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

November 15, 2022

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 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"). 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 EM-VER-123-007-010-099-060308 approval are included in Attachment 1.

Cellco now intends to modify its facility by removing nine (9) existing antennas and installing six (6) MX06FRO660-03 antennas and three (3) MT6407-77A antennas on Cellco's existing antenna mounts. Cellco also intends to install six (6) remote radio heads ("RRHs") behind its antennas. 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.

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 will be installed on Cellco's existing antenna platform.

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. A cumulative General Power Density table and far field tables for Cellco's modified facility are included in Attachment 3. 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 ("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 T. Paulhus, North Branford Town Manager
Eric Knapp, 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
Subdivision Name _____
Property Location _____
Lot Frontage 608
Lot # 7
Lot Area 9.31
Lot # _____

Property Owner S. Veronica Ochotorena
Owner's Address 88 Saxonage Hill Rd
Owner's Phone No. 484-9544

Property Use:

_____ single family residence
_____ two family residence
_____ commercial (Specify): _____
_____ industrial (Specify): _____
✓ other (Specify): 300' TOWER (REF. 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 Approval 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		
Temporary 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 comply with the conditions of this permit shall constitute a violation of the north Branford Zoning Regulations.

Signature of Owner _____
Signature of Agent: _____ Date 12/5/97
Agent's Address 188 Parmelee Hill Rd. Date _____
Agent's Telephone 484-2075

This permit is hereby: _____ Approved _____ Denied

By _____ Date _____
Zoning Enforcement Officer

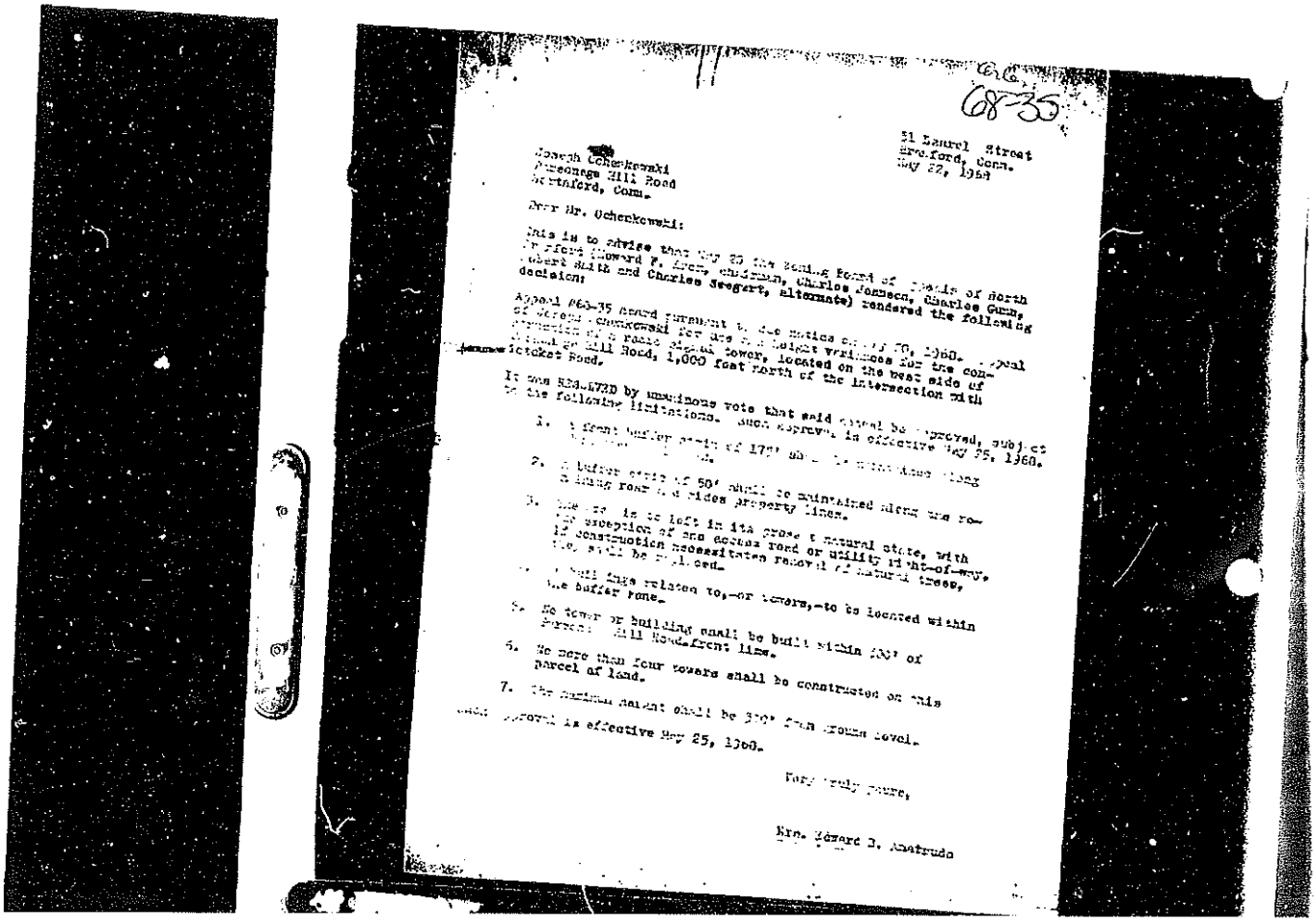
By _____ Date _____
Inland Wetlands Enforcement Officer

By _____ Date 1/2/98 PER ZBA #GB-35 ATTACHED
Planning and Zoning Administrator

By _____ Date _____
Town Engineer

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)



68-35

51 Laurel Street
Branford, Conn.
May 27, 1960

Joseph Ochenkowski
Passonage Hill Road
Northford, Conn.

Dear Mr. Ochenkowski:

This is to advise that [illegible] Board of [illegible] of North Branford, Edward F. Drew, chairman, Charles Jannuca, Charles Gunn, Robert Smith and Charles Swegart, alternate) rendered the following decision:

Appeal #60-35 heard pursuant to due notice on May 20, 1960. [illegible] appeal of Joseph Ochenkowski for area variance for the construction of a radio [illegible] tower, located on the west side of Passonage Hill Road, 1,000 feat north of the intersection with Pickett 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 [illegible] of 175' shall be maintained [illegible]
2. A buffer strip of 50' shall be maintained along the [illegible] along road and side property lines.
3. [illegible] is to be left in its present natural state, with the exception of any access road or utility right-of-way. If construction necessitates removal of natural trees, the same shall be replaced.
4. [illegible] shall [illegible] related to,—or towers,—to be located within the buffer zone.
5. No tower or building shall be built within 200' of present Hill Road[illegible]front line.
6. No more than four towers shall be construction on this parcel of land.
7. The maximum height shall be 370' from ground level.

[illegible] approval is effective May 25, 1960.

Very truly yours,

Mrs. Edward J. Mastruda

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 Swiecbowski 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 112' x 170' (ht)
_____ sq. ft.
_____
_____
Front ____ Rear ____ Side ____

Parking Spaces Required: 0
Proposed 0

East Shore Health District Approval:	Permit #	_____		Date:		
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 ommission, 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 10-17-02
Zoning Enforcement Officer

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

By _____ Date 10-25-02
Planning and Zoning Administrator N/A

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 Di Natale
INSPECTED BY

Robert F. Linsley
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 1-1-03

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' 04.99"
	LONGITUDE:	W72° 48' 37.99"

NOTE:

AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: CENTEK ENGINEERING.
DATED: SEPTEMBER 07, 2022

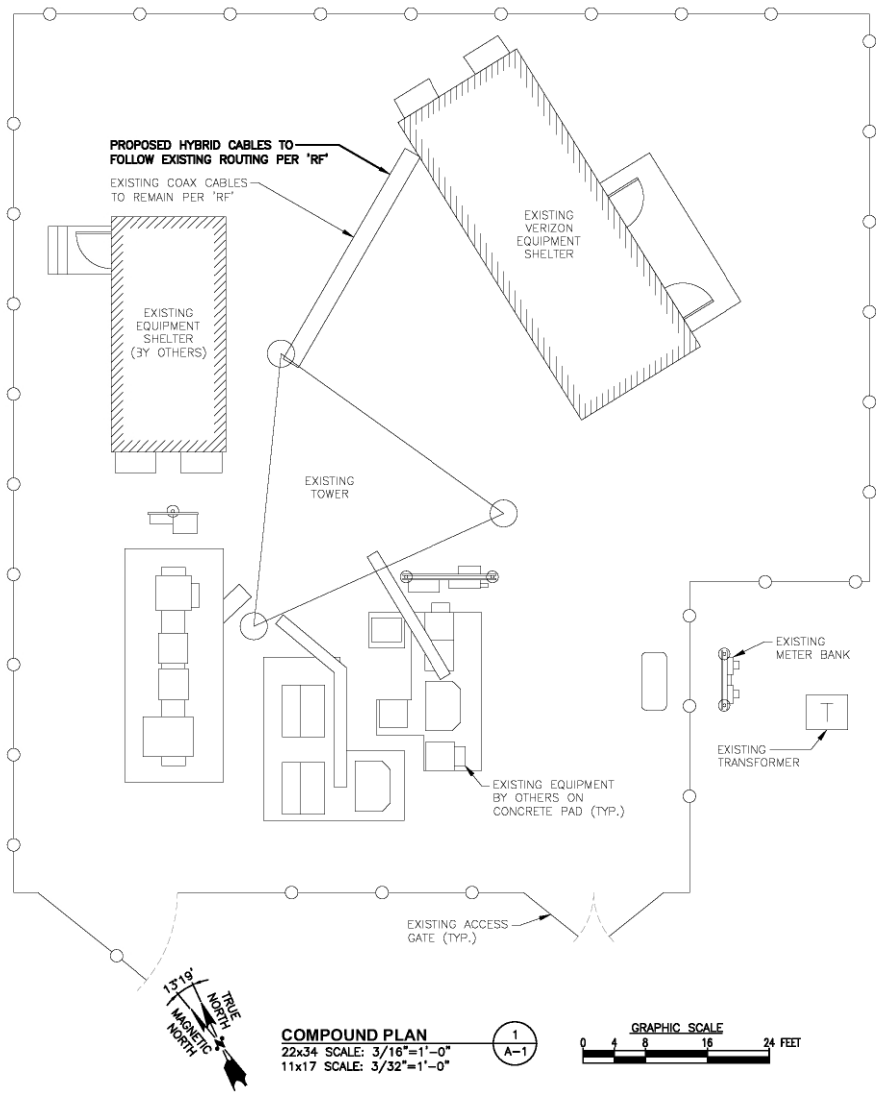
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC.
DATED: JUNE 14, 2022 (REV.5)

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. EXISTING (9) ANTENNAS TO BE REMOVED, EXISTING (3) ANTENNAS TO REMAIN, INSTALL (9) ANTENNAS PER 'RF'.
2. INSTALL (3) SIDE-BY-SIDE MOUNTS PER 'RF'.
3. EXISTING (3) DIPLEXERS TO BE REMOVED.
4. EXISTING (6) RRHS TO BE REMOVED, INSTALL (9) RRHS PER 'RF'.
5. EXISTING (1) OVP TO BE REMOVED, INSTALL (1) OVP PER 'RF'.
6. EXISTING (12) COAX CABLES TO REMAIN.
7. EXISTING (1) HYBRID CABLE TO BE REMOVED, INSTALL (1) 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:

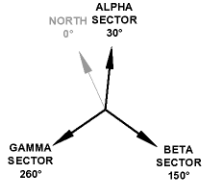
'RF' DESIGN AND EQUIPMENT IS BASED UPON RFDS ISSUED BY VZW DATED: APRIL 26, 2022 REVISION #4.

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 HDG. RAD CENTERS MAY NOT MATCH RF ANTENNA DESIGN SHEET.

ANTENNA ORIENTATION



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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-3386

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS FROM DATE OF RECORD'S STAMPED AND SIGNED BY ORIGINAL WET LISTED HEREON

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

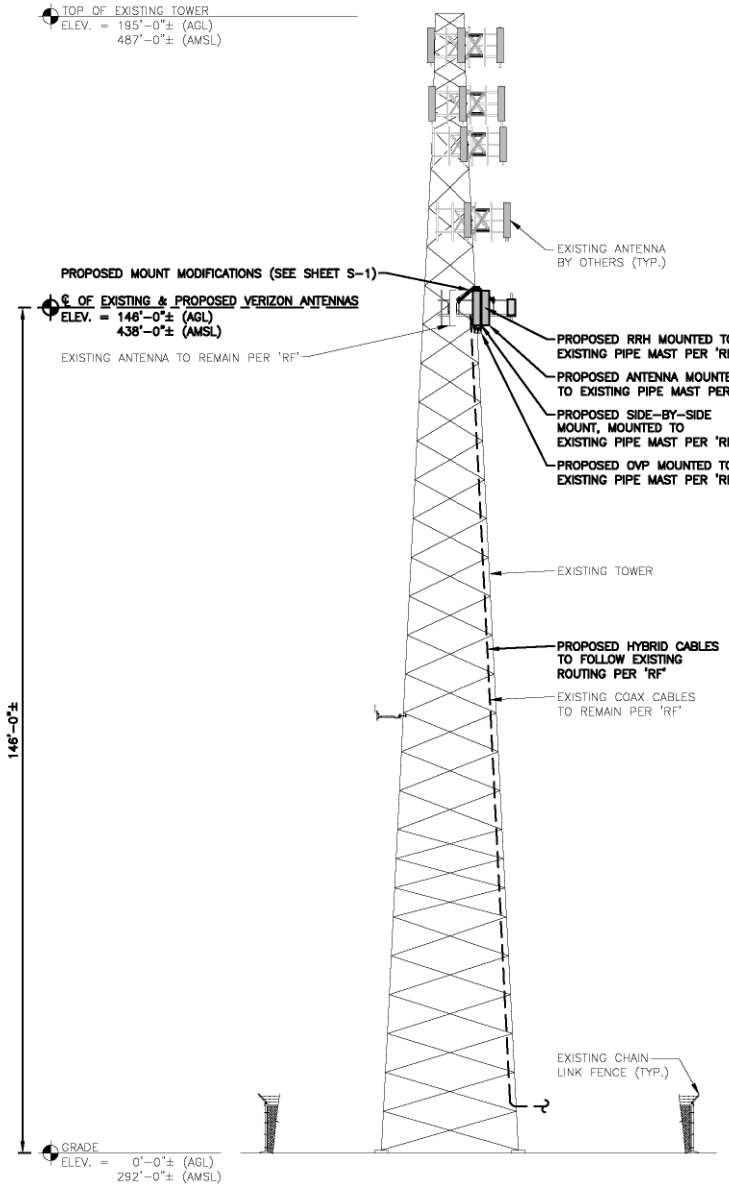
REV.	DATE	DESCRIPTION	BY
0	08/21/22	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

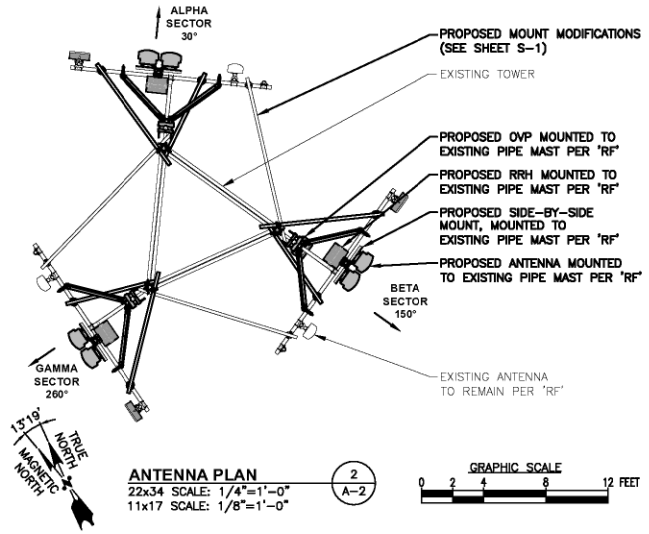
SHEET TITLE
COMPOUND PLAN

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 OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: CENTEK ENGINEERING.
DATED: SEPTEMBER 07, 2022

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC.
DATED: JUNE 14, 2022 (REV.5)

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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-3386

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS FROM DATE SIGNED. OR RECORD'S STAMPED AND APPROVED BY BUILDING DEPT. WHICHEVER IS LATER.

CHECKED BY: JX
APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	09/21/22	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-G 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

HUDSON Design Group LLC
45 BEECHWOOD DRIVE
N. ANDOVER, MA 01845
TEL: (978) 557-5553
FAX: (978) 336-5586

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS FROM ISSUED, OR RECORD'S STAMPED AND SIGNED BY ORIGINAL WET LISTED HEREON

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	08/21/22	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

SHEET TITLE
STRUCTURAL NOTES & SPECIAL INSPECTIONS

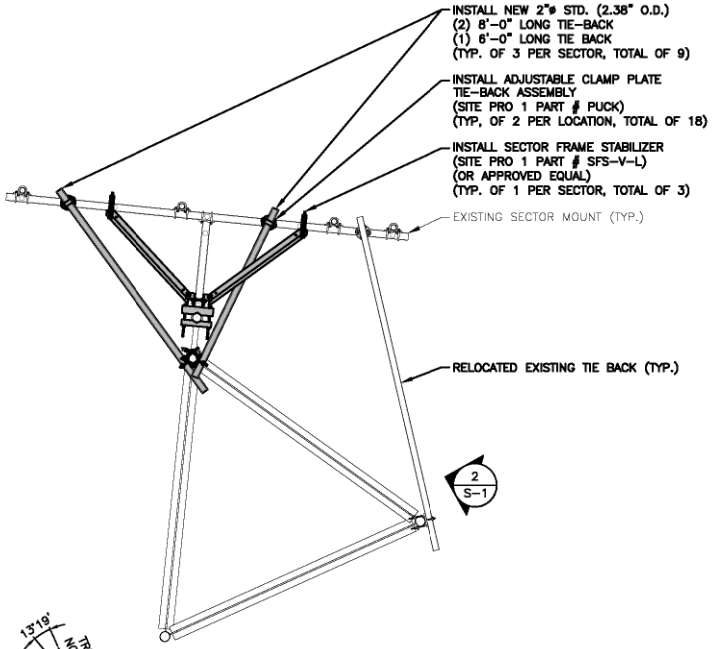
SHEET NUMBER
SN-1

NOTE:

AN ANALYSIS OF THE CAPACITY OF THE EXISTING STRUCTURE TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: CENTEK ENGINEERING.
DATED: SEPTEMBER 07, 2022

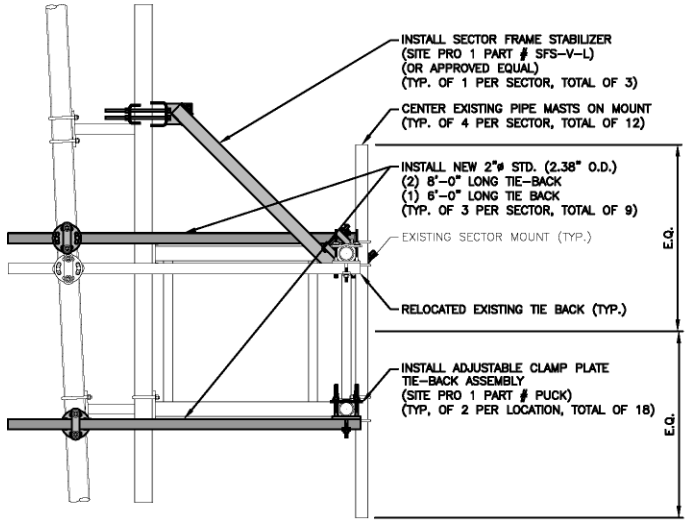
NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC.
DATED: JUNE 14, 2022 (REV.5)



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

GRAPHIC SCALE
0 1 2 4 6 FEET



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

GRAPHIC SCALE
0 1 2 4 6 FEET

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

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FAX: (978) 336-3386

STATE OF CONNECTICUT
DANIEL P. HAMM
LICENSED PROFESSIONAL ENGINEER
CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS FROM DATE SIGNED, OR RECORD'S STAMPED AND APPROVED BY BUILDING DATE LISTED HEREIN

CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	09/21/22	ISSUED FOR CONSTRUCTION	SF

SITE NAME:
NORTHFORD CT

SITE ADDRESS:
88 PARSONAGE HILL ROAD
NORTHFORD, CT 06472

SHEET TITLE
STRUCTURAL DETAILS

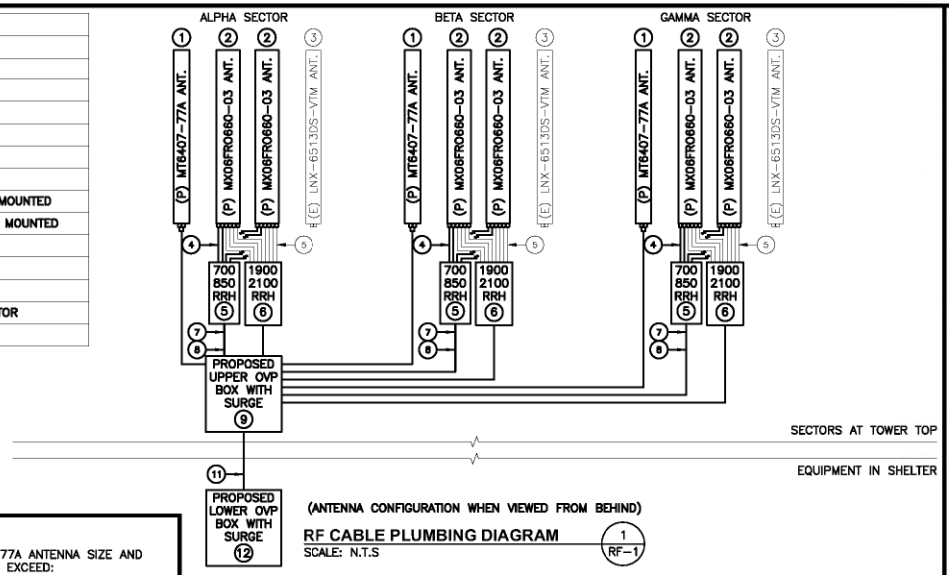
SHEET NUMBER
S-1

BILL OF MATERIALS

SITE NAME: NORTHFORD CT

ITEM	DESCRIPTION	QTY	LENGTH	COMMENTS
①	PROPOSED SAMSUNG MT6407-77A ANTENNA W/ CLIP ON RRH	3		MOUNTED TO EXISTING PIPE MAST
②	PROPOSED JMA MX06FRO660-03 ANTENNA	6		MOUNTED TO EXISTING PIPE MAST
③	EXISTING ANDREW LNX-6513DS-VTM ANTENNA	3		MOUNTED TO EXISTING PIPE MAST
④	PROPOSED 1/2" TOP COAX JUMPERS	18	15 FT.	ROUTE FROM RRH TO ANTENNA
④	EXISTING 1/2" TOP COAX JUMPERS	18	15 FT.	ROUTE FROM RRH TO ANTENNA
⑤	PROPOSED LTE 700/850 RRH	3		SAMSUNG RRH B5/B13 RRH-BRO4C PIPE MOUNTED
⑥	PROPOSED PCS/AWS 1900/2100 RRH	3		SAMSUNG RRH B2/B66A RRH-BRO49 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 12X24 HYBRID CABLE	1	235 FT.	ROUTE FROM EQUIPMENT TO ANTENNA SECTOR
⑪	PROPOSED LOWER OVP	1		RACK MOUNTED INSIDE CABINET

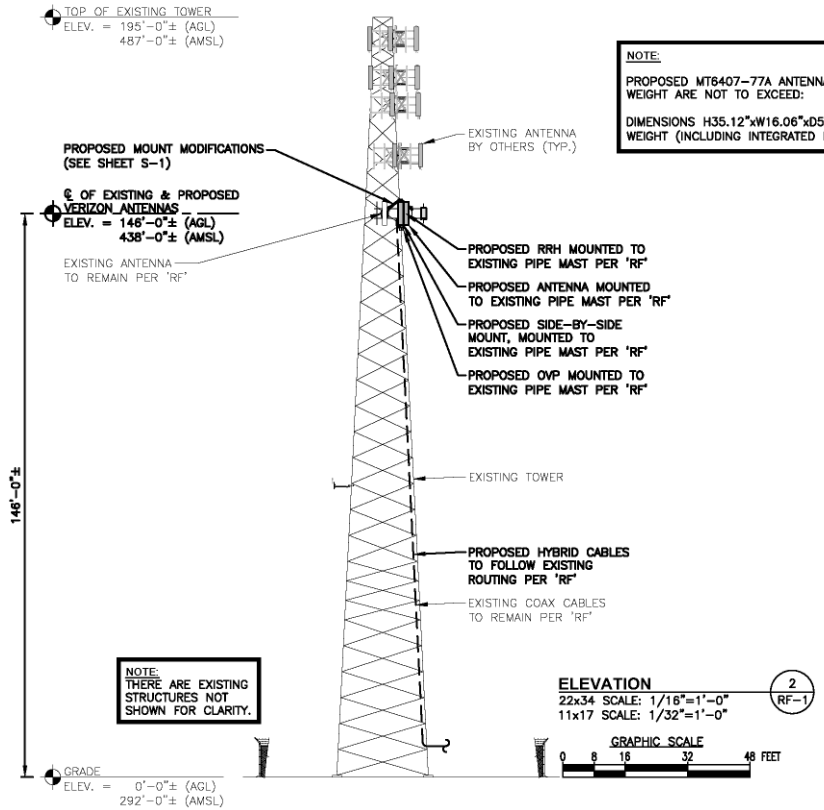
THE ABOVE RF-BOM SHEET IS BASED ON INFORMATION LISTED ON ANTENNA RECOMMENDATION SHEET DATED 04/26/22



(ANTENNA CONFIGURATION WHEN VIEWED FROM BEHIND)

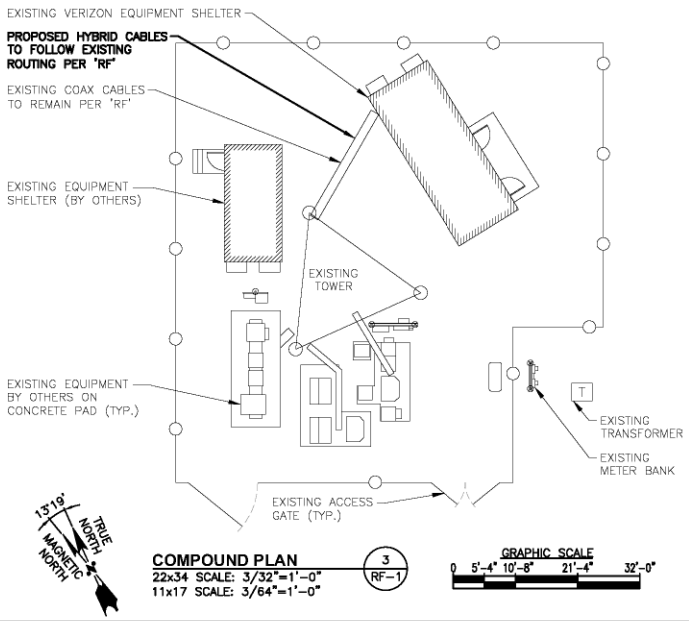
RF CABLE PLUMBING DIAGRAM (1 / RF-1)
SCALE: N.T.S

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



NOTE:
THERE ARE EXISTING STRUCTURES NOT SHOWN FOR CLARITY.

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



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: CELLCO PARTNERSHIP D.B.A. verizon

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CHECKED BY: JX

APPROVED BY: DPH

SUBMITTALS

REV.	DATE	DESCRIPTION	BY
0	09/21/22	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

Dual-Band Radio Unit
700/850MHz (B13/B5)
RFV01U-D2A

Samsung's RFV01U-D2A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D2A RU targets dual-band support across Band 13 (700MHz) and Band 5 (850MHz), making it an ideal product for broad coverage footprints across multiple common low-end, long-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
B13: DL(746-756MHz)/UL(777-787MHz)
B5: DL(869-894MHz)/UL(824-849MHz)
Instantaneous Bandwidth: 10MHz(B13) + 25MHz(B5)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 207mm (29.9L)
Weight: 31.9kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

Dual-Band Radio Unit
AWS/PCS (B66/B2)
RFV01U-D1A

Samsung's RFV01U-D1A is a compact remote Radio Unit (RU) designed for deployments that require flexibility in installation and rapid onlining, without compromising on coverage, capacity or operational expenses.

The RFV01U-D1A RU targets dual-band support across Band 66 (AWS) and Band 2 (PCS), making it an ideal product for broad coverage footprints across multiple common mid-range frequencies.

The RU handles all Radio Frequency (RF) processing in a single, compact unit, and is designed to interface via CPRI with Samsung's CDU baseband offerings, in both distributed- and central-RAN configurations.

In addition to its minimal footprint and ease of installation, the RU is also designed to reduce cost of ownership through its integrated spectrum analyzer, which allows for remote RF monitoring, greatly reducing the need for on-site maintenance visits.

Features and Benefits

- Dual-band support for broad frequency coverage
- Minimal footprint reduces site costs
- Rapid, easy installation
- Flexibly deployable in any location
- Remote RF monitoring capability
- Convection cooled, silent operation
- Built-in Broadcast Auxiliary Services (BAS) filter ensures compliant AWS operation without impacting footprint

Key Technical Specifications

Duplex Type: FDD
Operating Frequencies:
    B66: DL(2,110-2,180MHz)/UL(1,710-1,780MHz)
    B2: DL(1,930-1,990MHz)/UL(1,850-1,910MHz)
Instantaneous Bandwidth:
    70MHz(B66) + 60MHz(B2)
RF Chain: 4T4R/2T4R/2T2R
Output Power: Total 320W
DU-RU Interface: CPRI (10Gbps)
Dimensions: 380 x 380 x 255mm (36.8L)
Weight: 38.3kg
Input Power: -48V DC
Operating Temp.: -40 - 55°(w/o solar load)
Cooling: Natural convection

SAMSUNG

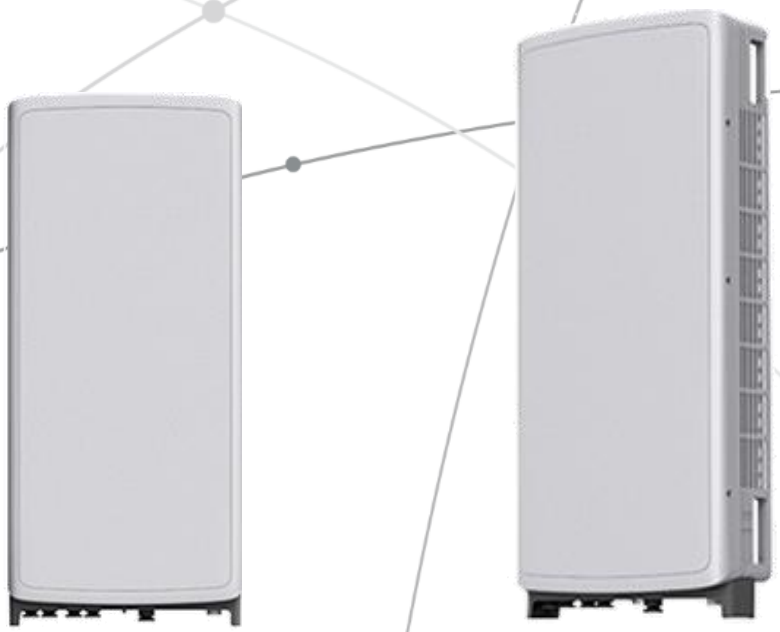
SAMSUNG

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

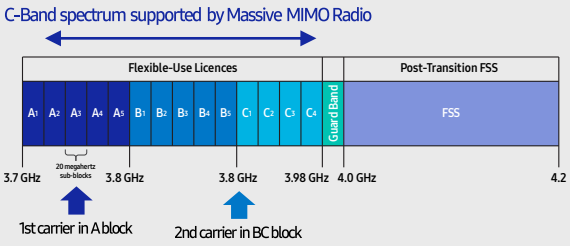


Points of Differentiation

Wide Bandwidth

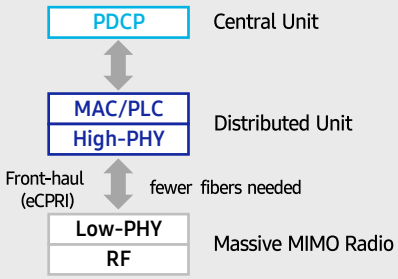
With capability to support up to 2 CC carrier configuration, Samsung C-Band massive MIMO Radio supports 200 MHz bandwidth in the C-Band spectrum.

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.

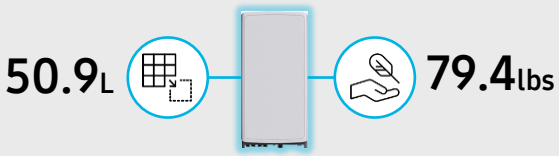
This helps operators reduce their CAPEX as they now need less products to cover the same area than before.

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

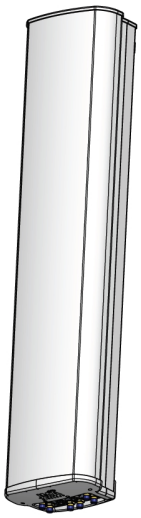
MX06FRO660-03

NWAV™ X-Pol Hex-Port Antenna

X-Pol Hex-Port 6 ft 60° Fast Roll Off antenna with independent tilt on 700 & 850 MHz:

2 ports 698-798, 824-894 MHz and 4 ports 1695-2180 MHz

- Fast Roll Off (FRO™) azimuth beam pattern improves Intra- and Inter-cell SINR
- Compatible with dual band 700/850 MHz radios with independent low band EDT without external diplexers
- Fully integrated (iRETs) with independent RET control for low and high bands for ease of network optimization
- SON-Ready array spacing supports beamforming capabilities
- Suitable for LTE/CDMA/PCS/UMTS/GSM air interface technologies
- Integrated Smart Bias-Ts reduce leasing costs

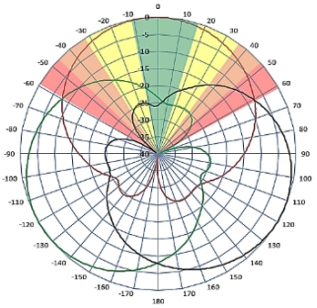


nwav

Fast Roll-Off antennas increase data throughput without compromising coverage

The horizontal beam produced by Fast Roll-Off (FRO) technology increases the Signal to Interference & Noise Ratio (SINR) by eliminating overlap between sectors .

Non-FRO antenna



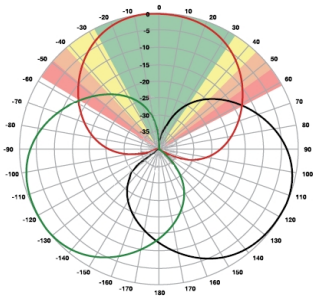
Large traditional antenna pattern overlap creates harmful interference.

JMA's FRO antenna pattern minimizes overlap, thereby minimizing interference.

LTE throughput	SINR	Speed (bps/Hz)	Speed increase	CQI
Excellent	>18	>4.5	333+%	8-10
Good	15-18	3.3-4.5	277%	6-7
Fair	10-15	2-3.3	160%	4-6
Poor	<10	<2	0%	1-3

The LTE radio automatically selects the best throughput based on measured SINR.

