NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

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

July 8, 2021

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

RE: Exempt Modification Application
88 Parsonage Hill Road, North Branford CT 06472
Latitude: 41. 369440000
Longitude: -72.810280000
T-Mobile Site#: CT11230A-Anchor-L600-L1900

Dear Ms. Bachman:

T-Mobile currently maintains nine (9) antennas at the 180-foot level of the existing 195-foot self-support tower located at 88 Parsonage Hill Road, North Branford CT 06472. The 195-foot tower is owned by Ochenkowski Towers LLC and property is owned by Jean Szwabowski. T-Mobile now intends to replace nine (9) existing antennas with three (3) new 600/700 MHz antenna, three (3) new 1900/2100 MHz antenna, and three (3) new 2500 MHz antenna. The new antennas would be installed at the 180-foot level of the tower. T-Mobile is also proposing mount modifications. As shown on the enclosed mount analysis.

Planned Modifications

Remove:

(6) Coax

Remove and Replace:

(3) AIR21 B2A B4P - 1900 MHZ Antenna (Remove) -(3) AIR32 B2A Antenna 1900/2100 MHz (Replace)
(3) AIR21 B2P B4A – 2100 MHz Antenna (Remove) -(3) AIR6449 Antenna 2500 MHz (Replace)
(3) LNX6515 Antenna (Remove) - (3) APXVAARR24 Antenna 600/700/1900/2100 MHz (Replace)
(3) 15- ft T-Frames Antenna Mount (Remove) - (3) VFA12-HD V-Frame Antenna Mount (Replace)
(3) RRUS11 B12 (Remove) - (3) Radio 4449 B71+B85 (Replace)

Install New:

(2) Hybrid Line
(3) Radio 4415 B25
(3) Diplexers

NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development

Existing to Remain:
(6) Coax
(3) Twin TMA
(1) Hybrid Line

Ground:
5'x7' Concrete pad
(1) 6160 Radio Cabinet
(2) B160 Battery Cabinet

This facility was approved by the Town of North Branford P&Z on December 5, 1997. This modification complies with this original approval. 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 Mayor Bob Viglione as Elected Official and Thomas Cowell –Building / Zoning officer for the Town of North Branford, 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
cc:
The Honorable Bob Viglione, Mayor (via email only to executivesecretary@townofnorthbranfordct.com)
Town of North Branford
909 Foxon Road
North Branford CT 06422

Thomas Cowell –Building / Zoning officer (via email only to Buildingofficial@townofnorthbranfordct.com)
Town of North Branford
909 Foxon Road
North Branford CT 06422

Ochenkowski Towers LLC (via email only to Jochenkowski@juno.com)
88 Parsonage Hill Road
Northford CT 06472

Jean Szwabowski
84 Parsonage Hill Road
Northford CT 06472

NORTHEAST SITE SOLUTIONS, LLC
1053 FARMINGTON AVE STE G
FARMINGTON, CT 06032

WEBSTER BANK
51-7010/2111

4527

07/07/2021

PAY TO THE ORDER OF Connecticut Siting Council

*625.00

$

EXACTLY SIX HUNDRED TWENTY-FIVE DOLLARS

DOLLARS

Connecticut Siting Council
10 Franklin Square
New Britain CT 06051

MEMO

AUTHORIZED SIGNATURE

⑈004527⑈ ⑆211170101⑆10 0010608887⑈

NORTHEAST SITE SOLUTIONS, LLC

Check#: 4527 **Date: 07/07/2021** **Vendor#: 10023 Connecticut Siting Council** **Check Total: *625.00** 4527

Invoice#	*Invoice Date*	*Job/Description*	*Balance*	*Retain*	*Discount*	*This Check*
CT11230A Zoning	07/07/2021	61 TMO Anchor L600 L	625.00			625.00

Exhibit A

TOWN OF NORTH BRANFORD, CT
ZONING PERMIT

Date of Application: 12/5/97

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

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

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

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

Property Use:

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

Existing Structures:

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

Proposed Structures/Signs:

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

Parking Spaces Required: _____

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

Conditions of Approval: _____

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

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

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

This permit is hereby: _____ Approved _____ Denied

By _____ Date _____
Zoning Enforcement Officer

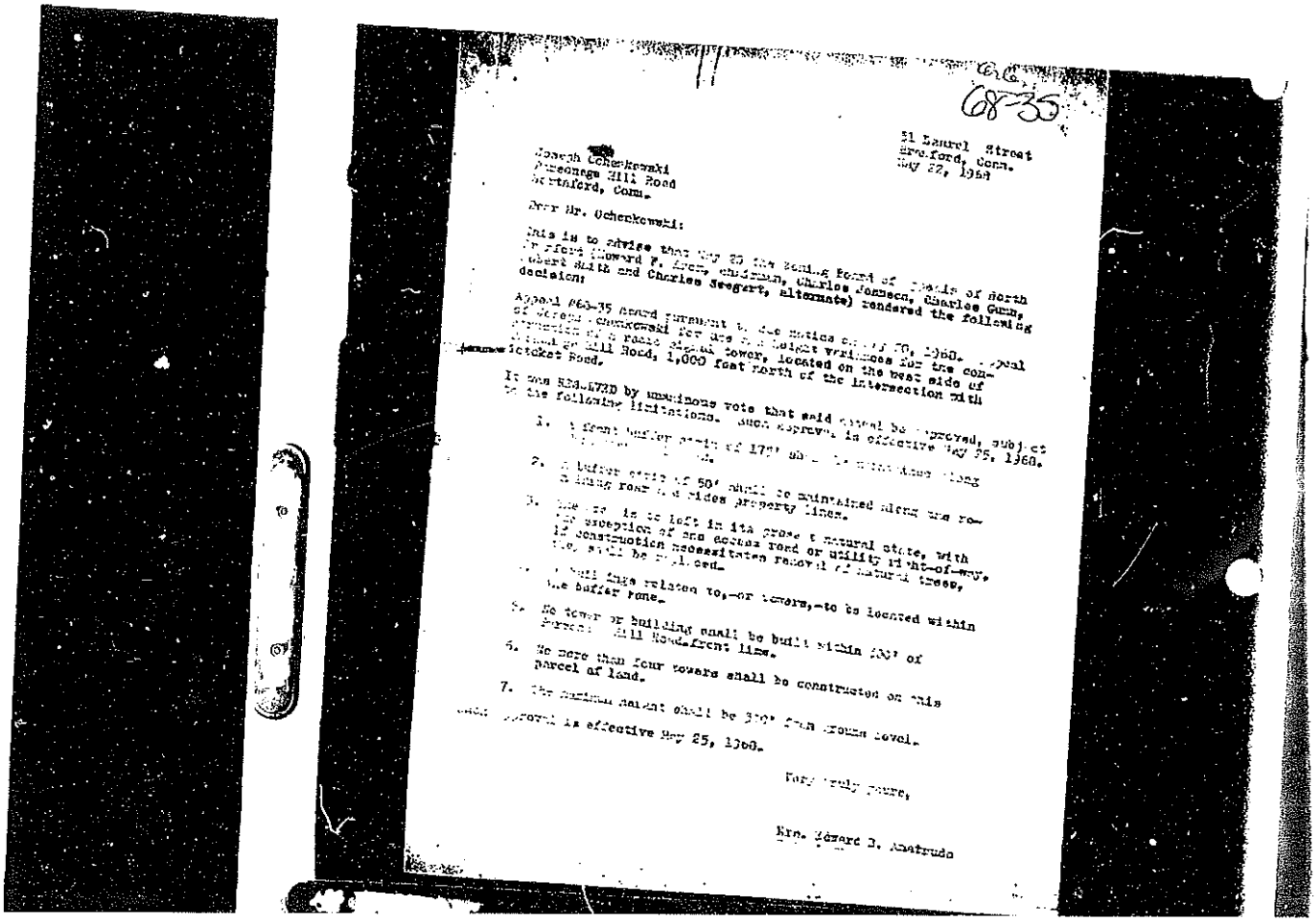
By _____ Date _____
Inland Wetlands Enforcement Officer

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

By _____ Date _____
Town Engineer

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)



68-35

51 Laurel Street
Branford, Conn.
May 27, 1960

Joseph Ochenkowski
Passonage Hill Road
Northford, Conn.

Dear Mr. Ochenkowski:

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

Appeal #60-35 heard pursuant to due notice on May 20, 1960. [illegible] appeal of Joseph Ochenkowski for area variance for the construction of a radio [illegible] tower, located on the west side of Passonage Hill Road, 1,000 feat north of the intersection with Pickett Road.

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

1. A front [illegible] of 175' shall be maintained [illegible]
2. A buffer strip of 50' shall be maintained along the [illegible] along road and side property lines.
3. [illegible] is to be left in its present natural state, with the exception of any access road or utility right-of-way. If construction necessitates removal of natural trees, the same shall be replaced.
4. [illegible] shall [illegible] related to,—or towers,—to be located within the buffer zone.
5. No tower or building shall be built within 200' of present Hill Road[illegible]front line.
6. No more than four towers shall be construction on this parcel of land.
7. The maximum height shall be 370' from ground level.

[illegible] approval is effective May 25, 1960.

Very truly yours,

Mrs. Edward J. Mastruda

TOWN OF NORTH BRANFORD, CT
ZONING PERMIT

Date of Application: _____

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

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

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

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

Property Use:

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

Existing Structures:

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

Proposed Structures/Signs:

Wireless Communication Tower
7 x 112' x 170' (ht)
_____ sq. ft.
_____
_____
Front ____ Rear ____ Side ____

Parking Spaces Required: 0
Proposed 0

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

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

Conditions of Approval: _____

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

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

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

This permit is hereby: ✓ Approved _____ Denied

By _____ Date 10-17-02
Zoning Enforcement Officer

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

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

By _____ Date _____
Town Engineer

Fee $ _____
Date Paid _____
Permit # _____

LR:dfs
(8/88)

TOWN OF NORTH BRANFORD

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

CERTIFICATE OF CODE COMPLIANCE

NO. 1853

DATE: January 9, 2003

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

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

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

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

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

Joseph Di Natale
INSPECTED BY

Robert F. Linsley
BUILDING OFFICIAL

DFS

CC: ASSESSOR'S OFFICE
FILES

North Branford Planning & Zoning Commission
North Branford, Connecticut

4429

ZONING PERMIT

This is to certify that the wireless communication facility

located at 83 Parsonage Hill Road

owned by Jean Szwabowski

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

Signed _____
Zoning Enforcement Officer

Date 1-1-03

Signed _____
Planning and Zoning Administrator

Date _____

NOTES:

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

4429

CERTIFICATE OF ZONING COMPLIANCE/NONCONFORMITY

This is to certify that the wireless communication facility

located at 88 Parsonage Hill Road

owned by Jean Szwabowski

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

____ It conforms to the Zoning Regulations

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

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

____ Other _____

Signed _____
Zoning Enforcement Officer

Date 1-9-03

Signed _____
Planning and Zoning Administrator

Date _____

Notes:

1. This is not a Certificate of Occupancy

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

6068

North Branford Planning & Zoning Commission

ZONING PERMIT

This is to certify that the installation of three (3) antennae to existing antenna array, add six (6) remote radio units to array along with a surge arrestor all on existing tower, add one ground cabinet on new 3'x3' concrete pad, as allowed by variance, which must comply with the 2005 CT State Building Code

located at 88 Parsonage Hill Rd.

owned by Jean Szwabowski

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

Signed _____
Zoning Enforcement Officer

Date 6/15/2012

Signed _____
Planning and Zoning Administrator

Date _____

Notes:

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

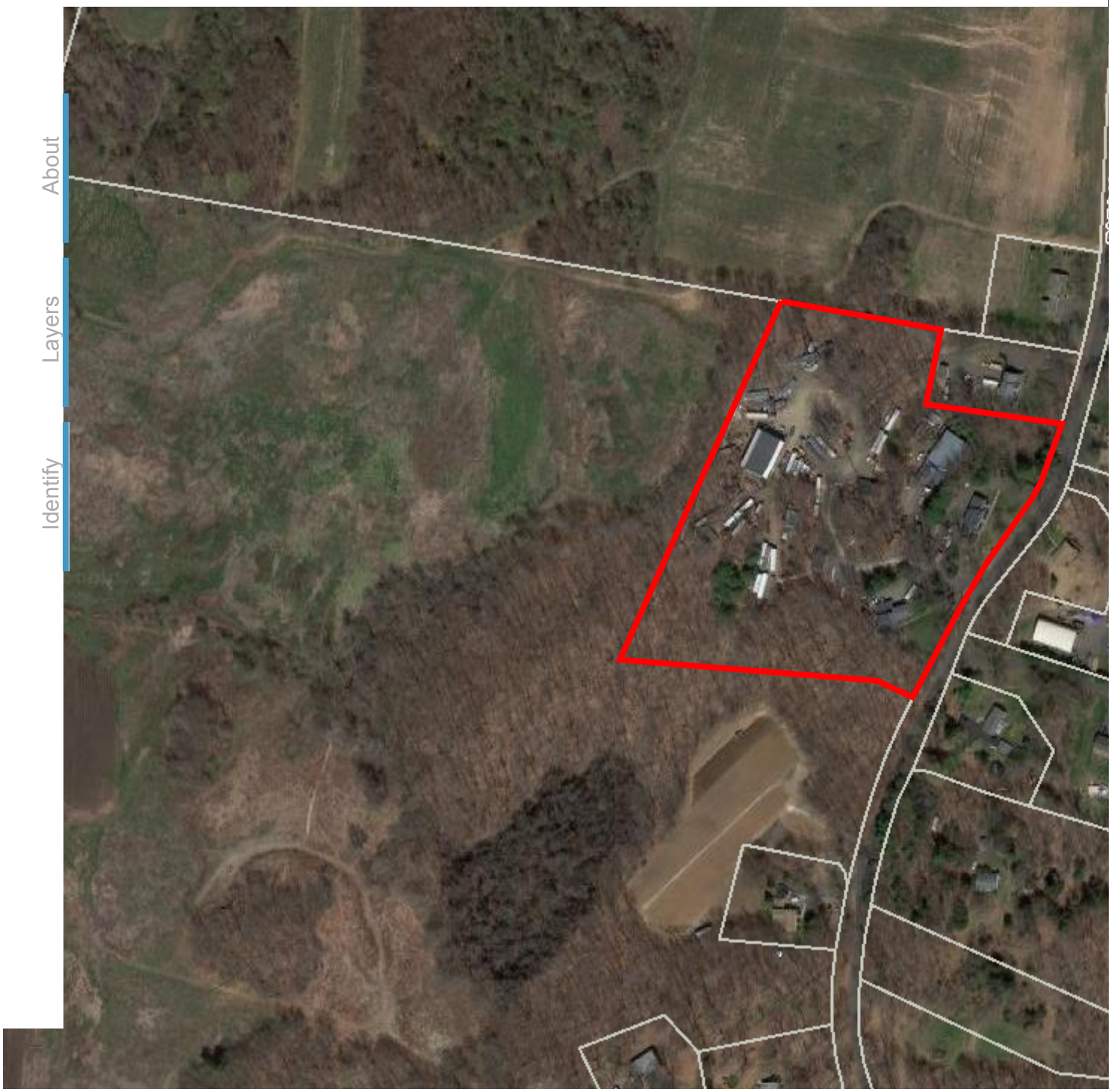
Exhibit B

Szwabowski

About

Layers

Identify



Email Map Link

Copy and paste the following string into an email to link to the current map view:

100m

Close

300ft

Tighe&Bond

lat:41.3682, long:-72.8070

88 PARSONAGE HILL RD

Location	88 PARSONAGE HILL RD	**Mblu**	51/A 7/ / /
Acct#	002953	**Owner**	SZWABOWSKI JEAN 1/3
Assessment	$864,000	**Appraisal**	$1,248,800
PID	3060	**Building Count**	3

Current Value

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$691,400	$557,400	$1,248,800

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2015	$473,900	$390,100	$864,000

Owner of Record

Owner	SZWABOWSKI JEAN 1/3	**Sale Price**	$90,000
Co-Owner	OCHENKOWSKI J J JR 1/3 & K W 1/3 EACH	**Certificate**	
Address	84 PARSONAGE HL RD NORTHFORD, CT 06472-1445	**Book & Page**	429/1132
		Sale Date	12/23/2009

Ownership History

Ownership History				
Owner	**Sale Price**	**Certificate**	**Book & Page**	**Sale Date**
SZWABOWSKI JEAN 1/3	$90,000		429/1132	12/23/2009
SZWABOWSKI JEAN &	$90,000		429/1128	12/23/2009
SZWABOWSKI JEAN &	$0		276/ 749	12/15/1998
OCHENKOWSKI VERONICA TIC +	$400,000		269/ 844	05/11/1998
OCHENKOWSKI VERONICA	$0		040/ 206	11/14/1960

Building Information

Building 1 : Section 1

Year Built:	1949
Living Area:	1,996
Replacement Cost:	$197,304
Building Percent Good:	55

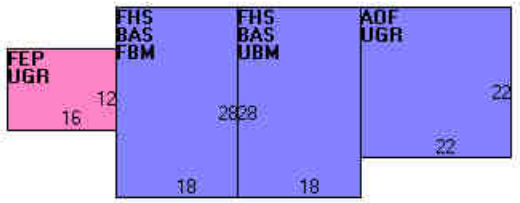
Replacement Cost Less Depreciation: $108,500

Building Attributes	
Field	**Description**
Style	RES TYPE COMM
Model	Res Type Com
Grade:	Above Avg
Stories:	1 1/2 Stories
Occupancy	2
Exterior Wall 1	Aluminum Sidng
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Plastered
Interior Wall 2	Plywood Panel
Interior Flr 1	Carpet
Interior Flr 2	Hardwood
Heat Fuel	Oil
Heat Type:	Forced Air-Duc
AC Type:	Central
Total Bedrooms:	2 Bedrooms
Total Bthrms:	2
Total Half Baths:	1
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	Average
Kitchen Style:	Average

Building Photo

(http://images.vgsi.com/photos/NorthBranfordCTPhotos//\00\00\

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	1,008	1,008
FHS	Half Story, Finished	1,008	504
AOF	Office, (Average)	484	484
FBM	Basement, Finished	504	0
FEP	Porch, Enclosed, Finished	192	0
UBM	Basement, Unfinished	504	0
UGR	Garage, Unfinished	676	0
		4,376	1,996

Building 1 : Section 1

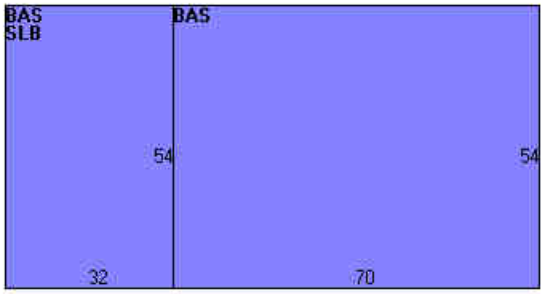
Year Built: 1949
Living Area: 0
Replacement Cost: $197,304
Building Percent Good: 55
Replacement Cost Less Depreciation: $108,500

Building Attributes	
Field	**Description**
Style	Outbuildings
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:	
Total Bthrms:	
Total Half Baths:	
Total Xtra Fixtrs:	
Total Rooms:	
Bath Style:	
Kitchen Style:	

Building Photo

(http://images.vgsi.com/photos/NorthBranfordCTPhotos//default.

Building Layout



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

Building 2 : Section 1

Year Built: 1958
Living Area: 2,286
Replacement Cost: $183,022
Building Percent Good: 64
Replacement Cost Less Depreciation: $117,100

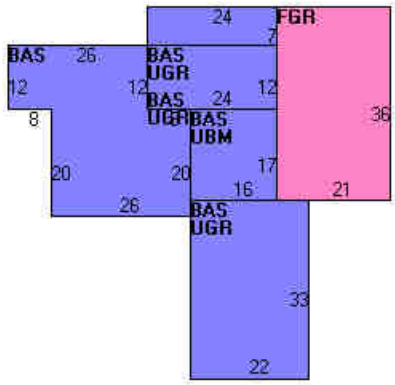
Building Attributes : Bldg 2 of 3	
Field	**Description**
Style	Ranch
Model	Residential
Grade:	Average
Stories:	1 Story
Occupancy	1

Building Photo

(http://images.vgsi.com/photos/NorthBranfordCTPhotos//default.

Building Layout

Exterior Wall 1	Vinyl Siding
Exterior Wall 2	
Roof Structure:	Gable/Hip
Roof Cover	Asphalt Shingl
Interior Wall 1	Drywall/Sheet
Interior Wall 2	
Interior Flr 1	Carpet
Interior Flr 2	
Heat Fuel	Oil
Heat Type:	Hot Water
AC Type:	None
Total Bedrooms:	3 Bedrooms
Total Bthrms:	2
Total Half Baths:	0
Total Xtra Fixtrs:	
Total Rooms:	5 Rooms
Bath Style:	Average
Kitchen Style:	Average



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	2,286	2,286
FGR	Garage, Framed	756	0
UBM	Basement, Unfinished	272	0
UGR	Garage, Unfinished	1,182	0
		4,496	2,286

Building 3 : Section 1

Year Built: 1973
Living Area: 600
Replacement Cost: $38,964
Building Percent Good: 49
Replacement Cost Less Depreciation: $19,100

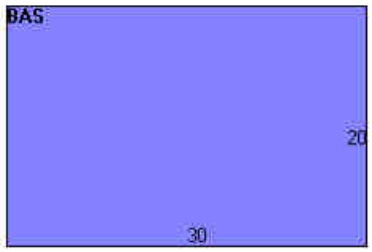
Building Attributes : Bldg 3 of 3	
Field	**Description**
STYLE	Industrial
MODEL	Ind or Comm
Grade	Average
Stories:	1
Occupancy	1
Exterior Wall 1	Concr/Cinder
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled Compos
Interior Wall 1	Drywall/Sheet
Interior Wall 2	Minim/Masonry
Interior Floor 1	Vinyl/Asphalt
Interior Floor 2	

Building Photo

(http://images.vgsi.com/photos/NorthBranfordCTPhotos//default.

Heating Fuel	Gas
Heating Type	Forced Air-Duc
AC Type	Heat Pump
Bldg Use	COMM WHSE MDL-96
Total Rooms	
Total Bedrms	00
Total Baths	0
1st Floor Use:	031I
Heat/AC	HEAT/AC PKGS
Frame Type	MASONRY
Baths/Plumbing	LIGHT
Ceiling/Wall	CEIL & WALLS
Rooms/Prtns	AVERAGE
Wall Height	0
% Comn Wall	12

Building Layout



Building Sub-Areas (sq ft)			Legend
Code	**Description**	**Gross Area**	**Living Area**
BAS	First Floor	600	600
		600	600

Extra Features

Extra Features				Legend
Code	**Description**	**Size**	**Value**	**Bldg #**
FPL2	FIREPLACE 1.5 STY	1 UNITS	$2,800	1

Land

Land Use

Use Code	010M
Description	SINGLE FAM MDL-03
Zone	R40
Neighborhood	
Alt Land Appr	No
Category	

Land Line Valuation

Size (Acres)	9.31
Frontage	0
Depth	0
Assessed Value	$390,100
Appraised Value	$557,400

Outbuildings

Outbuildings						Legend
Code	**Description**	**Sub Code**	**Sub Description**	**Size**	**Value**	**Bldg #**
ELCB	ELECTRONIC COMM BLDG			576 S.F.	$64,800	1
PAV1	PAVING-ASPHALT			4000 S.F.	$3,400	3
SHD1	SHED FRAME			220 S.F.	$800	2
ELCB	ELECTRONIC COMM BLDG			576 S.F.	$64,800	1
FN5	FENCE-10'CHAIN			300 L.F.	$3,200	3
BRN1	BARN - 1 STORY			5058 S.F.	$13,000	1

SHD8	SHED UNDER 144 SF			128 S.F.	$15,000	3
FGR2	GARAGE-GOOD			1200 S.F.	$27,000	3
SHD1	SHED FRAME			288 S.F.	$1,700	1
	RADIO TOWER			175	$17,500	3
	RADIO TOWER			175 HEIGHT	$87,500	3
TW1	CELL TOWER			125 HEIGHT	$50,600	3
ELCB	ELECTRONIC COMM BLDG			360 S.F.	$60,800	3
ELCB	ELECTRONIC COMM BLDG			200 S.F.	$33,800	3

Valuation History

Appraisal			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$691,400	$557,400	$1,248,800
2015	$691,400	$557,400	$1,248,800
2014	$548,500	$361,400	$909,900

Assessment			
Valuation Year	**Improvements**	**Land**	**Total**
2016	$473,900	$390,100	$864,000
2015	$473,900	$390,100	$864,000
2014	$373,700	$252,900	$626,600

Exhibit C

MODIFICATION OF EXISTING WIRELESS FACILITY BY

T-Mobile

T-MOBILE NORTHEAST LLC

ANCHOR PROJECT

SITE NUMBER: CT11230A

SITE NAME: NORTH HAVEN/RT 17

SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

(RF CONFIG: 67D5997DB_2XAIR+1OP (U21 MARKET)

PROJECT NOTES:

1. THIS IS AN UNMANNED TELECOMMUNICATION FACILITY AND NOT FOR HUMAN HABITATION: HANDICAPPED ACCESS IS NOT REQUIRED. POTABLE WATER OR SANITARY SERVICE IS NOT REQUIRED. NO OUTDOOR STORAGE OR ANY SOLID WASTE RECEPTACLES REQUIRED.
2. CONTRACTOR SHALL VERIFY ALL PLANS, EXISTING DIMENSIONS, AND CONDITIONS ON THE JOB SITE. CONTRACTOR SHALL IMMEDIATELY NOTIFY THE ARCHITECT/ENGINEER IN WRITING OF ANY DISCREPANCIES BEFORE PROCEEDING WITH THE WORK. FAILURE TO NOTIFY THE ARCHITECT/ENGINEER PLACES THE RESPONSIBILITY ON THE CONTRACTOR TO CORRECT THE DISCREPANCIES AT THE CONTRACTOR'S EXPENSE.
3. DEVELOPMENT AND USE OF THE SITE WILL CONFORM TO ALL APPLICABLE CODES, ORDINANCES AND SPECIFICATIONS.

