-Mobile)	B	From Leg	2.00	0.00	0.0000	180.00	No Ice	21.00	21.00	750.00
				0.00			1/2" Ice	25.00	25.00	900.00
				0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD (T-Mobile)	C	From Leg	2.00	0.00	0.0000	180.00	No Ice	21.00	21.00	750.00
				0.00			1/2" Ice	25.00	25.00	900.00
				0.00			1" Ice	29.00	29.00	1050.00
AIR6419 (T-Mobile)	A	From Leg	4.00	-4.00	0.0000	180.00	No Ice	4.17	2.02	56.00
				0.00			1/2" Ice	4.44	2.23	85.19
				0.00			1" Ice	4.71	2.44	118.11
APXVAALL24-43 (T-Mobile)	A	From Leg	0.00	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
				0.00			1/2" Ice	20.89	9.49	265.59
				0.00			1" Ice	21.54	10.09	386.72
AIR6419 (T-Mobile)	B	From Leg	4.00	-4.00	0.0000	180.00	No Ice	4.17	2.02	56.00
				0.00			1/2" Ice	4.44	2.23	85.19
				0.00			1" Ice	4.71	2.44	118.11
APXVAALL24-43 (T-Mobile)	B	From Leg	0.00	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
				0.00			1/2" Ice	20.89	9.49	265.59
				0.00			1" Ice	21.54	10.09	386.72
AIR6419 (T-Mobile)	C	From Leg	4.00	-4.00	0.0000	180.00	No Ice	4.17	2.02	56.00
				0.00			1/2" Ice	4.44	2.23	85.19
				0.00			1" Ice	4.71	2.44	118.11
APXVAALL24-43 (T-Mobile)	C	From Leg	0.00	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
				0.00			1/2" Ice	20.89	9.49	265.59
				0.00			1" Ice	21.54	10.09	386.72
4460 B25+B66 (T-Mobile)	A	From Leg	4.00	0.00	0.0000	180.00	No Ice	2.56	1.98	109.00
				0.00			1/2" Ice	2.76	2.16	134.38
				0.00			1" Ice	2.97	2.34	163.03
4460 B25+B66 (T-Mobile)	B	From Leg	4.00	0.00	0.0000	180.00	No Ice	2.56	1.98	109.00
				0.00			1/2" Ice	2.76	2.16	134.38
				0.00			1" Ice	2.97	2.34	163.03
4460 B25+B66 (T-Mobile)	C	From Leg	4.00	0.00	0.0000	180.00	No Ice	2.56	1.98	109.00
				0.00			1/2" Ice	2.76	2.16	134.38
				0.00			1" Ice	2.97	2.34	163.03
4480 B71+B85 (T-Mobile)	A	From Leg	4.00	0.00	0.0000	180.00	No Ice	2.85	1.38	84.00
				0.00			1/2" Ice	3.06	1.54	105.70
				0.00			1" Ice	3.28	1.71	130.51
4480 B71+B85 (T-Mobile)	B	From Leg	4.00	0.00	0.0000	180.00	No Ice	2.85	1.38	84.00
				0.00			1/2" Ice	3.06	1.54	105.70
				0.00			1" Ice	3.28	1.71	130.51
4480 B71+B85 (T-Mobile)	C	From Leg	4.00	0.00	0.0000	180.00	No Ice	2.85	1.38	84.00
				0.00			1/2" Ice	3.06	1.54	105.70
				0.00			1" Ice	3.28	1.71	130.51
Pirod 12' T-Frame Sector	A	From Leg	2.00		0.0000	173.00	No Ice	13.60	13.60	465.00

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 lb
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	173.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	173.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(AT&T)			0.00			1" Ice	23.20	23.20	735.00
TPA65R-BU6D	A	From Leg	4.00	0.0000	173.00	No Ice	12.71	5.62	75.00
(AT&T)			-6.00			1/2" Ice	13.21	6.07	148.96
			0.00			1" Ice	13.71	6.53	229.56
AIR6419	A	From Leg	4.00	0.0000	173.00	No Ice	4.17	2.02	56.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	85.19
			2.00			1" Ice	4.71	2.44	118.11
AIR6419	A	From Leg	4.00	0.0000	173.00	No Ice	4.17	2.02	56.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	85.19
			-2.00			1" Ice	4.71	2.44	118.11
DMP65R-BU6D	A	From Leg	4.00	0.0000	173.00	No Ice	12.71	5.62	96.00
(AT&T)			6.00			1/2" Ice	13.21	6.07	169.96
			0.00			1" Ice	13.71	6.53	250.56
TPA65R-BU6D	B	From Leg	4.00	0.0000	173.00	No Ice	12.71	5.62	75.00
(AT&T)			-6.00			1/2" Ice	13.21	6.07	148.96
			0.00			1" Ice	13.71	6.53	229.56
AIR6419	B	From Leg	4.00	0.0000	173.00	No Ice	4.17	2.02	56.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	85.19
			2.00			1" Ice	4.71	2.44	118.11
AIR6419	B	From Leg	4.00	0.0000	173.00	No Ice	4.17	2.02	56.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	85.19
			-2.00			1" Ice	4.71	2.44	118.11
DMP65R-BU6D	B	From Leg	4.00	0.0000	173.00	No Ice	12.71	5.62	96.00
(AT&T)			6.00			1/2" Ice	13.21	6.07	169.96
			0.00			1" Ice	13.71	6.53	250.56
TPA65R-BU6D	C	From Leg	4.00	0.0000	173.00	No Ice	12.71	5.62	75.00
(AT&T)			-6.00			1/2" Ice	13.21	6.07	148.96
			0.00			1" Ice	13.71	6.53	229.56
AIR6419	C	From Leg	4.00	0.0000	173.00	No Ice	4.17	2.02	56.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	85.19
			2.00			1" Ice	4.71	2.44	118.11
AIR6419	C	From Leg	4.00	0.0000	173.00	No Ice	4.17	2.02	56.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	85.19
			-2.00			1" Ice	4.71	2.44	118.11
DMP65R-BU6D	C	From Leg	4.00	0.0000	173.00	No Ice	12.71	5.62	96.00
(AT&T)			6.00			1/2" Ice	13.21	6.07	169.96
			0.00			1" Ice	13.71	6.53	250.56
DC6-48-60-18-8F Surge	A	From Face	0.50	0.0000	173.00	No Ice	1.91	1.91	26.00
Arrestor			0.50			1/2" Ice	2.10	2.10	45.36
(AT&T)			0.00			1" Ice	2.29	2.29	67.70
DC6-48-60-18-8F Surge	B	From Face	0.50	0.0000	173.00	No Ice	1.91	1.91	26.00
Arrestor			0.50			1/2" Ice	2.10	2.10	45.36
(AT&T)			0.00			1" Ice	2.29	2.29	67.70
DC6-48-60-18-8F Surge	C	From Face	0.50	0.0000	173.00	No Ice	1.91	1.91	26.00
Arrestor			0.50			1/2" Ice	2.10	2.10	45.36
(AT&T)			0.00			1" Ice	2.29	2.29	67.70
4478 B14	A	From Face	4.00	0.0000	173.00	No Ice	1.84	1.06	60.00
(AT&T)			-2.00			1/2" Ice	2.01	1.20	75.88
			0.00			1" Ice	2.19	1.34	94.39
4478 B14	B	From Face	4.00	0.0000	173.00	No Ice	1.84	1.06	60.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			-2.00			1/2" Ice	2.01	1.20	75.88
			0.00			1" Ice	2.19	1.34	94.39
4478 B14	C	From Face	4.00	0.0000	173.00	No Ice	1.84	1.06	60.00
(AT&T)			-2.00			1/2" Ice	2.01	1.20	75.88
			0.00			1" Ice	2.19	1.34	94.39
4449 B5/B12	A	From Face	4.00	0.0000	173.00	No Ice	1.97	1.41	71.00
(AT&T)			-2.00			1/2" Ice	2.14	1.56	89.51
			0.00			1" Ice	2.33	1.73	110.84
4449 B5/B12	B	From Face	4.00	0.0000	173.00	No Ice	1.97	1.41	71.00
(AT&T)			-2.00			1/2" Ice	2.14	1.56	89.51
			0.00			1" Ice	2.33	1.73	110.84
4449 B5/B12	C	From Face	4.00	0.0000	173.00	No Ice	1.97	1.41	71.00
(AT&T)			-2.00			1/2" Ice	2.14	1.56	89.51
			0.00			1" Ice	2.33	1.73	110.84
8843 B2/B66A	A	From Face	4.00	0.0000	173.00	No Ice	1.64	1.35	72.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
8843 B2/B66A	B	From Face	4.00	0.0000	173.00	No Ice	1.64	1.35	72.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
8843 B2/B66A	C	From Face	4.00	0.0000	173.00	No Ice	1.64	1.35	72.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.91
4415 B30	A	From Face	4.00	0.0000	173.00	No Ice	1.84	0.82	46.00
(AT&T)			-2.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
4415 B30	B	From Face	4.00	0.0000	173.00	No Ice	1.84	0.82	46.00
(AT&T)			-2.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
4415 B30	C	From Face	4.00	0.0000	173.00	No Ice	1.84	0.82	46.00
(AT&T)			-2.00			1/2" Ice	2.01	0.94	60.07
			0.00			1" Ice	2.19	1.07	76.66
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Dish)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Dish)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Dish)			0.00			1" Ice	23.20	23.20	735.00
MX08FRO665-21	A	From Leg	3.00	0.0000	162.00	No Ice	12.49	5.87	83.00
(Dish)			0.00			1/2" Ice	12.99	6.32	156.79
			0.00			1" Ice	13.49	6.79	237.26
MX08FRO665-21	B	From Leg	3.00	0.0000	162.00	No Ice	12.49	5.87	83.00
(Dish)			0.00			1/2" Ice	12.99	6.32	156.79
			0.00			1" Ice	13.49	6.79	237.26
MX08FRO665-21	C	From Leg	3.00	0.0000	162.00	No Ice	12.49	5.87	83.00
(Dish)			0.00			1/2" Ice	12.99	6.32	156.79
			0.00			1" Ice	13.49	6.79	237.26
TA08025-B604	A	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.04	65.00
(Dish)			2.00			1/2" Ice	2.15	1.18	81.85
			0.00			1" Ice	2.33	1.32	101.41
TA08025-B604	B	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.04	65.00
(Dish)			2.00			1/2" Ice	2.15	1.18	81.85
			0.00			1" Ice	2.33	1.32	101.41
TA08025-B604	C	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.04	65.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Dish)			2.00			1/2" Ice	2.15	1.18	81.85
			0.00			1" Ice	2.33	1.32	101.41
TA08025-B605 (Dish)	A	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.20	75.00
			-2.00			1/2" Ice	2.15	1.34	93.09
			0.00			1" Ice	2.33	1.49	113.96
TA08025-B605 (Dish)	B	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.20	75.00
			-2.00			1/2" Ice	2.15	1.34	93.09
			0.00			1" Ice	2.33	1.49	113.96
TA08025-B605 (Dish)	C	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.20	75.00
			-2.00			1/2" Ice	2.15	1.34	93.09
			0.00			1" Ice	2.33	1.49	113.96
Pirod 12' T-Frame Sector Mount (1) (Verizon)	A	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector Mount (1) (Verizon)	B	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector Mount (1) (Verizon)	C	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
			0.00			1/2" Ice	18.40	18.40	600.00
			0.00			1" Ice	23.20	23.20	735.00
SitePro SFS-V-L (Verizon)	A	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
SitePro SFS-V-L (Verizon)	B	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
SitePro SFS-V-L (Verizon)	C	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
(2) JAHH-65B-R3B (Verizon - Proposed)	A	From Leg	4.00	0.0000	146.00	No Ice	5.98	9.11	94.00
			0.00			1/2" Ice	6.44	9.58	152.08
			0.00			1" Ice	6.91	10.05	216.45
MT6407-77A (Verizon - Proposed)	A	From Leg	4.00	0.0000	146.00	No Ice	4.71	1.84	87.00
			2.00			1/2" Ice	5.00	2.06	116.31
			0.00			1" Ice	5.29	2.29	149.49
(2) JAHH-65B-R3B (Verizon - Proposed)	B	From Leg	4.00	0.0000	146.00	No Ice	5.98	9.11	94.00
			0.00			1/2" Ice	6.44	9.58	152.08
			0.00			1" Ice	6.91	10.05	216.45
MT6407-77A (Verizon - Proposed)	B	From Leg	4.00	0.0000	146.00	No Ice	4.71	1.84	87.00
			2.00			1/2" Ice	5.00	2.06	116.31
			0.00			1" Ice	5.29	2.29	149.49
(2) JAHH-65B-R3B (Verizon - Proposed)	C	From Leg	4.00	0.0000	146.00	No Ice	5.98	9.11	94.00
			0.00			1/2" Ice	6.44	9.58	152.08
			0.00			1" Ice	6.91	10.05	216.45
MT6407-77A (Verizon - Proposed)	C	From Leg	4.00	0.0000	146.00	No Ice	4.71	1.84	87.00
			2.00			1/2" Ice	5.00	2.06	116.31
			0.00			1" Ice	5.29	2.29	149.49
RF4439d-25A (B2/B66A RRH) (Verizon - Proposed)	A	From Leg	2.00	0.0000	146.00	No Ice	1.88	1.25	75.00
			-4.00			1/2" Ice	2.05	1.39	93.34
			0.00			1" Ice	2.22	1.54	114.47
RF4439d-25A (B2/B66A RRH) (Verizon - Proposed)	B	From Leg	2.00	0.0000	146.00	No Ice	1.88	1.25	75.00
			-4.00			1/2" Ice	2.05	1.39	93.34
			0.00			1" Ice	2.22	1.54	114.47
RF4439d-25A (B2/B66A RRH) (Verizon - Proposed)	C	From Leg	2.00	0.0000	146.00	No Ice	1.88	1.25	75.00
			-4.00			1/2" Ice	2.05	1.39	93.34
			0.00			1" Ice	2.22	1.54	114.47
RF4440d-13A (B5/B13 RRH)	A	From Leg	2.00	0.0000	146.00	No Ice	1.88	1.13	75.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon - Proposed)			-4.00			1/2" Ice	2.05	1.26	92.34
			0.00			1" Ice	2.22	1.41	112.40
RF4440d-13A (B5/B13 RRH)	B	From Leg	2.00	0.0000	146.00	No Ice	1.88	1.13	75.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.05	1.26	92.34
			0.00			1" Ice	2.22	1.41	112.40
RF4440d-13A (B5/B13 RRH)	C	From Leg	2.00	0.0000	146.00	No Ice	1.88	1.13	75.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.05	1.26	92.34
			0.00			1" Ice	2.22	1.41	112.40
CBC78T-DS-43	A	From Leg	2.00	0.0000	146.00	No Ice	0.37	0.26	11.00
(Verizon - Proposed)			-4.00			1/2" Ice	0.45	0.32	15.12
			0.00			1" Ice	0.53	0.40	20.61
CBC78T-DS-43	B	From Leg	2.00	0.0000	146.00	No Ice	0.37	0.26	11.00
(Verizon - Proposed)			-4.00			1/2" Ice	0.45	0.32	15.12
			0.00			1" Ice	0.53	0.40	20.61
CBC78T-DS-43	C	From Leg	2.00	0.0000	146.00	No Ice	0.37	0.26	11.00
(Verizon - Proposed)			-4.00			1/2" Ice	0.45	0.32	15.12
			0.00			1" Ice	0.53	0.40	20.61
RC2DC-3315-PF-48	A	From Leg	2.00	0.0000	146.00	No Ice	3.01	1.96	25.00
(Verizon - Proposed)			0.00			1/2" Ice	3.23	2.15	51.21
			0.00			1" Ice	3.46	2.35	80.79

