Robinson+Cole

KENNETH C. BALDWIN

One State Street
Hartford, CT 06103
Main (860) 275-8200
Fax (860) 275-8299
kbaldwin@rc.com
Direct (860) 275-8345

Also admitted in Massachusetts
and New York

November 26, 2024

Via Electronic Mail

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

Re: **Notice of Exempt Modification – Facility Modification**
24 Rockdale Road, West Haven, Connecticut

Dear Attorney Bachman:

Cellco Partnership d/b/a Verizon Wireless ("Cellco") currently maintains a wireless telecommunications facility at the 24 Rockdale Road in West Haven (the "Property"). The existing Cellco facility consists of antennas and remote radio heads attached to a telecommunications tower and associated equipment on the ground near the base of the tower. The tower and Cellco's shared use of the tower were approved by the Council in April of 1986 (Docket No. 56). A copy of Cellco's Docket No. 56 Decision and Order is included in Attachment 1.

Cellco now intends to modify its facility by removing three (3) antennas installing four (4) new antennas on its existing antenna mounting system. A set of project plans showing Cellco's proposed facility modifications and the specifications for Cellco's new antennas is 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 West Haven's Chief Elected Official and Land Use Officer. A copy of this letter is being sent to the owner of the tower and the Property owner.

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

1. The proposed modifications will not result in an increase in the height of the existing tower. Cellco's new antennas and RRHs will be installed at the same height on the tower.

2. The proposed modifications will not involve any change to ground-mounted equipment and, therefore, will not require the extension of the site boundary.

3. The proposed modifications will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.

4. The installation of Cellco's new antennas will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. Included in Attachment 3 is a Calculated Radio Frequency Emissions Report demonstrating that the proposed modified facility will comply with the FCC safety standards. The modified facility will be capable of providing Cellco's 5G wireless service.

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

6. According to the attached Structural Analysis Report ("SA") and Antenna Mount Analysis Report ("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:
Dorinda Borer, Mayor
Catherine Conniff, Asst. City Planner
Bob Knapp, Tower and Property Owner
Ryan Hand, Verizon Wireless

ATTACHMENT 1

DOCKET NO. 56

AN APPLICATION OF METRO MOBILE CTS OF NEW HAVEN, INC., FOR A CERTIFICATE OF ENVIRONMENTAL COMPATIBILITY AND PUBLIC NEED FOR THE CONSTRUCTION, MAINTENANCE, AND OPERATION OF FACILITIES TO PROVIDE CELLULAR SERVICE IN NEW HAVEN COUNTY.	:	CONNECTICUT SITING COUNCIL April 14, 1986

DECISION AND ORDER

Pursuant to the foregoing opinion, the Council hereby directs that a certificate of environmental compatibility and public need as required by section 16-50k of the General Statutes of Connecticut (CGS) be issued to Metro Mobile CTS of New Haven, Inc., for the construction, maintenance, and operation of cellular mobile phone telecommunication towers and associated equipment in the towns of Wolcott, Naugatuck, West Haven (existing tower), Milford, Hamden (existing tower), Guilford, and North Branford subject to the conditions below.

1. The proposed and alternate Beacon Falls sites are rejected without prejudice.
2. The Wolcott tower shall be constructed to meet Zone C wind loading with 1" of radial ice and shall not exceed 180' in height excluding antennas.
3. The Naugatuck tower shall not exceed 160' in height, excluding antennas. The certificate holder shall offer to remove the existing privately owned, unused tower now on the site.
4. Any future actions requiring the removal of the existing West Haven or Hamden towers to be shared by the certificate holder shall also apply to the equipment mounted on those towers by the certificate holder, regardless of that equipment's status under Chapter 277a of the CGS.

5. The Milford tower shall be a monopole structure not to exceed 100' in height, excluding antennas.
6. The Guilford tower shall be a monopole structure not to exceed 150' in height, excluding antennas.
7. The North Branford Route 17 site is rejected. The North Branford East Reeds Gap Road tower shall not exceed 160' in height, excluding antennas.
8. The certificate holder shall submit a development and management plan for the Wolcott, Naugatuck, Milford, Hamden, Guilford, and North Branford sites pursuant to sections 16-50j-75 through 16-50j-77 of the RSA, except that irrelevant items in section 16-50j-76 need only be identified as such. In addition to the requirements of section 16-50j-76, the D&M plan shall provide plans for evergreen screening around the fenced perimeter at the Wolcott, Milford, Hamden, Guilford, and North Branford sites. The D&M plan shall include a proposal for painting the approved monopole structures to blend with the sky. Any changes to specifications in the D&M plan must be approved by the Council prior to facility operation.
9. All certified facilities shall be constructed, operated, and maintained as specified in the Council's record and in the site development and management plan required by order 8.
10. The certificate holder shall permit public or private entities to share space on the towers approved herein, for due consideration received, or shall provide any requesting entity with specific legal, technical, environmental, or economic reasons precluding such tower sharing. In addition to complying with 16-50j-73, the

certificate holder shall notify the Council of the addition of any equipment to any approved tower.

11. A fence not lower than 8' shall surround each tower and associated equipment.
12. Unless necessary to comply with order 13, below, no lights shall be installed on any of these towers.
13. The facilities' construction and any future tower sharing shall be in accordance with all applicable federal, state, and municipal laws and regulations. Shared uses by entities not subject to jurisdiction pursuant to sections 16-50i and 16-50k of the CGS shall be subject to all applicable federal, state, and municipal laws and regulations.
14. Construction activities shall take place during daylight working hours.
15. This decision and order shall be void and the towers and associated equipment shall be dismantled and removed, or reapplication for any new use shall be made to the CSC before any such new use is made, if the towers do not provide or permanently cease to provide cellular service following completion of construction.
16. This decision and order shall be void if all construction authorized herein is not completed within three years of the issuance of this decision, or within three years of the completion of any appeal if appeal of this decision is taken, unless otherwise approved by the Council.

Pursuant to CGS section 16-50p, we hereby direct that a copy of the decision and order shall be served on each person listed below. A notice

of the issuance shall be published in The Record-Journal, The New Haven Register, The Branford Review, The Evening Sentinel, The Waterbury American, and The Waterbury Republican.

The parties to this proceeding are:

Metro Mobile CTS of New Haven, Inc. (Applicant)
5 Eversley Avenue
Norwalk, Connecticut 06855

ATTN: Armand Mascioli
General Manager

Mr. Kevin B. Sullivan, Esq. (its attorneys)
Byrne, Slater, Sandler, Shulman & Rouse, P.C.
111 Pearl Street
P.O. Box 3216
Hartford, Connecticut 06103

Mr. Richard Rubin, Esq.
Fleischman and Walsh, P.C.
1725 N Street, N.W.
Washington, D.C. 20036

Guilford Conservation Commission represented by:

Mr. David B. Damer
Chairman
Guilford Conservation Commission
440 Great Hill Road
Guilford, Connecticut 06437

Mr. Robert W. Griswold, Jr.
100 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Town of Hamden
Memorial Town Hall
2372 Whitney Avenue
Hamden, Connecticut 06518

ATTN: Shirley Gonzales
Town Planner

Guilford Planning and Zoning Commission represented by:

Mr. David W. Fisher
Chairman
Town Hall
31 Park Street
Guilford, Connecticut 06437

Town of Hamden represented by:

John DeNicola, Jr.
Mayor
Town of Hamden
Memorial Town Hall
2372 Whitney Avenue
New Haven, Connecticut 06518

Citizens Park Council of New Haven represented by:

Mr. John J. Ciarleglio
President
Citizens Park Council
of New Haven
36 Elmwood Road
New Haven, Connecticut 06515

Mr. Thomas V. Keating
343 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Ms. Evelyn M. Sirowich
245 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Mr. Jack B. Levine
11 White Birch Lane
Beacon Falls, Connecticut 06403

Southern New England Telephone Company represented by:

Mr. Peter J. Tyrrell, Esq.
227 Church Street
New Haven, Connecticut 06506

Mr. Dennis Bialecki
96 West Road
Beacon Falls, Connecticut 06403

Brittany Woods Homeowner's Association

represented by:

Mr. Stephen P. Del Sole, Esq.
Del Sole & Del Sole
152 Temple Street
P.O. Box 405
New Haven, Connecticut 06502-0405

Ms. Barbara G. Schlein
Box 2993 Westville Station
New Haven, Connecticut 06515

Mr. & Mrs. Joseph T. Farrell, Jr.
334 Rimmon Hill Road
Beacon Falls, Connecticut 06403

Town of Beacon Falls

represented by:

The Honorable Leonard F. D'Amico
First Selectman
10 Maple Avenue
Beacon Falls, Connecticut 06403

West Rock Ridge Park Association

represented by:

Mr. William L. Doheny Jr., D.D.S.
President
220 Mountain Road
Hamden, Connecticut 06514

Department of Parks,
Recreation & Trees

represented by:

Mr. Robert G. Sheeley
Director
Parks, Recreation & Trees
P.O. Box 1416
New Haven, Connecticut 06506

Town of Wallingford

represented by:

William W. Dickinson, Jr.
Mayor
Municipal Building
350 Center Street
P.O. Box 427
Wallingford, Connecticut 06492

New Haven Sierra Club

represented by:

Ms. Laurie Klein
270 Edgewood Avenue
New Haven, Connecticut 06511

Peter M. Lerner
State Representative
8 Merritt Avenue
Woodbridge, Connecticut 06525

Carleton J. Benson
State Representative
161 Scott Road
Prospect, Connecticut 06712

Dr. Stephen Collins (service waived)
Vice Chairman
West Rock State Park
Advisory Council
Bethany, Connecticut

Mr. Louis Melillo (service wavied)
985 Wintergreen Avenue
Hamden, Connecticut

Mr. John McGeever (service waived)
339 Rimmon Hill
Beacon Falls, Connecticut 06403

Senator John Consoli (service waived)
51 Luke Hill Road
Bethany, Connecticut 06525

Representative George P. Bassing (service waived)
14 Oakwood Drive
Seymour, Connecticut 06483

Dr. George D. Whitney (service waived)
858 Oakwood Road
Orange, Connecticut

Mr. Steve Molnar (service waived)
205 West Road
Beacon Falls, Connecticut

Mr. James W. Grandy (service waived)
President
Hamden Land Conservation Trust
Hamden, Connecticut

Senator Richard S. Eaton (service waived)
269 Mulberry Point Road
Guilford, Connecticut 06437

Representative Robert M. Ward
719 Totoket Road
Northford, Connecticut 06472

Town of North Branford

represented by:

John Gesmonde, Esquire
3127 Whitney Avenue
Hamden, Connecticut 06518

Regina Smith
1887 Middletown Avenue
Northford, Connecticut 06472

(service waived)

Richard A. Nizolek
The Restland Farm Corporation
Route 17
Northford, Connecticut 06472

Mary Liska
83 Reeds Gap Road
Northford, Connecticut 06472

Ben Bullard
50 Christmas Hill Road
Guilford, Connecticut 06437

(service waived)

Roland Robichaud
31 Berncliff Drive
North Branford, Connecticut 06471

(service waived)

Irene Flynn
1926 Middletown Avenue
Northford, Connecticut 06472

(service waived)

Charles Pope
199 Donalds Road
Guilford, Connecticut 06437

Richard Abate
131 Manor Road
Guilford, Connecticut 06437

(service waived)

City of Milford

represented by:

Mayor Alberta Jagoe
Alderman Maurice Condon
Alderman Frederick Lisman
City Hall
River Street
Milford, Connecticut 06460

Thomas Scelfo
81 Berncliff Drive
North Branford, Connecticut 06471

(service waived)

Senator Thomas Scott (service waived)
22 Meyers Court
Milford, Connecticut 06460

Helen Moore (service waived)
385 Oronoque Road
Milford, Connecticut 06460

William Barberi (service waived)
298 Oronoque Road
Milford, Connecticut 06460

CERTIFICATION

The undersigned members of the Connecticut Siting Council hereby certify that they have heard this case or read the record thereof, and that we voted as follows:

Dated at New Britain, Connecticut, this 14th day of April, 1986.

Council Members	Vote Cast
Gloria Dibble Pond Chairperson	Yes
Commissioner John Downey Designee: Commissioner Peter G. Boucher	Absent
Commissioner Stanley Pac Designee: Christopher Cooper	No
Owen L. Clark	Yes
Mortimer A. Gelston	Yes
James G. Horsfall	Yes
Pamela B. Katz	Yes
William H. Smith	No
Colin C. Tait	No

STATE OF CONNECTICUT)
: ss. New Britain, April 14, 1986
COUNTY OF HARTFORD)

I hereby certify that the foregoing is a true and correct copy of the decision and order issued by the Connecticut Siting Council, State of Connecticut.

ATTEST:

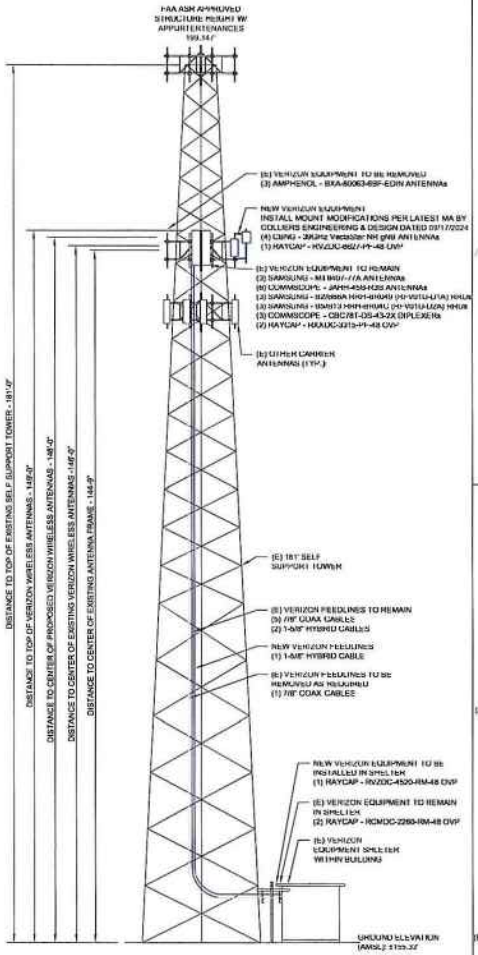
Christopher S. Wood

Christopher S. Wood, Executive Director
Connecticut Siting Council

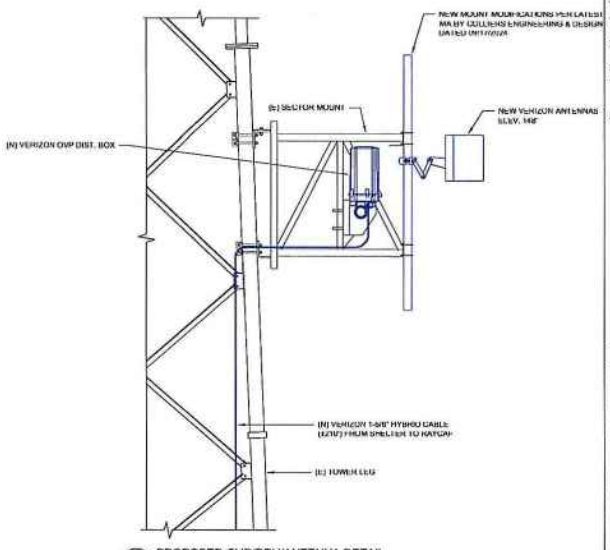
ATTACHMENT 2

NOTE:
THIS DRAWING IS FOR EXHIBIT AND LAYOUT PURPOSES ONLY.
PLEASE REFER TO TOWER STRUCTURAL ANALYSIS AND MOUNT ANALYSIS FOR CONFIRMATION OF ADEQUATE STRUCTURAL CAPACITY.

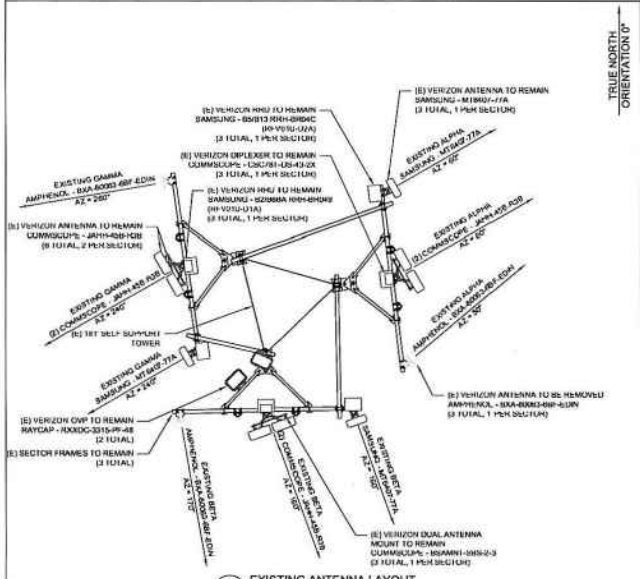
FINAL COAX/HYBRID CABLE COUNT
(3) 7/8" COAX CABLES
(2) 1-5/8" HYBRID CABLES



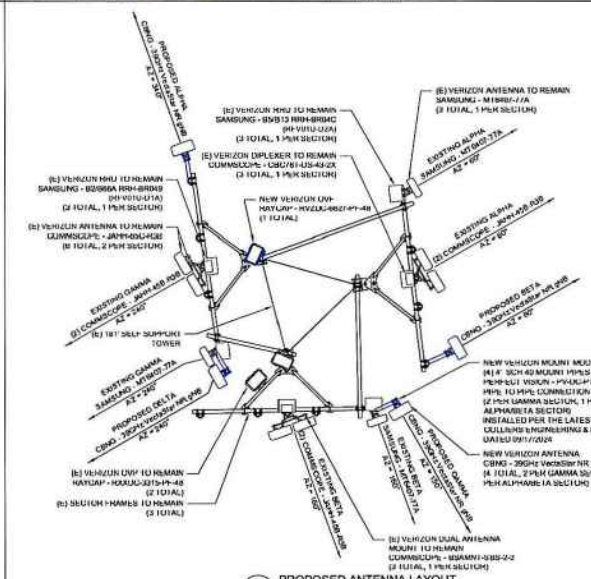
1 PROPOSED TOWER ELEVATION
SCALE: NOT TO SCALE



2 PROPOSED OVP/RRH/ANTENNA DETAIL
SCALE: NOT TO SCALE



3 EXISTING ANTENNA LAYOUT
SCALE: NOT TO SCALE



4 PROPOSED ANTENNA LAYOUT
SCALE: NOT TO SCALE

SEQUENCE OF OPERATION:

1. REMOVE (3) AMPHENOL - BXA-80063-6BF-EDIN ANTENNAs FROM TOWER.
2. INSTALL MOUNT MODIFICATIONS PER LATEST MA BY COLLIERS ENGINEERING & DESIGN DATED 09/17/2024.
3. INSTALL (4) CBNG - 39GHz VectaStar NR gNB ANTENNAs @ 148'-0" AGL.
4. INSTALL (1) NEW TOWER MOUNT RAYCAP - RVZDC-6627-PF-48 OVP W/ (1) NEW 1-5/8" HYBRID CABLE TO (1) NEW RAYCAP - RVZDC-4520-RM-48 IN SHELTER.
5. RETURN ALL REMOVED EQUIPMENT TO VERIZON WIRELESS.

VICINITY MAP

NOTES:

1. THIS DRAWING IS FOR EXHIBIT PURPOSES ONLY
2. PLEASE REFER TO STRUCTURAL REPORT PROVIDED BY OTHERS FOR CONFIRMATION OF ADEQUATE STRUCTURE CAPACITY.
3. NO LINE OR ANTENNA WORK TO BEGIN PRIOR TO CONFIRMATION OF ADEQUATE TOWER AND MOUNT CAPACITY USING THE FINAL CONFIGURATION.
4. ALL EXISTING & PROPOSED INFORMATION PROVIDED BY LL AND VERIZON WIRELESS.
5. NO NEW AC POWER CIRCUITS REQUIRED FOR THE SCOPE OF THIS PROJECT. POWER SCOPE OF WORK IS LIMITED TO -48VDC ONLY.
6. ALL NEW OVPS MUST BE INSTALLED ON A MOUNT, NOT DIRECTLY ON THE TOWER LEG.
7. ALL ANTENNA MOUNTING PIPES NEED TO BE 2-7/8" x96" O.D. HEAVY DUTY GALVANIZED.

ANTENNA REPLACEMENT NOTES:

1. CONTRACTOR TO INSPECT THE CONDITION OF EXISTING MOUNTING PIPES. CONFIRM THE FOLLOWING:
   - CORROSION; IF MOUNTS ARE FOUND TO BE CORRODED CONTACT VERIZON REP. FOR DIRECTION.
   - CHECK CONDITION OF ATTACHMENT BOLTS. IF FOUND LOOSE, TIGHTEN TO ORIGINAL SPECIFICATIONS (ALSO, TURN OF THE NUT METHOD).
   - IF BOLTS ARE MISSING, REPLACE TO SUITE.
   - CONFIRM MOUNTING PIPE IS ADEQUATELY SIZED TO ACCOMMODATE PROPOSED ANTENNA INSTALL.
2. ALL WORK DEPICTED ON THIS DRAWING DESIGNED IN ACCORDANCE WITH 2022 CSBC AND AMENDMENTS.

REVISIONS

NO	DESCRIPTION	DATE	BY
A	ISSUED FOR PERMIT	10/01/2024	CJW
0	ISSUED FOR CONSTRUCTION	10/03/2024	CJW
1	REVISED PER CLIENT	10/15/2024	CJW

verizon
7575 COMMERCE COURT
LEWIS CENTER, OH 43035

LATITUDE: 41° 17' 26.6" N (41.29072222°)
LONGITUDE: 72° 58' 3.3" W (-72.96758333°)

GPD Engineering and Architecture Professional Corporation
520 South Main Street, Suite 2531
Akron, OH 44311
330.572.2100 Fax 330.572.2101

STATE OF CONNECTICUT
CHRISTOPHER J. SCHEKS
No. 30026
LICENSED PROFESSIONAL ENGINEER
10/15/2024
THIS DOCUMENT WAS PREPARED UNDER MY DIRECTION AND SUPERVISION AND ACCEPTED UNDER MY DIRECTION BY PROFESSIONAL ENGINEERS, TECHNICIANS AND DRAFTSPERSONS

SITE ID: 325095
FUZE PROJECT ID: 17289552
MDG LOCATION ID: 5000382034
WEST HAVEN CT
24 ROCKDALE RD
WEST HAVEN, CT 06516

DRAWN BY:	CJW
CHECKED BY:	JDM
DATE:	10/15/2024
PROJECT #:	2024737.00.488096.01

SHEET TITLE
TOWER ELEVATION & ANTENNA LAYOUTS

SHEET NUMBER
C-1

CAMBRIDGE BROADBAND NETWORKS GROUP

39GHz VectaStar NR gNB Product Specification

Cambridge Broadband Networks Group Ltd
Suites 1a & 1b, Ground Floor, Enterprise House, Vision Park, Histon, CB24 9ZR

Contents

Version History

Issue Number	Author(s)	Version Date	Summary & Comments
0.1	Justin Clark	31st May 2024	DRAFT – Subject to Review
1	Justin Clark	6th June 2024	1st version
2			

1 Introduction

This product specification document is for the VectaStar NR 39GHz n260 3GPP gNB which shall be referred to as the AP or Access Point forming the donor end point for a 5G NR Point to Multi-Point Fixed Wireless Access system. The AP is designed and manufactured by Delta Electronics to CBNG's requirements and is based on a NXP Layerscape® LX2160 Host processor and LS1235 programmable modem.

2 Product Specification

The following table defines the key product specifications for the VectaStar NR gNB.

Description	Specification	Notes
RF Performance		
Frequency Range 1	37 - 40 GHz	n260 FR2 Band
EIRP	+64dBmi ± 3dB	
Antenna Type	Phased array	
Antenna Beam Width	>4.5°	Half Power Beam width
Antenna Scan Range	Azimuth ±45°, Elevation ±10°	
Antenna Scan Loss	3dB max @ ±45°	
Main Beam Sidelobes	20dBc min	
Features		
Channel Bandwidth	100, 200, 400, 800MHz	Contiguous
# of Layers	2	Horizontal & Vertical Antenna Polarization, 2x2 MIMO
Carrier Aggregation	Up to 8CC	800MHz aggregated BW per layer
Component Carrier Bandwidth	100, 200, 400MHz	800MHz aggregated BW per layer
Modulation UL & DL	QPSK, 16QAM, 64QAM, 256QAM	
Duplex Mode	TDD	
Time Sync	IEEE 1588 PTP v2 (Microchip DPLL) GPS with External Antenna Holdover – 8hrs	Holdover occurs when IEEE 1588 Grandmaster and GPS unavailable
MIMO	2T2R	
Interfaces		
Back Haul	2x 10GbE Fiber (SFP+) 1x 1GbE RJ45 as LMT (Local Management)	
Power	DC 54V (Option with External AC Adaptor, 100-240 VAC, 54V ±5%, 6.48A)	Peak Power consumption ~320W
LED Indicators	System & Front Haul	
Environmental/Certification		
Operating Temperature Range	-40°C to +55°C	
Operating Humidity Range	5% to 95% RH	
IP Rating	IP67	
Certification	UL, FCC	

	3GPP compliant RoSH and WEEE	
Weight	gNB 18kg AC/DC Power Adaptor 3.2kg Mounting Bracket 2.6kg	
Size	455mm (height) x 409mm (width) x 229mm (depth)	
Software		
Management	HTTPS / Netconf	
Firmware Upgrade	FOTA & Local (via Ethernet)	
LAN	IEEE 802.1Q-1998 / IEEE 802.1AD (VLAN, QinQ) IEEE 802.1P (DSCP QOS) IPv4/IPv6 Dual-Stack NAPT, DNS Proxy, Port Forwarding, VPN Pass-through, DHCP Server/Client MAC/IP Packet Filtering, Stateless Firewall	PDU Type Ethernet supported

2.1 Ethernet Ports

The device supports one 10Gbps Ethernet port for data in an SFP+ format to support LC or RJ45 connector formats via selection of the appropriate transceiver embedded in the data connector housing.

The device supports one 1Gbps Ethernet port for management interface in an RJ45 format supporting 10/100/1000 Base-T.

2.2 Power Supply

The device is powered by a -48V nominal DC Input Power Rating TBC:

2.3 Status & Signal Strength LED Functionality

The device has two LEDs whose functionality is described in the following table.

LED Behaviour

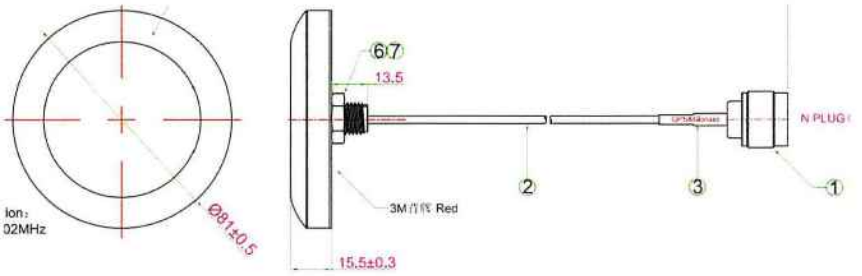
LED		Description
System	Off	Power Off
	Green - Solid	Operating
	Amber - Solid	System Crash
	Amber – Flashing Slow	PTP Unlock
	Amber – Flashing Fast	HW Failure
Front Haul	Green - Solid	Link Established
	Amber - Flashing	TX Active

2.4 GNSS

The device integrates global navigation satellite system solution that supports L1:

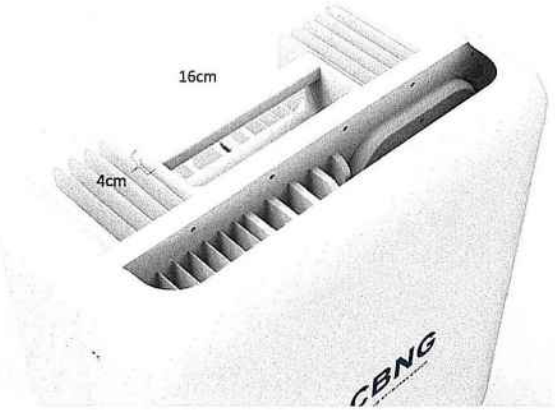
- GPS (North America)
- Galileo (Europe)
- GLONASS (Russia)
- QZSS (Japan)

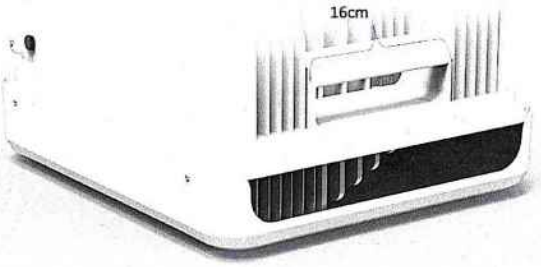
An external antenna is supplied affixed to a bracket attached to the unit, drawing below:

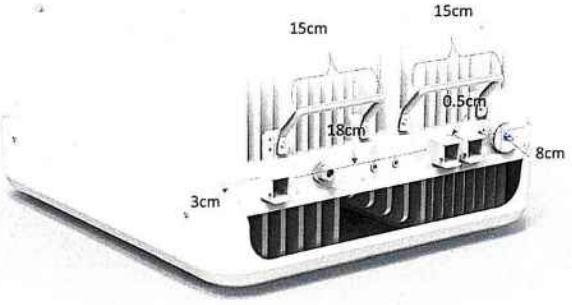


3 Mechanical

3.1 Device Images

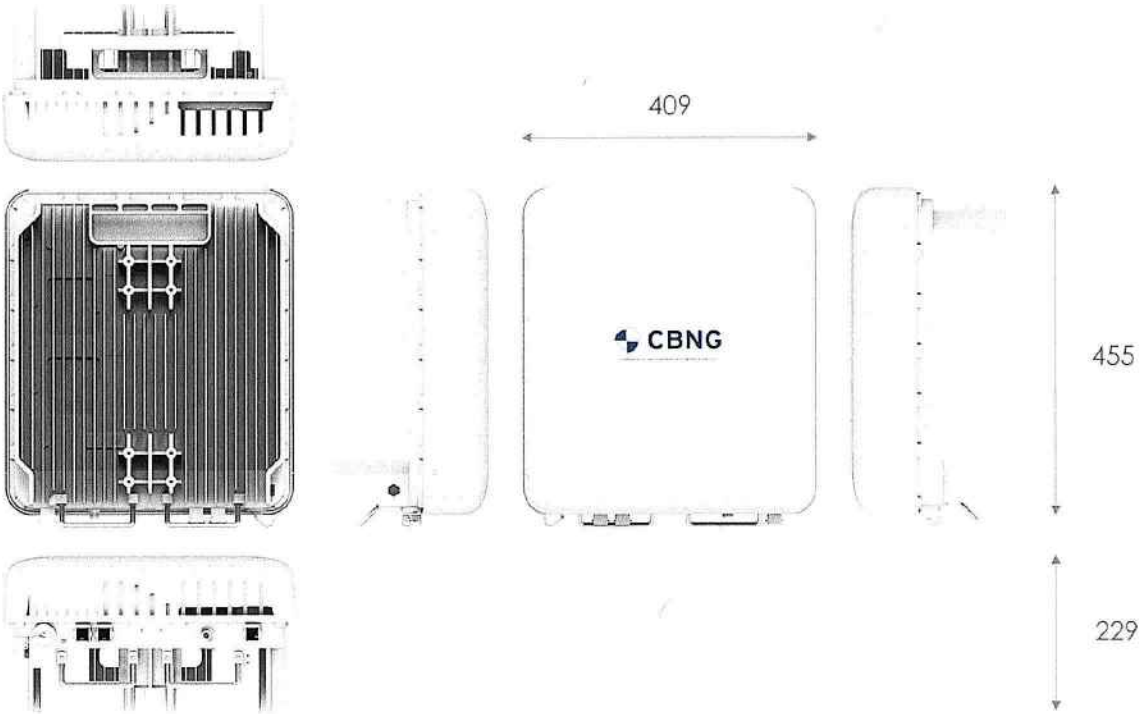

16cm
4cm
CBNG


16cm


15cm
15cm
0.5cm
18cm
8cm
3cm

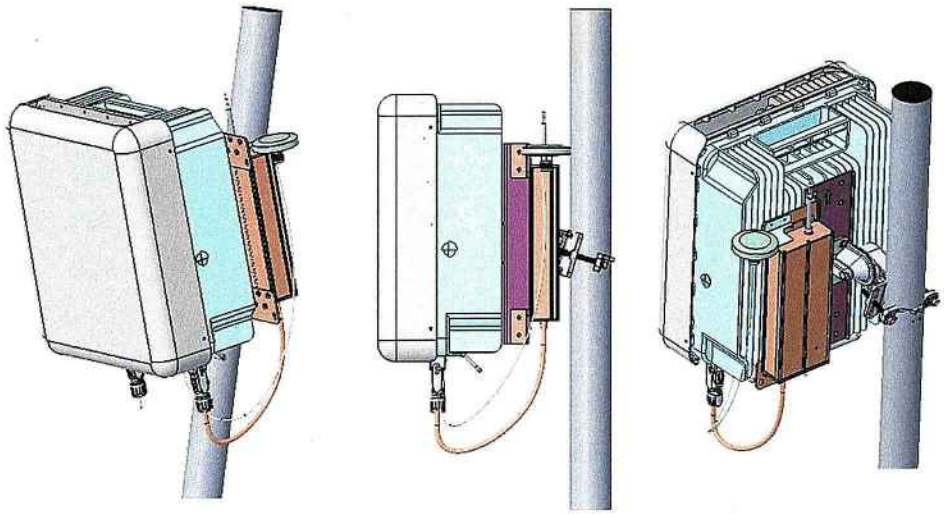
3.2 Device Dimensions

Product Dimensions: 409mm (width) x 455mm (height) x 229mm (depth)

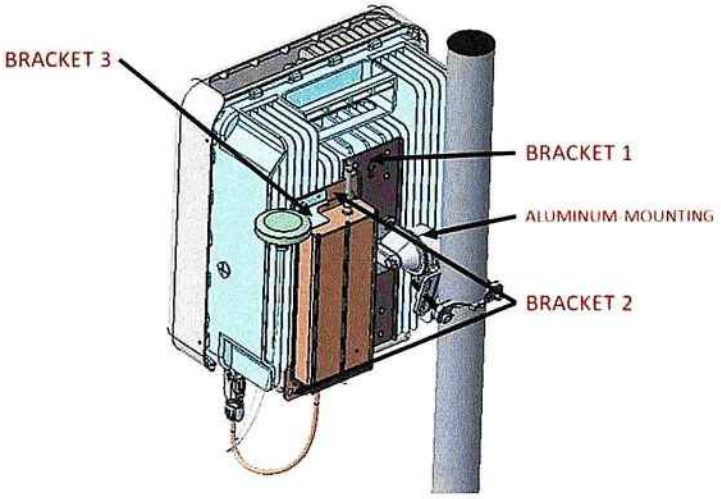


3.3 Mounting Options

Pole Mount

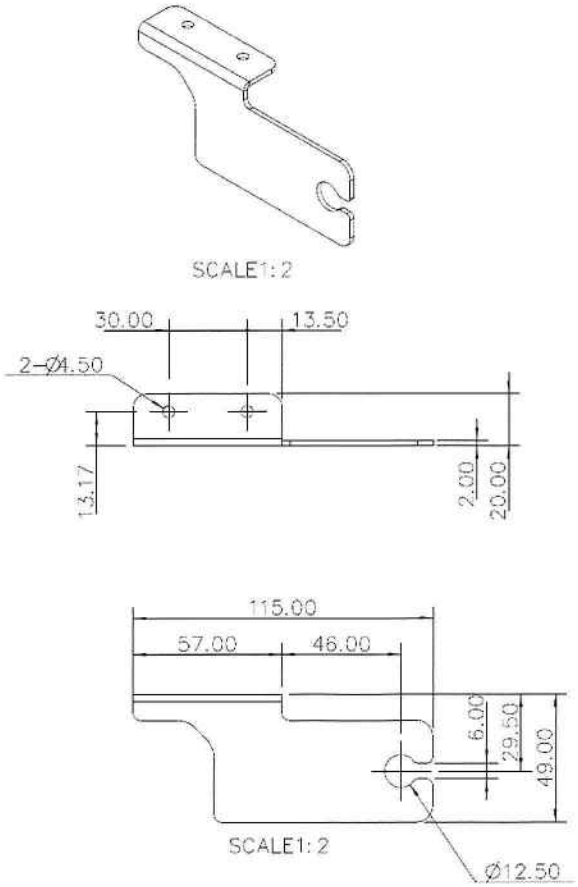


3.4 Mounting Bracket Details

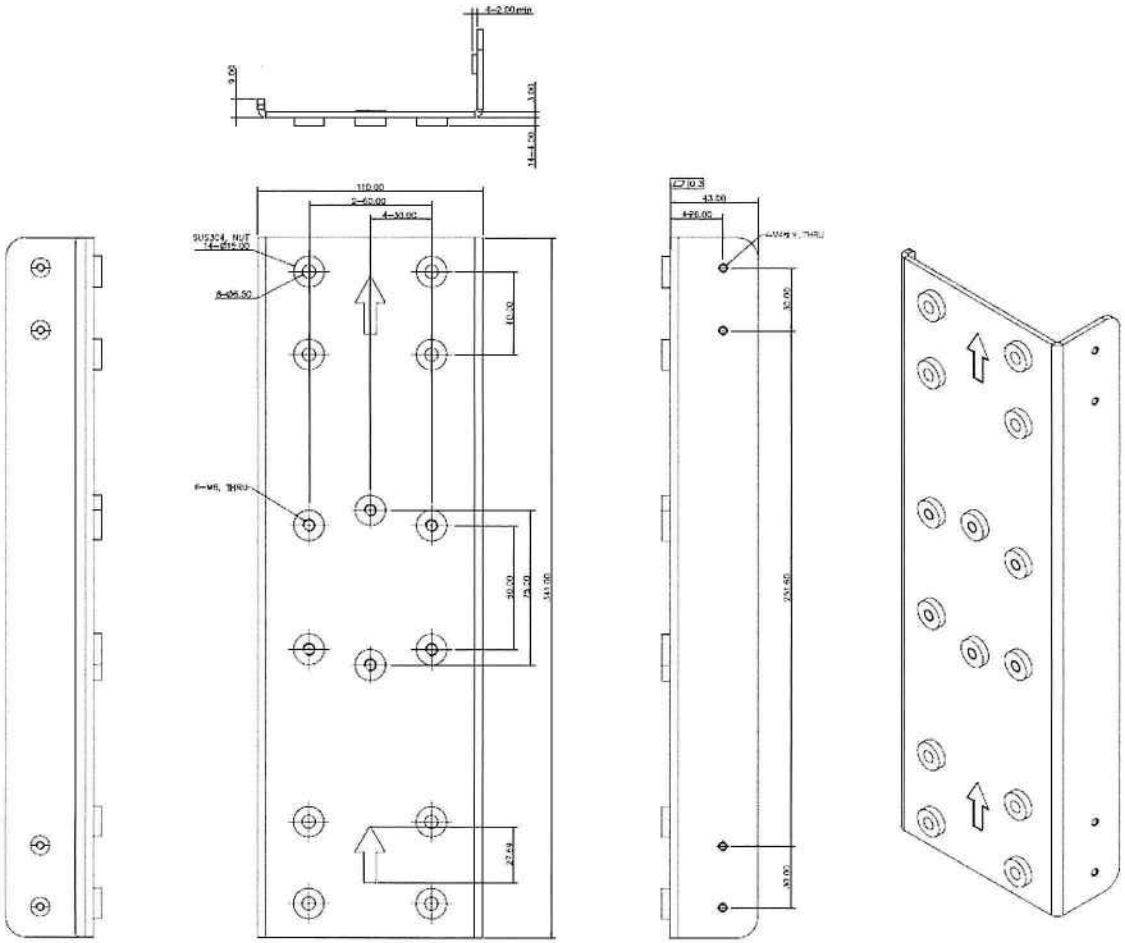


Technical Drawings:

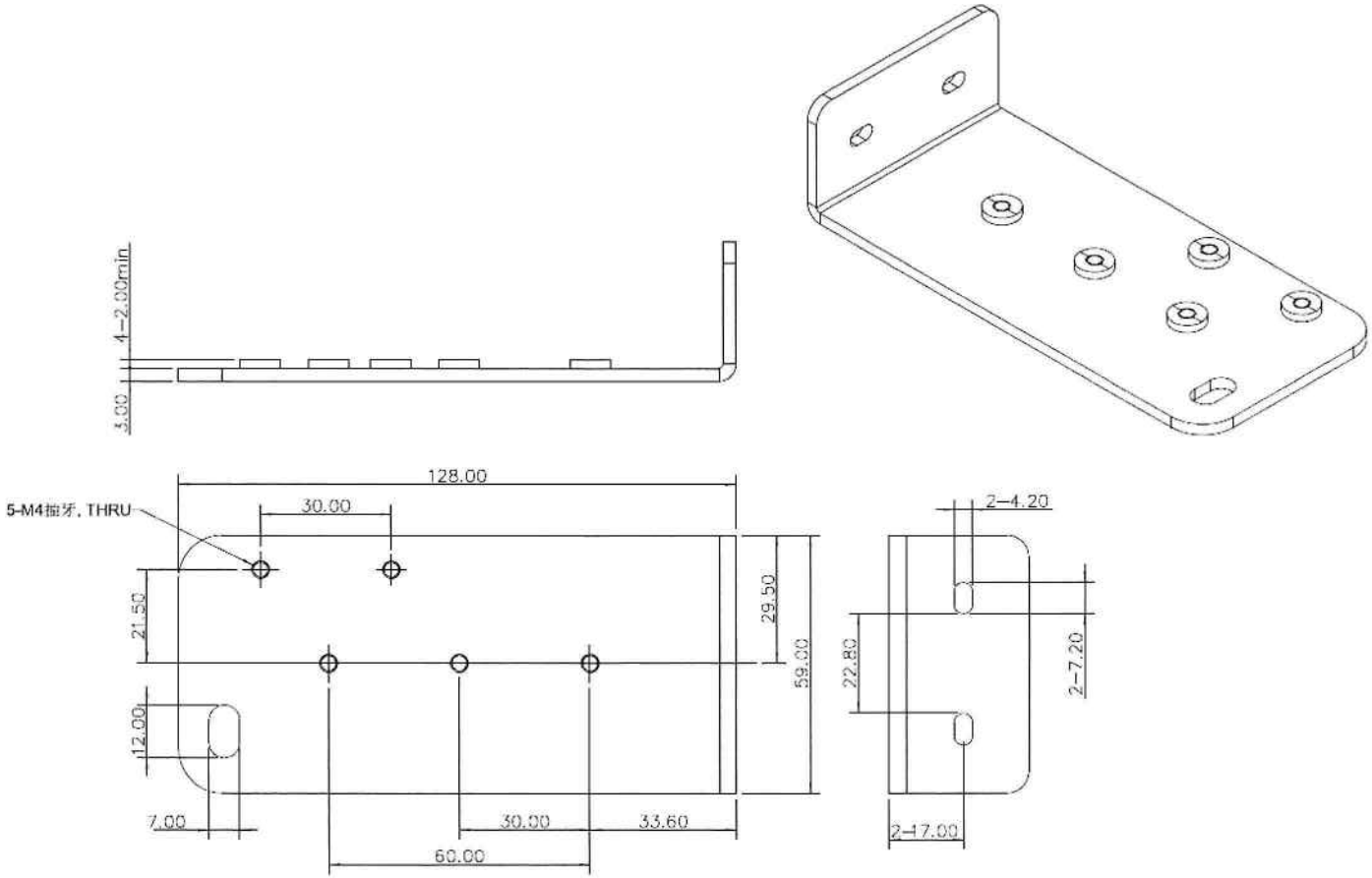
Bracket 3



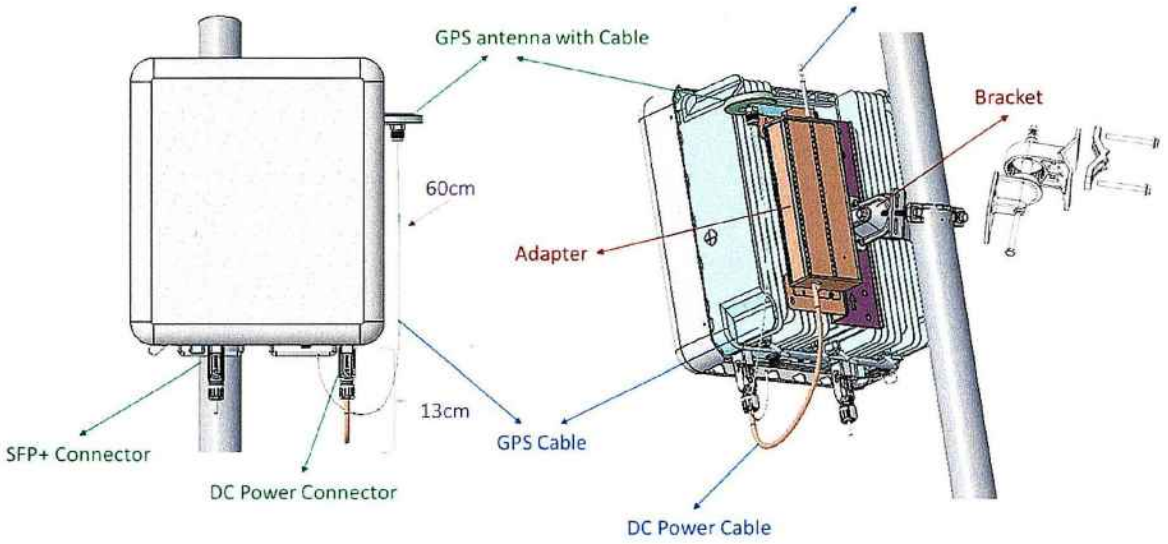
Bracket 1:



Bracket 2


4-2.00min
3.00
128.00
30.00
5-M4抽牙, THRU
21.50
12.00
7.00
30.00
33.60
60.00
29.50
59.00
2-4.20
22.80
2-7.20
2-17.00

3.5 Connectors and Accessories



SFP/SPF+

- *SFP transceiver inside the plug*
- *Direct heat dissipation to the chassis*
- *5 cm² surface savings on the PCB*
- *Easy access to the SFP for replacement*
- *No exposure of optical fibers*
- *EMI shielded*
- *IP67*

Power

- *Available with 2 or 4 contacts + cable braid grounding*
- *Crimped contacts or screw terminal blocks*
- *Wire size from 1.5 to 6 mm² (10-16AWG)*
- *Current rating up to 20A per contact*
- *Lightning protection*
- *EMI shielded*
- *IP67*

4 Qualification & Certification

The following qualification and certification standards are applicable, Item 6 is under investigation and as the design is in prototype phase compliance to standards has yet to be proven.

1. US UL
    a. CFR 29 - Part 1910,
    b. EN 62368-1
2. US FCC
    a. FCC Title 47 CFR parts 15B,
    b. part 18,
    c. part 30,
    d. CFR 47 - Part 1 §1310

3. 3GPP Rel 16
    a. TS 38.104,
    b. TS 38.113,
    c. TS 38.141-1,
    d. TS 38.141-2
4. Customer Compliance Requirements (under investigation for compliance)
    a. TL 9000 Quality Management System - Requirements Handbook,
    b. TL 9000 Quality Management System - Measurements Handbook,
    c. GR-63 Network Equipment - Building System (NEBS) Requirements: Physical Protection
    d. GR-78 Generic Requirements for the Physical Design and Manufacture of Telecommunications Products and Equipment
    e. GR-282 Software Reliability And Quality Acceptance Criteria (SRQAC), A Module Of RQGR, FR-796 Issue 4
    f. GR-383 COMMON LANGUAGE® Equipment Codes (CLEITM Codes) - Generic Requirements for Bar Code Labels Issue 3
    g. GR-485 Common Language® Equipment Codes (CLEITM Codes)- Generic Requirements for Processes and Guidelines Issue 5
    h. GR-929 Reliability and Quality Measurements for Telecommunications Systems RQMS-Wire line), A Module of RQMS, FR-929 and RQGR, FR-796 Issue 8
    i. GR-1089 Electromagnetic Compatibility and Electrical Safety Generic Criteria for Network Telecommunications Equipment Issue 4
    j. GR-1315 In-Process Quality Metrics (IPQM)
    k. GR-1421 Generic Requirements for ESD Protective Circuit Packet Containers
    l. SR-NWT-2759 A View of Packaging, Palletization and Marking Requirements
    m. SR-332 Reliability Prediction Procedure for Electronic Equipment
    n. TR-NWT-000357 Generic Requirements for Assuring Reliability of Components Used in Telecommunications Equipment
    o. GR-418 Generic Reliability Assurance Requirements For Fiber Optic Transport Systems A Module Of RQGR, FR-796 Issue 2
    p. GR-840 Supplier Support Generic Requirements (SSGR), A Module of LSSGR, FR-64; OTGR, FR-439; and TSGR, FR-440 Issue 1
    q. TR-NWT-000870 Electrostatic Discharge Control in the Manufacture of Telecommunications Equipment

ATTACHMENT 3

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

Calculated Radio Frequency Emissions Report

verizon

West Haven

24 Rockdale Road, West Haven, CT

November 12, 2024

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of Verizon's antenna array mounted at 146' and 148' on an existing self-support tower located at 24 Rockdale Road in West Haven, CT. The coordinates of the tower are 41° 17' 28.34" N, 72° 58' 4.37" W.

Verizon is proposing the following:

1) Remove three (3) CDMA directional panel antenna.
2) Retain six (9) directional panel antenna (three (3) antennas per sector, three sectors) to support its commercial LTE and 5G network.
3) Install four (4) millimeter wave antenna (one (1) antenna per sector, four sectors) to support its 5G network.

This report considers the planned antenna configuration for Verizon[1] as well as existing antenna configuration[2][3] for T-Mobile and Others (UHF and VHF Antenna) to derive the resulting % Maximum Permissible Exposure (MPE) of its proposed modification.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^2). The general population exposure limits for the various frequency ranges are defined in the documents referenced in Attachment A of this report.

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

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

[1] As referenced to Verizon's Radio Frequency Design Sheet, dated 9/18/2024.

[2] As referenced to T-Mobile's Connecticut Siting Council Notice of Exempt Modification – 24 Rockdale Road, West Haven, CT dated 11/18/2020

[3] As referenced to Verizon's Connecticut Siting Council Notice of Exempt Modification – 24 Rockdale Road, West Haven, CT dated 4/19/2021.

3. RF Exposure Prediction Methods

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

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

Where:

EIRP = Effective Isotropic Radiated Power

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

H = Horizontal Distance from antenna in meters

V = Vertical Distance from radiation center of antenna in meters

Off Beam Loss is determined by the selected antenna patterns

Ground reflection factor (GRF) of 1.6

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

The percent of MPE values presented in this report reflect levels that one may encounter from one sector of a carrier's antennas. Most carriers use 3 or 4 sectors per site with azimuths approximately 90 or 120 degrees apart, respectively; therefore, one could not be standing in the main beam of all sectors at the same time. In cases where antenna models are not uniform across all sectors, the antenna model with the highest gain was used for the calculations. This results in a conservative or "worst case" assumption for percent of MPE calculations.

4. Antenna Inventory

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

Operator	Sector / Azimuth	TX Freq (MHz)	Power at Antenna (Watts)	Ant Gain (dBi)	Power EIRP (Watts)	Antenna Model	Beam Width	Mech. Tilt	Length (ft)	Antenna Centerline Height (ft)
Verizon	Alpha / 340°	38000	0.066	-	4211	39 GHz VectaStar NR gNB	4.5	0	1.5	148
	Alpha / 60°	750	160	16.5	7147	JAHH-45B-R3B	48	2	6	146
		850	160	17.2	8397		43			
		1900	160	20.2	16754		43			
		2100	240	20.5	26928		41			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	146
	Beta / 60°	38000	0.066	-	4211	39 GHz VectaStar NR gNB	4.5	0	1.5	148
	Beta / 160°	750	160	16.5	7147	JAHH-45B-R3B	48	0	6	146
		850	160	17.2	8397		43			
		1900	160	20.2	16754		43			
		2100	240	20.5	26928		41			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	146
	Gamma / 150°	38000	0.066	-	4211	39 GHz VectaStar NR gNB	4.5	0	1.5	148
	Gamma / 240°	750	160	16.5	7147	JAHH-45B-R3B	48	0	6	146
		850	160	17.2	8397		43			
		1900	160	20.2	16754		43			
		2100	240	20.5	26928		41			
		3700	200	25.5	70963	MT6407-77A	-	0	2.92	146
	Delta / 240°	38000	0.066	-	4211	39 GHz VectaStar NR gNB	4.5	0	1.5	148

Table 1: Proposed Antenna Inventory [4,5]

[4] Antenna heights are in referenced to Verizon's Radio Frequency Design Sheet, dated 9/18/2024.

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

5. Calculation Results

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

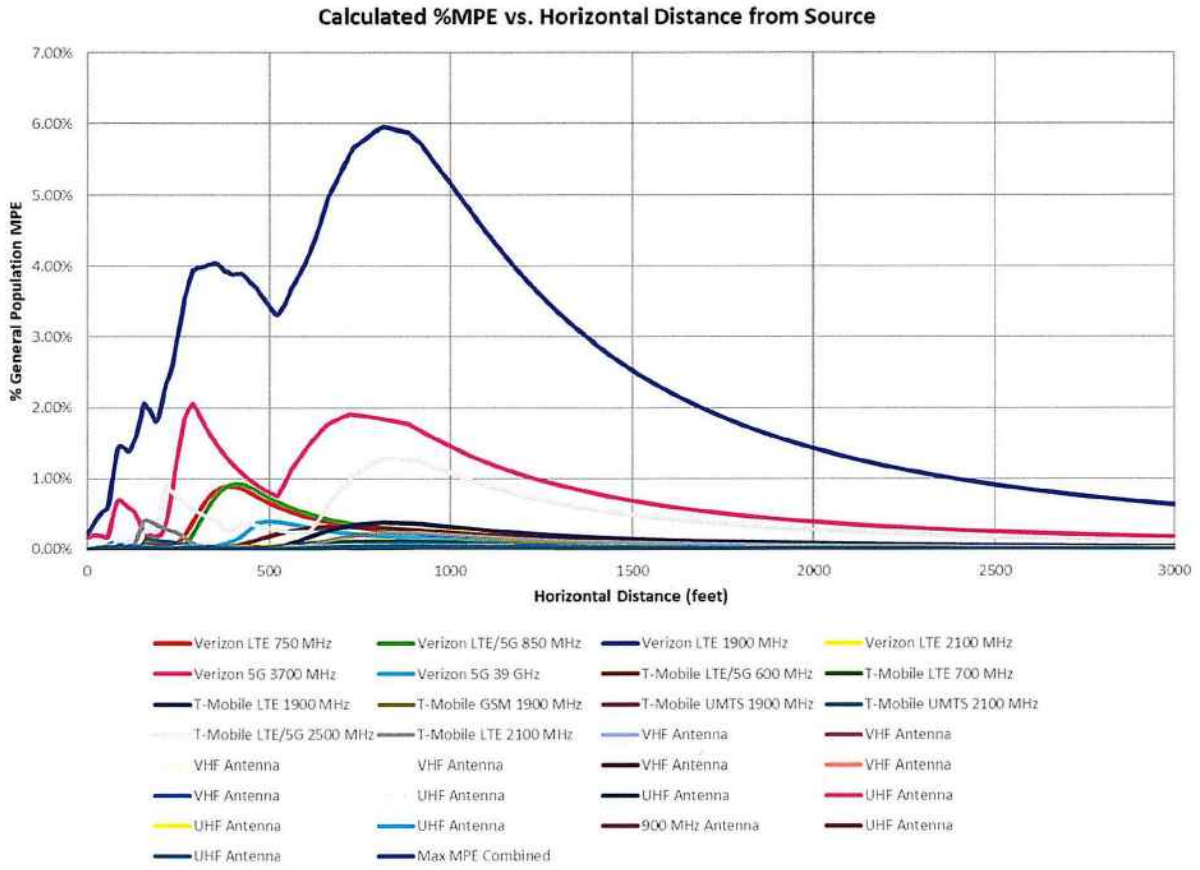


Figure 1: Graph of General Population % MPE vs. Distance

The highest percent of MPE (5.96% of the General Population limit) is calculated to occur at a horizontal distance of 815 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 1500 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

Table 2 below lists percent of MPE values as well as the associated parameters that were included in the calculations. The highest percent of MPE value was calculated to occur at a horizontal distance of 815 feet from the site (reference Figure 1).