STRUCTURAL NOTES:

PRIOR TO INSTALLATION OF THE PROPOSED EQUIPMENT CONTRACTOR SHOULD REVIEW THE MOUNT EVALUATION REPORT DATED 09/23/20 PREPARED BY EFI GLOBAL INC AND THE STRUCTURAL ANALYSIS REPORT DATED APRIL 28, 2021 PREPARED BY CENTEK ENGINEERING, AND ADHERE TO THE REPORTS FULLY AND ALL THE RECOMMENDATIONS THEREIN, INCLUDING BUT NOT LIMITED TO ANTENNA PLACEMENT, COAX ROUTING, STRUCTURAL IMPROVEMENTS, ETC.

CODE COMPLIANCE:

ALL WORK SHALL COMPLY WITH THE CURRENT NATIONAL AND CONNECTICUT STATE BUILDING AND LIFE SAFETY CODES, SUPPLEMENTS AND AMENDMENTS INCLUDING BUT NOT LIMITED TO THE LATEST EDITION OF:

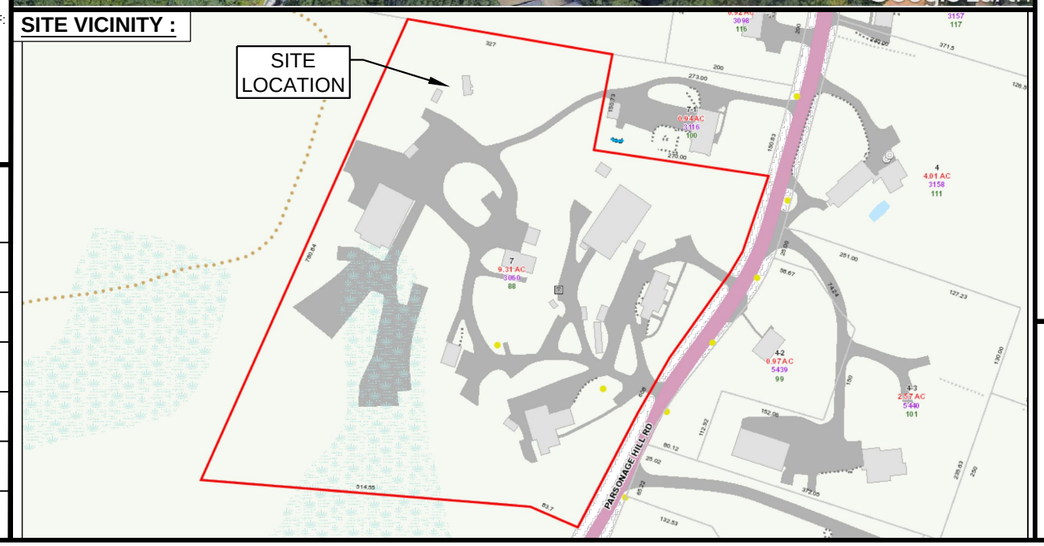
CONNECTICUT STATE BUILDING CODE (CSBC).
ANSI/TIA-222-G STRUCTURAL STANDARD FOR ANTENNA SUPPORTING STRUCTURES AND ANTENNAS.
NATIONAL ELECTRICAL CODE (NEC) FOR POWER AND GROUNDING REQUIREMENTS.
OCCUPATIONAL SAFETY AND HEALTH ACT (OSHA).
NFPA - NATIONAL FIRE PROTECTION ASSOCIATION.

APPROVALS:

FSA CM	DATE
RF ENGINEER	DATE
FOPS	DATE
T-MOBILE ENGINEERING AND DEVELOPMENT	DATE
	DATE
	DATE

SITE IMAGE:

SITE VICINITY :



PROJECT SCOPE:

UPGRADE OF EXISTING WIRELESS FACILITY AS FOLLOWS:

UPGRADE (E) 6131 CABINET INTERNALLY.
ADD (1) ENCLOSURE 6160.
ADD (1) BATTERY CABINET B160.
REPLACE (9) OF (9) EXISTING ANTENNAS.
REMOVE EXCESS COAXIAL LINES, ADD (2) 6X12 HCS, FOR FINAL CONFIGURATION OF (6) COAXIAL LINES AND (3) 6X12 HCS.

PROJECT INFORMATION:

ADDRESS:	88 PARSONAGE HILL ROAD NORTH BRANDFORD, CT 06472
STRUCTURE TYPE:	SELF SUPPORT TOWER
PARCEL ID:	51A 7
USE CODE:	010M
ZONING DISTRICT:	R40
COORDINATES:	41° 22' 09.09" N, 72° 48' 37.64" W
AVERAGE GROUND ELEV:	278'± (AMSL)

PROJECT TEAM:

APPLICANT:	T-MOBILE NORTHEAST, LLC. 35 GRIFFIN ROAD SOUTH BLOOMFIELD, CT 06002 860-692-7100
LAND OWNER:	OCHENKOWSKI TOWER LLC 88 PARSONAGE HILL ROAD NORTHFORD, CT 06472
PROJECT MANAGER:	NORTHEAST SITE SOLUTIONS 420 MAIN STREET, BLDG 4 STURBRIDGE, MA 01566 SHELDON FREINCLE SHELDON@NORTHEASTSITESOLUTIONS.COM 201-776-8521
CONSULTANTS:	FORESITE LLC 462 WALNUT ST NEWTON, MA 02460 SAEED MOSSAVAT SMOSSAVAT@FORESITELLC.COM 617-212-3123

SHEET INDEX:

APPLICANT:

T-Mobile

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

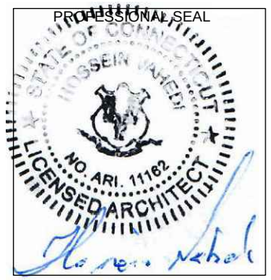
PROJECT MANAGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:

T-1: TITLE SHEET

GENERAL NOTES:

1. THE CONTRACTOR SHALL GIVE ALL NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY, MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS, AND LOCAL AND STATE JURISDICTIONAL CODES BEARING ON THE PERFORMANCE OF THE WORK. THE WORK PERFORMED ON THE PROJECT AND THE MATERIALS INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES.

2. THE ARCHITECT/ENGINEER HAS MADE EVERY EFFORT TO SET FORTH IN THE CONSTRUCTION AND CONTRACT DOCUMENTS THE COMPLETE SCOPE OF WORK. THE CONTRACTOR BIDDING THE JOB IS NEVERTHELESS CAUTIONED THAT MINOR OMISSIONS OR ERRORS IN THE DRAWINGS AND OR SPECIFICATIONS SHALL NOT EXCUSE SAID CONTRACTOR FROM COMPLETING THE PROJECT AND IMPROVEMENTS IN ACCORDANCE WITH THE INTENT OF THESE DOCUMENTS.

3. THE CONTRACTOR OR BIDDER SHALL BEAR THE RESPONSIBILITY OF NOTIFYING (IN WRITING) THE CLIENT'S REPRESENTATIVE OF ANY CONFLICTS, ERRORS, OR OMISSIONS PRIOR TO THE SUBMISSION OF CONTRACTOR'S PROPOSAL OR PERFORMANCE OF WORK.

5. THE CONTRACTOR SHALL VISIT THE JOB SITE PRIOR TO THE SUBMISSION OF BIDS OR PERFORMING WORK TO FAMILIARIZE HIMSELF WITH THE FIELD CONDITIONS AND TO VERIFY THAT THE PROJECT CAN BE CONSTRUCTED IN ACCORDANCE WITH THE CONSTRUCTION DOCUMENTS.

6. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS ACCORDING TO THE MANUFACTURER'S / VENDOR'S SPECIFICATIONS UNLESS NOTED OTHERWISE OR WHERE LOCAL CODES OR ORDINANCES TAKE PRECEDENCE.

7. THE CONTRACTOR SHALL MAKE NECESSARY PROVISIONS TO PROTECT EXISTING IMPROVEMENTS DURING CONSTRUCTION.

8. THE CONTRACTOR SHALL COMPLY WITH ALL PERTINENT SECTIONS OF THE BASIC STATE BUILDING CODE, LATEST EDITION, AND ALL OSHA REQUIREMENTS AS THEY APPLY TO THIS PROJEC

9. THE CONTRACTOR SHALL NOTIFY THE CLIENT'S REPRESENTATIVE IN WRITING WHERE A CONFLICT OCCURS ON ANY OF THE CONTRACT DOCUMENTS. THE CONTRACTOR IS NOT TO ORDER MATERIAL OR CONSTRUCT ANY PORTION OF THE WORK THAT IS IN CONFLICT UNTIL CONFLICT IS RESOLVED BY THE CLIENT'S REPRESENTATIVE.

10. THE WORK SHALL CONFORM TO THE CODES AND STANDARDS OF THE FOLLOWING AGENCIES AS FURTHER CITED HEREIN:

A. ASTM: AMERICAN SOCIETY FOR TESTING AND MATERIALS, AS PUBLISHED IN "COMPILATION OF ASTM STANDARDS BUILDING CODES" OR LATEST EDITION.

B. AWS: AMERICAN WELDING SOCIETY INC. AS PUBLISHED IN "STANDARD D1.1-08, STRUCTURAL WELDING CODE" OR LATEST EDITION.

C. AISC: AMERICAN INSTITUTE FOR STEEL CONSTRUCTION AS PUBLISHED IN "CODE FOR STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES"; "SPECIFICATIONS FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS" (LATEST EDITION).

11. BOLTING:

A. BOLTS SHALL BE CONFORMING TO ASTM A325 HIGH STRENGTH, HOT DIP GALVANIZED WITH ASTM A153 HEAVY HEX TYPE NUTS.

B. BOLTS SHALL BE 3/4"ϕ MINIMUM (UNLESS OTHERWISE NOTED)

C. ALL CONNECTIONS SHALL BE 2 BOLTS MINIMUM.

12. FABRICATION:

A. FABRICATION OF STEEL SHALL CONFORM TO THE AISC AND AWS STANDARDS AND CODES (LATEST EDITION).

B. ALL STRUCTURAL STEEL SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 (LATEST EDITION), UNLESS OTHERWISE NOTED.

13. ERECTION OF STEEL:

A. PROVIDE ALL ERECTION EQUIPMENT, BRACING, PLANKING, FIELD BOLTS, NUTS, WASHERS, DRIFT PINS, AND SIMILAR MATERIALS WHICH DO NOT FORM A PART OF THE COMPLETED CONSTRUCTION BUT ARE NECESSARY FOR ITS PROPER ERECTION.

B. ERECT AND ANCHOR ALL STRUCTURAL STEEL IN ACCORDANCE WITH AISC REFERENCE STANDARDS. ALL WORK SHALL BE ACCURATELY SET TO ESTABLISHED LINES AND ELEVATIONS AND RIGIDLY FASTENED IN PLACE WITH SUITABLE ATTACHMENTS TO THE CONSTRUCTION OF THE BUILDING.

C. TEMPORARY BRACING, GUYING AND SUPPORT SHALL BE PROVIDED TO KEEP THE STRUCTURE SAFE AND ALIGNED AT ALL TIMES DURING CONSTRUCTION, AND TO PREVENT DANGER TO PERSONS AND PROPERTY. CHECK ALL TEMPORARY LOADS AND STAY WITHIN SAFE CAPACITY OF ALL BUILDING COMPONENTS.

14. ANTENNA INSTALLATION:

A. INSTALL ANTENNAS AS INDICATED ON DRAWINGS AND CLIENT'S REPRESENTATIVE SPECIFICATIONS.

B. INSTALL GALVANIZED STEEL ANTENNA MOUNTS AS INDICATED ON DRAWINGS.

C. INSTALL COAXIAL / FIBER CABLES AND TERMINATIONS BETWEEN ANTENNAS AND EQUIPMENT PER MANUFACTURER'S RECOMMENDATIONS. WEATHERPROOF ALL CONNECTORS BETWEEN THE ANTENNA AND EQUIPMENT PER MANUFACTURER'S REQUIREMENTS.

15. ANTENNA AND COAXIAL / FIBER CABLE GROUNDING:

A. ALL EXTERIOR #6 GREEN GROUND WIRE "DAISY CHAIN" CONNECTIONS ARE TO BE WEATHER SEALED WITH ANDREWS CONNECTOR/SPLICE WEATHERPROOFING KIT TYPE #221213 OR EQUAL.

B. ALL COAXIAL / FIBER CABLE GROUNDING KITS ARE TO BE INSTALLED ON STRAIGHT RUNS OF COAXIAL / FIBER CABLE (NOT WITHIN BENDS).

16. RELATED WORK, FURNISH THE FOLLOWING WORK AS SPECIFIED UNDER CONSTRUCTION DOCUMENTS, BUT COORDINATE WITH OTHER TRADES PRIOR TO BID:

A. FLASHING OF OPENING INTO OUTSIDE WALLS

B. SEALING AND CAULKING ALL OPENINGS

C. PAINTING

D. CUTTING AND PATCHING

17. REQUIREMENTS OF REGULATORY AGENCIES:

A. FURNISH U.L. LISTED EQUIPMENT WHERE SUCH LABEL IS AVAILABLE. INSTALL IN CONFORMANCE WITH U.L. STANDARDS WHERE APPLICABLE.

B. INSTALL ANTENNA, ANTENNA CABLES, GROUNDING SYSTEM IN ACCORDANCE WITH DRAWINGS AND SPECIFICATION IN EFFECT AT PROJECT LOCATION AND RECOMMENDATIONS OF STATE AND LOCAL BUILDING CODES, AND SPECIAL CODES HAVING JURISDICTION OVER SPECIFIC PORTIONS OF WORK. THIS WORK INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:

C. TIA-EIA - 222 (LATEST EDITION). STRUCTURAL STANDARDS FOR STEEL ANTENNA TOWERS AND ANTENNA SUPPORTING STRUCTURES.

D. FAA - FEDERAL AVIATION ADMINISTRATION ADVISORY CIRCULAR AC 70/7460-lH, OBSTRUCTION MARKING AND LIGHTING.

E. FCC - FEDERAL COMMUNICATIONS COMMISSION RULES AND REGULATIONS FORM 715, OBSTRUCTION MARKING AND LIGHTING SPECIFICATION FOR ANTENNA STRUCTURES AND FORM 715A, HIGH INTENSITY OBSTRUCTION LIGHTING SPECIFICATIONS FOR ANTENNA STRUCTURES.

F. AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 BOLTS (LATEST EDITION).

G. NEC - NATIONAL ELECTRICAL CODE - ON TOWER LIGHTING KITS.

H. UL - UNDERWRITER'S LABORATORIES APPROVED ELECTRICAL PRODUCTS.

I. IN ALL CASES, PART 77 OF THE FAA RULES AND PARTS 17 AND 22 OF THE FCC RULES ARE APPLICABLE AND IN THE EVENT OF CONFLICT, SUPERSEDE ANY OTHER STANDARDS OR SPECIFICATIONS.

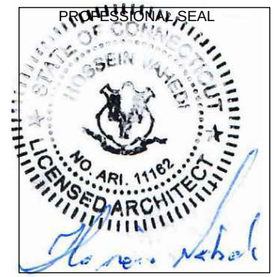
J. 2009 LIFE SAFETY CODE NFPA - 101.

APPLICANT:
T-Mobile
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

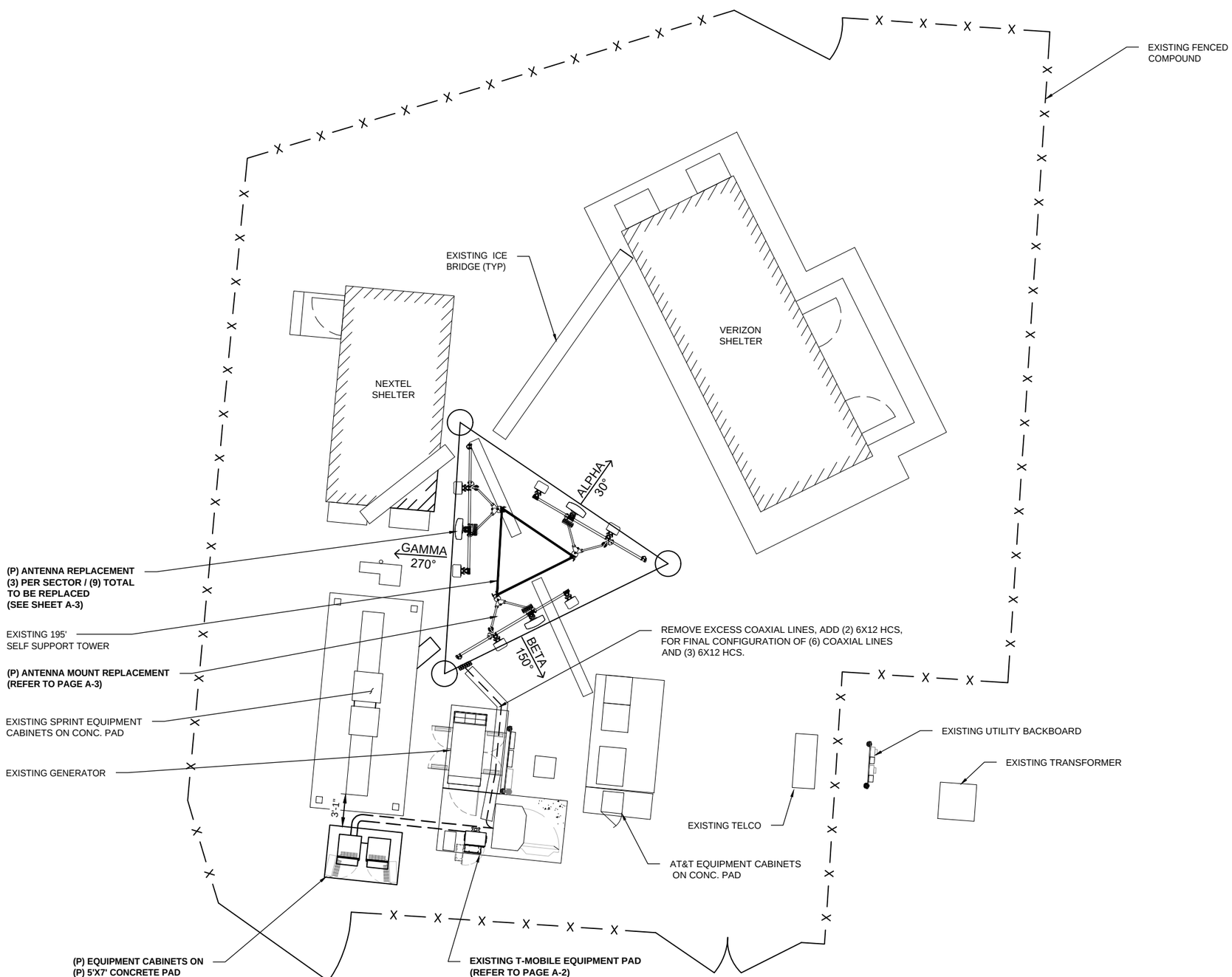


REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:
N-1: GENERAL NOTES

TRUE NORTH



SITE PLAN
SCALE: 3/32" = 1'-0"

1 / A-1

APPLICANT:

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

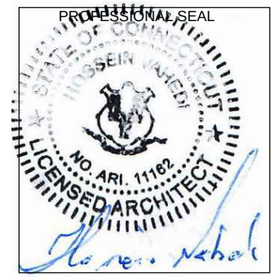
PROJECT MANAGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL

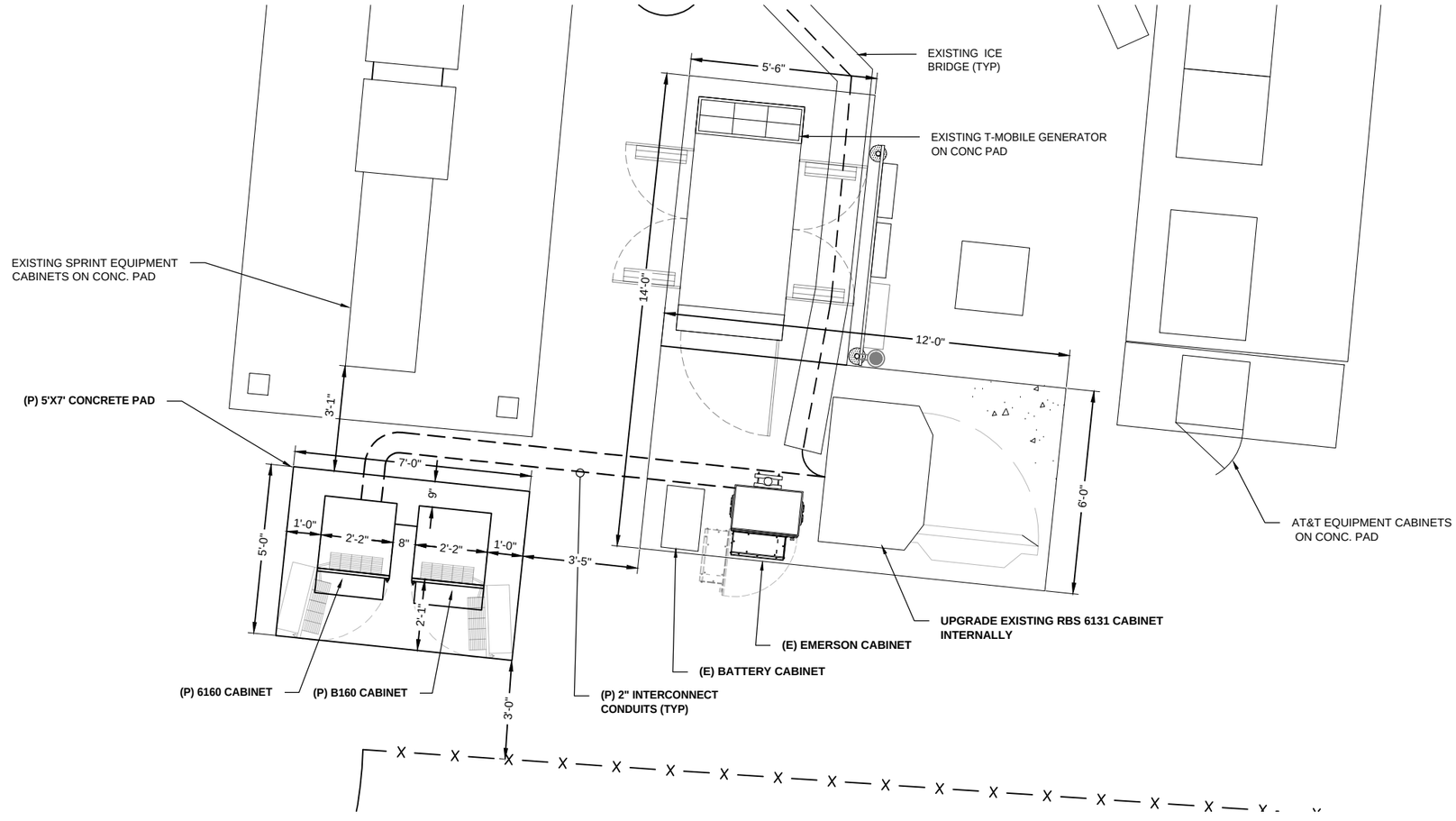


REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:
A-1: SITE PLAN

TRUE NORTH



PARTIAL SITE PLAN

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

1 / A-2

APPLICANT:

T-MOBILE NORTHEAST LLC

35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

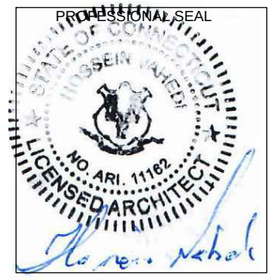
PROJECT MANAGER

NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:

FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

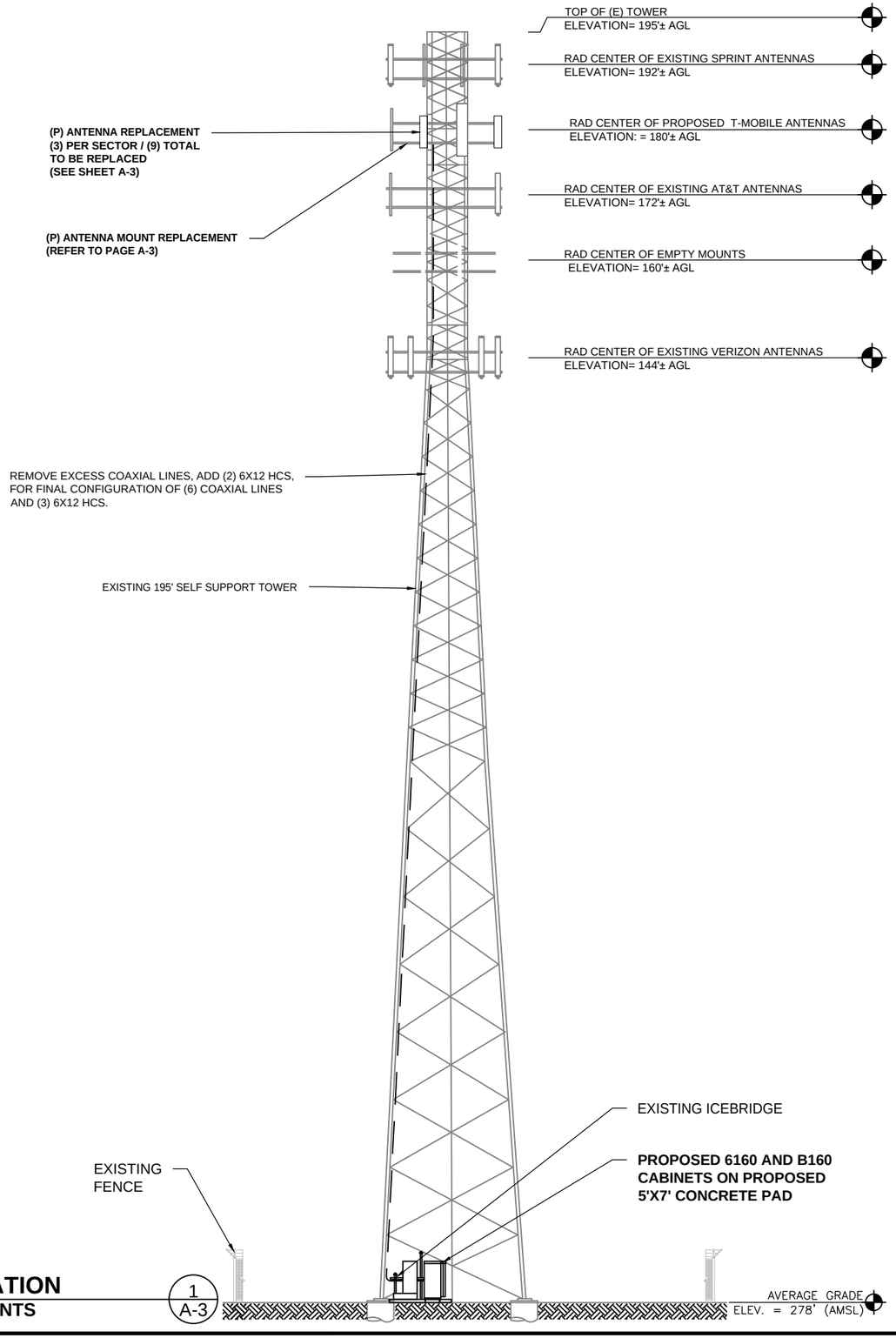
PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

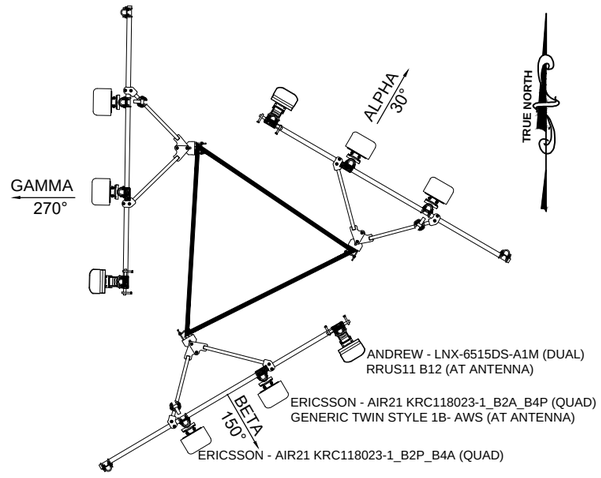
SHEET TITLE:
A-2: PARTIAL SITE PLAN



ELEVATION
SCALE: NTS

1 / A-3

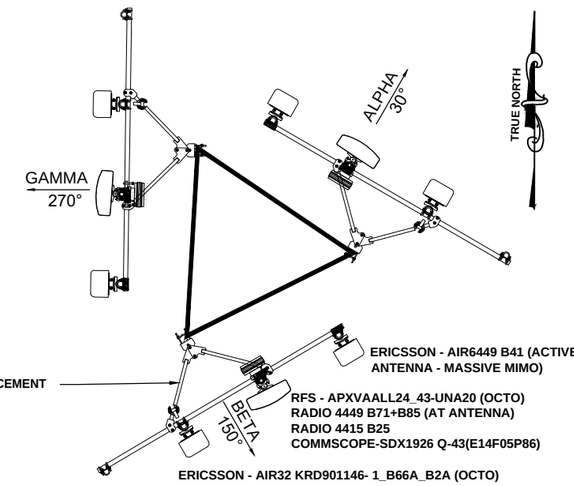
TYPICAL EACH SECTOR



EXISTING ANTENNA PLAN
N.T.S.

2 / A-3

TYPICAL EACH SECTOR



FINAL ANTENNA PLAN
N.T.S.

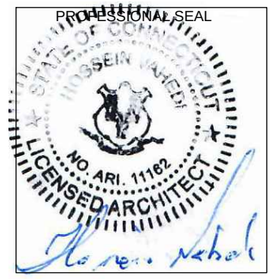
3 / A-3

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

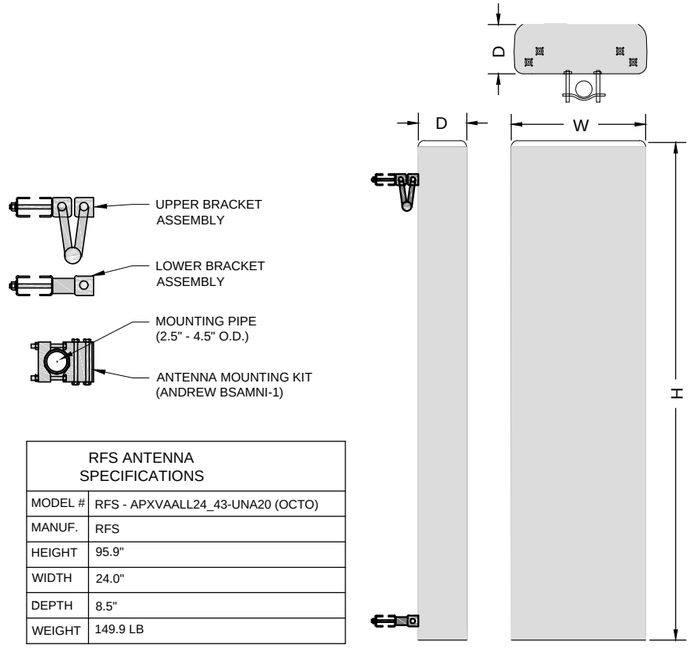
PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

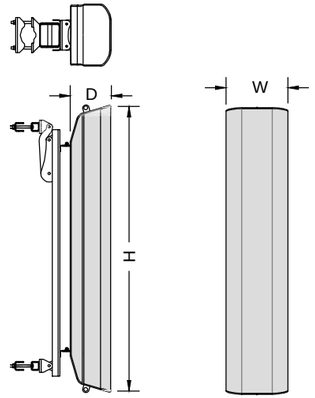
SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:
A-3: ELEVATION AND ANTENNA PLANS



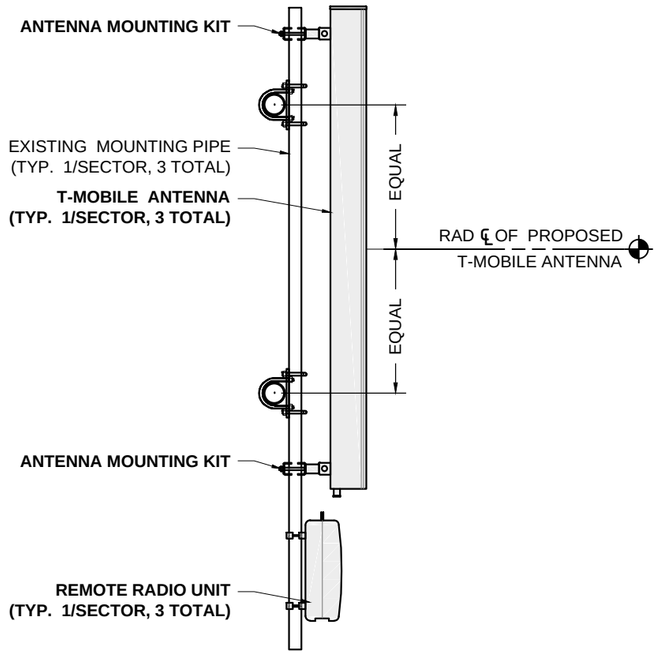
RFS ANTENNA SPECIFICATIONS	
MODEL #	RFS - APXVAALL24_43-UNA20 (OCTO)
MANUF.	RFS
HEIGHT	95.9"
WIDTH	24.0"
DEPTH	8.5"
WEIGHT	149.9 LB

RFS APX ANTENNA
N.T.S. — 1 / A-4

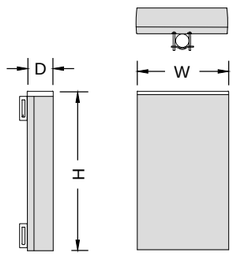


ERICSSON ANTENNA SPECIFICATIONS	
MODEL #	AIR32 KRD901146-1 B66A_B2A
MANUF.	ERICSSON
HEIGHT	56.6"
WIDTH	12.9"
DEPTH	8.7"
WEIGHT	132.2 LB

AIR32 ANTENNA
N.T.S. — 2 / A-4

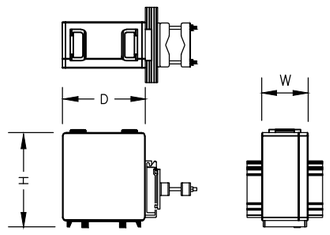


SPECIAL WORK NOTE:
VERTICALLY CENTER THE PIPE MAST AND THE PROPOSED ANTENNAS BETWEEN THE EXISTING PLATFORM AND HANDRAIL



ERICSON ANTENNA SPECIFICATIONS	
MODEL #	AIR6449 B41
MANUF.	ERICSSON
HEIGHT	33.1"
WIDTH	20.5"
DEPTH	8.3"
WEIGHT	103 LB

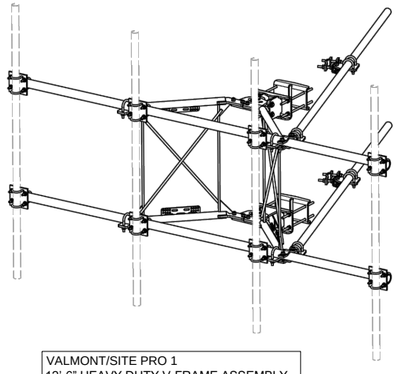
ERICSSON ANTENNA
N.T.S. — 4 / A-4



REMOTE RADIO UNIT SPECIFICATIONS	
MODEL #	RADIO 4415 B25
MANUF.	ERICSSON
HEIGHT	14.9"
WIDTH	13.2"
DEPTH	5.4"
WEIGHT	46.3 LB

REMOTE RADIO UNIT
N.T.S. — 5 / A-4

ANTENNA MOUNT
N.T.S. — 3 / A-4



VALMONT/SITE PRO 1
12'-6" HEAVY DUTY V-FRAME ASSEMBLY
WITH TWO STIFF ARMS (P/N: VFA12-HD)

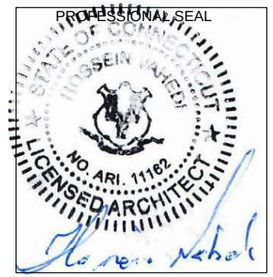
ANTENNA MOUNT REPLACEMENT
N.T.S. — 6 / A-4

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

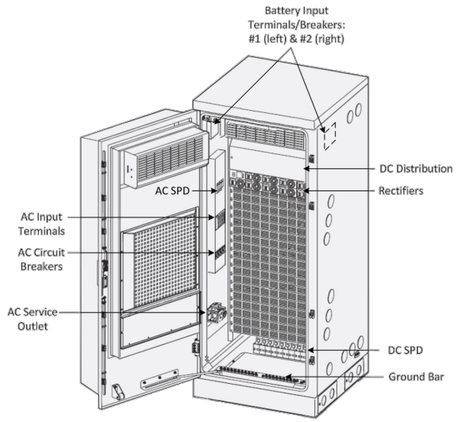
PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:
A-4: ANTENNA SPECIFICATIONS AND ANTENNA PLANS



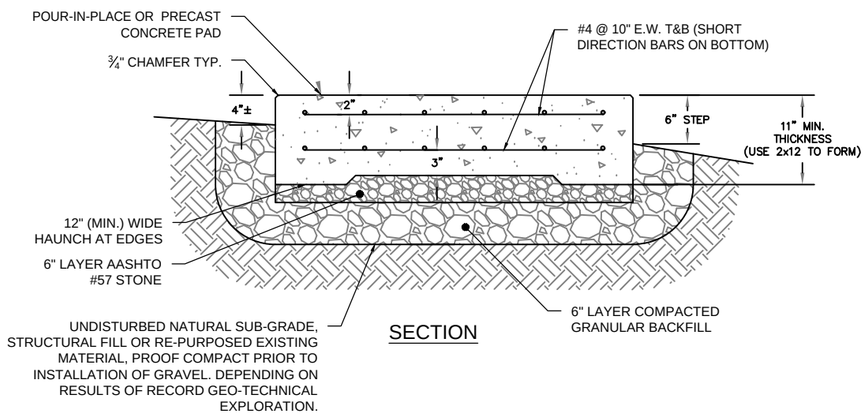
SITE SUPPORT CABINET SPECIFICATIONS	
MODEL #	6160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	25.6"
DEPTH	33.5"
WEIGHT	605 lbs

SITE SUPPORT CABINET 4 A-5
N.T.S.

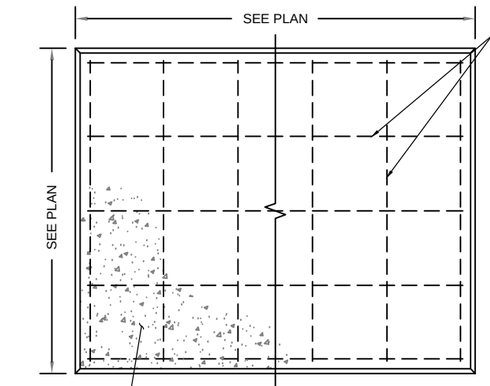
BATTERY CABINET SPECIFICATIONS	
MODEL #	B160
MANUF.	ERICSSON
HEIGHT	63"
WIDTH	26"
DEPTH	26"
WEIGHT	1883 lbs

BATTERY CABINET 5 A-5
N.T.S.

CONSTRUCTION NOTES:
- (HAND-DUG UTILITY TRENCH EXCAVATION REQUIRED):
- EXISTING UNDERGROUND UTILITY LOCATIONS ARE UNKNOWN. GENERAL CONTRACTOR SHALL HAND-EXCAVATE TO REQUIRED SUB-GRADE DEPTH, SUFFICIENT TEST HOLES.
ALL PROPOSED UNDERGROUND
UTILITY TRENCHES SHALL BE HAND-EXCAVATE AS REQUIRED.
- GENERAL CONTRACTOR IS RESPONSIBLE FOR ANY REQUIRED SPECIAL TEMPORARY PROTECTION OF, PHYSICAL DAMAGE TO, OR REPAIR OF EXISTING UNDERGROUND CONDUIT INCLUDING RESTORATION OF SERVICE.



SECTION



PLAN

NOTES:

1. BEARING STRATA MEDIUM TO DENSE INSET GRANULAR MATERIAL OR COMPACTED FILL. 95% COMPACTION.

2. SUBGRADE AND FILL SHALL CONSIST OF CLEAN SOIL.
NO DELETERIOUS MATERIALS OR ORGANICS TO BE USED.

3. CONCRETE FORM WORK SHALL BE CONSTRUCTED USING
MINIMUM 2"X8" NOMINAL SIZE LUMBER.
STRIP AND REMOVE UPON COMPLETION.

4. CONCRETE SHALL HAVE 4000PSI 28-DAY COMPRESSIVE
STRENGTH WITH 5(±1)% AIR ENTRAINMENT, 4(±1)"SLUMP AND BRISTLE BROOM FINISH.

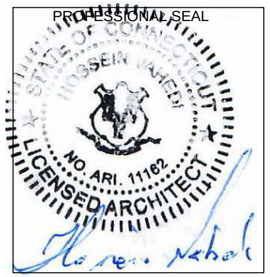
BATTERY CABINET 5 A-5
N.T.S.

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



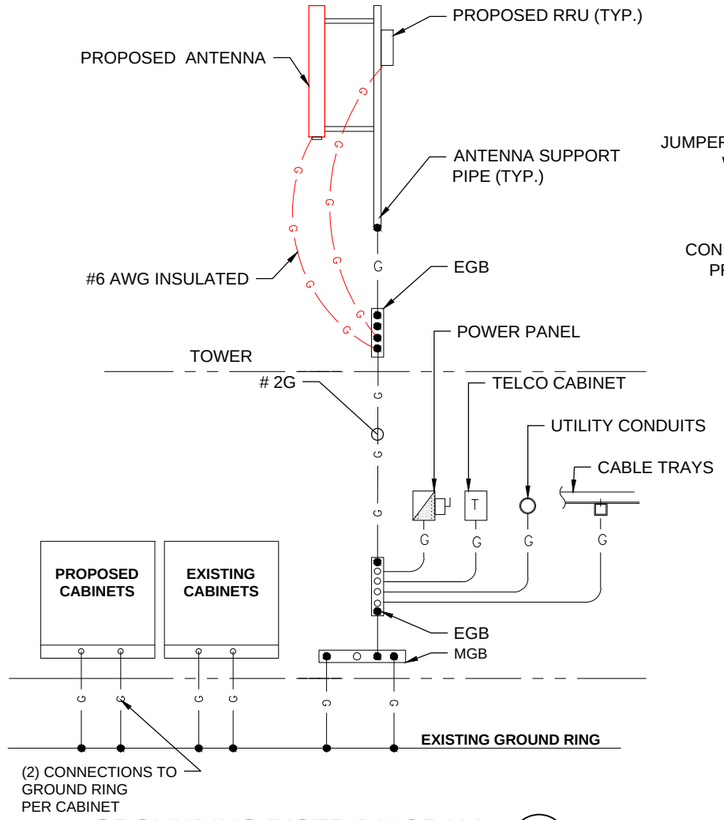
REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:
A-5: EQUIPMENT SPECIFICATIONS AND CONCRETE PAD DETAILS

ELECTRICAL & GROUNDING NOTES

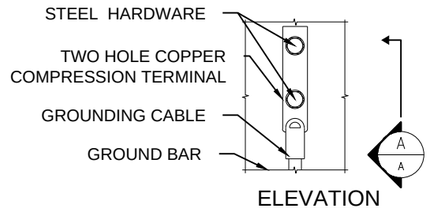
1. ALL ELECTRICAL WORK SHALL CONFORM TO THE REQUIREMENTS OF THE NATIONAL ELECTRICAL CODE (NEC) AS WELL AS APPLICABLE STATE AND LOCAL CODES.
2. ALL ELECTRICAL ITEMS SHALL BE U.L. APPROVED OR LISTED AND PRODUCED PER SPECIFICATION REQUIREMENTS.
3. THE ELECTRICAL WORK INCLUDES ALL LABOR AND MATERIAL DESCRIBED BY DRAWINGS AND SPECIFICATION INCLUDING INCIDENTAL WORK TO PROVIDE COMPLETE OPERATING AND APPROVED ELECTRICAL SYSTEM.
4. GENERAL CONTRACTOR SHALL PAY FEES FOR PERMITS, AND RESPONSIBLE FOR OBTAINING SAID PERMITS AND COORDINATION OF INSPECTIONS.
5. ELECTRICAL AND TELCO WIRING OUTSIDE A BUILDING AND EXPOSED TO WEATHER SHALL BE IN WATER TIGHT GALVANIZED RIGID STEEL CONDUITS OR SCHEDULE 80 PVC (AS PERMITTED BY CODE) ND WHERE REQUIRED IN LIQUID TIGHT FLEXIBLE METAL OR NONMETALLIC CONDUITS.
6. RIGID STEEL CONDUITS SHALL BE GROUNDED AT BOTH ENDS.
7. ELECTRICAL WIRING SHALL BE COPPER WITH TYPE XHHW, THWN, OR THIN INSULATION.
8. RUN ELECTRICAL CONDUIT OR CABLING BETWEEN ELECTRICAL ROOM AND PROPOSED CELL SITE ARE PEDESTAL AS INDICATED ON THIS DRAWING. PROVIDE FULL LENGTH PULL ROPE. COORDINATE INSTALLATION WITH UTILITY COMPANY.
9. RUN TELCO CONDUIT OR CABLE BETWEEN TELEPHONE UTILITY DEMARCATION POINT AND PROPOSED CELL SITE TELECOM CABINET AND RBS CABINET AS INDICATED ON DRAWING A -1. PROVIDE FULL LENGTH PULL ROPE INSTALLED TELCO CONDUIT. PROVIDE GREENLEE CONDUIT MEASURING TAPE AT EACH END.
10. ALL EQUIPMENT LOCATED OUTSIDE SHALL HAVE NAME 3R ENCLOSURE.
11. GROUNDING SHALL COMPLY WITH NEC ART. 250.
12. GROUNDING COAX CABLE SHIELDS MINIMUM AT BOTH ENDS USING MANUFACTURES COAX CABLE GROUNDING KITS SUPPLIED BY PROJECT OWNER.
13. USE #6 COPPER STRANDED WIRE WITH GREEN COLOR INSTALLATION FOR ABOVE GRADE GROUNDING (UNLESS OTHERWISE SPECIFIED) AND #2 SOLID TINNED BARE COPPER WIRE FOR BELOW GRADE GROUNDING AS INDICATED ON THE GROUND.
14. ALL GROUND CONNECTION TO BE BURNDY HYGROUND COMPRESSION TYPE CONNECTORS OR CADWELD EXOTHERMIC WELD. DO NOT ALLOW BARE COPPER WIRE TO BE IN CONTACT WITH GALVANIZED STEEL.
15. ROUTE GROUNDING CONDUCTORS ALONG THE SHORTEST AND STRAIGHTEST PATH POSSIBLE, EXCEPT AS OTHERWISE INDICATED. GROUNDING LEADS SHOULD NEVER BE BENT AS RIGHT ANGLE. ALWAYS MAKE AT LEAST 12" RADIUS BENDS. #6 WIRE CAN BE BENT AT 6" RADIUS WHEN NECESSARY BOND ANY METER OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
16. CONNECTIONS TO MGB SHALL BE ARRANGED IN THREE MAIN GROUPS: SURGE PROCEDURES (COAXIAL CABLE GROUND KITS, TELCO AND POWER PANEL GROUND); (GROUNDING ELECTRODE RING OR BUILDING STEEL); NON-SURGING OBJECTS (EGB GROUND IN RBS UNIT).
17. CONNECTIONS TO GROUND BARS SHALL BE MADE WITH TWO HOLE COMPRESSION TYPE COPPER LUGS. APPLY OXIDE INHIBITING COMPOUND TO ALL LOCATIONS.
18. APPLY OXIDE INHIBITING COMPOUND TO ALL COMPRESSION TYPE GROUND CONNECTION.
19. BOND ANTENNA MOUNTING BRACKETS, COAXIAL CABLE GROUND KITS, AND ALNA TO EGB PLACED NEAR THE ANTENNA LOCATION.
20 BOND ANTENNA EGB'S AND MGB TO WATER MAIN.
21. TEST COMPLETED GROUND SYSTEM AND RECORD RESULTS FOR PROJECT CLOSE-OUT DOCUMENTATION.
22. BOND ANY METAL OBJECTS WITHIN 7 FEET OF PROPOSED EQUIPMENT OR CABINET TO MASTER GROUND BAR.
23. VERIFY PROPOSED SERVICE UPGRADE WITH LOCAL UTILITY COMPANY PRIOR TO CONSTRUCTION.