JMA FRO antenna



Electrical specification (minimum/maximum)	Ports 1, 2		Ports 3, 4, 5, 6		
Frequency bands, MHz	698-798	824-894	1695-1880	1850-1990	1920-2180
Polarization	± 45°		± 45°		
Average gain over all tilts, dBi	14.4	14.0	17.6	18.0	18.2
Horizontal beamwidth (HBW), degrees	60.5	53.0	55.0	55.0	55.5
Front-to-back ratio, co-polar power @180°± 30°, dB	>24	>24.0	>25.0	>25.0	>25.0
X-Pol discrimination (CPR) at boresight, dB	>15.0	>14.2	>18	>18	>15
Sector power ratio, percent	<3.5	<3.0	<3.7	<3.8	<3.6
Vertical beamwidth (VBW), degrees[1]	13.1	11.8	6.0	5.5	5.5
Electrical downtilt (EDT) range, degrees	2-14	2-14	0-9		
First upper side lobe (USLS) suppression, dB[1]	≤-15.0	≤-16.5	≤-16.0	≤-16.0	≤-16.0
Cross-polar isolation, port-to-port, dB[1]	25	25	25	25	25
Max VSWR / return loss, dB	1.5:1 / -14.0		1.5:1 / -14.0		
Max passive intermodulation (PIM), 2x20W carrier, dBc	-153		-153		
Max input power per any port, watts	300		250		
Total composite power all ports, watts	1500				

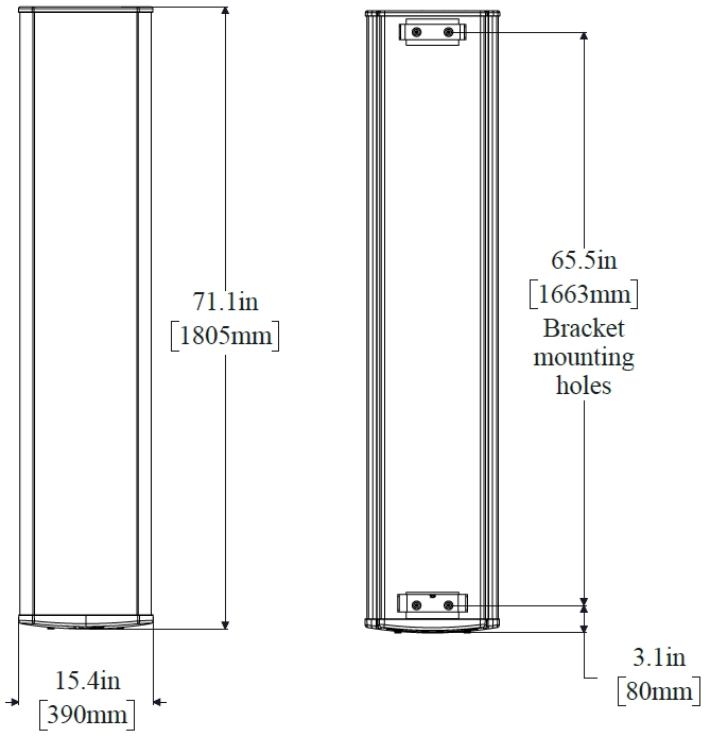
[1] Typical value over frequency and tilt

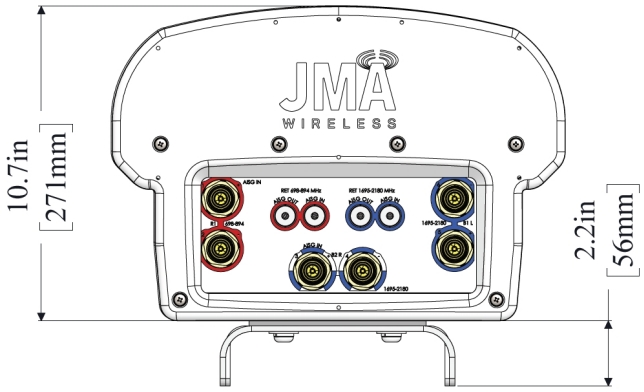
MX06FRO660-03

NWAV™ X-Pol Hex-Port Antenna

Mechanical specifications	
Dimensions height/width/depth, inches (mm)	71.3/ 15.4/ 10.7 (1811/ 392/ 273)
Shipping dimensions length/width/height, inches (mm)	82/ 20/ 15 (2083/ 508/ 381)
No. of RF input ports, connector type, and location	6 x 4.3-10 female, bottom
RF connector torque	96 lbf·in (10.85 N·m or 8 lbf·ft)
Net antenna weight, lb (kg)	60 (27.0)
Shipping weight, lb (kg)	90 (41.0)
Antenna mounting and downtilt kit included with antenna	91900318
Net weight of the mounting and downtilt kit, lb (kg)	18 (8.18)
Range of mechanical up/down tilt	-2° to 14°
Rated wind survival speed, mph (km/h)	150 (241)
Frontal, lateral, and rear wind loading @ 150 km/h, lbf (N)	154 (685), 73 (325), 158 (703)
Equivalent flat plate @ 100 mph and Cd=2, sq ft	2.6

Front view | **Back view** | **Bottom view**





Ordering information	
Antenna model	**Description**
MX06FRO660-03	6F X-Pol HEX FRO 60° independent tilt 700/850 RET, 4.3-10 & SBT
Optional accessories	
AISG cables	M/F cables for AISG connections
PCU-1000 RET controller	Stand-alone controller for RET control and configurations

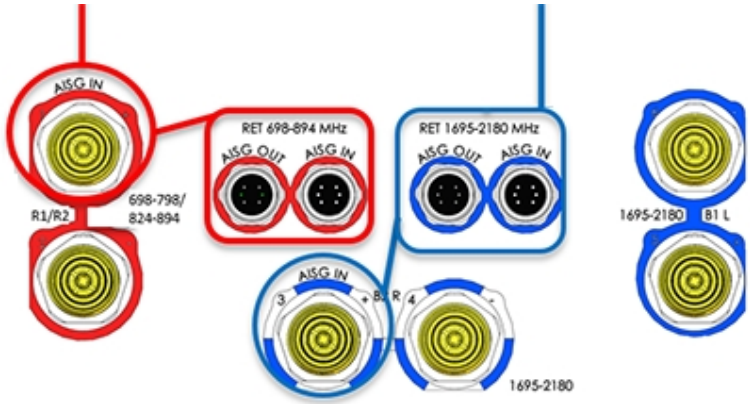
Remote electrical tilt (RET 1000) information	
RET location	Integrated into antenna
RET interface connector type	8-pin AISG connector per IEC 60130-9
RET connector torque	Min 0.5 N·m to max 1.0 N·m (hand pressure & finger tight)
RET interface connector quantity	2 pairs of AISG male/female connectors
RET interface connector location	Bottom of the antenna
Total no. of internal RETs (low bands)	2
Total no. of internal RETs (high bands)	1
RET input operating voltage, vdc	10-30
RET max power consumption, idle state, W	≤ 2.0
RET max power consumption, normal operating conditions, W	≤ 13.0
RET communication protocol	AISG 2.0 / 3GPP

RET and RF connector topology

Each RET device can be controlled either via the designated external AISG connector or RF port as shown below:

RET device	Band	RF port
R1	698-798	1-2
R2	824-894	1-2

RET device	Band	RF port
B1/B2	1695-2180	3-6

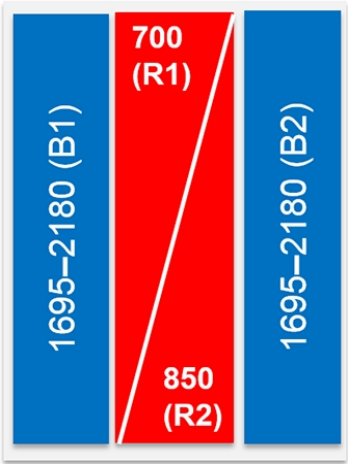


Array topology

3 sets of radiating arrays

R1/R2: 698-894 MHz
B1: 1695-2180 MHz
B2: 1695-2180 MHz

Band	RF port
1695-2180	3-4
698-894	1-2
1695-2180	5-6



ATTACHMENT 3

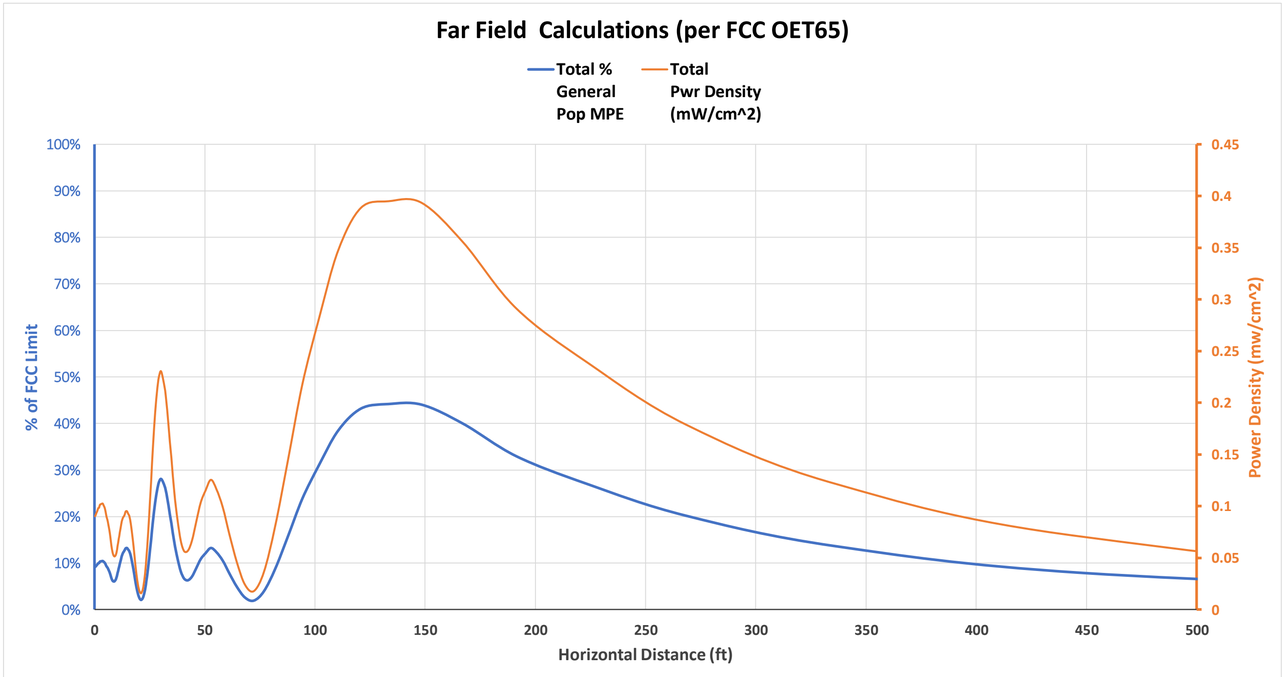
CUMULATIVE MPE TABLE

Carrier		MPE %
Dish		3.33%
Nextel		0.24%
Motient		0.54%
Sprint		1.56%
T-Mobile		7.83%
AT&T		3.78 %
***Verizon Wireless**		**44.2 %**
Site Total		*61.48 %*

*See attached Verizon Wireless Far Field Tables.

Note: MPE percentages for the carriers in the above table was compiled from the Fox Hill Telecomm Radio Frequency Exposure Analysis Report, dated June 17, 2022 submitted by Dish on August 31, 2022 in TS-DISH-099-220907.

Location	NORTHFORD CT						
Date	11/10/2022						
Band	C-Band	CBRS	AWS	PCS	850-LTE	850-CDMA	700
Operating Frequency (MHz)	3,700	3,550	2,145	1,970	880	869	746
General Population MPE (mW/cm^2)	1	1	1	1	0.586666667	0.579333333	0.497333333
ERP Per Transmitter (Watts)	13,335	54	1,530	1,369	623	380	623
Number of Transmitters	2	4	4	4	4	2	4
Antenna Centerline (feet)	29.5	29.5	29.5	29.5	29.5	29.5	29.5
Total ERP (Watts)	26,670	217	6,122	5,476	2,494	760	2,494
Total ERP (dBm)	74	53	68	67	64	59	64
Maximum % of General Population Limit	44.2%						



Angle Below Horizon	Power Density (mW/cm^2)							Percent of General Population MPE									Distance	Total Pwr Density (mW/cm^2)	Total % General Pop MPE
	C-Band	CBRS	AWS	PCS	850-LTE	850-CDMA	700 MHz	39GHz	28GHz	C-Band	CBRS	AWS	PCS	Cellular	CDMA	700 MHz			
90	0.085849539	0.000275783	0.000107292	0.002832511	0.000795371	8.36607E-05	0.00039863	0.00%	0.00%	8.58%	0.03%	0.01%	0.28%	0.14%	0.01%	0.08%	0	0.090342786	9.14%
89	0.08582339	0.000275699	0.000162344	0.003177161	0.000795129	8.94107E-05	0.000457549	0.00%	0.00%	8.58%	0.03%	0.02%	0.32%	0.14%	0.02%	0.09%	0.410194026	0.090780683	9.19%
88	0.087742233	0.000281863	0.000223892	0.003644536	0.000831841	9.22555E-05	0.000524856	0.00%	0.00%	8.77%	0.03%	0.02%	0.36%	0.14%	0.02%	0.11%	0.820638083	0.093341478	9.45%
87	0.088827365	0.00028799	0.000262649	0.004275436	0.00093192	0.000101002	0.000588002	0.00%	0.00%	8.88%	0.03%	0.03%	0.43%	0.16%	0.02%	0.12%	1.231582813	0.095274363	9.66%
86	0.09070256	0.000294069	0.000329951	0.004898387	0.001043401	0.000101719	0.000628711	0.00%	0.00%	9.07%	0.03%	0.03%	0.49%	0.18%	0.02%	0.13%	1.643280081	0.097998799	9.94%
85	0.090453717	0.000300093	0.000475615	0.005481003	0.001140928	0.000105247	0.000656535	0.00%	0.00%	9.05%	0.03%	0.05%	0.55%	0.19%	0.02%	0.13%	2.055983593	0.098613139	10.02%
84	0.092250062	0.000306053	0.000654329	0.00612915	0.001218424	0.000106844	0.000669574	0.00%	0.00%	9.23%	0.03%	0.07%	0.61%	0.21%	0.02%	0.13%	2.469949529	0.101334435	10.29%
83	0.091883893	0.000304838	0.000765718	0.006849722	0.001270782	0.000110668	0.000698347	0.00%	0.00%	9.19%	0.03%	0.08%	0.68%	0.22%	0.02%	0.14%	2.885437181	0.101883969	10.36%
82	0.091462595	0.000317741	0.000762207	0.007650276	0.001264956	0.000119132	0.000744861	0.00%	0.00%	9.15%	0.03%	0.08%	0.77%	0.22%	0.02%	0.15%	3.302709616	0.102321767	10.41%
81	0.090986681	0.000330985	0.000740981	0.008154764	0.001287685	0.000122394	0.000831399	0.00%	0.00%	9.10%	0.03%	0.07%	0.82%	0.22%	0.02%	0.17%	3.722034348	0.102454889	10.43%
80	0.088397684	0.000336722	0.000719897	0.008687093	0.001340518	0.000129487	0.000971119	0.00%	0.00%	8.84%	0.03%	0.07%	0.87%	0.23%	0.02%	0.20%	4.143684047	0.100582519	10.26%
79	0.08582842	0.000342343	0.000683063	0.009037841	0.001394642	0.000135336	0.001187033	0.00%	0.00%	8.58%	0.03%	0.07%	0.90%	0.24%	0.02%	0.24%	4.567937265	0.098608679	10.09%
78	0.081385447	0.000347838	0.000618552	0.009396808	0.001450035	0.000145322	0.001518373	0.00%	0.00%	8.14%	0.03%	0.06%	0.94%	0.25%	0.03%	0.31%	4.995079199	0.094862375	9.75%
77	0.075367799	0.000345156	0.000572816	0.009991241	0.001472372	0.000155944	0.001940965	0.00%	0.00%	7.54%	0.03%	0.06%	1.00%	0.25%	0.03%	0.39%	5.425402491	0.089846293	9.30%
76	0.071375014	0.000334485	0.000581267	0.010374801	0.001460084	0.000168395	0.002423137	0.00%	0.00%	7.14%	0.03%	0.06%	1.04%	0.25%	0.03%	0.49%	5.859208067	0.086717183	9.03%
75	0.0660124	0.00031656	0.000759373	0.010521051	0.001350384	0.000177178	0.002954318	0.00%	0.00%	6.60%	0.03%	0.08%	1.05%	0.23%	0.03%	0.59%	6.296806022	0.082091263	8.62%
74	0.059624018	0.000306374	0.00119193	0.01018251	0.001191936	0.000190636	0.00359959	0.00%	0.00%	5.96%	0.03%	0.12%	1.02%	0.20%	0.03%	0.72%	6.738516565	0.076286993	8.09%
73	0.052593321	0.000282983	0.002050029	0.009405117	0.001027454	0.000195756	0.004283141	0.00%	0.00%	5.26%	0.03%	0.21%	0.94%	0.18%	0.03%	0.86%	7.184671014	0.069837801	7.50%
72	0.044274189	0.000261204	0.003288365	0.008290566	0.000905696	0.000210346	0.004977169	0.00%	0.00%	4.43%	0.03%	0.33%	0.83%	0.15%	0.04%	1.00%	7.635612861	0.062207536	6.80%
71	0.036819518	0.000230095	0.005033934	0.006974478	0.000937367	0.000216203	0.005779761	0.00%	0.00%	3.68%	0.02%	0.50%	0.70%	0.16%	0.04%	1.16%	8.091698912	0.055991356	6.27%
70	0.030953488	0.000197943	0.007525563	0.005863314	0.00122051	0.000224643	0.006707202	0.00%	0.00%	3.10%	0.02%	0.75%	0.59%	0.21%	0.04%	1.35%	8.553300505	0.052692664	6.05%
69	0.025412152	0.000170165	0.010736701	0.005278069	0.001741298	0.000228468	0.007778094	0.00%	0.00%	2.54%	0.02%	1.07%	0.53%	0.30%	0.04%	1.56%	9.020804823	0.051344948	6.06%

68	0.020848254	0.000153073	0.01428562	0.004971681	0.00259957	0.00022691	0.009223621	0.00%	0.00%	2.08%	0.02%	1.43%	0.50%	0.44%	0.04%	1.85%	9.494616307	0.05230873	6.36%
67	0.017774203	0.000147442	0.017322858	0.005014455	0.003878126	0.000222625	0.010681246	0.00%	0.00%	1.78%	0.01%	1.73%	0.50%	0.66%	0.04%	2.15%	9.975158181	0.055040954	6.87%
66	0.017914236	0.000152065	0.020045999	0.005053961	0.005521157	0.00021134	0.012648239	0.00%	0.00%	1.79%	0.02%	2.00%	0.51%	0.94%	0.04%	2.54%	10.4628741	0.061546996	7.84%
65	0.019782874	0.000171838	0.021140673	0.004750321	0.007675756	0.000200481	0.014292926	0.00%	0.00%	1.98%	0.02%	2.11%	0.48%	1.31%	0.03%	2.87%	10.95822997	0.06801487	8.80%
64	0.022338723	0.000222786	0.021275891	0.003885903	0.010183337	0.00018657	0.016139501	0.00%	0.00%	2.23%	0.02%	2.13%	0.39%	1.74%	0.03%	3.25%	11.46171583	0.074232711	9.79%
63	0.027573998	0.000288622	0.01951323	0.002766517	0.013192634	0.000169544	0.017391278	0.00%	0.00%	2.76%	0.03%	1.95%	0.28%	2.25%	0.03%	3.50%	11.97384806	0.080895822	10.79%
62	0.033312546	0.000373627	0.015938125	0.001527712	0.01630946	0.000147364	0.018725766	0.00%	0.00%	3.33%	0.04%	1.59%	0.15%	2.78%	0.03%	3.77%	12.49517164	0.086334599	11.69%
61	0.03752982	0.000483288	0.011593269	0.000556942	0.019688301	0.000122789	0.019240141	0.00%	0.00%	3.75%	0.05%	1.16%	0.06%	3.36%	0.02%	3.87%	13.02626271	0.089214551	12.26%
60	0.041380833	0.000596526	0.007008558	7.5376E-05	0.023207641	9.89881E-05	0.018863879	0.00%	0.00%	4.14%	0.06%	0.70%	0.01%	3.96%	0.02%	3.79%	13.56773133	0.0912318	12.67%
59	0.046544584	0.000686593	0.003286235	1.4398E-05	0.026103631	7.18874E-05	0.0180593	0.00%	0.00%	4.65%	0.07%	0.33%	0.00%	4.45%	0.01%	3.63%	14.12022455	0.094766629	13.15%
58	0.047706651	0.000826816	0.001065144	0.000144216	0.028016295	4.72457E-05	0.017274707	0.00%	0.00%	4.77%	0.08%	0.11%	0.01%	4.78%	0.01%	3.47%	14.68442977	0.095081075	13.23%
57	0.046550116	0.000928433	0.000125242	0.00028142	0.029359762	2.66504E-05	0.015408222	0.00%	0.00%	4.66%	0.09%	0.01%	0.03%	5.00%	0.00%	3.10%	15.26107844	0.092679847	12.90%
56	0.045486906	0.000994756	8.08567E-05	0.000379595	0.029357439	9.52073E-06	0.013731506	0.00%	0.00%	4.55%	0.10%	0.01%	0.04%	5.00%	0.00%	2.76%	15.85095015	0.090040577	12.46%
55	0.040501117	0.001064871	0.000329076	0.000455933	0.028661491	1.63776E-06	0.011676126	0.00%	0.00%	4.05%	0.11%	0.03%	0.05%	4.89%	0.00%	2.35%	16.45487715	0.082690251	11.47%
54	0.034646012	0.001087635	0.000394896	0.000547125	0.026090657	3.39967E-06	0.009472945	0.00%	0.00%	3.46%	0.11%	0.04%	0.05%	4.45%	0.00%	1.90%	17.07374941	0.072242671	10.02%
53	0.028082463	0.001109852	0.000226602	0.000671226	0.023188196	1.73069E-05	0.007165838	0.00%	0.00%	2.81%	0.11%	0.02%	0.07%	3.95%	0.00%	1.44%	17.70852018	0.060461485	8.41%
52	0.020549547	0.001055923	0.000110569	0.000841852	0.018777338	4.51425E-05	0.005171708	0.00%	0.00%	2.05%	0.11%	0.01%	0.08%	3.20%	0.01%	1.04%	18.36021222	0.04655208	6.50%
51	0.013827484	0.000958458	0.000347995	0.001079386	0.01450691	8.58078E-05	0.003400752	0.00%	0.00%	1.38%	0.10%	0.03%	0.11%	2.47%	0.01%	0.68%	19.02992478	0.034206792	4.79%
50	0.008095541	0.000869112	0.000952961	0.001382546	0.009978785	0.000139646	0.002339256	0.00%	0.00%	0.81%	0.09%	0.10%	0.14%	1.70%	0.02%	0.47%	19.71884133	0.023757848	3.33%
49	0.004957899	0.000701662	0.001570822	0.001939685	0.005972133	0.000200947	0.002070759	0.00%	0.00%	0.50%	0.07%	0.16%	0.19%	1.02%	0.03%	0.42%	20.42823834	0.017413907	2.39%
48	0.004486265	0.000592536	0.001789428	0.003121178	0.002902129	0.000267097	0.002646773	0.00%	0.00%	0.45%	0.06%	0.18%	0.31%	0.49%	0.05%	0.53%	21.15949504	0.015805405	2.07%
47	0.006729656	0.000445475	0.001509462	0.005500808	0.001068623	0.000330961	0.004157427	0.00%	0.00%	0.67%	0.04%	0.15%	0.55%	0.18%	0.06%	0.84%	21.91410452	0.019742413	2.49%
46	0.011711328	0.000326916	0.001186959	0.009683664	0.000840307	0.000383169	0.006374379	0.00%	0.00%	1.17%	0.03%	0.12%	0.97%	0.14%	0.07%	1.28%	22.69368621	0.030506722	3.78%
45	0.018780536	0.000218544	0.001735951	0.016260787	0.002341746	0.000419268	0.009110448	0.00%	0.00%	1.88%	0.02%	0.17%	1.63%	0.40%	0.07%	1.83%	23.5	0.048867278	6.00%
44	0.027879213	0.000136179	0.004306356	0.023752761	0.005547691	0.0004296	0.012137026	0.00%	0.00%	2.79%	0.01%	0.43%	2.38%	0.95%	0.07%	2.44%	24.33496237	0.074188826	9.07%
43	0.038842272	7.55326E-05	0.009730475	0.031603721	0.010189113	0.000414084	0.015070803	0.00%	0.00%	3.88%	0.01%	0.97%	3.16%	1.74%	0.07%	3.03%	25.20066469	0.105926001	12.86%
42	0.051494371	4.08874E-05	0.018263717	0.037427717	0.016277643	0.000365211	0.017848081	0.00%	0.00%	5.15%	0.00%	1.83%	3.74%	2.77%	0.06%	3.59%	26.0993941	0.141717628	17.15%
41	0.063771084	2.65738E-05	0.029816264	0.03855293	0.023144914	0.000294719	0.019699516	0.00%	0.00%	6.38%	0.00%	2.98%	3.86%	3.95%	0.05%	3.96%	27.03365757	0.175306	21.17%
40	0.075487138	3.95096E-05	0.041371606	0.035343255	0.029971241	0.000210696	0.021218014	0.00%	0.00%	7.55%	0.00%	4.14%	3.53%	5.11%	0.04%	4.27%	28.00620943	0.20364146	24.64%
39	0.085996658	7.21625E-05	0.05108707	0.027536907	0.036167071	0.000123386	0.021792815	0.00%	0.00%	8.60%	0.01%	5.11%	2.75%	6.16%	0.02%	4.38%	29.02008318	0.22277607	27.04%
38	0.09320129	0.000122815	0.057444882	0.017817859	0.040668082	4.99121E-05	0.021342913	0.00%	0.00%	9.32%	0.01%	5.74%	1.78%	6.93%	0.01%	4.29%	30.07862836	0.230647753	28.09%
37	0.093253259	0.000173578	0.056168579	0.008731676	0.043600933	1.15997E-05	0.019929472	0.00%	0.00%	9.33%	0.02%	5.62%	0.87%	7.43%	0.00%	4.01%	31.18555331	0.221869095	27.27%
36	0.093794061	0.00022336	0.04775345	0.002574002	0.044566354	2.42638E-05	0.017742185	0.00%	0.00%	9.38%	0.02%	4.78%	0.26%	7.60%	0.00%	3.57%	32.34497513	0.206677676	25.60%
35	0.084707247	0.000274	0.034494511	0.000134696	0.042437749	0.000105125	0.015057481	0.00%	0.00%	8.47%	0.03%	3.45%	0.01%	7.23%	0.02%	3.03%	33.56147816	0.177210808	22.24%
34	0.076359182	0.000285556	0.020215789	0.00033674	0.037643763	0.000269554	0.011633035	0.00%	0.00%	7.64%	0.03%	2.02%	0.03%	6.42%	0.05%	2.34%	34.84018276	0.146743619	18.52%
33	0.061511384	0.000283652	0.00939258	0.001214476	0.031826381	0.000509025	0.00818064	0.00%	0.00%	6.15%	0.03%	0.94%	0.12%	5.42%	0.09%	1.64%	36.18682665	0.112918138	14.40%
32	0.050717447	0.000262414	0.004255855	0.001382264	0.02449002	0.00081272	0.005116691	0.00%	0.00%	5.07%	0.03%	0.43%	0.14%	4.17%	0.14%	1.03%	37.60786143	0.087037411	11.01%
31	0.041154435	0.000253657	0.003267729	0.000805101	0.017149379	0.001167348	0.002656124	0.00%	0.00%	4.12%	0.03%	0.33%	0.08%	2.92%	0.20%	0.53%	39.11056784	0.066453773	8.21%
30	0.038786266	0.000280872	0.003224834	0.000501316	0.010927221	0.001522165	0.001067849	0.00%	0.00%	3.88%	0.03%	0.32%	0.05%	1.86%	0.26%	0.21%	40.70319398	0.056310523	6.62%
29	0.044553356	0.000373001	0.002247552	0.001328355	0.006190307	0.001847839	0.000373003	0.00%	0.00%	4.46%	0.04%	0.22%	0.13%	1.06%	0.32%	0.08%	42.39512225	0.056913414	6.30%
28	0.056228507	0.000541735	0.001080901	0.00320177	0.00311737	0.002107368	0.000482823	0.00%	0.00%	5.62%	0.05%	0.11%	0.32%	0.53%	0.36%	0.10%	44.19707194	0.066760473	7.10%
27	0.072582429	0.000821602	0.000880361	0.005448351	0.001639318	0.002257435	0.001160548	0.00%	0.00%	7.26%	0.08%	0.09%	0.54%	0.28%	0.39%	0.23%	46.12134688	0.084790045	8.88%
26	0.087181009	0.001186457	0.00152845	0.007867839	0.001393971	0.002286681	0.00210986	0.00%	0.00%	8.72%	0.12%	0.15%	0.79%	0.24%	0.39%	0.42%	48.18214028	0.103554267	10.83%
25	0.094109721	0.001593912	0.001960938	0.010569832	0.001788407	0.002174794	0.00303715	0.00%	0.00%	9.41%	0.16%	0.20%	1.06%	0.30%	0.38%	0.61%	50.39591263	0.115234754	12.11%
24	0.099853793	0.00190193	0.001901928	0.013829235	0.002394398	0.001932628	0.003708483	0.00%	0.00%	9.99%	0.19%	0.19%	1.38%	0.41%	0.33%	0.75%	52.78186419	0.125522395	13.24%
23	0.085999117	0.002261122	0.002596112	0.017215815	0.002718478	0.001585907	0.003839952	0.00%	0.00%	8.60%	0.23%	0.26%	1.72%	0.46%	0.27%	0.77%	55.3625306	0.116216501	12.32%
22	0.065597729	0.002386266	0.005220574	0.018591841	0.002616499	0.00118215	0.003449217	0.00%	0.00%	6.56%	0.24%	0.52%	1.86%	0.45%	0.20%	0.69%	58.16454106	0.099044274	10.52%
21	0.037878807	0.002450339	0.008896634	0.017816807	0.002038112	0.000781952	0.002686755	0.00%	0.00%	3.79%	0.25%	0.89%	1.78%	0.35%	0.13%	0.54%	61.21959302	0.072549406	7.73%
20	0.01499137	0.00228387	0.010682447	0.014463551	0.001376173	0.000445272	0.001693063	0.00%	0.00%	1.50%	0.23%	1.07%	1.45%	0.23%	0.08%	0.34%	64.56571936	0.045935746	4.89%
19	0.001258989	0.001931309	0.008827774	0.009941579	0.000924386	0.000240329	0.000805107	0.00%	0.00%	0.13%	0.19%	0.88%	0.99%	0.16%	0.04%	0.16%	68.24895563	0.023929473	2.56%
18	0.003987518	0.001515419	0.004271025	0.006196355	0.001231784	0.000206769	0.000389524	0.00%	0.00%	0.40%	0.15%	0.43%	0.62%	0.21%	0.04%	0.08%	72.32556312	0.017798394	1.92%
17	0.026461146	0.001005631	0.001154617	0.003926831	0.002706702	0.000370162	0.000798804	0.00%	0.00%	2.65%	0.10%	0.12%	0.39%	0.46%	0.06%	0.16%	76.86503653	0.036423894	3.94%
16	0.067361867	0.000563955	0.00148335	0.002647572	0.005639569	0.000741648	0.002245153	0.00%	0.00%	6.74%	0.06%	0.15%	0.26%	0.96%	0.13%	0.45%	81.95423943	0.080683112	8.75%
15	0.12238563	0.000222106	0.003520139	0.001507176	0.009921154	0.001310733	0.004748563	0.00%	0.00%	12.24%	0.02%	0.35%	0.15%	1.69%	0.23%	0.95%	87.70319398	0.143615501	15.64%
14	0.187969904	3.29548E-05	0.003871843	0.000456585	0.015063299	0.002031758	0.008277898	0.00%	0.00%	18.80%	0.00%	0.39%	0.05%	2.57%	0.35%	1.66%	94.25335194	0.217704243	23.82%
13	0.243172261	9.43505E-06	0.00206416	0.00023246	0.020641716	0.002797034	0.012154744	0.00%	0.00%	24.32%	0.00%	0.21%	0.02%	3.52%	0.48%	2.44%	101.789683	0.28107181	30.99%
12	0.30025883	0.000130715	0.000202453	0.001169309	0.026081199	0.00358327	0.016081537	0.00%	0.00%	30.03%	0.01%	0.02%	0.12%	4.45%	0.62%	3.23%	110.5588076	0.347507313	38.47%
11	0.332610272	0.000340225	0.00033248	0.002362486	0.029632441	0.004223956	0.019132311	0.00%	0.00%	33.26%	0.03%	0.03%	0.24%	5.05%	0.73%	3.85%	120.8970194	0.388634169	43.19%
10	0.33348663	0.000602432	0.001548488	0.002352405	0.030896565	0.004665113	0.0213752	0.00%	0.00%	33.35%	0.06%	0.15%	0.24%	5.27%	0.81%	4.30%	133.2751228	0.394926833	44.17%
9	0.33296827	0.000849636	0.001734732	0.001025266	0.030146342	0.004866162	0.021839094	0.00%	0.00%	33.30%	0.08%	0.17%	0.10%	5.14%	0.84%	4.39%	148.3731606	0.393429501	44.03%
8	0.299811699	0.000994669	0.000972026	4.8897E-05	0.02739557	0.004738406	0.021265732	0.00%	0.00%	29.98%	0.10%	0.10%	0.00%	4.67%	0.82%	4.28%	167.2111885	0.355227	39.95%
7	0.240728167	0.00107735	0.001747255	0.001492659	0.023033433	0.004348211	0.018722277	0.00%	0.00%	24.07%	0.11%	0.17%	0.15%	3.93%	0.75%	3.76%	191.3921411	0.291149353	32.95%
6	0.18976106	0.001021027	0.005741647	0.005503522	0.017743483	0.003715274	0.015453927	0.00%	0.00%	18.98%	0.10%	0.57%	0.55%	3.02%	0.64%	3.11%	223.5875647	0.23893994	26.98%
5	0.130415732	0.000833988	0.010743837	0.009610889	0.012335642	0.002918191	0.011780446	0.00%	0.00%	13.04%	0.08%	1.07%	0.96%	2.10%	0.50%	2.37%	268.6062291	0.178638726	20.14%
4	0.079782383	0.000627678	0.012815526	0.010948146	0.00772216	0.002059163	0.00772216	0.00%	0.00%	7.98%	0.06%	1.28%	1.09%	1.32%	0.36%	1.55%	336.065657	0.121677215	13.64%
3	0.041623471	0.000369971	0.009957899	0.008705062	0.004056674	0.001247734	0.004448054	0.00%	0.00%	4.16%	0.04%	1.00%	0.87%	0.69%	0.22%	0.89%	448.4067122	0.070408865	7.87%
2	0.01571724	0.000168347	0.004855184	0.004343201	0.001607711	0.00058366	0.001932894	0.00%	0.00%	1.57%	0.02%	0.49%	0.43%	0.27%	0.10%	0.39%	672.9519521	0.029208238	3.27%
1	0.003194836	4.30803E-05	0.001057494	0.001013636	0.000350171	0.000150049	0.000461615	0.00%	0.00%	0.32%	0.00%	0.11%	0.10%	0.06%	0.03%	0.09%	1346.314098	0.006270883	0.71%

degree below horizon	AT1K02 (39GHz)	AT1K01 (28GHz)	MT6407-77A (3,730MHz)	XXDWMM-12.5-65 (3,550MHz)	AWS (2,155MHz)	PCS (1,962MHz)
0	0.08	0.08	3.28	0.4	2.1	1.4
1	0.39	0.39	2.19	0	0.6	0.3
2	0.3	0.3	1.29	0.1	0	0
3	0	0	0.58	0.2	0.4	0.5
4	0.31	0.31	0.25	0.4	1.8	2
5	0.42	0.42	0.05	1.1	4.5	4.5
6	0.13	0.13	0	1.8	8.8	8.5
7	0.44	0.44	0.3	2.9	15.3	15.5
8	0.36	0.36	0.5	4.4	19	31.5
9	0.09	0.09	1.06	6.1	17.5	19.3
10	0.4	0.4	1.96	8.5	18.9	16.6
11	0.52	0.52	2.79	11.8	26.4	17.4
12	0.26	0.26	3.98	16.7	29.3	21.2
13	0.57	0.57	5.58	28.8	19.9	28.9
14	0.51	0.51	7.33	24	17.8	26.6
15	0.26	0.26	9.78	16.3	18.8	22
16	0.58	0.58	12.92	12.8	23.1	20.1
17	1.07	1.07	17.49	10.8	24.7	18.9
18	0.55	0.55	26.19	9.5	19.5	17.4
19	0.58	0.58	31.65	8.9	16.8	15.8
20	1.08	1.08	21.32	8.6	16.4	14.6
21	0.59	0.59	17.7	8.7	17.6	14.1
22	0.65	0.65	15.7	9.2	20.3	14.3
23	1.22	1.22	14.89	9.8	23.7	15
24	0.99	0.99	14.59	10.9	25.4	16.3
25	0.8	0.8	15.18	12	25.6	17.8
26	1.11	1.11	15.83	13.6	27	19.4
27	1.12	1.12	16.93	15.5	29.7	21.3
28	0.95	0.95	18.33	17.6	29.1	23.9
29	1.25	1.25	19.62	19.5	26.2	28
30	2.03	2.03	20.49	21	24.9	32.5
31	3.32	3.32	20.49	21.7	25.1	30.7
32	5.21	5.21	19.83	21.8	24.2	28.6
33	7.88	7.88	19.23	21.7	21	29.4
34	11.74	11.74	18.52	21.9	17.9	35.2
35	16.19	16.19	18.29	22.3	15.8	39.4
36	14.94	14.94	18.06	23.4	14.6	26.8
37	15.07	15.07	18.29	24.7	14.1	21.7
38	16.33	16.33	18.49	26.4	14.2	18.8
39	15.38	15.38	19.03	28.9	14.9	17.1

40	15.03	15.03	19.78	31.7	16	16.2
41	15.75	15.75	20.69	33.6	17.6	16
42	17.49	17.49	21.79	31.9	19.9	16.3
43	20.55	20.55	23.18	29.4	22.8	17.2
44	21.87	21.87	24.78	27	26.5	18.6
45	20.56	20.56	26.65	25.1	30.6	20.4
46	20.35	20.35	28.85	23.5	32.4	22.8
47	21.02	21.02	31.4	22.3	31.5	25.4
48	21.62	21.62	33.3	21.2	30.9	28
49	20.49	20.49	33	20.6	31.6	30.2
50	20.28	20.28	31	19.8	33.9	31.8
51	20.83	20.83	28.8	19.5	38.4	33
52	22.1	22.1	27.2	19.2	43.5	34.2
53	22.84	22.84	25.96	19.1	40.5	35.3
54	23.96	23.96	25.16	19.3	38.2	36.3
55	25.61	25.61	24.59	19.5	39.1	37.2
56	24.75	24.75	24.19	19.9	45.3	38.1
57	24.54	24.54	24.19	20.3	43.5	39.5
58	24.84	24.84	24.18	20.9	34.3	42.5
59	25.6	25.6	24.38	21.8	29.5	52.6
60	25.03	25.03	24.98	22.5	26.3	45.5
61	24.18	24.18	25.49	23.5	24.2	36.9
62	23.83	23.83	26.09	24.7	22.9	32.6
63	23.88	23.88	26.99	25.9	22.1	30.1
64	24.25	24.25	27.98	27.1	21.8	28.7
65	24.7	24.7	28.58	28.3	21.9	27.9
66	24.47	24.47	29.08	28.9	22.2	27.7
67	24.47	24.47	29.18	29.1	22.9	27.8
68	24.68	24.68	28.55	29	23.8	27.9
69	25.07	25.07	27.75	28.6	25.1	27.7
70	25.64	25.64	26.95	28	26.7	27.3
71	26.36	26.36	26.25	27.4	28.5	26.6
72	27.24	27.24	25.5	26.9	30.4	25.9
73	28.26	28.26	24.8	26.6	32.5	25.4
74	28.68	28.68	24.3	26.3	34.9	25.1
75	28.98	28.98	23.9	26.2	36.9	25
76	29.37	29.37	23.6	26	38.1	25.1
77	29.83	29.83	23.4	25.9	38.2	25.3
78	30.36	30.36	23.1	25.9	37.9	25.6
79	30.94	30.94	22.9	26	37.5	25.8
80	30.89	30.89	22.8	26.1	37.3	26
81	30.44	30.44	22.7	26.2	37.2	26.3
82	30.13	30.13	22.7	26.4	37.1	26.6

83	29.93	29.93	22.7	26.6	37.1	27.1
84	29.81	29.81	22.7	26.6	37.8	27.6
85	29.76	29.76	22.8	26.7	39.2	28.1
86	29.78	29.78	22.8	26.8	40.8	28.6
87	29.85	29.85	22.9	26.9	41.8	29.2
88	29.97	29.97	22.96	27	42.5	29.9
89	30.13	30.13	23.06	27.1	43.9	30.5
90	30.33	30.33	23.06	27.1	45.7	31

850-LTE (880MHz)	850-CDMA (869MHz)	700-LTE (746MHz)
2.3	0	0.6
1.5	0.02	0.3
0.9	0.14	0.1
0.4	0.36	0
0.1	0.68	0.1
0	1.1	0.2
0	1.63	0.6
0.2	2.28	1.1
0.6	3.06	1.7
1.2	3.96	2.6
2	5.05	3.6
3	6.3	4.9
4.3	7.76	6.4
6	9.52	8.3
8	11.54	10.6
10.4	14.03	13.6
13.4	17.05	17.4
17.1	20.58	22.4
21	23.59	26
22.7	23.39	23.3
21.4	21.14	20.5
20.1	19.1	18.9
19.4	17.69	18.2
19.6	16.78	18.1
20.5	16.27	18.6
22.1	16.09	19.8
23.5	16.19	21.7
23.1	16.55	24.6
20.6	17.14	28.7
17.9	17.99	30.1
15.7	19.1	25.8
14	20.51	22.1
12.7	22.33	19.5
11.8	24.6	17.7
11.3	27.59	16.4
11	31.9	15.5
11	38.48	15
11.3	41.89	14.7
11.8	35.75	14.6
12.5	32.01	14.7

13.5	29.87	15
14.8	28.59	15.5
16.5	27.83	16.1
18.7	27.45	17
21.5	27.45	18.1
25.4	27.71	19.5
30	28.25	21.2
29.1	29.03	23.2
24.9	30.1	25.3
21.9	31.47	26.5
19.8	33.18	26.1
18.3	35.42	24.6
17.3	38.33	22.9
16.5	42.61	21.6
16.1	49.79	20.5
15.8	53.07	19.7
15.8	45.53	19.1
15.9	41.16	18.7
16.2	38.77	18.3
16.6	37.04	18.2
17.2	35.74	18.1
18	34.89	18.1
18.9	34.18	18.3
19.9	33.65	18.7
21.1	33.31	19.1
22.4	33.07	19.7
23.9	32.91	20.3
25.5	32.75	21.1
27.3	32.73	21.8
29.1	32.76	22.6
30.7	32.89	23.3
31.9	33.11	24
32.1	33.28	24.7
31.6	33.64	25.4
31	33.8	26.2
30.5	34.16	27.1
30.2	34.42	28
30.2	34.79	29
30.3	35.13	30.1
30.5	35.47	31.2
30.7	35.69	32.1
30.9	35.96	32.8
31	36.1	33.3

31	36.44	33.6
31.2	36.61	33.8
31.5	36.69	33.9
31.9	36.85	34.1
32.4	36.89	34.4
32.9	37.29	34.9
33.1	37.43	35.5
33.1	37.72	36.1

ATTACHMENT 4

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

195' Existing Lattice Tower

Proposed Verizon Wireless
Antenna Upgrade

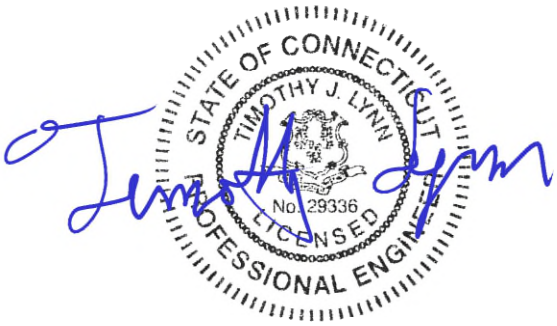
Site Ref: Northford

88 Parsonage Hill Road
North Branford, CT

Centek Project No. 22027.13

Date: September 7, 2022

Max Stress Ratio = 70%



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. 21091.01 dated August 31, 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):
  Antenna: Three (3) Kathrein 800-10121 panel antennas, three (3) CCI OPA65R-BU6DA panel antennas, three (3) CCI DMP65R-BU6DA panel antennas, six (6) Powerwave LGP21401 TMAs, three (3) Ericsson 4478 B14 remote radio heads, three (3) Ericsson 4449 B5/B12 remote radio heads, three (3) Ericsson 8843 B2/B66A remote radio heads and two (2) 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, two (2) fiber cable and four (4) 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):
  Antennas: Three (3) Andrew LNX-6513DS panel antennas mounted on (3) 12-ft T-Frames with a RAD center elevation of ±146-ft above grade level.
  Coax Cable: Twelve (12) 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) 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 running on a leg/face of the existing tower as specified in Section 3 of this report.
- **VERIZON (PROPOSED):**
  Antennas: Six (6) JMA MX06FRO660-03 panel antennas, three (3) Samsung MT6407-77A panel antennas, three (3) Samsung B2/B66A remote radio heads, three (3) Samsung B5/B13 remote radio heads 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: One (1) 1-5/8" ∅ fiber cable 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 Hudson Design Group dated June 14, 2022.