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

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
900 MHz Antenna	1	100.0	182.0	815	0.000108	0.300	0.04%
T-Mobile GSM 1900 MHz	4	30.0	135.0	815	0.000287	1.000	0.03%
T-Mobile LTE 1900 MHz	4	60.0	135.0	815	0.003790	1.000	0.38%
T-Mobile LTE 2100 MHz	4	40.0	135.0	815	0.002305	1.000	0.23%
T-Mobile LTE 700 MHz	2	30.0	135.0	815	0.000529	0.467	0.11%
T-Mobile LTE/5G 2500 MHz	4	40.0	135.0	815	0.012899	1.000	1.29%
T-Mobile LTE/5G 600 MHz	1	140.0	135.0	815	0.001220	0.400	0.30%
T-Mobile UMTS 1900 MHz	2	30.0	135.0	815	0.000143	1.000	0.01%
T-Mobile UMTS 2100 MHz	2	30.0	135.0	815	0.000864	1.000	0.09%
UHF Antenna	1	100.0	191.0	815	0.000100	0.300	0.03%
UHF Antenna	1	100.0	183.5	815	0.000111	0.300	0.04%
UHF Antenna	1	100.0	183.0	815	0.000112	0.300	0.04%
UHF Antenna	1	100.0	182.5	815	0.000113	0.300	0.04%
UHF Antenna	1	100.0	182.0	815	0.000114	0.300	0.04%
UHF Antenna	1	100.0	182.0	815	0.000114	0.300	0.04%
UHF Antenna	1	100.0	182.0	815	0.000114	0.300	0.04%
Verizon 5G 3700 MHz	1	200.0	146.0	815	0.018399	1.000	1.84%
Verizon 5G 39 GHz	2	0.033	148.0	815	0.001875	1.000	0.19%
Verizon LTE 1900 MHz	1	160.0	146.0	815	0.001293	1.000	0.13%
Verizon LTE 2100 MHz	1	240.0	146.0	815	0.001506	1.000	0.15%
Verizon LTE 750 MHz	1	160.0	146.0	815	0.001293	0.500	0.26%
Verizon LTE/5G 850 MHz	1	160.0	146.0	815	0.001628	0.567	0.29%
VHF Antenna	1	100.0	168.0	815	0.000115	0.200	0.06%
VHF Antenna	1	100.0	168.0	815	0.000115	0.200	0.06%
VHF Antenna	1	100.0	174.0	815	0.000107	0.200	0.05%
VHF Antenna	1	100.0	182.0	815	0.000096	0.200	0.05%
VHF Antenna	1	100.0	181.5	815	0.000097	0.200	0.05%
VHF Antenna	1	100.0	181.5	815	0.000097	0.200	0.05%
VHF Antenna	1	100.0	181.5	815	0.000097	0.200	0.05%
						Total	**5.96%**

Table 2: Maximum Percent of General Population Exposure Values[6,7,8,9]

[6] Frequencies listed are representative of the operating band and are not the specific operating frequency.

[7] The total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not reflect the total value listed in the table.

[8] In the case where specific antenna pattern is not available, similar antenna pattern was used based on the frequency, bandwidth and gain of the antenna.

[9] The antenna pattern, frequency, and power information for VHF, UHF and 900 MHz antenna were based on reasonable assumptions.

6. Conclusion

The above analysis verifies that RF exposure levels from the site with Verizon's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE in consideration of all transmitters is calculated to be **5.96%** of the FCC limit (General Population/Uncontrolled). This maximum cumulative percent of MPE value is calculated to occur 815 feet away from the site.

7. Statement of Certification

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

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

November 12, 2024
Date

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

November 12, 2024
Date

Attachment A: References

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

IEEE C95.1-2019, IEEE Standard Safety Levels With Respect to Human Exposure to Electric, Magnetic, and Electromagnetic Fields, 0 Hz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2021, IEEE Recommended Practice for Measurements and Computations of Electric, Magnetic, and Electromagnetic Fields with Respect to Human Exposure to Such Fields, 0 Hz-300 GHz IEEE-SA Standards Board

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

(A) Limits for Occupational/Controlled Exposure[10]

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

(B) Limits for General Population/Uncontrolled Exposure[11]

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

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

Table 3: FCC Limits for Maximum Permissible Exposure

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

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

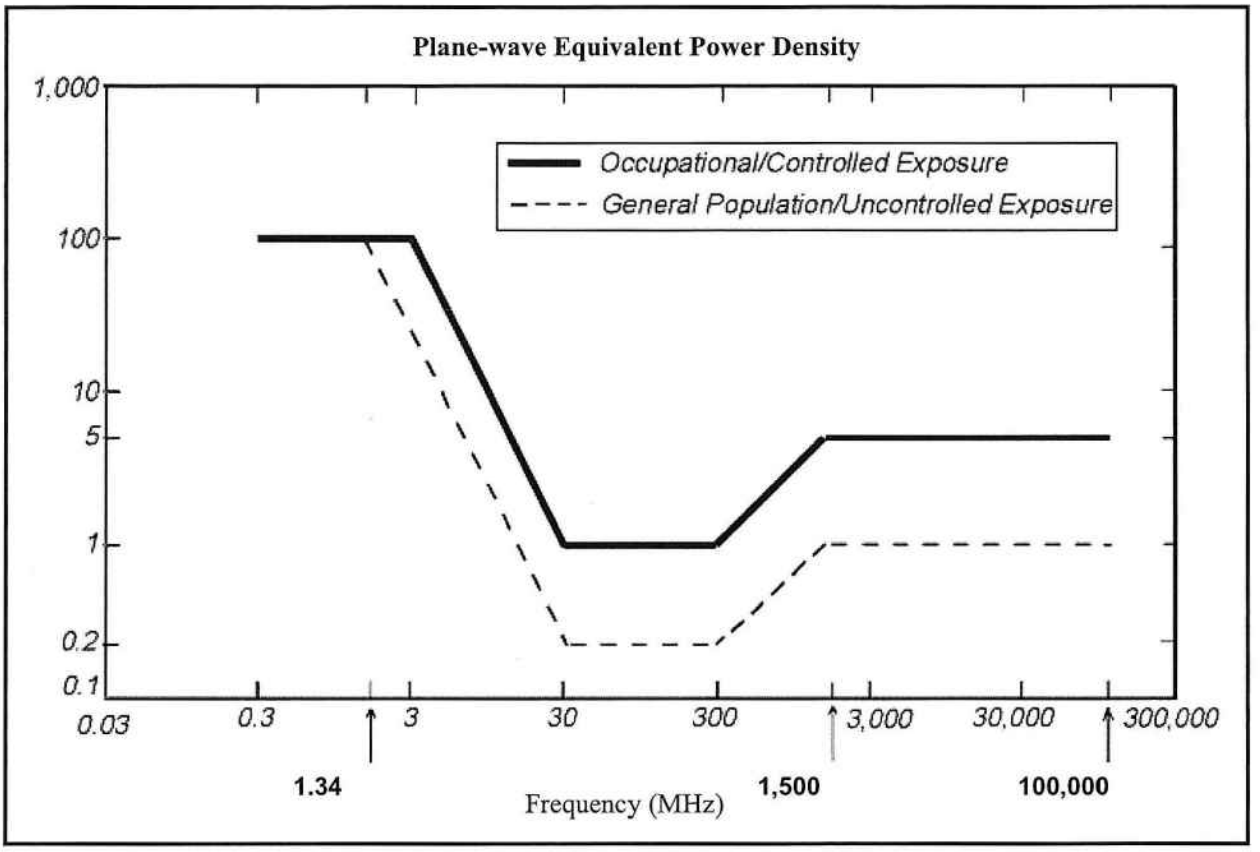
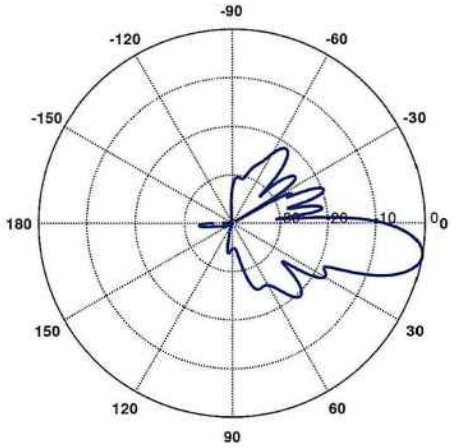


Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

Attachment C: Verizon Antenna Model Data and Electrical Patterns

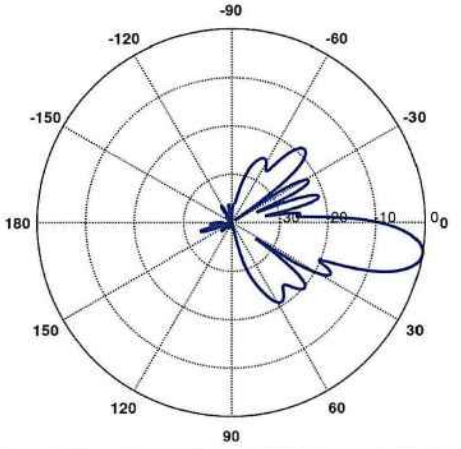
750 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-45B-R3B
Frequency Band:	698-798 MHz
Gain:	16.5 dBi
Electrical Down-Tilt	10°
Vertical Beamwidth:	12.6°
Horizontal Beamwidth:	48°
Polarization:	±45°
Dimensions (L x W x D):	72" x 18" x 7"



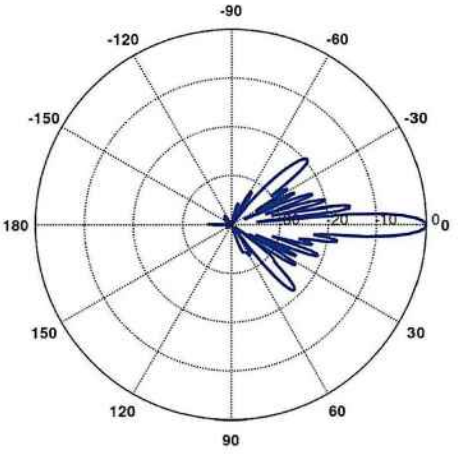
850 MHz

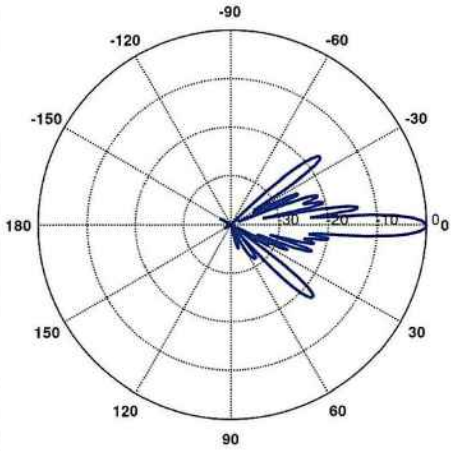
Manufacturer:	COMMSCOPE
Model #:	JAHH-45B-R3B
Frequency Band:	824-894 MHz
Gain:	17.2 dBi
Electrical Down-Tilt	10°
Vertical Beamwidth:	11.2°
Horizontal Beamwidth:	43°
Polarization:	±45°
Dimensions (L x W x D):	72" x 18" x 7"



1900 MHz

Manufacturer:	COMMSCOPE
Model #:	JAHH-45B-R3B
Frequency Band:	1850-1990 MHz
Gain:	20.2 dBi
Electrical Down-Tilt	0°
Vertical Beamwidth:	5.4°
Horizontal Beamwidth:	43°
Polarization:	±45°
Dimensions (L x W x D):	72" x 18" x 7"



2100 MHz Manufacturer: COMMSCOPE Model #: JAHH-45B-R3B Frequency Band: 1920-2200 MHz Gain: 20.5 dBi Electrical Down-Tilt 0° Vertical Beamwidth: 5° Horizontal Beamwidth: 41° Polarization: ±45° Dimensions (L x W x D): 72" x 18" x 7"	
3700 MHz Manufacturer: SAMSUNG Model #: MT6407-77A Frequency Band: 3700-3980 MHz Gain: 25.5 dBi Electrical Down-Tilt 0° Vertical Beamwidth: N/A° Horizontal Beamwidth: N/A° Polarization: N/A° Dimensions (L x W x D): 35.06" x 16.06" x 5.51"	N/A
38000 MHz Manufacturer: CBNG Model #: 39 GHz VectaStar NR gNB Frequency Band: 37000-40000 MHz Gain: - dBi Electrical Down-Tilt 0° Vertical Beamwidth: N/A° Horizontal Beamwidth: N/A° Polarization: N/A° Dimensions (L x W x D): 17.91" x 16.10" x 9.02"	N/A

ATTACHMENT 4

STRUCTURAL ANALYSIS REPORT

For

verizon

GPD Group
520 South Main Street
Suite 2531
Akron, OH 44311

West Haven
KM No. 241009.00

180' Self Support Tower
24 Rockdale Road
West Haven, CT 06516
41.290714, -72.967622

Prepared By:

KM CONSULTING ENGINEERS, INC.

262 Upper Ferry Rd, Ewing, NJ 08628
Ph: (609) 538-0400 www.kmengr.com

November 20, 2024

Prepared to ANSI/TIA-222-H October 2017
Structural Standard for Antenna Supporting Structures
and Antennas and Small Wind Turbine Support Structures

GPD Group
West Haven

TABLE OF CONTENTS

Load Case No. 1: Existing tower superstructure with existing inventory and proposed Verizon installation.

1.0 EXECUTIVE SUMMARY

Structure

Tower Manager: Radio Communications, Inc.

Location: 24 Rockdale Road
West Haven, CT 06516
41.290714, -72.967622

Manufacturer: Rohn

Equipment

Existing tower inventory plus the proposed installation are detailed in Section 2.0 "Tower Inventory."

Synopsis

Load Case No. 1: The existing tower superstructure with the current inventory and proposed Verizon installation.

The tower superstructure has sufficient capacity and therefore meets the current TIA standards. The tower superstructure is rated at 75.8% and the base foundation is rated at 55.9%.

2.0 TOWER INVENTORY

DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Dipole	191	(2) 8' pipe mount	146
10' Whip	183.5	(2) 8' pipe mount	146
10' Dipole	183	(2) 8' pipe mount	146
10' Whip	182.5	Samsung 64T64R MMU (Verizon)	146
6' Yagi	182	Samsung 64T64R MMU (Verizon)	146
PG1N0F-0090-310	182	Samsung 64T64R MMU (Verizon)	146
16' Whip	182	(2) CBC78T-DS-43-2X (Verizon)	146
6' Yagi	182	(2) CBC78T-DS-43-2X (Verizon)	146
21' Whip	182	(2) CBC78T-DS-43-2X (Verizon)	146
21' Whip	181.5	8' tall 2" Std. pipe 1' standoff (Verizon)	146
21' Whip	181.5	8' tall 2" Std. pipe 1' standoff (Verizon)	146
20' Dipole	181.5	8' tall 2" Std. pipe 1' standoff (Verizon)	146
14' Inverted Whip	180 - 166	8' tall 2" Std. pipe 1' standoff (Verizon)	146
Top Platform	180	Stand-Off T-Frame (Verizon)	146
10' Inverted Whip	180 - 170	Radio 4415 B25 (T-Mobile)	135
TMA	180	Radio 4415 B25 (T-Mobile)	135
TMA	180	AIR 3246 B66 (T-Mobile)	135
PSILP8OI-24 antenna (Channel 24)	178.6 - 162	AIR 3246 B66 (T-Mobile)	135
Raycap (Verizon)	148.5	AIR 3246 B66 (T-Mobile)	135
RHSDC-3315-PF-48 (Verizon)	148.5	APXVAARR24_43-U-NA20 (T-Mobile)	135
RVZDC-6627-PF-48 OVP (Verizon)	148.5	APXVAARR24_43-U-NA20 (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	APXVAARR24_43-U-NA20 (T-Mobile)	135
		Stand-Off T-Frame (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	AIR 32 B2a/B66Aa (T-Mobile)	135
		AIR 32 B2a/B66Aa (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	AIR 32 B2a/B66Aa (T-Mobile)	135
		Radio 4449 B71/B85 (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	Radio 4449 B71/B85 (T-Mobile)	135
		Radio 4449 B71/B85 (T-Mobile)	135
Stand-Off T-Frame (Verizon)	146	Stand-Off T-Frame (T-Mobile)	135
Stand-Off T-Frame (Verizon)	146	Stand-Off T-Frame (T-Mobile)	135
B5/B13 Dual Band RRH (Verizon)	146	AP259015-52	135
B5/B13 Dual Band RRH (Verizon)	146	AIR6449 B41 (T-Mobile)	135
B5/B13 Dual Band RRH (Verizon)	146	AIR6449 B41 (T-Mobile)	135
B2/B66a Dual Band RRH (Verizon)	146	AIR6449 B41 (T-Mobile)	135
B2/B66a Dual Band RRH (Verizon)	146	Radio 4415 B25 (T-Mobile)	135
B2/B66a Dual Band RRH (Verizon)	146	IBR1300	125
BSAMNT-SBS-2-3 (Verizon)	146	Empty Mount	103
BSAMNT-SBS-2-3 (Verizon)	146	2' yagi	102.5
BSAMNT-SBS-2-3 (Verizon)	146	GPS	59.5
(2) JAHH-45B-R3B (Verizon)	146	(2) GPS	18
(2) JAHH-45B-R3B (Verizon)	146	(2) GPS	17.67
(2) JAHH-45B-R3B (Verizon)	146		

Proposed Verizon Loading:

Addition of:

*(4) CBNG 39GHz VectaStar NR gNB antennas @ 148' AGL
*(4) 8' tall pipe mounts @ 146' AGL
*(1) Raycap RVZDC-6627-PF-48 OVP @ 148.5' AGL
*(1) 1-5/8" hybrid cable line up to 146' AGL

Removal of:

*(1) 1-5/8" coax line up to 146' AGL

3.0 COMMENTARY

Our scope of work is to determine if the existing structure is capable of withstanding the additional stresses/forces imposed by the installation of the proposed Verizon equipment noted in the tower inventory.

Tower structure information and foundation information was obtained from previous structural analyses by KMCE. The tower has been reinforced as per KMCE drawings in November 1997, July 2002, January 2009, August 2012, and December 2014. Previous tower inventory was determined from a tower climb and mapping completed on February 16, 2015. The proposed loading was obtained from construction drawing details done by GPD Engineering and Architecture Professional Corporation dated October 15, 2024 and from correspondence with the client.

The following report will provide analytical calculations and commentary regarding the capacity of the proposed tower and subsequent recommendations.

4.0 ANALYSIS PROCEDURE

KM Consulting Engineers, Inc. carried out their structural analysis by correlating field inspection and tower member data into proprietary software designed specifically for communication tower analysis.

These programs run in conjunction with the guidelines set down in the ANSI/TIA-222-H Standard entitled "Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Structures."

The existing tower is analyzed by placing wind forces on the structure in 30° positional increments around the tower (i.e. wind pressure directly onto the tower corners, faces and parallel to the faces). This enables the user to "create" a three-dimensional representation, yielding results for worst case scenarios. In effect, the production of these results allows the user to study the structural integrity of the tower when influenced by wind forces from any direction.

The proceeding report includes analysis for the tower with the addition of antennas in the scenarios stated. For clarity, the analysis shall include worst case loadings and a typical elevation view with maximum foundation loads tabulated.

Codes and Standards

2022 Connecticut State Building Code

TIA - Telecommunications Industry Association - *Structural Standard for Antenna Supporting Structures and Antennas and Small Wind Turbine Support Structures (ANSI/TIA-222-H)*, 2017

AISC - American Institute of Steel Construction – *Specification for Structural Steel Buildings (ANSI/AISC 360-16)*, 2016

ASCE - American Society of Civil Engineers - *Minimum Design Loads for Buildings and Other Structures (ASCE/SEI 7-16)*, 2017

ACI - American Concrete Institute - *Building Code Requirements for Structural Concrete (ACI 318-19)*, 2019

5.0 TOWER ANALYSIS RESULTS

The tower was analyzed for the inventory detailed in Section 2.0 "Tower Inventory".

The basic wind speed of 125 MPH with no radial ice is taken from Appendix P of the 2022 Connecticut State Building Code for the basic design wind speed for the municipality of West Haven, CT and is used in accordance with the ANSI/TIA-222-H. The basic wind speed of 50 MPH concurrent with 1" design ice thickness is taken from the online ASCE Hazard Tool in accordance with the ANSI/TIA-222-H. Additional criteria include Risk Category II, Exposure Category B, and Topographic Category 1.

All allowable capacities have been calculated to comply with the permitted EIA allowable increases (for wind). All bolts loaded in shear assume the threads **are included** in the shear plane.

Load Case No. 1: Proposed Verizon installation includes the addition of (4) CBNG 39GHz VectaStar NR gNB antennas, (4) 8' tall pipe mounts, (1) Raycap RVZDC-6627-PF-48 OVP, and (1) 1-5/8" hybrid cable line and the removal of (1) 1-5/8" coax line.

The tower superstructure has sufficient capacity and therefore meets the current TIA standards. The tower superstructure is rated at 75.8% and the base foundation is rated at 55.9%.

Foundation Capacity		
Actual Uplift	Allowable Uplift	% Use
214.6 kips	384 kips	**55.9%**

6.0 RECOMMENDATIONS

Further to our calculations, we conclude that the tower superstructure has adequate capacity and therefore meets the current ANSI/TIA-222-H design standards. The tower is acceptable to support the proposed Verizon installation.

Please do not hesitate to contact our office with any questions or concerns regarding this report.

Sincerely,
KM CONSULTING ENGINEERS, INC

Reviewed and Approved by:

Doug Austin, EIT
Project Manager

STATE OF CONNECTICUT
MICHAEL L BOHLINGER
20405
LICENSED
PROFESSIONAL ENGINEER

11/20/24

Michael L. Bohlinger, PE
Principal Engineer
CT License No. 20405

7.0 APPENDIX

LOAD CASE 1

Table from Appendix P of the 2022 CSBC

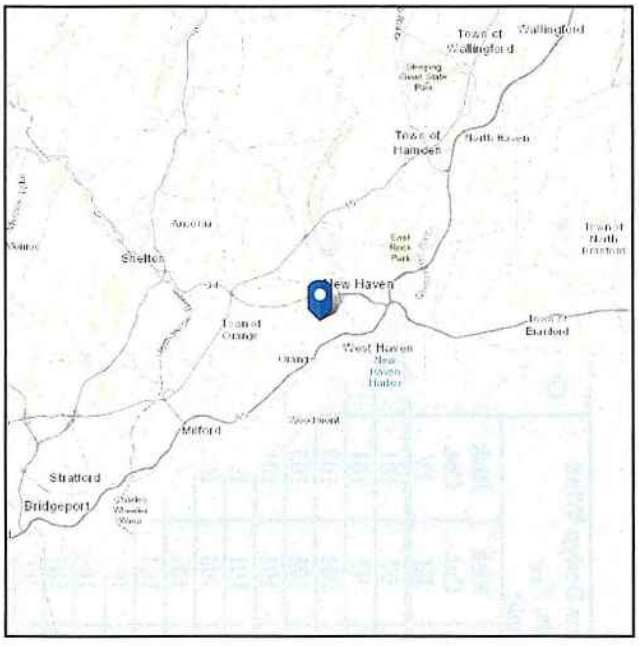
Municipality	Basic Design Wind Speeds, V (mph)				Allowable Stress Design Wind Speeds, V_{asd} (mph)				Ground Snow Load p_g (psf)	MCE Ground Accelerations		Wind-Borne Debris Region[1]		Hurricane-Prone Region
	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV	Risk Cat. I	Risk Cat. II	Risk Cat. III	Risk Cat. IV		S_S (g)	S_1 (g)	Risk Cat. III Occup. I-2	Risk Cat. IV	
Sherman	110	115	125	130	85	89	97	101	35	0.203	0.055			
Simsbury	110	120	125	130	85	93	97	101	35	0.177	0.054			Yes
Somers	110	120	130	135	85	93	101	105	35	0.174	0.055			Yes
South Windsor	110	120	130	135	85	93	101	105	30	0.183	0.055			Yes
Southbury	110	120	130	130	85	93	101	101	35	0.199	0.054			Yes
Southington	110	120	130	135	85	93	101	105	30	0.196	0.055			Yes
Sprague	115	125	135	140	89	97	105	108	30	0.191	0.054			Yes
Stafford	110	120	130	135	85	93	101	105	35	0.176	0.055			Yes
Stamford	110	120	130	135	85	93	101	105	30	0.261	0.058		Type B	Yes
Sterling	115	125	135	140	89	97	105	108	35	0.187	0.054			Yes
Stonington	120	130	140	145	93	101	108	112	30	0.182	0.051	Type B	Type A	Yes
Stratford	110	120	130	135	85	93	101	105	30	0.206	0.054		Type B	Yes
Suffield	110	120	125	130	85	93	97	101	35	0.170	0.054			Yes
Thomaston	110	120	125	130	85	93	97	101	35	0.184	0.054			Yes
Thompson	110	120	130	135	85	93	101	105	40	0.185	0.056			Yes
Tolland	110	120	130	135	85	93	101	105	35	0.182	0.055			Yes
Torrington	110	115	125	130	85	89	97	101	40	0.175	0.054			
Trumbull	110	120	130	135	85	93	101	105	30	0.210	0.054			Yes
Union	110	120	130	135	85	93	101	105	40	0.178	0.055			Yes
Vernon	110	120	130	135	85	93	101	105	30	0.186	0.055			Yes
Voluntown	120	130	135	140	93	101	105	108	30	0.188	0.053			Yes
Wallingford	110	120	130	135	85	93	101	105	30	0.205	0.055			Yes
Warren	110	115	125	130	85	89	97	101	40	0.179	0.054			
Washington	110	115	125	130	85	89	97	101	35	0.189	0.054			
Waterbury	110	120	130	135	85	93	101	105	35	0.193	0.054			Yes
Waterford	120	130	140	140	93	101	108	108	30	0.194	0.053	Type B	Type B	Yes
Watertown	110	120	130	130	85	93	101	101	35	0.189	0.054			Yes
West Hartford	110	120	130	135	85	93	101	105	30	0.187	0.055			Yes
West Haven	110	125	130	135	85	97	101	105	30	0.200	0.053	Type B	Type B	Yes
Westbrook	115	125	135	140	89	97	105	108	30	0.204	0.054	Type B	Type B	Yes
Weston	110	120	130	135	85	93	101	105	30	0.233	0.056			Yes
Westport	110	120	130	135	85	93	101	105	30	0.232	0.056		Type B	Yes

ASCE Hazards Report

Address:
No Address at This Location

Standard: ASCE/SEI 7-16
Risk Category: II
Soil Class: D - Default (see Section 11.4.3)

Latitude: 41.290714
Longitude: -72.967594
Elevation: 146.71104630236488 ft (NAVD 88)



Wind

Results:

Wind Speed	120 Vmph
10-year MRI	75 Vmph
25-year MRI	85 Vmph
50-year MRI	91 Vmph
100-year MRI	98 Vmph

Data Source:	ASCE/SEI 7-16, Fig. 26.5-1B and Figs. CC.2-1–CC.2-4, and Section 26.5.2
Date Accessed:	Sat Oct 19 2024

Value provided is 3-second gust wind speeds at 33 ft above ground for Exposure C Category, based on linear interpolation between contours. Wind speeds are interpolated in accordance with the 7-16 Standard. Wind speeds correspond to approximately a 7% probability of exceedance in 50 years (annual exceedance probability = 0.00143, MRI = 700 years).

Site is in a hurricane-prone region as defined in ASCE/SEI 7-16 Section 26.2. Glazed openings need not be protected against wind-borne debris.

ASCE
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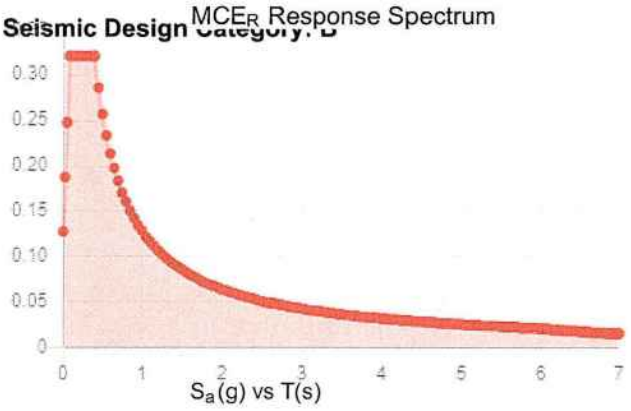
Seismic

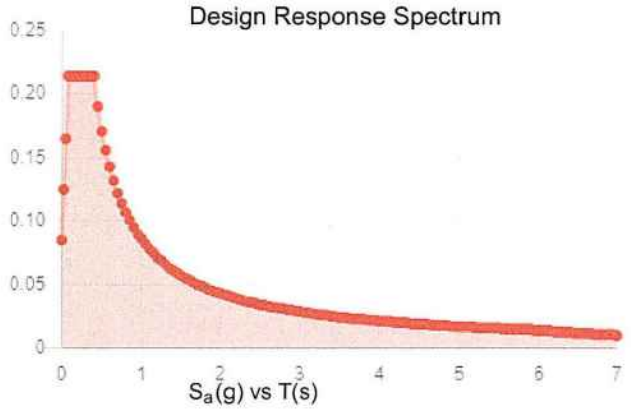
Site Soil Class: D - Default (see Section 11.4.3)

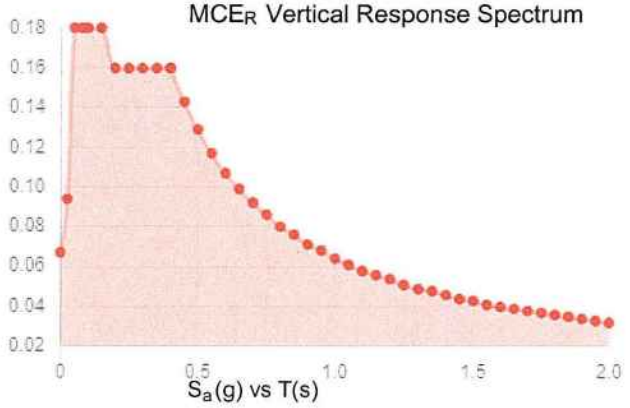
Results:

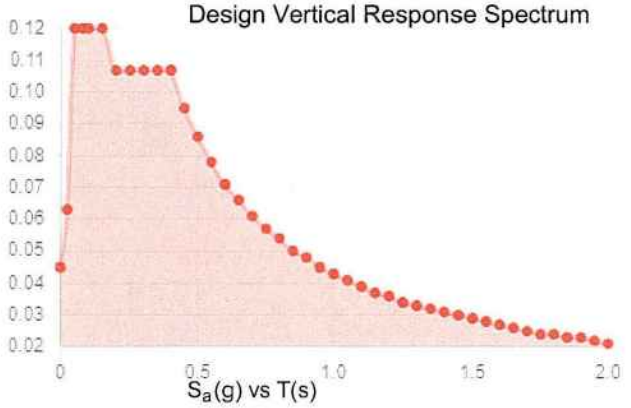
S_S :	0.2	S_{D1} :	0.086
S_1 :	0.054	T_L :	6
F_a :	1.6	PGA :	0.112
F_v :	2.4	PGA_M :	0.177
S_{MS} :	0.321	F_{PGA} :	1.576
S_{M1} :	0.129	I_e :	1
S_{DS} :	0.214	C_v :	0.701

Seismic Design Category: D









Data Accessed: **Sat Oct 19 2024**

Date Source:

USGS Seismic Design Maps based on ASCE/SEI 7-16 and ASCE/SEI 7-16 Table 1.5-2. Additional data for site-specific ground motion procedures in accordance with ASCE/SEI 7-16 Ch. 21 are available from USGS.

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Ice

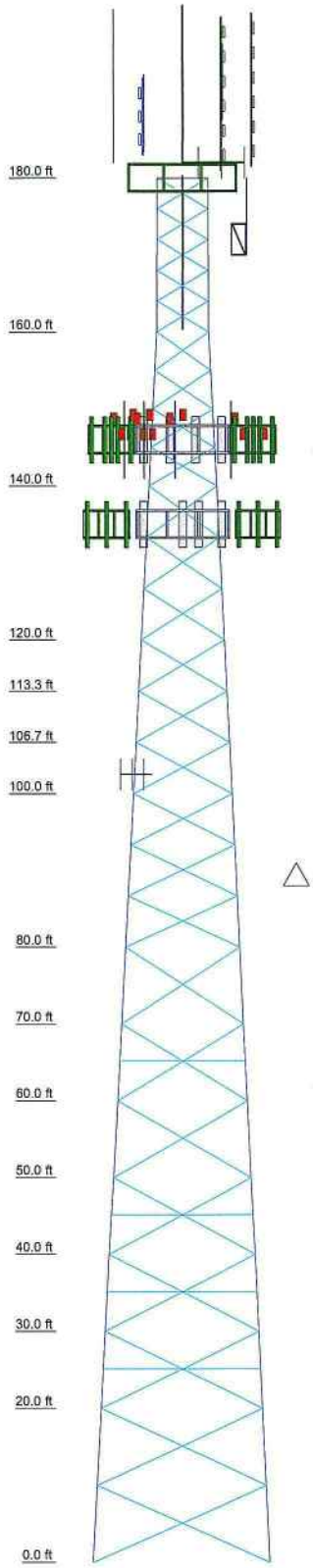
Results:

Ice Thickness:	1.00 in.
Concurrent Temperature:	15 F
Gust Speed	50 mph
Data Source:	Standard ASCE/SEI 7-16, Figs. 10-2 through 10-8
Date Accessed:	Sat Oct 19 2024

Ice thicknesses on structures in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Values provided are equivalent radial ice thicknesses due to freezing rain with concurrent 3-second gust speeds, for a 500-year mean recurrence interval, and temperatures concurrent with ice thicknesses due to freezing rain. Thicknesses for ice accretions caused by other sources shall be obtained from local meteorological studies. Ice thicknesses in exposed locations at elevations higher than the surrounding terrain and in valleys and gorges may exceed the mapped values.

Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	F	ROHN 5 X-STR (GR) w/ 5/8" Cable				E		D		C		B	A	ROHN 2 STD (GR)
Leg Grade	A572-50													
Diagonals	4x4x1/4 w/ sch 40	I		L3 1/2x3 1/2x1/4				L3x3x1/4		H		G	L1 3/4x1 3/4x1/8	L1 1/2x1 1/2x1/8
Diagonal Grade	A572-50													
Top Girts	N.A.							L3x3x1/4						
Sec. Horizontals	N.A.	L3 1/2x3 1/2x1/4			N.A.	J		N.A.						
Face Width (ft) 22.8	20.775	19.7625	18.75	17.7375	16.725	15.7125	14.7	12.675	12	11.325	10.65	8.625	6.6	6.5
# Panels @ (ft)	8 @ 10							9 @ 6.66667					4 @ 5	5 @ 4
Weight (lb) 28620.1	8793.7	2216.3	2159.1	1906.1	1561.2	1790.1	1378.2	2656.0	712.7	647.8	537.1	1635.6	860.1	806.2



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
20' Dipole	191	(2) 8' pipe mount	146
10' Whip	183.5	(2) 8' pipe mount	146
10' Dipole	183	(2) 8' pipe mount	146
10' Whip	182.5	Samsung 64T64R MMU (Verizon)	146
6' Yagi	182	Samsung 64T64R MMU (Verizon)	146
PG1N0F-0090-310	182	Samsung 64T64R MMU (Verizon)	146
16' Whip	182	(2) CBC78T-DS-43-2X (Verizon)	146
6' Yagi	182	(2) CBC78T-DS-43-2X (Verizon)	146
21' Whip	182	(2) CBC78T-DS-43-2X (Verizon)	146
21' Whip	181.5	8' tall 2" Std. pipe 1' standoff (Verizon)	146
21' Whip	181.5	8' tall 2" Std. pipe 1' standoff (Verizon)	146
20' Dipole	181.5	8' tall 2" Std. pipe 1' standoff (Verizon)	146
14' Inverted Whip	180 - 166	8' tall 2" Std. pipe 1' standoff (Verizon)	146
Top Platform	180	Stand-Off T-Frame (Verizon)	146
10' Inverted Whip	180 - 170	Radio 4415 B25 (T-Mobile)	135
TMA	180	Radio 4415 B25 (T-Mobile)	135
TMA	180	AIR 3246 B66 (T-Mobile)	135
PSILP8OI-24 antenna (Channel 24)	178.6 - 162	AIR 3246 B66 (T-Mobile)	135
Raycap (Verizon)	148.5	AIR 3246 B66 (T-Mobile)	135
RHSDC-3315-PF-48 (Verizon)	148.5	APXVAARR24_43-U-NA20 (T-Mobile)	135
RVZDC-6627-PF-48 OVP (Verizon)	148.5	APXVAARR24_43-U-NA20 (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	APXVAARR24_43-U-NA20 (T-Mobile)	135
		Stand-Off T-Frame (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	AIR 32 B2a/B66Aa (T-Mobile)	135
		AIR 32 B2a/B66Aa (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	AIR 32 B2a/B66Aa (T-Mobile)	135
		Radio 4449 B71/B85 (T-Mobile)	135
CBNG 39GHz VectaStar NR gNB (Verizon)	148	Radio 4449 B71/B85 (T-Mobile)	135
		Radio 4449 B71/B85 (T-Mobile)	135
Stand-Off T-Frame (Verizon)	146	Stand-Off T-Frame (T-Mobile)	135
Stand-Off T-Frame (Verizon)	146	Stand-Off T-Frame (T-Mobile)	135
B5/B13 Dual Band RRH (Verizon)	146	AP259015-52	135
B5/B13 Dual Band RRH (Verizon)	146	AIR6449 B41 (T-Mobile)	135
B5/B13 Dual Band RRH (Verizon)	146	AIR6449 B41 (T-Mobile)	135
B2/B66a Dual Band RRH (Verizon)	146	AIR6449 B41 (T-Mobile)	135
B2/B66a Dual Band RRH (Verizon)	146	Radio 4415 B25 (T-Mobile)	135
B2/B66a Dual Band RRH (Verizon)	146	IBR1300	125
BSAMNT-SBS-2-3 (Verizon)	146	Empty Mount	103
BSAMNT-SBS-2-3 (Verizon)	146	2' yagi	102.5
BSAMNT-SBS-2-3 (Verizon)	146	GPS	59.5
(2) JAHH-45B-R3B (Verizon)	146	(2) GPS	18
(2) JAHH-45B-R3B (Verizon)	146	(2) GPS	17.67
(2) JAHH-45B-R3B (Verizon)	146		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD (GR) w/ 5/8" Cable	F	ROHN 6 EH (GR) w/ 5/8" Cable (GR)
B	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	G	L2x2x1/8 w/1.5" sch 40 pipe
C	ROHN 3 X-STR (GR) w/ 5/8" Cable	H	L2 1/2x2 1/2x3/16
D	ROHN 4 X-STR (GR) w/ 5/8" Cable	I	L3.5x3.5x1/4 w/ 2x1/4 plate
E	ROHN 5 STD (GR) w/ 5/8" Cable	J	L3 1/2x3 1/2x1/4

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

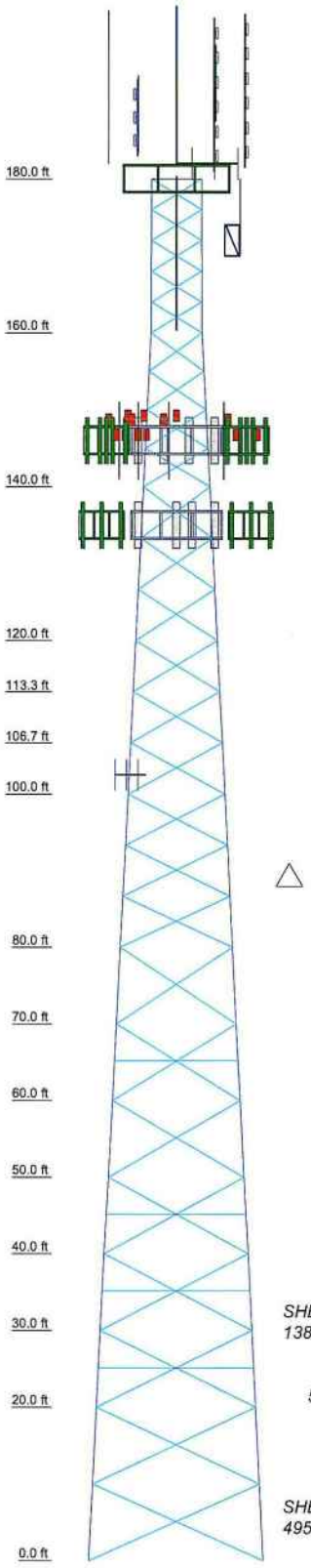
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Grouted pipe f'c is 8 ksi
9. Tower legs have 5/8" diameter stainless steel cable(40K tension) in grouted leg.

KM Consulting Engineers, Inc.
Consulting Engineers
262 Upper Ferry Road
Ewing, NJ 08628
Phone: (609)-538-0400
FAX:

Job: ***West Haven 180' Self-Support Tower***			
Project: ***241009.00***			
Client: GPD Group	Drawn by: DCA	App'd:	
Code: TIA-222-H	Date: 11/20/24	Scale: NTS	
Path: K:\GPD Group\West Haven\Structural Analysis\West Haven LC1.eri		Dwg No. E-1	

Section	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	F	ROHN 5 X-STR (GR) w/ 5/8" Cable					E	D		C		B	A	ROHN 2 STD (GR)
Leg Grade	A572-50													
Diagonals	4x4x1/4 w/ sch 40		I	L3 1/2x3 1/2x1/4				L3x3x1/4			H	G	L1 3/4x1 3/4x1/8	L1 1/2x1 1/2x1/8
Diagonal Grade	A572-50													
Top Girts	N.A.											L3x3x1/4		
Sec. Horizontals	N.A.	L3 1/2x3 1/2x1/4			N.A.	J		N.A.						
Face Width (ft) 22.8	20.775	19.7625	18.75	17.7375	16.725	15.7125	14.7	12.675	12	11.325	10.65	8.625	6.6	6.5
# Panels @ (ft)	8 @ 10							9 @ 6.66667					4 @ 5	5 @ 4
Weight (lb) 28620.1	9703.7	2216.3	2159.1	1906.1	1561.2	1780.1	1378.2	2656.0	712.7	547.8	537.1	1635.6	890.1	804.2



SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	ROHN 2.5 STD (GR) w/ 5/8" Cable	F	ROHN 6 EH (GR) w/ 5/8" Cable (GR)
B	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	G	L2x2x1/8 w/1.5" sch 40 pipe
C	ROHN 3 X-STR (GR) w/ 5/8" Cable	H	L2 1/2x2 1/2x3/16
D	ROHN 4 X-STR (GR) w/ 5/8" Cable	I	L3.5x3.5x1/4 w/ 2x1/4 plate
E	ROHN 5 STD (GR) w/ 5/8" Cable	J	L3 1/2x3 1/2x1/4

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi			

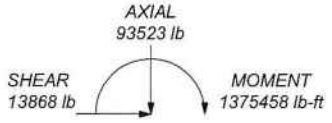
TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 125 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. Grouted pipe f'c is 8 ksi
9. Tower legs have 5/8" diameter stainless steel cable(40K tension) in grouted leg.
10. TOWER RATING: 75.8%

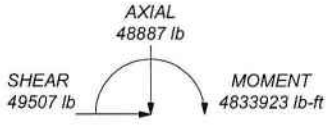
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 261108 lb
SHEAR: 30770 lb

UPLIFT: -214611 lb
SHEAR: 25506 lb



TORQUE 5921 lb-ft
50 mph WIND - 1.0000 in ICE



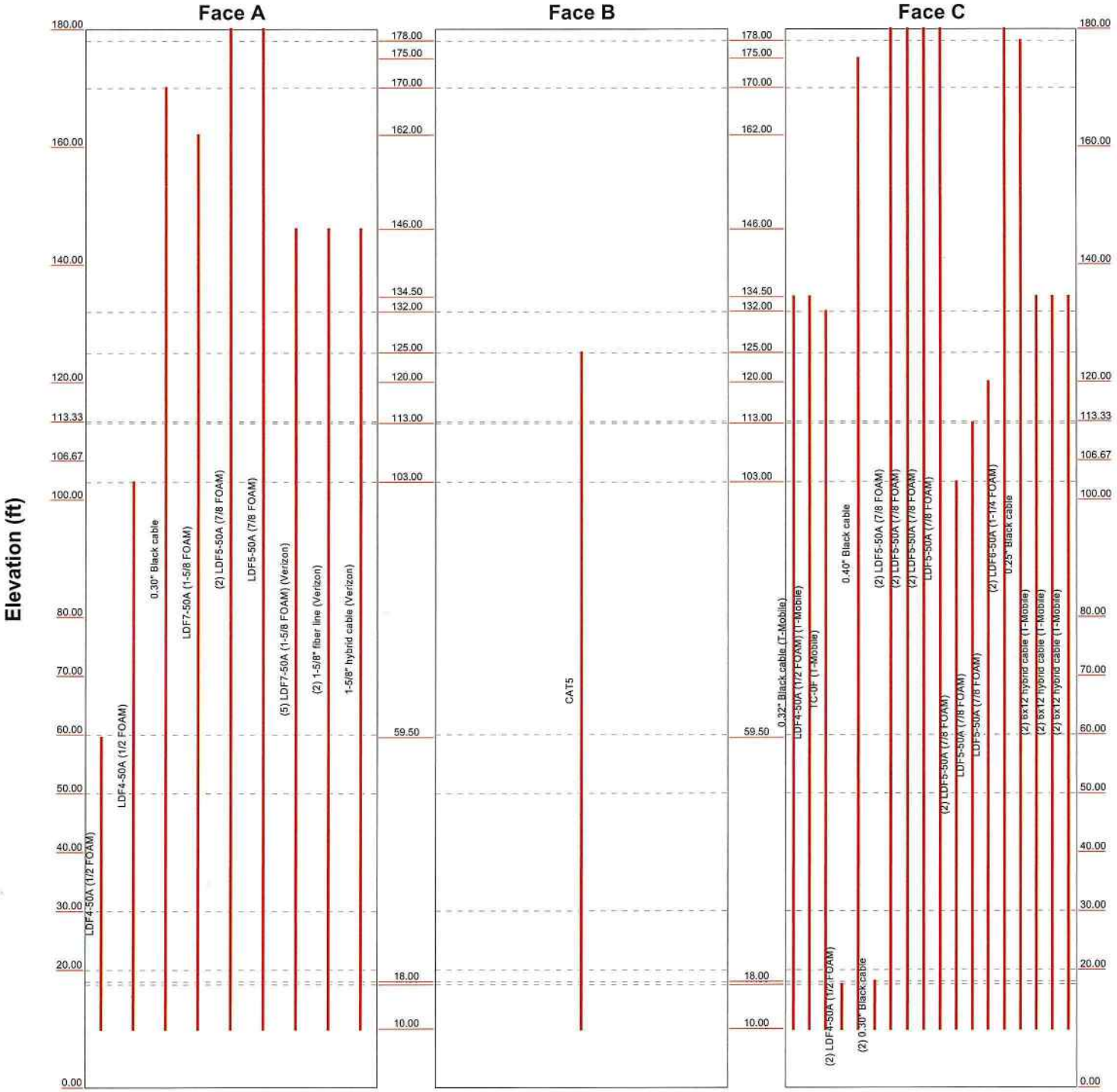
TORQUE 18478 lb-ft
REACTIONS - 125 mph WIND

KM Consulting Engineers, Inc.
262 Upper Ferry Road
Ewing, NJ 08628
Phone: (609)-538-0400
FAX:
Consulting Engineers

Job: **West Haven 180' Self-Support Tower**			
Project: **241009.00**			
Client: GPD Group	Drawn by: DCA	App'd:	
Code: TIA-222-H	Date: 11/20/24	Scale: NTS	
Path: K:\GPD Group\West Haven\Structural Analysis\West Haven LC1.eri		Dwg No. E-1	

Feed Line Distribution Chart
0' - 180'

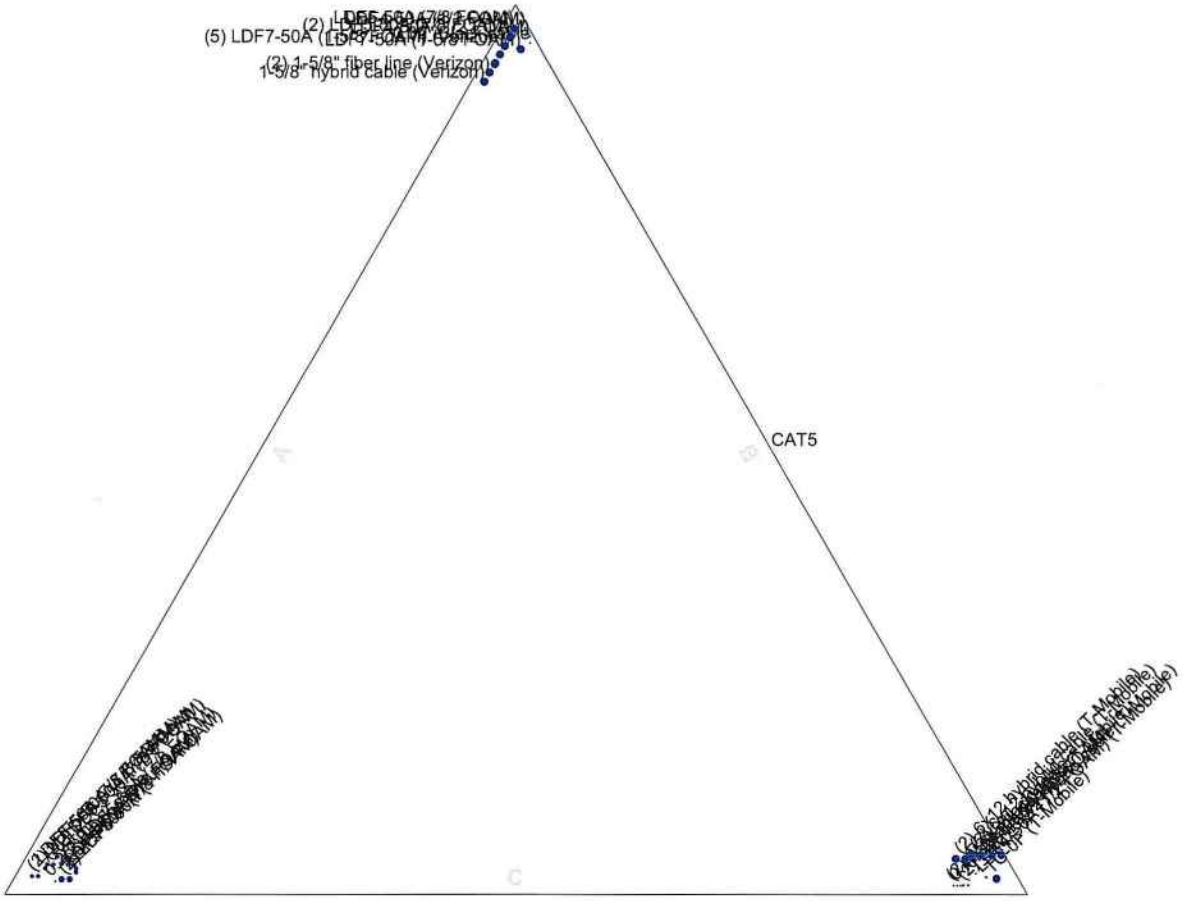
Round | Flat | App In Face | App Out Face | Truss Leg



KM Consulting Engineers, Inc. 262 Upper Ferry Road Ewing, NJ 08628 Phone: (609)-538-0400 FAX: Consulting Engineers	Job: ***West Haven 180' Self-Support Tower***		
	Project: ***241009.00***		
	Client: GPD Group	Drawn by: DCA	App'd:
	Code: TIA-222-H	Date: 11/20/24	Scale: NTS
	Path: K:\GPD Group\West Haven\Structural Analysis\West Haven LC1.eri		Dwg No. E-7

Feed Line Plan

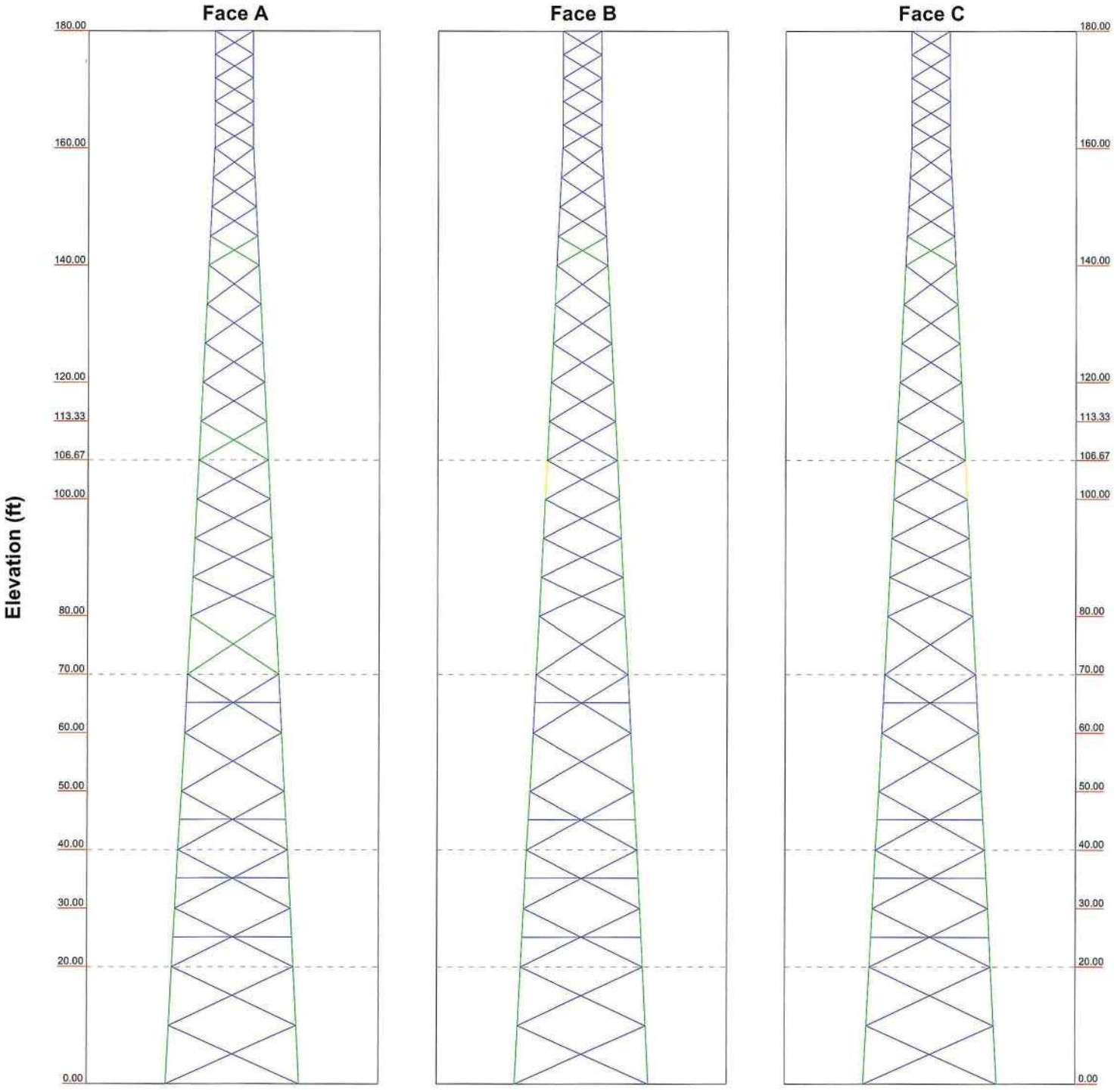
Round Flat App In Face App Out Face



KM Consulting Engineers, Inc. 262 Upper Ferry Road Ewing, NJ 08628 Phone: (609)-538-0400 FAX:	Job: West Haven 180' Self-Support Tower		
	Project: 241009.00		
	Client: GPD Group	Drawn by: DCA	App'd:
	Code: TIA-222-H	Date: 11/20/24	Scale: NTS
	Path: K:\GPD Group\West Haven\Structural Analysis\West Haven LC1.erl		Dwg No. E-7

Stress Distribution Chart
0' - 180'

> 100% | 90%-100% | 75%-90% | 50%-75% | < 50% Overstress



KM Consulting Engineers, Inc. 262 Upper Ferry Road Ewing, NJ 08628 Phone: (609)-538-0400 FAX: Consulting Engineers	Job: ***West Haven 180' Self-Support Tower***		
	Project: ***241009.00***		
	Client: GPD Group	Drawn by: DCA	App'd:
	Code: TIA-222-H	Date: 11/20/24	Scale: NTS
	Path: K:\GPD Group\West Haven\Structural Analysis\West Haven LC1.eri		Dwg No. E-8

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 180.00 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 6.50 ft at the top and 22.80 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Tower base elevation above sea level: 146.00 ft.
Basic wind speed of 125 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Tower legs have 5/8" diameter stainless steel cable(40K tension) in grouted leg..
Non-linear (P-delta) analysis was used.
Grouted pipe f'_c is 8 ksi.
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

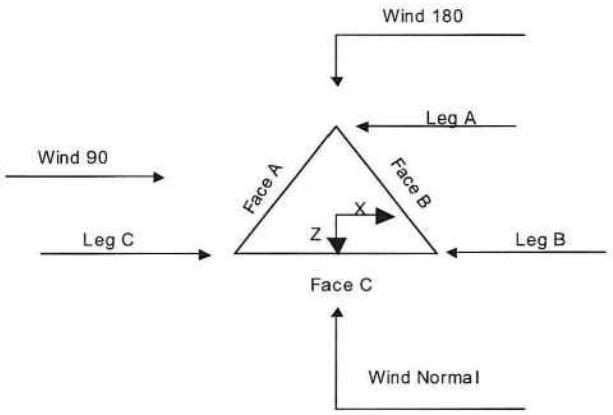
Consider Moments - Legs
Consider Moments - Horizontals
Consider Moments - Diagonals
Use Moment Magnification
√ Use Code Stress Ratios
√ Use Code Safety Factors - Guys
Escalate Ice
Always Use Max Kz
Kz In Exposure D Hurricane Region
√ Include Bolts In Member Capacity
√ Leg Bolts Are At Top Of Section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

Assume Legs Pinned
√ Assume Rigid Index Plate
√ Use Clear Spans For Wind Area
√ Use Clear Spans For KL/r
√ Retension Guys To Initial Tension
Bypass Mast Stability Checks
√ Use Azimuth Dish Coefficients
√ Project Wind Area of Appurtenances
Alternative Appurt. EPA Calculation
√ Autocalc Torque Arm Areas
Add IBC .6D+W Combination
Sort Capacity Reports By Component
√ Triangulate Diamond Inner Bracing
Treat Feed Line Bundles As Cylinder
Ignore KL/ry For 60 Deg. Angle Legs
Use ASCE 10 X-Brace Ly Rules