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	185.00	1.441	49	115.002	A	0.000	18.774	10.004	53.29	0.000	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	18.774		53.29	2.970	0.000
T2	165.00	1.406	48	146.258	A	11.554	12.521	12.521	52.01	23.294	0.000
175.00-155.00					B	11.554	12.521		52.01	0.000	0.000
					C	11.554	12.521		52.01	11.880	0.000
T3	145.00	1.369	47	186.675	A	13.489	13.356	13.356	49.75	32.262	0.000
155.00-135.00					B	13.489	13.356		49.75	9.900	0.000
					C	13.489	13.356		49.75	11.880	0.000
T4	125.00	1.326	45	227.092	A	18.679	14.190	14.190	43.17	32.262	0.000
135.00-115.00					B	18.679	14.190		43.17	19.800	0.000
					C	18.679	14.190		43.17	11.880	0.000
T5	105.00	1.279	43	267.092	A	21.322	14.190	14.190	39.96	32.262	0.000
115.00-95.00					B	21.322	14.190		39.96	19.800	0.000
					C	21.322	14.190		39.96	11.880	0.000
T6 95.00-75.00	85.00	1.223	42	307.509	A	28.012	15.025	15.025	34.91	32.262	0.000
					B	28.012	15.025		34.91	19.800	0.000
					C	28.012	15.025		34.91	11.880	0.000
T7 75.00-55.00	65.00	1.156	39	347.927	A	35.675	15.860	15.860	30.78	32.262	0.000
					B	35.675	15.860		30.78	19.800	0.000
					C	35.675	15.860		30.78	11.880	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T8 55.00-40.00	47.50	1.082	37	287.195	A	37.993	11.895	11.895	23.84	24.197	0.000
					B	37.993	11.895		23.84	14.850	0.000
					C	37.993	11.895		23.84	8.910	0.000
T9 40.00-20.00	30.00	0.982	33	417.927	A	42.284	15.860	15.860	27.28	32.262	0.000
					B	42.284	15.860		27.28	19.800	0.000
					C	42.284	15.860		27.28	11.880	0.000
T10 20.00-0.00	10.00	0.85	29	458.344	A	46.067	16.694	16.694	26.60	32.262	0.000
					B	46.067	16.694		26.60	19.800	0.000
					C	46.067	16.694		26.60	11.880	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 195.00-175.00	185.00	1.441	8	1.1881	118.963	A	0.000	43.369	17.928	41.34	0.000	0.000
						B	0.000	43.369		41.34	0.000	0.000
						C	0.000	43.369		41.34	8.141	0.000
T2 175.00-155.00	165.00	1.406	8	1.1746	150.178	A	11.554	31.221	20.365	47.61	54.721	0.000
						B	11.554	31.221		47.61	0.000	0.000
						C	11.554	31.221		47.61	32.479	0.000
T3 155.00-135.00	145.00	1.369	7	1.1595	190.545	A	13.489	33.611	21.099	44.80	71.884	0.000
						B	13.489	33.611		44.80	27.830	0.000
						C	13.489	33.611		44.80	32.383	0.000
T4 135.00-115.00	125.00	1.326	7	1.1425	230.905	A	18.679	36.046	21.819	39.87	71.464	0.000
						B	18.679	36.046		39.87	55.437	0.000
						C	18.679	36.046		39.87	32.274	0.000
T5 115.00-95.00	105.00	1.279	7	1.1227	270.839	A	21.322	37.647	21.687	36.78	70.978	0.000
						B	21.322	37.647		36.78	55.178	0.000
						C	21.322	37.647		36.78	32.149	0.000
T6 95.00-75.00	85.00	1.223	7	1.0992	311.178	A	28.012	39.961	22.365	32.90	70.402	0.000
						B	28.012	39.961		32.90	54.870	0.000
						C	28.012	39.961		32.90	31.999	0.000
T7 75.00-55.00	65.00	1.156	6	1.0701	351.498	A	35.675	42.094	23.006	29.58	69.687	0.000
						B	35.675	42.094		29.58	54.490	0.000
						C	35.675	42.094		29.58	31.814	0.000
T8 55.00-40.00	47.50	1.082	6	1.0371	289.791	A	37.993	36.790	17.089	22.85	51.658	0.000
						B	37.993	36.790		22.85	40.543	0.000
						C	37.993	36.790		22.85	23.704	0.000
T9 40.00-20.00	30.00	0.982	5	0.9905	421.232	A	42.284	43.416	22.474	26.22	67.736	0.000
						B	42.284	43.416		26.22	53.450	0.000
						C	42.284	43.416		26.22	31.310	0.000
T10 20.00-0.00	10.00	0.85	5	0.8875	461.306	A	46.067	43.062	22.621	25.38	75.291	0.000
						B	46.067	43.062		25.38	37.549	0.000
						C	46.067	43.062		25.38	22.530	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1 195.00-175.00	185.00	1.441	11	115.002	A	0.000	18.774	10.004	53.29	0.000	0.000
					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	18.774		53.29	2.970	0.000
T2 175.00-155.00	165.00	1.406	11	146.258	A	11.554	12.521	12.521	52.01	23.294	0.000
					B	11.554	12.521		52.01	0.000	0.000
					C	11.554	12.521		52.01	11.880	0.000
T3 155.00-135.00	145.00	1.369	11	186.675	A	13.489	13.356	13.356	49.75	32.262	0.000
					B	13.489	13.356		49.75	9.900	0.000
					C	13.489	13.356		49.75	11.880	0.000
T4 135.00-115.00	125.00	1.326	10	227.092	A	18.679	14.190	14.190	43.17	32.262	0.000
					B	18.679	14.190		43.17	19.800	0.000
					C	18.679	14.190		43.17	11.880	0.000
T5 115.00-95.00	105.00	1.279	10	267.092	A	21.322	14.190	14.190	39.96	32.262	0.000
					B	21.322	14.190		39.96	19.800	0.000
					C	21.322	14.190		39.96	11.880	0.000
T6 95.00-75.00	85.00	1.223	10	307.509	A	28.012	15.025	15.025	34.91	32.262	0.000
					B	28.012	15.025		34.91	19.800	0.000
					C	28.012	15.025		34.91	11.880	0.000
T7 75.00-55.00	65.00	1.156	9	347.927	A	35.675	15.860	15.860	30.78	32.262	0.000
					B	35.675	15.860		30.78	19.800	0.000
					C	35.675	15.860		30.78	11.880	0.000
T8 55.00-40.00	47.50	1.082	8	287.195	A	37.993	11.895	11.895	23.84	24.197	0.000
					B	37.993	11.895		23.84	14.850	0.000
					C	37.993	11.895		23.84	8.910	0.000
T9 40.00-20.00	30.00	0.982	8	417.927	A	42.284	15.860	15.860	27.28	32.262	0.000
					B	42.284	15.860		27.28	19.800	0.000
					C	42.284	15.860		27.28	11.880	0.000
T10 20.00-0.00	10.00	0.85	7	458.344	A	46.067	16.694	16.694	26.60	32.262	0.000
					B	46.067	16.694		26.60	19.800	0.000
					C	46.067	16.694		26.60	11.880	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation	Add Weight	Self Weight	Face	e	C_F	q_z	D_F	D_R	A_E	F	w	Ctrl. Face
ft	lb	lb				psf			ft^2	lb	plf	
T1 195.00-175.00	28.50	2548.67	A	0.163	2.723	49	1	1	10.683	1285.42	64.27	C
			B	0.163	2.723		1	1	10.683			
			C	0.163	2.723		1	1	10.683			
T2 175.00-155.00	280.30	2793.29	A	0.165	2.718	48	1	1	18.344	2907.08	145.35	C
			B	0.165	2.718		1	1	18.344			
			C	0.165	2.718		1	1	18.344			
T3 155.00-135.00	412.00	3572.06	A	0.144	2.794	47	1	1	20.555	3617.07	180.85	C
			B	0.144	2.794		1	1	20.555			
			C	0.144	2.794		1	1	20.555			
T4 135.00-115.00	481.20	4036.07	A	0.145	2.791	45	1	1	26.067	4320.41	216.02	C
			B	0.145	2.791		1	1	26.067			
			C	0.145	2.791		1	1	26.067			
T5 115.00-95.00	481.20	4789.76	A	0.133	2.835	43	1	1	28.727	4486.11	224.31	C
			B	0.133	2.835		1	1	28.727			
			C	0.133	2.835		1	1	28.727			
T6 95.00-75.00	481.20	5354.18	A	0.14	2.809	42	1	1	35.769	4963.18	248.16	C
			B	0.14	2.809		1	1	35.769			
			C	0.14	2.809		1	1	35.769			
T7	481.20	5794.03	A	0.148	2.778	39	1	1	43.809	5400.60	270.03	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
75.00-55.00			B	0.148	2.778		1	1	43.809			
			C	0.148	2.778		1	1	43.809			
T8	360.90	5023.91	A	0.174	2.686	37	1	1	44.248	4653.65	310.24	C
55.00-40.00			B	0.174	2.686		1	1	44.248			
			C	0.174	2.686		1	1	44.248			
T9	481.20	6793.06	A	0.139	2.812	33	1	1	50.643	5176.51	258.83	C
40.00-20.00			B	0.139	2.812		1	1	50.643			
			C	0.139	2.812		1	1	50.643			
T10	481.20	8126.54	A	0.137	2.82	29	1	1	54.927	4786.54	239.33	C
20.00-0.00			B	0.137	2.82		1	1	54.927			
			C	0.137	2.82		1	1	54.927			
Sum Weight:	3968.90	48831.58						OTM	3450158.2 8 lb-ft	41596.58		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	49	0.825	1	10.683	1285.42	64.27	C
195.00-175.00			B	0.163	2.723		0.825	1	10.683			
			C	0.163	2.723		0.825	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	48	0.825	1	16.322	2683.69	134.18	C
175.00-155.00			B	0.165	2.718		0.825	1	16.322			
			C	0.165	2.718		0.825	1	16.322			
T3	412.00	3572.06	A	0.144	2.794	47	0.825	1	18.195	3356.17	167.81	C
155.00-135.00			B	0.144	2.794		0.825	1	18.195			
			C	0.144	2.794		0.825	1	18.195			
T4	481.20	4036.07	A	0.145	2.791	45	0.825	1	22.798	3970.68	198.53	C
135.00-115.00			B	0.145	2.791		0.825	1	22.798			
			C	0.145	2.791		0.825	1	22.798			
T5	481.20	4789.76	A	0.133	2.835	43	0.825	1	24.996	4095.16	204.76	C
115.00-95.00			B	0.133	2.835		0.825	1	24.996			
			C	0.133	2.835		0.825	1	24.996			
T6	481.20	5354.18	A	0.14	2.809	42	0.825	1	30.867	4476.49	223.82	C
95.00-75.00			B	0.14	2.809		0.825	1	30.867			
			C	0.14	2.809		0.825	1	30.867			
T7	481.20	5794.03	A	0.148	2.778	39	0.825	1	37.566	4821.16	241.06	C
75.00-55.00			B	0.148	2.778		0.825	1	37.566			
			C	0.148	2.778		0.825	1	37.566			
T8	360.90	5023.91	A	0.174	2.686	37	0.825	1	37.599	4095.17	273.01	C
55.00-40.00			B	0.174	2.686		0.825	1	37.599			
			C	0.174	2.686		0.825	1	37.599			
T9	481.20	6793.06	A	0.139	2.812	33	0.825	1	43.244	4585.84	229.29	C
40.00-20.00			B	0.139	2.812		0.825	1	43.244			
			C	0.139	2.812		0.825	1	43.244			
T10	481.20	8126.54	A	0.137	2.82	29	0.825	1	46.865	4228.04	211.40	C
20.00-0.00			B	0.137	2.82		0.825	1	46.865			
			C	0.137	2.82		0.825	1	46.865			
Sum Weight:	3968.90	48831.58						OTM	3161836.1 2 lb-ft	37597.82		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	49	0.8	1	10.683	1285.42	64.27	C
195.00-175.00			B	0.163	2.723		0.8	1	10.683			
			C	0.163	2.723		0.8	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	48	0.8	1	16.033	2651.78	132.59	C
175.00-155.00			B	0.165	2.718		0.8	1	16.033			
			C	0.165	2.718		0.8	1	16.033			
T3	412.00	3572.06	A	0.144	2.794	47	0.8	1	17.858	3318.90	165.94	C
155.00-135.00			B	0.144	2.794		0.8	1	17.858			
			C	0.144	2.794		0.8	1	17.858			
T4	481.20	4036.07	A	0.145	2.791	45	0.8	1	22.331	3920.71	196.04	C
135.00-115.00			B	0.145	2.791		0.8	1	22.331			
			C	0.145	2.791		0.8	1	22.331			
T5	481.20	4789.76	A	0.133	2.835	43	0.8	1	24.463	4039.31	201.97	C
115.00-95.00			B	0.133	2.835		0.8	1	24.463			
			C	0.133	2.835		0.8	1	24.463			
T6	481.20	5354.18	A	0.14	2.809	42	0.8	1	30.166	4406.97	220.35	C
95.00-75.00			B	0.14	2.809		0.8	1	30.166			
			C	0.14	2.809		0.8	1	30.166			
T7	481.20	5794.03	A	0.148	2.778	39	0.8	1	36.674	4738.38	236.92	C
75.00-55.00			B	0.148	2.778		0.8	1	36.674			
			C	0.148	2.778		0.8	1	36.674			
T8	360.90	5023.91	A	0.174	2.686	37	0.8	1	36.649	4015.39	267.69	C
55.00-40.00			B	0.174	2.686		0.8	1	36.649			
			C	0.174	2.686		0.8	1	36.649			
T9	481.20	6793.06	A	0.139	2.812	33	0.8	1	42.186	4501.46	225.07	C
40.00-20.00			B	0.139	2.812		0.8	1	42.186			
			C	0.139	2.812		0.8	1	42.186			
T10	481.20	8126.54	A	0.137	2.82	29	0.8	1	45.713	4148.26	207.41	C
20.00-0.00			B	0.137	2.82		0.8	1	45.713			
			C	0.137	2.82		0.8	1	45.713			
Sum Weight:	3968.90	48831.58						OTM	3120647.2 4 lb-ft	37026.57		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	49	0.85	1	10.683	1285.42	64.27	C
195.00-175.00			B	0.163	2.723		0.85	1	10.683			
			C	0.163	2.723		0.85	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	48	0.85	1	16.611	2715.61	135.78	C
175.00-155.00			B	0.165	2.718		0.85	1	16.611			
			C	0.165	2.718		0.85	1	16.611			
T3	412.00	3572.06	A	0.144	2.794	47	0.85	1	18.532	3393.44	169.67	C
155.00-135.00			B	0.144	2.794		0.85	1	18.532			
			C	0.144	2.794		0.85	1	18.532			
T4	481.20	4036.07	A	0.145	2.791	45	0.85	1	23.265	4020.64	201.03	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
135.00-115.00			B	0.145	2.791		0.85	1	23.265			
			C	0.145	2.791		0.85	1	23.265			
T5	481.20	4789.76	A	0.133	2.835	43	0.85	1	25.529	4151.01	207.55	C
115.00-95.00			B	0.133	2.835		0.85	1	25.529			
			C	0.133	2.835		0.85	1	25.529			
T6	481.20	5354.18	A	0.14	2.809	42	0.85	1	31.567	4546.02	227.30	C
95.00-75.00			B	0.14	2.809		0.85	1	31.567			
			C	0.14	2.809		0.85	1	31.567			
T7	481.20	5794.03	A	0.148	2.778	39	0.85	1	38.458	4903.94	245.20	C
75.00-55.00			B	0.148	2.778		0.85	1	38.458			
			C	0.148	2.778		0.85	1	38.458			
T8	360.90	5023.91	A	0.174	2.686	37	0.85	1	38.549	4174.95	278.33	C
55.00-40.00			B	0.174	2.686		0.85	1	38.549			
			C	0.174	2.686		0.85	1	38.549			
T9	481.20	6793.06	A	0.139	2.812	33	0.85	1	44.301	4670.22	233.51	C
40.00-20.00			B	0.139	2.812		0.85	1	44.301			
			C	0.139	2.812		0.85	1	44.301			
T10	481.20	8126.54	A	0.137	2.82	29	0.85	1	48.017	4307.83	215.39	C
20.00-0.00			B	0.137	2.82		0.85	1	48.017			
			C	0.137	2.82		0.85	1	48.017			
Sum Weight:	3968.90	48831.58						OTM	3203025.0 0 lb-ft	38169.07		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	106.61	3850.02	A	0.365	2.138	8	1	1	26.959	416.58	20.83	C
195.00-175.00			B	0.365	2.138		1	1	26.959			
			C	0.365	2.138		1	1	26.959			
T2	1228.81	4395.28	A	0.285	2.337	8	1	1	30.110	805.73	40.29	C
175.00-155.00			B	0.285	2.337		1	1	30.110			
			C	0.285	2.337		1	1	30.110			
T3	1828.69	5353.02	A	0.247	2.446	7	1	1	33.128	1036.14	51.81	C
155.00-135.00			B	0.247	2.446		1	1	33.128			
			C	0.247	2.446		1	1	33.128			
T4	2128.97	6229.27	A	0.237	2.477	7	1	1	39.655	1209.23	60.46	C
135.00-115.00			B	0.237	2.477		1	1	39.655			
			C	0.237	2.477		1	1	39.655			
T5	2105.31	7168.45	A	0.218	2.538	7	1	1	43.075	1227.95	61.40	C
115.00-95.00			B	0.218	2.538		1	1	43.075			
			C	0.218	2.538		1	1	43.075			
T6	2077.36	8206.74	A	0.218	2.536	7	1	1	51.107	1285.42	64.27	C
95.00-75.00			B	0.218	2.536		1	1	51.107			
			C	0.218	2.536		1	1	51.107			
T7	2042.98	9142.51	A	0.221	2.527	6	1	1	60.027	1328.48	66.42	C
75.00-55.00			B	0.221	2.527		1	1	60.027			
			C	0.221	2.527		1	1	60.027			
T8	1503.21	8317.11	A	0.258	2.414	6	1	1	59.589	1079.69	71.98	C
55.00-40.00			B	0.258	2.414		1	1	59.589			
			C	0.258	2.414		1	1	59.589			
T9	1950.37	10332.13	A	0.203	2.585	5	1	1	67.252	1219.42	60.97	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
40.00-20.00			B	0.203	2.585		1	1	67.252			
			C	0.203	2.585		1	1	67.252			
T10	1525.87	11507.55	A	0.193	2.619	5	1	1	70.756	1059.33	52.97	C
20.00-0.00			B	0.193	2.619		1	1	70.756			
			C	0.193	2.619		1	1	70.756			
Sum Weight:	16498.17	74502.07						OTM	934413.93 lb-ft	10667.97		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	106.61	3850.02	A	0.365	2.138	8	0.825	1	26.959	416.58	20.83	C
195.00-175.00			B	0.365	2.138		0.825	1	26.959			
			C	0.365	2.138		0.825	1	26.959			
T2	1228.81	4395.28	A	0.285	2.337	8	0.825	1	28.088	775.00	38.75	C
175.00-155.00			B	0.285	2.337		0.825	1	28.088			
			C	0.285	2.337		0.825	1	28.088			
T3	1828.69	5353.02	A	0.247	2.446	7	0.825	1	30.768	999.60	49.98	C
155.00-135.00			B	0.247	2.446		0.825	1	30.768			
			C	0.247	2.446		0.825	1	30.768			
T4	2128.97	6229.27	A	0.237	2.477	7	0.825	1	36.386	1159.57	57.98	C
135.00-115.00			B	0.237	2.477		0.825	1	36.386			
			C	0.237	2.477		0.825	1	36.386			
T5	2105.31	7168.45	A	0.218	2.538	7	0.825	1	39.344	1171.95	58.60	C
115.00-95.00			B	0.218	2.538		0.825	1	39.344			
			C	0.218	2.538		0.825	1	39.344			
T6	2077.36	8206.74	A	0.218	2.536	7	0.825	1	46.205	1215.13	60.76	C
95.00-75.00			B	0.218	2.536		0.825	1	46.205			
			C	0.218	2.536		0.825	1	46.205			
T7	2042.98	9142.51	A	0.221	2.527	6	0.825	1	53.784	1244.17	62.21	C
75.00-55.00			B	0.221	2.527		0.825	1	53.784			
			C	0.221	2.527		0.825	1	53.784			
T8	1503.21	8317.11	A	0.258	2.414	6	0.825	1	52.940	999.41	66.63	C
55.00-40.00			B	0.258	2.414		0.825	1	52.940			
			C	0.258	2.414		0.825	1	52.940			
T9	1950.37	10332.13	A	0.203	2.585	5	0.825	1	59.852	1132.56	56.63	C
40.00-20.00			B	0.203	2.585		0.825	1	59.852			
			C	0.203	2.585		0.825	1	59.852			
T10	1525.87	11507.55	A	0.193	2.619	5	0.825	1	62.694	976.35	48.82	C
20.00-0.00			B	0.193	2.619		0.825	1	62.694			
			C	0.193	2.619		0.825	1	62.694			
Sum Weight:	16498.17	74502.07						OTM	893253.99 lb-ft	10090.31		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	106.61	3850.02	A	0.365	2.138	8	0.8	1	26.959	416.58	20.83	C
195.00-175.00			B	0.365	2.138		0.8	1	26.959			
			C	0.365	2.138		0.8	1	26.959			
T2	1228.81	4395.28	A	0.285	2.337	8	0.8	1	27.799	770.61	38.53	C
175.00-155.00			B	0.285	2.337		0.8	1	27.799			
			C	0.285	2.337		0.8	1	27.799			
T3	1828.69	5353.02	A	0.247	2.446	7	0.8	1	30.431	994.38	49.72	C
155.00-135.00			B	0.247	2.446		0.8	1	30.431			
			C	0.247	2.446		0.8	1	30.431			
T4	2128.97	6229.27	A	0.237	2.477	7	0.8	1	35.919	1152.47	57.62	C
135.00-115.00			B	0.237	2.477		0.8	1	35.919			
			C	0.237	2.477		0.8	1	35.919			
T5	2105.31	7168.45	A	0.218	2.538	7	0.8	1	38.810	1163.96	58.20	C
115.00-95.00			B	0.218	2.538		0.8	1	38.810			
			C	0.218	2.538		0.8	1	38.810			
T6	2077.36	8206.74	A	0.218	2.536	7	0.8	1	45.505	1205.09	60.25	C
95.00-75.00			B	0.218	2.536		0.8	1	45.505			
			C	0.218	2.536		0.8	1	45.505			
T7	2042.98	9142.51	A	0.221	2.527	6	0.8	1	52.892	1232.13	61.61	C
75.00-55.00			B	0.221	2.527		0.8	1	52.892			
			C	0.221	2.527		0.8	1	52.892			
T8	1503.21	8317.11	A	0.258	2.414	6	0.8	1	51.990	987.94	65.86	C
55.00-40.00			B	0.258	2.414		0.8	1	51.990			
			C	0.258	2.414		0.8	1	51.990			
T9	1950.37	10332.13	A	0.203	2.585	5	0.8	1	58.795	1120.15	56.01	C
40.00-20.00			B	0.203	2.585		0.8	1	58.795			
			C	0.203	2.585		0.8	1	58.795			
T10	1525.87	11507.55	A	0.193	2.619	5	0.8	1	61.542	964.50	48.22	C
20.00-0.00			B	0.193	2.619		0.8	1	61.542			
			C	0.193	2.619		0.8	1	61.542			
Sum Weight:	16498.17	74502.07						OTM	887374.00 lb-ft	10007.79		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	106.61	3850.02	A	0.365	2.138	8	0.85	1	26.959	416.58	20.83	C
195.00-175.00			B	0.365	2.138		0.85	1	26.959			
			C	0.365	2.138		0.85	1	26.959			
T2	1228.81	4395.28	A	0.285	2.337	8	0.85	1	28.377	779.39	38.97	C
175.00-155.00			B	0.285	2.337		0.85	1	28.377			
			C	0.285	2.337		0.85	1	28.377			
T3	1828.69	5353.02	A	0.247	2.446	7	0.85	1	31.105	1004.82	50.24	C
155.00-135.00			B	0.247	2.446		0.85	1	31.105			
			C	0.247	2.446		0.85	1	31.105			
T4	2128.97	6229.27	A	0.237	2.477	7	0.85	1	36.853	1166.66	58.33	C
135.00-115.00			B	0.237	2.477		0.85	1	36.853			
			C	0.237	2.477		0.85	1	36.853			
T5	2105.31	7168.45	A	0.218	2.538	7	0.85	1	39.877	1179.95	59.00	C
115.00-95.00			B	0.218	2.538		0.85	1	39.877			
			C	0.218	2.538		0.85	1	39.877			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	2077.36	8206.74	A	0.218	2.536	7	0.85	1	46.906	1225.17	61.26	C
95.00-75.00			B	0.218	2.536		0.85	1	46.906			
			C	0.218	2.536		0.85	1	46.906			
T7	2042.98	9142.51	A	0.221	2.527	6	0.85	1	54.676	1256.21	62.81	C
75.00-55.00			B	0.221	2.527		0.85	1	54.676			
			C	0.221	2.527		0.85	1	54.676			
T8	1503.21	8317.11	A	0.258	2.414	6	0.85	1	53.890	1010.87	67.39	C
55.00-40.00			B	0.258	2.414		0.85	1	53.890			
			C	0.258	2.414		0.85	1	53.890			
T9	1950.37	10332.13	A	0.203	2.585	5	0.85	1	60.909	1144.97	57.25	C
40.00-20.00			B	0.203	2.585		0.85	1	60.909			
			C	0.203	2.585		0.85	1	60.909			
T10	1525.87	11507.55	A	0.193	2.619	5	0.85	1	63.846	988.21	49.41	C
20.00-0.00			B	0.193	2.619		0.85	1	63.846			
			C	0.193	2.619		0.85	1	63.846			
Sum Weight:	16498.17	74502.07						OTM	899133.99 lb-ft	10172.84		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	11	1	1	10.683	296.16	14.81	C
195.00-175.00			B	0.163	2.723		1	1	10.683			
			C	0.163	2.723		1	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	11	1	1	18.680	678.35	33.92	C
175.00-155.00			B	0.165	2.718		1	1	18.680			
			C	0.165	2.718		1	1	18.680			
T3	412.00	3572.06	A	0.144	2.794	11	1	1	21.061	846.24	42.31	C
155.00-135.00			B	0.144	2.794		1	1	21.061			
			C	0.144	2.794		1	1	21.061			
T4	481.20	4036.07	A	0.145	2.791	10	1	1	26.725	1011.66	50.58	C
135.00-115.00			B	0.145	2.791		1	1	26.725			
			C	0.145	2.791		1	1	26.725			
T5	481.20	4789.76	A	0.133	2.835	10	1	1	29.354	1048.73	52.44	C
115.00-95.00			B	0.133	2.835		1	1	29.354			
			C	0.133	2.835		1	1	29.354			
T6	481.20	5354.18	A	0.14	2.809	10	1	1	36.525	1160.82	58.04	C
95.00-75.00			B	0.14	2.809		1	1	36.525			
			C	0.14	2.809		1	1	36.525			
T7	481.20	5794.03	A	0.148	2.778	9	1	1	44.673	1262.77	63.14	C
75.00-55.00			B	0.148	2.778		1	1	44.673			
			C	0.148	2.778		1	1	44.673			
T8	360.90	5023.91	A	0.174	2.686	8	1	1	44.777	1082.45	72.16	C
55.00-40.00			B	0.174	2.686		1	1	44.777			
			C	0.174	2.686		1	1	44.777			
T9	481.20	6793.06	A	0.139	2.812	8	1	1	51.269	1204.17	60.21	C
40.00-20.00			B	0.139	2.812		1	1	51.269			
			C	0.139	2.812		1	1	51.269			
T10	481.20	8126.54	A	0.137	2.82	7	1	1	55.522	1112.32	55.62	C
20.00-0.00			B	0.137	2.82		1	1	55.522			
			C	0.137	2.82		1	1	55.522			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	3968.90	48831.58						OTM	805409.90 lb-ft	9703.67		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	11	0.825	1	10.683	296.16	14.81	C
195.00-175.00			B	0.163	2.723		0.825	1	10.683			
			C	0.163	2.723		0.825	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	11	0.825	1	16.658	626.88	31.34	C
175.00-155.00			B	0.165	2.718		0.825	1	16.658			
			C	0.165	2.718		0.825	1	16.658			
T3	412.00	3572.06	A	0.144	2.794	11	0.825	1	18.700	786.12	39.31	C
155.00-135.00			B	0.144	2.794		0.825	1	18.700			
			C	0.144	2.794		0.825	1	18.700			
T4	481.20	4036.07	A	0.145	2.791	10	0.825	1	23.456	931.08	46.55	C
135.00-115.00			B	0.145	2.791		0.825	1	23.456			
			C	0.145	2.791		0.825	1	23.456			
T5	481.20	4789.76	A	0.133	2.835	10	0.825	1	25.623	958.66	47.93	C
115.00-95.00			B	0.133	2.835		0.825	1	25.623			
			C	0.133	2.835		0.825	1	25.623			
T6	481.20	5354.18	A	0.14	2.809	10	0.825	1	31.623	1048.69	52.43	C
95.00-75.00			B	0.14	2.809		0.825	1	31.623			
			C	0.14	2.809		0.825	1	31.623			
T7	481.20	5794.03	A	0.148	2.778	9	0.825	1	38.430	1129.26	56.46	C
75.00-55.00			B	0.148	2.778		0.825	1	38.430			
			C	0.148	2.778		0.825	1	38.430			
T8	360.90	5023.91	A	0.174	2.686	8	0.825	1	38.128	953.78	63.59	C
55.00-40.00			B	0.174	2.686		0.825	1	38.128			
			C	0.174	2.686		0.825	1	38.128			
T9	481.20	6793.06	A	0.139	2.812	8	0.825	1	43.869	1068.08	53.40	C
40.00-20.00			B	0.139	2.812		0.825	1	43.869			
			C	0.139	2.812		0.825	1	43.869			
T10	481.20	8126.54	A	0.137	2.82	7	0.825	1	47.460	983.64	49.18	C
20.00-0.00			B	0.137	2.82		0.825	1	47.460			
			C	0.137	2.82		0.825	1	47.460			
Sum Weight:	3968.90	48831.58						OTM	738980.47 lb-ft	8782.35		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	11	0.8	1	10.683	296.16	14.81	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
195.00-175.00			B	0.163	2.723		0.8	1	10.683			
			C	0.163	2.723		0.8	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	11	0.8	1	16.370	619.52	30.98	C
175.00-155.00			B	0.165	2.718		0.8	1	16.370			
			C	0.165	2.718		0.8	1	16.370			
T3	412.00	3572.06	A	0.144	2.794	11	0.8	1	18.363	777.54	38.88	C
155.00-135.00			B	0.144	2.794		0.8	1	18.363			
			C	0.144	2.794		0.8	1	18.363			
T4	481.20	4036.07	A	0.145	2.791	10	0.8	1	22.989	919.57	45.98	C
135.00-115.00			B	0.145	2.791		0.8	1	22.989			
			C	0.145	2.791		0.8	1	22.989			
T5	481.20	4789.76	A	0.133	2.835	10	0.8	1	25.090	945.79	47.29	C
115.00-95.00			B	0.133	2.835		0.8	1	25.090			
			C	0.133	2.835		0.8	1	25.090			
T6	481.20	5354.18	A	0.14	2.809	10	0.8	1	30.923	1032.67	51.63	C
95.00-75.00			B	0.14	2.809		0.8	1	30.923			
			C	0.14	2.809		0.8	1	30.923			
T7	481.20	5794.03	A	0.148	2.778	9	0.8	1	37.538	1110.19	55.51	C
75.00-55.00			B	0.148	2.778		0.8	1	37.538			
			C	0.148	2.778		0.8	1	37.538			
T8	360.90	5023.91	A	0.174	2.686	8	0.8	1	37.179	935.39	62.36	C
55.00-40.00			B	0.174	2.686		0.8	1	37.179			
			C	0.174	2.686		0.8	1	37.179			
T9	481.20	6793.06	A	0.139	2.812	8	0.8	1	42.812	1048.64	52.43	C
40.00-20.00			B	0.139	2.812		0.8	1	42.812			
			C	0.139	2.812		0.8	1	42.812			
T10	481.20	8126.54	A	0.137	2.82	7	0.8	1	46.308	965.26	48.26	C
20.00-0.00			B	0.137	2.82		0.8	1	46.308			
			C	0.137	2.82		0.8	1	46.308			
Sum Weight:	3968.90	48831.58						OTM	729490.56 lb-ft	8650.74		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	11	0.85	1	10.683	296.16	14.81	C
195.00-175.00			B	0.163	2.723		0.85	1	10.683			
			C	0.163	2.723		0.85	1	10.683			
T2	280.30	2793.29	A	0.165	2.718	11	0.85	1	16.947	634.23	31.71	C
175.00-155.00			B	0.165	2.718		0.85	1	16.947			
			C	0.165	2.718		0.85	1	16.947			
T3	412.00	3572.06	A	0.144	2.794	11	0.85	1	19.037	794.71	39.74	C
155.00-135.00			B	0.144	2.794		0.85	1	19.037			
			C	0.144	2.794		0.85	1	19.037			
T4	481.20	4036.07	A	0.145	2.791	10	0.85	1	23.923	942.59	47.13	C
135.00-115.00			B	0.145	2.791		0.85	1	23.923			
			C	0.145	2.791		0.85	1	23.923			
T5	481.20	4789.76	A	0.133	2.835	10	0.85	1	26.156	971.53	48.58	C
115.00-95.00			B	0.133	2.835		0.85	1	26.156			
			C	0.133	2.835		0.85	1	26.156			
T6	481.20	5354.18	A	0.14	2.809	10	0.85	1	32.323	1064.71	53.24	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
95.00-75.00			B	0.14	2.809		0.85	1	32.323			
			C	0.14	2.809		0.85	1	32.323			
T7	481.20	5794.03	A	0.148	2.778	9	0.85	1	39.321	1148.34	57.42	C
75.00-55.00			B	0.148	2.778		0.85	1	39.321			
			C	0.148	2.778		0.85	1	39.321			
T8	360.90	5023.91	A	0.174	2.686	8	0.85	1	39.078	972.16	64.81	C
55.00-40.00			B	0.174	2.686		0.85	1	39.078			
			C	0.174	2.686		0.85	1	39.078			
T9	481.20	6793.06	A	0.139	2.812	8	0.85	1	44.926	1087.53	54.38	C
40.00-20.00			B	0.139	2.812		0.85	1	44.926			
			C	0.139	2.812		0.85	1	44.926			
T10	481.20	8126.54	A	0.137	2.82	7	0.85	1	48.612	1002.02	50.10	C
20.00-0.00			B	0.137	2.82		0.85	1	48.612			
			C	0.137	2.82		0.85	1	48.612			
Sum Weight:	3968.90	48831.58						OTM	748470.39 lb-ft	8913.97		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	29308.81					
Bracing Weight	19522.77					
Total Member Self-Weight	48831.58			-6443.98	6291.11	
Total Weight	66848.48			-6443.98	6291.11	
Wind 0 deg - No Ice		0.00	-61921.67	-6910839.45	6291.11	-14568.57
Wind 30 deg - No Ice		29230.44	-50657.44	-5771802.16	-3319910.35	-29884.18
Wind 45 deg - No Ice		40934.15	-40957.69	-4684714.28	-4668543.17	-34721.36
Wind 60 deg - No Ice		49639.18	-28675.83	-3293886.20	-5683517.58	-37192.35
Wind 90 deg - No Ice		58460.89	0.00	-6443.98	-6646111.81	-34534.86
Wind 120 deg - No Ice		53596.92	30960.84	3445753.76	-5968882.51	-22623.78
Wind 135 deg - No Ice		42549.89	42573.43	4788326.07	-4785042.91	-14118.30
Wind 150 deg - No Ice		29230.44	50657.44	5758914.20	-3319910.35	-4650.68
Wind 180 deg - No Ice		0.00	57351.67	6568440.46	6291.11	14568.57
Wind 210 deg - No Ice		-29230.44	50657.44	5758914.20	3332492.58	29884.18
Wind 225 deg - No Ice		-40934.15	40957.69	4671826.33	4681125.40	34721.36
Wind 240 deg - No Ice		-53596.92	30960.84	3445753.76	5981464.74	37192.35
Wind 270 deg - No Ice		-58460.89	0.00	-6443.98	6658694.04	34534.86
Wind 300 deg - No Ice		-49639.18	-28675.83	-3293886.20	5696099.81	22623.78
Wind 315 deg - No Ice		-40934.15	-40957.69	-4684714.28	4681125.40	14118.30
Wind 330 deg - No Ice		-29230.44	-50657.44	-5771802.16	3332492.58	4650.68
Member Ice	25670.49					
Total Weight Ice	116088.63			-61235.65	18919.57	
Wind 0 deg - Ice		0.00	-15201.95	-1763799.90	18919.57	-5511.69
Wind 30 deg - Ice		7350.57	-12736.48	-1505146.21	-814307.69	-12065.98
Wind 45 deg - Ice		10336.92	-10340.94	-1236025.91	-1155283.94	-14210.82
Wind 60 deg - Ice		12588.62	-7270.89	-888997.81	-1414087.94	-15387.21
Wind 90 deg - Ice		14701.13	0.00	-61235.65	-1647534.95	-14585.44
Wind 120 deg - Ice		13160.35	7600.98	790046.47	-1454825.71	-9875.51
Wind 135 deg - Ice		10570.33	10574.35	1130185.73	-1171915.07	-6416.11
Wind 150 deg - Ice		7350.57	12736.48	1382674.91	-814307.69	-2519.45
Wind 180 deg - Ice		0.00	14541.77	1594288.67	18919.57	5511.69

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Wind 210 deg - Ice		-7350.57	12736.48	1382674.91	852146.83	12065.98
Wind 225 deg - Ice		-10336.92	10340.94	1113554.60	1193123.08	14210.82
Wind 240 deg - Ice		-13160.35	7600.98	790046.47	1492664.84	15387.21
Wind 270 deg - Ice		-14701.13	0.00	-61235.65	1685374.09	14585.44
Wind 300 deg - Ice		-12588.62	-7270.89	-888997.81	1451927.07	9875.51
Wind 315 deg - Ice		-10336.92	-10340.94	-1236025.91	1193123.08	6416.11
Wind 330 deg - Ice		-7350.57	-12736.48	-1505146.21	852146.83	2519.45
Total Weight	66848.48			-6443.98	6291.11	
Wind 0 deg - Service		0.00	-14386.57	-1592727.92	0.00	-3356.60
Wind 30 deg - Service		6794.60	-11775.24	-1328887.87	-771603.53	-6885.31
Wind 45 deg - Service		9515.95	-9521.37	-1076755.22	-1084501.80	-7999.80
Wind 60 deg - Service		11540.63	-6666.82	-754135.17	-1320019.50	-8569.12
Wind 90 deg - Service		13589.20	0.00	8538.23	-1543207.07	-7956.83
Wind 120 deg - Service		12452.49	7193.28	809171.31	-1385767.58	-5212.52
Wind 135 deg - Service		9888.22	9893.64	1120673.23	-1111343.34	-3252.86
Wind 150 deg - Service		6794.60	11775.24	1345964.34	-771603.53	-1071.52
Wind 180 deg - Service		0.00	13333.64	1533885.04	0.00	3356.60
Wind 210 deg - Service		-6794.60	11775.24	1345964.34	771603.53	6885.31
Wind 225 deg - Service		-9515.95	9521.37	1093831.69	1084501.80	7999.80
Wind 240 deg - Service		-12452.49	7193.28	809171.31	1385767.58	8569.12
Wind 270 deg - Service		-13589.20	0.00	8538.23	1543207.07	7956.83
Wind 300 deg - Service		-11540.63	-6666.82	-754135.17	1320019.50	5212.52
Wind 315 deg - Service		-9515.95	-9521.37	-1076755.22	1084501.80	3252.86
Wind 330 deg - Service		-6794.60	-11775.24	-1328887.87	771603.53	1071.52