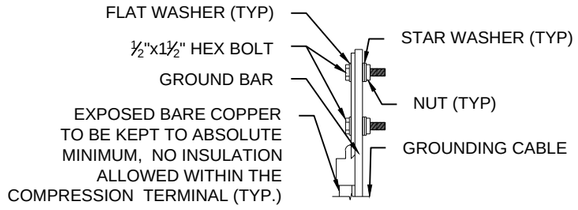
GROUNDING RISER DIAGRAM

1 E-1

SCALE: N.T.S



ELEVATION



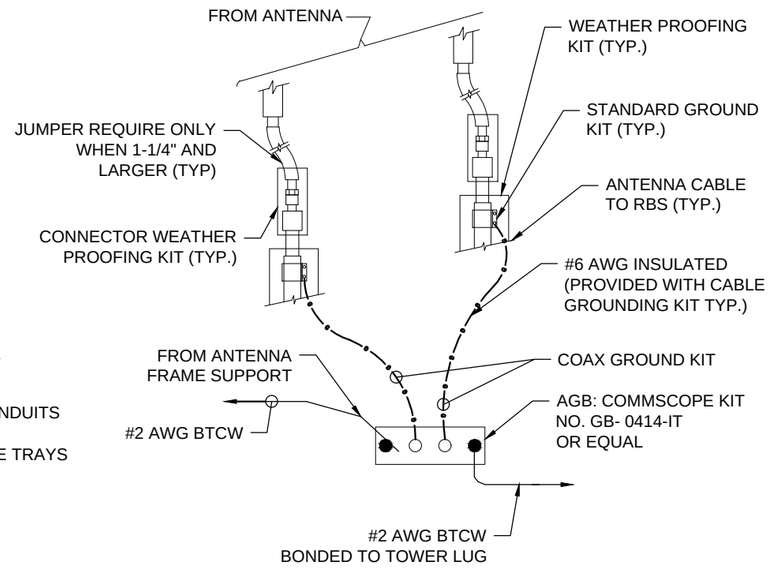
SECTION A-A

NOTES:
1. "DOUBLING UP" OR "STACKING " OF CONNECTIONS IS NOT PERMITTED.
2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATIONS.

TYPICAL GROUND BAR CONNECTIONS DETAIL

3 E-1

SCALE: N.T.S



NOTES:
INSTALL CABLE GROUND KIT ABOVE HORIZONTAL BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO AGB/EGB

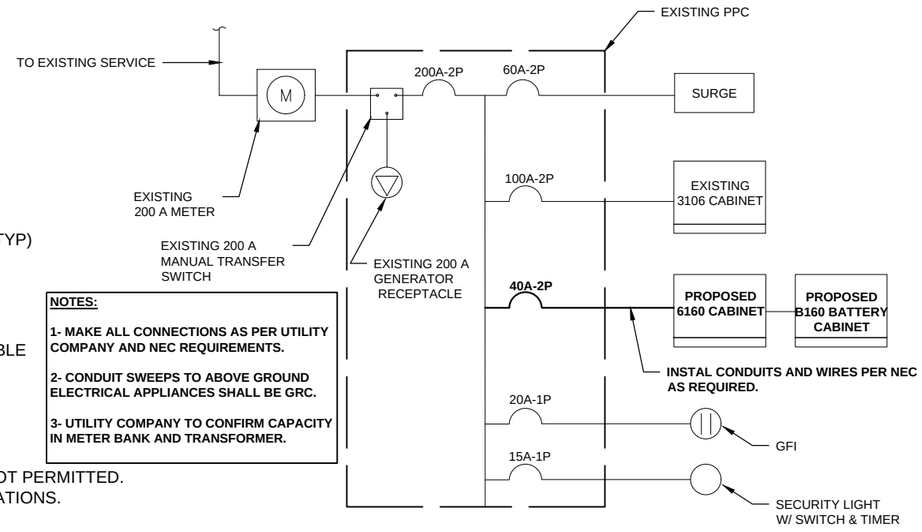
TOWER TOP CABLE GROUNDING DETAIL

2 E-1

SCALE: N.T.S

SPECIAL CONTRACTOR NOTES:

CONTRACTOR TO VERIFY THE POWER FEED & PHASE OF METER BANK AND THAT THE EXISTING AND PROPOSED CONDUITS AND WIRE SIZES ARE ADEQUATE FOR THE PROPOSED LOADING IN ACCORDANCE WITH NEC AND INCLUDE ELECTRICAL UPGRADES IN THE SCOPE OF WORK AS REQUIRED.



NOTES:

1- MAKE ALL CONNECTIONS AS PER UTILITY COMPANY AND NEC REQUIREMENTS.

2- CONDUIT SWEEPS TO ABOVE GROUND ELECTRICAL APPLIANCES SHALL BE GRC.

3- UTILITY COMPANY TO CONFIRM CAPACITY IN METER BANK AND TRANSFORMER.

ONE LINE DIAGRAM

4 E-1

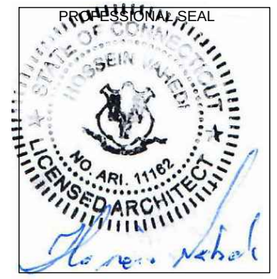
N.T.S.

APPLICANT:
T-MOBILE NORTHEAST LLC
35 GRIFFIN ROAD SOUTH
BLOOMFIELD, CT 06002
860-692-7100

PROJECT MANAGER
NSS NORTHEAST SITE SOLUTIONS
Turnkey Wireless Development
420 MAIN STREET, BLDG 4
STURBRIDGE, MA 01566
203-275-6669

CONSULTANT:
FORESITE LLC
Architects . Engineers . Surveyors
462 WALNUT STREET
NEWTON, MA 02460
617-212-3123

PROFESSIONAL SEAL



REV	DESCRIPTION	DATE
A	PRELIMINARY	09/15/20
B	REVISED PER COMMENTS	10/06/20
0	FINAL ISSUED	10/06/20
1	NEW STRUCTURAL REFERENCE	04/28/21

SITE NUMBER: CT11230A
SITE NAME: NORTH HAVEN/RT 17
SITE ADDRESS: 88 PARSONAGE HILL ROAD
NORTH BRANDFORD, CT 06472

SHEET TITLE:
E-1: GROUNDING DETAILS

Exhibit D

CENTEK engineering

Centered on Solutions℠

Structural Analysis Report

195' Existing Lattice Tower

Proposed T-Mobile
Antenna Upgrade

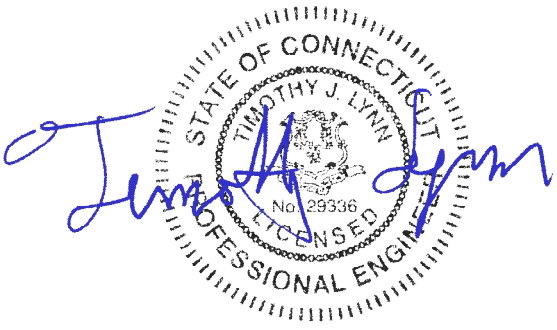
Site Ref: CT11230A

88 Parsonage Hill Road
Northford, CT

CENTEK Project No. 21048.01

Date: April 28, 2021

Max Stress Ratio = 74.9%



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

Table of Contents

Introduction

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

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

Existing antenna and appurtenance inventory was taken from tower mapping reports prepared by Provertic dated January 18, 2019 and Hightower Solutions dated January 16, 2020.

Proposed antenna and appurtenance inventory for T-Mobile was taken from an RF data sheet dated 8/24/20.

Proposed antenna and appurtenance inventory for AT&T was taken from an RF data sheet dated 4/5/21.

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

Antenna and Appurtenance Summary

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

- Sprint (Existing):
  Antenna: Three (3) RFS APXVSPP18-C-A20 panel antennas, three (3) 1900MHz 4X45W RRHs, three (3) 800MHz 2X50W RRHs and three (3) Notch Filters mounted on a triangular platform with a RAD center elevation of ±192-ft above grade level.
  Coax Cable: Three (3) 1-1/4"∅ Hybriflex cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- T-MOBILE (Existing Configuration):
  Antennas: Six (6) Ericsson AIR21 panel antennas, three (3) Andrew LNX-6515DS panel antennas, three (3) TMAs and three (3) Ericsson RRUS-11 mounted on three (3) 15-ft T-Frames with a RAD center elevation of ±180-ft above grade level.
  Coax Cables: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on a face of the existing tower as specified in Section 3 of this report.
- **T-MOBILE (Proposed Final Configuration):**
  Antennas: Three (3) Ericsson AIR6449 panel antennas, three (3) Ericsson AIR32 panel antennas, three (3) RFS APXVAALL24_43 panel antennas, three (3) TMAs, three (3) Ericsson 4449 remote radio heads, three (3) Ericsson 4415 remote radio heads and three (3) Commscope SDX1926Q-43 diplexers mounted on three (3) SitePro VFA12-HD V-Frames with a RAD center elevation of ±180-ft above grade level.
  Coax Cables: Six (6) 1-5/8" ∅ coax cables and three (3) 1-5/8" ∅ fiber cable running on a face of the existing tower as specified in Section 3 of this report.

- AT&T (Existing Configuration):
  Antenna: Three (3) Kathrein 800-10121 panel antennas, three (3) KMW AM-X-CD-16-65-00T panel antennas, six (6) Powerwave LGP21401 TMAs, three (3) Ericsson RRUS-11 remote radio heads, three (3) Ericsson RRUS-12 remote radio heads and one (1) Raycap DC6-48-60-18-8F surge arrestor mounted on three (3) 12-ft T-Frames with a RAD center elevation of ±172-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables, one (1) fiber cable and two (2) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- **AT&T (Final Configuration):**
  Antenna: Three (3) Kathrein 800-10121 panel antennas, three (3) CCI OPA65R-BU6DA panel antennas, three (3) CCI DMP65R-BU6DA panel antennas, six (6) Powerwave LGP21401 TMAs, three (3) Ericsson 4478 B14 remote radio heads, three (3) Ericsson 4449 B5/B12 remote radio heads, three (3) Ericsson 8843 B2/B66A remote radio heads and two (2) Raycap DC6-48-60-18-8F surge arrestors mounted on three (3) 12-ft T-Frames with a RAD center elevation of ±172-ft above grade level.
  Coax Cable: Six (6) 1-5/8" ∅ coax cables, two (2) fiber cable and four (4) dc control cables running on a leg/face of the existing tower as specified in Section 3 of this report.
- Empty Mounts (Existing):
  Antenna: Three (3) 12-ft T-Frames with a RAD center elevation of ±160-ft above grade level.
- Verizon (Existing):
  Antennas: Three (3) Andrew LNX-6513DS panel antennas, three (3) Antel BXA-171063-12CF panel antennas, three (3) Antel BXA-171085/8BF panel antennas, three (3) Antel BXA-70063/6CF panel antennas, three (3) RFS diplexers, three (3) Alcatel-Lucent RRH2x40-AWS remote radio heads and one (1) main distribution box mounted on (3) 12-ft T-Frames with a RAD center elevation of ±144-ft above grade level.
  Coax Cable: Twelve (12) 1-5/8" ∅ coax cables and one (1) 1-5/8" ∅ fiber cable running on a leg/face of the existing tower as specified in Section 3 of this report.
- Sprint (Existing):
  Antenna: One (1) GPS antenna on a 2-ft standoff with an elevation of ±80-ft above grade level.
  Coax Cable: One (1) 1/2" ∅ coax cable running on a leg/face of the existing tower as specified in Section 3 of this report.

Primary Assumptions Used in the Analysis

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

Analysis

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

The existing tower was analyzed for the controlling basic wind speed (3-second gust) with no ice and the applicable wind and ice combination to determine stresses in members as per guidelines of TIA-222-G-2005 entitled "Structural Standard for Antenna Support Structures and Antennas", the American Institute of Steel Construction (AISC) and the Manual of Steel Construction; Load and Resistance Factor Design (LRFD).

The controlling wind speed is determined by evaluating the local available wind speed data as provided in Appendix N of the CSBC[1] and the wind speed data available in the TIA-222-G-2005 Standard.

Tower Loading

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

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

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

Tower Capacity

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

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

Tower Section	Elevation	Stress Ratio (percentage of capacity)	Result
Diagonal (T10)	0'-0"-20'-0"	74.9%	**PASS**
Leg (T9)	20'-0"-40'-0"	65.4%	**PASS**

Foundation and Anchors

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

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

Load Effect	Proposed Tower Reactions
Leg Shear	45,101 lbs
Leg Compression	423,598 lbs
Leg Tension	358,716 lbs
Base Moment	8,065,138 ft-lbs
Base Shear	73,889 lbs

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

Tower Section	Component	Stress Ratio (percentage of capacity)	Result
Anchor Bolts	Tension	50.4%	**PASS**

- The foundation was found to be within allowable limits.

Foundation	Design Limit	TIA-222-G Section 9.4 FS[1]	Proposed Loading (FS)[1]	Result
Reinforced Concrete Pad and Piers	Overturning	1.0	1.61	**PASS**

Note 1: FS denotes Factor of Safety

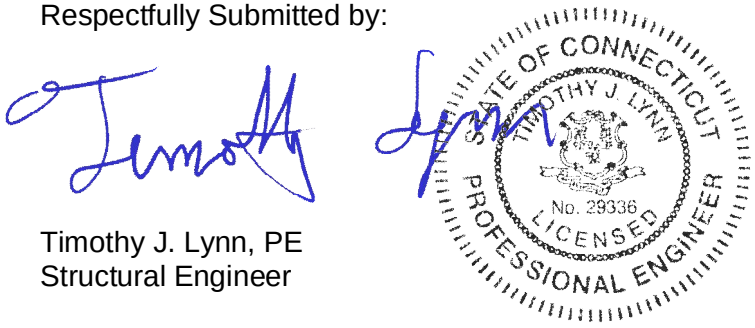
Conclusion

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

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

Please feel free to call with any questions or comments.

Respectfully Submitted by:



Timothy J. Lynn, PE
Structural Engineer

Standard Conditions for Furnishing of Professional Engineering Services on Existing Structures

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

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

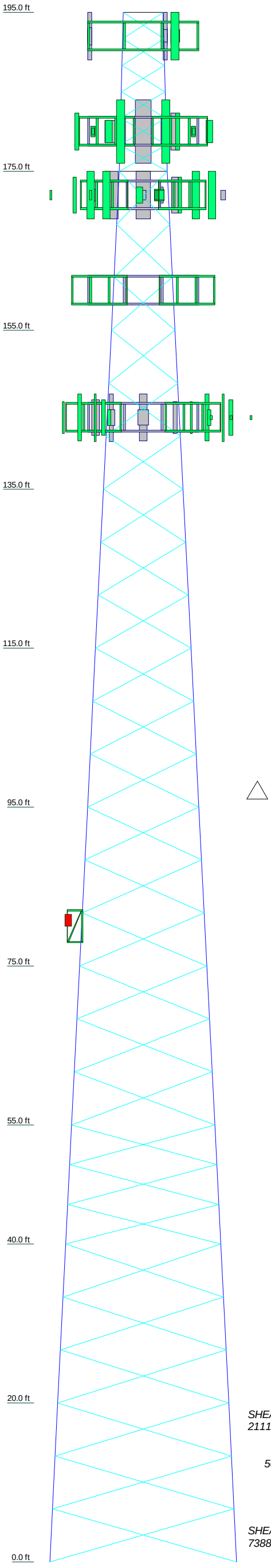
GENERAL DESCRIPTION OF STRUCTURAL ANALYSIS PROGRAM

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

tnxTower Features:

- tnxTower can analyze and design 3- and 4-sided guyed towers, 3- and 4-sided self-supporting towers and either round or tapered ground mounted poles with or without guys.
- The program analyzes towers using the TIA-222-G (2005) standard or any of the previous TIA/EIA standards back to RS-222 (1959). Steel design is checked using the AISC ASD 9th Edition or the AISC LRFD specifications.
- Linear and non-linear (P-delta) analyses can be used in determining displacements and forces in the structure. Wind pressures and forces are automatically calculated.
- Extensive graphics plots include material take-off, shear-moment, leg compression, displacement, twist, feed line, guy anchor and stress plots.
- tnxTower contains unique features such as True Cable behavior, hog rod take-up, foundation stiffness and much more.

	T1	T2	T3	T4	T5	T6	T7	T8	T9	T10
Section	SR 3	SR 3 3/4	SR 4	SR 4 1/4	SR 4 1/4	SR 4 1/2	SR 4 3/4	SR 5		
Legs	SR 1 1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	L3x3x1/4	L3x3x3/8	L3 1/2x3 1/2x5/16	L4x4x1/4	L4x4x3/8	L4x4x5/16	
Leg Grade	A529-50									
Diagonals	SR 1 1/4	L2 1/2x2 1/2x3/16	L2 1/2x2 1/2x5/16	L3x3x1/4	L3x3x3/8	L3 1/2x3 1/2x5/16	L4x4x1/4	L4x4x3/8	L4x4x5/16	
Diagonal Grade	A36									
Top Girts	SR 1 1/4					N.A.				
Bottom Girts	SR 1 1/4					N.A.				
Face Width (ft)	5	6	8	10	12	14	16	18	21.5	23.5
# Panels @ (ft)	6 @ 3.33333			18 @ 6.66667				3 @ 5	6 @ 6.66667	
Weight (lb)	2548.7	2793.3	3572.1	4039.1	4789.8	5354.2	5794.0	5023.9	6793.1	8126.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Top Triangular Mount (Sprint)	192	OPA65R-BU6D (AT⌶)	172
APXVSPP18-C-A20 (Sprint)	192	DMP65R-BU6D (AT⌶)	172
APXVSPP18-C-A20 (Sprint)	192	800 10121 (AT⌶)	172
APXVSPP18-C-A20 (Sprint)	192	OPA65R-BU6D (AT⌶)	172
FD-RRH 2x50 800 (Sprint)	192	DMP65R-BU6D (AT⌶)	172
FD-RRH 2x50 800 (Sprint)	192	(2) LGP21401 TMA (AT⌶)	172
FD-RRH 2x50 800 (Sprint)	192	(2) LGP21401 TMA (AT⌶)	172
Notch Filter (Sprint)	192	(2) LGP21401 TMA (AT⌶)	172
Notch Filter (Sprint)	192	DC6-48-60-18-8F Surge Arrestor (AT⌶)	172
Notch Filter (Sprint)	192	DC6-48-60-18-8F Surge Arrestor (AT⌶)	172
FD-RRH 4x45 1900 (Sprint)	192	4478 B14 (AT⌶)	172
FD-RRH 4x45 1900 (Sprint)	192	4478 B14 (AT⌶)	172
FD-RRH 4x45 1900 (Sprint)	192	4478 B14 (AT⌶)	172
SitePro VFA12-HD (T-Mobile)	180	4449 B5/B12 (AT⌶)	172
SitePro VFA12-HD (T-Mobile)	180	4449 B5/B12 (AT⌶)	172
SitePro VFA12-HD (T-Mobile)	180	4449 B5/B12 (AT⌶)	172
AIR6449 (T-Mobile)	180	8843 B2/B66A (AT⌶)	172
APXVAALL24-43 (T-Mobile)	180	8843 B2/B66A (AT⌶)	172
AIR32 (T-Mobile)	180	8843 B2/B66A (AT⌶)	172
AIR6449 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Empty)	160
APXVAALL24-43 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Empty)	160
AIR32 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Empty)	160
AIR6449 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Verizon)	144
APXVAALL24-43 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Verizon)	144
AIR32 (T-Mobile)	180	Pirod 12' T-Frame Sector Mount (1) (Verizon)	144
4449 B12,B71 (T-Mobile)	180	LNX-6513DS-VTM (Verizon)	144
4449 B12,B71 (T-Mobile)	180	BXA-171063-12CF (Verizon)	144
4449 B12,B71 (T-Mobile)	180	BXA-70063/6CF (Verizon)	144
4415 B25 (T-Mobile)	180	BXA-171085-8CF (Verizon)	144
4415 B25 (T-Mobile)	180	LNX-6513DS-VTM (Verizon)	144
4415 B25 (T-Mobile)	180	BXA-171063-12CF (Verizon)	144
SDX1926Q-43 (T-Mobile)	180	BXA-70063/6CF (Verizon)	144
SDX1926Q-43 (T-Mobile)	180	BXA-171085-8CF (Verizon)	144
SDX1926Q-43 (T-Mobile)	180	LNX-6513DS-VTM (Verizon)	144
TMA 10"x8"x3" (T-Mobile)	180	BXA-171063-12CF (Verizon)	144
TMA 10"x8"x3" (T-Mobile)	180	BXA-70063/6CF (Verizon)	144
TMA 10"x8"x3" (T-Mobile)	180	BXA-171085-8CF (Verizon)	144
Pirod 12' T-Frame Sector Mount (1) (AT⌶)	172	RRH2x40-AWS (Verizon)	144
Pirod 12' T-Frame Sector Mount (1) (AT⌶)	172	RRH2x40-AWS (Verizon)	144
Pirod 12' T-Frame Sector Mount (1) (AT⌶)	172	RRH2x40-AWS (Verizon)	144
Pirod 12' T-Frame Sector Mount (1) (AT⌶)	172	RRH2x40-AWS (Verizon)	144
800 10121 (AT⌶)	172	RC2DC-3315-PF-48 (Verizon)	144
OPA65R-BU6D (AT⌶)	172	(3) FD9R6004/2C-3L Diplexer (Verizon)	144
DMP65R-BU6D (AT⌶)	172	GPS (Sprint)	80
800 10121 (AT⌶)	172	2-ft Stand Off (Sprint)	80

MATERIAL STRENGTH

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

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 101 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class II.
6. Topographic Category 1 with Crest Height of 0.00 ft
7. TOWER RATING: 74.9%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 423598 lb
SHEAR: 45101 lb

UPLIFT: -358716 lb
SHEAR: 38991 lb

AXIAL
176315 lb

SHEAR *21117 lb* — *MOMENT* *2421604 lb-ft*

TORQUE 27079 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL
81927 lb

SHEAR *73889 lb* — *MOMENT* *8065138 lb-ft*

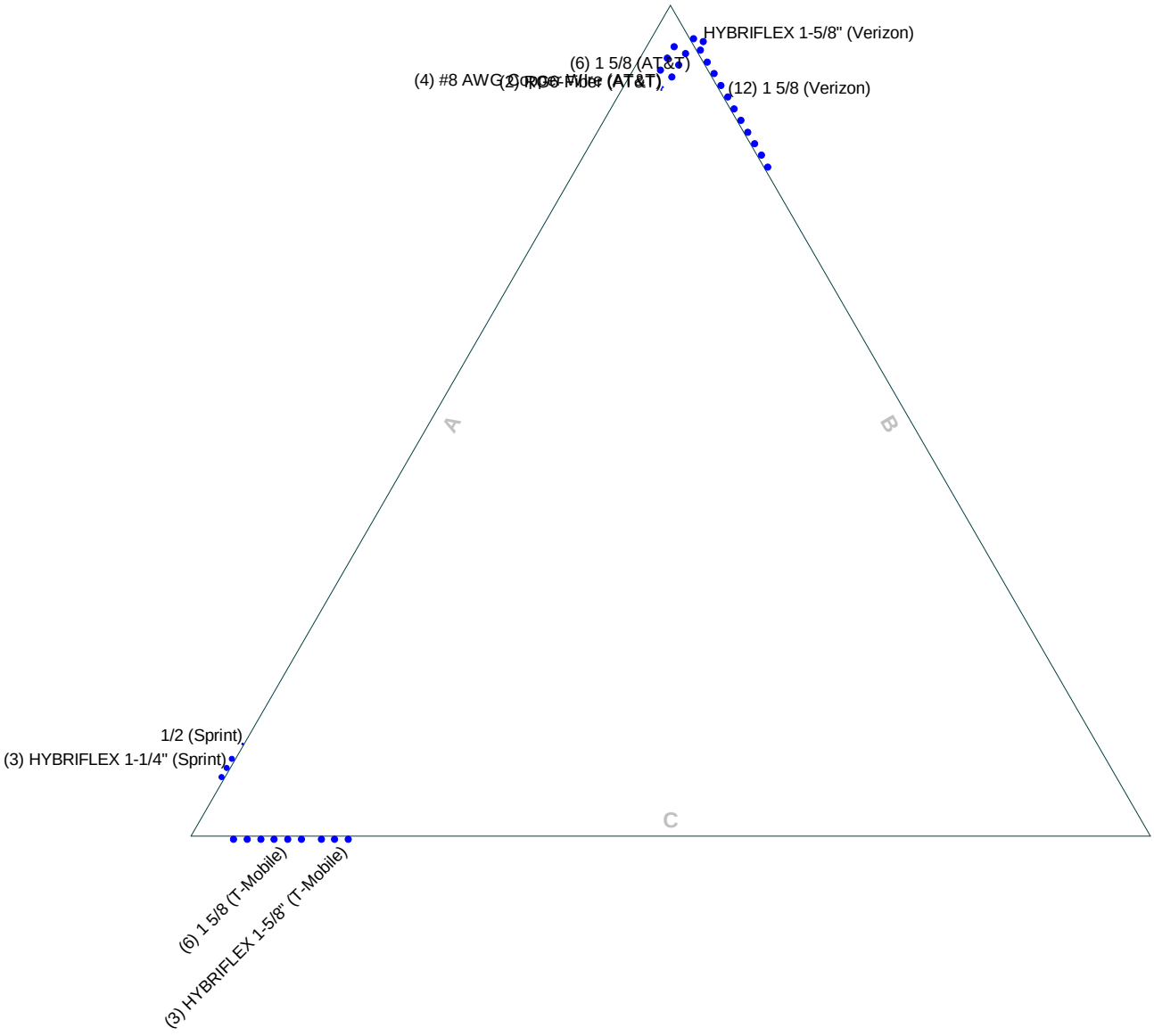
TORQUE 63742 lb-ft
REACTIONS - 101 mph WIND

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

Job: ***21048.00***		
Project: ***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 04/19/21	Scale: NTS
Path: J:\Jobs\2104800.WI\01_Parsonage Hill Road - NSS\05_Structural\Backup Documentation\ERI File\195-ft Centel Lattice Tower.eri		Dwg No. E-1