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

Poles

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



Triangular Tower

Tower Section Geometry

Tower Section	Tower Elevation ft	Assembly Database	Description	Section Width ft	Number of Sections	Section Length ft
T1	180.00-160.00			6.50	1	20.00
T2	160.00-140.00			6.60	1	20.00
T3	140.00-120.00			8.63	1	20.00
T4	120.00-113.33			10.65	1	6.67
T5	113.33-106.67			11.33	1	6.67
T6	106.67-100.00			12.00	1	6.67
T7	100.00-80.00			12.68	1	20.00
T8	80.00-70.00			14.70	1	10.00
T9	70.00-60.00			15.71	1	10.00
T10	60.00-50.00			16.73	1	10.00
T11	50.00-40.00			17.74	1	10.00
T12	40.00-30.00			18.75	1	10.00
T13	30.00-20.00			19.76	1	10.00
T14	20.00-0.00			20.78	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	180.00-160.00	4.00	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
T2	160.00-140.00	5.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	6.67	X Brace	No	No	0.0000	0.0000
T4	120.00-113.33	6.67	X Brace	No	No	0.0000	0.0000
T5	113.33-106.67	6.67	X Brace	No	No	0.0000	0.0000
T6	106.67-100.00	6.67	X Brace	No	No	0.0000	0.0000
T7	100.00-80.00	6.67	X Brace	No	No	0.0000	0.0000
T8	80.00-70.00	10.00	X Brace	No	No	0.0000	0.0000
T9	70.00-60.00	10.00	X Brace	No	Yes	0.0000	0.0000
T10	60.00-50.00	10.00	X Brace	No	No	0.0000	0.0000
T11	50.00-40.00	10.00	X Brace	No	Yes	0.0000	0.0000
T12	40.00-30.00	10.00	X Brace	No	Yes	0.0000	0.0000
T13	30.00-20.00	10.00	X Brace	No	Yes	0.0000	0.0000
T14	20.00-0.00	10.00	X Brace	No	Yes	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 180.00-160.00	Grouted Pipe	ROHN 2 STD	A572-50 (50 ksi)	Equal Angle	L1 1/2x1 1/2x1/8	A572-50 (50 ksi)
T2 160.00-140.00	Arbitrary Shape	ROHN 2.5 STD (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L1 3/4x1 3/4x1/8	A572-50 (50 ksi)
T3 140.00-120.00	Arbitrary Shape	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L2x2x1/8 w/1.5" sch 40 pipe	A572-50 (50 ksi)
T4 120.00-113.33	Arbitrary Shape	ROHN 3 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T5 113.33-106.67	Arbitrary Shape	ROHN 3 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T6 106.67-100.00	Arbitrary Shape	ROHN 3 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T7 100.00-80.00	Arbitrary Shape	ROHN 4 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T8 80.00-70.00	Arbitrary Shape	ROHN 5 STD (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A572-50 (50 ksi)
T9 70.00-60.00	Arbitrary Shape	ROHN 5 STD (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T10 60.00-50.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T11 50.00-40.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)
T12 40.00-30.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Arbitrary Shape	L3.5x3.5x1/4 w/ 2x1/4 plate	A572-50 (50 ksi)
T13 30.00-20.00	Arbitrary Shape	ROHN 5 X-STR (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Arbitrary Shape	L3.5x3.5x1/4 w/ 2x1/4 plate	A572-50 (50 ksi)
T14 20.00-0.00	Grouted Pipe	ROHN 6 EH (GR) w/ 5/8" Cable	A572-50 (50 ksi)	Double Equal Angle	4x4x1/4 w/ sch 40	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Secondary Horizontal Type	Secondary Horizontal Size	Secondary Horizontal Grade	Inner Bracing Type	Inner Bracing Size	Inner Bracing Grade
T9 70.00-60.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T11 50.00-40.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T12 40.00-30.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)
T13 30.00-20.00	Equal Angle	L3 1/2x3 1/2x1/4	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 180.00-160.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T2 160.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T4 120.00-113.33	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T5 113.33-106.67	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T6 106.67-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T7 100.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T8 80.00-70.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T9 70.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T10 60.00-50.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T11 50.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T12 40.00-30.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T13 30.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000
T14 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	0.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

K Factors[1]

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	No	1	0.95	1	1	1	1	1	1
180.00-160.00				0.95	1	1	1	1	1	1
T2	Yes	No	1	0.95	1	1	1	1	1	1
160.00-140.00				0.95	1	1	1	1	1	1
T3	Yes	No	1	0.95	1	1	1	1	1	1
140.00-120.00				0.95	1	1	1	1	1	1
T4	Yes	No	1	0.95	1	1	1	1	1	1
120.00-113.33				0.95	1	1	1	1	1	1
T5	Yes	No	1	0.95	1	1	1	1	1	1
113.33-106.67				0.95	1	1	1	1	1	1
T6	Yes	No	1	0.95	1	1	1	1	1	1
106.67-100.00				0.95	1	1	1	1	1	1
T7	Yes	No	1	0.95	1	1	1	1	1	1
100.00-80.00				0.95	1	1	1	1	1	1
T8	Yes	No	1	0.95	1	1	1	1	1	1
80.00-70.00				0.95	1	1	1	1	1	1
T9	Yes	No	1	0.95	1	1	1	1	1	1
70.00-60.00				0.95	1	1	1	1	1	1
T10	Yes	No	1	0.95	1	1	1	1	1	1
60.00-50.00				0.95	1	1	1	1	1	1
T11	Yes	No	1	0.95	1	1	1	1	1	1
50.00-40.00				0.95	1	1	1	1	1	1
T12	Yes	No	1	0.95	1	1	1	1	1	1
40.00-30.00				0.95	1	1	1	1	1	1
T13	Yes	No	1	0.95	1	1	1	1	1	1
30.00-20.00				0.95	1	1	1	1	1	1
T14	Yes	No	1	0.95	1	1	1	1	1	1
20.00-0.00				0.95	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
180.00-160.00														
T2	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
160.00-140.00														
T3	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
140.00-120.00														
T4	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
120.00-113.33														
T5	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
113.33-106.67														
T6	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
106.67-100.00														
T7	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
100.00-80.00														
T8 80.00-70.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	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
T9 70.00-60.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 60.00-50.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 50.00-40.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 40.00-30.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 30.00-20.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 20.00-0.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 180.00-160.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T2 160.00-140.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T3 140.00-120.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T4 120.00-113.33	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T5 113.33-106.67	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)

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
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T6 106.67-100.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T7 100.00-80.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T8 80.00-70.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T9 70.00-60.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T10 60.00-50.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T11 50.00-40.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T12 40.00-30.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)

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
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T13 30.00-20.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)
T14 20.00-0.00	0.0000	0.75 (1)	0.0000	0.75 (1)	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75 (1)	0.0000	0.75 (1)
	0.0000	0.75 (2)	0.0000	0.75 (2)							0.0000	0.75 (2)	0.0000	0.75 (2)
	0.0000	0.75 (3)	0.0000	0.75 (3)							0.0000	0.75 (3)	0.0000	0.75 (3)
	0.0000	0.75 (4)	0.0000	0.75 (4)							0.0000	0.75 (4)	0.0000	0.75 (4)

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 180.00-160.00	Flange	0.6250 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 160.00-140.00	Flange	0.6250 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	0.7500 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-113.33	Flange	0.8750 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 113.33-106.67	Flange	0.8750 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 106.67-100.00	Flange	0.8750 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 100.00-80.00	Flange	1.0000 A325N	8	0.5000 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 80.00-70.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Tower Elevation ft	Leg Connection Type	Leg Bolt Size in	Leg No.	Diagonal Bolt Size in	Diagonal No.	Top Girt Bolt Size in	Top Girt No.	Bottom Girt Bolt Size in	Bottom Girt No.	Mid Girt Bolt Size in	Mid Girt No.	Long Horizontal Bolt Size in	Long Horizontal No.	Short Horizontal Bolt Size in	Short Horizontal No.
T9 70.00-60.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 60.00-50.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 50.00-40.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 40.00-30.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 30.00-20.00	Flange	1.0000 A325N	8	0.6250 A325N	2	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 20.00-0.00	Flange	1.0000 A325N	12	0.6250 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Grouted Pipe Properties

Size	F_y ksi	A_s in^2	A_c in^2	Wt plf	E_c ksi	E_m ksi	F_{ym} ksi
ROHN 2 STD (GR)	50	1.0745	3.3556	10.647	5098	41737	71
ROHN 6 EH (GR) w/ 5/8" Cable (GR)	50	8.5495	25.9221	83.097	5098	41366	71

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
0.32" Black cable (T-Mobile)	C	No	No	Ar (CaAa)	134.50 - 10.00	-5.0000	-0.45	1	1	0.4400	0.4400		0.08
LDF4-50A (1/2 FOAM) (T-Mobile)	C	No	No	Ar (CaAa)	134.50 - 10.00	-4.0000	-0.46	1	1	0.6300	0.6300		0.15
TC-0F (T-Mobile)	C	No	No	Ar (CaAa)	132.00 - 10.00	-3.0000	-0.47	1	1	1.9800	1.9800		0.82
LDF4-50A (1/2 FOAM)	C	No	No	Ar (CaAa)	17.50 - 10.00	-2.0000	-0.44	2	2	0.6300	0.6300		0.15
0.40" Black cable	C	No	No	Ar (CaAa)	175.00 - 10.00	-2.0000	-0.435	1	1	0.4400	0.4400		0.08
0.30" Black cable	C	No	No	Ar (CaAa)	18.00 - 10.00	-2.0000	-0.43	2	2	0.4400	0.4400		0.08
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	180.00 - 10.00	-7.0000	0.455	2	2	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	180.00 - 10.00	-9.0000	0.445	2	2	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	180.00 - 10.00	-7.0000	0.435	2	2	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	180.00 - 10.00	-6.0000	0.43	1	1	0.5000	1.0900		0.33
LDF5-50A	C	No	No	Ar (CaAa)	103.00 -	-4.0000	0.47	2	2	0.5000	1.0900		0.33

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
(7/8 FOAM)					10.00								
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	113.00 - 10.00	-6.0000	0.46	1	1	1.0900	1.0900		0.33
LDF5-50A (7/8 FOAM)	C	No	No	Ar (CaAa)	120.00 - 10.00	-5.0000	0.43	1	1	1.0900	1.0900		0.33
LDF6-50A (1-1/4 FOAM)	C	No	No	Ar (CaAa)	180.00 - 10.00	-3.0000	0.44	2	2	0.5000	1.5500		0.66
0.25" Black cable	C	No	No	Ar (CaAa)	178.00 - 10.00	-3.0000	0.45	1	1	0.4400	0.4400		0.08
LDF4-50A (1/2 FOAM)	A	No	No	Ar (CaAa)	59.50 - 10.00	-5.0000	0.485	1	1	0.6300	0.6300		0.15
LDF4-50A (1/2 FOAM)	A	No	No	Ar (CaAa)	103.00 - 10.00	-7.0000	0.48	1	1	0.6300	0.6300		0.15
0.30" Black cable	A	No	No	Ar (CaAa)	170.00 - 10.00	-8.0000	0.475	1	1	0.4400	0.4400		0.08
LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	162.00 - 10.00	-6.0000	0.465	1	1	1.9800	1.9800		0.82
LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	180.00 - 10.00	-2.0000	0.475	2	2	0.5000	1.0900		0.33
LDF5-50A (7/8 FOAM)	A	No	No	Ar (CaAa)	180.00 - 10.00	-2.0000	0.48	1	1	0.5000	1.0900		0.33
CAT5	B	No	No	Ar (CaAa)	125.00 - 10.00	0.0000	0	1	1	0.2500	0.2500		0.10
LDF7-50A (1-5/8 FOAM) (Verizon)	A	No	No	Ar (CaAa)	146.00 - 10.00	-2.0000	0.46	5	5	0.5000	1.9800		0.82
1-5/8" fiber line (Verizon)	A	No	No	Ar (CaAa)	146.00 - 10.00	-2.0000	0.435	2	2	0.5000	1.9800		0.82
6x12 hybrid cable (T-Mobile)	C	No	No	Ar (CaAa)	134.50 - 10.00	-9.0000	-0.47	2	2	0.5000	1.9900		1.90
6x12 hybrid cable (T-Mobile)	C	No	No	Ar (CaAa)	134.50 - 10.00	-9.0000	-0.45	2	2	0.5000	1.9900		1.90
6x12 hybrid cable (T-Mobile)	C	No	No	Ar (CaAa)	134.50 - 10.00	-8.0000	-0.435	2	2	0.5000	1.9900		1.90
1-5/8" hybrid cable (Verizon)	A	No	No	Ar (CaAa)	146.00 - 10.00	-2.0000	0.42	1	1	0.5000	1.9800		0.82

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	180.00-160.00	A	0.000	0.000	7.376	0.000	22.24
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	22.912	0.000	75.24
T2	160.00-140.00	A	0.000	0.000	20.884	0.000	77.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	23.220	0.000	75.80
T3	140.00-120.00	A	0.000	0.000	43.060	0.000	169.00
		B	0.000	0.000	0.125	0.000	0.50
		C	0.000	0.000	44.461	0.000	254.28

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
T4	120.00-113.33	A	0.000	0.000	14.353	0.000	56.33
		B	0.000	0.000	0.167	0.000	0.67
		C	0.000	0.000	18.460	0.000	110.47
T5	113.33-106.67	A	0.000	0.000	14.353	0.000	56.33
		B	0.000	0.000	0.167	0.000	0.67
		C	0.000	0.000	19.150	0.000	112.56
T6	106.67-100.00	A	0.000	0.000	14.542	0.000	56.78
		B	0.000	0.000	0.167	0.000	0.67
		C	0.000	0.000	19.841	0.000	114.65
T7	100.00-80.00	A	0.000	0.000	44.320	0.000	172.00
		B	0.000	0.000	0.500	0.000	2.00
		C	0.000	0.000	61.920	0.000	351.20
T8	80.00-70.00	A	0.000	0.000	22.160	0.000	86.00
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	30.960	0.000	175.60
T9	70.00-60.00	A	0.000	0.000	22.160	0.000	86.00
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	30.960	0.000	175.60
T10	60.00-50.00	A	0.000	0.000	22.759	0.000	87.42
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	30.960	0.000	175.60
T11	50.00-40.00	A	0.000	0.000	22.790	0.000	87.50
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	30.960	0.000	175.60
T12	40.00-30.00	A	0.000	0.000	22.790	0.000	87.50
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	30.960	0.000	175.60
T13	30.00-20.00	A	0.000	0.000	22.790	0.000	87.50
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	30.960	0.000	175.60
T14	20.00-0.00	A	0.000	0.000	22.790	0.000	87.50
		B	0.000	0.000	0.250	0.000	1.00
		C	0.000	0.000	32.609	0.000	179.13

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	180.00-160.00	A	1.178	0.000	0.000	25.812	0.000	220.57
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	79.696	0.000	645.50
T2	160.00-140.00	A	1.163	0.000	0.000	55.897	0.000	544.36
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	81.071	0.000	652.51
T3	140.00-120.00	A	1.147	0.000	0.000	101.411	0.000	1016.43
		B		0.000	0.000	1.272	0.000	10.29
		C		0.000	0.000	137.327	0.000	1259.92
T4	120.00-113.33	A	1.135	0.000	0.000	33.655	0.000	335.25
		B		0.000	0.000	1.679	0.000	13.46
		C		0.000	0.000	55.404	0.000	521.42
T5	113.33-106.67	A	1.128	0.000	0.000	33.575	0.000	333.34
		B		0.000	0.000	1.671	0.000	13.33
		C		0.000	0.000	57.354	0.000	539.74
T6	106.67-100.00	A	1.121	0.000	0.000	34.352	0.000	338.96
		B		0.000	0.000	1.661	0.000	13.18
		C		0.000	0.000	59.505	0.000	553.54
T7	100.00-80.00	A	1.106	0.000	0.000	105.599	0.000	1030.68

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	4.922	0.000	38.62
		C		0.000	0.000	185.345	0.000	1695.51
T8	80.00-70.00	A	1.086	0.000	0.000	52.400	0.000	506.16
		B		0.000	0.000	2.421	0.000	18.71
		C		0.000	0.000	91.800	0.000	832.08
T9	70.00-60.00	A	1.070	0.000	0.000	52.091	0.000	499.13
		B		0.000	0.000	2.390	0.000	18.26
		C		0.000	0.000	91.127	0.000	820.08
T10	60.00-50.00	A	1.052	0.000	0.000	54.334	0.000	513.08
		B		0.000	0.000	2.355	0.000	17.75
		C		0.000	0.000	90.353	0.000	806.40
T11	50.00-40.00	A	1.032	0.000	0.000	54.011	0.000	504.16
		B		0.000	0.000	2.313	0.000	17.15
		C		0.000	0.000	89.440	0.000	790.42
T12	40.00-30.00	A	1.006	0.000	0.000	53.448	0.000	491.95
		B		0.000	0.000	2.262	0.000	16.43
		C		0.000	0.000	88.323	0.000	771.10
T13	30.00-20.00	A	0.973	0.000	0.000	52.716	0.000	476.29
		B		0.000	0.000	2.195	0.000	15.53
		C		0.000	0.000	86.871	0.000	746.36
T14	20.00-0.00	A	0.887	0.000	0.000	50.844	0.000	437.32
		B		0.000	0.000	2.025	0.000	13.33
		C		0.000	0.000	91.075	0.000	725.93

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	180.00-160.00	-9.2462	0.7980	-12.6019	1.1023
T2	160.00-140.00	-7.6558	-5.8134	-11.3313	-4.9843
T3	140.00-120.00	0.4367	-9.7239	-1.1122	-7.4206
T4	120.00-113.33	2.3022	-7.4217	1.2971	-5.0833
T5	113.33-106.67	1.6535	-7.1720	0.3156	-4.5670
T6	106.67-100.00	0.9047	-6.7858	-0.8162	-4.2997
T7	100.00-80.00	0.0708	-6.5537	-2.2030	-4.0754
T8	80.00-70.00	0.0131	-7.1004	-2.5204	-4.3132
T9	70.00-60.00	-0.0220	-6.4858	-2.4748	-4.0877
T10	60.00-50.00	-0.0446	-7.8905	-2.7244	-5.6866
T11	50.00-40.00	-0.0707	-7.3836	-2.6643	-5.5261
T12	40.00-30.00	-0.0991	-7.4528	-2.7063	-5.5881
T13	30.00-20.00	-0.1273	-7.6152	-2.7893	-5.7288
T14	20.00-0.00	0.8291	-5.2212	0.4248	-2.8193

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	17	0.40" Black cable	160.00 - 175.00	0.8720	0.7770
T1	20	LDF5-50A (7/8 FOAM)	160.00 -	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	21	LDF5-50A (7/8 FOAM)	180.00 160.00 -	0.8720	0.7770
T1	22	LDF5-50A (7/8 FOAM)	180.00 160.00 -	0.8720	0.7770
T1	23	LDF5-50A (7/8 FOAM)	180.00 160.00 -	0.8720	0.7770
T1	27	LDF6-50A (1-1/4 FOAM)	180.00 160.00 -	0.8720	0.7770
T1	28	0.25" Black cable	180.00 160.00 -	0.8720	0.7770
T1	32	0.30" Black cable	178.00 160.00 -	0.8720	0.7770
T1	33	LDF7-50A (1-5/8 FOAM)	170.00 160.00 -	0.8720	0.7770
T1	34	LDF5-50A (7/8 FOAM)	162.00 160.00 -	0.8720	0.7770
T1	35	LDF5-50A (7/8 FOAM)	180.00 160.00 -	0.8720	0.7770
T2	17	0.40" Black cable	180.00 140.00 -	0.8720	0.7770
T2	20	LDF5-50A (7/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	21	LDF5-50A (7/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	22	LDF5-50A (7/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	23	LDF5-50A (7/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	27	LDF6-50A (1-1/4 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	28	0.25" Black cable	160.00 140.00 -	0.8720	0.7770
T2	32	0.30" Black cable	160.00 140.00 -	0.8720	0.7770
T2	33	LDF7-50A (1-5/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	34	LDF5-50A (7/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	35	LDF5-50A (7/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	37	LDF7-50A (1-5/8 FOAM)	160.00 140.00 -	0.8720	0.7770
T2	38	1-5/8" fiber line	146.00 140.00 -	0.8720	0.7770
T2	44	1-5/8" hybrid cable	146.00 140.00 -	0.8720	0.7770
T3	13	0.32" Black cable	146.00 120.00 -	0.8720	0.7770
T3	14	LDF4-50A (1/2 FOAM)	134.50 120.00 -	0.8720	0.7770
T3	15	TC-0F	134.50 120.00 -	0.8720	0.7770
T3	17	0.40" Black cable	132.00 120.00 -	0.8720	0.7770
T3	20	LDF5-50A (7/8 FOAM)	140.00 120.00 -	0.8720	0.7770
T3	21	LDF5-50A (7/8 FOAM)	140.00 120.00 -	0.8720	0.7770
T3	22	LDF5-50A (7/8 FOAM)	140.00 120.00 -	0.8720	0.7770
T3	23	LDF5-50A (7/8 FOAM)	140.00 120.00 -	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T3	27	LDF6-50A (1-1/4 FOAM)	140.00 120.00 - 140.00	0.8720	0.7770
T3	28	0.25" Black cable	120.00 - 140.00	0.8720	0.7770
T3	32	0.30" Black cable	120.00 - 140.00	0.8720	0.7770
T3	33	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	0.8720	0.7770
T3	34	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.8720	0.7770
T3	35	LDF5-50A (7/8 FOAM)	120.00 - 140.00	0.8720	0.7770
T3	36	CAT5	120.00 - 140.00	0.8720	0.7770
T3	37	LDF7-50A (1-5/8 FOAM)	120.00 - 125.00	0.8720	0.7770
T3	38	1-5/8" fiber line	120.00 - 140.00	0.8720	0.7770
T3	41	6x12 hybrid cable	120.00 - 140.00	0.8720	0.7770
T3	42	6x12 hybrid cable	120.00 - 134.50	0.8720	0.7770
T3	43	6x12 hybrid cable	120.00 - 134.50	0.8720	0.7770
T3	44	1-5/8" hybrid cable	120.00 - 134.50	0.8720	0.7770
T4	13	0.32" Black cable	113.33 - 140.00	0.8720	0.7770
T4	14	LDF4-50A (1/2 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	15	TC-0F	113.33 - 120.00	0.8720	0.7770
T4	17	0.40" Black cable	113.33 - 120.00	0.8720	0.7770
T4	20	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	21	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	22	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	23	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	26	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	27	LDF6-50A (1-1/4 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	28	0.25" Black cable	113.33 - 120.00	0.8720	0.7770
T4	32	0.30" Black cable	113.33 - 120.00	0.8720	0.7770
T4	33	LDF7-50A (1-5/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	34	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	35	LDF5-50A (7/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	36	CAT5	113.33 - 120.00	0.8720	0.7770
T4	37	LDF7-50A (1-5/8 FOAM)	113.33 - 120.00	0.8720	0.7770
T4	38	1-5/8" fiber line	113.33 -	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T4	41	6x12 hybrid cable	120.00 113.33 -	0.8720	0.7770
T4	42	6x12 hybrid cable	120.00 113.33 -	0.8720	0.7770
T4	43	6x12 hybrid cable	120.00 113.33 -	0.8720	0.7770
T4	44	1-5/8" hybrid cable	120.00 113.33 -	0.8720	0.7770
T5	13	0.32" Black cable	120.00 106.67 -	0.8720	0.7770
T5	14	LDF4-50A (1/2 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	15	TC-0F	113.33 106.67 -	0.8720	0.7770
T5	17	0.40" Black cable	113.33 106.67 -	0.8720	0.7770
T5	20	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	21	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	22	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	23	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	25	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	26	LDF5-50A (7/8 FOAM)	113.00 106.67 -	0.8720	0.7770
T5	27	LDF6-50A (1-1/4 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	28	0.25" Black cable	113.33 106.67 -	0.8720	0.7770
T5	32	0.30" Black cable	113.33 106.67 -	0.8720	0.7770
T5	33	LDF7-50A (1-5/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	34	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	35	LDF5-50A (7/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	36	CAT5	113.33 106.67 -	0.8720	0.7770
T5	37	LDF7-50A (1-5/8 FOAM)	113.33 106.67 -	0.8720	0.7770
T5	38	1-5/8" fiber line	113.33 106.67 -	0.8720	0.7770
T5	41	6x12 hybrid cable	113.33 106.67 -	0.8720	0.7770
T5	42	6x12 hybrid cable	113.33 106.67 -	0.8720	0.7770
T5	43	6x12 hybrid cable	113.33 106.67 -	0.8720	0.7770
T5	44	1-5/8" hybrid cable	113.33 106.67 -	0.8720	0.7770
T6	13	0.32" Black cable	113.33 100.00 -	0.8720	0.7770
T6	14	LDF4-50A (1/2 FOAM)	106.67 100.00 -	0.8720	0.7770
T6	15	TC-0F	106.67 100.00 -	0.8720	0.7770
T6	17	0.40" Black cable	106.67 100.00 -	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T6	20	LDF5-50A (7/8 FOAM)	106.67 100.00 - 106.67	0.8720	0.7770
T6	21	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	22	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	23	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	24	LDF5-50A (7/8 FOAM)	100.00 - 103.00	0.8720	0.7770
T6	25	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	26	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	27	LDF6-50A (1-1/4 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	28	0.25" Black cable	100.00 - 106.67	0.8720	0.7770
T6	31	LDF4-50A (1/2 FOAM)	100.00 - 103.00	0.8720	0.7770
T6	32	0.30" Black cable	100.00 - 106.67	0.8720	0.7770
T6	33	LDF7-50A (1-5/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	34	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	35	LDF5-50A (7/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	36	CAT5	100.00 - 106.67	0.8720	0.7770
T6	37	LDF7-50A (1-5/8 FOAM)	100.00 - 106.67	0.8720	0.7770
T6	38	1-5/8" fiber line	100.00 - 106.67	0.8720	0.7770
T6	41	6x12 hybrid cable	100.00 - 106.67	0.8720	0.7770
T6	42	6x12 hybrid cable	100.00 - 106.67	0.8720	0.7770
T6	43	6x12 hybrid cable	100.00 - 106.67	0.8720	0.7770
T6	44	1-5/8" hybrid cable	100.00 - 106.67	0.8720	0.7770
T7	13	0.32" Black cable	80.00 - 100.00	0.8720	0.7770
T7	14	LDF4-50A (1/2 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	15	TC-0F	80.00 - 100.00	0.8720	0.7770
T7	17	0.40" Black cable	80.00 - 100.00	0.8720	0.7770
T7	20	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	21	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	22	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	23	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	24	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	25	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	26	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	27	LDF6-50A (1-1/4 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	28	0.25" Black cable	80.00 - 100.00	0.8720	0.7770
T7	31	LDF4-50A (1/2 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	32	0.30" Black cable	80.00 - 100.00	0.8720	0.7770
T7	33	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	34	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	35	LDF5-50A (7/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	36	CAT5	80.00 - 100.00	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	37	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	0.8720	0.7770
T7	38	1-5/8" fiber line	80.00 - 100.00	0.8720	0.7770
T7	41	6x12 hybrid cable	80.00 - 100.00	0.8720	0.7770
T7	42	6x12 hybrid cable	80.00 - 100.00	0.8720	0.7770
T7	43	6x12 hybrid cable	80.00 - 100.00	0.8720	0.7770
T7	44	1-5/8" hybrid cable	80.00 - 100.00	0.8720	0.7770
T8	13	0.32" Black cable	70.00 - 80.00	0.8720	0.7770
T8	14	LDF4-50A (1/2 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	15	TC-0F	70.00 - 80.00	0.8720	0.7770
T8	17	0.40" Black cable	70.00 - 80.00	0.8720	0.7770
T8	20	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	21	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	22	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	23	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	24	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	25	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	26	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	27	LDF6-50A (1-1/4 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	28	0.25" Black cable	70.00 - 80.00	0.8720	0.7770
T8	31	LDF4-50A (1/2 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	32	0.30" Black cable	70.00 - 80.00	0.8720	0.7770
T8	33	LDF7-50A (1-5/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	34	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	35	LDF5-50A (7/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	36	CAT5	70.00 - 80.00	0.8720	0.7770
T8	37	LDF7-50A (1-5/8 FOAM)	70.00 - 80.00	0.8720	0.7770
T8	38	1-5/8" fiber line	70.00 - 80.00	0.8720	0.7770
T8	41	6x12 hybrid cable	70.00 - 80.00	0.8720	0.7770
T8	42	6x12 hybrid cable	70.00 - 80.00	0.8720	0.7770
T8	43	6x12 hybrid cable	70.00 - 80.00	0.8720	0.7770
T8	44	1-5/8" hybrid cable	70.00 - 80.00	0.8720	0.7770
T9	13	0.32" Black cable	60.00 - 70.00	0.8720	0.7770
T9	14	LDF4-50A (1/2 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	15	TC-0F	60.00 - 70.00	0.8720	0.7770
T9	17	0.40" Black cable	60.00 - 70.00	0.8720	0.7770
T9	20	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	21	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	22	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	23	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	24	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	25	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	26	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	27	LDF6-50A (1-1/4 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	28	0.25" Black cable	60.00 - 70.00	0.8720	0.7770
T9	31	LDF4-50A (1/2 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	32	0.30" Black cable	60.00 - 70.00	0.8720	0.7770
T9	33	LDF7-50A (1-5/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	34	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	35	LDF5-50A (7/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	36	CAT5	60.00 - 70.00	0.8720	0.7770
T9	37	LDF7-50A (1-5/8 FOAM)	60.00 - 70.00	0.8720	0.7770
T9	38	1-5/8" fiber line	60.00 - 70.00	0.8720	0.7770
T9	41	6x12 hybrid cable	60.00 - 70.00	0.8720	0.7770
T9	42	6x12 hybrid cable	60.00 - 70.00	0.8720	0.7770
T9	43	6x12 hybrid cable	60.00 - 70.00	0.8720	0.7770
T9	44	1-5/8" hybrid cable	60.00 - 70.00	0.8720	0.7770
T10	13	0.32" Black cable	50.00 - 60.00	0.8720	0.7770
T10	14	LDF4-50A (1/2 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	15	TC-0F	50.00 - 60.00	0.8720	0.7770
T10	17	0.40" Black cable	50.00 - 60.00	0.8720	0.7770
T10	20	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	21	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	22	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	23	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	24	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	25	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	26	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	27	LDF6-50A (1-1/4 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	28	0.25" Black cable	50.00 - 60.00	0.8720	0.7770
T10	30	LDF4-50A (1/2 FOAM)	50.00 - 59.50	0.8720	0.7770
T10	31	LDF4-50A (1/2 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	32	0.30" Black cable	50.00 - 60.00	0.8720	0.7770
T10	33	LDF7-50A (1-5/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	34	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	35	LDF5-50A (7/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	36	CAT5	50.00 - 60.00	0.8720	0.7770
T10	37	LDF7-50A (1-5/8 FOAM)	50.00 - 60.00	0.8720	0.7770
T10	38	1-5/8" fiber line	50.00 - 60.00	0.8720	0.7770
T10	41	6x12 hybrid cable	50.00 - 60.00	0.8720	0.7770
T10	42	6x12 hybrid cable	50.00 - 60.00	0.8720	0.7770
T10	43	6x12 hybrid cable	50.00 - 60.00	0.8720	0.7770
T10	44	1-5/8" hybrid cable	50.00 - 60.00	0.8720	0.7770
T11	13	0.32" Black cable	40.00 - 50.00	0.8720	0.7770
T11	14	LDF4-50A (1/2 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	15	TC-0F	40.00 - 50.00	0.8720	0.7770
T11	17	0.40" Black cable	40.00 - 50.00	0.8720	0.7770
T11	20	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	21	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	22	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	23	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	24	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	25	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	26	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	27	LDF6-50A (1-1/4 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	28	0.25" Black cable	40.00 - 50.00	0.8720	0.7770
T11	30	LDF4-50A (1/2 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	31	LDF4-50A (1/2 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	32	0.30" Black cable	40.00 - 50.00	0.8720	0.7770
T11	33	LDF7-50A (1-5/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	34	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	35	LDF5-50A (7/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	36	CAT5	40.00 - 50.00	0.8720	0.7770
T11	37	LDF7-50A (1-5/8 FOAM)	40.00 - 50.00	0.8720	0.7770
T11	38	1-5/8" fiber line	40.00 - 50.00	0.8720	0.7770
T11	41	6x12 hybrid cable	40.00 - 50.00	0.8720	0.7770
T11	42	6x12 hybrid cable	40.00 - 50.00	0.8720	0.7770
T11	43	6x12 hybrid cable	40.00 - 50.00	0.8720	0.7770
T11	44	1-5/8" hybrid cable	40.00 - 50.00	0.8720	0.7770
T12	13	0.32" Black cable	30.00 - 40.00	0.8720	0.7770
T12	14	LDF4-50A (1/2 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	15	TC-0F	30.00 - 40.00	0.8720	0.7770
T12	17	0.40" Black cable	30.00 - 40.00	0.8720	0.7770
T12	20	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	21	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	22	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	23	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	24	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	25	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	26	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	27	LDF6-50A (1-1/4 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	28	0.25" Black cable	30.00 - 40.00	0.8720	0.7770
T12	30	LDF4-50A (1/2 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	31	LDF4-50A (1/2 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	32	0.30" Black cable	30.00 - 40.00	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T12	33	LDF7-50A (1-5/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	34	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	35	LDF5-50A (7/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	36	CAT5	30.00 - 40.00	0.8720	0.7770
T12	37	LDF7-50A (1-5/8 FOAM)	30.00 - 40.00	0.8720	0.7770
T12	38	1-5/8" fiber line	30.00 - 40.00	0.8720	0.7770
T12	41	6x12 hybrid cable	30.00 - 40.00	0.8720	0.7770
T12	42	6x12 hybrid cable	30.00 - 40.00	0.8720	0.7770
T12	43	6x12 hybrid cable	30.00 - 40.00	0.8720	0.7770
T12	44	1-5/8" hybrid cable	30.00 - 40.00	0.8720	0.7770
T13	13	0.32" Black cable	20.00 - 30.00	0.8720	0.7770
T13	14	LDF4-50A (1/2 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	15	TC-0F	20.00 - 30.00	0.8720	0.7770
T13	17	0.40" Black cable	20.00 - 30.00	0.8720	0.7770
T13	20	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	21	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	22	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	23	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	24	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	25	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	26	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	27	LDF6-50A (1-1/4 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	28	0.25" Black cable	20.00 - 30.00	0.8720	0.7770
T13	30	LDF4-50A (1/2 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	31	LDF4-50A (1/2 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	32	0.30" Black cable	20.00 - 30.00	0.8720	0.7770
T13	33	LDF7-50A (1-5/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	34	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	35	LDF5-50A (7/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	36	CAT5	20.00 - 30.00	0.8720	0.7770
T13	37	LDF7-50A (1-5/8 FOAM)	20.00 - 30.00	0.8720	0.7770
T13	38	1-5/8" fiber line	20.00 - 30.00	0.8720	0.7770
T13	41	6x12 hybrid cable	20.00 - 30.00	0.8720	0.7770
T13	42	6x12 hybrid cable	20.00 - 30.00	0.8720	0.7770
T13	43	6x12 hybrid cable	20.00 - 30.00	0.8720	0.7770
T13	44	1-5/8" hybrid cable	20.00 - 30.00	0.8720	0.7770
T14	13	0.32" Black cable	10.00 - 20.00	0.8720	0.7770
T14	14	LDF4-50A (1/2 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	15	TC-0F	10.00 - 20.00	0.8720	0.7770
T14	16	LDF4-50A (1/2 FOAM)	10.00 - 17.50	0.8720	0.7770
T14	17	0.40" Black cable	10.00 - 20.00	0.8720	0.7770
T14	18	0.30" Black cable	10.00 - 18.00	0.8720	0.7770
T14	20	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	21	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	22	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	23	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	24	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	25	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	26	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	27	LDF6-50A (1-1/4 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	28	0.25" Black cable	10.00 - 20.00	0.8720	0.7770
T14	30	LDF4-50A (1/2 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	31	LDF4-50A (1/2 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	32	0.30" Black cable	10.00 - 20.00	0.8720	0.7770
T14	33	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	34	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	35	LDF5-50A (7/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	36	CAT5	10.00 - 20.00	0.8720	0.7770
T14	37	LDF7-50A (1-5/8 FOAM)	10.00 - 20.00	0.8720	0.7770
T14	38	1-5/8" fiber line	10.00 - 20.00	0.8720	0.7770
T14	41	6x12 hybrid cable	10.00 - 20.00	0.8720	0.7770
T14	42	6x12 hybrid cable	10.00 - 20.00	0.8720	0.7770

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T14	43	6x12 hybrid cable	10.00 - 20.00	0.8720	0.7770
T14	44	1-5/8" hybrid cable	10.00 - 20.00	0.8720	0.7770

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 Platform	C	None		0.0000	180.00	No Ice	20.00	20.00	1200.00
						1/2" Ice	26.50	26.50	1600.00
						1" Ice	33.00	33.00	2000.00
10' Inverted Whip	B	From Face	6.50	0.0000	180.00 - 170.00	No Ice	5.10	5.10	65.00
			0.00			1/2" Ice	7.20	7.20	90.00
			0.00			1" Ice	9.30	9.30	115.00
2' yagi	A	From Face	1.00	0.0000	102.50	No Ice	1.50	1.50	25.00
			0.00			1/2" Ice	3.00	3.00	40.00
			0.00			1" Ice	4.50	4.50	55.00
(2) GPS	B	From Leg	0.00	0.0000	17.67	No Ice	0.10	0.10	20.00
			0.00			1/2" Ice	0.17	0.17	35.00
			0.00			1" Ice	0.24	0.24	50.00
(2) GPS	B	From Leg	0.00	0.0000	18.00	No Ice	0.10	0.10	20.00
			0.00			1/2" Ice	0.17	0.17	35.00
			0.00			1" Ice	0.24	0.24	50.00
GPS	A	From Leg	0.00	0.0000	59.50	No Ice	0.10	0.10	20.00
			0.00			1/2" Ice	0.17	0.17	35.00
			0.00			1" Ice	0.24	0.24	50.00
Empty Mount	C	From Leg	0.00	0.0000	103.00	No Ice	4.00	3.50	150.00
			0.00			1/2" Ice	6.20	5.50	250.00
			0.00			1" Ice	8.40	7.50	350.00
Stand-Off T-Frame (T-Mobile)	A	From Leg	0.00	0.0000	135.00	No Ice	8.50	4.50	150.00
			0.00			1/2" Ice	11.50	6.25	250.00
			0.00			1" Ice	14.50	8.00	350.00
Stand-Off T-Frame (T-Mobile)	B	From Leg	0.00	0.0000	135.00	No Ice	8.50	4.50	150.00
			0.00			1/2" Ice	11.50	6.25	250.00
			0.00			1" Ice	14.50	8.00	350.00
Stand-Off T-Frame (T-Mobile)	C	From Leg	0.00	0.0000	135.00	No Ice	8.50	4.50	150.00
			0.00			1/2" Ice	11.50	6.25	250.00
			0.00			1" Ice	14.50	8.00	350.00
Stand-Off T-Frame (Verizon)	B	From Leg	4.50	0.0000	146.00	No Ice	8.50	4.50	150.00
			0.00			1/2" Ice	11.50	6.25	250.00
			0.00			1" Ice	14.50	8.00	350.00
Stand-Off T-Frame (Verizon)	C	From Leg	4.50	0.0000	146.00	No Ice	8.50	4.50	150.00
			0.00			1/2" Ice	11.50	6.25	250.00
			0.00			1" Ice	14.50	8.00	350.00
Stand-Off T-Frame (Verizon)	A	From Face	4.50	10.0000	146.00	No Ice	8.50	4.50	150.00
			4.00			1/2" Ice	11.50	6.25	250.00
			0.00			1" Ice	14.50	8.00	350.00
14' Inverted Whip	C	From Face	6.50	0.0000	166.00 - 180.00	No Ice	5.20	5.20	65.00
			0.00			1/2" Ice	7.10	7.10	94.00
			0.00			1" Ice	9.00	9.00	123.00
20' Dipole	B	From Leg	2.00	0.0000	191.00	No Ice	6.00	6.15	65.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1/2" Ice	8.50	6.75	105.00
			0.00			1" Ice	11.00	7.35	145.00
6' Yagi	C	From Face	4.00	0.0000	182.00	No Ice	1.10	0.60	22.00
			0.00			1/2" Ice	1.60	0.80	28.00
			0.00			1" Ice	2.10	1.00	34.00
PG1N0F-0090-310	B	From Leg	2.00	0.0000	182.00	No Ice	3.00	3.00	33.00
			0.00			1/2" Ice	4.00	4.00	44.00
			5.00			1" Ice	5.00	5.00	55.00
21' Whip	C	From Leg	6.50	0.0000	181.50	No Ice	4.38	4.38	40.00
			0.00			1/2" Ice	6.15	6.15	70.00
			10.50			1" Ice	7.92	7.92	100.00
16' Whip	C	From Face	4.00	0.0000	182.00	No Ice	3.50	3.50	30.00
			0.00			1/2" Ice	5.25	5.25	45.00
			8.00			1" Ice	7.00	7.00	60.00
6' Yagi	C	From Face	4.00	0.0000	182.00	No Ice	1.10	0.60	22.00
			0.00			1/2" Ice	1.60	0.80	28.00
			0.00			1" Ice	2.10	1.00	34.00
10' Whip	B	From Face	4.00	0.0000	182.50	No Ice	3.10	3.10	30.00
			0.00			1/2" Ice	3.90	3.90	37.00
			10.00			1" Ice	4.70	4.70	44.00
10' Dipole	A	From Face	4.00	0.0000	183.00	No Ice	3.00	2.19	25.00
			0.00			1/2" Ice	4.25	3.08	42.00
			5.00			1" Ice	5.50	3.96	59.00
10' Whip	C	From Leg	2.00	0.0000	183.50	No Ice	3.10	3.10	30.00
			0.00			1/2" Ice	3.90	3.90	37.00
			5.00			1" Ice	4.70	4.70	44.00
Raycap	C	From Leg	0.50	0.0000	148.50	No Ice	2.22	2.22	15.00
(Verizon)			0.00			1/2" Ice	2.48	2.48	25.00
			0.00			1" Ice	2.74	2.74	35.00
TMA	C	From Face	6.50	0.0000	180.00	No Ice	3.25	1.63	45.00
			0.00			1/2" Ice	3.60	1.85	55.00
			0.00			1" Ice	3.95	2.07	65.00
TMA	C	From Face	6.50	0.0000	180.00	No Ice	2.92	3.50	50.00
			0.00			1/2" Ice	3.23	3.85	65.00
			0.00			1" Ice	3.54	4.20	80.00
21' Whip	A	From Leg	6.50	0.0000	181.50	No Ice	4.38	4.38	40.00
			0.00			1/2" Ice	6.15	6.15	70.00
			10.50			1" Ice	7.92	7.92	100.00
20' Dipole	B	From Leg	6.50	0.0000	181.50	No Ice	6.00	6.15	65.00
			0.00			1/2" Ice	8.50	6.75	105.00
			10.00			1" Ice	11.00	7.35	145.00
21' Whip	A	From Leg	6.50	0.0000	182.00	No Ice	4.38	4.38	40.00
			0.00			1/2" Ice	6.15	6.15	70.00
			10.50			1" Ice	7.92	7.92	100.00
IBR1300	A	From Leg	0.00	0.0000	125.00	No Ice	0.56	0.25	10.00
			0.00			1/2" Ice	0.69	0.35	15.00
			0.00			1" Ice	0.82	0.46	20.00
AIR 32 B2a/B66Aa	A	From Leg	5.00	0.0000	135.00	No Ice	4.67	3.11	125.00
(T-Mobile)			3.50			1/2" Ice	5.15	4.02	205.00
			0.00			1" Ice	5.62	4.93	285.00
AIR 32 B2a/B66Aa	B	From Leg	5.00	0.0000	135.00	No Ice	4.67	3.11	125.00
(T-Mobile)			-3.50			1/2" Ice	5.15	4.02	205.00
			0.00			1" Ice	5.62	4.93	285.00
AIR 32 B2a/B66Aa	C	From Leg	5.00	0.0000	135.00	No Ice	4.67	3.11	125.00
(T-Mobile)			3.50			1/2" Ice	5.15	4.02	205.00
			0.00			1" Ice	5.62	4.93	285.00
AIR 3246 B66	A	From Leg	5.00	0.0000	135.00	No Ice	8.00	5.12	200.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			2.00			1/2" Ice	8.70	5.80	265.00
			0.00			1" Ice	9.40	6.48	330.00
AIR 3246 B66	B	From Leg	5.00	0.0000	135.00	No Ice	8.00	5.12	200.00
(T-Mobile)			1.75			1/2" Ice	8.70	5.80	265.00
			0.00			1" Ice	9.40	6.48	330.00
AIR 3246 B66	C	From Leg	5.00	0.0000	135.00	No Ice	8.00	5.12	200.00
(T-Mobile)			-3.50			1/2" Ice	8.70	5.80	265.00
			0.00			1" Ice	9.40	6.48	330.00
APXVAARR24_43-U-NA20	A	From Leg	5.00	0.0000	135.00	No Ice	20.80	9.10	154.00
(T-Mobile)			-3.50			1/2" Ice	21.90	10.30	290.00
			0.00			1" Ice	23.00	11.50	426.00
APXVAARR24_43-U-NA20	B	From Leg	5.00	0.0000	135.00	No Ice	20.80	9.10	154.00
(T-Mobile)			3.50			1/2" Ice	21.90	10.30	290.00
			0.00			1" Ice	23.00	11.50	426.00
APXVAARR24_43-U-NA20	C	From Leg	5.00	0.0000	135.00	No Ice	20.80	9.10	154.00
(T-Mobile)			-1.75			1/2" Ice	21.90	10.30	290.00
			0.00			1" Ice	23.00	11.50	426.00
B5/B13 Dual Band RRH	B	From Leg	4.50	0.0000	146.00	No Ice	1.90	1.10	80.00
(Verizon)			-5.50			1/2" Ice	2.10	1.20	105.00
			0.00			1" Ice	2.30	1.30	130.00
B5/B13 Dual Band RRH	C	From Leg	4.50	0.0000	146.00	No Ice	1.90	1.10	80.00
(Verizon)			-5.50			1/2" Ice	2.10	1.20	105.00
			0.00			1" Ice	2.30	1.30	130.00
B5/B13 Dual Band RRH	A	From Face	4.50	10.0000	146.00	No Ice	1.90	1.10	80.00
(Verizon)			-1.50			1/2" Ice	2.10	1.20	105.00
			0.00			1" Ice	2.30	1.30	130.00
B2/B66a Dual Band RRH	B	From Leg	4.50	0.0000	146.00	No Ice	1.90	1.30	95.00
(Verizon)			0.00			1/2" Ice	2.10	1.40	125.00
			0.00			1" Ice	2.30	1.50	155.00
B2/B66a Dual Band RRH	C	From Leg	4.50	0.0000	146.00	No Ice	1.90	1.30	95.00
(Verizon)			0.00			1/2" Ice	2.10	1.40	125.00
			0.00			1" Ice	2.30	1.50	155.00
B2/B66a Dual Band RRH	A	From Face	4.50	10.0000	146.00	No Ice	1.90	1.30	95.00
(Verizon)			4.00			1/2" Ice	2.10	1.40	125.00
			0.00			1" Ice	2.30	1.50	155.00
Radio 4449 B71/B85	A	From Leg	4.00	0.0000	135.00	No Ice	1.65	1.16	89.00
(T-Mobile)			-3.50			1/2" Ice	1.90	1.40	105.00
			-1.50			1" Ice	2.15	1.64	121.00
Radio 4449 B71/B85	B	From Leg	4.00	0.0000	135.00	No Ice	1.65	1.16	89.00
(T-Mobile)			3.50			1/2" Ice	1.90	1.40	105.00
			-1.50			1" Ice	2.15	1.64	121.00
Radio 4449 B71/B85	C	From Leg	4.00	0.0000	135.00	No Ice	1.65	1.16	89.00
(T-Mobile)			-1.75			1/2" Ice	1.90	1.40	105.00
			-1.50			1" Ice	2.15	1.64	121.00
AP259015-52	A	From Leg	5.00	0.0000	135.00	No Ice	2.60	4.00	75.00
			2.00			1/2" Ice	3.10	4.90	110.00
			0.00			1" Ice	3.50	5.80	145.00
AIR6449 B41	A	From Leg	5.00	0.0000	135.00	No Ice	6.50	4.20	165.00
(T-Mobile)			0.00			1/2" Ice	7.10	5.10	220.00
			0.00			1" Ice	7.70	6.10	275.00
AIR6449 B41	B	From Leg	5.00	0.0000	135.00	No Ice	6.50	4.20	165.00
(T-Mobile)			-1.75			1/2" Ice	7.10	5.10	220.00
			0.00			1" Ice	7.70	6.10	275.00
AIR6449 B41	C	From Leg	5.00	0.0000	135.00	No Ice	6.50	4.20	165.00
(T-Mobile)			1.75			1/2" Ice	7.10	5.10	220.00
			0.00			1" Ice	7.70	6.10	275.00
Radio 4415 B25	A	From Leg	4.00	0.0000	135.00	No Ice	1.70	0.72	60.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			-3.50			1/2" Ice	1.80	0.84	75.00
			1.50			1" Ice	1.90	0.96	90.00
Radio 4415 B25	B	From Leg	4.00	0.0000	135.00	No Ice	1.70	0.72	60.00
(T-Mobile)			3.50			1/2" Ice	1.80	0.84	75.00
			1.50			1" Ice	1.90	0.96	90.00
Radio 4415 B25	C	From Leg	4.00	0.0000	135.00	No Ice	1.70	0.72	60.00
(T-Mobile)			-1.75			1/2" Ice	1.80	0.84	75.00
			1.50			1" Ice	1.90	0.96	90.00
BSAMNT-SBS-2-3	B	From Leg	5.50	-5.0000	146.00	No Ice	1.40	2.50	110.00
(Verizon)			0.00			1/2" Ice	1.90	3.00	130.00
			0.00			1" Ice	2.40	3.50	150.00
BSAMNT-SBS-2-3	C	From Leg	5.50	-25.0000	146.00	No Ice	1.40	2.50	110.00
(Verizon)			0.00			1/2" Ice	1.90	3.00	130.00
			0.00			1" Ice	2.40	3.50	150.00
BSAMNT-SBS-2-3	A	From Face	5.50	-5.0000	146.00	No Ice	1.40	2.50	110.00
(Verizon)			4.00			1/2" Ice	1.90	3.00	130.00
			0.00			1" Ice	2.40	3.50	150.00
(2) JAHH-45B-R3B	B	From Leg	6.00	-5.0000	146.00	No Ice	11.70	5.30	110.00
(Verizon)			0.00			1/2" Ice	12.30	5.90	200.00
			0.00			1" Ice	12.90	6.50	290.00
(2) JAHH-45B-R3B	C	From Leg	6.00	-25.0000	146.00	No Ice	11.70	5.30	110.00
(Verizon)			0.00			1/2" Ice	12.30	5.90	200.00
			0.00			1" Ice	12.90	6.50	290.00
(2) JAHH-45B-R3B	A	From Face	6.00	-5.0000	146.00	No Ice	11.70	5.30	110.00
(Verizon)			4.00			1/2" Ice	12.30	5.90	200.00
			0.00			1" Ice	12.90	6.50	290.00
(2) 8' pipe mount	B	From Leg	5.25	0.0000	146.00	No Ice	2.00	2.00	45.00
			0.00			1/2" Ice	2.60	2.60	70.00
			0.00			1" Ice	3.30	3.30	95.00
(2) 8' pipe mount	C	From Leg	5.25	0.0000	146.00	No Ice	2.00	2.00	45.00
			0.00			1/2" Ice	2.60	2.60	70.00
			0.00			1" Ice	3.30	3.30	95.00
(2) 8' pipe mount	A	From Face	5.25	0.0000	146.00	No Ice	2.00	2.00	45.00
			4.00			1/2" Ice	2.60	2.60	70.00
			0.00			1" Ice	3.30	3.30	95.00
Samsung 64T64R MMU	B	From Leg	6.00	-5.0000	146.00	No Ice	6.80	3.90	150.00
(Verizon)			-5.50			1/2" Ice	7.50	5.00	210.00
			0.00			1" Ice	8.20	6.10	270.00
Samsung 64T64R MMU	C	From Leg	6.00	-25.0000	146.00	No Ice	6.80	3.90	150.00
(Verizon)			-5.50			1/2" Ice	7.50	5.00	210.00
			0.00			1" Ice	8.20	6.10	270.00
Samsung 64T64R MMU	A	From Face	6.00	-5.0000	146.00	No Ice	6.80	3.90	150.00
(Verizon)			-1.50			1/2" Ice	7.50	5.00	210.00
			0.00			1" Ice	8.20	6.10	270.00
(2) CBC78T-DS-43-2X	B	From Leg	5.00	0.0000	146.00	No Ice	0.57	0.52	25.00
(Verizon)			0.00			1/2" Ice	0.64	0.59	35.00
			2.00			1" Ice	0.71	0.66	45.00
(2) CBC78T-DS-43-2X	C	From Leg	5.00	0.0000	146.00	No Ice	0.57	0.52	25.00
(Verizon)			0.00			1/2" Ice	0.64	0.59	35.00
			2.00			1" Ice	0.71	0.66	45.00
(2) CBC78T-DS-43-2X	A	From Face	5.00	0.0000	146.00	No Ice	0.57	0.52	25.00
(Verizon)			4.00			1/2" Ice	0.64	0.59	35.00
			2.00			1" Ice	0.71	0.66	45.00
RHSDC-3315-PF-48	C	From Leg	2.00	45.0000	148.50	No Ice	2.22	2.22	15.00
(Verizon)			1.50			1/2" Ice	2.48	2.48	25.00
			0.00			1" Ice	2.74	2.74	35.00
PSILP8OI-24 antenna	A	From Leg	0.50	25.0000	178.60 - 162.00	No Ice	5.90	10.40	80.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Channel 24)			0.00			1/2" Ice	7.50	12.10	135.00
			0.00			1" Ice	9.20	13.80	190.00
8' tall 2" Std. pipe 1' standoff	B	From Leg	5.75	-5.0000	146.00	No Ice	2.00	2.40	70.00
(Verizon)			5.50			1/2" Ice	2.80	3.50	95.00
			0.00			1" Ice	3.60	4.60	120.00
8' tall 2" Std. pipe 1' standoff	C	From Leg	5.00	-10.0000	146.00	No Ice	2.40	2.00	70.00
(Verizon)			-6.75			1/2" Ice	3.50	2.80	95.00
			0.00			1" Ice	4.60	3.60	120.00
8' tall 2" Std. pipe 1' standoff	A	From Face	5.00	0.0000	146.00	No Ice	2.40	2.00	70.00
(Verizon)			-2.25			1/2" Ice	3.50	2.80	95.00
			0.00			1" Ice	4.60	3.60	120.00
8' tall 2" Std. pipe 1' standoff	A	From Face	5.00	-10.0000	146.00	No Ice	2.40	2.00	70.00
(Verizon)			10.75			1/2" Ice	3.50	2.80	95.00
			0.00			1" Ice	4.60	3.60	120.00
CBNG 39GHz VectaStar NR	B	From Leg	6.50	-5.0000	148.00	No Ice	2.50	1.40	60.00
gNB			5.50			1/2" Ice	2.60	1.50	85.00
(Verizon)			0.00			1" Ice	2.70	1.70	110.00
CBNG 39GHz VectaStar NR	C	From Leg	6.00	-35.0000	148.00	No Ice	2.50	1.40	60.00
gNB			-6.50			1/2" Ice	2.60	1.50	85.00
(Verizon)			0.00			1" Ice	2.70	1.70	110.00
CBNG 39GHz VectaStar NR	A	From Face	6.50	-5.0000	148.00	No Ice	2.50	1.40	60.00
gNB			-2.50			1/2" Ice	2.60	1.50	85.00
(Verizon)			0.00			1" Ice	2.70	1.70	110.00
CBNG 39GHz VectaStar NR	A	From Face	6.00	85.0000	148.00	No Ice	2.50	1.40	60.00
gNB			11.00			1/2" Ice	2.60	1.50	85.00
(Verizon)			0.00			1" Ice	2.70	1.70	110.00
RVZDC-6627-PF-48 OVP	A	From Leg	0.50	0.0000	148.50	No Ice	3.40	1.80	40.00
(Verizon)			0.00			1/2" Ice	3.60	2.00	75.00
			0.00			1" Ice	3.80	2.20	110.00

