NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

February 15, 2021

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

RE: Exempt Modification Application
435 Mills Street, Southington CT 06489
Latitude: 41.604929620
Longitude: -72.89411820
T-Mobile Site#: CT11239A-Anchor

Dear Ms. Bachman:

T-Mobile is requesting to file an exempt modification for an existing tower located at 435 Mills Street, Southington CT. T-Mobile currently maintains six (6) antennas at the 110-foot level of the existing 120-foot tower. The tower and property are owned by the Town of Southington. T-Mobile now intends to add three (3) new 2500 MHz 5G antenna. The new antennas would be installed at the 110-foot and 120-Foot level of the tower.

T-Mobile Planned Modifications:

Remove: NONE

Remove and Replace: NONE

Install New:
(3) AIR6449 B41 Antenna 2500 MHz (Replace) 5G
(3) Diplexers
(3) RRU 4415 B25
(1) Hybrid Line

Existing to Remain:
(3) AIR32 B66A_B2A Antenna 19002100 MHz
(3) APXVAARR24 Antenna 600/700/1900/2100 MHz 5G
(3) Hybrid Lines
(3) RRU 4449 B71+B85
(3) RRU 4415 B66

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

This facility was approved by the CT Siting Council. Per the attached Tower Share No. TS-T-MOBILE-131-200413 – Dated May 22, 2000. Please see attached.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies§ 16- SOj-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-72(b)(2). In accordance with R.C.SA. § 16-SOj-73, a copy of this letter is being sent to Town Manager Mark Sciota, Elected Official and Matthew Reimondo, Zoning Enforcement Officer for the Town of Southington, as well as the property owner and the tower owner.

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

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

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

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

4. The operation of the replacement antennas will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.

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

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

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

Sincerely,

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

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Attachments

C: Mark Sciota, Town Manager, as elected official
Matthew A Reimondo, Zoning Enforcement Officer
Town of Southington - as tower owner and property owner

Exhibit A

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

CERTIFIED MAIL
RETURN RECEIPT REQUESTED

October 26, 2018

Lucia Chiocchio, Esq.
Cuddy & Feder, LLP
445 Hamilton Avenue, 14th Floor
White Plains, NY 10601

RE: **PETITION NO. 1349** – New Cingular Wireless PCS, LLC petition for a declaratory ruling, pursuant to Connecticut General Statutes §4-176 and §16-50k, for the proposed extension of an existing wireless telecommunications facility located at 250 Meriden Waterbury Turnpike, Southington, Connecticut.

Dear Attorney Chiocchio:

At a public meeting held on October 25, 2018, the Connecticut Siting Council (Council) considered and ruled that the above-referenced proposal would not have a substantial adverse environmental effect, and pursuant to Connecticut General Statutes § 16-50k, would not require a Certificate of Environmental Compatibility and Public Need with the following conditions:

1. Prior to AT&T's antenna installation the tower modification shall be carried out in accordance with the Structural Modification Report and Modification Drawings prepared by Paul J. Ford, dated March 16, 2018 and March 19, 2018 respectively, and stamped and signed by Joseph Pachicarah Jacobs;

2. Within 45 days following completion of proposed modifications, AT&T shall provide documentation that its installation complied with the recommendations of the Tower Modification Schedule;

3. Approval of any minor project changes be delegated to Council staff;

4. Unless otherwise approved by the Council, if the facility authorized herein is not fully constructed within three years from the date of the mailing of the Council's decision, this decision shall be void, and the facility owner/operator shall dismantle the facility and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made. The time between the filing and resolution of any appeals of the Council's decision shall not be counted in calculating this deadline. Authority to monitor and modify this schedule, as necessary, is delegated to the Executive Director. The facility owner/operator shall provide written notice to the Executive Director of any schedule changes as soon as is practicable;

5. Any request for extension of the time period to fully construct the facility shall be filed with the Council not later than 60 days prior to the expiration date of this decision and shall be served on all parties and intervenors, if applicable, and the Town of Southington;

6. Within 45 days after completion of construction, the Council shall be notified in writing that construction has been completed;

7. Any nonfunctioning antenna and associated antenna mounting equipment on this facility owned and operated by the Petitioner shall be removed within 60 days of the date the antenna ceased to function;

8. The facility owner/operator shall remit timely payments associated with annual assessments and invoices submitted by the Council for expenses attributable to the facility under Conn. Gen. Stat. §16-50v;

9. This Declaratory Ruling may be transferred, provided the facility owner/operator/transferor is current with payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v and the transferee provides written confirmation that the transferee agrees to comply with the terms, limitations and conditions contained in the Declaratory Ruling, including timely payments to the Council for annual assessments and invoices under Conn. Gen. Stat. §16-50v; and

10. If the facility owner/operator is a wholly owned subsidiary of a corporation or other entity and is sold/transferred to another corporation or other entity, the Council shall be notified of such sale and/or transfer and of any change in contact information for the individual or representative responsible for management and operations of the facility within 30 days of the sale and/or transfer.

This decision is under the exclusive jurisdiction of the Council and is not applicable to any other modification or construction. All work is to be implemented as specified in the petition received September 4, 2018 and additional information received on October 5, 2018 and October 11, 2018.

Enclosed for your information is a copy of the staff report on this project.

Sincerely,

Robert Stein

Robert Stein
Chairman

RS/IN/lm

Enclosure: Staff Report dated October 25, 2018

c: The Honorable Christopher Palmieri, Chairman, Town of Southington
Mark J. Sciota, Town Manager, Town of Southington
Robert Phillips, Director of Planning and Community Development, Town of Southington
John Rogus, property owner

STATE OF CONNECTICUT
CONNECTICUT SITING COUNCIL
Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@ct.gov
www.ct.gov/csc

Petition No. 1349
New Cingular Wireless PCS, LLC
Southington, Connecticut
Staff Report
October 25, 2018

On September 4, 2018, New Cingular Wireless PCS, LLC (AT&T) submitted a petition (Petition) to the Connecticut Siting Council (Council) for a declaratory ruling pursuant to Connecticut General Statutes (CGS) §4-176 and §16-50k for the proposed extension of an existing wireless telecommunications facility located at 250 Meriden Waterbury Turnpike, Southington, Connecticut. A field review of the proposed project was conducted on September 25, 2018. Council member Daniel Lynch and Fred Cunliffe and Ifeanyi Nwankwo of the Council staff attended the field review. Kristen Motel Esq., Mark Roberts and Brian Huff attended the field review as representatives of AT&T. At the request of the Council, AT&T attempted to fly a balloon during the field review to simulate the proposed extension of the facility, but it was unsuccessful due to weather conditions. AT&T conducted a second balloon float at the site on October 1, 2018. Two balloons were flown, one red (2-feet in diameter) and one white (3.5-feet in diameter) and flown at elevations of 110-feet and 120-feet above ground level, respectively.

The existing facility is located on a 1.2 acre parcel containing a commercial building, associated outbuildings and a parking area within a Business District Zone. The surrounding area consists of a mix of residential, commercial and retail uses to the north and west and residential uses to the south and east.

The existing facility consists of an 80-foot self-supporting lattice tower owned by Crown Castle. AT&T currently has nine antennas mounted at a center line height of 78-feet above ground level (agl) and Verizon has six antennas mounted at a center line height of 60-feet agl. AT&T and Verizon have associated equipment located at the base of the tower. The equipment shelter is locked and the tower is equipped with an anti-climbing shield.

AT&T proposes to extend the height of the existing self-supporting lattice tower to 120-feet agl. AT&T would remove its existing antennas and install three new 700/850 MHz antennas at the top of the lattice extension. Antennas would be installed at a centerline height of 120-feet agl. The height at the top of AT&T's antennas would be 123-feet agl. AT&T would also install six remote radio head units (RRU's), one surge arrestor, nine cables and an 11-foot lightning mast at the same 120-foot level. The proposed equipment is dual technology capable and compatible with 5G. Aside from minor equipment upgrades within AT&T's equipment shelter, there will be no changes to the existing equipment area at ground level. Existing access to the site would continue to be used. Verizon's existing antennas and equipment would not be affected.

AT&T has backup power batteries within its equipment shelter. These batteries can handle periods of commercial power outages of up to eight hours. For extended commercial power outages, AT&T would utilize a mobile diesel generator that would be transported to the site. This method of backup power has been successfully deployed several times during the sites existence.

AT&T states that in the event of a tower failure due to a catastrophic event, the tower's control section (40 – 60 foot along the legs of the tower) would cause it to collapse upon itself keeping it within the subject parcel.

The purpose of the proposed modification is to provide reliable wireless service in this area of Southington. The existing AT&T antennas are currently at or below the height of the surrounding tree canopy and as a result two of the three sectors of antennas are blocked by the tree line. AT&T dropped call data for this site indicates elevated voice and data drops, as well as substandard data service, that drive the need for the proposed height extension. The proposed height is the lowest height AT&T could locate antennas to gain the coverage necessary to provide reliable service, particularly north along State Route 120. Reducing the height to 100-feet would decrease coverage by one-half to the area.

The proposed extension would have a minimal impact on visibility. The proposed extension would be consistent with the existing tower in design, color and material. Views from the closest residential areas on Meriden Waterbury Turnpike and Orchard Lane are not expected to be substantial. The existing facility can be seen from West Peak and Castle Craig (0.5 miles and 0.9 miles northeast respectively, of the AT&T facility) within Hubbard Park in Meriden. The proposed extension would also be visible from these locations.

There are no schools or child day care centers within 1,000-feet of the tower. The nearest school is South End Elementary School located approximately 8,270-feet from the site. There are 72 residences within 1000-feet of the existing site. The closest residence is within approximately 10-feet and is located on the subject parcel. The closest off-site residence is within approximately 200-feet and is located at Orchard Lane.

The site is outside of the 100-year and 500-year flood zones. The nearest wetland is approximately 1,155-feet to the northwest of the site. No aviation marking or lighting is required. The nearest Important Bird Areas to the site (East Rock Park (11 miles away) and Naugatuck State Forest (12 miles away)) would not be adversely impacted by the proposed modification. Furthermore, the proposed modifications would comply with the recommended guidelines of the U.S. Fish and Wildlife Service for minimizing the potential for telecommunication towers to impact bird species.

There will be no ground disturbance or tree removal for the proposed extension.

A Professional Engineer duly licensed in the State of Connecticut has certified that the tower is structurally adequate to support the proposed loading with certain conditions. The maximum worst-case power density would be 25.2% of the applicable limit. AT&T's RF Tier rating for this facility is Tier 1 (level of priority to maintain network continuity) since it provides service to an interstate highway (I-691).

Notice was provided to the Town of Southington, the property owner and abutting property owners on August 29, 2018. No comments have been received to date.

AT&T contends that this proposal will not have a substantial adverse environmental effect. Staff recommends approval with the following conditions:

- Prior to AT&T's antenna installation the tower modification shall be carried out in accordance with the Structural Modification Report and Modification Drawings prepared by Paul J. Ford, dated March 16, 2018 and March 19, 2018 respectively, and stamped and signed by Joseph Pachicarah Jacobs;
- Within 45 days following completion of proposed modifications, AT&T shall provide documentation that its installation complied with the recommendations of the Tower Modification Schedule; and
- Approval of any minor project changes be delegated to Council staff.

View of Balloon float from Commercial district on Meriden Avenue

Photo-simulation showing proposed tower extension from commercial district on Meriden Avenue

View of Balloon float from nearby residential area on Orchard Lane

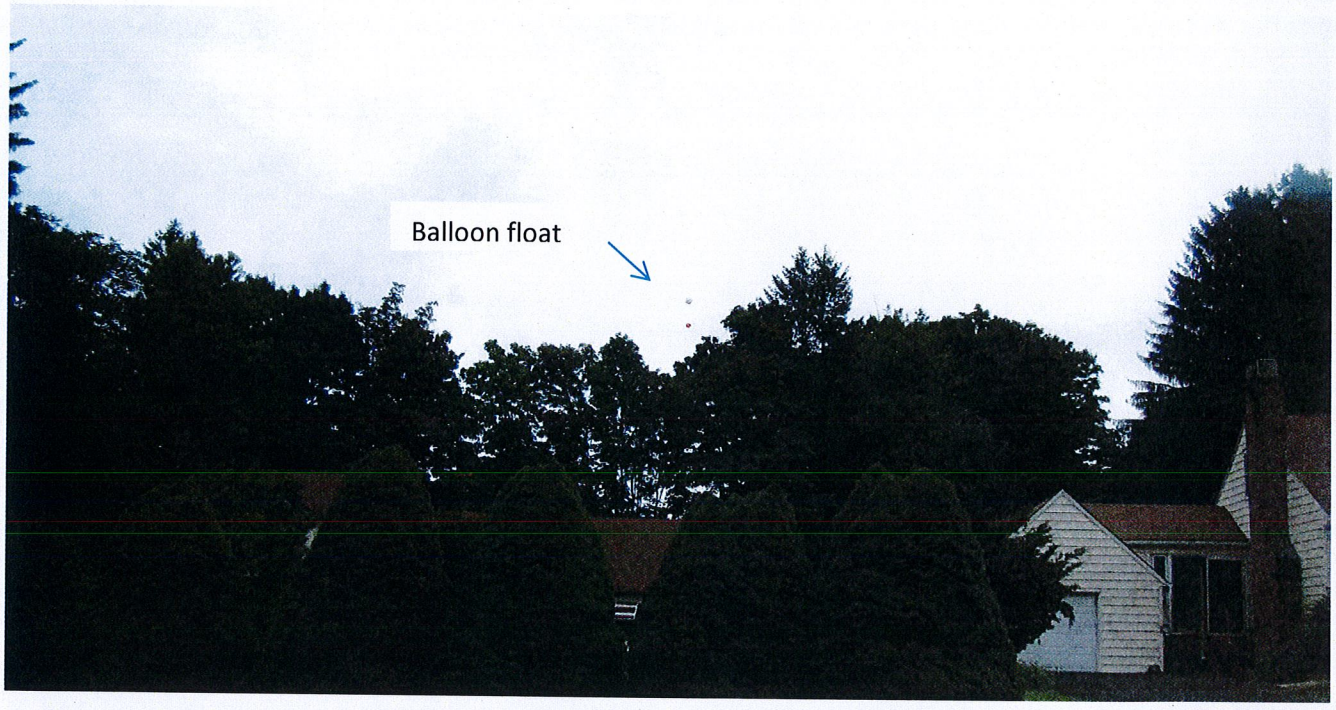
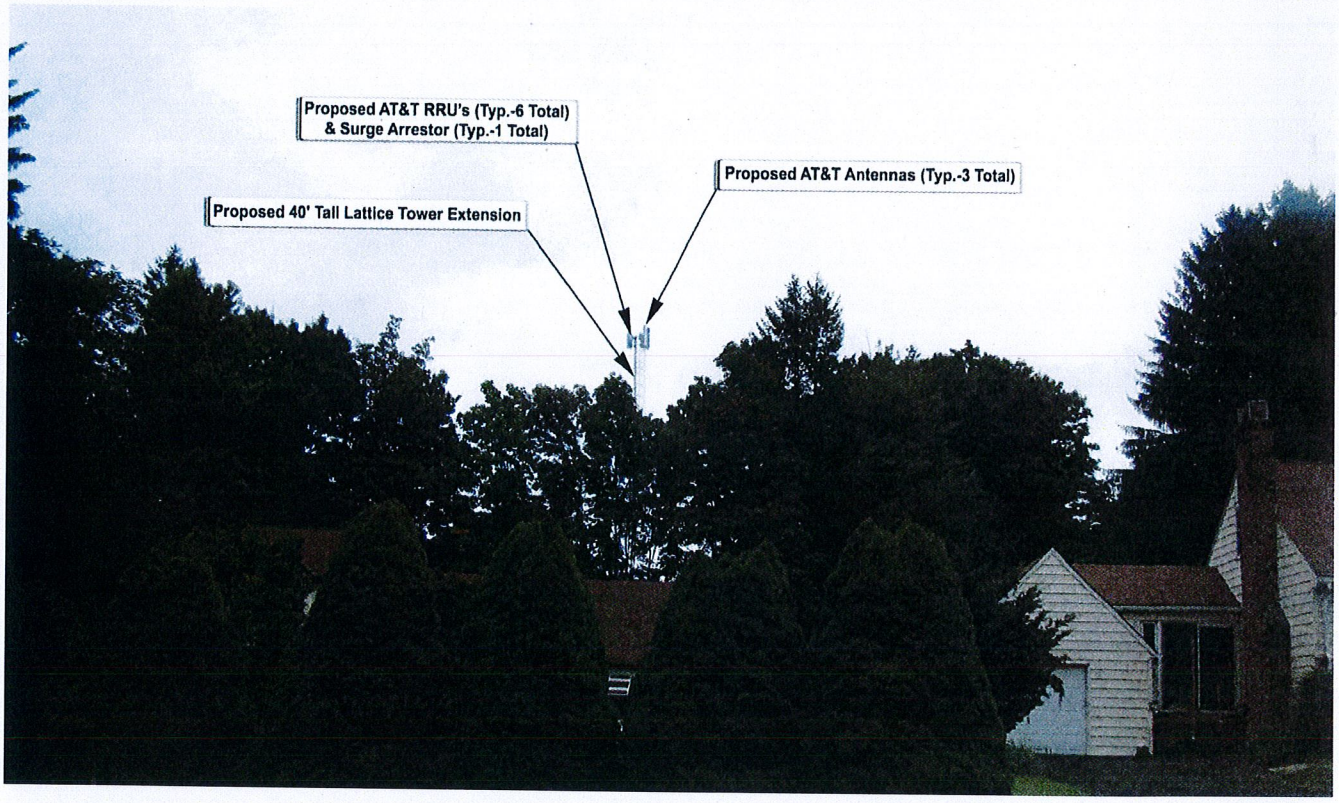


Photo-simulation showing proposed tower extension from nearby residential area on Orchard lane



View of Balloon float from the Tower Farm on West Peak

Photo-simulation showing proposed tower extension from the Tower Farm on West Peak

Exhibit B

435 MILL ST

Location	435 MILL ST	**Mblu**	109/ / 120/ /
Acct#	14081	**Owner**	SOUTHINGTON TOWN OF
Assessment	$789,380	**Appraisal**	$1,127,680
PID	10843	**Building Count**	1

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$839,570	$288,110	$1,127,680

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2020	$587,700	$201,680	$789,380

Owner of Record

Owner	SOUTHINGTON TOWN OF	**Sale Price**	$0
Co-Owner		**Certificate**	
Address	75 MAIN ST SOUTHINGTON, CT 06489-2504	**Book & Page**	0087/0075
		Sale Date	09/30/1938
		Instrument	25

Ownership History

Ownership History					
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Instrument**	**Sale Date**
SOUTHINGTON TOWN OF	$0		0087/0075	25	09/30/1938

Building Information

Building 1 : Section 1

Year Built:
Living Area: 0
Building Percent Good:

Building Attributes	
Field	**Description**
Style	Vacant w/OB

Model	
Grade:	
Stories	
Occupancy	
Exterior Wall 1	
Exterior Wall 2	
Roof Structure	
Roof Cover	
Interior Wall 1	
Interior Wall 2	
Interior Flr 1	
Interior Flr 2	
Heat Fuel	
Heat Type:	
AC Type:	
Total Bedrooms:	
Full Bthrms:	
Half Baths:	
Extra Fixtures	
Total Rooms:	
Bath Style:	
Kitchen Style:	
Total Kitchens	
Fireplaces	
Whirlpool Tubs	
Fin Bsmt Area	
Fin Bsmt Quality	
Bsmt Garages	
.	
Bsmt Type	
Attic Type	
Cath Ceiling	
Fndtn Cndtn	
Basement	

Building Photo

109 120 05/21/2015

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//\00\04\35\89.JPG)

Building Layout

(http://images.vgsi.com/photos2/SouthingtonCTPhotos//Sketches/10843_1

Building Sub-Areas (sq ft)	Legend
No Data for Building Sub-Areas	

Extra Features

Extra Features	Legend
No Data for Extra Features	

Land

Land Use

Use Code	903V
Description	Municipality Lnd
Zone	R-20/25
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	2.8
Depth	

Outbuildings

Outbuildings					Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Bldg #**
FN1	Fence - Chain			4848.00 L.F.	1
PCS	PreCast Shed/Bldg			80.00 S.F.	1
PCS	PreCast Shed/Bldg			80.00 S.F.	1
CTR	Cell Recievers			4.00 Units	1
TNK5	Elevated Tank			2000000.00 Gals	1
SHD1	Shed	MS	Masonry	160.00 S.F.	1

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$217,730	$109,610	$327,340
2018	$217,730	$87,980	$305,710
2017	$217,730	$87,980	$305,710
2016	$217,730	$87,980	$305,710
2015	$217,730	$87,980	$305,710

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2019	$152,410	$76,730	$229,140
2018	$152,410	$61,590	$214,000
2017	$152,410	$61,590	$214,000
2016	$152,410	$61,590	$214,000
2015	$152,410	$61,590	$214,000

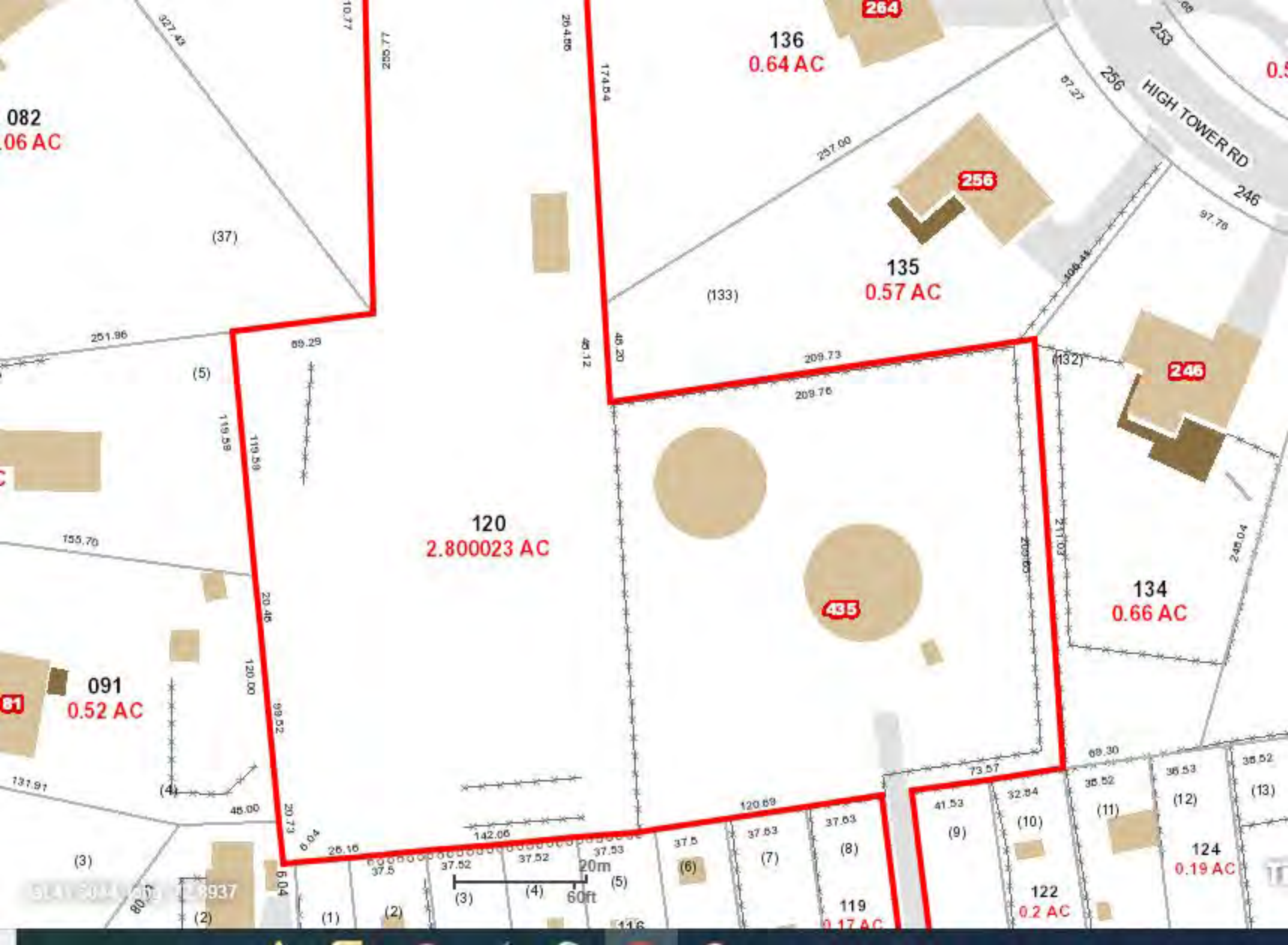

120
2.800023 AC
136
0.64 AC
135
0.57 AC
134
0.66 AC
124
0.19 AC
122
0.2 AC
119
091
0.52 AC
082
HIGH TOWER RD
264
256
246
435
(37)
(133)
(132)
(5)
(4)
(3)
(2)
(1)
(6)
(7)
(8)
(9)
(10)
(11)
(12)
(13)
20m
60ft

Exhibit C

T-Mobile

NORTHEAST, LLC.

PROJECT: ANCHOR

SITE I.D. NUMBER:

CT11239A

SITE NAME:

SOUTHINGTON / I-84

SITE ADDRESS:

435 MILL STREET

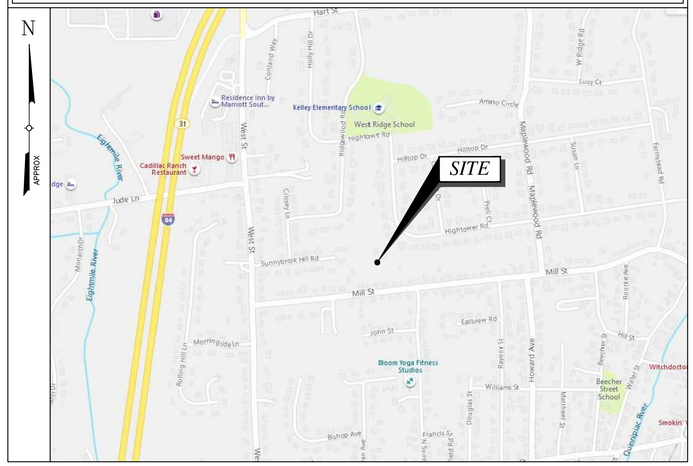
SOUTHINGTON, CT 06489

PROJECT INDEX

SITE NUMBER:	CT11239A
SITE NAME:	SOUTHINGTON/I-84
SITE ADDRESS:	435 MILL STREET SOUTHINGTON, CT 06489
PROPERTY OWNER:	TOWN OF SOUTHINGTON 75 MAIN STREET SOUTHINGTON, CT 06489
APPLICANT:	T-MOBILE NORTHEAST LLC 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002
STRUCTURE TYPE:	SELF-SUPPORT
LATTITUDE (NAD83):	41° 36' 16.94" N
LONGITUDE (NAD83):	72° 53' 38.03" W
GRADE ELEVATION:	389' (AMSL, PER GOOGLE MAPS)
ZONING:	R-20/25
PARCEL ID:	109120

PROJECT CLIENT:	NORTHEAST SITE SOLUTIONS, LLC
CONTACT:	SHELDON FREINCLE
PHONE:	(201) 776-8521
ENGINEER/ STRUCTURAL ENG:	TECTONIC ENGINEERING & SURVEYING CONSULTANTS, PC.
CONTACT:	EDWARD IAMICELI
PHONE:	(845) 567-6656x2811

VICINITY MAP (NTS)



SHEET INDEX

SHEET NO	DESCRIPTION	REVISION	DATE
T-1	TITLE SHEET	0	02/01/21
A-1	SITE PLAN	0	02/01/21
A-2	TOWER ELEVATION	0	02/01/21
A-3	EXISTING & PROPOSED EQUIPMENT PLANS	0	02/01/21
A-4	EXIST/DEMO & NEW T-MOBILE ANTENNA PLANS & ANTENNA SCHEDULE	0	02/01/21
A-5	DETAILS, SPECIFICATIONS & ANTENNA SCHEMATIC	0	02/01/21
A-6	NOTES	0	02/01/21
E-1	ELECTRICAL NOTES & ONE-LINE DIAGRAM	0	02/01/21
G-1	GROUNDING DETAILS & NOTES	0	02/01/21

CODE COMPLIANCE

CODE INFORMATION

- STATE OF CONNECTICUT BUILDING CODE, LATEST EDITION
- ANSI/TIA-222-G
- NATIONAL ELECTRIC CODE, LATEST EDITION

DESIGN NOTE

DESIGN BASED ON RFDS DATED 9/30/2020, VERSION 9.

RAN TEMPLATE: 67D5A997DB MUAC
A&L TEMPLATE: 67D5997DB_2xAIR+1OP (U21 MARKET)

STRUCTURAL NOTE

ANTENNA FRAME

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED NOVEMBER 19, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED JANUARY 26, 2021.

811 Know what's below. Call before you dig.

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

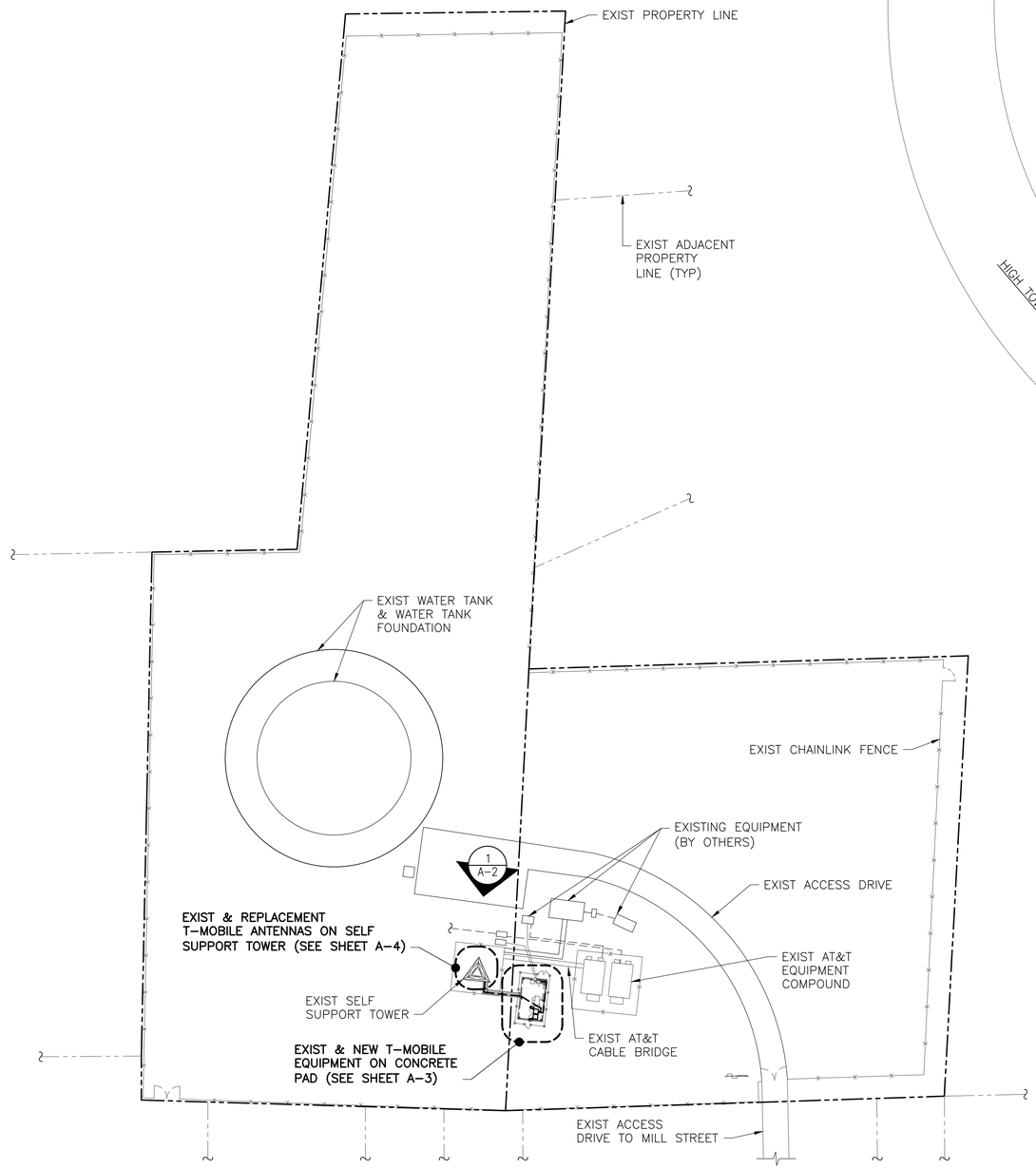
TITLE SHEET

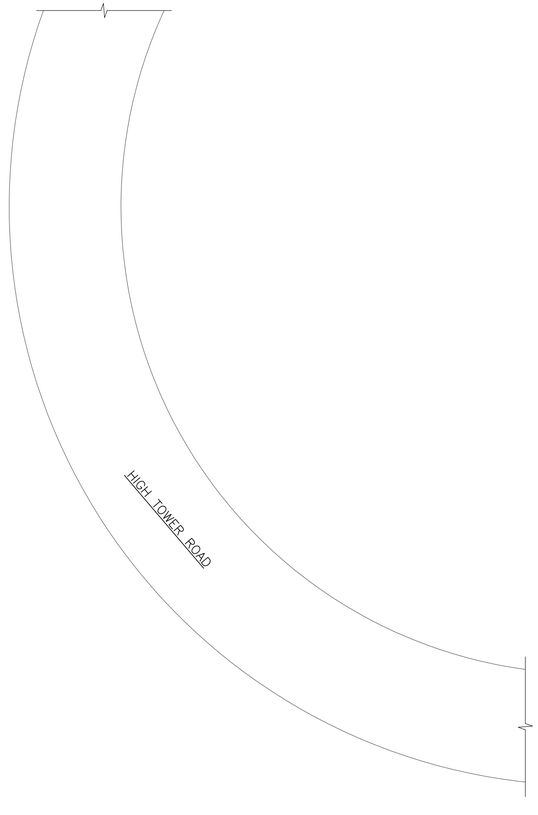
SHEET NUMBER

T-1

N

APPROX.