Feed Line Plan

Round Flat App In Face App Out Face

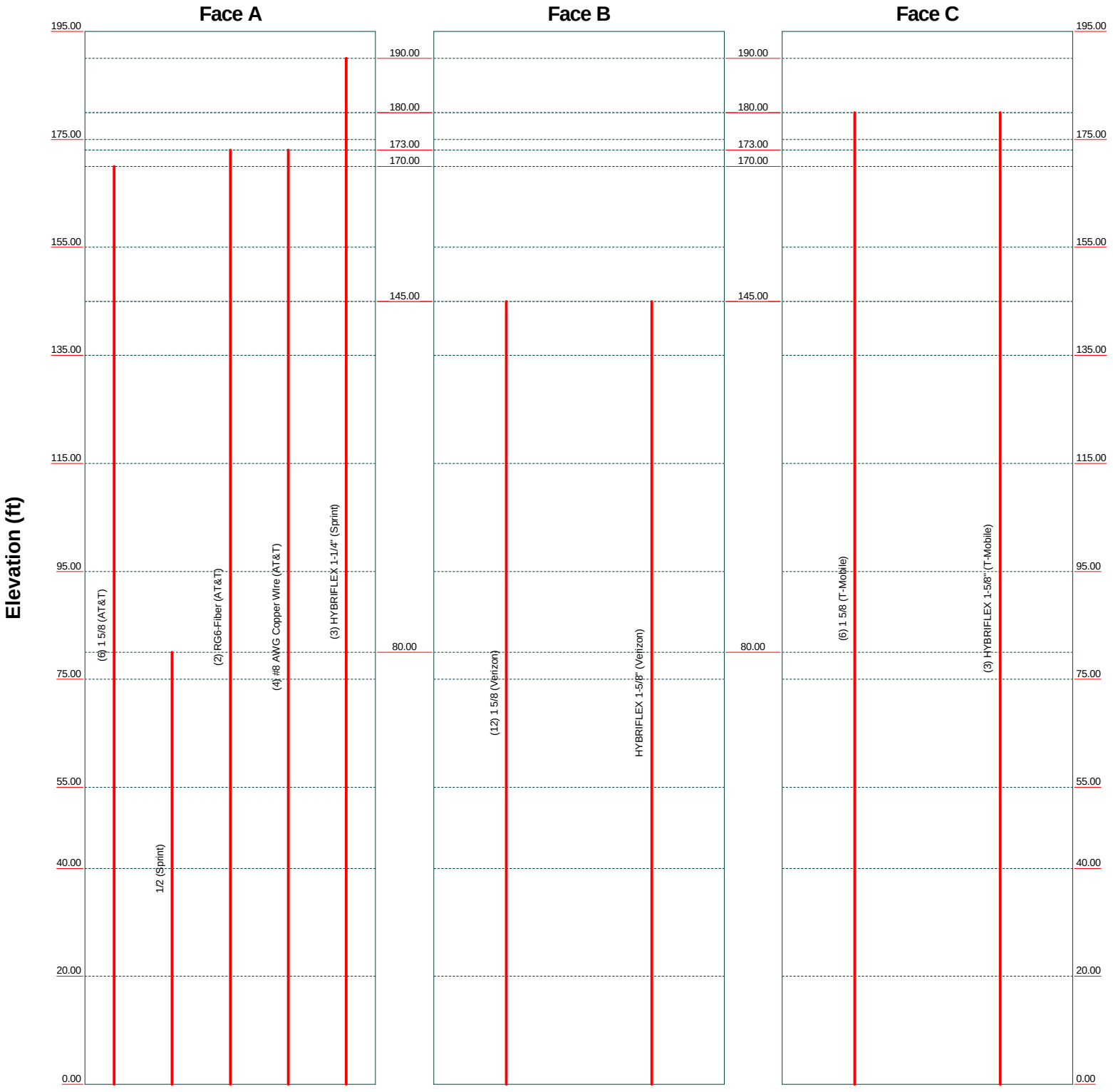


Centek Engineering Inc.
63-2 North Branford Rd.
Branford, CT 06405
Phone: (203) 488-0580
FAX: (203) 488-8587

Job: ***21048.00***			
Project: ***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***			
Client: T-Mobile	Drawn by: TJL	App'd:	
Code: TIA-222-G	Date: 04/16/21	Scale: NTS	
Path: J:\Jobs\21048\00.WI\01_Parsonage Hill Road - NSS\05_Structural\Backup Documentation\ERI Files\195-ft Central Lattice Tower.eri		Dwg No. E-7	

Feed Line Distribution Chart
0' - 195'

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



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

Job: ***21048.00***		
Project: ***195' Lattice Tower - 88 Parsonage Hill Rd., Northford, CT***		
Client: T-Mobile	Drawn by: TJL	App'd:
Code: TIA-222-G	Date: 04/16/21	Scale: NTS
Path: J:\Jobs\21048\00.WI\01_Parsonage Hill Road - NSS\05_Structural\Backup Documentation\ERI Files\195-ft Central Lattice Tower.eri		Dwg No. E-7

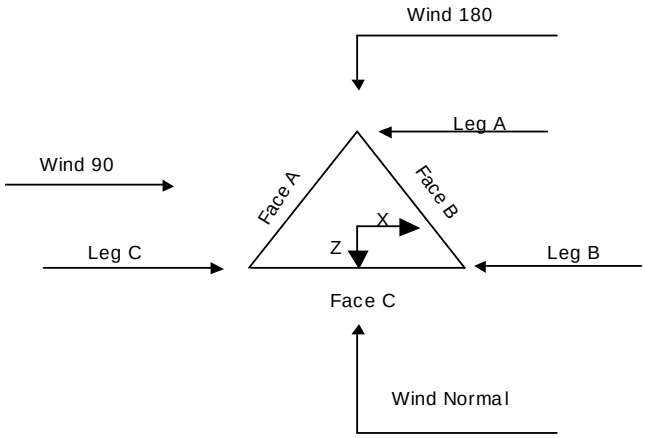
Tower Input Data

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

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

Options

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



Triangular Tower

Tower Section Geometry

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

Tower Section Geometry *(cont'd)*

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

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T6	95.00-75.00	6.67	X Brace	No	No	0.0000	0.0000
T7	75.00-55.00	6.67	X Brace	No	No	0.0000	0.0000
T8	55.00-40.00	5.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	6.67	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	6.67	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 195.00-175.00	Solid Round	1 1/4	A36 (36 ksi)	Solid Round	1 1/4	A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in

Tower Elevation ft	Gusset Area (per face) 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 195.00-175.00	0.00	0.0000	A36 (36 ksi)	1	1	1	30.0000	30.0000	36.0000
T2 175.00-155.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 155.00-135.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 135.00-115.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 115.00-95.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 95.00-75.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 75.00-55.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 55.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
195.00-175.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
175.00-155.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
155.00-135.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
135.00-115.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1
115.00-95.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
95.00-75.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
75.00-55.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
55.00-40.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 195.00-175.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	0.75	0.0000	1	0.0000	0.75
T2 175.00-155.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 155.00-135.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 135.00-115.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 115.00-95.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 95.00-75.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 75.00-55.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 55.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 195.00-175.00	Flange	1.1250 A325N	4	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 175.00-155.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 155.00-135.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 135.00-115.00	Flange	1.1250 A325N	6	0.8750 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 115.00-95.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 95.00-75.00	Flange	1.1250 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 75.00-55.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 55.00-40.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T9 40.00-20.00	Flange	1.2500 A325N	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0
T10 20.00-0.00	Flange	1.3750 A449	8	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325X	0	0.6250 A325N	0	0.6250 A325X	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
1 5/8 (Verizon)	B	No	No	Ar (CaAa)	145.00 - 0.00	0.0000	-0.38	12	12	1.9800	1.9800		1.04
1 5/8 (AT&T)	A	No	No	Ar (CaAa)	170.00 - 0.00	-10.0000	0.45	6	3	1.9800	1.9800		1.04
1 5/8 (T-Mobile)	C	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.42	6	6	1.9800	1.9800		1.04
1/2 (Sprint)	A	No	No	Ar (CaAa)	80.00 - 0.00	0.0000	-0.39	1	1	0.5800	0.5800		0.25
RG6-Fiber (AT&T)	A	No	No	Ar (CaAa)	173.00 - 0.00	-10.0000	0.42	2	2	0.5000	0.5000		1.00
#8 AWG Copper WIre (AT&T)	A	No	No	Ar (CaAa)	173.00 - 0.00	-10.0000	0.42	4	4	0.2500	0.1285		0.05
HYBRIFLEX 1-5/8" (T-Mobile)	C	No	No	Ar (CaAa)	180.00 - 0.00	0.0000	0.35	3	3	1.9800	1.9800		1.90
HYBRIFLEX 1-1/4" (Sprint)	A	No	No	Ar (CaAa)	190.00 - 0.00	0.0000	-0.42	3	3	1.5400	1.5400		1.30
HYBRIFLEX 1-5/8" (Verizon)	B	No	No	Ar (CaAa)	145.00 - 0.00	2.0000	-0.45	1	1	1.9800	1.9800		1.90

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	195.00-175.00	A	0.000	0.000	6.930	0.000	58.50
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	8.910	0.000	59.70
T2	175.00-155.00	A	0.000	0.000	29.785	0.000	211.20
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	35.640	0.000	238.80
T3	155.00-135.00	A	0.000	0.000	36.028	0.000	246.80
		B	0.000	0.000	25.740	0.000	143.80
		C	0.000	0.000	35.640	0.000	238.80
T4	135.00-115.00	A	0.000	0.000	36.028	0.000	246.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	35.640	0.000	238.80
T5	115.00-95.00	A	0.000	0.000	36.028	0.000	246.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	35.640	0.000	238.80
T6	95.00-75.00	A	0.000	0.000	36.318	0.000	248.05
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	35.640	0.000	238.80
T7	75.00-55.00	A	0.000	0.000	37.188	0.000	251.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	35.640	0.000	238.80
T8	55.00-40.00	A	0.000	0.000	27.891	0.000	188.85
		B	0.000	0.000	38.610	0.000	215.70
		C	0.000	0.000	26.730	0.000	179.10
T9	40.00-20.00	A	0.000	0.000	37.188	0.000	251.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	35.640	0.000	238.80

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T10	20.00-0.00	A	0.000	0.000	37.188	0.000	251.80
		B	0.000	0.000	51.480	0.000	287.60
		C	0.000	0.000	35.640	0.000	238.80

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	195.00-175.00	A	1.782	0.000	0.000	23.188	0.000	328.69
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	25.316	0.000	398.55
T2	175.00-155.00	A	1.762	0.000	0.000	89.611	0.000	1378.82
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	101.010	0.000	1579.99
T3	155.00-135.00	A	1.739	0.000	0.000	102.366	0.000	1619.80
		B		0.000	0.000	67.111	0.000	1094.84
		C		0.000	0.000	100.728	0.000	1564.18
T4	135.00-115.00	A	1.714	0.000	0.000	101.659	0.000	1600.51
		B		0.000	0.000	133.977	0.000	2165.52
		C		0.000	0.000	100.409	0.000	1546.32
T5	115.00-95.00	A	1.684	0.000	0.000	100.842	0.000	1578.38
		B		0.000	0.000	133.695	0.000	2137.66
		C		0.000	0.000	100.040	0.000	1525.77
T6	95.00-75.00	A	1.649	0.000	0.000	101.809	0.000	1575.99
		B		0.000	0.000	133.361	0.000	2104.66
		C		0.000	0.000	99.602	0.000	1501.44
T7	75.00-55.00	A	1.605	0.000	0.000	106.248	0.000	1611.00
		B		0.000	0.000	132.946	0.000	2063.92
		C		0.000	0.000	99.061	0.000	1471.46
T8	55.00-40.00	A	1.556	0.000	0.000	78.513	0.000	1177.93
		B		0.000	0.000	99.356	0.000	1513.41
		C		0.000	0.000	73.835	0.000	1078.22
T9	40.00-20.00	A	1.486	0.000	0.000	102.481	0.000	1514.61
		B		0.000	0.000	131.812	0.000	1953.40
		C		0.000	0.000	97.583	0.000	1390.36
T10	20.00-0.00	A	1.331	0.000	0.000	97.615	0.000	1395.03
		B		0.000	0.000	130.348	0.000	1812.41
		C		0.000	0.000	95.680	0.000	1287.47

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	195.00-175.00	-7.2903	4.5100	-7.8871	4.7906
T2	175.00-155.00	-9.6510	1.5222	-13.0880	2.3373
T3	155.00-135.00	-8.6037	-7.9922	-11.8059	-8.3302
T4	135.00-115.00	-7.6656	-14.5796	-10.9435	-16.4001
T5	115.00-95.00	-8.7335	-16.4477	-12.6608	-18.7952
T6	95.00-75.00	-9.1883	-17.0895	-14.1130	-20.3390
T7	75.00-55.00	-9.6012	-17.3156	-15.7974	-21.1943
T8	55.00-40.00	-8.9900	-16.3356	-15.6451	-21.1114
T9	40.00-20.00	-10.6222	-19.1036	-17.9040	-24.0934

Section	Elevation	CP_X	CP_Z	CP_X Ice	CP_Z Ice
	ft	in	in	in	in
T10	20.00-0.00	-11.0883	-19.9180	-18.8580	-25.5525

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	3	1 5/8	175.00 - 180.00	0.6000	0.5397
T1	7	HYBRIFLEX 1-5/8"	175.00 - 180.00	0.6000	0.5397
T1	8	HYBRIFLEX 1-1/4"	175.00 - 190.00	0.6000	0.5397
T2	2	1 5/8	155.00 - 170.00	0.6000	0.6000
T2	3	1 5/8	155.00 - 175.00	0.6000	0.6000
T2	5	RG6-Fiber	155.00 - 173.00	0.6000	0.6000
T2	6	#8 AWG Copper WIre	155.00 - 173.00	0.6000	0.6000
T2	7	HYBRIFLEX 1-5/8"	155.00 - 175.00	0.6000	0.6000
T2	8	HYBRIFLEX 1-1/4"	155.00 - 175.00	0.6000	0.6000
T3	1	1 5/8	135.00 - 145.00	0.6000	0.6000
T3	2	1 5/8	135.00 - 155.00	0.6000	0.6000
T3	3	1 5/8	135.00 - 155.00	0.6000	0.6000
T3	5	RG6-Fiber	135.00 - 155.00	0.6000	0.6000
T3	6	#8 AWG Copper WIre	135.00 - 155.00	0.6000	0.6000
T3	7	HYBRIFLEX 1-5/8"	135.00 - 155.00	0.6000	0.6000
T3	8	HYBRIFLEX 1-1/4"	135.00 - 155.00	0.6000	0.6000
T3	9	HYBRIFLEX 1-5/8"	135.00 - 145.00	0.6000	0.6000
T4	1	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	2	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	3	1 5/8	115.00 - 135.00	0.6000	0.6000
T4	5	RG6-Fiber	115.00 - 135.00	0.6000	0.6000
T4	6	#8 AWG Copper WIre	115.00 - 135.00	0.6000	0.6000
T4	7	HYBRIFLEX 1-5/8"	115.00 - 135.00	0.6000	0.6000
T4	8	HYBRIFLEX 1-1/4"	115.00 - 135.00	0.6000	0.6000
T4	9	HYBRIFLEX 1-5/8"	115.00 -	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			135.00		
T5	1	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	2	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	3	1 5/8	95.00 - 115.00	0.6000	0.6000
T5	5	RG6-Fiber	95.00 - 115.00	0.6000	0.6000
T5	6	#8 AWG Copper WIre	95.00 - 115.00	0.6000	0.6000
T5	7	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T5	8	HYBRIFLEX 1-1/4"	95.00 - 115.00	0.6000	0.6000
T5	9	HYBRIFLEX 1-5/8"	95.00 - 115.00	0.6000	0.6000
T6	1	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	2	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	3	1 5/8	75.00 - 95.00	0.6000	0.6000
T6	4	1/2	75.00 - 80.00	0.6000	0.6000
T6	5	RG6-Fiber	75.00 - 95.00	0.6000	0.6000
T6	6	#8 AWG Copper WIre	75.00 - 95.00	0.6000	0.6000
T6	7	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T6	8	HYBRIFLEX 1-1/4"	75.00 - 95.00	0.6000	0.6000
T6	9	HYBRIFLEX 1-5/8"	75.00 - 95.00	0.6000	0.6000
T7	1	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	2	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	3	1 5/8	55.00 - 75.00	0.6000	0.6000
T7	4	1/2	55.00 - 75.00	0.6000	0.6000
T7	5	RG6-Fiber	55.00 - 75.00	0.6000	0.6000
T7	6	#8 AWG Copper WIre	55.00 - 75.00	0.6000	0.6000
T7	7	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T7	8	HYBRIFLEX 1-1/4"	55.00 - 75.00	0.6000	0.6000
T7	9	HYBRIFLEX 1-5/8"	55.00 - 75.00	0.6000	0.6000
T8	1	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	2	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	3	1 5/8	40.00 - 55.00	0.6000	0.6000
T8	4	1/2	40.00 - 55.00	0.6000	0.6000
T8	5	RG6-Fiber	40.00 - 55.00	0.6000	0.6000
T8	6	#8 AWG Copper WIre	40.00 - 55.00	0.6000	0.6000
T8	7	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T8	8	HYBRIFLEX 1-1/4"	40.00 - 55.00	0.6000	0.6000
T8	9	HYBRIFLEX 1-5/8"	40.00 - 55.00	0.6000	0.6000
T9	1	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	2	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	3	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	4	1/2	20.00 - 40.00	0.6000	0.6000
T9	5	RG6-Fiber	20.00 - 40.00	0.6000	0.6000
T9	6	#8 AWG Copper WIre	20.00 - 40.00	0.6000	0.6000
T9	7	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T9	8	HYBRIFLEX 1-1/4"	20.00 - 40.00	0.6000	0.6000
T9	9	HYBRIFLEX 1-5/8"	20.00 - 40.00	0.6000	0.6000
T10	1	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	2	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	3	1 5/8	0.00 - 20.00	0.6000	0.6000
T10	4	1/2	0.00 - 20.00	0.6000	0.6000
T10	5	RG6-Fiber	0.00 - 20.00	0.6000	0.6000
T10	6	#8 AWG Copper WIre	0.00 - 20.00	0.6000	0.6000
T10	7	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000
T10	8	HYBRIFLEX 1-1/4"	0.00 - 20.00	0.6000	0.6000
T10	9	HYBRIFLEX 1-5/8"	0.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Top Triangular Mount	C	From Face	2.00	0.0000	192.00	No Ice	75.30	75.30	2500.00
(Sprint)			0.00			1/2" Ice	86.60	86.60	2875.00
			0.00			1" Ice	97.90	97.90	3250.00
APXVSPP18-C-A20	A	From Face	4.00	0.0000	192.00	No Ice	8.02	5.28	60.00
(Sprint)			-4.00			1/2" Ice	8.48	5.74	106.52
			0.00			1" Ice	8.94	6.20	162.12
APXVSPP18-C-A20	B	From Face	4.00	0.0000	192.00	No Ice	8.02	5.28	60.00
(Sprint)			-4.00			1/2" Ice	8.48	5.74	106.52
			0.00			1" Ice	8.94	6.20	162.12
APXVSPP18-C-A20	C	From Face	4.00	0.0000	192.00	No Ice	8.02	5.28	60.00
(Sprint)			-4.00			1/2" Ice	8.48	5.74	106.52
			0.00			1" Ice	8.94	6.20	162.12
FD-RRH 2x50 800	A	From Face	4.00	0.0000	192.00	No Ice	2.06	1.93	60.00
(Sprint)			-4.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
FD-RRH 2x50 800	B	From Face	4.00	0.0000	192.00	No Ice	2.06	1.93	60.00
(Sprint)			-4.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
FD-RRH 2x50 800	C	From Face	4.00	0.0000	192.00	No Ice	2.06	1.93	60.00
(Sprint)			-4.00			1/2" Ice	2.24	2.11	86.12
			0.00			1" Ice	2.43	2.29	111.30
Notch Filter	A	From Face	4.00	0.0000	192.00	No Ice	0.74	0.32	10.00
(Sprint)			-4.00			1/2" Ice	0.85	0.40	16.32
			0.00			1" Ice	0.97	0.48	24.34
Notch Filter	B	From Face	4.00	0.0000	192.00	No Ice	0.74	0.32	10.00
(Sprint)			-4.00			1/2" Ice	0.85	0.40	16.32
			0.00			1" Ice	0.97	0.48	24.34
Notch Filter	C	From Face	4.00	0.0000	192.00	No Ice	0.74	0.32	10.00
(Sprint)			-4.00			1/2" Ice	0.85	0.40	16.32
			0.00			1" Ice	0.97	0.48	24.34
FD-RRH 4x45 1900	A	From Face	4.00	0.0000	192.00	No Ice	2.32	2.38	60.00
(Sprint)			-4.00			1/2" Ice	2.52	2.59	83.97
			0.00			1" Ice	2.74	2.80	111.21
FD-RRH 4x45 1900	B	From Face	4.00	0.0000	192.00	No Ice	2.32	2.38	60.00
(Sprint)			-4.00			1/2" Ice	2.52	2.59	83.97
			0.00			1" Ice	2.74	2.80	111.21
FD-RRH 4x45 1900	C	From Face	4.00	0.0000	192.00	No Ice	2.32	2.38	60.00
(Sprint)			-4.00			1/2" Ice	2.52	2.59	83.97
			0.00			1" Ice	2.74	2.80	111.21
SitePro VFA12-HD	A	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD	B	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
SitePro VFA12-HD	C	From Leg	2.00	0.0000	180.00	No Ice	21.00	21.00	750.00
(T-Mobile)			0.00			1/2" Ice	25.00	25.00	900.00
			0.00			1" Ice	29.00	29.00	1050.00
AIR6449	A	From Leg	4.00	0.0000	180.00	No Ice	5.65	2.42	100.00
(T-Mobile)			-4.00			1/2" Ice	5.96	2.64	141.45
			0.00			1" Ice	6.26	2.87	184.10
APXVAALL24-43	A	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	150.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
AIR32	A	From Leg	4.00	0.0000	180.00	No Ice	6.51	4.71	130.00
(T-Mobile)			4.00			1/2" Ice	6.89	5.07	178.82
			0.00			1" Ice	7.27	5.43	229.91
AIR6449	B	From Leg	4.00	0.0000	180.00	No Ice	5.65	2.42	100.00
(T-Mobile)			-4.00			1/2" Ice	5.96	2.64	141.45
			0.00			1" Ice	6.26	2.87	184.10
APXVAALL24-43	B	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	150.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR32	B	From Leg	4.00	0.0000	180.00	No Ice	6.51	4.71	130.00
(T-Mobile)			4.00			1/2" Ice	6.89	5.07	178.82
			0.00			1" Ice	7.27	5.43	229.91
AIR6449	C	From Leg	4.00	0.0000	180.00	No Ice	5.65	2.42	100.00
(T-Mobile)			-4.00			1/2" Ice	5.96	2.64	141.45
			0.00			1" Ice	6.26	2.87	184.10
APXVAALL24-43	C	From Leg	0.00	0.0000	180.00	No Ice	20.24	8.89	150.00
(T-Mobile)			0.00			1/2" Ice	20.89	9.49	265.59
			0.00			1" Ice	21.54	10.09	386.72
AIR32	C	From Leg	4.00	0.0000	180.00	No Ice	6.51	4.71	130.00
(T-Mobile)			4.00			1/2" Ice	6.89	5.07	178.82
			0.00			1" Ice	7.27	5.43	229.91
4449 B12,B71	A	From Leg	4.00	0.0000	180.00	No Ice	1.65	1.16	80.00
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	96.12
			0.00			1" Ice	1.98	1.44	114.85
4449 B12,B71	B	From Leg	4.00	0.0000	180.00	No Ice	1.65	1.16	80.00
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	96.12
			0.00			1" Ice	1.98	1.44	114.85
4449 B12,B71	C	From Leg	4.00	0.0000	180.00	No Ice	1.65	1.16	80.00
(T-Mobile)			0.00			1/2" Ice	1.81	1.29	96.12
			0.00			1" Ice	1.98	1.44	114.85
4415 B25	A	From Leg	4.00	0.0000	180.00	No Ice	1.84	0.82	50.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.08
			0.00			1" Ice	2.19	1.07	76.67
4415 B25	B	From Leg	4.00	0.0000	180.00	No Ice	1.84	0.82	50.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.08
			0.00			1" Ice	2.19	1.07	76.67
4415 B25	C	From Leg	4.00	0.0000	180.00	No Ice	1.84	0.82	50.00
(T-Mobile)			0.00			1/2" Ice	2.01	0.94	60.08
			0.00			1" Ice	2.19	1.07	76.67
SDX1926Q-43	A	From Leg	4.00	0.0000	180.00	No Ice	0.24	0.10	30.00
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	32.47
			0.00			1" Ice	0.38	0.19	36.04
SDX1926Q-43	B	From Leg	4.00	0.0000	180.00	No Ice	0.24	0.10	30.00
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	32.47
			0.00			1" Ice	0.38	0.19	36.04
SDX1926Q-43	C	From Leg	4.00	0.0000	180.00	No Ice	0.24	0.10	30.00
(T-Mobile)			0.00			1/2" Ice	0.31	0.14	32.47
			0.00			1" Ice	0.38	0.19	36.04
TMA 10"x8"x3"	A	From Leg	4.00	0.0000	180.00	No Ice	0.67	0.26	20.00
(T-Mobile)			0.00			1/2" Ice	0.77	0.33	20.06
			0.00			1" Ice	0.88	0.41	26.67
TMA 10"x8"x3"	B	From Leg	4.00	0.0000	180.00	No Ice	0.67	0.26	20.00
(T-Mobile)			0.00			1/2" Ice	0.77	0.33	20.06
			0.00			1" Ice	0.88	0.41	26.67
TMA 10"x8"x3"	C	From Leg	4.00	0.0000	180.00	No Ice	0.67	0.26	20.00
(T-Mobile)			0.00			1/2" Ice	0.77	0.33	20.06
			0.00			1" Ice	0.88	0.41	26.67