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 45 deg - No Ice
7	0.9 Dead+1.0 Wind 45 deg - No Ice
8	1.2 Dead+1.0 Wind 60 deg - No Ice
9	0.9 Dead+1.0 Wind 60 deg - No Ice
10	1.2 Dead+1.0 Wind 90 deg - No Ice
11	0.9 Dead+1.0 Wind 90 deg - No Ice
12	1.2 Dead+1.0 Wind 120 deg - No Ice
13	0.9 Dead+1.0 Wind 120 deg - No Ice
14	1.2 Dead+1.0 Wind 135 deg - No Ice
15	0.9 Dead+1.0 Wind 135 deg - No Ice
16	1.2 Dead+1.0 Wind 150 deg - No Ice
17	0.9 Dead+1.0 Wind 150 deg - No Ice
18	1.2 Dead+1.0 Wind 180 deg - No Ice
19	0.9 Dead+1.0 Wind 180 deg - No Ice
20	1.2 Dead+1.0 Wind 210 deg - No Ice
21	0.9 Dead+1.0 Wind 210 deg - No Ice
22	1.2 Dead+1.0 Wind 225 deg - No Ice
23	0.9 Dead+1.0 Wind 225 deg - No Ice
24	1.2 Dead+1.0 Wind 240 deg - No Ice
25	0.9 Dead+1.0 Wind 240 deg - No Ice
26	1.2 Dead+1.0 Wind 270 deg - No Ice
27	0.9 Dead+1.0 Wind 270 deg - No Ice

Comb. No.	Description
28	1.2 Dead+1.0 Wind 300 deg - No Ice
29	0.9 Dead+1.0 Wind 300 deg - No Ice
30	1.2 Dead+1.0 Wind 315 deg - No Ice
31	0.9 Dead+1.0 Wind 315 deg - No Ice
32	1.2 Dead+1.0 Wind 330 deg - No Ice
33	0.9 Dead+1.0 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	195 - 175	Leg	Max Tension	19	13531.58	-217.89	1.36
			Max. Compression	24	-18772.80	667.51	-29.06
			Max. Mx	8	6761.48	1032.31	1.36
			Max. My	32	-2770.76	-2.21	-1009.85
			Max. Vy	8	1085.28	-159.06	-104.43
			Max. Vx	12	1868.71	-83.85	-182.26
		Diagonal	Max Tension	10	4424.15	0.00	0.00
			Max. Compression	10	-4490.15	0.00	0.00
			Max. Mx	44	430.60	-11.36	0.70
			Max. My	26	-2921.65	-4.93	-3.84
			Max. Vy	46	-16.12	-11.32	-1.20
			Max. Vx	26	1.26	-4.93	-3.84
		Top Girt	Max Tension	19	225.94	0.00	0.00
			Max. Compression	12	-248.61	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	34	-28.03	26.72	0.00
			Max. My	26	-10.29	0.00	0.00
			Max. Vy	34	-21.38	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	3	471.05	0.00	0.00
			Max. Compression	28	-518.48	0.00	0.00
			Max. Mx	34	-58.89	38.48	0.00
			Max. My	14	-150.48	0.00	-0.00
			Max. Vy	34	-25.65	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
T2	175 - 155	Leg	Max Tension	19	48565.20	-342.71	-8.29
			Max. Compression	24	-59416.17	194.94	2.49
			Max. Mx	8	19363.70	1771.83	32.45
			Max. My	32	-5880.55	-49.88	-1745.98
			Max. Vy	18	-1253.95	-710.03	-9.34
			Max. Vx	10	1180.66	-26.76	584.82
		Diagonal	Max Tension	10	7487.59	0.00	0.00
			Max. Compression	10	-7596.26	0.00	0.00
			Max. Mx	44	770.29	27.98	-3.33
			Max. My	26	-6887.72	3.24	17.96
			Max. Vy	44	26.17	27.98	-3.33
			Max. Vx	26	-4.35	0.00	0.00
T3	155 - 135	Leg	Max Tension	19	89604.50	-766.90	-12.91
			Max. Compression	24	-106642.60	15.39	-36.27
			Max. Mx	18	73999.66	1537.08	-12.54
			Max. My	10	-7547.39	-50.33	-1597.06
			Max. Vy	18	-1085.86	-946.22	-12.54
			Max. Vx	26	-1032.09	-36.40	-741.95
		Diagonal	Max Tension	10	8391.90	0.00	0.00
			Max. Compression	10	-8434.08	0.00	0.00
			Max. Mx	43	1535.51	49.39	-6.64
			Max. My	26	-8073.83	6.73	10.94
			Max. Vy	43	39.68	49.39	-6.64
			Max. Vx	26	-2.49	0.00	0.00
T4	135 - 115	Leg	Max Tension	19	129333.98	-170.05	-10.45
			Max. Compression	24	-150753.89	347.50	-42.37
			Max. Mx	13	-147407.32	349.13	25.15
			Max. My	26	-10443.71	-6.48	-337.91
			Max. Vy	18	111.17	-278.43	-11.72
			Max. Vx	26	135.41	-13.78	-261.00
		Diagonal	Max Tension	10	7902.48	0.00	0.00
			Max. Compression	10	-7969.47	0.00	0.00
			Max. Mx	48	1517.08	71.21	-8.95
			Max. My	35	34.26	61.55	9.62
			Max. Vy	48	50.50	71.21	-8.95
			Max. Vx	35	-2.75	0.00	0.00
T5	115 - 95	Leg	Max Tension	19	163392.74	-237.15	-12.39
			Max. Compression	24	-190066.85	216.46	-40.89
			Max. Mx	13	-160393.96	349.13	25.15
			Max. My	26	-10746.52	-6.49	-337.91
			Max. Vy	18	-90.19	-337.86	-16.79
			Max. Vx	10	113.94	-6.49	337.66
		Diagonal	Max Tension	4	7857.23	0.00	0.00
			Max. Compression	4	-7979.04	0.00	0.00
			Max. Mx	48	1448.10	111.77	-13.85
			Max. My	46	-258.72	108.20	-14.64
			Max. Vy	48	70.26	111.77	-13.85
			Max. Vx	46	3.69	0.00	0.00
T6	95 - 75	Leg	Max Tension	19	194334.95	-253.53	-12.09
			Max. Compression	24	-227053.88	207.22	-33.67
			Max. Mx	18	181075.73	-270.59	-11.52

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	26	-14494.64	-13.11	-312.99
			Max. Vy	18	77.99	-270.59	-11.52
			Max. Vx	26	108.86	-13.11	-312.99
		Diagonal	Max Tension	4	8451.91	0.00	0.00
			Max. Compression	4	-8524.65	0.00	0.00
			Max. Mx	48	1460.38	147.10	-18.30
			Max. My	46	34.77	130.68	-19.30
			Max. Vy	48	83.54	147.10	-18.30
			Max. Vx	46	4.32	0.00	0.00
T7	75 - 55	Leg	Max Tension	19	223624.06	-313.98	-13.21
			Max. Compression	24	-262982.39	90.30	-0.95
			Max. Mx	18	219586.42	-325.30	-13.29
			Max. My	26	-17172.08	-42.68	-400.16
			Max. Vy	18	-111.34	-325.30	-13.29
			Max. Vx	10	142.94	-42.68	399.47
		Diagonal	Max Tension	4	9205.75	0.00	0.00
			Max. Compression	4	-9329.87	0.00	0.00
			Max. Mx	48	1416.91	185.48	-22.98
			Max. My	46	-22.49	167.24	-24.07
			Max. Vy	48	94.49	185.48	-22.98
			Max. Vx	46	4.83	0.00	0.00
T8	55 - 40	Leg	Max Tension	29	246240.52	-117.45	-3.33
			Max. Compression	2	-291570.85	634.14	30.16
			Max. Mx	43	29826.95	-684.76	-11.14
			Max. My	26	-20350.91	-17.09	-565.53
			Max. Vy	43	225.94	-684.76	-11.14
			Max. Vx	10	-148.08	-17.10	565.47
		Diagonal	Max Tension	4	9663.21	0.00	0.00
			Max. Compression	4	-9751.62	0.00	0.00
			Max. Mx	48	1232.31	196.21	-23.67
			Max. My	38	-1569.14	170.90	25.56
			Max. Vy	48	98.49	186.81	-24.10
			Max. Vx	38	4.92	0.00	0.00
T9	40 - 20	Leg	Max Tension	29	273334.03	-296.08	-19.61
			Max. Compression	2	-326388.28	338.06	15.97
			Max. Mx	40	-109766.01	2026.24	10.82
			Max. My	26	-20748.39	-17.09	-565.53
			Max. Vy	43	-497.03	-1278.66	-3.82
			Max. Vx	26	140.73	-29.23	-552.77
		Diagonal	Max Tension	20	10636.48	0.00	0.00
			Max. Compression	20	-10807.98	0.00	0.00
			Max. Mx	48	301.87	322.26	-35.53
			Max. My	38	-3289.25	296.23	36.88
			Max. Vy	48	124.46	322.26	-35.53
			Max. Vx	38	-6.18	0.00	0.00
T10	20 - 0	Leg	Max Tension	29	300325.99	-300.96	-22.20
			Max. Compression	2	-362377.55	-0.00	-0.02
			Max. Mx	40	-117395.09	3329.08	4.43
			Max. My	26	-25671.86	-54.32	-658.28
			Max. Vy	43	-960.04	-3042.77	-1.83
			Max. Vx	26	-175.51	-54.33	-658.28
		Diagonal	Max Tension	20	11388.25	0.00	0.00
			Max. Compression	20	-11632.52	0.00	0.00
			Max. Mx	48	-1442.06	460.63	-45.80
			Max. My	38	-5932.74	446.87	47.70
			Max. Vy	48	145.79	460.63	-45.80
			Max. Vx	38	-7.25	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	24	367269.46	32685.07	-19911.16
	Max. H_x	24	367269.46	32685.07	-19911.16
	Max. H_z	7	-294635.05	-26121.10	17482.68
	Min. Vert	9	-303683.99	-27423.85	16905.26
	Min. H_x	9	-303683.99	-27423.85	16905.26
	Min. H_z	24	367269.46	32685.07	-19911.16
Leg B	Max. Vert	12	366624.85	-32854.29	-19597.86
	Max. H_x	29	-304167.00	27611.26	16595.67
	Max. H_z	31	-295118.49	26381.62	17040.47
	Min. Vert	29	-304167.00	27611.26	16595.67
	Min. H_x	12	366624.85	-32854.29	-19597.86
	Min. H_z	12	366624.85	-32854.29	-19597.86
Leg A	Max. Vert	2	367694.27	-355.95	38280.69
	Max. H_x	27	20339.99	5489.26	1588.46
	Max. H_z	2	367694.27	-355.95	38280.69
	Min. Vert	19	-303678.16	361.84	-32214.78
	Min. H_x	11	20340.16	-5497.98	1588.60
	Min. H_z	19	-303678.16	361.84	-32214.78

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	66848.48	0.00	0.00	-6444.54	6291.12	0.00
1.2 Dead+1.0 Wind 0 deg - No Ice	80218.17	-0.00	-61921.67	-6938976.26	7598.20	-14594.29
0.9 Dead+1.0 Wind 0 deg - No Ice	60163.63	-0.00	-61921.67	-6930296.54	5699.96	-14587.91
1.2 Dead+1.0 Wind 30 deg - No Ice	80218.17	29230.45	-50657.44	-5795710.77	-3331668.25	-29892.56
0.9 Dead+1.0 Wind 30 deg - No Ice	60163.63	29230.45	-50657.44	-5788097.80	-3330279.87	-29893.68
1.2 Dead+1.0 Wind 45 deg - No Ice	80218.17	40934.16	-40957.69	-4704394.99	-4685628.62	-34718.37
0.9 Dead+1.0 Wind 45 deg - No Ice	60163.63	40934.16	-40957.69	-4697846.99	-4682902.13	-34718.85
1.2 Dead+1.0 Wind 60 deg - No Ice	80218.17	49639.18	-28675.84	-3308122.74	-5704639.46	-37181.48
0.9 Dead+1.0 Wind 60 deg - No Ice	60163.63	49639.18	-28675.84	-3302945.54	-5700899.12	-37183.56
1.2 Dead+1.0 Wind 90 deg - No Ice	80218.17	58460.89	-0.00	-7735.80	-6670964.44	-34515.73
0.9 Dead+1.0 Wind 90 deg - No Ice	60163.63	58460.89	-0.00	-5812.71	-6666294.79	-34501.34
1.2 Dead+1.0 Wind 120 deg - No Ice	80218.17	53596.92	30960.84	3457917.43	-5990878.79	-22594.60
0.9 Dead+1.0 Wind 120 deg - No Ice	60163.63	53596.92	30960.84	3456460.51	-5986924.09	-22602.21
1.2 Dead+1.0 Wind 135 deg - No Ice	80218.17	42549.90	42573.43	4805793.24	-4802503.72	-14089.59
0.9 Dead+1.0 Wind 135 deg - No Ice	60163.63	42549.89	42573.43	4803010.61	-4799690.39	-14106.65
1.2 Dead+1.0 Wind 150 deg -	80218.17	29230.44	50657.44	5780286.32	-3331684.94	-4620.52

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
No Ice						
0.9 Dead+1.0 Wind 150 deg - No Ice	60164.10	29229.68	50658.05	5776514.67	-3330301.30	-4636.04
1.2 Dead+1.0 Wind 180 deg - No Ice	80218.17	-0.00	57351.67	6593066.26	7594.86	14590.62
0.9 Dead+1.0 Wind 180 deg - No Ice	60163.63	-0.00	57351.67	6588477.47	5697.25	14584.75
1.2 Dead+1.0 Wind 210 deg - No Ice	80218.17	-29230.44	50657.44	5780268.56	3346864.19	29892.68
0.9 Dead+1.0 Wind 210 deg - No Ice	60163.63	-29230.44	50657.44	5776498.23	3341681.18	29893.79
1.2 Dead+1.0 Wind 225 deg - No Ice	80218.17	-40934.15	40957.69	4688932.50	4700821.99	34713.56
0.9 Dead+1.0 Wind 225 deg - No Ice	60163.63	-40934.15	40957.69	4686231.40	4694303.42	34736.30
1.2 Dead+1.0 Wind 240 deg - No Ice	80218.17	-53596.92	30960.84	3457901.52	6006036.22	37189.20
0.9 Dead+1.0 Wind 240 deg - No Ice	60163.63	-53596.92	30960.84	3456443.19	5998286.12	37190.10
1.2 Dead+1.0 Wind 270 deg - No Ice	80218.17	-58460.89	-0.00	-7731.31	6686111.79	34515.73
0.9 Dead+1.0 Wind 270 deg - No Ice	60163.63	-58460.89	-0.00	-5809.35	6677646.07	34501.37
1.2 Dead+1.0 Wind 300 deg - No Ice	80218.17	-49639.18	-28675.84	-3308099.47	5719799.30	22590.81
0.9 Dead+1.0 Wind 300 deg - No Ice	60163.63	-49639.18	-28675.84	-3302923.14	5712262.63	22598.77
1.2 Dead+1.0 Wind 315 deg - No Ice	80218.17	-40934.16	-40957.69	-4704368.49	4700801.49	14082.27
0.9 Dead+1.0 Wind 315 deg - No Ice	60163.63	-40934.16	-40957.69	-4697822.09	4694277.49	14092.70
1.2 Dead+1.0 Wind 330 deg - No Ice	80218.17	-29230.45	-50657.44	-5795689.06	3346852.16	4620.30
0.9 Dead+1.0 Wind 330 deg - No Ice	60164.10	-29231.36	-50657.08	-5788079.07	3341663.59	4635.85
1.2 Dead+1.0 Ice+1.0 Temp	129458.33	0.00	0.00	-62541.41	20176.30	-0.36
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	129458.33	0.00	-15201.95	-1775544.68	20281.93	-5525.37
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	129458.33	7350.57	-12736.47	-1515385.10	-817985.80	-12091.95
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	129458.33	10336.92	-10340.94	-1244645.83	-1161031.63	-14240.07
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	129458.33	12588.62	-7270.88	-895540.98	-1421420.32	-15415.60
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	129458.33	14701.13	0.00	-62750.96	-1656256.84	-14614.77
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	129458.33	13160.35	7600.97	793650.56	-1462333.64	-9894.77
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	129458.33	10570.33	10574.34	1135856.07	-1177736.90	-6427.96
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	129458.33	7350.57	12736.47	1389892.63	-817981.79	-2522.22
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	129458.33	0.00	14541.77	1602818.22	20291.61	5524.00
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	129458.33	-7350.56	12736.47	1389893.81	858558.77	12091.97
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	129458.33	-10336.92	10340.94	1119152.31	1201603.00	14239.93
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	129458.33	-13160.35	7600.97	793654.41	1502903.24	15420.08
1.2 Dead+1.0 Wind 270	129458.33	-14701.13	0.00	-62744.63	1696822.21	14614.77

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 300	129458.33	-12588.62	-7270.88	-895531.61	1461986.22	9891.33
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 315	129458.33	-10336.92	-10340.94	-1244638.13	1201594.83	6425.56
deg+1.0 Ice+1.0 Temp						
1.2 Dead+1.0 Wind 330	129458.33	-7350.56	-12736.47	-1515378.90	858549.43	2522.58
deg+1.0 Ice+1.0 Temp						
Dead+Wind 0 deg - Service	66848.48	-0.00	-14386.57	-1612885.98	6309.53	-3361.22
Dead+Wind 30 deg - Service	66848.48	6794.60	-11775.24	-1348227.86	-767819.30	-6884.34
Dead+Wind 45 deg - Service	66848.48	9515.95	-9521.37	-1095275.56	-1081747.84	-7998.18
Dead+Wind 60 deg - Service	66848.48	11540.63	-6666.82	-771602.79	-1318044.33	-8567.23
Dead+Wind 90 deg - Service	66848.48	13589.20	-0.00	-6431.88	-1541950.60	-7953.00
Dead+Wind 120 deg - Service	66848.48	12452.49	7193.28	796803.13	-1383957.88	-5206.60
Dead+Wind 135 deg - Service	66848.48	9888.22	9893.64	1109331.38	-1108655.71	-3242.24
Dead+Wind 150 deg - Service	66848.48	6794.60	11775.24	1335375.73	-767819.56	-1064.65
Dead+Wind 180 deg - Service	66848.48	0.00	13333.64	1523924.80	6308.89	3361.23
Dead+Wind 210 deg - Service	66848.48	-6794.60	11775.24	1335373.90	780439.51	6884.24
Dead+Wind 225 deg - Service	66848.48	-9515.95	9521.37	1082421.09	1094363.02	7998.22
Dead+Wind 240 deg - Service	66848.48	-12452.49	7193.28	796802.96	1396574.44	8568.26
Dead+Wind 270 deg - Service	66848.48	-13589.20	-0.00	-6431.04	1554566.83	7952.98
Dead+Wind 300 deg - Service	66848.48	-11540.63	-6666.82	-771601.43	1330661.18	5206.52
Dead+Wind 315 deg - Service	66848.48	-9515.95	-9521.37	-1095274.31	1094365.06	3245.37
Dead+Wind 330 deg - Service	66848.48	-6794.60	-11775.24	-1348225.61	780439.55	1064.65

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	lb	lb	lb	lb	lb	lb	
1	0.00	-66848.48	0.00	-0.00	66848.48	-0.00	0.000%
2	-0.00	-80218.17	-61921.67	0.00	80218.17	61921.67	0.000%
3	-0.00	-60163.63	-61921.67	0.00	60163.63	61921.67	0.000%
4	29230.44	-80218.17	-50657.44	-29230.45	80218.17	50657.44	0.000%
5	29230.44	-60163.63	-50657.44	-29230.45	60163.63	50657.44	0.000%
6	40934.15	-80218.17	-40957.69	-40934.16	80218.17	40957.69	0.000%
7	40934.15	-60163.63	-40957.69	-40934.16	60163.63	40957.69	0.000%
8	49639.18	-80218.17	-28675.83	-49639.18	80218.17	28675.84	0.000%
9	49639.18	-60163.63	-28675.83	-49639.18	60163.63	28675.84	0.000%
10	58460.89	-80218.17	0.00	-58460.89	80218.17	0.00	0.000%
11	58460.89	-60163.63	0.00	-58460.89	60163.63	0.00	0.000%
12	53596.92	-80218.17	30960.84	-53596.92	80218.17	-30960.84	0.000%
13	53596.92	-60163.63	30960.84	-53596.92	60163.63	-30960.84	0.000%
14	42549.89	-80218.17	42573.43	-42549.90	80218.17	-42573.43	0.000%
15	42549.89	-60163.63	42573.43	-42549.89	60163.63	-42573.43	0.000%
16	29230.44	-80218.17	50657.44	-29230.44	80218.17	-50657.44	0.000%
17	29230.44	-60163.63	50657.44	-29229.68	60164.10	-50658.05	0.001%
18	0.00	-80218.17	57351.67	0.00	80218.17	-57351.67	0.000%
19	0.00	-60163.63	57351.67	0.00	60163.63	-57351.67	0.000%
20	-29230.44	-80218.17	50657.44	29230.44	80218.17	-50657.44	0.000%
21	-29230.44	-60163.63	50657.44	29230.44	60163.63	-50657.44	0.000%
22	-40934.15	-80218.17	40957.69	40934.15	80218.17	-40957.69	0.000%
23	-40934.15	-60163.63	40957.69	40934.15	60163.63	-40957.69	0.000%
24	-53596.92	-80218.17	30960.84	53596.92	80218.17	-30960.84	0.000%
25	-53596.92	-60163.63	30960.84	53596.92	60163.63	-30960.84	0.000%
26	-58460.89	-80218.17	0.00	58460.89	80218.17	0.00	0.000%
27	-58460.89	-60163.63	0.00	58460.89	60163.63	0.00	0.000%
28	-49639.18	-80218.17	-28675.83	49639.18	80218.17	28675.84	0.000%
29	-49639.18	-60163.63	-28675.83	49639.18	60163.63	28675.84	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
30	-40934.15	-80218.17	-40957.69	40934.16	80218.17	40957.69	0.000%
31	-40934.15	-60163.63	-40957.69	40934.16	60163.63	40957.69	0.000%
32	-29230.44	-80218.17	-50657.44	29230.45	80218.17	50657.44	0.000%
33	-29230.44	-60163.63	-50657.44	29231.36	60164.10	50657.08	0.001%
34	-0.00	-129458.33	0.00	-0.00	129458.33	-0.00	0.000%
35	0.00	-129458.33	-15201.95	-0.00	129458.33	15201.95	0.000%
36	7350.57	-129458.33	-12736.48	-7350.57	129458.33	12736.47	0.000%
37	10336.92	-129458.33	-10340.94	-10336.92	129458.33	10340.94	0.000%
38	12588.62	-129458.33	-7270.89	-12588.62	129458.33	7270.88	0.000%
39	14701.13	-129458.33	0.00	-14701.13	129458.33	-0.00	0.000%
40	13160.35	-129458.33	7600.98	-13160.35	129458.33	-7600.97	0.000%
41	10570.33	-129458.33	10574.35	-10570.33	129458.33	-10574.34	0.000%
42	7350.57	-129458.33	12736.48	-7350.57	129458.33	-12736.47	0.000%
43	-0.00	-129458.33	14541.77	-0.00	129458.33	-14541.77	0.000%
44	-7350.57	-129458.33	12736.48	7350.56	129458.33	-12736.47	0.000%
45	-10336.92	-129458.33	10340.94	10336.92	129458.33	-10340.94	0.000%
46	-13160.35	-129458.33	7600.98	13160.35	129458.33	-7600.97	0.000%
47	-14701.13	-129458.33	0.00	14701.13	129458.33	-0.00	0.000%
48	-12588.62	-129458.33	-7270.89	12588.62	129458.33	7270.88	0.000%
49	-10336.92	-129458.33	-10340.94	10336.92	129458.33	10340.94	0.000%
50	-7350.57	-129458.33	-12736.48	7350.56	129458.33	12736.47	0.000%
51	-0.00	-66848.48	-14386.57	0.00	66848.48	14386.57	0.000%
52	6794.60	-66848.48	-11775.24	-6794.60	66848.48	11775.24	0.000%
53	9515.95	-66848.48	-9521.37	-9515.95	66848.48	9521.37	0.000%
54	11540.63	-66848.48	-6666.82	-11540.63	66848.48	6666.82	0.000%
55	13589.20	-66848.48	0.00	-13589.20	66848.48	0.00	0.000%
56	12452.49	-66848.48	7193.28	-12452.49	66848.48	-7193.28	0.000%
57	9888.22	-66848.48	9893.64	-9888.22	66848.48	-9893.64	0.000%
58	6794.60	-66848.48	11775.24	-6794.60	66848.48	-11775.24	0.000%
59	0.00	-66848.48	13333.64	-0.00	66848.48	-13333.64	0.000%
60	-6794.60	-66848.48	11775.24	6794.60	66848.48	-11775.24	0.000%
61	-9515.95	-66848.48	9521.37	9515.95	66848.48	-9521.37	0.000%
62	-12452.49	-66848.48	7193.28	12452.49	66848.48	-7193.28	0.000%
63	-13589.20	-66848.48	0.00	13589.20	66848.48	0.00	0.000%
64	-11540.63	-66848.48	-6666.82	11540.63	66848.48	6666.82	0.000%
65	-9515.95	-66848.48	-9521.37	9515.95	66848.48	9521.37	0.000%
66	-6794.60	-66848.48	-11775.24	6794.60	66848.48	11775.24	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000001
5	Yes	4	0.00000001	0.00000001
6	Yes	4	0.00000001	0.00000001
7	Yes	4	0.00000001	0.00000001
8	Yes	4	0.00000001	0.00000001
9	Yes	4	0.00000001	0.00000001
10	Yes	4	0.00000001	0.00000001
11	Yes	4	0.00000001	0.00000001
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000001

15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000001
17	Yes	4	0.00000001	0.00000091
18	Yes	4	0.00000001	0.00000001
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000001
21	Yes	4	0.00000001	0.00000001
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000001
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00000001
28	Yes	4	0.00000001	0.00000001
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000001
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000001
33	Yes	4	0.00000001	0.00000091
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000001
36	Yes	4	0.00000001	0.00000001
37	Yes	4	0.00000001	0.00000001
38	Yes	4	0.00000001	0.00000001
39	Yes	4	0.00000001	0.00000001
40	Yes	4	0.00000001	0.00000001
41	Yes	4	0.00000001	0.00000001
42	Yes	4	0.00000001	0.00000001
43	Yes	4	0.00000001	0.00000001
44	Yes	4	0.00000001	0.00000001
45	Yes	4	0.00000001	0.00000001
46	Yes	4	0.00000001	0.00000001
47	Yes	4	0.00000001	0.00000001
48	Yes	4	0.00000001	0.00000001
49	Yes	4	0.00000001	0.00000001
50	Yes	4	0.00000001	0.00000001
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	2.548	62	0.1028	0.0226
T2	175 - 155	2.118	62	0.0993	0.0121

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	155 - 135	1.689	62	0.0926	0.0058
T4	135 - 115	1.302	62	0.0820	0.0074
T5	115 - 95	0.961	62	0.0701	0.0080
T6	95 - 75	0.679	62	0.0564	0.0077
T7	75 - 55	0.449	51	0.0437	0.0067
T8	55 - 40	0.265	51	0.0320	0.0051
T9	40 - 20	0.150	51	0.0233	0.0034
T10	20 - 0	0.050	51	0.0112	0.0016

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	Top Triangular Mount	62	2.484	0.1023	0.0212	561467
180.00	SitePro VFA12-HD	62	2.226	0.1003	0.0151	187155
173.00	Pirod 12' T-Frame Sector Mount (1)	62	2.074	0.0988	0.0108	200110
162.00	MX08FRO665-21	62	1.836	0.0954	0.0057	131149
160.00	Pirod 12' T Frame Sector Mount (1)	62	1.793	0.0947	0.0056	111946
146.00	Pirod 12' T-Frame Sector Mount (1)	62	1.509	0.0882	0.0071	98753

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	10.950	24	0.4351	0.0983
T2	175 - 155	9.116	24	0.4244	0.0528
T3	155 - 135	7.274	24	0.3978	0.0252
T4	135 - 115	5.613	24	0.3528	0.0323
T5	115 - 95	4.141	24	0.3018	0.0348
T6	95 - 75	2.925	2	0.2432	0.0332
T7	75 - 55	1.935	2	0.1883	0.0290
T8	55 - 40	1.142	2	0.1382	0.0223
T9	40 - 20	0.647	2	0.1005	0.0147
T10	20 - 0	0.215	2	0.0480	0.0071