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	170.00	1.150	39	134.958	A	10.879	7.917	7.917	42.12	7.376	0.000
180.00-160.00					B	10.879	7.917		42.12	0.000	0.000
					C	10.879	7.917		42.12	22.912	0.000
T2	150.00	1.110	38	157.047	A	19.898	0.000	9.600	48.25	20.884	0.000
160.00-140.00					B	19.898	0.000		48.25	0.000	0.000
					C	19.898	0.000		48.25	23.220	0.000
T3	130.00	1.065	36	198.281	A	21.032	0.000	9.600	45.64	43.060	0.000
140.00-120.00					B	21.032	0.000		45.64	0.125	0.000
					C	21.032	0.000		45.64	44.461	0.000
T4	116.67	1.033	35	75.200	A	9.109	0.000	3.896	42.77	14.353	0.000
120.00-113.33					B	9.109	0.000		42.77	0.167	0.000
					C	9.109	0.000		42.77	18.460	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
T5	110.00	1.016	34	79.700	A	9.353	0.000	3.896	41.65	14.353	0.000
113.33-106.67					B	9.353	0.000		41.65	0.167	0.000
					C	9.353	0.000		41.65	19.150	0.000
T6	103.33	0.998	34	84.200	A	10.742	0.000	3.896	36.26	14.542	0.000
106.67-100.00					B	10.742	0.000		36.26	0.167	0.000
					C	10.742	0.000		36.26	19.841	0.000
T7	90.00	0.959	32	281.260	A	37.241	0.000	15.026	40.35	44.320	0.000
100.00-80.00					B	37.241	0.000		40.35	0.500	0.000
					C	37.241	0.000		40.35	61.920	0.000
T8 80.00-70.00	75.00	0.910	31	156.710	A	18.111	0.000	9.287	51.28	22.160	0.000
					B	18.111	0.000		51.28	0.250	0.000
					C	18.111	0.000		51.28	30.960	0.000
T9 70.00-60.00	65.00	0.874	30	166.835	A	24.676	0.000	9.287	37.64	22.160	0.000
					B	24.676	0.000		37.64	0.250	0.000
					C	24.676	0.000		37.64	30.960	0.000
T10	55.00	0.833	28	176.797	A	20.598	0.000	9.287	45.09	22.759	0.000
60.00-50.00					B	20.598	0.000		45.09	0.250	0.000
					C	20.598	0.000		45.09	30.960	0.000
T11	45.00	0.787	27	186.922	A	26.298	0.000	9.287	35.32	22.790	0.000
50.00-40.00					B	26.298	0.000		35.32	0.250	0.000
					C	26.298	0.000		35.32	30.960	0.000
T12	35.00	0.732	25	197.047	A	27.937	0.000	9.287	33.24	22.790	0.000
40.00-30.00					B	27.937	0.000		33.24	0.250	0.000
					C	27.937	0.000		33.24	30.960	0.000
T13	25.00	0.700	24	207.172	A	28.798	0.000	9.287	32.25	22.790	0.000
30.00-20.00					B	28.798	0.000		32.25	0.250	0.000
					C	28.798	0.000		32.25	30.960	0.000
T14 20.00-0.00	10.00	0.700	24	446.806	A	31.157	22.121	22.121	41.52	22.790	0.000
					B	31.157	22.121		41.52	0.250	0.000
					C	31.157	22.121		41.52	32.609	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	170.00	1.150	6	1.1781	138.885	A	10.879	31.623	15.771	37.11	25.812	0.000
180.00-160.00						B	10.879	31.623		37.11	0.000	0.000
						C	10.879	31.623		37.11	79.696	0.000
T2	150.00	1.110	6	1.1635	160.930	A	25.078	13.693	14.780	38.12	55.897	0.000
160.00-140.00						B	25.078	13.693		38.12	0.000	0.000
						C	25.078	13.693		38.12	81.071	0.000
T3	130.00	1.065	6	1.1469	202.109	A	26.139	13.113	14.706	37.47	101.411	0.000
140.00-120.00						B	26.139	13.113		37.47	1.272	0.000
						C	26.139	13.113		37.47	137.327	0.000
T4	116.67	1.033	6	1.1346	76.463	A	10.793	4.732	5.579	35.94	33.655	0.000
120.00-113.33						B	10.793	4.732		35.94	1.679	0.000
						C	10.793	4.732		35.94	55.404	0.000
T5	110.00	1.016	5	1.1279	80.955	A	11.027	4.925	5.569	34.91	33.575	0.000
113.33-106.67						B	11.027	4.925		34.91	1.671	0.000
						C	11.027	4.925		34.91	57.354	0.000
T6	103.33	0.998	5	1.1209	85.447	A	12.406	5.116	5.559	31.73	34.352	0.000
106.67-100.00						B	12.406	5.116		31.73	1.661	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						C	12.406	5.116		31.73	59.505	0.000
T7 100.00-80.00	90.00	0.959	5	1.1055	284.949	A	42.163	16.374	19.947	34.08	105.599	0.000
						B	42.163	16.374		34.08	4.922	0.000
						C	42.163	16.374		34.08	185.345	0.000
T8 80.00-70.00	75.00	0.910	5	1.0856	158.522	A	20.528	6.386	11.704	43.49	52.400	0.000
						B	20.528	6.386		43.49	2.421	0.000
						C	20.528	6.386		43.49	91.800	0.000
T9 70.00-60.00	65.00	0.874	5	1.0701	168.621	A	27.059	9.410	11.670	32.00	52.091	0.000
						B	27.059	9.410		32.00	2.390	0.000
						C	27.059	9.410		32.00	91.127	0.000
T10 60.00-50.00	55.00	0.833	5	1.0524	178.553	A	22.940	6.802	11.630	39.10	54.334	0.000
						B	22.940	6.802		39.10	2.355	0.000
						C	22.940	6.802		39.10	90.353	0.000
T11 50.00-40.00	45.00	0.787	4	1.0315	188.643	A	28.594	10.027	11.584	29.99	54.011	0.000
						B	28.594	10.027		29.99	2.313	0.000
						C	28.594	10.027		29.99	89.440	0.000
T12 40.00-30.00	35.00	0.732	4	1.0059	198.725	A	34.910	3.148	11.527	30.29	53.448	0.000
						B	34.910	3.148		30.29	2.262	0.000
						C	34.910	3.148		30.29	88.323	0.000
T13 30.00-20.00	25.00	0.700	4	0.9726	208.795	A	35.737	3.208	11.453	29.41	52.716	0.000
						B	35.737	3.208		29.41	2.195	0.000
						C	35.737	3.208		29.41	86.871	0.000
T14 20.00-0.00	10.00	0.700	4	0.8875	449.768	A	31.157	41.873	28.048	38.41	50.844	0.000
						B	31.157	41.873		38.41	2.025	0.000
						C	31.157	41.873		38.41	91.075	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	170.00	1.150	9	134.958	A	10.879	7.917	7.917	42.12	7.376	0.000
180.00-160.00					B	10.879	7.917		42.12	0.000	0.000
					C	10.879	7.917		42.12	22.912	0.000
T2	150.00	1.110	9	157.047	A	19.898	0.000	9.600	48.25	20.884	0.000
160.00-140.00					B	19.898	0.000		48.25	0.000	0.000
					C	19.898	0.000		48.25	23.220	0.000
T3	130.00	1.065	8	198.281	A	21.032	0.000	9.600	45.64	43.060	0.000
140.00-120.00					B	21.032	0.000		45.64	0.125	0.000
					C	21.032	0.000		45.64	44.461	0.000
T4	116.67	1.033	8	75.200	A	9.109	0.000	3.896	42.77	14.353	0.000
120.00-113.33					B	9.109	0.000		42.77	0.167	0.000
					C	9.109	0.000		42.77	18.460	0.000
T5	110.00	1.016	8	79.700	A	9.353	0.000	3.896	41.65	14.353	0.000
113.33-106.67					B	9.353	0.000		41.65	0.167	0.000
					C	9.353	0.000		41.65	19.150	0.000
T6	103.33	0.998	8	84.200	A	10.742	0.000	3.896	36.26	14.542	0.000
106.67-100.00					B	10.742	0.000		36.26	0.167	0.000
					C	10.742	0.000		36.26	19.841	0.000
T7	90.00	0.959	7	281.260	A	37.241	0.000	15.026	40.35	44.320	0.000
100.00-80.00					B	37.241	0.000		40.35	0.500	0.000
					C	37.241	0.000		40.35	61.920	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T8 80.00-70.00	75.00	0.910	7	156.710	A	18.111	0.000	9.287	51.28	22.160	0.000
					B	18.111	0.000		51.28	0.250	0.000
					C	18.111	0.000		51.28	30.960	0.000
T9 70.00-60.00	65.00	0.874	7	166.835	A	24.676	0.000	9.287	37.64	22.160	0.000
					B	24.676	0.000		37.64	0.250	0.000
					C	24.676	0.000		37.64	30.960	0.000
T10 60.00-50.00	55.00	0.833	6	176.797	A	20.598	0.000	9.287	45.09	22.759	0.000
					B	20.598	0.000		45.09	0.250	0.000
					C	20.598	0.000		45.09	30.960	0.000
T11 50.00-40.00	45.00	0.787	6	186.922	A	26.298	0.000	9.287	35.32	22.790	0.000
					B	26.298	0.000		35.32	0.250	0.000
					C	26.298	0.000		35.32	30.960	0.000
T12 40.00-30.00	35.00	0.732	6	197.047	A	27.937	0.000	9.287	33.24	22.790	0.000
					B	27.937	0.000		33.24	0.250	0.000
					C	27.937	0.000		33.24	30.960	0.000
T13 30.00-20.00	25.00	0.700	5	207.172	A	28.798	0.000	9.287	32.25	22.790	0.000
					B	28.798	0.000		32.25	0.250	0.000
					C	28.798	0.000		32.25	30.960	0.000
T14 20.00-0.00	10.00	0.700	5	446.806	A	31.157	22.121	22.121	41.52	22.790	0.000
					B	31.157	22.121		41.52	0.250	0.000
					C	31.157	22.121		41.52	32.609	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 180.00-160.00	97.48	806.22	A	0.139	2.811	39	1	1	15.364	2301.17	115.06	C
			B	0.139	2.811		1	1	15.364			
			C	0.139	2.811		1	1	15.364			
T2 160.00-140.00	152.96	890.14	A	0.127	2.859	38	1	1	19.898	3041.48	152.07	C
			B	0.127	2.859		1	1	19.898			
			C	0.127	2.859		1	1	19.898			
T3 140.00-120.00	423.77	1635.64	A	0.106	2.94	36	1	1	21.032	4233.51	211.68	C
			B	0.106	2.94		1	1	21.032			
			C	0.106	2.94		1	1	21.032			
T4 120.00-113.33	167.47	537.07	A	0.121	2.881	35	1	1	9.109	1632.80	244.92	C
			B	0.121	2.881		1	1	9.109			
			C	0.121	2.881		1	1	9.109			
T5 113.33-106.67	169.56	547.78	A	0.117	2.895	34	1	1	9.353	1647.72	247.16	C
			B	0.117	2.895		1	1	9.353			
			C	0.117	2.895		1	1	9.353			
T6 106.67-100.00	172.10	712.70	A	0.128	2.856	34	1	1	10.742	1743.66	261.55	C
			B	0.128	2.856		1	1	10.742			
			C	0.128	2.856		1	1	10.742			
T7 100.00-80.00	525.20	2695.98	A	0.132	2.837	32	1	1	37.241	5478.70	273.93	C
			B	0.132	2.837		1	1	37.241			
			C	0.132	2.837		1	1	37.241			
T8 80.00-70.00	262.60	1378.16	A	0.116	2.902	31	1	1	18.111	2593.25	259.32	C
			B	0.116	2.902		1	1	18.111			
			C	0.116	2.902		1	1	18.111			
T9 70.00-60.00	262.60	1780.07	A	0.148	2.779	30	1	1	24.676	2891.73	289.17	C
			B	0.148	2.779		1	1	24.676			
			C	0.148	2.779		1	1	24.676			
T10 60.00-50.00	264.02	1561.19	A	0.117	2.899	28	1	1	20.598	2556.85	255.69	C
			B	0.117	2.899		1	1	20.598			

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	0.117	2.899		1	1	20.598			
T11	264.10	1906.12	A	0.141	2.806	27	1	1	26.298	2733.64	273.36	C
50.00-40.00			B	0.141	2.806		1	1	26.298			
			C	0.141	2.806		1	1	26.298			
T12	264.10	2159.10	A	0.142	2.802	25	1	1	27.937	2638.64	263.86	C
40.00-30.00			B	0.142	2.802		1	1	27.937			
			C	0.142	2.802		1	1	27.937			
T13	264.10	2216.27	A	0.139	2.812	24	1	1	28.798	2577.37	257.74	C
30.00-20.00			B	0.139	2.812		1	1	28.798			
			C	0.139	2.812		1	1	28.798			
T14	267.63	9793.68	A	0.119	2.888	24	1	1	41.957	3414.81	170.74	C
20.00-0.00			B	0.119	2.888		1	1	41.957			
			C	0.119	2.888		1	1	41.957			
Sum Weight:	3557.69	28620.10						OTM	3279811.22 lb-ft	39485.32		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	97.48	806.22	A	0.139	2.811	39	0.8	1	13.188	2098.94	104.95	C
180.00-160.00			B	0.139	2.811		0.8	1	13.188			
			C	0.139	2.811		0.8	1	13.188			
T2	152.96	890.14	A	0.127	2.859	38	0.8	1	15.918	2678.54	133.93	C
160.00-140.00			B	0.127	2.859		0.8	1	15.918			
			C	0.127	2.859		0.8	1	15.918			
T3	423.77	1635.64	A	0.106	2.94	36	0.8	1	16.826	3854.86	192.74	C
140.00-120.00			B	0.106	2.94		0.8	1	16.826			
			C	0.106	2.94		0.8	1	16.826			
T4	167.47	537.07	A	0.121	2.881	35	0.8	1	7.287	1477.00	221.55	C
120.00-113.33			B	0.121	2.881		0.8	1	7.287			
			C	0.121	2.881		0.8	1	7.287			
T5	169.56	547.78	A	0.117	2.895	34	0.8	1	7.483	1489.60	223.44	C
113.33-106.67			B	0.117	2.895		0.8	1	7.483			
			C	0.117	2.895		0.8	1	7.483			
T6	172.10	712.70	A	0.128	2.856	34	0.8	1	8.594	1567.72	235.16	C
106.67-100.00			B	0.128	2.856		0.8	1	8.594			
			C	0.128	2.856		0.8	1	8.594			
T7	525.20	2695.98	A	0.132	2.837	32	0.8	1	29.793	4896.13	244.81	C
100.00-80.00			B	0.132	2.837		0.8	1	29.793			
			C	0.132	2.837		0.8	1	29.793			
T8	262.60	1378.16	A	0.116	2.902	31	0.8	1	14.489	2318.16	231.82	C
80.00-70.00			B	0.116	2.902		0.8	1	14.489			
			C	0.116	2.902		0.8	1	14.489			
T9	262.60	1780.07	A	0.148	2.779	30	0.8	1	19.741	2547.19	254.72	C
70.00-60.00			B	0.148	2.779		0.8	1	19.741			
			C	0.148	2.779		0.8	1	19.741			
T10	264.02	1561.19	A	0.117	2.899	28	0.8	1	16.478	2270.89	227.09	C
60.00-50.00			B	0.117	2.899		0.8	1	16.478			
			C	0.117	2.899		0.8	1	16.478			
T11	264.10	1906.12	A	0.141	2.806	27	0.8	1	21.039	2399.88	239.99	C
50.00-40.00			B	0.141	2.806		0.8	1	21.039			

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	0.141	2.806		0.8	1	21.039			
T12	264.10	2159.10	A	0.142	2.802	25	0.8	1	22.350	2309.13	230.91	C
40.00-30.00			B	0.142	2.802		0.8	1	22.350			
			C	0.142	2.802		0.8	1	22.350			
T13	264.10	2216.27	A	0.139	2.812	24	0.8	1	23.038	2251.41	225.14	C
30.00-20.00			B	0.139	2.812		0.8	1	23.038			
			C	0.139	2.812		0.8	1	23.038			
T14	267.63	9793.68	A	0.119	2.888	24	0.8	1	35.726	3052.67	152.63	C
20.00-0.00			B	0.119	2.888		0.8	1	35.726			
			C	0.119	2.888		0.8	1	35.726			
Sum Weight:	3557.69	28620.10						OTM	2938507.79 lb-ft	35212.11		

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	97.48	806.22	A	0.139	2.811	39	0.85	1	13.732	2149.50	107.47	C
180.00-160.00			B	0.139	2.811		0.85	1	13.732			
			C	0.139	2.811		0.85	1	13.732			
T2	152.96	890.14	A	0.127	2.859	38	0.85	1	16.913	2769.28	138.46	C
160.00-140.00			B	0.127	2.859		0.85	1	16.913			
			C	0.127	2.859		0.85	1	16.913			
T3	423.77	1635.64	A	0.106	2.94	36	0.85	1	17.878	3949.52	197.48	C
140.00-120.00			B	0.106	2.94		0.85	1	17.878			
			C	0.106	2.94		0.85	1	17.878			
T4	167.47	537.07	A	0.121	2.881	35	0.85	1	7.743	1515.95	227.39	C
120.00-113.33			B	0.121	2.881		0.85	1	7.743			
			C	0.121	2.881		0.85	1	7.743			
T5	169.56	547.78	A	0.117	2.895	34	0.85	1	7.950	1529.13	229.37	C
113.33-106.67			B	0.117	2.895		0.85	1	7.950			
			C	0.117	2.895		0.85	1	7.950			
T6	172.10	712.70	A	0.128	2.856	34	0.85	1	9.131	1611.70	241.76	C
106.67-100.00			B	0.128	2.856		0.85	1	9.131			
			C	0.128	2.856		0.85	1	9.131			
T7	525.20	2695.98	A	0.132	2.837	32	0.85	1	31.655	5041.77	252.09	C
100.00-80.00			B	0.132	2.837		0.85	1	31.655			
			C	0.132	2.837		0.85	1	31.655			
T8	262.60	1378.16	A	0.116	2.902	31	0.85	1	15.394	2386.93	238.69	C
80.00-70.00			B	0.116	2.902		0.85	1	15.394			
			C	0.116	2.902		0.85	1	15.394			
T9	262.60	1780.07	A	0.148	2.779	30	0.85	1	20.975	2633.32	263.33	C
70.00-60.00			B	0.148	2.779		0.85	1	20.975			
			C	0.148	2.779		0.85	1	20.975			
T10	264.02	1561.19	A	0.117	2.899	28	0.85	1	17.508	2342.38	234.24	C
60.00-50.00			B	0.117	2.899		0.85	1	17.508			
			C	0.117	2.899		0.85	1	17.508			
T11	264.10	1906.12	A	0.141	2.806	27	0.85	1	22.353	2483.32	248.33	C
50.00-40.00			B	0.141	2.806		0.85	1	22.353			
			C	0.141	2.806		0.85	1	22.353			
T12	264.10	2159.10	A	0.142	2.802	25	0.85	1	23.747	2391.51	239.15	C
40.00-30.00			B	0.142	2.802		0.85	1	23.747			

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	0.142	2.802		0.85	1	23.747			
T13	264.10	2216.27	A	0.139	2.812	24	0.85	1	24.478	2332.90	233.29	C
30.00-20.00			B	0.139	2.812		0.85	1	24.478			
			C	0.139	2.812		0.85	1	24.478			
T14	267.63	9793.68	A	0.119	2.888	24	0.85	1	37.283	3143.21	157.16	C
20.00-0.00			B	0.119	2.888		0.85	1	37.283			
			C	0.119	2.888		0.85	1	37.283			
Sum Weight:	3557.69	28620.10						OTM	3023833.6 5 lb-ft	36280.41		

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	866.07	2358.68	A	0.306	2.28	6	1	1	29.879	794.01	39.70	C
180.00-160.00			B	0.306	2.28		1	1	29.879			
			C	0.306	2.28		1	1	29.879			
T2	1196.87	2266.15	A	0.241	2.465	6	1	1	33.058	959.08	47.95	C
160.00-140.00			B	0.241	2.465		1	1	33.058			
			C	0.241	2.465		1	1	33.058			
T3	2286.64	3052.51	A	0.194	2.615	6	1	1	33.659	1344.96	67.25	C
140.00-120.00			B	0.194	2.615		1	1	33.659			
			C	0.194	2.615		1	1	33.659			
T4	870.13	1133.55	A	0.203	2.586	6	1	1	13.514	500.90	75.13	C
120.00-113.33			B	0.203	2.586		1	1	13.514			
			C	0.203	2.586		1	1	13.514			
T5	886.40	1162.48	A	0.197	2.606	5	1	1	13.854	504.71	75.71	C
113.33-106.67			B	0.197	2.606		1	1	13.854			
			C	0.197	2.606		1	1	13.854			
T6	905.69	1426.85	A	0.205	2.579	5	1	1	15.350	522.18	78.33	C
106.67-100.00			B	0.205	2.579		1	1	15.350			
			C	0.205	2.579		1	1	15.350			
T7	2764.81	5041.28	A	0.205	2.578	5	1	1	51.586	1600.53	80.03	C
100.00-80.00			B	0.205	2.578		1	1	51.586			
			C	0.205	2.578		1	1	51.586			
T8	1356.95	2371.64	A	0.17	2.7	5	1	1	24.166	750.17	75.02	C
80.00-70.00			B	0.17	2.7		1	1	24.166			
			C	0.17	2.7		1	1	24.166			
T9	1337.47	3281.10	A	0.216	2.543	5	1	1	32.493	786.75	78.67	C
70.00-60.00			B	0.216	2.543		1	1	32.493			
			C	0.216	2.543		1	1	32.493			
T10	1337.22	2698.74	A	0.167	2.711	5	1	1	26.813	716.37	71.64	C
60.00-50.00			B	0.167	2.711		1	1	26.813			
			C	0.167	2.711		1	1	26.813			
T11	1311.73	3470.03	A	0.205	2.58	4	1	1	34.363	730.61	73.06	C
50.00-40.00			B	0.205	2.58		1	1	34.363			
			C	0.205	2.58		1	1	34.363			
T12	1279.48	3525.59	A	0.192	2.625	4	1	1	36.714	701.37	70.14	C
40.00-30.00			B	0.192	2.625		1	1	36.714			
			C	0.192	2.625		1	1	36.714			
T13	1238.17	3586.38	A	0.187	2.642	4	1	1	37.573	674.27	67.43	C
30.00-20.00			B	0.187	2.642		1	1	37.573			

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	0.187	2.642		1	1	37.573			
T14	1176.59	13055.60	A	0.162	2.726	4	1	1	54.979	842.75	42.14	C
20.00-0.00			B	0.162	2.726		1	1	54.979			
			C	0.162	2.726		1	1	54.979			
Sum Weight:	18814.21	48430.60						OTM	995161.53 lb-ft	11428.66		

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	866.07	2358.68	A	0.306	2.28	6	0.8	1	27.703	767.76	38.39	C
180.00-160.00			B	0.306	2.28		0.8	1	27.703			
			C	0.306	2.28		0.8	1	27.703			
T2	1196.87	2266.15	A	0.241	2.465	6	0.8	1	28.043	895.98	44.80	C
160.00-140.00			B	0.241	2.465		0.8	1	28.043			
			C	0.241	2.465		0.8	1	28.043			
T3	2286.64	3052.51	A	0.194	2.615	6	0.8	1	28.431	1277.97	63.90	C
140.00-120.00			B	0.194	2.615		0.8	1	28.431			
			C	0.194	2.615		0.8	1	28.431			
T4	870.13	1133.55	A	0.203	2.586	6	0.8	1	11.355	474.39	71.16	C
120.00-113.33			B	0.203	2.586		0.8	1	11.355			
			C	0.203	2.586		0.8	1	11.355			
T5	886.40	1162.48	A	0.197	2.606	5	0.8	1	11.649	477.86	71.68	C
113.33-106.67			B	0.197	2.606		0.8	1	11.649			
			C	0.197	2.606		0.8	1	11.649			
T6	905.69	1426.85	A	0.205	2.579	5	0.8	1	12.868	492.82	73.92	C
106.67-100.00			B	0.205	2.579		0.8	1	12.868			
			C	0.205	2.579		0.8	1	12.868			
T7	2764.81	5041.28	A	0.205	2.578	5	0.8	1	43.153	1504.64	75.23	C
100.00-80.00			B	0.205	2.578		0.8	1	43.153			
			C	0.205	2.578		0.8	1	43.153			
T8	1356.95	2371.64	A	0.17	2.7	5	0.8	1	20.061	703.76	70.38	C
80.00-70.00			B	0.17	2.7		0.8	1	20.061			
			C	0.17	2.7		0.8	1	20.061			
T9	1337.47	3281.10	A	0.216	2.543	5	0.8	1	27.082	731.45	73.14	C
70.00-60.00			B	0.216	2.543		0.8	1	27.082			
			C	0.216	2.543		0.8	1	27.082			
T10	1337.22	2698.74	A	0.167	2.711	5	0.8	1	22.225	668.70	66.87	C
60.00-50.00			B	0.167	2.711		0.8	1	22.225			
			C	0.167	2.711		0.8	1	22.225			
T11	1311.73	3470.03	A	0.205	2.58	4	0.8	1	28.644	677.22	67.72	C
50.00-40.00			B	0.205	2.58		0.8	1	28.644			
			C	0.205	2.58		0.8	1	28.644			
T12	1279.48	3525.59	A	0.192	2.625	4	0.8	1	29.732	639.66	63.97	C
40.00-30.00			B	0.192	2.625		0.8	1	29.732			
			C	0.192	2.625		0.8	1	29.732			
T13	1238.17	3586.38	A	0.187	2.642	4	0.8	1	30.425	613.48	61.35	C
30.00-20.00			B	0.187	2.642		0.8	1	30.425			
			C	0.187	2.642		0.8	1	30.425			
T14	1176.59	13055.60	A	0.162	2.726	4	0.8	1	48.748	788.05	39.40	C
20.00-0.00			B	0.162	2.726		0.8	1	48.748			

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	0.162	2.726		0.8	1	48.748			
Sum Weight:	18814.21	48430.60						OTM	938490.46 lb-ft	10713.74		

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	866.07	2358.68	A	0.306	2.28	6	0.85	1	28.247	774.32	38.72	C
180.00-160.00			B	0.306	2.28		0.85	1	28.247			
			C	0.306	2.28		0.85	1	28.247			
T2	1196.87	2266.15	A	0.241	2.465	6	0.85	1	29.297	911.75	45.59	C
160.00-140.00			B	0.241	2.465		0.85	1	29.297			
			C	0.241	2.465		0.85	1	29.297			
T3	2286.64	3052.51	A	0.194	2.615	6	0.85	1	29.738	1294.72	64.74	C
140.00-120.00			B	0.194	2.615		0.85	1	29.738			
			C	0.194	2.615		0.85	1	29.738			
T4	870.13	1133.55	A	0.203	2.586	6	0.85	1	11.895	481.01	72.15	C
120.00-113.33			B	0.203	2.586		0.85	1	11.895			
			C	0.203	2.586		0.85	1	11.895			
T5	886.40	1162.48	A	0.197	2.606	5	0.85	1	12.200	484.57	72.69	C
113.33-106.67			B	0.197	2.606		0.85	1	12.200			
			C	0.197	2.606		0.85	1	12.200			
T6	905.69	1426.85	A	0.205	2.579	5	0.85	1	13.489	500.16	75.02	C
106.67-100.00			B	0.205	2.579		0.85	1	13.489			
			C	0.205	2.579		0.85	1	13.489			
T7	2764.81	5041.28	A	0.205	2.578	5	0.85	1	45.261	1528.62	76.43	C
100.00-80.00			B	0.205	2.578		0.85	1	45.261			
			C	0.205	2.578		0.85	1	45.261			
T8	1356.95	2371.64	A	0.17	2.7	5	0.85	1	21.087	715.37	71.54	C
80.00-70.00			B	0.17	2.7		0.85	1	21.087			
			C	0.17	2.7		0.85	1	21.087			
T9	1337.47	3281.10	A	0.216	2.543	5	0.85	1	28.435	745.27	74.53	C
70.00-60.00			B	0.216	2.543		0.85	1	28.435			
			C	0.216	2.543		0.85	1	28.435			
T10	1337.22	2698.74	A	0.167	2.711	5	0.85	1	23.372	680.62	68.06	C
60.00-50.00			B	0.167	2.711		0.85	1	23.372			
			C	0.167	2.711		0.85	1	23.372			
T11	1311.73	3470.03	A	0.205	2.58	4	0.85	1	30.074	690.57	69.06	C
50.00-40.00			B	0.205	2.58		0.85	1	30.074			
			C	0.205	2.58		0.85	1	30.074			
T12	1279.48	3525.59	A	0.192	2.625	4	0.85	1	31.478	655.09	65.51	C
40.00-30.00			B	0.192	2.625		0.85	1	31.478			
			C	0.192	2.625		0.85	1	31.478			
T13	1238.17	3586.38	A	0.187	2.642	4	0.85	1	32.212	628.68	62.87	C
30.00-20.00			B	0.187	2.642		0.85	1	32.212			
			C	0.187	2.642		0.85	1	32.212			
T14	1176.59	13055.60	A	0.162	2.726	4	0.85	1	50.306	801.73	40.09	C
20.00-0.00			B	0.162	2.726		0.85	1	50.306			
			C	0.162	2.726		0.85	1	50.306			
Sum Weight:	18814.21	48430.60						OTM	952658.23 lb-ft	10892.47		

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	97.48	806.22	A	0.139	2.811	9	1	1	15.364	530.19	26.51	C
180.00-160.00			B	0.139	2.811		1	1	15.364			
			C	0.139	2.811		1	1	15.364			
T2	152.96	890.14	A	0.127	2.859	9	1	1	19.898	700.76	35.04	C
160.00-140.00			B	0.127	2.859		1	1	19.898			
			C	0.127	2.859		1	1	19.898			
T3	423.77	1635.64	A	0.106	2.94	8	1	1	21.032	975.40	48.77	C
140.00-120.00			B	0.106	2.94		1	1	21.032			
			C	0.106	2.94		1	1	21.032			
T4	167.47	537.07	A	0.121	2.881	8	1	1	9.109	376.20	56.43	C
120.00-113.33			B	0.121	2.881		1	1	9.109			
			C	0.121	2.881		1	1	9.109			
T5	169.56	547.78	A	0.117	2.895	8	1	1	9.353	379.63	56.95	C
113.33-106.67			B	0.117	2.895		1	1	9.353			
			C	0.117	2.895		1	1	9.353			
T6	172.10	712.70	A	0.128	2.856	8	1	1	10.742	401.74	60.26	C
106.67-100.00			B	0.128	2.856		1	1	10.742			
			C	0.128	2.856		1	1	10.742			
T7	525.20	2695.98	A	0.132	2.837	7	1	1	37.241	1262.29	63.11	C
100.00-80.00			B	0.132	2.837		1	1	37.241			
			C	0.132	2.837		1	1	37.241			
T8	262.60	1378.16	A	0.116	2.902	7	1	1	18.111	597.48	59.75	C
80.00-70.00			B	0.116	2.902		1	1	18.111			
			C	0.116	2.902		1	1	18.111			
T9	262.60	1780.07	A	0.148	2.779	7	1	1	24.676	666.25	66.63	C
70.00-60.00			B	0.148	2.779		1	1	24.676			
			C	0.148	2.779		1	1	24.676			
T10	264.02	1561.19	A	0.117	2.899	6	1	1	20.598	589.10	58.91	C
60.00-50.00			B	0.117	2.899		1	1	20.598			
			C	0.117	2.899		1	1	20.598			
T11	264.10	1906.12	A	0.141	2.806	6	1	1	26.298	629.83	62.98	C
50.00-40.00			B	0.141	2.806		1	1	26.298			
			C	0.141	2.806		1	1	26.298			
T12	264.10	2159.10	A	0.142	2.802	6	1	1	27.937	607.94	60.79	C
40.00-30.00			B	0.142	2.802		1	1	27.937			
			C	0.142	2.802		1	1	27.937			
T13	264.10	2216.27	A	0.139	2.812	5	1	1	28.798	593.83	59.38	C
30.00-20.00			B	0.139	2.812		1	1	28.798			
			C	0.139	2.812		1	1	28.798			
T14	267.63	9793.68	A	0.119	2.888	5	1	1	43.659	809.55	40.48	C
20.00-0.00			B	0.119	2.888		1	1	43.659			
			C	0.119	2.888		1	1	43.659			
Sum Weight:	3557.69	28620.10						OTM	755896.32 lb-ft	9120.20		

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	97.48	806.22	A	0.139	2.811	9	0.8	1	13.188	483.60	24.18	C
180.00-160.00			B	0.139	2.811		0.8	1	13.188			
			C	0.139	2.811		0.8	1	13.188			
T2	152.96	890.14	A	0.127	2.859	9	0.8	1	15.918	617.14	30.86	C
160.00-140.00			B	0.127	2.859		0.8	1	15.918			
			C	0.127	2.859		0.8	1	15.918			
T3	423.77	1635.64	A	0.106	2.94	8	0.8	1	16.826	888.16	44.41	C
140.00-120.00			B	0.106	2.94		0.8	1	16.826			
			C	0.106	2.94		0.8	1	16.826			
T4	167.47	537.07	A	0.121	2.881	8	0.8	1	7.287	340.30	51.05	C
120.00-113.33			B	0.121	2.881		0.8	1	7.287			
			C	0.121	2.881		0.8	1	7.287			
T5	169.56	547.78	A	0.117	2.895	8	0.8	1	7.483	343.20	51.48	C
113.33-106.67			B	0.117	2.895		0.8	1	7.483			
			C	0.117	2.895		0.8	1	7.483			
T6	172.10	712.70	A	0.128	2.856	8	0.8	1	8.594	361.20	54.18	C
106.67-100.00			B	0.128	2.856		0.8	1	8.594			
			C	0.128	2.856		0.8	1	8.594			
T7	525.20	2695.98	A	0.132	2.837	7	0.8	1	29.793	1128.07	56.40	C
100.00-80.00			B	0.132	2.837		0.8	1	29.793			
			C	0.132	2.837		0.8	1	29.793			
T8	262.60	1378.16	A	0.116	2.902	7	0.8	1	14.489	534.10	53.41	C
80.00-70.00			B	0.116	2.902		0.8	1	14.489			
			C	0.116	2.902		0.8	1	14.489			
T9	262.60	1780.07	A	0.148	2.779	7	0.8	1	19.741	586.87	58.69	C
70.00-60.00			B	0.148	2.779		0.8	1	19.741			
			C	0.148	2.779		0.8	1	19.741			
T10	264.02	1561.19	A	0.117	2.899	6	0.8	1	16.478	523.21	52.32	C
60.00-50.00			B	0.117	2.899		0.8	1	16.478			
			C	0.117	2.899		0.8	1	16.478			
T11	264.10	1906.12	A	0.141	2.806	6	0.8	1	21.039	552.93	55.29	C
50.00-40.00			B	0.141	2.806		0.8	1	21.039			
			C	0.141	2.806		0.8	1	21.039			
T12	264.10	2159.10	A	0.142	2.802	6	0.8	1	22.350	532.02	53.20	C
40.00-30.00			B	0.142	2.802		0.8	1	22.350			
			C	0.142	2.802		0.8	1	22.350			
T13	264.10	2216.27	A	0.139	2.812	5	0.8	1	23.038	518.73	51.87	C
30.00-20.00			B	0.139	2.812		0.8	1	23.038			
			C	0.139	2.812		0.8	1	23.038			
T14	267.63	9793.68	A	0.119	2.888	5	0.8	1	37.427	726.12	36.31	C
20.00-0.00			B	0.119	2.888		0.8	1	37.427			
			C	0.119	2.888		0.8	1	37.427			
Sum Weight:	3557.69	28620.10						OTM	677260.02 lb-ft	8135.65		

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	97.48	806.22	A	0.139	2.811	9	0.85	1	13.732	495.24	24.76	C
180.00-160.00			B	0.139	2.811		0.85	1	13.732			
			C	0.139	2.811		0.85	1	13.732			

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
T2	152.96	890.14	A	0.127	2.859	9	0.85	1	16.913	638.04	31.90	C
160.00-140.00			B	0.127	2.859		0.85	1	16.913			
			C	0.127	2.859		0.85	1	16.913			
T3	423.77	1635.64	A	0.106	2.94	8	0.85	1	17.878	909.97	45.50	C
140.00-120.00			B	0.106	2.94		0.85	1	17.878			
			C	0.106	2.94		0.85	1	17.878			
T4	167.47	537.07	A	0.121	2.881	8	0.85	1	7.743	349.27	52.39	C
120.00-113.33			B	0.121	2.881		0.85	1	7.743			
			C	0.121	2.881		0.85	1	7.743			
T5	169.56	547.78	A	0.117	2.895	8	0.85	1	7.950	352.31	52.85	C
113.33-106.67			B	0.117	2.895		0.85	1	7.950			
			C	0.117	2.895		0.85	1	7.950			
T6	172.10	712.70	A	0.128	2.856	8	0.85	1	9.131	371.34	55.70	C
106.67-100.00			B	0.128	2.856		0.85	1	9.131			
			C	0.128	2.856		0.85	1	9.131			
T7	525.20	2695.98	A	0.132	2.837	7	0.85	1	31.655	1161.62	58.08	C
100.00-80.00			B	0.132	2.837		0.85	1	31.655			
			C	0.132	2.837		0.85	1	31.655			
T8	262.60	1378.16	A	0.116	2.902	7	0.85	1	15.394	549.95	54.99	C
80.00-70.00			B	0.116	2.902		0.85	1	15.394			
			C	0.116	2.902		0.85	1	15.394			
T9	262.60	1780.07	A	0.148	2.779	7	0.85	1	20.975	606.72	60.67	C
70.00-60.00			B	0.148	2.779		0.85	1	20.975			
			C	0.148	2.779		0.85	1	20.975			
T10	264.02	1561.19	A	0.117	2.899	6	0.85	1	17.508	539.68	53.97	C
60.00-50.00			B	0.117	2.899		0.85	1	17.508			
			C	0.117	2.899		0.85	1	17.508			
T11	264.10	1906.12	A	0.141	2.806	6	0.85	1	22.353	572.16	57.22	C
50.00-40.00			B	0.141	2.806		0.85	1	22.353			
			C	0.141	2.806		0.85	1	22.353			
T12	264.10	2159.10	A	0.142	2.802	6	0.85	1	23.747	551.00	55.10	C
40.00-30.00			B	0.142	2.802		0.85	1	23.747			
			C	0.142	2.802		0.85	1	23.747			
T13	264.10	2216.27	A	0.139	2.812	5	0.85	1	24.478	537.50	53.75	C
30.00-20.00			B	0.139	2.812		0.85	1	24.478			
			C	0.139	2.812		0.85	1	24.478			
T14	267.63	9793.68	A	0.119	2.888	5	0.85	1	38.985	746.98	37.35	C
20.00-0.00			B	0.119	2.888		0.85	1	38.985			
			C	0.119	2.888		0.85	1	38.985			
Sum Weight:	3557.69	28620.10						OTM	696919.09 lb-ft	8381.79		

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	12520.68					
Bracing Weight	16099.43					
Total Member Self-Weight	28620.10			5274.34	-1973.66	
Total Weight	40738.79			5274.34	-1973.66	
Wind 0 deg - No Ice		0.00	-48889.81	-4716251.73	-1973.66	-8507.55
Wind 30 deg - No Ice		22809.58	-39507.36	-3852223.07	-2229100.83	-18482.55

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 - No Ice		38820.90	-22413.26	-2199309.66	-3820425.16	-14699.56
Wind 90 deg - No Ice		46236.20	0.00	5274.34	-4548001.21	-9955.46
Wind 120 deg - No Ice		42874.19	24753.42	2411923.98	-4170413.11	-11349.42
Wind 150 deg - No Ice		23013.14	39859.94	3917182.26	-2260514.75	-6724.68
Wind 180 deg - No Ice		0.00	44616.60	4385496.98	-1973.66	8507.55
Wind 210 deg - No Ice		-22809.58	39507.36	3862771.76	2225153.51	18482.55
Wind 240 deg - No Ice		-42521.61	24549.86	2380510.06	4112055.29	14699.56
Wind 270 deg - No Ice		-46236.20	0.00	5274.34	4544053.90	9955.46
Wind 300 deg - No Ice		-39173.48	-22616.82	-2230723.59	3870888.36	11349.42
Wind 330 deg - No Ice		-23013.14	-39859.94	-3906633.58	2256567.44	6724.68
Member Ice	19810.49					
Total Weight Ice	85375.44			-3031.34	7551.30	
Wind 0 deg - Ice		0.00	-13718.21	-1352820.60	7551.30	-4324.77
Wind 30 deg - Ice		6578.15	-11393.69	-1131029.04	-643698.48	-5899.97
Wind 60 deg - Ice		11292.80	-6519.90	-651932.50	-1116378.48	-4353.30
Wind 90 deg - Ice		13306.49	0.00	-3031.34	-1318675.72	-2161.76
Wind 120 deg - Ice		12010.38	6934.20	683727.02	-1181949.08	-931.95
Wind 150 deg - Ice		6634.99	11492.14	1141458.38	-653220.15	1069.16
Wind 180 deg - Ice		0.00	13003.30	1290086.85	7551.30	4324.77
Wind 210 deg - Ice		-6578.15	11393.69	1124966.36	658801.07	5899.97
Wind 240 deg - Ice		-11911.93	6877.36	674205.35	1180559.66	4353.30
Wind 270 deg - Ice		-13306.49	0.00	-3031.34	1333778.32	2161.76
Wind 300 deg - Ice		-11391.25	-6576.74	-661454.17	1147973.09	931.95
Wind 330 deg - Ice		-6634.99	-11492.14	-1147521.06	668322.74	-1069.16
Total Weight	40738.79			5274.34	-1973.66	
Wind 0 deg - Service		0.00	-11286.99	-1081804.71	4236.07	-1960.14
Wind 30 deg - Service		5266.72	-9122.22	-882701.98	-509007.94	-4258.38
Wind 60 deg - Service		8964.07	-5175.41	-501787.35	-875732.45	-3386.78
Wind 90 deg - Service		10675.60	0.00	6262.72	-1043396.50	-2293.74
Wind 120 deg - Service		9897.94	5714.58	560868.71	-956369.68	-2614.91
Wind 150 deg - Service		5313.62	9203.46	907763.60	-516245.71	-1549.37
Wind 180 deg - Service		0.00	10302.45	1015693.84	4236.07	1960.14
Wind 210 deg - Service		-5266.72	9122.22	895227.42	517480.08	4258.38
Wind 240 deg - Service		-9816.71	5667.68	553630.94	952305.64	3386.78
Wind 270 deg - Service		-10675.60	0.00	6262.72	1051868.64	2293.74
Wind 300 deg - Service		-9045.30	-5222.31	-509025.11	896740.78	2614.91
Wind 330 deg - Service		-5313.62	-9203.46	-895238.17	524717.85	1549.37

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.0 Wind 0 deg - No Ice
3	0.9 Dead+1.0 Wind 0 deg - No Ice
4	1.2 Dead+1.0 Wind 30 deg - No Ice
5	0.9 Dead+1.0 Wind 30 deg - No Ice
6	1.2 Dead+1.0 Wind 60 deg - No Ice
7	0.9 Dead+1.0 Wind 60 deg - No Ice
8	1.2 Dead+1.0 Wind 90 deg - No Ice
9	0.9 Dead+1.0 Wind 90 deg - No Ice
10	1.2 Dead+1.0 Wind 120 deg - No Ice
11	0.9 Dead+1.0 Wind 120 deg - No Ice
12	1.2 Dead+1.0 Wind 150 deg - No Ice
13	0.9 Dead+1.0 Wind 150 deg - No Ice
14	1.2 Dead+1.0 Wind 180 deg - No Ice

Comb. No.	Description
15	0.9 Dead+1.0 Wind 180 deg - No Ice
16	1.2 Dead+1.0 Wind 210 deg - No Ice
17	0.9 Dead+1.0 Wind 210 deg - No Ice
18	1.2 Dead+1.0 Wind 240 deg - No Ice
19	0.9 Dead+1.0 Wind 240 deg - No Ice
20	1.2 Dead+1.0 Wind 270 deg - No Ice
21	0.9 Dead+1.0 Wind 270 deg - No Ice
22	1.2 Dead+1.0 Wind 300 deg - No Ice
23	0.9 Dead+1.0 Wind 300 deg - No Ice
24	1.2 Dead+1.0 Wind 330 deg - No Ice
25	0.9 Dead+1.0 Wind 330 deg - No Ice
26	1.2 Dead+1.0 Ice+1.0 Temp
27	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
28	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
29	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
30	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
31	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
32	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
33	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
34	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
39	Dead+Wind 0 deg - Service
40	Dead+Wind 30 deg - Service
41	Dead+Wind 60 deg - Service
42	Dead+Wind 90 deg - Service
43	Dead+Wind 120 deg - Service
44	Dead+Wind 150 deg - Service
45	Dead+Wind 180 deg - Service
46	Dead+Wind 210 deg - Service
47	Dead+Wind 240 deg - Service
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	180 - 160	Leg	Max Tension	15	13365.17	-12.81	-7.74
			Max. Compression	10	-15722.37	81.41	-5.04
			Max. Mx	10	-15722.37	81.41	-5.04
			Max. My	12	-1016.05	-3.46	-63.34
			Max. Vy	10	78.94	-0.00	0.00
			Max. Vx	8	-66.22	-0.81	45.78
		Diagonal	Max Tension	20	1981.38	0.00	0.00
			Max. Compression	20	-2033.31	0.00	0.00
			Max. Mx	31	505.48	11.89	0.06
			Max. My	16	-1636.64	0.01	1.82
			Max. Vy	31	-13.33	11.89	0.06
			Max. Vx	16	-0.48	0.34	1.82
		Top Girt	Max Tension	2	396.86	0.00	0.00
			Max. Compression	15	-400.94	0.00	0.00
			Max. Mx	26	-0.16	-72.26	0.00
			Max. My	33	58.83	0.00	0.10
			Max. Vy	26	44.47	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	33	-0.06	0.00	0.00
T2	160 - 140	Leg	Max Tension	23	27486.70	-418.34	62.74
			Max. Compression	18	-33963.94	243.30	-17.79
			Max. Mx	6	20028.81	649.07	-5.49
			Max. My	12	-1279.15	-33.42	840.06
			Max. Vy	22	1074.28	-421.64	62.59
			Max. Vx	24	-1167.49	-35.70	321.42
		Diagonal	Max Tension	8	3722.03	0.00	0.00
			Max. Compression	8	-3774.82	0.00	0.00
			Max. Mx	36	414.24	19.43	2.60
			Max. My	14	-3289.87	4.45	-7.53
			Max. Vy	36	18.74	19.43	2.60
			Max. Vx	14	1.71	0.00	0.00
T3	140 - 120	Leg	Max Tension	23	52771.88	93.52	-43.48
			Max. Compression	10	-63345.77	163.97	26.72
			Max. Mx	6	30550.69	841.55	13.30
			Max. My	22	-23496.80	296.77	-828.86
			Max. Vy	22	929.09	-697.40	15.01
			Max. Vx	2	-779.92	-362.49	475.73
		Diagonal	Max Tension	4	5877.48	0.00	0.00
			Max. Compression	4	-5944.76	0.00	0.00
			Max. Mx	35	1303.35	51.73	-6.38
			Max. My	16	-5799.91	3.32	-16.06
			Max. Vy	37	36.38	47.51	-6.67
			Max. Vx	16	3.27	0.00	0.00
T4	120 - 113.333	Leg	Max Tension	23	61849.47	-162.66	-26.71
			Max. Compression	10	-73490.88	95.82	30.30
			Max. Mx	11	-72000.68	164.90	26.98
			Max. My	20	-4418.64	-7.38	-175.35
			Max. Vy	19	63.75	164.47	-24.26
			Max. Vx	20	89.87	-7.38	-175.35
		Diagonal	Max Tension	4	5917.81	0.00	0.00
			Max. Compression	4	-5940.22	0.00	0.00
			Max. Mx	37	1181.74	51.42	6.41
			Max. My	16	-5821.76	3.86	-9.68
			Max. Vy	37	36.54	51.42	6.41
			Max. Vx	33	2.15	0.00	0.00
T5	113.333 - 106.667	Leg	Max Tension	23	71333.59	-85.65	-28.10
			Max. Compression	10	-84085.83	196.79	9.85
			Max. Mx	11	-82610.99	198.59	9.91
			Max. My	18	33718.57	-106.40	-196.67
			Max. Vy	19	-67.66	195.25	-23.82
			Max. Vx	10	-74.36	-106.92	182.95
		Diagonal	Max Tension	4	6031.88	0.00	0.00
			Max. Compression	4	-6097.48	0.00	0.00
			Max. Mx	37	1380.00	52.30	-6.65
			Max. My	27	26.38	44.32	7.76
			Max. Vy	37	37.92	52.30	-6.65
			Max. Vx	27	-2.17	0.00	0.00
T6	106.667 - 100	Leg	Max Tension	23	80247.58	-191.51	-9.13
			Max. Compression	10	-94164.53	172.44	-1.85
			Max. Mx	11	-92487.36	198.59	9.91
			Max. My	18	38332.15	-106.41	-196.67
			Max. Vy	6	78.59	-169.77	22.99
			Max. Vx	18	91.27	-92.86	-176.49
		Diagonal	Max Tension	4	6271.96	0.00	0.00
			Max. Compression	4	-6405.53	0.00	0.00
			Max. Mx	35	1403.43	92.38	9.08
			Max. My	34	685.96	78.62	-11.20
			Max. Vy	37	54.08	87.57	-10.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	34	2.97	0.00	0.00
T7	100 - 80	Leg	Max Tension	23	107576.15	-157.39	-13.10
			Max. Compression	10	-126028.75	432.76	28.27
			Max. Mx	37	18380.63	-439.98	-1.50
			Max. My	20	-6555.43	-11.74	-296.55
			Max. Vy	33	116.54	-439.86	-5.99
			Max. Vx	20	94.18	-11.74	-296.55
		Diagonal	Max Tension	4	7088.79	0.00	0.00
			Max. Compression	4	-7079.43	0.00	0.00
			Max. Mx	37	1258.75	102.90	-11.65
			Max. My	33	-1323.09	71.28	-13.43
			Max. Vy	37	59.15	102.90	-11.65
			Max. Vx	33	3.22	0.00	0.00
T8	80 - 70	Leg	Max Tension	23	118702.14	-412.41	-26.53
			Max. Compression	10	-139001.87	27.80	35.61
			Max. Mx	37	21647.63	-439.98	-1.51
			Max. My	20	-7173.45	-48.59	-808.18
			Max. Vy	19	150.50	433.70	-27.80
			Max. Vx	20	178.66	-48.59	-808.18
		Diagonal	Max Tension	4	8020.83	0.00	0.00
			Max. Compression	4	-8170.87	0.00	0.00
			Max. Mx	37	1417.97	134.14	-16.54
			Max. My	33	-2294.91	109.95	-18.24
			Max. Vy	37	65.13	134.14	-16.54
			Max. Vx	33	3.74	0.00	0.00
T9	70 - 60	Leg	Max Tension	23	132076.62	-88.04	-32.10
			Max. Compression	10	-154935.93	217.47	31.04
			Max. Mx	10	-154715.01	1165.84	-6.53
			Max. My	20	-7552.12	-48.60	-808.18
			Max. Vy	10	-281.95	1165.84	-6.53
			Max. Vx	20	-250.09	-48.60	-808.18
		Diagonal	Max Tension	4	8360.43	0.00	0.00
			Max. Compression	4	-8665.59	0.00	0.00
			Max. Mx	37	2147.09	135.58	-13.95
			Max. My	27	2294.71	132.64	17.44
			Max. Vy	37	75.58	135.58	-13.95
			Max. Vx	34	-3.88	0.00	0.00
		Secondary Horizontal	Max Tension	20	295.78	56.81	-0.08
			Max. Compression	21	-348.84	42.07	17.97
			Max. Mx	27	119.15	98.51	21.69
			Max. My	36	7.86	95.34	24.70
			Max. Vy	27	-71.97	98.51	21.69
			Max. Vx	38	-4.85	0.00	0.00
T10	60 - 50	Leg	Max Tension	23	145593.05	-237.70	-28.79
			Max. Compression	10	-171320.52	-28.21	30.37
			Max. Mx	33	25463.12	-792.58	-6.10
			Max. My	20	-8863.23	-64.07	-788.29
			Max. Vy	33	-175.79	-792.58	-6.10
			Max. Vx	8	-160.78	-64.07	787.53
		Diagonal	Max Tension	4	8804.29	0.00	0.00
			Max. Compression	4	-8797.91	0.00	0.00
			Max. Mx	37	1430.19	199.89	-22.03
			Max. My	33	-2515.58	167.40	-24.33
			Max. Vy	37	84.31	199.89	-22.03
			Max. Vx	33	4.58	0.00	0.00
T11	50 - 40	Leg	Max Tension	23	158749.52	-55.32	-28.69
			Max. Compression	10	-186983.63	-718.84	22.90
			Max. Mx	35	-72883.47	-1451.01	-6.52
			Max. My	20	-9147.71	-64.08	-788.29
			Max. Vy	10	456.86	1401.90	-5.25

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Vx	20	-244.89	-64.08	-788.29
		Diagonal	Max Tension	5	8983.30	94.44	-3.53
			Max. Compression	4	-9495.37	0.00	0.00
			Max. Mx	37	2445.40	152.57	-17.71
			Max. My	27	2634.88	148.17	20.49
			Max. Vy	37	81.96	152.57	-17.71
			Max. Vx	27	-4.14	0.00	0.00
		Secondary Horizontal	Max Tension	20	462.58	77.18	3.51
			Max. Compression	21	-507.68	50.75	17.81
			Max. Mx	27	150.12	114.92	24.36
			Max. My	36	-7.65	110.54	27.04
			Max. Vy	27	-78.38	114.92	24.36
			Max. Vx	38	-4.94	0.00	0.00
T12	40 - 30	Leg	Max Tension	23	171896.19	544.26	-19.43
			Max. Compression	10	-203431.72	-1300.15	14.78
			Max. Mx	10	-203227.44	1776.22	-2.72
			Max. My	20	-10623.26	-202.52	-1337.88
			Max. Vy	10	639.65	1776.22	-2.72
			Max. Vx	20	371.99	-202.52	-1337.88
		Diagonal	Max Tension	5	9388.79	-125.45	1.90
			Max. Compression	4	-9708.88	0.00	0.00
			Max. Mx	37	1122.18	-254.94	20.52
			Max. My	4	-9663.63	-75.57	-27.85
			Max. Vy	37	-94.31	-254.94	20.52
			Max. Vx	28	-4.71	0.00	0.00
		Secondary Horizontal	Max Tension	20	738.67	64.19	6.61
			Max. Compression	21	-742.60	68.87	20.62
			Max. Mx	30	-167.35	210.96	29.06
			Max. My	36	-174.05	210.96	29.22
			Max. Vy	30	-90.30	210.96	29.06
			Max. Vx	38	-5.05	0.00	0.00
T13	30 - 20	Leg	Max Tension	23	184859.16	850.99	-12.40
			Max. Compression	10	-219389.70	534.93	38.39
			Max. Mx	37	32147.43	-2734.77	-3.47
			Max. My	20	-11127.73	-202.53	-1337.87
			Max. Vy	31	693.27	1056.89	-0.68
			Max. Vx	20	-350.98	-202.53	-1337.87
		Diagonal	Max Tension	4	9599.69	0.00	0.00
			Max. Compression	4	-10123.87	0.00	0.00
			Max. Mx	10	8307.61	-188.64	19.69
			Max. My	35	3251.88	-158.36	25.38
			Max. Vy	36	-88.00	-160.70	23.13
			Max. Vx	35	-4.59	0.00	0.00
		Secondary Horizontal	Max Tension	22	499.33	104.70	9.98
			Max. Compression	21	-536.41	59.91	19.38
			Max. Mx	36	414.15	127.68	22.60
			Max. My	36	171.07	121.24	25.96
			Max. Vy	36	83.16	127.68	22.60
			Max. Vx	38	-4.67	0.00	0.00
T14	20 - 0	Leg	Max Tension	23	208971.27	-782.06	-10.48
			Max. Compression	10	-253051.66	-0.00	-0.07
			Max. Mx	35	-89336.66	2881.22	3.05
			Max. My	8	-13082.92	-154.94	1685.12
			Max. Vy	37	-567.53	-2734.77	-3.47
			Max. Vx	8	252.31	-154.94	1685.12
		Diagonal	Max Tension	4	10531.08	0.00	0.00
			Max. Compression	4	-10596.40	0.00	0.00
			Max. Mx	37	-335.57	-787.76	-71.06

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. My	16	-10386.88	-336.82	92.92
			Max. Vy	37	-263.71	-787.76	-71.06
			Max. Vx	34	-13.62	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	18	257707.54	26237.15	-15565.00
	Max. H_x	18	257707.54	26237.15	-15565.00
	Max. H_z	5	-183564.34	-18042.95	12959.29
	Min. Vert	7	-211574.95	-21673.25	12951.92
	Min. H_x	7	-211574.95	-21673.25	12951.92
	Min. H_z	18	257707.54	26237.15	-15565.00
Leg B	Max. Vert	10	261108.32	-26507.62	-15625.92
	Max. H_x	23	-214611.41	21941.52	13005.50
	Max. H_z	23	-214611.41	21941.52	13005.50
	Min. Vert	23	-214611.41	21941.52	13005.50
	Min. H_x	10	261108.32	-26507.62	-15625.92
	Min. H_z	10	261108.32	-26507.62	-15625.92
Leg A	Max. Vert	2	255855.62	-211.41	30366.08
	Max. H_x	20	15972.92	3798.58	1508.64
	Max. H_z	2	255855.62	-211.41	30366.08
	Min. Vert	15	-210390.43	219.73	-25118.84
	Min. H_x	9	11979.97	-3794.79	1101.30
	Min. H_z	15	-210390.43	219.73	-25118.84

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	40738.79	-0.00	0.00	5273.76	-1974.27	0.01
1.2 Dead+1.0 Wind 0 deg - No Ice	48886.55	-0.00	-48889.81	-4730205.09	-2302.16	-8532.87
0.9 Dead+1.0 Wind 0 deg - No Ice	36664.92	-0.00	-48889.81	-4728015.00	-1719.37	-8526.15
1.2 Dead+1.0 Wind 30 deg - No Ice	48886.55	22809.58	-39507.36	-3863541.17	-2236567.60	-18462.09
0.9 Dead+1.0 Wind 30 deg - No Ice	36665.11	22810.43	-39507.00	-3862023.53	-2234181.55	-18478.37
1.2 Dead+1.0 Wind 60 deg - No Ice	48886.55	38820.90	-22413.26	-2205345.40	-3833099.03	-14661.93
0.9 Dead+1.0 Wind 60 deg - No Ice	36664.92	38820.90	-22413.26	-2205157.49	-3829413.91	-14671.14
1.2 Dead+1.0 Wind 90 deg - No Ice	48886.55	46236.20	-0.00	6373.59	-4563029.23	-9908.56
0.9 Dead+1.0 Wind 90 deg - No Ice	36664.92	46236.20	-0.00	4771.88	-4558755.93	-9899.61
1.2 Dead+1.0 Wind 120 deg - No Ice	48886.55	42874.19	24753.42	2420714.37	-4184131.72	-11283.48
0.9 Dead+1.0 Wind 120 deg -	36664.92	42874.19	24753.42	2417171.23	-4180187.40	-11300.29