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
Pirod 12' T-Frame Sector Mount (1) (AT&T)	A	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
Pirod 12' T-Frame Sector Mount (1) (AT&T)	B	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
Pirod 12' T-Frame Sector Mount (1) (AT&T)	C	From Leg	2.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	13.60 18.40 23.20	13.60 18.40 23.20	465.00 600.00 735.00
800 10121 (AT&T)	A	From Leg	4.00 4.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	5.16 5.51 5.87	3.29 3.64 3.99	50.00 79.21 116.89
OPA65R-BU6D (AT&T)	A	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	12.87 13.37 13.87	5.67 6.13 6.59	70.00 145.04 226.75
DMP65R-BU6D (AT&T)	A	From Leg	4.00 -4.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	100.00 169.96 250.56
800 10121 (AT&T)	B	From Leg	4.00 4.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	5.16 5.51 5.87	3.29 3.64 3.99	50.00 79.21 116.89
OPA65R-BU6D (AT&T)	B	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	12.87 13.37 13.87	5.67 6.13 6.59	70.00 145.04 226.75
DMP65R-BU6D (AT&T)	B	From Leg	4.00 -4.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	100.00 169.96 250.56
800 10121 (AT&T)	C	From Leg	4.00 4.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	5.16 5.51 5.87	3.29 3.64 3.99	50.00 79.21 116.89
OPA65R-BU6D (AT&T)	C	From Leg	4.00 0.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	12.87 13.37 13.87	5.67 6.13 6.59	70.00 145.04 226.75
DMP65R-BU6D (AT&T)	C	From Leg	4.00 -4.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	12.71 13.21 13.71	5.62 6.07 6.53	100.00 169.96 250.56
(2) LGP21401 TMA (AT&T)	A	From Leg	4.00 5.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	0.82 0.94 1.06	0.35 0.44 0.54	20.00 23.31 30.86
(2) LGP21401 TMA (AT&T)	B	From Leg	4.00 5.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	0.82 0.94 1.06	0.35 0.44 0.54	20.00 23.31 30.86
(2) LGP21401 TMA (AT&T)	C	From Leg	4.00 5.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	0.82 0.94 1.06	0.35 0.44 0.54	20.00 23.31 30.86
DC6-48-60-18-8F Surge Arrestor (AT&T)	B	From Face	0.50 0.50 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.91 2.10 2.29	1.91 2.10 2.29	20.00 39.36 61.70
DC6-48-60-18-8F Surge Arrestor (AT&T)	C	From Face	0.50 0.50 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.91 2.10 2.29	1.91 2.10 2.29	20.00 39.36 61.70
4478 B14 (AT&T)	A	From Face	4.00 -2.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	60.00 75.88 94.39
4478 B14 (AT&T)	B	From Face	4.00 -2.00 0.00	0.0000	172.00	No Ice 1/2" Ice 1" Ice	1.84 2.01 2.19	1.06 1.20 1.34	60.00 75.88 94.39

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
4478 B14	C	From Face	4.00	0.0000	172.00	No Ice	1.84	1.06	60.00
(AT&T)			-2.00			1/2" Ice	2.01	1.20	75.88
			0.00			1" Ice	2.19	1.34	94.39
4449 B5/B12	A	From Face	4.00	0.0000	172.00	No Ice	1.97	1.41	70.00
(AT&T)			-2.00			1/2" Ice	2.14	1.56	89.51
			0.00			1" Ice	2.33	1.73	110.84
4449 B5/B12	B	From Face	4.00	0.0000	172.00	No Ice	1.97	1.41	70.00
(AT&T)			-2.00			1/2" Ice	2.14	1.56	89.51
			0.00			1" Ice	2.33	1.73	110.84
4449 B5/B12	C	From Face	4.00	0.0000	172.00	No Ice	1.97	1.41	70.00
(AT&T)			-2.00			1/2" Ice	2.14	1.56	89.51
			0.00			1" Ice	2.33	1.73	110.84
8843 B2/B66A	A	From Face	4.00	0.0000	172.00	No Ice	1.64	1.35	70.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.92
8843 B2/B66A	B	From Face	4.00	0.0000	172.00	No Ice	1.64	1.35	70.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.92
8843 B2/B66A	C	From Face	4.00	0.0000	172.00	No Ice	1.64	1.35	70.00
(AT&T)			-2.00			1/2" Ice	1.80	1.50	89.60
			0.00			1" Ice	1.97	1.65	109.92
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Empty)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Empty)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	160.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Empty)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	A	From Leg	2.00	0.0000	144.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	B	From Leg	2.00	0.0000	144.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
Pirod 12' T-Frame Sector	C	From Leg	2.00	0.0000	144.00	No Ice	13.60	13.60	465.00
Mount (1)			0.00			1/2" Ice	18.40	18.40	600.00
(Verizon)			0.00			1" Ice	23.20	23.20	735.00
LNX-6513DS-VTM	A	From Leg	4.00	0.0000	144.00	No Ice	5.85	3.84	30.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
BXA-171063-12CF	A	From Leg	4.00	0.0000	144.00	No Ice	4.79	3.62	20.00
(Verizon)			-4.00			1/2" Ice	5.24	4.06	42.45
			0.00			1" Ice	5.70	4.50	75.45
BXA-70063/6CF	A	From Leg	4.00	0.0000	144.00	No Ice	7.57	4.16	10.00
(Verizon)			0.00			1/2" Ice	8.02	4.60	54.49
			0.00			1" Ice	8.47	5.04	102.83
BXA-171085-8CF	A	From Leg	4.00	0.0000	144.00	No Ice	2.94	2.16	10.00
(Verizon)			4.00			1/2" Ice	3.26	2.46	29.28
			0.00			1" Ice	3.57	2.77	52.05
LNX-6513DS-VTM	B	From Leg	4.00	0.0000	144.00	No Ice	5.85	3.84	30.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
BXA-171063-12CF	B	From Leg	4.00	0.0000	144.00	No Ice	4.79	3.62	20.00
(Verizon)			-4.00			1/2" Ice	5.24	4.06	42.45
			0.00			1" Ice	5.70	4.50	75.45

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
BXA-70063/6CF	B	From Leg	4.00	0.0000	144.00	No Ice	7.57	4.16	10.00
(Verizon)			0.00			1/2" Ice	8.02	4.60	54.49
			0.00			1" Ice	8.47	5.04	102.83
BXA-171085-8CF	B	From Leg	4.00	0.0000	144.00	No Ice	2.94	2.16	10.00
(Verizon)			4.00			1/2" Ice	3.26	2.46	29.28
			0.00			1" Ice	3.57	2.77	52.05
LNX-6513DS-VTM	C	From Leg	4.00	0.0000	144.00	No Ice	5.85	3.84	30.00
(Verizon)			-6.00			1/2" Ice	6.21	4.19	70.84
			0.00			1" Ice	6.58	4.54	114.65
BXA-171063-12CF	C	From Leg	4.00	0.0000	144.00	No Ice	4.79	3.62	20.00
(Verizon)			-4.00			1/2" Ice	5.24	4.06	42.45
			0.00			1" Ice	5.70	4.50	75.45
BXA-70063/6CF	C	From Leg	4.00	0.0000	144.00	No Ice	7.57	4.16	10.00
(Verizon)			0.00			1/2" Ice	8.02	4.60	54.49
			0.00			1" Ice	8.47	5.04	102.83
BXA-171085-8CF	C	From Leg	4.00	0.0000	144.00	No Ice	2.94	2.16	10.00
(Verizon)			4.00			1/2" Ice	3.26	2.46	29.28
			0.00			1" Ice	3.57	2.77	52.05
RRH2x40-AWS	A	From Leg	2.00	0.0000	144.00	No Ice	2.16	1.42	40.00
(Verizon)			-4.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
RRH2x40-AWS	B	From Leg	2.00	0.0000	144.00	No Ice	2.16	1.42	40.00
(Verizon)			-4.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
RRH2x40-AWS	C	From Leg	2.00	0.0000	144.00	No Ice	2.16	1.42	40.00
(Verizon)			-4.00			1/2" Ice	2.36	1.59	61.40
			0.00			1" Ice	2.57	1.77	81.69
RC2DC-3315-PF-48	A	From Leg	2.00	0.0000	144.00	No Ice	3.01	1.96	30.00
(Verizon)			0.00			1/2" Ice	3.23	2.15	51.21
			0.00			1" Ice	3.46	2.35	80.79
(3) FD9R6004/2C-3L	B	From Leg	4.00	0.0000	144.00	No Ice	0.31	0.08	3.00
Diplexer			-6.00			1/2" Ice	0.39	0.12	5.30
(Verizon)			0.00			1" Ice	0.47	0.17	8.69
GPS	C	From Leg	2.00	0.0000	80.00	No Ice	1.00	1.00	10.00
(Sprint)			0.00			1/2" Ice	1.50	1.50	15.00
			0.00			1" Ice	2.00	2.00	20.00
2-ft Stand Off	C	From Leg	1.00	0.0000	80.00	No Ice	1.07	1.07	20.00
(Sprint)			0.00			1/2" Ice	1.62	1.62	28.00
			0.00			1" Ice	2.17	2.17	36.00

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft^2	Face	A_F ft^2	A_R ft^2	A_{leg} ft^2	Leg %	C_AA_A In Face ft^2	C_AA_A Out Face ft^2
T1	185.00	1.441	32	115.002	A	0.000	18.774	10.004	53.29	6.930	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
					C	0.000	18.774		53.29	8.910	0.000
T2	165.00	1.406	31	146.258	A	11.572	12.521	12.521	51.97	29.785	0.000
175.00-155.00					B	11.572	12.521		51.97	0.000	0.000
					C	11.572	12.521		51.97	35.640	0.000
T3	145.00	1.369	30	186.675	A	13.494	13.356	13.356	49.74	36.028	0.000
155.00-135.00					B	13.494	13.356		49.74	25.740	0.000
					C	13.494	13.356		49.74	35.640	0.000
T4	125.00	1.326	29	227.092	A	18.685	14.190	14.190	43.16	36.028	0.000
135.00-115.00					B	18.685	14.190		43.16	51.480	0.000
					C	18.685	14.190		43.16	35.640	0.000
T5	105.00	1.279	28	267.092	A	21.322	14.190	14.190	39.96	36.028	0.000
115.00-95.00					B	21.322	14.190		39.96	51.480	0.000
					C	21.322	14.190		39.96	35.640	0.000
T6 95.00-75.00	85.00	1.223	27	307.509	A	28.019	15.025	15.025	34.91	36.318	0.000
					B	28.019	15.025		34.91	51.480	0.000
					C	28.019	15.025		34.91	35.640	0.000
T7 75.00-55.00	65.00	1.156	26	347.927	A	35.682	15.860	15.860	30.77	37.188	0.000
					B	35.682	15.860		30.77	51.480	0.000
					C	35.682	15.860		30.77	35.640	0.000
T8 55.00-40.00	47.50	1.082	24	287.195	A	37.993	11.895	11.895	23.84	27.891	0.000
					B	37.993	11.895		23.84	38.610	0.000
					C	37.993	11.895		23.84	26.730	0.000
T9 40.00-20.00	30.00	0.982	22	417.927	A	42.284	15.860	15.860	27.28	37.188	0.000
					B	42.284	15.860		27.28	51.480	0.000
					C	42.284	15.860		27.28	35.640	0.000
T10 20.00-0.00	10.00	0.85	19	458.344	A	46.074	16.694	16.694	26.60	37.188	0.000
					B	46.074	16.694		26.60	51.480	0.000
					C	46.074	16.694		26.60	35.640	0.000

Tower Pressure - With Ice

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.441	8	1.7822	120.944	A	0.000	55.666	21.890	39.32	23.188	0.000
195.00-175.00						B	0.000	55.666		39.32	0.000	0.000
						C	0.000	55.666		39.32	25.316	0.000
T2	165.00	1.406	8	1.7619	152.138	A	11.572	40.598	24.287	46.55	89.611	0.000
175.00-155.00						B	11.572	40.598		46.55	0.000	0.000
						C	11.572	40.598		46.55	101.010	0.000
T3	145.00	1.369	7	1.7393	192.480	A	13.494	43.747	24.970	43.62	102.366	0.000
155.00-135.00						B	13.494	43.747		43.62	67.111	0.000
						C	13.494	43.747		43.62	100.728	0.000
T4	125.00	1.326	7	1.7137	232.812	A	18.685	46.981	25.634	39.04	101.659	0.000
135.00-115.00						B	18.685	46.981		39.04	133.977	0.000
						C	18.685	46.981		39.04	100.409	0.000
T5 115.00-95.00	105.00	1.279	7	1.6841	272.713	A	21.322	49.375	25.436	35.98	100.842	0.000
						B	21.322	49.375		35.98	133.695	0.000
						C	21.322	49.375		35.98	100.040	0.000
T6 95.00-75.00	85.00	1.223	7	1.6489	313.012	A	28.019	52.435	26.036	32.36	101.809	0.000
						B	28.019	52.435		32.36	133.361	0.000
						C	28.019	52.435		32.36	99.602	0.000
T7 75.00-55.00	65.00	1.156	6	1.6052	353.284	A	35.682	55.217	26.579	29.24	106.248	0.000

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
						B	35.682	55.217		29.24	132.946	0.000
						C	35.682	55.217		29.24	99.061	0.000
T8 55.00-40.00	47.50	1.082	6	1.5556	291.089	A	37.993	49.237	19.686	22.57	78.513	0.000
						B	37.993	49.237		22.57	99.356	0.000
						C	37.993	49.237		22.57	73.835	0.000
T9 40.00-20.00	30.00	0.982	5	1.4858	422.885	A	42.284	57.194	25.781	25.92	102.481	0.000
						B	42.284	57.194		25.92	131.812	0.000
						C	42.284	57.194		25.92	97.583	0.000
T10 20.00-0.00	10.00	0.85	5	1.3312	462.787	A	46.074	56.251	25.584	25.00	97.615	0.000
						B	46.074	56.251		25.00	130.348	0.000
						C	46.074	56.251		25.00	95.680	0.000

Tower Pressure - Service

G_H = 0.850

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	185.00	1.441	11	115.002	A	0.000	18.774	10.004	53.29	6.930	0.000
195.00-175.00					B	0.000	18.774		53.29	0.000	0.000
					C	0.000	18.774		53.29	8.910	0.000
T2	165.00	1.406	11	146.258	A	11.572	12.521	12.521	51.97	29.785	0.000
175.00-155.00					B	11.572	12.521		51.97	0.000	0.000
					C	11.572	12.521		51.97	35.640	0.000
T3	145.00	1.369	11	186.675	A	13.494	13.356	13.356	49.74	36.028	0.000
155.00-135.00					B	13.494	13.356		49.74	25.740	0.000
					C	13.494	13.356		49.74	35.640	0.000
T4	125.00	1.326	10	227.092	A	18.685	14.190	14.190	43.16	36.028	0.000
135.00-115.00					B	18.685	14.190		43.16	51.480	0.000
					C	18.685	14.190		43.16	35.640	0.000
T5	105.00	1.279	10	267.092	A	21.322	14.190	14.190	39.96	36.028	0.000
115.00-95.00					B	21.322	14.190		39.96	51.480	0.000
					C	21.322	14.190		39.96	35.640	0.000
T6 95.00-75.00	85.00	1.223	10	307.509	A	28.019	15.025	15.025	34.91	36.318	0.000
					B	28.019	15.025		34.91	51.480	0.000
					C	28.019	15.025		34.91	35.640	0.000
T7 75.00-55.00	65.00	1.156	9	347.927	A	35.682	15.860	15.860	30.77	37.188	0.000
					B	35.682	15.860		30.77	51.480	0.000
					C	35.682	15.860		30.77	35.640	0.000
T8 55.00-40.00	47.50	1.082	8	287.195	A	37.993	11.895	11.895	23.84	27.891	0.000
					B	37.993	11.895		23.84	38.610	0.000
					C	37.993	11.895		23.84	26.730	0.000
T9 40.00-20.00	30.00	0.982	8	417.927	A	42.284	15.860	15.860	27.28	37.188	0.000
					B	42.284	15.860		27.28	51.480	0.000
					C	42.284	15.860		27.28	35.640	0.000
T10 20.00-0.00	10.00	0.85	7	458.344	A	46.074	16.694	16.694	26.60	37.188	0.000
					B	46.074	16.694		26.60	51.480	0.000
					C	46.074	16.694		26.60	35.640	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	1	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		1	1	10.683			
			C	0.163	2.723		1	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	1	1	18.396	2368.34	118.42	C
175.00-155.00			B	0.165	2.718		1	1	18.396			
			C	0.165	2.718		1	1	18.396			
T3	629.40	3572.06	A	0.144	2.794	30	1	1	20.600	2995.57	149.78	C
155.00-135.00			B	0.144	2.794		1	1	20.600			
			C	0.144	2.794		1	1	20.600			
T4	773.20	4036.07	A	0.145	2.791	29	1	1	26.116	3673.44	183.67	C
135.00-115.00			B	0.145	2.791		1	1	26.116			
			C	0.145	2.791		1	1	26.116			
T5	773.20	4789.76	A	0.133	2.835	28	1	1	28.771	3750.60	187.53	C
115.00-95.00			B	0.133	2.835		1	1	28.771			
			C	0.133	2.835		1	1	28.771			
T6	774.45	5354.18	A	0.14	2.809	27	1	1	35.822	4030.88	201.54	C
95.00-75.00			B	0.14	2.809		1	1	35.822			
			C	0.14	2.809		1	1	35.822			
T7	778.20	5794.03	A	0.148	2.778	26	1	1	43.866	4284.60	214.23	C
75.00-55.00			B	0.148	2.778		1	1	43.866			
			C	0.148	2.778		1	1	43.866			
T8	583.65	5023.91	A	0.174	2.686	24	1	1	44.281	3570.36	238.02	C
55.00-40.00			B	0.174	2.686		1	1	44.281			
			C	0.174	2.686		1	1	44.281			
T9	778.20	6793.06	A	0.139	2.812	22	1	1	50.690	4023.88	201.19	C
40.00-20.00			B	0.139	2.812		1	1	50.690			
			C	0.139	2.812		1	1	50.690			
T10	778.20	8126.54	A	0.137	2.82	19	1	1	54.982	3682.90	184.14	C
20.00-0.00			B	0.137	2.82		1	1	54.982			
			C	0.137	2.82		1	1	54.982			
Sum Weight:	6436.70	48831.58						OTM	2820471.2 5 lb-ft	33429.67		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	0.825	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		0.825	1	10.683			
			C	0.163	2.723		0.825	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	0.825	1	16.371	2222.28	111.11	C
175.00-155.00			B	0.165	2.718		0.825	1	16.371			
			C	0.165	2.718		0.825	1	16.371			
T3	629.40	3572.06	A	0.144	2.794	30	0.825	1	18.238	2825.17	141.26	C
155.00-135.00			B	0.144	2.794		0.825	1	18.238			
			C	0.144	2.794		0.825	1	18.238			
T4	773.20	4036.07	A	0.145	2.791	29	0.825	1	22.846	3445.04	172.25	C
135.00-115.00			B	0.145	2.791		0.825	1	22.846			
			C	0.145	2.791		0.825	1	22.846			
T5	773.20	4789.76	A	0.133	2.835	28	0.825	1	25.039	3495.37	174.77	C
115.00-95.00			B	0.133	2.835		0.825	1	25.039			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
			C	0.133	2.835		0.825	1	25.039			
T6	774.45	5354.18	A	0.14	2.809	27	0.825	1	30.919	3713.08	185.65	C
95.00-75.00			B	0.14	2.809		0.825	1	30.919			
			C	0.14	2.809		0.825	1	30.919			
T7	778.20	5794.03	A	0.148	2.778	26	0.825	1	37.622	3906.24	195.31	C
75.00-55.00			B	0.148	2.778		0.825	1	37.622			
			C	0.148	2.778		0.825	1	37.622			
T8	583.65	5023.91	A	0.174	2.686	24	0.825	1	37.632	3205.74	213.72	C
55.00-40.00			B	0.174	2.686		0.825	1	37.632			
			C	0.174	2.686		0.825	1	37.632			
T9	778.20	6793.06	A	0.139	2.812	22	0.825	1	43.290	3638.26	181.91	C
40.00-20.00			B	0.139	2.812		0.825	1	43.290			
			C	0.139	2.812		0.825	1	43.290			
T10	778.20	8126.54	A	0.137	2.82	19	0.825	1	46.919	3318.22	165.91	C
20.00-0.00			B	0.137	2.82		0.825	1	46.919			
			C	0.137	2.82		0.825	1	46.919			
Sum Weight:	6436.70	48831.58						OTM	2632172.56 lb-ft	30818.50		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	0.8	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		0.8	1	10.683			
			C	0.163	2.723		0.8	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	0.8	1	16.081	2201.42	110.07	C
175.00-155.00			B	0.165	2.718		0.8	1	16.081			
			C	0.165	2.718		0.8	1	16.081			
T3	629.40	3572.06	A	0.144	2.794	30	0.8	1	17.901	2800.83	140.04	C
155.00-135.00			B	0.144	2.794		0.8	1	17.901			
			C	0.144	2.794		0.8	1	17.901			
T4	773.20	4036.07	A	0.145	2.791	29	0.8	1	22.378	3412.41	170.62	C
135.00-115.00			B	0.145	2.791		0.8	1	22.378			
			C	0.145	2.791		0.8	1	22.378			
T5	773.20	4789.76	A	0.133	2.835	28	0.8	1	24.506	3458.91	172.95	C
115.00-95.00			B	0.133	2.835		0.8	1	24.506			
			C	0.133	2.835		0.8	1	24.506			
T6	774.45	5354.18	A	0.14	2.809	27	0.8	1	30.218	3667.68	183.38	C
95.00-75.00			B	0.14	2.809		0.8	1	30.218			
			C	0.14	2.809		0.8	1	30.218			
T7	778.20	5794.03	A	0.148	2.778	26	0.8	1	36.729	3852.18	192.61	C
75.00-55.00			B	0.148	2.778		0.8	1	36.729			
			C	0.148	2.778		0.8	1	36.729			
T8	583.65	5023.91	A	0.174	2.686	24	0.8	1	36.682	3153.66	210.24	C
55.00-40.00			B	0.174	2.686		0.8	1	36.682			
			C	0.174	2.686		0.8	1	36.682			
T9	778.20	6793.06	A	0.139	2.812	22	0.8	1	42.233	3583.17	179.16	C
40.00-20.00			B	0.139	2.812		0.8	1	42.233			
			C	0.139	2.812		0.8	1	42.233			
T10	778.20	8126.54	A	0.137	2.82	19	0.8	1	45.767	3266.13	163.31	C
20.00-0.00			B	0.137	2.82		0.8	1	45.767			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	6436.70	48831.58	C	0.137	2.82		0.8	1 OTM	45.767 2605272.75 lb-ft	30445.47		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	32	0.85	1	10.683	1049.10	52.45	C
195.00-175.00			B	0.163	2.723		0.85	1	10.683			
			C	0.163	2.723		0.85	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	31	0.85	1	16.660	2243.15	112.16	C
175.00-155.00			B	0.165	2.718		0.85	1	16.660			
			C	0.165	2.718		0.85	1	16.660			
T3	629.40	3572.06	A	0.144	2.794	30	0.85	1	18.575	2849.51	142.48	C
155.00-135.00			B	0.144	2.794		0.85	1	18.575			
			C	0.144	2.794		0.85	1	18.575			
T4	773.20	4036.07	A	0.145	2.791	29	0.85	1	23.313	3477.67	173.88	C
135.00-115.00			B	0.145	2.791		0.85	1	23.313			
			C	0.145	2.791		0.85	1	23.313			
T5	773.20	4789.76	A	0.133	2.835	28	0.85	1	25.572	3531.83	176.59	C
115.00-95.00			B	0.133	2.835		0.85	1	25.572			
			C	0.133	2.835		0.85	1	25.572			
T6	774.45	5354.18	A	0.14	2.809	27	0.85	1	31.619	3758.48	187.92	C
95.00-75.00			B	0.14	2.809		0.85	1	31.619			
			C	0.14	2.809		0.85	1	31.619			
T7	778.20	5794.03	A	0.148	2.778	26	0.85	1	38.514	3960.29	198.01	C
75.00-55.00			B	0.148	2.778		0.85	1	38.514			
			C	0.148	2.778		0.85	1	38.514			
T8	583.65	5023.91	A	0.174	2.686	24	0.85	1	38.582	3257.83	217.19	C
55.00-40.00			B	0.174	2.686		0.85	1	38.582			
			C	0.174	2.686		0.85	1	38.582			
T9	778.20	6793.06	A	0.139	2.812	22	0.85	1	44.347	3693.35	184.67	C
40.00-20.00			B	0.139	2.812		0.85	1	44.347			
			C	0.139	2.812		0.85	1	44.347			
T10	778.20	8126.54	A	0.137	2.82	19	0.85	1	48.071	3370.32	168.52	C
20.00-0.00			B	0.137	2.82		0.85	1	48.071			
			C	0.137	2.82		0.85	1	48.071			
Sum Weight:	6436.70	48831.58						OTM	2659072.38 lb-ft	31191.52		