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-G-2005 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 N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

Tower loading was determined by the basic wind speed as applied to projected surface areas with modification factors per TIA-222-G-2005, gravity loads of the tower structure and its components, and the application of 0.75" radial ice on the tower structure and its components.

Basic Wind Speed:	Northford; v = 101 mph (Vasd)	*[Appendix N of the 2018 CT Building Code]*
Load Cases:	Load Case 1; 101 mph wind speed w/ no ice plus gravity load – used in calculation of tower stresses and rotation.	*[Appendix N of the 2018 CT Building Code]*
	Load Case 2; 50 mph wind speed w/ 0.75" radial ice plus gravity load – used in calculation of tower stresses.	*[Annex B of TIA-222-G-2005]*

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

Tower Capacity

Tower stresses were calculated utilizing the structural analysis software tnxTower. Design flexural strength was determined based on section 4.7 and Table 4-8 of the TIA-222-G.

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

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T2)	155'-0"-175'-0"	69.8%	**PASS**
Leg (T9)	20'-0"-40'-0"	62.3%	**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	42,627 lbs
Leg Compression	402,868 lbs
Leg Tension	337,994 lbs
Base Moment	7,651,408 ft-lbs
Base Shear	69,589 lbs

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

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	47.5%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[1]	Proposed Loading (FS)[1]	Result
Reinforced Concrete Pad and Piers	Overturning	1.0	1.69	**PASS**

Note 1: FS denotes Factor of Safety

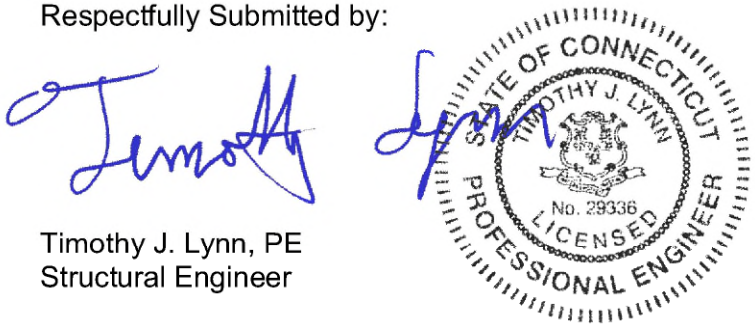
Conclusion

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.

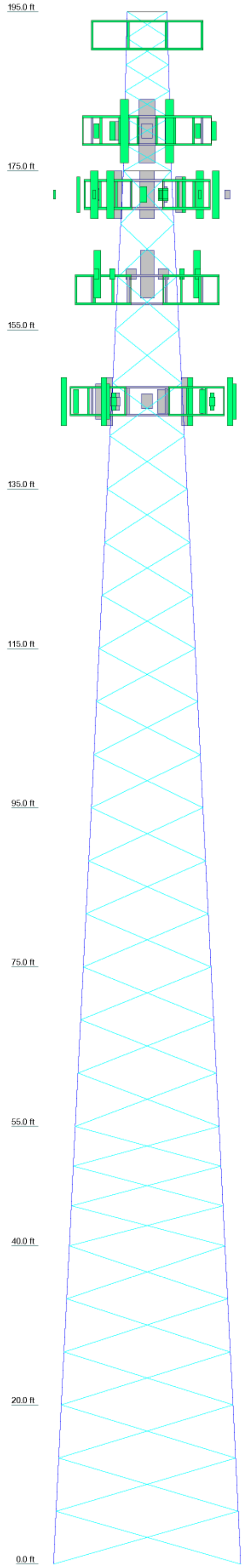
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

Section	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10	
Legs	SR 3	SR 3 3/4	SR 4	SR 4 1/4		SR 4 1/2	SR 4 3/4			SR 5	
Leg Grade	A529-50										
Diagonals	SR 1 1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	L3x3x1/4	L3x3x3/8	L3 1/2x3 1/2x5/16	L4x4x1/4		L4x4x5/16	L4x4x3/8	
Diagonal Grade	A36										
Top Girts	SR 1 1/4	N.A.									
Bottom Girts	SR 1 1/4	N.A.									
Face Width (ft)	5 / 6	8	10	12	14	16	18	19.5	21.5	23.5	
# Panels @ (ft)	6 @ 3.33333	18 @ 6.66667						3 @ 5	6 @ 6.66667		
Weight (lb)	2548.7	2793.3	3572.1	4036.1	4789.8	5354.2	5794.0	5023.9	6793.1	8128.5	48831.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Top Triangular Mount (Empty)	192	4449 B5/B12 (AT&T)	172
SitePro VFA12-HD (T-Mobile)	180	8843 B2/B66A (AT&T)	172
SitePro VFA12-HD (T-Mobile)	180	8843 B2/B66A (AT&T)	172
SitePro VFA12-HD (T-Mobile)	180	8843 B2/B66A (AT&T)	172
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) (AT&T)	172	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
Pirod 12' T-Frame Sector Mount (1) (AT&T)	172	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
Pirod 12' T-Frame Sector Mount (1) (AT&T)	172	Pirod 12' T-Frame Sector Mount (1) (Verizon)	146
800 10121 (AT&T)	172	SitePro SFS-V-L (Verizon)	146
OPA65R-BU6D (AT&T)	172	SitePro SFS-V-L (Verizon)	146
DMP65R-BU6D (AT&T)	172	SitePro SFS-V-L (Verizon)	146
800 10121 (AT&T)	172	LNX-6513DS-VTM (Verizon)	146
OPA65R-BU6D (AT&T)	172	(2) MX06FRO660 (Verizon - Proposed)	146
DMP65R-BU6D (AT&T)	172	MT6407-77A (Verizon - Proposed)	146
800 10121 (AT&T)	172	LNX-6513DS-VTM (Verizon)	146
OPA65R-BU6D (AT&T)	172	(2) MX06FRO660 (Verizon - Proposed)	146
DMP65R-BU6D (AT&T)	172	MT6407-77A (Verizon - Proposed)	146
(2) LGP21401 TMA (AT&T)	172	LNX-6513DS-VTM (Verizon)	146
(2) LGP21401 TMA (AT&T)	172	(2) MX06FRO660 (Verizon - Proposed)	146
(2) LGP21401 TMA (AT&T)	172	MT6407-77A (Verizon - Proposed)	146
DC6-48-60-18-8F Surge Arrestor (AT&T)	172	B2/B66A RRH (Verizon - Proposed)	146
DC6-48-60-18-8F Surge Arrestor (AT&T)	172	B2/B66A RRH (Verizon - Proposed)	146
4478 B14 (AT&T)	172	B2/B66A RRH (Verizon - Proposed)	146
4478 B14 (AT&T)	172	B5/B13 RRH (Verizon - Proposed)	146
4478 B14 (AT&T)	172	B5/B13 RRH (Verizon - Proposed)	146
4449 B5/B12 (AT&T)	172	B5/B13 RRH (Verizon - Proposed)	146
4449 B5/B12 (AT&T)	172	RC2DC-3315-PF-48 (Verizon - Proposed)	146

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-G Standard.
2. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 69.8%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 402868 lb
SHEAR: 42627 lb

UPLIFT: -337994 lb
SHEAR: 36524 lb

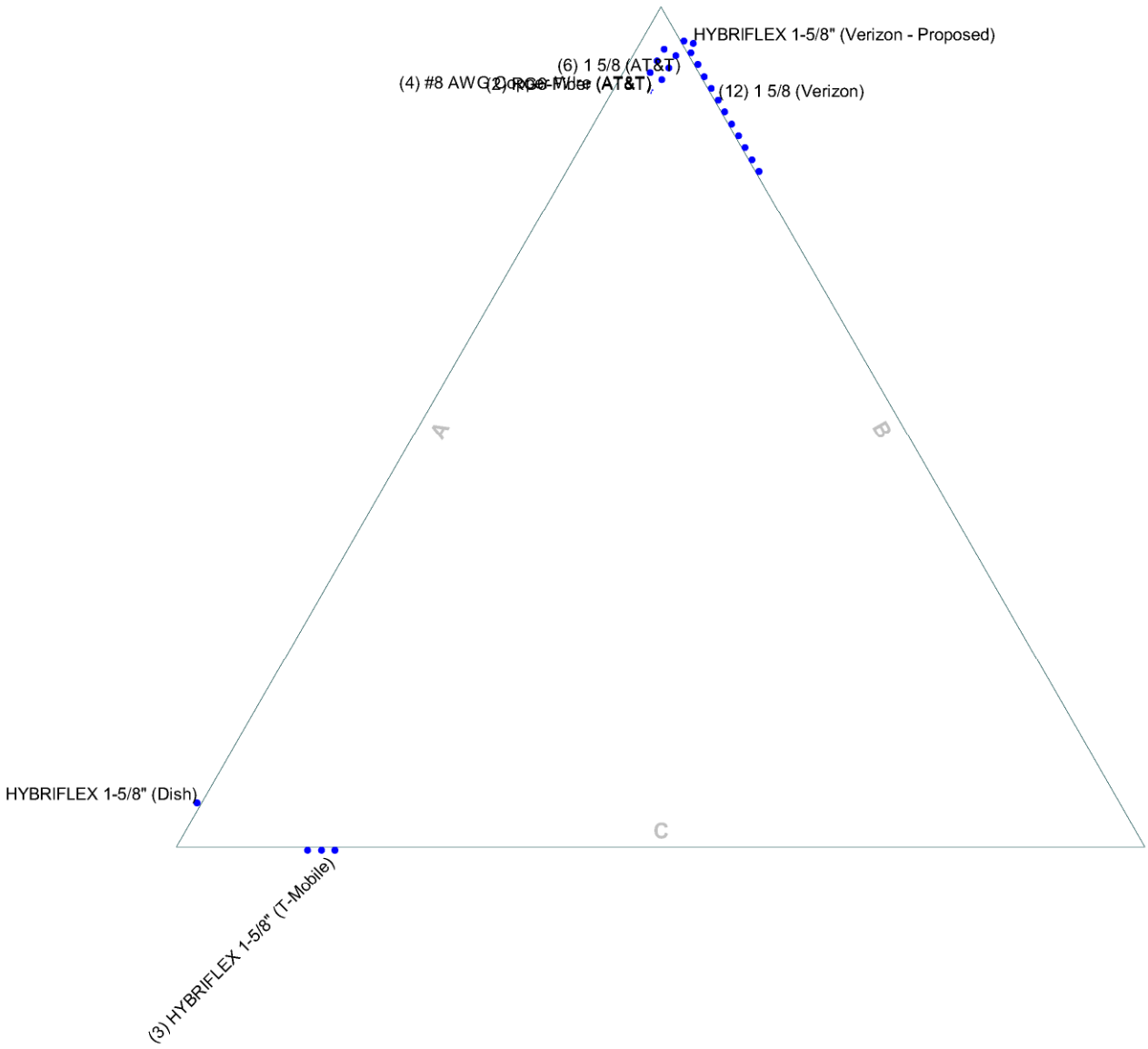
AXIAL 166050 lb
SHEAR 18840 lb
MOMENT 2236759 lb-ft
TORQUE 28252 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL 80721 lb
SHEAR 69589 lb
MOMENT 7651408 lb-ft
TORQUE 69026 lb-ft
REACTIONS - 101 mph WIND

Centek Engineering Inc.	Job: 22027.13 - Northford		
63-2 North Branford Rd.	Project: 195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT		
Branford, CT 06405	Client: Verizon Wireless	Drawn by: TJL	App'd:
Phone: (203) 488-0580	Code: TIA-222-G	Date: 09/07/22	Scale: NTS
FAX: (203) 488-8587	Path: [illegible]		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face

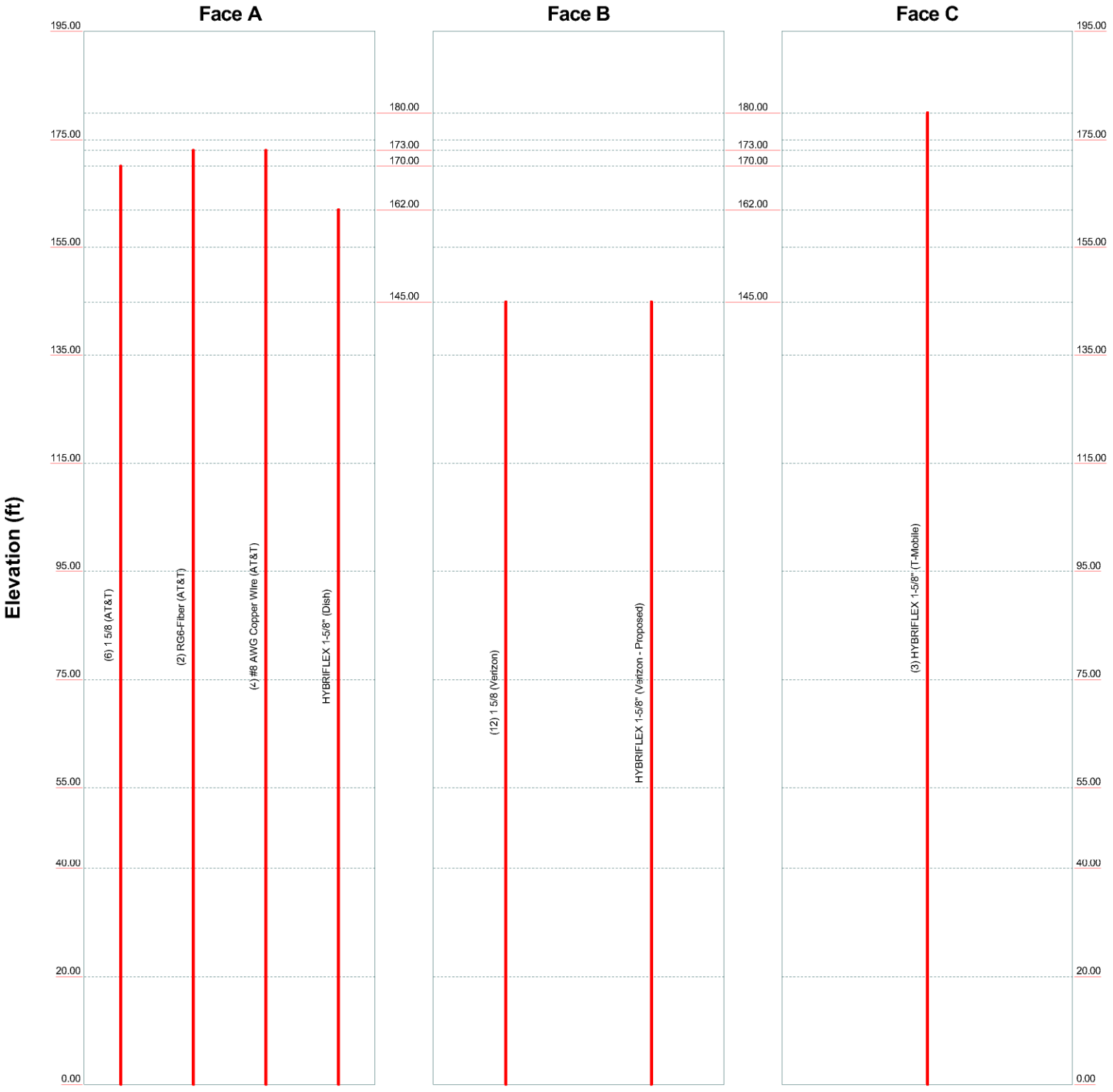


Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job:	***22027.13 - Northford***		
Project:	***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***		
Client: Verizon Wireless		Drawn by: TJL	App'd:
Code: TIA-222-G		Date: 09/07/22	Scale: NTS
Path:			Dwg No. E-7

Feed Line Distribution Chart
0' - 195'

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



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FAX: (203) 488-8587

Job: ***22027.13 - Northford***		
Project: ***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***		
Client: Verizon Wireless	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 09/07/22	Scale: NTS
Path: J:\Jobs\22027\00\Rf\13_Northford CT\05_Structural\Tower\Backup Documentation\Tnx\195-ft Central Lattice Tower.eri		Dwg No. E-7

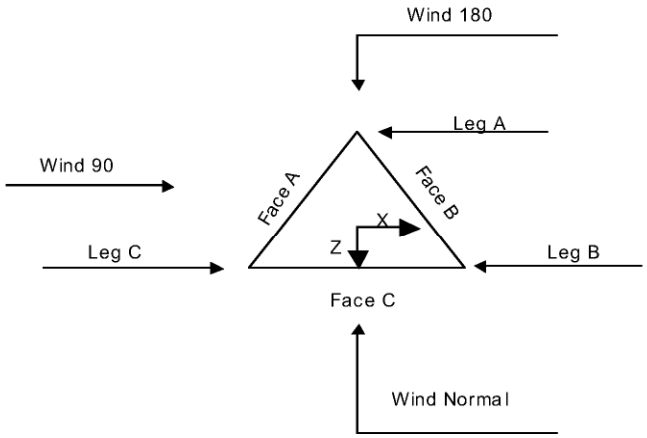
Tower Input Data

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-G standard.
The following design criteria apply:

Basic wind speed of 101 mph.
Structure Class II.
Exposure Category C.
Topographic Category 1.
Crest Height 0.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area	√	SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice		Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz	√	Use Azimuth Dish Coefficients		Include Angle Block Shear Check
	Use Special Wind Profile	√	Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
√	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets
	SR Members Are Concentric		Ignore KL/ry For 60 Deg. Angle Legs		Pole Without Linear Attachments
					Pole With Shroud Or No Appurtenances
					Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation	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 ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 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 ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
195.00-175.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
175.00-155.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
155.00-135.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
135.00-115.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
115.00-95.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
95.00-75.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
75.00-55.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
55.00-40.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 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		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 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	12	12	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	2	2	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	4	4	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	1	1	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	21.931	0.000	146.50
		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	30.748	0.000	206.80
		B	0.000	0.000	25.740	0.000	143.80
		C	0.000	0.000	11.880	0.000	114.00
T4	135.00-115.00	A	0.000	0.000	30.748	0.000	206.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	11.880	0.000	114.00
T5	115.00-95.00	A	0.000	0.000	30.748	0.000	206.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	11.880	0.000	114.00
T6	95.00-75.00	A	0.000	0.000	30.748	0.000	206.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	11.880	0.000	114.00
T7	75.00-55.00	A	0.000	0.000	30.748	0.000	206.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	11.880	0.000	114.00
T8	55.00-40.00	A	0.000	0.000	23.061	0.000	155.10
		B	0.000	0.000	38.610	0.000	215.70
		C	0.000	0.000	8.910	0.000	85.50
T9	40.00-20.00	A	0.000	0.000	30.748	0.000	206.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	11.880	0.000	114.00
T10	20.00-0.00	A	0.000	0.000	30.748	0.000	206.80
		B	0.000	0.000	51.480	0.000	287.60
		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	1.782	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	9.101	0.000	142.87
T2	175.00-155.00	A	1.762	0.000	0.000	62.680	0.000	1014.71
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	36.271	0.000	566.24
T3	155.00-135.00	A	1.739	0.000	0.000	82.650	0.000	1387.03
		B		0.000	0.000	67.111	0.000	1094.84
		C		0.000	0.000	36.123	0.000	560.42
T4	135.00-115.00	A	1.714	0.000	0.000	82.009	0.000	1369.92
		B		0.000	0.000	133.977	0.000	2165.52
		C		0.000	0.000	35.956	0.000	553.86
T5	115.00-95.00	A	1.684	0.000	0.000	81.269	0.000	1350.31
		B		0.000	0.000	133.695	0.000	2137.66
		C		0.000	0.000	35.764	0.000	546.32
T6	95.00-75.00	A	1.649	0.000	0.000	80.389	0.000	1327.21
		B		0.000	0.000	133.361	0.000	2104.66
		C		0.000	0.000	35.535	0.000	537.41
T7	75.00-55.00	A	1.605	0.000	0.000	79.298	0.000	1298.92
		B		0.000	0.000	132.946	0.000	2063.92
		C		0.000	0.000	35.251	0.000	526.45
T8	55.00-40.00	A	1.556	0.000	0.000	58.545	0.000	950.43

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	99.356	0.000	1513.41
		C		0.000	0.000	26.197	0.000	385.59
T9	40.00-20.00	A	1.486	0.000	0.000	76.316	0.000	1223.41
		B		0.000	0.000	131.812	0.000	1953.40
		C		0.000	0.000	34.478	0.000	496.94
T10	20.00-0.00	A	1.331	0.000	0.000	72.460	0.000	1129.81
		B		0.000	0.000	130.348	0.000	1812.41
		C		0.000	0.000	33.482	0.000	459.78

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	-1.5683	1.3564
T2	175.00-155.00	-2.8555	-4.5489	-4.3824	-5.7260
T3	155.00-135.00	-2.7843	-14.4632	-4.2374	-17.1012
T4	135.00-115.00	-1.8799	-21.2456	-3.1090	-25.8775
T5	115.00-95.00	-2.2844	-23.7599	-3.7561	-29.4203
T6	95.00-75.00	-2.4696	-24.4372	-4.2008	-31.8182
T7	75.00-55.00	-2.5826	-24.6916	-4.5347	-33.7375
T8	55.00-40.00	-2.4388	-22.9361	-4.4564	-33.0583
T9	40.00-20.00	-2.9518	-26.9581	-5.1347	-37.9796
T10	20.00-0.00	-3.1204	-27.9605	-5.2660	-40.1536

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	0.5397
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 Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Top Triangular Mount	C	From Face	2.00	0.0000	192.00	No Ice	75.30	75.30	2500.00
(Empty)			0.00			1/2" Ice	86.60	86.60	2875.00
			0.00			1" Ice	97.90	97.90	3250.00
SitePro VFA12-HD	A	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD	B	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD	C	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
AIR6419	A	From Leg	4.00	0.0000	180.00	No Ice	3.66	1.66	66.00
(T-Mobile)			-4.00			1/2" Ice	3.91	1.85	91.40
			0.00			1" Ice	4.16	2.05	120.26
APXVAALL24-43	A	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR6419	B	From Leg	4.00	0.0000	180.00	No Ice	3.66	1.66	66.00
(T-Mobile)			-4.00			1/2" Ice	3.91	1.85	91.40
			0.00			1" Ice	4.16	2.05	120.26
APXVAALL24-43	B	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR6419	C	From Leg	4.00	0.0000	180.00	No Ice	3.66	1.66	66.00
(T-Mobile)			-4.00			1/2" Ice	3.91	1.85	91.40
			0.00			1" Ice	4.16	2.05	120.26
APXVAALL24-43	C	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	153.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
4460 B25+B66	A	From Leg	4.00	0.0000	180.00	No Ice	2.56	1.98	109.00
(T-Mobile)			0.00			1/2" Ice	2.76	2.16	134.38
			0.00			1" Ice	2.97	2.34	163.03
4460 B25+B66	B	From Leg	4.00	0.0000	180.00	No Ice	2.56	1.98	109.00
(T-Mobile)			0.00			1/2" Ice	2.76	2.16	134.38
			0.00			1" Ice	2.97	2.34	163.03
4460 B25+B66	C	From Leg	4.00	0.0000	180.00	No Ice	2.56	1.98	109.00
(T-Mobile)			0.00			1/2" Ice	2.76	2.16	134.38
			0.00			1" Ice	2.97	2.34	163.03
4480 B71+B85	A	From Leg	4.00	0.0000	180.00	No Ice	2.85	1.38	84.00
(T-Mobile)			0.00			1/2" Ice	3.06	1.54	105.70
			0.00			1" Ice	3.28	1.71	130.51
4480 B71+B85	B	From Leg	4.00	0.0000	180.00	No Ice	2.85	1.38	84.00
(T-Mobile)			0.00			1/2" Ice	3.06	1.54	105.70
			0.00			1" Ice	3.28	1.71	130.51
4480 B71+B85	C	From Leg	4.00	0.0000	180.00	No Ice	2.85	1.38	84.00
(T-Mobile)			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	172.00	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	172.00	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	172.00	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
800 10121	A	From Leg	4.00	0.0000	172.00	No Ice	5.16	3.29	46.30
(AT&T)			4.00			1/2" Ice	5.51	3.64	79.21
			0.00			1" Ice	5.87	3.99	116.89
OPA65R-BU6D	A	From Leg	4.00	0.0000	172.00	No Ice	12.87	5.67	70.00
(AT&T)			0.00			1/2" Ice	13.37	6.13	145.03
			0.00			1" Ice	13.87	6.59	226.75
DMP65R-BU6D	A	From Leg	4.00	0.0000	172.00	No Ice	12.71	5.62	96.00
(AT&T)			-4.00			1/2" Ice	13.21	6.07	169.96
			0.00			1" Ice	13.71	6.53	250.56
800 10121	B	From Leg	4.00	0.0000	172.00	No Ice	5.16	3.29	46.30
(AT&T)			4.00			1/2" Ice	5.51	3.64	79.21
			0.00			1" Ice	5.87	3.99	116.89
OPA65R-BU6D	B	From Leg	4.00	0.0000	172.00	No Ice	12.87	5.67	70.00
(AT&T)			0.00			1/2" Ice	13.37	6.13	145.03
			0.00			1" Ice	13.87	6.59	226.75
DMP65R-BU6D	B	From Leg	4.00	0.0000	172.00	No Ice	12.71	5.62	96.00
(AT&T)			-4.00			1/2" Ice	13.21	6.07	169.96
			0.00			1" Ice	13.71	6.53	250.56
800 10121	C	From Leg	4.00	0.0000	172.00	No Ice	5.16	3.29	46.30
(AT&T)			4.00			1/2" Ice	5.51	3.64	79.21
			0.00			1" Ice	5.87	3.99	116.89
OPA65R-BU6D	C	From Leg	4.00	0.0000	172.00	No Ice	12.87	5.67	70.00
(AT&T)			0.00			1/2" Ice	13.37	6.13	145.03
			0.00			1" Ice	13.87	6.59	226.75
DMP65R-BU6D	C	From Leg	4.00	0.0000	172.00	No Ice	12.71	5.62	96.00
(AT&T)			-4.00			1/2" Ice	13.21	6.07	169.96
			0.00			1" Ice	13.71	6.53	250.56
(2) LGP21401 TMA	A	From Leg	4.00	0.0000	172.00	No Ice	0.82	0.35	17.50
(AT&T)			5.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
(2) LGP21401 TMA	B	From Leg	4.00	0.0000	172.00	No Ice	0.82	0.35	17.50
(AT&T)			5.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
(2) LGP21401 TMA	C	From Leg	4.00	0.0000	172.00	No Ice	0.82	0.35	17.50
(AT&T)			5.00			1/2" Ice	0.94	0.44	23.31
			0.00			1" Ice	1.06	0.54	30.86
DC6-48-60-18-8F Surge Arrestor	B	From Face	0.50	0.0000	172.00	No Ice	1.91	1.91	20.00
			0.50			1/2" Ice	2.10	2.10	39.36
(AT&T)			0.00			1" Ice	2.29	2.29	61.70
DC6-48-60-18-8F Surge Arrestor	C	From Face	0.50	0.0000	172.00	No Ice	1.91	1.91	20.00
			0.50			1/2" Ice	2.10	2.10	39.36
(AT&T)			0.00			1" Ice	2.29	2.29	61.70
4478 B14	A	From Face	4.00	0.0000	172.00	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	172.00	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	C	From Face	4.00	0.0000	172.00	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
4449 B5/B12	A	From Face	4.00	0.0000	172.00	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	172.00	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	172.00	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	172.00	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	172.00	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	172.00	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
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
(Dish)			2.00			1/2" Ice	2.15	1.18	81.85
			0.00			1" Ice	2.33	1.32	101.41
TA08025-B605	A	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.20	75.00
(Dish)			-2.00			1/2" Ice	2.15	1.34	93.09
			0.00			1" Ice	2.33	1.49	113.96
TA08025-B605	B	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.20	75.00
(Dish)			-2.00			1/2" Ice	2.15	1.34	93.09
			0.00			1" Ice	2.33	1.49	113.96
TA08025-B605	C	From Leg	2.00	0.0000	162.00	No Ice	1.98	1.20	75.00
(Dish)			-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	A	From Leg	2.00	0.0000	146.00	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
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	146.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
SitePro SFS-V-L	A	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
(Verizon)			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	B	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
(Verizon)			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	C	From Leg	2.00	0.0000	146.00	No Ice	5.09	4.75	77.00
(Verizon)			0.00			1/2" Ice	5.74	5.35	100.00
			0.00			1" Ice	6.53	6.07	137.00
LNX-6513DS-VTM	A	From Leg	4.00	0.0000	146.00	No Ice	5.85	3.84	32.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
(2) MX06FRO660	A	From Leg	4.00	0.0000	146.00	No Ice	9.87	7.34	57.00
(Verizon - Proposed)			0.00			1/2" Ice	10.34	7.78	125.84
			0.00			1" Ice	10.82	8.24	201.18
MT6407-77A	A	From Leg	4.00	0.0000	146.00	No Ice	4.71	1.84	87.00
(Verizon - Proposed)			2.00			1/2" Ice	5.00	2.06	116.31
			0.00			1" Ice	5.29	2.29	149.49
LNX-6513DS-VTM	B	From Leg	4.00	0.0000	146.00	No Ice	5.85	3.84	32.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
(2) MX06FRO660	B	From Leg	4.00	0.0000	146.00	No Ice	9.87	7.34	57.00
(Verizon - Proposed)			0.00			1/2" Ice	10.34	7.78	125.84
			0.00			1" Ice	10.82	8.24	201.18
MT6407-77A	B	From Leg	4.00	0.0000	146.00	No Ice	4.71	1.84	87.00
(Verizon - Proposed)			2.00			1/2" Ice	5.00	2.06	116.31
			0.00			1" Ice	5.29	2.29	149.49
LNX-6513DS-VTM	C	From Leg	4.00	0.0000	146.00	No Ice	5.85	3.84	32.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
(2) MX06FRO660	C	From Leg	4.00	0.0000	146.00	No Ice	9.87	7.34	57.00
(Verizon - Proposed)			0.00			1/2" Ice	10.34	7.78	125.84
			0.00			1" Ice	10.82	8.24	201.18
MT6407-77A	C	From Leg	4.00	0.0000	146.00	No Ice	4.71	1.84	87.00
(Verizon - Proposed)			2.00			1/2" Ice	5.00	2.06	116.31
			0.00			1" Ice	5.29	2.29	149.49
B2/B66A RRH	A	From Leg	2.00	0.0000	146.00	No Ice	2.54	1.61	60.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.75	1.79	80.12
			0.00			1" Ice	2.97	1.98	103.35
B2/B66A RRH	B	From Leg	2.00	0.0000	146.00	No Ice	2.54	1.61	60.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.75	1.79	80.12
			0.00			1" Ice	2.97	1.98	103.35
B2/B66A RRH	C	From Leg	2.00	0.0000	146.00	No Ice	2.54	1.61	60.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.75	1.79	80.12
			0.00			1" Ice	2.97	1.98	103.35
B5/B13 RRH	A	From Leg	2.00	0.0000	146.00	No Ice	1.87	1.02	70.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.03	1.15	86.42
			0.00			1" Ice	2.21	1.29	105.50
B5/B13 RRH	B	From Leg	2.00	0.0000	146.00	No Ice	1.87	1.02	70.00

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
(Verizon - Proposed)			-4.00			1/2" Ice	2.03	1.15	86.42
			0.00			1" Ice	2.21	1.29	105.50
B5/B13 RRH	C	From Leg	2.00	0.0000	146.00	No Ice	1.87	1.02	70.00
(Verizon - Proposed)			-4.00			1/2" Ice	2.03	1.15	86.42
			0.00			1" Ice	2.21	1.29	105.50
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	32	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	31	146.258	A	11.554	12.521	12.521	52.01	21.931	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	30	186.675	A	13.489	13.356	13.356	49.75	30.748	0.000
155.00-135.00					B	13.489	13.356		49.75	25.740	0.000
					C	13.489	13.356		49.75	11.880	0.000
T4	125.00	1.326	29	227.092	A	18.679	14.190	14.190	43.17	30.748	0.000
135.00-115.00					B	18.679	14.190		43.17	51.480	0.000
					C	18.679	14.190		43.17	11.880	0.000
T5	105.00	1.279	28	267.092	A	21.322	14.190	14.190	39.96	30.748	0.000
115.00-95.00					B	21.322	14.190		39.96	51.480	0.000
					C	21.322	14.190		39.96	11.880	0.000
T6 95.00-75.00	85.00	1.223	27	307.509	A	28.012	15.025	15.025	34.91	30.748	0.000
					B	28.012	15.025		34.91	51.480	0.000
					C	28.012	15.025		34.91	11.880	0.000
T7 75.00-55.00	65.00	1.156	26	347.927	A	35.675	15.860	15.860	30.78	30.748	0.000
					B	35.675	15.860		30.78	51.480	0.000
					C	35.675	15.860		30.78	11.880	0.000
T8 55.00-40.00	47.50	1.082	24	287.195	A	37.993	11.895	11.895	23.84	23.061	0.000
					B	37.993	11.895		23.84	38.610	0.000
					C	37.993	11.895		23.84	8.910	0.000
T9 40.00-20.00	30.00	0.982	22	417.927	A	42.284	15.860	15.860	27.28	30.748	0.000
					B	42.284	15.860		27.28	51.480	0.000
					C	42.284	15.860		27.28	11.880	0.000
T10 20.00-0.00	10.00	0.85	19	458.344	A	46.067	16.694	16.694	26.60	30.748	0.000
					B	46.067	16.694		26.60	51.480	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	185.00	1.441	8	1.7822	120.944	A	0.000	55.666	21.890	39.32	0.000	0.000
195.00-175.00						B	0.000	55.666		39.32	0.000	0.000
						C	0.000	55.666		39.32	9.101	0.000
T2	165.00	1.406	8	1.7619	152.138	A	11.554	40.572	24.287	46.59	62.680	0.000
175.00-155.00						B	11.554	40.572		46.59	0.000	0.000
						C	11.554	40.572		46.59	36.271	0.000
T3	145.00	1.369	7	1.7393	192.480	A	13.489	43.739	24.970	43.63	82.650	0.000
155.00-135.00						B	13.489	43.739		43.63	67.111	0.000
						C	13.489	43.739		43.63	36.123	0.000
T4	125.00	1.326	7	1.7137	232.812	A	18.679	46.974	25.634	39.04	82.009	0.000
135.00-115.00						B	18.679	46.974		39.04	133.977	0.000
						C	18.679	46.974		39.04	35.956	0.000
T5 115.00-95.00	105.00	1.279	7	1.6841	272.713	A	21.322	49.375	25.436	35.98	81.269	0.000
						B	21.322	49.375		35.98	133.695	0.000
						C	21.322	49.375		35.98	35.764	0.000
T6 95.00-75.00	85.00	1.223	7	1.6489	313.012	A	28.012	52.429	26.036	32.37	80.389	0.000
						B	28.012	52.429		32.37	133.361	0.000
						C	28.012	52.429		32.37	35.535	0.000
T7 75.00-55.00	65.00	1.156	6	1.6052	353.284	A	35.675	55.211	26.579	29.24	79.298	0.000
						B	35.675	55.211		29.24	132.946	0.000
						C	35.675	55.211		29.24	35.251	0.000
T8 55.00-40.00	47.50	1.082	6	1.5556	291.089	A	37.993	49.237	19.686	22.57	58.545	0.000
						B	37.993	49.237		22.57	99.356	0.000
						C	37.993	49.237		22.57	26.197	0.000
T9 40.00-20.00	30.00	0.982	5	1.4858	422.885	A	42.284	57.194	25.781	25.92	76.316	0.000
						B	42.284	57.194		25.92	131.812	0.000
						C	42.284	57.194		25.92	34.478	0.000
T10 20.00-0.00	10.00	0.85	5	1.3312	462.787	A	46.067	56.246	25.584	25.01	72.460	0.000
						B	46.067	56.246		25.01	130.348	0.000
						C	46.067	56.246		25.01	33.482	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.441	11	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	11	146.258	A	11.554	12.521	12.521	52.01	21.931	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	11	186.675	A	13.489	13.356	13.356	49.75	30.748	0.000
155.00-135.00					B	13.489	13.356		49.75	25.740	0.000
					C	13.489	13.356		49.75	11.880	0.000
T4	125.00	1.326	10	227.092	A	18.679	14.190	14.190	43.17	30.748	0.000
135.00-115.00					B	18.679	14.190		43.17	51.480	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
					C	18.679	14.190		43.17	11.880	0.000
T5	105.00	1.279	10	267.092	A	21.322	14.190	14.190	39.96	30.748	0.000
115.00-95.00					B	21.322	14.190		39.96	51.480	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	30.748	0.000
					B	28.012	15.025		34.91	51.480	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	30.748	0.000
					B	35.675	15.860		30.78	51.480	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	23.061	0.000
					B	37.993	11.895		23.84	38.610	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	30.748	0.000
					B	42.284	15.860		27.28	51.480	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	30.748	0.000
					B	46.067	16.694		26.60	51.480	0.000
					C	46.067	16.694		26.60	11.880	0.000

Tower Forces - No 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	28.50	2548.67	A	0.163	2.723	32	1	1	10.683	839.20	41.96	C
195.00-175.00			B	0.163	2.723		1	1	10.683			
			C	0.163	2.723		1	1	10.683			
T2	260.50	2793.29	A	0.165	2.718	31	1	1	18.377	1878.58	93.93	C
175.00-155.00			B	0.165	2.718		1	1	18.377			
			C	0.165	2.718		1	1	18.377			
T3	464.60	3572.06	A	0.144	2.794	30	1	1	20.594	2586.20	129.31	C
155.00-135.00			B	0.144	2.794		1	1	20.594			
			C	0.144	2.794		1	1	20.594			
T4	608.40	4036.07	A	0.145	2.791	29	1	1	26.109	3276.62	163.83	C
135.00-115.00			B	0.145	2.791		1	1	26.109			
			C	0.145	2.791		1	1	26.109			
T5	608.40	4789.76	A	0.133	2.835	28	1	1	28.771	3368.45	168.42	C
115.00-95.00			B	0.133	2.835		1	1	28.771			
			C	0.133	2.835		1	1	28.771			
T6	608.40	5354.18	A	0.14	2.809	27	1	1	35.815	3660.97	183.05	C
95.00-75.00			B	0.14	2.809		1	1	35.815			
			C	0.14	2.809		1	1	35.815			
T7	608.40	5794.03	A	0.148	2.778	26	1	1	43.858	3923.59	196.18	C
75.00-55.00			B	0.148	2.778		1	1	43.858			
			C	0.148	2.778		1	1	43.858			
T8	456.30	5023.91	A	0.174	2.686	24	1	1	44.281	3317.16	221.14	C
55.00-40.00			B	0.174	2.686		1	1	44.281			
			C	0.174	2.686		1	1	44.281			
T9	608.40	6793.06	A	0.139	2.812	22	1	1	50.690	3717.42	185.87	C
40.00-20.00			B	0.139	2.812		1	1	50.690			
			C	0.139	2.812		1	1	50.690			
T10	608.40	8126.54	A	0.137	2.82	19	1	1	54.975	3417.42	170.87	C
20.00-0.00			B	0.137	2.82		1	1	54.975			
			C	0.137	2.82		1	1	54.975			
Sum Weight:	4860.30	48831.58						OTM	2472958.3	29985.60		