MILL STREET

1
A-1

SITE PLAN

SCALE: 1/32" = 1'-0"

STRUCTURAL NOTE

ANTENNA FRAME

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED NOVEMBER 19, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED JANUARY 26, 2021.

STATE OF CONNECTICUT
EDWARD N. LAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

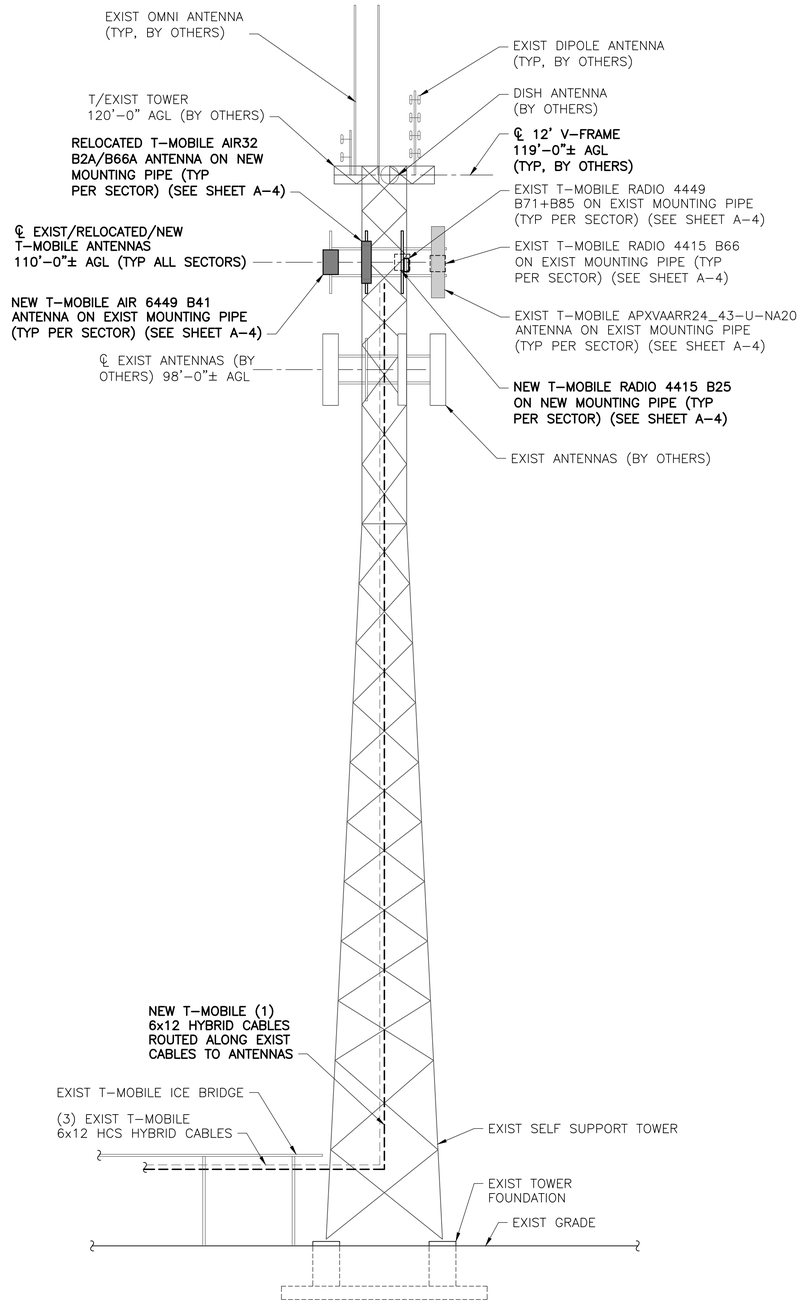
SOUTHINGTON/I-84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

SITE PLAN

SHEET NUMBER

A-1



1 / A-2 TOWER ELEVATION

SCALE: 1/8" = 1'-0"

STRUCTURAL NOTE

ANTENNA FRAME

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED NOVEMBER 19, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED JANUARY 26, 2021.

STATE OF CONNECTICUT
EDWARD N. LAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____

RF _____

CONSTRUCTION _____

OPERATIONS _____

SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

TOWER ELEVATION

SHEET NUMBER

A-2

N

APPROX.

EQUIPMENT AREA	
EXISTING CONCRETE PAD:	240± SF
TOTAL LEASE AREA:	240± SF

STRUCTURAL NOTE

ANTENNA FRAME

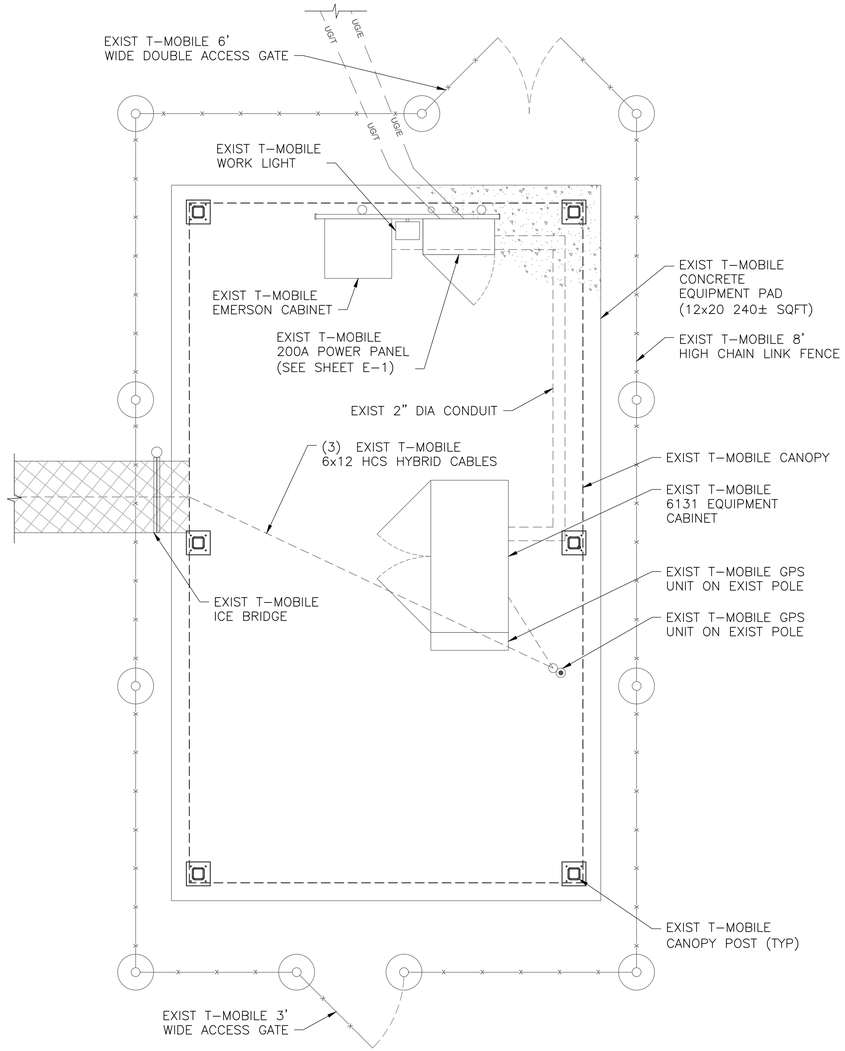
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED NOVEMBER 19, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED JANUARY 26, 2021.

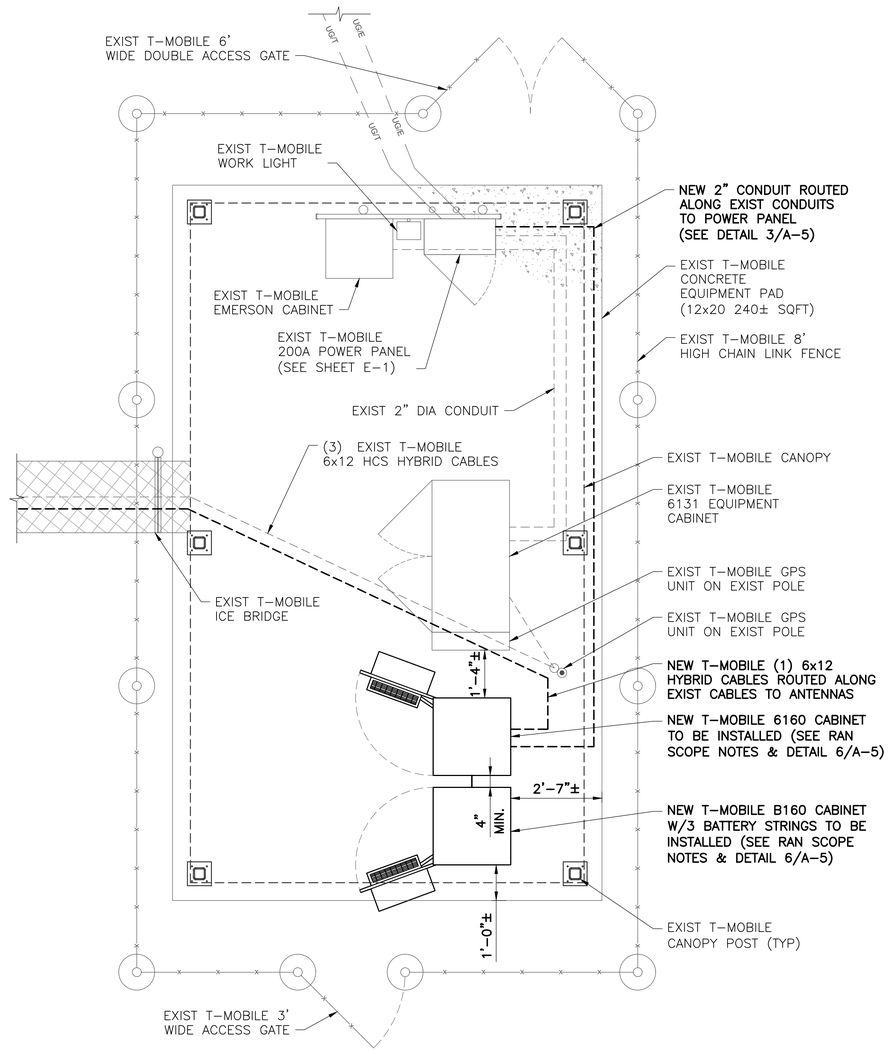
RAN SCOPE NOTES

1. ADD (1) ENCLOSURE 6160.
2. ADD (1) BATTERY CABINET B160.
3. ADD (1) IXRE ROUTER TO NEW ENCLOSURE 6160.
4. ADD (1) BB6630 FOR L2500 TO NEW ENCLOSURE 6160.
5. ADD (1) BB6648 FOR N2500 TO NEW ENCLOSURE 6160.
6. ADD (1) PSU 4813 TO NEW ENCLOSURE 6160.
7. ADD (1) 6x12 HCS. LENGTH OF NEW HCS TO MATCH EXIST. CONNECT DC FOR THE AIR 6449 B41 TO THE PSU4813 VOLTAGE BOOSTER.
8. EXISTING (3) 6x12 HCS.



1 / A–3 EXIST T–MOBILE EQUIPMENT PLAN

SCALE: 3/4" = 1'–0"



NOTES: ALL EQUIPMENT TO BE GROUNDED TO EXISTING GROUND RING.

2 / A–3 NEW T–MOBILE EQUIPMENT PLAN

SCALE: 3/4" = 1'–0"

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534–5959
(800) 829–6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____

RF _____

CONSTRUCTION _____

OPERATIONS _____

SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I–84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

EXIST AND PROPOSED EQUIPMENT PLANS

SHEET NUMBER

A–3

N

APPROX.

STRUCTURAL NOTE

ANTENNA FRAME

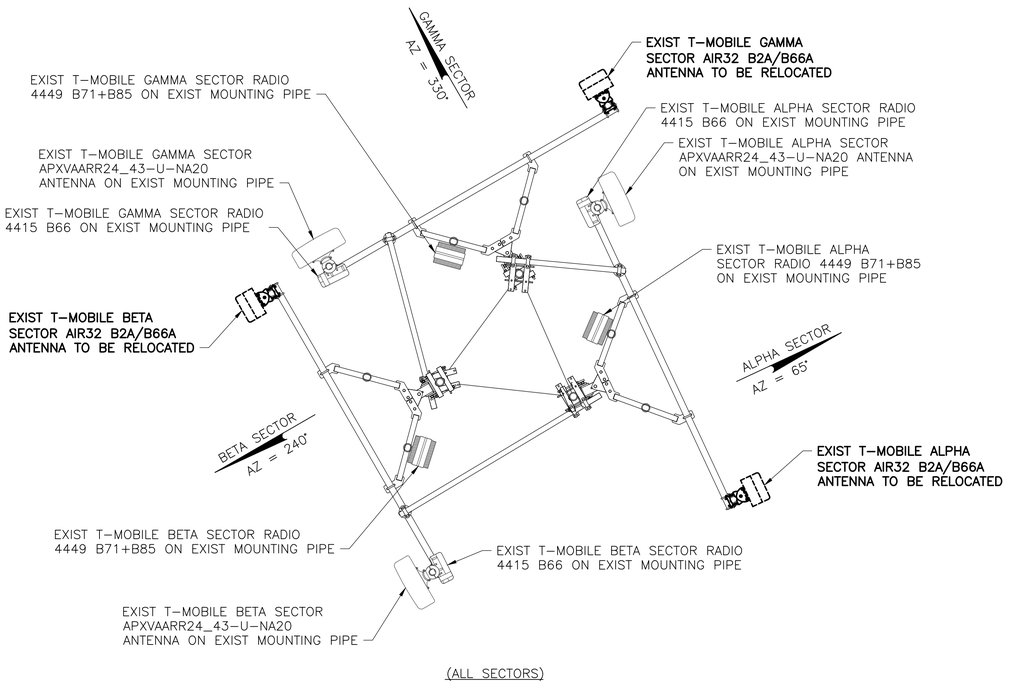
REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED NOVEMBER 19, 2020.

TOWER

REFER TO THE STRUCTURAL ANALYSIS REPORT BY TECTONIC ENGINEERING & SURVEYING CONSULTANTS P.C. DATED JANUARY 26, 2021.

ANTENNA CABLE SCHEDULE

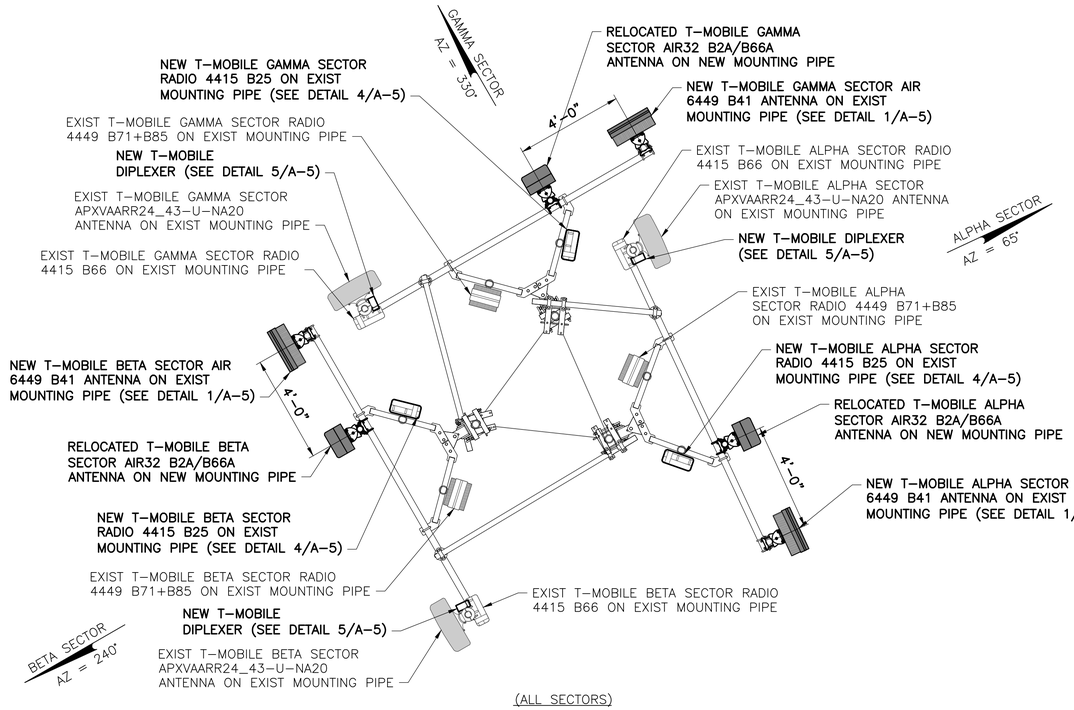
SECTOR MARK	ANTENNA MODEL	AZIMUTH	ELEC DOWNTILT	MECH DOWNTILT	ANTENNA CENTERLINE	SECTOR	STATUS	TMA/RRU	CABLE	JUMPER TYPE	CABLE LENGTH
A-1 LTE/UMTS	RFS APXVAARR24-43-U-NA20	65°	2°	0°	110'-0"±	LEFT ALPHA	EXIST	0/3	(1) EXIST 6x12 HYBRID CABLE	1/2 COAX	165'-0"±
										1/2 COAX	165'-0"±
A-2 LTE/GSM	**ERICSSON AIR32 B2A/B4P**	**65°**	**2°**	**0°**	**110'-0"±**	**CENTER ALPHA**	**RELOCATED**	0/0	SHARED 6x12 HYBRID CABLE	FIBER	165'-0"±
										FIBER	165'-0"±
A-3 LTE	**ERICSSON AIR6449 B41**	**65°**	**2°**	**0°**	**110'-0"±**	**RIGHT ALPHA**	**NEW**	**0/0**	**(1) NEW 6x12 HYBRID CABLE**	**FIBER**	**165'-0"±**
										FIBER	**165'-0"±**
B-1 LTE/UMTS	RFS APXVAARR24-43-U-NA20	240°	2°	0°	110'-0"±	LEFT BETA	EXIST	0/3	(1) EXIST 6x12 HYBRID CABLE	1/2 COAX	165'-0"±
										1/2 COAX	165'-0"±
B-2 LTE/GSM	**ERICSSON AIR32 B2A/B4P**	**240°**	**2°**	**0°**	**110'-0"±**	**CENTER BETA**	**RELOCATED**	0/0	SHARED 6x12 HYBRID CABLE	FIBER	165'-0"±
										FIBER	165'-0"±
B-3 LTE	**ERICSSON AIR6449 B41**	**240°**	**2°**	**0°**	**110'-0"±**	**RIGHT BETA**	**NEW**	**0/0**	**(1) NEW 6x12 HYBRID CABLE**	**FIBER**	**165'-0"±**
										FIBER	**165'-0"±**
C-1 LTE/UMTS	RFS APXVAARR24-43-U-NA20	330°	2°	0°	110'-0"±	LEFT GAMMA	EXIST	0/3	(1) EXIST 6x12 HYBRID CABLE	1/2 COAX	165'-0"±
										1/2 COAX	165'-0"±
C-2 LTE/GSM	**ERICSSON AIR32 B2A/B4P**	**330°**	**2°**	**0°**	**110'-0"±**	**CENTER GAMMA**	**RELOCATED**	0/0	SHARED 6x12 HYBRID CABLE	FIBER	165'-0"±
										FIBER	165'-0"±
C-3 LTE	**ERICSSON AIR6449 B41**	**330°**	**2°**	**0°**	**110'-0"±**	**RIGHT GAMMA**	**NEW**	**0/0**	**(1) NEW 6x12 HYBRID CABLE**	**FIBER**	**165'-0"±**
										FIBER	**165'-0"±**



(ALL SECTORS)

1 / A-4 EXIST/DEMO T-MOBILE ANTENNA PLAN

SCALE: 3/8" = 1'-0"



(ALL SECTORS)

2 / A-4 NEW T-MOBILE ANTENNA PLAN

SCALE: 3/8" = 1'-0"

STATE OF CONNECTICUT
EDWARD N. IAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road — Phone: (845) 534-5959
P.O. Box 37 — (800) 829-6531
Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

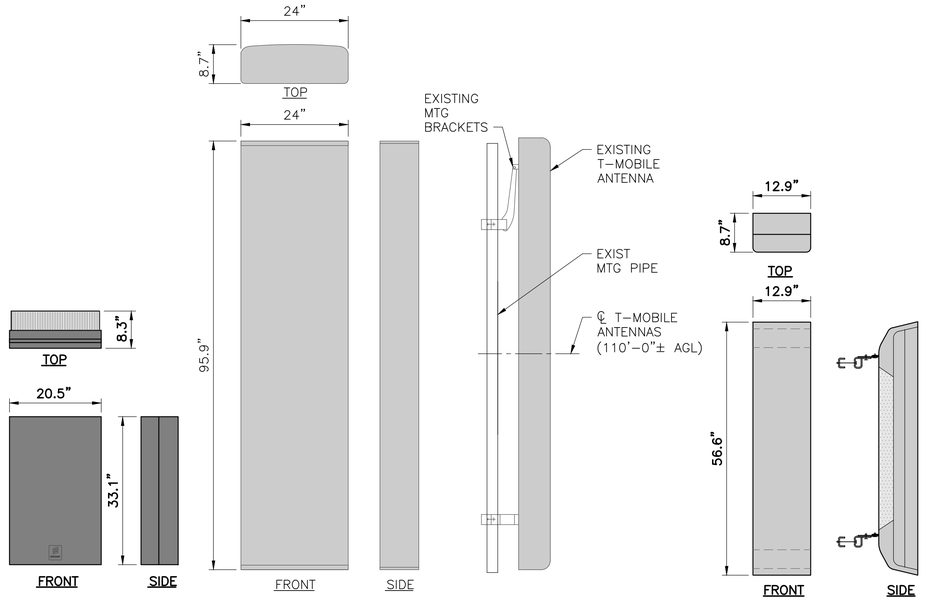
SOUTHINGTON/I-84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

EXIST/DEMO & NEW T-MOBILE ANTENNA PLANS & ANTENNA SCHEDULE

SHEET NUMBER

A-4



AIR6449 B41
WEIGHT: 103 LBS

PROPOSED

RFS: APXVAARR24_43_U_NA20
WEIGHT: 128 LBS

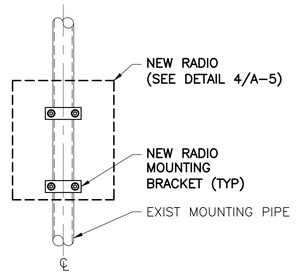
EXISTING

AIR32 DUAL BAND (DB) B66Ag/B2a
WEIGHT: 132.2 LBS

RELOCATED

1 A-5 ANTENNA DETAILS

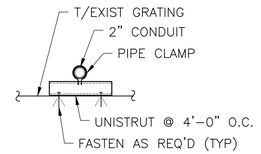
SCALE: 3/4" = 1'-0"



NOTE: MOUNTING OF RADIO TO MOUNTING PIPE, INCLUDING MOUNTING BRACKET ASSEMBLY SHALL BE PER MANUFACTURER DIRECTION.

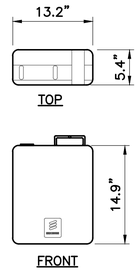
2 A-5 RADIO MOUNTING DETAIL

SCALE: 1" = 1'-0"



3 A-5 CONDUIT ROUTING DETAIL

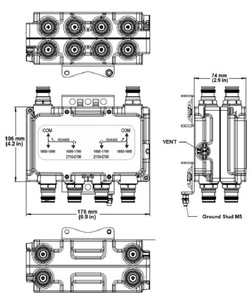
SCALE: 1-1/2" = 1'-0"



RRUS-4415 B25
WEIGHT 46.3 LB

4 A-5 RADIO DETAIL

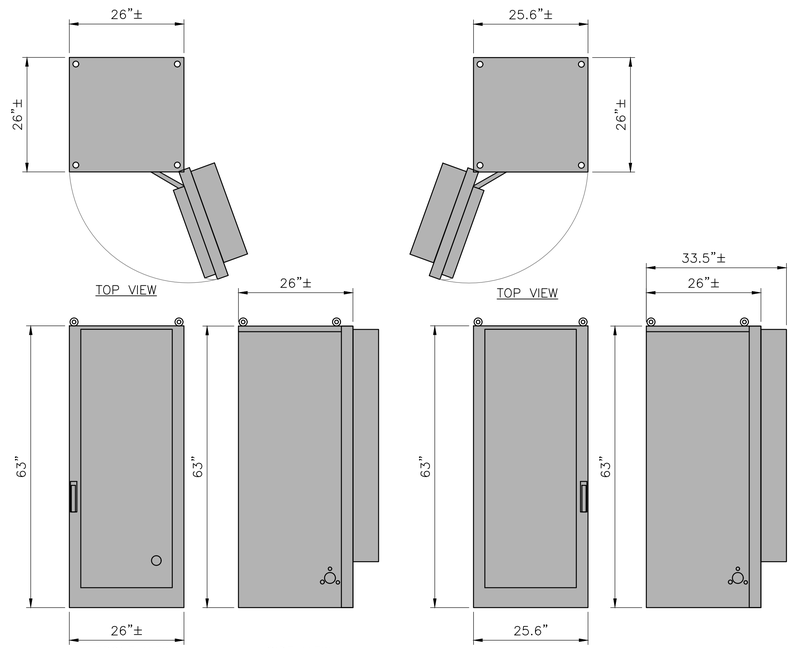
SCALE: 1" = 1'-0"



COMMSCOPE: SDX1926Q-43/E14F05P86
WEIGHT: 6.614 LBS

5 A-5 DIPLEXER DETAIL

SCALE: 1" = 1'-0"



WEIGHT: 1883 LBS (W/3 BATTERY STRINGS)

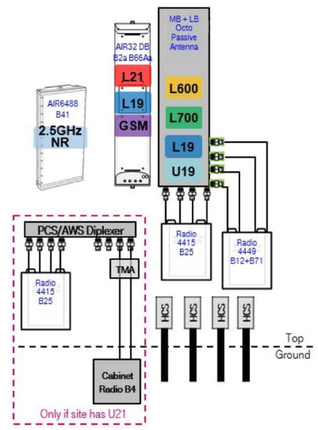
ERICSSON ENCLOSURE B160

WEIGHT: 605 LB (FULLY LOADED)

ERICSSON ENCLOSURE 6160 AC

6 A-5 EQUIPMENT CABINET SPECIFICATIONS

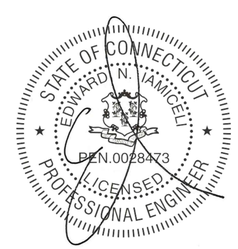
SCALE: NTS



TYP ALL SECTORS

7 A-5 ANTENNA SCHEMATIC

SCALE: NTS



Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

DETAILS,
SPECIFICATIONS &
ANTENNA SCHEMATIC

SHEET NUMBER

A-5

GENERAL NOTES

1. ALL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE STATE OF CONNECTICUT BUILDING CODE, LATEST VERSION AND ALL OTHER APPLICABLE CODES AND ORDINANCES.
2. CONTRACTOR SHALL VISIT THE JOB SITE AND FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND MAKE PROVISIONS AS TO THE COST THEREOF. CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS AND DIMENSIONS AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
3. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY, UNLESS OTHERWISE NOTED. THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO EFFECT ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
4. DIMENSIONS SHOWN ARE TO FINISH SURFACES, UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS. SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, EXISTING CONDITIONS AND/OR DESIGN INTENT, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE AUTHORIZED REPRESENTATIVE OR THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK.
5. DETAILS ARE INTENDED TO SHOW END RESULT OF DESIGN. MINOR MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS, AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF THE WORK.
6. CONTRACTOR SHALL RECEIVE CLARIFICATION IN WRITING, AND SHALL RECEIVE IN WRITING AUTHORIZATION TO PROCEED BEFORE STARTING WORK ON ANY ITEMS NOT CLEARLY DEFINED OR IDENTIFIED BY THE CONTRACT DOCUMENTS.
7. ONCE THE CONTRACTOR HAS RECEIVED AND ACCEPTED THE "NOTICE TO PROCEED," CONTRACTOR WILL CONTACT THE CONSTRUCTION MANAGER OF RECORD A MINIMUM OF 48 HOURS PRIOR TO WORK START.
8. CONTRACTOR SHALL NOTIFY THE CONSTRUCTION MANAGER OF ALL PRODUCTS OR ITEMS NOTED AS "EXISTING" WHICH ARE NOT FOUND TO BE IN THE FIELD.
9. CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK USING THE BEST CONSTRUCTION SKILLS AND ATTENTION. CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, PROCEDURES, AND FOR COORDINATING ALL PORTIONS OF THE WORK UNDER CONTRACT, UNLESS OTHERWISE NOTED.
10. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMEN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
11. CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF THE WORK AREA, ADJACENT AREAS, AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFORM TO ALL OSHA REQUIREMENTS.
12. CONTRACTOR SHALL COORDINATE HIS WORK AND SCHEDULE HIS ACTIVITIES AND WORKING HOURS IN ACCORDANCE WITH THE REQUIREMENTS OF THE OWNER.
13. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING HIS WORK WITH THE WORK OF OTHERS AS IT MAY RELATE TO RADIO EQUIPMENT, ANTENNAS AND ANY OTHER PORTIONS OF THE WORK.
14. CONTRACTOR SHALL MAINTAIN LIABILITY INSURANCE TO PROTECT THE OWNER.
15. INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY INDICATED OR WHERE LOCAL CODES OR REGULATIONS TAKE PRECEDENCE.
16. MAKE NECESSARY PROVISIONS TO PROTECT EXISTING SURFACES, EQUIPMENT, IMPROVEMENTS, AND PIPING. REPAIR ANY DAMAGE THAT OCCURS DURING CONSTRUCTION.
17. REPAIR ALL EXISTING SURFACES DAMAGED DURING CONSTRUCTION SUCH THAT THEY MATCH AND BLEND WITH ADJACENT SURFACES.
18. KEEP CONTRACT AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS AND RUBBISH. EQUIPMENT NOT SPECIFIED AS REMAINING ON THE PROPERTY OF THE OWNER SHALL BE REMOVED. LEAVE PREMISES IN CLEAN CONDITION AND FREE FROM PAINT SPOTS, DUST, OR SMUDGES OF ANY NATURE. CONTRACTOR SHALL BE RESPONSIBLE FOR MAINTAINING ALL ITEMS UNTIL COMPLETION OF CONSTRUCTION.
19. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
20. PROVIDE 48 HOURS WRITTEN NOTICE TO THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
21. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS AND OTHER DOCUMENTATION SHALL BE TURNED OVER TO AT COMPLETION OF CONSTRUCTION.
22. COMPLETE JOB SHALL BE GUARANTEED FOR A PERIOD OF ONE (1) YEAR AFTER DATE OF ACCEPTANCE BY. ANY WORK, MATERIALS OR EQUIPMENT FOUND TO BE DEFECTIVE DURING THAT PERIOD SHALL BE CORRECTED IMMEDIATELY UPON WRITTEN NOTIFICATION AT NO ADDITIONAL COST TO T–MOBILE.

STRUCTURAL NOTES

1. CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE ENGINEER.
2. DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS", LATEST EDITION.
3. STRUCTURAL STEEL BEAMS SHALL CONFORM TO ASTM A992 (Fy=50ksi). STRUCTURAL STEEL PLATES AND ANGLES SHALL CONFORM TO ASTM A36.
4. ROUND AND SQUARE HOLLOW STRUCTURAL SECTIONS (HSS) CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE C.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD–FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 "PIPE, STEEL, BLACK AND HOT–DIPPED, ZINC–COATED WELDED AND SEAMLESS", TYPE E OR S, GRADE B.
6. CONNECTIONS: WELD OR BOLT CONNECTIONS, AS INDICATED:

   A) CONNECTIONS NOT DETAILED ON THE DRAWINGS SHALL CONFORM TO THE REQUIREMENTS OF THE CITED AISC SPECIFICATION.

   B) STRUCTURAL BOLTS SHALL CONFORM TO THE LATEST ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS".

   C) WHERE THE REACTION VALUES OF BEAMS, BRACING, STRUTS, ETC., ARE NOT SHOWN ON THE DRAWINGS THE CONNECTIONS SHALL BE DESIGNED TO SUPPORT THE END REACTION DERIVED FROM THE TABLES AND FORMULA OF UNIFORM LOAD CONSTANTS IN PART 2, NINTH EDITION, OF THE AISC MANUAL OF STEEL CONSTRUCTION FOR THE GIVEN MEMBER SIZE, SPAN AND YIELD STRENGTH.

   D) MINIMUM 3/16" FILLET E70–XX WELD SHALL APPLY UNLESS NOTED.

   E) MINIMUM 1/2" DIA. A325 BOLTS SHALL APPLY UNLESS NOTED.

   F) MINIMUM SIZE OF CLIP ANGLES SHALL BE L3x3x3/8" UNLESS NOTED.

   G) ALL GUSSET PLATES SHALL BE 3/8" THICK UNLESS NOTED.

   H) ALL HOLES FOR BOLTS SHALL BE 1/16 INCH LARGER THAN THE BOLT DIAMETER WITH AN EDGE DISTANCE OF AT LEAST 1 1/2 TIMES THE BOLT DIAMETER AND A SPACING OF AT LEAST 3 TIMES THE BOLT DIAMETER. ALL BOLTS SHALL BE PROVIDED WITH PALNUTS OR LOCK NUTS.
7. STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS AND CONFORM TO ASTM A325 "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS", LATEST EDITION. BOLTS SHALL BE 3/4 INCH DIA. UNLESS OTHERWISE NOTED.
8. CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES".
9. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
10. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
11. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
12. ALL STEEL SUPPORTS SHALL BE INSTALLED WITH DOUBLE NUTS AND SHALL BE INSTALLED SNUG TIGHT.
13. SLEEVE ANCHORS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 3, CLASS 3, AS MANUFACTURED BY HILTI FASTENING SYSTEMS OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE THREE (3) INCHES.
14. EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF–S–325, GROUP II, TYPE 4, CLASS 1, HILTI KWIK BOLT II OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS. MINIMUM EMBEDMENT SHALL BE FOUR (4) INCHES.
15. EPOXY ANCHORING SYSTEM SHALL BE THE HILTI HY–270 FOR MASONRY CONSTRUCTION WITH HOLLOW BRICK OR BLOCK & THE HILTI HIT HY200 INJECTION ADHESIVE ANCHOR FOR GROUT FILLED CONCRETE MASONRY UNITS AND CONCRETE. EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF 1/2"ø STAINLESS STEEL ANCHOR ROD W/NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE FOR THE HY–270 ONLY & AN EPOXY ADHESIVE (6" MIN EMBEDMENT). THE INSTALLATION PROCEDURE SHALL BE AS FOLLOWS

   A. DRILL THE HOLE USING MANUFACTURER RECOMMENDED DRILL BIT UP TO SPECIFIED DEPTH. HAMMERING IS NOT PERMITTED.

   B. CLEAN THE HOLE USING NYLON BRUSH AND/OR COMPRESSED AIR. THE HOLE SHOULD BE CLEAR OF ANY LOOSE MATERIAL. IF WET, THE MASONRY SHOULD BE ALLOWED TO DRY FULLY BEFORE ANCHOR INSTALLATION.