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
No Ice						
1.2 Dead+1.0 Wind 150 deg - No Ice	48886.55	23013.14	39859.94	3930880.24	-2268170.59	-6662.13
0.9 Dead+1.0 Wind 150 deg - No Ice	36664.92	23013.14	39859.94	3926104.53	-2265756.02	-6700.00
1.2 Dead+1.0 Wind 180 deg - No Ice	48886.55	-0.00	44616.60	4400718.50	-2317.66	8530.23
0.9 Dead+1.0 Wind 180 deg - No Ice	36664.92	-0.00	44616.60	4395559.66	-1732.21	8523.88
1.2 Dead+1.0 Wind 210 deg - No Ice	48886.55	-22809.58	39507.36	3876228.99	2231972.10	18461.83
0.9 Dead+1.0 Wind 210 deg - No Ice	36665.11	-22808.85	39507.91	3871503.95	2230758.66	18478.16
1.2 Dead+1.0 Wind 240 deg - No Ice	48886.55	-42521.61	24549.86	2389158.44	4124812.80	14660.38
0.9 Dead+1.0 Wind 240 deg - No Ice	36664.92	-42521.61	24549.86	2385647.28	4122091.69	14669.98
1.2 Dead+1.0 Wind 270 deg - No Ice	48886.55	-46236.20	-0.00	6369.87	4558328.63	9908.65
0.9 Dead+1.0 Wind 270 deg - No Ice	36664.92	-46236.20	-0.00	4769.12	4555223.23	9899.67
1.2 Dead+1.0 Wind 300 deg - No Ice	48886.55	-39173.48	-22616.82	-2236868.22	3883036.57	11286.51
0.9 Dead+1.0 Wind 300 deg - No Ice	36664.92	-39173.48	-22616.82	-2236648.27	3880464.01	11302.45
1.2 Dead+1.0 Wind 330 deg - No Ice	48886.55	-23013.15	-39859.94	-3918136.25	2263462.36	6662.16
0.9 Dead+1.0 Wind 330 deg - No Ice	36664.92	-23013.15	-39859.94	-3916566.65	2262213.17	6700.06
1.2 Dead+1.0 Ice+1.0 Temp	93523.20	0.00	0.00	-1927.75	7315.20	-0.18
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	93523.20	0.00	-13718.21	-1360750.58	7354.13	-4357.77
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	93523.20	6578.15	-11393.69	-1137499.50	-648276.46	-5921.26
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	93523.20	11292.80	-6519.90	-655193.70	-1124168.07	-4359.00
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	93523.20	13306.49	0.00	-1907.35	-1327847.89	-2148.35
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	93523.20	12010.38	6934.20	689480.74	-1190168.97	-902.87
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	93523.20	6634.99	11492.14	1150325.89	-657892.37	1104.42
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	93523.20	-0.00	13003.30	1299947.66	7348.38	4357.51
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	93523.20	-6578.15	11393.69	1133681.93	662979.20	5921.22
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	93523.20	-11911.93	6877.36	679869.87	1188221.03	4358.45
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	93523.20	-13306.49	0.00	-1908.90	1342544.05	2148.45
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	93523.20	-11391.25	-6576.74	-664800.94	1155511.68	903.85
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	93523.20	-6634.99	-11492.14	-1154138.60	672590.38	-1104.46
Dead+Wind 0 deg - Service	40738.79	-0.00	-11286.99	-1085672.65	-1957.82	-1965.01
Dead+Wind 30 deg - Service	40738.79	5266.72	-9122.22	-886060.19	-516588.97	-4255.13
Dead+Wind 60 deg - Service	40738.79	8964.07	-5175.41	-504108.56	-884283.86	-3379.14
Dead+Wind 90 deg - Service	40738.79	10675.60	0.00	5301.39	-1052433.35	-2283.81
Dead+Wind 120 deg - Service	40738.79	9897.94	5714.58	561400.81	-965147.43	-2602.33
Dead+Wind 150 deg - Service	40738.79	5313.62	9203.46	909251.22	-523850.66	-1538.17
Dead+Wind 180 deg - Service	40738.79	0.00	10302.45	1017439.75	-1959.28	1964.61

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+Wind 210 deg - Service	40738.79	-5266.72	9122.22	896672.02	512667.90	4255.12
Dead+Wind 240 deg - Service	40738.79	-9816.71	5667.68	554137.64	948647.09	3379.25
Dead+Wind 270 deg - Service	40738.79	-10675.60	-0.00	5300.53	1048511.28	2283.81
Dead+Wind 300 deg - Service	40738.79	-9045.30	-5222.31	-511369.45	892941.31	2602.83
Dead+Wind 330 deg - Service	40738.79	-5313.62	-9203.46	-898636.00	519933.45	1538.16

Solution Summary

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
1	-0.00	-40738.79	0.00	0.00	40738.79	-0.00	0.000%
2	0.00	-48886.55	-48889.81	0.00	48886.55	48889.81	0.000%
3	0.00	-36664.92	-48889.81	0.00	36664.92	48889.81	0.000%
4	22809.58	-48886.55	-39507.36	-22809.58	48886.55	39507.36	0.000%
5	22809.58	-36664.92	-39507.36	-22810.43	36665.11	39507.00	0.002%
6	38820.90	-48886.55	-22413.26	-38820.90	48886.55	22413.26	0.000%
7	38820.90	-36664.92	-22413.26	-38820.90	36664.92	22413.26	0.000%
8	46236.20	-48886.55	0.00	-46236.20	48886.55	0.00	0.000%
9	46236.20	-36664.92	0.00	-46236.20	36664.92	0.00	0.000%
10	42874.19	-48886.55	24753.42	-42874.19	48886.55	-24753.42	0.000%
11	42874.19	-36664.92	24753.42	-42874.19	36664.92	-24753.42	0.000%
12	23013.14	-48886.55	39859.94	-23013.14	48886.55	-39859.94	0.000%
13	23013.14	-36664.92	39859.94	-23013.14	36664.92	-39859.94	0.000%
14	-0.00	-48886.55	44616.60	0.00	48886.55	-44616.60	0.000%
15	-0.00	-36664.92	44616.60	0.00	36664.92	-44616.60	0.000%
16	-22809.58	-48886.55	39507.36	22809.58	48886.55	-39507.36	0.000%
17	-22809.58	-36664.92	39507.36	22808.85	36665.11	-39507.91	0.002%
18	-42521.61	-48886.55	24549.86	42521.61	48886.55	-24549.86	0.000%
19	-42521.61	-36664.92	24549.86	42521.61	36664.92	-24549.86	0.000%
20	-46236.20	-48886.55	0.00	46236.20	48886.55	0.00	0.000%
21	-46236.20	-36664.92	0.00	46236.20	36664.92	0.00	0.000%
22	-39173.48	-48886.55	-22616.82	39173.48	48886.55	22616.82	0.000%
23	-39173.48	-36664.92	-22616.82	39173.48	36664.92	22616.82	0.000%
24	-23013.14	-48886.55	-39859.94	23013.15	48886.55	39859.94	0.000%
25	-23013.14	-36664.92	-39859.94	23013.15	36664.92	39859.94	0.000%
26	-0.00	-93523.20	0.00	-0.00	93523.20	-0.00	0.000%
27	0.00	-93523.20	-13718.21	-0.00	93523.20	13718.21	0.000%
28	6578.15	-93523.20	-11393.69	-6578.15	93523.20	11393.69	0.000%
29	11292.80	-93523.20	-6519.90	-11292.80	93523.20	6519.90	0.000%
30	13306.49	-93523.20	0.00	-13306.49	93523.20	-0.00	0.000%
31	12010.38	-93523.20	6934.20	-12010.38	93523.20	-6934.20	0.000%
32	6634.99	-93523.20	11492.14	-6634.99	93523.20	-11492.14	0.000%
33	-0.00	-93523.20	13003.30	0.00	93523.20	-13003.30	0.000%
34	-6578.15	-93523.20	11393.69	6578.15	93523.20	-11393.69	0.000%
35	-11911.93	-93523.20	6877.36	11911.93	93523.20	-6877.36	0.000%
36	-13306.49	-93523.20	-0.00	13306.49	93523.20	-0.00	0.000%
37	-11391.25	-93523.20	-6576.74	11391.25	93523.20	6576.74	0.000%
38	-6634.99	-93523.20	-11492.14	6634.99	93523.20	11492.14	0.000%
39	-0.00	-40738.79	-11286.99	0.00	40738.79	11286.99	0.000%
40	5266.72	-40738.79	-9122.22	-5266.72	40738.79	9122.22	0.000%
41	8964.07	-40738.79	-5175.41	-8964.07	40738.79	5175.41	0.000%
42	10675.60	-40738.79	0.00	-10675.60	40738.79	-0.00	0.000%
43	9897.94	-40738.79	5714.58	-9897.94	40738.79	-5714.58	0.000%
44	5313.62	-40738.79	9203.46	-5313.62	40738.79	-9203.46	0.000%
45	0.00	-40738.79	10302.45	-0.00	40738.79	-10302.45	0.000%
46	-5266.72	-40738.79	9122.22	5266.72	40738.79	-9122.22	0.000%
47	-9816.71	-40738.79	5667.68	9816.71	40738.79	-5667.68	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
48	-10675.60	-40738.79	-0.00	10675.60	40738.79	0.00	0.000%
49	-9045.30	-40738.79	-5222.31	9045.30	40738.79	5222.31	0.000%
50	-5313.62	-40738.79	-9203.46	5313.62	40738.79	9203.46	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	0.00000109
3	Yes	4	0.00000001	0.00000114
4	Yes	4	0.00000001	0.00000170
5	Yes	4	0.00000001	0.00000173
6	Yes	4	0.00000001	0.00000224
7	Yes	4	0.00000001	0.00000187
8	Yes	4	0.00000001	0.00000191
9	Yes	4	0.00000001	0.00000180
10	Yes	4	0.00000001	0.00000120
11	Yes	4	0.00000001	0.00000127
12	Yes	4	0.00000001	0.00000181
13	Yes	4	0.00000001	0.00000167
14	Yes	4	0.00000001	0.00000230
15	Yes	4	0.00000001	0.00000205
16	Yes	4	0.00000001	0.00000180
17	Yes	4	0.00000001	0.00000179
18	Yes	4	0.00000001	0.00000115
19	Yes	4	0.00000001	0.00000121
20	Yes	4	0.00000001	0.00000198
21	Yes	4	0.00000001	0.00000185
22	Yes	4	0.00000001	0.00000247
23	Yes	4	0.00000001	0.00000222
24	Yes	4	0.00000001	0.00000178
25	Yes	4	0.00000001	0.00000165
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

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	3.220	43	0.1641	0.0106
T2	160 - 140	2.543	43	0.1477	0.0148
T3	140 - 120	1.937	43	0.1312	0.0145
T4	120 - 113.333	1.419	43	0.1088	0.0110
T5	113.333 - 106.667	1.262	43	0.1017	0.0094
T6	106.667 - 100	1.116	43	0.0941	0.0079
T7	100 - 80	0.985	43	0.0858	0.0071
T8	80 - 70	0.640	43	0.0676	0.0046
T9	70 - 60	0.495	43	0.0596	0.0036
T10	60 - 50	0.369	43	0.0513	0.0028
T11	50 - 40	0.258	43	0.0429	0.0021
T12	40 - 30	0.167	43	0.0342	0.0014
T13	30 - 20	0.093	43	0.0252	0.0008
T14	20 - 0	0.041	43	0.0160	0.0003

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.00	20' Dipole	43	3.220	0.1641	0.0106	229996
183.50	10' Whip	43	3.220	0.1641	0.0106	229996
183.00	10' Dipole	43	3.220	0.1641	0.0106	229996
182.50	10' Whip	43	3.220	0.1641	0.0106	229996
182.00	6' Yagi	43	3.220	0.1641	0.0106	229996
181.50	21' Whip	43	3.220	0.1641	0.0106	229996
180.00	Top Platform	43	3.220	0.1641	0.0106	229996
178.60	PSILP8OI-24 antenna	43	3.172	0.1629	0.0103	229996
175.00	10' Inverted Whip	43	3.048	0.1596	0.0100	229996
173.07	PSILP8OI-24 antenna	43	2.981	0.1579	0.0107	165863
173.00	14' Inverted Whip	43	2.979	0.1578	0.0107	164283
170.00	10' Inverted Whip	43	2.877	0.1553	0.0117	114998
167.53	PSILP8OI-24 antenna	43	2.793	0.1534	0.0126	92244
166.00	14' Inverted Whip	43	2.742	0.1523	0.0131	82141
162.00	PSILP8OI-24 antenna	43	2.609	0.1492	0.0144	64444
148.50	Raycap	43	2.184	0.1389	0.0154	53072
148.00	CBNG 39GHz VectaStar NR gNB	43	2.169	0.1385	0.0154	52599
146.00	Stand-Off T-Frame	43	2.110	0.1368	0.0152	50789
135.00	Stand-Off T-Frame	43	1.800	0.1258	0.0138	50342
125.00	IBR1300	43	1.541	0.1143	0.0121	61923
103.00	Empty Mount	43	1.042	0.0895	0.0074	44254
102.50	2' yagi	43	1.032	0.0888	0.0074	46716
59.50	GPS	43	0.363	0.0509	0.0028	84097
18.00	(2) GPS	43	0.033	0.0142	0.0002	47764
17.67	(2) GPS	43	0.032	0.0140	0.0002	48448

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	180 - 160	13.967	10	0.7067	0.0463
T2	160 - 140	11.041	10	0.6366	0.0644
T3	140 - 120	8.405	10	0.5668	0.0631
T4	120 - 113.333	6.152	10	0.4724	0.0479
T5	113.333 - 106.667	5.473	10	0.4416	0.0409
T6	106.667 - 100	4.839	10	0.4082	0.0345
T7	100 - 80	4.268	10	0.3721	0.0307
T8	80 - 70	2.775	10	0.2930	0.0200
T9	70 - 60	2.145	10	0.2585	0.0156
T10	60 - 50	1.599	10	0.2223	0.0122
T11	50 - 40	1.120	10	0.1858	0.0090
T12	40 - 30	0.722	10	0.1483	0.0059
T13	30 - 20	0.402	10	0.1091	0.0036
T14	20 - 0	0.176	10	0.0692	0.0014

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
191.00	20' Dipole	10	13.967	0.7067	0.0463	57306
183.50	10' Whip	10	13.967	0.7067	0.0463	57306
183.00	10' Dipole	10	13.967	0.7067	0.0463	57306
182.50	10' Whip	10	13.967	0.7067	0.0463	57306
182.00	6' Yagi	10	13.967	0.7067	0.0463	57306
181.50	21' Whip	10	13.967	0.7067	0.0463	57306
180.00	Top Platform	10	13.967	0.7067	0.0463	57306
178.60	PSILP8OI-24 antenna	10	13.758	0.7016	0.0448	57306
175.00	10' Inverted Whip	10	13.223	0.6887	0.0436	57306
173.07	PSILP8OI-24 antenna	10	12.936	0.6818	0.0466	41326
173.00	14' Inverted Whip	10	12.926	0.6816	0.0467	40933
170.00	10' Inverted Whip	10	12.483	0.6709	0.0508	28653
167.53	PSILP8OI-24 antenna	10	12.122	0.6623	0.0546	22983
166.00	14' Inverted Whip	10	11.899	0.6570	0.0570	20466
162.00	PSILP8OI-24 antenna	10	11.324	0.6433	0.0624	16044
148.50	Raycap	10	9.479	0.5987	0.0671	12595
148.00	CBNG 39GHz VectaStar NR gNB	10	9.414	0.5970	0.0669	12525
146.00	Stand-Off T-Frame	10	9.156	0.5899	0.0662	12253
135.00	Stand-Off T-Frame	10	7.807	0.5447	0.0601	12356
125.00	IBR1300	10	6.683	0.4964	0.0526	14880
103.00	Empty Mount	10	4.518	0.3881	0.0322	10168
102.50	2' yagi	10	4.476	0.3854	0.0319	10747
59.50	GPS	10	1.573	0.2205	0.0120	19191
18.00	(2) GPS	10	0.144	0.0617	0.0010	10983
17.67	(2) GPS	10	0.139	0.0604	0.0010	11140

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	180	Leg	A325N	0.6250	8	396.60	20340.10	0.019 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	990.69	6215.62	0.159 ✔	1	Member Bearing
T2	160	Leg	A325N	0.6250	8	2068.48	20340.10	0.102 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	1861.01	6215.62	0.299 ✔	1	Member Bearing
T3	140	Leg	A325N	0.7500	8	4306.32	30101.40	0.143 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	2938.74	6215.62	0.473 ✔	1	Member Bearing
T4	120	Leg	A325N	0.8750	8	7731.18	41556.00	0.186 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	2970.11	8835.73	0.336 ✔	1	Bolt Shear
T5	113.333	Leg	A325N	0.8750	8	8916.70	41556.00	0.215 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	3048.74	8835.73	0.345 ✔	1	Bolt Shear
T6	106.667	Leg	A325N	0.8750	8	10030.90	41556.00	0.241 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	3202.76	8835.73	0.362 ✔	1	Bolt Shear
T7	100	Leg	A325N	1.0000	8	11186.70	54517.00	0.205 ✔	1	Bolt Tension
		Diagonal	A325N	0.5000	2	3544.40	8835.73	0.401 ✔	1	Bolt Shear
T8	80	Leg	A325N	1.0000	8	14837.80	54517.00	0.272 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	4085.43	13805.80	0.296 ✔	1	Bolt Shear
T9	70	Leg	A325N	1.0000	8	16509.60	54517.00	0.303 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	4332.79	13805.80	0.314 ✔	1	Bolt Shear
T10	60	Leg	A325N	1.0000	8	18199.10	54517.00	0.334 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	4402.14	13805.80	0.319 ✔	1	Bolt Shear
T11	50	Leg	A325N	1.0000	8	19843.70	54517.00	0.364 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	4747.68	13805.80	0.344 ✔	1	Bolt Shear
T12	40	Leg	A325N	1.0000	8	21487.00	54517.00	0.394 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	4854.44	13805.80	0.352 ✔	1	Bolt Shear
T13	30	Leg	A325N	1.0000	8	23107.40	54517.00	0.424 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	5061.94	13805.80	0.367 ✔	1	Bolt Shear
T14	20	Leg	A325N	1.0000	12	16505.70	54517.00	0.303 ✔	1	Bolt Tension
		Diagonal	A325N	0.6250	2	5298.20	27611.70	0.192 ✔	1	Bolt Shear

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	180 - 160	ROHN 2 STD (GR)	20.00	4.00	61.0 K=1.00	1.0745	-15722.40	47357.40	0.332 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T2	160 - 140	ROHN 2.5 STD (GR) w/ 5/8" Cable	20.03	5.01	73.9 K=1.00	2.8170	-33963.90	85040.70	0.399 [1] ✓
T3	140 - 120	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	20.03	6.68	87.3 K=1.00	3.4680	-63345.80	89416.20	0.708 [1] ✓
T4	120 - 113.333	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0 K=1.00	4.4060	-73490.90	124199.00	0.592 [1] ✓
T5	113.333 - 106.667	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0 K=1.00	4.4060	-84085.80	124199.00	0.677 [1] ✓
T6	106.667 - 100	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0 K=1.00	4.4060	-94164.50	124199.00	0.758 [1] ✓
T7	100 - 80	ROHN 4 X-STR (GR) w/ 5/8" Cable	20.03	6.68	61.6 K=1.00	6.6150	-126029.00	225464.00	0.559 [1] ✓
T8	80 - 70	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	10.02	72.1 K=1.00	8.2440	-139002.00	253652.00	0.548 [1] ✓
T9	70 - 60	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	5.16	37.2 K=1.00	8.2440	-154936.00	335317.00	0.462 [1] ✓
T10	60 - 50	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	10.02	72.1 K=1.00	8.5440	-171321.00	262883.00	0.652 [1] ✓
T11	50 - 40	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.15	37.1 K=1.00	8.5440	-186984.00	347755.00	0.538 [1] ✓
T12	40 - 30	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.14	37.0 K=1.00	8.5440	-203432.00	347854.00	0.585 [1] ✓
T13	30 - 20	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.13	37.0 K=1.00	8.5440	-219390.00	347943.00	0.631 [1] ✓
T14	20 - 0	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	20.03	10.02	54.8 K=1.00	8.5495	-253052.00	397313.00	0.637 [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	180 - 160	L1 1/2x1 1/2x1/8	7.71	3.74	138.4 K=0.91	0.3594	-2033.31	5368.17	0.379 [1] ✓
T2	160 - 140	L1 3/4x1 3/4x1/8	9.75	4.88	150.9 K=0.89	0.4219	-3774.82	5300.32	0.712 [1] ✓
T3	140 - 120	L2x2x1/8 w/1.5" sch 40 pipe	12.28	6.20	164.1 K=0.88	1.2900	-5812.39	13718.50	0.424 [1] ✓
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12.85	6.45	141.9 K=0.91	0.9020	-5940.22	12830.00	0.463 [1] ✓
T5	113.333 - 106.667	L2 1/2x2 1/2x3/16	13.43	6.74	146.9 K=0.90	0.9020	-6097.48	11955.60	0.510 [1] ✓
T6	106.667 - 100	L3x3x1/4	14.02	7.04	131.9 K=0.92	1.4400	-6405.53	23697.40	0.270 [1] ✓
T7	100 - 80	L3x3x1/4	15.84	7.90	144.5 K=0.90	1.4400	-7079.43	19744.60	0.359 [1] ✓
T8	80 - 70	L3x3x1/4	18.20	9.13	162.5 K=0.88	1.4400	-8170.87	15604.20	0.524 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	70 - 60	L3 1/2x3 1/2x1/4	19.06	9.55	148.2 K=0.90	1.6900	-8665.59	22030.50	0.393 [1]
T10	60 - 50	L3 1/2x3 1/2x1/4	19.92	9.99	153.6 K=0.89	1.6900	-8797.91	20499.80	0.429 [1]
T11	50 - 40	L3 1/2x3 1/2x1/4	20.81	10.43	159.1 K=0.88	1.6900	-9495.37	19103.50	0.497 [1]
T12	40 - 30	L3.5x3.5x1/4 w/ 2x1/4 plate	21.70	10.87	118.8 K=0.95	2.1520	-9708.88	34444.50	0.282 [1]
T13	30 - 20	L3.5x3.5x1/4 w/ 2x1/4 plate	22.60	11.33	123.7 K=0.95	2.1520	-10123.90	31753.50	0.319 [1]
T14	20 - 0	4x4x1/4 w/ sch 40	24.44	12.19	138.6 K=0.91	6.5600	-10596.40	97716.80	0.108 [1]

[1] P_u / ϕP_n controls

Secondary Horizontal 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 $\frac{P_u}{\phi P_n}$
T9	70 - 60	L3 1/2x3 1/2x1/4	16.20	15.74	173.3 K=1.00	1.6900	-2687.00	16110.20	0.167 [1]
T11	50 - 40	L3 1/2x3 1/2x1/4	18.23	17.77	195.6 K=1.00	1.6900	-3242.80	12644.20	0.256 [1]
T12	40 - 30	L3 1/2x3 1/2x1/4	19.24	18.78	206.7 K=1.00	1.6900	-3528.05	11316.50	0.312 [1]
T13	30 - 20	L3 1/2x3 1/2x1/4	20.26	19.79	217.9 K=1.00	1.6900	-3804.80	10187.60	0.373 [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	180 - 160	L3x3x1/4	6.50	6.30	124.8 K=0.98	1.4400	-400.94	26466.40	0.015 [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	180 - 160	ROHN 2 STD (GR)	20.00	4.00	61.0	1.0745	13365.20	48353.90	0.276 [1] ✓
T2	160 - 140	ROHN 2.5 STD (GR) w/ 5/8" Cable	20.03	5.01	73.9	2.8170	27486.70	126765.00	0.217 [1] ✓
T3	140 - 120	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	20.03	6.68	87.3	3.4680	52771.90	156060.00	0.338 [1] ✓
T4	120 - 113.333	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0	4.4060	61849.50	198270.00	0.312 [1] ✓
T5	113.333 - 106.667	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0	4.4060	71333.60	198270.00	0.360 [1] ✓
T6	106.667 - 100	ROHN 3 X-STR (GR) w/ 5/8" Cable	6.68	6.68	80.0	4.4060	80247.60	198270.00	0.405 [1] ✓
T7	100 - 80	ROHN 4 X-STR (GR) w/ 5/8" Cable	20.03	6.68	61.6	6.6150	107576.00	297675.00	0.361 [1] ✓
T8	80 - 70	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	10.02	72.1	8.2440	118702.00	370980.00	0.320 [1] ✓
T9	70 - 60	ROHN 5 STD (GR) w/ 5/8" Cable	10.02	5.16	37.2	8.2440	132077.00	370980.00	0.356 [1] ✓
T10	60 - 50	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	10.02	72.1	8.5440	145593.00	384480.00	0.379 [1] ✓
T11	50 - 40	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.15	37.1	8.5440	158750.00	384480.00	0.413 [1] ✓
T12	40 - 30	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.14	37.0	8.5440	171896.00	384480.00	0.447 [1] ✓
T13	30 - 20	ROHN 5 X-STR (GR) w/ 5/8" Cable	10.02	5.13	37.0	8.5440	184859.00	384480.00	0.481 [1] ✓
T14	20 - 0	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	20.03	10.02	54.8	8.5495	208971.00	384729.00	0.543 [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	180 - 160	L1 1/2x1 1/2x1/8	7.71	3.74	96.6	0.2109	1981.38	10283.20	0.193 [1] ✓
T2	160 - 140	L1 3/4x1 3/4x1/8	9.75	4.88	107.4	0.2578	3722.03	12568.40	0.296 [1] ✓
T3	140 - 120	L2x2x1/8 w/1.5" sch 40 pipe	11.72	5.92	113.5	0.9089	5877.48	44309.20	0.133 [1] ✓
T4	120 - 113.333	L2 1/2x2 1/2x3/16	12.85	6.45	99.5	0.5886	5917.81	28694.70	0.206 [1] ✓
T5	113.333 -	L2 1/2x2 1/2x3/16	13.43	6.74	104.0	0.5886	6031.88	28694.70	0.210 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
	106.667								✓
T6	106.667 - 100	L3x3x1/4	14.02	7.04	90.8	0.9628	6271.96	46937.10	0.134 [1]
									✓
T7	100 - 80	L3x3x1/4	15.84	7.90	101.9	0.9628	7088.79	46937.10	0.151 [1]
									✓
T8	80 - 70	L3x3x1/4	18.20	9.13	117.8	0.9394	8020.83	45794.50	0.175 [1]
									✓
T9	70 - 60	L3 1/2x3 1/2x1/4	19.06	9.55	105.2	1.1269	8360.43	54935.20	0.152 [1]
									✓
T10	60 - 50	L3 1/2x3 1/2x1/4	19.92	9.99	109.9	1.1269	8804.29	54935.20	0.160 [1]
									✓
T11	50 - 40	L3 1/2x3 1/2x1/4	20.81	10.43	114.8	1.1269	8983.30	54935.20	0.164 [1]
									✓
T12	40 - 30	L3.5x3.5x1/4 w/ 2x1/4 plate	21.70	10.87	125.1	2.1520	9388.79	96840.00	0.097 [1]
									✓
T13	30 - 20	L3.5x3.5x1/4 w/ 2x1/4 plate	22.60	11.33	130.2	2.1520	9599.69	96840.00	0.099 [1]
									✓
T14	20 - 0	4x4x1/4 w/ sch 40	24.44	12.19	152.0	4.6388	10531.10	226139.00	0.047 [1]
									✓

[1] P_u / ϕP_n controls

Secondary Horizontal 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 $\frac{P_u}{\phi P_n}$
T9	70 - 60	L3 1/2x3 1/2x1/4	16.20	15.74	173.3	1.2675	2687.00	61790.60	0.043 [1]
									✓
T11	50 - 40	L3 1/2x3 1/2x1/4	18.23	17.77	195.6	1.2675	3242.80	61790.60	0.052 [1]
									✓
T12	40 - 30	L3 1/2x3 1/2x1/4	19.24	18.78	206.7	1.2675	3528.05	61790.60	0.057 [1]
									✓
T13	30 - 20	L3 1/2x3 1/2x1/4	20.26	19.79	217.9	1.2675	3804.80	61790.60	0.062 [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	180 - 160	L3x3x1/4	6.50	6.30	81.3	1.4400	396.86	46656.00	0.009 [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	180 - 160	Leg	ROHN 2 STD (GR)	2	-15722.40	47357.40	33.2	Pass
		Diagonal	L1 1/2x1 1/2x1/8	7	-2033.31	5368.17	37.9	Pass
		Top Girt	L3x3x1/4	4	-400.94	26466.40	1.5	Pass
T2	160 - 140	Leg	ROHN 2.5 STD (GR) w/ 5/8" Cable	37	-33963.90	85040.70	39.9	Pass
		Diagonal	L1 3/4x1 3/4x1/8	41	-3774.82	5300.32	71.2	Pass
T3	140 - 120	Leg	ROHN 2.5 X-STR (GR) w/ 5/8" Cable	65	-63345.80	89416.20	70.8	Pass
		Diagonal	L2x2x1/8 w/1.5" sch 40 pipe	71	-5812.39	13718.50	42.4 47.3 (b)	Pass
T4	120 - 113.333	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	86	-73490.90	124199.00	59.2	Pass
		Diagonal	L2 1/2x2 1/2x3/16	92	-5940.22	12830.00	46.3	Pass
T5	113.333 - 106.667	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	95	-84085.80	124199.00	67.7	Pass
		Diagonal	L2 1/2x2 1/2x3/16	101	-6097.48	11955.60	51.0	Pass
T6	106.667 - 100	Leg	ROHN 3 X-STR (GR) w/ 5/8" Cable	104	-94164.50	124199.00	75.8	Pass
		Diagonal	L3x3x1/4	110	-6405.53	23697.40	27.0 36.2 (b)	Pass
T7	100 - 80	Leg	ROHN 4 X-STR (GR) w/ 5/8" Cable	113	-126029.00	225464.00	55.9	Pass
		Diagonal	L3x3x1/4	119	-7079.43	19744.60	35.9 40.1 (b)	Pass
T8	80 - 70	Leg	ROHN 5 STD (GR) w/ 5/8" Cable	134	-139002.00	253652.00	54.8	Pass
		Diagonal	L3x3x1/4	140	-8170.87	15604.20	52.4	Pass
T9	70 - 60	Leg	ROHN 5 STD (GR) w/ 5/8" Cable	143	-154936.00	335317.00	46.2	Pass
		Diagonal	L3 1/2x3 1/2x1/4	149	-8665.59	22030.50	39.3	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	151	-2687.00	16110.20	16.7	Pass
T10	60 - 50	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	155	-171321.00	262883.00	65.2	Pass
		Diagonal	L3 1/2x3 1/2x1/4	161	-8797.91	20499.80	42.9	Pass
T11	50 - 40	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	164	-186984.00	347755.00	53.8	Pass
		Diagonal	L3 1/2x3 1/2x1/4	170	-9495.37	19103.50	49.7	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	172	-3242.80	12644.20	25.6	Pass
T12	40 - 30	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	176	-203432.00	347854.00	58.5	Pass
		Diagonal	L3.5x3.5x1/4 w/ 2x1/4 plate	182	-9708.88	34444.50	28.2 35.2 (b)	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	184	-3528.05	11316.50	31.2	Pass
T13	30 - 20	Leg	ROHN 5 X-STR (GR) w/ 5/8" Cable	188	-219390.00	347943.00	63.1	Pass
		Diagonal	L3.5x3.5x1/4 w/ 2x1/4 plate	194	-10123.90	31753.50	31.9 36.7 (b)	Pass
		Secondary Horizontal	L3 1/2x3 1/2x1/4	196	-3804.80	10187.60	37.3	Pass
T14	20 - 0	Leg	ROHN 6 EH (GR) w/ 5/8" Cable (GR)	200	-253052.00	397313.00	63.7	Pass
		Diagonal	4x4x1/4 w/ sch 40	206	-10596.40	97716.80	10.8 19.2 (b)	Pass
							Summary	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	$øP_{allow}$ lb	% Capacity	Pass Fail
						Leg (T6)	75.8	Pass
						Diagonal (T2)	71.2	Pass
						Secondary Horizontal (T13)	37.3	Pass
						Top Girt (T1)	1.5	Pass
						Bolt Checks	47.3	Pass
						RATING =	**75.8**	**Pass**

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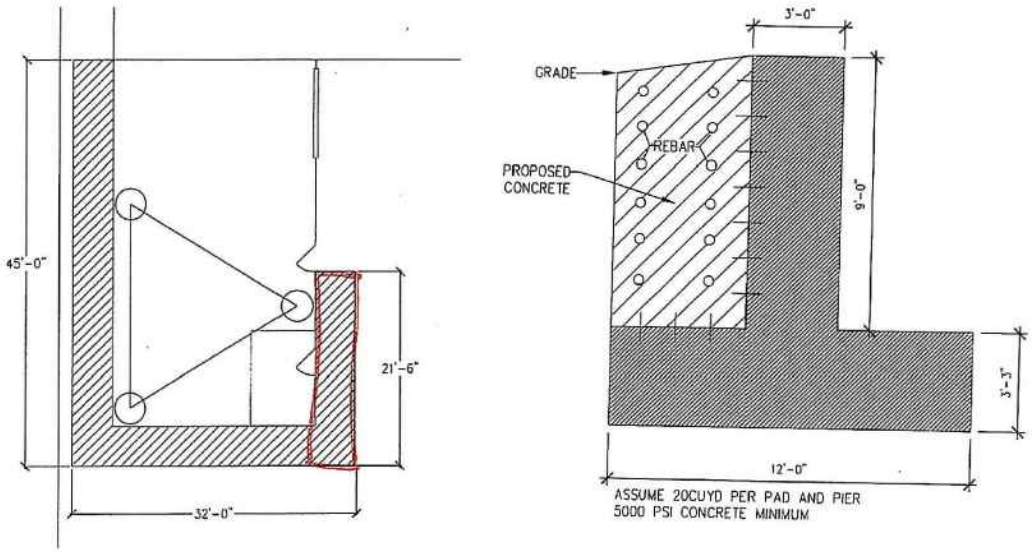
Foundation Calculations

Allowable uplift prior to reinforcement: $467.96 \ k$
Actual uplift from analysis: $\text{Actual} := 214.61 \ k$

Proposed Reinforcement:



Assume section marked in red as minimum supporting max corner reaction

$\text{Volume} := 21.5 \cdot 4.5 \cdot 9 = 870.75 \ ft^3 \ concrete$

$\text{Weight} := 50 \ \frac{lb}{ft^3}$ (150 lb/ft^3 concrete - 100 lb/ft^3 soil)

$\text{Resistance} := \frac{\text{Volume} \cdot \text{Weight}}{1000} = 43.54 \ k$

$\text{Total} := \text{Resistance} + 467.96 = 511.5 \ k$

$\phi := 0.75$

$\text{Allow} := \text{Total} \cdot \phi = 383.623$

$\frac{\text{Actual}}{\text{Allow}} = 55.9\%$ **OK**

By: Domenic Aversa, PE
Approved by: Michael Bohlinger, PE

GPD Group
West Haven
KM #241009.00

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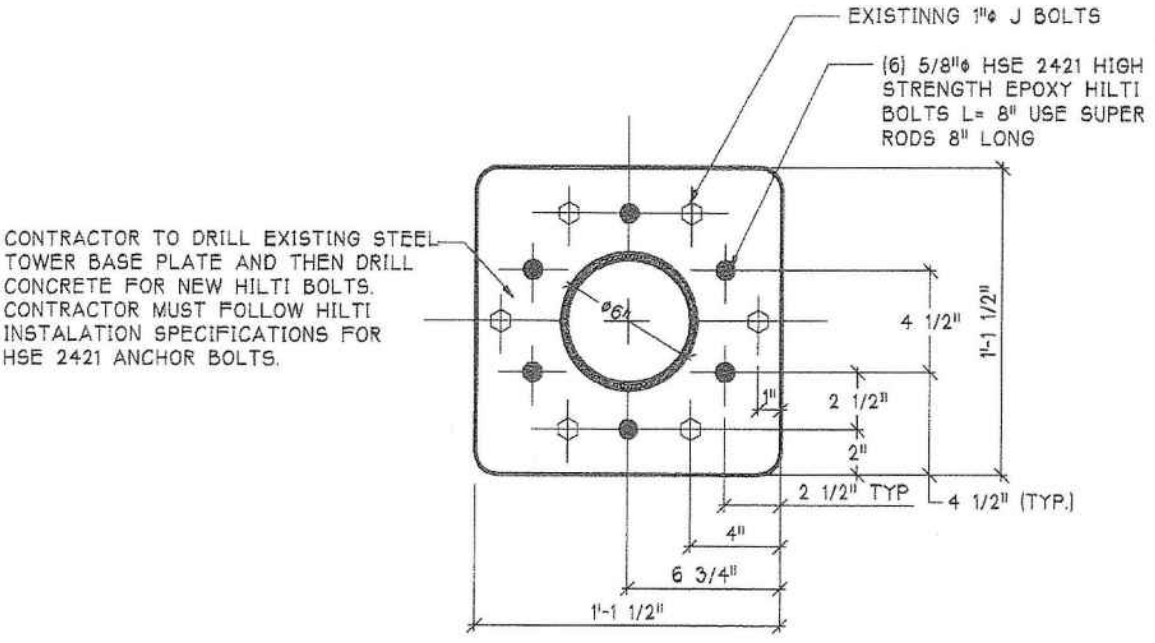
Anchor Bolt Calculations

Existing anchor bolt configuration:



(6) Original 1" diameter A-490 anchor bolts:

Yield Strength: $F_y := 130 ksi$

Allowable Strength $F_{allow} := F_y \cdot 0.6 = 78\ ksi$

Area of bolts: $A_b := 6 \cdot \pi \cdot (0.5)^2 = 4.712\ \ in^2$

Allowable tension (per leg): $F_{allow} \cdot 4.712 = 367.5\ k$

(6) reinforcement Hilti anchors:

Allowable tension (per bolt): $T_a := 6.25\ \ k$

Total allowable tension: $T := 6 \cdot T_a = 37.5\ \ k$

Total resistance: $T_{total} := 367.5 + 37.5 = 405\ k$

Actual max tension per leg: $T_{max} := 214.61\ k$

$$\frac{T_{max}}{T_{total}} = 0.530$$ **OK**

By: Domenic Aversa, PE
Approved by: Michael Bohlinger, PE

GPD Group
West Haven
KM #241009.00

verizon

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Antenna Mount Analysis Report with Hardware Upgrades and PMI Requirements

Mount ReAnalysis

SMART Tool Project #: 10252478
Colliers Engineering & Design Project #: 24777390

September 17, 2024

Site Information	*Site ID:*	*5000382034-VZW / WEST HAVEN CT*
	Site Name:	*WEST HAVEN CT*
	Carrier Name:	*Verizon Wireless*
	Address:	*24 Rockdale Rd* *West Haven, Connecticut 06516* *New Haven County*
	Latitude:	*41.291205°*
	Longitude:	*-72.967881°*
Structure Information	*Tower Type:*	*148-Ft Self Support*
	Mount Type:	*12.00-Ft Sector Frame*

FUZE ID # 17289552

Analysis Results

Sector Frame: **67.6% Pass w/ Hardware Upgrades***

*** Antennas and equipment to be installed in compliance with PMI Requirements of this mount analysis.**

******Contractor PMI Requirements*:**
Included at the end of this MA report
Available & Submitted via portal at https://pmi.vzwsmart.com
For additional questions and support, please reach out to:
pmisupport@colliersengineering.com

Report Prepared By: David Bogart

Dejian Xu

Digitally signed by Dejian Xu
Date: 2024.09.17 10:59:06-04'00'

Executive Summary:

The objective of this report is to determine the capacity of the antenna support mount at the subject facility for the final wireless telecommunications configuration, per the applicable codes and standards. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

This analysis is inclusive of the mount structure only and does not address the structural capacity of the supporting structure. This mounting frame was not analyzed as an anchor attachment point for fall protection. All climbing activities are required to have a fall protection plan completed by a competent person.

Sources of Information:

Document Type	Remarks
Radio Frequency Data Sheet (RFDS)	Verizon RFDS Site ID: 325095, dated August 29, 2024
Mount Mapping Report	RKS Design & Engineering LLC, Site ID: VZW:468096, dated October 24, 2020
Previous Mount Analysis Report	Maser Consulting Connecticut Project #: 20777340A, dated November 10, 2020
Post-Modification Inspection Report	Maser Consulting Connecticut Project #: 20777340A, dated August 25, 2021

Analysis Criteria:

Codes and Standards:	ANSI/TIA-222-H 2022 Connecticut State Building Code (CSBC), Effective October 1, 2022	
Wind Parameters:	Basic Wind Speed (Ultimate 3-sec. Gust), V_{ULT}:	125 mph
	Ice Wind Speed (3-sec. Gust):	50 mph
	Design Ice Thickness:	1.00 in
	Risk Category:	II
	Exposure Category:	C
	Topographic Category:	1
	Topographic Feature Considered:	N/A
	Topographic Method:	N/A
	Ground Elevation Factor, K_e:	0.995
Seismic Parameters:	S_S:	0.200 g
	S_1:	0.053 g
Maintenance Parameters:	Wind Speed (3-sec. Gust):	50 mph
	Maintenance Load, Lv:	250 lbs.
	Maintenance Load, Lm:	500 lbs.
Analysis Software:	RISA-3D (V22)	

Final Loading Configuration:

The following equipment has been considered for the analysis of the mounts:

Mount Elevation (ft)	Equipment Elevation (ft)	Quantity	Manufacturer	Model	Status
144.75	146.00	6	Commscope	JAHH-45B-R3B	Retained
		3	Commscope	CBC78T-DS-43-2X	
		3	Samsung	B2/B66A RRH-BR049	
		3	Samsung	B5/B13 RRH-BR04C	
		1	Raycap	RHSDC-3315-PF-48	
		1	Raycap	RHSDC-3315-PF-48*	
		3	Samsung	MT6407-77A	
		1	Raycap	RVZDC-6627-PF-48	Added
	148.00	4	CBNG	39GHz VectaStar NR gNB	

* Equipment to be flush mounted directly to the Self Support. They are not mounted on Sector Frame mounts and are not included in this mount analysis.

The recent mount mapping reported existing OVP units. It is acceptable to install up to any three (3) of the OVP model numbers listed below as required at any location other than the mount face without affecting the structural capacity of the mount. If OVP units are installed on the mount face, a mount re-analysis may be required unless replacing an existing OVP.

Model Number	Ports	AKA
DB-B1-6C-12AB-0Z	6	OVP-6
RVZDC-6627-PF-48	12	OVP-12

Standard Conditions:

1. All engineering services are performed on the basis that the information provided to Colliers Engineering & Design and used in this analysis is current and correct. The existing equipment loading has been applied at locations determined from the supplied documentation. Any deviation from the loading locations specified in this report shall be communicated to Colliers Engineering & Design to verify deviation will not adversely impact the analysis.

2. Mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.

   Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping and reported in the Mount Mapping Report are assumed to be corrected and documented as part of the PMI process and are not considered in the mount analysis.

   The mount analysis and the mount mapping are not a condition assessment of the mount. Proper maintenance and condition assessments are still required post analysis.

3. For mount analyses completed from other data sources (including new replacement mounts) and not specifically mapped in accordance with the NSTD-446 Standard, the mounts are assumed to have been properly fabricated, installed and maintained in good condition, twist free and plumb in accordance with its original design and manufacturer's specifications.

4. All member connections are assumed to have been designed to meet or exceed the load carrying capacity of the connected member unless otherwise specified in this report.

5. The mount was checked up to, and including, the bolts that fasten it to the mount collar/attachment and threaded rod connections in collar members if applicable. Local deformation and interaction between the mount collar/attachment and the supporting tower structure are outside the scope of this analysis.

6. All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. Colliers Engineering & Design is not responsible for the conclusion, opinions, and recommendations made by others based on the information supplied.

7. Structural Steel Grades have been assumed as follows, if applicable, unless otherwise noted in this analysis:
   - Channel, Solid Round, Angle, Plate — ASTM A36 (Gr. 36)
   - HSS (Rectangular) — ASTM 500 (Gr. B-46)
   - Pipe — ASTM A53 (Gr. B-35)
   - Threaded Rod — F1554 (Gr. 36)
   - Bolts — ASTM A325

Discrepancies between in-field conditions and the assumptions listed above may render this analysis invalid unless explicitly approved by Colliers Engineering & Design.

Analysis Results:

Component	Utilization %	Pass/Fail
Standoff Bar	67.6 %	Pass
Face Horizontal	36.6 %	Pass
Standoff Horizontal	34.2 %	Pass
Standoff Diagonal	13.4 %	Pass
Standoff Vertical 2	2.8 %	Pass
Antenna Pipe	22.1 %	Pass
Tie Back	10.7 %	Pass
Antenna Pipe 2	13.8 %	Pass
Pipe to Pipe	7.9 %	Pass
Mount Connection	30.7 %	Pass

Structure Rating – *(Controlling Utilization of all Components)*	**67.6%***

* Results valid after hardware upgrades noted in the PMI Requirements are installed.

Mount Connection Envelope Reactions:

Connection Description	Elev. AGL (Ft)	Node Label	Envelope Wind Reactions				Envelope Wind + Ice Reactions			
			Axial (Lbs)	Lateral (Lbs)	Moment (K-Ft)	Torsion (K-Ft)	Axial (Lbs)	Lateral (Lbs)	Moment (K-Ft)	Torsion (K-Ft)
Sector A Bottom Standoff	143.2	N65	669	2431	0.208	0.000	1347	3344	0.408	0.000
Sector A Top Standoff	146.6	N80	707	4111	0.215	0.000	1444	3689	0.431	0.000

Notes:
- Axial loads act along the axis of the tower leg
- Lateral reactions act perpendicular to the tower leg
- Moment loads introduce bending moment to the tower leg
- Torsion loads introduce twisting moment to the tower leg

- Batch solutions by individual load cases are included at the end of this document

Mount Steel (EPA)a per ANSI/TIA-222-H Section 2.6.11.2:

Ice Thickness (In)	Mount Pipes Excluded		Mount Pipes Included	
	Front (EPA)a (Sq. Ft.)	Side (EPA)a (Sq. Ft.)	Front (EPA)a (Sq. Ft.)	Side (EPA)a (Sq. Ft.)
0	27.0	19.2	38.9	31.1
0.5	39.1	28.4	55.8	45.1
1	50.4	36.9	71.9	58.3

Notes:
- (EPA)a values listed above may be used in the absence of more precise information
- (EPA)a values in the table above include 1 sector(s).
- Ka factors included in (EPA)a calculations

Requirements:

The existing mounts will be **SUFFICIENT** for the final loading configuration shown in attachment 2 upon the completion of the requirements listed below.

Contractor shall install proposed OVP to top right (as seen from behind mount) Gamma sector standoff.

Contractor shall install (4) additional 96" long PIPE 2 SCH40 mount pipes (1 per Alpha & beta, 2 per Gamma). Connect to existing mount pipes (Alpha position 3, Beta position 1, Gamma Position 1 & 3) with Pipe-to-Pipe connections (Perfect Vision Part #: PV-DC-PTPC-2020-12). Install Pipe to Pipe connection 12" from (Alpha Position 5, Beta Position 1, Gamma Position 1 & 5). 12" from top of the proposed pipe and 12" from top of existing pipe, install the 2nd pipe-to-pipe connection at 60" from the 1st connection.

ANSI/ASSP rigging plan review services compliant with the requirements of ANSI/TIA 322 are available for a Construction Class IV site or other, if required. Separate review fees will apply.

Attachments:

1. **Contractor Required Post Installation Inspection (PMI) Report Deliverables**
2. Antenna Placement Diagrams
3. Mount Photos
4. Mount Mapping Report (for reference only)
5. Analysis Calculations

Mount Desktop – Post Modification Inspection (PMI) Report Requirements

Documents & Photos Required from Contractor – Passing Mount Analysis

Passing Mount Analysis requires a PMI due to a modification in loading.
Electronic pdf version of this can be downloaded at https://pmi.vzwsmart.com.
For additional questions and support, please reach out to pmisupport@colliersengineering.com

MDG #: 5000382034 SMART Project #: 10252478 Fuze Project ID: 17289552

Purpose – to provide SMART Tool structural vendor the proper documentation in order to complete the required Mount Desktop review of the Post Modification Inspection Report.

- Contractor is responsible for making certain the photos provided as noted below provide confirmation that the installation was completed in accordance with this Passing Mount Analysis.
- Contractor shall relay any data that can impact the performance of the mount, this includes safety issues.

Base Requirements:

- If installation will cause damage to the structure, the climbing facility, or safety climb if present or any installed system, SMART Tool vendor to be notified prior to install. Any special photos outside of the standard requirements will be indicated on the drawings.
- Provide "as built mount drawings" showing contractor's name, contact information, preparer's signature, and date. Any deviations from the drawings (Proposed modification) shall be shown. NOTE: If loading is different than what is conveyed in the passing mount analysis (MA) contact the SMART Tool vendor immediately.
- Each photo should be time and date stamped
- Photos should be high resolution.
- Contractor shall ensure that the safety climb wire rope is supported and not adversely impacted by the install of the modification components. This may involve the install of wire rope guides, or other items to protect the wire rope. If there is conflict, contact the SMART Tool engineer for recommendations.
- The PMI can be accessed at the following portal: ***https://pmi.vzwsmart.com***

Photo Requirements:

- *Photos taken at ground level*
  - Photo of Gate Signs showing the tower owner, site name, and number.
  - Overall tower structure after installation.
  - Photos of the mount after installation; if the mounts are at different rad elevations, pictures must be provided for all elevations that equipment was installed.
- *Photos taken at Mount Elevation*
  - Photos showing the safety climb wire rope above and below the mount prior to installation.
  - Photos showing the climbing facility and safety climb if present.
  - Photos showing each individual sector after installation. Each entire sector shall be in one photo to show the interconnection of members.

    - These photos shall also certify that the placement and geometry of the equipment on the mount is as depicted in the antenna placement diagram in this form.
  - Photos that show the model number of each antenna and piece of equipment installed per sector.

Antenna & equipment placement and Geometry Confirmation:

- The contractor shall certify that the antenna & equipment placement and geometry is in accordance with the sketch and table as included in the mount analysis and noted below.

☐ The contractor certifies that the photos support and the equipment on the mount is as depicted on the sketch and table included in this form and with the mount analysis provided.

OR

☐ The contractor notes that the equipment on the mount is not in accordance with the sketch and has noted the differences below and provided photo documentation of any alterations.

Special Instructions / Validation as required from the MA or any other information the contractor deems necessary to share that was identified:

Issue:

Contractor shall install proposed OVP to top right (as seen from behind mount) Gamma sector standoff. Contractor shall install (4) additional 96" long PIPE 2 SCH40 mount pipes (1 per Alpha & beta, 2 per Gamma). Connect to existing mount pipes (Alpha position 3, Beta position 1, Gamma Position 1 & 3) with Pipe-to-Pipe connections (Perfect Vision Part #: PV-DC-PTPC-2020-12). Install Pipe to Pipe connection 12" from (Alpha Position 5, Beta Position 1, Gamma Position 1 & 5). 12'' from top of the proposed pipe and 12'' from top of existing pipe, install the 2nd pipe-to-pipe connection at 60'' from the 1st connection.

Response:

Special Instruction Confirmation:

☐ The contractor has read and acknowledges the above special instructions.

☐ All hardware listed in the Special Instructions above (if applicable) has been properly installed, and the existing hardware was inspected.

☐ The material utilized was as specified in the SMART Tool engineering vendor Special Instructions above (if applicable) and included in the material certification folder is a packing list or invoice for these materials.

OR

☐ The material utilized was approved by a SMART Tool engineering vendor as an "equivalent" and this approval is included as part of the contractor submission.