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
									4 lb-ft			

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 ft^2	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	32	0.825	1	10.683	839.20	41.96	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	260.50	2793.29	A	0.165	2.718	31	0.825	1	16.355	1732.73	86.64	C
175.00-155.00			B	0.165	2.718		0.825	1	16.355			
			C	0.165	2.718		0.825	1	16.355			
T3	464.60	3572.06	A	0.144	2.794	30	0.825	1	18.233	2415.86	120.79	C
155.00-135.00			B	0.144	2.794		0.825	1	18.233			
			C	0.144	2.794		0.825	1	18.233			
T4	608.40	4036.07	A	0.145	2.791	29	0.825	1	22.840	3048.29	152.41	C
135.00-115.00			B	0.145	2.791		0.825	1	22.840			
			C	0.145	2.791		0.825	1	22.840			
T5	608.40	4789.76	A	0.133	2.835	28	0.825	1	25.039	3113.21	155.66	C
115.00-95.00			B	0.133	2.835		0.825	1	25.039			
			C	0.133	2.835		0.825	1	25.039			
T6	608.40	5354.18	A	0.14	2.809	27	0.825	1	30.913	3343.23	167.16	C
95.00-75.00			B	0.14	2.809		0.825	1	30.913			
			C	0.14	2.809		0.825	1	30.913			
T7	608.40	5794.03	A	0.148	2.778	26	0.825	1	37.615	3545.29	177.26	C
75.00-55.00			B	0.148	2.778		0.825	1	37.615			
			C	0.148	2.778		0.825	1	37.615			
T8	456.30	5023.91	A	0.174	2.686	24	0.825	1	37.632	2952.55	196.84	C
55.00-40.00			B	0.174	2.686		0.825	1	37.632			
			C	0.174	2.686		0.825	1	37.632			
T9	608.40	6793.06	A	0.139	2.812	22	0.825	1	43.290	3331.80	166.59	C
40.00-20.00			B	0.139	2.812		0.825	1	43.290			
			C	0.139	2.812		0.825	1	43.290			
T10	608.40	8126.54	A	0.137	2.82	19	0.825	1	46.913	3052.80	152.64	C
20.00-0.00			B	0.137	2.82		0.825	1	46.913			
			C	0.137	2.82		0.825	1	46.913			
Sum Weight:	4860.30	48831.58						OTM	2284723.1 8 lb-ft	27374.96		

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 ft^2	F lb	w plf	Ctrl. Face
T1	28.50	2548.67	A	0.163	2.723	32	0.8	1	10.683	839.20	41.96	C
195.00-175.00			B	0.163	2.723		0.8	1	10.683			

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
			C	0.163	2.723		0.8	1	10.683			
T2	260.50	2793.29	A	0.165	2.718	31	0.8	1	16.066	1711.90	85.59	C
175.00-155.00			B	0.165	2.718		0.8	1	16.066			
			C	0.165	2.718		0.8	1	16.066			
T3	464.60	3572.06	A	0.144	2.794	30	0.8	1	17.896	2391.53	119.58	C
155.00-135.00			B	0.144	2.794		0.8	1	17.896			
			C	0.144	2.794		0.8	1	17.896			
T4	608.40	4036.07	A	0.145	2.791	29	0.8	1	22.373	3015.67	150.78	C
135.00-115.00			B	0.145	2.791		0.8	1	22.373			
			C	0.145	2.791		0.8	1	22.373			
T5	608.40	4789.76	A	0.133	2.835	28	0.8	1	24.506	3076.75	153.84	C
115.00-95.00			B	0.133	2.835		0.8	1	24.506			
			C	0.133	2.835		0.8	1	24.506			
T6	608.40	5354.18	A	0.14	2.809	27	0.8	1	30.213	3297.84	164.89	C
95.00-75.00			B	0.14	2.809		0.8	1	30.213			
			C	0.14	2.809		0.8	1	30.213			
T7	608.40	5794.03	A	0.148	2.778	26	0.8	1	36.723	3491.24	174.56	C
75.00-55.00			B	0.148	2.778		0.8	1	36.723			
			C	0.148	2.778		0.8	1	36.723			
T8	456.30	5023.91	A	0.174	2.686	24	0.8	1	36.682	2900.46	193.36	C
55.00-40.00			B	0.174	2.686		0.8	1	36.682			
			C	0.174	2.686		0.8	1	36.682			
T9	608.40	6793.06	A	0.139	2.812	22	0.8	1	42.233	3276.71	163.84	C
40.00-20.00			B	0.139	2.812		0.8	1	42.233			
			C	0.139	2.812		0.8	1	42.233			
T10	608.40	8126.54	A	0.137	2.82	19	0.8	1	45.762	3000.71	150.04	C
20.00-0.00			B	0.137	2.82		0.8	1	45.762			
			C	0.137	2.82		0.8	1	45.762			
Sum Weight:	4860.30	48831.58						OTM	2257832.4 4 lb-ft	27002.01		

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	32	0.85	1	10.683	839.20	41.96	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	260.50	2793.29	A	0.165	2.718	31	0.85	1	16.644	1753.57	87.68	C
175.00-155.00			B	0.165	2.718		0.85	1	16.644			
			C	0.165	2.718		0.85	1	16.644			
T3	464.60	3572.06	A	0.144	2.794	30	0.85	1	18.571	2440.20	122.01	C
155.00-135.00			B	0.144	2.794		0.85	1	18.571			
			C	0.144	2.794		0.85	1	18.571			
T4	608.40	4036.07	A	0.145	2.791	29	0.85	1	23.307	3080.91	154.05	C
135.00-115.00			B	0.145	2.791		0.85	1	23.307			
			C	0.145	2.791		0.85	1	23.307			
T5	608.40	4789.76	A	0.133	2.835	28	0.85	1	25.572	3149.67	157.48	C
115.00-95.00			B	0.133	2.835		0.85	1	25.572			
			C	0.133	2.835		0.85	1	25.572			
T6	608.40	5354.18	A	0.14	2.809	27	0.85	1	31.613	3388.62	169.43	C
95.00-75.00			B	0.14	2.809		0.85	1	31.613			

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
			C	0.14	2.809		0.85	1	31.613			
T7	608.40	5794.03	A	0.148	2.778	26	0.85	1	38.507	3599.33	179.97	C
75.00-55.00			B	0.148	2.778		0.85	1	38.507			
			C	0.148	2.778		0.85	1	38.507			
T8	456.30	5023.91	A	0.174	2.686	24	0.85	1	38.582	3004.64	200.31	C
55.00-40.00			B	0.174	2.686		0.85	1	38.582			
			C	0.174	2.686		0.85	1	38.582			
T9	608.40	6793.06	A	0.139	2.812	22	0.85	1	44.347	3386.89	169.34	C
40.00-20.00			B	0.139	2.812		0.85	1	44.347			
			C	0.139	2.812		0.85	1	44.347			
T10	608.40	8126.54	A	0.137	2.82	19	0.85	1	48.065	3104.89	155.24	C
20.00-0.00			B	0.137	2.82		0.85	1	48.065			
			C	0.137	2.82		0.85	1	48.065			
Sum Weight:	4860.30	48831.58						OTM	2311613.9 2 lb-ft	27747.91		

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	142.87	4920.60	A	0.46	1.957	8	1	1	36.982	514.83	25.74	C
195.00-175.00			B	0.46	1.957		1	1	36.982			
			C	0.46	1.957		1	1	36.982			
T2	1580.95	5492.44	A	0.343	2.189	8	1	1	36.438	914.74	45.74	C
175.00-155.00			B	0.343	2.189		1	1	36.438			
			C	0.343	2.189		1	1	36.438			
T3	3042.29	6566.06	A	0.297	2.303	7	1	1	39.649	1311.33	65.57	C
155.00-135.00			B	0.297	2.303		1	1	39.649			
			C	0.297	2.303		1	1	39.649			
T4	4089.30	7674.74	A	0.282	2.345	7	1	1	46.559	1623.42	81.17	C
135.00-115.00			B	0.282	2.345		1	1	46.559			
			C	0.282	2.345		1	1	46.559			
T5	4034.29	8731.00	A	0.259	2.41	7	1	1	50.321	1631.85	81.59	C
115.00-95.00			B	0.259	2.41		1	1	50.321			
			C	0.259	2.41		1	1	50.321			
T6	3969.28	10026.74	A	0.257	2.417	7	1	1	58.774	1673.04	83.65	C
95.00-75.00			B	0.257	2.417		1	1	58.774			
			C	0.257	2.417		1	1	58.774			
T7	3889.30	11224.75	A	0.257	2.416	6	1	1	68.073	1694.89	84.74	C
75.00-55.00			B	0.257	2.416		1	1	68.073			
			C	0.257	2.416		1	1	68.073			
T8	2849.44	10352.39	A	0.3	2.297	6	1	1	67.477	1343.39	89.56	C
55.00-40.00			B	0.3	2.297		1	1	67.477			
			C	0.3	2.297		1	1	67.477			
T9	3673.74	12504.55	A	0.235	2.483	5	1	1	75.544	1530.93	76.55	C
40.00-20.00			B	0.235	2.483		1	1	75.544			
			C	0.235	2.483		1	1	75.544			
T10	3402.00	13546.27	A	0.221	2.527	5	1	1	78.605	1352.57	67.63	C
20.00-0.00			B	0.221	2.527		1	1	78.605			
			C	0.221	2.527		1	1	78.605			
Sum Weight:	30673.47	91039.54						OTM	1186233.0 2 lb-ft	13591.00		

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	142.87	4920.60	A	0.46	1.957	8	0.825	1	36.982	514.83	25.74	C
195.00-175.00			B	0.46	1.957		0.825	1	36.982			
			C	0.46	1.957		0.825	1	36.982			
T2	1580.95	5492.44	A	0.343	2.189	8	0.825	1	34.416	885.96	44.30	C
175.00-155.00			B	0.343	2.189		0.825	1	34.416			
			C	0.343	2.189		0.825	1	34.416			
T3	3042.29	6566.06	A	0.297	2.303	7	0.825	1	37.288	1276.93	63.85	C
155.00-135.00			B	0.297	2.303		0.825	1	37.288			
			C	0.297	2.303		0.825	1	37.288			
T4	4089.30	7674.74	A	0.282	2.345	7	0.825	1	43.290	1576.40	78.82	C
135.00-115.00			B	0.282	2.345		0.825	1	43.290			
			C	0.282	2.345		0.825	1	43.290			
T5	4034.29	8731.00	A	0.259	2.41	7	0.825	1	46.590	1578.68	78.93	C
115.00-95.00			B	0.259	2.41		0.825	1	46.590			
			C	0.259	2.41		0.825	1	46.590			
T6	3969.28	10026.74	A	0.257	2.417	7	0.825	1	53.872	1606.05	80.30	C
95.00-75.00			B	0.257	2.417		0.825	1	53.872			
			C	0.257	2.417		0.825	1	53.872			
T7	3889.30	11224.75	A	0.257	2.416	6	0.825	1	61.830	1614.28	80.71	C
75.00-55.00			B	0.257	2.416		0.825	1	61.830			
			C	0.257	2.416		0.825	1	61.830			
T8	2849.44	10352.39	A	0.3	2.297	6	0.825	1	60.828	1266.98	84.47	C
55.00-40.00			B	0.3	2.297		0.825	1	60.828			
			C	0.3	2.297		0.825	1	60.828			
T9	3673.74	12504.55	A	0.235	2.483	5	0.825	1	68.144	1447.49	72.37	C
40.00-20.00			B	0.235	2.483		0.825	1	68.144			
			C	0.235	2.483		0.825	1	68.144			
T10	3402.00	13546.27	A	0.221	2.527	5	0.825	1	70.543	1272.50	63.62	C
20.00-0.00			B	0.221	2.527		0.825	1	70.543			
			C	0.221	2.527		0.825	1	70.543			
Sum Weight:	30673.47	91039.54						OTM	1147167.6 5 lb-ft	13040.10		

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	142.87	4920.60	A	0.46	1.957	8	0.8	1	36.982	514.83	25.74	C
195.00-175.00			B	0.46	1.957		0.8	1	36.982			
			C	0.46	1.957		0.8	1	36.982			
T2	1580.95	5492.44	A	0.343	2.189	8	0.8	1	34.127	881.85	44.09	C
175.00-155.00			B	0.343	2.189		0.8	1	34.127			
			C	0.343	2.189		0.8	1	34.127			
T3	3042.29	6566.06	A	0.297	2.303	7	0.8	1	36.951	1272.01	63.60	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
155.00-135.00			B	0.297	2.303		0.8	1	36.951			
			C	0.297	2.303		0.8	1	36.951			
T4	4089.30	7674.74	A	0.282	2.345	7	0.8	1	42.823	1569.69	78.48	C
135.00-115.00			B	0.282	2.345		0.8	1	42.823			
			C	0.282	2.345		0.8	1	42.823			
T5	4034.29	8731.00	A	0.259	2.41	7	0.8	1	46.057	1571.08	78.55	C
115.00-95.00			B	0.259	2.41		0.8	1	46.057			
			C	0.259	2.41		0.8	1	46.057			
T6	3969.28	10026.74	A	0.257	2.417	7	0.8	1	53.172	1596.47	79.82	C
95.00-75.00			B	0.257	2.417		0.8	1	53.172			
			C	0.257	2.417		0.8	1	53.172			
T7	3889.30	11224.75	A	0.257	2.416	6	0.8	1	60.939	1602.76	80.14	C
75.00-55.00			B	0.257	2.416		0.8	1	60.939			
			C	0.257	2.416		0.8	1	60.939			
T8	2849.44	10352.39	A	0.3	2.297	6	0.8	1	59.878	1256.07	83.74	C
55.00-40.00			B	0.3	2.297		0.8	1	59.878			
			C	0.3	2.297		0.8	1	59.878			
T9	3673.74	12504.55	A	0.235	2.483	5	0.8	1	67.087	1435.57	71.78	C
40.00-20.00			B	0.235	2.483		0.8	1	67.087			
			C	0.235	2.483		0.8	1	67.087			
T10	3402.00	13546.27	A	0.221	2.527	5	0.8	1	69.391	1261.06	63.05	C
20.00-0.00			B	0.221	2.527		0.8	1	69.391			
			C	0.221	2.527		0.8	1	69.391			
Sum Weight:	30673.47	91039.54						OTM	1141586.8 9 lb-ft	12961.40		

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	142.87	4920.60	A	0.46	1.957	8	0.85	1	36.982	514.83	25.74	C
195.00-175.00			B	0.46	1.957		0.85	1	36.982			
			C	0.46	1.957		0.85	1	36.982			
T2	1580.95	5492.44	A	0.343	2.189	8	0.85	1	34.705	890.07	44.50	C
175.00-155.00			B	0.343	2.189		0.85	1	34.705			
			C	0.343	2.189		0.85	1	34.705			
T3	3042.29	6566.06	A	0.297	2.303	7	0.85	1	37.625	1281.84	64.09	C
155.00-135.00			B	0.297	2.303		0.85	1	37.625			
			C	0.297	2.303		0.85	1	37.625			
T4	4089.30	7674.74	A	0.282	2.345	7	0.85	1	43.757	1583.12	79.16	C
135.00-115.00			B	0.282	2.345		0.85	1	43.757			
			C	0.282	2.345		0.85	1	43.757			
T5	4034.29	8731.00	A	0.259	2.41	7	0.85	1	47.123	1586.27	79.31	C
115.00-95.00			B	0.259	2.41		0.85	1	47.123			
			C	0.259	2.41		0.85	1	47.123			
T6	3969.28	10026.74	A	0.257	2.417	7	0.85	1	54.573	1615.62	80.78	C
95.00-75.00			B	0.257	2.417		0.85	1	54.573			
			C	0.257	2.417		0.85	1	54.573			
T7	3889.30	11224.75	A	0.257	2.416	6	0.85	1	62.722	1625.79	81.29	C
75.00-55.00			B	0.257	2.416		0.85	1	62.722			
			C	0.257	2.416		0.85	1	62.722			
T8	2849.44	10352.39	A	0.3	2.297	6	0.85	1	61.778	1277.90	85.19	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
55.00-40.00			B	0.3	2.297		0.85	1	61.778			
			C	0.3	2.297		0.85	1	61.778			
T9	3673.74	12504.55	A	0.235	2.483	5	0.85	1	69.201	1459.41	72.97	C
40.00-20.00			B	0.235	2.483		0.85	1	69.201			
			C	0.235	2.483		0.85	1	69.201			
T10	3402.00	13546.27	A	0.221	2.527	5	0.85	1	71.695	1283.94	64.20	C
20.00-0.00			B	0.221	2.527		0.85	1	71.695			
			C	0.221	2.527		0.85	1	71.695			
Sum Weight:	30673.47	91039.54						OTM	1152748.4 2 lb-ft	13118.80		

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	260.50	2793.29	A	0.165	2.718	11	1	1	18.680	670.69	33.53	C
175.00-155.00			B	0.165	2.718		1	1	18.680			
			C	0.165	2.718		1	1	18.680			
T3	464.60	3572.06	A	0.144	2.794	11	1	1	21.061	924.57	46.23	C
155.00-135.00			B	0.144	2.794		1	1	21.061			
			C	0.144	2.794		1	1	21.061			
T4	608.40	4036.07	A	0.145	2.791	10	1	1	26.725	1171.52	58.58	C
135.00-115.00			B	0.145	2.791		1	1	26.725			
			C	0.145	2.791		1	1	26.725			
T5	608.40	4789.76	A	0.133	2.835	10	1	1	29.354	1202.84	60.14	C
115.00-95.00			B	0.133	2.835		1	1	29.354			
			C	0.133	2.835		1	1	29.354			
T6	608.40	5354.18	A	0.14	2.809	10	1	1	36.525	1308.22	65.41	C
95.00-75.00			B	0.14	2.809		1	1	36.525			
			C	0.14	2.809		1	1	36.525			
T7	608.40	5794.03	A	0.148	2.778	9	1	1	44.673	1402.07	70.10	C
75.00-55.00			B	0.148	2.778		1	1	44.673			
			C	0.148	2.778		1	1	44.673			
T8	456.30	5023.91	A	0.174	2.686	8	1	1	44.777	1180.25	78.68	C
55.00-40.00			B	0.174	2.686		1	1	44.777			
			C	0.174	2.686		1	1	44.777			
T9	608.40	6793.06	A	0.139	2.812	8	1	1	51.269	1322.55	66.13	C
40.00-20.00			B	0.139	2.812		1	1	51.269			
			C	0.139	2.812		1	1	51.269			
T10	608.40	8126.54	A	0.137	2.82	7	1	1	55.522	1214.76	60.74	C
20.00-0.00			B	0.137	2.82		1	1	55.522			
			C	0.137	2.82		1	1	55.522			
Sum Weight:	4860.30	48831.58						OTM	882473.72 lb-ft	10693.63		

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	260.50	2793.29	A	0.165	2.718	11	0.825	1	16.658	619.22	30.96	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	464.60	3572.06	A	0.144	2.794	11	0.825	1	18.700	864.46	43.22	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	608.40	4036.07	A	0.145	2.791	10	0.825	1	23.456	1090.94	54.55	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	608.40	4789.76	A	0.133	2.835	10	0.825	1	25.623	1112.76	55.64	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	608.40	5354.18	A	0.14	2.809	10	0.825	1	31.623	1196.09	59.80	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	608.40	5794.03	A	0.148	2.778	9	0.825	1	38.430	1268.57	63.43	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	456.30	5023.91	A	0.174	2.686	8	0.825	1	38.128	1051.58	70.11	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	608.40	6793.06	A	0.139	2.812	8	0.825	1	43.869	1186.46	59.32	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	608.40	8126.54	A	0.137	2.82	7	0.825	1	47.460	1086.08	54.30	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:	4860.30	48831.58						OTM	816044.30 lb-ft	9772.32		

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
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	260.50	2793.29	A	0.165	2.718	11	0.8	1	16.370	611.87	30.59	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	464.60	3572.06	A	0.144	2.794	11	0.8	1	18.363	855.87	42.79	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	608.40	4036.07	A	0.145	2.791	10	0.8	1	22.989	1079.43	53.97	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			

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
T5	608.40	4789.76	A	0.133	2.835	10	0.8	1	25.090	1099.90	54.99	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	608.40	5354.18	A	0.14	2.809	10	0.8	1	30.923	1180.07	59.00	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	608.40	5794.03	A	0.148	2.778	9	0.8	1	37.538	1249.50	62.47	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	456.30	5023.91	A	0.174	2.686	8	0.8	1	37.179	1033.20	68.88	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	608.40	6793.06	A	0.139	2.812	8	0.8	1	42.812	1167.02	58.35	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	608.40	8126.54	A	0.137	2.82	7	0.8	1	46.308	1067.70	53.38	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:	4860.30	48831.58						OTM	806554.38 lb-ft	9640.70		

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	260.50	2793.29	A	0.165	2.718	11	0.85	1	16.947	626.57	31.33	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	464.60	3572.06	A	0.144	2.794	11	0.85	1	19.037	873.04	43.65	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	608.40	4036.07	A	0.145	2.791	10	0.85	1	23.923	1102.46	55.12	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	608.40	4789.76	A	0.133	2.835	10	0.85	1	26.156	1125.63	56.28	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	608.40	5354.18	A	0.14	2.809	10	0.85	1	32.323	1212.11	60.61	C
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	608.40	5794.03	A	0.148	2.778	9	0.85	1	39.321	1287.64	64.38	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	456.30	5023.91	A	0.174	2.686	8	0.85	1	39.078	1069.96	71.33	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	608.40	6793.06	A	0.139	2.812	8	0.85	1	44.926	1205.90	60.30	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			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T10	608.40	8126.54	A	0.137	2.82	7	0.85	1	48.612	1104.46	55.22	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:	4860.30	48831.58						OTM	825534.22 lb-ft	9903.94		

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			-13129.48	5034.59	
Total Weight	67267.78			-13129.48	5034.59	
Wind 0 deg - No Ice		0.00	-43492.97	-4767292.05	5034.59	-6304.41
Wind 30 deg - No Ice		20616.77	-35728.12	-3990626.68	-2289788.26	-27027.88
Wind 45 deg - No Ice		28892.81	-28908.17	-3241727.72	-3221320.39	-34959.79
Wind 60 deg - No Ice		35063.33	-20254.69	-2282647.82	-3923139.06	-40509.25
Wind 90 deg - No Ice		41233.55	0.00	-13129.48	-4584611.12	-43136.20
Wind 120 deg - No Ice		37647.20	21746.49	2363951.80	-4109443.55	-34204.83
Wind 135 deg - No Ice		29947.67	29963.03	3291527.24	-3297378.88	-26044.00
Wind 150 deg - No Ice		20616.77	35728.12	3964367.71	-2289788.26	-16108.32
Wind 180 deg - No Ice		0.00	40509.38	4525907.19	5034.59	6304.41
Wind 210 deg - No Ice		-20616.77	35728.12	3964367.71	2299857.44	27027.88
Wind 225 deg - No Ice		-28892.81	28908.17	3215468.75	3231389.57	34959.79
Wind 240 deg - No Ice		-37647.20	21746.49	2363951.80	4119512.73	40509.25
Wind 270 deg - No Ice		-41233.55	0.00	-13129.48	4594680.29	43136.20
Wind 300 deg - No Ice		-35063.33	-20254.69	-2282647.82	3933208.24	34204.83
Wind 315 deg - No Ice		-28892.81	-28908.17	-3241727.72	3231389.57	26044.00
Wind 330 deg - No Ice		-20616.77	-35728.12	-3990626.68	2299857.44	16108.32
Member Ice	42207.96					
Total Weight Ice	152596.63			-147499.28	16743.91	
Wind 0 deg - Ice		0.00	-18839.95	-2217692.32	16743.91	-4745.36
Wind 30 deg - Ice		9180.95	-15906.94	-1911340.53	-1001182.35	-18185.51
Wind 45 deg - Ice		12928.17	-12932.31	-1583723.43	-1418875.01	-23261.82
Wind 60 deg - Ice		15765.55	-9105.18	-1160272.73	-1736689.91	-26752.87
Wind 90 deg - Ice		18361.89	0.00	-147499.28	-2019108.60	-28151.82
Wind 120 deg - Ice		16310.80	9419.98	887597.24	-1775354.60	-22007.51
Wind 135 deg - Ice		13150.77	13154.91	1304509.67	-1434659.80	-16550.87
Wind 150 deg - Ice		9180.95	15906.94	1616341.97	-1001182.35	-9966.31
Wind 180 deg - Ice		0.00	18210.35	1878047.63	16743.91	4745.36
Wind 210 deg - Ice		-9180.95	15906.94	1616341.97	1034670.16	18185.51
Wind 225 deg - Ice		-12928.17	12932.31	1288724.87	1452362.82	23261.82
Wind 240 deg - Ice		-16310.80	9419.98	887597.24	1808842.41	26752.87
Wind 270 deg - Ice		-18361.89	0.00	-147499.28	2052596.42	28151.82
Wind 300 deg - Ice		-15765.55	-9105.18	-1160272.73	1770177.73	22007.51
Wind 315 deg - Ice		-12928.17	-12932.31	-1583723.43	1452362.83	16550.87
Wind 330 deg - Ice		-9180.95	-15906.94	-1911340.53	1034670.16	9966.31
Total Weight	67267.78			-13129.48	5034.59	
Wind 0 deg - Service		0.00	-15460.47	-1678955.62	-35.16	-2224.87
Wind 30 deg - Service		7331.55	-12705.26	-1403558.99	-814768.47	-9538.32
Wind 45 deg - Service		10275.32	-10280.74	-1137718.09	-1145531.67	-12337.54

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 60 deg - Service		12470.66	-7203.77	-797233.10	-1394757.63	-14295.98
Wind 90 deg - Service		14663.11	0.00	8570.08	-1629501.78	-15223.05
Wind 120 deg - Service		13382.52	7730.24	852332.93	-1460505.71	-12071.11
Wind 135 deg - Service		10647.58	10653.00	1181699.79	-1172373.21	-9191.10
Wind 150 deg - Service		7331.55	12705.26	1420699.15	-814768.47	-5684.73
Wind 180 deg - Service		0.00	14407.54	1620176.44	-35.16	2224.87
Wind 210 deg - Service		-7331.55	12705.26	1420699.15	814698.15	9538.32
Wind 225 deg - Service		-10275.32	10280.74	1154858.25	1145461.35	12337.54
Wind 240 deg - Service		-13382.52	7730.24	852332.93	1460435.39	14295.98
Wind 270 deg - Service		-14663.11	0.00	8570.08	1629431.46	15223.05
Wind 300 deg - Service		-12470.66	-7203.77	-797233.10	1394687.31	12071.11
Wind 315 deg - Service		-10275.32	-10280.74	-1137718.09	1145461.35	9191.10
Wind 330 deg - Service		-7331.55	-12705.26	-1403558.99	814698.15	5684.73

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 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

Comb. No.	Description
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	14162.43	-233.20	-0.01
			Max. Compression	24	-19423.04	675.49	-30.74
			Max. Mx	8	7176.45	1066.02	1.50
			Max. My	32	-2764.12	-2.65	-1048.28
			Max. Vy	8	1131.34	-166.07	-109.14
			Max. Vx	12	1952.10	-87.33	-189.70
		Diagonal	Max Tension	10	4607.53	0.00	0.00
			Max. Compression	10	-4672.28	0.00	0.00
			Max. Mx	45	442.98	-15.27	-1.50
			Max. My	26	-3050.68	-4.92	-4.04
			Max. Vy	45	-21.87	-15.27	-1.50
			Max. Vx	26	1.33	-4.92	-4.04
		Top Girt	Max Tension	19	237.59	0.00	0.00
			Max. Compression	12	-259.54	0.00	0.00
			Max. Mx	34	-37.33	36.29	0.00
			Max. My	26	-9.94	0.00	0.00
			Max. Vy	34	-29.03	0.00	0.00
			Max. Vx	26	-0.00	0.00	0.00
		Bottom Girt	Max Tension	3	285.21	0.00	0.00
			Max. Compression	28	-312.51	0.00	0.00
			Max. Mx	34	-53.43	52.26	0.00
			Max. My	16	-13.66	0.00	-0.00
			Max. Vy	34	-34.84	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T2	175 - 155	Leg	Max Tension	19	49507.91	-304.24	-10.37

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	24	-60180.54	191.94	-0.91
			Max. Mx	28	18447.45	2065.52	10.56
			Max. My	4	-5704.37	-53.50	2006.57
			Max. Vy	18	-952.08	-715.21	-3.66
			Max. Vx	10	902.06	-25.25	631.64
		Diagonal	Max Tension	10	7747.59	0.00	0.00
			Max. Compression	10	-7850.22	0.00	0.00
			Max. Mx	44	865.80	40.15	-5.15
			Max. My	26	-6735.45	2.63	17.51
			Max. Vy	43	37.76	40.05	-5.44
			Max. Vx	26	-4.25	0.00	0.00
T3	155 - 135	Leg	Max Tension	19	92873.53	-887.85	-11.07
			Max. Compression	24	-109615.81	-16.95	-56.74
			Max. Mx	18	75975.60	1842.81	-10.07
			Max. My	10	-7430.32	-46.76	-1925.29
			Max. Vy	18	-1285.75	-1105.20	-10.07
			Max. Vx	10	1252.14	-35.85	910.45
		Diagonal	Max Tension	10	9008.05	0.00	0.00
			Max. Compression	10	-9057.26	0.00	0.00
			Max. Mx	43	1844.62	66.64	-8.99
			Max. My	26	-8561.80	6.60	11.40
			Max. Vy	43	53.92	66.64	-8.99
			Max. Vx	50	-3.12	0.00	0.00
T4	135 - 115	Leg	Max Tension	19	136473.72	-170.79	-6.37
			Max. Compression	24	-157728.78	373.20	-76.31
			Max. Mx	13	-154447.79	374.43	64.72
			Max. My	26	-10500.31	-6.40	-396.57
			Max. Vy	18	121.92	-297.13	-6.92
			Max. Vx	26	179.09	-13.25	-304.58
		Diagonal	Max Tension	10	8467.28	0.00	0.00
			Max. Compression	10	-8534.59	0.00	0.00
			Max. Mx	48	1768.39	96.85	-12.79
			Max. My	46	6.21	84.36	-13.57
			Max. Vy	48	69.09	96.85	-12.79
			Max. Vx	46	3.81	0.00	0.00
T5	115 - 95	Leg	Max Tension	19	174733.03	-250.19	-7.95
			Max. Compression	24	-201405.95	228.14	-66.49
			Max. Mx	13	-168858.82	374.43	64.73
			Max. My	26	-10821.03	-6.41	-396.57
			Max. Vy	18	-96.18	-361.35	-11.23
			Max. Vx	10	152.49	-6.41	396.36
		Diagonal	Max Tension	4	8975.75	0.00	0.00
			Max. Compression	4	-9105.86	0.00	0.00
			Max. Mx	48	1685.75	145.05	-18.67
			Max. My	47	-1266.43	125.09	-19.65
			Max. Vy	48	91.47	145.05	-18.67
			Max. Vx	46	4.87	0.00	0.00
T6	95 - 75	Leg	Max Tension	19	210090.32	-269.14	-7.96
			Max. Compression	24	-242989.60	219.32	-53.48
			Max. Mx	18	195331.14	-285.72	-7.61
			Max. My	26	-14758.59	-13.93	-362.53
			Max. Vy	18	82.05	-285.72	-7.61
			Max. Vx	26	144.75	-13.93	-362.53
		Diagonal	Max Tension	4	9778.67	0.00	0.00
			Max. Compression	4	-9858.65	0.00	0.00
			Max. Mx	48	1686.32	192.17	-24.89
			Max. My	47	-1366.41	168.29	-26.21
			Max. Vy	48	109.41	192.17	-24.89
			Max. Vx	47	5.76	0.00	0.00
T7	75 - 55	Leg	Max Tension	29	244029.59	-332.26	-59.49
			Max. Compression	2	-283924.11	77.37	-3.30

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	18	239825.91	-347.15	-8.96
			Max. My	26	-17535.50	-42.60	-459.71
			Max. Vy	18	-119.10	-347.15	-8.96
			Max. Vx	10	185.88	-42.60	459.14
		Diagonal	Max Tension	20	10731.63	0.00	0.00
			Max. Compression	20	-10858.95	0.00	0.00
			Max. Mx	48	1615.89	244.95	-31.65
			Max. My	47	-1563.22	218.49	-33.15
			Max. Vy	48	125.18	244.95	-31.65
			Max. Vx	47	6.53	0.00	0.00
T8	55 - 40	Leg	Max Tension	29	270430.72	-120.26	-3.74
			Max. Compression	2	-316545.78	711.07	20.99
			Max. Mx	43	30959.44	-746.27	-9.52
			Max. My	26	-20792.04	-15.81	-689.89
			Max. Vy	43	249.99	-746.27	-9.52
			Max. Vx	10	-194.51	-15.82	689.84
		Diagonal	Max Tension	20	11266.42	0.00	0.00
			Max. Compression	20	-11373.74	0.00	0.00
			Max. Mx	48	1399.81	256.87	-32.38
			Max. My	47	-1082.21	229.53	-35.00
			Max. Vy	48	130.14	249.05	-32.90
			Max. Vx	47	-6.62	0.00	0.00
T9	40 - 20	Leg	Max Tension	29	301944.25	-318.75	-39.76
			Max. Compression	2	-356034.42	373.02	10.98
			Max. Mx	40	-134553.33	2044.36	22.44
			Max. My	26	-21185.85	-15.82	-689.89
			Max. Vy	43	-504.86	-1298.22	-3.30
			Max. Vx	26	177.76	-31.44	-643.14
		Diagonal	Max Tension	20	12432.97	0.00	0.00
			Max. Compression	20	-12626.33	0.00	0.00
			Max. Mx	48	513.13	396.55	-46.41
			Max. My	39	-2801.69	365.46	48.40
			Max. Vy	48	157.50	396.55	-46.41
			Max. Vx	39	-8.01	0.00	0.00
T10	20 - 0	Leg	Max Tension	29	333450.36	-323.00	-45.60
			Max. Compression	2	-396807.97	-0.00	-0.01
			Max. Mx	40	-144285.18	3334.26	6.12
			Max. My	26	-26224.50	-55.85	-740.44
			Max. Vy	43	-965.65	-3050.59	-1.96
			Max. Vx	26	-212.18	-55.86	-740.44
		Diagonal	Max Tension	20	13308.15	0.00	0.00
			Max. Compression	14	-13693.18	0.00	0.00
			Max. Mx	48	-1229.25	532.77	-57.32
			Max. My	38	-6824.93	515.37	59.95
			Max. Vy	48	176.21	532.77	-57.32
			Max. Vx	47	9.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	24	401778.14	36106.52	-22653.75
	Max. H_x	24	401778.14	36106.52	-22653.75
	Max. H_z	7	-327493.57	-29360.57	20192.58
	Min. Vert	9	-337607.99	-30791.65	19651.09
	Min. H_x	9	-337607.99	-30791.65	19651.09

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
	Min. H_z	24	401778.14	36106.52	-22653.75
Leg B	Max. Vert	12	401262.12	-36222.80	-22436.18
	Max. H_x	29	-337994.42	30922.17	19437.00
	Max. H_z	31	-327880.35	29541.65	19886.33
	Min. Vert	29	-337994.42	30922.17	19437.00
	Min. H_x	12	401262.12	-36222.80	-22436.18
	Min. H_z	12	401262.12	-36222.80	-22436.18
Leg A	Max. Vert	2	402868.06	-246.60	42625.86
	Max. H_x	27	20764.53	7062.58	1571.98
	Max. H_z	2	402868.06	-246.60	42625.86
	Min. Vert	19	-337117.27	250.71	-36497.17
	Min. H_x	11	20764.84	-7069.55	1572.13
	Min. H_z	19	-337117.27	250.71	-36497.17

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	67267.78	0.00	0.00	-13130.07	5034.61	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	80721.33	-0.00	-69588.75	-7651405.72	6079.28	-10109.47
0.9 Dead+1.6 Wind 0 deg - No Ice	60541.00	-0.00	-69588.75	-7640175.36	4560.31	-10103.97
1.2 Dead+1.6 Wind 30 deg - No Ice	80721.33	32986.84	-57164.99	-6404215.08	-3679725.02	-43264.18
0.9 Dead+1.6 Wind 30 deg - No Ice	60541.00	32986.84	-57164.99	-6394129.37	-3677692.92	-43263.33
1.2 Dead+1.6 Wind 45 deg - No Ice	80721.33	46228.50	-46253.08	-5201426.50	-5175930.26	-55945.01
0.9 Dead+1.6 Wind 45 deg - No Ice	60541.00	46228.49	-46253.08	-5192491.27	-5172450.35	-55943.49
1.2 Dead+1.6 Wind 60 deg - No Ice	80721.33	56101.34	-32407.51	-3661035.35	-6303205.79	-64820.75
0.9 Dead+1.6 Wind 60 deg - No Ice	60541.00	56101.34	-32407.51	-3653579.48	-6298630.43	-64817.77
1.2 Dead+1.6 Wind 90 deg - No Ice	80721.33	65973.68	-0.00	-15838.18	-7365604.29	-69026.04
0.9 Dead+1.6 Wind 90 deg - No Ice	60541.00	65973.68	-0.00	-11895.63	-7360022.48	-68997.82
1.2 Dead+1.6 Wind 120 deg - No Ice	80721.33	60235.52	34794.38	3802018.51	-6602246.24	-54727.80
0.9 Dead+1.6 Wind 120 deg - No Ice	60541.00	60235.52	34794.38	3802309.73	-6597449.09	-54728.27
1.2 Dead+1.6 Wind 135 deg - No Ice	80721.33	47916.27	47940.85	5291881.73	-5298063.74	-41665.36
0.9 Dead+1.6 Wind 135 deg - No Ice	60541.00	47916.27	47940.85	5290742.70	-5294496.24	-41680.27
1.2 Dead+1.6 Wind 150 deg - No Ice	80721.33	32986.84	57164.99	6372670.35	-3679785.26	-25759.16
0.9 Dead+1.6 Wind 150 deg - No Ice	60541.00	32986.84	57164.99	6370461.96	-3677757.34	-25760.83
1.2 Dead+1.6 Wind 180 deg - No Ice	80721.33	-0.00	64815.01	7274674.68	6078.41	10106.42
0.9 Dead+1.6 Wind 180 deg - No Ice	60541.00	-0.00	64815.01	7271576.86	4559.51	10101.31
1.2 Dead+1.6 Wind 210 deg -	80721.33	-32986.84	57164.99	6372659.05	3691933.72	43264.36

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+1.6 Wind 210 deg - No Ice	60541.00	-32986.84	57164.99	6370447.66	3686865.34	43263.49
1.2 Dead+1.6 Wind 225 deg - No Ice	80721.33	-46228.49	46253.08	5169817.33	5188149.08	55959.24
0.9 Dead+1.6 Wind 225 deg - No Ice	60541.00	-46228.49	46253.08	5168767.44	5181634.15	55968.01
1.2 Dead+1.6 Wind 240 deg - No Ice	80721.33	-60235.52	34794.38	3802010.52	6614377.27	64837.23
0.9 Dead+1.6 Wind 240 deg - No Ice	60541.00	-60235.52	34794.38	3802300.42	6606541.53	64833.22
1.2 Dead+1.6 Wind 270 deg - No Ice	80721.33	-65973.68	-0.00	-15829.69	7377726.53	69026.01
0.9 Dead+1.6 Wind 270 deg - No Ice	60541.00	-65973.68	-0.00	-11889.28	7369106.72	68997.84
1.2 Dead+1.6 Wind 300 deg - No Ice	80721.33	-56101.34	-32407.51	-3661012.91	6315336.93	54714.40
0.9 Dead+1.6 Wind 300 deg - No Ice	60541.00	-56101.34	-32407.51	-3653558.85	6307723.56	54716.56
1.2 Dead+1.6 Wind 315 deg - No Ice	80721.33	-46228.50	-46253.08	-5201403.15	5188070.28	41652.18
0.9 Dead+1.6 Wind 315 deg - No Ice	60541.00	-46228.49	-46253.08	-5192469.35	5181552.38	41657.95
1.2 Dead+1.6 Wind 330 deg - No Ice	80721.33	-32986.84	-57164.99	-6404195.75	3691874.16	25758.89
0.9 Dead+1.6 Wind 330 deg - No Ice	60541.00	-32986.84	-57164.99	-6394114.26	3686804.40	25760.61
1.2 Dead+1.0 Ice+1.0 Temp	166050.18	0.00	0.00	-150440.30	17793.25	-0.63
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	166050.18	0.00	-18839.95	-2236687.98	17866.33	-4761.00
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	166050.18	9180.94	-15906.94	-1928086.96	-1007770.96	-18249.48
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	166050.18	12928.16	-12932.31	-1598006.89	-1428634.31	-23343.98
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	166050.18	15765.55	-9105.17	-1171361.49	-1748868.56	-26847.68
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	166050.18	18361.89	0.00	-150926.75	-2033412.21	-28252.26
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	166050.18	16310.80	9419.98	891962.28	-1787757.98	-22090.00
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	166050.18	13150.76	13154.91	1312040.19	-1444509.91	-16611.38
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	166050.18	9180.94	15906.94	1626253.89	-1007765.60	-10003.79
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	166050.18	0.00	18210.35	1889961.16	17882.34	4759.69
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	166050.18	-9180.94	15906.94	1626257.75	1043526.68	18249.55
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	166050.18	-12928.16	12932.31	1296169.99	1464390.59	23343.92
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	166050.18	-16310.80	9419.98	891970.63	1823510.21	26850.35
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	166050.18	-18361.89	0.00	-150915.04	2069155.50	28252.23
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	166050.18	-15765.55	-9105.17	-1171349.23	1784605.01	22086.91
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	166050.18	-12928.16	-12932.31	-1597994.59	1464369.34	16611.18
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	166050.18	-9180.94	-15906.94	-1928079.01	1043503.74	10003.83
Dead+Wind 0 deg - Service	67267.78	-0.00	-15460.47	-1706016.33	5049.18	-2228.60