   C. INSERT SPECIFIED SCREEN TUBE INTO THE HOLE.

   D. FILL THE SCREEN TUBE COMPLETELY WITH ADHESIVE, BEGINNING AT THE BOTTOM END.

   E. INSERT ANCHOR ROD OR INTERNALLY THREADED INSERT INTO THE ADHESIVE–FILLED SCREEN TUBE, TWISTING SLIGHTLY.

   F. LOAD FASTENER ONLY AFTER MANUFACTURER SPECIFIED CURE TIME HAS ELAPSED.
16. GRATING SHALL BE GALVANIZED WELDED STEEL BAR GRATING TYPE W/BA WITH 1–1/4" BEARING BARS AT 1–3/16" OC. FASTEN TO SUPPORTING MEMBERS WITH SADDLE–TYPE CLIPS AT 2'–0" O.C. AND BAND ALL EXPOSED EDGES.
17. SUBMIT DRAWINGS OF ALL STRUCTURAL AND MISCELLANEOUS STEEL TO THE ENGINEER FOR APPROVAL AND INCORPORATE ALL COMMENTS PRIOR TO FABRICATION.
18. INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NONCONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE ENGINEER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE ENGINEER APPROVAL.
19. ALL WORK SHALL BE INSPECTED BY THE ENGINEER DURING AND AT THE COMPLETION OF CONSTRUCTION.
20. CONTRACTOR TO REMOVE MASTIC ON THE EXISTING WALL/PARAPET AT EVERY STEEL SUPPORT ATTACHMENT AND REPOINT MASONRY AS REQUIRED. A BED OF SILICONE SHALL BE APPLIED BEHIND AND ALL AROUND THE STEEL SUPPORT ATTACHMENT TO MAKE IT WEATHERPROOF.
21. HAMMER DRILLS ARE NOT TO BE USED WHEN DRILLING HOLES FOR SLEEVE OR EXPANSION BOLTS INSTALLED IN MASONRY BLOCKS/BRICKS.
22. ALL HOLES TO BE ADDED IN THE FIELD SHALL BE PUNCHED OR DRILLED. NO HOLE BURNING SHALL BE ALLOWED.
23. NOTES ARE NOT PROJECT SPECIFIC.

SITE NOTES

1. ALL SITE WORK SHALL BE AS INDICATED ON THE DRAWING.
2. RUBBISH, STUMPS, DEBRIS, STICKS, STONES AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF LEGALLY.
3. THE SITE SHALL BE GRADED TO CAUSE SURFACE WATER TO FLOW AWAY FROM THE BTS EQUIPMENT AND TOWER AREAS.
4. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUND. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
5. THE SUBGRADE SHALL BE COMPACTED AND BROUGHT TO A SMOOTH UNIFORM GRADE PRIOR TO FINISHED SURFACE APPLICATION.
6. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES WHERE ENCOUNTERED IN THE WORK, SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY ENGINEERS. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR PIER DRILLING AROUND OR NEAR UTILITIES.
7. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED AND/OR CAPPED, PLUGGED OR OTHERWISE DISCONTINUED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, SUBJECT TO THE APPROVAL OF ENGINEER.
8. THE AREAS OF THE OWNERS PROPERTY DISTURBED BY THE WORK SHALL BE GRADED TO A UNIFORM SLOPE, FERTILIZED, SEEDED, AND COVERED WITH MULCH.
9. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE LOCAL GUIDELINES FOR EROSION AND SEDIMENT CONTROL.
10. CARE SHALL BE TAKEN TO RETAIN NATURAL GROWTH AND PREVENT DAMAGE TO TREES WITHIN AND OUTSIDE THE LIMITS OF CONSTRUCTION AND SPECIFIED WORK AREAS CAUSED BY EQUIPMENT AND MATERIALS. ANY DAMAGE TO THIS NATURAL GROWTH SHALL BE RESTORED AT THE EXPENSE OF THE CONTRACTOR.
11. ALL AREAS DISTURBED BY THE CONTRACTOR WITHOUT AUTHORIZATION SHALL BE RESTORED BY THE CONTRACTOR.
12. IN THE EVENT THE CONTRACTOR DAMAGES AN EXISTING UTILITY SERVICE CAUSING AN INTERRUPTION IN SAID SERVICE, HE SHALL IMMEDIATELY COMMENCE WORK TO RESTORE SERVICE AND MAY NOT CEASE HIS WORK OPERATION UNTIL SERVICE IS RESTORED.

STATE OF CONNECTICUT
EDWARD N. LAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road — Phone: (845) 534–5959
P.O. Box 37 — (800) 829–6531
Mountainville, NY 10953 — www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550 — Phone: (845) 567–6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY _____ DATE _____

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

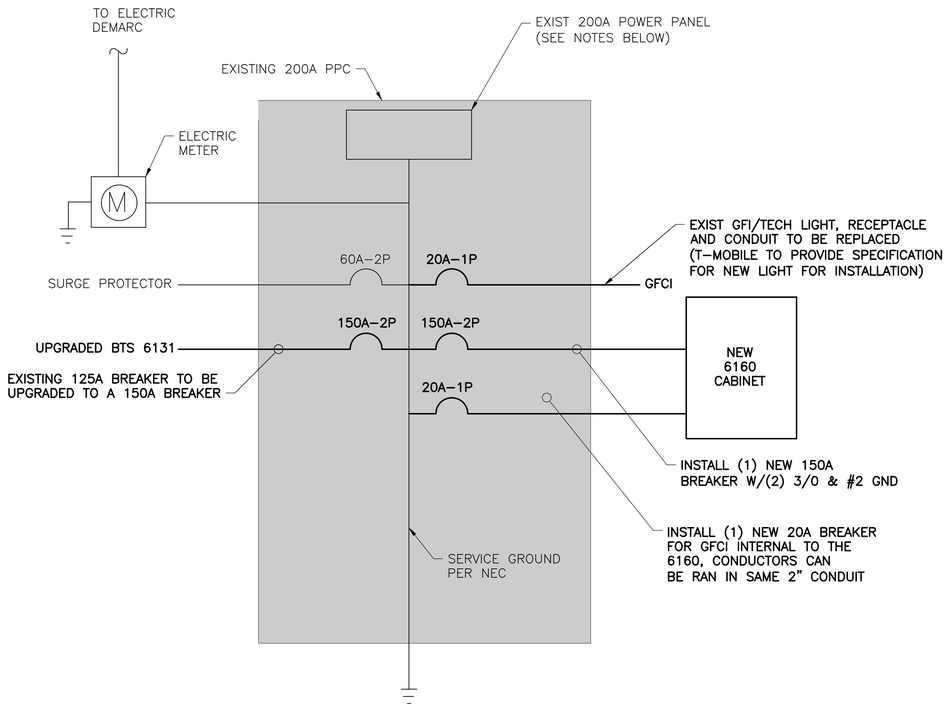
SOUTHINGTON/I–84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

NOTES

SHEET NUMBER

A–6



NOTES:
1. THE ABOVE DIAGRAM IS GENERIC AND ANY ELECTRICAL WORK SHALL BE COMPLETED BY A LICENSED ELECTRICIAN IN ACCORDANCE WITH NEC STANDARDS.
2. ELECTRICAL CONSULT SHALL BE PERFORMED TO CONSTRUCTION TO CONFIRM THE POWER REQUIREMENTS AND FEASIBILITY.

1 / E–1 ONE–LINE DIAGRAM

SCALE: NTS

GENERAL ELECTRICAL NOTES

1. CONTRACTOR SHALL PERFORM ALL VERIFICATION OBSERVATION TESTS, AND EXAMINATION WORK PRIOR TO THE ORDERING OF THE ELECTRICAL EQUIPMENT AND THE ACTUAL CONSTRUCTION. CONTRACTOR SHALL ISSUE A WRITTEN NOTICE OF ALL FINDINGS TO THE ENGINEER LISTING ALL MALFUNCTIONS, FAULTY EQUIPMENT AND DISCREPANCIES.
2. CONTRACTOR SHALL PROVIDE ALL LABOR, MATERIALS, INSURANCE, EQUIPMENT, INSTALLATION, CONSTRUCTION TOOLS, TRANSPORTATION, ETC., FOR A COMPLETE AND PROPERLY OPERATIVE SYSTEM ENERGIZED THROUGHOUT AND AS INDICATED ON DRAWINGS, AS SPECIFIED HEREIN AND/OR AS OTHERWISE REQUIRED.
3. ALL MATERIALS AND EQUIPMENT SHALL BE NEW AND IN PERFECT CONDITION WHEN INSTALLED AND SHALL BE OF THE BEST GRADE AND OF THE SAME MANUFACTURER THROUGHOUT FOR EACH CLASS OR GROUP OF EQUIPMENT. MATERIALS SHALL BE LISTED AND APPROVED BY UNDERWRITER'S LABORATORIES (U.L.) AND SHALL BEAR THE INSPECTION LABEL "J" WHERE SUBJECT TO SUCH APPROVAL. MATERIALS SHALL MEET WITH APPROVAL OF ALL GOVERNING BODIES HAVING JURISDICTION. AND SHALL BE MANUFACTURED IN ACCORDANCE WITH APPLICABLE STANDARDS ESTABLISHED BY ANSI, NEMA AND NBFU.
4. CONTRACTOR TO COORDINATE WITH SITE OWNER FOR CONNECTION OF TEMPORARY AND PERMANENT POWER TO THE SITE. THE TEMPORARY POWER AND ALL HOOKUP COSTS TO BE PAID BY CONTRACTOR.
5. ALL CIRCUIT BREAKERS, FUSES AND ELECTRICAL EQUIPMENT SHALL HAVE AN INTERRUPTING RATING NOT LESS THAN THE MAXIMUM SHORT CIRCUIT CURRENT TO WHICH THEY MAY BE SUBJECTED, AND A MINIMUM OF 10,000 A.I.C.
6. ALL ELECTRICAL EQUIPMENT SHALL BE LABELED WITH PERMANENT ENGRAVED PLASTIC LABELS.
7. METER SOCKETS AMPERES, VOLTAGE AND NUMBER OF PHASES SHALL BE NOTED AND SHALL BE MANUFACTURED BY SQUARE "D" COMPANY, SANGAMO OR APPROVED EQUAL. METER SOCKET SHALL BE APPROVED BY UTILITY COMPANY PRIOR TO INSTALLATION.
8. WIRE AND CABLE CONDUCTORS SHALL BE COPPER #12 AWG MINIMUM WITH TYPE THHN INSULATION UNLESS SPECIFICALLY NOTED OTHERWISE.
9. ALL CONDUCTORS SHALL BE COPPER.
10. USE T–TAP CONNECTIONS ON ALL MULTI–CIRCUITS WITH COMMON NEUTRAL CONDUCTOR FOR LIGHTING FIXTURES.
11. EACH CONDUCTOR OF EVERY SYSTEM SHALL BE PERMANENTLY TAGGED IN EACH PANEL BOARD, PULLBOX, J–BOX, SWITCH BOX, ETC., IN COMPLIANCE WITH THE OCCUPATIONAL SAFETY AND HEALTH ACT (O.S.H.A.)
12. CONDUIT:
    A. RIGID CONDUIT SHALL BE U.L. LABEL GALVANIZED ZINC COATED WITH ZINC INTERIOR AND SHALL BE USED WHEN INSTALLED IN OR UNDER CONCRETE SLABS, IN CONTACT WITH THE EARTH, UNDER PUBLIC ROADWAYS, IN MASONRY WALLS OR EXPOSED ON BUILDING EXTERIOR.
    B. INTERMEDIATE METAL CONDUIT SHALL BE U.L. LABEL, FITTINGS SHALL BE THREADED ALUMINUM OR STEEL AND SHALL BE USED FOR ALL EXTERIOR RUNS. THREADLESS COUPLINGS AND CONNECTORS SHALL NOT BE USED.
    C. ELECTRICAL METALLIC TUBING (EMT) SHALL HAVE U.L. LABEL, FITTINGS SHALL BE NO SET SCREW OR CRIMP TYPE FITTINGS SHALL BE USED. GLAND RING COMPRESSION TYPE. EMT SHALL BE USED ONLY FOR INTERIOR RUNS.
    D. FLEXIBLE METALLIC CONDUIT SHALL HAVE U.L. LISTED LABEL AND MAY BE USED WHERE PERMITTED BY CODE. FITTINGS SHALL BE "JAKE" OR "SQUEEZE" TYPE, SEAL TIGHT FLEXIBLE CONDUIT. ALL CONDUIT IN EXCESS OF SIX FEET IN LENGTH SHALL HAVE FULL SIZE GROUND WIRE.
    E. CONDUIT SHALL BE SIZED PER THE NEC AND AS SHOWN.
    F. CONDUIT RUNS MAY BE SURFACE MOUNTED IN CEILINGS OR WALLS UNLESS INDICATED OTHERWISE. CONDUIT INDICATED SHALL RUN PARALLEL OR AT RIGHT ANGLES TO CEILING, FLOOR OR BEAMS. VERIFY EXACT ROUTING OF ALL EXPOSED CONDUIT WITH OWNER PRIOR TO INSTALLING.
    G. ALL CONDUIT ONLY (C.O.) RUNS SHALL HAVE A PULL WIRE OR ROPE.
13. COVERPLATES SHALL BE BRUSHED STAINLESS STEEL FOR ALL SWITCHES, RECEPTACLES, TELEPHONE AND BLANKED OUTLETS, AND SHALL HAVE ENGRAVED LETTERING WHERE INDICATED WEATHERPROOF RECEPTACLES SHALL HAVE SIERRA #WPD–8 LIFT COVERPLATES.
14. REFER TO MANUFACTURERS MANUAL FOR RECOMMENDED FUSE AND WIRE SIZES.
15. ALL FINAL CONNECTIONS TO THE EQUIPMENT ARE TO BE OF FLEXIBLE WEATHERPROOF CONDUIT TO MEET APPLICABLE CODES.
16. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
17. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2, UNLESS OTHERWISE NOTED.
18. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE CONSTRUCTION MANAGER. CLEAN PREMISES OF ALL DEBRIS RESULTING FROM WORK AND LEAVE WORK IN A COMPLETE AND UNDAMAGED CONDITION.
19. PROVIDE CONSTRUCTION MANAGER WITH ONE SET OF COMPLETE ELECTRICAL "AS INSTALLED" DRAWINGS AT THE COMPLETION OF THE JOB, SHOWING ACTUAL DIMENSIONS, ROUTINGS, AND CIRCUITS.
20. CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING WITH GAINING APPROVALS AND PAYING ALL FEES ASSESSED BY UTILITY COMPANY FOR ELECTRICAL SERVICE.

STATE OF CONNECTICUT
EDWARD N. LAMICELI
PEN.0028473
LICENSED
PROFESSIONAL ENGINEER

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534–5959
(800) 829–6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567–6656

T-Mobile NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY	DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

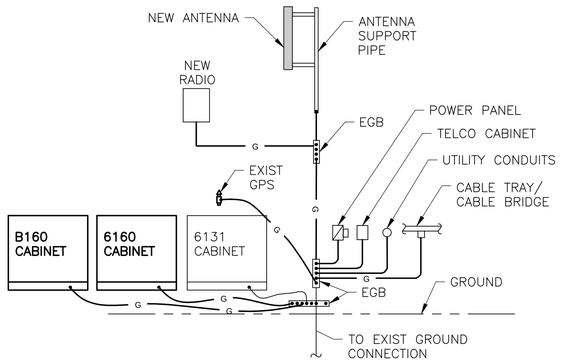
SOUTHINGTON/I–84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

ELECTRICAL NOTES & ONE–LINE DIAGRAM

SHEET NUMBER

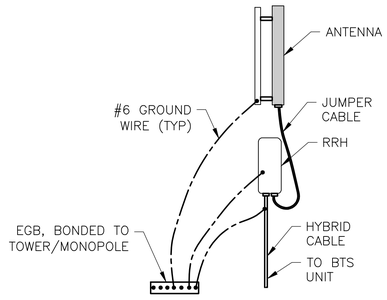
E–1



NOTE: CONTRACTOR SHALL CONFIRM ALL EQUIPMENT IS GROUNDED. IF NOT, CONTRACTOR SHALL GROUND EQUIPMENT AS SHOWN AND AS REQUIRED.

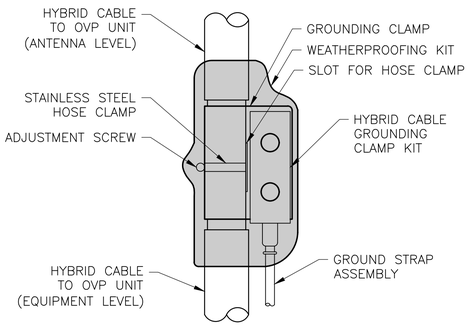
1 / G-1 GROUNDING RISER DIAGRAM

SCALE: NTS



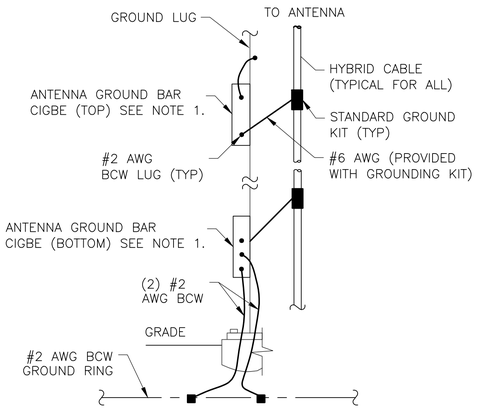
2 / G-1 HYBRID CABLE CONNECTION DETAIL

SCALE: NTS



3 / G-1 HYBRID CABLE GROUNDING DETAIL

SCALE: NTS

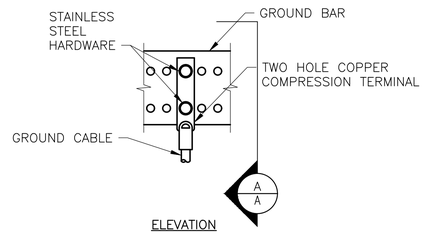


NOTES:

1. NUMBER OF GROUND BARS MAY VARY DEPENDING ON THE TYPE OF TOWER. ANTENNA LOCATION AND CONNECTION ANTENNA LOCATION AND CONNECTION ORIENTATION. PROVIDE AS REQUIRED.
2. A SEPARATE GROUND BAR TO BE USED FOR GPS UNIT IF REQUIRED.

4 / G-1 ANTENNA CABLE GROUNDING

SCALE: NTS



NOTES:

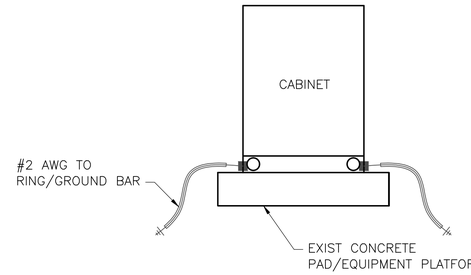
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.
3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB AND MGB.
4. ALL GROUND LUGS MUST NE HEAT SHRUNK AT WIRE/LUG CONNECTION.

5 / G-1 GROUND BAR CONNECTION DETAIL

SCALE: NTS

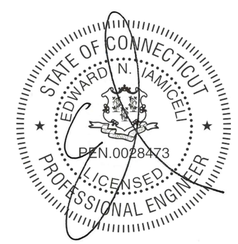
GROUNDING NOTES

1. THE ENTIRE ELECTRICAL INSTALLATION SHALL BE GROUNDED AS REQUIRED BY ALL APPLICABLE CODES.
2. ALL GROUNDING WORK SHALL BE IN ACCORDANCE WITH T-MOBILE STANDARD PRACTICE.
3. ALL BUS CONNECTORS SHALL BE TWO-HOLE, LONG-BARREL TYPE COMPRESSION LUGS, T&B OR EQUAL, UNLESS OTHERWISE NOTED ON DRAWINGS. ALL LUGS SHALL BE ATTACHED TO BUSSES USING BOLTS, NUTS, AND LOCK WASHERS. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED.
4. ALL CONNECTORS SHALL BE CRIMPED USING HYDRAULIC CRIMPING TOOLS, T&B #TBM 8 OR EQUIVALENT.
5. ALL CONNECTIONS SHALL BE MADE TO BARE METAL. ALL PAINTED SURFACES SHALL BE FILED TO ENSURE PROPER CONTACT. NO WASHERS ARE ALLOWED BETWEEN THE ITEMS BEING GROUNDED. ALL CONNECTIONS ARE TO HAVE A NON-OXIDIZING AGENT APPLIED PRIOR TO INSTALLATION.
6. ALL COPPER BUSSES SHALL BE CLEANED, POLISHED, AND A NON-OXIDIZING AGENT APPLIED. NO FINGERPRINTS OR DISCOLORED COPPER WILL BE PERMITTED.
7. ALL BENDS SHALL BE AS SHALLOW AS POSSIBLE, WITH NO TURN SHORTER THAN AN 8-INCH NOMINAL RADIUS.
8. GROUNDING CONDUCTORS SHALL BE SOLID TINNED COPPER AND ANNEALED #2. ALL GROUNDING CONDUCTORS SHALL RUN THROUGH PVC SLEEVES WHEREVER CONDUCTORS RUN THROUGH WALLS, FLOORS, OR CEILINGS. IF CONDUCTORS MUST RUN THROUGH EMT, BOTH ENDS OF CONDUIT SHALL BE GROUNDED. SEAL BOTH ENDS OF CONDUIT WITH SILICONE CAULK.
9. GROUNDING SYSTEM RESISTANCE SHALL NOT EXCEED 10 OHMS. IF THE RESISTANCE VALUE IS EXCEEDED, NOTIFY THE PROJECT MANAGER FOR FURTHER INSTRUCTION ON METHODS FOR REDUCING THE RESISTANCE VALUE.
10. ALL ROOF TOP ANTENNA MOUNTS SHALL BE GROUNDED WITH A #2 GROUND WIRE CONNECTED TO THE NEAREST GROUND BUS. ALL CONNECTIONS ARE TO BE CAD-WELDED IF POSSIBLE.
11. UPON COMPLETION OF WORK, CONDUCT CONTINUITY, SHORT CIRCUIT, AND FALL OF POTENTIAL GROUNDING TESTS FOR APPROVAL. SUBMIT TEST REPORTS TO THE PROJECT MANAGER.
12. GROUNDING CONNECTION TO TRAVEL IN A DOWNWARD DIRECTION.
13. ALL EXPOSED #2 WIRE MUST BE TINN NOT BTW.
14. TECTONIC TAKES NO RESPONSIBILITY OR LIABILITY FOR THE GROUNDING SYSTEM AS SHOWN ON THIS SITE. THIS IS A STANDARD GROUNDING SYSTEM.



6 / G-1 CABINET GROUNDING DETAIL

SCALE: NTS



Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.
Tectonic Engineering & Surveying Consultants P.C.
70 Pleasant Hill Road
P.O. Box 37
Mountainville, NY 10953
Phone: (845) 534-5959
(800) 829-6531
www.tectonicengineering.com
Project Contact Info
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656

T-Mobile
NORTHEAST, LLC.

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

APPROVALS

LANDLORD _____
RF _____
CONSTRUCTION _____
OPERATIONS _____
SITE ACQ. _____

PROJECT NUMBER	DESIGNED BY
10473.CT11239A	EI

REV.	DATE	DESCRIPTION	DRAWN BY
0	02/01/21	ISSUED FOR CONSTRUCTION	BWY

ISSUED BY | DATE

0 1 2 3
ORIGINAL SIZE IN INCHES

SITE INFORMATION

SOUTHINGTON/I-84
CT11239A
435 MILL STREET
SOUTHINGTON, CT 06489

SHEET TITLE

GROUNDING DETAILS & NOTES

SHEET NUMBER

G-1

Exhibit D

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Date: **January 26, 2021**

Structural Analysis Report – Rev 1

Tower Owner: Town of Southington
Carrier: T-Mobile

Carrier Designation:
Project Number: CT11239A - L600
Site Name: Southington / I-84
Site Data: 435 Mill St., Southington, Hartford County, CT 06489
Latitude 41° 36' 16.53", Longitude -72° 53' 39.61"
120 Foot – Self Support Tower

Tectonic Project Number: 10473.CT11239A – Rev 1

Tectonic Engineering & Surveying Consultants P.C. is pleased to submit this **"Structural Analysis Report"** to determine the structural integrity of the above mentioned tower.

The purpose of the analysis is to determine acceptability of the tower stress level. Based on our analysis we have determined the tower stress level for the structure and foundation to be:

Structure: **Sufficient – 67.6%**
Foundation: **Sufficient – 92.9%**

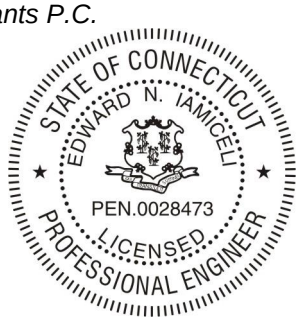
This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Structure Class 3 were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with the analysis for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and T-Mobile. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: John-Fritz Julien / Ian Marinaccio

Respectfully submitted by:
Tectonic Engineering & Surveying Consultants P.C.



Edward N. Iamiceli, P.E.
Managing Director - Structural

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

TABLE OF CONTENTS

1) INTRODUCTION

The tower is a 120 ft self-support tower designed by Valmont Structures.

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Structure Class:	3
Wind Speed:	97 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
110.0	T-Mobile	3	commscope	SDX1926Q-43	1	6x12 Hybrid	-
		3	ericsson	AIR 6449 B41			
		3	ericsson	RRUS 4415 B25			

Table 2 - Existing Antenna and Cable Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
120.0	Municipal	1	tower mounts	3ft Side Arm Mount	4 4	7/8 1/2	1
		2	andrew	VHLP800-11			
		1	commscope	DB404-B			
		1	miscl	10' Dipole			
		3	motorola	PTP 49400			
		2	rfi antennas	BA4040-67-DIN			
110.0	T-Mobile	3	sitepro1	VFA12-RRU	3	6x12 Hybrid	1
		3	rfs celwave	APXVAARR24_43-U-NA20			
		3	ericsson	AIR 32 B66A B2A			
		3	ericsson	RADIO 4449 B71 + B85			
		3	ericsson	RADIO 4415 B66a			
98.0	AT&T	1	raycap	DC6-48-60-0-8C-EV	6 6 2	1-5/8 7/16 DC 1/2 Fiber	1
		2	raycap	DC6-48-60-18-8C-EV			
		3	sitepro1	VFA12			
		3	cci antennas	OPA65R-BU8D			
		6	cci antennas	TPA65R-BU8D			
		3	ericsson	RADIO 4415 B30			
		3	ericsson	RRUS 4449 B5/B12			
		3	ericsson	RRUS 4478 B14			
		3	ericsson	RRUS 8843 B2/B66A			

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Number of Feed Lines	Feed Line Size (in)	Note
88.0	Verizon Wireless	3	commscope	NHH-65B-R2B	2	6x12 Hybrid	2
		3	commscope	NHHSS-65B-R2B			
		3	commscope	BSAMNT-SBS-1-2			
		3	samsung	B2/B66A RRH-BR049			
		3	samsung	B5/B13 RRH-BR04C			
		3	samsung	CBRS RRH			
		1	raycap	RVZDC-6627-PF-48			
		3	sitepro1	VFA12-HD			

Notes:
1) Existing equipment
2) Reserved equipment to be installed by others.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
TOWER AND FOUNDATION DRAWINGS REPORT	Valmont Structures	12/12/19
STRUCTURAL ANALYSIS REPORT	Hudson Design Group LLC	07/21/20
STRUCTURAL ANALYSIS REPORT	Paul J. Ford and Company	09/04/20
RFDS	T-Mobile	10/14/20
FIELD NOTES	Tectonic	11/11/20
STRUCTURAL ANALYSIS REPORT	Tectonic	11/19/20

3.1) Analysis Method

tnxTower (version 8.0.7.5), a commercially available analysis software package, was used to create a three-dimensional model of the tower and calculate member stresses for various loading cases. Selected output from the analysis is included in Appendix A.

3.2) Assumptions

1) Tower and structures were built and maintained in accordance with the manufacturer's specifications.
2) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in Tables 1 and 2 and the referenced drawings.
3) The AT&T load configurations is based on the previous structural analysis report by Hudson Design Group LLC, referenced above.
4) The reserved Verizon Wireless load configurations is based on the previous structural analysis report by Paul J. Ford, referenced above.
5) Foundation has been evaluated through comparative analysis with original design reactions.

This analysis is solely for the supporting tower structure and it may be affected if any assumptions are not valid or have been made in error. Tectonic should be notified to determine the effect on the structural integrity of the tower.

4) ANALYSIS RESULTS

Table 4 - Section Capacity (Summary)

Section No.	Elevation (ft)	Component Type	Size	Critical Element	P (K)	SF*P_allow (K)	% Capacity	Pass / Fail
T1	120 - 100	Leg	1 3/4" solid	3	-25.50	83.36	30.6	Pass
T2	100 - 80	Leg	2 1/4" solid	80	-107.20	158.64	67.6	Pass
T3	80 - 60	Leg	Pirod 194651 (Gr. 58)	158	-142.50	236.90	60.2	Pass
T4	60 - 40	Leg	Priod 195213 (Gr. 58)	176	-177.24	331.32	53.5	Pass
T5	40 - 20	Leg	Pirod 195217 (Gr. 58)	191	-210.63	331.32	63.6	Pass
T6	20 - 0	Leg	Pirod 196915 (Gr. 58)	206	-212.32	385.15	55.1	Pass
T1	120 - 100	Diagonal	3/4" solid	16	-3.35	5.92	56.6	Pass
T2	100 - 80	Diagonal	7/8" solid	96	-7.34	11.16	65.8	Pass
T3	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	174	-8.77	18.78	46.7 57.4 (b)	Pass
T4	60 - 40	Diagonal	L2 1/2x2 1/2x3/16	188	-5.66	11.78	48.1 52.5 (b)	Pass
T5	40 - 20	Diagonal	L2 1/2x2 1/2x5/16	198	-7.05	13.50	52.2	Pass
T6	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	212	-16.86	51.14	33.0	Pass
T1	120 - 100	Horizontal	3/4" solid	28	-0.24	3.35	7.2	Pass
T2	100 - 80	Horizontal	3/4" solid	99	-1.24	3.42	36.3	Pass
T1	120 - 100	Top Girt	7/8" solid	4	-0.32	6.20	5.2	Pass
T2	100 - 80	Top Girt	1" solid	84	-0.84	10.81	7.7	Pass
T3	80 - 60	Top Girt	L3x3x3/16	162	-1.51	25.91	5.8 15.8 (b)	Pass
T1	120 - 100	Bottom Girt	7/8" solid	9	-1.16	6.20	18.7	Pass
T2	100 - 80	Bottom Girt	1" solid	87	-0.69	10.81	6.4	Pass
T1	120 - 100	Mid Girt	7/8" solid	11	-0.40	6.20	6.5	Pass
T2	100 - 80	Mid Girt	1" solid	88	-0.84	10.81	7.8	Pass
							Summary	
						Leg (T2)	67.6	Pass
						Diagonal (T2)	65.8	Pass
						Horizontal (T2)	36.3	Pass
						Top Girt (T3)	15.8	Pass
						Bottom Girt (T1)	18.7	Pass
						Mid Girt (T2)	7.8	Pass
						Bolt Checks	57.4	Pass
						Rating =	67.6	Pass

Table 5 - Tower Component Stresses vs. Capacity

Notes	Component	Elevation (ft)	% Capacity	Pass / Fail
1	Anchor Rods	0	35.1	Pass
1	Base Foundation (Compared w/ Design Loads)	0	92.9	Pass

Structure Rating (max from all components) =	92.9%

Notes:
1) See additional documentation in “Appendix C – Additional Calculations” for calculations supporting the % capacity consumed.

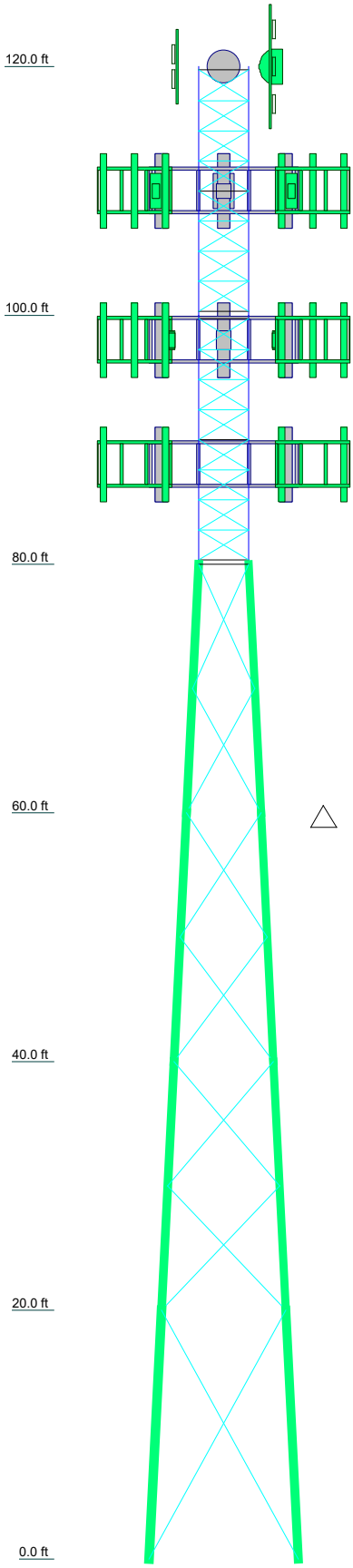
4.1) Results / Conclusions

The tower and its foundation have sufficient capacity to support the proposed T-Mobile load configurations. No modification is required at this time.