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	Top Triangular Mount	24	10.676	0.4339	0.0922	189055
180.00	SitePro VFA12-HD	24	9.579	0.4281	0.0657	63019
173.00	Pirod 12' T-Frame Sector Mount (1)	24	8.930	0.4226	0.0472	76883
162.00	MX08FRO665-21	24	7.907	0.4095	0.0250	34079
160.00	Pirod 12' T-Frame Sector Mount (1)	24	7.724	0.4064	0.0245	27826
146.00	Pirod 12' T-Frame Sector Mount (1)	24	6.502	0.3791	0.0307	23287

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	195	Leg	A325N	1.1250	4	3382.90	68694.60	0.049 ✔	1	Bolt Tension
T2	175	Leg	A325N	1.1250	6	8094.20	68694.60	0.118 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	7487.58	11092.50	0.675 ✔	1	Member Bearing
T3	155	Leg	A325N	1.1250	6	14934.10	68694.60	0.217 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	8391.90	18487.50	0.454 ✔	1	Member Bearing
T4	135	Leg	A325N	1.1250	6	21555.70	68694.60	0.314 ✔	1	Bolt Tension
		Diagonal	A325N	0.8750	1	7902.48	14790.00	0.534 ✔	1	Member Bearing
T5	115	Leg	A325N	1.1250	8	20424.10	68694.60	0.297 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	7857.23	25447.50	0.309 ✔	1	Member Bearing
T6	95	Leg	A325N	1.1250	8	24291.90	68694.60	0.354 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8451.91	21206.30	0.399 ✔	1	Member Bearing
T7	75	Leg	A325N	1.2500	8	27953.00	87219.80	0.320 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9205.75	16965.00	0.543 ✔	1	Member Bearing
T8	55	Leg	A325N	1.2500	8	30780.10	87219.80	0.353 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9663.21	16965.00	0.570 ✔	1	Member Bearing
T9	40	Leg	A325N	1.2500	8	34166.80	87219.80	0.392 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	10636.50	21206.30	0.502 ✔	1	Member Bearing
T10	20	Leg	A449	1.3750	8	37540.80	103939.00	0.361 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11388.20	25447.50	0.448 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $P_u / \phi P_n$
T1	195 - 175	3	20.01	3.33	53.4 K=1.00	7.0686	-18772.80	258313.00	0.073 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5 K=1.00	11.0447	-59416.20	291317.00	0.204 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1 K=1.00	12.5664	-106643.00	353604.00	0.302 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-150754.00	421170.00	0.358 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T5	115 - 95	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-190067.00	421170.00	0.451 [1]
T6	95 - 75	4 1/2	20.03	6.68	71.2 K=1.00	15.9043	-227054.00	493875.00	0.460 [1]
T7	75 - 55	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-262982.00	571599.00	0.460 [1]
T8	55 - 40	4 3/4	15.03	5.01	50.6 K=1.00	17.7205	-291571.00	661231.00	0.441 [1]
T9	40 - 20	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-326388.00	571599.00	0.571 [1]
T10	20 - 0	5	20.03	6.68	64.1 K=1.00	19.6350	-362378.00	654248.00	0.554 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.79	3.30	114.0 K=0.90	1.2272	-4490.15	20048.60	0.224 [1]
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	119.9 K=1.00	0.9020	-7596.26	17796.90	0.427 [1]
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	140.4 K=1.00	1.4600	-8434.08	21200.60	0.398 [1]
T4	135 - 115	L3x3x1/4	13.44	6.56	132.9 K=1.00	1.4400	-7666.83	23336.40	0.329 [1]
T5	115 - 95	L3x3x3/8	15.21	7.43	151.8 K=1.00	2.1100	-7979.04	26209.50	0.304 [1]
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	144.8 K=1.00	2.0900	-8524.65	28541.90	0.299 [1]
T7	75 - 55	L4x4x1/4	18.88	9.24	139.5 K=1.00	1.9400	-9329.87	28533.90	0.327 [1]
T8	55 - 40	L4x4x1/4	19.89	9.70	146.5 K=1.00	1.9400	-9751.62	25887.60	0.377 [1]
T9	40 - 20	L4x4x5/16	22.19	10.90	165.3 K=1.00	2.4000	-10808.00	25136.10	0.430 [1]
T10	20 - 0	L4x4x3/8	24.11	11.84	180.4 K=1.00	2.8600	-11632.50	25163.60	0.462 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	5.00	4.75	127.7 K=0.70	1.2272	-248.61	16855.20	0.015 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.00	5.75	154.6 K=0.70	1.2272	-1030.40	11605.30	0.089 [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 lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	3	20.01	3.33	53.4	7.0686	13531.60	318086.00	0.043 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5	11.0447	48565.20	497010.00	0.098 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1	12.5664	89604.50	565487.00	0.158 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4	14.1863	129334.00	638381.00	0.203 [1] ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4	14.1863	163393.00	638381.00	0.256 [1] ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2	15.9043	194335.00	715694.00	0.272 [1] ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5	17.7205	223624.00	797425.00	0.280 [1] ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6	17.7205	246241.00	797425.00	0.309 [1] ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5	17.7205	273334.00	797425.00	0.343 [1] ✔
T10	20 - 0	5	20.03	6.68	64.1	19.6350	300326.00	883573.00	0.340 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	195 - 175	1 1/4	6.79	3.30	126.7	1.2272	4424.15	39760.80	0.111 [1] ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	78.6	0.9020	7487.58	29224.80	0.256 [1] ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	92.6	1.4600	8391.90	47304.00	0.177 [1] ✔
T4	135 - 115	L3x3x1/4	12.30	5.99	79.3	1.4400	7902.48	46656.00	0.169 [1] ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	99.8	2.1100	7857.23	68364.00	0.115 [1] ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	94.3	2.0900	8451.91	67716.00	0.125 [1] ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	90.3	1.9400	9205.75	62856.00	0.146 [1] ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	94.7	1.9400	9663.21	62856.00	0.154 [1] ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	107.1	2.4000	10636.50	77760.00	0.137 [1] ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	117.2	2.8600	11388.20	92664.00	0.123 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	195 - 175	1 1/4	5.00	4.75	182.4	1.2272	225.94	39760.80	0.006 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	lb	lb	
T1	195 - 175	1 1/4	6.00	5.75	220.8	1.2272	1030.40	39760.80	0.026 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	195 - 175	Leg	3	1	-18772.80	258313.00	7.3	Pass
T2	175 - 155	Leg	3 3/4	46	-59416.20	291317.00	20.4	Pass
T3	155 - 135	Leg	4	67	-106643.00	353604.00	30.2	Pass
T4	135 - 115	Leg	4 1/4	88	-150754.00	421170.00	35.8	Pass
T5	115 - 95	Leg	4 1/4	109	-190067.00	421170.00	45.1	Pass
T6	95 - 75	Leg	4 1/2	130	-227054.00	493875.00	46.0	Pass
T7	75 - 55	Leg	4 3/4	151	-262982.00	571599.00	46.0	Pass
T8	55 - 40	Leg	4 3/4	174	-291571.00	661231.00	44.1	Pass
T9	40 - 20	Leg	4 3/4	195	-326388.00	571599.00	57.1	Pass
T10	20 - 0	Leg	5	216	-362378.00	654248.00	55.4	Pass
T1	195 - 175	Diagonal	1 1/4	11	-4490.15	20048.60	22.4	Pass
T2	175 - 155	Diagonal	L2 1/2x2 1/2x3/16	50	-7596.26	17796.90	42.7 67.5 (b)	Pass
T3	155 - 135	Diagonal	L2 1/2x2 1/2x5/16	71	-8434.08	21200.60	39.8 45.4 (b)	Pass
T4	135 - 115	Diagonal	L3x3x1/4	92	-7666.83	23336.40	32.9 53.4 (b)	Pass
T5	115 - 95	Diagonal	L3x3x3/8	116	-7979.04	26209.50	30.4 30.9 (b)	Pass
T6	95 - 75	Diagonal	L3 1/2x3 1/2x5/16	137	-8524.65	28541.90	29.9 39.9 (b)	Pass
T7	75 - 55	Diagonal	L4x4x1/4	158	-9329.87	28533.90	32.7 54.3 (b)	Pass
T8	55 - 40	Diagonal	L4x4x1/4	179	-9751.62	25887.60	37.7 57.0 (b)	Pass
T9	40 - 20	Diagonal	L4x4x5/16	201	-10808.00	25136.10	43.0 50.2 (b)	Pass
T10	20 - 0	Diagonal	L4x4x3/8	222	-11632.50	25163.60	46.2	Pass
T1	195 - 175	Top Girt	1 1/4	6	-248.61	16855.20	1.5	Pass
T1	195 - 175	Bottom Girt	1 1/4	9	-1030.40	11605.30	8.9	Pass
							Summary	
							Leg (T9) 57.1	Pass
							Diagonal (T2) 67.5	Pass
							Top Girt (T1) 1.5	Pass
							Bottom Girt (T1) 8.9	Pass
							Bolt Checks 67.5	Pass
							RATING = 67.5	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Northford, CT
Rev. 2: 5/22/23	Prepared by: T.J.L. Checked by: C.F.C. Job No. 22027.13

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 6939 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 62 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 80 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 368 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 304 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 195 \cdot ft$	(User Input)	
Tower Width =	$W_t := 23.5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

Overall Depth of Footing =	$D_f := 6.0 \cdot ft$	(User Input)	
Length of Pier =	$L_p := 4.0 \cdot ft$	(User Input)	
Extension of Pier Above Grade =	$L_{pag} := 0.5 \cdot ft$	(User Input)	
Diameter of Pier =	$d_p := 3.0 \cdot ft$	(User Input)	
Thickness of Footing =	$T_f := 2.5 \cdot ft$	(User Input)	
Width of Footing =	$W_f := 34.0 \cdot ft$	(User Input)	

Material Properties:

Concrete Compressive Strength =	$f_c := 3000 \cdot psi$	(User Input)	
Steel Reinforcment Yield Strength =	$f_y := 60000 \cdot psi$	(User Input)	
Internal Friction Angle of Soil =	$\Phi_s := 30 \cdot deg$	(User Input)	
Allowable Soil Bearing Capacity =	$q_s := 4000 \cdot psf$	(User Input)	
Unit Weight of Soil =	$\gamma_{soil} := 110 \cdot pcf$	(User Input)	
Unit Weight of Concrete =	$\gamma_{conc} := 150 \cdot pcf$	(User Input)	
Foundation Bouyancy =	$Bouyancy := 0$	(User Input)	(Yes=1 / No=0)
Depth to Neglect =	$n := 0 \cdot ft$	(User Input)	
Cohesion of Clay Type Soil =	$c := 0 \cdot ksf$	(User Input)	(Use 0 for Sandy Soil)
Seismic Zone Factor =	$Z := 2$	(User Input)	(UBC-1997 Fig 23-2)
Coefficient of Friction Between Concrete =	$\mu := 0.45$	(User Input)	

Pier Reinforcement:

Bar Size =	$BS_{pier} := 8$	(User Input)	
Bar Diameter =	$d_{bpier} := 1.0 \cdot in$	(User Input)	
Number of Bars =	$NB_{pier} := 20$	(User Input)	
Clear Cover of Reinforcement =	$Cvr_{pier} := 3 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pier} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Diameter of Tie =	$d_{Tie} := 4 \cdot in$	(User Input)	

Pad Reinforcement:

Bar Size =	$BS_{top} := 8$	(User Input)	(Top of Pad)
Bar Diameter =	$d_{btop} := 1.0 \cdot in$	(User Input)	(Top of Pad)
Number of Bars =	$NB_{top} := 34$	(User Input)	(Top of Pad)
Bar Size =	$BS_{bot} := 8$	(User Input)	(Bottom of Pad)
Bar Diameter =	$d_{bbot} := 1.000 \cdot in$	(User Input)	(Bottom of Pad)
Number of Bars =	$NB_{bot} := 34$	(User Input)	(Bottom of Pad)
Clear Cover of Reinforcement =	$Cvr_{pad} := 3.0 \cdot in$	(User Input)	
Reinforcement Location Factor =	$\alpha_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Coating Factor =	$\beta_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Concrete Strength Factor =	$\lambda_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)
Reinforcement Size Factor =	$\gamma_{pad} := 1.0$	(User Input)	(ACI-2008 12.2.4)

Calculated Factors:

Pier Reinforcement Bar Area = $A_{bpier} := \frac{\pi \cdot d_{bpier}^2}{4} = 0.785 \cdot in^2$

Pad Top Reinforcement Bar Area = $A_{btop} := \frac{\pi \cdot d_{btop}^2}{4} = 0.785 \cdot in^2$

Pad Bottom Reinforcement Bar Area = $A_{bbot} := \frac{\pi \cdot d_{bbot}^2}{4} = 0.785 \cdot in^2$

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

Load Factor = $LF := 1$

Stability of Footing:

Adjusted Concrete Unit Weight =

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

Adjusted Soil Unit Weight =

$\gamma_s := if(Bouyancy = 1, \gamma_{soil} - 62.4pcf, \gamma_{soil}) = 110 \cdot pcf$

Passive Pressure =

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

$P_{pt} := K_p \cdot \gamma_s \cdot (D_f - T_f) + c \cdot 2 \cdot \sqrt{K_p} = 1.155 \cdot ksf$

$P_{top} := if[n < (D_f - T_f), P_{pt}, P_{pn}] = 1.155 \cdot ksf$

$P_{bot} := K_p \cdot \gamma_s \cdot D_f + c \cdot 2 \cdot \sqrt{K_p} = 1.98 \cdot ksf$

$P_{ave} := \frac{P_{top} + P_{bot}}{2} = 1.568 \cdot ksf$

$T_p := if[n < (D_f - T_f), T_f, (D_f - n)] = 2.5 \cdot ft$

$A_p := W_f \cdot T_p = 85 \cdot ft^2$

Ultimate Shear =

$S_u := P_{ave} \cdot A_p = 133.238 \cdot kip$

Weight of Concrete =

$WT_c := \left[\left(W_f^2 \cdot T_f\right) + (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4} L_p\right)\right] \cdot \gamma_c = 446.223 \cdot kip$

Weight of Soil Above Footing =

$WT_{s1} := \left[\left[W_f^2 - (3) \cdot \left(\frac{d_p^2 \cdot \pi}{4}\right)\right] \cdot \left(|L_p - L_{pag} - n|\right)\right] \cdot \gamma_s = 436.9 \cdot kip$

Tower Offset =

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

$X_t := if(Pos_t = 1, X_{t1}, X_{t2}) = 10.216$

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

$X_{off} := if(Pos_t = 1, X_{off1}, X_{off2})$ $X_{off} = 0 \cdot ft$

Total Weight =

$WT_{tot} := 0.9WT_c + 0.75WT_{s1} = 729.3 \cdot kip$

Resisting Moment =

$M_r := (WT_{tot}) \cdot \frac{W_f}{2} + 0.9WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75\left(S_u \cdot \frac{T_p}{3}\right) = 13705 \cdot kip \cdot ft$

Overturning Moment =

$M_{ot} := OM + S_t \cdot (L_p + T_f) = 7342 \cdot kip \cdot ft$

Factor of Safety Actual =

$FS := \frac{M_r}{M_{ot}} = 1.87$

Factor of Safety Required =

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

$OverTurning\_Moment\_Check = "Okay"$

Shear Capacity in Pier:

Shear Resistance of Pier =

$$S_p := \frac{P_{ave} \cdot A_p + \mu \cdot WT_{tot}}{FS_{req}} = 461.41 \cdot kips$$

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

Shear_Check = "Okay"

Bearing Pressure Caused by Footing:

Total Load =

$$Load_{tot} := WT_c + WT_{s1} + WT_t = 963 \cdot kip$$

Area of the Mat =

$$A_{mat} := W_f^2 = 1.156 \times 10^3$$

Section Modulus of Mat =

$$S := \frac{W_f^3}{6} = 6550.67 \cdot ft^3$$

Maximum Pressure in Mat =

$$P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 1.954 \cdot ksf$$

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

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat =

$$P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.288 \cdot ksf$$

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

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution =

$$X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 9.879$$

Distance to Kern =

$$X_k := \frac{W_f}{6} = 5.667$$

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

Eccentricity =

$$e := \frac{M_{ot}}{Load_{tot}} = 7.623$$

Adjusted Soil Pressure =

$$P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \left(\frac{W_f}{2} - e\right)} = 2.014 \cdot ksf$$

$$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 2.014 \cdot ksf$$

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

Pressure_Check = "Okay"

Concrete Bearing Capacity:

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

Bearing Strength Between Pier and Pad = $P_b := \Phi_c \cdot 0.85 \cdot f_c \cdot \frac{\pi \cdot d_p^2}{4} = 1.687 \times 10^3 \cdot kips$ (ACI-2008 10.14)

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

Bearing_Check = "Okay"

Shear Strength of Concrete:

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

$\phi_c := 0.85$ (ACI 9.3.2.5)

$d := T_f - Cvr_{pad} - d_{bbot} = 26 \cdot in$

$FL := LF \cdot \frac{C_l}{W_f^2} = 0.318 \cdot ksf$

$V_{req} := FL \cdot \left(X_t - .5 \cdot d_p - d\right) \cdot W_f = 70.888 \cdot kips$

$V_{Avail} := \phi_c \cdot 2 \cdot \sqrt{f_c \cdot psi} \cdot W_f \cdot d = 988 \cdot kip$ (ACI-2008 11.2.1.1)

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

Beam_Shear_Check = "Okay"

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

Critical Perimeter of Punching Shear = $b_o := \left(d_p + d\right) \cdot \pi = 16.2$

Area Included Inside Perimeter = $A_{bo} := \frac{\pi \cdot \left(d_p + d\right)^2}{4} = 21$

Required Shear Strength = $V_{req} := FL \cdot \left(W_f^2 - A_{bo}\right) = 361 \cdot kips$

Available Shear Strength = $V_{Avail} := \phi_c \cdot 4 \cdot \sqrt{f_c \cdot psi} \cdot b_o \cdot d = 943.1 \cdot kip$ (ACI-2008 11.11.2.1)

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

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

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

Maximum Moment in Pad = $M_{max} := 1400 \cdot kip \cdot ft$ (User Input)

Design Moment = $M_n := \frac{LF \cdot M_{max}}{\phi_m} = 1.556 \times 10^3 \cdot kips \cdot ft$

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

(ACI-200810.2.7.3)

$b_{eff} := W_t \cdot \cos(30 \cdot deg) + d_p = 280.219 \cdot in$

$A_s := \frac{M_n}{(f_y \cdot d)} = 11.966 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 1.005 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 12.202 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.0201 \cdot in$

Required Reinforcement for Temperature and Shrinkage:

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

Check Bottom Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 6.6 \cdot in^2$$

$$As_{prov} := A_{bbot} \cdot NB_{bot} = 26.7 \cdot in^2$$

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

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

$$As := if\left(\rho \geq \rho_{sh}, A_s, \rho_{sh} \cdot \frac{b_{eff}}{2} \cdot d\right) = 6.6 \cdot in^2$$

$$As_{prov} := A_{btop} \cdot NB_{top} = 26.7 \cdot in^2$$

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

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

$$B_{sPad} := \frac{W_f - 2 \cdot Cvr_{pad} - NB_{bot} \cdot d_{bbot}}{NB_{bot} - 1} = 11.15 \cdot in$$

Spacing or Cover Dimension =

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

Transverse Reinforcement Index =

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

$$L_{dbt} := \frac{3 \cdot f_y \alpha_{pad} \cdot \beta_{pad} \cdot \gamma_{pad} \cdot \lambda_{pad}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \frac{c + k_{tr}}{d_{bbot}}} \cdot d_{bbot} = 27.4 \cdot in$$

Minimum Development Length =

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

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

Available Length in Pad =

$$L_{Pad} := \frac{W_f}{2} - \frac{W_t}{2} - Cvr_{pad} = 60 \cdot in$$

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

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

Area of Pier = $A_p := \frac{\pi \cdot d_p^2}{4} = 1017.88 \cdot in^2$

$A_{smin} := 0.01 \cdot 0.5 \cdot A_p = 5.09 \cdot in^2$ (ACI-2008 10.8.4 & 10.9.1)

$A_{sprov} := NB_{pier} \cdot A_{bpier} = 15.71 \cdot in^2$

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

Steel_Area_Check = "Okay"

Bar Spacing In Pier = $B_{sPier} := \frac{d_p \cdot \pi}{NB_{pier}} - d_{bpier} = 4.655 \cdot in$

Diameter of Reinforcement Cage = $Diam_{cage} := d_p - 2 \cdot Cvr_{pier} = 30 \cdot in$

Maximum Moment in Pier = $M_p := S_{ft} \cdot (L_p) \cdot LF = 2976 \cdot in \cdot kips$

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

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

$(D\ N\ n\ P_u\ M_{xu}) = (36\ \ 20\ \ 8\ \ 490.544\ \ 2.976 \times 10^3)$

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

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

$(\phi P_n\ \ \phi M_{xn}\ \ f_{sp}\ \ \rho) = (1.53 \times 10^3\ \ 9.282 \times 10^3\ \ -27.766\ \ 0.016)$

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

Axial_Load_Check = "Okay"

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

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

$L_{pier} := L_p - Cvr_{pier} = 45 \cdot in$

$L_{pad} := T_f - Cvr_{pad} = 27 \cdot in$

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

$c := if\left(Cvr_{pier} < \frac{B_{sPier}}{2}, Cvr_{pier}, \frac{B_{sPier}}{2}\right) = 2.327 \cdot in$

Transverse Reinforcement =

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

$L_{dbt} := \frac{3 \cdot f_y \cdot \alpha_{pier} \cdot \beta_{pier} \cdot \gamma_{pier} \cdot \lambda_{pier}}{40 \cdot \sqrt{f_c \cdot psi} \cdot \left(\frac{c + k_{tr}}{d_{bpier}}\right)} \cdot d_{bpier} = 35.3 \cdot in$

Minimum Development Length =

$L_{dh} := \frac{1200 \cdot d_{bpier}}{\sqrt{\frac{f_c}{psi}}} \cdot .7 = 15.336 \cdot in$ (ACI 12.2.1)

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

$L_{db} := \max\left(L_{dbt}, L_{dbmin}\right) = 35.3 \cdot in$

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

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

Compression: (ACI-2008 12.3.2)

$L_{dbc1} := \frac{.02 \cdot d_{bpier} \cdot f_y}{\sqrt{f_c \cdot psi}} = 21.909 \cdot in$

$L_{dbmin} := 0.0003 \cdot \frac{in^2}{lb} \cdot \left(d_{bpier} \cdot f_y\right) = 18 \cdot in$

$L_{dbc} := if\left(L_{dbc1} \geq L_{dbmin}, L_{dbc1}, L_{dbmin}\right) = 21.909 \cdot in$

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

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

verizon
fuze | RFDS

EAST > North East > New England > New England West > NORTHFORD CT

RF Submit by: Cheiban, Ziad - ziad.cheiban@verizonwireless.com - 5/2/2023, 6:39:30 AM

EE Submit by: , - -

Project Details

FUZE Project ID: 2027561
Project Name: NORTHFORD CT-CXR-850-PCS-201507
Project Alt Name: NORTHFORD CT-CXR-850-PCS-201507
Project Type: Modification
Modification Type: RF
Designed Sector Carrier 4G: 18
Designed Sector Carrier 5G: 3
Additional Sector Carrier 4G: N/A
Additional Sector Carrier 5G: N/A
FP Solution Type & Tech Type: MODIFICATION;4G_4TX,4G_850,4G_PCS,5G_850,5G_L-Sub6
Carrier Aggregation: false
MPT Id: 103583
eCIP-0: false
Suffix: Rev6_2023-05-02

Location Information

Site ID: 324546
E-NodeB ID: 0649404,064174
MDG Location ID: 5000383830
PSLC: 469137
Switch Name: Wallingford 1
Tower Owner:
Tower Type: Guyed structure
Site Type: MACRO
Site Sub Type: SPOKE
Street Address: 88 Parsonage Road
City: Northford
State: CT
Zip Code: 06472
County: New Haven
Latitude: 41.368053 / 41° 22' 4.9908" N
Longitude: -72.810553 / 72° 48' 37.9908" W

RFDS Project Scope: Scope: C-Band upgrade and swap RRHs

Rev6_2023-05-02: Corrected RRH count
Rev5_2023-03-16: Removed CDMA antennas and 9 of the 12 coax to reduce tower loading. Changed RRHs to ORAN model. Changed antennas back to Commscope
Rev4_2022-04-26: Added C-Band, changed antennas to JMA
Rev3_2021-04-22: Changed diplexer to Commscope. Added RET table and Plumbing diagram
Rev2: Update equipment inventory

Antenna Summary

Added

700	850	1900	AWS	L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID
				5G	Samsung	MT6407-77A	146	147.5	30(0100) 150(0101) 260(0102)		false	PHYSICAL	3	
LTE	LTE 5G	LTE	LTE		COMMSCOPE	JAHH-65B-R3B	146	149	30(01) 150(02) 260(03) 30(0100) 150(0101) 260(0102)		false	PHYSICAL	6	000000001900055848

Removed

700	850	1900	AWS	L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID
					COMMSCOPE	LNX-6513DS-VTM	146	149			false	PHYSICAL	3	
LTE					AMPHENOL	BXA-70063-6CF	146	149	30(01) 150(02) 260(03)		false	PHYSICAL	3	
					AMPHENOL	BXA-171085-8BF-EDIN	145	148	30(D1) 150(D2) 270(D3)		false	PHYSICAL	3	
			LTE		AMPHENOL	BXA-171063-12CF-EDIN	146	149	30(01) 150(02) 270(03)		false	PHYSICAL	3	

Retained

700	850	1900	AWS	L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID

No data available.