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
Dead+Wind 30 deg - Service	67267.78	7331.55	-12705.26	-1429780.19	-812293.54	-9538.84
Dead+Wind 45 deg - Service	67267.78	10275.32	-10280.74	-1163093.35	-1144122.41	-12338.17
Dead+Wind 60 deg - Service	67267.78	12470.66	-7203.77	-821521.00	-1394154.69	-14296.77
Dead+Wind 90 deg - Service	67267.78	14663.11	-0.00	-13137.31	-1629640.71	-15223.71
Dead+Wind 120 deg - Service	67267.78	13382.52	7730.24	833313.49	-1460068.76	-12070.12
Dead+Wind 135 deg - Service	67267.78	10647.58	10653.00	1163740.87	-1171031.56	-9187.03
Dead+Wind 150 deg - Service	67267.78	7331.55	12705.26	1403522.51	-812295.95	-5681.53
Dead+Wind 180 deg - Service	67267.78	0.00	14407.54	1603652.43	5049.07	2228.83
Dead+Wind 210 deg - Service	67267.78	-7331.55	12705.26	1403521.70	822395.03	9538.83
Dead+Wind 225 deg - Service	67267.78	-10275.32	10280.74	1136833.61	1154220.76	12338.83
Dead+Wind 240 deg - Service	67267.78	-13382.52	7730.24	833314.23	1470165.78	14299.00
Dead+Wind 270 deg - Service	67267.78	-14663.11	-0.00	-13135.78	1639737.32	15223.70
Dead+Wind 300 deg - Service	67267.78	-12470.66	-7203.77	-821519.13	1404251.38	12069.29
Dead+Wind 315 deg - Service	67267.78	-10275.32	-10280.74	-1163091.32	1154219.76	9186.94
Dead+Wind 330 deg - Service	67267.78	-7331.55	-12705.26	-1429778.28	822391.53	5680.71

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-67267.78	0.00	-0.00	67267.78	-0.00	0.000%
2	-0.00	-80721.33	-69588.75	0.00	80721.33	69588.75	0.000%
3	-0.00	-60541.00	-69588.75	0.00	60541.00	69588.75	0.000%
4	32986.84	-80721.33	-57164.99	-32986.84	80721.33	57164.99	0.000%
5	32986.84	-60541.00	-57164.99	-32986.84	60541.00	57164.99	0.000%
6	46228.49	-80721.33	-46253.08	-46228.50	80721.33	46253.08	0.000%
7	46228.49	-60541.00	-46253.08	-46228.49	60541.00	46253.08	0.000%
8	56101.34	-80721.33	-32407.50	-56101.34	80721.33	32407.51	0.000%
9	56101.34	-60541.00	-32407.50	-56101.34	60541.00	32407.51	0.000%
10	65973.68	-80721.33	0.00	-65973.68	80721.33	0.00	0.000%
11	65973.68	-60541.00	0.00	-65973.68	60541.00	0.00	0.000%
12	60235.52	-80721.33	34794.38	-60235.52	80721.33	-34794.38	0.000%
13	60235.52	-60541.00	34794.38	-60235.52	60541.00	-34794.38	0.000%
14	47916.27	-80721.33	47940.85	-47916.27	80721.33	-47940.85	0.000%
15	47916.27	-60541.00	47940.85	-47916.27	60541.00	-47940.85	0.000%
16	32986.84	-80721.33	57164.99	-32986.84	80721.33	-57164.99	0.000%
17	32986.84	-60541.00	57164.99	-32986.84	60541.00	-57164.99	0.000%
18	0.00	-80721.33	64815.01	0.00	80721.33	-64815.01	0.000%
19	0.00	-60541.00	64815.01	0.00	60541.00	-64815.01	0.000%
20	-32986.84	-80721.33	57164.99	32986.84	80721.33	-57164.99	0.000%
21	-32986.84	-60541.00	57164.99	32986.84	60541.00	-57164.99	0.000%
22	-46228.49	-80721.33	46253.08	46228.49	80721.33	-46253.08	0.000%
23	-46228.49	-60541.00	46253.08	46228.49	60541.00	-46253.08	0.000%
24	-60235.52	-80721.33	34794.38	60235.52	80721.33	-34794.38	0.000%
25	-60235.52	-60541.00	34794.38	60235.52	60541.00	-34794.38	0.000%
26	-65973.68	-80721.33	0.00	65973.68	80721.33	0.00	0.000%
27	-65973.68	-60541.00	0.00	65973.68	60541.00	0.00	0.000%
28	-56101.34	-80721.33	-32407.50	56101.34	80721.33	32407.51	0.000%
29	-56101.34	-60541.00	-32407.50	56101.34	60541.00	32407.51	0.000%
30	-46228.49	-80721.33	-46253.08	46228.50	80721.33	46253.08	0.000%
31	-46228.49	-60541.00	-46253.08	46228.49	60541.00	46253.08	0.000%
32	-32986.84	-80721.33	-57164.99	32986.84	80721.33	57164.99	0.000%
33	-32986.84	-60541.00	-57164.99	32986.84	60541.00	57164.99	0.000%
34	0.00	-166050.18	0.00	-0.00	166050.18	-0.00	0.000%
35	0.00	-166050.18	-18839.95	-0.00	166050.18	18839.95	0.000%
36	9180.95	-166050.18	-15906.94	-9180.94	166050.18	15906.94	0.000%
37	12928.17	-166050.18	-12932.31	-12928.16	166050.18	12932.31	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
38	15765.55	-166050.18	-9105.18	-15765.55	166050.18	9105.17	0.000%
39	18361.89	-166050.18	0.00	-18361.89	166050.18	-0.00	0.000%
40	16310.80	-166050.18	9419.98	-16310.80	166050.18	-9419.98	0.000%
41	13150.77	-166050.18	13154.91	-13150.76	166050.18	-13154.91	0.000%
42	9180.95	-166050.18	15906.94	-9180.94	166050.18	-15906.94	0.000%
43	-0.00	-166050.18	18210.35	-0.00	166050.18	-18210.35	0.000%
44	-9180.95	-166050.18	15906.94	9180.94	166050.18	-15906.94	0.000%
45	-12928.17	-166050.18	12932.31	12928.16	166050.18	-12932.31	0.000%
46	-16310.80	-166050.18	9419.98	16310.80	166050.18	-9419.98	0.000%
47	-18361.89	-166050.18	0.00	18361.89	166050.18	-0.00	0.000%
48	-15765.55	-166050.18	-9105.18	15765.55	166050.18	9105.17	0.000%
49	-12928.17	-166050.18	-12932.31	12928.16	166050.18	12932.31	0.000%
50	-9180.95	-166050.18	-15906.94	9180.94	166050.18	15906.94	0.000%
51	-0.00	-67267.78	-15460.47	0.00	67267.78	15460.47	0.000%
52	7331.55	-67267.78	-12705.26	-7331.55	67267.78	12705.26	0.000%
53	10275.32	-67267.78	-10280.74	-10275.32	67267.78	10280.74	0.000%
54	12470.66	-67267.78	-7203.77	-12470.66	67267.78	7203.77	0.000%
55	14663.11	-67267.78	0.00	-14663.11	67267.78	0.00	0.000%
56	13382.52	-67267.78	7730.24	-13382.52	67267.78	-7730.24	0.000%
57	10647.58	-67267.78	10653.00	-10647.58	67267.78	-10653.00	0.000%
58	7331.55	-67267.78	12705.26	-7331.55	67267.78	-12705.26	0.000%
59	0.00	-67267.78	14407.54	-0.00	67267.78	-14407.54	0.000%
60	-7331.55	-67267.78	12705.26	7331.55	67267.78	-12705.26	0.000%
61	-10275.32	-67267.78	10280.74	10275.32	67267.78	-10280.74	0.000%
62	-13382.52	-67267.78	7730.24	13382.52	67267.78	-7730.24	0.000%
63	-14663.11	-67267.78	0.00	14663.11	67267.78	0.00	0.000%
64	-12470.66	-67267.78	-7203.77	12470.66	67267.78	7203.77	0.000%
65	-10275.32	-67267.78	-10280.74	10275.32	67267.78	10280.74	0.000%
66	-7331.55	-67267.78	-12705.26	7331.55	67267.78	12705.26	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	0.00000001
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	0.00000001
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	2.624	62	0.1044	0.0136
T2	175 - 155	2.186	62	0.1009	0.0043
T3	155 - 135	1.751	62	0.0944	0.0120
T4	135 - 115	1.359	51	0.0840	0.0149
T5	115 - 95	1.008	51	0.0721	0.0153
T6	95 - 75	0.716	51	0.0585	0.0143
T7	75 - 55	0.476	51	0.0456	0.0123
T8	55 - 40	0.282	51	0.0336	0.0093
T9	40 - 20	0.160	51	0.0245	0.0061
T10	20 - 0	0.054	51	0.0118	0.0029

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °

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	2.558	0.1040	0.0114	593748
180.00	SitePro VFA12-HD	62	2.296	0.1020	0.0056	197914
172.00	Pirod 12' T-Frame Sector Mount (1)	62	2.120	0.1002	0.0043	249893
162.00	MX08FRO665-21	62	1.900	0.0972	0.0078	137115
160.00	Pirod 12' T-Frame Sector Mount (1)	62	1.857	0.0964	0.0091	117801
146.00	Pirod 12' T-Frame Sector Mount (1)	51	1.569	0.0901	0.0144	104155

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	11.800	24	0.4626	0.0620
T2	175 - 155	9.850	24	0.4515	0.0196
T3	155 - 135	7.897	2	0.4245	0.0544
T4	135 - 115	6.123	2	0.3786	0.0677
T5	115 - 95	4.539	2	0.3254	0.0696
T6	95 - 75	3.220	2	0.2637	0.0648
T7	75 - 55	2.139	2	0.2052	0.0556
T8	55 - 40	1.268	2	0.1510	0.0423
T9	40 - 20	0.721	2	0.1101	0.0277
T10	20 - 0	0.241	2	0.0528	0.0133

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	11.509	0.4613	0.0521	198355
180.00	SitePro VFA12-HD	24	10.341	0.4552	0.0252	66119
172.00	Pirod 12' T-Frame Sector Mount (1)	24	9.554	0.4487	0.0211	107912
162.00	MX08FRO665-21	24	8.568	0.4363	0.0354	34414
160.00	Pirod 12' T-Frame Sector Mount (1)	2	8.373	0.4332	0.0414	28207
146.00	Pirod 12' T-Frame Sector Mount (1)	2	7.074	0.4054	0.0654	23549

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	3540.61	67096.30	0.053 ✓	1	Bolt Tension
T2	175	Leg	A325N	1.1250	6	8251.32	67096.30	0.123 ✓	1	Bolt Tension
		Diagonal	A325N	0.8750	1	7747.59	11092.50	0.698 ✓	1	Member Bearing
T3	155	Leg	A325N	1.1250	6	15478.90	67096.30	0.231 ✓	1	Bolt Tension
		Diagonal	A325N	0.8750	1	9008.05	18487.50	0.487 ✓	1	Member Bearing
T4	135	Leg	A325N	1.1250	6	22745.60	67096.30	0.339 ✓	1	Bolt Tension
		Diagonal	A325N	0.8750	1	8467.28	14790.00	0.572 ✓	1	Member Bearing
T5	115	Leg	A325N	1.1250	8	21841.60	67096.30	0.326 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8975.75	25447.50	0.353 ✓	1	Member Bearing
T6	95	Leg	A325N	1.1250	8	26261.30	67096.30	0.391 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9778.67	21206.30	0.461 ✓	1	Member Bearing
T7	75	Leg	A325N	1.2500	8	30503.70	82835.00	0.368 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	10731.60	16965.00	0.633 ✓	1	Member Bearing
T8	55	Leg	A325N	1.2500	8	33803.80	82835.00	0.408 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11266.40	16965.00	0.664 ✓	1	Member Bearing
T9	40	Leg	A325N	1.2500	8	37743.00	82835.00	0.456 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	12433.00	21206.30	0.586 ✓	1	Member Bearing
T10	20	Leg	A449	1.3750	8	41681.30	87701.50	0.475 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	13308.20	25447.50	0.523 ✓	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 $\frac{P_u}{\phi P_n}$
T1	195 - 175	3	20.01	3.33	53.4 K=1.00	7.0686	-19423.00	258313.00	0.075 [1] ✓
T2	175 - 155	3 3/4	20.03	6.68	85.5 K=1.00	11.0447	-60180.50	291317.00	0.207 [1] ✓
T3	155 - 135	4	20.03	6.68	80.1 K=1.00	12.5664	-109616.00	353604.00	0.310 [1] ✓
T4	135 - 115	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-157729.00	421170.00	0.375 [1] ✓
T5	115 - 95	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-201406.00	421170.00	0.478 [1] ✓
T6	95 - 75	4 1/2	20.03	6.68	71.2 K=1.00	15.9043	-242990.00	493875.00	0.492 [1] ✓
T7	75 - 55	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-283924.00	571599.00	0.497 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T8	55 - 40	4 3/4	15.03	5.01	50.6 K=1.00	17.7205	-316546.00	661231.00	0.479 [1]
T9	40 - 20	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-356034.00	571599.00	0.623 [1]
T10	20 - 0	5	20.03	6.68	64.1 K=1.00	19.6350	-396808.00	654248.00	0.607 [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	-4672.28	20048.60	0.233 [1]
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	119.9 K=1.00	0.9020	-7850.22	13713.70	0.572 [1]
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	140.4 K=1.00	1.4600	-9057.26	16733.60	0.541 [1]
T4	135 - 115	L3x3x1/4	13.44	6.56	132.9 K=1.00	1.4400	-8502.63	18412.40	0.462 [1]
T5	115 - 95	L3x3x3/8	15.21	7.43	151.8 K=1.00	2.1100	-9105.86	20687.10	0.440 [1]
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	144.8 K=1.00	2.0900	-9858.65	22528.10	0.438 [1]
T7	75 - 55	L4x4x1/4	18.88	9.24	139.5 K=1.00	1.9400	-10859.00	22521.80	0.482 [1]
T8	55 - 40	L4x4x1/4	19.89	9.70	146.5 K=1.00	1.9400	-11373.70	20433.10	0.557 [1]
T9	40 - 20	L4x4x5/16	22.19	10.90	165.3 K=1.00	2.4000	-12626.30	19839.90	0.636 [1]
T10	20 - 0	L4x4x3/8	24.11	11.84	180.4 K=1.00	2.8600	-13693.20	19861.70	0.689 [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	-259.54	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	-1043.66	11605.30	0.090 [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	14162.40	318086.00	0.045 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5	11.0447	49507.90	497010.00	0.100 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1	12.5664	92873.50	565487.00	0.164 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4	14.1863	136474.00	638381.00	0.214 [1] ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4	14.1863	174733.00	638381.00	0.274 [1] ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2	15.9043	210090.00	715694.00	0.294 [1] ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5	17.7205	244030.00	797425.00	0.306 [1] ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6	17.7205	270431.00	797425.00	0.339 [1] ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5	17.7205	301944.00	797425.00	0.379 [1] ✔
T10	20 - 0	5	20.03	6.68	64.1	19.6350	333450.00	883573.00	0.377 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.79	3.30	126.7	1.2272	4607.53	39760.80	0.116 [1] ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	78.6	0.9020	7747.59	29224.80	0.265 [1] ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	92.6	1.4600	9008.05	47304.00	0.190 [1] ✔
T4	135 - 115	L3x3x1/4	12.30	5.99	79.3	1.4400	8467.28	46656.00	0.181 [1] ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	99.8	2.1100	8975.75	68364.00	0.131 [1] ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	94.3	2.0900	9778.67	67716.00	0.144 [1] ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	90.3	1.9400	10731.60	62856.00	0.171 [1] ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	94.7	1.9400	11266.40	62856.00	0.179 [1] ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	107.1	2.4000	12433.00	77760.00	0.160 [1] ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	117.2	2.8600	13308.20	92664.00	0.144 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	5.00	4.75	182.4	1.2272	237.59	39760.80	0.006 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.00	5.75	220.8	1.2272	1043.66	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	-19423.00	258313.00	7.5	Pass
T2	175 - 155	Leg	3 3/4	46	-60180.50	291317.00	20.7	Pass
T3	155 - 135	Leg	4	67	-109616.00	353604.00	31.0	Pass
T4	135 - 115	Leg	4 1/4	88	-157729.00	421170.00	37.5	Pass
T5	115 - 95	Leg	4 1/4	109	-201406.00	421170.00	47.8	Pass
T6	95 - 75	Leg	4 1/2	130	-242990.00	493875.00	49.2	Pass
T7	75 - 55	Leg	4 3/4	153	-283924.00	571599.00	49.7	Pass
T8	55 - 40	Leg	4 3/4	174	-316546.00	661231.00	47.9	Pass
T9	40 - 20	Leg	4 3/4	195	-356034.00	571599.00	62.3	Pass
T10	20 - 0	Leg	5	216	-396808.00	654248.00	60.7	Pass
T1	195 - 175	Diagonal	1 1/4	11	-4672.28	20048.60	23.3	Pass
T2	175 - 155	Diagonal	L2 1/2x2 1/2x3/16	50	-7850.22	13713.70	57.2 69.8 (b)	Pass
T3	155 - 135	Diagonal	L2 1/2x2 1/2x5/16	71	-9057.26	16733.60	54.1	Pass
T4	135 - 115	Diagonal	L3x3x1/4	95	-8502.63	18412.40	46.2 57.2 (b)	Pass
T5	115 - 95	Diagonal	L3x3x3/8	116	-9105.86	20687.10	44.0	Pass
T6	95 - 75	Diagonal	L3 1/2x3 1/2x5/16	137	-9858.65	22528.10	43.8 46.1 (b)	Pass
T7	75 - 55	Diagonal	L4x4x1/4	159	-10859.00	22521.80	48.2 63.3 (b)	Pass
T8	55 - 40	Diagonal	L4x4x1/4	180	-11373.70	20433.10	55.7 66.4 (b)	Pass
T9	40 - 20	Diagonal	L4x4x5/16	201	-12626.30	19839.90	63.6	Pass
T10	20 - 0	Diagonal	L4x4x3/8	219	-13693.20	19861.70	68.9	Pass
T1	195 - 175	Top Girt	1 1/4	6	-259.54	16855.20	1.5	Pass
T1	195 - 175	Bottom Girt	1 1/4	9	-1043.66	11605.30	9.0	Pass
							Summary	
							Leg (T9) 62.3	Pass
							Diagonal (T2) 69.8	Pass
							Top Girt (T1) 1.5	Pass
							Bottom Girt (T1) 9.0	Pass
							Bolt Checks 69.8	Pass
							RATING = 69.8	**Pass**

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Subject:	FOUNDATION ANALYSIS
Location:	Northford, CT
Rev. 0: 9/7/22	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 =	$OM := 7652 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 70 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 81 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 403 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 338 \cdot kip$	(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 = $M_r := (WT_{tot}) \cdot \frac{W_f}{2} + 0.9WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75\left(S_u \cdot \frac{T_p}{3}\right) = 13720 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 8107 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.69$

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 = $Load_{tot} := WT_c + WT_{s1} + WT_t = 964 \cdot kip$

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 = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 2.072 \cdot ksf$

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

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.404 \cdot ksf$

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

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 9.485$

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 = $e := \frac{M_{ot}}{Load_{tot}} = 8.409$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 2.2 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 2.2 \cdot ksf$

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

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)

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

Bearing_Check = "Okay"

Shear Strength of Concrete:

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

$\phi_c := 0.85$ (ACI 9.3.2.5)

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

$FL := LF \cdot \frac{C_t}{W_f^2} = 0.349 \cdot ksf$

$V_{req} := FL \cdot (X_t - .5 \cdot d_p - d) \cdot W_f = 77.63 \cdot kips$

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

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

Beam_Shear_Check = "Okay"

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

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

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

Required Shear Strength = $V_{req} := FL \cdot (W_f^2 - A_{bo}) = 396 \cdot kips$

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)

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

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

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

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

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

Check Bottom Bars:

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

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

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

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

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

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

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

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 =

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

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

Minimum Development Length =

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

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

Available Length in Pad =

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

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

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 = $M_p := S_t \cdot (L_p) \cdot LF = 3360 \cdot in \cdot kips$

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

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

$(D \ N \ n \ P_u \ M_{xu}) = (36 \ \ 20 \ \ 8 \ \ 537.199 \ \ 3.36 \times 10^3)$

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

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

$(\phi P_n \ \ \phi M_{xn} \ \ f_{sp} \ \ \rho) = (1.508 \times 10^3 \ \ 9.43 \times 10^3 \ \ -28.99 \ \ 0.016)$

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

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)

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

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

Cheiban, Ziad - ziad.cheiban@verizonwireless.com - 4/26/2022 14:19:35

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,4G_Radio Swap
Carrier Aggregation:	false
MPT Id:	103583
eCIP-0:	false
Suffix:	Rev4_2022-04-26

Location Information

Site ID:	324546
E-NodeB ID:	064174
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

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
LTE	LTE 5G	LTE	LTE		JMA WIRELESS	MX06FRO660-03	146	149	30(01) 150(02) 260(03) 30(0100) 150(0101) 260(0102)	false	false	PHYSICAL	6	MX06FRO660-03
				5G	Samsung	MT6407-77A	146	147.5	30(0100) 150(0101) 260(0102)	false	false	PHYSICAL	3	

Removed

700	850	1900	AWS	L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID
			LTE		AMPHENOL	BXA-171063-12CF-EDIN-5 (269701)	146	149	30(01) 150(02) 270(03)	false	false	PHYSICAL	3	
LTE					AMPHENOL	BXA-70063-6CF	146	149	30(01) 150(02)	false	false	PHYSICAL	2	
LTE					AMPHENOL	BXA-70063-6CF-8-750MHZ	146	149	260(03)	false	false	PHYSICAL	1	
					AMPHENOL	BXA-171063	145	148	30(D1) 150(D2) 270(D3)	false	false	PHYSICAL	3	

Retained

700	850	1900	AWS	L-Sub6	Make	Model	Centerline	Tip Height	Azimuth	RET	4xRx	Inst. Type	Quantity	Item ID
	CDMA				ANDREW	LNX-6513DS-VTM	145	147.3	30(D1) 150(D2)	false	false	PHYSICAL	2	LNX-6513DS-VTM
	CDMA				COMMSCOPE	LNX-6513DS-VTM	145	147.3	260(D3)	false	false	PHYSICAL	1	LNX-6513DS-VTM

Added: 9 **Removed:** 9 **Retained:** 3

Equipment Summary

Added

Equipment Type	Location	700	850	1900	AWS	L-Sub6	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
Mount	Tower						JMA	91900314-02			PHYSICAL	3	
OVP Box	Tower						N/A	12 OVP			PHYSICAL	1	
Hybrid Cable	Tower						N/A	12x24 Hybriflex			PHYSICAL	1	
RRU	Tower			LTE	LTE		Samsung	B2/B66A RRH-BR049 (RFV01U-D1A)			PHYSICAL	3	SLS-BR0497EAEX
RRU	Tower	LTE	LTE 5G				Samsung	B5/B13 RRH-BR04C (RFV01U-D2A)			PHYSICAL	3	SLS-BR04C4ECEX
RRU	Tower					5G	Samsung	MT6407-77A			PHYSICAL	3	

Removed

Equipment Type	Location	700	850	1900	AWS	L-Sub6	Make	Model	Cable Length	Cable Size	Install Type	Quantity	Item ID
RRU	Tower						ALU	RH_2X40-AWS			PHYSICAL	3	
Diplexer	Tower										PHYSICAL	3	
Hybrid Cable	Tower										PHYSICAL	1	
OVP Box	Tower										PHYSICAL	1	
RRU	Shelter						NOKIA	RH_2X60-700U			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	12	

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-8-750 MHZ	MX06FRO660-03	MX06FRO660-03	MX06FRO660-03
Antenna Make	AMPHENOL	AMPHENOL	AMPHENOL	JMA WIRELESS	JMA WIRELESS	JMA WIRELESS
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	10
Tip Height	149	149	149	149	149	149
Regulatory Power	137.33	137.33	137.33	69.27	69.27	69.27
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	623.45	623.45	623.45
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-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
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				MX06FRO660-03	MX06FRO660-03	MX06FRO660-03
Antenna Make				JMA WIRELESS	JMA WIRELESS	JMA WIRELESS
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				277.09	277.09	277.09
DLEARFCN				2450	2450	2450
Channel Bandwidth(MHz)				10	10	10
Total ERP (W)				623.45	623.45	623.45
TMA Make						
TMA Model						
RRU Make				Samsung	Samsung	Samsung
RRU Model				B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
Number of Tx, Rx Lines				4,4	4,4	4,4
Position						
Transmitter Id				12949140	12949141	12949142
Source				ATOLL_API	ATOLL_API	ATOLL_API

850 MHz CDMA

	0000			0001		
Sector	**D1**	**D2**	**D3**	**D1**	**D2**	**D3**
Azimuth	30	150	260	30	150	260
Cell / ENode B ID						
Antenna Model	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM	LNX-6513DS-VTM
Antenna Make	ANDREW	ANDREW	COMMSCOPE	ANDREW	ANDREW	COMMSCOPE
Antenna Centerline(Ft)	145	145	145	145	145	145
Mechanical Down-Tilt(Deg.)	0	0	5	0	0	5
Electrical Down-Tilt	0	0	6	0	0	6
Tip Height	147.3	147.3	147.3	147.3	147.3	147.3
Regulatory Power	391.74	391.74	391.74	391.74	391.74	391.74
DLEARFCN	242, 283, 201	283, 242, 201	283, 242, 201	283, 242, 201	242, 283, 201	283, 242, 201
Channel Bandwidth(MHz)	1.23	1.23	1.23	1.23	1.23	1.23
Total ERP (W)						
TMA Make						
TMA Model						
RRU Make						
RRU Model						
Number of Tx, Rx Lines	2,2	2,2	2,2	2,2	2,2	2,2
Position						
Transmitter Id						
Source	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API	ATOLL_API

850 MHz 5GNR

				0001		
Sector				**0100**	**0101**	**0102**
Azimuth				30	150	260
Cell / ENode B ID				649404	649404	649404
Antenna Model				MX06FRO660-03	MX06FRO660-03	MX06FRO660-03
Antenna Make				JMA WIRELESS	JMA WIRELESS	JMA WIRELESS
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				277.09	277.09	277.09
DLEARFCN				2450	2450	2450
Channel Bandwidth(MHz)				10	10	10
Total ERP (W)				623.45	623.45	623.45
TMA Make						
TMA Model						
RRU Make				Samsung	Samsung	Samsung
RRU Model				B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)	B5/B13 RRH-BR04C (RFV01U-D2A)
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

0001

Sector	01	01	02
Azimuth	30	30	150
Cell / ENode B ID	064174	064174	064174
Antenna Model	MX06FRO660-03	MX06FRO660-03	MX06FRO660-03
Antenna Make	JMA WIRELESS	JMA WIRELESS	JMA WIRELESS
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	184.31	130.79	184.31
DLEARFCN	1050	1175	1050
Channel Bandwidth(MHz)	10	5	10
Total ERP (W)	1011.11	358.76	1011.11
TMA Make			
TMA Model			
RRU Make	Samsung	Samsung	Samsung
RRU Model	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
Number of Tx, Rx Lines	4,4	4,4	4,4
Position			
Transmitter Id	1957037	12950342	1957040
Source	ATOLL_API	ATOLL_API	ATOLL_API

	02	03	03
	150	260	260
	064174	064174	064174
	MX06FRO660-03	MX06FRO660-03	MX06FRO660-03
	JMA WIRELESS	JMA WIRELESS	JMA WIRELESS
	146	146	146
	0	0	0
	0	0	0
	149	149	149
	130.79	184.31	130.79
	1175	1050	1175
	5	10	5
	358.76	1011.11	358.76
	Samsung	Samsung	Samsung
	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
	4,4	4,4	4,4
	12950343	1957043	12950345
	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-5 (269701)	BXA-171063-12CF-EDIN-5 (269701)	BXA-171063-12CF-EDIN-5 (269701)	MX06FRO660-03	MX06FRO660-03	MX06FRO660-03
Antenna Make	AMPHENOL	AMPHENOL	AMPHENOL	JMA WIRELESS	JMA WIRELESS	JMA WIRELESS
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	139.48	139.48	139.48
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	1530.38	1530.38	1530.38
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-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)	B2/B66A RRH-BR049 (RFV01U-D1A)
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	649404	649404	649404
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	6	6	6
Tip Height	147.5	147.5	147.5
Regulatory Power	767.64	767.64	767.64
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

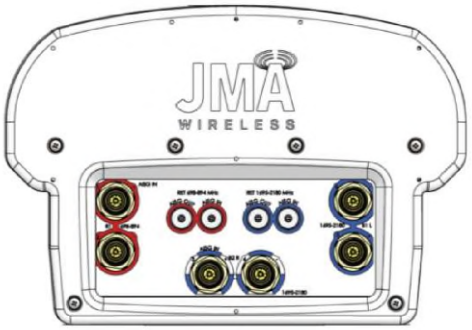
Sector	Antenna Make	Antenna Model	Ant CL Height AGL	Tip Height	Azimuth (TN)	Elec Tilt	Mech Tilt	Gain	Beam Width	Regulatory Power	Callsigns						
											700	850	1900	2100	28 GHz	31 GHz	39 GHz
03	JMA WIRELESS	MX06FRO660-03	146	149	260	0	0	15.748	57	130.79			KNLH262 WQCS396 WQEM953				
0102	Samsung	MT6407-77A	146	147.5	260	6	0	23.35	100	767.64							
01	JMA WIRELESS	MX06FRO660-03	146	149	30	2	0	12.048	51.9	277.09		KNKA313					
03	JMA WIRELESS	MX06FRO660-03	146	149	260	0	0	15.748	57	184.31			KNLH262 WQCS396 WQEM953				
02	JMA WIRELESS	MX06FRO660-03	146	149	150	0	0	15.748	57	184.31			KNLH262 WQCS396 WQEM953				
01	JMA WIRELESS	MX06FRO660-03	146	149	30	0	0	15.948	51.2	139.48				WQGA906 WQGB280			
02	JMA WIRELESS	MX06FRO660-03	146	149	150	0	0	15.948	51.2	139.48				WQGA906 WQGB280			
0100	Samsung	MT6407-77A	146	147.5	30	6	0	23.35	100	767.64							
02	JMA WIRELESS	MX06FRO660-03	146	149	150	2	0	12.048	56.9	69.27	WQJQ689						
03	JMA WIRELESS	MX06FRO660-03	146	149	260	10	4	12.048	57.2	69.27	WQJQ689						
0100	JMA WIRELESS	MX06FRO660-03	146	149	30	2	0	12.048	51.9	277.09		KNKA313					
D2	ANDREW	LNX-6513DS-VTM	145	147.3	150	0	0	13	65.5	290.42		KNKA313					
02	JMA WIRELESS	MX06FRO660-03	146	149	150	2	0	12.048	51.9	277.09		KNKA313					
03	JMA WIRELESS	MX06FRO660-03	146	149	260	2	4	12.048	51.9	277.09		KNKA313					
01	JMA WIRELESS	MX06FRO660-03	146	149	30	0	0	15.748	57	184.31			KNLH262 WQCS396 WQEM953				
D3	COMMSCOPE	LNX-6513DS-VTM	145	147.3	260	6	5	13	64.75	391.74		KNKA313					
D2	ANDREW	LNX-6513DS-VTM	145	147.3	150	0	0	13	65.5	391.74		KNKA313					
D1	ANDREW	LNX-6513DS-VTM	145	147.3	30	0	0	13	65.5	391.74		KNKA313					
02	JMA WIRELESS	MX06FRO660-03	146	149	150	0	0	15.748	57	130.79			KNLH262 WQCS396 WQEM953				
01	JMA WIRELESS	MX06FRO660-03	146	149	30	2	0	12.048	56.9	69.27	WQJQ689						
01	JMA WIRELESS	MX06FRO660-03	146	149	30	0	0	15.748	57	130.79			KNLH262 WQCS396 WQEM953				
0101	Samsung	MT6407-77A	146	147.5	150	6	0	23.35	100	767.64							
D3	COMMSCOPE	LNX-6513DS-VTM	145	147.3	260	6	5	13	64.75	290.42		KNKA313					
D1	ANDREW	LNX-6513DS-VTM	145	147.3	30	0	0	13	65.5	290.42		KNKA313					
03	JMA WIRELESS	MX06FRO660-03	146	149	260	0	0	15.948	51.2	139.48				WQGA906 WQGB280			
0101	JMA WIRELESS	MX06FRO660-03	146	149	150	2	0	12.048	51.9	277.09		KNKA313					
0102	JMA WIRELESS	MX06FRO660-03	146	149	260	2	4	12.048	51.9	277.09		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
WQJQ689	Northeast	WU	REA001	C	CT	New Haven	Cellco Partnership	Yes	22.000	746.000-757.000	776.000-787.000	.000-.000	.000-.000	69.27	1000	1430.62	Active	added	Yes
KNKA313	New Haven-West Haven-Waterbury-Meriden, CT	CL	CMA049	A	CT	New Haven	Cellco Partnership	Yes	25.000	824.000-835.000	869.000-880.000	845.000-846.500	890.000-891.500	391.74	500	1430.62	Active	added	Yes
WQEM953	New Haven-Waterbury-Meriden, CT	CW	BTA318	C	CT	New Haven	Cellco Partnership	Yes	10.000	1895.000-1900.000	1975.000-1980.000	.000-.000	.000-.000	184.31	1640	1430.62	Active	added	Yes
WQCS396	New Haven-Waterbury-Meriden, CT	CW	BTA318	C	CT	New Haven	Cellco Partnership	Yes	10.000	1905.000-1910.000	1985.000-1990.000	.000-.000	.000-.000	184.31	1640	1430.62	Active	added	Yes
KNLH262	New Haven-Waterbury-Meriden, CT	CW	BTA318	F	CT	New Haven	Cellco Partnership	Yes	10.000	1890.000-1895.000	1970.000-1975.000	.000-.000	.000-.000	184.31	1640	1430.62	Active	added	Yes
WQGB280	New Haven-West Haven-Waterbury-Meriden, CT	AW	CMA049	A	CT	New Haven	Cellco Partnership	Yes	20.000	1710.000-1720.000	2110.000-2120.000	.000-.000	.000-.000	139.48	1640	1430.62	Active	added	Yes
WRNE581	New York, NY	PM	PEA001	A1	CT	New Haven	Cellco Partnership	Yes	20.000	3700.000-3720.000	.000-.000	.000-.000	.000-.000	767.64	1640	1430.62	Active	added	Yes
WRNE582	New York, NY	PM	PEA001	A2	CT	New Haven	Cellco Partnership	Yes	20.000	3720.000-3740.000	.000-.000	.000-.000	.000-.000	767.64	1640	1430.62	Active	added	Yes
WRNE583	New York, NY	PM	PEA001	A3	CT	New Haven	Cellco Partnership	Yes	20.000	3740.000-3760.000	.000-.000	.000-.000	.000-.000	767.64	1640	1430.62	Active	added	Yes
WQGA906	New York-No. New Jer.-Long Island, NY-NJ-CT-PA-MA-	AW	BEA010	B	CT	New Haven	Cellco Partnership	Yes	20.000	1720.000-1730.000	2120.000-2130.000	.000-.000	.000-.000	139.48	1640	1430.62	Active	added	Yes
WRBA734	New Haven-Waterbury-Meriden, CT	UU	BTA318	L1	CT	New Haven	Cellco Partnership	Yes	325.000	27600.000-27925.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRBA735	New Haven-Waterbury-Meriden, CT	UU	BTA318	L2	CT	New Haven	Cellco Partnership	Yes	325.000	27925.000-27950.000	28050.000-28350.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD609	New York, NY	UU	PEA001	M1	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37600.000-37700.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD610	New York, NY	UU	PEA001	M10	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38500.000-38600.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD611	New York, NY	UU	PEA001	M2	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37700.000-37800.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD612	New York, NY	UU	PEA001	M3	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37800.000-37900.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD613	New York, NY	UU	PEA001	M4	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	37900.000-38000.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD614	New York, NY	UU	PEA001	M5	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38000.000-38100.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes

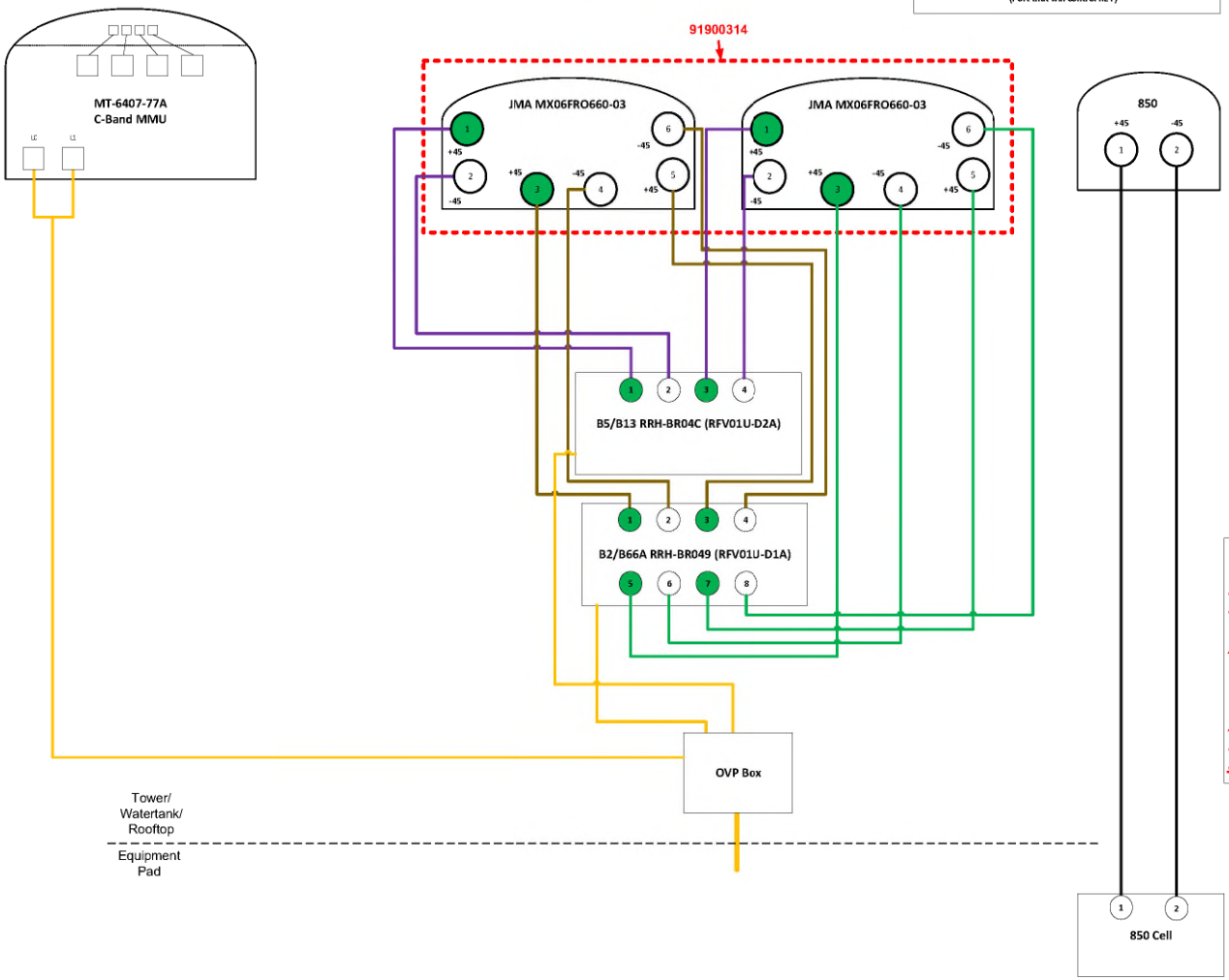
WRHD615	New York, NY	UU	PEA001	M6	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38100.000-38200.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD616	New York, NY	UU	PEA001	M7	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38200.000-38300.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD617	New York, NY	UU	PEA001	M8	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38300.000-38400.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD618	New York, NY	UU	PEA001	M9	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38400.000-38500.000	.000-.000	.000-.000	.000-.000			1430.62	Active		Yes
WRHD619	New York, NY	UU	PEA001	N1	CT	New Haven	Straight Path Spectrum, LLC	Yes	100.000	38600.000-38700.000	.000-.000	.000-.000	.000-.000			1430.62	Active	N/A	No
WRLD516	D09009 - New Haven, CT	PL	D09009	0	CT	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
WRLD517	D09009 - New Haven, CT	PL	D09009	0	CT	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	CT	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
WRNE584	New York, NY	PM	PEA001	A4	CT	New Haven	Cellco Partnership	Yes	20.000	3760.000-3780.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WRNE585	New York, NY	PM	PEA001	A5	CT	New Haven	Cellco Partnership	Yes	20.000	3780.000-3800.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WRNE586	New York, NY	PM	PEA001	B1	CT	New Haven	Cellco Partnership	Yes	20.000	3800.000-3820.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WRNE587	New York, NY	PM	PEA001	B2	CT	New Haven	Cellco Partnership	Yes	20.000	3820.000-3840.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No
WRNE588	New York, NY	PM	PEA001	B3	CT	New Haven	Cellco Partnership	Yes	20.000	3840.000-3860.000	.000-.000	.000-.000	.000-.000		1640	1430.62	Active		No