Comments:

Contractor certifies that the climbing facility / safety climb was not damaged prior to starting work:

☐ Yes ☐ No

Contractor certifies no new damage created during the current installation:

☐ Yes ☐ No

Contractor to certify the condition of the safety climb and verify no damage when leaving the site:

☐ Safety Climb in Good Condition ☐ Safety Climb Damaged

Contractor to provide measurement from top of the highest equipment/steel to the bottom of the lowest equipment/steel by documenting it using the most appropriate illustration below along with supporting photos:

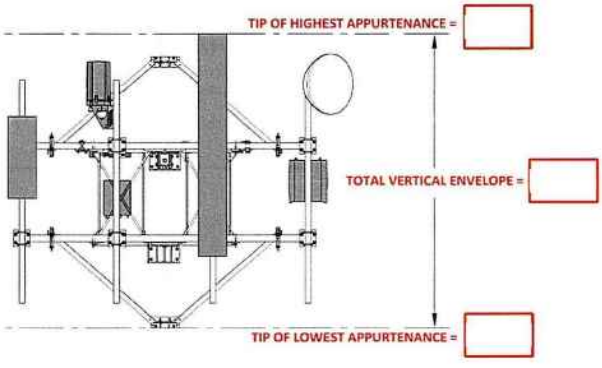


Illustration #1

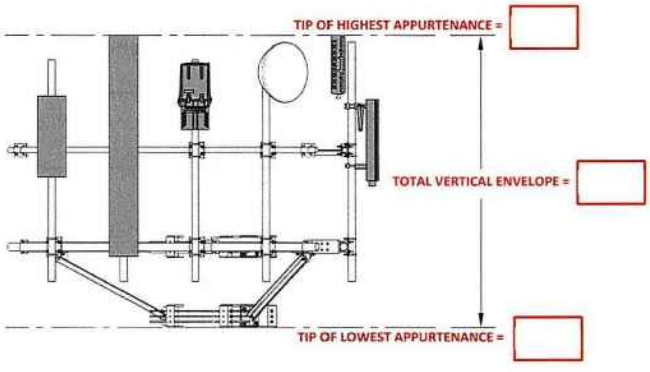


Illustration #2

Certifying Individual:

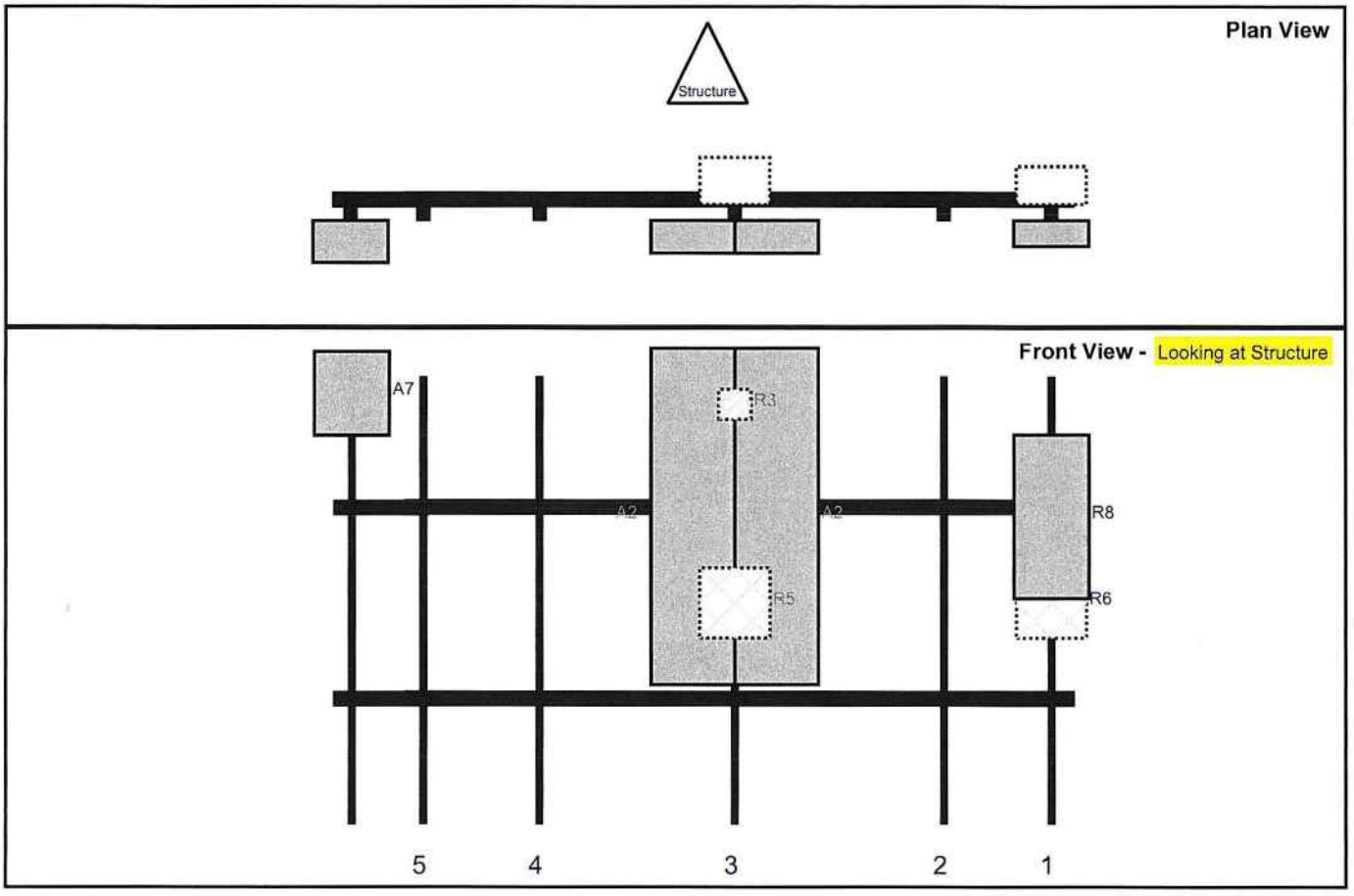
Company:	
Employee Name:	
Contact Phone:	
Email:	
Date:	

Structure: 5000382034-VZW - West Haven CT

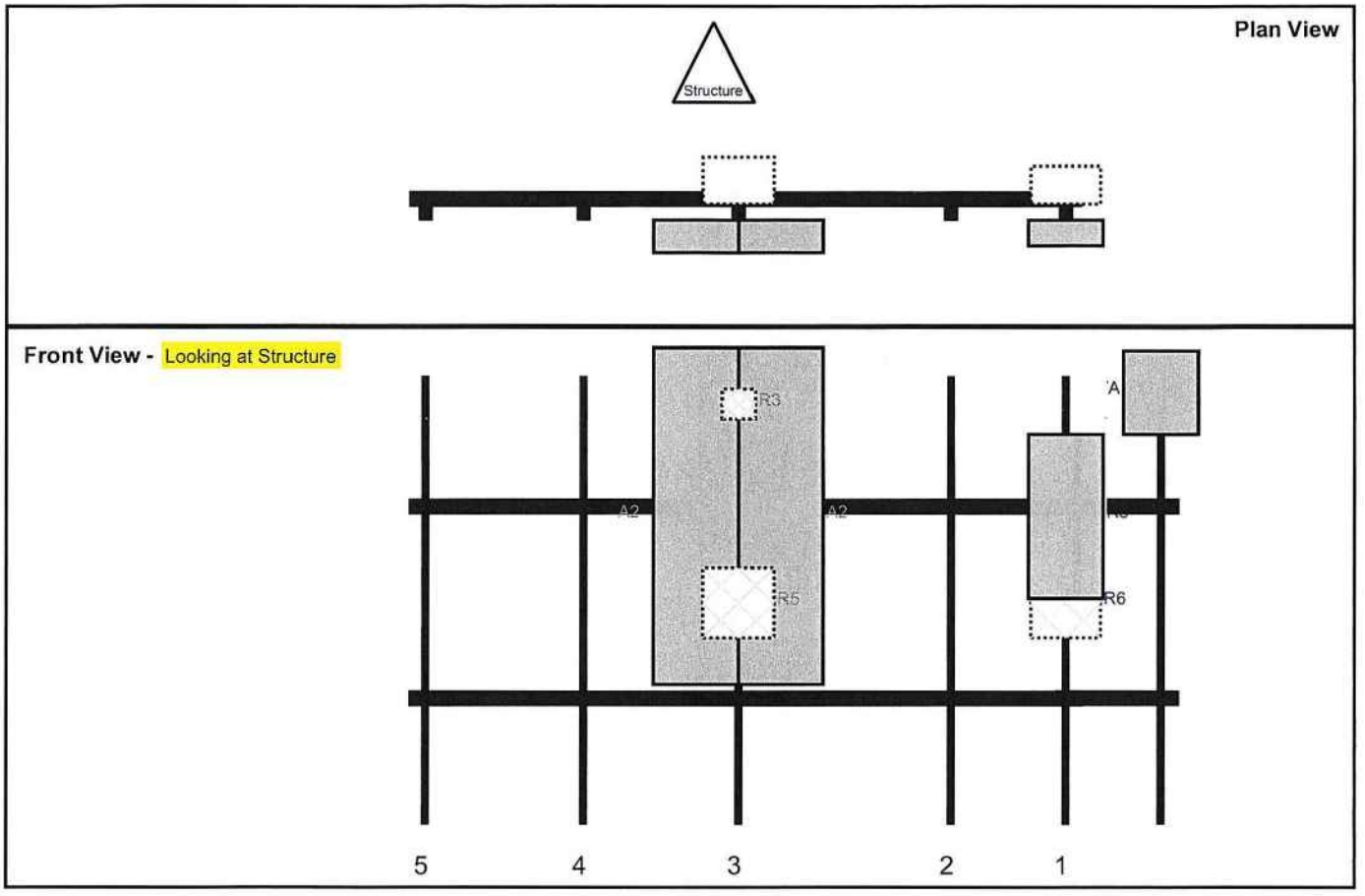
Sector: **A** 9/12/2024

Structure Type: Self Support 10252478

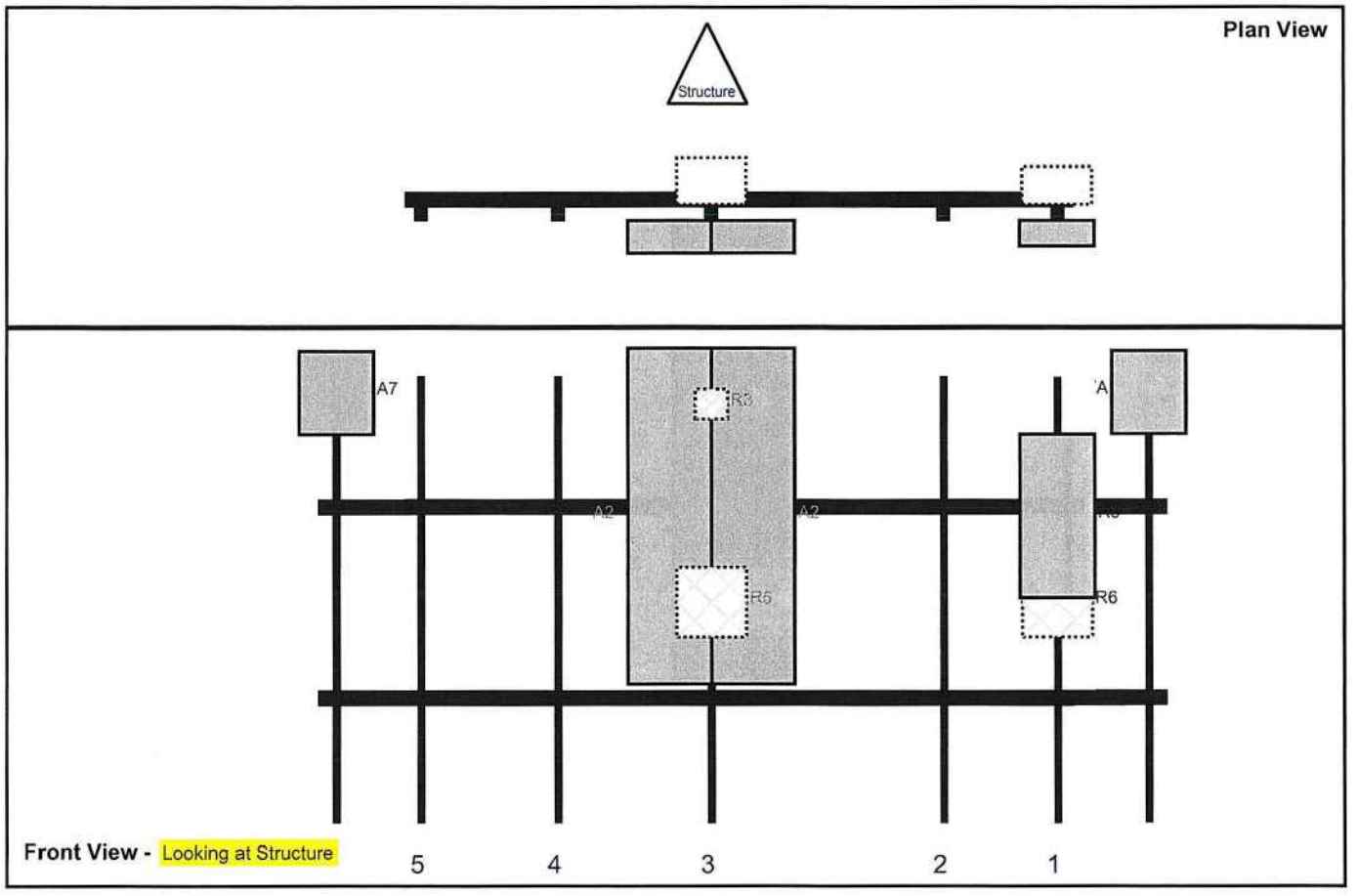
Mount Elev: 144.75 Page: 1



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
R6	B5/B13 RRH-BR04C	15	15	139	1	a	Behind	48.48	0	Retained	06/18/2021
R8	MT6407-77A	35.1	16.1	139	1	a	Front	30	0	Retained	06/18/2021
A2	JAHH-45B-R3B	72	18	71	3	a	Front	30	9	Retained	06/18/2021
A2	JAHH-45B-R3B	72	18	71	3	b	Front	30	-9	Retained	06/18/2021
R3	CBC78T-DS-43-2X	6.4	6.9	71	3	a	Behind	6	0	Retained	06/18/2021
R5	B2/B66A RRH-BR049	15	15	71	3	a	Behind	48.48	0	Retained	06/18/2021
M53	39GHz VectaStar NR gNB	17.9	16.1		Member					Added	
M56	39GHz VectaStar NR gNB	17.9	16.1		Member					Added	
M11	RHSDC-3315-PF-48	25.7	17.3		Member					Retained	06/18/2021



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
R6	B5/B13 RRH-BR04C	15	15	140.5	1	a	Behind	48.48	0	Retained	06/18/2021
R8	MT6407-77A	35.1	16.1	140.5	1	a	Front	30	0	Retained	06/18/2021
A2	JAHH-45B-R3B	72	18	70.5	3	a	Front	30	9	Retained	06/18/2021
A2	JAHH-45B-R3B	72	18	70.5	3	b	Front	30	-9	Retained	06/18/2021
R3	CBC78T-DS-43-2X	6.4	6.9	70.5	3	a	Behind	6	0	Retained	06/18/2021
R5	B2/B66A RRH-BR049	15	15	70.5	3	a	Behind	48.48	0	Retained	06/18/2021



Ref#	Model	Height (in)	Width (in)	H Dist Frm L.	Pipe #	Pipe Pos V	Ant Pos	C. Ant Frm T.	Ant H Off	Status	Validation
R6	B5/B13 RRH-BR04C	15	15	140.5	1	a	Behind	48.48	0	Retained	06/18/2021
R8	MT6407-77A	35.1	16.1	140.5	1	a	Front	30	0	Retained	06/18/2021
A2	JAHH-45B-R3B	72	18	66	3	a	Front	30	9	Retained	06/18/2021
A2	JAHH-45B-R3B	72	18	66	3	b	Front	30	-9	Retained	06/18/2021
R3	CBC78T-DS-43-2X	6.4	6.9	66	3	a	Behind	6	0	Retained	06/18/2021
R5	B2/B66A RRH-BR049	15	15	66	3	a	Behind	48.48	0	Retained	06/18/2021


Jun 18, 2021 at 4:26:47 PM
24 Rockdale Rd
West Haven CT 06516
United States


24 Rockdale Rd

V3.0 Updated on 8-31-2020

Antenna Mount Mapping Form (PATENT PENDING)

			FCC #
			UNKNOWN
Tower Owner:	BOB KNAPP	Mapping Date:	10/24/2020
Site Name:	VZW:West Haven CT	Tower Type:	Self Support
Site Number or ID:	VZW:468096	Tower Height (Ft.):	UNKNOWN
Mapping Contractor:	RKS Design & Engineering LLC	Mount Elevation (Ft.):	148

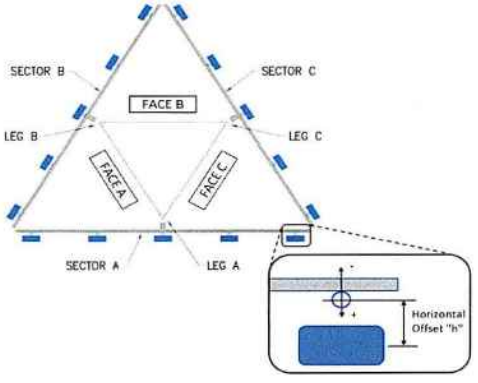
Please insert the sketches of the antenna mount from the "Sketches" tab with dimensions and members here.

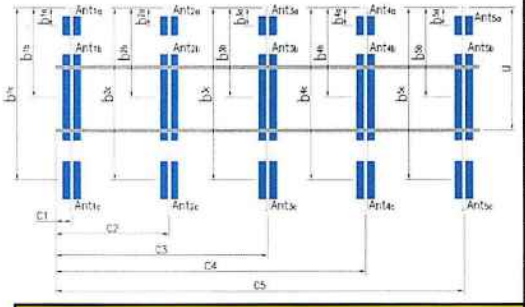
Mount Pipe Configuration and Geometries [Unit = Inches]

Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."	Sector / Position	Mount Pipe Size & Length	Vertical Offset Dimension "u"	Horizontal Offset "C1, C2, C3, etc."
A1	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	4.00	C1	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	3.50
A2	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	29.00	C2	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	33.00
A3	Pipe 2.875"Ø X 0.20" X 96" Long	64.00	71.00	C3	Pipe 2.875"Ø X 0.20" X 96" Long	64.00	66.00
A4	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	116.00	C4	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	116.00
A5	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	139.00	C5	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	140.50
A6				C6			
B1	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	3.50	D1			
B2	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	37.50	D2			
B3	Pipe 2.875"Ø X 0.20" X 96" Long	64.00	70.50	D3			
B4	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	116.00	D4			
B5	Pipe 2.375"Ø X 0.20" X 96" Long	69.00	140.50	D5			
B6				D6			

Distance between bottom rail and mount CL elevation (dim d). Unit is inches. See 'Mount Elev Ref' tab for details. :	20.50
Distance from top of bottom support rail to lowest tip of ant./eqpt. of Carrier above. (N/A if > 10 ft.) :	
Distance from top of bottom support rail to highest tip of ant./eqpt. of Carrier below. (N/A if > 10 ft.) :	
Please enter additional infomation or comments below.	

Tower Face Width at Mount Elev. (ft.):	8	Tower Leg Size or Pole Shaft Diameter at Mount Elev. (in.):	2.87



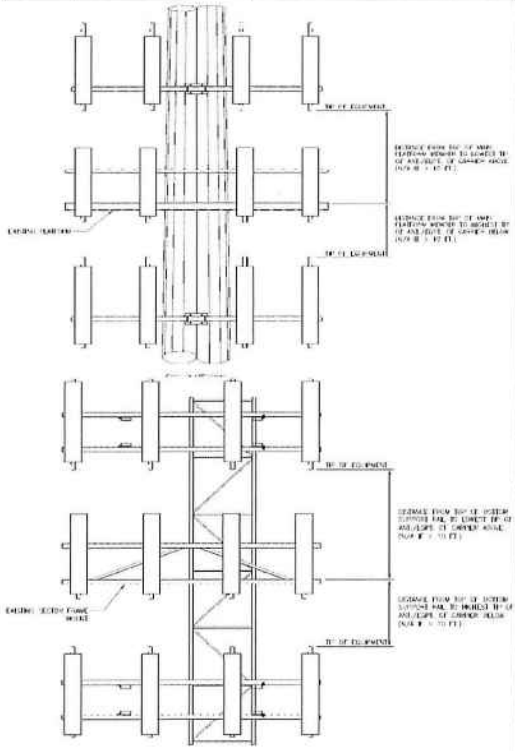


Antenna Layout (Looking Out From Tower)

Ants. Items	Enter antenna model. If not labeled, enter "Unknown". Antenna Models if Known	Width (in.)	Depth (in.)	Height (in.)	Coax Size and Qty	Antenna Center-line (Ft.)	Mounting Locations [Units are inches and degrees] Vertical Distances"b_{1a}, b_{2a}, b_{3a}, b_{1b}...." (Inches)	Horiz. Offset "h" (Use "-" if Ant. is behind)	Antenna Azimuth (Degrees)	Photos of antennas Photo Numbers
Sector A										
Ant_{1a}	RFV01U-D2A	15.00	8.00	15.00		148.333	44.50	-8.00		8,249
Ant_{1b}										
Ant_{1c}										
Ant_{2a}										
Ant_{2b}										
Ant_{2c}										
Ant_{3a}	(2)CBC78T-DS-43-2X	6.90	6.40	9.60		150.625	12.00	-6.00		8,249
Ant_{3b}	(2)JAHH-45B-R3B	18.00	7.00	72.00		148.042	43.00	15.50	60.00	8,249
Ant_{3c}	RFV01U-D1A	15.00	10.00	15.00		148.708	35.00	-8.50		8,249
Ant_{4a}										
Ant_{4b}	BXA-171063-8BF-EDIN	6.00	4.00	48.50		149.167	34.50	8.50	60.00	8,251
Ant_{4c}										
Ant_{5a}										
Ant_{5b}	BXA-80063-6BF-EDIN-	11.00	5.00	68.00		148.625	41.00	10.00	60.00	8,251
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										

Mount Azimuth (Degree) for Each Sector			Tower Leg Azimuth (Degree) for Each Sector	
Sector A:	70.00	Deg	Leg A: 90.00	Deg
Sector B:	190.00	Deg	Leg B: 210.00	Deg
Sector C:	270.00	Deg	Leg C: 330.00	Deg
Sector D:		Deg	Leg D:	Deg

Climbing Facility Information			
Location:	210.00	Deg	Inside Corner Leg B
Climbing Facility	Corrosion Type:		N/A
	Access:		Climbing path was unobstructed.
	Condition:		Good condition.



Sector B										
Ant_{1a}	RFV01U-D2A	15.00	8.00	15.00		148.333	44.50	-8.00		15,253
Ant_{1b}										
Ant_{1c}										
Ant_{2a}										
Ant_{2b}										
Ant_{2c}										
Ant_{3a}	(2)CBC78T-DS-43-2X	6.90	6.40	9.60		150.625	12.00	-6.00		15,253
Ant_{3b}	(2)JAHH-45B-R3B	18.00	7.00	72.00		148.042	43.00	15.50	160.00	15,253
Ant_{3c}	RFV01U-D1A	15.00	10.00	15.00		148.708	35.00	-8.50		15,253
Ant_{4a}										
Ant_{4b}	BXA-171063-8BF-EDIN	6.00	4.00	48.50		149.167	34.50	8.50	160.00	15,255
Ant_{4c}										
Ant_{5a}										
Ant_{5b}	BXA-80063-6BF-EDIN-	11.00	5.00	68.00		148.625	41.00	10.00	160.00	15,255
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower	RHSDC-3315-PF-48	15.70	10.20	25.60			79.00			253
Ant on Tower										
Sector C										
Ant_{1a}	RFV01U-D2A	15.00	8.00	15.00		148.333	44.50	-8.00		22,257
Ant_{1b}										
Ant_{1c}										
Ant_{2a}										
Ant_{2b}										
Ant_{2c}										
Ant_{3a}	(2)CBC78T-DS-43-2X	6.90	6.40	9.60		150.625	12.00	-6.00		22,257
Ant_{3b}	(2)JAHH-45B-R3B	18.00	7.00	72.00		148.042	43.00	15.50	240.00	22,257
Ant_{3c}	RFV01U-D1A	15.00	10.00	15.00		148.708	35.00	-8.50		22,257
Ant_{4a}										
Ant_{4b}	BXA-171063-12BF-EDI	6.00	4.00	48.50		149.167	34.50	8.50	240.00	22,258
Ant_{4c}										
Ant_{5a}										
Ant_{5b}	BXA-80063-6BF-EDIN-	11.00	5.00	68.00		148.625	41.00	10.00	240.00	22,258
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower	RRFDC-3315-PF-48	15.70	10.20	25.60			71.00			258
Ant on Tower										
Sector D										
Ant_{1a}										
Ant_{1b}										
Ant_{1c}										
Ant_{2a}										
Ant_{2b}										
Ant_{2c}										
Ant_{3a}										
Ant_{3b}										
Ant_{3c}										
Ant_{4a}										
Ant_{4b}										
Ant_{4c}										
Ant_{5a}										
Ant_{5b}										
Ant_{5c}										
Ant on Standoff										
Ant on Standoff										
Ant on Tower										
Ant on Tower										

Observed Safety and Structural Issues During the Mount Mapping		
Issue #	Description of Issue	Photo #

1	COAX TOTAL (8): (6) FH 1.5"Ø, (2) 1.5"Ø HYBRID	
2		
3		
4		
5		
6		
7		
8		

Mapping Notes
1. Please report any visible structural or safety issues observed on the antenna mounts (Damaged members, loose connections, tilting mounts, safety climb issues, etc.)
2. If the thickness of the existing pipes or tubing can't be obtained from a general tool (such as Caliper), please use an ultrasonic measurement tool (thickness gauge) to measure the thickness.
3. Please create all required detail sketches of the mounts and insert them into the "Sketches" tab.
4. Please measure and enter the bolt sizes and types under the Members Box in the spreadsheet of the mount type.
5. Take and label the photos of the tower, mounts, connections, antennas and all measurements. Minimum 50 photos are required.
6. Please measure and report the size and length of all existing antenna mounting pipes.
7. Please measure and report the antenna information for all sectors.
8. Don't delete or rearrange any sheet or contents of any sheet from this mapping form.

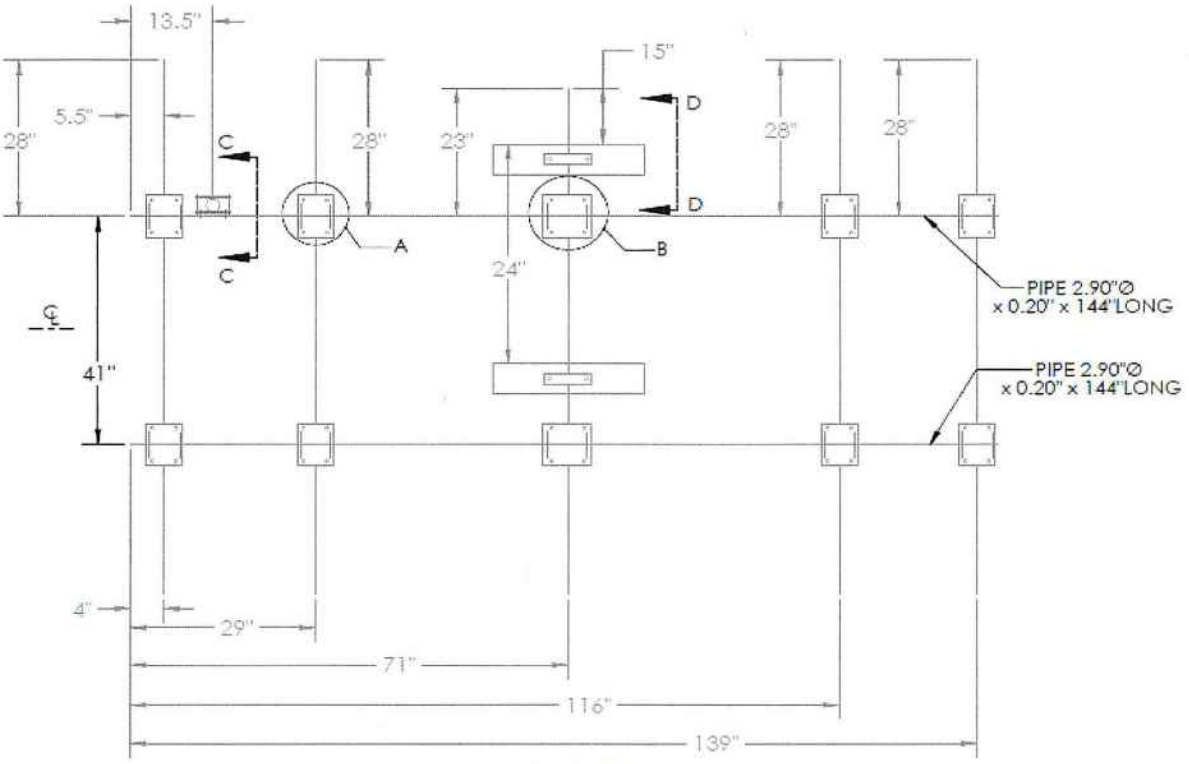
Standard Conditions
1. Obvious safety and structural issues/deficiencies noticed at the time of the mount mapping are to be reported in this mapping. However, this mount mapping is not a condition assessment of the mount.

V3.0 Updated on 8-31-2020

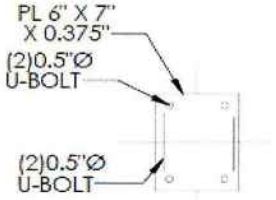
Antenna Mount Mapping Form (PATENT PENDING)

			FCC #
			UNKNOWN
Tower Owner:	BOB KNAPP	Mapping Date:	10/24/2020
Site Name:	VZW:West Haven CT	Tower Type:	Self Support
Site Number or ID:	VZW:468096	Tower Height (Ft.):	UNKNOWN
Mapping Contractor:	RKS Design & Engineering LLC	Mount Elevation (Ft.):	148

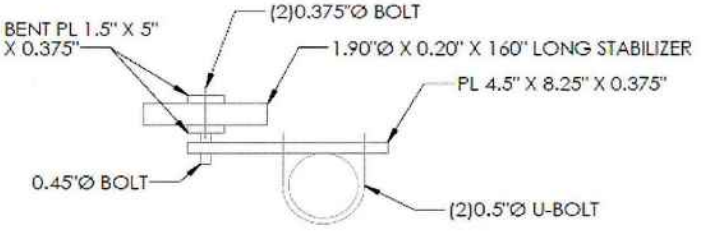
Please Insert Sketches of the Antenna Mount



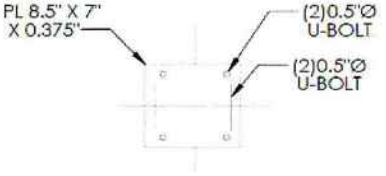
SECTOR A



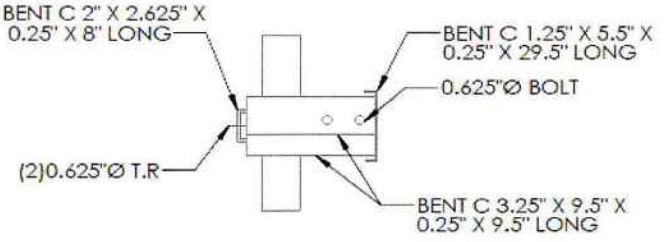
DETAIL A



SECTION C-C
STABILIZER CONNECTION

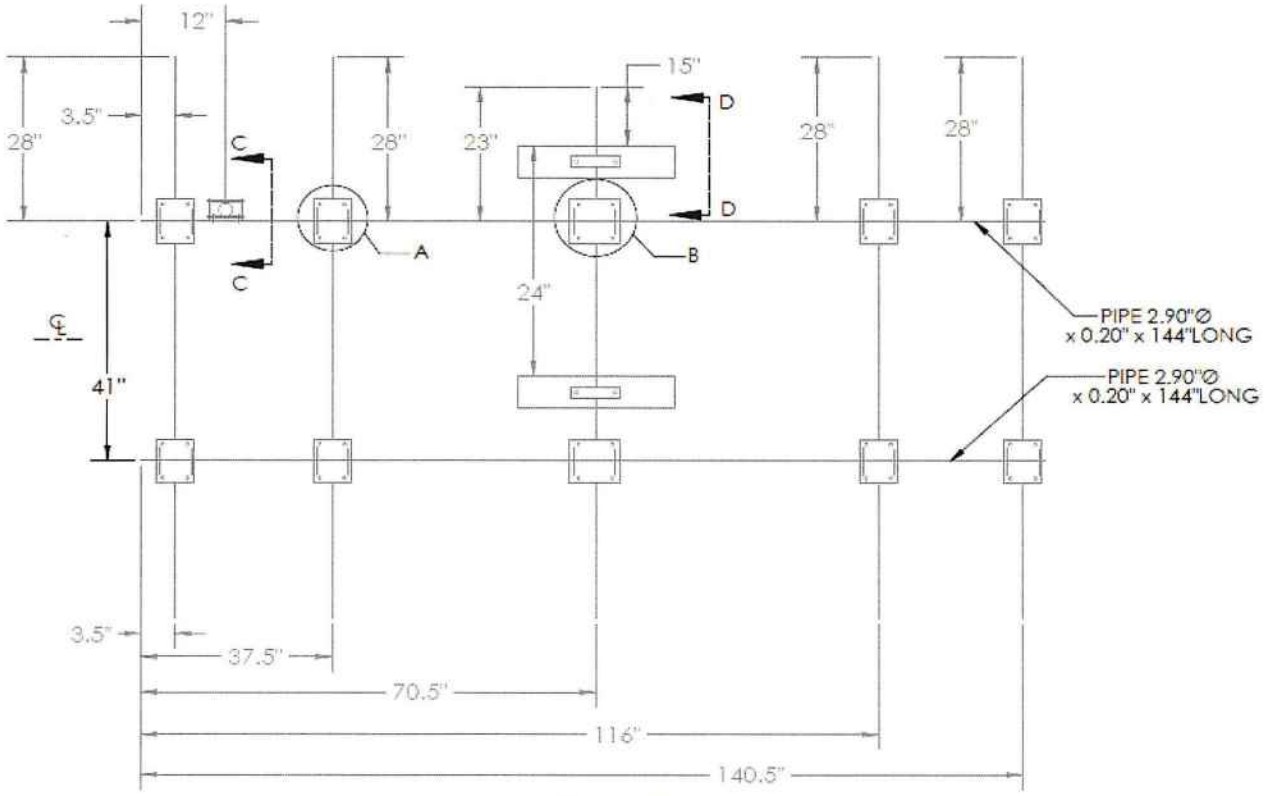


DETAIL B

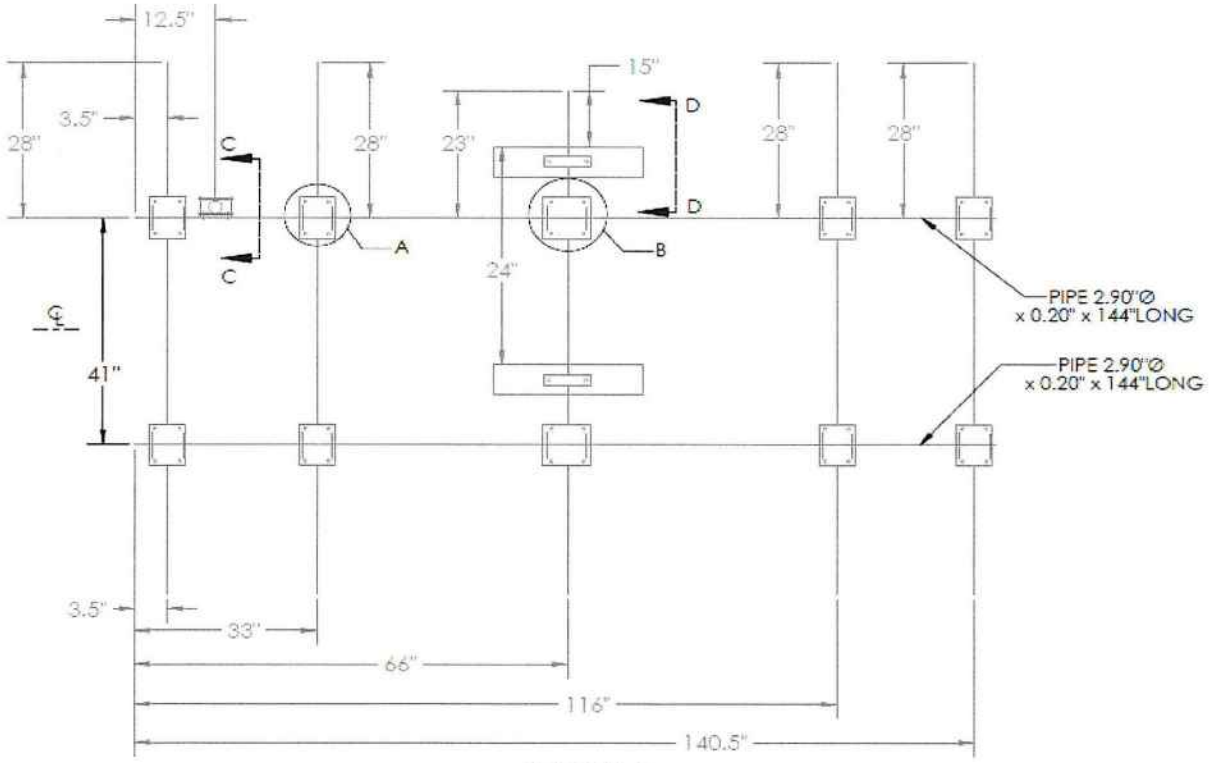


SECTION D-D

Please Insert Sketches of the Antenna Mount, cont'd

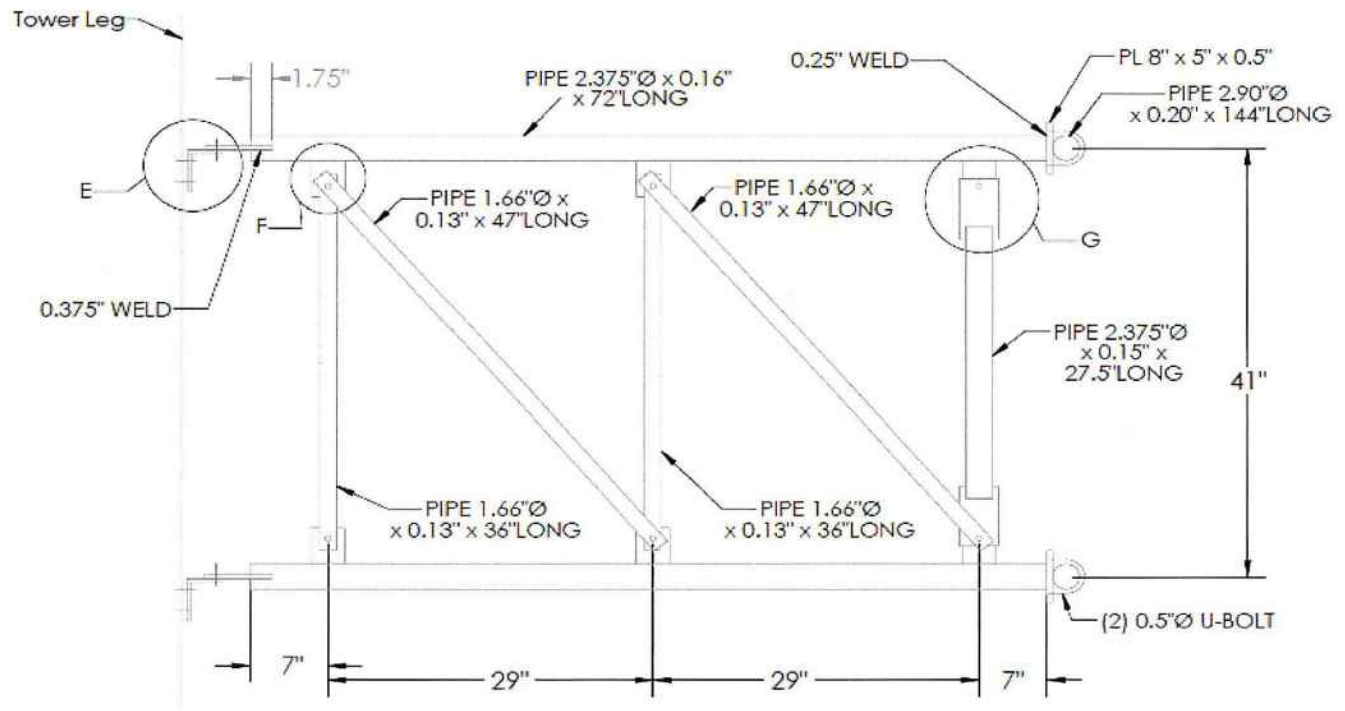


SECTOR B

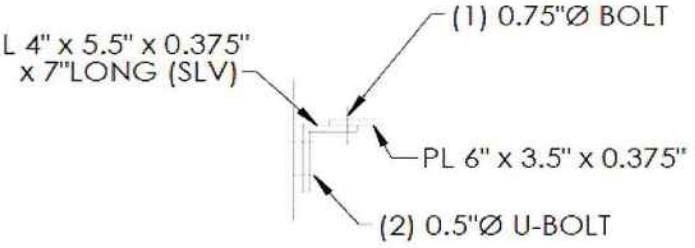


SECTOR C

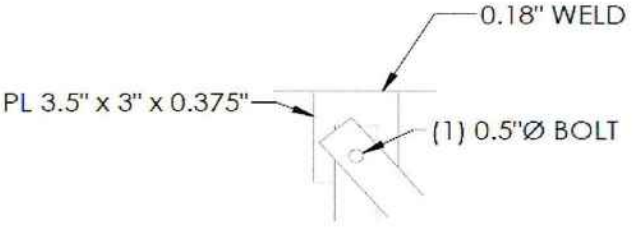
Please Insert Sketches of the Antenna Mount, cont'd



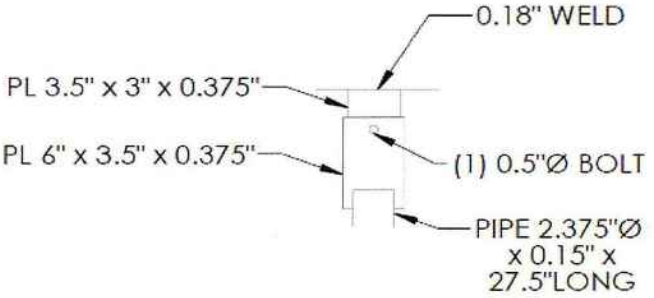
STAND OFF VIEW



DETAIL E

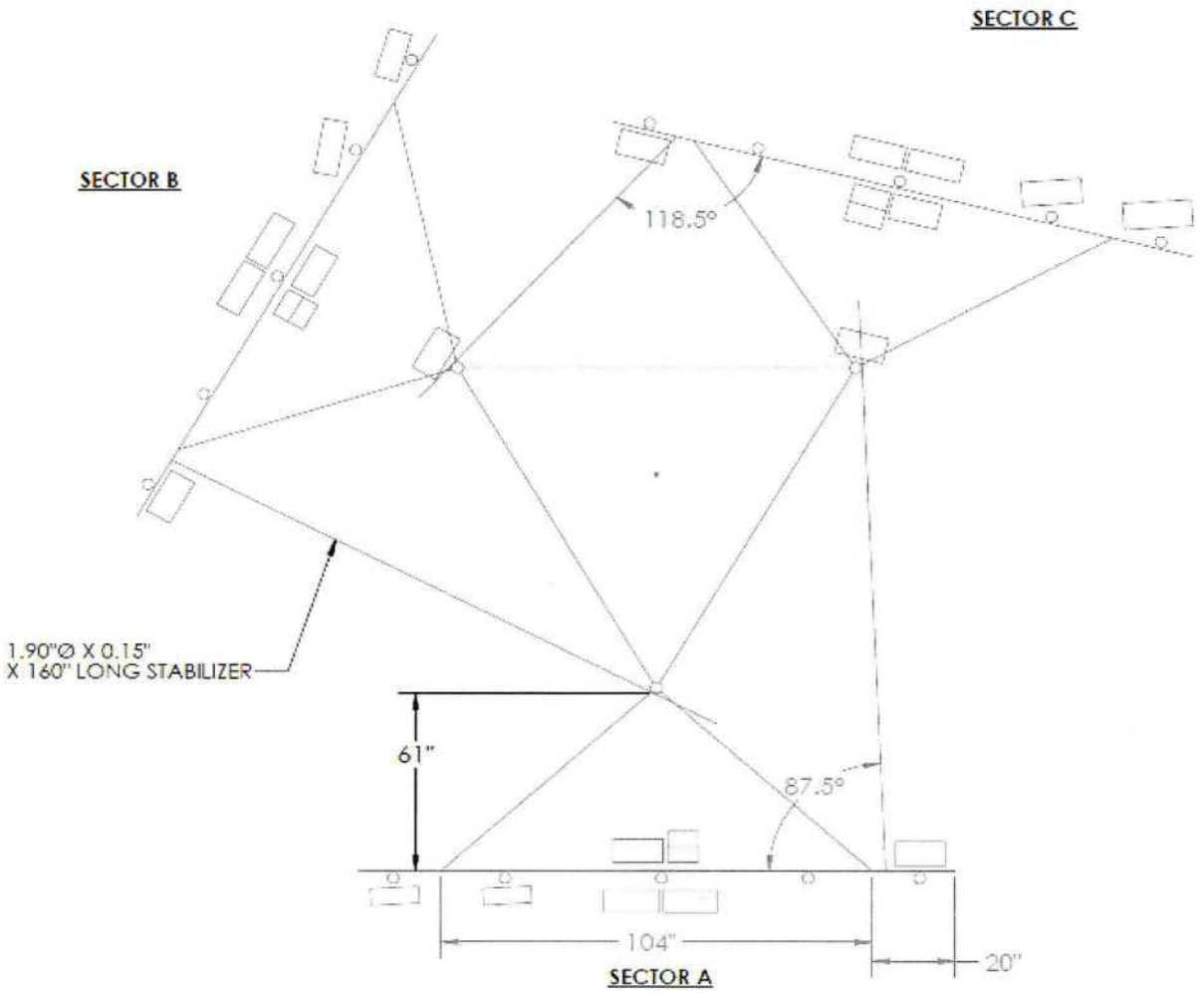


DETAIL F

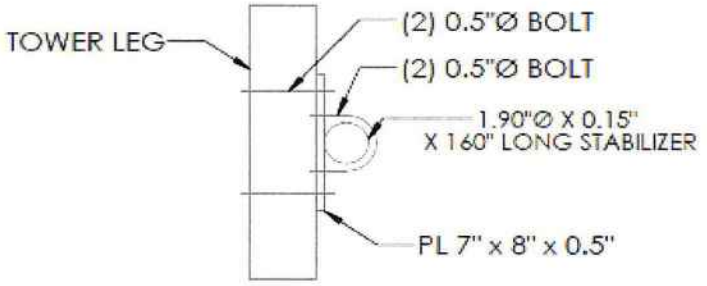


DETAIL G

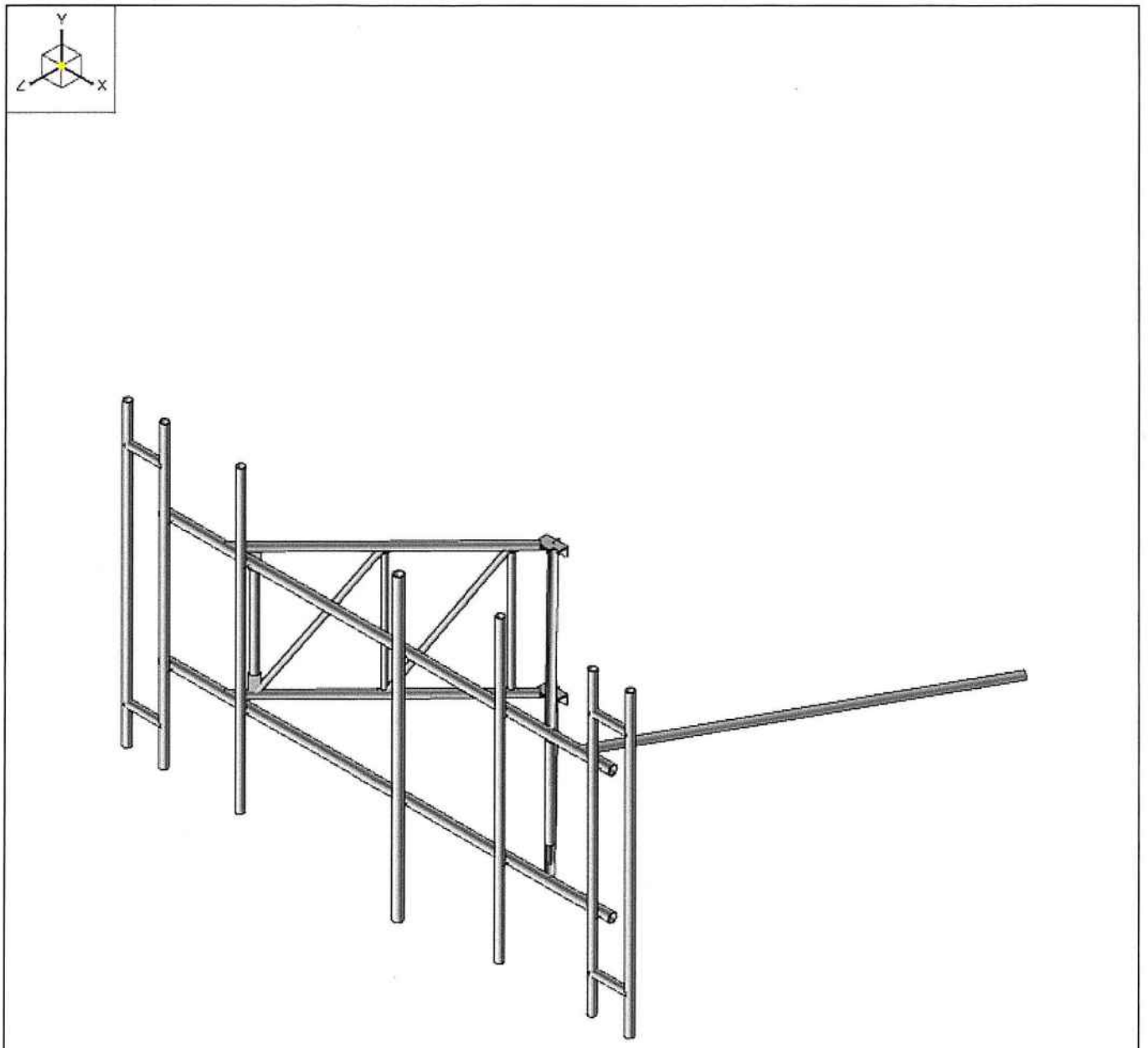
Please Insert Sketches of the Antenna Mount, cont'd



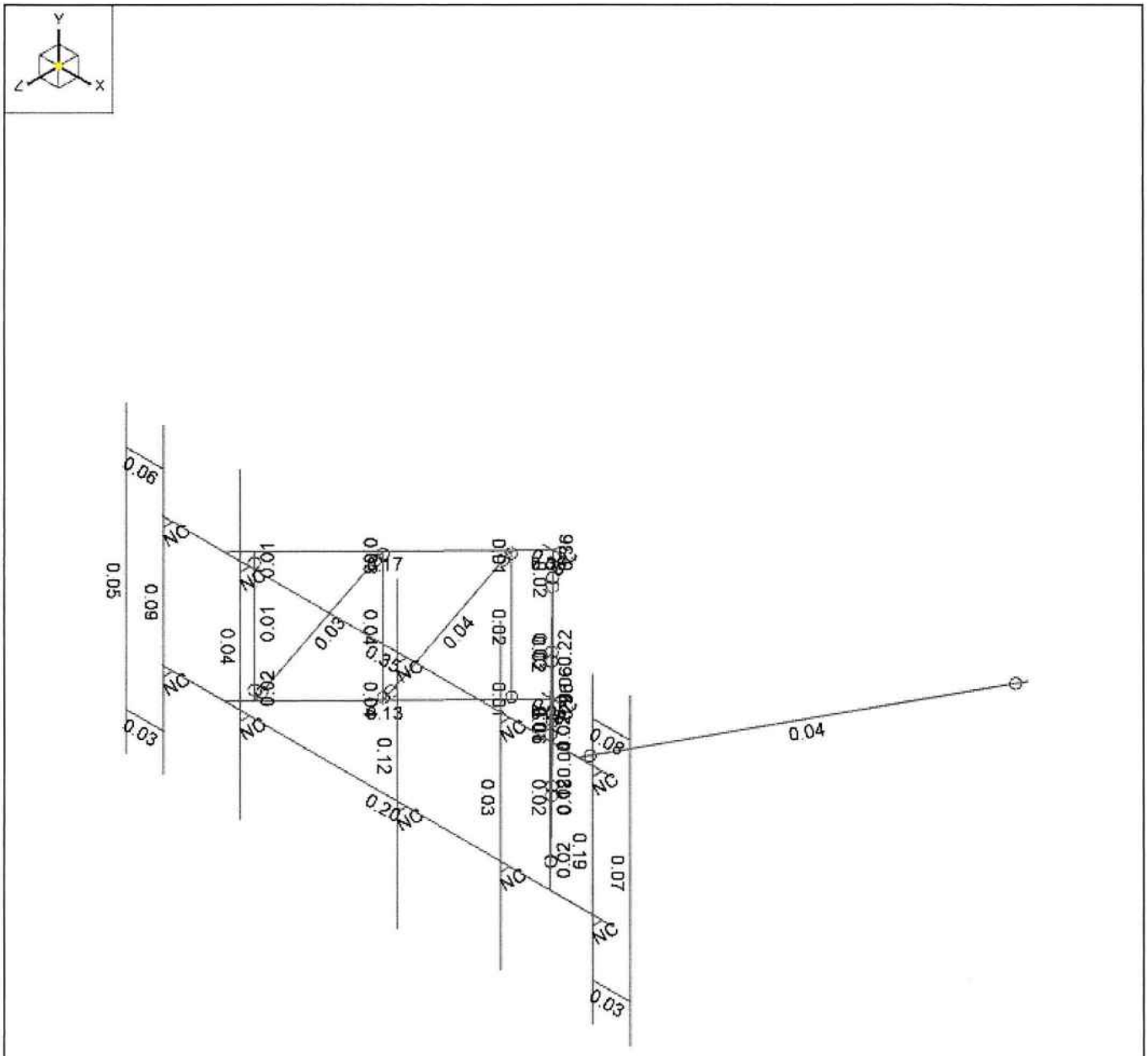
ANTENNA PLAN VIEW



STABILIZER CONNECTION
ON TOWER

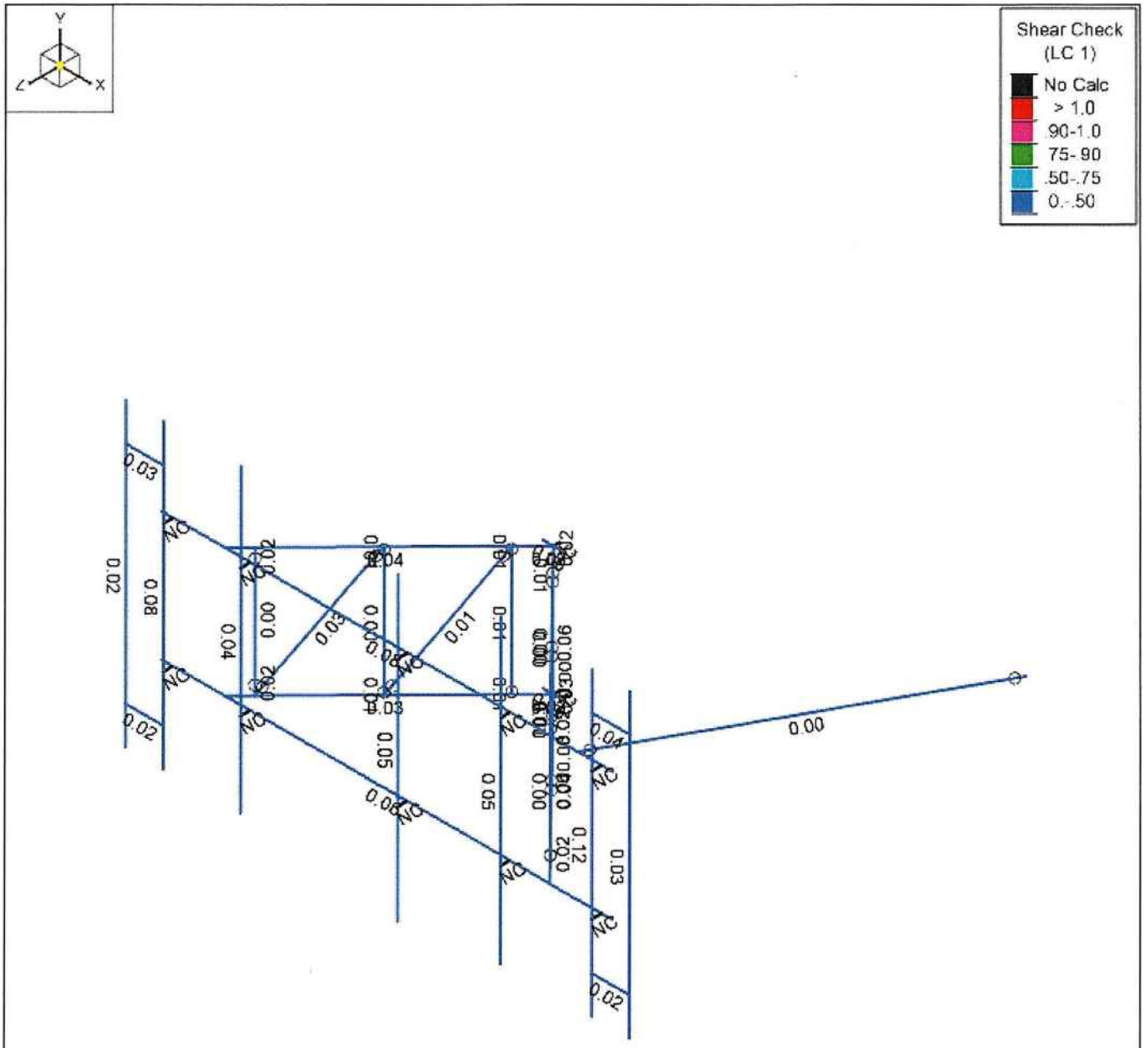


RISA	Colliers Engineering & De…	5000382034-VZW_MT_LOT_SectorC_H	SK-1
	MNC		Sep 10, 2024 at 02:47 PM
	Project No. 10252478		5000382034-VZW_MT_LOT…



Member Code Checks Displayed
Results for LC 1, 1.2D+1.0Wo (0 Deg)

RISA	Colliers Engineering & De...	5000382034-VZW_MT_LOT_SectorA_H	SK-4
	MNC		Sep 12, 2024 at 12:45 PM
	Project No. 10252478		5000382034-VZW_MT_LOT...