APPENDIX A

TNXTOWER OUTPUT

Section	T1	T2	T3	T4	T5	T6
Legs	SR 1 3/4" solid	SR 2 1/4" solid	Pirod 194651 (Gr. 58)	Priod 195213 (Gr. 58)	Pirod 195217 (Gr. 58)	Pirod 196915 (Gr. 58)
Leg Grade	A572-55					
Diagonals	SR 3/4" solid	SR 7/8" solid	L2 1/2x2 1/2x1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	2L3 1/2x3 1/2x1/4
Diagonal Grade	A572-50					
Top Girts	SR 7/8" solid	SR 1" solid	L3x3x3/16	N.A.		
Mid Girts	SR 7/8" solid	SR 1" solid	N.A.			
Bottom Girts	SR 7/8" solid	SR 1" solid	N.A.			
Horizontals	SR 3/4" solid		N.A.			
Face Width (ft)	4	16 @ 2.42708		6	8	10
# Panels @ (ft)	1.1	1.5	2.4	2.6	3.0	4.3
Weight (K)	14.9					



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
10' Lightning Rod	120	RRUS 8843 B2/B66A	98
PTP 49400	120	RRUS 8843 B2/B66A	98
PTP 49400	120	RRUS 8843 B2/B66A	98
PTP 49400	120	RRUS 4478 B14	98
10' Dipole	120	RRUS 4478 B14	98
DB404-B	120	RRUS 4478 B14	98
BA4040-67-DIN	120	RADIO 4415 B30	98
BA4040-67-DIN	120	RADIO 4415 B30	98
Pipe Mount	120	RADIO 4415 B30	98
3ft Side Arm Mount	120	OPA65R-BU8D w/ Mount Pipe	98
VHLP800-11	120	OPA65R-BU8D w/ Mount Pipe	98
VHLP800-11	120	OPA65R-BU8D w/ Mount Pipe	98
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	110	(2) TPA65R-BU8D_TIA w/ Mount Pipe	98
		(2) TPA65R-BU8D_TIA w/ Mount Pipe	98
AIR -32 B2A/B66AA w/ Mount Pipe	110	(2) TPA65R-BU8D_TIA w/ Mount Pipe	98
AIR -32 B2A/B66AA w/ Mount Pipe	110	SitePro VFA12-HD	98
AIR -32 B2A/B66AA w/ Mount Pipe	110	SitePro VFA12-HD	98
RADIO 4449 B71/B85	110	SitePro VFA12-HD	98
RADIO 4449 B71/B85	110	DC6-48-60-18-8C-EV	98
RADIO 4449 B71/B85	110	DC6-48-60-18-8C-EV	98
RRUS 4415 B25	110	NHH-65B-R2B_TIA w/ Mount Pipe	88
RRUS 4415 B25	110	NHHSS-65B-R2BT4 w/ Mount Pipe	88
RRUS 4415 B25	110	NHHSS-65B-R2BT4 w/ Mount Pipe	88
AIR 6449 B41 w/ Mount Pipe	110	NHHSS-65B-R2BT4 w/ Mount Pipe	88
AIR 6449 B41 w/ Mount Pipe	110	BSAMNT-SBS-1-2	88
AIR 6449 B41 w/ Mount Pipe	110	BSAMNT-SBS-1-2	88
SDX1926Q-43	110	BSAMNT-SBS-1-2	88
SDX1926Q-43	110	B2/B66 RRH-BR049	88
SDX1926Q-43	110	B2/B66 RRH-BR049	88
4415 B66A	110	B2/B66 RRH-BR049	88
4415 B66A	110	B5/B13 RRH-BR04C	88
4415 B66A	110	B5/B13 RRH-BR04C	88
SitePro VFA12-RRU	110	B5/B13 RRH-BR04C	88
SitePro VFA12-RRU	110	CBRS RRH-RT4401-48A	88
SitePro VFA12-RRU	110	CBRS RRH-RT4401-48A	88
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	110	CBRS RRH-RT4401-48A	88
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	110	RVZDC-6627-PF-48	88
		RVZDC-6627-PF-48	88
DC6-48-60-0-8C-EV	98	SitePro VFA12-HD	88
RRUS 4449 B5/B12	98	SitePro VFA12-HD	88
RRUS 4449 B5/B12	98	SitePro VFA12-HD	88
RRUS 4449 B5/B12	98	NHH-65B-R2B_TIA w/ Mount Pipe	88
		NHH-65B-R2B_TIA w/ Mount Pipe	88

MATERIAL STRENGTH

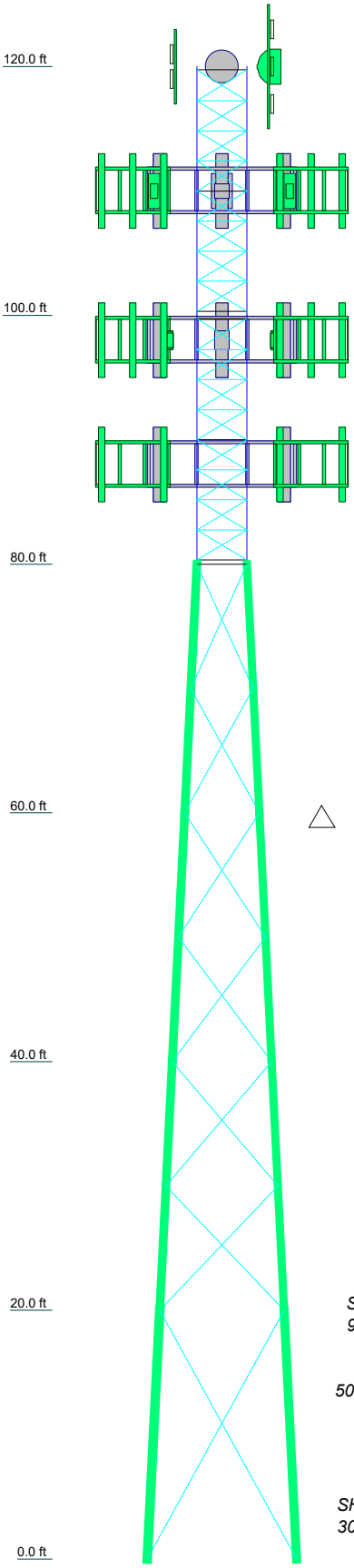
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-55	55 ksi	70 ksi	A572-50	50 ksi	65 ksi

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***10473.CT11239A - Rev 1***			
Project: ***120' Self-Support Tower***			
Client: T-Mobile	Drawn by: John-Fritz Julien		App'd:
Code: TIA-222-G	Date: 01/26/21		Scale: NTS
Path: G:\Newburgh\Projects\10473-NSS\10473.CT11239A\Structural\Tower Analysis\Rev 1\10473.CT11239A - TowerSA_Rev1.eri			Dwg No. E-1

Section	T6	T5	T4	T3	T2	T1
Legs	Pirod 196915 (Gr. 58)	Pirod 195217 (Gr. 58)	Priod 195213 (Gr. 58)	Pirod 194651 (Gr. 58)	SR 2 1/4" solid	SR 1 3/4" solid
Leg Grade	A572-55					
Diagonals	2L3 1/2x3 1/2x1/4	L2 1/2x2 1/2x5/16	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x1/4	SR 7/8" solid	SR 3/4" solid
Diagonal Grade	A572-50					
Top Girts		N.A.		L3x3x3/16	SR 1" solid	SR 7/8" solid
Mid Girts			N.A.		SR 1" solid	SR 7/8" solid
Bottom Girts			N.A.		SR 1" solid	SR 7/8" solid
Horizontals			N.A.		SR 3/4" solid	
Face Width (ft)	12	10	8	6	4	
# Panels @ (ft)	1 @ 20		6 @ 10		16 @ 2.42708	
Weight (K)	14.9	4.3	3.0	2.6	2.4	1.5 1.1



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-55	55 ksi	70 ksi	A572-50	50 ksi	65 ksi

TOWER DESIGN NOTES

1. Tower is located in Hartford County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 67.6%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 239 K
SHEAR: 25 K

UPLIFT: -215 K
SHEAR: 22 K

AXIAL 112 K
SHEAR 9 K
MOMENT 752 kip-ft
TORQUE 3 kip-ft
50 mph WIND - 0.75 in ICE

AXIAL 38 K
SHEAR 30 K
MOMENT 2347 kip-ft
TORQUE 9 kip-ft
REACTIONS - 97 mph WIND

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***10473.CT11239A - Rev 1***			
Project: ***120' Self-Support Tower***			
Client: T-Mobile	Drawn by: John-Fritz Julien	App'd:	
Code: TIA-222-G	Date: 01/26/21	Scale: NTS	
Path: G:\Newburgh\Projects\10473-NSS\10473.CT11239A\Structural\Tower Analysis\Rev 1\10473.CT11239A - TowerSA_Rev1.eri		Dwg No. E-1	

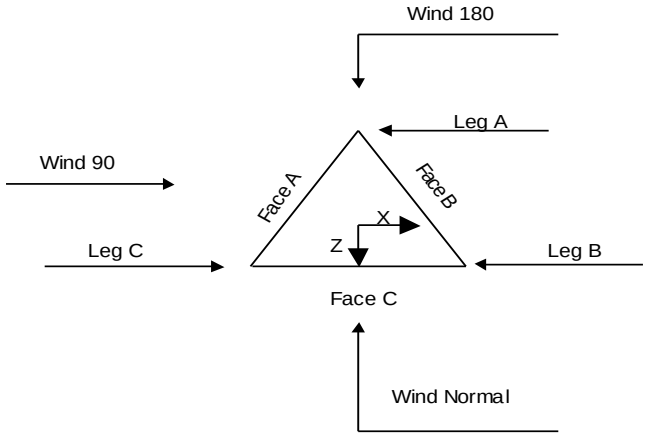
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 120.00 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 4.00 ft at the top and 12.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

1) Tower is located in Hartford County, Connecticut.
2) Basic wind speed of 97 mph.
3) Structure Class III.
4) Exposure Category B.
5) Topographic Category 1.
6) Crest Height 0.00 ft.
7) Nominal ice thickness of 0.75 in.
8) Ice thickness is considered to increase with height.
9) Ice density of 56 pcf.
10) A wind speed of 50 mph is used in combination with ice.
11) Temperature drop of 50 °F.
12) Deflections calculated using a wind speed of 60 mph.
13) A non-linear (P-delta) analysis was used.
14) Pressures are calculated at each section.
15) Stress ratio used in tower member design is 1.
16) Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Options

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



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	120.00-100.00			4.00	1	20.00
T2	100.00-80.00			4.00	1	20.00
T3	80.00-60.00			4.00	1	20.00
T4	60.00-40.00			6.00	1	20.00
T5	40.00-20.00			8.00	1	20.00
T6	20.00-0.00			10.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	*Tower Elevation*	*Diagonal Spacing*	*Bracing Type*	*Has K Brace End Panels*	*Has Horizontals*	*Top Girt Offset*	*Bottom Girt Offset*
	ft	*ft*				*in*	*in*
T1	120.00-100.00	2.43	X Brace	No	Yes	3.50	3.50
T2	100.00-80.00	2.43	X Brace	No	Yes	3.50	3.50
T3	80.00-60.00	10.00	X Brace	No	No	0.00	0.00
T4	60.00-40.00	10.00	X Brace	No	No	0.00	0.00
T5	40.00-20.00	10.00	X Brace	No	No	0.00	0.00
T6	20.00-0.00	20.00	X Brace	No	No	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T1 120.00-100.00	Solid Round	1 3/4" solid	A572-55 (55 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)

Tower Elevation ft	*Leg Type*	*Leg Size*	*Leg Grade*	*Diagonal Type*	*Diagonal Size*	*Diagonal Grade*
T2 100.00-80.00	Solid Round	2 1/4" solid	A572-55 (55 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T3 80.00-60.00	Truss Leg	Pirod 194651 (Gr. 58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x1/4	A572-50 (50 ksi)
T4 60.00-40.00	Truss Leg	Priod 195213 (Gr. 58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x3/16	A572-50 (50 ksi)
T5 40.00-20.00	Truss Leg	Pirod 195217 (Gr. 58)	A572-55 (55 ksi)	Equal Angle	L2 1/2x2 1/2x5/16	A572-50 (50 ksi)
T6 20.00-0.00	Truss Leg	Pirod 196915 (Gr. 58)	A572-55 (55 ksi)	Double Equal Angle	2L3 1/2x3 1/2x1/4	A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*Top Girt Type*	*Top Girt Size*	*Top Girt Grade*	*Bottom Girt Type*	*Bottom Girt Size*	*Bottom Girt Grade*
T1 120.00-100.00	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	7/8" solid	A572-50 (50 ksi)
T2 100.00-80.00	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round	1" solid	A572-50 (50 ksi)
T3 80.00-60.00	Equal Angle	L3x3x3/16	A572-50 (50 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	*No. of Mid Girts*	*Mid Girt Type*	*Mid Girt Size*	*Mid Girt Grade*	*Horizontal Type*	*Horizontal Size*	*Horizontal Grade*
T1 120.00-100.00	1	Solid Round	7/8" solid	A572-50 (50 ksi)	Solid Round	3/4" solid	A572-50 (50 ksi)
T2 100.00-80.00	1	Solid Round	1" solid	A572-50 (50 ksi)	Solid Round	3/4" solid	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 120.00-100.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T2 100.00-80.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T3 80.00-60.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T4 60.00-40.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T5 40.00-20.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00
T6 20.00-0.00	0.00	0.00	A36 (36 ksi)	1.03	1	1.05	0.00	0.00	0.00

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X	X Brace Diags Y	K Single Diags X	K Single Diags Y	Girts X	Girts Y	Horiz. X	Horiz. Y	Sec. Horiz. X	Sec. Horiz. Y	Inner Brace X	Inner Brace Y
T1 120.00-100.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T2 100.00-80.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T3 80.00-60.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T4 60.00-40.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T5 40.00-20.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1
T6 20.00-0.00	Yes	Yes	1	1	1	1	1	1	1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T3 80.00-60.00	1	0.5	0.85	1	0.5	0.85
T4 60.00-40.00	1	0.5	0.85	1	0.5	0.85
T5 40.00-20.00	1	0.5	0.85	1	0.5	0.85
T6 20.00-0.00	1	0.5	0.85	1	0.5	0.85

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Net Width Deduct in	Leg U	Diagonal Net Width Deduct in	Diagonal U	Top Girt Net Width Deduct in	Top Girt U	Bottom Girt Net Width Deduct in	Bottom Girt U	Mid Girt Net Width Deduct in	Mid Girt U	Long Horizontal Net Width Deduct in	Long Horizontal U	Short Horizontal Net Width Deduct in	Short Horizontal U
T1 120.00-100.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T2 100.00-80.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T3 80.00-60.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T4 60.00-40.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T5 40.00-20.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1
T6 20.00-0.00	0.00	1	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	0.75	0.00	1

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 120.00-100.00	Flange	1.25 A325N	2	0.00 A325N	0	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T2 100.00-80.00	Flange	1.00 A325N	4	0.00 A325N	0	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T3 80.00-60.00	Flange	1.00 A325N	6	1.00 A325N	1	1.00 A325N	1	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T4 60.00-40.00	Flange	1.25 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T5 40.00-20.00	Flange	1.25 A325N	6	1.00 A325N	1	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0
T6 20.00-0.00	Flange	0.00 A325N	0	0.88 A325N	2	0.00 A325N	0	0.00 A325X	0	0.63 A325N	0	0.75 A325X	0	0.63 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
***													
LDF5-50A(7/8)	A	No	No	Ar (CaAa)	120.00 - 3.00	0.00	-0.47	4	4	1.03	1.03		0.00
LDF4P-50A(1/2")	A	No	No	Ar (CaAa)	120.00 - 3.00	0.00	-0.48	4	4	0.63	0.63		0.00
***													
HCS 6X12 4AWG(1-5/8)	B	No	No	Ar (CaAa)	110.00 - 8.00	0.00	-0.4	3	3	1.66	1.99		0.00
HCS 6X12 4AWG(1-5/8)	B	No	No	Ar (CaAa)	110.00 - 8.00	0.00	-0.4	1	1	1.66	1.99		0.00
***													
1-5/8 coax	A	No	No	Ar (CaAa)	98.00 - 6.00	0.00	-0.42	6	6	1.98	1.98		0.00
WR-VG122ST-BRDA(7/16")	A	No	No	Ar (CaAa)	98.00 - 6.00	0.00	-0.45	6	6	0.00	0.40		0.00
FB-L98B-002-100000(3/8")	A	No	No	Ar (CaAa)	98.00 - 6.00	0.00	-0.4	2	2	0.00	0.40		0.00
***													
HCS 6X12 4AWG(1-5/8)	C	No	No	Ar (CaAa)	88.00 - 6.00	0.00	-0.4	2	2	1.66	1.99		0.00
***													
Feedline Ladder (Af)	A	No	No	Af (CaAa)	120.00 - 10.00	0.00	-0.45	1	1	3.00	3.00		0.01
Feedline Ladder (Af)	B	No	No	Af (CaAa)	120.00 - 10.00	0.00	-0.45	1	1	3.00	3.00		0.01
Feedline Ladder (Af)	C	No	No	Af (CaAa)	88.00 - 6.00	0.00	-0.45	1	1	3.00	3.00		0.01
Banjo	A	No	No	Af (CaAa)	120.00 - 10.00	0.00	-0.5	1	1	1.00	1.00		0.01
Banjo	B	No	No	Af (CaAa)	120.00 - 10.00	0.00	-0.5	1	1	1.00	1.00		0.01
**													

Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C_AA_A ft^2/ft	Weight klf
**								

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	0.000	0.000	26.613	0.000	0.31
		B	0.000	0.000	21.293	0.000	0.37
		C	0.000	0.000	0.000	0.000	0.00
T2	100.00-80.00	A	0.000	0.000	53.757	0.000	0.49
		B	0.000	0.000	29.253	0.000	0.48
		C	0.000	0.000	7.184	0.000	0.11
T3	80.00-60.00	A	0.000	0.000	56.773	0.000	0.51
		B	0.000	0.000	29.253	0.000	0.48
		C	0.000	0.000	17.960	0.000	0.27
T4	60.00-40.00	A	0.000	0.000	56.773	0.000	0.51
		B	0.000	0.000	29.253	0.000	0.48
		C	0.000	0.000	17.960	0.000	0.27
T5	40.00-20.00	A	0.000	0.000	56.773	0.000	0.51
		B	0.000	0.000	29.253	0.000	0.48
		C	0.000	0.000	17.960	0.000	0.27
T6	20.00-0.00	A	0.000	0.000	39.067	0.000	0.31
		B	0.000	0.000	16.219	0.000	0.26
		C	0.000	0.000	12.572	0.000	0.19

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	120.00-100.00	A	2.115	0.000	0.000	86.512	0.000	1.48
		B		0.000	0.000	55.075	0.000	1.24
		C		0.000	0.000	0.000	0.000	0.00
T2	100.00-80.00	A	2.073	0.000	0.000	178.596	0.000	2.86
		B		0.000	0.000	79.114	0.000	1.68
		C		0.000	0.000	18.867	0.000	0.38
T3	80.00-60.00	A	2.021	0.000	0.000	186.795	0.000	2.94
		B		0.000	0.000	78.156	0.000	1.64
		C		0.000	0.000	46.607	0.000	0.93
T4	60.00-40.00	A	1.955	0.000	0.000	184.026	0.000	2.84
		B		0.000	0.000	76.911	0.000	1.59
		C		0.000	0.000	45.879	0.000	0.90
T5	40.00-20.00	A	1.857	0.000	0.000	180.001	0.000	2.71
		B		0.000	0.000	75.101	0.000	1.52
		C		0.000	0.000	44.820	0.000	0.86
T6	20.00-0.00	A	1.664	0.000	0.000	122.628	0.000	1.67
		B		0.000	0.000	40.243	0.000	0.77
		C		0.000	0.000	29.905	0.000	0.55

Feed Line Center of Pressure

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T1	120.00-100.00	-6.83	-3.07	-5.19	-2.48
T2	100.00-80.00	-6.59	-0.53	-4.74	-1.06
T3	80.00-60.00	-3.77	0.78	-2.96	-0.02
T4	60.00-40.00	-4.96	1.07	-5.34	0.63
T5	40.00-20.00	-6.06	1.34	-7.36	1.25
T6	20.00-0.00	-5.19	2.85	-6.96	3.60

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	2	LDF5-50A(7/8)	100.00 - 120.00	0.6000	0.2844
T1	3	LDF4P-50A(1/2")	100.00 - 120.00	0.6000	0.2844
T1	5	HCS 6X12 4AWG(1-5/8)	100.00 - 110.00	0.6000	0.2844
T1	6	HCS 6X12 4AWG(1-5/8)	100.00 - 110.00	0.6000	0.2844
T1	14	Feedline Ladder (Af)	100.00 - 120.00	1.0000	1.0000
T1	15	Feedline Ladder (Af)	100.00 - 120.00	1.0000	1.0000
T1	17	Banjo	100.00 - 120.00	1.0000	1.0000
T1	18	Banjo	100.00 - 120.00	1.0000	1.0000
T2	2	LDF5-50A(7/8)	80.00 - 100.00	0.6000	0.2785
T2	3	LDF4P-50A(1/2")	80.00 - 100.00	0.6000	0.2785
T2	5	HCS 6X12 4AWG(1-5/8)	80.00 - 100.00	0.6000	0.2785
T2	6	HCS 6X12 4AWG(1-5/8)	80.00 - 100.00	0.6000	0.2785
T2	8	1-5/8 coax	80.00 - 98.00	0.6000	0.2785
T2	9	WR-VG122ST-BRDA(7/16")	80.00 - 98.00	0.6000	0.2785
T2	10	FB-L98B-002-100000(3/8")	80.00 - 98.00	0.6000	0.2785
T2	12	HCS 6X12 4AWG(1-5/8)	80.00 - 88.00	0.6000	0.2785
T2	14	Feedline Ladder (Af)	80.00 - 100.00	1.0000	1.0000
T2	15	Feedline Ladder (Af)	80.00 - 100.00	1.0000	1.0000
T2	16	Feedline Ladder (Af)	80.00 - 88.00	1.0000	1.0000
T2	17	Banjo	80.00 - 100.00	1.0000	1.0000
T2	18	Banjo	80.00 - 100.00	1.0000	1.0000
T3	2	LDF5-50A(7/8)	60.00 - 80.00	0.6000	0.2580
T3	3	LDF4P-50A(1/2")	60.00 - 80.00	0.6000	0.2580
T3	5	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.2580

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
T3	6	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.2580
T3	8	1-5/8 coax	60.00 - 80.00	0.6000	0.2580
T3	9	WR-VG122ST-BRDA(7/16")	60.00 - 80.00	0.6000	0.2580
T3	10	FB-L98B-002-100000(3/8")	60.00 - 80.00	0.6000	0.2580
T3	12	HCS 6X12 4AWG(1-5/8)	60.00 - 80.00	0.6000	0.2580
T3	14	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T3	15	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T3	16	Feedline Ladder (Af)	60.00 - 80.00	1.0000	1.0000
T3	17	Banjo	60.00 - 80.00	1.0000	1.0000
T3	18	Banjo	60.00 - 80.00	1.0000	1.0000
T4	2	LDF5-50A(7/8)	40.00 - 60.00	0.6000	0.4257
T4	3	LDF4P-50A(1/2")	40.00 - 60.00	0.6000	0.4257
T4	5	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.4257
T4	6	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.4257
T4	8	1-5/8 coax	40.00 - 60.00	0.6000	0.4257
T4	9	WR-VG122ST-BRDA(7/16")	40.00 - 60.00	0.6000	0.4257
T4	10	FB-L98B-002-100000(3/8")	40.00 - 60.00	0.6000	0.4257
T4	12	HCS 6X12 4AWG(1-5/8)	40.00 - 60.00	0.6000	0.4257
T4	14	Feedline Ladder (Af)	40.00 - 60.00	1.0000	1.0000
T4	15	Feedline Ladder (Af)	40.00 - 60.00	1.0000	1.0000
T4	16	Feedline Ladder (Af)	40.00 - 60.00	1.0000	1.0000
T4	17	Banjo	40.00 - 60.00	1.0000	1.0000
T4	18	Banjo	40.00 - 60.00	1.0000	1.0000
T5	2	LDF5-50A(7/8)	20.00 - 40.00	0.6000	0.5267
T5	3	LDF4P-50A(1/2")	20.00 - 40.00	0.6000	0.5267
T5	5	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.5267
T5	6	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.5267
T5	8	1-5/8 coax	20.00 - 40.00	0.6000	0.5267
T5	9	WR-VG122ST-BRDA(7/16")	20.00 - 40.00	0.6000	0.5267
T5	10	FB-L98B-002-100000(3/8")	20.00 - 40.00	0.6000	0.5267
T5	12	HCS 6X12 4AWG(1-5/8)	20.00 - 40.00	0.6000	0.5267
T5	14	Feedline Ladder (Af)	20.00 - 40.00	1.0000	1.0000
T5	15	Feedline Ladder (Af)	20.00 - 40.00	1.0000	1.0000
T5	16	Feedline Ladder (Af)	20.00 - 40.00	1.0000	1.0000
T5	17	Banjo	20.00 -	1.0000	1.0000

Tower Section	*Feed Line Record No.*	*Description*	*Feed Line Segment Elev.*	*K_a No Ice*	*K_a Ice*
			40.00		
T5	18	Banjo	20.00 - 40.00	1.0000	1.0000
T6	2	LDF5-50A(7/8)	3.00 - 20.00	0.6000	0.6000
T6	3	LDF4P-50A(1/2")	3.00 - 20.00	0.6000	0.6000
T6	5	HCS 6X12 4AWG(1-5/8)	8.00 - 20.00	0.6000	0.6000
T6	6	HCS 6X12 4AWG(1-5/8)	8.00 - 20.00	0.6000	0.6000
T6	8	1-5/8 coax	6.00 - 20.00	0.6000	0.6000
T6	9	WR-VG122ST-BRDA(7/16")	6.00 - 20.00	0.6000	0.6000
T6	10	FB-L98B-002-100000(3/8")	6.00 - 20.00	0.6000	0.6000
T6	12	HCS 6X12 4AWG(1-5/8)	6.00 - 20.00	0.6000	0.6000
T6	14	Feedline Ladder (Af)	10.00 - 20.00	1.0000	1.0000
T6	15	Feedline Ladder (Af)	10.00 - 20.00	1.0000	1.0000
T6	16	Feedline Ladder (Af)	6.00 - 20.00	1.0000	1.0000
T6	17	Banjo	10.00 - 20.00	1.0000	1.0000
T6	18	Banjo	10.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
***									
10' Lightning Rod	C	From Leg	0.00	0.00	120.00	No Ice	0.63	0.63	0.02
			0.00			1/2" Ice	1.64	1.64	0.03
			0.00			1" Ice	2.67	2.67	0.04
PTP 49400	A	From Leg	3.00	0.00	120.00	No Ice	1.75	0.48	0.01
			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.69	0.04
PTP 49400	B	From Leg	1.00	0.00	120.00	No Ice	1.75	0.48	0.01
			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.69	0.04
PTP 49400	C	From Leg	1.00	0.00	120.00	No Ice	1.75	0.48	0.01
			0.00			1/2" Ice	1.92	0.58	0.02
			0.00			1" Ice	2.09	0.69	0.04
10' Dipole	A	From Leg	2.00	0.00	120.00	No Ice	3.69	3.69	0.03
			0.00			1/2" Ice	4.73	4.73	0.05
			0.00			1" Ice	5.40	5.40	0.08
DB404-B	C	From Leg	2.00	0.00	120.00	No Ice	1.14	1.14	0.01
			0.00			1/2" Ice	2.29	2.29	0.03
			0.00			1" Ice	3.38	3.38	0.06
BA4040-67-DIN	A	From Leg	3.00	0.00	120.00	No Ice	12.76	4.92	0.18
			0.00			1/2" Ice	13.51	6.06	0.23
			0.00			1" Ice	14.25	7.22	0.30
BA4040-67-DIN	B	From Leg	2.00	0.00	120.00	No Ice	12.76	4.92	0.18

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert ft ft ft*	*Azimuth Adjustment ˚*	*Placement ft*		*C_AA_A Front ft²*	*C_AA_A Side ft²*	*Weight K*
			0.00			1/2"	13.51	6.06	0.23
			0.00			Ice	14.25	7.22	0.30
						1" Ice			
Pipe Mount	B	None		0.00	120.00	No Ice	1.32	1.32	0.07
						1/2"	1.58	1.58	0.08
						Ice	1.84	1.84	0.09
						1" Ice			
3ft Side Arm Mount	A	None		0.00	120.00	No Ice	1.78	3.79	0.13
						1/2"	2.24	4.47	0.15
						Ice	2.75	5.21	0.19
						1" Ice			
***									
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	A	From Leg	4.00	0.00	110.00	No Ice	20.48	11.02	0.19
			0.00			1/2"	21.23	12.55	0.32
			0.00			Ice	21.99	14.10	0.47
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	B	From Leg	4.00	0.00	110.00	No Ice	20.48	11.02	0.19
			0.00			1/2"	21.23	12.55	0.32
			0.00			Ice	21.99	14.10	0.47
						1" Ice			
APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	C	From Leg	4.00	0.00	110.00	No Ice	20.48	11.02	0.19
			0.00			1/2"	21.23	12.55	0.32
			0.00			Ice	21.99	14.10	0.47
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	A	From Leg	4.00	0.00	110.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	B	From Leg	4.00	0.00	110.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice			
AIR -32 B2A/B66AA w/ Mount Pipe	C	From Leg	4.00	0.00	110.00	No Ice	6.75	6.07	0.15
			0.00			1/2"	7.20	6.87	0.21
			0.00			Ice	7.65	7.58	0.28
						1" Ice			
RADIO 4449 B71/B85	A	From Leg	4.00	0.00	110.00	No Ice	1.64	1.31	0.07
			0.00			1/2"	1.80	1.46	0.09
			0.00			Ice	1.97	1.61	0.11
						1" Ice			
RADIO 4449 B71/B85	B	From Leg	4.00	0.00	110.00	No Ice	1.64	1.31	0.07
			0.00			1/2"	1.80	1.46	0.09
			0.00			Ice	1.97	1.61	0.11
						1" Ice			
RADIO 4449 B71/B85	C	From Leg	4.00	0.00	110.00	No Ice	1.64	1.31	0.07
			0.00			1/2"	1.80	1.46	0.09
			0.00			Ice	1.97	1.61	0.11
						1" Ice			
RRUS 4415 B25	A	From Leg	4.00	0.00	110.00	No Ice	1.64	0.68	0.04
			0.00			1/2"	1.80	0.79	0.06
			0.00			Ice	1.97	0.91	0.07
						1" Ice			
RRUS 4415 B25	B	From Leg	4.00	0.00	110.00	No Ice	1.64	0.68	0.04
			0.00			1/2"	1.80	0.79	0.06
			0.00			Ice	1.97	0.91	0.07
						1" Ice			
RRUS 4415 B25	C	From Leg	4.00	0.00	110.00	No Ice	1.64	0.68	0.04
			0.00			1/2"	1.80	0.79	0.06
			0.00			Ice	1.97	0.91	0.07
						1" Ice			
AIR 6449 B41 w/ Mount Pipe	A	From Leg	4.00	0.00	110.00	No Ice	6.90	4.32	0.13
			0.00			1/2"	7.74	5.37	0.19
			0.00			Ice	8.49	6.28	0.26
						1" Ice			
AIR 6449 B41 w/ Mount	B	From Leg	4.00	0.00	110.00	No Ice	6.90	4.32	0.13

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* ft ft ft	*Azimuth Adjustment* °	*Placement* ft		*C_AA_A Front* ft^2	*C_AA_A Side* ft^2	*Weight* K
Pipe			0.00			1/2"	7.74	5.37	0.19
			0.00			Ice	8.49	6.28	0.26
						1" Ice			
AIR 6449 B41 w/ Mount	C	From Leg	4.00	0.00	110.00	No Ice	6.90	4.32	0.13
Pipe			0.00			1/2"	7.74	5.37	0.19
			0.00			Ice	8.49	6.28	0.26
						1" Ice			
SDX1926Q-43	A	From Leg	4.00	0.00	110.00	No Ice	0.24	0.10	0.01
			0.00			1/2"	0.31	0.14	0.01
			0.00			Ice	0.38	0.19	0.01
						1" Ice			
SDX1926Q-43	B	From Leg	4.00	0.00	110.00	No Ice	0.24	0.10	0.01
			0.00			1/2"	0.31	0.14	0.01
			0.00			Ice	0.38	0.19	0.01
						1" Ice			
SDX1926Q-43	C	From Leg	4.00	0.00	110.00	No Ice	0.24	0.10	0.01
			0.00			1/2"	0.31	0.14	0.01
			0.00			Ice	0.38	0.19	0.01
						1" Ice			
4415 B66A	A	From Leg	2.50	0.00	110.00	No Ice	1.86	0.82	0.04
			0.00			1/2"	2.03	0.94	0.06
			0.00			Ice	2.20	1.07	0.07
						1" Ice			
4415 B66A	B	From Leg	2.50	0.00	110.00	No Ice	1.86	0.82	0.04
			0.00			1/2"	2.03	0.94	0.06
			0.00			Ice	2.20	1.07	0.07
						1" Ice			
4415 B66A	C	From Leg	2.50	0.00	110.00	No Ice	1.86	0.82	0.04
			0.00			1/2"	2.03	0.94	0.06
			0.00			Ice	2.20	1.07	0.07
						1" Ice			
SitePro VFA12-RRU	A	None		0.00	110.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
SitePro VFA12-RRU	B	None		0.00	110.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
SitePro VFA12-RRU	C	None		0.00	110.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
***									
DC6-48-60-18-8C-EV	A	From Leg	1.00	0.00	98.00	No Ice	1.09	1.09	0.03
			0.00			1/2"	1.70	1.70	0.05
			2.00			Ice	1.91	1.91	0.07
						1" Ice			
DC6-48-60-18-8C-EV	B	From Leg	1.00	0.00	98.00	No Ice	1.09	1.09	0.03
			0.00			1/2"	1.70	1.70	0.05
			2.00			Ice	1.91	1.91	0.07
						1" Ice			
DC6-48-60-0-8C-EV	C	From Leg	1.00	0.00	98.00	No Ice	1.09	1.09	0.03
			0.00			1/2"	1.70	1.70	0.05
			2.00			Ice	1.91	1.91	0.07
						1" Ice			
RRUS 4449 B5/B12	A	From Leg	2.50	0.00	98.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice			
RRUS 4449 B5/B12	B	From Leg	2.50	0.00	98.00	No Ice	1.97	1.41	0.07
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice			
RRUS 4449 B5/B12	C	From Leg	2.50	0.00	98.00	No Ice	1.97	1.41	0.07