Tower Forces - With Ice - Wind Normal To Face

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

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	1	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		1	1	36.982			
			C	0.46	1.957		1	1	36.982			
T2	2958.81	5492.44	A	0.343	2.188	8	1	1	36.477	1262.79	63.14	C
175.00-155.00			B	0.343	2.188		1	1	36.477			
			C	0.343	2.188		1	1	36.477			
T3	4278.82	6566.06	A	0.297	2.303	7	1	1	39.660	1603.98	80.20	C
155.00-135.00			B	0.297	2.303		1	1	39.660			
			C	0.297	2.303		1	1	39.660			
T4	5312.35	7674.74	A	0.282	2.345	7	1	1	46.570	1906.51	95.33	C
135.00-115.00			B	0.282	2.345		1	1	46.570			
			C	0.282	2.345		1	1	46.570			
T5	5241.81	8731.00	A	0.259	2.41	7	1	1	50.321	1904.01	95.20	C
115.00-95.00			B	0.259	2.41		1	1	50.321			
			C	0.259	2.41		1	1	50.321			
T6	5182.09	10026.74	A	0.257	2.417	7	1	1	58.785	1939.35	96.97	C
95.00-75.00			B	0.257	2.417		1	1	58.785			
			C	0.257	2.417		1	1	58.785			
T7	5146.38	11224.75	A	0.257	2.416	6	1	1	68.085	1963.86	98.19	C
75.00-55.00			B	0.257	2.416		1	1	68.085			
			C	0.257	2.416		1	1	68.085			
T8	3769.56	10352.39	A	0.3	2.297	6	1	1	67.477	1531.05	102.07	C
55.00-40.00			B	0.3	2.297		1	1	67.477			
			C	0.3	2.297		1	1	67.477			
T9	4858.36	12504.55	A	0.235	2.483	5	1	1	75.544	1756.21	87.81	C
40.00-20.00			B	0.235	2.483		1	1	75.544			
			C	0.235	2.483		1	1	75.544			
T10	4494.91	13546.27	A	0.221	2.527	5	1	1	78.615	1544.05	77.20	C
20.00-0.00			B	0.221	2.527		1	1	78.615			
			C	0.221	2.527		1	1	78.615			
Sum Weight:	41970.34	91039.54						OTM	1433974.3 0 lb-ft	16068.33		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	0.825	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		0.825	1	36.982			
			C	0.46	1.957		0.825	1	36.982			
T2	2958.81	5492.44	A	0.343	2.188	8	0.825	1	34.452	1233.97	61.70	C
175.00-155.00			B	0.343	2.188		0.825	1	34.452			
			C	0.343	2.188		0.825	1	34.452			
T3	4278.82	6566.06	A	0.297	2.303	7	0.825	1	37.298	1569.57	78.48	C
155.00-135.00			B	0.297	2.303		0.825	1	37.298			
			C	0.297	2.303		0.825	1	37.298			
T4	5312.35	7674.74	A	0.282	2.345	7	0.825	1	43.300	1859.49	92.97	C
135.00-115.00			B	0.282	2.345		0.825	1	43.300			
			C	0.282	2.345		0.825	1	43.300			
T5	5241.81	8731.00	A	0.259	2.41	7	0.825	1	46.590	1850.84	92.54	C
115.00-95.00			B	0.259	2.41		0.825	1	46.590			
			C	0.259	2.41		0.825	1	46.590			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T6	5182.09	10026.74	A	0.257	2.417	7	0.825	1	53.882	1872.34	93.62	C
95.00-75.00			B	0.257	2.417		0.825	1	53.882			
			C	0.257	2.417		0.825	1	53.882			
T7	5146.38	11224.75	A	0.257	2.416	6	0.825	1	61.841	1883.23	94.16	C
75.00-55.00			B	0.257	2.416		0.825	1	61.841			
			C	0.257	2.416		0.825	1	61.841			
T8	3769.56	10352.39	A	0.3	2.297	6	0.825	1	60.828	1454.65	96.98	C
55.00-40.00			B	0.3	2.297		0.825	1	60.828			
			C	0.3	2.297		0.825	1	60.828			
T9	4858.36	12504.55	A	0.235	2.483	5	0.825	1	68.144	1672.78	83.64	C
40.00-20.00			B	0.235	2.483		0.825	1	68.144			
			C	0.235	2.483		0.825	1	68.144			
T10	4494.91	13546.27	A	0.221	2.527	5	0.825	1	70.552	1463.97	73.20	C
20.00-0.00			B	0.221	2.527		0.825	1	70.552			
			C	0.221	2.527		0.825	1	70.552			
Sum Weight:	41970.34	91039.54						OTM	1394897.4 7 lb-ft	15517.33		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	0.8	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		0.8	1	36.982			
			C	0.46	1.957		0.8	1	36.982			
T2	2958.81	5492.44	A	0.343	2.188	8	0.8	1	34.163	1229.85	61.49	C
175.00-155.00			B	0.343	2.188		0.8	1	34.163			
			C	0.343	2.188		0.8	1	34.163			
T3	4278.82	6566.06	A	0.297	2.303	7	0.8	1	36.961	1564.65	78.23	C
155.00-135.00			B	0.297	2.303		0.8	1	36.961			
			C	0.297	2.303		0.8	1	36.961			
T4	5312.35	7674.74	A	0.282	2.345	7	0.8	1	42.833	1852.77	92.64	C
135.00-115.00			B	0.282	2.345		0.8	1	42.833			
			C	0.282	2.345		0.8	1	42.833			
T5	5241.81	8731.00	A	0.259	2.41	7	0.8	1	46.057	1843.25	92.16	C
115.00-95.00			B	0.259	2.41		0.8	1	46.057			
			C	0.259	2.41		0.8	1	46.057			
T6	5182.09	10026.74	A	0.257	2.417	7	0.8	1	53.182	1862.77	93.14	C
95.00-75.00			B	0.257	2.417		0.8	1	53.182			
			C	0.257	2.417		0.8	1	53.182			
T7	5146.38	11224.75	A	0.257	2.416	6	0.8	1	60.949	1871.71	93.59	C
75.00-55.00			B	0.257	2.416		0.8	1	60.949			
			C	0.257	2.416		0.8	1	60.949			
T8	3769.56	10352.39	A	0.3	2.297	6	0.8	1	59.878	1443.73	96.25	C
55.00-40.00			B	0.3	2.297		0.8	1	59.878			
			C	0.3	2.297		0.8	1	59.878			
T9	4858.36	12504.55	A	0.235	2.483	5	0.8	1	67.087	1660.86	83.04	C
40.00-20.00			B	0.235	2.483		0.8	1	67.087			
			C	0.235	2.483		0.8	1	67.087			
T10	4494.91	13546.27	A	0.221	2.527	5	0.8	1	69.400	1452.53	72.63	C
20.00-0.00			B	0.221	2.527		0.8	1	69.400			
			C	0.221	2.527		0.8	1	69.400			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
Sum Weight:	41970.34	91039.54						OTM	1389315.07 lb-ft	15438.62		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	727.24	4920.60	A	0.46	1.957	8	0.85	1	36.982	656.50	32.83	C
195.00-175.00			B	0.46	1.957		0.85	1	36.982			
			C	0.46	1.957		0.85	1	36.982			
T2	2958.81	5492.44	A	0.343	2.188	8	0.85	1	34.741	1238.09	61.90	C
175.00-155.00			B	0.343	2.188		0.85	1	34.741			
			C	0.343	2.188		0.85	1	34.741			
T3	4278.82	6566.06	A	0.297	2.303	7	0.85	1	37.636	1574.48	78.72	C
155.00-135.00			B	0.297	2.303		0.85	1	37.636			
			C	0.297	2.303		0.85	1	37.636			
T4	5312.35	7674.74	A	0.282	2.345	7	0.85	1	43.767	1866.20	93.31	C
135.00-115.00			B	0.282	2.345		0.85	1	43.767			
			C	0.282	2.345		0.85	1	43.767			
T5	5241.81	8731.00	A	0.259	2.41	7	0.85	1	47.123	1858.44	92.92	C
115.00-95.00			B	0.259	2.41		0.85	1	47.123			
			C	0.259	2.41		0.85	1	47.123			
T6	5182.09	10026.74	A	0.257	2.417	7	0.85	1	54.582	1881.92	94.10	C
95.00-75.00			B	0.257	2.417		0.85	1	54.582			
			C	0.257	2.417		0.85	1	54.582			
T7	5146.38	11224.75	A	0.257	2.416	6	0.85	1	62.733	1894.75	94.74	C
75.00-55.00			B	0.257	2.416		0.85	1	62.733			
			C	0.257	2.416		0.85	1	62.733			
T8	3769.56	10352.39	A	0.3	2.297	6	0.85	1	61.778	1465.56	97.70	C
55.00-40.00			B	0.3	2.297		0.85	1	61.778			
			C	0.3	2.297		0.85	1	61.778			
T9	4858.36	12504.55	A	0.235	2.483	5	0.85	1	69.201	1684.70	84.23	C
40.00-20.00			B	0.235	2.483		0.85	1	69.201			
			C	0.235	2.483		0.85	1	69.201			
T10	4494.91	13546.27	A	0.221	2.527	5	0.85	1	71.704	1475.41	73.77	C
20.00-0.00			B	0.221	2.527		0.85	1	71.704			
			C	0.221	2.527		0.85	1	71.704			
Sum Weight:	41970.34	91039.54						OTM	1400479.88 lb-ft	15596.05		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	1	1	10.683	370.23	18.51	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
195.00-175.00			B	0.163	2.723		1	1	10.683			
			C	0.163	2.723		1	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	1	1	18.396	835.80	41.79	C
175.00-155.00			B	0.165	2.718		1	1	18.396			
			C	0.165	2.718		1	1	18.396			
T3	629.40	3572.06	A	0.144	2.794	11	1	1	20.600	1057.16	52.86	C
155.00-135.00			B	0.144	2.794		1	1	20.600			
			C	0.144	2.794		1	1	20.600			
T4	773.20	4036.07	A	0.145	2.791	10	1	1	26.116	1296.38	64.82	C
135.00-115.00			B	0.145	2.791		1	1	26.116			
			C	0.145	2.791		1	1	26.116			
T5	773.20	4789.76	A	0.133	2.835	10	1	1	28.771	1323.61	66.18	C
115.00-95.00			B	0.133	2.835		1	1	28.771			
			C	0.133	2.835		1	1	28.771			
T6	774.45	5354.18	A	0.14	2.809	10	1	1	35.822	1422.53	71.13	C
95.00-75.00			B	0.14	2.809		1	1	35.822			
			C	0.14	2.809		1	1	35.822			
T7	778.20	5794.03	A	0.148	2.778	9	1	1	43.866	1512.06	75.60	C
75.00-55.00			B	0.148	2.778		1	1	43.866			
			C	0.148	2.778		1	1	43.866			
T8	583.65	5023.91	A	0.174	2.686	8	1	1	44.281	1260.00	84.00	C
55.00-40.00			B	0.174	2.686		1	1	44.281			
			C	0.174	2.686		1	1	44.281			
T9	778.20	6793.06	A	0.139	2.812	8	1	1	50.690	1420.05	71.00	C
40.00-20.00			B	0.139	2.812		1	1	50.690			
			C	0.139	2.812		1	1	50.690			
T10	778.20	8126.54	A	0.137	2.82	7	1	1	54.982	1299.72	64.99	C
20.00-0.00			B	0.137	2.82		1	1	54.982			
			C	0.137	2.82		1	1	54.982			
Sum Weight:	6436.70	48831.58						OTM	995362.86 lb-ft	11797.55		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	0.825	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		0.825	1	10.683			
			C	0.163	2.723		0.825	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	0.825	1	16.371	784.26	39.21	C
175.00-155.00			B	0.165	2.718		0.825	1	16.371			
			C	0.165	2.718		0.825	1	16.371			
T3	629.40	3572.06	A	0.144	2.794	11	0.825	1	18.238	997.02	49.85	C
155.00-135.00			B	0.144	2.794		0.825	1	18.238			
			C	0.144	2.794		0.825	1	18.238			
T4	773.20	4036.07	A	0.145	2.791	10	0.825	1	22.846	1215.78	60.79	C
135.00-115.00			B	0.145	2.791		0.825	1	22.846			
			C	0.145	2.791		0.825	1	22.846			
T5	773.20	4789.76	A	0.133	2.835	10	0.825	1	25.039	1233.54	61.68	C
115.00-95.00			B	0.133	2.835		0.825	1	25.039			
			C	0.133	2.835		0.825	1	25.039			
T6	774.45	5354.18	A	0.14	2.809	10	0.825	1	30.919	1310.37	65.52	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
95.00-75.00			B	0.14	2.809		0.825	1	30.919			
			C	0.14	2.809		0.825	1	30.919			
T7	778.20	5794.03	A	0.148	2.778	9	0.825	1	37.622	1378.54	68.93	C
75.00-55.00			B	0.148	2.778		0.825	1	37.622			
			C	0.148	2.778		0.825	1	37.622			
T8	583.65	5023.91	A	0.174	2.686	8	0.825	1	37.632	1131.33	75.42	C
55.00-40.00			B	0.174	2.686		0.825	1	37.632			
			C	0.174	2.686		0.825	1	37.632			
T9	778.20	6793.06	A	0.139	2.812	8	0.825	1	43.290	1283.97	64.20	C
40.00-20.00			B	0.139	2.812		0.825	1	43.290			
			C	0.139	2.812		0.825	1	43.290			
T10	778.20	8126.54	A	0.137	2.82	7	0.825	1	46.919	1171.02	58.55	C
20.00-0.00			B	0.137	2.82		0.825	1	46.919			
			C	0.137	2.82		0.825	1	46.919			
Sum Weight:	6436.70	48831.58						OTM	928911.01 lb-ft	10876.05		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	0.8	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		0.8	1	10.683			
			C	0.163	2.723		0.8	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	0.8	1	16.081	776.89	38.84	C
175.00-155.00			B	0.165	2.718		0.8	1	16.081			
			C	0.165	2.718		0.8	1	16.081			
T3	629.40	3572.06	A	0.144	2.794	11	0.8	1	17.901	988.43	49.42	C
155.00-135.00			B	0.144	2.794		0.8	1	17.901			
			C	0.144	2.794		0.8	1	17.901			
T4	773.20	4036.07	A	0.145	2.791	10	0.8	1	22.378	1204.26	60.21	C
135.00-115.00			B	0.145	2.791		0.8	1	22.378			
			C	0.145	2.791		0.8	1	22.378			
T5	773.20	4789.76	A	0.133	2.835	10	0.8	1	24.506	1220.67	61.03	C
115.00-95.00			B	0.133	2.835		0.8	1	24.506			
			C	0.133	2.835		0.8	1	24.506			
T6	774.45	5354.18	A	0.14	2.809	10	0.8	1	30.218	1294.35	64.72	C
95.00-75.00			B	0.14	2.809		0.8	1	30.218			
			C	0.14	2.809		0.8	1	30.218			
T7	778.20	5794.03	A	0.148	2.778	9	0.8	1	36.729	1359.46	67.97	C
75.00-55.00			B	0.148	2.778		0.8	1	36.729			
			C	0.148	2.778		0.8	1	36.729			
T8	583.65	5023.91	A	0.174	2.686	8	0.8	1	36.682	1112.95	74.20	C
55.00-40.00			B	0.174	2.686		0.8	1	36.682			
			C	0.174	2.686		0.8	1	36.682			
T9	778.20	6793.06	A	0.139	2.812	8	0.8	1	42.233	1264.52	63.23	C
40.00-20.00			B	0.139	2.812		0.8	1	42.233			
			C	0.139	2.812		0.8	1	42.233			
T10	778.20	8126.54	A	0.137	2.82	7	0.8	1	45.767	1152.64	57.63	C
20.00-0.00			B	0.137	2.82		0.8	1	45.767			
			C	0.137	2.82		0.8	1	45.767			
Sum Weight:	6436.70	48831.58						OTM	919417.89	10744.41		

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

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft^2	F lb	w plf	Ctrl. Face
T1	118.20	2548.67	A	0.163	2.723	11	0.85	1	10.683	370.23	18.51	C
195.00-175.00			B	0.163	2.723		0.85	1	10.683			
			C	0.163	2.723		0.85	1	10.683			
T2	450.00	2793.29	A	0.165	2.718	11	0.85	1	16.660	791.62	39.58	C
175.00-155.00			B	0.165	2.718		0.85	1	16.660			
			C	0.165	2.718		0.85	1	16.660			
T3	629.40	3572.06	A	0.144	2.794	11	0.85	1	18.575	1005.61	50.28	C
155.00-135.00			B	0.144	2.794		0.85	1	18.575			
			C	0.144	2.794		0.85	1	18.575			
T4	773.20	4036.07	A	0.145	2.791	10	0.85	1	23.313	1227.29	61.36	C
135.00-115.00			B	0.145	2.791		0.85	1	23.313			
			C	0.145	2.791		0.85	1	23.313			
T5	773.20	4789.76	A	0.133	2.835	10	0.85	1	25.572	1246.41	62.32	C
115.00-95.00			B	0.133	2.835		0.85	1	25.572			
			C	0.133	2.835		0.85	1	25.572			
T6	774.45	5354.18	A	0.14	2.809	10	0.85	1	31.619	1326.39	66.32	C
95.00-75.00			B	0.14	2.809		0.85	1	31.619			
			C	0.14	2.809		0.85	1	31.619			
T7	778.20	5794.03	A	0.148	2.778	9	0.85	1	38.514	1397.61	69.88	C
75.00-55.00			B	0.148	2.778		0.85	1	38.514			
			C	0.148	2.778		0.85	1	38.514			
T8	583.65	5023.91	A	0.174	2.686	8	0.85	1	38.582	1149.71	76.65	C
55.00-40.00			B	0.174	2.686		0.85	1	38.582			
			C	0.174	2.686		0.85	1	38.582			
T9	778.20	6793.06	A	0.139	2.812	8	0.85	1	44.347	1303.41	65.17	C
40.00-20.00			B	0.139	2.812		0.85	1	44.347			
			C	0.139	2.812		0.85	1	44.347			
T10	778.20	8126.54	A	0.137	2.82	7	0.85	1	48.071	1189.41	59.47	C
20.00-0.00			B	0.137	2.82		0.85	1	48.071			
			C	0.137	2.82		0.85	1	48.071			
Sum Weight:	6436.70	48831.58						OTM	938404.13 lb-ft	11007.69		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	29308.81					
Bracing Weight	19522.77					

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Total Member Self-Weight	48831.58			-7042.45	14768.26	
Total Weight	68272.28			-7042.45	14768.26	
Wind 0 deg - No Ice		-6.38	-46180.82	-5023027.76	15686.61	-26178.54
Wind 30 deg - No Ice		21958.66	-38052.28	-4210778.45	-2410699.90	-37736.59
Wind 45 deg - No Ice		30793.77	-30803.88	-3420083.03	-3396816.04	-39816.58
Wind 60 deg - No Ice		37393.80	-21592.79	-2406640.54	-4140592.33	-39183.14
Wind 90 deg - No Ice		43928.37	6.38	-6124.10	-4837758.68	-30130.61
Wind 120 deg - No Ice		39984.56	23095.93	2501745.52	-4327878.05	-13004.61
Wind 135 deg - No Ice		31857.86	31867.97	3483381.02	-3474198.94	-2794.54
Wind 150 deg - No Ice		21969.71	38058.66	4197611.90	-2412290.53	7605.97
Wind 180 deg - No Ice		6.38	43196.62	4793744.35	13849.91	26178.54
Wind 210 deg - No Ice		-21958.66	38052.28	4196693.55	2440236.41	37736.59
Wind 225 deg - No Ice		-30793.77	30803.88	3405998.12	3426352.55	39816.58
Wind 240 deg - No Ice		-39978.18	23084.88	2500154.89	4356496.21	39183.14
Wind 270 deg - No Ice		-43928.37	-6.38	-7960.80	4867295.19	30130.61
Wind 300 deg - No Ice		-37400.17	-21603.83	-2408231.17	4171047.19	13004.61
Wind 315 deg - No Ice		-30802.79	-30812.90	-3421381.77	3427651.29	2794.54
Wind 330 deg - No Ice		-21969.71	-38058.66	-4211696.80	2441827.04	-7605.97
Member Ice	42207.96					
Total Weight Ice	162660.33			-103952.20	84781.04	
Wind 0 deg - Ice		-2.22	-21116.65	-2399607.45	85100.86	-19182.59
Wind 30 deg - Ice		10318.62	-17877.44	-2062881.03	-1045786.22	-26091.01
Wind 45 deg - Ice		14538.22	-14540.54	-1699367.96	-1510300.71	-26968.62
Wind 60 deg - Ice		17738.26	-10241.55	-1229173.24	-1864069.71	-26008.37
Wind 90 deg - Ice		20641.09	2.22	-103632.38	-2176907.43	-18956.80
Wind 120 deg - Ice		18285.83	10560.25	1044152.40	-1903065.56	-6825.77
Wind 135 deg - Ice		14764.00	14766.32	1507705.27	-1526542.43	159.66
Wind 150 deg - Ice		10322.47	17879.66	1855296.45	-1046340.17	7134.21
Wind 180 deg - Ice		2.22	20486.94	2147043.82	84461.22	19182.59
Wind 210 deg - Ice		-10318.62	17877.44	1854976.63	1215348.31	26091.01
Wind 225 deg - Ice		-14538.22	14540.54	1491463.55	1679862.80	26968.62
Wind 240 deg - Ice		-18283.61	10556.40	1043598.45	2072307.83	26008.37
Wind 270 deg - Ice		-20641.09	-2.22	-104272.02	2346469.52	18956.80
Wind 300 deg - Ice		-17740.48	-10245.39	-1229727.18	2033951.62	6825.77
Wind 315 deg - Ice		-14541.36	-14543.68	-1699820.25	1680315.09	-159.66
Wind 330 deg - Ice		-10322.47	-17879.66	-2063200.85	1215902.25	-7134.21
Total Weight	68272.28			-7042.45	14768.26	
Wind 0 deg - Service		-2.25	-16297.51	-1761494.18	456.95	-9238.58
Wind 30 deg - Service		7749.36	-13428.90	-1474846.05	-855830.81	-13317.49
Wind 45 deg - Service		10867.32	-10870.89	-1195804.44	-1203837.68	-14051.53
Wind 60 deg - Service		13196.52	-7620.24	-838153.92	-1466321.23	-13827.99
Wind 90 deg - Service		15502.61	2.25	9004.13	-1712355.82	-10633.29
Wind 120 deg - Service		14110.81	8150.71	894047.81	-1532415.59	-4589.41
Wind 135 deg - Service		11242.85	11246.42	1240473.44	-1231146.62	-986.21
Wind 150 deg - Service		7753.25	13431.15	1492530.21	-856392.16	2684.20
Wind 180 deg - Service		2.25	15244.37	1702909.28	-191.24	9238.58
Wind 210 deg - Service		-7749.36	13428.90	1492206.12	856096.52	13317.49
Wind 225 deg - Service		-10867.32	10870.89	1213164.50	1204103.39	14051.53
Wind 240 deg - Service		-14108.56	8146.81	893486.47	1532357.21	13827.99
Wind 270 deg - Service		-15502.61	-2.25	8355.94	1712621.53	10633.29
Wind 300 deg - Service		-13198.77	-7624.13	-838715.26	1466911.03	4589.41
Wind 315 deg - Service		-10870.51	-10874.08	-1196262.77	1204561.73	986.21
Wind 330 deg - Service		-7753.25	-13431.15	-1475170.14	856657.86	-2684.20

Load Combinations

Comb. No.	Description
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service