Added: 9 Removed: 12 Retained: 0

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Equipment Summary

Added

Equipment Type	Location	700	850	1900	AWS	L-Sub6	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
RRU	Tower			LTE	LTE		Samsung	B2/B66A RRH ORAN (RF4439d-25A)			PHYSICAL	3	
RRU	Tower	LTE	LTE 5G				Samsung	B5/B13 RRH ORAN (RF4440d-13A)			PHYSICAL	3	
RRU	Tower					5G	Samsung	MT6407-77A			PHYSICAL	0	
Diplexer	Tower						Commscope	CBC78T-DS-43-2X			PHYSICAL	3	
Hybrid Cable	Tower						N/A	6x12 Hybriflex			PHYSICAL	2	
Mount	Tower						Commscope	BASMNT-SBS-2-2			PHYSICAL	3	000000001900059
OVP Box	Tower						N/A	12 OVP			PHYSICAL	1	

Removed

Equipment Type	Location	700	850	1900	AWS	L-Sub6	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
Coaxial Cables	Tower						N/A			1"5/8	PHYSICAL	7	
Diplexer	Tower										PHYSICAL	3	
Hybrid Cable	Tower						N/A	6x12 Hybriflex			PHYSICAL	1	
OVP Box	Tower										PHYSICAL	1	
RRU	Shelter	LTE					Nokia	UHBA B13 RRH 4x30			PHYSICAL	3	
RRU	Tower	LTE					Nokia	UHBA B13 RRH 4x30			PHYSICAL	3	
RRU	Tower				LTE		Nokia	UHID B4 RRH 2x40			PHYSICAL	3	
RRU	Tower				LTE		Nokia	UHID B4 RRH 2x40			PHYSICAL	3	

Retained

Equipment Type	Location	700	850	1900	AWS	L-Sub6	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
Coaxial Cables	Tower										PHYSICAL	3	

Service Info

700 MHz LTE

	0000			0001		
Sector	**01**	**02**	**03**	**01**	**02**	**03**
Azimuth	30	150	260	30	150	260
Cell / ENode B ID	064174	064174	064174	064174	064174	064174
Antenna Model	BXA-70063-6CF	BXA-70063-6CF	BXA-70063-6CF	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make	AMPHENOL	AMPHENOL	AMPHENOL	COMMSCOPE	COMMSCOPE	COMMSCOPE
Antenna Centerline(Ft)	146	146	146	146	146	146
Mechanical Down-Tilt(Deg.)	2	2	3	0	0	4
Electrical Down-Tilt	2	2	8	2	2	8
Tip Height	149	149	149	149	149	149
Regulatory Power	137.33	137.33	137.33	71.71	71.71	71.71
DLEARFCN	5230	5230	5230	5230	5230	5230
Channel Bandwidth(MHz)	10	10	10	10	10	10
Total ERP (W)	1235.95	1235.95	1235.95	645.36	645.36	645.36
TMA Make						
TMA Model						
RRU Make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU Model	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	UHBA B13 RRH 4x30	B5/B13 RRH ORAN (RF4440d-13A)	B5/B13 RRH ORAN (RF4440d-13A)	B5/B13 RRH ORAN (RF4440d-13A)
Number of Tx, Rx Lines	2,4	2,4	2,4	4,4	4,4	4,4
Position						
Transmitter Id	1949352	1949431	1949436	1957036	1957039	1957042
Source	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API

850 MHz LTE

				0001		
Sector				**01**	**02**	**03**
Azimuth				30	150	260
Cell / ENode B ID				064174	064174	064174
Antenna Model				JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make				COMMSCOPE	COMMSCOPE	COMMSCOPE
Antenna Centerline(Ft)				146	146	146
Mechanical Down-Tilt(Deg.)				0	0	4
Electrical Down-Tilt				2	2	2
Tip Height				149	149	149
Regulatory Power				391.4	391.4	391.4
DLEARFCN				2450	2450	2450
Channel Bandwidth(MHz)				10	10	10
Total ERP (W)				880.64	880.64	880.64
TMA Make						
TMA Model						
RRU Make				Samsung	Samsung	Samsung
RRU Model				B5/B13 RRH ORAN (RF4440d-13A)	B5/B13 RRH ORAN (RF4440d-13A)	B5/B13 RRH ORAN (RF4440d-13A)
Number of Tx, Rx Lines				4,4	4,4	4,4
Position						
Transmitter Id				12949140	12949141	12949142
Source				ATOLL_API	ATOLL_API	ATOLL_API

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850 MHz 5GNR

		0001	
Sector	**0100**	**0101**	**0102**
Azimuth	30	150	260
Cell / ENode B ID	0649404	0649404	0649404
Antenna Model	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE
Antenna Centerline(Ft)	146	146	146
Mechanical Down-Tilt(Deg.)	0	0	4
Electrical Down-Tilt	2	2	2
Tip Height	149	149	149
Regulatory Power	391.4	391.4	391.4
DLEARFCN	2450	2450	2450
Channel Bandwidth(MHz)	10	10	10
Total ERP (W)	880.64	880.64	880.64
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	B5/B13 RRH ORAN (RF4440d-13A)	B5/B13 RRH ORAN (RF4440d-13A)	B5/B13 RRH ORAN (RF4440d-13A)
Number of Tx, Rx Lines	4,4	4,4	4,4
Position			
Transmitter Id	12949140	12949141	12949142
Source	ATOLL_API	ATOLL_API	ATOLL_API

1900 MHz LTE ....

Sector		0001	
Azimuth	**01**	**01**	**02**
Cell / ENode B ID	30	30	150
Antenna Model	064174	064174	064174
	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make	COMMSCOPE	COMMSCOPE	COMMSCOPE
Antenna Centerline(Ft)	146	146	146
Mechanical Down-Tilt(Deg.)	0	0	0
Electrical Down-Tilt	0	0	0
Tip Height	149	149	149
Regulatory Power	151.56	213.58	151.56
DLEARFCN	1175	1050	1175
Channel Bandwidth(MHz)	5	10	5
Total ERP (W)	415.72	1171.66	415.72
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx, Rx Lines	4,4	4,4	4,4
Position			
Transmitter Id	12950342	1957037	12950343
Source	ATOLL_API	ATOLL_API	ATOLL_API
	02	**03**	**03**
	150	260	260
	064174	064174	064174
	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
	COMMSCOPE	COMMSCOPE	COMMSCOPE
	146	146	146
	0	0	0
	0	0	0
	149	149	149
	213.58	151.56	213.58
	1050	1175	1050
	10	5	10
	1171.66	415.72	1171.66
	Samsung	Samsung	Samsung
	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
	4,4	4,4	4,4
	1957040	12950345	1957043
	ATOLL_API	ATOLL_API	ATOLL_API

2100 MHz LTE

	0000			0001		
Sector	**01**	**02**	**03**	**01**	**02**	**03**
Azimuth	30	150	270	30	150	260
Cell / ENode B ID	064174	064174	064174	064174	064174	064174
Antenna Model	BXA-171063-12CF-EDIN	BXA-171063-12CF-EDIN	BXA-171063-12CF-EDIN	JAHH-65B-R3B	JAHH-65B-R3B	JAHH-65B-R3B
Antenna Make	AMPHENOL	AMPHENOL	AMPHENOL	COMMSCOPE	COMMSCOPE	COMMSCOPE
Antenna Centerline(Ft)	146	146	146	146	146	146
Mechanical Down-Tilt(Deg.)	3	6	3	0	0	0
Electrical Down-Tilt	5	5	5	0	0	0
Tip Height	149	149	149	149	149	149
Regulatory Power	169.72	169.72	169.72	152.24	152.24	152.24
DLEARFCN	2050	2050	2050	2050	2050	2050
Channel Bandwidth(MHz)	20	20	20	20	20	20
Total ERP (W)	1862.09	1862.09	1862.09	1670.32	1670.32	1670.32
TMA Make						
TMA Model						
RRU Make	Nokia	Nokia	Nokia	Samsung	Samsung	Samsung
RRU Model	UHID B4 RRH 2x40	UHID B4 RRH 2x40	UHID B4 RRH 2x40	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)	B2/B66A RRH ORAN (RF4439d-25A)
Number of Tx, Rx Lines	2,4	2,4	2,4	4,4	4,4	4,4
Position						
Transmitter Id	1949430	1949435	1949440	1957038	1957041	1957044
Source	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API

nL-Sub6

				0001		
Sector				**0100**	**0101**	**0102**
Azimuth				30	150	260
Cell / ENode B ID				0649404	0649404	0649404
Antenna Model				MT6407-77A	MT6407-77A	MT6407-77A
Antenna Make				Samsung	Samsung	Samsung
Antenna Centerline(Ft)				146	146	146
Mechanical Down-Tilt(Deg.)				0	0	0
Electrical Down-Tilt				1	1	1
Tip Height				147.5	147.5	147.5
Regulatory Power				810.28	810.28	810.28
DLEARFCN				648672	648672	648672
Channel Bandwidth(MHz)				60	60	60
Total ERP (W)				13335.21	13335.21	13335.21
TMA Make						
TMA Model						
RRU Make				Samsung	Samsung	Samsung
RRU Model				MT6407-77A	MT6407-77A	MT6407-77A
Number of Tx, Rx Lines				2,2	2,2	2,2
Position						
Transmitter Id				12950289	12950290	12950291
Source				ATOLL_API	ATOLL_API	ATOLL_API

Service Comments

Callsigns Per Antenna

Sector	Antenna Make	Antenna Model	Ant CL Height AGL	Tip Height	Azimuth (TN)	Elec Tilt	Mech Tilt	Gain	Beam Width	Regulatory Power	Callsigns						
											700	850	1900	2100	28 GHz	31 GHz	39 GHz
0100	COMMSCOPE	JAHH-65B-R3B	146	149	30	2	0	12.908	65	391.4 - PSD		KNKA313					
03	COMMSCOPE	JAHH-65B-R3B	146	149	260	2	4	12.908	65	391.4 - PSD		KNKA313					
03	COMMSCOPE	JAHH-65B-R3B	146	149	260	8	4	12.158	67	71.71	WQJQ689						
02	COMMSCOPE	JAHH-65B-R3B	146	149	150	0	0	15.868	65	152.24				WQGA906 WQGB280			
03	COMMSCOPE	JAHH-65B-R3B	146	149	260	0	0	15.678	63	151.56			KNLH262 WQCS396 WQEM953				
0102	Samsung	MT6407-77A	146	147.5	260	1	0	23.25	100	810.28							
0102	COMMSCOPE	JAHH-65B-R3B	146	149	260	2	4	12.908	65	391.4 - PSD		KNKA313					
02	COMMSCOPE	JAHH-65B-R3B	146	149	150	0	0	15.678	63	213.58			KNLH262 WQCS396 WQEM953				
01	COMMSCOPE	JAHH-65B-R3B	146	149	30	0	0	15.678	63	213.58			KNLH262 WQCS396 WQEM953				
02	COMMSCOPE	JAHH-65B-R3B	146	149	150	0	0	15.678	63	151.56			KNLH262 WQCS396 WQEM953				
03	COMMSCOPE	JAHH-65B-R3B	146	149	260	0	0	15.678	63	213.58			KNLH262 WQCS396 WQEM953				
01	COMMSCOPE	JAHH-65B-R3B	146	149	30	0	0	15.678	63	151.56			KNLH262 WQCS396 WQEM953				
01	COMMSCOPE	JAHH-65B-R3B	146	149	30	2	0	12.258	67	71.71	WQJQ689						
02	COMMSCOPE	JAHH-65B-R3B	146	149	150	2	0	12.258	67	71.71	WQJQ689						
02	COMMSCOPE	JAHH-65B-R3B	146	149	150	2	0	12.908	65	391.4 - PSD		KNKA313					
0101	COMMSCOPE	JAHH-65B-R3B	146	149	150	2	0	12.908	65	391.4 - PSD		KNKA313					
01	COMMSCOPE	JAHH-65B-R3B	146	149	30	0	0	15.868	65	152.24				WQGA906 WQGB280			
03	COMMSCOPE	JAHH-65B-R3B	146	149	260	0	0	15.868	65	152.24				WQGA906 WQGB280			
0101	Samsung	MT6407-77A	146	147.5	150	1	0	23.25	100	810.28							
0100	Samsung	MT6407-77A	146	147.5	30	1	0	23.25	100	810.28							
01	COMMSCOPE	JAHH-65B-R3B	146	149	30	2	0	12.908	65	391.4 - PSD		KNKA313					

Callsigns

Callsign	Market	Radio Code	Market Number	Block	State	County	Licensee Name	Wholly Owned	Total MHZ	Freq Range 1	Freq Range 2	Freq Range 3	Freq Range 4	Regulatory Power	Threshold (W)	POPs /Sq Mi	Status	Action	Approved for Insvc
WRBA735	New Haven-Waterbury-Meriden, CT	UU	BTA318	L2	9009	New Haven	Cellco Partnership	Yes	325.000	27925.000-27950.000	28050.000-28350.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRNE581	New York, NY	PM	PEA001	A1	9009	New Haven	Cellco Partnership	Yes	20.000	3700.000-3720.000	.000-.000	.000-.000	.000-.000	810.28	1640	1430.62	Active	added	Yes
WRHD614	New York, NY	UU	PEA001	M5	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38000.000-38100.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WQGB280	New Haven-West Haven-Waterbury-Meriden, CT	AW	CMA049	A	9009	New Haven	Cellco Partnership	Yes	20.000	1710.000-1720.000	2110.000-2120.000	.000-.000	.000-.000	152.24	1640	1430.62	Active	added	Yes
WRLD516	D09009 - New Haven, CT	PL	D09009	0	9009	New Haven	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000-3650.000	.000-.000	.000-.000	.000-.000		501	1430.62	Active		Yes
WRLD518	D09009 - New Haven, CT	PL	D09009	0	9009	New Haven	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000-3650.000	.000-.000	.000-.000	.000-.000		501	1430.62	Active		Yes
WQJQ689	Northeast	WU	REA001	C	9009	New Haven	Cellco Partnership	Yes	22.000	746.000-757.000	776.000-787.000	.000-.000	.000-.000	71.71	1000	1430.62	Active	added	Yes
KNLH262	New Haven-Waterbury-Meriden, CT	CW	BTA318	F	9009	New Haven	Cellco Partnership	Yes	10.000	1890.000-1895.000	1970.000-1975.000	.000-.000	.000-.000	213.58	1640	1430.62	Active	added	Yes
WRBA734	New Haven-Waterbury-Meriden, CT	UU	BTA318	L1	9009	New Haven	Cellco Partnership	Yes	325.000	27600.000-27925.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRNE588	New York, NY	PM	PEA001	B3	9009	New Haven	Cellco Partnership	Yes	20.000	3840.000-3860.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WRHD610	New York, NY	UU	PEA001	M10	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38500.000-38600.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRHD618	New York, NY	UU	PEA001	M9	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38400.000-38500.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRLD517	D09009 - New Haven, CT	PL	D09009	0	9009	New Haven	Verizon Wireless Network Procurement LP	Yes	100.000	3550.000-3650.000	.000-.000	.000-.000	.000-.000		501	1430.62	Active		Yes
WQCS396	New Haven-Waterbury-Meriden, CT	CW	BTA318	C	9009	New Haven	Cellco Partnership	Yes	10.000	1905.000-1910.000	1985.000-1990.000	.000-.000	.000-.000	213.58	1640	1430.62	Active	added	Yes
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	9009	New Haven	Cellco Partnership	Yes	20.000	1720.000-1730.000	2120.000-2130.000	.000-.000	.000-.000	152.24	1640	1430.62	Active	added	Yes
WRNE584	New York, NY	PM	PEA001	A4	9009	New Haven	Cellco Partnership	Yes	20.000	3760.000-3780.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
KNKA313	New Haven-West Haven-Waterbury-Meriden, CT	CL	CMA049	A	9009	New Haven	Cellco Partnership	Yes	25.000	824.000-835.000	869.000-880.000	845.000-846.500	890.000-891.500	391.4 - PSD	400	1430.62	Active	added	Yes
WRNE585	New York, NY	PM	PEA001	A5	9009	New Haven	Cellco Partnership	Yes	20.000	3780.000-3800.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No

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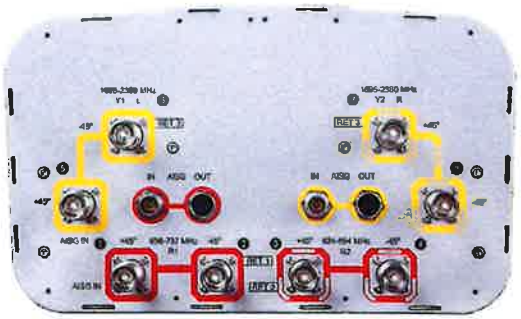
WRNE587	New York, NY	PM	PEA001	B2	9009	New Haven	Cellco Partnership	Yes	20.000	3820.000-3840.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WRHD609	New York, NY	UU	PEA001	M1	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37600.000-37700.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRNE586	New York, NY	PM	PEA001	B1	9009	New Haven	Cellco Partnership	Yes	20.000	3800.000-3820.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WQEM953	*New Haven-Waterbury-Meriden, CT*	*CW*	*BTA318*	*C*	*9009*	*New Haven*	*Cellco Partnership*	*Yes*	*10.000*	*1895.000-1900.000*	*1975.000-1980.000*	*.000-.000*	*.000-.000*	*213.58*	*1640*	*1430.62*	*Active*	*added*	*Yes*
WRHD613	New York, NY	UU	PEA001	M4	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37900.000-38000.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRHD612	New York, NY	UU	PEA001	M3	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37800.000-37900.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRHD616	New York, NY	UU	PEA001	M7	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38200.000-38300.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRHD617	New York, NY	UU	PEA001	M8	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38300.000-38400.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRNE582	*New York, NY*	*PM*	*PEA001*	*A2*	*9009*	*New Haven*	*Cellco Partnership*	*Yes*	*20.000*	*3720.000-3740.000*	*.000-.000*	*.000-.000*	*.000-.000*	*810.28*	*1640*	*1430.62*	*Active*	*added*	*Yes*
WRHD611	New York, NY	UU	PEA001	M2	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37700.000-37800.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRNE583	*New York, NY*	*PM*	*PEA001*	*A3*	*9009*	*New Haven*	*Cellco Partnership*	*Yes*	*20.000*	*3740.000-3760.000*	*.000-.000*	*.000-.000*	*.000-.000*	*810.28*	*1640*	*1430.62*	*Active*	*added*	*Yes*
WRHD615	New York, NY	UU	PEA001	M6	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38100.000-38200.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes
WRHD619	New York, NY	UU	PEA001	N1	9009	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38600.000-38700.000	.000-.000	.000-.000	.000-.000		0	1430.62	Active		Yes

Proprietary and Confidential. Not for disclosure outside of Verizon.

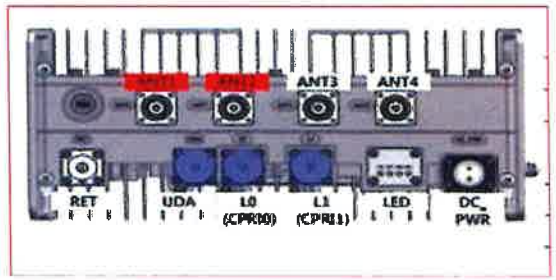


BSAMNT-SBS-2-2

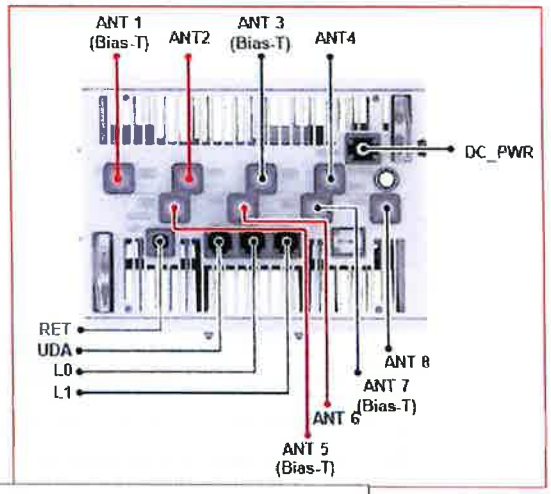
- Port 1 & 2 are for low band (698-787 MHz).
- Port 3 & 4 are for low band (824-894 MHz).
- Port 3,4,5, & 6 are for high band (1695-2360 MHz).
- Antenna Smart Bias Tee (SBT) is through port 1 for low band and port 5 for high band.
- AISG cable is only needed when drawn in the diagrams below, if it is not drawn then SBT is enough to control all RET motors.
- Not all SBT ports are needed to control RET, only green port connection to green port will control RET.

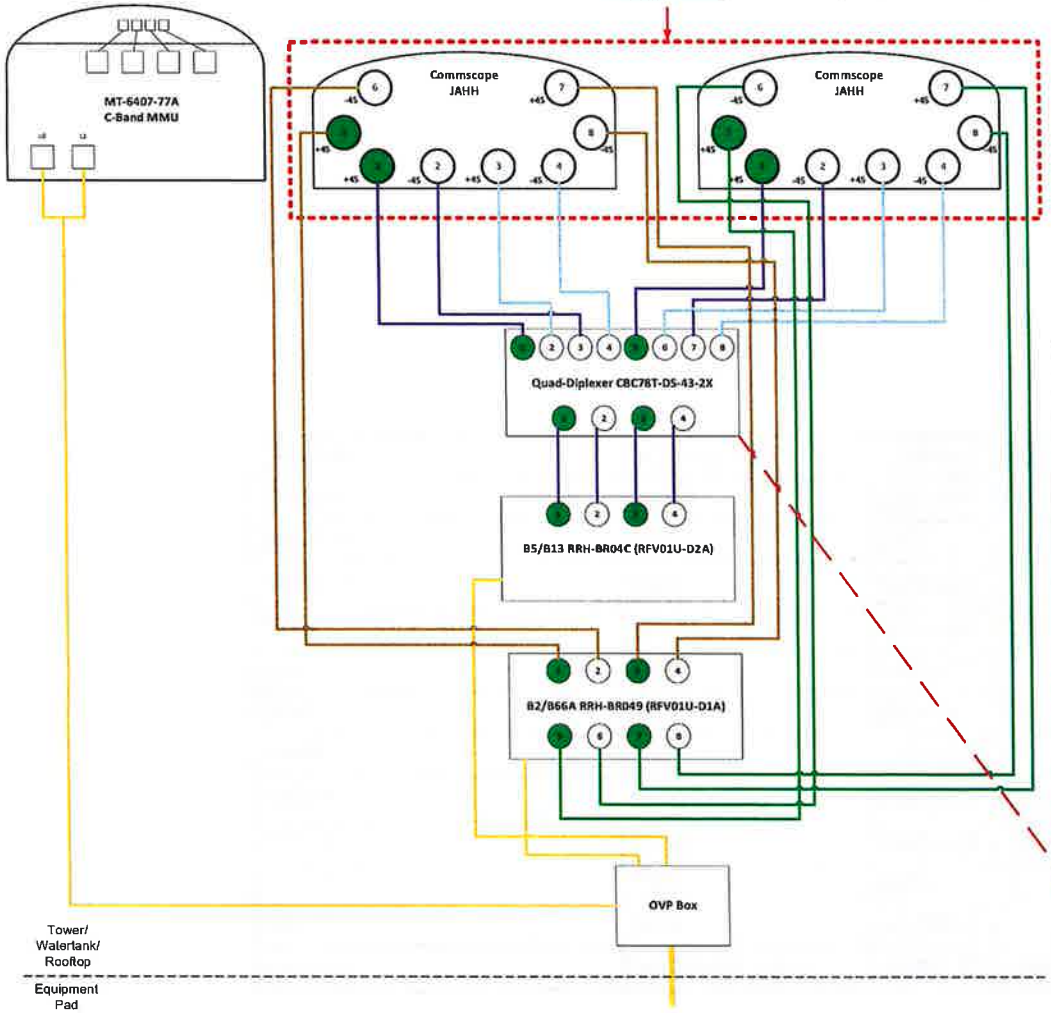
RET DC signal pass for RET (Port that will control RET)

B5/B13 RRH-BR04C (RFV01U-D2A)



B2/B66A RRH-BR049 (RFV01U-D1A)





DC signal capable Port

AISG Cable

RET DC signal pass for RET (Port that will control RET)

Hybriflex cables

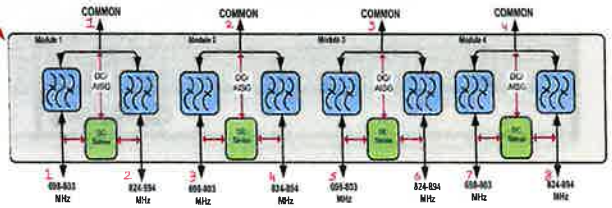
Comments:

Diagram shows configuration as viewed from standing behind the antennas.

Antennas will be installed in that order from left to right.

Cap and weatherproof unused antenna ports.

All plumbing diagram colors are irrelevant except for AISG & Hybriflex cable. (For the coax colors follow Coax Colors guide above)



NORTHFORD CT

Sector	Antenna Desc	Base Station ID	Sector ID
Alpha	700	064174_1	064174_1
Alpha	850	064174_1_6	064174_1_6
Alpha	AWS	064174_1_2	064174_1_2
Alpha	PCS-PCS2	064174_1_45	064174_1_4,064174_1_5
Beta	700	064174_2	064174_2
Beta	850	064174_2_6	064174_2_6
Beta	AWS	064174_2_2	064174_2_2
Beta	PCS-PCS2	064174_2_45	064174_2_4,064174_2_5
Gamma	700	064174_3	064174_3
Gamma	850	064174_3_6	064174_3_6
Gamma	AWS	064174_3_2	064174_3_2
Gamma	PCS-PCS2	064174_3_45	064174_3_4,064174_3_5

November 27, 2018 (Rev.2)
December 6, 2018 (Rev.3)
August 18, 2021 (Rev.4)
June 14, 2022 (Rev.5)
June 26, 2023 (Rev. 6)

verizon

Verizon Wireless
20 Alexander Drive, 2nd Floor
Wallingford, CT 06492

RE:	Verizon Site Name:	NORTHFORD CT
	TEP Project Number:	134075.855979
	Site Address:	88 Parsonage Hill Road Northford, CT 06472

To Whom It May Concern:

TEP Northeast (TEP NE) has been authorized by Verizon Wireless to perform a mount analysis on the existing Verizon antenna/RRH mounts to determine their capability of supporting the following loading:

- **(3) MT6407-77A Antennas w/ RRH's (Not to Exceed: 35.12"x16.06"x5.51" – Wt. = 87.1 lbs. /each)**
- **(6) JAHH-65B-R3B Antennas (72.0"x13.8"x8.2" – Wt. = 64 lbs. /each)**
- **(3) B2/B66A RRH ORAN (RF4439D-25A) RRH's (15.0"x15.0"x10.0" – Wt. = 75 lbs. /each)**
- **(3) B5/B13 RRH ORAN (RF4440D-13A) RRH's (15.0"x15.0"x9.1" – Wt. = 71 lbs. /each)**
- **(3) CBC78T-DS-43-2X Diplexers (9.6"x6.9"x6.4" – Wt. = 21 lbs. /each)**
- **(1) OVP Box (28.9"x15.7"x10.3" – Wt. = 32 lbs. /each) (Tower Mounted)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. ProVertic, LLC conducted a survey climb and mapping of the existing Verizon antenna mounts on October 30, 2018.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, and the International Building Code 2021 with 2022 Connecticut State Building Code.
- TEP NE considers this mount to be asymmetrical and has applied wind loads in 30-degree increments all around the mount. Per TIA-222-H and Appendix P of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.16 in was used for this analysis.
- TEP NE considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- TEP NE considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- TEP NE considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.204 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.054.
- The mounts have been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst-case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 1.
- The mounts have been analyzed with load combinations consisting of a 250 lbs live load in a worst-case location on the mount.
- The existing mounts are secured to the existing self-supporting tower with U-bolts tightened around the tower leg. TEP NE considers the threaded rods as the governing connection members.

Based on our evaluation, we have determined that the existing mounts **ARE NOT CAPABLE** of supporting the proposed installation. TEP NE recommends the following modifications:

- **Proposed sector frame stabilizer, SitePro1 P/N SFS-V-L (or approved equal), secured to existing horizontal face pipe and vertical mounting pipe mast (typ. of 1 per sector, total of 3).**
- **Proposed 2" std. (2.38" O.D.) pipe brace secured to the mount face and tower leg (typ. of 3 per sector, total of 9).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	8	LC12	137%	**FAIL**
Modified Mount Rating	19	LC5	93%	**PASS**

Reference Documents:

- Mount Mapping Report prepared by ProVertic, LLC dated June 21, 2019.

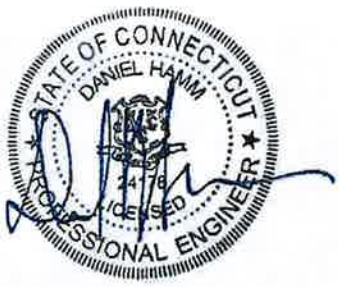
This determination was based on the following limitations and assumptions:

1. TEP NE is not responsible for any modifications completed prior to and hereafter in which TEP NE was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to their member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mounts have been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to Verizon's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. TEP NE performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,
TEP Northeast

Michael Cabral
Director



Daniel P. Hamm, PE
Vice President

FIELD PHOTOS:

FIELD PHOTOS (CONT'D):

TEP NORTHEAST

Wind & Ice Calculations

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC **Checked By:** MSC

TEP NORTHEAST

2.6.5.2 Velocity Pressure Coeff:

$K_z = 2.01\ (z/z_g)^{2/\alpha}$

z=	146	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.371

$K_{zmin} \le K_z \le 2.01$

Table 2-4

Exposure	Z_g	α	K_{zmin}	K_c
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

2.6.6.2 Topographic Factor:

Table 2-5

Topo. Category	K_t	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$K_{zt} = [1+(K_c K_t/K_h)]^2$

$K_h = e^{(f*z/H)}$

K_{zt}= 1

(If Category 1 then K_{zt}=1.0)

Category= 1

K_h=	1	
K_c=	1.0	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	146	
z_s=	280	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	0.99	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =
Importance Factor =

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$

t_i =	1.00	in
I=	1.00	(from Table 2-3)
K_{iz} =	1.16	(from Sec. 2.6.10)
t_{iz} =	1.16	in

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h= 195 G_h= 0.85

2.6.9.2 Guyed Masts G_h= 0.85

2.6.9.3 Pole Structures G_h= 1.1

2.6.9 Appurtenances G_h= 1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings (ht. : width ratio > 5)

G_h= 1.35 Gh= 1.00

2.6.11.2 Design Wind Force on Appurtenances

$F = q_z * G_h * (EPA)_A$

$q_z = 0.00256 * K_z * K_{zt} * K_s * K_e * K_d * V_{max}^2$

q_z=	46.13	K_z=	1.371 (from 2.6.5.2)
$q_{z\,(ice)}$=	7.38	K_{zt}=	1.0 (from 2.6.6.2.1)
$q_{z\,(30)}$=	2.66	K_s=	1.0 (from 2.6.7)
		K_e=	0.99 (from 2.6.8)
		K_d=	0.85 (from Table 2-2)
		V_{max}=	125 mph (Ultimate Wind Speed)
		$V_{max\,(ice)}$=	50 mph
		V_{30}=	30 mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 78 (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.
(Aspect ratio is independent of the spacing between support points of a linear appurtenance,

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.16** in **Angle = 0 (deg)** **Equivalent Angle = 180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
MT6407-77A Antenna	35.1	16.1	5.5	3.92	2.19	1.20	217	42	12
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	5.22	1.32	420	81	24
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.00	1.20	86	18	5
RF4439D-25A RRH (Shielded)	15.0	0.0	10.0	0.00	0.00	1.20	0	2	0
RF4440D-13A RRH	15.0	15.0	9.1	1.56	1.00	1.20	86	18	5
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.00	1.20	0	2	0
OVP Box	28.9	15.7	10.3	3.15	1.84	0.70	102	20	6
1-1/2" Pipe	1.9	12.0		0.16	0.16	1.20	9		
2" Pipe	2.4	12.0		0.20	0.20	1.20	11		
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	13		
3" Pipe	3.5	12.0		0.29	0.29	1.20	16		
2x2 HSS	2.0	12.0		0.17	0.17	1.25	10		
L2-1/2x2-1/2x3/16	2.5	12.0		0.21	0.21	2.00	19		

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

WIND LOADS

Angle = 30 (deg)

Ice Thickness = 1.16 in.

Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	217	85	184
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	420	276	384
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	86	58	79
RF4439D-25A RRH (Shielded)	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	43	58	47
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	86	52	78
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	24	0

WIND LOADS WITH ICE:

MT6407-77A Antenna	37.4	18.4	7.8	4.78	2.04	2.04	4.78	1.20	1.30	42	20	37
JAHH-65B-R3B Antenna	74.3	16.1	10.5	8.32	5.43	4.61	7.06	1.29	1.40	79	56	74
RF4439D-25A RRH	17.3	17.3	12.3	2.08	1.48	1.00	1.41	1.20	1.20	18	13	17
RF4439D-25A RRH (Shielded)	17.3	8.7	12.3	1.04	1.48	2.00	1.41	1.20	1.20	9	13	10
RF4440D-13A RRH	17.3	17.3	11.4	2.08	1.37	1.00	1.52	1.20	1.20	18	12	17
CBC78T-DS-43-2X Diplexer	11.9	2.3	8.7	0.19	0.72	5.14	1.37	1.32	1.20	2	6	3

WIND LOADS AT 30 MPH:

MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	12	5	11
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	22
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	5
RF4439D-25A RRH (Shielded)	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	2	3	3
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	5	3	4
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	1	0

Date: 4/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

WIND LOADS

Angle = 60 (deg)

Ice Thickness = 1.16 in.

Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	217	85	118
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	420	276	312
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	86	58	65
RF4439D-25A RRH (Shielded)	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	65	58	59
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	86	52	61
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	24	18

WIND LOADS WITH ICE:

MT6407-77A Antenna	37.4	18.4	7.8	4.78	2.04	2.04	4.78	1.20	1.30	42	20	25
JAHH-65B-R3B Antenna	74.3	16.1	10.5	8.32	5.43	4.61	7.06	1.29	1.40	79	56	62
RF4439D-25A RRH	17.3	17.3	12.3	2.08	1.48	1.00	1.41	1.20	1.20	18	13	14
RF4439D-25A RRH (Shielded)	17.3	13.0	12.3	1.56	1.48	1.33	1.41	1.20	1.20	14	13	13
RF4440D-13A RRH	17.3	17.3	11.4	2.08	1.37	1.00	1.52	1.20	1.20	18	12	14
CBC78T-DS-43-2X Diplexer	11.9	2.3	8.7	0.19	0.72	5.14	1.37	1.32	1.20	2	6	5

WIND LOADS AT 30 MPH:

MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	12	5	7
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	18
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	4
RF4439D-25A RRH (Shielded)	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	4	3	3
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	5	3	4
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	1	1

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

WIND LOADS

Angle = 90 (deg)

Ice Thickness = 1.16 in.

Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	217	85	85
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	420	276	276
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	86	58	58
RF4439D-25A RRH (Shielded)	15.0	0.0	10.0	0.00	1.04	0.00	1.50	1.20	1.20	0	58	58
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	86	52	52
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	24	24

WIND LOADS WITH ICE:

MT6407-77A Antenna	37.4	18.4	7.8	4.78	2.04	2.04	4.78	1.20	1.30	42	20	20
JAHH-65B-R3B Antenna	74.3	16.1	10.5	8.32	5.43	4.61	7.06	1.29	1.40	79	56	56
RF4439D-25A RRH	17.3	17.3	12.3	2.08	1.48	1.00	1.41	1.20	1.20	18	13	13
RF4439D-25A RRH (Shielded)	17.3	2.3	12.3	0.28	1.48	7.46	1.41	1.42	1.20	3	13	13
RF4440D-13A RRH	17.3	17.3	11.4	2.08	1.37	1.00	1.52	1.20	1.20	18	12	12
CBC78T-DS-43-2X Diplexer	11.9	2.3	8.7	0.19	0.72	5.14	1.37	1.32	1.20	2	6	6

WIND LOADS AT 30 MPH:

MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	12	5	5
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	16
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	3
RF4439D-25A RRH (Shielded)	15.0	0.0	10.0	0.00	1.04	0.00	1.50	1.20	1.20	0	3	3
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	5	3	3
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	1	1

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

TEP NORTHEAST

WIND LOADS

Angle = 120 (deg)

Ice Thickness = 1.16 in.

Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	217	85	118
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	420	276	312
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	86	58	65
RF4439D-25A RRH (Shielded)	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	65	58	59
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	86	52	61
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	24	18

WIND LOADS WITH ICE:

MT6407-77A Antenna	37.4	18.4	7.8	4.78	2.04	2.04	4.78	1.20	1.30	42	20	25
JAHH-65B-R3B Antenna	74.3	16.1	10.5	8.32	5.43	4.61	7.06	1.29	1.40	79	58	62
RF4439D-25A RRH	17.3	17.3	12.3	2.08	1.48	1.00	1.41	1.20	1.20	18	13	14
RF4439D-25A RRH (Shielded)	17.3	13.0	12.3	1.56	1.48	1.33	1.41	1.20	1.20	14	13	13
RF4440D-13A RRH	17.3	17.3	11.4	2.08	1.37	1.00	1.52	1.20	1.20	18	12	14
CBC78T-DS-43-2X Diplexer	11.9	2.3	8.7	0.19	0.72	5.14	1.37	1.32	1.20	2	6	5

WIND LOADS AT 30 MPH:

MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	12	5	7
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	18
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	4
RF4439D-25A RRH (Shielded)	15.0	11.3	10.0	1.17	1.04	1.33	1.50	1.20	1.20	4	3	3
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	5	3	4
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	1	1

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC Checked By: MSC

TEP NORTHEAST

WIND LOADS

Angle = 150 (deg)

Ice Thickness = 1.16 in.

Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	217	[illegible]	184
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	[illegible] 420	276	384
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	86	58	79
RF4439D-25A RRH (Shielded)	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	43	58	47
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	86	52	78
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	0	24	6

WIND LOADS WITH ICE:

MT6407-77A Antenna	37.4	18.4	7.8	4.78	2.04	2.04	4.78	1.20	1.30	[illegible] 42	[illegible] 20	37
JAHH-65B-R3B Antenna	74.3	16.1	10.5	8.32	5.43	4.61	7.06	1.29	1.40	79	[illegible] 56	74
RF4439D-25A RRH	17.3	17.3	12.3	2.08	1.48	1.00	1.41	1.20	1.20	18	13	17
RF4439D-25A RRH (Shielded)	17.3	8.7	12.3	1.04	1.48	2.00	1.41	1.20	1.20	9	13	10
RF4440D-13A RRH	17.3	17.3	11.4	2.08	1.37	1.00	1.52	1.20	1.20	18	[illegible] 12	17
CBC78T-DS-43-2X Diplexer	11.9	2.3	8.7	0.19	0.72	5.14	1.37	1.32	1.20	[illegible] 2	6	3

WIND LOADS AT 30 MPH:

MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	[illegible] 12	[illegible] 6	11
JAHH-65B-R3B Antenna	72.0	13.8	8.2	6.90	4.10	5.22	8.78	1.32	1.46	24	16	22
RF4439D-25A RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	5
RF4439D-25A RRH (Shielded)	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	2	3	3
RF4440D-13A RRH	15.0	15.0	9.1	1.56	0.95	1.00	1.65	1.20	1.20	[illegible] 5	[illegible] 3	4
CBC78T-DS-43-2X Diplexer	9.6	0.0	6.4	0.00	0.43	0.00	1.50	1.20	1.20	[illegible] 0	1	0

Date: 6/21/2023
Project Name: NORTHFORD CT
Designed By: JC **Checked By:** MSC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.16 in.
Density of ice: 56 pcf

MT6407-77A Antenna
Weight of ice based on total radial SF area:
Height (in): 35.1
Width (in): 16.1
Depth (in): 5.5
Total weight of ice on object: 75 lbs
Weight of object: 87.1 lbs
Combined weight of ice and object: 162 lbs

B2/B66A RRH ORAN (RF4439D-25A) RRH
Weight of ice based on total radial SF area:
Height (in): 15.0
Width (in): 15.0
Depth (in): 10.0
Total weight of ice on object: 34 lbs
Weight of object: 75.0 lbs
Combined weight of ice and object: 109 lbs

CBC78T-DS-43-2X Diplexer
Weight of ice based on total radial SF area:
Height (in): 9.6
Width (in): 6.9
Depth (in): 6.4
Total weight of ice on object: 12 lbs
Weight of object: 21.0 lbs
Combined weight of ice and object: 33 lbs

2-1/2" pipe
Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 6 plf

HSS 2x2
Weight of ice based on total radial SF area:
Height (in): 2
Width (in): 2
Per foot weight of ice on object: 6 plf

L 2-1/2x2-1/2 Angles
Weight of ice based on total radial SF area:
Height (in): 2.5
Width (in): 2.5
Per foot weight of ice on object: 7 plf

JAHH-65B-R3B Antenna
Weight of ice based on total radial SF area:
Height (in): 72.0
Width (in): 13.8
Depth (in): 8.2
Total weight of ice on object: 146 lbs
Weight of object: 64.0 lbs
Combined weight of ice and object: 210 lbs

B5/B13 RRH ORAN (RF4440d-13A) RRH
Weight of ice based on total radial SF area:
Height (in): 15.0
Width (in): 15.0
Depth (in): 9.1
Total weight of ice on object: 33 lbs
Weight of object: 71.0 lbs
Combined weight of ice and object: 104 lbs

OVP Box
Weight of ice based on total radial SF area:
Height (in): 28.9
Width (in): 15.7
Depth (in): 10.3
Total weight of ice on object: 68 lbs
Weight of object: 32.0 lbs
Combined weight of ice and object: 100 lbs

1-1/2" Pipe
Per foot weight of ice:
diameter (in): 1.88
Per foot weight of ice on object: 4 plf

2" pipe
Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 5 plf

3" Pipe
Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 7 plf

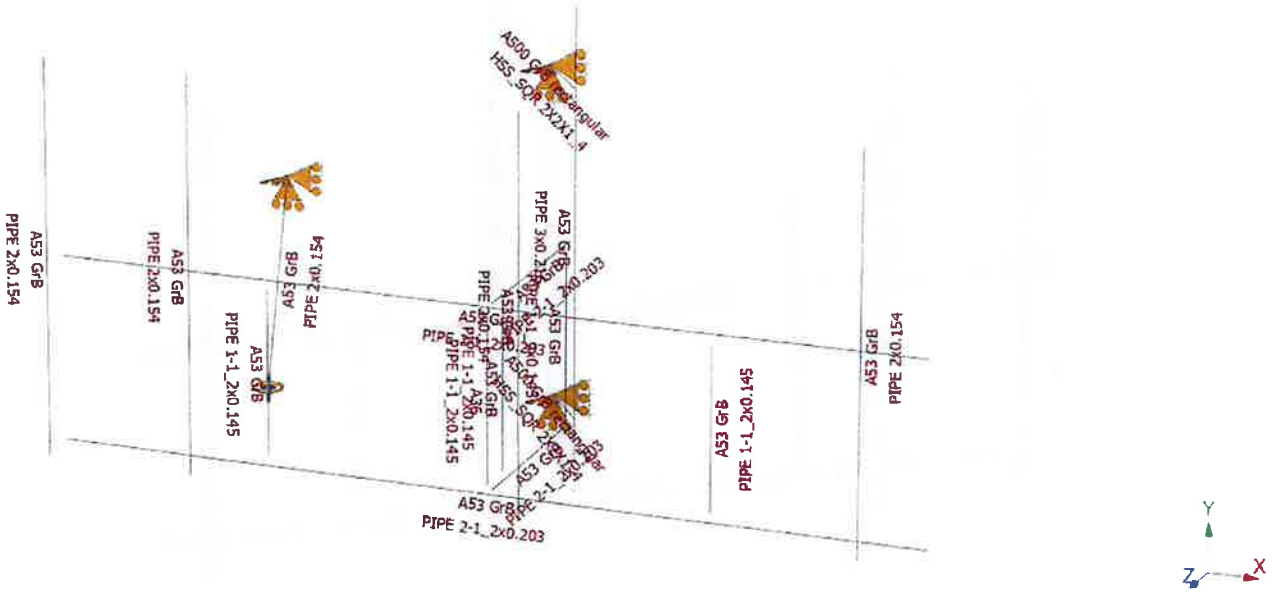
TEP NORTHEAST

Mount Calculations
(Existing Conditions)


Y
Z
X

RAM Elements
CONNECT Edition

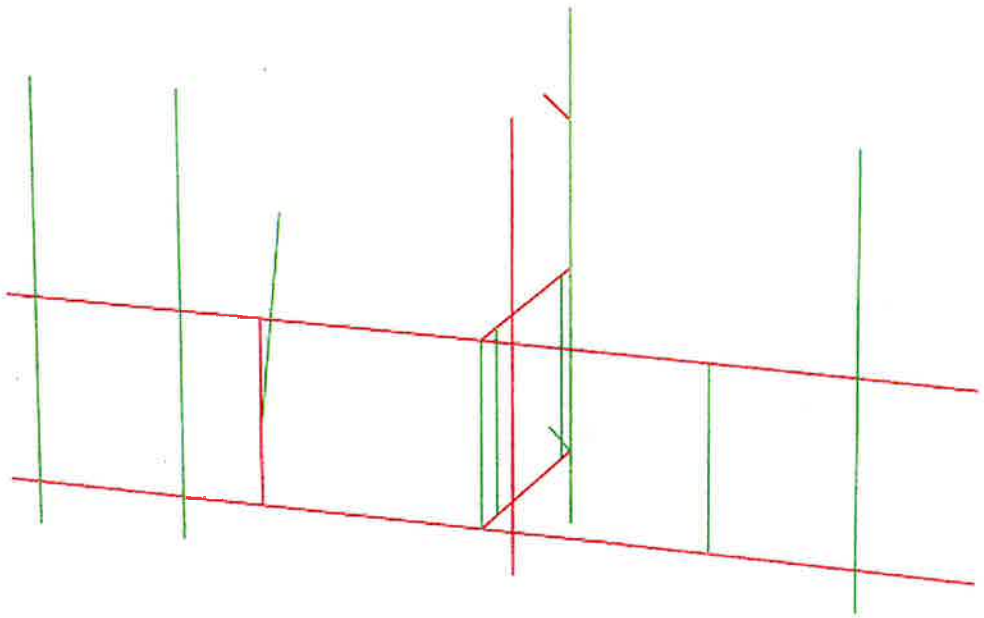
Current Date: 6/21/2023 11:33 PM
Units system: English

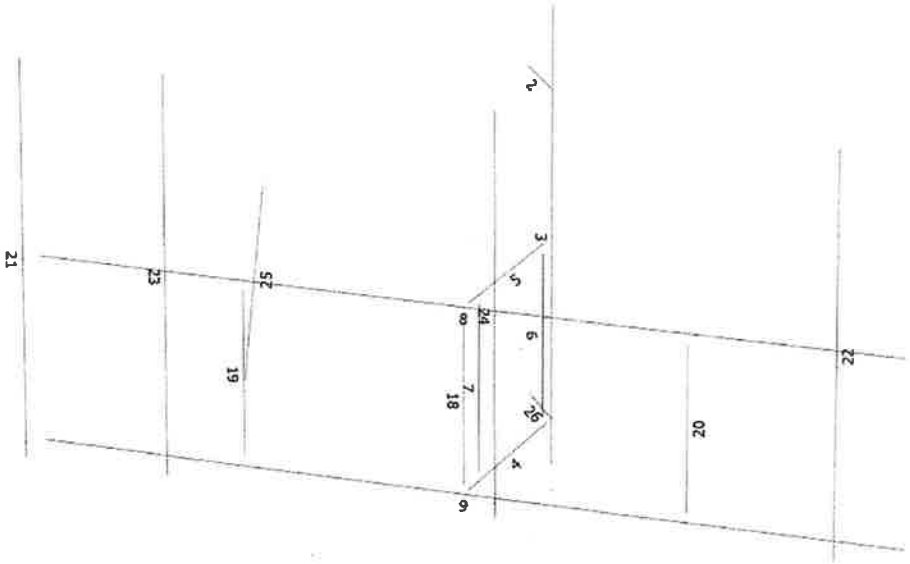


RAM Elements
CONNECT Edition

Current Date: 6/21/2023 11:33 PM
Units system: English

Design status
- Not designed
- Error on design
- Design O.K.
- With warnings




21
23
12
19
2
3
5
8
24
6
22
7
18
16
20
4
9


Y
Z
X

RAM Elements

Current Date: 6/23/2023 3:31 PM
Units system: English

Load data

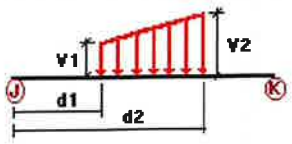
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load on Left End	No	LL
LL2	250 lb Live Load on Center	No	LL
LL3	250 lb Live Load on Right End	No	LL
LLa1	500 lb Live Load on Antenna 1	No	LL
LLa2	500 lb Live Load on Antenna 2	No	LL
LLa3	500 lb Live Load on Antenna 3	No	LL
LLa4	500 lb Live Load on Antenna 4	No	LL

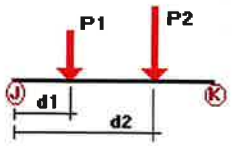
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	2	z	-0.01	0.00	0.00	No	0.00	No
	3	z	-0.016	0.00	0.00	No	0.00	No
	6	z	-0.009	0.00	0.00	No	0.00	No
	7	z	-0.009	0.00	0.00	No	0.00	No
	8	z	-0.013	0.00	0.00	No	0.00	No
	9	z	-0.013	0.00	0.00	No	0.00	No
	19	z	-0.009	0.00	0.00	No	0.00	No
	20	z	-0.009	0.00	0.00	No	0.00	No
	21	z	-0.011	0.00	0.00	No	0.00	No
	22	z	-0.011	-0.011	0.00	No	1.50	No
		z	-0.011	-0.011	4.00	No	6.00	No
	23	z	-0.011	0.00	0.00	No	0.00	No
	25	z	-0.011	0.00	0.00	No	0.00	No
	26	z	-0.01	0.00	0.00	No	0.00	No
W30	2	z	-0.01	0.00	0.00	No	0.00	No
	3	z	-0.016	0.00	0.00	No	0.00	No
	4	z	-0.013	0.00	0.00	No	0.00	No
	5	z	-0.013	0.00	0.00	No	0.00	No
	6	z	-0.009	0.00	0.00	No	0.00	No
	7	z	-0.009	0.00	0.00	No	0.00	No
	8	z	-0.013	0.00	0.00	No	0.00	No
	9	z	-0.013	0.00	0.00	No	0.00	No
	18	z	-0.009	0.00	0.00	No	0.00	No
	19	z	-0.009	0.00	0.00	No	0.00	No
	20	z	-0.009	0.00	0.00	No	0.00	No
	21	z	-0.011	0.00	0.00	No	0.00	No
	22	z	-0.011	-0.011	0.00	No	1.50	No
		z	-0.011	-0.011	4.00	No	6.00	No
	23	z	-0.011	0.00	0.00	No	0.00	No
	25	z	-0.011	0.00	0.00	No	0.00	No
	26	z	-0.01	0.00	0.00	No	0.00	No
W60	2	x	-0.01	0.00	0.00	No	0.00	No
	3	x	-0.016	0.00	0.00	No	0.00	No
	4	x	-0.013	0.00	0.00	No	0.00	No
	5	x	-0.013	0.00	0.00	No	0.00	No
	6	x	-0.009	0.00	0.00	No	0.00	No
	7	x	-0.009	0.00	0.00	No	0.00	No
	8	x	-0.013	0.00	0.00	No	0.00	No
	9	x	-0.013	0.00	0.00	No	0.00	No
	18	x	-0.009	0.00	0.00	No	0.00	No
	19	x	-0.009	0.00	0.00	No	0.00	No
	20	x	-0.009	0.00	0.00	No	0.00	No
	21	x	-0.011	0.00	0.00	No	0.00	No
	22	x	-0.011	0.00	0.00	No	0.00	No
	24	x	-0.011	0.00	0.00	No	0.00	No
	23	x	-0.011	0.00	0.00	No	0.00	No
	25	x	-0.011	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
W90	2	x	-0.01	0.00	0.00	No	0.00	No
	3	x	-0.016	0.00	0.00	No	0.00	No
	4	x	-0.013	0.00	0.00	No	0.00	No
	5	x	-0.013	0.00	0.00	No	0.00	No
	6	x	-0.009	0.00	0.00	No	0.00	No
	7	x	-0.009	0.00	0.00	No	0.00	No
	18	x	-0.009	0.00	0.00	No	0.00	No
	19	x	-0.009	0.00	0.00	No	0.00	No
	20	x	-0.009	0.00	0.00	No	0.00	No
	21	x	-0.011	0.00	0.00	No	0.00	No
	22	x	-0.011	0.00	0.00	No	0.00	No
	24	x	-0.011	0.00	0.00	No	0.00	No

	23	x	-0.011	0.00	0.00	No	0.00	No
	25	x	-0.011	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
W120	2	x	-0.01	0.00	0.00	No	0.00	No
	3	x	-0.016	0.00	0.00	No	0.00	No
	4	x	-0.013	0.00	0.00	No	0.00	No
	5	x	-0.013	0.00	0.00	No	0.00	No
	6	x	-0.009	0.00	0.00	No	0.00	No
	7	x	-0.009	0.00	0.00	No	0.00	No
	8	x	-0.013	0.00	0.00	No	0.00	No
	9	x	-0.013	0.00	0.00	No	0.00	No
	18	x	-0.009	0.00	0.00	No	0.00	No
	19	x	-0.009	0.00	0.00	No	0.00	No
	20	x	-0.009	0.00	0.00	No	0.00	No
	21	x	-0.011	0.00	0.00	No	0.00	No
	22	x	-0.011	0.00	0.00	No	0.00	No
	24	x	-0.011	0.00	0.00	No	0.00	No
	23	x	-0.011	0.00	0.00	No	0.00	No
	25	x	-0.011	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
W150	2	z	0.01	0.00	0.00	No	0.00	No
	3	z	0.016	0.00	0.00	No	0.00	No
	4	z	0.013	0.00	0.00	No	0.00	No
	5	z	0.013	0.00	0.00	No	0.00	No
	6	z	0.009	0.00	0.00	No	0.00	No
	7	z	0.009	0.00	0.00	No	0.00	No
	8	z	0.013	0.00	0.00	No	0.00	No
	9	z	0.013	0.00	0.00	No	0.00	No
	18	z	0.009	0.00	0.00	No	0.00	No
	19	z	0.009	0.00	0.00	No	0.00	No
	20	z	0.009	0.00	0.00	No	0.00	No
	21	z	0.011	0.00	0.00	No	0.00	No
	22	z	0.011	0.00	0.00	No	0.00	No
	24	z	0.011	0.00	0.00	No	0.00	No
	23	z	0.011	0.00	0.00	No	0.00	No
	25	z	0.011	0.00	0.00	No	0.00	No
	26	z	0.01	0.00	0.00	No	0.00	No
Di	2	y	-0.006	0.00	0.00	No	0.00	No
	3	y	-0.007	0.00	0.00	No	0.00	No
	4	y	-0.006	0.00	0.00	No	0.00	No
	5	y	-0.006	0.00	0.00	No	0.00	No
	6	y	-0.004	0.00	0.00	No	0.00	No
	7	y	-0.004	0.00	0.00	No	0.00	No
	8	y	-0.006	0.00	0.00	No	0.00	No
	9	y	-0.006	0.00	0.00	No	0.00	No
	18	y	-0.004	0.00	0.00	No	0.00	No
	19	y	-0.004	0.00	0.00	No	0.00	No
	20	y	-0.004	0.00	0.00	No	0.00	No
	21	y	-0.005	0.00	0.00	No	0.00	No
	22	y	-0.005	0.00	0.00	No	0.00	No
	24	y	-0.005	0.00	0.00	No	0.00	No
	23	y	-0.005	0.00	0.00	No	0.00	No
	25	y	-0.005	0.00	0.00	No	0.00	No
	26	y	-0.006	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	3	y	-0.032	2.50	No
	22	y	-0.044	1.50	No
		y	-0.044	4.00	No
		y	-0.021	2.50	No
	24	y	-0.092	0.50	No
		y	-0.092	5.00	No
		y	-0.075	2.50	No
	23	y	-0.071	2.00	No
Wo	3	z	-0.174	2.50	No
	22	z	-0.109	1.50	No
		z	-0.109	4.00	No
	24	z	-0.42	0.50	No
		z	-0.42	5.00	No
	23	z	-0.086	2.00	No
W30	3	3	-0.16	2.50	No
	22	3	-0.092	1.50	No
		3	-0.092	4.00	No
		3	-0.006	2.50	No
	24	3	-0.384	0.50	No
		3	-0.384	5.00	No
		3	-0.047	2.50	No
	23	3	-0.078	2.00	No
W60	3	3	-0.13	2.50	No
	22	3	-0.06	1.50	No
		3	-0.06	4.00	No
		3	-0.018	2.50	No
	24	3	-0.312	0.50	No
		3	-0.312	5.00	No
		3	-0.059	2.50	No
	23	3	-0.061	2.00	No
W90	3	x	-0.116	2.50	No
	22	x	-0.043	1.50	No
		x	-0.043	4.00	No
		x	-0.024	2.50	No
	24	x	-0.138	0.50	No
		x	-0.138	5.00	No
		x	-0.058	2.50	No
	23	x	-0.052	2.00	No
W120	3	2	-0.13	2.50	No
	22	2	-0.06	1.50	No
		2	-0.06	4.00	No
		2	-0.018	2.50	No
	24	2	-0.312	0.50	No
		2	-0.312	5.00	No
		2	-0.059	2.50	No
	23	2	-0.061	2.00	No
W150	3	2	-0.16	2.50	No
	22	2	-0.092	1.50	No
		2	-0.092	4.00	No
		2	-0.006	2.50	No
	24	2	-0.384	0.50	No
		2	-0.384	5.00	No
		2	-0.047	2.50	No
	23	2	-0.078	2.00	No