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
			0.00			1/2"	2.14	1.56	0.09
			0.00			Ice	2.33	1.73	0.11
						1" Ice			
RRUS 8843 B2/B66A	A	From Leg	2.50	0.00	98.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			0.00			Ice	1.97	1.65	0.11
						1" Ice			
RRUS 8843 B2/B66A	B	From Leg	2.50	0.00	98.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			0.00			Ice	1.97	1.65	0.11
						1" Ice			
RRUS 8843 B2/B66A	C	From Leg	2.50	0.00	98.00	No Ice	1.64	1.35	0.07
			0.00			1/2"	1.80	1.50	0.09
			0.00			Ice	1.97	1.65	0.11
						1" Ice			
RRUS 4478 B14	A	From Leg	2.50	0.00	98.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			0.00			Ice	2.19	1.34	0.09
						1" Ice			
RRUS 4478 B14	B	From Leg	2.50	0.00	98.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			0.00			Ice	2.19	1.34	0.09
						1" Ice			
RRUS 4478 B14	C	From Leg	2.50	0.00	98.00	No Ice	1.84	1.06	0.06
			0.00			1/2"	2.01	1.20	0.08
			0.00			Ice	2.19	1.34	0.09
						1" Ice			
RADIO 4415 B30	A	From Leg	2.50	0.00	98.00	No Ice	1.64	0.64	0.04
			0.00			1/2"	1.80	0.75	0.05
			0.00			Ice	1.97	0.87	0.07
						1" Ice			
RADIO 4415 B30	B	From Leg	2.50	0.00	98.00	No Ice	1.64	0.64	0.04
			0.00			1/2"	1.80	0.75	0.05
			0.00			Ice	1.97	0.87	0.07
						1" Ice			
RADIO 4415 B30	C	From Leg	2.50	0.00	98.00	No Ice	1.64	0.64	0.04
			0.00			1/2"	1.80	0.75	0.05
			0.00			Ice	1.97	0.87	0.07
						1" Ice			
OPA65R-BU8D w/ Mount Pipe	A	From Leg	3.50	0.00	98.00	No Ice	18.09	10.10	0.11
			0.00			1/2"	18.72	11.52	0.23
			0.00			Ice	19.36	12.80	0.36
						1" Ice			
OPA65R-BU8D w/ Mount Pipe	B	From Leg	3.50	0.00	98.00	No Ice	18.09	10.10	0.11
			0.00			1/2"	18.72	11.52	0.23
			0.00			Ice	19.36	12.80	0.36
						1" Ice			
OPA65R-BU8D w/ Mount Pipe	C	From Leg	3.50	0.00	98.00	No Ice	18.09	10.10	0.11
			0.00			1/2"	18.72	11.52	0.23
			0.00			Ice	19.36	12.80	0.36
						1" Ice			
(2) TPA65R-BU8D_TIA w/ Mount Pipe	A	From Leg	3.50	0.00	98.00	No Ice	18.33	10.34	0.12
			0.00			1/2"	19.06	11.86	0.24
			0.00			Ice	19.81	13.41	0.38
						1" Ice			
(2) TPA65R-BU8D_TIA w/ Mount Pipe	B	From Leg	3.50	0.00	98.00	No Ice	18.33	10.34	0.12
			0.00			1/2"	19.06	11.86	0.24
			0.00			Ice	19.81	13.41	0.38
						1" Ice			
(2) TPA65R-BU8D_TIA w/ Mount Pipe	C	From Leg	3.50	0.00	98.00	No Ice	18.33	10.34	0.12
			0.00			1/2"	19.06	11.86	0.24
			0.00			Ice	19.81	13.41	0.38
						1" Ice			
SitePro VFA12-HD	A	None		0.00	98.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral Vert* *ft* *ft* *ft*	*Azimuth Adjustment* *°*	*Placement* *ft*		*C_AA_A Front* *ft^2*	*C_AA_A Side* *ft^2*	*Weight* *K*
						Ice	27.20	27.62	0.92
						1" Ice			
SitePro VFA12-HD	B	None		0.00	98.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
SitePro VFA12-HD	C	None		0.00	98.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
***									
NHH-65B-R2B_TIA w/ Mount Pipe	A	From Leg	4.00	0.00	88.00	No Ice	8.32	7.00	0.07
			0.00			1/2"	8.88	8.19	0.14
			0.00			Ice	9.40	9.08	0.21
						1" Ice			
NHH-65B-R2B_TIA w/ Mount Pipe	B	From Leg	4.00	0.00	88.00	No Ice	8.32	7.00	0.07
			0.00			1/2"	8.88	8.19	0.14
			0.00			Ice	9.40	9.08	0.21
						1" Ice			
NHH-65B-R2B_TIA w/ Mount Pipe	C	From Leg	4.00	0.00	88.00	No Ice	8.32	7.00	0.07
			0.00			1/2"	8.88	8.19	0.14
			0.00			Ice	9.40	9.08	0.21
						1" Ice			
NHHSS-65B-R2BT4 w/ Mount Pipe	A	From Leg	4.00	0.00	88.00	No Ice	8.52	7.25	0.11
			0.00			1/2"	9.19	8.54	0.18
			0.00			Ice	9.82	9.67	0.26
						1" Ice			
NHHSS-65B-R2BT4 w/ Mount Pipe	B	From Leg	4.00	0.00	88.00	No Ice	8.52	7.25	0.11
			0.00			1/2"	9.19	8.54	0.18
			0.00			Ice	9.82	9.67	0.26
						1" Ice			
NHHSS-65B-R2BT4 w/ Mount Pipe	C	From Leg	4.00	0.00	88.00	No Ice	8.52	7.25	0.11
			0.00			1/2"	9.19	8.54	0.18
			0.00			Ice	9.82	9.67	0.26
						1" Ice			
BSAMNT-SBS-1-2	A	From Leg	4.00	0.00	88.00	No Ice	0.15	0.05	0.00
			0.00			1/2"	0.21	0.10	0.00
			0.00			Ice	0.27	0.16	0.01
						1" Ice			
BSAMNT-SBS-1-2	B	From Leg	4.00	0.00	88.00	No Ice	0.15	0.05	0.00
			0.00			1/2"	0.21	0.10	0.00
			0.00			Ice	0.27	0.16	0.01
						1" Ice			
BSAMNT-SBS-1-2	C	From Leg	4.00	0.00	88.00	No Ice	0.15	0.05	0.00
			0.00			1/2"	0.21	0.10	0.00
			0.00			Ice	0.27	0.16	0.01
						1" Ice			
B2/B66 RRH-BR049	A	From Leg	4.00	0.00	88.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice			
B2/B66 RRH-BR049	B	From Leg	4.00	0.00	88.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice			
B2/B66 RRH-BR049	C	From Leg	4.00	0.00	88.00	No Ice	1.88	1.25	0.08
			0.00			1/2"	2.05	1.39	0.10
			0.00			Ice	2.22	1.54	0.12
						1" Ice			
B5/B13 RRH-BR04C	A	From Leg	4.00	0.00	88.00	No Ice	1.88	1.01	0.07
			0.00			1/2"	2.05	1.14	0.09
			0.00			Ice	2.22	1.28	0.11
						1" Ice			
B5/B13 RRH-BR04C	B	From Leg	4.00	0.00	88.00	No Ice	1.88	1.01	0.07
			0.00			1/2"	2.05	1.14	0.09

Description	*Face or Leg*	*Offset Type*	*Offsets: Horz Lateral* / *Vert*	*Azimuth Adjustment*	*Placement*		C_AA_A *Front*	C_AA_A *Side*	*Weight*
			ft / *ft* / *ft*	°	*ft*		ft^2	ft^2	*K*
			0.00			Ice	2.22	1.28	0.11
						1" Ice			
B5/B13 RRH-BR04C	C	From Leg	4.00	0.00	88.00	No Ice	1.88	1.01	0.07
			0.00			1/2"	2.05	1.14	0.09
			0.00			Ice	2.22	1.28	0.11
						1" Ice			
CBRS RRH-RT4401-48A	A	From Leg	4.00	0.00	88.00	No Ice	1.54	0.75	0.02
			0.00			1/2"	1.70	0.87	0.04
			0.00			Ice	1.86	0.99	0.05
						1" Ice			
CBRS RRH-RT4401-48A	B	From Leg	4.00	0.00	88.00	No Ice	1.54	0.75	0.02
			0.00			1/2"	1.70	0.87	0.04
			0.00			Ice	1.86	0.99	0.05
						1" Ice			
CBRS RRH-RT4401-48A	C	From Leg	4.00	0.00	88.00	No Ice	1.54	0.75	0.02
			0.00			1/2"	1.70	0.87	0.04
			0.00			Ice	1.86	0.99	0.05
						1" Ice			
RVZDC-6627-PF-48	A	From Leg	4.00	0.00	88.00	No Ice	3.79	2.51	0.03
			0.00			1/2"	4.04	2.73	0.06
			0.00			Ice	4.30	2.95	0.10
						1" Ice			
RVZDC-6627-PF-48	A	From Leg	4.00	0.00	88.00	No Ice	3.79	2.51	0.03
			0.00			1/2"	4.04	2.73	0.06
			0.00			Ice	4.30	2.95	0.10
						1" Ice			
SitePro VFA12-HD	A	None		0.00	88.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
SitePro VFA12-HD	B	None		0.00	88.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
SitePro VFA12-HD	C	None		0.00	88.00	No Ice	15.40	14.00	0.56
						1/2"	21.30	20.81	0.74
						Ice	27.20	27.62	0.92
						1" Ice			
**									

Dishes

Description	*Face or Leg*	*Dish Type*	*Offset Type*	*Offsets: Horz Lateral* / *Vert*	*Azimuth Adjustment*	*3 dB Beam Width*	*Elevation*	*Outside Diameter*		*Aperture Area*	*Weight*
				ft	°	°	*ft*	*ft*		ft^2	*K*
VHLP800-11	A	Paraboloid w/Shroud (HP)	From Leg	3.00	Worst		120.00	2.80	No Ice	6.16	0.05
				0.00					1/2" Ice	6.53	0.08
				0.00					1" Ice	6.90	0.12
VHLP800-11	B	Paraboloid w/Shroud (HP)	From Leg	1.00	Worst		120.00	2.80	No Ice	6.16	0.05
				0.00					1/2" Ice	6.53	0.08
				0.00					1" Ice	6.90	0.12
***											

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 194651 (Gr. 58)	2306.37	6419.16	0.58	1.47	8.01	22.29	5.30
Priod 195213 (Gr. 58)	2435.39	6443.58	0.72	1.42	8.46	22.37	7.22
Pirod 195217 (Gr. 58)	2435.39	6374.34	0.72	1.30	8.46	22.13	7.22
Pirod 196915 (Gr. 58)	2572.73	6308.88	0.88	1.13	8.93	21.91	9.42

Load Combinations

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

Comb. No.	*Description*
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 K*	*Major Axis Moment kip-ft*	*Minor Axis Moment kip-ft*
T1	120 - 100	Leg	Max Tension	23	24.12	0.35	0.24
			Max. Compression	2	-28.38	0.01	0.43
			Max. Mx	8	-24.31	-0.39	-0.08
			Max. My	2	-28.38	0.01	0.43
			Max. Vy	8	2.47	-0.39	-0.08
			Max. Vx	2	-2.83	0.01	0.43
		Diagonal	Max Tension	24	3.23	0.00	0.00
			Max. Compression	24	-3.35	0.00	0.00
			Max. Mx	38	0.85	-0.01	0.00
			Max. My	22	-3.03	-0.00	0.00
			Max. Vy	38	0.01	-0.01	0.00
			Max. Vx	22	0.00	0.00	0.00
		Horizontal	Max Tension	22	0.38	0.00	0.00
			Max. Compression	3	-0.24	0.00	0.00
			Max. Mx	26	0.29	0.02	0.00
			Max. My	20	0.00	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Top Girt	Max Tension	10	0.33	0.00	0.00
			Max. Compression	14	-0.32	0.00	0.00
			Max. Mx	31	0.08	0.02	0.00
			Max. My	20	0.02	0.00	-0.00
			Max. Vy	31	0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
		Bottom Girt	Max Tension	22	1.25	0.00	0.00
			Max. Compression	11	-1.16	0.00	0.00
			Max. Mx	26	0.18	0.02	0.00
			Max. My	6	-0.51	0.00	-0.00
			Max. Vy	26	0.02	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Mid Girt	Max Tension	18	0.51	0.00	0.00
			Max. Compression	7	-0.40	0.00	0.00
			Max. Mx	31	0.30	0.02	0.00
			Max. My	20	0.04	0.00	-0.00
			Max. Vy	31	0.02	0.00	0.00
			Max. Vx	20	0.00	0.00	0.00
T2	100 - 80	Leg	Max Tension	23	104.52	0.09	0.04
			Max. Compression	10	-114.37	-2.50	-1.52
			Max. Mx	10	-114.37	-2.50	-1.52
			Max. My	2	-114.16	-0.04	2.88
			Max. Vy	10	8.18	-2.50	-1.52
			Max. Vx	2	-9.46	-0.04	2.88
		Diagonal	Max Tension	7	7.01	0.00	0.00
			Max. Compression	18	-7.34	0.00	0.00
			Max. Mx	27	1.31	-0.01	-0.00
			Max. My	18	-6.08	0.00	0.00
			Max. Vy	27	0.01	-0.01	-0.00
			Max. Vx	18	-0.00	0.00	0.00
		Horizontal	Max Tension	22	1.60	0.00	0.00
			Max. Compression	11	-1.24	0.00	0.00
			Max. Mx	26	0.58	0.02	0.00
			Max. My	6	-0.02	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Top Girt	Max Tension	10	0.94	0.00	0.00
			Max. Compression	23	-0.84	0.00	0.00
			Max. Mx	26	0.14	0.02	0.00
			Max. My	18	-0.41	0.00	0.00
			Max. Vy	26	-0.02	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	18	-0.00	0.00	0.00
		Bottom Girt	Max Tension	23	0.65	0.00	0.00
			Max. Compression	10	-0.69	0.00	0.00
			Max. Mx	26	-0.06	0.02	0.00
			Max. My	6	-0.37	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
		Mid Girt	Max Tension	22	1.09	0.00	0.00
			Max. Compression	3	-0.84	0.00	0.00
			Max. Mx	26	0.43	0.02	0.00
			Max. My	6	-0.35	0.00	-0.00
			Max. Vy	26	-0.02	0.00	0.00
			Max. Vx	6	0.00	0.00	0.00
T3	80 - 60	Leg	Max Tension	23	131.38	-7.14	-0.21
			Max. Compression	10	-142.50	7.09	0.03
			Max. Mx	22	130.28	-7.29	-0.22
			Max. My	24	-5.75	-0.45	12.69
			Max. Vy	22	0.56	-7.29	-0.22
			Max. Vx	24	-1.33	-0.45	12.69
		Diagonal	Max Tension	9	7.88	0.11	0.02
			Max. Compression	18	-8.77	0.00	0.00
			Max. Mx	10	5.60	0.14	0.01
			Max. My	18	-8.75	-0.11	-0.05
			Max. Vy	27	-0.04	0.10	-0.01
			Max. Vx	18	0.01	0.00	0.00
		Top Girt	Max Tension	22	1.81	0.00	0.00
			Max. Compression	11	-1.51	0.00	0.00
			Max. Mx	26	0.48	-0.04	0.00
			Max. My	35	0.64	0.00	0.00
			Max. Vy	26	0.04	0.00	0.00
			Max. Vx	35	-0.00	0.00	0.00
T4	60 - 40	Leg	Max Tension	23	162.57	-7.24	-0.07
			Max. Compression	10	-177.24	5.32	0.02
			Max. Mx	10	-162.21	7.50	0.06
			Max. My	24	-8.90	-0.62	10.42
			Max. Vy	10	0.31	7.50	0.06
			Max. Vx	24	-0.60	-0.62	10.42
		Diagonal	Max Tension	18	5.40	0.00	0.00
			Max. Compression	6	-5.66	0.00	0.00
			Max. Mx	10	4.79	0.08	0.00
			Max. My	29	1.16	0.05	0.01
			Max. Vy	37	0.04	0.07	0.01
			Max. Vx	28	-0.00	0.00	0.00
T5	40 - 20	Leg	Max Tension	23	191.80	-8.46	0.01
			Max. Compression	10	-210.63	4.53	-0.03
			Max. Mx	10	-190.39	10.00	-0.02
			Max. My	24	-11.28	-0.89	16.26
			Max. Vy	10	0.63	10.00	-0.02
			Max. Vx	24	-2.03	-0.89	16.26
		Diagonal	Max Tension	12	7.81	0.00	0.00
			Max. Compression	18	-7.09	0.00	0.00
			Max. Mx	20	-2.51	0.12	-0.00
			Max. My	6	-6.16	0.00	0.04
			Max. Vy	36	0.06	0.10	0.01
			Max. Vx	6	-0.01	0.00	0.00
T6	20 - 0	Leg	Max Tension	23	194.50	-5.84	0.02
			Max. Compression	10	-212.32	0.00	-0.00
			Max. Mx	22	192.73	-6.06	0.02
			Max. My	24	-9.66	-0.89	16.26
			Max. Vy	22	-0.52	-6.06	0.02
			Max. Vx	24	1.06	-0.89	16.26
		Diagonal	Max Tension	25	15.07	0.00	0.00
			Max. Compression	24	-16.86	0.00	0.00
			Max. Mx	10	0.31	-0.42	-0.10
			Max. My	25	-8.38	0.14	-0.14
			Max. Vy	36	-0.12	-0.34	0.10
			Max. Vx	25	0.01	0.16	-0.14

Maximum Reactions

Location	*Condition*	*Gov. Load Comb.*	*Vertical K*	*Horizontal, X K*	*Horizontal, Z K*
Leg C	Max. Vert	18	232.83	20.92	-12.42
	Max. H_x	18	232.83	20.92	-12.42
	Max. H_z	9	-183.54	-15.64	11.04
	Min. Vert	7	-208.00	-18.48	10.98
	Min. H_x	7	-208.00	-18.48	10.98
	Min. H_z	18	232.83	20.92	-12.42
Leg B	Max. Vert	10	238.58	-21.77	-12.29
	Max. H_x	23	-214.95	19.38	10.89
	Max. H_z	21	-185.38	15.77	11.07
	Min. Vert	23	-214.95	19.38	10.89
	Min. H_x	10	238.58	-21.77	-12.29
	Min. H_z	8	207.13	-17.90	-12.33
Leg A	Max. Vert	2	233.32	-0.32	24.29
	Max. H_x	8	11.79	3.21	1.36
	Max. H_z	2	233.32	-0.32	24.29
	Min. Vert	15	-208.11	0.30	-21.44
	Min. H_x	20	14.44	-3.24	1.57
	Min. H_z	15	-208.11	0.30	-21.44

Tower Mast Reaction Summary

Load Combination	*Vertical K*	*Shear$_x$ K*	*Shear$_z$ K*	*Overturning Moment, M_x kip-ft*	*Overturning Moment, M_z kip-ft*	*Torque kip-ft*
Dead Only	31.84	0.00	0.00	-3.18	3.46	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	38.21	-0.11	-29.33	-2292.34	17.94	-5.77
0.9 Dead+1.6 Wind 0 deg - No Ice	28.66	-0.11	-29.33	-2286.65	16.85	-5.76
1.2 Dead+1.6 Wind 30 deg - No Ice	38.21	13.62	-23.87	-1899.57	-1071.69	-3.23
0.9 Dead+1.6 Wind 30 deg - No Ice	28.66	13.62	-23.87	-1894.64	-1070.50	-3.22
1.2 Dead+1.6 Wind 60 deg - No Ice	38.21	25.06	-14.50	-1139.38	-1957.71	-5.90
0.9 Dead+1.6 Wind 60 deg - No Ice	28.66	25.06	-14.50	-1136.05	-1954.70	-5.88
1.2 Dead+1.6 Wind 90 deg - No Ice	38.21	30.00	0.11	9.80	-2327.08	-1.88
0.9 Dead+1.6 Wind 90 deg - No Ice	28.66	30.00	0.11	10.75	-2323.34	-1.86
1.2 Dead+1.6 Wind 120 deg - No Ice	38.21	26.26	15.32	1186.39	-2025.14	4.49
0.9 Dead+1.6 Wind 120 deg - No Ice	28.66	26.26	15.32	1184.93	-2022.04	4.50
1.2 Dead+1.6 Wind 150 deg - No Ice	38.21	14.80	25.69	2004.33	-1152.40	8.63
0.9 Dead+1.6 Wind 150 deg - No Ice	28.66	14.80	25.69	2001.15	-1151.07	8.63
1.2 Dead+1.6 Wind 180 deg - No Ice	38.21	0.11	28.83	2265.77	-9.53	5.77
0.9 Dead+1.6 Wind 180 deg - No Ice	28.66	0.11	28.83	2262.03	-10.55	5.76
1.2 Dead+1.6 Wind 210 deg - No Ice	38.21	-13.62	23.87	1891.86	1080.02	3.23
0.9 Dead+1.6 Wind 210 deg - No Ice	28.66	-13.62	23.87	1888.88	1076.75	3.22
1.2 Dead+1.6 Wind 240 deg - No Ice	38.21	-25.49	14.75	1140.99	1982.43	5.90
0.9 Dead+1.6 Wind 240 deg - No Ice	28.66	-25.49	14.75	1139.63	1977.32	5.89

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	K	K	K	kip-ft	kip-ft	kip-ft
1.2 Dead+1.6 Wind 270 deg - No Ice	38.21	-30.00	-0.11	-17.68	2335.44	1.88
0.9 Dead+1.6 Wind 270 deg - No Ice	28.66	-30.00	-0.11	-16.65	2329.60	1.86
1.2 Dead+1.6 Wind 300 deg - No Ice	38.21	-25.83	-15.07	-1184.71	2017.18	-4.49
0.9 Dead+1.6 Wind 300 deg - No Ice	28.66	-25.83	-15.07	-1181.29	2011.98	-4.50
1.2 Dead+1.6 Wind 330 deg - No Ice	38.21	-14.80	-25.69	-2011.99	1160.88	-8.63
0.9 Dead+1.6 Wind 330 deg - No Ice	28.66	-14.80	-25.69	-2006.87	1157.43	-8.63
1.2 Dead+1.0 Ice+1.0 Temp	112.06	-0.00	-0.00	-3.31	31.75	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	112.06	-0.01	-8.98	-713.57	33.58	-2.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	112.06	4.40	-7.66	-613.16	-317.79	-2.06
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	112.06	7.75	-4.48	-357.32	-580.46	-2.05
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	112.06	9.18	0.01	-1.63	-685.90	-0.41
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	112.06	8.06	4.67	360.76	-594.53	2.05
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	112.06	4.57	7.93	618.80	-326.86	2.93
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	112.06	0.01	8.93	704.85	30.13	2.26
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	112.06	-4.40	7.66	606.50	381.47	2.06
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	112.06	-7.79	4.50	351.66	645.93	2.05
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	112.06	-9.18	-0.01	-5.08	749.60	0.41
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	112.06	-8.01	-4.65	-366.41	656.46	-2.05
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	112.06	-4.57	-7.93	-625.46	390.59	-2.93
Dead+Wind 0 deg - Service	31.84	-0.02	-6.10	-478.46	6.33	-1.20
Dead+Wind 30 deg - Service	31.84	2.83	-4.96	-396.88	-219.93	-0.68
Dead+Wind 60 deg - Service	31.84	5.21	-3.02	-239.01	-403.93	-1.22
Dead+Wind 90 deg - Service	31.84	6.24	0.02	-0.36	-480.64	-0.38
Dead+Wind 120 deg - Service	31.84	5.46	3.19	243.96	-417.95	0.94
Dead+Wind 150 deg - Service	31.84	3.08	5.34	413.81	-236.71	1.79
Dead+Wind 180 deg - Service	31.84	0.02	5.99	468.09	0.63	1.20
Dead+Wind 210 deg - Service	31.84	-2.83	4.96	390.45	226.90	0.68
Dead+Wind 240 deg - Service	31.84	-5.30	3.07	234.54	414.30	1.22
Dead+Wind 270 deg - Service	31.84	-6.24	-0.02	-6.07	487.60	0.38
Dead+Wind 300 deg - Service	31.84	-5.37	-3.13	-248.43	421.50	-0.93
Dead+Wind 330 deg - Service	31.84	-3.08	-5.34	-420.23	243.67	-1.79

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX	PY	PZ	PX	PY	PZ	% Error
	K	K	K	K	K	K	
1	0.00	-31.84	0.00	0.00	31.84	0.00	0.000%
2	-0.11	-38.21	-29.33	0.11	38.21	29.33	0.000%
3	-0.11	-28.66	-29.33	0.11	28.66	29.33	0.000%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
4	13.62	-38.21	-23.87	-13.62	38.21	23.87	0.000%
5	13.62	-28.66	-23.87	-13.62	28.66	23.87	0.000%
6	25.06	-38.21	-14.50	-25.06	38.21	14.50	0.000%
7	25.06	-28.66	-14.50	-25.06	28.66	14.50	0.000%
8	30.00	-38.21	0.11	-30.00	38.21	-0.11	0.000%
9	30.00	-28.66	0.11	-30.00	28.66	-0.11	0.000%
10	26.26	-38.21	15.32	-26.26	38.21	-15.32	0.000%
11	26.26	-28.66	15.32	-26.26	28.66	-15.32	0.000%
12	14.80	-38.21	25.69	-14.80	38.21	-25.69	0.000%
13	14.80	-28.66	25.69	-14.80	28.66	-25.69	0.000%
14	0.11	-38.21	28.83	-0.11	38.21	-28.83	0.000%
15	0.11	-28.66	28.83	-0.11	28.66	-28.83	0.000%
16	-13.62	-38.21	23.87	13.62	38.21	-23.87	0.000%
17	-13.62	-28.66	23.87	13.62	28.66	-23.87	0.000%
18	-25.49	-38.21	14.75	25.49	38.21	-14.75	0.000%
19	-25.49	-28.66	14.75	25.49	28.66	-14.75	0.000%
20	-30.00	-38.21	-0.11	30.00	38.21	0.11	0.000%
21	-30.00	-28.66	-0.11	30.00	28.66	0.11	0.000%
22	-25.83	-38.21	-15.07	25.83	38.21	15.07	0.000%
23	-25.83	-28.66	-15.07	25.83	28.66	15.07	0.000%
24	-14.80	-38.21	-25.69	14.80	38.21	25.69	0.000%
25	-14.80	-28.66	-25.69	14.80	28.66	25.69	0.000%
26	-0.00	-112.06	0.00	0.00	112.06	0.00	0.000%
27	-0.01	-112.06	-8.98	0.01	112.06	8.98	0.000%
28	4.40	-112.06	-7.66	-4.40	112.06	7.66	0.000%
29	7.75	-112.06	-4.48	-7.75	112.06	4.48	0.000%
30	9.18	-112.06	0.01	-9.18	112.06	-0.01	0.000%
31	8.06	-112.06	4.67	-8.06	112.06	-4.67	0.000%
32	4.57	-112.06	7.93	-4.57	112.06	-7.93	0.000%
33	0.01	-112.06	8.93	-0.01	112.06	-8.93	0.000%
34	-4.40	-112.06	7.66	4.40	112.06	-7.66	0.000%
35	-7.79	-112.06	4.50	7.79	112.06	-4.50	0.000%
36	-9.18	-112.06	-0.01	9.18	112.06	0.01	0.000%
37	-8.01	-112.06	-4.65	8.01	112.06	4.65	0.000%
38	-4.57	-112.06	-7.93	4.57	112.06	7.93	0.000%
39	-0.02	-31.84	-6.10	0.02	31.84	6.10	0.000%
40	2.83	-31.84	-4.96	-2.83	31.84	4.96	0.000%
41	5.21	-31.84	-3.02	-5.21	31.84	3.02	0.000%
42	6.24	-31.84	0.02	-6.24	31.84	-0.02	0.000%
43	5.46	-31.84	3.19	-5.46	31.84	-3.19	0.000%
44	3.08	-31.84	5.34	-3.08	31.84	-5.34	0.000%
45	0.02	-31.84	5.99	-0.02	31.84	-5.99	0.000%
46	-2.83	-31.84	4.96	2.83	31.84	-4.96	0.000%
47	-5.30	-31.84	3.07	5.30	31.84	-3.07	0.000%
48	-6.24	-31.84	-0.02	6.24	31.84	0.02	0.000%
49	-5.37	-31.84	-3.13	5.37	31.84	3.13	0.000%
50	-3.08	-31.84	-5.34	3.08	31.84	5.34	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	0.00000206
3	Yes	4	0.00000001	0.00000131
4	Yes	4	0.00000001	0.00000498
5	Yes	4	0.00000001	0.00000388
6	Yes	4	0.00000001	0.00000455
7	Yes	4	0.00000001	0.00000289
8	Yes	4	0.00000001	0.00000674
9	Yes	4	0.00000001	0.00000551
10	Yes	4	0.00000001	0.00000250
11	Yes	4	0.00000001	0.00000182
12	Yes	4	0.00000001	0.00000611
13	Yes	4	0.00000001	0.00000501

14	Yes	4	0.00000001	0.00000431
15	Yes	4	0.00000001	0.00000248
16	Yes	4	0.00000001	0.00000495
17	Yes	4	0.00000001	0.00000383
18	Yes	4	0.00000001	0.00000355
19	Yes	4	0.00000001	0.00000291
20	Yes	4	0.00000001	0.00000669
21	Yes	4	0.00000001	0.00000547
22	Yes	4	0.00000001	0.00000439
23	Yes	4	0.00000001	0.00000260
24	Yes	4	0.00000001	0.00000609
25	Yes	4	0.00000001	0.00000500
26	Yes	4	0.00000001	0.00000001
27	Yes	4	0.00000001	0.00005328
28	Yes	4	0.00000001	0.00005463
29	Yes	4	0.00000001	0.00005661
30	Yes	4	0.00000001	0.00005435
31	Yes	4	0.00000001	0.00005189
32	Yes	4	0.00000001	0.00005439
33	Yes	4	0.00000001	0.00005670
34	Yes	4	0.00000001	0.00005480
35	Yes	4	0.00000001	0.00005345
36	Yes	4	0.00000001	0.00005636
37	Yes	4	0.00000001	0.00005858
38	Yes	4	0.00000001	0.00005623
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*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		*°*	*°*
T1	120 - 100	3.32	49	0.25	0.05
T2	100 - 80	2.26	49	0.24	0.04
T3	80 - 60	1.31	49	0.18	0.02
T4	60 - 40	0.67	49	0.11	0.01
T5	40 - 20	0.27	49	0.07	0.00
T6	20 - 0	0.05	43	0.03	0.00

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	*°*	*°*	*ft*
120.00	VHLP800-11	49	3.32	0.25	0.05	219227
110.00	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	49	2.78	0.25	0.04	109614
98.00	DC6-48-60-18-8C-EV	49	2.15	0.24	0.03	40332
88.00	NHH-65B-R2B_TIA w/ Mount Pipe	49	1.66	0.21	0.03	17947

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	120 - 100	15.88	22	1.21	0.23
T2	100 - 80	10.80	22	1.14	0.17
T3	80 - 60	6.28	22	0.87	0.11
T4	60 - 40	3.22	22	0.55	0.05
T5	40 - 20	1.30	22	0.33	0.02
T6	20 - 0	0.26	10	0.13	0.01

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
120.00	VHLP800-11	22	15.88	1.21	0.23	49511
110.00	APXVAARR24_43-U-NA20_TIA w/ Mount Pipe	22	13.31	1.19	0.20	24755
98.00	DC6-48-60-18-8C-EV	22	10.31	1.12	0.17	8858
88.00	NHH-65B-R2B_TIA w/ Mount Pipe	22	7.95	1.00	0.14	3824

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt K	Allowable Load per Bolt K	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	120	Leg	A325N	1.25	2	12.06	82.83	0.146	1	Bolt Tension
T2	100	Leg	A325N	1.00	4	26.13	53.01	0.493	1	Bolt Tension
T3	80	Leg	A325N	1.00	6	21.90	53.01	0.413	1	Bolt Tension
		Diagonal	A325N	1.00	1	7.88	13.71	0.574	1	Member Block Shear
		Top Girt	A325N	1.00	1	1.81	11.43	0.158	1	Member Block Shear
T4	60	Leg	A325N	1.25	6	27.10	82.83	0.327	1	Bolt Tension
		Diagonal	A325N	1.00	1	5.40	10.28	0.525	1	Member Block Shear
T5	40	Leg	A325N	1.25	6	31.97	82.83	0.386	1	Bolt Tension
		Diagonal	A325N	1.00	1	7.81	17.14	0.456	1	Member Block Shear
T6	20	Diagonal	A325N	0.88	2	7.53	30.01	0.251	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	1 3/4" solid	20.00	2.43	66.6	2.41	-25.50	83.36	0.306 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T2	100 - 80	2 1/4" solid	20.00	2.43	K=1.00 51.8	3.98	-107.20	158.64	0.676 [1]
T3	80 - 60	Pirod 194651 (Gr. 58)	20.03	10.02	K=1.00 35.7	5.30	-142.50	236.90	0.602 [1]
T4	60 - 40	Priod 195213 (Gr. 58)	20.03	10.02	K=1.00 30.6	7.22	-177.24	331.32	0.535 [1]
T5	40 - 20	Pirod 195217 (Gr. 58)	20.03	10.02	K=1.00 30.6	7.22	-210.63	331.32	0.636 [1]
T6	20 - 0	Pirod 196915 (Gr. 58)	20.03	20.03	K=1.00 48.8	9.42	-212.32	385.15	0.551 [1]
					K=1.00				