Member Shear Checks Displayed
Results for LC 1, 1.2D+1.0Wo (0 Deg)

RISA	Colliers Engineering & De…	5000382034-VZW_MT_LOT_SectorA_H	SK-5
	MNC		Sep 12, 2024 at 12:46 PM
	Project No. 10252478		5000382034-VZW_MT_LOT…

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
1	Antenna D	None				36	
2	Antenna Di	None				36	
3	Antenna Wo (0 Deg)	None				36	
4	Antenna Wo (30 Deg)	None				36	
5	Antenna Wo (60 Deg)	None				36	
6	Antenna Wo (90 Deg)	None				36	
7	Antenna Wo (120 Deg)	None				36	
8	Antenna Wo (150 Deg)	None				36	
9	Antenna Wo (180 Deg)	None				36	
10	Antenna Wo (210 Deg)	None				36	
11	Antenna Wo (240 Deg)	None				36	
12	Antenna Wo (270 Deg)	None				36	
13	Antenna Wo (300 Deg)	None				36	
14	Antenna Wo (330 Deg)	None				36	
15	Antenna Wi (0 Deg)	None				36	
16	Antenna Wi (30 Deg)	None				36	
17	Antenna Wi (60 Deg)	None				36	
18	Antenna Wi (90 Deg)	None				36	
19	Antenna Wi (120 Deg)	None				36	
20	Antenna Wi (150 Deg)	None				36	
21	Antenna Wi (180 Deg)	None				36	
22	Antenna Wi (210 Deg)	None				36	
23	Antenna Wi (240 Deg)	None				36	
24	Antenna Wi (270 Deg)	None				36	
25	Antenna Wi (300 Deg)	None				36	
26	Antenna Wi (330 Deg)	None				36	
27	Antenna Wm (0 Deg)	None				36	
28	Antenna Wm (30 Deg)	None				36	
29	Antenna Wm (60 Deg)	None				36	
30	Antenna Wm (90 Deg)	None				36	
31	Antenna Wm (120 Deg)	None				36	
32	Antenna Wm (150 Deg)	None				36	
33	Antenna Wm (180 Deg)	None				36	
34	Antenna Wm (210 Deg)	None				36	
35	Antenna Wm (240 Deg)	None				36	
36	Antenna Wm (270 Deg)	None				36	
37	Antenna Wm (300 Deg)	None				36	
38	Antenna Wm (330 Deg)	None				36	
39	Structure D	None		-1			
40	Structure Di	None					46
41	Structure Wo (0 Deg)	None					92
42	Structure Wo (30 Deg)	None					92
43	Structure Wo (60 Deg)	None					92
44	Structure Wo (90 Deg)	None					92
45	Structure Wo (120 Deg)	None					92
46	Structure Wo (150 Deg)	None					92
47	Structure Wo (180 Deg)	None					92
48	Structure Wo (210 Deg)	None					92
49	Structure Wo (240 Deg)	None					92
50	Structure Wo (270 Deg)	None					92
51	Structure Wo (300 Deg)	None					92
52	Structure Wo (330 Deg)	None					92
53	Structure Wi (0 Deg)	None					92
54	Structure Wi (30 Deg)	None					92
55	Structure Wi (60 Deg)	None					92

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Point	Distributed
56	Structure Wi (90 Deg)	None					92
57	Structure Wi (120 Deg)	None					92
58	Structure Wi (150 Deg)	None					92
59	Structure Wi (180 Deg)	None					92
60	Structure Wi (210 Deg)	None					92
61	Structure Wi (240 Deg)	None					92
62	Structure Wi (270 Deg)	None					92
63	Structure Wi (300 Deg)	None					92
64	Structure Wi (330 Deg)	None					92
65	Structure Wm (0 Deg)	None					92
66	Structure Wm (30 Deg)	None					92
67	Structure Wm (60 Deg)	None					92
68	Structure Wm (90 Deg)	None					92
69	Structure Wm (120 Deg)	None					92
70	Structure Wm (150 Deg)	None					92
71	Structure Wm (180 Deg)	None					92
72	Structure Wm (210 Deg)	None					92
73	Structure Wm (240 Deg)	None					92
74	Structure Wm (270 Deg)	None					92
75	Structure Wm (300 Deg)	None					92
76	Structure Wm (330 Deg)	None					92
77	Lm1	None				1	
78	Lm2	None				1	
79	Lv1	None				1	
80	Lv2	None				1	
81	Antenna Ev	None				36	
82	Antenna Eh (0 Deg)	None				24	
83	Antenna Eh (90 Deg)	None				24	
84	Structure Ev	ELY		-0.043			
85	Structure Eh (0 Deg)	ELZ			-0.107		
86	Structure Eh (90 Deg)	ELX	0.107				

Load Combinations

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
1	1.2D+1.0Wo (0 Deg)	Yes	Y	1	1.2	39	1.2	3	1	41	1								
2	1.2D+1.0Wo (30 Deg)	Yes	Y	1	1.2	39	1.2	4	1	42	1								
3	1.2D+1.0Wo (60 Deg)	Yes	Y	1	1.2	39	1.2	5	1	43	1								
4	1.2D+1.0Wo (90 Deg)	Yes	Y	1	1.2	39	1.2	6	1	44	1								
5	1.2D+1.0Wo (120 Deg)	Yes	Y	1	1.2	39	1.2	7	1	45	1								
6	1.2D+1.0Wo (150 Deg)	Yes	Y	1	1.2	39	1.2	8	1	46	1								
7	1.2D+1.0Wo (180 Deg)	Yes	Y	1	1.2	39	1.2	9	1	47	1								
8	1.2D+1.0Wo (210 Deg)	Yes	Y	1	1.2	39	1.2	10	1	48	1								
9	1.2D+1.0Wo (240 Deg)	Yes	Y	1	1.2	39	1.2	11	1	49	1								
10	1.2D+1.0Wo (270 Deg)	Yes	Y	1	1.2	39	1.2	12	1	50	1								
11	1.2D+1.0Wo (300 Deg)	Yes	Y	1	1.2	39	1.2	13	1	51	1								
12	1.2D+1.0Wo (330 Deg)	Yes	Y	1	1.2	39	1.2	14	1	52	1								
13	1.2D + 1.0Di + 1.0Wi (0 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	15	1	53	1				
14	1.2D + 1.0Di + 1.0Wi (30 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	16	1	54	1				
15	1.2D + 1.0Di + 1.0Wi (60 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	17	1	55	1				
16	1.2D + 1.0Di + 1.0Wi (90 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	18	1	56	1				
17	1.2D + 1.0Di + 1.0Wi (120 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	19	1	57	1				
18	1.2D + 1.0Di + 1.0Wi (150 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	20	1	58	1				
19	1.2D + 1.0Di + 1.0Wi (180 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	21	1	59	1				
20	1.2D + 1.0Di + 1.0Wi (210 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	22	1	60	1				
21	1.2D + 1.0Di + 1.0Wi (240 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	23	1	61	1				

Load Combinations (Continued)

	Description	Solve	P-Delta	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor	BLC	Factor
22	1.2D + 1.0Di + 1.0Wi (270 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	24	1	62	1				
23	1.2D + 1.0Di + 1.0Wi (300 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	25	1	63	1				
24	1.2D + 1.0Di + 1.0Wi (330 Deg)	Yes	Y	1	1.2	39	1.2	2	1	40	1	26	1	64	1				
25	1.2D + 1.5Lm1 + 1.0Wm (0 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	27	1	65	1						
26	1.2D + 1.5Lm1 + 1.0Wm (30 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	28	1	66	1						
27	1.2D + 1.5Lm1 + 1.0Wm (60 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	29	1	67	1						
28	1.2D + 1.5Lm1 + 1.0Wm (90 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	30	1	68	1						
29	1.2D + 1.5Lm1 + 1.0Wm (120 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	31	1	69	1						
30	1.2D + 1.5Lm1 + 1.0Wm (150 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	32	1	70	1						
31	1.2D + 1.5Lm1 + 1.0Wm (180 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	33	1	71	1						
32	1.2D + 1.5Lm1 + 1.0Wm (210 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	34	1	72	1						
33	1.2D + 1.5Lm1 + 1.0Wm (240 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	35	1	73	1						
34	1.2D + 1.5Lm1 + 1.0Wm (270 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	36	1	74	1						
35	1.2D + 1.5Lm1 + 1.0Wm (300 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	37	1	75	1						
36	1.2D + 1.5Lm1 + 1.0Wm (330 Deg)	Yes	Y	1	1.2	39	1.2	77	1.5	38	1	76	1						
37	1.2D + 1.5Lm2 + 1.0Wm (0 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	27	1	65	1						
38	1.2D + 1.5Lm2 + 1.0Wm (30 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	28	1	66	1						
39	1.2D + 1.5Lm2 + 1.0Wm (60 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	29	1	67	1						
40	1.2D + 1.5Lm2 + 1.0Wm (90 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	30	1	68	1						
41	1.2D + 1.5Lm2 + 1.0Wm (120 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	31	1	69	1						
42	1.2D + 1.5Lm2 + 1.0Wm (150 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	32	1	70	1						
43	1.2D + 1.5Lm2 + 1.0Wm (180 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	33	1	71	1						
44	1.2D + 1.5Lm2 + 1.0Wm (210 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	34	1	72	1						
45	1.2D + 1.5Lm2 + 1.0Wm (240 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	35	1	73	1						
46	1.2D + 1.5Lm2 + 1.0Wm (270 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	36	1	74	1						
47	1.2D + 1.5Lm2 + 1.0Wm (300 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	37	1	75	1						
48	1.2D + 1.5Lm2 + 1.0Wm (330 Deg)	Yes	Y	1	1.2	39	1.2	78	1.5	38	1	76	1						
49	1.2D + 1.5Lv1	Yes	Y	1	1.2	39	1.2	79	1.5										
50	1.2D + 1.5Lv2	Yes	Y	1	1.2	39	1.2	80	1.5										
51	1.4D	Yes	Y	1	1.4	39	1.4												
52	1.2D + 1.0Ev + 1.0Eh (0 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	1	83		ELZ	1	ELX	
53	1.2D + 1.0Ev + 1.0Eh (30 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.866	83	0.5	ELZ	0.866	ELX	0.5
54	1.2D + 1.0Ev + 1.0Eh (60 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.5	83	0.866	ELZ	0.5	ELX	0.866
55	1.2D + 1.0Ev + 1.0Eh (90 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82		83	1	ELZ		ELX	1
56	1.2D + 1.0Ev + 1.0Eh (120 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.5	83	0.866	ELZ	-0.5	ELX	0.866
57	1.2D + 1.0Ev + 1.0Eh (150 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.866	83	0.5	ELZ	-0.866	ELX	0.5
58	1.2D + 1.0Ev + 1.0Eh (180 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-1	83		ELZ	-1	ELX	
59	1.2D + 1.0Ev + 1.0Eh (210 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.866	83	-0.5	ELZ	-0.866	ELX	-0.5
60	1.2D + 1.0Ev + 1.0Eh (240 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	-0.5	83	-0.866	ELZ	-0.5	ELX	-0.866
61	1.2D + 1.0Ev + 1.0Eh (270 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82		83	-1	ELZ		ELX	-1
62	1.2D + 1.0Ev + 1.0Eh (300 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.5	83	-0.866	ELZ	0.5	ELX	-0.866
63	1.2D + 1.0Ev + 1.0Eh (330 Deg)	Yes	Y	1	1.2	39	1.2	81	1	ELY	1	82	0.866	83	-0.5	ELZ	0.866	ELX	-0.5
64	0.9D - 1.0Ev + 1.0Eh (0 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	1	83		ELZ	1	ELX	
65	0.9D - 1.0Ev + 1.0Eh (30 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.866	83	0.5	ELZ	0.866	ELX	0.5
66	0.9D - 1.0Ev + 1.0Eh (60 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.5	83	0.866	ELZ	0.5	ELX	0.866
67	0.9D - 1.0Ev + 1.0Eh (90 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82		83	1	ELZ		ELX	1
68	0.9D - 1.0Ev + 1.0Eh (120 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.5	83	0.866	ELZ	-0.5	ELX	0.866
69	0.9D - 1.0Ev + 1.0Eh (150 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.866	83	0.5	ELZ	-0.866	ELX	0.5
70	0.9D - 1.0Ev + 1.0Eh (180 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-1	83		ELZ	-1	ELX	
71	0.9D - 1.0Ev + 1.0Eh (210 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.866	83	-0.5	ELZ	-0.866	ELX	-0.5
72	0.9D - 1.0Ev + 1.0Eh (240 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	-0.5	83	-0.866	ELZ	-0.5	ELX	-0.866
73	0.9D - 1.0Ev + 1.0Eh (270 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82		83	-1	ELZ		ELX	-1
74	0.9D - 1.0Ev + 1.0Eh (300 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.5	83	-0.866	ELZ	0.5	ELX	-0.866
75	0.9D - 1.0Ev + 1.0Eh (330 Deg)	Yes	Y	1	0.9	39	0.9	81	-1	ELY	-1	82	0.866	83	-0.5	ELZ	0.866	ELX	-0.5

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rule	Area [in²]	Iyy [in⁴]	Izz [in⁴]	J [in⁴]
1	Antenna Pipe	PIPE 2.0	Column	Pipe	A53 Gr. B	Typical	1.02	0.627	0.627	1.25
2	Standoff Horizontal	PIPE 2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	0.627	0.627	1.25
3	Standoff Vertical	PIPE 1.25	Beam	Pipe	A53 Gr. B	Typical	0.625	0.184	0.184	0.368
4	Standoff Diagonal	PIPE 1.25	Beam	Pipe	A53 Gr. B	Typical	0.625	0.184	0.184	0.368
5	Face Horizontal	PIPE 2.5	Beam	Pipe	A53 Gr. B	Typical	1.61	1.45	1.45	2.89
6	Tie Back	PIPE 2.0	Beam	Pipe	A53 Gr. B	Typical	1.02	0.627	0.627	1.25
7	Standoff Bar	PL3/8X3	Beam	RECT	A36 Gr.36	Typical	1.125	0.013	0.844	0.049
8	TES Mount Angle	L4X3X6	Beam	Single Angle	A36 Gr.36	Typical	2.49	1.89	3.94	0.123
9	Standoff Vertical 2	PIPE 2.0	Column	Pipe	A53 Gr. B	Typical	1.02	0.627	0.627	1.25
10	Mount Angle	L4X5.5X6	Beam	Single Angle	A36 Gr.36	Typical	3.422	4.79	10.595	0.152
11	Antenna Pipe 2	PIPE 2.5	Column	Pipe	A53 Gr. B	Typical	1.61	1.45	1.45	2.89
12	Pipe to Pipe	PIPE 2.0	Column	Pipe	A53 Gr. B	Typical	1.02	0.627	0.627	1.25

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm. Coeff. [1e⁵°F⁻¹]	Density [k/ft³]	Yield [ksi]	Ry	Fu [ksi]	Rt
1	A36 Gr.36	29000	11154	0.3	0.65	0.49	36	1.5	58	1.2
2	A53 Gr. B	29000	11154	0.3	0.65	0.49	35	1.5	60	1.2
3	A572 Gr.50	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
4	A992	29000	11154	0.3	0.65	0.49	50	1.1	65	1.1
5	A500 Gr. B 42	29000	11154	0.3	0.65	0.49	42	1.4	58	1.3
6	A500 Gr. B 46	29000	11154	0.3	0.65	0.49	46	1.4	58	1.3

Member Primary Data

	Label	I Node	J Node	K Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
1	M3	N6	N7		90	TES Mount Angle	Beam	Single Angle	A36 Gr.36	Typical
2	M5	N1	N17A		90	Standoff Bar	Beam	RECT	A36 Gr.36	Typical
3	M6	N1	N18		90	Standoff Bar	Beam	RECT	A36 Gr.36	Typical
4	M7	N11A	N12			Face Horizontal	Beam	Pipe	A53 Gr. B	Typical
5	M8	N5	N19		90	Standoff Bar	Beam	RECT	A36 Gr.36	Typical
6	M9	N5	N20		90	Standoff Bar	Beam	RECT	A36 Gr.36	Typical
7	LV	N16	N17			Face Horizontal	Beam	Pipe	A53 Gr. B	Typical
8	M11	N17A	N10			Standoff Horizontal	Beam	Pipe	A53 Gr. B	Typical
9	M12	N18	N11			Standoff Horizontal	Beam	Pipe	A53 Gr. B	Typical
10	M13	N19	N14			Standoff Horizontal	Beam	Pipe	A53 Gr. B	Typical
11	M14	N20	N15			Standoff Horizontal	Beam	Pipe	A53 Gr. B	Typical
12	M15	N21	N29	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
13	M16	N21	N24		90	Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
14	M17	N23	N30	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
15	M18	N23	N26		90	Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
16	M19	N26	N31	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
17	M20	N27	N22	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
18	M21	N28	N24	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
19	M22	N29	N27	N1		Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
20	M23	N30	N28	N1		Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
21	M24	N31	N32	N1		Standoff Vertical 2	Column	Pipe	A53 Gr. B	Typical
22	M25	N32	N25	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
23	M26	N33	N41	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
24	M27	N33	N36		90	Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
25	M28	N35	N42	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
26	M29	N35	N38		90	Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
27	M30	N38	N43	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
28	M31	N39	N34	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical

Member Primary Data (Continued)

	Label	I Node	J Node	K Node	Rotate(deg)	Section/Shape	Type	Design List	Material	Design Rule
29	M32	N40	N36	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
30	M33	N41	N39	N1		Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
31	M34	N42	N40	N1		Standoff Diagonal	Beam	Pipe	A53 Gr. B	Typical
32	M35	N43	N44	N1		Standoff Vertical 2	Column	Pipe	A53 Gr. B	Typical
33	M36	N44	N37	N1		Standoff Bar	Beam	RECT	A36 Gr.36	Typical
34	M37	N45	N47			RIGID	None	None	RIGID	Typical
35	M38	N46	N48			RIGID	None	None	RIGID	Typical
36	MP5A	N49	N50		270	Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
37	M46	N82	N80B			Tie Back	Beam	Pipe	A53 Gr. B	Typical
38	M46A	N5	N65			RIGID	None	None	RIGID	Typical
39	M41	N58	N60			RIGID	None	None	RIGID	Typical
40	M42	N59	N61A			RIGID	None	None	RIGID	Typical
41	MP4A	N62A	N63A			Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
42	M44	N64	N66			RIGID	None	None	RIGID	Typical
43	LM2	N65A	N67			RIGID	None	None	RIGID	Typical
44	MP3A	N68	N69			Antenna Pipe 2	Column	Pipe	A53 Gr. B	Typical
45	M47	N70	N72			RIGID	None	None	RIGID	Typical
46	M48	N71	N73			RIGID	None	None	RIGID	Typical
47	MP2A	N74	N75			Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
48	M50	N76	N78			RIGID	None	None	RIGID	Typical
49	LM1	N77	N79			RIGID	None	None	RIGID	Typical
50	MP1A	N80A	N81			Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
51	M52	N78A	N79A		90	TES Mount Angle	Beam	Single Angle	A36 Gr.36	Typical
52	M52A	N1	N80			RIGID	None	None	RIGID	Typical
53	M53	N84	N83		270	Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
54	M54	N85	N87			Pipe to Pipe	Column	Pipe	A53 Gr. B	Typical
55	M55	N86	N88			Pipe to Pipe	Column	Pipe	A53 Gr. B	Typical
56	M56	N91	N92			Antenna Pipe	Column	Pipe	A53 Gr. B	Typical
57	M57	N93	N94			Pipe to Pipe	Column	Pipe	A53 Gr. B	Typical
58	M58	N95	N96			Pipe to Pipe	Column	Pipe	A53 Gr. B	Typical

Member Advanced Data

	Label	I Release	J Release	Col-Wall Vert Release	Physical	Deflection Ratio Options	Seismic DR
1	M3				Yes	N/A	None
2	M5				Yes	Default	None
3	M6				Yes	Default	None
4	M7				Yes	N/A	None
5	M8				Yes	Default	None
6	M9				Yes	Default	None
7	LV				Yes	Default	None
8	M11				Yes	N/A	None
9	M12				Yes	N/A	None
10	M13				Yes	N/A	None
11	M14				Yes	N/A	None
12	M15	OOOOOX			Yes	N/A	None
13	M16	BenPIN	BenPIN		Yes	Default	None
14	M17	OOOOOX			Yes	N/A	None
15	M18	BenPIN	BenPIN		Yes	Default	None
16	M19	OOOOOX			Yes	N/A	None
17	M20		OOOOOX		Yes	N/A	None
18	M21		OOOOOX		Yes	N/A	None
19	M22				Yes	N/A	None
20	M23				Yes	N/A	None
21	M24				Yes	** NA **	None
22	M25		OOOOOX		Yes	Default	None

Member Advanced Data (Continued)

	Label	I Release	J Release	Col-Wall Vert Release	Physical	Deflection Ratio Options	Seismic DR
23	M26	OOOOOX			Yes	N/A	None
24	M27	BenPIN	BenPIN		Yes	N/A	None
25	M28	OOOOOX			Yes	N/A	None
26	M29	BenPIN	BenPIN		Yes	N/A	None
27	M30	OOOOOX			Yes	N/A	None
28	M31		OOOOOX		Yes	N/A	None
29	M32		OOOOOX		Yes	N/A	None
30	M33				Yes	N/A	None
31	M34				Yes	N/A	None
32	M35				Yes	** NA **	None
33	M36		OOOOOX		Yes	N/A	None
34	M37				Yes	** NA **	None
35	M38				Yes	** NA **	None
36	MP5A				Yes	** NA **	None
37	M46	BenPIN	BenPIN		Yes	Default	None
38	M46A				Yes	** NA **	None
39	M41				Yes	** NA **	None
40	M42				Yes	** NA **	None
41	MP4A				Yes	** NA **	None
42	M44				Yes	** NA **	None
43	LM2				Yes	** NA **	None
44	MP3A				Yes	** NA **	None
45	M47				Yes	** NA **	None
46	M48				Yes	** NA **	None
47	MP2A				Yes	** NA **	None
48	M50				Yes	** NA **	None
49	LM1				Yes	** NA **	None
50	MP1A				Yes	** NA **	None
51	M52				Yes	N/A	None
52	M52A				Yes	** NA **	None
53	M53				Yes	** NA **	None
54	M54				Yes	** NA **	None
55	M55				Yes	** NA **	None
56	M56				Yes	** NA **	None
57	M57				Yes	** NA **	None
58	M58				Yes	** NA **	None

Member Point Loads (BLC 1 : Antenna D)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	Y	-44	2.98
2	M11	My	0	2.98
3	M11	Mz	0	2.98
4	MP3A	Y	-45.75	1.5
5	MP3A	My	0.059	1.5
6	MP3A	Mz	-0.034	1.5
7	MP3A	Y	-45.75	3.5
8	MP3A	My	0.059	3.5
9	MP3A	Mz	-0.034	3.5
10	MP3A	Y	-45.75	1.5
11	MP3A	My	0.059	1.5
12	MP3A	Mz	0.034	1.5
13	MP3A	Y	-45.75	3.5
14	MP3A	My	0.059	3.5
15	MP3A	Mz	0.034	3.5
16	MP3A	Y	-10.4	0.5

Member Point Loads (BLC 1 : Antenna D) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
17	MP3A	My	-0.005	0.5
18	MP3A	Mz	0	0.5
19	MP3A	Y	-84.4	4.04
20	MP3A	My	-0.06	4.04
21	MP3A	Mz	0	4.04
22	MP1A	Y	-70.3	4.04
23	MP1A	My	-0.047	4.04
24	MP1A	Mz	0	4.04
25	M53	Y	-52.5	0.3
26	M53	My	0	0.3
27	M53	Mz	0	0.3
28	MP1A	Y	-43.55	1.5
29	MP1A	My	0.022	1.5
30	MP1A	Mz	0	1.5
31	MP1A	Y	-43.55	3.5
32	MP1A	My	0.022	3.5
33	MP1A	Mz	0	3.5
34	M56	Y	-52.5	0.3
35	M56	My	0	0.3
36	M56	Mz	0	0.3

Member Point Loads (BLC 2 : Antenna Di)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	Y	-74.195	2.98
2	M11	My	0	2.98
3	M11	Mz	0	2.98
4	MP3A	Y	-79.105	1.5
5	MP3A	My	0.102	1.5
6	MP3A	Mz	-0.059	1.5
7	MP3A	Y	-79.105	3.5
8	MP3A	My	0.102	3.5
9	MP3A	Mz	-0.059	3.5
10	MP3A	Y	-79.105	1.5
11	MP3A	My	0.102	1.5
12	MP3A	Mz	0.059	1.5
13	MP3A	Y	-79.105	3.5
14	MP3A	My	0.102	3.5
15	MP3A	Mz	0.059	3.5
16	MP3A	Y	-10.804	0.5
17	MP3A	My	-0.005	0.5
18	MP3A	Mz	0	0.5
19	MP3A	Y	-45.135	4.04
20	MP3A	My	-0.032	4.04
21	MP3A	Mz	0	4.04
22	MP1A	Y	-40.592	4.04
23	MP1A	My	-0.027	4.04
24	MP1A	Mz	0	4.04
25	M53	Y	-50.745	0.3
26	M53	My	0	0.3
27	M53	Mz	0	0.3
28	MP1A	Y	-35.797	1.5
29	MP1A	My	0.018	1.5
30	MP1A	Mz	0	1.5
31	MP1A	Y	-35.797	3.5
32	MP1A	My	0.018	3.5

Member Point Loads (BLC 2 : Antenna Di) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
33	MP1A	Mz	0	3.5
34	M56	Y	-50.745	0.3
35	M56	My	0	0.3
36	M56	Mz	0	0.3

Member Point Loads (BLC 3 : Antenna Wo (0 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	0	2.98
2	M11	Z	-120.157	2.98
3	M11	Mx	0	2.98
4	MP3A	X	0	1.5
5	MP3A	Z	-265.264	1.5
6	MP3A	Mx	0.199	1.5
7	MP3A	X	0	3.5
8	MP3A	Z	-265.264	3.5
9	MP3A	Mx	0.199	3.5
10	MP3A	X	0	1.5
11	MP3A	Z	-265.264	1.5
12	MP3A	Mx	-0.199	1.5
13	MP3A	X	0	3.5
14	MP3A	Z	-265.264	3.5
15	MP3A	Mx	-0.199	3.5
16	MP3A	X	0	0.5
17	MP3A	Z	-17.219	0.5
18	MP3A	Mx	0	0.5
19	MP3A	X	0	4.04
20	MP3A	Z	-72.133	4.04
21	MP3A	Mx	0	4.04
22	MP1A	X	0	4.04
23	MP1A	Z	-72.133	4.04
24	MP1A	Mx	0	4.04
25	M53	X	0	0.3
26	M53	Z	-63.961	0.3
27	M53	Mx	0	0.3
28	MP1A	X	0	1.5
29	MP1A	Z	-91.214	1.5
30	MP1A	Mx	0	1.5
31	MP1A	X	0	3.5
32	MP1A	Z	-91.214	3.5
33	MP1A	Mx	0	3.5
34	M56	X	0	0.3
35	M56	Z	-111.69	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 4 : Antenna Wo (30 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	51.329	2.98
2	M11	Z	-88.905	2.98
3	M11	Mx	0	2.98
4	MP3A	X	114.841	1.5
5	MP3A	Z	-198.911	1.5
6	MP3A	Mx	0.298	1.5
7	MP3A	X	114.841	3.5

Member Point Loads (BLC 4 : Antenna Wo (30 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
8	MP3A	Z	-198.911	3.5
9	MP3A	Mx	0.298	3.5
10	MP3A	X	114.841	1.5
11	MP3A	Z	-198.911	1.5
12	MP3A	Mx	-0.000847	1.5
13	MP3A	X	114.841	3.5
14	MP3A	Z	-198.911	3.5
15	MP3A	Mx	-0.000847	3.5
16	MP3A	X	7.946	0.5
17	MP3A	Z	-13.763	0.5
18	MP3A	Mx	-0.004	0.5
19	MP3A	X	33.1	4.04
20	MP3A	Z	-57.331	4.04
21	MP3A	Mx	-0.023	4.04
22	MP1A	X	31.995	4.04
23	MP1A	Z	-55.416	4.04
24	MP1A	Mx	-0.021	4.04
25	M53	X	34.117	0.3
26	M53	Z	-59.092	0.3
27	M53	Mx	0	0.3
28	MP1A	X	38.132	1.5
29	MP1A	Z	-66.046	1.5
30	MP1A	Mx	0.019	1.5
31	MP1A	X	38.132	3.5
32	MP1A	Z	-66.046	3.5
33	MP1A	Mx	0.019	3.5
34	M56	X	49.693	0.3
35	M56	Z	-86.072	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 5 : Antenna Wo (60 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	104.059	2.98
2	M11	Z	-60.079	2.98
3	M11	Mx	0	2.98
4	MP3A	X	137.281	1.5
5	MP3A	Z	-79.259	1.5
6	MP3A	Mx	0.237	1.5
7	MP3A	X	137.281	3.5
8	MP3A	Z	-79.259	3.5
9	MP3A	Mx	0.237	3.5
10	MP3A	X	137.281	1.5
11	MP3A	Z	-79.259	1.5
12	MP3A	Mx	0.118	1.5
13	MP3A	X	137.281	3.5
14	MP3A	Z	-79.259	3.5
15	MP3A	Mx	0.118	3.5
16	MP3A	X	11.466	0.5
17	MP3A	Z	-6.62	0.5
18	MP3A	Mx	-0.006	0.5
19	MP3A	X	47.053	4.04
20	MP3A	Z	-27.166	4.04
21	MP3A	Mx	-0.033	4.04
22	MP1A	X	41.31	4.04
23	MP1A	Z	-23.851	4.04

Member Point Loads (BLC 5 : Antenna Wo (60 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
24	MP1A	Mx	-0.028	4.04
25	M53	X	79.117	0.3
26	M53	Z	-45.678	0.3
27	M53	Mx	0	0.3
28	MP1A	X	40.152	1.5
29	MP1A	Z	-23.182	1.5
30	MP1A	Mx	0.02	1.5
31	MP1A	X	40.152	3.5
32	MP1A	Z	-23.182	3.5
33	MP1A	Mx	0.02	3.5
34	M56	X	64.762	0.3
35	M56	Z	-37.39	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 6 : Antenna Wo (90 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	155.155	2.98
2	M11	Z	0	2.98
3	M11	Mx	0	2.98
4	MP3A	X	122.937	1.5
5	MP3A	Z	0	1.5
6	MP3A	Mx	0.159	1.5
7	MP3A	X	122.937	3.5
8	MP3A	Z	0	3.5
9	MP3A	Mx	0.159	3.5
10	MP3A	X	122.937	1.5
11	MP3A	Z	0	1.5
12	MP3A	Mx	0.159	1.5
13	MP3A	X	122.937	3.5
14	MP3A	Z	0	3.5
15	MP3A	Mx	0.159	3.5
16	MP3A	X	11.914	0.5
17	MP3A	Z	0	0.5
18	MP3A	Mx	-0.006	0.5
19	MP3A	X	48.399	4.04
20	MP3A	Z	0	4.04
21	MP3A	Mx	-0.034	4.04
22	MP1A	X	39.557	4.04
23	MP1A	Z	0	4.04
24	MP1A	Mx	-0.026	4.04
25	M53	X	110.206	0.3
26	M53	Z	0	0.3
27	M53	Mx	0	0.3
28	MP1A	X	31.413	1.5
29	MP1A	Z	0	1.5
30	MP1A	Mx	0.016	1.5
31	MP1A	X	31.413	3.5
32	MP1A	Z	0	3.5
33	MP1A	Mx	0.016	3.5
34	M56	X	62.477	0.3
35	M56	Z	0	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 7 : Antenna Wo (120 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	149.523	2.98
2	M11	Z	86.327	2.98
3	M11	Mx	0	2.98
4	MP3A	X	137.281	1.5
5	MP3A	Z	79.259	1.5
6	MP3A	Mx	0.118	1.5
7	MP3A	X	137.281	3.5
8	MP3A	Z	79.259	3.5
9	MP3A	Mx	0.118	3.5
10	MP3A	X	137.281	1.5
11	MP3A	Z	79.259	1.5
12	MP3A	Mx	0.237	1.5
13	MP3A	X	137.281	3.5
14	MP3A	Z	79.259	3.5
15	MP3A	Mx	0.237	3.5
16	MP3A	X	11.466	0.5
17	MP3A	Z	6.62	0.5
18	MP3A	Mx	-0.006	0.5
19	MP3A	X	47.053	4.04
20	MP3A	Z	27.166	4.04
21	MP3A	Mx	-0.033	4.04
22	MP1A	X	41.31	4.04
23	MP1A	Z	23.851	4.04
24	MP1A	Mx	-0.028	4.04
25	M53	X	91.741	0.3
26	M53	Z	52.967	0.3
27	M53	Mx	0	0.3
28	MP1A	X	40.152	1.5
29	MP1A	Z	23.182	1.5
30	MP1A	Mx	0.02	1.5
31	MP1A	X	40.152	3.5
32	MP1A	Z	23.182	3.5
33	MP1A	Mx	0.02	3.5
34	M56	X	64.762	0.3
35	M56	Z	37.39	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 8 : Antenna Wo (150 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	77.578	2.98
2	M11	Z	134.369	2.98
3	M11	Mx	0	2.98
4	MP3A	X	114.841	1.5
5	MP3A	Z	198.911	1.5
6	MP3A	Mx	-0.000847	1.5
7	MP3A	X	114.841	3.5
8	MP3A	Z	198.911	3.5
9	MP3A	Mx	-0.000847	3.5
10	MP3A	X	114.841	1.5
11	MP3A	Z	198.911	1.5
12	MP3A	Mx	0.298	1.5
13	MP3A	X	114.841	3.5
14	MP3A	Z	198.911	3.5
15	MP3A	Mx	0.298	3.5

Member Point Loads (BLC 8 : Antenna Wo (150 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
16	MP3A	X	7.946	0.5
17	MP3A	Z	13.763	0.5
18	MP3A	Mx	-0.004	0.5
19	MP3A	X	33.1	4.04
20	MP3A	Z	57.331	4.04
21	MP3A	Mx	-0.023	4.04
22	MP1A	X	31.995	4.04
23	MP1A	Z	55.416	4.04
24	MP1A	Mx	-0.021	4.04
25	M53	X	41.405	0.3
26	M53	Z	71.716	0.3
27	M53	Mx	0	0.3
28	MP1A	X	38.132	1.5
29	MP1A	Z	66.046	1.5
30	MP1A	Mx	0.019	1.5
31	MP1A	X	38.132	3.5
32	MP1A	Z	66.046	3.5
33	MP1A	Mx	0.019	3.5
34	M56	X	49.693	0.3
35	M56	Z	86.072	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 9 : Antenna Wo (180 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	0	2.98
2	M11	Z	120.157	2.98
3	M11	Mx	0	2.98
4	MP3A	X	0	1.5
5	MP3A	Z	265.264	1.5
6	MP3A	Mx	-0.199	1.5
7	MP3A	X	0	3.5
8	MP3A	Z	265.264	3.5
9	MP3A	Mx	-0.199	3.5
10	MP3A	X	0	1.5
11	MP3A	Z	265.264	1.5
12	MP3A	Mx	0.199	1.5
13	MP3A	X	0	3.5
14	MP3A	Z	265.264	3.5
15	MP3A	Mx	0.199	3.5
16	MP3A	X	0	0.5
17	MP3A	Z	17.219	0.5
18	MP3A	Mx	0	0.5
19	MP3A	X	0	4.04
20	MP3A	Z	72.133	4.04
21	MP3A	Mx	0	4.04
22	MP1A	X	0	4.04
23	MP1A	Z	72.133	4.04
24	MP1A	Mx	0	4.04
25	M53	X	0	0.3
26	M53	Z	63.961	0.3
27	M53	Mx	0	0.3
28	MP1A	X	0	1.5
29	MP1A	Z	91.214	1.5
30	MP1A	Mx	0	1.5
31	MP1A	X	0	3.5

Member Point Loads (BLC 9 : Antenna Wo (180 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
32	MP1A	Z	91.214	3.5
33	MP1A	Mx	0	3.5
34	M56	X	0	0.3
35	M56	Z	111.69	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 10 : Antenna Wo (210 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-51.329	2.98
2	M11	Z	88.905	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-114.841	1.5
5	MP3A	Z	198.911	1.5
6	MP3A	Mx	-0.298	1.5
7	MP3A	X	-114.841	3.5
8	MP3A	Z	198.911	3.5
9	MP3A	Mx	-0.298	3.5
10	MP3A	X	-114.841	1.5
11	MP3A	Z	198.911	1.5
12	MP3A	Mx	0.000847	1.5
13	MP3A	X	-114.841	3.5
14	MP3A	Z	198.911	3.5
15	MP3A	Mx	0.000847	3.5
16	MP3A	X	-7.946	0.5
17	MP3A	Z	13.763	0.5
18	MP3A	Mx	0.004	0.5
19	MP3A	X	-33.1	4.04
20	MP3A	Z	57.331	4.04
21	MP3A	Mx	0.023	4.04
22	MP1A	X	-31.995	4.04
23	MP1A	Z	55.416	4.04
24	MP1A	Mx	0.021	4.04
25	M53	X	-34.117	0.3
26	M53	Z	59.092	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-38.132	1.5
29	MP1A	Z	66.046	1.5
30	MP1A	Mx	-0.019	1.5
31	MP1A	X	-38.132	3.5
32	MP1A	Z	66.046	3.5
33	MP1A	Mx	-0.019	3.5
34	M56	X	-49.693	0.3
35	M56	Z	86.072	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 11 : Antenna Wo (240 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-104.059	2.98
2	M11	Z	60.079	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-137.281	1.5
5	MP3A	Z	79.259	1.5
6	MP3A	Mx	-0.237	1.5

Member Point Loads (BLC 11 : Antenna Wo (240 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
7	MP3A	X	-137.281	3.5
8	MP3A	Z	79.259	3.5
9	MP3A	Mx	-0.237	3.5
10	MP3A	X	-137.281	1.5
11	MP3A	Z	79.259	1.5
12	MP3A	Mx	-0.118	1.5
13	MP3A	X	-137.281	3.5
14	MP3A	Z	79.259	3.5
15	MP3A	Mx	-0.118	3.5
16	MP3A	X	-11.466	0.5
17	MP3A	Z	6.62	0.5
18	MP3A	Mx	0.006	0.5
19	MP3A	X	-47.053	4.04
20	MP3A	Z	27.166	4.04
21	MP3A	Mx	0.033	4.04
22	MP1A	X	-41.31	4.04
23	MP1A	Z	23.851	4.04
24	MP1A	Mx	0.028	4.04
25	M53	X	-79.117	0.3
26	M53	Z	45.678	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-40.152	1.5
29	MP1A	Z	23.182	1.5
30	MP1A	Mx	-0.02	1.5
31	MP1A	X	-40.152	3.5
32	MP1A	Z	23.182	3.5
33	MP1A	Mx	-0.02	3.5
34	M56	X	-64.762	0.3
35	M56	Z	37.39	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 12 : Antenna Wo (270 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-155.155	2.98
2	M11	Z	0	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-122.937	1.5
5	MP3A	Z	0	1.5
6	MP3A	Mx	-0.159	1.5
7	MP3A	X	-122.937	3.5
8	MP3A	Z	0	3.5
9	MP3A	Mx	-0.159	3.5
10	MP3A	X	-122.937	1.5
11	MP3A	Z	0	1.5
12	MP3A	Mx	-0.159	1.5
13	MP3A	X	-122.937	3.5
14	MP3A	Z	0	3.5
15	MP3A	Mx	-0.159	3.5
16	MP3A	X	-11.914	0.5
17	MP3A	Z	0	0.5
18	MP3A	Mx	0.006	0.5
19	MP3A	X	-48.399	4.04
20	MP3A	Z	0	4.04
21	MP3A	Mx	0.034	4.04
22	MP1A	X	-39.557	4.04

Member Point Loads (BLC 12 : Antenna Wo (270 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
23	MP1A	Z	0	4.04
24	MP1A	Mx	0.026	4.04
25	M53	X	-110.206	0.3
26	M53	Z	0	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-31.413	1.5
29	MP1A	Z	0	1.5
30	MP1A	Mx	-0.016	1.5
31	MP1A	X	-31.413	3.5
32	MP1A	Z	0	3.5
33	MP1A	Mx	-0.016	3.5
34	M56	X	-62.477	0.3
35	M56	Z	0	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 13 : Antenna Wo (300 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-149.523	2.98
2	M11	Z	-86.327	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-137.281	1.5
5	MP3A	Z	-79.259	1.5
6	MP3A	Mx	-0.118	1.5
7	MP3A	X	-137.281	3.5
8	MP3A	Z	-79.259	3.5
9	MP3A	Mx	-0.118	3.5
10	MP3A	X	-137.281	1.5
11	MP3A	Z	-79.259	1.5
12	MP3A	Mx	-0.237	1.5
13	MP3A	X	-137.281	3.5
14	MP3A	Z	-79.259	3.5
15	MP3A	Mx	-0.237	3.5
16	MP3A	X	-11.466	0.5
17	MP3A	Z	-6.62	0.5
18	MP3A	Mx	0.006	0.5
19	MP3A	X	-47.053	4.04
20	MP3A	Z	-27.166	4.04
21	MP3A	Mx	0.033	4.04
22	MP1A	X	-41.31	4.04
23	MP1A	Z	-23.851	4.04
24	MP1A	Mx	0.028	4.04
25	M53	X	-91.741	0.3
26	M53	Z	-52.967	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-40.152	1.5
29	MP1A	Z	-23.182	1.5
30	MP1A	Mx	-0.02	1.5
31	MP1A	X	-40.152	3.5
32	MP1A	Z	-23.182	3.5
33	MP1A	Mx	-0.02	3.5
34	M56	X	-64.762	0.3
35	M56	Z	-37.39	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 14 : Antenna Wo (330 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-77.578	2.98
2	M11	Z	-134.369	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-114.841	1.5
5	MP3A	Z	-198.911	1.5
6	MP3A	Mx	0.000847	1.5
7	MP3A	X	-114.841	3.5
8	MP3A	Z	-198.911	3.5
9	MP3A	Mx	0.000847	3.5
10	MP3A	X	-114.841	1.5
11	MP3A	Z	-198.911	1.5
12	MP3A	Mx	-0.298	1.5
13	MP3A	X	-114.841	3.5
14	MP3A	Z	-198.911	3.5
15	MP3A	Mx	-0.298	3.5
16	MP3A	X	-7.946	0.5
17	MP3A	Z	-13.763	0.5
18	MP3A	Mx	0.004	0.5
19	MP3A	X	-33.1	4.04
20	MP3A	Z	-57.331	4.04
21	MP3A	Mx	0.023	4.04
22	MP1A	X	-31.995	4.04
23	MP1A	Z	-55.416	4.04
24	MP1A	Mx	0.021	4.04
25	M53	X	-41.405	0.3
26	M53	Z	-71.716	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-38.132	1.5
29	MP1A	Z	-66.046	1.5
30	MP1A	Mx	-0.019	1.5
31	MP1A	X	-38.132	3.5
32	MP1A	Z	-66.046	3.5
33	MP1A	Mx	-0.019	3.5
34	M56	X	-49.693	0.3
35	M56	Z	-86.072	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 15 : Antenna Wi (0 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	0	2.98
2	M11	Z	-22.579	2.98
3	M11	Mx	0	2.98
4	MP3A	X	0	1.5
5	MP3A	Z	-45.949	1.5
6	MP3A	Mx	0.034	1.5
7	MP3A	X	0	3.5
8	MP3A	Z	-45.949	3.5
9	MP3A	Mx	0.034	3.5
10	MP3A	X	0	1.5
11	MP3A	Z	-45.949	1.5
12	MP3A	Mx	-0.034	1.5
13	MP3A	X	0	3.5
14	MP3A	Z	-45.949	3.5
15	MP3A	Mx	-0.034	3.5

Member Point Loads (BLC 15 : Antenna Wi (0 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
16	MP3A	X	0	0.5
17	MP3A	Z	-4.051	0.5
18	MP3A	Mx	0	0.5
19	MP3A	X	0	4.04
20	MP3A	Z	-16.674	4.04
21	MP3A	Mx	0	4.04
22	MP1A	X	0	4.04
23	MP1A	Z	-16.674	4.04
24	MP1A	Mx	0	4.04
25	M53	X	0	0.3
26	M53	Z	-12.704	0.3
27	M53	Mx	0	0.3
28	MP1A	X	0	1.5
29	MP1A	Z	-19.778	1.5
30	MP1A	Mx	0	1.5
31	MP1A	X	0	3.5
32	MP1A	Z	-19.778	3.5
33	MP1A	Mx	0	3.5
34	M56	X	0	0.3
35	M56	Z	-20.93	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 16 : Antenna Wi (30 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	9.821	2.98
2	M11	Z	-17.01	2.98
3	M11	Mx	0	2.98
4	MP3A	X	20.065	1.5
5	MP3A	Z	-34.753	1.5
6	MP3A	Mx	0.052	1.5
7	MP3A	X	20.065	3.5
8	MP3A	Z	-34.753	3.5
9	MP3A	Mx	0.052	3.5
10	MP3A	X	20.065	1.5
11	MP3A	Z	-34.753	1.5
12	MP3A	Mx	-0.000147	1.5
13	MP3A	X	20.065	3.5
14	MP3A	Z	-34.753	3.5
15	MP3A	Mx	-0.000147	3.5
16	MP3A	X	1.899	0.5
17	MP3A	Z	-3.29	0.5
18	MP3A	Mx	-0.00095	0.5
19	MP3A	X	7.703	4.04
20	MP3A	Z	-13.341	4.04
21	MP3A	Mx	-0.005	4.04
22	MP1A	X	7.462	4.04
23	MP1A	Z	-12.924	4.04
24	MP1A	Mx	-0.005	4.04
25	M53	X	6.72	0.3
26	M53	Z	-11.64	0.3
27	M53	Mx	0	0.3
28	MP1A	X	8.47	1.5
29	MP1A	Z	-14.671	1.5
30	MP1A	Mx	0.004	1.5
31	MP1A	X	8.47	3.5

Member Point Loads (BLC 16 : Antenna Wi (30 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
32	MP1A	Z	-14.671	3.5
33	MP1A	Mx	0.004	3.5
34	M56	X	9.405	0.3
35	M56	Z	-16.29	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 17 : Antenna Wi (60 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	19.554	2.98
2	M11	Z	-11.289	2.98
3	M11	Mx	0	2.98
4	MP3A	X	24.674	1.5
5	MP3A	Z	-14.246	1.5
6	MP3A	Mx	0.043	1.5
7	MP3A	X	24.674	3.5
8	MP3A	Z	-14.246	3.5
9	MP3A	Mx	0.043	3.5
10	MP3A	X	24.674	1.5
11	MP3A	Z	-14.246	1.5
12	MP3A	Mx	0.021	1.5
13	MP3A	X	24.674	3.5
14	MP3A	Z	-14.246	3.5
15	MP3A	Mx	0.021	3.5
16	MP3A	X	2.852	0.5
17	MP3A	Z	-1.647	0.5
18	MP3A	Mx	-0.001	0.5
19	MP3A	X	11.145	4.04
20	MP3A	Z	-6.434	4.04
21	MP3A	Mx	-0.008	4.04
22	MP1A	X	9.892	4.04
23	MP1A	Z	-5.711	4.04
24	MP1A	Mx	-0.007	4.04
25	M53	X	15.091	0.3
26	M53	Z	-8.713	0.3
27	M53	Mx	0	0.3
28	MP1A	X	9.756	1.5
29	MP1A	Z	-5.633	1.5
30	MP1A	Mx	0.005	1.5
31	MP1A	X	9.756	3.5
32	MP1A	Z	-5.633	3.5
33	MP1A	Mx	0.005	3.5
34	M56	X	12.617	0.3
35	M56	Z	-7.284	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 18 : Antenna Wi (90 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	28.454	2.98
2	M11	Z	0	2.98
3	M11	Mx	0	2.98
4	MP3A	X	22.672	1.5
5	MP3A	Z	0	1.5
6	MP3A	Mx	0.029	1.5

Member Point Loads (BLC 18 : Antenna Wi (90 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
7	MP3A	X	22.672	3.5
8	MP3A	Z	0	3.5
9	MP3A	Mx	0.029	3.5
10	MP3A	X	22.672	1.5
11	MP3A	Z	0	1.5
12	MP3A	Mx	0.029	1.5
13	MP3A	X	22.672	3.5
14	MP3A	Z	0	3.5
15	MP3A	Mx	0.029	3.5
16	MP3A	X	3.041	0.5
17	MP3A	Z	0	0.5
18	MP3A	Mx	-0.002	0.5
19	MP3A	X	11.6	4.04
20	MP3A	Z	0	4.04
21	MP3A	Mx	-0.008	4.04
22	MP1A	X	9.672	4.04
23	MP1A	Z	0	4.04
24	MP1A	Mx	-0.006	4.04
25	M53	X	20.675	0.3
26	M53	Z	0	0.3
27	M53	Mx	0	0.3
28	MP1A	X	8.428	1.5
29	MP1A	Z	0	1.5
30	MP1A	Mx	0.004	1.5
31	MP1A	X	8.428	3.5
32	MP1A	Z	0	3.5
33	MP1A	Mx	0.004	3.5
34	M56	X	12.449	0.3
35	M56	Z	0	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 19 : Antenna Wi (120 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	27.186	2.98
2	M11	Z	15.696	2.98
3	M11	Mx	0	2.98
4	MP3A	X	24.674	1.5
5	MP3A	Z	14.246	1.5
6	MP3A	Mx	0.021	1.5
7	MP3A	X	24.674	3.5
8	MP3A	Z	14.246	3.5
9	MP3A	Mx	0.021	3.5
10	MP3A	X	24.674	1.5
11	MP3A	Z	14.246	1.5
12	MP3A	Mx	0.043	1.5
13	MP3A	X	24.674	3.5
14	MP3A	Z	14.246	3.5
15	MP3A	Mx	0.043	3.5
16	MP3A	X	2.852	0.5
17	MP3A	Z	1.647	0.5
18	MP3A	Mx	-0.001	0.5
19	MP3A	X	11.145	4.04
20	MP3A	Z	6.434	4.04
21	MP3A	Mx	-0.008	4.04
22	MP1A	X	9.892	4.04

Member Point Loads (BLC 19 : Antenna Wi (120 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
23	MP1A	Z	5.711	4.04
24	MP1A	Mx	-0.007	4.04
25	M53	X	17.267	0.3
26	M53	Z	9.969	0.3
27	M53	Mx	0	0.3
28	MP1A	X	9.756	1.5
29	MP1A	Z	5.633	1.5
30	MP1A	Mx	0.005	1.5
31	MP1A	X	9.756	3.5
32	MP1A	Z	5.633	3.5
33	MP1A	Mx	0.005	3.5
34	M56	X	12.617	0.3
35	M56	Z	7.284	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 20 : Antenna Wi (150 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	14.227	2.98
2	M11	Z	24.642	2.98
3	M11	Mx	0	2.98
4	MP3A	X	20.065	1.5
5	MP3A	Z	34.753	1.5
6	MP3A	Mx	-0.000147	1.5
7	MP3A	X	20.065	3.5
8	MP3A	Z	34.753	3.5
9	MP3A	Mx	-0.000147	3.5
10	MP3A	X	20.065	1.5
11	MP3A	Z	34.753	1.5
12	MP3A	Mx	0.052	1.5
13	MP3A	X	20.065	3.5
14	MP3A	Z	34.753	3.5
15	MP3A	Mx	0.052	3.5
16	MP3A	X	1.899	0.5
17	MP3A	Z	3.29	0.5
18	MP3A	Mx	-0.00095	0.5
19	MP3A	X	7.703	4.04
20	MP3A	Z	13.341	4.04
21	MP3A	Mx	-0.005	4.04
22	MP1A	X	7.462	4.04
23	MP1A	Z	12.924	4.04
24	MP1A	Mx	-0.005	4.04
25	M53	X	7.977	0.3
26	M53	Z	13.816	0.3
27	M53	Mx	0	0.3
28	MP1A	X	8.47	1.5
29	MP1A	Z	14.671	1.5
30	MP1A	Mx	0.004	1.5
31	MP1A	X	8.47	3.5
32	MP1A	Z	14.671	3.5
33	MP1A	Mx	0.004	3.5
34	M56	X	9.405	0.3
35	M56	Z	16.29	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 21 : Antenna Wi (180 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	0	2.98
2	M11	Z	22.579	2.98
3	M11	Mx	0	2.98
4	MP3A	X	0	1.5
5	MP3A	Z	45.949	1.5
6	MP3A	Mx	-0.034	1.5
7	MP3A	X	0	3.5
8	MP3A	Z	45.949	3.5
9	MP3A	Mx	-0.034	3.5
10	MP3A	X	0	1.5
11	MP3A	Z	45.949	1.5
12	MP3A	Mx	0.034	1.5
13	MP3A	X	0	3.5
14	MP3A	Z	45.949	3.5
15	MP3A	Mx	0.034	3.5
16	MP3A	X	0	0.5
17	MP3A	Z	4.051	0.5
18	MP3A	Mx	0	0.5
19	MP3A	X	0	4.04
20	MP3A	Z	16.674	4.04
21	MP3A	Mx	0	4.04
22	MP1A	X	0	4.04
23	MP1A	Z	16.674	4.04
24	MP1A	Mx	0	4.04
25	M53	X	0	0.3
26	M53	Z	12.704	0.3
27	M53	Mx	0	0.3
28	MP1A	X	0	1.5
29	MP1A	Z	19.778	1.5
30	MP1A	Mx	0	1.5
31	MP1A	X	0	3.5
32	MP1A	Z	19.778	3.5
33	MP1A	Mx	0	3.5
34	M56	X	0	0.3
35	M56	Z	20.93	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 22 : Antenna Wi (210 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-9.821	2.98
2	M11	Z	17.01	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-20.065	1.5
5	MP3A	Z	34.753	1.5
6	MP3A	Mx	-0.052	1.5
7	MP3A	X	-20.065	3.5
8	MP3A	Z	34.753	3.5
9	MP3A	Mx	-0.052	3.5
10	MP3A	X	-20.065	1.5
11	MP3A	Z	34.753	1.5
12	MP3A	Mx	0.000147	1.5
13	MP3A	X	-20.065	3.5
14	MP3A	Z	34.753	3.5
15	MP3A	Mx	0.000147	3.5

Member Point Loads (BLC 22 : Antenna Wi (210 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
16	MP3A	X	-1.899	0.5
17	MP3A	Z	3.29	0.5
18	MP3A	Mx	0.00095	0.5
19	MP3A	X	-7.703	4.04
20	MP3A	Z	13.341	4.04
21	MP3A	Mx	0.005	4.04
22	MP1A	X	-7.462	4.04
23	MP1A	Z	12.924	4.04
24	MP1A	Mx	0.005	4.04
25	M53	X	-6.72	0.3
26	M53	Z	11.64	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-8.47	1.5
29	MP1A	Z	14.671	1.5
30	MP1A	Mx	-0.004	1.5
31	MP1A	X	-8.47	3.5
32	MP1A	Z	14.671	3.5
33	MP1A	Mx	-0.004	3.5
34	M56	X	-9.405	0.3
35	M56	Z	16.29	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 23 : Antenna Wi (240 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-19.554	2.98
2	M11	Z	11.289	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-24.674	1.5
5	MP3A	Z	14.246	1.5
6	MP3A	Mx	-0.043	1.5
7	MP3A	X	-24.674	3.5
8	MP3A	Z	14.246	3.5
9	MP3A	Mx	-0.043	3.5
10	MP3A	X	-24.674	1.5
11	MP3A	Z	14.246	1.5
12	MP3A	Mx	-0.021	1.5
13	MP3A	X	-24.674	3.5
14	MP3A	Z	14.246	3.5
15	MP3A	Mx	-0.021	3.5
16	MP3A	X	-2.852	0.5
17	MP3A	Z	1.647	0.5
18	MP3A	Mx	0.001	0.5
19	MP3A	X	-11.145	4.04
20	MP3A	Z	6.434	4.04
21	MP3A	Mx	0.008	4.04
22	MP1A	X	-9.892	4.04
23	MP1A	Z	5.711	4.04
24	MP1A	Mx	0.007	4.04
25	M53	X	-15.091	0.3
26	M53	Z	8.713	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-9.756	1.5
29	MP1A	Z	5.633	1.5
30	MP1A	Mx	-0.005	1.5
31	MP1A	X	-9.756	3.5

Member Point Loads (BLC 23 : Antenna Wi (240 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
32	MP1A	Z	5.633	3.5
33	MP1A	Mx	-0.005	3.5
34	M56	X	-12.617	0.3
35	M56	Z	7.284	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 24 : Antenna Wi (270 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-28.454	2.98
2	M11	Z	0	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-22.672	1.5
5	MP3A	Z	0	1.5
6	MP3A	Mx	-0.029	1.5
7	MP3A	X	-22.672	3.5
8	MP3A	Z	0	3.5
9	MP3A	Mx	-0.029	3.5
10	MP3A	X	-22.672	1.5
11	MP3A	Z	0	1.5
12	MP3A	Mx	-0.029	1.5
13	MP3A	X	-22.672	3.5
14	MP3A	Z	0	3.5
15	MP3A	Mx	-0.029	3.5
16	MP3A	X	-3.041	0.5
17	MP3A	Z	0	0.5
18	MP3A	Mx	0.002	0.5
19	MP3A	X	-11.6	4.04
20	MP3A	Z	0	4.04
21	MP3A	Mx	0.008	4.04
22	MP1A	X	-9.672	4.04
23	MP1A	Z	0	4.04
24	MP1A	Mx	0.006	4.04
25	M53	X	-20.675	0.3
26	M53	Z	0	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-8.428	1.5
29	MP1A	Z	0	1.5
30	MP1A	Mx	-0.004	1.5
31	MP1A	X	-8.428	3.5
32	MP1A	Z	0	3.5
33	MP1A	Mx	-0.004	3.5
34	M56	X	-12.449	0.3
35	M56	Z	0	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 25 : Antenna Wi (300 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-27.186	2.98
2	M11	Z	-15.696	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-24.674	1.5
5	MP3A	Z	-14.246	1.5
6	MP3A	Mx	-0.021	1.5

Member Point Loads (BLC 25 : Antenna Wi (300 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
7	MP3A	X	-24.674	3.5
8	MP3A	Z	-14.246	3.5
9	MP3A	Mx	-0.021	3.5
10	MP3A	X	-24.674	1.5
11	MP3A	Z	-14.246	1.5
12	MP3A	Mx	-0.043	1.5
13	MP3A	X	-24.674	3.5
14	MP3A	Z	-14.246	3.5
15	MP3A	Mx	-0.043	3.5
16	MP3A	X	-2.852	0.5
17	MP3A	Z	-1.647	0.5
18	MP3A	Mx	0.001	0.5
19	MP3A	X	-11.145	4.04
20	MP3A	Z	-6.434	4.04
21	MP3A	Mx	0.008	4.04
22	MP1A	X	-9.892	4.04
23	MP1A	Z	-5.711	4.04
24	MP1A	Mx	0.007	4.04
25	M53	X	-17.267	0.3
26	M53	Z	-9.969	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-9.756	1.5
29	MP1A	Z	-5.633	1.5
30	MP1A	Mx	-0.005	1.5
31	MP1A	X	-9.756	3.5
32	MP1A	Z	-5.633	3.5
33	MP1A	Mx	-0.005	3.5
34	M56	X	-12.617	0.3
35	M56	Z	-7.284	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 26 : Antenna Wi (330 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-14.227	2.98
2	M11	Z	-24.642	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-20.065	1.5
5	MP3A	Z	-34.753	1.5
6	MP3A	Mx	0.000147	1.5
7	MP3A	X	-20.065	3.5
8	MP3A	Z	-34.753	3.5
9	MP3A	Mx	0.000147	3.5
10	MP3A	X	-20.065	1.5
11	MP3A	Z	-34.753	1.5
12	MP3A	Mx	-0.052	1.5
13	MP3A	X	-20.065	3.5
14	MP3A	Z	-34.753	3.5
15	MP3A	Mx	-0.052	3.5
16	MP3A	X	-1.899	0.5
17	MP3A	Z	-3.29	0.5
18	MP3A	Mx	0.00095	0.5
19	MP3A	X	-7.703	4.04
20	MP3A	Z	-13.341	4.04
21	MP3A	Mx	0.005	4.04
22	MP1A	X	-7.462	4.04