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



- Port 1 & 2 are for low band (698-896 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 3 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)



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)

March 6, 2018
July 12, 2018 (Rev.1)
November 27, 2018 (Rev.2)
December 6, 2018 (Rev.3)
August 18, 2021 (Rev.4)
June 14, 2022 (Rev.5)

Verizon Wireless
20 Alexander Drive
Wallingford, CT 06492

RE: Site Name: NORTHFORD CT
Site Address: 88 Parsonage Road
Northford, CT 06472

To Whom It May Concern:

Hudson Design Group LLC (HDG) 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 additional loading:

- (3) LNX-6513DS-VTM Antennas (54.8"x11.9"x7.1" – Wt. = 33 lbs. /each)
- **(6) MX06FRO660-03 Antennas (71.3"x15.4"x10.7" – Wt. = 60 lbs. /each)**
- **(3) MT6407-77A Antennas w/ RRH's (Not to Exceed: 35.12"x16.06"x5.51" – Wt. = 87.1 lbs. /each)**
- **(3) B5/B13 RRH-BR04C RRH's (15.0"x15.0"x8.1" – Wt. = 82 lbs. /each)**
- **(3) B2/B66A RRH-BR049 RRH's (15.0"x15.0"x10.0" – Wt. = 98 lbs. /each)**
- **(1) OVP (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. HDG's subconsultant, ProVertic LLC, conducted a survey climb and mapping of the existing Verizon antenna mounts on February 15, 2018.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-G, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-G Annex B, the max basic wind speed for this site is equal to 115 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 0.75 in. Per Appendix N of the Connecticut State Building Code, an ultimate wind speed of 130 mph converted to a nominal wind speed of 101 mph and an escalated ice thickness of 1.74 in was used for this analysis.
- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods, S_S, of 0.179 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.061.
- The mount has been analyzed with load combinations consisting of 250 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 mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mount is secured to the existing self supporting tower with U-bolts tightened around the tower leg. HDG 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. HDG 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).**
- **Relocate the mount connection of the existing 2" std. (2.38" O.D.) pipe brace from the vertical pipe brace to the mount face (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).**
- **Center existing pipe masts on mount face (typ. of 4 per sector, total of 12).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	24	LC7	135%	**FAIL**
Modified Mount Rating	8	LC11	87%	**PASS**

Reference Documents:

- Mount mapping report prepared by ProVertic LLC.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG 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 its 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 mount has 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. HDG 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,
Hudson Design Group LLC

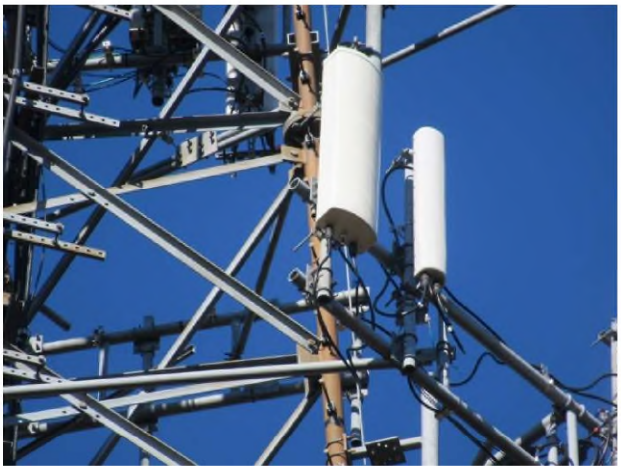
Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:








FIELD PHOTOS:

HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 6/14/2022
Project Name: NORTHFORD CT
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

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_e
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

2.6.6.4 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

$K_{zt} = [1+(K_e\,K_t/K_h)]^2$ $\quad K_h = e^{(f*z/H)}$

K_{zt}=	**1**	
K_h=	1.00	
K_e=	1	(from Table 2-4)
K_t=	0	(from Table 2-5)
f=	0	(from Table 2-5)
z=	146	
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	
K_{iz} =	1.16	(from Sec. 2.6.8)

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

Category= 1

2.6.8 Design Ice Thickness

Max Ice Thickness =	t_i =	0.75 in
Importance Factor, I_{ice} =	I_{ice}=	1.00 (from Table 2-3)
$t_{iz} = 2.0*t_i*I_{ice}*K_{iz}*(Kzt)^{0.35}$	t_{iz} =	1.74 in

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2.6.7 Gust Effect Factor

2.6.7.1 Self Supporting Lattice Structures

Gh = 1.0 Latticed Structures > 600 ft

Gh = 0.85 Latticed Structures 450 ft or less

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

h=	195	Gh=	0.85

2.6.7.2 Guyed Masts Gh= 0.85

2.6.7.3 Pole Structures Gh= 1.1

2.6.9 Appurtenances Gh= 1.0

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

Gh=	1.35	**Gh=**	**1.00**

2.6.9.2 Design Wind Force on Appurtenances

State Code Ultimate Design Wind Speed: V_{ult} = 130 mph

Nomial Design Wind Speed, $V_{asd} = V_{ult} \sqrt{(0.6)}$ V_{asd} = 101 mph

V_{asd} per the Connecticut State Building Code, Latest Edition.
Per TIA-222-G, V_{min} = 95 mph V_{max} = 115 mph

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

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

		K_z=	1.371	
		K_{zt}=	1.0	
q_z=	**30.24**	K_d=	0.85	(from Table 2-2)
$q_{z\ (ice)}$=	**7.46**	V_{asd}=	101	mph
$q_{z\ (30)}$=	**2.68**	$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph
		I=	1.0	(from Table 2-3)
		I_{wice}=	1.0	(from Table 2-3)

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

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Determine Ca:

Table 2-8

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
Round	C < 32 (Subcritical)	0.7	0.8	1.2
	32 ≤ C ≤ 64 (Transitional)	$3.76/(C^{0.485})$	$3.37/(C^{0.415})$	$38.4/(C^{-1.0})$
	C > 64 (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 = 1.74 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)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	4.61	1.29	177	60	16
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	4.63	1.29	299	95	26
MT6407-77A Antenna	35.1	16.1	5.5	3.92	2.19	1.20	142	47	13
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	1.00	1.20	57	21	5
B5/B13 RRH-BR04C RRH (Shielde	15.0	7.5	8.1	0.78	2.00	1.20	28	13	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.00	1.20	57	21	5
B2/B66A RRH-BR049 RRH (Shiel	15.0	7.5	10.0	0.78	2.00	1.20	28	13	3
1-1/2" Pipe	1.9	12.0		0.16	0.16	1.20	6		
2" Pipe	2.4	12.0		0.20	0.20	1.20	7		
2-1/2" Pipe	2.9	12.0		0.24	0.24	1.20	9		
3" Pipe	3.5	12.0		0.29	0.29	1.20	11		
2x2 HSS	2.0	12.0		0.17	0.17	2.00	10		

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WIND LOADS

Angle = 30 (deg) | Ice Thickness = 1.74 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)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	162
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	299	222	279
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	142	56	121
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	50
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	29
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	52
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	31

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	58.3	15.4	10.6	6.23	4.28	3.79	5.51	1.26	1.33	58	43	54
MX06FRO660-03 Antenna	74.8	18.9	14.2	9.81	7.36	3.96	5.27	1.26	1.32	92	73	88
MT6407-77A Antenna	38.6	19.5	9.0	5.24	2.41	1.98	4.29	1.20	1.28	47	23	41
B5/B13 RRH-BR04C RRH	18.5	18.5	11.6	2.37	1.49	1.00	1.60	1.20	1.20	21	13	19
B5/B13 RRH-BR04C RRH (Shielded	18.5	11.0	11.6	1.41	1.49	1.68	1.60	1.20	1.20	13	13	13
B2/B66A RRH-BR049 RRH	18.5	18.5	13.5	2.37	1.73	1.00	1.37	1.20	1.20	21	15	20
B2/B66A RRH-BR049 RRH (Shielde	18.5	11.0	13.5	1.41	1.73	1.68	1.37	1.20	1.20	13	15	13

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	14
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	26	20	25
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	13	5	11
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	4
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	5
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3

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WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.74	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)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	132
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	299	222	241
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	142	56	77
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	37
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	30
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	43
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	35

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	58.3	15.4	10.6	6.23	4.28	3.79	5.51	1.26	1.33	58	43	47
MX06FRO660-03 Antenna	74.8	18.9	14.2	9.81	7.36	3.96	5.27	1.26	1.32	92	73	78
MT6407-77A Antenna	38.6	19.5	9.0	5.24	2.41	1.98	4.29	1.20	1.28	47	23	29
B5/B13 RRH-BR04C RRH	18.5	18.5	11.6	2.37	1.49	1.00	1.60	1.20	1.20	21	13	15
B5/B13 RRH-BR04C RRH (Shielded	18.5	11.0	11.6	1.41	1.49	1.68	1.60	1.20	1.20	13	13	13
B2/B66A RRH-BR049 RRH	18.5	18.5	13.5	2.37	1.73	1.00	1.37	1.20	1.20	21	15	17
B2/B66A RRH-BR049 RRH (Shielde	18.5	11.0	13.5	1.41	1.73	1.68	1.37	1.20	1.20	13	15	15

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	12
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	26	20	21
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	13	5	7
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	3
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	4
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3

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WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.74	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)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	116
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	299	222	222
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	142	56	56
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	31
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	31
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	38
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	38

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	58.3	15.4	10.6	6.23	4.28	3.79	5.51	1.26	1.33	58	43	43
MX06FRO660-03 Antenna	74.8	18.9	14.2	9.81	7.36	3.96	5.27	1.26	1.32	92	73	73
MT6407-77A Antenna	38.6	19.5	9.0	5.24	2.41	1.98	4.29	1.20	1.28	47	23	23
B5/B13 RRH-BR04C RRH	18.5	18.5	11.6	2.37	1.49	1.00	1.60	1.20	1.20	21	13	13
B5/B13 RRH-BR04C RRH (Shielded	18.5	11.0	11.6	1.41	1.49	1.68	1.60	1.20	1.20	13	13	13
B2/B66A RRH-BR049 RRH	18.5	18.5	13.5	2.37	1.73	1.00	1.37	1.20	1.20	21	15	15
B2/B66A RRH-BR049 RRH (Shielde	18.5	11.0	13.5	1.41	1.73	1.68	1.37	1.20	1.20	13	15	15

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	10
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	26	20	20
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	13	5	5
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	3
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	3
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3

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WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.74	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)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	132
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	299	222	241
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	142	56	77
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	37
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	30
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	43
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	35

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	58.3	15.4	10.6	6.23	4.28	3.79	5.51	1.26	1.33	58	43	47
MX06FRO660-03 Antenna	74.8	18.9	14.2	9.81	7.36	3.96	5.27	1.26	1.32	92	73	78
MT6407-77A Antenna	38.6	19.5	9.0	5.24	2.41	1.98	4.29	1.20	1.28	47	23	29
B5/B13 RRH-BR04C RRH	18.5	18.5	11.6	2.37	1.49	1.00	1.60	1.20	1.20	21	13	15
B5/B13 RRH-BR04C RRH (Shielded	18.5	11.0	11.6	1.41	1.49	1.68	1.60	1.20	1.20	13	13	13
B2/B66A RRH-BR049 RRH	18.5	18.5	13.5	2.37	1.73	1.00	1.37	1.20	1.20	21	15	17
B2/B66A RRH-BR049 RRH (Shielde	18.5	11.0	13.5	1.41	1.73	1.68	1.37	1.20	1.20	13	15	15

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	12
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	26	20	21
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	13	5	7
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	3
B5/B13 RRH-BR04C RRH (Shielded	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	4
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3

Date: 6/14/2022
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Designed By: CL Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 150 (deg) | Ice Thickness = 1.74 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)
LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	177	116	162
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	299	222	279
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	142	56	121
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	57	31	50
B5/B13 RRH-BR04C RRH (Shieldec	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	28	31	29
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	57	38	52
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	28	38	31

WIND LOADS WITH ICE:

LNX-6513DS-VTM Antenna	58.3	15.4	10.6	6.23	4.28	3.79	5.51	1.26	1.33	58	43	54
MX06FRO660-03 Antenna	74.8	18.9	14.2	9.81	7.36	3.96	5.27	1.26	1.32	92	73	88
MT6407-77A Antenna	38.6	19.5	9.0	5.24	2.41	1.98	4.29	1.20	1.28	47	23	41
B5/B13 RRH-BR04C RRH	18.5	18.5	11.6	2.37	1.49	1.00	1.60	1.20	1.20	21	13	19
B5/B13 RRH-BR04C RRH (Shieldec	18.5	11.0	11.6	1.41	1.49	1.68	1.60	1.20	1.20	13	13	13
B2/B66A RRH-BR049 RRH	18.5	18.5	13.5	2.37	1.73	1.00	1.37	1.20	1.20	21	15	20
B2/B66A RRH-BR049 RRH (Shielde	18.5	11.0	13.5	1.41	1.73	1.68	1.37	1.20	1.20	13	15	13

WIND LOADS AT 30 MPH:

LNX-6513DS-VTM Antenna	54.8	11.9	7.1	4.53	2.70	4.61	7.72	1.29	1.42	16	10	14
MX06FRO660-03 Antenna	71.3	15.4	10.7	7.63	5.30	4.63	6.66	1.29	1.39	26	20	25
MT6407-77A Antenna	35.1	16.1	5.5	3.92	1.34	2.19	6.37	1.20	1.37	13	5	11
B5/B13 RRH-BR04C RRH	15.0	15.0	8.1	1.56	0.84	1.00	1.85	1.20	1.20	5	3	4
B5/B13 RRH-BR04C RRH (Shieldec	15.0	7.5	8.1	0.78	0.84	2.00	1.85	1.20	1.20	3	3	3
B2/B66A RRH-BR049 RRH	15.0	15.0	10.0	1.56	1.04	1.00	1.50	1.20	1.20	5	3	5
B2/B66A RRH-BR049 RRH (Shielde	15.0	7.5	10.0	0.78	1.04	2.00	1.50	1.20	1.20	3	3	3

Date: 6/14/2022
Project Name: NORTHFORD CT
Designed By: CL **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.74 in.
Density of ice: 56 pcf

LNX-6513DS-VTM Antenna

Weight of ice based on total radial SF area:

Height (in):	54.8	
Width (in):	11.9	
Depth (in):	7.1	
Total weight of ice on object:		151 lbs
Weight of object:	33.0 lbs	
Combined weight of ice and object:		184 lbs

MX06FRO660-03 Antenna

Weight of ice based on total radial SF area:

Height (in):	71.3	
Width (in):	15.4	
Depth (in):	10.7	
Total weight of ice on object:		259 lbs
Weight of object:	60.0 lbs	
Combined weight of ice and object:		319 lbs

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:		116 lbs
Weight of object:	87.1 lbs	
Combined weight of ice and object:		204 lbs

B5/B13 RRH-BR04C RRH

Weight of ice based on total radial SF area:

Height (in):	15.0	
Width (in):	15.0	
Depth (in):	8.1	
Total weight of ice on object:		50 lbs
Weight of object:	82.0 lbs	
Combined weight of ice and object:		132 lbs

B2/B66A RRH-BR049 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:		53 lbs
Weight of object:	98.0 lbs	
Combined weight of ice and object:		151 lbs

1-1/2" Pipe

Per foot weight of ice:

diameter (in):	1.9	
Per foot weight of ice on object:		8 plf

2" Pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		9 plf

2-1/2" Pipe

Per foot weight of ice:

diameter (in):	2.88	
Per foot weight of ice on object:		10 plf

3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		11 plf

2x2 HSS

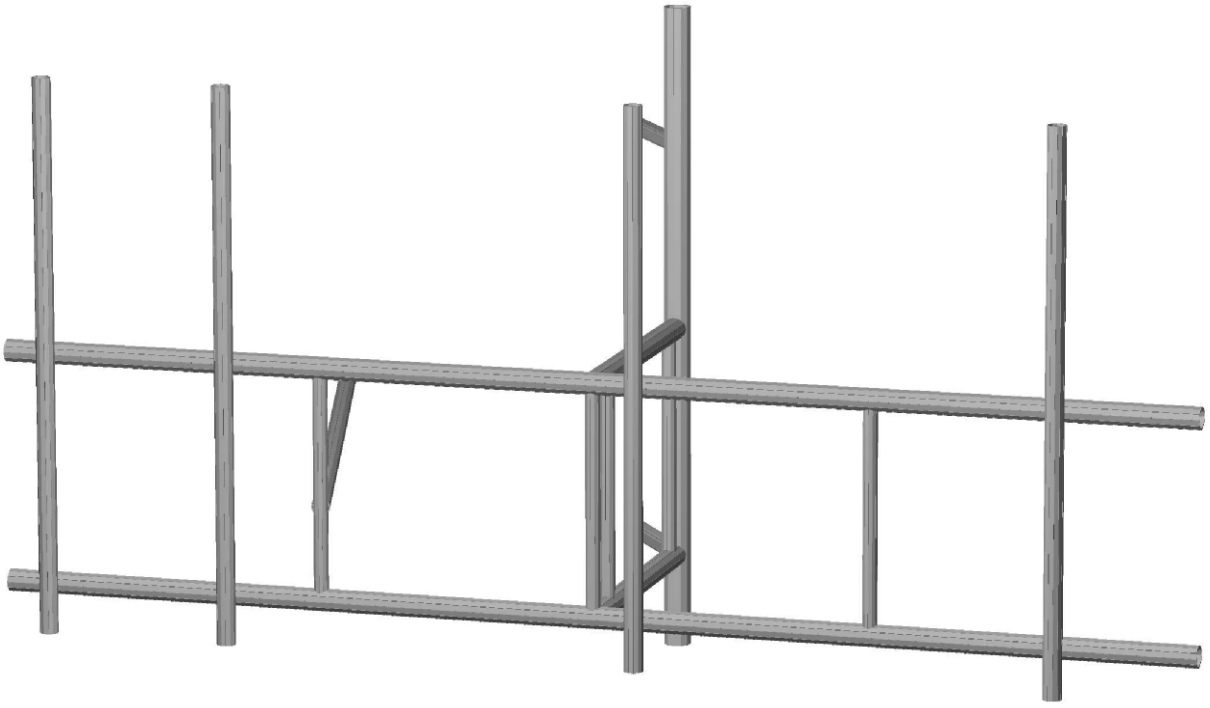
Weight of ice based on total radial SF area:

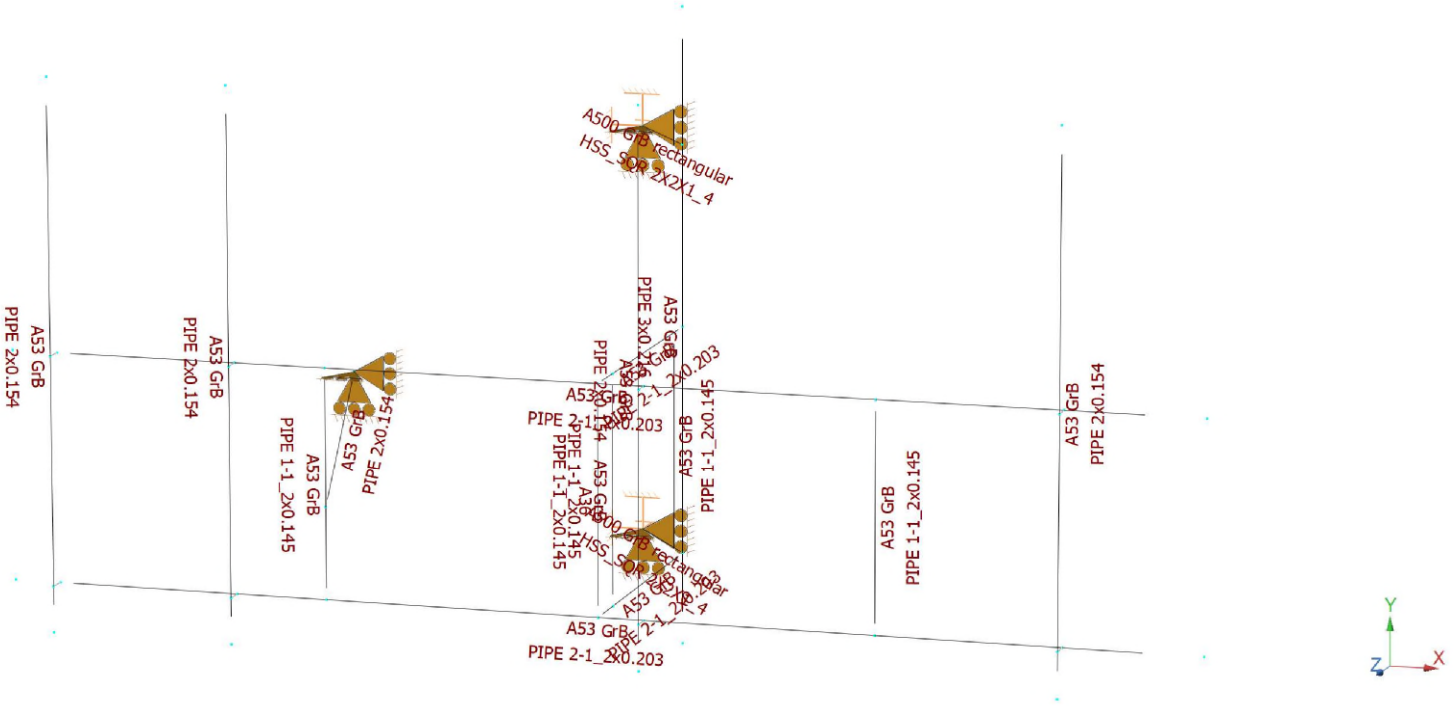
Height (in):	2	
Width (in):	2	
Per foot weight of ice on object:		10 plf

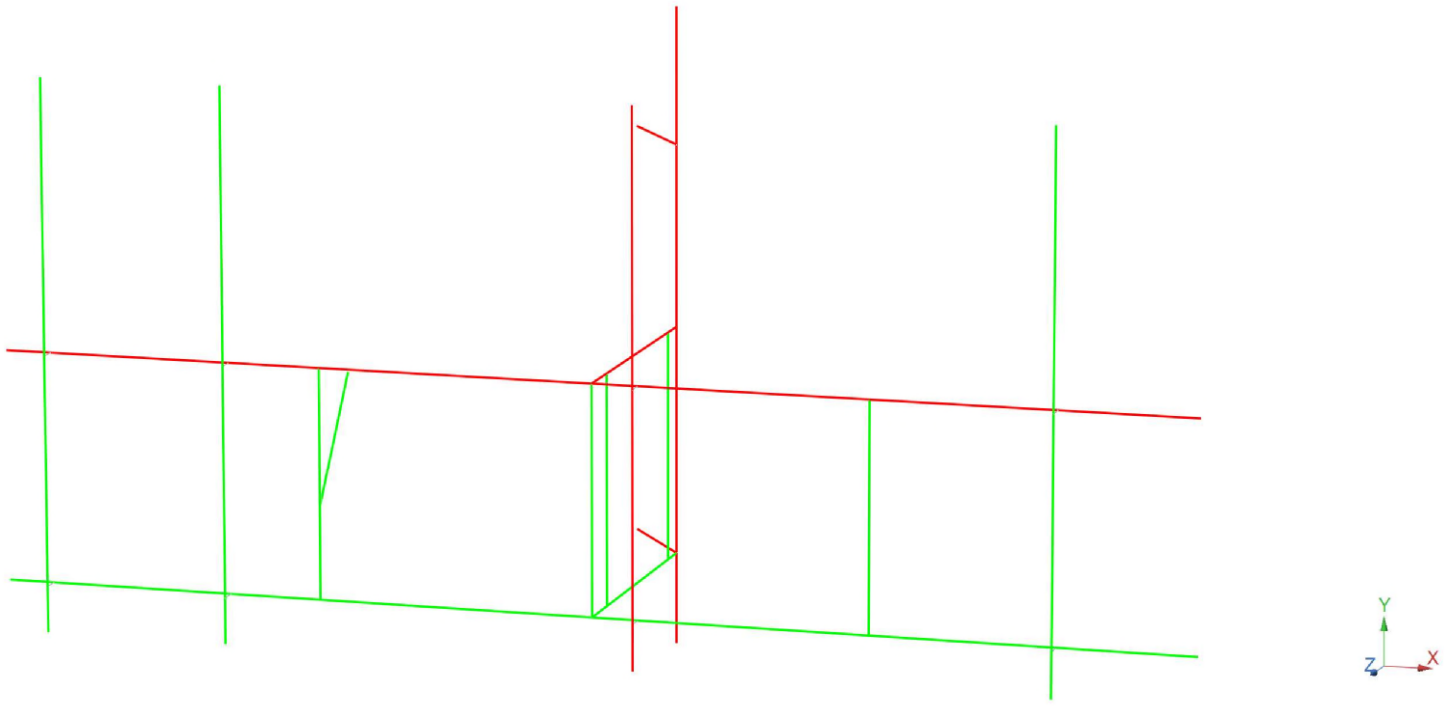
HUDSON
Design Group LLC

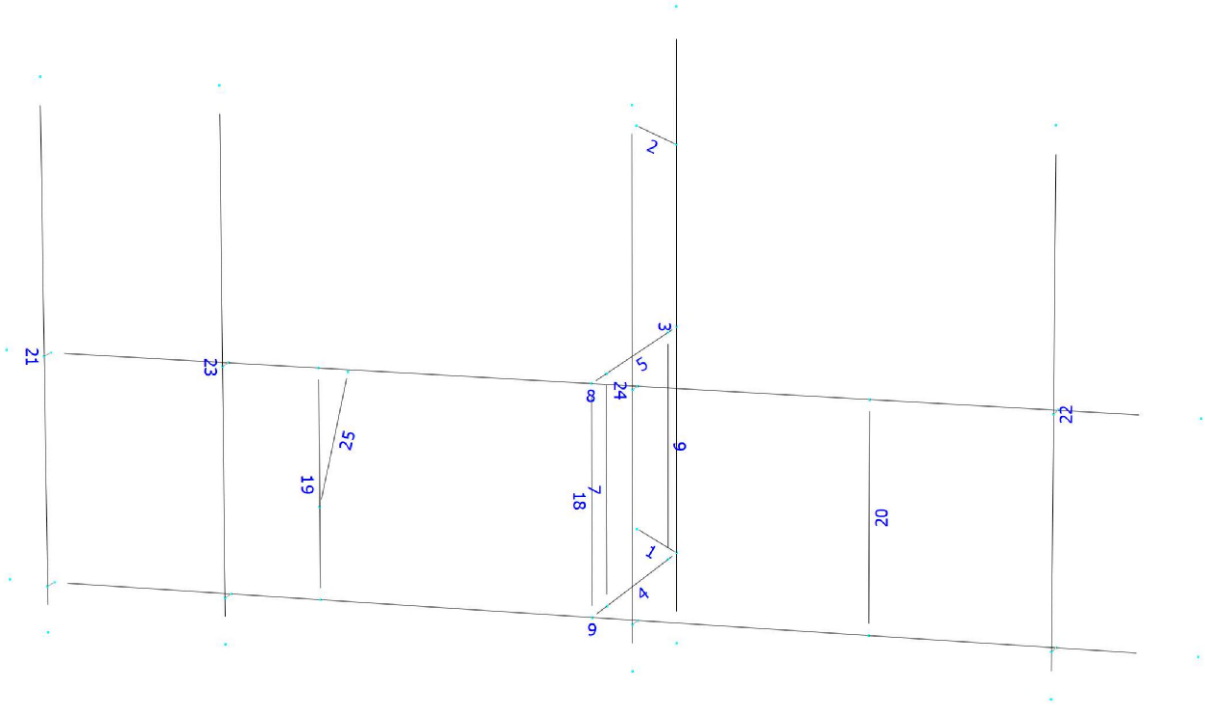
Mount Calculations
(Existing Conditions)

Current Date: 6/14/2022 10:03 AM
Units system: English




A500 GrB rectangular
HSS_SQR 2X2X1_4
PIPE 3x0.216
A53 GrB
PIPE 2-1_2x0.203
PIPE 1-1_2x0.145
PIPE 2x0.154
PIPE 1-1_2x0.145
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 1-1_2x0.145
A53 GrB
PIPE 2x0.154
A53 GrB
PIPE 2-1_2x0.203
Y
Z
X


Design status
Not designed
Error on design
Design O.K.
With warnings
Y
Z
X


21
23
19
25
2
3
5
8
24
6
18
7
20
1
4
9
22
Y
Z
X

RAM® Elements
CONNECT Edition

Current Date: 6/14/2022 10:05 AM
Units system: English

Load data

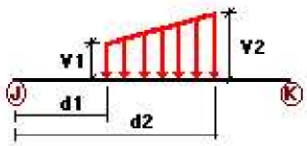
GLOSSARY

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	250 lb Live Load on Antenna 1	No	LL
LLa2	250 lb Live Load on Antenna 2	No	LL
LLa3	250 lb Live Load on Antenna 3	No	LL
LLa4	250 lb Live Load on Antenna 4	No	LL

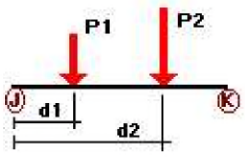
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.01	-0.01	0.00	No	100.00	Yes
	2	z	-0.01	-0.01	0.00	No	100.00	Yes
	3	z	-0.011	-0.011	0.00	No	100.00	Yes
	6	z	-0.006	-0.006	0.00	No	100.00	Yes
	7	z	-0.006	-0.006	0.00	No	100.00	Yes
	8	z	-0.009	-0.009	0.00	No	100.00	Yes
	9	z	-0.009	-0.009	0.00	No	100.00	Yes
	18	z	-0.006	-0.006	0.00	No	100.00	Yes
	19	z	-0.006	-0.006	0.00	No	100.00	Yes
	20	z	-0.006	-0.006	0.00	No	100.00	Yes
	21	z	-0.007	-0.007	0.00	No	100.00	Yes
	25	z	-0.007	-0.007	0.00	No	100.00	Yes
W30	1	z	-0.01	-0.01	0.00	No	100.00	Yes
	2	z	-0.01	-0.01	0.00	No	100.00	Yes
	3	z	-0.011	-0.011	0.00	No	100.00	Yes
	6	z	-0.006	-0.006	0.00	No	100.00	Yes
	7	z	-0.006	-0.006	0.00	No	100.00	Yes
	8	z	-0.009	-0.009	0.00	No	100.00	Yes
	9	z	-0.009	-0.009	0.00	No	100.00	Yes
	18	z	-0.006	-0.006	0.00	No	100.00	Yes
	19	z	-0.006	-0.006	0.00	No	100.00	Yes
	20	z	-0.006	-0.006	0.00	No	100.00	Yes
	21	z	-0.007	-0.007	0.00	No	100.00	Yes
	25	z	-0.007	-0.007	0.00	No	100.00	Yes
W60	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.011	-0.011	0.00	No	100.00	Yes
	4	x	-0.009	-0.009	0.00	No	100.00	Yes
	5	x	-0.009	-0.009	0.00	No	100.00	Yes
	6	x	-0.006	-0.006	0.00	No	100.00	Yes
	7	x	-0.006	-0.006	0.00	No	100.00	Yes
	18	x	-0.006	-0.006	0.00	No	100.00	Yes
	19	x	-0.006	-0.006	0.00	No	100.00	Yes
	20	x	-0.006	-0.006	0.00	No	100.00	Yes
	21	x	-0.007	-0.007	0.00	No	100.00	Yes
	22	x	-0.007	-0.007	0.00	No	100.00	Yes
	23	x	-0.007	-0.007	0.00	No	100.00	Yes
	24	x	-0.007	-0.007	0.00	No	100.00	Yes
	25	x	-0.007	-0.007	0.00	No	100.00	Yes
W90	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.011	-0.011	0.00	No	100.00	Yes
	4	x	-0.009	-0.009	0.00	No	100.00	Yes
	5	x	-0.009	-0.009	0.00	No	100.00	Yes
	6	x	-0.006	-0.006	0.00	No	100.00	Yes
	7	x	-0.006	-0.006	0.00	No	100.00	Yes
	18	x	-0.006	-0.006	0.00	No	100.00	Yes
	19	x	-0.006	-0.006	0.00	No	100.00	Yes
	20	x	-0.006	-0.006	0.00	No	100.00	Yes
	21	x	-0.007	-0.007	0.00	No	100.00	Yes
	22	x	-0.007	-0.007	0.00	No	100.00	Yes
	23	x	-0.007	-0.007	0.00	No	100.00	Yes
	24	x	-0.007	-0.007	0.00	No	100.00	Yes
	25	x	-0.007	-0.007	0.00	No	100.00	Yes
W120	1	x	-0.01	-0.01	0.00	No	100.00	Yes
	2	x	-0.01	-0.01	0.00	No	100.00	Yes
	3	x	-0.011	-0.011	0.00	No	100.00	Yes
	4	x	-0.009	-0.009	0.00	No	100.00	Yes
	5	x	-0.009	-0.009	0.00	No	100.00	Yes
	6	x	-0.006	-0.006	0.00	No	100.00	Yes

	7	x	-0.006	-0.006	0.00	No	100.00	Yes
	18	x	-0.006	-0.006	0.00	No	100.00	Yes
	19	x	-0.006	-0.006	0.00	No	100.00	Yes
	20	x	-0.006	-0.006	0.00	No	100.00	Yes
	21	x	-0.007	-0.007	0.00	No	100.00	Yes
	22	x	-0.007	-0.007	0.00	No	100.00	Yes
	23	x	-0.007	-0.007	0.00	No	100.00	Yes
	24	x	-0.007	-0.007	0.00	No	100.00	Yes
	25	x	-0.007	-0.007	0.00	No	100.00	Yes
W150	1	z	0.01	0.01	0.00	No	100.00	Yes
	2	z	0.01	0.01	0.00	No	100.00	Yes
	3	z	0.011	0.011	0.00	No	100.00	Yes
	6	z	0.006	0.006	0.00	No	100.00	Yes
	7	z	0.006	0.006	0.00	No	100.00	Yes
	8	z	0.009	0.009	0.00	No	100.00	Yes
	9	z	0.009	0.009	0.00	No	100.00	Yes
	18	z	0.006	0.006	0.00	No	100.00	Yes
	19	z	0.006	0.006	0.00	No	100.00	Yes
	20	z	0.006	0.006	0.00	No	100.00	Yes
	21	z	0.007	0.007	0.00	No	100.00	Yes
	22	z	0.007	0.007	0.00	No	100.00	Yes
	23	z	0.007	0.007	0.00	No	100.00	Yes
	24	z	0.007	0.007	0.00	No	100.00	Yes
	25	z	0.007	0.007	0.00	No	100.00	Yes
Di	1	y	-0.01	-0.01	0.00	No	100.00	Yes
	2	y	-0.01	-0.01	0.00	No	100.00	Yes
	3	y	-0.011	-0.011	0.00	No	100.00	Yes
	4	y	-0.01	-0.01	0.00	No	100.00	Yes
	5	y	-0.01	-0.01	0.00	No	100.00	Yes
	6	y	-0.008	-0.008	0.00	No	100.00	Yes
	7	y	-0.008	-0.008	0.00	No	100.00	Yes
	8	y	-0.01	-0.01	0.00	No	100.00	Yes
	9	y	-0.01	-0.01	0.00	No	100.00	Yes
	18	y	-0.008	-0.008	0.00	No	100.00	Yes
	19	y	-0.008	-0.008	0.00	No	100.00	Yes
	20	y	-0.008	-0.008	0.00	No	100.00	Yes
	21	y	-0.009	-0.009	0.00	No	100.00	Yes
	22	y	-0.009	-0.009	0.00	No	100.00	Yes
	23	y	-0.009	-0.009	0.00	No	100.00	Yes
	24	y	-0.009	-0.009	0.00	No	100.00	Yes
	25	y	-0.009	-0.009	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	22	y	-0.017	1.00	No
		y	-0.017	5.00	No
		y	-0.082	2.00	No
	23	y	-0.044	0.50	No
		y	-0.044	3.50	No
	24	y	-0.06	0.50	No
		y	-0.06	5.00	No
		y	-0.098	2.00	No
		y	-0.028	1.00	No
		y	-0.028	5.00	No
Wo	22	z	-0.089	1.00	No
		z	-0.089	5.00	No
		z	-0.028	2.00	No
	23	z	-0.071	0.50	No
		z	-0.071	3.50	No
	24	z	-0.299	0.50	No
		z	-0.299	5.00	No
		z	-0.028	2.00	No
W30	22	3	-0.081	1.00	No
		3	-0.081	5.00	No
		3	-0.029	2.00	No
	23	3	-0.061	0.50	No
		3	-0.061	3.50	No
	24	3	-0.279	0.50	No
		3	-0.279	5.00	No
		3	-0.031	2.00	No
W60	22	3	-0.066	1.00	No
		3	-0.066	5.00	No
		3	-0.03	2.00	No
	23	3	-0.039	0.50	No
		3	-0.039	3.50	No
	24	3	-0.241	0.50	No
		3	-0.241	5.00	No
		3	-0.035	2.00	No
W90	22	x	-0.058	1.00	No
		x	-0.058	5.00	No
		x	-0.031	2.00	No
	23	x	-0.028	0.50	No
		x	-0.028	3.50	No
	24	x	-0.111	0.50	No
		x	-0.111	5.00	No
		x	-0.038	2.00	No
W120	22	2	-0.066	1.00	No
		2	-0.066	5.00	No
		2	-0.03	2.00	No
	23	2	-0.039	0.50	No
		2	-0.039	3.50	No
	24	2	-0.241	0.50	No
		2	-0.241	5.00	No
		2	-0.035	2.00	No
W150	22	2	-0.081	1.00	No
		2	-0.081	5.00	No
		2	-0.029	2.00	No
	23	2	-0.061	0.50	No
		2	-0.061	3.50	No
	24	2	-0.279	0.50	No
		2	-0.279	5.00	No
		2	-0.031	2.00	No
Di	22	y	-0.076	1.00	No
		y	-0.076	5.00	No

		y	-0.05	2.00	No
	23	y	-0.058	0.50	No
		y	-0.058	3.50	No
	24	y	-0.259	0.50	No
		y	-0.259	5.00	No
		y	-0.053	2.00	No
WI0	22	z	-0.03	1.00	No
		z	-0.03	5.00	No
		z	-0.013	2.00	No
	23	z	-0.024	0.50	No
		z	-0.024	3.50	No
	24	z	-0.092	0.50	No
		z	-0.092	5.00	No
		z	-0.013	2.00	No
WI30	22	3	-0.027	1.00	No
		3	-0.027	5.00	No
		3	-0.013	2.00	No
	23	3	-0.021	0.50	No
		3	-0.021	3.50	No
	24	3	-0.088	0.50	No
		3	-0.088	5.00	No
		3	-0.013	2.00	No
WI60	22	3	-0.024	1.00	No
		3	-0.024	5.00	No
		3	-0.013	2.00	No
	23	3	-0.015	0.50	No
		3	-0.015	3.50	No
	24	3	-0.078	0.50	No
		3	-0.078	5.00	No
		3	-0.015	2.00	No
WI90	22	x	-0.022	1.00	No
		x	-0.022	5.00	No
		x	-0.013	2.00	No
	23	x	-0.012	0.50	No
		x	-0.012	3.50	No
	24	x	-0.037	0.50	No
		x	-0.037	5.00	No
		x	-0.015	2.00	No
WI120	22	2	-0.024	1.00	No
		2	-0.024	5.00	No
		2	-0.013	2.00	No
	23	2	-0.015	0.50	No
		2	-0.015	3.50	No
	24	2	-0.078	0.50	No
		2	-0.078	5.00	No
		2	-0.015	2.00	No
WI150	22	2	-0.027	1.00	No
		2	-0.027	5.00	No
		2	-0.013	2.00	No
	23	2	-0.021	0.50	No
		2	-0.021	3.50	No
	24	2	-0.088	0.50	No
		2	-0.088	5.00	No
		2	-0.013	2.00	No
WL0	22	z	-0.008	1.00	No
		z	-0.008	5.00	No
		z	-0.003	2.00	No
	23	z	-0.007	0.50	No
		z	-0.007	3.50	No
	24	z	-0.026	0.50	No

		z	-0.026	5.00	No
		z	-0.003	2.00	No
WL30	22	3	-0.007	1.00	No
		3	-0.007	5.00	No
		3	-0.003	2.00	No
	23	3	-0.006	0.50	No
		3	-0.006	3.50	No
	24	3	-0.025	0.50	No
		3	-0.025	5.00	No
		3	-0.003	2.00	No
WL60	22	3	-0.006	1.00	No
		3	-0.006	5.00	No
		3	-0.003	2.00	No
	23	3	-0.004	0.50	No
		3	-0.004	3.50	No
	24	3	-0.021	0.50	No
		3	-0.021	5.00	No
		3	-0.003	2.00	No
WL90	22	x	-0.005	1.00	No
		x	-0.005	5.00	No
		x	-0.003	2.00	No
	23	x	-0.003	0.50	No
		x	-0.003	3.50	No
	24	x	-0.01	0.50	No
		x	-0.01	5.00	No
		x	-0.003	2.00	No
WL120	22	2	-0.006	1.00	No
		2	-0.006	5.00	No
		2	-0.003	2.00	No
	23	2	-0.004	0.50	No
		2	-0.004	3.50	No
	24	2	-0.021	0.50	No
		2	-0.021	5.00	No
		2	-0.003	2.00	No
WL150	22	2	-0.007	1.00	No
		2	-0.007	5.00	No
		2	-0.003	2.00	No
	23	2	-0.006	0.50	No
		2	-0.006	3.50	No
	24	2	-0.025	0.50	No
		2	-0.025	5.00	No
		2	-0.003	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	-0.25	50.00	Yes
LLa2	24	y	-0.25	50.00	Yes
LLa3	23	y	-0.25	50.00	Yes
LLa4	21	y	-0.25	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	250 lb Live Load on Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load on Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load on Antenna 3	No	0.00	0.00	0.00
LLa4	250 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
CONNECT Edition