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	80 - 60	0.5	1.42	115.6	262.42	0.20	1.33	3.64	0.367
T4	60 - 40	0.5	1.40	114.6	357.18	0.20	0.61	3.69	0.165
T5	40 - 20	0.5	1.40	114.6	357.18	0.20	2.04	3.69	0.553
T6	20 - 0	0.5	1.39	113.2	466.53	0.20	1.07	3.76	0.284

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.68	2.25	129.8 K=0.90	0.44	-3.35	5.92	0.566 [1]
T2	100 - 80	7/8" solid	4.68	2.23	110.1 K=0.90	0.60	-7.34	11.16	0.658 [1]
T3	80 - 60	L2 1/2x2 1/2x1/4	10.97	4.89	119.7 K=1.00	1.19	-8.77	18.78	0.467 [1]
T4	60 - 40	L2 1/2x2 1/2x3/16	11.93	5.42	131.5 K=1.00	0.90	-5.66	11.78	0.481 [1]
T5	40 - 20	L2 1/2x2 1/2x5/16	13.80	6.37	156.3 K=1.00	1.46	-7.05	13.50	0.522 [1]
T6	20 - 0	2L3 1/2x3 1/2x1/4	22.83	11.16	122.2 K=0.99	3.38	-16.86	51.14	0.330 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.00	3.85	172.7 K=0.70	0.44	-0.24	3.35	0.072 [1]
T2	100 - 80	3/4" solid	4.00	3.81	170.8 K=0.70	0.44	-1.24	3.42	0.363 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	148.0 K=0.70	0.60	-0.32	6.20	0.052 [1]
T2	100 - 80	1" solid	4.00	3.81	128.1 K=0.70	0.79	-0.84	10.81	0.077 [1]
T3	80 - 60	L3x3x3/16	4.00	2.67	86.8 K=1.62	1.09	-1.51	25.91	0.058 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	148.0 K=0.70	0.60	-1.16	6.20	0.187 [1]
T2	100 - 80	1" solid	4.00	3.81	128.1 K=0.70	0.79	-0.69	10.81	0.064 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	148.0 K=0.70	0.60	-0.40	6.20	0.065 [1]
T2	100 - 80	1" solid	4.00	3.81	128.1 K=0.70	0.79	-0.84	10.81	0.078 [1]

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	1 3/4" solid	20.00	0.29	8.0	2.41	24.12	119.06	0.203 [1]
T2	100 - 80	2 1/4" solid	20.00	0.29	6.2	3.98	104.52	196.82	0.531 [1]
T3	80 - 60	Pirod 194651 (Gr. 58)	20.03	10.02	35.7	5.30	131.38	262.42	0.501 [1]
T4	60 - 40	Priod 195213 (Gr. 58)	20.03	10.02	30.6	7.22	162.57	357.18	0.455 [1]
T5	40 - 20	Pirod 195217 (Gr. 58)	20.03	10.02	30.6	7.22	191.80	357.18	0.537 [1]
T6	20 - 0	Pirod 196915 (Gr. 58)	20.03	20.03	48.8	9.42	194.50	466.53	0.417 [1]

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T3	80 - 60	0.5	1.42	115.6	262.42	0.20	1.33	3.64	0.367
T4	60 - 40	0.5	1.40	114.6	357.18	0.20	0.61	3.69	0.165
T5	40 - 20	0.5	1.40	114.6	357.18	0.20	2.04	3.69	0.553
T6	20 - 0	0.5	1.39	113.2	466.53	0.20	1.07	3.76	0.284

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.68	2.25	144.3	0.44	3.23	19.88	0.163 [1]
T2	100 - 80	7/8" solid	4.68	2.23	122.3	0.60	7.01	27.06	0.259 [1]
T3	80 - 60	L2 1/2x2 1/2x1/4	10.97	4.89	78.9	0.68	7.88	33.23	0.237 [1]
T4	60 - 40	L2 1/2x2 1/2x3/16	11.93	5.42	86.2	0.52	5.40	25.27	0.214 [1]
T5	40 - 20	L2 1/2x2 1/2x5/16	13.80	6.37	103.1	0.83	7.81	40.53	0.193 [1]
T6	20 - 0	2L3 1/2x3 1/2x1/4	22.83	11.16	125.7	2.16	15.07	105.30	0.143 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	3/4" solid	4.00	3.85	246.7	0.44	0.38	19.88	0.019 [1]
T2	100 - 80	3/4" solid	4.00	3.81	244.0	0.44	1.60	19.88	0.081 [1]

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	211.4	0.60	0.33	27.06	0.012 [1]
T2	100 - 80	1" solid	4.00	3.81	183.0	0.79	0.94	35.34	0.027 [1]
T3	80 - 60	L3x3x3/16	4.00	2.67	38.3	0.66	1.81	32.14	0.056 [1]

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	211.4	0.60	1.25	27.06	0.046 [1]
T2	100 - 80	1" solid	4.00	3.81	183.0	0.79	0.65	35.34	0.018 [1]

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	120 - 100	7/8" solid	4.00	3.85	211.4	0.60	0.51	27.06	0.019 [1]
T2	100 - 80	1" solid	4.00	3.81	183.0	0.79	1.09	35.34	0.031 [1]

[1] P_u / ϕP_n controls

Section Capacity Table

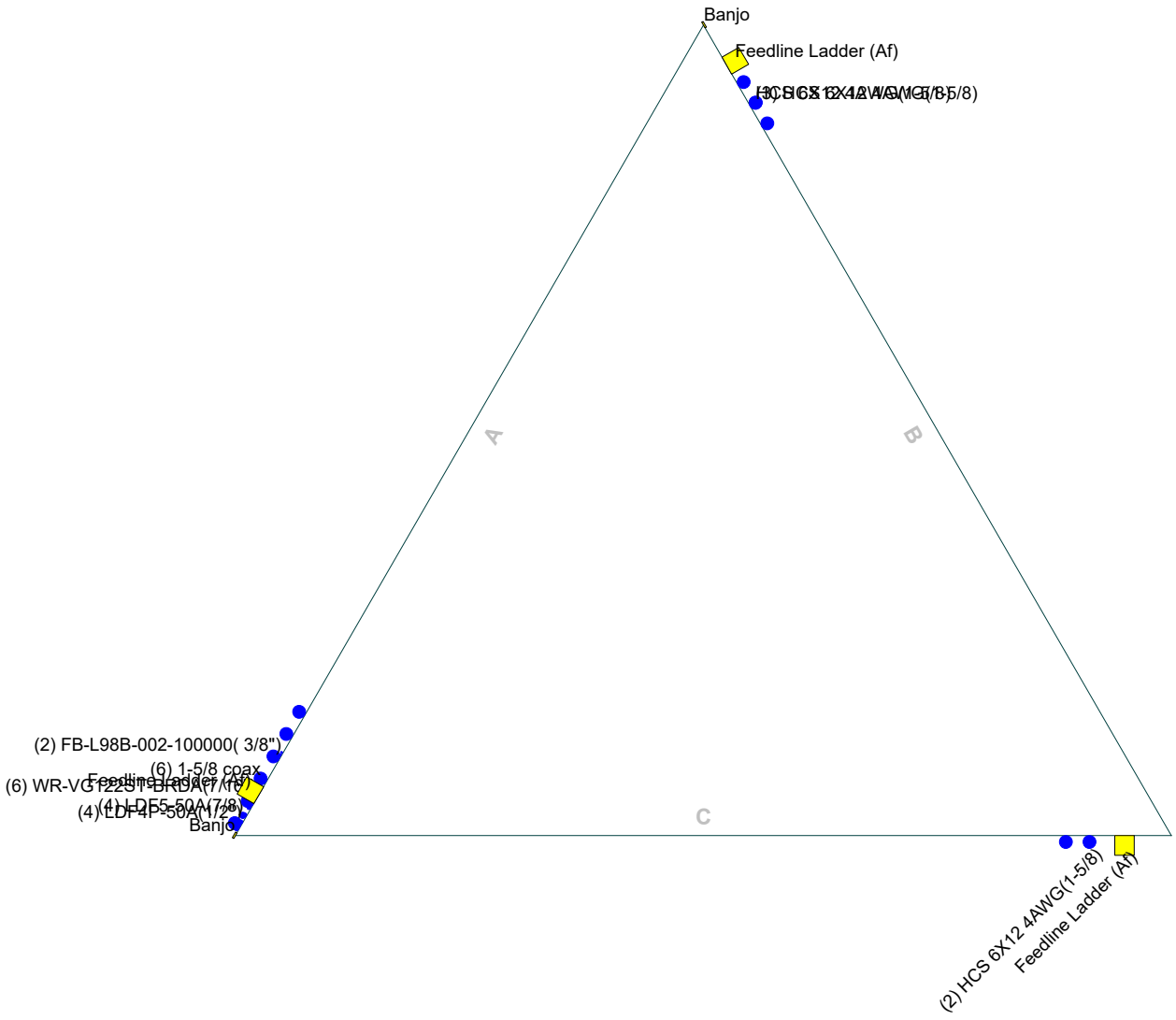
Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	120 - 100	Leg	1 3/4" solid	3	-25.50	83.36	30.6	Pass
T2	100 - 80	Leg	2 1/4" solid	80	-107.20	158.64	67.6	Pass
T3	80 - 60	Leg	Pirod 194651 (Gr. 58)	158	-142.50	236.90	60.2	Pass
T4	60 - 40	Leg	Priod 195213 (Gr. 58)	176	-177.24	331.32	53.5	Pass
T5	40 - 20	Leg	Pirod 195217 (Gr. 58)	191	-210.63	331.32	63.6	Pass
T6	20 - 0	Leg	Pirod 196915 (Gr. 58)	206	-212.32	385.15	55.1	Pass
T1	120 - 100	Diagonal	3/4" solid	16	-3.35	5.92	56.6	Pass
T2	100 - 80	Diagonal	7/8" solid	96	-7.34	11.16	65.8	Pass
T3	80 - 60	Diagonal	L2 1/2x2 1/2x1/4	174	-8.77	18.78	46.7 57.4 (b)	Pass
T4	60 - 40	Diagonal	L2 1/2x2 1/2x3/16	188	-5.66	11.78	48.1 52.5 (b)	Pass
T5	40 - 20	Diagonal	L2 1/2x2 1/2x5/16	198	-7.05	13.50	52.2	Pass
T6	20 - 0	Diagonal	2L3 1/2x3 1/2x1/4	212	-16.86	51.14	33.0	Pass
T1	120 - 100	Horizontal	3/4" solid	28	-0.24	3.35	7.2	Pass
T2	100 - 80	Horizontal	3/4" solid	99	-1.24	3.42	36.3	Pass
T1	120 - 100	Top Girt	7/8" solid	4	-0.32	6.20	5.2	Pass
T2	100 - 80	Top Girt	1" solid	84	-0.84	10.81	7.7	Pass
T3	80 - 60	Top Girt	L3x3x3/16	162	-1.51	25.91	5.8 15.8 (b)	Pass
T1	120 - 100	Bottom Girt	7/8" solid	9	-1.16	6.20	18.7	Pass
T2	100 - 80	Bottom Girt	1" solid	87	-0.69	10.81	6.4	Pass
T1	120 - 100	Mid Girt	7/8" solid	11	-0.40	6.20	6.5	Pass
T2	100 - 80	Mid Girt	1" solid	88	-0.84	10.81	7.8	Pass
						Summary		
						Leg (T2)	67.6	Pass
						Diagonal (T2)	65.8	Pass
						Horizontal (T2)	36.3	Pass
						Top Girt (T3)	15.8	Pass
						Bottom Girt (T1)	18.7	Pass
						Mid Girt (T2)	7.8	Pass
						Bolt Checks	57.4	Pass
						RATING =	**67.6**	**Pass**

APPENDIX B

BASE LEVEL DRAWING

Feed Line Plan

Round Flat App In Face App Out Face Truss-Leg



Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Tectonic
1279 Route 300
Newburgh, NY 12550
Phone: (845) 567-6656
FAX: (845) 567-8703

Job: ***10473.CT11239A - Rev 1***			
Project: ***120' Self-Support Tower***			
Client: T-Mobile	Drawn by: John-Fritz Julien		App'd:
Code: TIA-222-G	Date: 01/26/21		Scale: NTS
Path: G:\Newburgh\Projects\10473-NSS\10473.CT11239A\Structural\Tower Analysis\Rev 1\10473.CT11239A - TowerSA_Rev1.eri			Dwg No. E-7

APPENDIX C

ADDITIONAL CALCULATIONS

Anchor Rod Check for Self Supporting Towers

TIA-222-G, Section 4.9.9 Rev. 6.1

Site Data	
Work Order #:	**10473.CT11239A - Rev 1**
Site Name:	**Southington / I-84**

Reactions		
Eta Factor, η	**0.55**	Detail Type
Uplift, Pu:	**215**	kips
Shear, Vu:	**22**	kips

Anchor Rod Data		
Qty:	**12**	
Diam:	**1**	in
Rod Material:	**Other**	F1554
Strength (Fu):	125	ksi
Yield (Fy):	105	ksi

* Rod Circle:		in
* e:		in
* # of Rods		1 or 2

Mu= Pu x e:		ft-kips

** Only enter rod circle, offset (e) and number of anchor rods at the extreme fiber to consider if eccentric load due to leg reinforcement exist.*

l_{ar}:		in
Mu = 0.65*l_{ar}*V_u		ft-kips

Anchor Rod Results:

Max Rod (Cu+ Vu/ń):	21.3	Kips
Design Axial, Φ*Fu*Anet:	60.6	Kips
Anchor Rod Stress Ratio:	35.1%	

If Applicable;

Anchor Rod Results with Bending Considered:

When the clear distance from the top of concrete to the bottom of level nut excceeds 1.0 times the diameter of the anchor rod, the following interaction equation shall also be satisfied (see Figure 4-4 of Rev. G):

$$(V_u/\phi R_{nv})^2 + [(P_u/\phi R_{nt}) + (M_u/\phi R_{nm})]^2 <= 1$$

$\phi R_{nv}=\phi*0.45*F_{ub}*A_b=$		kips
$\phi R_{nt}=\phi*F_u*A_{net}=$		kips
$\phi R_{nm}=\phi*F_y*Z=$		ft-kips

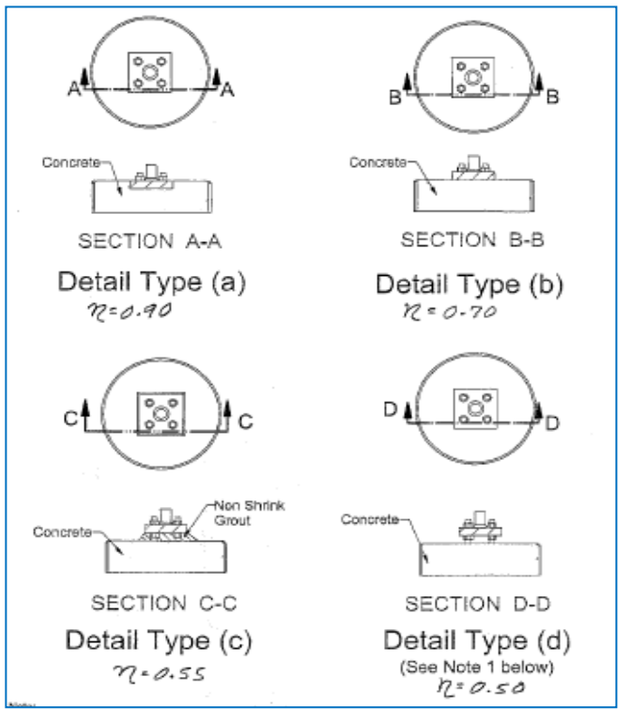


Figure 4-4 of TIA-222-G

Maximum Acceptable Ratio:	**105**	%
Governing Stress Ratio:	**35.1%**	**Pass**

FOUNDATION REACTION COMPARISON

TIA/EIA Design Revision:	G	
TIA/EIA Analysis Revision:	G	

Design Reactions		
Leg Compression (Max)	270.7	kips
Leg Uplift (Max)	244.4	kips
Leg Shear (Max)	30	kips
Overall Shear	37.1	kips
Overall Compression	40.9	kips
Overturning Moment	2799.1	ft-kips

Current Analysis Reactions		
Leg Compression (Max)	239	kips
Leg Uplift (Max)	215	kips
Leg Shear (Max)	25	kips
Overall Shear	30	kips
Overall Compression	38	kips
Overturning Moment	2347	ft-kips

Percentage of Original Reactions		
Leg Compression (Max)	88.3	%
Leg Uplift (Max)	88.0	%
Leg Shear (Max)	83.3	%
Overall Shear	80.9	%
Overall Compression	92.9	%
Overturning Moment	83.8	%

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

Municipality	Ground Snow Load	*Wind Design Parameters*							
		MCE Spectral Accelerations (%g)		Ultimate Design Wind Speeds, V_{ult} (mph)			Nominal Design Wind Speeds, V_{asd} (mph)		
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
Andover	30	0.176	0.063	120	130	140	93	101	108
Ansonia	30	0.195	0.064	115	125	135	89	97	105
Ashford	35	0.173	0.063	120	130	140	93	101	108
Avon	35	0.181	0.064	110	120	130	85	93	101
Barkhamsted	40	0.177	0.065	110	120	125	85	93	97
Beacon Falls	30	0.192	0.064	115	125	135	89	97	105
Berlin	30	0.183	0.063	115	125	135	89	97	105
Bethany	30	0.189	0.063	115	125	135	89	97	105
Bethel	30	0.215	0.066	110	120	125	85	93	97
Bethlehem	35	0.190	0.065	110	120	125	85	93	97
Bloomfield	35	0.180	0.064	115	125	130	89	97	101
Bolton	30	0.177	0.063	115	125	135	89	97	105
Bozrah	30	0.170	0.061	120	135	145	93	105	112
Branford	30	0.180	0.061	120	130	140	93	101	108
Bridgeport	30	0.209	0.064	115	125	135	89	97	105
Bridgewater	35	0.201	0.066	110	120	125	85	93	97
Bristol	35	0.185	0.064	110	120	130	85	93	101
Brookfield	35	0.208	0.066	110	120	125	85	93	97
Brooklyn	35	0.171	0.062	120	130	140	93	101	108
Burlington	35	0.182	0.064	110	120	130	85	93	101
Canaan	40	0.173	0.065	105	115	120	81	89	93
Canterbury	35	0.171	0.061	120	130	140	93	101	108
Canton	35	0.180	0.064	110	120	130	85	93	101
Chaplin	35	0.173	0.062	120	130	140	93	101	108
Cheshire	30	0.186	0.063	115	125	135	89	97	105
Chester	30	0.172	0.060	120	130	140	93	101	108
Clinton	30	0.169	0.059	120	135	140	93	105	108
Colchester	30	0.174	0.061	120	130	140	93	101	108
Colebrook	40	0.174	0.065	105	115	125	81	89	97
Columbia	30	0.175	0.062	120	130	140	93	101	108
Cornwall	40	0.180	0.065	105	115	120	81	89	93
Coventry	30	0.176	0.063	120	130	140	93	101	108
Cromwell	30	0.181	0.063	115	125	135	89	97	105
Danbury	30	0.217	0.067	110	120	125	85	93	97
Darien	30	0.242	0.068	110	120	130	85	93	101
Deep River	30	0.170	0.060	120	130	140	93	101	108
Derby	30	0.195	0.064	115	125	135	89	97	105
Durham	30	0.179	0.062	115	130	140	89	101	108
Eastford	40	0.172	0.063	120	130	140	93	101	108
East Granby	35	0.177	0.065	110	120	130	85	93	101
East Haddam	30	0.172	0.061	120	130	140	93	101	108
Southington	30	0.185	0.064	115	125	135	89	97	105

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Wed Nov 04 2020

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 50-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.

Exhibit E

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Date: **November 19, 2020**

Mount Analysis Report

Tower Owner: Town of Southington
Carrier: T-Mobile

Site ID: CT11239A
Site Name: Southington/ I-84
Site Data: 435 Mill St., Southington, Hartford County, CT 06489
Latitude *41° 36' 16.53"*, Longitude *-72° 53' 39.61"*
12.5 ft Sector Frame Mount

Tectonic Project Number: 10473.CT11239A

Tectonic Engineering & Surveying Consultants P.C. is pleased to submit this **"Mount Analysis Report"** to determine the structural integrity of the above mentioned mount.

The purpose of the analysis is to determine acceptability of the mount stress level. Based on our analysis we have determined the mount stress level to be:

Sector Frame: **Sufficient Capacity – 90%**

This analysis has been performed in accordance with the 2018 Connecticut State Building Code based upon an ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second gust wind speed of 97 mph per Section 1609.3 and Appendix N as required for use in the TIA-222-G Standard per Exception #5 of Section 1609.1.1. Exposure Category B with a maximum topographic factor, Kzt, of 1.0 and Structure Class 2 were used in this analysis.

All modifications and equipment proposed in this report shall be installed in accordance with this analysis for the determined available structural capacity to be effective.

We at Tectonic appreciate the opportunity of providing our continuing professional services to you and T-Mobile. If you have any questions or need further assistance on this or any other projects please give us a call.

Structural analysis prepared by: John-Fritz Julien / Ian Marinaccio

Respectfully submitted by:
Tectonic Engineering & Surveying Consultants P.C.

Edward N. Iamiceli, P.E.
Managing Director - Structural

Project Contact Info

1279 Route 300 | Newburgh, NY 12550
845.567.6656 Tel | 845.567.8703 Fax

tectonicengineering.com
Equal Opportunity Employer

TABLE OF CONTENTS

1) INTRODUCTION

The existing mount is a 12.5 ft sector frame mount designed by SitePro1 (P/N: VFA12-RRU).

2) ANALYSIS CRITERIA

TIA-222 Revision:	TIA-222-G
Structure Class:	2
Wind Speed:	97 mph
Exposure Category:	B
Topographic Factor:	1.0
Ice Thickness:	0.75 in
Wind Speed with Ice:	50 mph
Service Wind Speed:	60 mph

Table 1 - Proposed Equipment Loading Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Proposed Mount Type	Note
110.0	T-Mobile	3	ericsson	AIR 6449 B41	-	1
		3	commscope	SDX1926Q-43		
		3	ericsson	RRUS 4415 B25		

Note:
1) Proposed equipment to be installed on the existing sector frame mount.

Table 2 - Existing Equipment Loading Information

Mounting Level (ft)	Carrier Designation	Number of Antennas	Antenna Manufacturer	Antenna Model	Existing Mount Type	Note
110.0	T-Mobile	3	rfs	APXVAARR24_43-U-NA20	SitePro1 VFA12-RRU	1
		3	ericsson	AIR 32 B66A B2A		
		3	ericsson	RADIO 4449 B71 + B85		
		3	ericsson	RADIO 4415 B66a		

Note:
1) Existing equipment to remain.

3) ANALYSIS PROCEDURE

Table 3 - Documents Provided

Document	Remarks	Dated
ASSEMBLY DRAWINGS (VFA12-RRU)	SitePro1	08/22/18
MOUNT EVALUATION REPORT	Tectonic	03/30/20
RFDS	T-Mobile	10/14/20

3.1) Analysis Method

A tool internally developed, using Microsoft Excel, was used to calculate wind loading on all appurtenances and mount members. This information was then used in conjunction with another program, RISA-3D, which is a commercially available analysis software package, used to check the supporting building framing and calculate member stresses for various loading cases. The selected output from the analysis is included in Appendices B and C.

3.2) Assumptions

1) The antenna mounting system was properly fabricated, installed, and maintained in good condition in accordance with its original design, TIA Standards, and/or manufacturer's specifications.
2) The configuration of antennas, mounts, and other appurtenances are as specified in Tables 1 and 2.
3) 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.
4) Steel grades have been assumed as follows, unless noted otherwise:

Channel, Solid Round, Angle, Plate	ASTM A36 (GR 36)
HSS (Rectangular)	ASTM 500 (GR B-46)
Pipe	ASTM A53 (GR 35)
Connection Bolts	ASTM A325

This analysis may be affected if any assumptions are not valid or have been made in error. Tectonic should be notified to determine the effect on the structural integrity of the mount.

4) ANALYSIS RESULTS

Table 4 - Mount Component Stresses vs. Capacity (Sector Mount)

Notes	Component	Mount Centerline (ft)	% Capacity	Pass / Fail
1	Face Horizontal	110.0	90	Pass
	Sector Horizontal		79	Pass
	Mount Pipe		76	Pass
	Sector Brace		62	Pass
	Stiffarm Pipe		6	Pass

Structure Rating (max from all components) =	90%

Note:
1) See additional documentation in "Appendix C - Analysis Output" for calculations supporting the % capacity consumed.

4.1) Results / Conclusions

The sector frame mount has sufficient capacity to carry the proposed T-Mobile load configurations. No modification is required at this time.

This structural analysis only includes evaluation of the antenna sector mounts and not the self-support tower. The self-support tower is to be analyzed under a separate structural analysis by Tectonic Engineering & Surveying Consultants, P.C.

Contractor shall field verify existing conditions and recommendations as noted on the construction drawings and notify the design engineer of any discrepancies prior to construction. Any further changes to the antenna and/or appurtenance configuration should be reviewed with respect to their effect on structural loads prior to implementation.

APPENDIX A

SOFTWARE INPUT CALCULATIONS

Tectonic	Job No.	10473.CT11239A		
	Sheet No.	1	of	3
	Calculated By	JJ	Date :	11/19/2020
	Checked By	IM	Date :	11/19/2020

WIND AND ICE LOADS PER TIA-222-G

W.O.	10473.CT11239A
Project Name	Southington/ I-84
Location	435 Mill St, Southington, CT 06489
County	Hartford

Tower Type	SST	Self-Supporting (lattice)
Structure Class	2	Substantial hazard
Exposure Category	B	Suburban/wooded/obstructed
Topo Category	1	Flat or rolling terrain
Height of crest	0	ft

Basic Wind Speed (3-sec gust):		
Without ice	97	mph*
With ice	50	mph
Service	60	mph
Ice thickness	0.75	in

Importance Factor	
Wind only	1.00
Wind with ice	1.00
Ice thickness	1.00
Supporting Data:	
K_e	0.90
K_t	N/A
f	N/A
z_g	1200
α	7
$K_{z,min}$	0.7
K_d	0.95
G_h	1.00

Height	z (ft)	110
	Kh	N/A
	Kzt	1.00
	Kz	1.02
	Kiz	1.13
Wind Pressure, qz (psf)	No Ice	23.24
	With Ice	6.17
	Service	8.89
(tiz)	Ice Thk	1.69
Appurtenances (qzGh)	No Ice	23.24
	With Ice	6.17
	Service	8.89

*Ultimate 3-second gust wind speed of 125 mph converted to a nominal 3-second wind gust speed of 97 mph per Section 1609.3 and Appendix N, as required for use in the TIA-222-G Standard.

Tectonic

Job No.	10473.CT11239A		
Sheet No.	2	of	3
Calculated By	JJ	Date :	11/19/20
Checked By	IM	Date :	11/19/20

Appurtenance Information

Effective Projected Area for Appurtenance $(EPA)_A=Max((EPA)_N,(EPA)_T)$

$(EPA)_T=\sum(C_aA_A)_T$ | $(EPA)_N=\sum(C_aA_A)_N$

Reduction Factor = 1

Wind Only Load Combinations

Antenna Configuration	(E) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(Aa)_T$ (ft^2)	Wind ward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Antenna Weight (lb)	Total Weight (lb)
AIR 6449 B41	**P**	**3**	110	2.76	20.50	8.30	Flat	1.27	1.20	1.91	7.25	4.71	16.96	131	56	103.0	309.0
SDX1926Q-43	**P**	**3**	110	0.35	6.93	2.91	Flat	1.20	1.20	0.08	0.30	0.20	0.72	6	2	6.2	18.5
RRUS 4415 B25	**P**	**3**	110	1.24	13.20	5.40	Flat	1.21	1.20	0.56	2.03	1.37	4.92	38	16	46.3	138.9
RADIO 4449 B71 + B85	E	3	110	1.25	13.19	10.51	Flat	1.20	1.20	1.09	3.93	1.37	4.93	38	30	75.0	224.9
RADIO 4415 B66a	E	3	110	1.38	13.46	5.87	Flat	1.21	1.20	0.67	2.45	1.55	5.57	43	19	47.4	142.2
APXVAARR24_43-U-NA20	E	3	110	7.99	24.00	8.70	Flat	1.53	1.27	5.79	26.67	15.98	60.73	470	207	153.3	459.9
AIR-32 B2A/B66A	E	3	110	4.72	12.90	8.70	Flat	1.38	1.28	3.42	14.14	5.07	19.53	151	110	132.2	396.6
										$\sum(CaA_A)_T$	56.77	$\sum(CaA_A)_N$	113.36				1690

Note: Appurtenances listed above are to be installed along three (3) sector mounts.

Wind with Ice Load Combinations **Ice Thk=** 1.69 in

Antenna Configuration	(E), (R) or (P)	Qty	z (ft)	Length or Diameter (ft)	Width (in)	Depth (in)	Flat or Cylindrical?	Antenna $(Ca)_T$	Antenna $(Ca)_N$	Side Face $(A_a)_T$ (ft^2)	Windward Side Face (CaAa)T (ft^2)	Face Normal $(A_a)_N$ (ft^2)	Windward Face Normal $(C_aA_a)_N$ (ft^2)	Normal Antenna Wind Load Each (lb)	Transverse Antenna Wind Load Each (lb)	Ice Area for Weight (ft^2)	Ice Weight Alone (lbs)
AIR 6449 B41	P	3	110	3.04	23.88	11.68	Cylindrical	1.23	1.20	2.96	10.90	6.05	21.78	45	22	13.2	104.5
SDX1926Q-43	P	3	110	0.63	10.31	6.30	Cylindrical	1.20	1.20	0.33	1.19	0.54	1.95	4	2	0.6	4.5
RRUS 4415 B25	P	3	110	1.52	16.58	8.78	Cylindrical	1.20	1.20	1.12	4.02	2.11	7.58	16	8	3.8	30.4
RADIO 4449 B71 + B85	E	3	110	1.53	16.57	13.89	Cylindrical	1.20	1.20	1.77	6.37	2.11	7.60	16	13	4.9	38.9
RADIO 4415 B66a	E	3	110	1.66	16.85	9.25	Cylindrical	1.20	1.20	1.28	4.61	2.33	8.39	17	9	4.4	35.1
APXVAARR24_43-U-NA20	E	3	110	8.27	27.38	12.08	Cylindrical	1.44	1.25	8.33	36.01	18.88	70.80	146	74	43.6	343.9
AIR-32 B2A/B66A	E	3	110	5.00	16.28	12.08	Cylindrical	1.31	1.25	5.03	19.77	6.78	25.49	52	41	17.0	134.1
										$\sum(CaA_A)_T$	82.87	$\sum(CaA_A)_N$	143.60				691

Tectonic
PRACTICAL SOLUTIONS. EXCEPTIONAL SERVICE.