Di	3	y	-0.068	2.50	No
	22	y	-0.038	1.50	No
		y	-0.038	4.00	No
		y	-0.012	2.50	No
	24	y	-0.146	0.50	No
		y	-0.146	5.00	No
		y	-0.034	2.50	No
	23	y	-0.033	2.00	No
WI0	3	z	-0.035	2.50	No
	22	z	-0.022	1.50	No
		z	-0.022	4.00	No
		z	-0.002	2.50	No
	24	z	-0.081	0.50	No
		z	-0.081	5.00	No
		z	-0.002	2.50	No
	23	z	-0.018	2.00	No
WI30	3	3	-0.032	2.50	No
	22	3	-0.019	1.50	No
		3	-0.019	4.00	No
		3	-0.003	2.50	No
	24	3	-0.074	0.50	No
		3	-0.074	5.00	No
		3	-0.01	2.50	No
	23	3	-0.017	2.00	No
WI60	3	3	-0.027	2.50	No
	22	3	-0.013	1.50	No
		3	-0.013	4.00	No
		3	-0.005	2.50	No
	24	3	-0.062	0.50	No
		3	-0.062	5.00	No
		3	-0.013	2.50	No
	23	3	-0.014	2.00	No
WI90	3	x	-0.024	2.50	No
	22	x	-0.01	1.50	No
		x	-0.01	4.00	No
		x	-0.006	2.50	No
	24	x	-0.028	0.50	No
		x	-0.028	5.00	No
		x	-0.013	2.50	No
	23	x	-0.012	2.00	No
WI120	3	2	-0.027	2.50	No
	22	2	-0.013	1.50	No
		2	-0.013	4.00	No
		2	-0.005	2.50	No
	24	2	-0.062	0.50	No
		2	-0.062	5.00	No
		2	-0.013	2.50	No
	23	2	-0.014	2.00	No
WI150	3	2	-0.032	2.50	No
	22	2	-0.019	1.50	No
		2	-0.019	4.00	No
		2	-0.003	2.50	No
	24	2	-0.074	0.50	No
		2	-0.074	5.00	No
		2	-0.01	2.50	No
	23	2	-0.017	2.00	No
WL0	3	z	-0.01	2.50	No
	22	z	-0.007	1.50	No
		z	-0.007	4.00	No
	24	z	-0.024	0.50	No

		z	-0.024	5.00	No
	23	z	-0.005	2.00	No
WL30	3	3	-0.009	2.50	No
	22	3	-0.006	1.50	No
		3	-0.006	4.00	No
	24	3	-0.022	0.50	No
		3	-0.022	5.00	No
		3	-0.003	2.50	No
	23	3	-0.004	2.00	No
WL60	3	3	-0.008	2.50	No
	22	3	-0.004	1.50	No
		3	-0.004	4.00	No
		3	-0.001	2.50	No
	24	3	-0.018	0.50	No
		3	-0.018	5.00	No
		3	-0.003	2.50	No
	23	3	-0.004	2.00	No
WL90	3	x	-0.007	2.50	No
	22	x	-0.003	1.50	No
		x	-0.003	4.00	No
		x	-0.001	2.50	No
	24	x	-0.008	0.50	No
		x	-0.008	5.00	No
		x	-0.003	2.50	No
	23	x	-0.003	2.00	No
WL120	3	2	-0.008	2.50	No
	22	2	-0.004	1.50	No
		2	-0.004	4.00	No
		2	-0.001	2.50	No
	24	2	-0.018	0.50	No
		2	-0.018	5.00	No
		2	-0.003	2.50	No
	23	2	-0.004	2.00	No
WL150	3	2	-0.009	2.50	No
	22	2	-0.006	1.50	No
		2	-0.006	4.00	No
	24	2	-0.022	0.50	No
		2	-0.022	5.00	No
		2	-0.003	2.50	No
	23	2	-0.004	2.00	No
LL1	8	y	-0.25	0.00	Yes
LL2	8	y	-0.25	50.00	Yes
LL3	8	y	-0.25	100.00	Yes
LLa1	22	y	-0.50	50.00	Yes
LLa2	24	y	-0.50	50.00	Yes
LLa3	23	y	-0.50	50.00	Yes
LLa4	21	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load on Left End	No	0.00	0.00	0.00
LL2	250 lb Live Load on Center	No	0.00	0.00	0.00
LL3	250 lb Live Load on Right End	No	0.00	0.00	0.00
LLa1	500 lb Live Load on Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load on Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load on Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load on Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00

LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

RAM Elements

Current Date: 6/23/2023 3:32 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+1.6Wo
LC2=1.2D+1.6W30
LC3=1.2D+1.6W60
LC4=1.2D+1.6W90
LC5=1.2D+1.6W120
LC6=1.2D+1.6W150
LC7=1.2D-1.6Wo
LC8=1.2D-1.6W30
LC9=1.2D-1.6W60
LC10=1.2D-1.6W90
LC11=1.2D-1.6W120
LC12=1.2D-1.6W150
LC13=0.9D+1.6Wo
LC14=0.9D+1.6W30
LC15=0.9D+1.6W60
LC16=0.9D+1.6W90
LC17=0.9D+1.6W120
LC18=0.9D+1.6W150
LC19=0.9D-1.6Wo
LC20=0.9D-1.6W30
LC21=0.9D-1.6W60
LC22=0.9D-1.6W90
LC23=0.9D-1.6W120
LC24=0.9D-1.6W150
LC25=1.2D+Di+Wl0
LC26=1.2D+Di+Wl30
LC27=1.2D+Di+Wl60
LC28=1.2D+Di+Wl90
LC29=1.2D+Di+Wl120
LC30=1.2D+Di+Wl150
LC31=1.2D+Di-Wl0
LC32=1.2D+Di-Wl30
LC33=1.2D+Di-Wl60
LC34=1.2D+Di-Wl90
LC35=1.2D+Di-Wl120
LC36=1.2D+Di-Wl150
LC37=0.9D
LC38=1.2D+1.6LL1
LC39=1.2D+1.6LL2
LC40=1.2D+1.6LL3
LC41=1.2D+WL0+LLa1
LC42=1.2D+WL30+LLa1
LC43=1.2D+WL60+LLa1
LC44=1.2D+WL90+LLa1
LC45=1.2D+WL120+LLa1
LC46=1.2D+WL150+LLa1
LC47=1.2D-WL0+LLa1
LC48=1.2D-WL30+LLa1
LC49=1.2D-WL60+LLa1
LC50=1.2D-WL90+LLa1
LC51=1.2D-WL120+LLa1
LC52=1.2D-WL150+LLa1
LC53=1.2D+WL0+LLa2
LC54=1.2D+WL30+LLa2

LC55=1.2D+WL60+LLa2
LC56=1.2D+WL90+LLa2
LC57=1.2D+WL120+LLa2
LC58=1.2D+WL150+LLa2
LC59=1.2D-WL0+LLa2
LC60=1.2D-WL30+LLa2
LC61=1.2D-WL60+LLa2
LC62=1.2D-WL90+LLa2
LC63=1.2D-WL120+LLa2
LC64=1.2D-WL150+LLa2
LC65=1.2D+WL0+LLa3
LC66=1.2D+WL30+LLa3
LC67=1.2D+WL60+LLa3
LC68=1.2D+WL90+LLa3
LC69=1.2D+WL120+LLa3
LC70=1.2D+WL150+LLa3
LC71=1.2D-WL0+LLa3
LC72=1.2D-WL30+LLa3
LC73=1.2D-WL60+LLa3
LC74=1.2D-WL90+LLa3
LC75=1.2D-WL120+LLa3
LC76=1.2D-WL150+LLa3
LC77=1.2D+WL0+LLa4
LC78=1.2D+WL30+LLa4
LC79=1.2D+WL60+LLa4
LC80=1.2D+WL90+LLa4
LC81=1.2D+WL120+LLa4
LC82=1.2D+WL150+LLa4
LC83=1.2D-WL0+LLa4
LC84=1.2D-WL30+LLa4
LC85=1.2D-WL60+LLa4
LC86=1.2D-WL90+LLa4
LC87=1.2D-WL120+LLa4
LC88=1.2D-WL150+LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 2X2X1_4	**2**	LC6 at 100.00%	**1.07**	**N.G.**	
		26	LC12 at 100.00%	0.90	OK	
	PIPE 1-1_2x0.145	**6**	LC12 at 100.00%	0.34	OK	
		7	LC82 at 0.00%	0.49	OK	
		18	LC6 at 0.00%	0.36	OK	
		19	LC23 at 59.38%	**1.08**	**N.G.**	
		20	LC40 at 100.00%	0.56	OK	
	PIPE 2-1_2x0.203	**4**	LC12 at 0.00%	1.02	N.G.	
		5	LC11 at 100.00%	1.17	N.G.	
		8	LC12 at 49.22%	**1.37**	**N.G.**	
		9	LC6 at 49.22%	1.13	N.G.	
	PIPE 2x0.154	**21**	LC79 at 8.33%	0.25	OK	
		22	LC40 at 50.00%	0.42	OK	
		24	LC7 at 47.92%	**1.22**	**N.G.**	
		23	LC80 at 50.00%	0.28	OK	
		25	LC5 at 50.00%	0.35	OK	
	PIPE 3x0.216	**3**	LC6 at 48.44%	**0.98**	**OK**	

RAM Elements

Current Date: 6/21/2023 11:34 PM
Units system: English

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
5	0.00	0.00	-3.21	0
6	0.00	0.00	-2.88	0
7	0.00	0.00	-0.55	0
8	0.00	2.50	0.00	0
9	6.50	2.50	0.00	0
10	-6.50	2.50	0.00	0
11	0.00	2.50	-3.21	0
12	0.00	2.50	-2.88	0
13	0.00	2.50	-0.55	0
14	-0.75	4.50	-4.25	0
15	0.00	4.50	-3.21	0
16	0.00	6.00	-3.21	0
17	0.00	-1.00	-3.21	0
18	-6.00	0.00	0.00	0
19	-6.00	2.50	0.00	0
20	0.50	0.00	0.00	0
21	0.50	2.50	0.00	0
22	-4.00	0.00	0.00	0
23	-4.00	2.50	0.00	0
24	5.00	0.00	0.00	0
25	5.00	2.50	0.00	0
26	0.50	0.00	0.20	0
27	0.50	2.50	0.20	0
28	-4.00	0.00	0.20	0
29	-4.00	2.50	0.20	0
30	5.00	0.00	0.20	0

31	5.00	2.50	0.20	0
32	-6.00	0.00	0.20	0
33	-6.00	2.50	0.20	0
34	3.00	2.50	0.00	0
35	3.00	0.00	0.00	0
36	-3.00	2.50	0.00	0
37	-3.00	0.00	0.00	0
38	-4.00	-0.50	0.20	0
39	5.00	-0.50	0.20	0
40	-6.00	-0.50	0.20	0
41	0.50	-0.50	0.20	0
42	-6.00	5.50	0.20	0
43	5.00	5.50	0.20	0
44	-4.00	5.50	0.20	0
45	0.50	5.50	0.20	0
46	-3.00	1.00	0.00	0
47	-6.50	1.00	-9.00	0
56	-0.6136	0.00	-4.0609	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
14	1	1	1	0	0	0
47	1	1	1	0	0	0
56	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
2	14	15		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
3	16	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
4	5	1		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
5	11	8		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
6	12	6		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
7	13	7		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
8	10	9		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
9	3	2		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
18	8	1		PIPE 1-1_2x0.145	A36	0.00	0.00	0.00
19	36	37		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
20	34	35		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
21	40	42		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	43	39		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	45	41		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
23	44	38		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
25	47	46		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
26	56	5		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00

Orientation of local axes

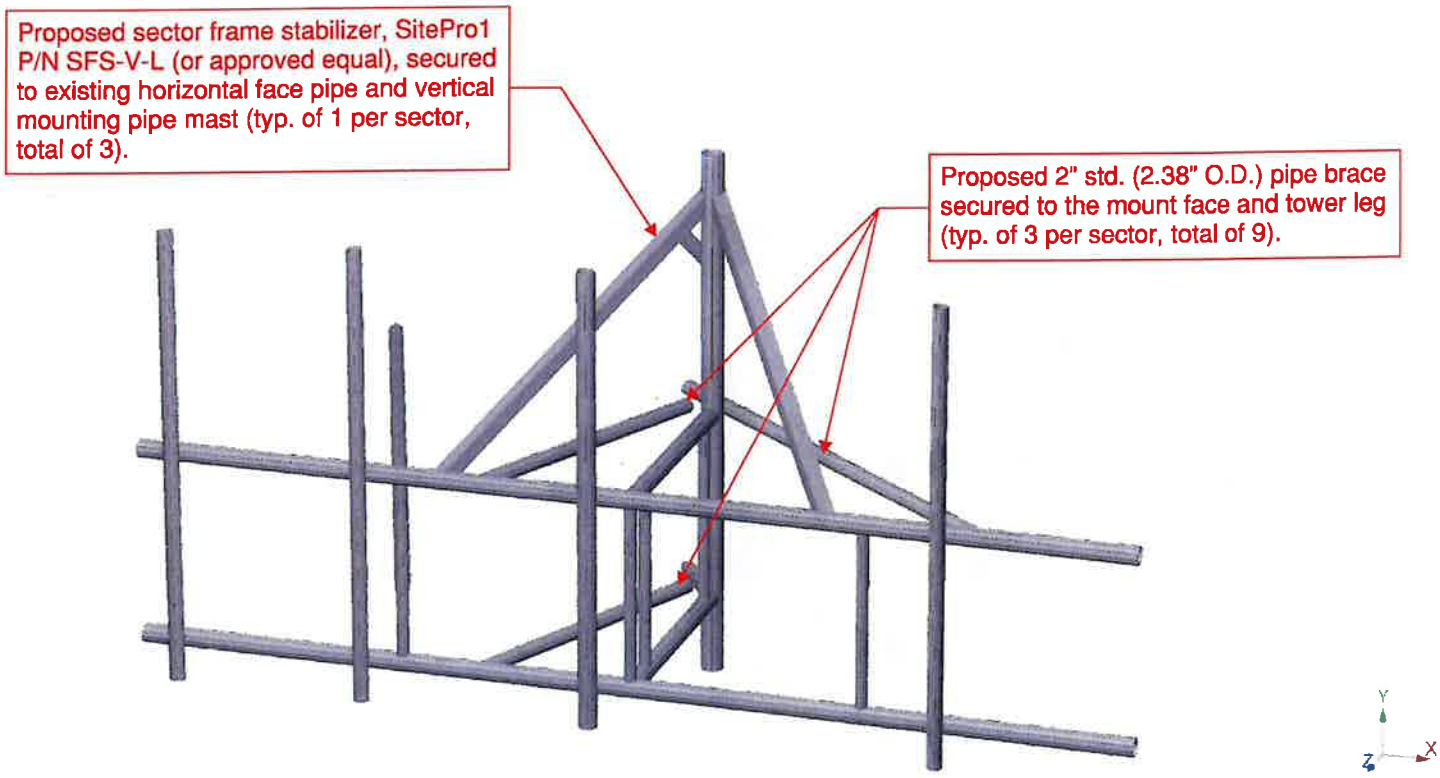
Member	Rotation [Deg]	Axes23	NX	NY	NZ
3	315.00	0	0.00	0.00	0.00
21	315.00	0	0.00	0.00	0.00
22	315.00	0	0.00	0.00	0.00
24	315.00	0	0.00	0.00	0.00
23	315.00	0	0.00	0.00	0.00

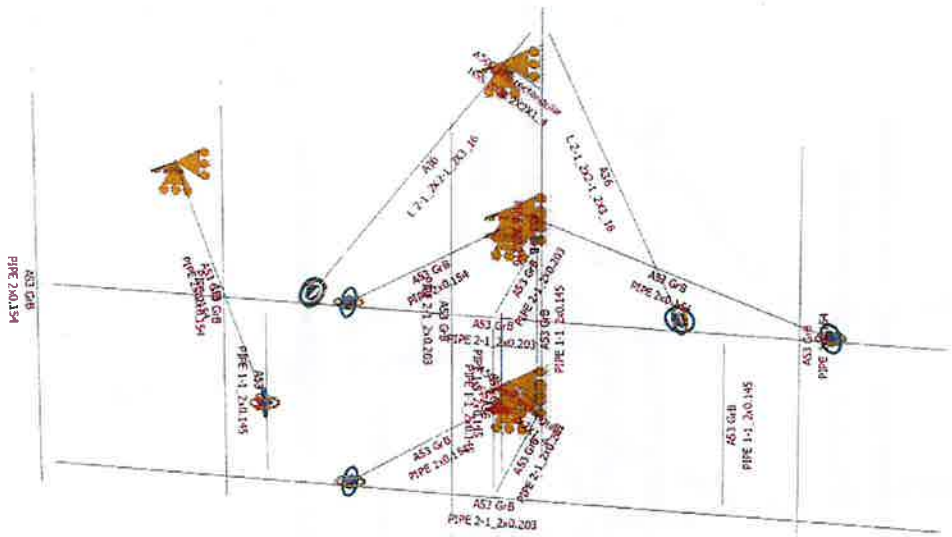
Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
25	0	0	0	0	1	1	0	0	0	0	Full

TEP NORTHEAST

Mount Calculations
(Modified Conditions)

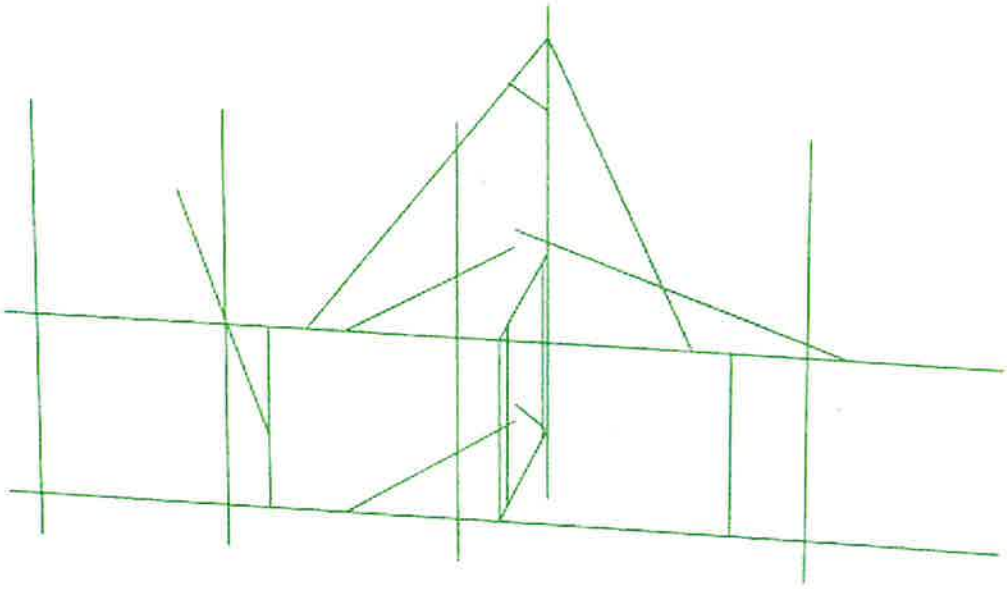

Proposed sector frame stabilizer, SitePro1 P/N SFS-V-L (or approved equal), secured to existing horizontal face pipe and vertical mounting pipe mast (typ. of 1 per sector, total of 3).
Proposed 2" std. (2.38" O.D.) pipe brace secured to the mount face and tower leg (typ. of 3 per sector, total of 9).
Y
Z
X

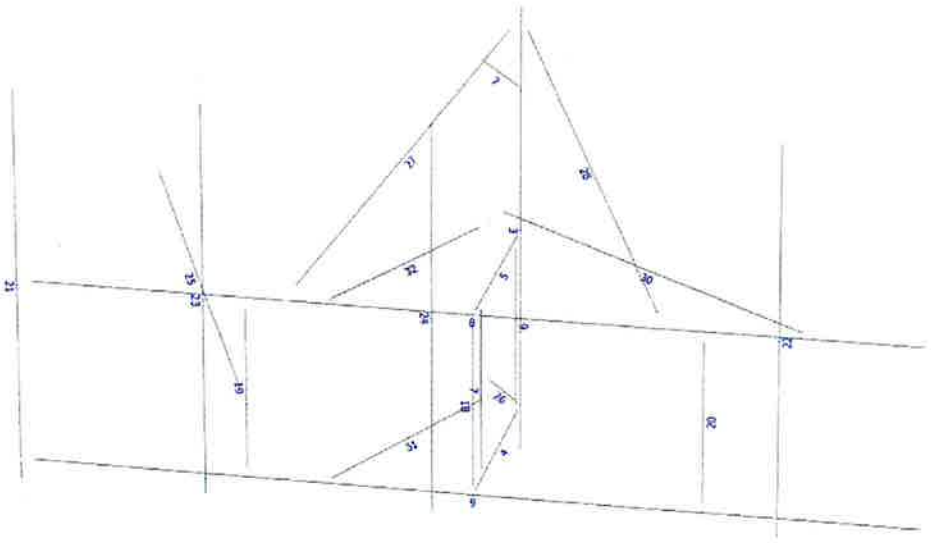

A53 GrB
PIPE 2-1_2x0.203
PIPE 1-1_2x0.145
PIPE 2x0.154
Y
X
Z

RAM Elements
CONNECT Edition

Current Date: 6/23/2023 3:55 PM
Units system: English

Design status
- Not designed
- Error on design
- Design O.K.
- With warnings




Y
X
Z

RAM Elements

Current Date: 6/23/2023 3:55 PM
Units system: English

Load data

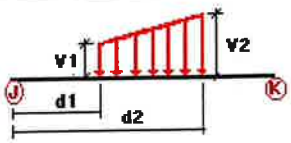
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load on Left End	No	LL
LL2	250 lb Live Load on Center	No	LL
LL3	250 lb Live Load on Right End	No	LL
LLa1	500 lb Live Load on Antenna 1	No	LL
LLa2	500 lb Live Load on Antenna 2	No	LL
LLa3	500 lb Live Load on Antenna 3	No	LL
LLa4	500 lb Live Load on Antenna 4	No	LL

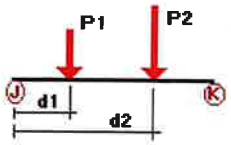
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	2	z	-0.01	0.00	0.00	No	0.00	No
	3	z	-0.016	0.00	0.00	No	0.00	No
	6	z	-0.009	0.00	0.00	No	0.00	No
	7	z	-0.009	0.00	0.00	No	0.00	No
	8	z	-0.013	0.00	0.00	No	0.00	No
	9	z	-0.013	0.00	0.00	No	0.00	No
	19	z	-0.009	0.00	0.00	No	0.00	No
	20	z	-0.009	0.00	0.00	No	0.00	No
	21	z	-0.011	0.00	0.00	No	0.00	No
	22	z	-0.011	-0.011	0.00	No	1.50	No
		z	-0.011	-0.011	4.00	No	6.00	No
	23	z	-0.011	0.00	0.00	No	0.00	No
	25	z	-0.011	0.00	0.00	No	0.00	No
	26	z	-0.01	0.00	0.00	No	0.00	No
W30	2	z	-0.01	0.00	0.00	No	0.00	No
	3	z	-0.016	0.00	0.00	No	0.00	No
	4	z	-0.013	0.00	0.00	No	0.00	No
	5	z	-0.013	0.00	0.00	No	0.00	No
	6	z	-0.009	0.00	0.00	No	0.00	No
	7	z	-0.009	0.00	0.00	No	0.00	No
	8	z	-0.013	0.00	0.00	No	0.00	No
	9	z	-0.013	0.00	0.00	No	0.00	No
	18	z	-0.009	0.00	0.00	No	0.00	No
	19	z	-0.009	0.00	0.00	No	0.00	No
	20	z	-0.009	0.00	0.00	No	0.00	No
	21	z	-0.011	0.00	0.00	No	0.00	No
	22	z	-0.011	-0.011	0.00	No	1.50	No
		z	-0.011	-0.011	4.00	No	6.00	No
	23	z	-0.011	0.00	0.00	No	0.00	No
	25	z	-0.011	0.00	0.00	No	0.00	No
	26	z	-0.01	0.00	0.00	No	0.00	No
W60	2	x	-0.01	0.00	0.00	No	0.00	No
	3	x	-0.016	0.00	0.00	No	0.00	No
	4	x	-0.013	0.00	0.00	No	0.00	No
	5	x	-0.013	0.00	0.00	No	0.00	No
	6	x	-0.009	0.00	0.00	No	0.00	No
	7	x	-0.009	0.00	0.00	No	0.00	No
	8	x	-0.013	0.00	0.00	No	0.00	No
	9	x	-0.013	0.00	0.00	No	0.00	No
	18	x	-0.009	0.00	0.00	No	0.00	No
	19	x	-0.009	0.00	0.00	No	0.00	No
	20	x	-0.009	0.00	0.00	No	0.00	No
	21	x	-0.011	0.00	0.00	No	0.00	No
	22	x	-0.011	0.00	0.00	No	0.00	No
	24	x	-0.011	0.00	0.00	No	0.00	No
	23	x	-0.011	0.00	0.00	No	0.00	No
	25	x	-0.011	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
W90	2	x	-0.01	0.00	0.00	No	0.00	No
	3	x	-0.016	0.00	0.00	No	0.00	No
	4	x	-0.013	0.00	0.00	No	0.00	No
	5	x	-0.013	0.00	0.00	No	0.00	No
	6	x	-0.009	0.00	0.00	No	0.00	No
	7	x	-0.009	0.00	0.00	No	0.00	No
	18	x	-0.009	0.00	0.00	No	0.00	No
	19	x	-0.009	0.00	0.00	No	0.00	No
	20	x	-0.009	0.00	0.00	No	0.00	No
	21	x	-0.011	0.00	0.00	No	0.00	No
	22	x	-0.011	0.00	0.00	No	0.00	No
	24	x	-0.011	0.00	0.00	No	0.00	No

	23	x	-0.011	0.00	0.00	No	0.00	No
	25	x	-0.011	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
W120	2	x	-0.01	0.00	0.00	No	0.00	No
	3	x	-0.016	0.00	0.00	No	0.00	No
	4	x	-0.013	0.00	0.00	No	0.00	No
	5	x	-0.013	0.00	0.00	No	0.00	No
	6	x	-0.009	0.00	0.00	No	0.00	No
	7	x	-0.009	0.00	0.00	No	0.00	No
	8	x	-0.013	0.00	0.00	No	0.00	No
	9	x	-0.013	0.00	0.00	No	0.00	No
	18	x	-0.009	0.00	0.00	No	0.00	No
	19	x	-0.009	0.00	0.00	No	0.00	No
	20	x	-0.009	0.00	0.00	No	0.00	No
	21	x	-0.011	0.00	0.00	No	0.00	No
	22	x	-0.011	0.00	0.00	No	0.00	No
	24	x	-0.011	0.00	0.00	No	0.00	No
	23	x	-0.011	0.00	0.00	No	0.00	No
	25	x	-0.011	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
W150	2	z	0.01	0.00	0.00	No	0.00	No
	3	z	0.016	0.00	0.00	No	0.00	No
	4	z	0.013	0.00	0.00	No	0.00	No
	5	z	0.013	0.00	0.00	No	0.00	No
	6	z	0.009	0.00	0.00	No	0.00	No
	7	z	0.009	0.00	0.00	No	0.00	No
	8	z	0.013	0.00	0.00	No	0.00	No
	9	z	0.013	0.00	0.00	No	0.00	No
	18	z	0.009	0.00	0.00	No	0.00	No
	19	z	0.009	0.00	0.00	No	0.00	No
	20	z	0.009	0.00	0.00	No	0.00	No
	21	z	0.011	0.00	0.00	No	0.00	No
	22	z	0.011	0.00	0.00	No	0.00	No
	24	z	0.011	0.00	0.00	No	0.00	No
	23	z	0.011	0.00	0.00	No	0.00	No
	25	z	0.011	0.00	0.00	No	0.00	No
	26	z	0.01	0.00	0.00	No	0.00	No
Di	2	y	-0.006	0.00	0.00	No	0.00	No
	3	y	-0.007	0.00	0.00	No	0.00	No
	4	y	-0.006	0.00	0.00	No	0.00	No
	5	y	-0.006	0.00	0.00	No	0.00	No
	6	y	-0.004	0.00	0.00	No	0.00	No
	7	y	-0.004	0.00	0.00	No	0.00	No
	8	y	-0.006	0.00	0.00	No	0.00	No
	9	y	-0.006	0.00	0.00	No	0.00	No
	18	y	-0.004	0.00	0.00	No	0.00	No
	19	y	-0.004	0.00	0.00	No	0.00	No
	20	y	-0.004	0.00	0.00	No	0.00	No
	21	y	-0.005	0.00	0.00	No	0.00	No
	22	y	-0.005	0.00	0.00	No	0.00	No
	24	y	-0.005	0.00	0.00	No	0.00	No
	23	y	-0.005	0.00	0.00	No	0.00	No
	25	y	-0.005	0.00	0.00	No	0.00	No
	26	y	-0.006	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	3	y	-0.032	2.50	No
	22	y	-0.044	1.50	No
		y	-0.044	4.00	No
		y	-0.021	2.50	No
	24	y	-0.092	0.50	No
		y	-0.092	5.00	No
		y	-0.075	2.50	No
	23	y	-0.071	2.00	No
Wo	3	z	-0.174	2.50	No
	22	z	-0.109	1.50	No
		z	-0.109	4.00	No
	24	z	-0.42	0.50	No
		z	-0.42	5.00	No
	23	z	-0.086	2.00	No
W30	3	3	-0.16	2.50	No
	22	3	-0.092	1.50	No
		3	-0.092	4.00	No
		3	-0.006	2.50	No
	24	3	-0.384	0.50	No
		3	-0.384	5.00	No
		3	-0.047	2.50	No
	23	3	-0.078	2.00	No
W60	3	3	-0.13	2.50	No
	22	3	-0.06	1.50	No
		3	-0.06	4.00	No
		3	-0.018	2.50	No
	24	3	-0.312	0.50	No
		3	-0.312	5.00	No
		3	-0.059	2.50	No
	23	3	-0.061	2.00	No
W90	3	x	-0.116	2.50	No
	22	x	-0.043	1.50	No
		x	-0.043	4.00	No
		x	-0.024	2.50	No
	24	x	-0.138	0.50	No
		x	-0.138	5.00	No
		x	-0.058	2.50	No
	23	x	-0.052	2.00	No
W120	3	2	-0.13	2.50	No
	22	2	-0.06	1.50	No
		2	-0.06	4.00	No
		2	-0.018	2.50	No
	24	2	-0.312	0.50	No
		2	-0.312	5.00	No
		2	-0.059	2.50	No
	23	2	-0.061	2.00	No
W150	3	2	-0.16	2.50	No
	22	2	-0.092	1.50	No
		2	-0.092	4.00	No
		2	-0.006	2.50	No
	24	2	-0.384	0.50	No
		2	-0.384	5.00	No
		2	-0.047	2.50	No
	23	2	-0.078	2.00	No