Member Point Loads (BLC 26 : Antenna Wi (330 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
23	MP1A	Z	-12.924	4.04
24	MP1A	Mx	0.005	4.04
25	M53	X	-7.977	0.3
26	M53	Z	-13.816	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-8.47	1.5
29	MP1A	Z	-14.671	1.5
30	MP1A	Mx	-0.004	1.5
31	MP1A	X	-8.47	3.5
32	MP1A	Z	-14.671	3.5
33	MP1A	Mx	-0.004	3.5
34	M56	X	-9.405	0.3
35	M56	Z	-16.29	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 27 : Antenna Wm (0 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	0	2.98
2	M11	Z	-19.225	2.98
3	M11	Mx	0	2.98
4	MP3A	X	0	1.5
5	MP3A	Z	-42.442	1.5
6	MP3A	Mx	0.032	1.5
7	MP3A	X	0	3.5
8	MP3A	Z	-42.442	3.5
9	MP3A	Mx	0.032	3.5
10	MP3A	X	0	1.5
11	MP3A	Z	-42.442	1.5
12	MP3A	Mx	-0.032	1.5
13	MP3A	X	0	3.5
14	MP3A	Z	-42.442	3.5
15	MP3A	Mx	-0.032	3.5
16	MP3A	X	0	0.5
17	MP3A	Z	-2.755	0.5
18	MP3A	Mx	0	0.5
19	MP3A	X	0	4.04
20	MP3A	Z	-11.541	4.04
21	MP3A	Mx	0	4.04
22	MP1A	X	0	4.04
23	MP1A	Z	-11.541	4.04
24	MP1A	Mx	0	4.04
25	M53	X	0	0.3
26	M53	Z	-10.234	0.3
27	M53	Mx	0	0.3
28	MP1A	X	0	1.5
29	MP1A	Z	-14.594	1.5
30	MP1A	Mx	0	1.5
31	MP1A	X	0	3.5
32	MP1A	Z	-14.594	3.5
33	MP1A	Mx	0	3.5
34	M56	X	0	0.3
35	M56	Z	-17.87	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 28 : Antenna Wm (30 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	8.213	2.98
2	M11	Z	-14.225	2.98
3	M11	Mx	0	2.98
4	MP3A	X	18.375	1.5
5	MP3A	Z	-31.826	1.5
6	MP3A	Mx	0.048	1.5
7	MP3A	X	18.375	3.5
8	MP3A	Z	-31.826	3.5
9	MP3A	Mx	0.048	3.5
10	MP3A	X	18.375	1.5
11	MP3A	Z	-31.826	1.5
12	MP3A	Mx	-0.000135	1.5
13	MP3A	X	18.375	3.5
14	MP3A	Z	-31.826	3.5
15	MP3A	Mx	-0.000135	3.5
16	MP3A	X	1.271	0.5
17	MP3A	Z	-2.202	0.5
18	MP3A	Mx	-0.000636	0.5
19	MP3A	X	5.296	4.04
20	MP3A	Z	-9.173	4.04
21	MP3A	Mx	-0.004	4.04
22	MP1A	X	5.119	4.04
23	MP1A	Z	-8.867	4.04
24	MP1A	Mx	-0.003	4.04
25	M53	X	5.459	0.3
26	M53	Z	-9.455	0.3
27	M53	Mx	0	0.3
28	MP1A	X	6.101	1.5
29	MP1A	Z	-10.567	1.5
30	MP1A	Mx	0.003	1.5
31	MP1A	X	6.101	3.5
32	MP1A	Z	-10.567	3.5
33	MP1A	Mx	0.003	3.5
34	M56	X	7.951	0.3
35	M56	Z	-13.771	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 29 : Antenna Wm (60 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	16.649	2.98
2	M11	Z	-9.613	2.98
3	M11	Mx	0	2.98
4	MP3A	X	21.965	1.5
5	MP3A	Z	-12.682	1.5
6	MP3A	Mx	0.038	1.5
7	MP3A	X	21.965	3.5
8	MP3A	Z	-12.682	3.5
9	MP3A	Mx	0.038	3.5
10	MP3A	X	21.965	1.5
11	MP3A	Z	-12.682	1.5
12	MP3A	Mx	0.019	1.5
13	MP3A	X	21.965	3.5
14	MP3A	Z	-12.682	3.5
15	MP3A	Mx	0.019	3.5

Member Point Loads (BLC 29 : Antenna Wm (60 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
16	MP3A	X	1.835	0.5
17	MP3A	Z	-1.059	0.5
18	MP3A	Mx	-0.000918	0.5
19	MP3A	X	7.529	4.04
20	MP3A	Z	-4.347	4.04
21	MP3A	Mx	-0.005	4.04
22	MP1A	X	6.61	4.04
23	MP1A	Z	-3.816	4.04
24	MP1A	Mx	-0.004	4.04
25	M53	X	12.659	0.3
26	M53	Z	-7.309	0.3
27	M53	Mx	0	0.3
28	MP1A	X	6.424	1.5
29	MP1A	Z	-3.709	1.5
30	MP1A	Mx	0.003	1.5
31	MP1A	X	6.424	3.5
32	MP1A	Z	-3.709	3.5
33	MP1A	Mx	0.003	3.5
34	M56	X	10.362	0.3
35	M56	Z	-5.982	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 30 : Antenna Wm (90 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	24.825	2.98
2	M11	Z	0	2.98
3	M11	Mx	0	2.98
4	MP3A	X	19.67	1.5
5	MP3A	Z	0	1.5
6	MP3A	Mx	0.025	1.5
7	MP3A	X	19.67	3.5
8	MP3A	Z	0	3.5
9	MP3A	Mx	0.025	3.5
10	MP3A	X	19.67	1.5
11	MP3A	Z	0	1.5
12	MP3A	Mx	0.025	1.5
13	MP3A	X	19.67	3.5
14	MP3A	Z	0	3.5
15	MP3A	Mx	0.025	3.5
16	MP3A	X	1.906	0.5
17	MP3A	Z	0	0.5
18	MP3A	Mx	-0.000953	0.5
19	MP3A	X	7.744	4.04
20	MP3A	Z	0	4.04
21	MP3A	Mx	-0.005	4.04
22	MP1A	X	6.329	4.04
23	MP1A	Z	0	4.04
24	MP1A	Mx	-0.004	4.04
25	M53	X	17.633	0.3
26	M53	Z	0	0.3
27	M53	Mx	0	0.3
28	MP1A	X	5.026	1.5
29	MP1A	Z	0	1.5
30	MP1A	Mx	0.003	1.5
31	MP1A	X	5.026	3.5

Member Point Loads (BLC 30 : Antenna Wm (90 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
32	MP1A	Z	0	3.5
33	MP1A	Mx	0.003	3.5
34	M56	X	9.996	0.3
35	M56	Z	0	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 31 : Antenna Wm (120 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	23.924	2.98
2	M11	Z	13.812	2.98
3	M11	Mx	0	2.98
4	MP3A	X	21.965	1.5
5	MP3A	Z	12.682	1.5
6	MP3A	Mx	0.019	1.5
7	MP3A	X	21.965	3.5
8	MP3A	Z	12.682	3.5
9	MP3A	Mx	0.019	3.5
10	MP3A	X	21.965	1.5
11	MP3A	Z	12.682	1.5
12	MP3A	Mx	0.038	1.5
13	MP3A	X	21.965	3.5
14	MP3A	Z	12.682	3.5
15	MP3A	Mx	0.038	3.5
16	MP3A	X	1.835	0.5
17	MP3A	Z	1.059	0.5
18	MP3A	Mx	-0.000918	0.5
19	MP3A	X	7.529	4.04
20	MP3A	Z	4.347	4.04
21	MP3A	Mx	-0.005	4.04
22	MP1A	X	6.61	4.04
23	MP1A	Z	3.816	4.04
24	MP1A	Mx	-0.004	4.04
25	M53	X	14.679	0.3
26	M53	Z	8.475	0.3
27	M53	Mx	0	0.3
28	MP1A	X	6.424	1.5
29	MP1A	Z	3.709	1.5
30	MP1A	Mx	0.003	1.5
31	MP1A	X	6.424	3.5
32	MP1A	Z	3.709	3.5
33	MP1A	Mx	0.003	3.5
34	M56	X	10.362	0.3
35	M56	Z	5.982	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 32 : Antenna Wm (150 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	12.412	2.98
2	M11	Z	21.499	2.98
3	M11	Mx	0	2.98
4	MP3A	X	18.375	1.5
5	MP3A	Z	31.826	1.5
6	MP3A	Mx	-0.000135	1.5

Member Point Loads (BLC 32 : Antenna Wm (150 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
7	MP3A	X	18.375	3.5
8	MP3A	Z	31.826	3.5
9	MP3A	Mx	-0.000135	3.5
10	MP3A	X	18.375	1.5
11	MP3A	Z	31.826	1.5
12	MP3A	Mx	0.048	1.5
13	MP3A	X	18.375	3.5
14	MP3A	Z	31.826	3.5
15	MP3A	Mx	0.048	3.5
16	MP3A	X	1.271	0.5
17	MP3A	Z	2.202	0.5
18	MP3A	Mx	-0.000636	0.5
19	MP3A	X	5.296	4.04
20	MP3A	Z	9.173	4.04
21	MP3A	Mx	-0.004	4.04
22	MP1A	X	5.119	4.04
23	MP1A	Z	8.867	4.04
24	MP1A	Mx	-0.003	4.04
25	M53	X	6.625	0.3
26	M53	Z	11.475	0.3
27	M53	Mx	0	0.3
28	MP1A	X	6.101	1.5
29	MP1A	Z	10.567	1.5
30	MP1A	Mx	0.003	1.5
31	MP1A	X	6.101	3.5
32	MP1A	Z	10.567	3.5
33	MP1A	Mx	0.003	3.5
34	M56	X	7.951	0.3
35	M56	Z	13.771	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 33 : Antenna Wm (180 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	0	2.98
2	M11	Z	19.225	2.98
3	M11	Mx	0	2.98
4	MP3A	X	0	1.5
5	MP3A	Z	42.442	1.5
6	MP3A	Mx	-0.032	1.5
7	MP3A	X	0	3.5
8	MP3A	Z	42.442	3.5
9	MP3A	Mx	-0.032	3.5
10	MP3A	X	0	1.5
11	MP3A	Z	42.442	1.5
12	MP3A	Mx	0.032	1.5
13	MP3A	X	0	3.5
14	MP3A	Z	42.442	3.5
15	MP3A	Mx	0.032	3.5
16	MP3A	X	0	0.5
17	MP3A	Z	2.755	0.5
18	MP3A	Mx	0	0.5
19	MP3A	X	0	4.04
20	MP3A	Z	11.541	4.04
21	MP3A	Mx	0	4.04
22	MP1A	X	0	4.04

Member Point Loads (BLC 33 : Antenna Wm (180 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
23	MP1A	Z	11.541	4.04
24	MP1A	Mx	0	4.04
25	M53	X	0	0.3
26	M53	Z	10.234	0.3
27	M53	Mx	0	0.3
28	MP1A	X	0	1.5
29	MP1A	Z	14.594	1.5
30	MP1A	Mx	0	1.5
31	MP1A	X	0	3.5
32	MP1A	Z	14.594	3.5
33	MP1A	Mx	0	3.5
34	M56	X	0	0.3
35	M56	Z	17.87	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 34 : Antenna Wm (210 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-8.213	2.98
2	M11	Z	14.225	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-18.375	1.5
5	MP3A	Z	31.826	1.5
6	MP3A	Mx	-0.048	1.5
7	MP3A	X	-18.375	3.5
8	MP3A	Z	31.826	3.5
9	MP3A	Mx	-0.048	3.5
10	MP3A	X	-18.375	1.5
11	MP3A	Z	31.826	1.5
12	MP3A	Mx	0.000135	1.5
13	MP3A	X	-18.375	3.5
14	MP3A	Z	31.826	3.5
15	MP3A	Mx	0.000135	3.5
16	MP3A	X	-1.271	0.5
17	MP3A	Z	2.202	0.5
18	MP3A	Mx	0.000636	0.5
19	MP3A	X	-5.296	4.04
20	MP3A	Z	9.173	4.04
21	MP3A	Mx	0.004	4.04
22	MP1A	X	-5.119	4.04
23	MP1A	Z	8.867	4.04
24	MP1A	Mx	0.003	4.04
25	M53	X	-5.459	0.3
26	M53	Z	9.455	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-6.101	1.5
29	MP1A	Z	10.567	1.5
30	MP1A	Mx	-0.003	1.5
31	MP1A	X	-6.101	3.5
32	MP1A	Z	10.567	3.5
33	MP1A	Mx	-0.003	3.5
34	M56	X	-7.951	0.3
35	M56	Z	13.771	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 35 : Antenna Wm (240 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-16.649	2.98
2	M11	Z	9.613	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-21.965	1.5
5	MP3A	Z	12.682	1.5
6	MP3A	Mx	-0.038	1.5
7	MP3A	X	-21.965	3.5
8	MP3A	Z	12.682	3.5
9	MP3A	Mx	-0.038	3.5
10	MP3A	X	-21.965	1.5
11	MP3A	Z	12.682	1.5
12	MP3A	Mx	-0.019	1.5
13	MP3A	X	-21.965	3.5
14	MP3A	Z	12.682	3.5
15	MP3A	Mx	-0.019	3.5
16	MP3A	X	-1.835	0.5
17	MP3A	Z	1.059	0.5
18	MP3A	Mx	0.000918	0.5
19	MP3A	X	-7.529	4.04
20	MP3A	Z	4.347	4.04
21	MP3A	Mx	0.005	4.04
22	MP1A	X	-6.61	4.04
23	MP1A	Z	3.816	4.04
24	MP1A	Mx	0.004	4.04
25	M53	X	-12.659	0.3
26	M53	Z	7.309	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-6.424	1.5
29	MP1A	Z	3.709	1.5
30	MP1A	Mx	-0.003	1.5
31	MP1A	X	-6.424	3.5
32	MP1A	Z	3.709	3.5
33	MP1A	Mx	-0.003	3.5
34	M56	X	-10.362	0.3
35	M56	Z	5.982	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 36 : Antenna Wm (270 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-24.825	2.98
2	M11	Z	0	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-19.67	1.5
5	MP3A	Z	0	1.5
6	MP3A	Mx	-0.025	1.5
7	MP3A	X	-19.67	3.5
8	MP3A	Z	0	3.5
9	MP3A	Mx	-0.025	3.5
10	MP3A	X	-19.67	1.5
11	MP3A	Z	0	1.5
12	MP3A	Mx	-0.025	1.5
13	MP3A	X	-19.67	3.5
14	MP3A	Z	0	3.5
15	MP3A	Mx	-0.025	3.5

Member Point Loads (BLC 36 : Antenna Wm (270 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
16	MP3A	X	-1.906	0.5
17	MP3A	Z	0	0.5
18	MP3A	Mx	0.000953	0.5
19	MP3A	X	-7.744	4.04
20	MP3A	Z	0	4.04
21	MP3A	Mx	0.005	4.04
22	MP1A	X	-6.329	4.04
23	MP1A	Z	0	4.04
24	MP1A	Mx	0.004	4.04
25	M53	X	-17.633	0.3
26	M53	Z	0	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-5.026	1.5
29	MP1A	Z	0	1.5
30	MP1A	Mx	-0.003	1.5
31	MP1A	X	-5.026	3.5
32	MP1A	Z	0	3.5
33	MP1A	Mx	-0.003	3.5
34	M56	X	-9.996	0.3
35	M56	Z	0	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 37 : Antenna Wm (300 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-23.924	2.98
2	M11	Z	-13.812	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-21.965	1.5
5	MP3A	Z	-12.682	1.5
6	MP3A	Mx	-0.019	1.5
7	MP3A	X	-21.965	3.5
8	MP3A	Z	-12.682	3.5
9	MP3A	Mx	-0.019	3.5
10	MP3A	X	-21.965	1.5
11	MP3A	Z	-12.682	1.5
12	MP3A	Mx	-0.038	1.5
13	MP3A	X	-21.965	3.5
14	MP3A	Z	-12.682	3.5
15	MP3A	Mx	-0.038	3.5
16	MP3A	X	-1.835	0.5
17	MP3A	Z	-1.059	0.5
18	MP3A	Mx	0.000918	0.5
19	MP3A	X	-7.529	4.04
20	MP3A	Z	-4.347	4.04
21	MP3A	Mx	0.005	4.04
22	MP1A	X	-6.61	4.04
23	MP1A	Z	-3.816	4.04
24	MP1A	Mx	0.004	4.04
25	M53	X	-14.679	0.3
26	M53	Z	-8.475	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-6.424	1.5
29	MP1A	Z	-3.709	1.5
30	MP1A	Mx	-0.003	1.5
31	MP1A	X	-6.424	3.5

Member Point Loads (BLC 37 : Antenna Wm (300 Deg)) (Continued)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
32	MP1A	Z	-3.709	3.5
33	MP1A	Mx	-0.003	3.5
34	M56	X	-10.362	0.3
35	M56	Z	-5.982	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 38 : Antenna Wm (330 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	-12.412	2.98
2	M11	Z	-21.499	2.98
3	M11	Mx	0	2.98
4	MP3A	X	-18.375	1.5
5	MP3A	Z	-31.826	1.5
6	MP3A	Mx	0.000135	1.5
7	MP3A	X	-18.375	3.5
8	MP3A	Z	-31.826	3.5
9	MP3A	Mx	0.000135	3.5
10	MP3A	X	-18.375	1.5
11	MP3A	Z	-31.826	1.5
12	MP3A	Mx	-0.048	1.5
13	MP3A	X	-18.375	3.5
14	MP3A	Z	-31.826	3.5
15	MP3A	Mx	-0.048	3.5
16	MP3A	X	-1.271	0.5
17	MP3A	Z	-2.202	0.5
18	MP3A	Mx	0.000636	0.5
19	MP3A	X	-5.296	4.04
20	MP3A	Z	-9.173	4.04
21	MP3A	Mx	0.004	4.04
22	MP1A	X	-5.119	4.04
23	MP1A	Z	-8.867	4.04
24	MP1A	Mx	0.003	4.04
25	M53	X	-6.625	0.3
26	M53	Z	-11.475	0.3
27	M53	Mx	0	0.3
28	MP1A	X	-6.101	1.5
29	MP1A	Z	-10.567	1.5
30	MP1A	Mx	-0.003	1.5
31	MP1A	X	-6.101	3.5
32	MP1A	Z	-10.567	3.5
33	MP1A	Mx	-0.003	3.5
34	M56	X	-7.951	0.3
35	M56	Z	-13.771	0.3
36	M56	Mx	0	0.3

Member Point Loads (BLC 77 : Lm1)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	LM1	Y	-500	0

Member Point Loads (BLC 78 : Lm2)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	LM2	Y	-500	0

Member Point Loads (BLC 79 : Lv1)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	LV	Y	-250	0

Member Point Loads (BLC 80 : Lv2)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	LV	Y	-250	%50

Member Point Loads (BLC 81 : Antenna Ev)

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	Y	-1.877	2.98
2	M11	My	0	2.98
3	M11	Mz	0	2.98
4	MP3A	Y	-1.952	1.5
5	MP3A	My	0.003	1.5
6	MP3A	Mz	-0.001	1.5
7	MP3A	Y	-1.952	3.5
8	MP3A	My	0.003	3.5
9	MP3A	Mz	-0.001	3.5
10	MP3A	Y	-1.952	1.5
11	MP3A	My	0.003	1.5
12	MP3A	Mz	0.001	1.5
13	MP3A	Y	-1.952	3.5
14	MP3A	My	0.003	3.5
15	MP3A	Mz	0.001	3.5
16	MP3A	Y	-0.444	0.5
17	MP3A	My	-0.000222	0.5
18	MP3A	Mz	0	0.5
19	MP3A	Y	-3.601	4.04
20	MP3A	My	-0.003	4.04
21	MP3A	Mz	0	4.04
22	MP1A	Y	-2.999	4.04
23	MP1A	My	-0.002	4.04
24	MP1A	Mz	0	4.04
25	M53	Y	-2.24	0.3
26	M53	My	0	0.3
27	M53	Mz	0	0.3
28	MP1A	Y	-1.858	1.5
29	MP1A	My	0.000929	1.5
30	MP1A	Mz	0	1.5
31	MP1A	Y	-1.858	3.5
32	MP1A	My	0.000929	3.5
33	MP1A	Mz	0	3.5
34	M56	Y	-2.24	0.3
35	M56	My	0	0.3
36	M56	Mz	0	0.3

Member Point Loads (BLC 82 : Antenna Eh (0 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	Z	-4.693	2.98
2	M11	Mx	0	2.98
3	MP3A	Z	-4.88	1.5
4	MP3A	Mx	0.004	1.5
5	MP3A	Z	-4.88	3.5
6	MP3A	Mx	0.004	3.5
7	MP3A	Z	-4.88	1.5
8	MP3A	Mx	-0.004	1.5
9	MP3A	Z	-4.88	3.5
10	MP3A	Mx	-0.004	3.5
11	MP3A	Z	-1.109	0.5
12	MP3A	Mx	0	0.5
13	MP3A	Z	-9.003	4.04
14	MP3A	Mx	0	4.04
15	MP1A	Z	-7.499	4.04
16	MP1A	Mx	0	4.04
17	M53	Z	-5.6	0.3
18	M53	Mx	0	0.3
19	MP1A	Z	-4.645	1.5
20	MP1A	Mx	0	1.5
21	MP1A	Z	-4.645	3.5
22	MP1A	Mx	0	3.5
23	M56	Z	-5.6	0.3
24	M56	Mx	0	0.3

Member Point Loads (BLC 83 : Antenna Eh (90 Deg))

	Member Label	Direction	Magnitude [lb, k-ft]	Location [(ft, %)]
1	M11	X	4.693	2.98
2	M11	Mx	0	2.98
3	MP3A	X	4.88	1.5
4	MP3A	Mx	0.006	1.5
5	MP3A	X	4.88	3.5
6	MP3A	Mx	0.006	3.5
7	MP3A	X	4.88	1.5
8	MP3A	Mx	0.006	1.5
9	MP3A	X	4.88	3.5
10	MP3A	Mx	0.006	3.5
11	MP3A	X	1.109	0.5
12	MP3A	Mx	-0.000555	0.5
13	MP3A	X	9.003	4.04
14	MP3A	Mx	-0.006	4.04
15	MP1A	X	7.499	4.04
16	MP1A	Mx	-0.005	4.04
17	M53	X	5.6	0.3
18	M53	Mx	0	0.3
19	MP1A	X	4.645	1.5
20	MP1A	Mx	0.002	1.5
21	MP1A	X	4.645	3.5
22	MP1A	Mx	0.002	3.5
23	M56	X	5.6	0.3
24	M56	Mx	0	0.3

Member Area Loads

No Data to Print...

Node Reactions

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
1	1	N65	351.215	668.016	2405.895	-0.194	0	0.014
2	1	N80	-196.3	702.329	402.943	-0.209	0	0.016
3	1	N80B	-154.916	18.124	295.052	-0.002	0	0.004
4	1	Totals:	-0.002	1388.469	3103.89			
5	1	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
6	2	N65	-32.047	666.785	2230.706	-0.195	0	-0.001
7	2	N80	-839.149	703.871	-774.754	-0.21	0	-0.004
8	2	N80B	-522.578	17.813	958.157	-0.003	0	0.005
9	2	Totals:	-1393.774	1388.469	2414.108			
10	2	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
11	3	N65	-192.045	665.839	1868.422	-0.198	0	-0.004
12	3	N80	-1183.674	704.883	-1825.836	-0.211	0	-0.01
13	3	N80B	-609.786	17.746	1103.757	-0.004	0	0.008
14	3	Totals:	-1985.505	1388.469	1146.343			
15	3	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
16	4	N65	-203.555	664.95	1546.639	-0.2	0	0.001
17	4	N80	-1291.574	705.794	-2612.955	-0.212	0	-0.007
18	4	N80B	-618.974	17.725	1066.322	-0.005	0	0.009
19	4	Totals:	-2114.103	1388.469	0.006			
20	4	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
21	5	N65	-189.629	663.845	1229.191	-0.202	0	0.003
22	5	N80	-1312.023	706.905	-3448.963	-0.212	0	-0.004
23	5	N80B	-603.156	17.719	1004.561	-0.006	0	0.011
24	5	Totals:	-2104.807	1388.469	-1215.211			
25	5	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
26	6	N65	-36.211	663.22	870.348	-0.204	0	0.009
27	6	N80	-1085.675	707.315	-3965.18	-0.212	0	0.003
28	6	N80B	-340.766	17.933	561.429	-0.007	0	0.013
29	6	Totals:	-1462.652	1388.469	-2533.403			
30	6	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
31	7	N65	341.244	663.747	689.191	-0.205	0	0.024
32	7	N80	-495.854	706.248	-3498.817	-0.211	0	0.024
33	7	N80B	154.611	18.474	-294.263	-0.007	0	0.013
34	7	Totals:	0.002	1388.469	-3103.89			
35	7	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
36	8	N65	723.753	664.957	865.31	-0.204	0	0.04
37	8	N80	145.978	704.519	-2320.221	-0.209	0	0.044
38	8	N80B	524.043	18.993	-959.197	-0.006	0	0.011
39	8	Totals:	1393.774	1388.469	-2414.108			
40	8	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
41	9	N65	883.559	666.013	1228.212	-0.202	0	0.042
42	9	N80	490.625	703.359	-1269.88	-0.209	0	0.051
43	9	N80B	611.32	19.097	-1104.675	-0.005	0	0.009
44	9	Totals:	1985.505	1388.469	-1146.343			
45	9	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
46	10	N65	895.349	666.965	1549.883	-0.199	0	0.037
47	10	N80	598.587	702.467	-483.124	-0.208	0	0.047
48	10	N80B	620.167	19.037	-1066.764	-0.004	0	0.007
49	10	Totals:	2114.103	1388.469	-0.005			
50	10	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
51	11	N65	881.573	668.092	1866.996	-0.197	0	0.035
52	11	N80	619.071	701.394	353.037	-0.208	0	0.045

Node Reactions (Continued)

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
53	11	N80B	604.163	18.983	-1004.821	-0.003	0	0.006
54	11	Totals:	2104.808	1388.469	1215.212			
55	11	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
56	12	N65	728.56	668.673	2225.095	-0.195	0	0.03
57	12	N80	393.595	701.135	868.847	-0.208	0	0.037
58	12	N80B	340.498	18.661	-560.54	-0.002	0	0.004
59	12	Totals:	1462.652	1388.469	2533.403			
60	12	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
61	13	N65	566.559	1347.11	3296.099	-0.404	0	0.029
62	13	N80	-534.203	1442.544	-2599.387	-0.429	0	0.031
63	13	N80B	-32.356	40.19	62.804	-0.007	0	0.013
64	13	Totals:	0	2829.844	759.516			
65	13	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
66	14	N65	454.009	1346.553	3247.283	-0.404	0	0.024
67	14	N80	-672.296	1443.293	-2881.989	-0.429	0	0.025
68	14	N80B	-127.461	39.998	233.56	-0.007	0	0.013
69	14	Totals:	-345.748	2829.844	598.855			
70	14	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
71	15	N65	400.959	1346.128	3143.829	-0.405	0	0.023
72	15	N80	-753.286	1443.771	-3134.044	-0.429	0	0.022
73	15	N80B	-157.878	39.945	284.788	-0.008	0	0.014
74	15	Totals:	-510.205	2829.844	294.572			
75	15	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
76	16	N65	392.758	1345.792	3045.226	-0.405	0	0.024
77	16	N80	-783.53	1444.105	-3324.131	-0.429	0	0.023
78	16	N80B	-164.023	39.948	278.908	-0.008	0	0.014
79	16	Totals:	-554.795	2829.844	0.003			
80	16	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
81	17	N65	401.134	1345.427	2947.388	-0.406	0	0.024
82	17	N80	-783.751	1444.453	-3514.038	-0.429	0	0.023
83	17	N80B	-156.753	39.964	255.246	-0.008	0	0.014
84	17	Totals:	-539.37	2829.844	-311.405			
85	17	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
86	18	N65	452.731	1345.287	2844.739	-0.406	0	0.026
87	18	N80	-725.834	1444.473	-3616.782	-0.429	0	0.026
88	18	N80B	-89.484	40.084	144.028	-0.008	0	0.015
89	18	Totals:	-362.586	2829.844	-628.015			
90	18	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
91	19	N65	564.152	1345.61	2795.321	-0.406	0	0.032
92	19	N80	-596.465	1443.907	-3492.116	-0.429	0	0.033
93	19	N80B	32.313	40.327	-62.718	-0.008	0	0.015
94	19	Totals:	0	2829.844	-759.513			
95	19	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
96	20	N65	676.647	1346.157	2844.188	-0.406	0	0.037
97	20	N80	-458.372	1443.151	-3209.544	-0.428	0	0.04
98	20	N80B	127.472	40.536	-233.496	-0.008	0	0.015
99	20	Totals:	345.748	2829.844	-598.852			
100	20	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
101	21	N65	729.669	1346.584	2947.681	-0.406	0	0.038
102	21	N80	-377.384	1442.664	-2957.506	-0.428	0	0.042
103	21	N80B	157.92	40.596	-284.744	-0.008	0	0.015
104	21	Totals:	510.205	2829.844	-294.569			
105	21	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
106	22	N65	737.88	1346.926	3046.28	-0.405	0	0.037
107	22	N80	-347.154	1442.328	-2767.408	-0.428	0	0.041

Node Reactions (Continued)

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
108	22	N80B	164.069	40.59	-278.872	-0.008	0	0.014
109	22	Totals:	554.795	2829.844	0			
110	22	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
111	23	N65	729.514	1347.295	3144.102	-0.405	0	0.037
112	23	N80	-346.952	1441.98	-2577.461	-0.429	0	0.041
113	23	N80B	156.807	40.57	-255.233	-0.008	0	0.014
114	23	Totals:	539.37	2829.844	311.408			
115	23	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
116	24	N65	677.958	1347.438	3246.706	-0.405	0	0.035
117	24	N80	-404.857	1441.968	-2474.695	-0.429	0	0.038
118	24	N80B	89.485	40.438	-143.994	-0.007	0	0.013
119	24	Totals:	362.586	2829.844	628.018			
120	24	COG (ft):	X: 0.675	Y: -0.975	Z: 4.136			
121	25	N65	1545.266	1022.502	2624.539	-0.303	0	0.099
122	25	N80	-1520.601	1097.756	-2174.89	-0.323	0	0.101
123	25	N80B	-24.663	18.21	46.971	-0.017	0	0.032
124	25	Totals:	0.002	2138.468	496.62			
125	25	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
126	26	N65	1484.288	1022.268	2596.13	-0.304	0	0.096
127	26	N80	-1623.67	1098.164	-2363.099	-0.323	0	0.097
128	26	N80B	-83.621	18.036	153.227	-0.018	0	0.032
129	26	Totals:	-223.003	2138.468	386.258			
130	26	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
131	27	N65	1458.709	1022.022	2537.956	-0.304	0	0.096
132	27	N80	-1678.797	1098.446	-2531.079	-0.323	0	0.096
133	27	N80B	-97.591	18	176.54	-0.018	0	0.033
134	27	Totals:	-317.679	2138.468	183.417			
135	27	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
136	28	N65	1456.805	1021.785	2486.41	-0.304	0	0.097
137	28	N80	-1696.015	1098.675	-2656.937	-0.324	0	0.097
138	28	N80B	-99.044	18.007	170.528	-0.018	0	0.033
139	28	Totals:	-338.254	2138.468	0.001			
140	28	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
141	29	N65	1458.979	1021.525	2435.567	-0.305	0	0.097
142	29	N80	-1699.241	1098.927	-2790.646	-0.324	0	0.097
143	29	N80B	-96.506	18.017	160.644	-0.018	0	0.033
144	29	Totals:	-336.768	2138.468	-194.436			
145	29	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
146	30	N65	1483.227	1021.353	2378.24	-0.305	0	0.098
147	30	N80	-1662.808	1098.986	-2873.25	-0.324	0	0.098
148	30	N80B	-54.442	18.129	89.665	-0.018	0	0.033
149	30	Totals:	-234.022	2138.468	-405.345			
150	30	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
151	31	N65	1543.15	1021.413	2349.541	-0.305	0	0.1
152	31	N80	-1567.971	1098.697	-2798.902	-0.323	0	0.102
153	31	N80B	24.823	18.358	-47.26	-0.018	0	0.033
154	31	Totals:	0.003	2138.468	-496.62			
155	31	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
156	32	N65	1604.109	1021.647	2377.974	-0.305	0	0.103
157	32	N80	-1464.928	1098.284	-2610.669	-0.323	0	0.105
158	32	N80B	83.827	18.536	-153.563	-0.018	0	0.033
159	32	Totals:	223.008	2138.468	-386.258			
160	32	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
161	33	N65	1629.683	1021.896	2436.163	-0.305	0	0.103
162	33	N80	-1409.798	1097.999	-2442.708	-0.323	0	0.106

Node Reactions (Continued)

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
163	33	N80B	97.799	18.573	-176.872	-0.018	0	0.033
164	33	Totals:	317.684	2138.468	-183.418			
165	33	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
166	34	N65	1631.594	1022.134	2487.706	-0.304	0	0.103
167	34	N80	-1392.577	1097.77	-2316.859	-0.323	0	0.106
168	34	N80B	99.243	18.564	-170.848	-0.018	0	0.032
169	34	Totals:	338.259	2138.468	-0.001			
170	34	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
171	35	N65	1629.424	1022.395	2538.542	-0.304	0	0.102
172	35	N80	-1389.35	1097.519	-2183.147	-0.323	0	0.105
173	35	N80B	96.7	18.554	-160.96	-0.018	0	0.032
174	35	Totals:	336.774	2138.468	194.435			
175	35	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
176	36	N65	1605.186	1022.566	2595.85	-0.304	0	0.101
177	36	N80	-1425.761	1097.464	-2100.554	-0.323	0	0.104
178	36	N80B	54.603	18.438	-89.951	-0.017	0	0.032
179	36	Totals:	234.028	2138.468	405.345			
180	36	COG (ft):	X: 2.49	Y: -1.831	Z: 4.342			
181	37	N65	455.778	1026.023	2623.735	-0.312	0	0.023
182	37	N80	-431.001	1094.197	-2174.295	-0.331	0	0.025
183	37	N80B	-24.779	18.249	47.18	-0.002	0	0.003
184	37	Totals:	-0.001	2138.469	496.62			
185	37	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
186	38	N65	394.452	1025.71	2595.537	-0.312	0	0.02
187	38	N80	-533.746	1094.589	-2362.661	-0.331	0	0.021
188	38	N80B	-83.712	18.17	153.382	-0.002	0	0.003
189	38	Totals:	-223.006	2138.469	386.258			
190	38	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
191	39	N65	368.832	1025.467	2537.413	-0.313	0	0.02
192	39	N80	-588.852	1094.849	-2530.651	-0.331	0	0.02
193	39	N80B	-97.662	18.153	176.656	-0.002	0	0.004
194	39	Totals:	-317.682	2138.469	183.417			
195	39	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
196	40	N65	366.965	1025.262	2485.854	-0.313	0	0.021
197	40	N80	-606.117	1095.051	-2656.481	-0.331	0	0.021
198	40	N80B	-99.105	18.156	170.627	-0.002	0	0.004
199	40	Totals:	-338.257	2138.469	0.001			
200	40	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
201	41	N65	369.151	1025.02	2435.001	-0.313	0	0.021
202	41	N80	-609.364	1095.29	-2790.163	-0.331	0	0.021
203	41	N80B	-96.558	18.16	160.726	-0.002	0	0.004
204	41	Totals:	-336.772	2138.469	-194.436			
205	41	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
206	42	N65	393.624	1024.898	2377.553	-0.314	0	0.022
207	42	N80	-573.165	1095.36	-2872.636	-0.331	0	0.022
208	42	N80B	-54.486	18.212	89.738	-0.002	0	0.004
209	42	Totals:	-234.026	2138.469	-405.345			
210	42	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
211	43	N65	454.018	1025.062	2348.595	-0.314	0	0.024
212	43	N80	-478.788	1095.09	-2798.057	-0.331	0	0.026
213	43	N80B	24.77	18.318	-47.158	-0.002	0	0.004
214	43	Totals:	0	2138.469	-496.62			
215	43	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
216	44	N65	515.325	1025.374	2376.817	-0.314	0	0.027
217	44	N80	-376.069	1094.693	-2609.668	-0.331	0	0.029

Node Reactions (Continued)

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
218	44	N80B	83.749	18.402	-153.407	-0.002	0	0.004
219	44	Totals:	223.005	2138.469	-386.258			
220	44	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
221	45	N65	540.94	1025.62	2434.957	-0.313	0	0.027
222	45	N80	-320.96	1094.429	-2441.697	-0.331	0	0.03
223	45	N80B	97.701	18.42	-176.678	-0.002	0	0.004
224	45	Totals:	317.681	2138.469	-183.418			
225	45	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
226	46	N65	542.814	1025.826	2486.513	-0.313	0	0.027
227	46	N80	-303.693	1094.228	-2315.877	-0.331	0	0.03
228	46	N80B	99.135	18.415	-170.637	-0.002	0	0.004
229	46	Totals:	338.256	2138.469	-0.001			
230	46	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
231	47	N65	540.632	1026.07	2537.358	-0.313	0	0.026
232	47	N80	-300.444	1093.99	-2182.191	-0.331	0	0.029
233	47	N80B	96.583	18.41	-160.731	-0.002	0	0.003
234	47	Totals:	336.77	2138.469	194.435			
235	47	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
236	48	N65	516.168	1026.191	2594.786	-0.312	0	0.025
237	48	N80	-336.622	1093.923	-2099.728	-0.331	0	0.028
238	48	N80B	54.478	18.355	-89.714	-0.002	0	0.003
239	48	Totals:	234.024	2138.469	405.345			
240	48	COG (ft):	X: 0.664	Y: -1.831	Z: 4.342			
241	49	N65	-286.607	846.758	2019.583	-0.253	0	-0.023
242	49	N80	286.641	898.427	-2019.648	-0.266	0	-0.022
243	49	N80B	-0.035	18.283	0.065	-0.004	0	0.006
244	49	Totals:	-0.001	1763.468	0			
245	49	COG (ft):	X: -0.648	Y: -1.494	Z: 4.291			
246	50	N65	347.645	846.206	2017.112	-0.257	0	0.018
247	50	N80	-347.64	898.98	-2017.122	-0.27	0	0.019
248	50	N80B	-0.006	18.283	0.01	-0.003	0	0.006
249	50	Totals:	0	1763.469	0			
250	50	COG (ft):	X: 0.628	Y: -1.494	Z: 4.291			
251	51	N65	404.013	775.947	1805.982	-0.233	0	0.022
252	51	N80	-404.01	822.603	-1805.987	-0.245	0	0.024
253	51	N80B	-0.003	21.33	0.005	-0.005	0	0.01
254	51	Totals:	0	1619.88	0			
255	51	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
256	52	N65	358.94	689.489	1638.388	-0.207	0	0.02
257	52	N80	-351.063	729.424	-1531.023	-0.217	0	0.021
258	52	N80B	-7.877	18.924	16.055	-0.005	0	0.008
259	52	Totals:	0	1437.837	123.421			
260	52	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
261	53	N65	341.777	689.452	1633.608	-0.207	0	0.019
262	53	N80	-377.61	729.481	-1574.05	-0.217	0	0.02
263	53	N80B	-25.877	18.904	47.325	-0.005	0	0.009
264	53	Totals:	-61.71	1437.837	106.882			
265	53	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
266	54	N65	329.123	689.401	1620.634	-0.207	0	0.018
267	54	N80	-399.062	729.544	-1624.837	-0.217	0	0.019
268	54	N80B	-36.942	18.892	65.913	-0.005	0	0.009
269	54	Totals:	-106.882	1437.837	61.711			
270	54	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
271	55	N65	324.366	689.348	1602.941	-0.207	0	0.019
272	55	N80	-409.674	729.598	-1669.785	-0.217	0	0.019

Node Reactions (Continued)

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
273	55	N80B	-38.111	18.891	66.844	-0.005	0	0.009
274	55	Totals:	-123.42	1437.837	0			
275	55	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
276	56	N65	328.784	689.308	1585.27	-0.207	0	0.019
277	56	N80	-406.598	729.628	-1696.842	-0.217	0	0.02
278	56	N80B	-29.068	18.901	49.862	-0.005	0	0.009
279	56	Totals:	-106.882	1437.837	-61.71			
280	56	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
281	57	N65	341.19	689.292	1572.357	-0.207	0	0.02
282	57	N80	-390.662	729.625	-1698.763	-0.217	0	0.02
283	57	N80B	-12.238	18.92	19.524	-0.005	0	0.009
284	57	Totals:	-61.71	1437.837	-106.882			
285	57	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
286	58	N65	358.262	689.303	1567.66	-0.207	0	0.02
287	58	N80	-366.134	729.592	-1675.034	-0.217	0	0.021
288	58	N80B	7.872	18.942	-16.047	-0.005	0	0.009
289	58	Totals:	0	1437.837	-123.42			
290	58	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
291	59	N65	375.424	689.339	1572.442	-0.207	0	0.021
292	59	N80	-339.587	729.535	-1632.008	-0.217	0	0.022
293	59	N80B	25.873	18.963	-47.317	-0.005	0	0.009
294	59	Totals:	61.71	1437.837	-106.882			
295	59	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
296	60	N65	388.077	689.391	1585.417	-0.207	0	0.021
297	60	N80	-318.136	729.471	-1581.221	-0.217	0	0.023
298	60	N80B	36.941	18.975	-65.906	-0.005	0	0.009
299	60	Totals:	106.882	1437.837	-61.71			
300	60	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
301	61	N65	392.834	689.444	1603.111	-0.207	0	0.021
302	61	N80	-307.525	729.417	-1536.273	-0.217	0	0.023
303	61	N80B	38.111	18.976	-66.838	-0.005	0	0.009
304	61	Totals:	123.42	1437.837	0			
305	61	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
306	62	N65	388.416	689.484	1620.781	-0.207	0	0.021
307	62	N80	-310.601	729.387	-1509.215	-0.217	0	0.022
308	62	N80B	29.067	18.966	-49.856	-0.005	0	0.009
309	62	Totals:	106.882	1437.837	61.71			
310	62	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
311	63	N65	376.012	689.5	1633.692	-0.207	0	0.02
312	63	N80	-326.536	729.39	-1507.293	-0.217	0	0.021
313	63	N80B	12.235	18.946	-19.517	-0.005	0	0.008
314	63	Totals:	61.71	1437.837	106.882			
315	63	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
316	64	N65	247.721	476.795	1141.294	-0.143	0	0.013
317	64	N80	-239.846	502.133	-1033.926	-0.15	0	0.014
318	64	N80B	-7.875	13.056	16.052	-0.003	0	0.006
319	64	Totals:	0	991.984	123.42			
320	64	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
321	65	N65	230.55	476.772	1136.523	-0.143	0	0.013
322	65	N80	-266.385	502.169	-1076.961	-0.15	0	0.013
323	65	N80B	-25.875	13.042	47.321	-0.003	0	0.006
324	65	Totals:	-61.71	991.984	106.882			
325	65	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
326	66	N65	217.892	476.737	1123.561	-0.143	0	0.012
327	66	N80	-287.833	502.213	-1127.76	-0.15	0	0.013

Node Reactions (Continued)

	LC	Node Label	X [lb]	Y [lb]	Z [lb]	MX [k-ft]	MY [k-ft]	MZ [k-ft]
328	66	N80B	-36.941	13.034	65.909	-0.003	0	0.006
329	66	Totals:	-106.882	991.984	61.711			
330	66	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
331	67	N65	213.137	476.697	1105.879	-0.143	0	0.012
332	67	N80	-298.447	502.253	-1172.718	-0.15	0	0.013
333	67	N80B	-38.11	13.033	66.84	-0.003	0	0.006
334	67	Totals:	-123.42	991.984	0			
335	67	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
336	68	N65	217.561	476.665	1088.215	-0.143	0	0.013
337	68	N80	-295.377	502.279	-1199.783	-0.15	0	0.013
338	68	N80B	-29.066	13.04	49.859	-0.003	0	0.006
339	68	Totals:	-106.882	991.984	-61.71			
340	68	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
341	69	N65	229.977	476.647	1075.303	-0.143	0	0.013
342	69	N80	-279.45	502.284	-1201.706	-0.15	0	0.014
343	69	N80B	-12.237	13.053	19.522	-0.003	0	0.006
344	69	Totals:	-61.71	991.984	-106.882			
345	69	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
346	70	N65	247.058	476.65	1070.602	-0.143	0	0.014
347	70	N80	-254.931	502.265	-1177.974	-0.15	0	0.015
348	70	N80B	7.873	13.069	-16.048	-0.003	0	0.006
349	70	Totals:	0	991.984	-123.42			
350	70	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
351	71	N65	264.228	476.672	1075.374	-0.143	0	0.015
352	71	N80	-228.392	502.229	-1134.939	-0.15	0	0.016
353	71	N80B	25.874	13.083	-47.317	-0.003	0	0.006
354	71	Totals:	61.71	991.984	-106.882			
355	71	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
356	72	N65	276.885	476.708	1088.337	-0.143	0	0.015
357	72	N80	-206.945	502.185	-1084.142	-0.15	0	0.016
358	72	N80B	36.942	13.091	-65.906	-0.003	0	0.006
359	72	Totals:	106.882	991.984	-61.71			
360	72	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
361	73	N65	281.64	476.747	1106.02	-0.143	0	0.015
362	73	N80	-196.332	502.144	-1039.183	-0.15	0	0.016
363	73	N80B	38.112	13.092	-66.838	-0.003	0	0.006
364	73	Totals:	123.42	991.984	0			
365	73	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
366	74	N65	277.217	476.78	1123.683	-0.143	0	0.015
367	74	N80	-199.402	502.119	-1012.117	-0.15	0	0.016
368	74	N80B	29.068	13.085	-49.856	-0.003	0	0.006
369	74	Totals:	106.882	991.984	61.71			
370	74	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			
371	75	N65	264.802	476.798	1136.593	-0.143	0	0.014
372	75	N80	-215.328	502.115	-1010.193	-0.15	0	0.015
373	75	N80B	12.236	13.071	-19.519	-0.003	0	0.006
374	75	Totals:	61.71	991.984	106.882			
375	75	COG (ft):	X: 0.842	Y: -0.975	Z: 4.212			

Envelope Node Reactions

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N65	max	1631.594	34	1347.438	24	3296.099	13	-0.143	64	0	75	0.103	33
2		min	-286.607	49	476.647	69	689.191	7	-0.406	19	0	1	-0.023	49
3	N80	max	619.071	11	1444.473	18	868.847	12	-0.15	74	0	75	0.106	33
4		min	-1699.241	29	502.115	75	-3965.18	6	-0.429	15	0	1	-0.022	49

Envelope Node Reactions (Continued)

	Node Label		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
5	N80B	max	620.167	10	40.596	21	1103.757	3	-0.002	37	0	75	0.033	31
6		min	-618.974	4	13.033	67	-1104.675	9	-0.018	31	0	1	0.003	37
7	Totals:	max	2114.103	10	2829.844	24	3103.89	1						
8		min	-2114.103	4	991.984	67	-3103.89	7						

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

	Member	Shape	Code Check	Loc[ft]	LC	Shear Check	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt [lb]	phi*Mn y-y [k-ft]	phi*Mn z-z [k-ft]	Cb	Eqn
1	M3	L4X3X6	0	0.281	20	0	0.281	z	20	80199.017	80676	2.686	7.063	1.5	H2-1
2	M5	PL3/8X3	0.469	0	15	0.062	0.026	y	33	34985.705	36450	0.284	2.279	1.026	H1-1b
3	M6	PL3/8X3	0.676	0	31	0.089	0	z	33	34985.705	36450	0.284	2.279	1.032	H1-1b
4	M7	PIPE 2.5	0.366	6.5	7	0.129	10.375		11	15797.3	50715	3.596	3.596	1	H1-1b
5	M8	PL3/8X3	0.428	0	18	0.071	0.031	y	32	34985.705	36450	0.284	2.279	1.053	H1-1b
6	M9	PL3/8X3	0.647	0	36	0.089	0	z	36	34985.705	36450	0.284	2.279	1.017	H1-1b
7	LV	PIPE 2.5	0.214	6.5	7	0.087	10.375		32	15797.3	50715	3.596	3.596	1	H1-1b
8	M11	PIPE 2.0	0.218	0.495	17	0.066	0		15	21054.34	32130	1.872	1.872	1	H1-1b
9	M12	PIPE 2.0	0.31	0.495	31	0.099	0		33	21054.34	32130	1.872	1.872	1	H1-1b
10	M13	PIPE 2.0	0.236	0.557	15	0.065	0		17	21054.34	32130	1.872	1.872	1	H1-1b
11	M14	PIPE 2.0	0.342	0.557	35	0.1	5.381		33	21054.34	32130	1.872	1.872	1	H1-1b
12	M15	PL3/8X3	0.042	0	42	0.074	0	y	29	36078.278	36450	0.284	2.279	1.655	H1-1b
13	M16	PIPE 1.25	0.134	0	33	0.015	4.185		5	12699.069	19687.5	0.801	0.801	1	H1-1b*
14	M17	PL3/8X3	0.061	0	42	0.029	0	y	5	36078.278	36450	0.284	2.279	1.655	H1-1b
15	M18	PIPE 1.25	0.107	0	33	0.029	4.185		7	12699.069	19687.5	0.801	0.801	1	H1-1b*
16	M19	PL3/8X3	0.03	0	40	0.042	0	y	3	30936.41	36450	0.284	2.279	1.555	H1-1b
17	M20	PL3/8X3	0.042	0.125	40	0.074	0.125	y	29	36078.278	36450	0.284	2.279	1.635	H1-1b
18	M21	PL3/8X3	0.062	0.125	40	0.029	0.125	y	5	36078.278	36450	0.284	2.279	1.636	H1-1b
19	M22	PIPE 1.25	0.068	3.167	33	0.022	3.167		32	15316.663	19687.5	0.801	0.801	1	H1-1b*
20	M23	PIPE 1.25	0.126	3.167	33	0.011	3.167		5	15316.663	19687.5	0.801	0.801	1	H1-1b*
21	M24	PIPE 2.0	0.028	0	35	0.006	2.417		3	29957.096	32130	1.872	1.872	1	H1-1b*
22	M25	PL3/8X3	0.032	0.5	44	0.042	0.5	y	3	30936.41	36450	0.284	2.279	1.614	H1-1b
23	M26	PL3/8X3	0.021	0.125	3	0.077	0	y	31	36078.278	36450	0.284	2.279	1.641	H1-1b
24	M27	PIPE 1.25	0.095	0	15	0.02	4.185		5	12699.069	19687.5	0.801	0.801	1	H1-1b*
25	M28	PL3/8X3	0.037	0	37	0.035	0	y	4	36078.278	36450	0.284	2.279	1.662	H1-1b
26	M29	PIPE 1.25	0.056	0	49	0.031	4.185		2	12699.069	19687.5	0.801	0.801	1	H1-1b*
27	M30	PL3/8X3	0.027	0	38	0.024	0	y	12	30936.41	36450	0.284	2.279	1.614	H1-1b
28	M31	PL3/8X3	0.027	0.125	11	0.077	0.125	y	31	36078.278	36450	0.284	2.279	1.641	H1-1b
29	M32	PL3/8X3	0.038	0.125	48	0.035	0.125	y	4	36078.278	36450	0.284	2.279	1.655	H1-1b
30	M33	PIPE 1.25	0.049	3.167	15	0.023	3.167		31	15316.663	19687.5	0.801	0.801	1	H1-1b*
31	M34	PIPE 1.25	0.083	3.167	15	0.013	3.167		5	15316.663	19687.5	0.801	0.801	1	H1-1b*
32	M35	PIPE 2.0	0.017	0	14	0.004	2.417		6	29957.096	32130	1.872	1.872	1	H1-1b*
33	M36	PL3/8X3	0.034	0.5	5	0.024	0.5	y	12	30936.41	36450	0.284	2.279	1.572	H1-1b
34	MP5A	PIPE 2.0	0.115	5.75	49	0.081	2.333		12	14916.096	32130	1.872	1.872	1	H1-1b
35	M46	PIPE 2.0	0.107	4.39	5	0.025	8.779		30	12751.488	32130	1.872	1.872	1	H1-1b
36	MP4A	PIPE 2.0	0.164	2.333	41	0.035	2.333		1	14916.096	32130	1.872	1.872	1	H1-1b
37	MP3A	PIPE 2.5	0.138	1.917	11	0.136	1.917		9	30038.461	50715	3.596	3.596	1	H1-1b
38	MP2A	PIPE 2.0	0.178	2.333	45	0.06	2.333		8	14916.096	32130	1.872	1.872	1	H1-1b
39	MP1A	PIPE 2.0	0.221	2.333	30	0.119	2.333		1	14916.096	32130	1.872	1.872	1	H1-1b
40	M52	L4X3X6	0	0.281	20	0	0.281	z	18	80199.017	80676	2.686	7.063	1.5	H2-1
41	M53	PIPE 2.0	0.065	1	11	0.023	1		5	14916.096	32130	1.872	1.872	1	H1-1b
42	M54	PIPE 2.0	0.065	1	6	0.036	1		7	31747.067	32130	1.872	1.872	1	H1-1b
43	M55	PIPE 2.0	0.044	1	11	0.025	1		12	31747.067	32130	1.872	1.872	1	H1-1b
44	M56	PIPE 2.0	0.077	1	2	0.036	1		6	14916.096	32130	1.872	1.872	1	H1-1b
45	M57	PIPE 2.0	0.079	0	8	0.044	0		2	31747.067	32130	1.872	1.872	1	H1-1b
46	M58	PIPE 2.0	0.045	0	6	0.028	0		12	31747.067	32130	1.872	1.872	1	H1-1b

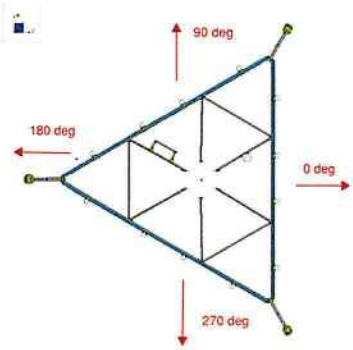
VzW SMART Tool© Vendor			
	Client:	Verizion Wireless	Date: 9/12/2024
	Site Name:	West Haven CT	
	MDG #:	5000382034	
	Fuze ID #:	17289552	Page: 1

Version 2.00

I. Mount-to-Tower Connection Check

Custom Orientation Required | Yes

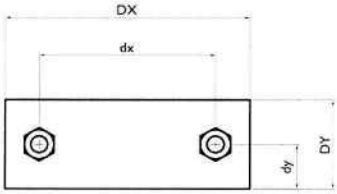
Nodes (labeled per Risa)	Orientation (per graphic of typical platform)
N80	0
N65	0



Tower Connection Bolt Checks | Yes

Bolt Orientation | Parallel

Bolt Quantity per Reaction:	2 (Horizontal)
d_x (in) *(Delta X of typ. bolt config. sketch)* :	5
d_y (in) *(Delta Y of typ. bolt config. sketch)* :	1.5
Bolt Type:	A36
Bolt Diameter (in):	0.5
Required Tensile Strength / bolt (kips):	3.5
Required Shear Strength / bolt (kips):	0.9
Tensile Capacity / bolt (kips):	6.4
Shear Capacity / bolt (kips):	3.8
Bolt Overall Utilization:	**55.0%**



Tower Connection Baseplate Checks | No

ATTACHMENT 5

City of West Haven, Connecticut - Assessment Parcel Map

Parcel: 059-0120-0-0000 Address: 24 ROCKDALE RD

N

Approximate Scale: 1 inch = 100 feet

0 30 60 120 180 240 Feet

Map Produced: April 2021

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

City of West Haven, CT

Property Listing Report

Map Block Lot	059-0120-0-0000	Building #	1	Section #	1	Account	00007905

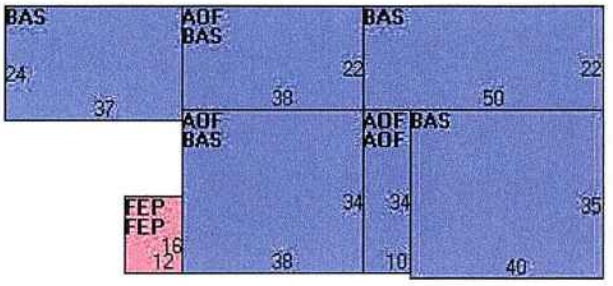
Property Information

Property Location	24 ROCKDALE RD
Owner	KNAPP ANDREW W & KNAPP ROBERT C & RADIO
Co-Owner	COMMUNICATIONS CORPORATION & SV
Mailing Address	24 ROCKDALE RD WEST HAVEN CT 06516
Land Use	3320 SVC SHOP MDL-94
Land Class	C
Zoning Code	R2
Census Tract	

Street Index	C400
Acreage	0.21
Utilities	Public Water,Public Sewer
Lot Setting/Desc	
Additional Info	

Photo

Sketch



Primary Construction Details

				(*Industrial / Commercial Details)	
Year Built	1959	Bedrooms	0	Building Desc.	SVC SHOP MDL-94
Stories	2	Full Bathrooms	0	Building Grade	Average +10
Building Style	Light Industrial	Half Bathrooms	0	Heat / AC	HEAT/AC SPLIT
Building Use	Ind/Comm	Total Rooms		Frame Type	MASONRY
Building Condition	G	Roof Style	Flat	Baths / Plumbing	AVERAGE
Occupancy	1.00	Roof Cover	T&G/Rubber	Ceiling / Wall	SUS-CEIL & WL
Extra Fixtures	0	Interior Floors 1	Concr-Finished	Rooms / Prtns	AVERAGE
Bath Style	NA	Interior Floors 2	Vinyl/Asphalt	Wall Height	12.00
Kitchen Style	NA	Exterior Walls	Concr/Cinder	First Floor Use	3320
AC Type	01	Exterior Walls 2	Brick/Masonry		
Heating Type	Forced Air-Duc	Interior Walls	Minim/Masonry		
Heating Fuel	Gas	Interior Walls 2	Drywall/Sheet		

Report Created On 4/16/2021

ATTACHMENT 6

Verizon/West Haven

UNITED STATES POSTAL SERVICE®

Certificate of Mailing — Firm

Name and Address of Sender	TOTAL NO. of Pieces Listed by Sender	TOTAL NO. of Pieces Received at Post Office™	Affix Stamp Here *Postmark with Date of Receipt.*
Kenneth C. Baldwin, Esq. Robinson & Cole LLP One State Street Hartford, CT 06103	3	3	quadient CORRECTION IMI $003.44 11/26/2024 ZIP 06103 043M3220861B US POSTAGE
	Postmaster, per *(name of receiving employee)*	NOV 26 2024 HARTFORD CT 06103 USPS	

USPS® Tracking Number / Firm-specific Identifier	Address (Name, Street, City, State, and ZIP Code™)	Postage	Fee	Special Handling	Parcel Airlift
1.	Dorinda Borer, Mayor City of West Haven 355 Main Street West Haven, CT 06516				
2.	Catherine Conniff, Asst. City Planner City of West Haven 355 Main Street West Haven, CT 06516				
3.	Bob Knapp Radio Communications Corporation 24 Rockdale Road West Haven, CT 06516				
4.					
5.					
6.					