Job No.	10473.CT11239A		
Sheet No.	3	of	3
Calculated By	JJ	Date :	11/19/20
Checked By	IM	Date :	11/19/20

Existing Sector Mount

Mount Center Line=	110 ft

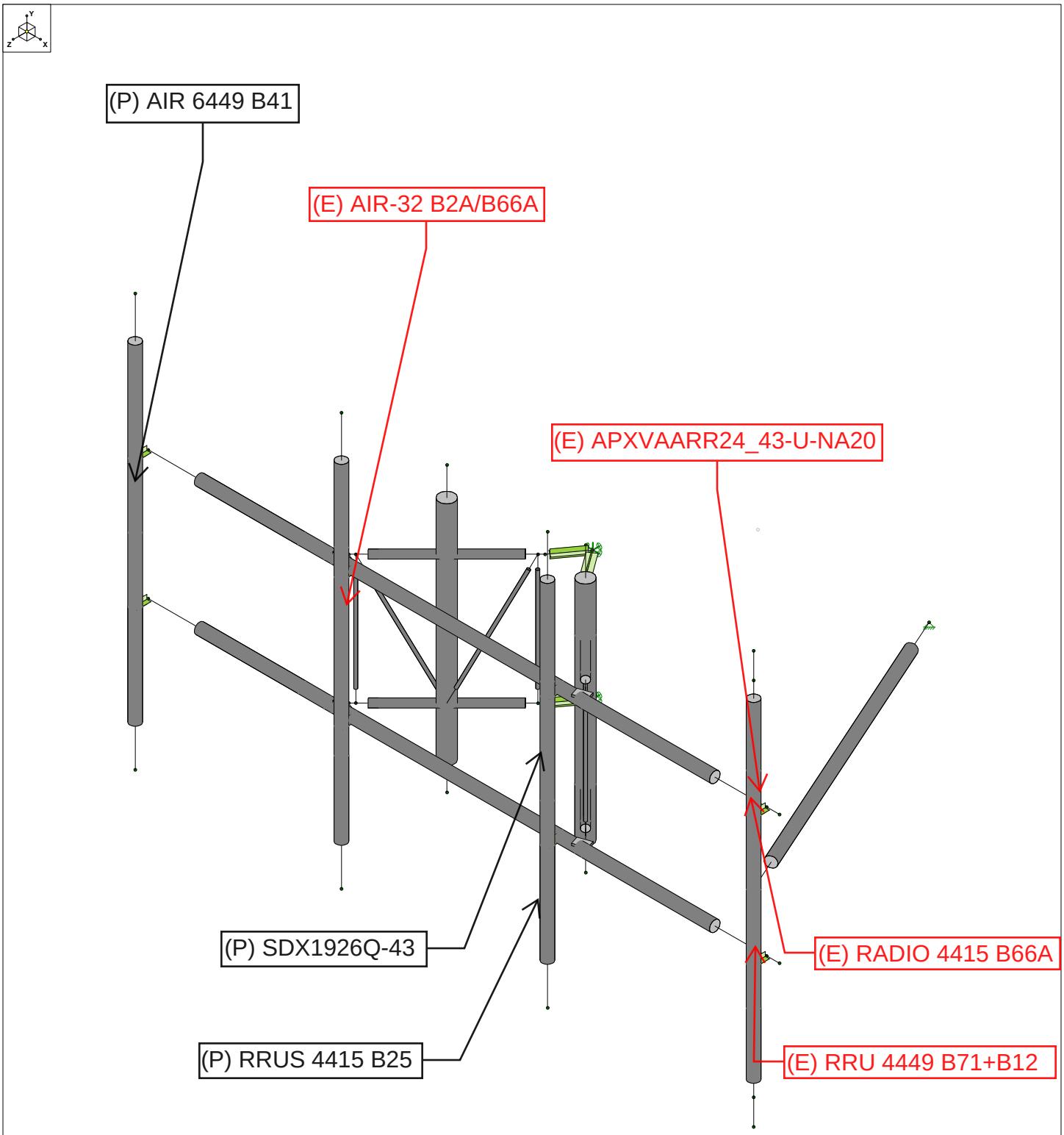
Member sizes and lengths are based on the assembly drawing by SitePro1 VFA12-RRU

Reduction Factor = 1

Mount Part	Quantity	Length (ft)	Projected Width (in)	Depth (in)	Flat or Cylindrical?	Drag Factor	Projected Area (ft^2)	Wind Force (lbs/ft)	Ice Weight Area (ft^2)	Ice Weight (lbs/ft)	Projected Area with Ice (ft^2)	Wind Force Ice (lbs/ft)	Service Wind Force (lbs/ft)
Face Horizontal_2.0" STD Pipe	2	12.50	2.38	2.38	Cylindrical	1.2	5.95	5.5	15.57	4.9	14.41	3.6	2.1
Sector Horizontal_1.25" STD Pipe	4	3.50	1.66	1.66	Cylindrical	1.2	2.32	3.9	6.08	3.4	7.06	3.1	1.5
Sector Vertical_5/8" SR	4	2.50	0.63	0.63	Cylindrical	1.2	0.63	1.5	1.64	1.3	4.01	2.5	0.6
Sector Diagonal_5/8" SR	4	2.50	0.63	0.63	Cylindrical	1.2	0.63	1.5	1.64	1.3	4.01	2.5	0.6
Mount Pipe_2.0" STD	4	8.00	2.38	2.38	Cylindrical	1.2	7.60	5.5	19.89	4.9	18.43	3.6	2.1
Vertical Pipe_HSS3.5x1/8	2	6.00	3.50	3.50	Cylindrical	1.2	4.20	8.1	10.99	7.2	8.26	4.3	3.1
Stiffarm_2.0" STD Pipe	1	7.00	2.38	2.38	Cylindrical	1.2	1.66	5.5	4.35	4.9	4.03	3.6	2.1

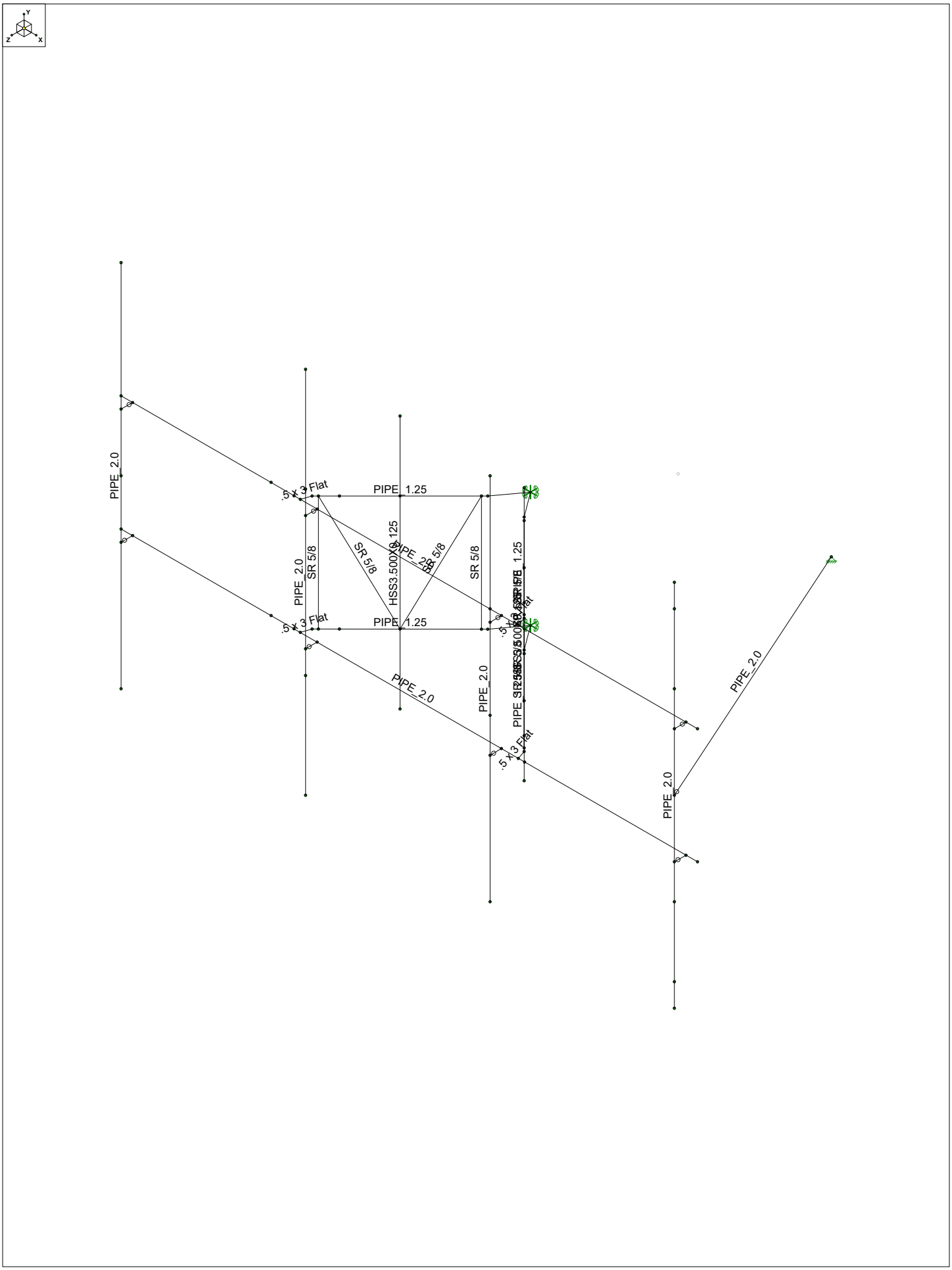
APPENDIX B

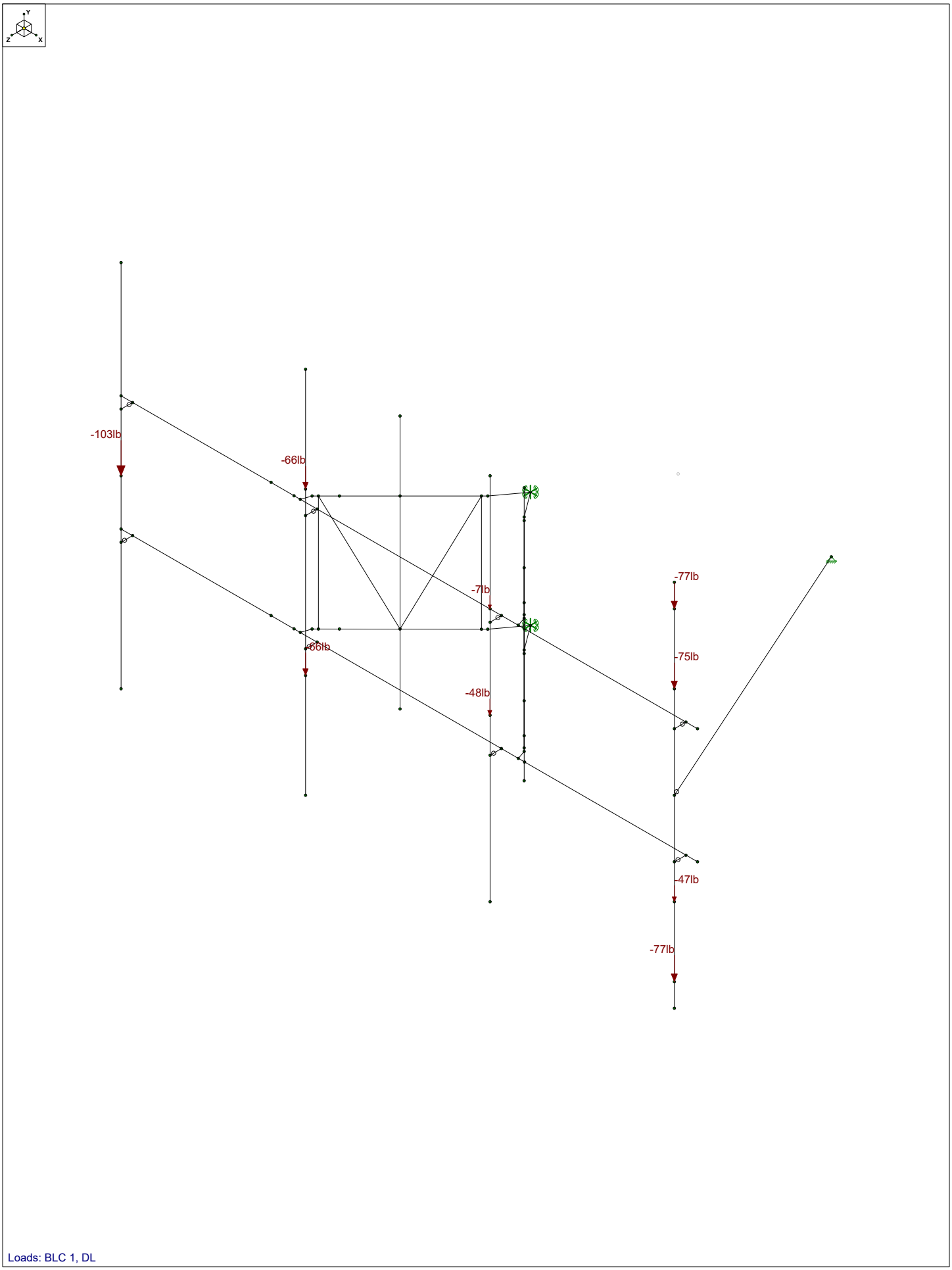
WIRE FRAME AND RENDERED MODELS



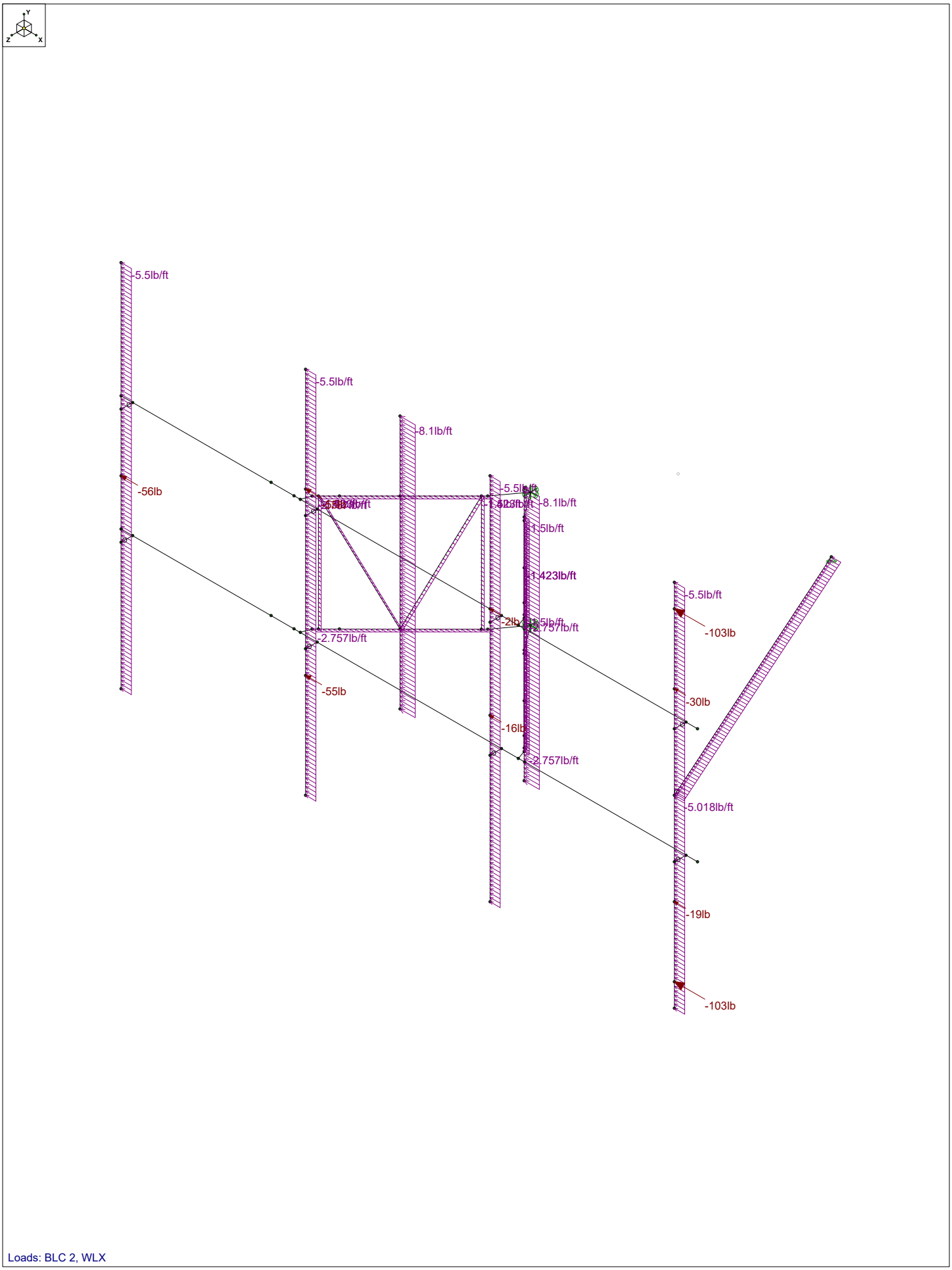
(P) PROPOSED
(E) EXISTING

NOTES:
1)EXISTING AND PROPOSED ANTENNAS AND MOUNTING PIPES HAVE BEEN VERTICALLY CENTERED ALONG THE EXISTING MOUNT (NO OFFSET).
2) LISTED APPURTENANCES ABOVE ARE TYPICAL FOR ALL SECTORS.
3) RADIOS ARE LOCATED BEHIND THE ANTENNAS.

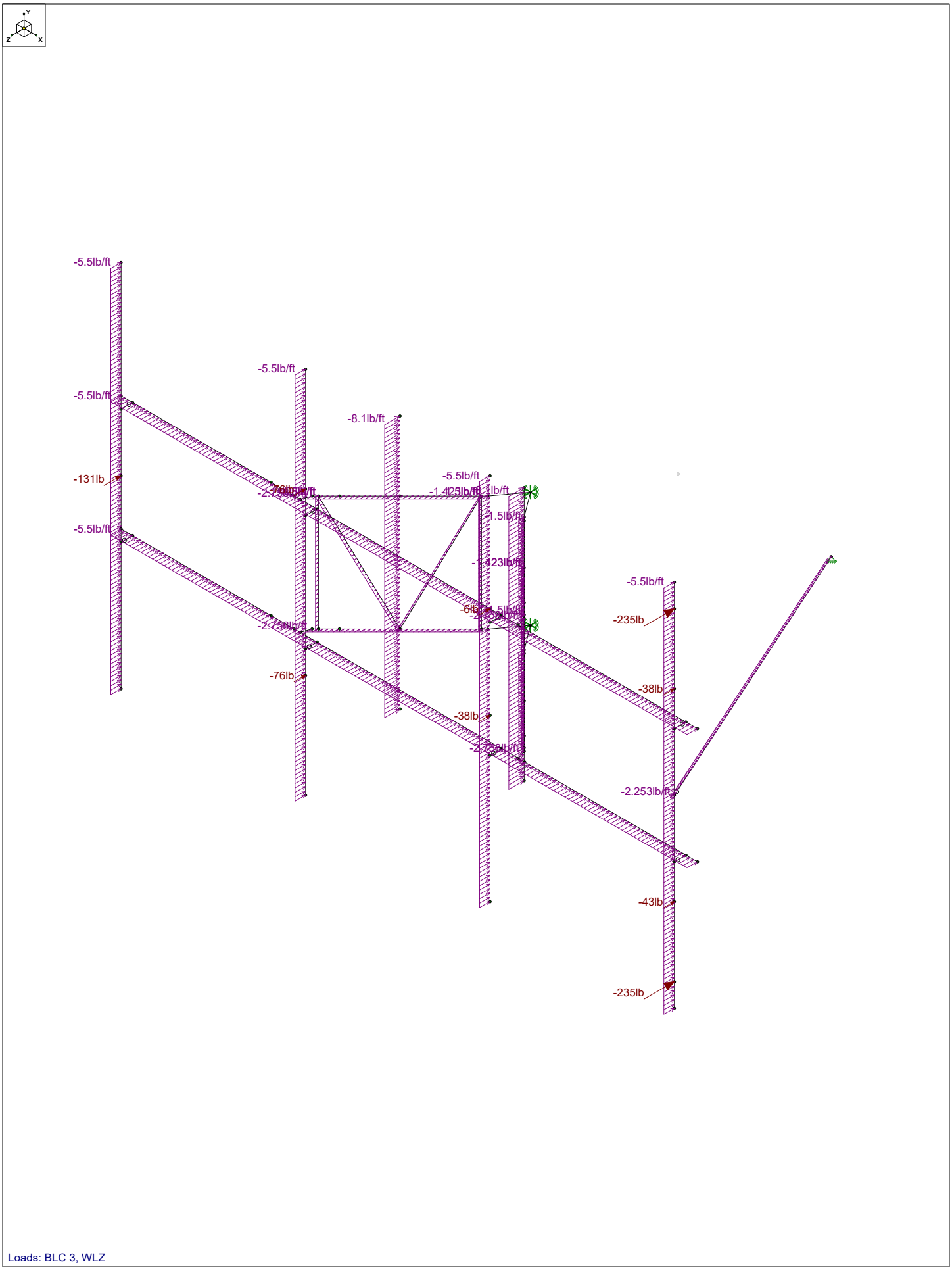

Y
Z
X
PIPE_2.0
.5 X 3 Flat
PIPE_1.25
SR 5/8
HSS3.500X0.125
PIPE_2.0
PIPE_2.0
PIPE_2.0
PIPE_2.0



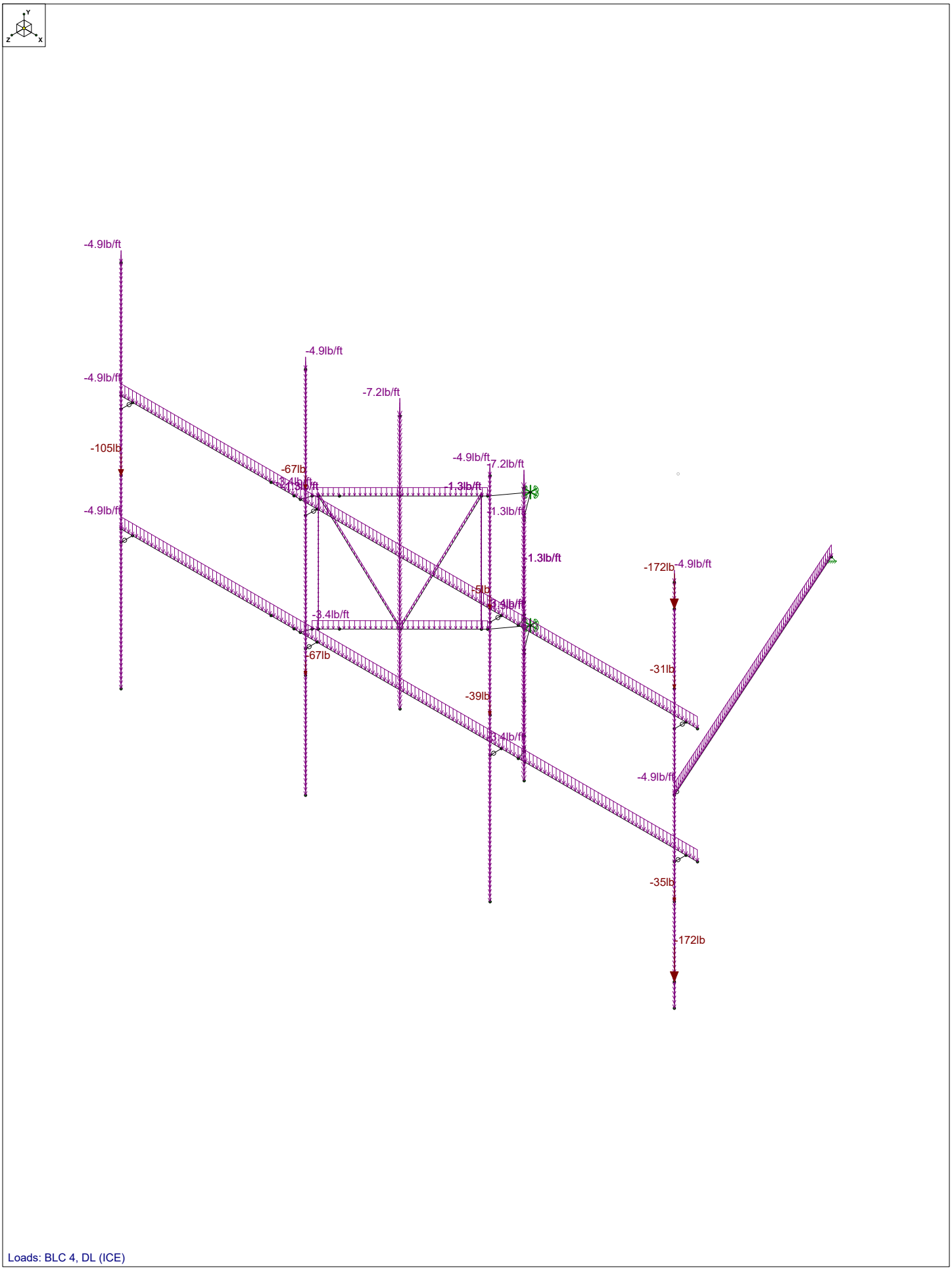
Loads: BLC 1, DL



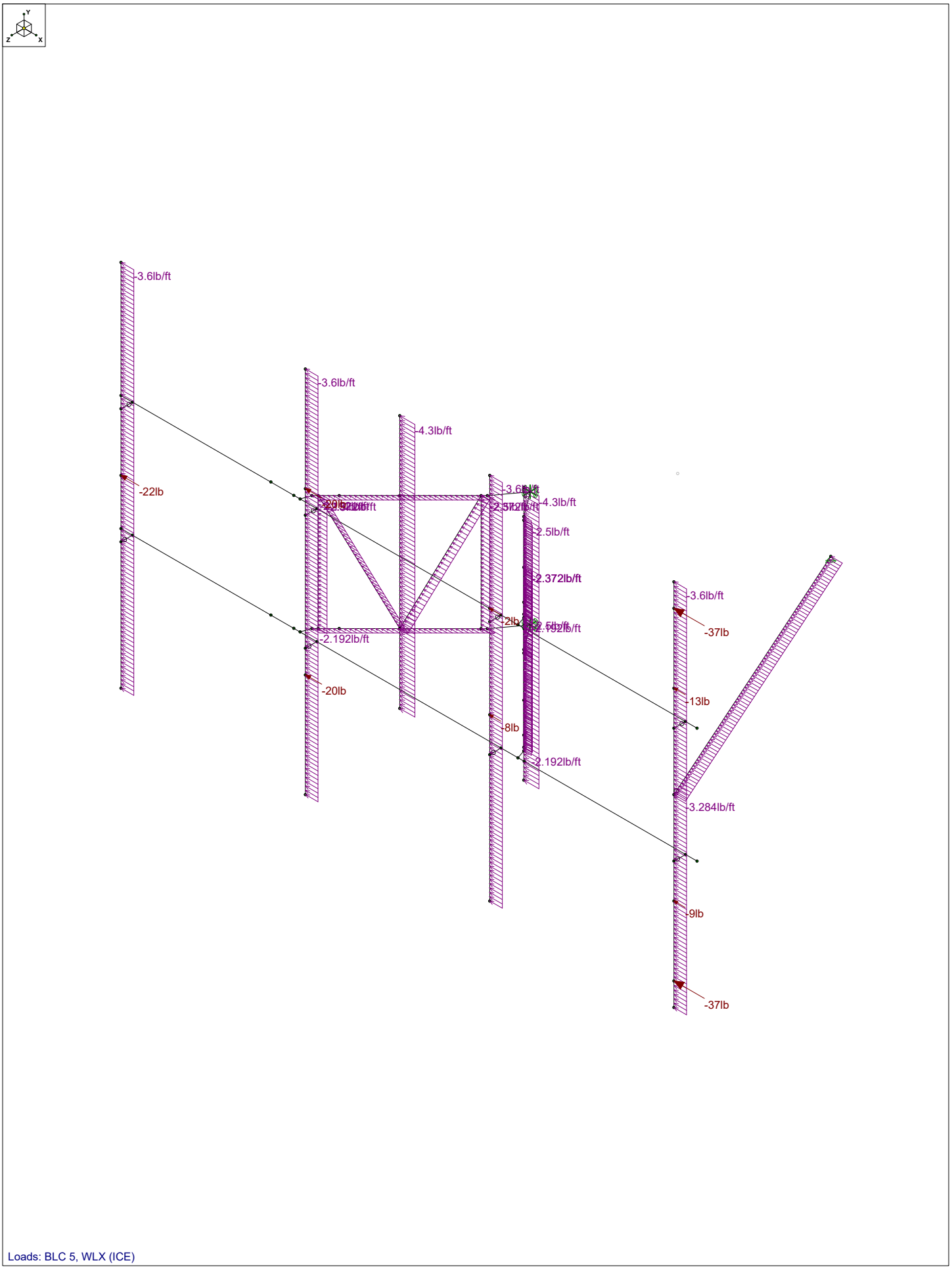
Loads: BLC 2, WLX



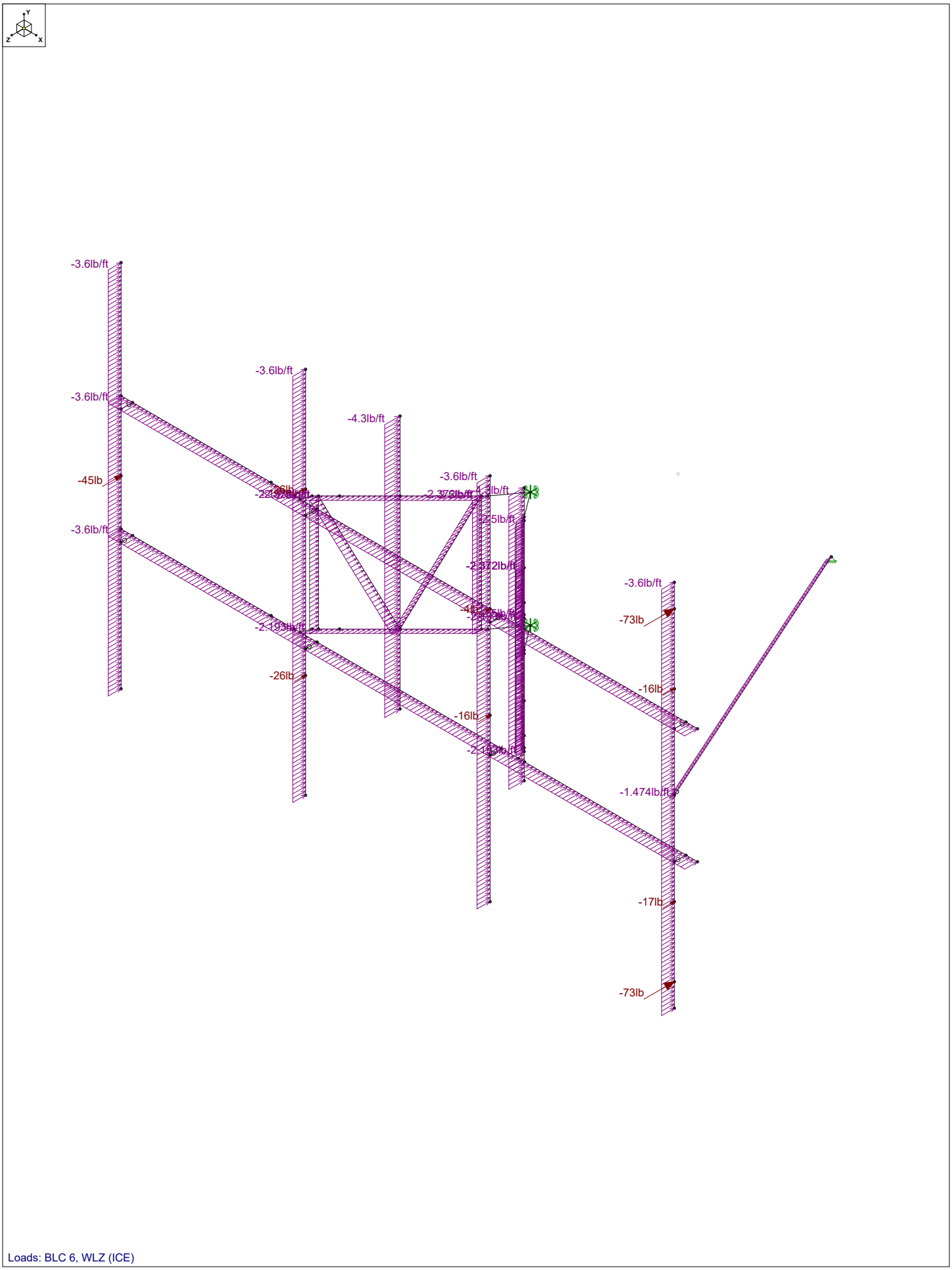
Loads: BLC 3, WLZ



Loads: BLC 4, DL (ICE)



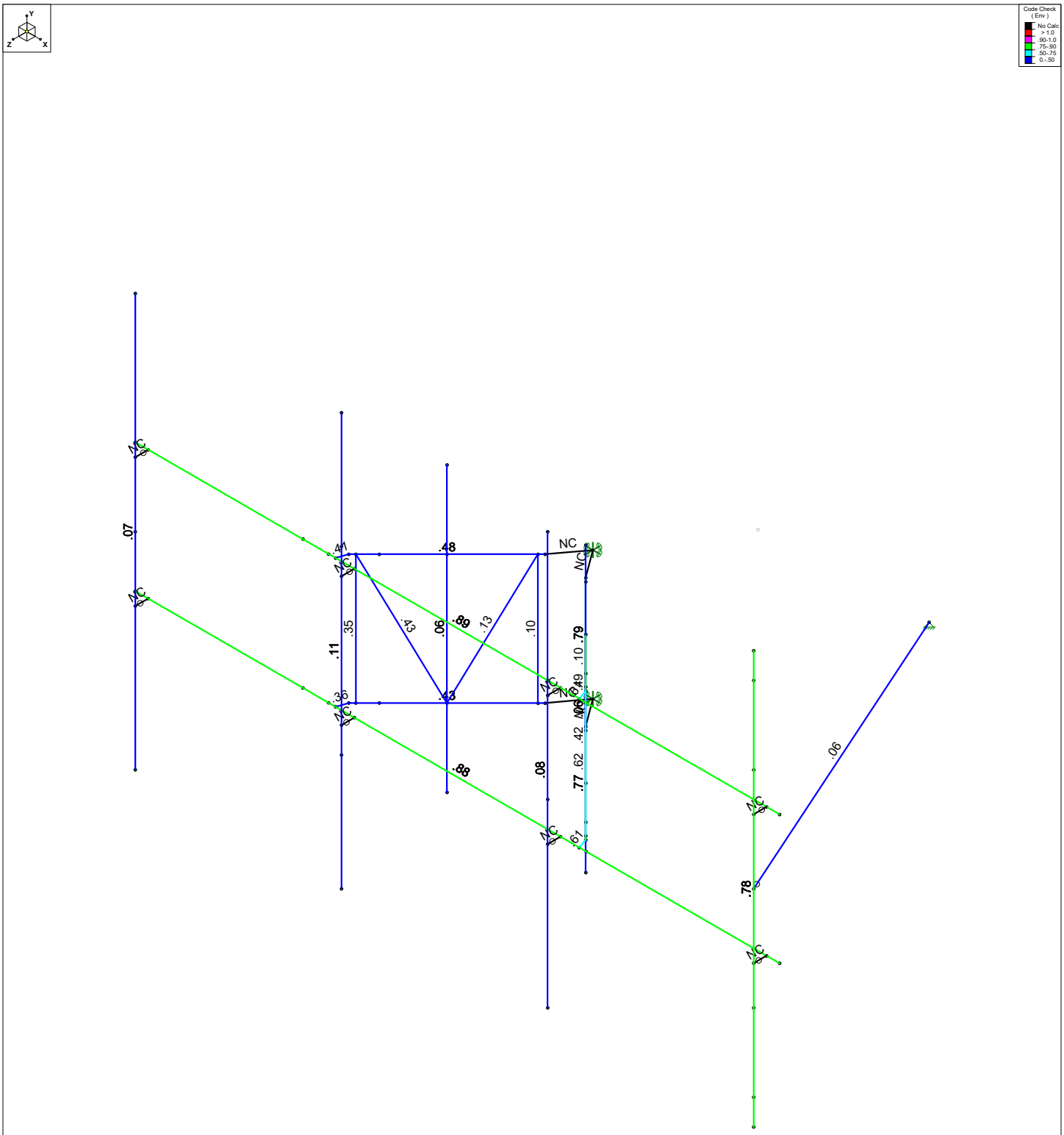
Loads: BLC 5, WLX (ICE)



Loads: BLC 6, WLZ (ICE)

APPENDIX C

SOFTWARE ANALYSIS OUTPUT



Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E5 F)	Density[k/...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A992	29000	11154	.3	.65	.49	50	1.1	65	1.1
2	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
3	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.1
4	A500 Gr.B RND	29000	11154	.3	.65	.527	42	1.4	58	1.3
5	A500 Gr.B Rect	29000	11154	.3	.65	.527	46	1.4	58	1.3
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.6	60	1.2
7	A1085	29000	11154	.3	.65	.49	50	1.4	65	1.3
8	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
9	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
10	A53-b	29000	11154	.3	.65	.49	35	1.5	58	1.2