Di	3	y	-0.068	2.50	No
	22	y	-0.038	1.50	No
		y	-0.038	4.00	No
		y	-0.012	2.50	No
	24	y	-0.146	0.50	No
		y	-0.146	5.00	No
		y	-0.034	2.50	No
	23	y	-0.033	2.00	No
WI0	3	z	-0.035	2.50	No
	22	z	-0.022	1.50	No
		z	-0.022	4.00	No
		z	-0.002	2.50	No
	24	z	-0.081	0.50	No
		z	-0.081	5.00	No
		z	-0.002	2.50	No
	23	z	-0.018	2.00	No
WI30	3	3	-0.032	2.50	No
	22	3	-0.019	1.50	No
		3	-0.019	4.00	No
		3	-0.003	2.50	No
	24	3	-0.074	0.50	No
		3	-0.074	5.00	No
		3	-0.01	2.50	No
	23	3	-0.017	2.00	No
WI60	3	3	-0.027	2.50	No
	22	3	-0.013	1.50	No
		3	-0.013	4.00	No
		3	-0.005	2.50	No
	24	3	-0.062	0.50	No
		3	-0.062	5.00	No
		3	-0.013	2.50	No
	23	3	-0.014	2.00	No
WI90	3	x	-0.024	2.50	No
	22	x	-0.01	1.50	No
		x	-0.01	4.00	No
		x	-0.006	2.50	No
	24	x	-0.028	0.50	No
		x	-0.028	5.00	No
		x	-0.013	2.50	No
	23	x	-0.012	2.00	No
WI120	3	2	-0.027	2.50	No
	22	2	-0.013	1.50	No
		2	-0.013	4.00	No
		2	-0.005	2.50	No
	24	2	-0.062	0.50	No
		2	-0.062	5.00	No
		2	-0.013	2.50	No
	23	2	-0.014	2.00	No
WI150	3	2	-0.032	2.50	No
	22	2	-0.019	1.50	No
		2	-0.019	4.00	No
		2	-0.003	2.50	No
	24	2	-0.074	0.50	No
		2	-0.074	5.00	No
		2	-0.01	2.50	No
	23	2	-0.017	2.00	No
WL0	3	z	-0.01	2.50	No
	22	z	-0.007	1.50	No
		z	-0.007	4.00	No
	24	z	-0.024	0.50	No

		z	-0.024	5.00	No
	23	z	-0.005	2.00	No
WL30	3	3	-0.009	2.50	No
	22	3	-0.006	1.50	No
		3	-0.006	4.00	No
	24	3	-0.022	0.50	No
		3	-0.022	5.00	No
		3	-0.003	2.50	No
	23	3	-0.004	2.00	No
WL60	3	3	-0.008	2.50	No
	22	3	-0.004	1.50	No
		3	-0.004	4.00	No
		3	-0.001	2.50	No
	24	3	-0.018	0.50	No
		3	-0.018	5.00	No
		3	-0.003	2.50	No
	23	3	-0.004	2.00	No
WL90	3	x	-0.007	2.50	No
	22	x	-0.003	1.50	No
		x	-0.003	4.00	No
		x	-0.001	2.50	No
	24	x	-0.008	0.50	No
		x	-0.008	5.00	No
		x	-0.003	2.50	No
	23	x	-0.003	2.00	No
WL120	3	2	-0.008	2.50	No
	22	2	-0.004	1.50	No
		2	-0.004	4.00	No
		2	-0.001	2.50	No
	24	2	-0.018	0.50	No
		2	-0.018	5.00	No
		2	-0.003	2.50	No
	23	2	-0.004	2.00	No
WL150	3	2	-0.009	2.50	No
	22	2	-0.006	1.50	No
		2	-0.006	4.00	No
	24	2	-0.022	0.50	No
		2	-0.022	5.00	No
		2	-0.003	2.50	No
	23	2	-0.004	2.00	No
LL1	8	y	-0.25	0.00	Yes
LL2	8	y	-0.25	50.00	Yes
LL3	8	y	-0.25	100.00	Yes
LLa1	22	y	-0.50	50.00	Yes
LLa2	24	y	-0.50	50.00	Yes
LLa3	23	y	-0.50	50.00	Yes
LLa4	21	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	No	0.00	0.00	0.00
LL1	250 lb Live Load on Left End	No	0.00	0.00	0.00
LL2	250 lb Live Load on Center	No	0.00	0.00	0.00
LL3	250 lb Live Load on Right End	No	0.00	0.00	0.00
LLa1	500 lb Live Load on Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load on Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load on Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load on Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00

LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

RAM Elements

Current Date: 6/23/2023 3:53 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+1.6Wo
LC2=1.2D+1.6W30
LC3=1.2D+1.6W60
LC4=1.2D+1.6W90
LC5=1.2D+1.6W120
LC6=1.2D+1.6W150
LC7=1.2D-1.6Wo
LC8=1.2D-1.6W30
LC9=1.2D-1.6W60
LC10=1.2D-1.6W90
LC11=1.2D-1.6W120
LC12=1.2D-1.6W150
LC13=0.9D+1.6Wo
LC14=0.9D+1.6W30
LC15=0.9D+1.6W60
LC16=0.9D+1.6W90
LC17=0.9D+1.6W120
LC18=0.9D+1.6W150
LC19=0.9D-1.6Wo
LC20=0.9D-1.6W30
LC21=0.9D-1.6W60
LC22=0.9D-1.6W90
LC23=0.9D-1.6W120
LC24=0.9D-1.6W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=0.9D
LC38=1.2D+1.6LL1
LC39=1.2D+1.6LL2
LC40=1.2D+1.6LL3
LC41=1.2D+WL0+LLa1
LC42=1.2D+WL30+LLa1
LC43=1.2D+WL60+LLa1
LC44=1.2D+WL90+LLa1
LC45=1.2D+WL120+LLa1
LC46=1.2D+WL150+LLa1
LC47=1.2D-WL0+LLa1
LC48=1.2D-WL30+LLa1
LC49=1.2D-WL60+LLa1
LC50=1.2D-WL90+LLa1
LC51=1.2D-WL120+LLa1
LC52=1.2D-WL150+LLa1
LC53=1.2D+WL0+LLa2
LC54=1.2D+WL30+LLa2

LC55=1.2D+WL60+LLa2
LC56=1.2D+WL90+LLa2
LC57=1.2D+WL120+LLa2
LC58=1.2D+WL150+LLa2
LC59=1.2D-WL0+LLa2
LC60=1.2D-WL30+LLa2
LC61=1.2D-WL60+LLa2
LC62=1.2D-WL90+LLa2
LC63=1.2D-WL120+LLa2
LC64=1.2D-WL150+LLa2
LC65=1.2D+WL0+LLa3
LC66=1.2D+WL30+LLa3
LC67=1.2D+WL60+LLa3
LC68=1.2D+WL90+LLa3
LC69=1.2D+WL120+LLa3
LC70=1.2D+WL150+LLa3
LC71=1.2D-WL0+LLa3
LC72=1.2D-WL30+LLa3
LC73=1.2D-WL60+LLa3
LC74=1.2D-WL90+LLa3
LC75=1.2D-WL120+LLa3
LC76=1.2D-WL150+LLa3
LC77=1.2D+WL0+LLa4
LC78=1.2D+WL30+LLa4
LC79=1.2D+WL60+LLa4
LC80=1.2D+WL90+LLa4
LC81=1.2D+WL120+LLa4
LC82=1.2D+WL150+LLa4
LC83=1.2D-WL0+LLa4
LC84=1.2D-WL30+LLa4
LC85=1.2D-WL60+LLa4
LC86=1.2D-WL90+LLa4
LC87=1.2D-WL120+LLa4
LC88=1.2D-WL150+LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	HSS_SQR 2X2X1_4	**2**	LC6 at 100.00%	**0.68**	**OK**	
		26	LC26 at 100.00%	0.50	OK	
	L 2-1_2X2-1_2X3_16	**27**	LC6 at 100.00%	**0.27**	**OK**	
		28	LC6 at 100.00%	0.26	OK	
	PIPE 1-1_2x0.145	**6**	LC26 at 100.00%	0.23	OK	
		7	LC3 at 100.00%	0.25	OK	
		18	LC12 at 100.00%	0.24	OK	
		19	LC5 at 59.38%	**0.93**	**OK**	
		20	LC40 at 100.00%	0.38	OK	
	PIPE 2-1_2x0.203	**4**	LC36 at 100.00%	0.17	OK	
		5	LC30 at 0.00%	0.33	OK	
		8	LC6 at 34.90%	0.58	OK	
		9	LC12 at 34.72%	0.30	OK	
		24	LC7 at 47.92%	**0.63**	**OK**	
	PIPE 2x0.154	**21**	LC88 at 8.33%	0.24	OK	
		22	LC40 at 50.00%	**0.34**	**OK**	
		23	LC5 at 89.58%	0.25	OK	
		25	LC5 at 50.00%	0.33	OK	
		30	LC12 at 0.00%	0.06	OK	
		31	LC11 at 100.00%	0.06	OK	
		32	LC24 at 100.00%	0.09	OK	
	PIPE 3x0.216	**3**	LC31 at 22.50%	**0.35**	**OK**	

Current Date: 6/23/2023 3:55 PM
Units system: English

Geometry data

GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member 0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
5	0.00	0.00	-3.21	0
6	0.00	0.00	-2.88	0
7	0.00	0.00	-0.55	0
8	0.00	2.50	0.00	0
9	6.50	2.50	0.00	0
10	-6.50	2.50	0.00	0
11	0.00	2.50	-3.21	0
12	0.00	2.50	-2.88	0
13	0.00	2.50	-0.55	0
14	-0.75	4.50	-4.25	0
15	0.00	4.50	-3.21	0
16	0.00	6.00	-3.21	0
17	0.00	-1.00	-3.21	0
18	-6.00	0.00	0.00	0
19	-6.00	2.50	0.00	0
20	-0.50	0.00	0.00	0
21	-0.50	2.50	0.00	0
22	-3.50	0.00	0.00	0
23	-3.50	2.50	0.00	0
24	4.00	0.00	0.00	0

25	4.00	2.50	0.00	0
26	-0.50	0.00	0.20	0
27	-0.50	2.50	0.20	0
28	-3.50	0.00	0.20	0
29	-3.50	2.50	0.20	0
30	4.00	0.00	0.20	0
31	4.00	2.50	0.20	0
32	-6.00	0.00	0.20	0
33	-6.00	2.50	0.20	0
34	3.00	2.50	0.00	0
35	3.00	0.00	0.00	0
36	-3.00	2.50	0.00	0
37	-3.00	0.00	0.00	0
38	-3.50	-0.50	0.20	0
39	4.00	-0.50	0.20	0
40	-6.00	-0.50	0.20	0
41	-0.50	-0.50	0.20	0
42	-6.00	5.50	0.20	0
43	4.00	5.50	0.20	0
44	-3.50	5.50	0.20	0
45	-0.50	5.50	0.20	0
46	-3.00	1.00	0.00	0
47	-6.50	1.00	-9.00	0
56	-0.6136	0.00	-4.0609	0
57	-2.50	2.50	0.00	0
58	2.50	2.50	0.00	0
59	0.00	5.50	-3.21	0
62	4.50	2.50	0.00	0
63	-0.6136	2.50	-4.0609	0
64	-2.00	0.00	0.00	0
65	-0.6136	-0.25	-4.0609	0
66	-2.00	2.50	0.00	0
67	-0.6136	2.25	-4.0609	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
14	1	1	1	0	0	0
47	1	1	1	0	0	0
56	1	1	1	0	0	0
63	1	1	1	0	0	0
65	1	1	1	0	0	0
67	1	1	1	0	0	0

Members

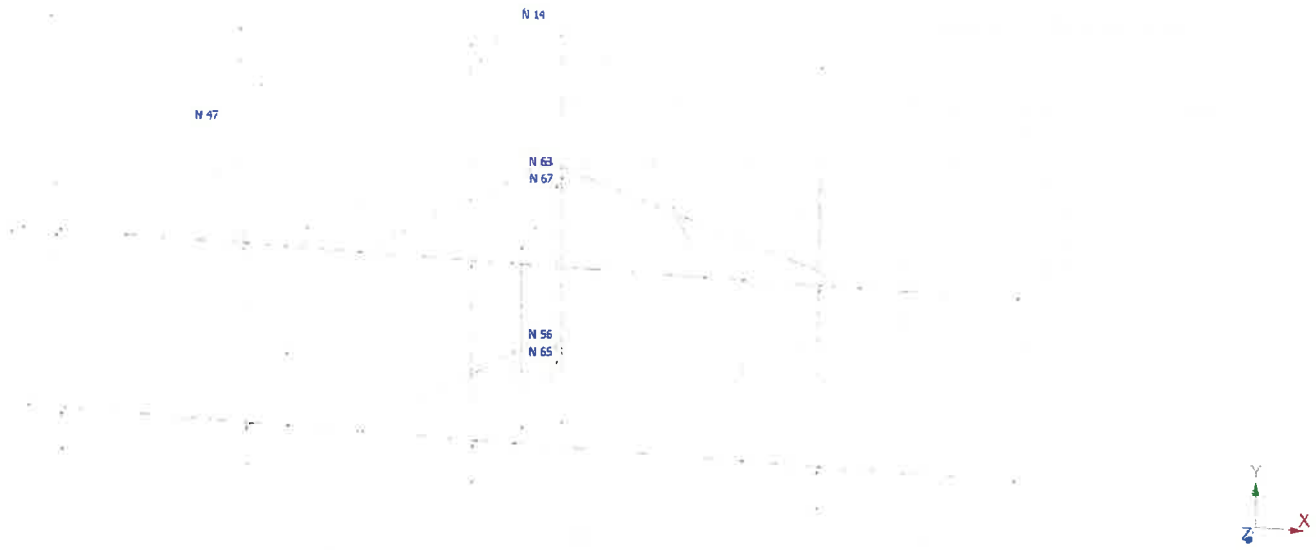
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
2	14	15		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
3	16	17		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
4	5	1		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
5	11	8		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
6	12	6		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
7	13	7		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
8	10	9		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
9	3	2		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
18	8	1		PIPE 1-1_2x0.145	A36	0.00	0.00	0.00
19	36	37		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
20	34	35		PIPE 1-1_2x0.145	A53 GrB	0.00	0.00	0.00
21	40	42		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
22	43	39		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	45	41		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
23	44	38		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
25	47	46		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
26	56	5		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
27	57	59		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
28	58	59		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
30	62	63		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	64	65		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
32	66	67		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
3	315.00	0	0.00	0.00	0.00
21	315.00	0	0.00	0.00	0.00
22	315.00	0	0.00	0.00	0.00
24	315.00	0	0.00	0.00	0.00
23	315.00	0	0.00	0.00	0.00
27	180.00	0	0.00	0.00	0.00
28	90.00	0	0.00	0.00	0.00

Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
25	0	0	0	0	1	1	0	0	0	0	Full
27	1	1	0	0	0	0	0	0	0	0	Full
28	1	1	0	0	0	0	0	0	0	0	Full
30	1	1	0	0	0	0	0	0	0	0	Full
31	1	1	0	0	0	0	0	0	0	0	Full
32	1	1	0	0	0	0	0	0	0	0	Full


N 14
N 47
N 63
N 67
N 56
N 65
Y
X
Z

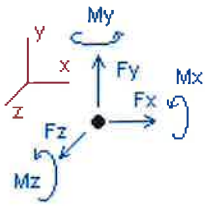
RAM Elements

Current Date: 6/23/2023 3:56 PM
Units system: English

Analysis result

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2D+1.6Wo
LC2=1.2D+1.6W30
LC3=1.2D+1.6W60
LC4=1.2D+1.6W90
LC5=1.2D+1.6W120
LC6=1.2D+1.6W150
LC7=1.2D-1.6Wo
LC8=1.2D-1.6W30
LC9=1.2D-1.6W60
LC10=1.2D-1.6W90
LC11=1.2D-1.6W120
LC12=1.2D-1.6W150
LC13=0.9D+1.6Wo
LC14=0.9D+1.6W30
LC15=0.9D+1.6W60
LC16=0.9D+1.6W90
LC17=0.9D+1.6W120
LC18=0.9D+1.6W150
LC19=0.9D-1.6Wo
LC20=0.9D-1.6W30
LC21=0.9D-1.6W60
LC22=0.9D-1.6W90
LC23=0.9D-1.6W120
LC24=0.9D-1.6W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=0.9D
LC38=1.2D+1.6LL1
LC39=1.2D+1.6LL2
LC40=1.2D+1.6LL3
LC41=1.2D+WL0+LLa1
LC42=1.2D+WL30+LLa1

LC43=1.2D+WL60+LLa1
LC44=1.2D+WL90+LLa1
LC45=1.2D+WL120+LLa1
LC46=1.2D+WL150+LLa1
LC47=1.2D-WL0+LLa1
LC48=1.2D-WL30+LLa1
LC49=1.2D-WL60+LLa1
LC50=1.2D-WL90+LLa1
LC51=1.2D-WL120+LLa1
LC52=1.2D-WL150+LLa1
LC53=1.2D+WL0+LLa2
LC54=1.2D+WL30+LLa2
LC55=1.2D+WL60+LLa2
LC56=1.2D+WL90+LLa2
LC57=1.2D+WL120+LLa2
LC58=1.2D+WL150+LLa2
LC59=1.2D-WL0+LLa2
LC60=1.2D-WL30+LLa2
LC61=1.2D-WL60+LLa2
LC62=1.2D-WL90+LLa2
LC63=1.2D-WL120+LLa2
LC64=1.2D-WL150+LLa2
LC65=1.2D+WL0+LLa3
LC66=1.2D+WL30+LLa3
LC67=1.2D+WL60+LLa3
LC68=1.2D+WL90+LLa3
LC69=1.2D+WL120+LLa3
LC70=1.2D+WL150+LLa3
LC71=1.2D-WL0+LLa3
LC72=1.2D-WL30+LLa3
LC73=1.2D-WL60+LLa3
LC74=1.2D-WL90+LLa3
LC75=1.2D-WL120+LLa3
LC76=1.2D-WL150+LLa3
LC77=1.2D+WL0+LLa4
LC78=1.2D+WL30+LLa4
LC79=1.2D+WL60+LLa4
LC80=1.2D+WL90+LLa4
LC81=1.2D+WL120+LLa4
LC82=1.2D+WL150+LLa4
LC83=1.2D-WL0+LLa4
LC84=1.2D-WL30+LLa4
LC85=1.2D-WL60+LLa4
LC86=1.2D-WL90+LLa4
LC87=1.2D-WL120+LLa4
LC88=1.2D-WL150+LLa4

		Forces						Moments					
Node		**Fx** [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
14	Max	0.811	LC15	0.627	LC82	0.050	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-1.213	LC9	0.079	LC24	-1.753	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1
47	Max	0.914	LC5	0.044	LC36	2.154	LC5	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.911	LC23	0.008	LC17	-2.132	LC23	0.00000	LC1	0.00000	LC1	0.00000	LC1
56	Max	0.618	LC12	1.230	LC25	1.145	LC42	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.368	LC18	0.449	LC21	-0.142	LC21	0.00000	LC1	0.00000	LC1	0.00000	LC1
63	Max	0.849	LC12	0.014	LC8	0.669	LC12	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.559	LC18	0.007	LC24	-0.449	LC18	0.00000	LC1	0.00000	LC1	0.00000	LC1
65	Max	0.336	LC17	0.100	LC11	1.456	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1

	Min	-0.495	LC11	-0.049	LC15	-0.980	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1
67	Max	0.774	LC6	0.149	LC12	2.236	LC24	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.753	LC24	-0.118	LC18	-2.229	LC6	0.00000	LC1	0.00000	LC1	0.00000	LC1

TEP NORTHEAST

Connection Check

Date: 6/27/2023
Project Name: NORTHFORD CT
Designed By: JC **Checked By:** MSC

CHECK CONNECTION CAPACITY (Worst Case)

Reference: AISC Steel Construction Manual 14th Edition (ASD)

Bolt Type = A36 1/2" U-Bolt

Allowable Tensile Load =

F_{Tall} = 4271 lbs.

Allowable Shear Load =

F_{Vall} = 2562 lbs.

TENSILE FORCES

Reaction **F =** 2154 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 914 lbs. (See Bentley Output)
Reactions in Y direction: 44 lbs. (See Bentley Output)

Resultant: 915 lbs.

No. of Supports = 1
No. of Bolts / Support = 1

Tension Design Load /Bolts =

f_t= 2154.00 lbs. < 4271 lbs. **Therefore, OK !**

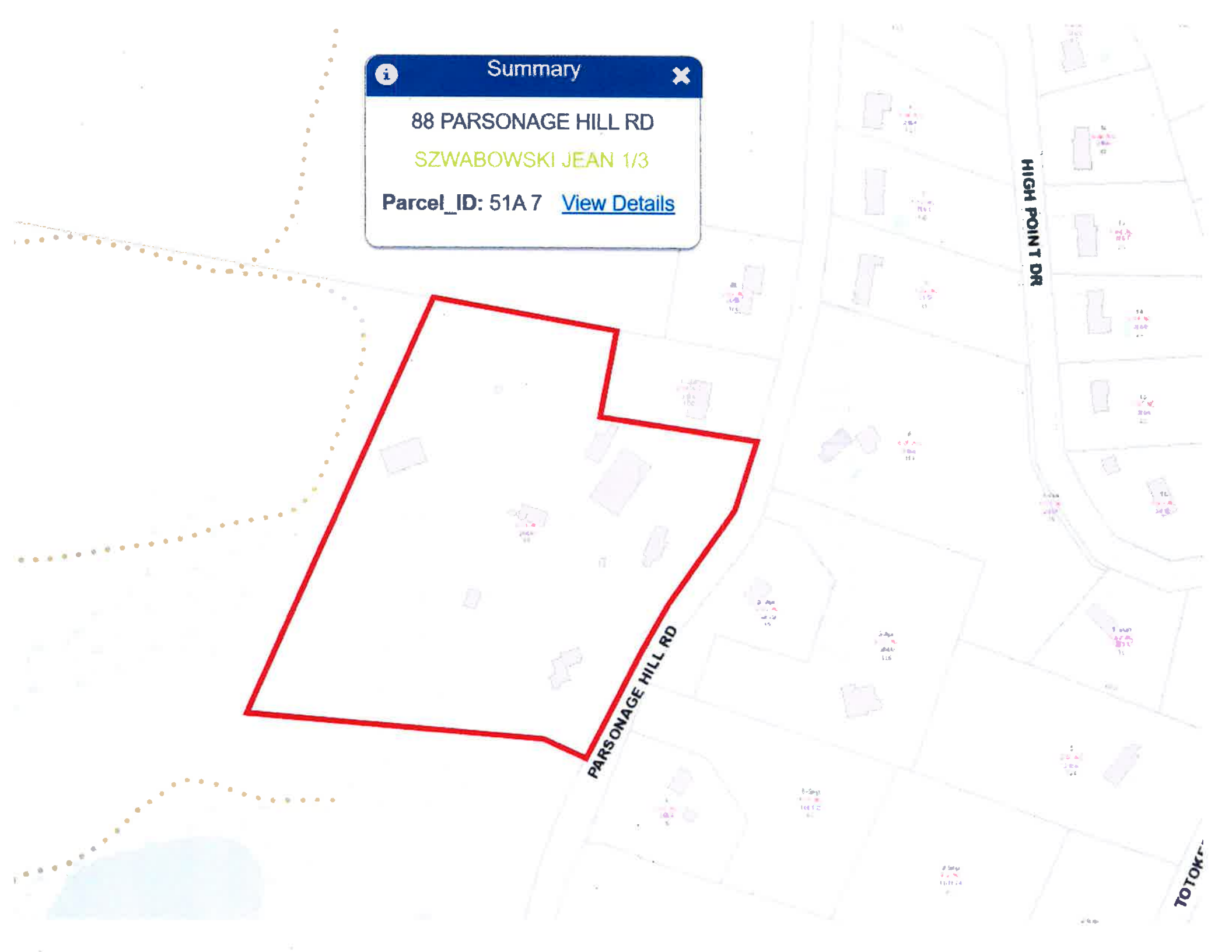
Shear Design Load / Bolts=

f_v= 915.06 lbs. < 2562 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.504	+	0.357	=	0.861	<	1.0	**Therefore, OK !**

ATTACHMENT 5


Summary
88 PARSONAGE HILL RD
SZWABOWSKI JEAN 1/3
Parcel_ID: 51A 7
View Details
HIGH POINT DR
PARSONAGE HILL RD

88 PARSONAGE HILL RD

Sales | Print | Field Card | Map It

Location	88 PARSONAGE HILL RD	**Mblu**	51/A 7/ / /
Acct#	002953	**Owner**	SZWABOWSKI JEAN 1/3
Assessment	$885,600	**Appraisal**	$1,279,900
PID	3060	**Building Count**	4

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$713,000	$566,900	$1,279,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$488,800	$396,800	$885,600

Owner of Record

Owner	SZWABOWSKI JEAN 1/3	**Sale Price**	$90,000
Co-Owner	OCHENKOWSKI J J JR 1/3 & K W 1/3 EACH	**Certificate**	
Address	84 PARSONAGE HL RD NORTHFORD, CT 06472-1445	**Book & Page**	0429/1132
		Sale Date	12/23/2009

Ownership History

ATTACHMENT 6

Verizon/Northford

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103		3	quadient CORRECTION IMI $003.19 01/17/2024 ZIP 06101 043M32206619 US POSTAGE
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Michael Downes, Town Manager Town of North Branford 909 Foxon Road North Branford, CT 06471		JAN 17 2024 USPS		
2.	David Perkins, Town Planner Town of North Branford 909 Foxon Road North Branford, CT 06471				
3.	Jean Szwabowski, KW Ochenkowski and JJ Ochenkowski, Sr. 84 Parsonage Hill Road Northford, CT 06472				
4.					
5.					
6.					