Current Date: 6/14/2022 10:05 AM
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	**1**	LC12 at 0.00%	1.04	N.G.	Eq. H1-1b
		2	LC6 at 0.00%	**1.17**	**N.G.**	Eq. H1-1b
	PIPE 1-1_2x0.145	**6**	LC36 at 100.00%	0.53	OK	Eq. H1-1b
		7	LC32 at 0.00%	0.88	OK	Eq. H1-1b
		18	LC30 at 100.00%	0.67	OK	Eq. H1-1b
		19	LC11 at 59.38%	**0.97**	**OK**	Eq. H1-1b
		20	LC40 at 100.00%	0.83	OK	Eq. H1-1b
	PIPE 2-1_2x0.203	**4**	LC32 at 10.42%	0.79	OK	Eq. H1-1b
		5	LC32 at 0.00%	**1.29**	**N.G.**	Eq. H1-1b
		8	LC12 at 49.22%	1.19	N.G.	Eq. H1-1b
		9	LC6 at 49.22%	0.82	OK	Eq. H1-1b
	PIPE 2x0.154	**21**	LC38 at 8.33%	0.36	OK	Eq. H1-1b
		22	LC40 at 50.00%	0.64	OK	Eq. H1-1b
		23	LC38 at 50.00%	0.38	OK	Eq. H1-1b
		24	LC7 at 47.92%	**1.35**	**N.G.**	Eq. H1-1b
		25	LC12 at 100.00%	0.40	OK	Eq. H1-1b
	PIPE 3x0.216	**3**	LC6 at 50.00%	**1.11**	**N.G.**	Eq. H1-1b

RAM® Elements
CONNECT Edition

Current Date: 6/14/2022 10:05 AM
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
4	-0.75	0.00	-4.25	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	-5.00	1.00	-7.00	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
4	1	1	1	1	1	1
14	1	1	1	1	1	1
47	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	4	5		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
2	14	15		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
3	17	16		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
23	44	38		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
25	47	46		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

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

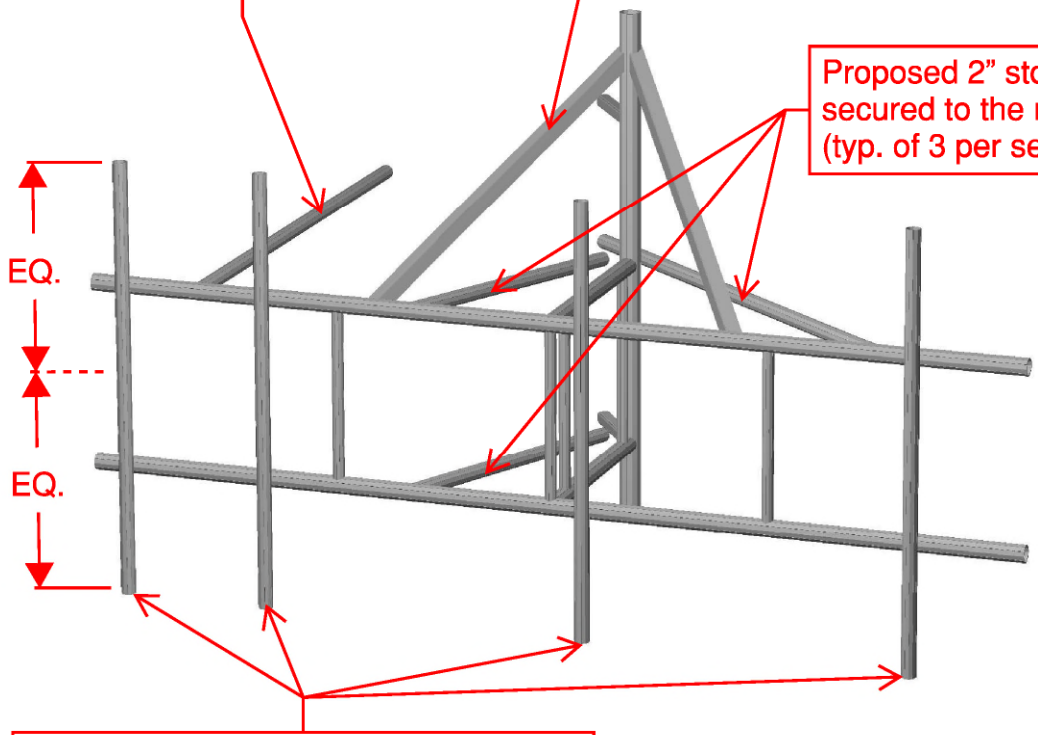
HUDSON
Design Group LLC

Mount Calculations
(Modified Conditions)

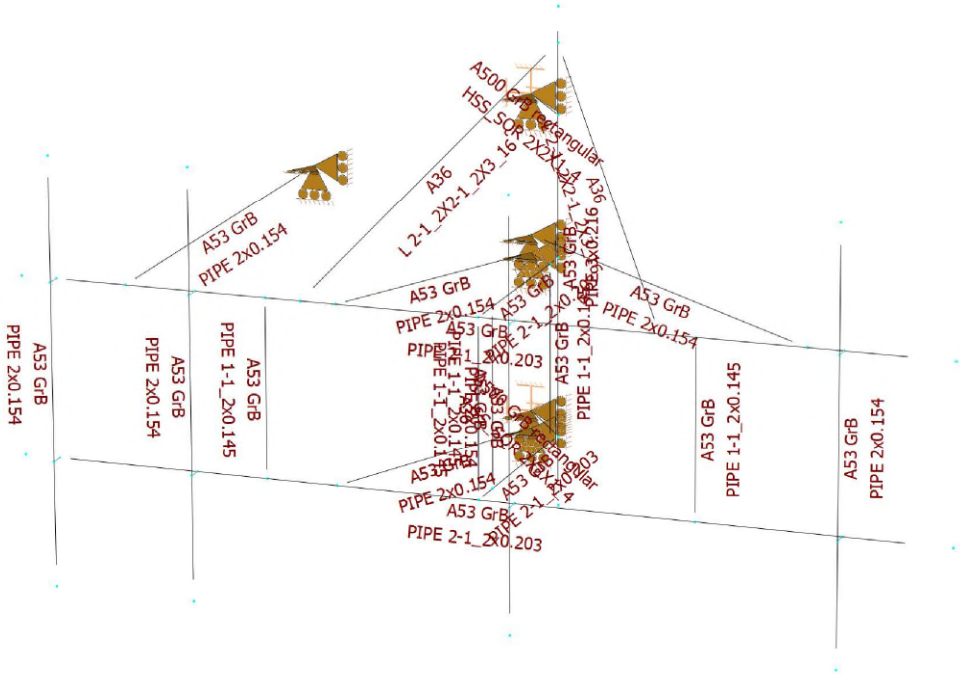
Proposed sector frame stabilizer, SitePro1 P/N SFS-V-L (or approved equal), secured to existing horizontal face pipe and vertical mounting pipe mast (typ. of 1 per sector, total of 3).

Relocate the mount connection of the existing 2" std. (2.38 " O.D.) pipe brace from the vertical pipe brace to the mount face (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).

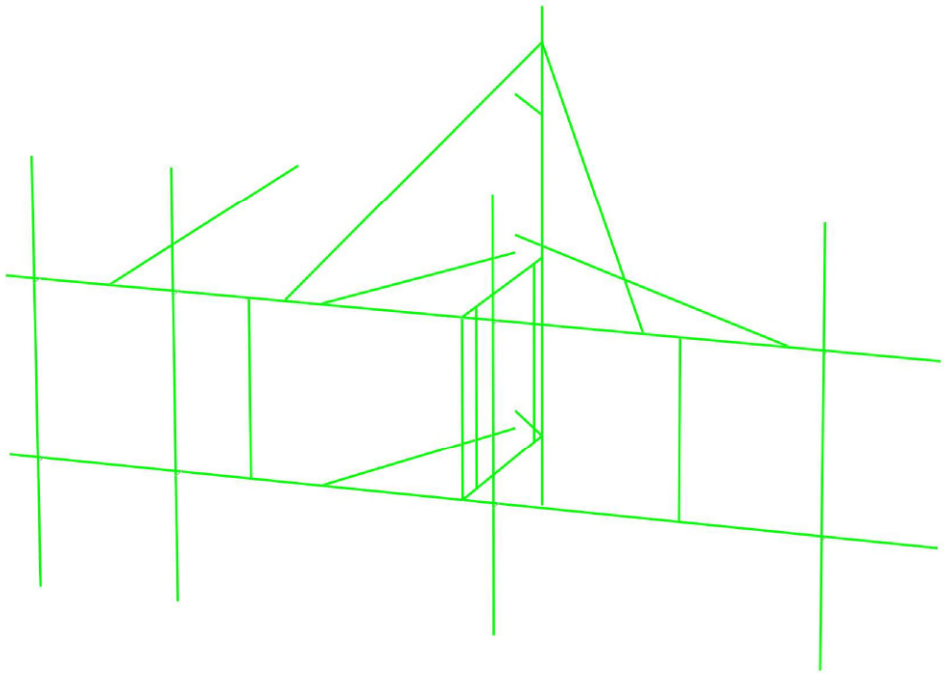


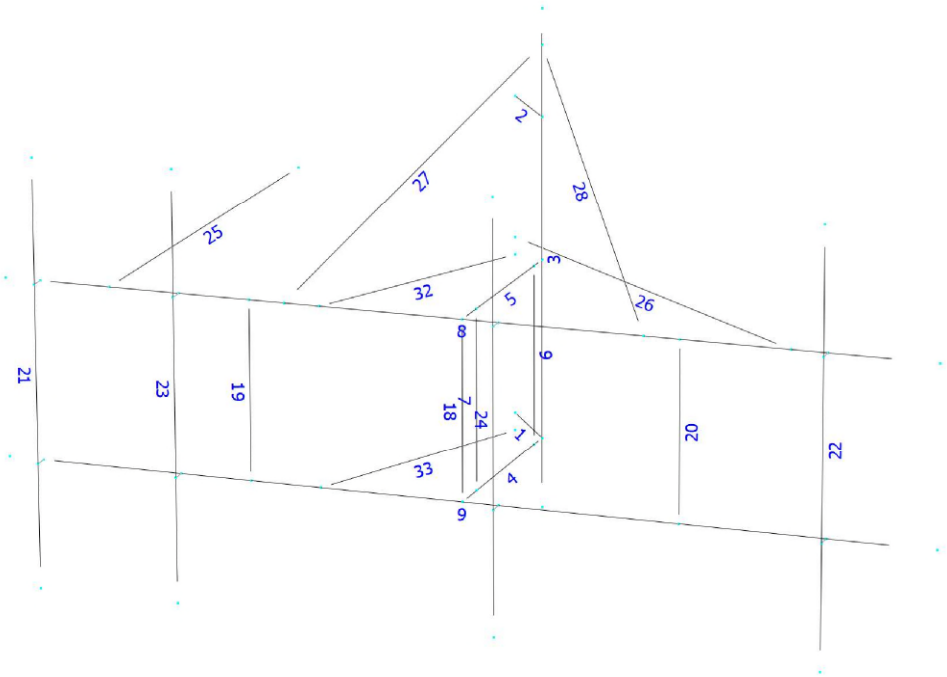
Center existing pipe masts on mount face (typ. of 4 per sector, total of 12).


A500 GrB Rectangular
HSS_SQR 2X2X1.2A
A36
L 2-1_2X2-1_2X3_16
A53 GrB
PIPE 2X0.154
A53 GrB
PIPE 2-1_2X0.203
A53 GrB
PIPE 1-1_2X0.145
A53 GrB
PIPE 2X0.154


Y
Z
X

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




2
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4
9


Y
Z
X

RAM® Elements
CONNECT Edition

Current Date: 6/14/2022 12:17 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	**1**	LC5 at 0.00%	0.75	OK	Eq. H1-1b
		2	LC6 at 0.00%	**0.84**	**OK**	Eq. H1-1b
	L 2-1_2X2-1_2X3_16	**27**	LC11 at 0.00%	**0.78**	**OK**	Sec. F1
		28	LC40 at 0.00%	0.34	OK	Eq. H2-1
	PIPE 1-1_2x0.145	**6**	LC26 at 100.00%	0.32	OK	Eq. H1-1b
		7	LC36 at 0.00%	0.37	OK	Eq. H1-1b
		18	LC25 at 0.00%	0.26	OK	Eq. H1-1b
		19	LC38 at 0.00%	0.43	OK	Eq. H1-1b
		20	LC40 at 100.00%	**0.53**	**OK**	Eq. H1-1b
	PIPE 2-1_2x0.203	**4**	LC3 at 0.00%	0.37	OK	Eq. H1-1b
		5	LC36 at 0.00%	0.45	OK	Eq. H1-1b
		8	LC11 at 34.13%	**0.87**	**OK**	Eq. H1-1b
		9	LC12 at 34.03%	0.60	OK	Eq. H1-1b
	PIPE 2x0.154	**21**	LC38 at 29.17%	0.31	OK	Eq. H1-1b
		22	LC40 at 29.17%	0.51	OK	Eq. H1-1b
		23	LC38 at 29.17%	0.27	OK	Eq. H1-1b
		24	LC7 at 27.08%	0.62	OK	Eq. H1-1b
		25	LC11 at 100.00%	**0.63**	**OK**	Eq. H1-1b
		26	LC40 at 0.00%	0.15	OK	Eq. H1-1b
		32	LC11 at 100.00%	0.47	OK	Eq. H1-1b
		33	LC12 at 100.00%	0.42	OK	Eq. H1-1b
	PIPE 3x0.216	**3**	LC31 at 77.50%	**0.51**	**OK**	Eq. H1-1b

RAM® Elements
CONNECT Edition

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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
4	-0.75	0.00	-4.25	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	-1.75	0.20	0
39	5.00	-1.75	0.20	0
40	-6.00	-1.75	0.20	0
41	0.50	-1.75	0.20	0
42	-6.00	4.25	0.20	0
43	5.00	4.25	0.20	0
44	-4.00	4.25	0.20	0
45	0.50	4.25	0.20	0
46	-5.00	2.50	0.00	0
47	-5.00	2.50	-7.00	0
48	4.50	2.50	0.00	0
49	-0.75	2.50	-4.25	0
50	-2.50	2.50	0.00	0
51	0.00	5.50	-3.21	0
52	2.50	2.50	0.00	0
59	-0.75	2.25	-4.25	0
60	-2.00	2.50	0.00	0
61	-0.75	-0.25	-4.25	0
62	-2.00	0.00	0.00	0

Restraints

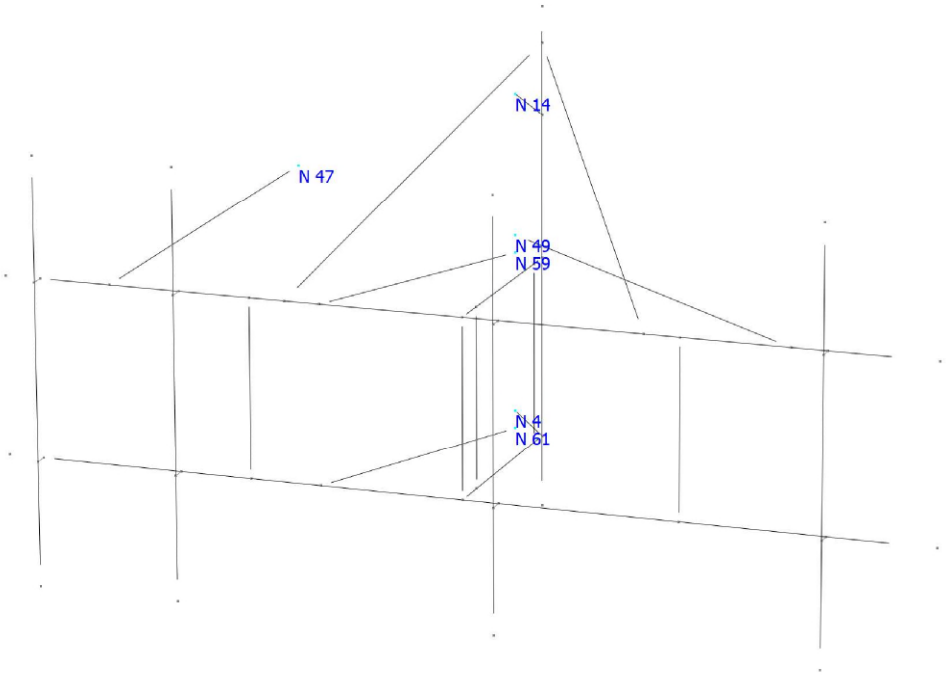
Node	TX	TY	TZ	RX	RY	RZ
4	1	1	1	1	1	1
14	1	1	1	1	1	1
47	1	1	1	0	0	0
49	1	1	1	0	0	0
59	1	1	1	0	0	0
61	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	4	5		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
2	14	15		HSS_SQR 2X2X1_4	A500 GrB rectangular	0.00	0.00	0.00
3	17	16		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
23	44	38		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
25	47	46		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
26	48	49		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
27	50	51		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
28	52	51		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
32	59	60		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
33	61	62		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

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


N 14
N 47
N 49
N 59
N 4
N 61


Y
Z
X

RAM® Elements
CONNECT Edition

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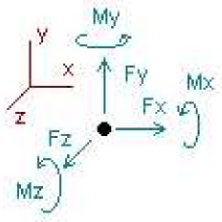
Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2D+1.6Wo**						
4	0.13850	0.62016	1.28473	-0.36600	-0.82375	0.23352
14	-0.46231	0.36690	-0.63173	-0.29528	-0.32889	0.16211
47	-0.03535	0.02690	-0.35096	0.00000	0.00000	0.00000
49	0.82661	0.00048	0.66616	0.00000	0.00000	0.00000
59	-0.30445	0.07217	0.89964	0.00000	0.00000	0.00000
61	-0.16300	0.04704	0.42792	0.00000	0.00000	0.00000
SUM	0.00000	1.13365	2.29575	-0.66128	-1.15265	0.39563
Condition **LC2=1.2D+1.6W30**						
4	0.48518	0.77986	1.32083	-0.42716	0.02241	0.31285
14	-0.13976	0.32844	-0.82760	-0.32664	0.49533	0.14796
47	0.01593	0.00206	0.55457	0.00000	0.00000	0.00000
49	0.65562	0.00361	0.54230	0.00000	0.00000	0.00000
59	0.00978	0.01224	0.07319	0.00000	0.00000	0.00000
61	-0.00626	0.00744	0.09456	0.00000	0.00000	0.00000
SUM	1.02050	1.13365	1.75785	-0.75380	0.51773	0.46081
Condition **LC3=1.2D+1.6W60**						
4	0.70720	0.85995	1.23679	-0.46036	0.48337	0.34468
14	0.09571	0.30435	-0.96972	-0.33611	0.95280	0.14201
47	0.06959	-0.00502	0.79335	0.00000	0.00000	0.00000
49	0.46466	0.00825	0.39282	0.00000	0.00000	0.00000
59	0.18808	-0.01588	-0.35724	0.00000	0.00000	0.00000
61	0.14269	-0.01801	-0.23956	0.00000	0.00000	0.00000
SUM	1.66794	1.13365	0.85645	-0.79648	1.43617	0.48669
Condition **LC4=1.2D+1.6W90**						
4	0.67279	0.84446	0.85499	-0.45491	0.72191	0.34346
14	0.16967	0.33814	-1.12522	-0.35054	1.16636	0.14858
47	0.07733	-0.00832	0.91999	0.00000	0.00000	0.00000
49	0.20820	0.01230	0.18600	0.00000	0.00000	0.00000
59	0.26079	-0.03028	-0.55970	0.00000	0.00000	0.00000
61	0.16351	-0.02266	-0.27606	0.00000	0.00000	0.00000
SUM	1.55229	1.13365	0.00000	-0.80545	1.88828	0.49204

Condition **LC5=1.2D+1.6W120**

4	0.72174	0.86574	0.52560	-0.46338	1.11607	0.36031
14	0.28429	0.35883	-1.30730	-0.36855	1.51591	0.15346
47	0.09254	-0.01582	1.22235	0.00000	0.00000	0.00000
49	-0.04026	0.01656	-0.01445	0.00000	0.00000	0.00000
59	0.39283	-0.05612	-0.90509	0.00000	0.00000	0.00000
61	0.21680	-0.03552	-0.37754	0.00000	0.00000	0.00000
SUM	1.66794	1.13365	-0.85645	-0.83192	2.63198	0.51377

Condition **LC6=1.2D+1.6W150**

4	0.46947	0.79487	0.10077	-0.43456	1.06218	0.33628
14	0.25082	0.40773	-1.41429	-0.38231	1.50579	0.15325
47	0.06133	-0.00923	0.95996	0.00000	0.00000	0.00000
49	-0.34176	0.02290	-0.26215	0.00000	0.00000	0.00000
59	0.35433	-0.04887	-0.86914	0.00000	0.00000	0.00000
61	0.22629	-0.03375	-0.47459	0.00000	0.00000	0.00000
SUM	1.02050	1.13365	-1.95945	-0.81687	2.56797	0.48953

Condition **LC7=1.2D-1.6Wo**

4	0.12720	0.64230	-0.29661	-0.37712	0.53407	0.26720
14	0.00513	0.47353	-1.40100	-0.36786	0.95623	0.17482
47	0.02837	0.00672	0.25166	0.00000	0.00000	0.00000
49	-0.39264	0.02195	-0.30660	0.00000	0.00000	0.00000
59	0.13937	-0.00951	-0.35225	0.00000	0.00000	0.00000
61	0.09256	-0.00134	-0.19095	0.00000	0.00000	0.00000
SUM	0.00000	1.13365	-2.29575	-0.74498	1.49030	0.44202

Condition **LC8=1.2D-1.6W30**

4	-0.21964	0.48611	-0.32740	-0.31736	-0.29800	0.18986
14	-0.31667	0.51068	-1.20765	-0.33692	0.14495	0.18885
47	-0.02230	0.03172	-0.63554	0.00000	0.00000	0.00000
49	-0.22708	0.01781	-0.17716	0.00000	0.00000	0.00000
59	-0.17155	0.04955	0.45461	0.00000	0.00000	0.00000
61	-0.06326	0.03777	0.13528	0.00000	0.00000	0.00000
SUM	-1.02050	1.13365	-1.75785	-0.65429	-0.15305	0.37872

Condition **LC9=1.2D-1.6W60**

4	-0.44573	0.40510	-0.24495	-0.28377	-0.75682	0.15801
14	-0.55139	0.53598	-1.06598	-0.32802	-0.30948	0.19483
47	-0.08032	0.04044	-0.87437	0.00000	0.00000	0.00000
49	-0.03893	0.01317	-0.02905	0.00000	0.00000	0.00000
59	-0.34399	0.07655	0.88741	0.00000	0.00000	0.00000
61	-0.20758	0.06241	0.47049	0.00000	0.00000	0.00000
SUM	-1.66794	1.13365	-0.85645	-0.61180	-1.06630	0.35284

Condition **LC10=1.2D-1.6W90**

4	-0.41057	0.41897	0.13498	-0.28845	-0.99878	0.15841
14	-0.62526	0.50240	-0.90811	-0.31318	-0.52746	0.18828
47	-0.09098	0.04481	-1.00851	0.00000	0.00000	0.00000
49	0.21766	0.00968	0.17387	0.00000	0.00000	0.00000
59	-0.41499	0.09067	1.09776	0.00000	0.00000	0.00000
61	-0.22814	0.06711	0.51000	0.00000	0.00000	0.00000
SUM	-1.55229	1.13365	0.00000	-0.60164	-1.52625	0.34669

Condition **LC11=1.2D-1.6W120**

4	-0.46046	0.39389	0.45896	-0.27832	-1.39870	0.13993
14	-0.74122	0.48294	-0.72390	-0.29462	-0.88473	0.18369
47	-0.11398	0.05545	-1.32587	0.00000	0.00000	0.00000
49	0.46865	0.00613	0.36995	0.00000	0.00000	0.00000
59	-0.54157	0.11546	1.45961	0.00000	0.00000	0.00000
61	-0.27937	0.07978	0.61770	0.00000	0.00000	0.00000
SUM	-1.66794	1.13365	0.85645	-0.57294	-2.28343	0.32362

Condition **LC12=1.2D-1.6W150**

4	-0.20781	0.46336	0.87989	-0.30662	-1.35394	0.16302
14	-0.70862	0.43480	-0.61558	-0.28076	-0.88278	0.18397
47	-0.07927	0.04700	-1.07184	0.00000	0.00000	0.00000
49	0.77406	0.00048	0.61362	0.00000	0.00000	0.00000
59	-0.50889	0.10958	1.43379	0.00000	0.00000	0.00000
61	-0.28996	0.07843	0.71957	0.00000	0.00000	0.00000
SUM	-1.02050	1.13365	1.95945	-0.58738	-2.23672	0.34700

Condition **LC13=0.9D+1.6Wo**

4	0.10498	0.46190	1.16066	-0.27278	-0.78841	0.17066
14	-0.40462	0.26165	-0.37702	-0.21218	-0.40831	0.11988
47	-0.03471	0.02270	-0.33991	0.00000	0.00000	0.00000
49	0.77253	-0.00206	0.62092	0.00000	0.00000	0.00000
59	-0.28391	0.06457	0.83220	0.00000	0.00000	0.00000
61	-0.15428	0.04146	0.39891	0.00000	0.00000	0.00000
SUM	0.00000	0.85024	2.29575	-0.48496	-1.19671	0.29054

Condition **LC14=0.9D+1.6W30**

4	0.45205	0.62180	1.19671	-0.33402	0.05773	0.25001
14	-0.08309	0.22316	-0.57299	-0.24353	0.41573	0.10580
47	0.01648	-0.00190	0.56546	0.00000	0.00000	0.00000
49	0.60172	0.00107	0.49669	0.00000	0.00000	0.00000
59	0.03062	0.00437	0.00649	0.00000	0.00000	0.00000
61	0.00272	0.00173	0.06549	0.00000	0.00000	0.00000
SUM	1.02050	0.85024	1.75785	-0.57755	0.47345	0.35581

Condition **LC15=0.9D+1.6W60**

4	0.67421	0.70201	1.11265	-0.36730	0.51859	0.28188
14	0.15196	0.19912	-0.71527	-0.25304	0.87322	0.09988
47	0.07010	-0.00890	0.80413	0.00000	0.00000	0.00000
49	0.41088	0.00569	0.34702	0.00000	0.00000	0.00000
59	0.20902	-0.02386	-0.42348	0.00000	0.00000	0.00000
61	0.15177	-0.02382	-0.26861	0.00000	0.00000	0.00000
SUM	1.66794	0.85024	0.85645	-0.62035	1.39181	0.38176

Condition **LC16=0.9D+1.6W90**

4	0.63988	0.68658	0.73089	-0.36193	0.75705	0.28069
14	0.22570	0.23296	-0.87095	-0.26752	1.08682	0.10649
47	0.07782	-0.01217	0.93068	0.00000	0.00000	0.00000
49	0.15452	0.00966	0.14018	0.00000	0.00000	0.00000
59	0.28175	-0.03831	-0.62572	0.00000	0.00000	0.00000
61	0.17262	-0.02848	-0.30508	0.00000	0.00000	0.00000
SUM	1.55229	0.85024	0.00000	-0.62945	1.84387	0.38719

Condition **LC17=0.9D+1.6W120**

4	0.68900	0.70795	0.40153	-0.37048	1.15114	0.29759
14	0.33988	0.25366	-1.05318	-0.28557	1.43631	0.11143
47	0.09300	-0.01959	1.23293	0.00000	0.00000	0.00000
49	-0.09379	0.01386	-0.06038	0.00000	0.00000	0.00000
59	0.41386	-0.06426	-0.97079	0.00000	0.00000	0.00000
61	0.22599	-0.04138	-0.40656	0.00000	0.00000	0.00000
SUM	1.66794	0.85024	-0.85645	-0.65605	2.58745	0.40901

Condition **LC18=0.9D+1.6W150**

4	0.43670	0.63712	-0.02323	-0.34175	1.09717	0.27361
14	0.30644	0.30266	-1.16039	-0.29942	1.42630	0.11126
47	0.06181	-0.01307	0.97051	0.00000	0.00000	0.00000
49	-0.39521	0.02011	-0.30802	0.00000	0.00000	0.00000
59	0.37530	-0.05697	-0.93476	0.00000	0.00000	0.00000
61	0.23545	-0.03963	-0.50357	0.00000	0.00000	0.00000
SUM	1.02050	0.85024	-1.95945	-0.64117	2.52347	0.38487

Condition **LC19=0.9D-1.6Wo**

4	0.09417	0.48443	-0.42051	-0.28431	0.56901	0.20454
14	0.06144	0.36854	-1.14718	-0.28504	0.87692	0.13280
47	0.02891	0.00270	0.26228	0.00000	0.00000	0.00000
49	-0.44615	0.01911	-0.35215	0.00000	0.00000	0.00000
59	0.16012	-0.01743	-0.41833	0.00000	0.00000	0.00000
61	0.10151	-0.00710	-0.21986	0.00000	0.00000	0.00000
SUM	0.00000	0.85024	-2.29575	-0.56935	1.44593	0.33734

Condition **LC20=0.9D-1.6W30**

4	-0.25305	0.32805	-0.45124	-0.22446	-0.26303	0.12718
14	-0.25936	0.40572	-0.95373	-0.25412	0.06581	0.14677
47	-0.02168	0.02747	-0.62476	0.00000	0.00000	0.00000
49	-0.28076	0.01497	-0.22234	0.00000	0.00000	0.00000
59	-0.15109	0.04189	0.38781	0.00000	0.00000	0.00000
61	-0.05455	0.03214	0.10642	0.00000	0.00000	0.00000
SUM	-1.02050	0.85024	-1.75785	-0.47858	-0.19722	0.27395

Condition **LC21=0.9D-1.6W60**

4	-0.47927	0.24691	-0.36877	-0.19080	-0.72176	0.09530
14	-0.49367	0.43096	-0.81189	-0.24518	-0.38864	0.15271
47	-0.07966	0.03612	-0.86348	0.00000	0.00000	0.00000
49	-0.09273	0.01036	-0.07407	0.00000	0.00000	0.00000
59	-0.32363	0.06901	0.82015	0.00000	0.00000	0.00000
61	-0.19898	0.05688	0.44161	0.00000	0.00000	0.00000
SUM	-1.66794	0.85024	-0.85645	-0.43598	-1.11040	0.24801

Condition **LC22=0.9D-1.6W90**

4	-0.44420	0.26073	0.01111	-0.19540	-0.96364	0.09566
14	-0.56731	0.39735	-0.65386	-0.23029	-0.60665	0.14612
47	-0.09030	0.04045	-0.99754	0.00000	0.00000	0.00000
49	0.16375	0.00694	0.12890	0.00000	0.00000	0.00000
59	-0.39466	0.08317	1.03028	0.00000	0.00000	0.00000
61	-0.21957	0.06160	0.48110	0.00000	0.00000	0.00000
SUM	-1.55229	0.85024	0.00000	-0.42569	-1.57029	0.24178

Condition **LC23=0.9D-1.6W120**

4	-0.49427	0.23555	0.33505	-0.18518	-1.36349	0.07713
14	-0.68281	0.37787	-0.46949	-0.21169	-0.96386	0.14148
47	-0.11326	0.05100	-1.31479	0.00000	0.00000	0.00000
49	0.41460	0.00344	0.32509	0.00000	0.00000	0.00000
59	-0.52133	0.10807	1.39179	0.00000	0.00000	0.00000
61	-0.27088	0.07430	0.58880	0.00000	0.00000	0.00000
SUM	-1.66794	0.85024	0.85645	-0.39686	-2.32735	0.21862

Condition **LC24=0.9D-1.6W150**

4	-0.24160	0.30498	0.75592	-0.21339	-1.31865	0.10017
14	-0.65023	0.32962	-0.36094	-0.19773	-0.96201	0.14172
47	-0.07856	0.04262	-1.06073	0.00000	0.00000	0.00000
49	0.71992	-0.00212	0.56870	0.00000	0.00000	0.00000
59	-0.48859	0.10216	1.36589	0.00000	0.00000	0.00000
61	-0.28144	0.07297	0.69062	0.00000	0.00000	0.00000
SUM	-1.02050	0.85024	1.95945	-0.41112	-2.28066	0.24189

Condition **LC25=1.2D+Di+WI0**

4	0.32193	1.40379	1.29384	-0.82817	-0.43145	0.55390
14	-0.61111	0.91134	-2.25632	-0.72331	0.58111	0.37562
47	-0.01025	0.04978	-0.16285	0.00000	0.00000	0.00000
49	0.59892	0.00848	0.50022	0.00000	0.00000	0.00000
59	-0.21487	0.08220	0.67959	0.00000	0.00000	0.00000
61	-0.08462	0.05964	0.26351	0.00000	0.00000	0.00000
SUM	0.00000	2.51523	0.31800	-1.55148	0.14966	0.92952

Condition **LC26=1.2D+Di+WI30**

4	0.39349	1.43646	1.30439	-0.84065	-0.25861	0.57007
14	-0.54099	0.90331	-2.29489	-0.72984	0.75200	0.37229
47	0.00041	0.04442	0.02374	0.00000	0.00000	0.00000
49	0.56068	0.00924	0.47202	0.00000	0.00000	0.00000
59	-0.15041	0.07018	0.50997	0.00000	0.00000	0.00000
61	-0.05247	0.05163	0.19548	0.00000	0.00000	0.00000
SUM	0.21072	2.51523	0.21072	-1.57049	0.49339	0.94236

Condition **LC27=1.2D+Di+WI60**

4	0.38500	1.43298	1.29056	-0.83933	-0.26824	0.56856
14	-0.54592	0.90509	-2.29541	-0.72965	0.74114	0.37285
47	-0.00041	0.04480	0.00433	0.00000	0.00000	0.00000
49	0.55522	0.00933	0.46745	0.00000	0.00000	0.00000
59	-0.15395	0.07079	0.51832	0.00000	0.00000	0.00000
61	-0.05468	0.05224	0.20002	0.00000	0.00000	0.00000
SUM	0.18526	2.51523	0.18526	-1.56898	0.47291	0.94142

Condition **LC28=1.2D+Di+WI90**

4	0.38176	1.43177	1.21418	-0.83891	-0.20945	0.56922
14	-0.52484	0.91144	-2.32845	-0.73302	0.79601	0.37378
47	0.00207	0.04370	0.04101	0.00000	0.00000	0.00000
49	0.49482	0.01030	0.41944	0.00000	0.00000	0.00000
59	-0.13522	0.06719	0.46540	0.00000	0.00000	0.00000
61	-0.04859	0.05085	0.18843	0.00000	0.00000	0.00000
SUM	0.17000	2.51523	0.00000	-1.57193	0.58656	0.94300

Condition **LC29=1.2D+Di+WI120**

4	0.39019	1.43578	1.14489	-0.84046	-0.12915	0.57250
14	-0.49993	0.91584	-2.36530	-0.73676	0.86809	0.37464
47	0.00582	0.04186	0.10124	0.00000	0.00000	0.00000
49	0.43622	0.01126	0.37298	0.00000	0.00000	0.00000
59	-0.10884	0.06212	0.39306	0.00000	0.00000	0.00000
61	-0.03820	0.04836	0.16787	0.00000	0.00000	0.00000
SUM	0.18526	2.51523	-0.18526	-1.57723	0.73894	0.94714

Condition **LC30=1.2D+Di+WI150**

4	0.39821	1.43970	1.14268	-0.84197	-0.10684	0.57450
14	-0.49093	0.91518	-2.37102	-0.73773	0.88994	0.37428
47	0.00706	0.04120	0.12130	0.00000	0.00000	0.00000
49	0.43023	0.01139	0.36842	0.00000	0.00000	0.00000
59	-0.09993	0.06043	0.36928	0.00000	0.00000	0.00000
61	-0.03392	0.04733	0.15861	0.00000	0.00000	0.00000
SUM	0.21072	2.51523	-0.21072	-1.57970	0.78310	0.94878