Basic Load Cases

	BLC Description	Category	X Grav...	Y Grav...	Z Gravity	Joint	Point	Distrib...	Area(Memb...	Surface(...
1	DL	None		-1.05		9				
2	WLX	None				9		21		
3	WLZ	None				9		21		
4	DL (ICE)	None				9		21		
5	WLX (ICE)	None				9		21		
6	WLZ (ICE)	None				9		21		

Load Combinations

	Description	So...	P...	SRSS	BLC	Fa...	B...	Factor	BLC	Factor	B...	Fact...	B...	Fa...	B...	Fa...
1	1.4D	Yes	Y		1	1.4										
2	1.2D+1.6(WLX+WLZ) - 0 Deg	Yes	Y		1	1.2	2	1.6								
3	1.2D+1.6(WLX+WLZ) - 30 Deg	Yes	Y		1	1.2	2	1.385	3	.8						
4	1.2D+1.6(WLX+WLZ) - 60 Deg	Yes	Y		1	1.2	2	.8	3	1.385						
5	1.2D+1.6(WLX+WLZ) - 90 Deg	Yes	Y		1	1.2	2		3	1.6						
6	1.2D+1.6(WLX+WLZ) - 120 Deg	Yes	Y		1	1.2	2	-.8	3	1.385						
7	1.2D+1.6(WLX+WLZ) - 150 Deg	Yes	Y		1	1.2	2	-1.385	3	.8						
8	1.2D+1.6(WLX+WLZ) - 180 Deg	Yes	Y		1	1.2	2	-1.6	3							
9	1.2D+1.6(WLX+WLZ) - 210 Deg	Yes	Y		1	1.2	2	-1.385	3	-.8						
10	1.2D+1.6(WLX+WLZ) - 240 Deg	Yes	Y		1	1.2	2	-.8	3	-1.385						
11	1.2D+1.6(WLX+WLZ) - 270 Deg	Yes	Y		1	1.2	2		3	-1.6						
12	1.2D+1.6(WLX+WLZ) - 300 Deg	Yes	Y		1	1.2	2	.8	3	-1.385						
13	1.2D+1.6(WLX+WLZ) - 330 Deg	Yes	Y		1	1.2	2	1.385	3	-.8						
14	**Wind Load with Ice**															
15	1.2D+1.0Di+1.0(WLXi+WLZi) - 0 Deg	Yes	Y		1	1.2	4	1	5	1	6					
16	1.2D+1.0Di+1.0(WLXi+WLZi) - 30 Deg	Yes	Y		1	1.2	4	1	5	.87	6	.5				
17	1.2D+1.0Di+1.0(WLXi+WLZi) - 60 Deg	Yes	Y		1	1.2	4	1	5	.5	6	.87				
18	1.2D+1.0Di+1.0(WLXi+WLZi) - 90 Deg	Yes	Y		1	1.2	4	1	5		6	1				
19	1.2D+1.0Di+1.0(WLXi+WLZi) - 120 Deg	Yes	Y		1	1.2	4	1	5	-.5	6	.87				
20	1.2D+1.0Di+1.0(WLXi+WLZi) - 150 Deg	Yes	Y		1	1.2	4	1	5	-.87	6	.5				
21	1.2D+1.0Di+1.0(WLXi+WLZi) - 180 Deg	Yes	Y		1	1.2	4	1	5	-1	6					
22	1.2D+1.0Di+1.0(WLXi+WLZi) - 210 Deg	Yes	Y		1	1.2	4	1	5	-.87	6	-.5				
23	1.2D+1.0Di+1.0(WLXi+WLZi) - 240 Deg	Yes	Y		1	1.2	4	1	5	-.5	6	-.87				
24	1.2D+1.0Di+1.0(WLXi+WLZi) - 270 Deg	Yes	Y		1	1.2	4	1	5		6	-1				
25	1.2D+1.0Di+1.0(WLXi+WLZi) - 300 Deg	Yes	Y		1	1.2	4	1	5	.5	6	-.87				
26	1.2D+1.0Di+1.0(WLXi+WLZi) - 330 Deg	Yes	Y		1	1.2	4	1	5	.87	6	-.5				

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design...	A [in2]	Iyy [in...	Izz [in...	J [in4]
1	Sector Horizontal_1.25" STD ...	PIPE_1.25	None	None	A53 Gr.B	Typical	.625	.184	.184	.368
2	Face Horizontal_2.0" STD Pipe	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
3	Sector Vertical_5/8" SR	SR 5/8	None	None	A36 Gr.36	Typical	.307	.007	.007	.015
4	Sector Diagonal_5/8" SR	SR 5/8	None	None	A36 Gr.36	Typical	.307	.007	.007	.015
5	Vertical Pipe_HSS3.5x1/8	HSS3.500X0.125	None	None	A500 Gr.B R...	Typical	1.23	1.77	1.77	3.53
6	Mount Pipe_2.0" STD	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25
7	Stiffarm_2.0" STD Pipe	PIPE_2.0	None	None	A53 Gr.B	Typical	1.02	.627	.627	1.25

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [lb-ft]	LC	MY [lb-ft]	LC	MZ [lb-ft]	LC
1	N6	max	553.983	2	750.919	26	-135.584	4	-131.093	7	0	26	94.692	2
2		min	-1244.076	7	190.779	7	-2053.227	23	-489.857	15	0	1	-142.086	7
3	N5_1	max	1122.247	15	1553.652	20	2066.488	17	-285.288	2	0	26	716.519	15
4		min	-330.152	8	450.393	2	106.282	10	-958.303	20	0	1	214.778	7
5	N78	max	473.754	6	37.669	26	1052.069	6	0	26	0	26	0	26
6		min	-446.475	12	-4.343	6	-1048.352	12	0	1	0	1	0	1
7	N79	max	0	26	0	26	0	26	0	26	0	26	0	26
8		min	0	1	0	1	0	1	0	1	0	1	0	1
9	Totals:	max	1277.897	2	2231.283	19	2170.403	5						
10		min	-1277.902	8	1082.416	13	-2170.406	11						

BASED ON THE CURRENT REACTIONS AND STRESS RATIO'S IN THE FRAME MEMBERS, WE EXPECT THE CONNECTIONS TO BE ADEQUATE TO SUPPORT THE PROPOSED UPGRADE.

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

	Member	Shape	Code Ch...	Loc[ft]	LC	Shear C...	Loc[ft]	Dir	LC	phi*Pnc [lb]	phi*Pnt ...	phi*Mn y-y [l...	phi*M.....	Eqn
1	M11	PIPE_2.0	.895	8.724	21	.071	8.594		21	24514.617	32130	1871.625	1871.....	H1-1b
2	M12	PIPE_2.0	.880	8.724	20	.119	8.724		21	24514.617	32130	1871.625	1871.....	H1-1b
3	M19_1	PIPE_1.25	.787	.084	21	.422	.084		20	19685.566	19687.5	800.625	800.6.....	H3-6
4	M24	PIPE_2.0	.784	4	12	.093	5.25		13	14916.096	32130	1871.625	1871.....	H1-1b
5	M18_1	PIPE_1.25	.770	.084	8	.397	.084		20	19685.566	19687.5	800.625	800.6.....	H3-6
6	M27_1	SR 5/8	.618	0	20	.085	0		2	4378.243	9940.196	103.544	103.5.....	H1-1a
7	M6	.5 x 3 Flat	.611	.203	21	1.039	0	y	20	46960.835	47250	492.188	2953.....	H1-1b
8	M8	.5 x 3 Flat	.609	.203	16	.969	0	y	20	46960.835	47250	492.188	2953.....	H1-1b
9	M29_1	SR 5/8	.488	2.795	20	.031	0		13	3560.267	9940.196	103.544	103.5.....	H1-1a
10	M16	PIPE_1.25	.481	1.346	2	.340	2.692		2	19364.92	19687.5	800.625	800.6.....	H3-6
11	M17_1	PIPE_1.25	.433	2.692	2	.263	1.346		2	19685.566	19687.5	800.625	800.6.....	H3-6
12	M31	SR 5/8	.431	0	15	.048	0		13	3560.267	9940.196	103.544	103.5.....	H1-1a
13	M28_1	SR 5/8	.419	2.795	20	.050	0		5	3560.267	9940.196	103.544	103.5.....	H1-1a
14	M2_1	.5 x 3 Flat	.412	.203	22	.692	0	y	15	46960.835	47250	492.188	2953.....	H1-1b
15	M4_1	.5 x 3 Flat	.364	.203	16	.697	0	y	16	46960.835	47250	492.188	2953.....	H1-1b
16	M24_1	SR 5/8	.348	0	2	.091	0		2	4378.243	9940.196	103.544	103.5.....	H1-1b
17	M30	SR 5/8	.126	0	2	.014	0		9	3560.267	9940.196	103.544	103.5.....	H1-1b
18	M25	PIPE_2.0	.106	5.25	8	.015	2.75		11	14916.096	32130	1871.625	1871.....	H1-1b
19	M25_1	SR 5/8	.102	0	2	.072	0		2	4378.243	9940.196	103.544	103.5.....	H1-1b
20	M26_1	SR 5/8	.097	0	2	.073	0		2	4378.243	9940.196	103.544	103.5.....	H1-1b
21	M29	PIPE_2.0	.076	2.75	13	.009	5.25		3	14916.096	32130	1871.625	1871.....	H1-1b
22	M26	PIPE_2.0	.065	2.75	3	.016	5.25		3	14916.096	32130	1871.625	1871.....	H1-1b
23	M36	HSS3.500X0.125	.064	1.547	7	.124	1.547		2	42981.654	46494	4189.5	4189.5...	H1-1b
24	M35A	HSS3.500X0.125	.064	1.547	2	.123	1.547		2	42981.654	46494	4189.5	4189.5...	H1-1b
25	M39A	PIPE_2.0	.062	6.772	6	.003	0		21	18538.987	32130	1871.625	1871.....	H1-...

The maximum member stress is at 90% of its design strength and is adequate to support the proposed upgrade.

CONNECTICUT DESIGN CRITERIA - STATE

Revison:

CT is NOT a Home Rule State; Tab added only for Design Criteria

(APPENDIX N) MUNICIPALITY - SPECIFIC STRUCTURAL DESIGN PARAMETERS

Municipality	Ground Snow Load	*Wind Design Parameters*							
		MCE Spectral Accelerations (%g)		Ultimate Design Wind Speeds, V_{ult} (mph)			Nominal Design Wind Speeds, V_{asd} (mph)		
		S_s	S_1	Risk Cat.I	Risk Cat.II	Risk Cat III-IV	Risk Cat. I	Risk Cat. II	Risk Cat. III-IV
Andover	30	0.176	0.063	120	130	140	93	101	108
Ansonia	30	0.195	0.064	115	125	135	89	97	105
Ashford	35	0.173	0.063	120	130	140	93	101	108
Avon	35	0.181	0.064	110	120	130	85	93	101
Barkhamsted	40	0.177	0.065	110	120	125	85	93	97
Beacon Falls	30	0.192	0.064	115	125	135	89	97	105
Berlin	30	0.183	0.063	115	125	135	89	97	105
Bethany	30	0.189	0.063	115	125	135	89	97	105
Bethel	30	0.215	0.066	110	120	125	85	93	97
Bethlehem	35	0.190	0.065	110	120	125	85	93	97
Bloomfield	35	0.180	0.064	115	125	130	89	97	101
Bolton	30	0.177	0.063	115	125	135	89	97	105
Bozrah	30	0.170	0.061	120	135	145	93	105	112
Branford	30	0.180	0.061	120	130	140	93	101	108
Bridgeport	30	0.209	0.064	115	125	135	89	97	105
Bridgewater	35	0.201	0.066	110	120	125	85	93	97
Bristol	35	0.185	0.064	110	120	130	85	93	101
Brookfield	35	0.208	0.066	110	120	125	85	93	97
Brooklyn	35	0.171	0.062	120	130	140	93	101	108
Burlington	35	0.182	0.064	110	120	130	85	93	101
Canaan	40	0.173	0.065	105	115	120	81	89	93
Canterbury	35	0.171	0.061	120	130	140	93	101	108
Canton	35	0.180	0.064	110	120	130	85	93	101
Chaplin	35	0.173	0.062	120	130	140	93	101	108
Cheshire	30	0.186	0.063	115	125	135	89	97	105
Chester	30	0.172	0.060	120	130	140	93	101	108
Clinton	30	0.169	0.059	120	135	140	93	105	108
Colchester	30	0.174	0.061	120	130	140	93	101	108
Colebrook	40	0.174	0.065	105	115	125	81	89	97
Columbia	30	0.175	0.062	120	130	140	93	101	108
Cornwall	40	0.180	0.065	105	115	120	81	89	93
Coventry	30	0.176	0.063	120	130	140	93	101	108
Cromwell	30	0.181	0.063	115	125	135	89	97	105
Danbury	30	0.217	0.067	110	120	125	85	93	97
Darien	30	0.242	0.068	110	120	130	85	93	101
Deep River	30	0.170	0.060	120	130	140	93	101	108
Derby	30	0.195	0.064	115	125	135	89	97	105
Durham	30	0.179	0.062	115	130	140	89	101	108
Eastford	40	0.172	0.063	120	130	140	93	101	108
East Granby	35	0.177	0.065	110	120	130	85	93	101
East Haddam	30	0.172	0.061	120	130	140	93	101	108
Southington	30	0.185	0.064	115	125	135	89	97	105

Ice

Results:

Ice Thickness:	0.75 in.
Concurrent Temperature:	5 F
Gust Speed:	50 mph

Data Source: Standard ASCE/SEI 7-10, Figs. 10-2 through 10-8

Date Accessed: Wed Nov 04 2020

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 50-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.

Exhibit F

EBI Consulting

environmental | engineering | due diligence

RADIO FREQUENCY EMISSIONS ANALYSIS REPORT
EVALUATION OF HUMAN EXPOSURE POTENTIAL TO NON-IONIZING EMISSIONS

T-Mobile Existing Facility

Site ID: CT11239A

Southington / I-84
435 Mill Street
Southington, Connecticut 06489

December 6, 2020

EBI Project Number: 6220006131

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**45.68%**

December 6, 2020

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

Emissions Analysis for Site: CT11239A - Southington / I-84

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **435 Mill Street** in **Southington, Connecticut** for the purpose of determining whether the emissions from the Proposed T-Mobile Antenna Installation located on this property are within specified federal limits.

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

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

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

Public exposure to radio frequencies is regulated and enforced in units of microwatts per square centimeter ($\mu W/cm^2$). The general population exposure limits for the 600 MHz and 700 MHz frequency bands are approximately 400 $\mu W/cm^2$ and 467 $\mu W/cm^2$, respectively. The general population exposure limit for the 1900 MHz (PCS), 2100 MHz (AWS) and 11 GHz frequency bands is 1000 $\mu W/cm^2$. Because each carrier will be using different frequency bands, and each frequency band has different exposure limits, it is necessary to report percent of MPE rather than power density.

Occupational/controlled exposure limits apply to situations in which persons are exposed as a consequence of their employment and in which those persons who are exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Occupational/controlled exposure limits also apply where exposure is of a transient nature as a result of incidental passage through a location where exposure levels may be above general population/uncontrolled limits (see below), as long as the exposed person has been made fully aware of the potential for exposure and can exercise control over his or her exposure by leaving the area or by some other appropriate means.

Additional details can be found in FCC OET 65.

CALCULATIONS

Calculations were done for the proposed T-Mobile Wireless antenna facility located at 435 Mill Street in Southington, Connecticut using the equipment information listed below. All calculations were performed per the specifications under FCC OET 65. Since T-Mobile is proposing highly focused directional panel antennas, which project most of the emitted energy out toward the horizon, all calculations were performed assuming a lobe representing the maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was focused at the base of the tower. For this report, the sample point is the top of a 6-foot person standing at the base of the tower.

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

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

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

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

4) 4 GSM channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

5) 4 LTE channels (PCS Band - 1900 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

6) 2 UMTS channels (AWS Band - 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 30 Watts per Channel.

7) 2 LTE channels (AWS Band – 2100 MHz) were considered for each sector of the proposed installation. These Channels have a transmit power of 60 Watts per Channel.

8) 1 LTE channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

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

10) All radios at the proposed installation were considered to be running at full power and were uncombined in their RF transmissions paths per carrier prescribed configuration. Per FCC OET Bulletin No. 65 - Edition 97-01 recommendations to achieve the maximum anticipated value at each sample point, all power levels emitting from the proposed antenna installation are increased by a factor of 2.56 to account for possible in-phase reflections from the surrounding environment. This is rarely the case, and if so, is never continuous.

11) For the following calculations, the sample point was the top of a 6-foot person standing at the base of the tower. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used in this direction. This value is a very conservative estimate as gain reductions for these particular antennas are typically much higher in this direction.

12) The antennas used in this modeling are the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector A, the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector B, the RFS APXVAARR24_43-U-NA20 for the 600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 32 for the 1900 MHz / 1900 MHz / 2100 MHz channel(s), the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz channel(s) in Sector C. This is based on feedback from the carrier with regard to anticipated antenna selection. All Antenna gain values and associated transmit power levels are shown in the Site Inventory and Power Data table below. The maximum gain of the antenna per the antenna manufacturer's supplied specifications, minus 10 dB for directional panel antennas and 20 dB for highly focused parabolic microwave dishes, was used for all calculations. This value is a very conservative

estimate as gain reductions for these particular antennas are typically much higher in this direction.

13) The antenna mounting height centerline of the proposed antennas is 110 feet above ground level (AGL).

14) Emissions values for additional carriers were taken from the Connecticut Siting Council active database. Values in this database are provided by the individual carriers themselves.

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

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20	Make / Model:	RFS APXVAARR24_43-U-NA20
Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	600 MHz / 600 MHz / 700 MHz / 1900 MHz / 2100 MHz
Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.35 dBd / 15.65 dBd / 16.35 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	9	Channel Count:	9	Channel Count:	9
Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts	Total TX Power (W):	380 Watts
ERP (W):	11,055.53	ERP (W):	11,055.53	ERP (W):	11,055.53
Antenna A1 MPE %:	**4.96%**	Antenna B1 MPE %:	**4.96%**	Antenna C1 MPE %:	**4.96%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32	Make / Model:	Ericsson AIR 32
Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz	Frequency Bands:	1900 MHz / 1900 MHz / 2100 MHz
Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd	Gain:	15.35 dBd / 15.35 dBd / 15.85 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	8	Channel Count:	8	Channel Count:	8
Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts	Total TX Power (W):	360 Watts
ERP (W):	12,841.53	ERP (W):	12,841.53	ERP (W):	12,841.53
Antenna A2 MPE %:	**3.82%**	Antenna B2 MPE %:	**3.82%**	Antenna C2 MPE %:	**3.82%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz
Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd	Gain:	22.05 dBd / 22.05 dBd
Height (AGL):	110 feet	Height (AGL):	110 feet	Height (AGL):	110 feet
Channel Count:	2	Channel Count:	2	Channel Count:	2
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	38,477.89	ERP (W):	38,477.89	ERP (W):	38,477.89
Antenna A3 MPE %:	**11.43%**	Antenna B3 MPE %:	**11.43%**	Antenna C3 MPE %:	**11.43%**

Site Composite MPE %	
Carrier	**MPE %**
T-Mobile (Max at Sector A):	20.20%
Verizon	12.93%
AT&T	10.73%
Others	1.82%
Site Total MPE % :	45.68%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	20.20%
T-Mobile Sector B Total:	20.20%
T-Mobile Sector C Total:	20.20%
Site Total MPE % :	45.68%

T-Mobile Maximum MPE Power Values (Sector A)

T-Mobile Frequency Band / Technology (Sector A)	# Channels	Watts ERP (Per Channel)	Height (feet)	Total Power Density (μW/cm²)	Frequency (MHz)	Allowable MPE (μW/cm²)	Calculated % MPE
T-Mobile 600 MHz LTE	2	591.73	110.0	3.52	600 MHz LTE	400	0.88%
T-Mobile 600 MHz NR	1	1577.94	110.0	4.69	600 MHz NR	400	1.17%
T-Mobile 700 MHz LTE	2	648.82	110.0	3.86	700 MHz LTE	467	0.83%
T-Mobile 1900 MHz LTE	2	2203.69	110.0	13.10	1900 MHz LTE	1000	1.31%
T-Mobile 2100 MHz UMTS	2	1294.56	110.0	7.69	2100 MHz UMTS	1000	0.77%
T-Mobile 1900 MHz GSM	4	1028.30	110.0	12.22	1900 MHz GSM	1000	1.22%
T-Mobile 1900 MHz LTE	2	2056.61	110.0	12.22	1900 MHz LTE	1000	1.22%
T-Mobile 2100 MHz LTE	2	2307.55	110.0	13.71	2100 MHz LTE	1000	1.37%
T-Mobile 2500 MHz LTE	1	19238.94	110.0	57.16	2500 MHz LTE	1000	5.72%
T-Mobile 2500 MHz NR	1	19238.94	110.0	57.16	2500 MHz NR	1000	5.72%
						Total:	**20.20%**

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

Summary

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

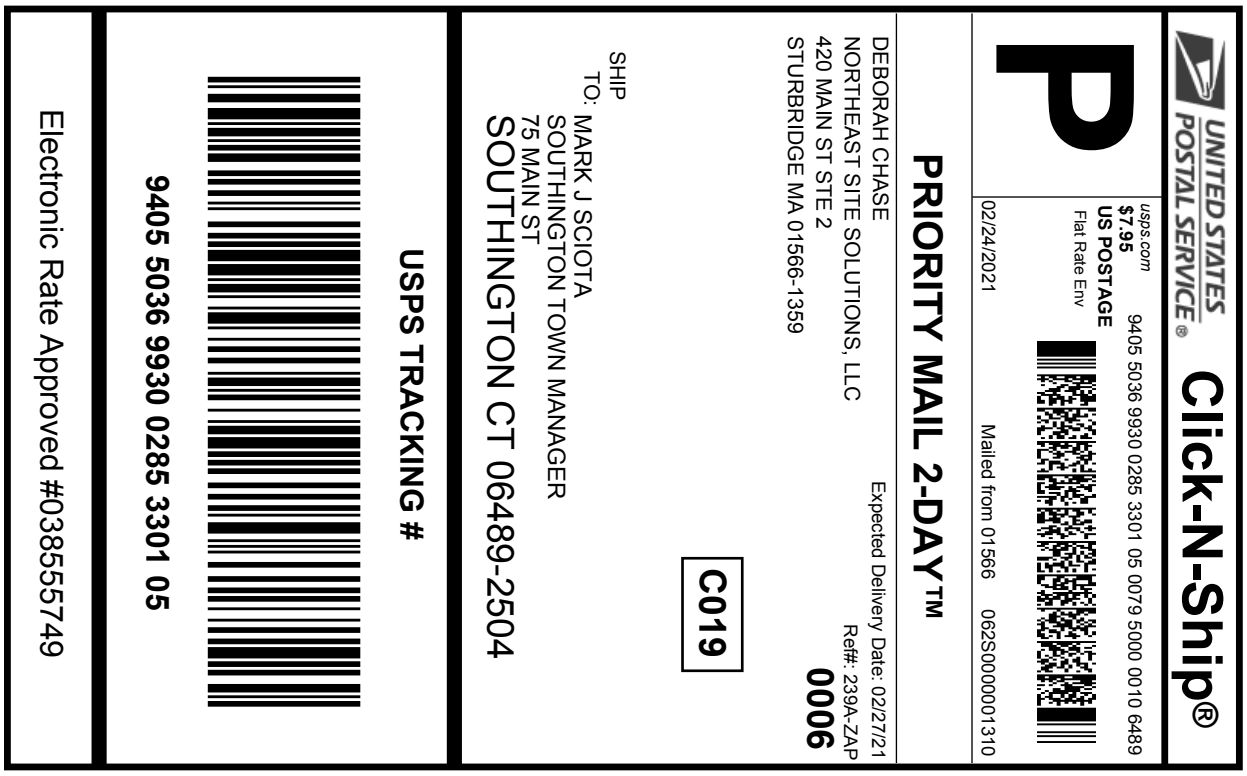
The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	20.20%
Sector B:	20.20%
Sector C:	20.20%
T-Mobile Maximum MPE % (Sector A):	20.20%
Site Total:	45.68%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **45.68%** of the allowable FCC established general population limit sampled at the ground level. This is based upon values listed in the Connecticut Siting Council database for existing carrier emissions.

FCC guidelines state that if a site is found to be out of compliance (over allowable thresholds), that carriers over a 5% contribution to the composite value will require measures to bring the site into compliance. For this facility, the composite values calculated were well within the allowable 100% threshold standard per the federal government.

Exhibit G



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 3301 05

Trans. #:	525603824
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

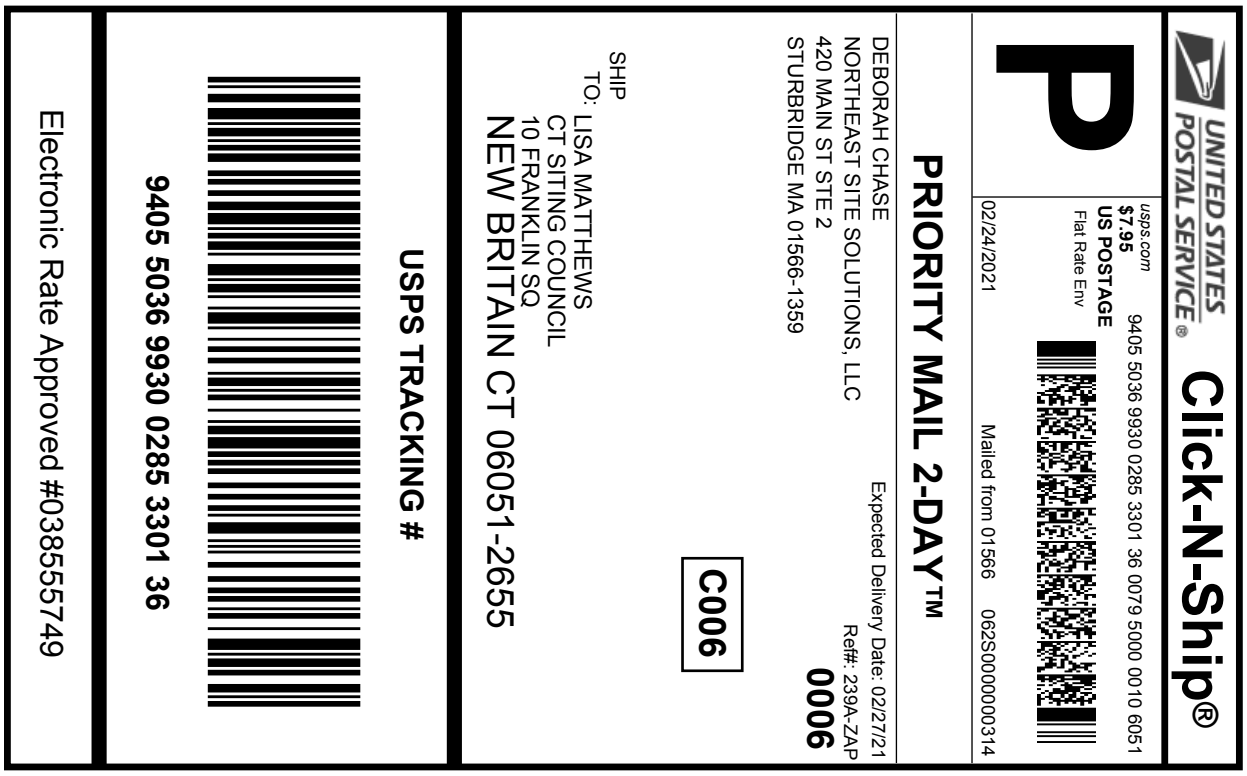
Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: 239A-ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: MARK J SCIOTA
SOUTHINGTON TOWN MANAGER
75 MAIN ST
SOUTHINGTON CT 06489-2504

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 3301 36

Trans. #:	525603824
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: 239A-ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: LISA MATTHEWS
CT SITING COUNCIL
10 FRANKLIN SQ
NEW BRITAIN CT 06051-2655

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

UNITED STATES POSTAL SERVICE®

Click-N-Ship®

9405 5036 9930 0285 3301 50 0079 5000 0010 6489

usps.com
$7.95
US POSTAGE
Flat Rate Env

02/24/2021 Mailed from 01566 062S0000001301

P

PRIORITY MAIL 2-DAY™

DEBORAH CHASE
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

Expected Delivery Date: 02/27/21
Ref#: 239A-ZAP

0006

C020

SHIP TO: MATTHEW A REIMONDO
SOUTHINGTON ZONING ENFORCEMENT OFFICER
196 N MAIN ST
200
SOUTHINGTON CT 06489-2514

USPS TRACKING #

9405 5036 9930 0285 3301 50

Electronic Rate Approved #038555749

Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 3301 50

Trans. #:	525603824
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

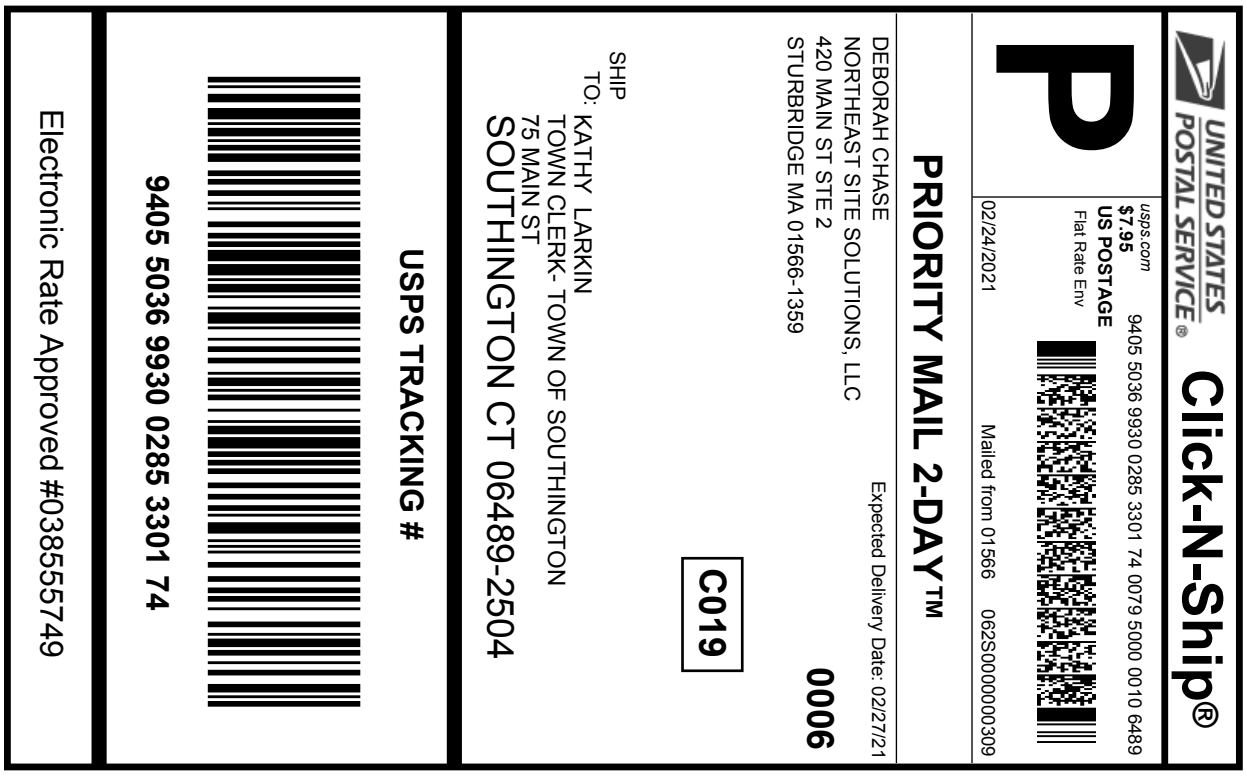
Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE Ref#: 239A-ZAP
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: MATTHEW A REIMONDO
SOUTHINGTON ZONING ENFORCEMENT OFFICER
196 N MAIN ST
200
SOUTHINGTON CT 06489-2514

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

UNITED STATES POSTAL SERVICE® *Thank you for shipping with the United States Postal Service!*
Check the status of your shipment on the USPS Tracking® page at usps.com



Cut on dotted line.

Instructions

1. **Each Click-N-Ship® label is unique. Labels are to be used as printed and used only once. DO NOT PHOTO COPY OR ALTER LABEL.**
2. **Place your label so it does not wrap around the edge of the package.**
3. **Adhere your label to the package. A self-adhesive label is recommended. If tape or glue is used, DO NOT TAPE OVER BARCODE. Be sure all edges are secure.**
4. **To mail your package with PC Postage®, you may schedule a Package Pickup online, hand to your letter carrier, take to a Post Office™, or drop in a USPS collection box.**
5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0285 3301 74

Trans. #:	525603824
Print Date:	02/22/2021
Ship Date:	02/24/2021
Expected Delivery Date:	02/27/2021

Priority Mail® Postage:	**$7.95**
Total:	**$7.95**

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS, LLC
420 MAIN ST STE 2
STURBRIDGE MA 01566-1359

To: KATHY LARKIN
TOWN CLERK- TOWN OF SOUTHINGTON
75 MAIN ST
SOUTHINGTON CT 06489-2504

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com

Deborah Chase

From: Deborah Chase
Sent: Monday, February 22, 2021 3:07 PM
To: 'larkink@southington.org'; 'sciotam@southington.org'; 'reimondom@southington.org'
Subject: 435 MILL STREET TANKS SOUTHINGTON CT 06489 T-MOBILE EM APPLICATION (CT11239A-ANCHOR)
Attachments: 435 MILL STREET TANKS SOUTHINGTON CT 06489 T-MOBILE EM APPLICATION (CT11239A Anchor).pdf

Good afternoon,
This is to inform you that you will be receiving a copy of T-Mobile's Exempt Modification (Zoning) Application to the CT Siting Council for the site listed above.
It will be delivered via Priority Mail.
Please let me know if you have any questions.
Thank you very much

Deborah Chase
Senior Project Coordinator & Analyst
Mobile: 860-490-8839

Save a tree. Refuse.Reduce. Reuse. Recycle.