Condition **LC31=1.2D+Di-WI0**

4	0.32983	1.40974	1.05433	-0.83052	-0.20307	0.56098
14	-0.53396	0.92839	-2.36733	-0.73512	0.78917	0.37827
47	0.00005	0.04477	-0.01826	0.00000	0.00000	0.00000
49	0.39865	0.01179	0.34153	0.00000	0.00000	0.00000
59	-0.13820	0.06741	0.46473	0.00000	0.00000	0.00000
61	-0.05637	0.05312	0.20701	0.00000	0.00000	0.00000
SUM	0.00000	2.51523	-0.31800	-1.56564	0.58611	0.93925

Condition **LC32=1.2D+Di-WI30**

4	0.25818	1.37717	1.04389	-0.81807	-0.37549	0.54487
14	-0.60403	0.93642	-2.32886	-0.72861	0.61871	0.38159
47	-0.01062	0.05014	-0.20431	0.00000	0.00000	0.00000
49	0.43667	0.01099	0.36987	0.00000	0.00000	0.00000
59	-0.20252	0.07940	0.63382	0.00000	0.00000	0.00000
61	-0.08840	0.06111	0.27487	0.00000	0.00000	0.00000
SUM	-0.21072	2.51523	-0.21072	-1.54669	0.24322	0.92646

Condition **LC33=1.2D+Di-WI60**

4	0.26670	1.38064	1.05772	-0.81939	-0.36592	0.54637
14	-0.59910	0.93464	-2.32833	-0.72880	0.62952	0.38104
47	-0.00977	0.04975	-0.18494	0.00000	0.00000	0.00000
49	0.44216	0.01091	0.37443	0.00000	0.00000	0.00000
59	-0.19902	0.07880	0.62551	0.00000	0.00000	0.00000
61	-0.08622	0.06050	0.27034	0.00000	0.00000	0.00000
SUM	-0.18526	2.51523	-0.18526	-1.54820	0.26361	0.92741

Condition **LC34=1.2D+Di-WI90**

4	0.26995	1.38182	1.13405	-0.81980	-0.42475	0.54569
14	-0.62017	0.92829	-2.29522	-0.72542	0.57458	0.38011
47	-0.01235	0.05088	-0.22177	0.00000	0.00000	0.00000
49	0.50253	0.00996	0.42232	0.00000	0.00000	0.00000
59	-0.21767	0.08239	0.67861	0.00000	0.00000	0.00000
61	-0.09229	0.06189	0.28202	0.00000	0.00000	0.00000
SUM	-0.17000	2.51523	0.00000	-1.54522	0.14983	0.92581

Condition **LC35=1.2D+Di-Wl120**

4	0.26151	1.37769	1.20317	-0.81819	-0.50524	0.54237
14	-0.64514	0.92392	-2.25830	-0.72166	0.50223	0.37926
47	-0.01631	0.05281	-0.28248	0.00000	0.00000	0.00000
49	0.56122	0.00902	0.46863	0.00000	0.00000	0.00000
59	-0.24391	0.08743	0.75147	0.00000	0.00000	0.00000
61	-0.10264	0.06437	0.30277	0.00000	0.00000	0.00000
SUM	-0.18526	2.51523	0.18526	-1.53985	-0.00300	0.92163

Condition **LC36=1.2D+Di-Wl150**

4	0.25347	1.37374	1.20533	-0.81667	-0.52758	0.54035
14	-0.65415	0.92460	-2.25256	-0.72069	0.48032	0.37962
47	-0.01765	0.05351	-0.30266	0.00000	0.00000	0.00000
49	0.56722	0.00889	0.47313	0.00000	0.00000	0.00000
59	-0.25272	0.08910	0.77539	0.00000	0.00000	0.00000
61	-0.10688	0.06540	0.31209	0.00000	0.00000	0.00000
SUM	-0.21072	2.51523	0.21072	-1.53736	-0.04726	0.91998

Condition **LC37=0.9D**

4	0.09976	0.47446	0.37203	-0.27905	-0.10542	0.18825
14	-0.17093	0.31461	-0.76277	-0.24877	0.23855	0.12625
47	-0.00176	0.01229	-0.03252	0.00000	0.00000	0.00000
49	0.16141	0.00826	0.13632	0.00000	0.00000	0.00000
59	-0.06192	0.02350	0.19998	0.00000	0.00000	0.00000
61	-0.02656	0.01711	0.08696	0.00000	0.00000	0.00000
SUM	0.00000	0.85024	0.00000	-0.52782	0.13313	0.31450

Condition **LC38=1.2D+1.6LL1**

4	-0.14528	0.68380	0.38169	-0.43354	-0.39364	0.26384
14	0.38525	0.68197	-1.51589	-0.52506	0.94690	0.14562
47	-0.00693	0.03658	-0.13607	0.00000	0.00000	0.00000
49	0.14138	0.01083	0.11647	0.00000	0.00000	0.00000
59	-0.25349	0.07182	0.79970	0.00000	0.00000	0.00000
61	-0.12092	0.04866	0.35410	0.00000	0.00000	0.00000
SUM	0.00000	1.53365	0.00000	-0.95860	0.55327	0.40945

Condition **LC39=1.2D+1.6LL2**

4	0.17532	0.83745	0.70067	-0.50127	-0.20695	0.33201
14	-0.28199	0.59710	-1.39262	-0.45960	0.45771	0.23447
47	-0.00307	0.01762	-0.06123	0.00000	0.00000	0.00000
49	0.27103	0.01173	0.22874	0.00000	0.00000	0.00000
59	-0.10806	0.03937	0.34937	0.00000	0.00000	0.00000
61	-0.05323	0.03038	0.17507	0.00000	0.00000	0.00000
SUM	0.00000	1.53365	0.00000	-0.96088	0.25076	0.56648

Condition **LC40=1.2D+1.6LL3**

4	0.47257	1.09452	0.90603	-0.60144	-0.00631	0.44119
14	-1.00140	0.40118	-1.41147	-0.37966	-0.01564	0.28381
47	-0.00091	0.00740	0.00535	0.00000	0.00000	0.00000
49	0.52919	0.00490	0.44865	0.00000	0.00000	0.00000
59	-0.01595	0.01631	0.06899	0.00000	0.00000	0.00000
61	0.01651	0.00934	-0.01754	0.00000	0.00000	0.00000
SUM	0.00000	1.53365	0.00000	-0.98110	-0.02195	0.72500

Condition **LC41=1.2D+WL0+LLa1**

4	0.30204	0.88637	0.76910	-0.50214	-0.12409	0.35344
14	-0.61766	0.43028	-1.25819	-0.37138	0.15655	0.23119
47	-0.00300	0.01319	-0.04066	0.00000	0.00000	0.00000
49	0.40042	0.00806	0.33796	0.00000	0.00000	0.00000
59	-0.06532	0.02752	0.21536	0.00000	0.00000	0.00000
61	-0.01649	0.01822	0.06445	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	0.08800	-0.87352	0.03245	0.58463

Condition **LC42=1.2D+WL30+LLa1**

4	0.32177	0.89542	0.77184	-0.50560	-0.07662	0.35791
14	-0.59881	0.42806	-1.26886	-0.37317	0.20327	0.23031
47	-0.00011	0.01179	0.01020	0.00000	0.00000	0.00000
49	0.39013	0.00828	0.33028	0.00000	0.00000	0.00000
59	-0.04744	0.02412	0.16878	0.00000	0.00000	0.00000
61	-0.00756	0.01597	0.04574	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	0.05798	-0.87876	0.12665	0.58822

Condition **LC43=1.2D+WL60+LLa1**

4	0.31841	0.89398	0.76619	-0.50506	-0.08033	0.35729
14	-0.60087	0.42883	-1.26939	-0.37310	0.19906	0.23056
47	-0.00043	0.01193	0.00290	0.00000	0.00000	0.00000
49	0.38829	0.00831	0.32873	0.00000	0.00000	0.00000
59	-0.04886	0.02437	0.17210	0.00000	0.00000	0.00000
61	-0.00845	0.01622	0.04756	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	0.04808	-0.87816	0.11872	0.58785

Condition **LC44=1.2D+WL90+LLa1**

4	0.31668	0.89329	0.74551	-0.50482	-0.06675	0.35730
14	-0.59641	0.43063	-1.27789	-0.37393	0.21142	0.23088
47	0.00010	0.01171	0.01015	0.00000	0.00000	0.00000
49	0.37348	0.00854	0.31692	0.00000	0.00000	0.00000
59	-0.04465	0.02354	0.16008	0.00000	0.00000	0.00000
61	-0.00719	0.01594	0.04522	0.00000	0.00000	0.00000
SUM	0.04200	1.38365	0.00000	-0.87875	0.14467	0.58817

Condition **LC45=1.2D+WL120+LLa1**

4	0.31941	0.89461	0.72773	-0.50534	-0.04489	0.35828
14	-0.58983	0.43169	-1.28777	-0.37494	0.23099	0.23111
47	0.00114	0.01122	0.02684	0.00000	0.00000	0.00000
49	0.35901	0.00878	0.30546	0.00000	0.00000	0.00000
59	-0.03739	0.02212	0.14030	0.00000	0.00000	0.00000
61	-0.00425	0.01522	0.03937	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	-0.04808	-0.88028	0.18610	0.58939

Condition **LC46=1.2D+WL150+LLa1**

4	0.32247	0.89606	0.72654	-0.50590	-0.03616	0.35903
14	-0.58648	0.43151	-1.29037	-0.37533	0.23957	0.23099
47	0.00163	0.01097	0.03486	0.00000	0.00000	0.00000
49	0.35696	0.00882	0.30390	0.00000	0.00000	0.00000
59	-0.03398	0.02146	0.13124	0.00000	0.00000	0.00000
61	-0.00261	0.01482	0.03584	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	-0.05798	-0.88123	0.20341	0.59002

Condition **LC47=1.2D-WL0+LLa1**

4	0.30352	0.88776	0.70215	-0.50274	-0.06276	0.35530
14	-0.59811	0.43518	-1.28929	-0.37463	0.21183	0.23208
47	-0.00032	0.01192	-0.00396	0.00000	0.00000	0.00000
49	0.34830	0.00893	0.29655	0.00000	0.00000	0.00000
59	-0.04456	0.02342	0.15743	0.00000	0.00000	0.00000
61	-0.00882	0.01644	0.04912	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	-0.08800	-0.87737	0.14907	0.58738

Condition **LC48=1.2D-WL30+LLa1**

4	0.28379	0.87872	0.69942	-0.49928	-0.11020	0.35083
14	-0.61695	0.43740	-1.27863	-0.37284	0.16514	0.23296
47	-0.00322	0.01331	-0.05479	0.00000	0.00000	0.00000
49	0.35857	0.00871	0.30424	0.00000	0.00000	0.00000
59	-0.06242	0.02682	0.20397	0.00000	0.00000	0.00000
61	-0.01774	0.01868	0.06781	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	-0.05798	-0.87212	0.05494	0.58380

Condition **LC49=1.2D-WL60+LLa1**

4	0.28715	0.88016	0.70506	-0.49982	-0.10650	0.35145
14	-0.61490	0.43663	-1.27810	-0.37291	0.16935	0.23271
47	-0.00289	0.01317	-0.04749	0.00000	0.00000	0.00000
49	0.36041	0.00868	0.30578	0.00000	0.00000	0.00000
59	-0.06100	0.02657	0.20066	0.00000	0.00000	0.00000
61	-0.01685	0.01844	0.06600	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	-0.04808	-0.87273	0.06285	0.58416

Condition **LC50=1.2D-WL90+LLa1**

4	0.28888	0.88085	0.72575	-0.50006	-0.12008	0.35144
14	-0.61935	0.43484	-1.26959	-0.37208	0.15698	0.23240
47	-0.00343	0.01339	-0.05476	0.00000	0.00000	0.00000
49	0.37522	0.00845	0.31758	0.00000	0.00000	0.00000
59	-0.06521	0.02740	0.21268	0.00000	0.00000	0.00000
61	-0.01811	0.01872	0.06834	0.00000	0.00000	0.00000
SUM	-0.04200	1.38365	0.00000	-0.87214	0.03690	0.58384

Condition **LC51=1.2D-WL120+LLa1**

4	0.28614	0.87952	0.74352	-0.49953	-0.14195	0.35045
14	-0.62594	0.43377	-1.25971	-0.37107	0.13739	0.23217
47	-0.00448	0.01389	-0.07147	0.00000	0.00000	0.00000
49	0.38970	0.00821	0.32904	0.00000	0.00000	0.00000
59	-0.07246	0.02882	0.23250	0.00000	0.00000	0.00000
61	-0.02105	0.01943	0.07421	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	0.04808	-0.87060	-0.00456	0.58262

Condition **LC52=1.2D-WL150+LLa1**

4	0.28309	0.87807	0.74469	-0.49897	-0.15069	0.34970
14	-0.62929	0.43396	-1.25711	-0.37068	0.12881	0.23228
47	-0.00498	0.01414	-0.07951	0.00000	0.00000	0.00000
49	0.39175	0.00817	0.33059	0.00000	0.00000	0.00000
59	-0.07586	0.02948	0.24157	0.00000	0.00000	0.00000
61	-0.02269	0.01984	0.07774	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	0.05798	-0.86965	-0.02188	0.58198

Condition **LC53=1.2D+WL0+LLa2**

4	0.17436	0.76944	0.67910	-0.45672	-0.20811	0.30460
14	-0.30578	0.52144	-1.24543	-0.40707	0.35970	0.21205
47	-0.00401	0.01739	-0.06966	0.00000	0.00000	0.00000
49	0.28653	0.01103	0.24068	0.00000	0.00000	0.00000
59	-0.10342	0.03697	0.33032	0.00000	0.00000	0.00000
61	-0.04768	0.02738	0.15298	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	0.08800	-0.86379	0.15159	0.51665

Condition **LC54=1.2D+WL30+LLa2**

4	0.19412	0.77847	0.68186	-0.46017	-0.16065	0.30906
14	-0.28690	0.51922	-1.25604	-0.40886	0.40644	0.21116
47	-0.00110	0.01597	-0.01879	0.00000	0.00000	0.00000
49	0.27626	0.01124	0.23296	0.00000	0.00000	0.00000
59	-0.08560	0.03360	0.28378	0.00000	0.00000	0.00000
61	-0.03879	0.02515	0.13421	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	0.05798	-0.86903	0.24579	0.52023

Condition **LC55=1.2D+WL60+LLa2**

4	0.19075	0.77704	0.67621	-0.45964	-0.16436	0.30845
14	-0.28896	0.51999	-1.25659	-0.40880	0.40223	0.21142
47	-0.00142	0.01612	-0.02609	0.00000	0.00000	0.00000
49	0.27442	0.01127	0.23142	0.00000	0.00000	0.00000
59	-0.08702	0.03385	0.28709	0.00000	0.00000	0.00000
61	-0.03968	0.02539	0.13603	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	0.04808	-0.86843	0.23787	0.51986

Condition **LC56=1.2D+WL90+LLa2**

4	0.18902	0.77635	0.65553	-0.45940	-0.15078	0.30845
14	-0.28450	0.52179	-1.26508	-0.40963	0.41460	0.21174
47	-0.00090	0.01589	-0.01882	0.00000	0.00000	0.00000
49	0.25962	0.01149	0.21961	0.00000	0.00000	0.00000
59	-0.08282	0.03302	0.27508	0.00000	0.00000	0.00000
61	-0.03842	0.02511	0.13369	0.00000	0.00000	0.00000
SUM	0.04200	1.38365	0.00000	-0.86902	0.26382	0.52019

Condition **LC57=1.2D+WL120+LLa2**

4	0.19177	0.77767	0.63776	-0.45992	-0.12892	0.30944
14	-0.27791	0.52287	-1.27495	-0.41064	0.43418	0.21197
47	0.00015	0.01539	-0.00213	0.00000	0.00000	0.00000
49	0.24516	0.01171	0.20813	0.00000	0.00000	0.00000
59	-0.07558	0.03161	0.25530	0.00000	0.00000	0.00000
61	-0.03549	0.02440	0.12780	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	-0.04808	-0.87056	0.30526	0.52141

Condition **LC58=1.2D+WL150+LLa2**

4	0.19483	0.77912	0.63658	-0.46049	-0.12019	0.31019
14	-0.27456	0.52268	-1.27754	-0.41102	0.44276	0.21185
47	0.00064	0.01514	0.00590	0.00000	0.00000	0.00000
49	0.24311	0.01175	0.20657	0.00000	0.00000	0.00000
59	-0.07219	0.03095	0.24625	0.00000	0.00000	0.00000
61	-0.03386	0.02400	0.12426	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	-0.05798	-0.87151	0.32257	0.52204

Condition **LC59=1.2D-WL0+LLa2**

4	0.17586	0.77083	0.61218	-0.45733	-0.14677	0.30646
14	-0.28623	0.52635	-1.27650	-0.41033	0.41501	0.21295
47	-0.00132	0.01610	-0.03293	0.00000	0.00000	0.00000
49	0.23445	0.01185	0.19926	0.00000	0.00000	0.00000
59	-0.08271	0.03290	0.27240	0.00000	0.00000	0.00000
61	-0.04004	0.02561	0.13758	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	-0.08800	-0.86766	0.26823	0.51941

Condition **LC60=1.2D-WL30+LLa2**

4	0.15610	0.76181	0.60943	-0.45388	-0.19420	0.30201
14	-0.30511	0.52857	-1.26589	-0.40855	0.36830	0.21383
47	-0.00423	0.01752	-0.08376	0.00000	0.00000	0.00000
49	0.24470	0.01163	0.20699	0.00000	0.00000	0.00000
59	-0.10052	0.03627	0.31891	0.00000	0.00000	0.00000
61	-0.04892	0.02784	0.15633	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	-0.05798	-0.86243	0.17410	0.51584

Condition **LC61=1.2D-WL60+LLa2**

4	0.15946	0.76324	0.61508	-0.45442	-0.19050	0.30262
14	-0.30305	0.52780	-1.26535	-0.40861	0.37251	0.21358
47	-0.00390	0.01738	-0.07646	0.00000	0.00000	0.00000
49	0.24654	0.01161	0.20853	0.00000	0.00000	0.00000
59	-0.09910	0.03602	0.31560	0.00000	0.00000	0.00000
61	-0.04804	0.02760	0.15451	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	-0.04808	-0.86303	0.18201	0.51620

Condition **LC62=1.2D-WL90+LLa2**

4	0.16120	0.76392	0.63576	-0.45465	-0.20408	0.30261
14	-0.30751	0.52600	-1.25685	-0.40778	0.36012	0.21326
47	-0.00443	0.01761	-0.08373	0.00000	0.00000	0.00000
49	0.26134	0.01139	0.22033	0.00000	0.00000	0.00000
59	-0.10330	0.03685	0.32762	0.00000	0.00000	0.00000
61	-0.04929	0.02788	0.15686	0.00000	0.00000	0.00000
SUM	-0.04200	1.38365	0.00000	-0.86243	0.15604	0.51587

Condition **LC63=1.2D-WL120+LLa2**

4	0.15845	0.76259	0.65352	-0.45412	-0.22596	0.30162
14	-0.31410	0.52493	-1.24698	-0.40677	0.34053	0.21303
47	-0.00549	0.01811	-0.10046	0.00000	0.00000	0.00000
49	0.27581	0.01117	0.23180	0.00000	0.00000	0.00000
59	-0.11052	0.03826	0.34743	0.00000	0.00000	0.00000
61	-0.05222	0.02859	0.16276	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	0.04808	-0.86089	0.11457	0.51465

Condition **LC64=1.2D-WL150+LLa2**

4	0.15539	0.76114	0.65470	-0.45356	-0.23469	0.30088
14	-0.31745	0.52511	-1.24439	-0.40638	0.33195	0.21314
47	-0.00600	0.01837	-0.10850	0.00000	0.00000	0.00000
49	0.27785	0.01112	0.23336	0.00000	0.00000	0.00000
59	-0.11391	0.03891	0.35650	0.00000	0.00000	0.00000
61	-0.05386	0.02899	0.16631	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	0.05798	-0.85994	0.09726	0.51402

Condition **LC65=1.2D+WL0+LLa3**

4	0.03947	0.70411	0.52672	-0.42669	-0.27323	0.27751
14	-0.01139	0.55935	-1.29701	-0.43705	0.57362	0.17270
47	-0.00590	0.02328	-0.10620	0.00000	0.00000	0.00000
49	0.22716	0.01059	0.18942	0.00000	0.00000	0.00000
59	-0.16914	0.05097	0.53353	0.00000	0.00000	0.00000
61	-0.08020	0.03535	0.24154	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	0.08800	-0.86374	0.30039	0.45021

Condition **LC66=1.2D+WL30+LLa3**

4	0.05925	0.71312	0.52943	-0.43013	-0.22577	0.28196
14	0.00758	0.55715	-1.30755	-0.43883	0.62040	0.17181
47	-0.00298	0.02182	-0.05531	0.00000	0.00000	0.00000
49	0.21691	0.01080	0.18168	0.00000	0.00000	0.00000
59	-0.15141	0.04763	0.48694	0.00000	0.00000	0.00000
61	-0.07137	0.03314	0.22279	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	0.05798	-0.86897	0.39463	0.45378

Condition **LC67=1.2D+WL60+LLa3**

4	0.05588	0.71169	0.52379	-0.42960	-0.22947	0.28135
14	0.00551	0.55791	-1.30810	-0.43877	0.61618	0.17206
47	-0.00330	0.02197	-0.06261	0.00000	0.00000	0.00000
49	0.21506	0.01082	0.18014	0.00000	0.00000	0.00000
59	-0.15282	0.04787	0.49026	0.00000	0.00000	0.00000
61	-0.07224	0.03338	0.22461	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	0.04808	-0.86837	0.38671	0.45341

Condition **LC68=1.2D+WL90+LLa3**

4	0.05414	0.71101	0.50310	-0.42936	-0.21589	0.28136
14	0.00998	0.55972	-1.31659	-0.43960	0.62857	0.17238
47	-0.00277	0.02174	-0.05533	0.00000	0.00000	0.00000
49	0.20027	0.01104	0.16833	0.00000	0.00000	0.00000
59	-0.14863	0.04705	0.47823	0.00000	0.00000	0.00000
61	-0.07100	0.03310	0.22226	0.00000	0.00000	0.00000
SUM	0.04200	1.38365	0.00000	-0.86896	0.41269	0.45374

Condition **LC69=1.2D+WL120+LLa3**

4	0.05690	0.71233	0.48532	-0.42988	-0.19401	0.28235
14	0.01660	0.56080	-1.32644	-0.44062	0.64817	0.17261
47	-0.00172	0.02122	-0.03861	0.00000	0.00000	0.00000
49	0.18581	0.01126	0.15685	0.00000	0.00000	0.00000
59	-0.14142	0.04565	0.45843	0.00000	0.00000	0.00000
61	-0.06809	0.03240	0.21638	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	-0.04808	-0.87050	0.45416	0.45496

Condition **LC70=1.2D+WL150+LLa3**

4	0.05996	0.71377	0.48413	-0.43045	-0.18528	0.28309
14	0.01997	0.56061	-1.32901	-0.44100	0.65675	0.17250
47	-0.00122	0.02096	-0.03058	0.00000	0.00000	0.00000
49	0.18376	0.01130	0.15528	0.00000	0.00000	0.00000
59	-0.13803	0.04500	0.44936	0.00000	0.00000	0.00000
61	-0.06646	0.03200	0.21284	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	-0.05798	-0.87145	0.47147	0.45559

Condition **LC71=1.2D-WL0+LLa3**

4	0.04098	0.70550	0.45977	-0.42730	-0.21185	0.27938
14	0.00823	0.56428	-1.32802	-0.44031	0.62898	0.17360
47	-0.00319	0.02196	-0.06940	0.00000	0.00000	0.00000
49	0.17509	0.01139	0.14799	0.00000	0.00000	0.00000
59	-0.14850	0.04693	0.47553	0.00000	0.00000	0.00000
61	-0.07260	0.03360	0.22614	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	-0.08800	-0.86761	0.41713	0.45297

Condition **LC72=1.2D-WL30+LLa3**

4	0.02119	0.69649	0.45706	-0.42386	-0.25929	0.27493
14	-0.01074	0.56648	-1.31748	-0.43852	0.58223	0.17449
47	-0.00612	0.02342	-0.12026	0.00000	0.00000	0.00000
49	0.18533	0.01117	0.15574	0.00000	0.00000	0.00000
59	-0.16622	0.05027	0.52207	0.00000	0.00000	0.00000
61	-0.08143	0.03581	0.24488	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	-0.05798	-0.86238	0.32295	0.44942

Condition **LC73=1.2D-WL60+LLa3**

4	0.02456	0.69792	0.46271	-0.42439	-0.25559	0.27554
14	-0.00867	0.56572	-1.31693	-0.43858	0.58644	0.17424
47	-0.00579	0.02327	-0.11296	0.00000	0.00000	0.00000
49	0.18718	0.01115	0.15728	0.00000	0.00000	0.00000
59	-0.16482	0.05002	0.51876	0.00000	0.00000	0.00000
61	-0.08055	0.03557	0.24306	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	-0.04808	-0.86298	0.33086	0.44978

Condition **LC74=1.2D-WL90+LLa3**

4	0.02630	0.69861	0.48339	-0.42463	-0.26918	0.27553
14	-0.01314	0.56391	-1.30843	-0.43775	0.57405	0.17391
47	-0.00633	0.02350	-0.12025	0.00000	0.00000	0.00000
49	0.20197	0.01094	0.16908	0.00000	0.00000	0.00000
59	-0.16900	0.05084	0.53081	0.00000	0.00000	0.00000
61	-0.08179	0.03585	0.24541	0.00000	0.00000	0.00000
SUM	-0.04200	1.38365	0.00000	-0.86238	0.30487	0.44945

Condition **LC75=1.2D-WL120+LLa3**

4	0.02354	0.69728	0.50116	-0.42410	-0.29106	0.27454
14	-0.01976	0.56283	-1.29859	-0.43674	0.55444	0.17368
47	-0.00740	0.02403	-0.13700	0.00000	0.00000	0.00000
49	0.21644	0.01072	0.18055	0.00000	0.00000	0.00000
59	-0.17620	0.05224	0.55064	0.00000	0.00000	0.00000
61	-0.08470	0.03655	0.25131	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	0.04808	-0.86084	0.26337	0.44823

Condition **LC76=1.2D-WL150+LLa3**

4	0.02047	0.69583	0.50235	-0.42354	-0.29980	0.27380
14	-0.02313	0.56302	-1.29601	-0.43635	0.54585	0.17380
47	-0.00790	0.02429	-0.14505	0.00000	0.00000	0.00000
49	0.21848	0.01067	0.18212	0.00000	0.00000	0.00000
59	-0.17958	0.05289	0.55973	0.00000	0.00000	0.00000
61	-0.08633	0.03695	0.25485	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	0.05798	-0.85989	0.24605	0.44760

Condition **LC77=1.2D+WL0+LLa4**

4	-0.02315	0.67373	0.46635	-0.41423	-0.31133	0.26298
14	0.11395	0.57679	-1.31371	-0.44859	0.66503	0.15771
47	-0.00617	0.02690	-0.11919	0.00000	0.00000	0.00000
49	0.20257	0.01050	0.16812	0.00000	0.00000	0.00000
59	-0.19193	0.05636	0.60469	0.00000	0.00000	0.00000
61	-0.09527	0.03937	0.28174	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	0.08800	-0.86282	0.35371	0.42069

Condition **LC78=1.2D+WL30+LLa4**

4	-0.00337	0.68275	0.46904	-0.41768	-0.26386	0.26743
14	0.13296	0.57459	-1.32423	-0.45038	0.71183	0.15682
47	-0.00324	0.02540	-0.06828	0.00000	0.00000	0.00000
49	0.19232	0.01071	0.16037	0.00000	0.00000	0.00000
59	-0.17422	0.05303	0.55806	0.00000	0.00000	0.00000
61	-0.08647	0.03716	0.26302	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	0.05798	-0.86806	0.44797	0.42425

Condition **LC79=1.2D+WL60+LLa4**

4	-0.00674	0.68132	0.46339	-0.41714	-0.26756	0.26682
14	0.13088	0.57536	-1.32478	-0.45032	0.70762	0.15707
47	-0.00357	0.02556	-0.07558	0.00000	0.00000	0.00000
49	0.19048	0.01073	0.15883	0.00000	0.00000	0.00000
59	-0.17562	0.05327	0.56138	0.00000	0.00000	0.00000
61	-0.08735	0.03740	0.26484	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	0.04808	-0.86746	0.44005	0.42388

Condition **LC80=1.2D+WL90+LLa4**

4	-0.00847	0.68064	0.44270	-0.41691	-0.25397	0.26683
14	0.13536	0.57717	-1.33327	-0.45115	0.72001	0.15739
47	-0.00303	0.02532	-0.06829	0.00000	0.00000	0.00000
49	0.17568	0.01094	0.14702	0.00000	0.00000	0.00000
59	-0.17144	0.05245	0.54933	0.00000	0.00000	0.00000
61	-0.08611	0.03712	0.26250	0.00000	0.00000	0.00000
SUM	0.04200	1.38365	0.00000	-0.86806	0.46604	0.42421

Condition **LC81=1.2D+WL120+LLa4**

4	-0.00571	0.68196	0.42491	-0.41743	-0.23209	0.26782
14	0.14199	0.57825	-1.34310	-0.45217	0.73961	0.15762
47	-0.00198	0.02480	-0.05156	0.00000	0.00000	0.00000
49	0.16122	0.01116	0.13553	0.00000	0.00000	0.00000
59	-0.16423	0.05106	0.52951	0.00000	0.00000	0.00000
61	-0.08321	0.03642	0.25662	0.00000	0.00000	0.00000
SUM	0.04808	1.38365	-0.04808	-0.86960	0.50752	0.42543

Condition **LC82=1.2D+WL150+LLa4**

4	-0.00265	0.68341	0.42372	-0.41800	-0.22336	0.26856
14	0.14536	0.57806	-1.34567	-0.45255	0.74820	0.15751
47	-0.00148	0.02454	-0.04352	0.00000	0.00000	0.00000
49	0.15918	0.01121	0.13396	0.00000	0.00000	0.00000
59	-0.16085	0.05041	0.52044	0.00000	0.00000	0.00000
61	-0.08158	0.03602	0.25309	0.00000	0.00000	0.00000
SUM	0.05798	1.38365	-0.05798	-0.87055	0.52484	0.42607

Condition **LC83=1.2D-WL0+LLa4**

4	-0.02164	0.67514	0.39938	-0.41485	-0.24993	0.26485
14	0.13360	0.58172	-1.34470	-0.45185	0.72042	0.15860
47	-0.00346	0.02555	-0.08235	0.00000	0.00000	0.00000
49	0.15050	0.01129	0.12667	0.00000	0.00000	0.00000
59	-0.17130	0.05233	0.54662	0.00000	0.00000	0.00000
61	-0.08770	0.03762	0.26637	0.00000	0.00000	0.00000
SUM	0.00000	1.38365	-0.08800	-0.86670	0.47049	0.42345

Condition **LC84=1.2D-WL30+LLa4**

4	-0.04143	0.66613	0.39671	-0.41141	-0.29737	0.26040
14	0.11459	0.58392	-1.33418	-0.45007	0.67365	0.15949
47	-0.00639	0.02704	-0.13323	0.00000	0.00000	0.00000
49	0.16074	0.01107	0.13444	0.00000	0.00000	0.00000
59	-0.18900	0.05566	0.59321	0.00000	0.00000	0.00000
61	-0.09649	0.03982	0.28507	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	-0.05798	-0.86147	0.37628	0.41990

Condition **LC85=1.2D-WL60+LLa4**

4	-0.03806	0.66756	0.40235	-0.41194	-0.29367	0.26101
14	0.11667	0.58315	-1.33363	-0.45013	0.67786	0.15924
47	-0.00606	0.02689	-0.12593	0.00000	0.00000	0.00000
49	0.16258	0.01105	0.13597	0.00000	0.00000	0.00000
59	-0.18760	0.05541	0.58990	0.00000	0.00000	0.00000
61	-0.09562	0.03958	0.28326	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	-0.04808	-0.86207	0.38420	0.42026

Condition **LC86=1.2D-WL90+LLa4**

4	-0.03633	0.66824	0.42304	-0.41218	-0.30726	0.26100
14	0.11219	0.58134	-1.32514	-0.44930	0.66546	0.15892
47	-0.00660	0.02713	-0.13323	0.00000	0.00000	0.00000
49	0.17738	0.01084	0.14778	0.00000	0.00000	0.00000
59	-0.19178	0.05623	0.60196	0.00000	0.00000	0.00000
61	-0.09686	0.03986	0.28560	0.00000	0.00000	0.00000
SUM	-0.04200	1.38365	0.00000	-0.86147	0.35820	0.41992

Condition **LC87=1.2D-WL120+LLa4**

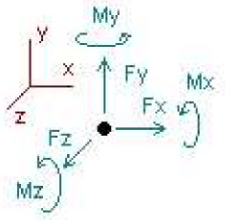
4	-0.03908	0.66691	0.44082	-0.41165	-0.32915	0.26001
14	0.10556	0.58027	-1.31530	-0.44828	0.64584	0.15869
47	-0.00767	0.02766	-0.14999	0.00000	0.00000	0.00000
49	0.19184	0.01063	0.15925	0.00000	0.00000	0.00000
59	-0.19898	0.05763	0.62181	0.00000	0.00000	0.00000
61	-0.09976	0.04056	0.29149	0.00000	0.00000	0.00000
SUM	-0.04808	1.38365	0.04808	-0.85993	0.31669	0.41870

Condition **LC88=1.2D-WL150+LLa4**

4	-0.04215	0.66546	0.44200	-0.41108	-0.33790	0.25927
14	0.10219	0.58045	-1.31273	-0.44789	0.63725	0.15880
47	-0.00818	0.02792	-0.15805	0.00000	0.00000	0.00000
49	0.19389	0.01058	0.16082	0.00000	0.00000	0.00000
59	-0.20235	0.05827	0.63091	0.00000	0.00000	0.00000
61	-0.10138	0.04096	0.29503	0.00000	0.00000	0.00000
SUM	-0.05798	1.38365	0.05798	-0.85897	0.29936	0.41807

Envelope for nodal reactions

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



Direction of positive forces and moments

Envelope of nodal reactions for :

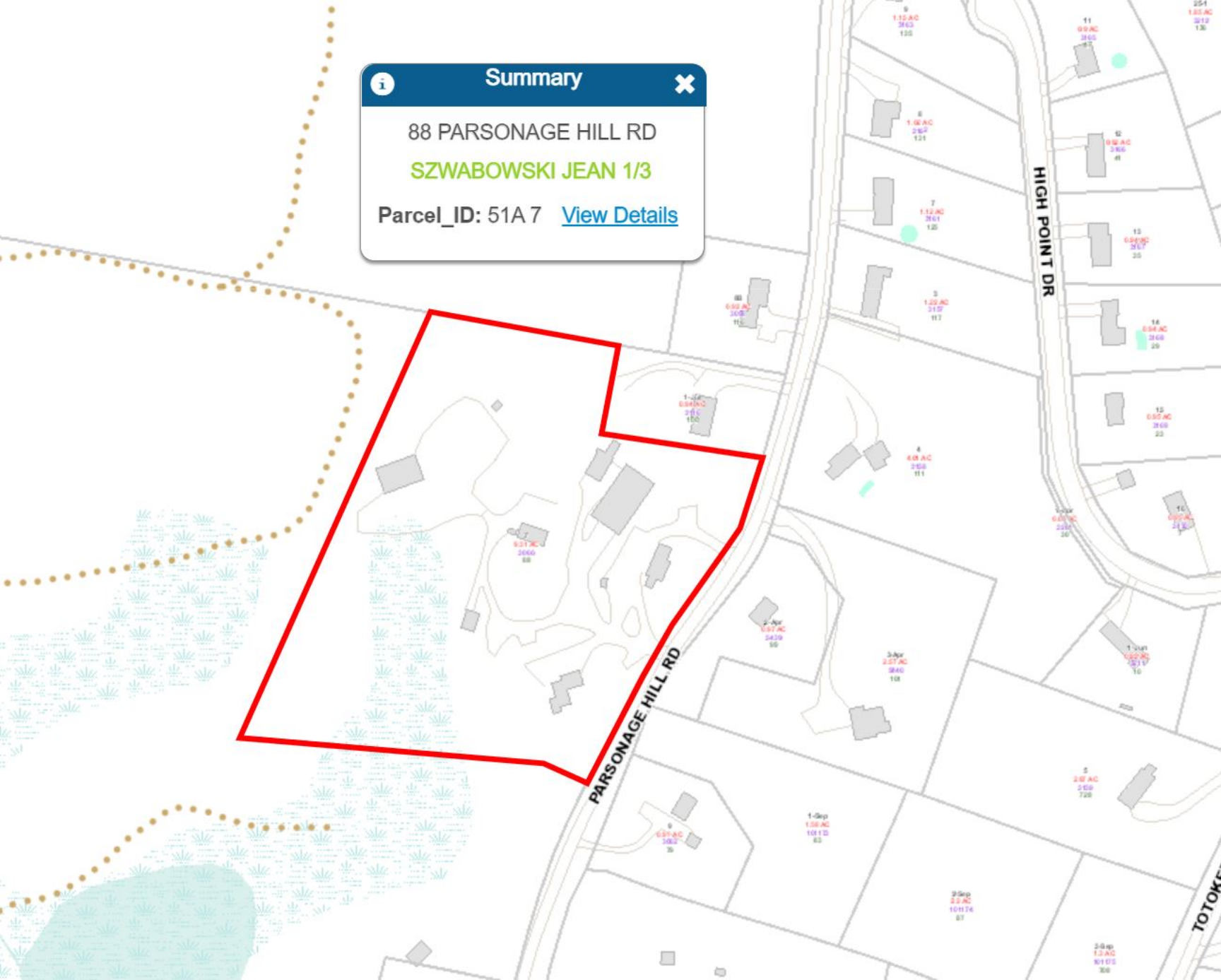
LC1=1.2D+1.6Wo
LC2=1.2D+1.6W30
LC3=1.2D+1.6W60
LC4=1.2D+1.6W90
LC5=1.2D+1.6W120
LC6=1.2D+1.6W150
LC7=1.2D-1.6Wo
LC8=1.2D-1.6W30
LC9=1.2D-1.6W60
LC10=1.2D-1.6W90
LC11=1.2D-1.6W120
LC12=1.2D-1.6W150
LC13=0.9D+1.6Wo
LC14=0.9D+1.6W30
LC15=0.9D+1.6W60
LC16=0.9D+1.6W90
LC17=0.9D+1.6W120
LC18=0.9D+1.6W150
LC19=0.9D-1.6Wo
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**
4	Max	0.722	LC5	1.440	LC30	1.321	LC2	-0.18518	LC23	1.15114	LC17	0.57450	LC30
	Min	-0.494	LC23	0.236	LC23	-0.451	LC20	-0.84197	LC30	-1.39870	LC11	0.07713	LC23
14	Max	0.385	LC38	0.936	LC32	-0.361	LC24	-0.19773	LC24	1.51591	LC5	0.38159	LC32
	Min	-1.001	LC40	0.199	LC15	-2.371	LC30	-0.73773	LC30	-0.96386	LC23	0.09988	LC15
47	Max	0.093	LC17	0.055	LC11	1.233	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.114	LC11	-0.020	LC17	-1.326	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1
49	Max	0.827	LC1	0.023	LC6	0.666	LC1	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.446	LC19	-0.002	LC24	-0.352	LC19	0.00000	LC1	0.00000	LC1	0.00000	LC1
59	Max	0.414	LC17	0.115	LC11	1.460	LC11	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.542	LC11	-0.064	LC17	-0.971	LC17	0.00000	LC1	0.00000	LC1	0.00000	LC1

61	Max	0.235	LC18	0.080	LC11	0.720	LC12	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.290	LC12	-0.041	LC17	-0.504	LC18	0.00000	LC1	0.00000	LC1	0.00000	LC1

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

NORTHFORD

Certificate of Mailing — Firm

UNITED STATES POSTAL SERVICE®

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	3 WW	neopost 11/15/2022 US POSTAGE $003.09⁰ ZIP 06103 041L12203937 OLD STATE HOUSE STATION 06106 NOV 15 2022
	Postmaster, per *(name of receiving employee)*		

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	USPS Postage	Fee	Special Handling	Parcel Airlift
1.	Michael T. Paulhus, Town Manager Town of North Branford 909 Foxon Road North Branford, CT 06471				
2.	Eric Knapp, 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.					

See Reverse for Instructions