Comb. No.	Description
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	195 - 175	Leg	Max Tension	19	18.44	-0.29	0.00
			Max. Compression	24	-24.49	0.65	-0.03
			Max. Mx	8	10.25	1.19	0.00
			Max. My	32	-3.08	-0.00	-1.18
			Max. Vy	8	1.52	-0.23	-0.11
			Max. Vx	12	2.28	-0.12	-0.21
		Diagonal	Max Tension	10	5.42	0.00	0.00
			Max. Compression	10	-5.49	0.00	0.00
			Max. Mx	45	0.85	-0.02	0.00
			Max. My	26	-3.59	-0.00	-0.00
			Max. Vy	44	-0.02	-0.02	-0.00
			Max. Vx	26	0.00	-0.00	-0.00
		Top Girt	Max Tension	19	0.34	0.00	0.00
			Max. Compression	12	-0.36	0.00	0.00
			Max. Mx	34	-0.04	0.04	0.00
			Max. My	14	0.07	0.00	-0.00
			Max. Vy	34	-0.03	0.00	0.00
			Max. Vx	14	0.00	0.00	0.00
		Bottom Girt	Max Tension	3	0.19	0.00	0.00
			Max. Compression	28	-0.20	0.00	0.00
			Max. Mx	34	-0.04	0.05	0.00
			Max. My	16	-0.01	0.00	-0.00
			Max. Vy	34	-0.03	0.00	0.00
			Max. Vx	16	0.00	0.00	0.00
T2	175 - 155	Leg	Max Tension	19	58.94	-0.17	-0.04
			Max. Compression	24	-70.17	0.42	0.00
			Max. Mx	8	24.04	2.07	-0.01
			Max. My	32	-6.33	-0.05	-2.06
			Max. Vy	8	-0.95	-0.68	0.03
			Max. Vx	32	0.94	-0.02	0.64
		Diagonal	Max Tension	10	8.30	0.00	0.00
			Max. Compression	10	-8.27	0.00	0.00
			Max. Mx	43	1.35	0.04	-0.01
			Max. My	26	-7.69	0.00	0.02
			Max. Vy	43	0.04	0.04	-0.01
			Max. Vx	26	-0.00	0.00	0.00
T3	155 - 135	Leg	Max Tension	19	101.99	-0.95	-0.03
			Max. Compression	24	-118.74	-0.07	-0.05
			Max. Mx	18	84.95	1.23	-0.03
			Max. My	10	-7.20	-0.03	-1.32
			Max. Vy	18	0.96	-0.96	-0.03
			Max. Vx	26	0.92	-0.03	-0.76
		Diagonal	Max Tension	10	9.05	0.00	0.00
			Max. Compression	10	-9.12	0.00	0.00
			Max. Mx	43	1.77	0.07	-0.01
			Max. My	28	-7.87	0.02	0.01
			Max. Vy	43	0.05	0.07	-0.01
			Max. Vx	49	-0.00	0.00	0.00
T4	135 - 115	Leg	Max Tension	19	145.58	-0.16	-0.03

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Compression	24	-167.04	0.40	-0.07
			Max. Mx	12	-166.43	0.40	0.02
			Max. My	26	-10.30	-0.00	-0.35
			Max. Vy	18	0.13	-0.33	-0.03
			Max. Vx	24	0.15	-0.11	-0.31
		Diagonal	Max Tension	4	8.75	0.00	0.00
			Max. Compression	4	-8.85	0.00	0.00
			Max. Mx	48	1.87	0.10	0.01
			Max. My	35	-0.07	0.08	0.01
			Max. Vy	48	0.07	0.10	0.01
			Max. Vx	35	-0.00	0.00	0.00
T5	115 - 95	Leg	Max Tension	19	184.74	-0.26	-0.03
			Max. Compression	24	-211.76	0.23	-0.06
			Max. Mx	12	-181.14	0.40	0.02
			Max. My	26	-10.64	-0.00	-0.35
			Max. Vy	18	-0.10	-0.38	-0.05
			Max. Vx	24	-0.14	-0.20	-0.34
		Diagonal	Max Tension	4	9.55	0.00	0.00
			Max. Compression	4	-9.69	0.00	0.00
			Max. Mx	48	2.09	0.15	-0.02
			Max. My	35	-0.40	0.14	0.02
			Max. Vy	48	0.09	0.15	-0.02
			Max. Vx	35	-0.00	0.00	0.00
T6	95 - 75	Leg	Max Tension	19	221.68	-0.29	-0.04
			Max. Compression	24	-255.13	0.23	-0.05
			Max. Mx	18	218.31	-0.29	-0.04
			Max. My	26	-14.61	-0.01	-0.36
			Max. Vy	8	-0.10	-0.29	0.06
			Max. Vx	24	-0.15	-0.16	-0.34
		Diagonal	Max Tension	4	10.59	0.00	0.00
			Max. Compression	4	-10.68	0.00	0.00
			Max. Mx	48	2.18	0.19	-0.02
			Max. My	45	0.72	0.17	-0.03
			Max. Vy	48	0.11	0.19	0.02
			Max. Vx	45	0.01	0.00	0.00
T7	75 - 55	Leg	Max Tension	29	257.78	-0.34	-0.03
			Max. Compression	24	-298.02	0.08	0.00
			Max. Mx	18	253.53	-0.36	-0.04
			Max. My	26	-17.44	-0.04	-0.46
			Max. Vy	18	-0.12	-0.36	-0.04
			Max. Vx	24	-0.17	-0.21	-0.42
		Diagonal	Max Tension	4	11.73	0.00	0.00
			Max. Compression	4	-11.86	0.00	0.00
			Max. Mx	48	2.30	0.25	0.03
			Max. My	45	0.06	0.24	-0.03
			Max. Vy	48	0.13	0.25	0.03
			Max. Vx	45	0.01	0.00	0.00
T8	55 - 40	Leg	Max Tension	29	286.01	-0.12	-0.01
			Max. Compression	24	-332.33	0.75	-0.13
			Max. Mx	43	38.68	-0.76	-0.04
			Max. My	26	-20.77	-0.01	-0.68
			Max. Vy	43	0.25	-0.76	-0.04
			Max. Vx	24	0.18	-0.39	-0.64
		Diagonal	Max Tension	4	12.32	0.00	0.00
			Max. Compression	4	-12.44	0.00	0.00
			Max. Mx	48	1.98	0.26	-0.03
			Max. My	37	-2.91	0.23	0.03
			Max. Vy	48	0.13	0.25	-0.03
			Max. Vx	37	0.01	0.00	0.00
T9	40 - 20	Leg	Max Tension	29	319.83	-0.33	-0.02
			Max. Compression	24	-373.98	0.39	-0.08

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Mx	40	-145.48	2.05	0.01
			Max. My	26	-21.20	-0.01	-0.68
			Max. Vy	43	-0.50	-1.30	-0.01
			Max. Vx	26	0.17	-0.03	-0.65
		Diagonal	Max Tension	4	13.63	0.00	0.00
			Max. Compression	4	-13.83	0.00	0.00
			Max. Mx	48	1.16	0.40	-0.04
			Max. My	37	-5.80	0.38	0.05
			Max. Vy	48	0.16	0.40	-0.04
			Max. Vx	37	-0.01	0.00	0.00
T10	20 - 0	Leg	Max Tension	29	353.78	-0.33	-0.02
			Max. Compression	2	-417.13	-0.00	-0.00
			Max. Mx	40	-156.26	3.34	0.00
			Max. My	26	-26.30	-0.06	-0.76
			Max. Vy	43	-0.96	-3.05	-0.01
			Max. Vx	26	-0.20	-0.06	-0.76
		Diagonal	Max Tension	4	14.59	0.00	0.00
			Max. Compression	4	-14.87	0.00	0.00
			Max. Mx	48	-0.56	0.53	-0.06
			Max. My	37	-7.70	0.51	0.06
			Max. Vy	48	0.18	0.53	-0.06
			Max. Vx	37	-0.01	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	24	423.55	38.28	-23.85
	Max. H_x	24	423.55	38.28	-23.85
	Max. H_z	7	-346.62	-31.27	21.65
	Min. Vert	9	-357.46	-32.95	20.84
	Min. H_x	9	-357.46	-32.95	20.84
	Min. H_z	24	423.55	38.28	-23.85
Leg B	Max. Vert	12	422.16	-38.78	-22.96
	Max. H_x	29	-358.72	33.50	19.95
	Max. H_z	31	-347.89	32.03	20.37
	Min. Vert	29	-358.72	33.50	19.95
	Min. H_x	12	422.16	-38.78	-22.96
	Min. H_z	12	422.16	-38.78	-22.96
Leg A	Max. Vert	2	423.60	-1.02	45.09
	Max. H_x	25	-176.89	6.97	-20.00
	Max. H_z	2	423.60	-1.02	45.09
	Min. Vert	19	-357.74	1.05	-38.98
	Min. H_x	11	20.72	-6.96	1.59
	Min. H_z	19	-357.74	1.05	-38.98

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	68.27	0.00	0.00	-7.04	14.77	-0.00

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 0 deg - No Ice	81.93	-0.01	-73.89	-8065.11	19.34	-41.96
0.9 Dead+1.6 Wind 0 deg - No Ice	61.45	-0.01	-73.89	-8055.19	14.88	-41.94
1.2 Dead+1.6 Wind 30 deg - No Ice	81.93	35.13	-60.88	-6760.71	-3878.05	-60.42
0.9 Dead+1.6 Wind 30 deg - No Ice	61.45	35.13	-60.88	-6752.00	-3878.69	-60.42
1.2 Dead+1.6 Wind 45 deg - No Ice	81.93	49.27	-49.29	-5490.71	-5462.05	-63.73
0.9 Dead+1.6 Wind 45 deg - No Ice	61.45	49.27	-49.29	-5483.23	-5461.13	-63.72
1.2 Dead+1.6 Wind 60 deg - No Ice	81.93	59.83	-34.55	-3862.88	-6656.80	-62.70
0.9 Dead+1.6 Wind 60 deg - No Ice	61.45	59.83	-34.55	-3857.00	-6654.71	-62.69
1.2 Dead+1.6 Wind 90 deg - No Ice	81.93	70.29	0.01	-7.00	-7776.60	-48.19
0.9 Dead+1.6 Wind 90 deg - No Ice	61.45	70.29	0.01	-4.89	-7773.43	-48.16
1.2 Dead+1.6 Wind 120 deg - No Ice	81.93	63.98	36.95	4021.20	-6957.40	-20.75
0.9 Dead+1.6 Wind 120 deg - No Ice	61.45	63.98	36.95	4019.39	-6955.08	-20.77
1.2 Dead+1.6 Wind 135 deg - No Ice	81.93	50.97	50.99	5598.00	-5586.28	-4.42
0.9 Dead+1.6 Wind 135 deg - No Ice	61.45	50.97	50.99	5594.63	-5585.27	-4.44
1.2 Dead+1.6 Wind 150 deg - No Ice	81.93	35.15	60.89	6745.32	-3880.65	12.24
0.9 Dead+1.6 Wind 150 deg - No Ice	61.45	35.15	60.89	6740.81	-3881.29	12.21
1.2 Dead+1.6 Wind 180 deg - No Ice	81.93	0.01	69.11	7702.92	16.38	41.95
0.9 Dead+1.6 Wind 180 deg - No Ice	61.45	0.01	69.11	7697.45	11.93	41.93
1.2 Dead+1.6 Wind 210 deg - No Ice	81.93	-35.13	60.88	6743.78	3913.76	60.42
0.9 Dead+1.6 Wind 210 deg - No Ice	61.45	-35.13	60.88	6739.27	3905.49	60.42
1.2 Dead+1.6 Wind 225 deg - No Ice	81.93	-49.27	49.29	5473.73	5497.73	63.74
0.9 Dead+1.6 Wind 225 deg - No Ice	61.45	-49.27	49.29	5470.46	5487.90	63.74
1.2 Dead+1.6 Wind 240 deg - No Ice	81.93	-63.97	36.94	4018.59	6991.53	62.71
0.9 Dead+1.6 Wind 240 deg - No Ice	61.45	-63.97	36.94	4016.77	6980.29	62.71
1.2 Dead+1.6 Wind 270 deg - No Ice	81.93	-70.29	-0.01	-9.93	7812.17	48.19
0.9 Dead+1.6 Wind 270 deg - No Ice	61.45	-70.29	-0.01	-7.83	7800.08	48.16
1.2 Dead+1.6 Wind 300 deg - No Ice	81.93	-59.84	-34.57	-3865.36	6693.89	20.75
0.9 Dead+1.6 Wind 300 deg - No Ice	61.45	-59.84	-34.57	-3859.47	6682.87	20.76
1.2 Dead+1.6 Wind 315 deg - No Ice	81.93	-49.28	-49.30	-5492.70	5499.78	4.40
0.9 Dead+1.6 Wind 315 deg - No Ice	61.45	-49.28	-49.30	-5485.23	5489.95	4.42
1.2 Dead+1.6 Wind 330 deg -	81.93	-35.15	-60.89	-6762.12	3916.30	-12.24

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
No Ice						
0.9 Dead+1.6 Wind 330 deg - No Ice	61.45	-35.15	-60.89	-6753.41	3908.02	-12.21
1.2 Dead+1.0 Ice+1.0 Temp	176.31	0.00	0.00	-105.51	88.03	-0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	176.31	-0.00	-21.12	-2419.98	88.72	-19.27
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	176.31	10.32	-17.88	-2080.54	-1051.28	-26.20
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	176.31	14.54	-14.54	-1714.12	-1519.53	-27.08
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	176.31	17.74	-10.24	-1240.15	-1876.15	-26.11
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	176.31	20.64	0.00	-105.56	-2191.48	-19.02
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	176.31	18.29	10.56	1051.45	-1915.46	-6.84
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	176.31	14.76	14.77	1518.70	-1535.85	0.17
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	176.31	10.32	17.88	1869.12	-1051.81	7.18
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	176.31	0.00	20.49	2163.23	88.08	19.27
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	176.31	-10.32	17.88	1868.80	1228.05	26.20
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	176.31	-14.54	14.54	1502.37	1696.29	27.08
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	176.31	-18.28	10.56	1050.88	2091.93	26.11
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	176.31	-20.64	-0.00	-106.17	2368.22	19.02
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	176.31	-17.74	-10.25	-1240.67	2053.20	6.84
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	176.31	-14.54	-14.54	-1714.54	1696.72	-0.17
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	176.31	-10.32	-17.88	-2080.83	1228.57	-7.18
Dead+Wind 0 deg - Service	68.27	-0.00	-16.30	-1782.93	15.14	-9.25
Dead+Wind 30 deg - Service	68.27	7.75	-13.43	-1495.39	-843.94	-13.32
Dead+Wind 45 deg - Service	68.27	10.87	-10.87	-1215.44	-1193.09	-14.05
Dead+Wind 60 deg - Service	68.27	13.20	-7.62	-856.63	-1456.44	-13.83
Dead+Wind 90 deg - Service	68.27	15.50	0.00	-6.71	-1703.26	-10.63
Dead+Wind 120 deg - Service	68.27	14.11	8.15	881.21	-1522.70	-4.58
Dead+Wind 135 deg - Service	68.27	11.24	11.25	1228.77	-1220.47	-0.97
Dead+Wind 150 deg - Service	68.27	7.75	13.43	1481.67	-844.50	2.70
Dead+Wind 180 deg - Service	68.27	0.00	15.24	1692.74	14.49	9.25
Dead+Wind 210 deg - Service	68.27	-7.75	13.43	1481.34	873.57	13.32
Dead+Wind 225 deg - Service	68.27	-10.87	10.87	1201.39	1222.71	14.06
Dead+Wind 240 deg - Service	68.27	-14.11	8.15	880.65	1552.00	13.83
Dead+Wind 270 deg - Service	68.27	-15.50	-0.00	-7.35	1732.88	10.63
Dead+Wind 300 deg - Service	68.27	-13.20	-7.62	-857.19	1486.39	4.58
Dead+Wind 315 deg - Service	68.27	-10.87	-10.87	-1215.90	1223.17	0.97
Dead+Wind 330 deg - Service	68.27	-7.75	-13.43	-1495.71	874.14	-2.70

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
1	0.00	-68.27	0.00	0.00	68.27	0.00	0.000%
2	-0.01	-81.93	-73.89	0.01	81.93	73.89	0.000%
3	-0.01	-61.45	-73.89	0.01	61.45	73.89	0.000%
4	35.13	-81.93	-60.88	-35.13	81.93	60.88	0.000%
5	35.13	-61.45	-60.88	-35.13	61.45	60.88	0.000%
6	49.27	-81.93	-49.29	-49.27	81.93	49.29	0.000%
7	49.27	-61.45	-49.29	-49.27	61.45	49.29	0.000%
8	59.83	-81.93	-34.55	-59.83	81.93	34.55	0.000%
9	59.83	-61.45	-34.55	-59.83	61.45	34.55	0.000%
10	70.29	-81.93	0.01	-70.29	81.93	-0.01	0.000%
11	70.29	-61.45	0.01	-70.29	61.45	-0.01	0.000%
12	63.98	-81.93	36.95	-63.98	81.93	-36.95	0.000%
13	63.98	-61.45	36.95	-63.98	61.45	-36.95	0.000%
14	50.97	-81.93	50.99	-50.97	81.93	-50.99	0.001%
15	50.97	-61.45	50.99	-50.97	61.45	-50.99	0.000%
16	35.15	-81.93	60.89	-35.15	81.93	-60.89	0.000%
17	35.15	-61.45	60.89	-35.15	61.45	-60.89	0.001%
18	0.01	-81.93	69.11	-0.01	81.93	-69.11	0.000%
19	0.01	-61.45	69.11	-0.01	61.45	-69.11	0.000%
20	-35.13	-81.93	60.88	35.13	81.93	-60.88	0.000%
21	-35.13	-61.45	60.88	35.13	61.45	-60.88	0.000%
22	-49.27	-81.93	49.29	49.27	81.93	-49.29	0.000%
23	-49.27	-61.45	49.29	49.27	61.45	-49.29	0.001%
24	-63.97	-81.93	36.94	63.97	81.93	-36.94	0.000%
25	-63.97	-61.45	36.94	63.97	61.45	-36.94	0.000%
26	-70.29	-81.93	-0.01	70.29	81.93	0.01	0.000%
27	-70.29	-61.45	-0.01	70.29	61.45	0.01	0.000%
28	-59.84	-81.93	-34.57	59.84	81.93	34.57	0.000%
29	-59.84	-61.45	-34.57	59.84	61.45	34.57	0.000%
30	-49.28	-81.93	-49.30	49.28	81.93	49.30	0.000%
31	-49.28	-61.45	-49.30	49.28	61.45	49.30	0.000%
32	-35.15	-81.93	-60.89	35.15	81.93	60.89	0.000%
33	-35.15	-61.45	-60.89	35.15	61.45	60.89	0.001%
34	0.00	-176.31	0.00	-0.00	176.31	-0.00	0.000%
35	-0.00	-176.31	-21.12	0.00	176.31	21.12	0.000%
36	10.32	-176.31	-17.88	-10.32	176.31	17.88	0.000%
37	14.54	-176.31	-14.54	-14.54	176.31	14.54	0.000%
38	17.74	-176.31	-10.24	-17.74	176.31	10.24	0.000%
39	20.64	-176.31	0.00	-20.64	176.31	-0.00	0.000%
40	18.29	-176.31	10.56	-18.29	176.31	-10.56	0.000%
41	14.76	-176.31	14.77	-14.76	176.31	-14.77	0.000%
42	10.32	-176.31	17.88	-10.32	176.31	-17.88	0.000%
43	0.00	-176.31	20.49	-0.00	176.31	-20.49	0.000%
44	-10.32	-176.31	17.88	10.32	176.31	-17.88	0.000%
45	-14.54	-176.31	14.54	14.54	176.31	-14.54	0.000%
46	-18.28	-176.31	10.56	18.28	176.31	-10.56	0.000%
47	-20.64	-176.31	-0.00	20.64	176.31	0.00	0.000%
48	-17.74	-176.31	-10.25	17.74	176.31	10.25	0.000%
49	-14.54	-176.31	-14.54	14.54	176.31	14.54	0.000%
50	-10.32	-176.31	-17.88	10.32	176.31	17.88	0.000%
51	-0.00	-68.27	-16.30	0.00	68.27	16.30	0.000%
52	7.75	-68.27	-13.43	-7.75	68.27	13.43	0.000%
53	10.87	-68.27	-10.87	-10.87	68.27	10.87	0.000%
54	13.20	-68.27	-7.62	-13.20	68.27	7.62	0.000%
55	15.50	-68.27	0.00	-15.50	68.27	-0.00	0.000%
56	14.11	-68.27	8.15	-14.11	68.27	-8.15	0.000%
57	11.24	-68.27	11.25	-11.24	68.27	-11.25	0.000%
58	7.75	-68.27	13.43	-7.75	68.27	-13.43	0.000%
59	0.00	-68.27	15.24	-0.00	68.27	-15.24	0.000%
60	-7.75	-68.27	13.43	7.75	68.27	-13.43	0.000%
61	-10.87	-68.27	10.87	10.87	68.27	-10.87	0.000%

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX K	PY K	PZ K	PX K	PY K	PZ K	% Error
62	-14.11	-68.27	8.15	14.11	68.27	-8.15	0.000%
63	-15.50	-68.27	-0.00	15.50	68.27	0.00	0.000%
64	-13.20	-68.27	-7.62	13.20	68.27	7.62	0.000%
65	-10.87	-68.27	-10.87	10.87	68.27	10.87	0.000%
66	-7.75	-68.27	-13.43	7.75	68.27	13.43	0.000%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	4	0.00000001	0.00000001
2	Yes	4	0.00000001	0.00000001
3	Yes	4	0.00000001	0.00000001
4	Yes	4	0.00000001	0.00000052
5	Yes	4	0.00000001	0.00000048
6	Yes	4	0.00000001	0.00000054
7	Yes	4	0.00000001	0.00000049
8	Yes	4	0.00000001	0.00000053
9	Yes	4	0.00000001	0.00000047
10	Yes	4	0.00000001	0.00000050
11	Yes	4	0.00000001	0.00000110
12	Yes	4	0.00000001	0.00000001
13	Yes	4	0.00000001	0.00000001
14	Yes	4	0.00000001	0.00000123
15	Yes	4	0.00000001	0.00000001
16	Yes	4	0.00000001	0.00000050
17	Yes	4	0.00000001	0.00000112
18	Yes	4	0.00000001	0.00000052
19	Yes	4	0.00000001	0.00000001
20	Yes	4	0.00000001	0.00000052
21	Yes	4	0.00000001	0.00000048
22	Yes	4	0.00000001	0.00000001
23	Yes	4	0.00000001	0.00000135
24	Yes	4	0.00000001	0.00000001
25	Yes	4	0.00000001	0.00000001
26	Yes	4	0.00000001	0.00000050
27	Yes	4	0.00000001	0.00000110
28	Yes	4	0.00000001	0.00000049
29	Yes	4	0.00000001	0.00000001
30	Yes	4	0.00000001	0.00000052
31	Yes	4	0.00000001	0.00000001
32	Yes	4	0.00000001	0.00000050
33	Yes	4	0.00000001	0.00000111
34	Yes	4	0.00000001	0.00000001
35	Yes	4	0.00000001	0.00000137
36	Yes	4	0.00000001	0.00000142
37	Yes	4	0.00000001	0.00000145
38	Yes	4	0.00000001	0.00000146
39	Yes	4	0.00000001	0.00000141
40	Yes	4	0.00000001	0.00000134
41	Yes	4	0.00000001	0.00000138
42	Yes	4	0.00000001	0.00000141
43	Yes	4	0.00000001	0.00000145
44	Yes	4	0.00000001	0.00000142
45	Yes	4	0.00000001	0.00000140
46	Yes	4	0.00000001	0.00000138

47	Yes	4	0.00000001	0.00000145
48	Yes	4	0.00000001	0.00000149
49	Yes	4	0.00000001	0.00000147
50	Yes	4	0.00000001	0.00000221
51	Yes	4	0.00000001	0.00000001
52	Yes	4	0.00000001	0.00000001
53	Yes	4	0.00000001	0.00000001
54	Yes	4	0.00000001	0.00000001
55	Yes	4	0.00000001	0.00000001
56	Yes	4	0.00000001	0.00000001
57	Yes	4	0.00000001	0.00000001
58	Yes	4	0.00000001	0.00000001
59	Yes	4	0.00000001	0.00000001
60	Yes	4	0.00000001	0.00000001
61	Yes	4	0.00000001	0.00000001
62	Yes	4	0.00000001	0.00000001
63	Yes	4	0.00000001	0.00000001
64	Yes	4	0.00000001	0.00000001
65	Yes	4	0.00000001	0.00000001
66	Yes	4	0.00000001	0.00000001

Maximum Tower Deflections - Service Wind

Section No.	*Elevation*	*Horz. Deflection*	*Gov. Load Comb.*	*Tilt*	*Twist*
	ft	*in*		°	°
T1	195 - 175	2.788	62	0.1131	0.0304
T2	175 - 155	2.314	62	0.1088	0.0221
T3	155 - 135	1.846	62	0.1009	0.0168
T4	135 - 115	1.428	62	0.0890	0.0165
T5	115 - 95	1.058	62	0.0762	0.0152
T6	95 - 75	0.750	62	0.0616	0.0138
T7	75 - 55	0.499	62	0.0479	0.0117
T8	55 - 40	0.296	62	0.0352	0.0088
T9	40 - 20	0.168	62	0.0257	0.0057
T10	20 - 0	0.056	51	0.0123	0.0027

Critical Deflections and Radius of Curvature - Service Wind

Elevation	*Appurtenance*	*Gov. Load Comb.*	*Deflection*	*Tilt*	*Twist*	*Radius of Curvature*
ft			*in*	°	°	*ft*
192.00	Top Triangular Mount	62	2.717	0.1125	0.0292	672852
180.00	SitePro VFA12-HD	62	2.433	0.1101	0.0241	224286
172.00	Pirod 12' T-Frame Sector Mount (1)	62	2.242	0.1079	0.0207	331403
160.00	Pirod 12' T-Frame Sector Mount (1)	62	1.960	0.1033	0.0174	96904
144.00	Pirod 12' T-Frame Sector Mount (1)	62	1.610	0.0946	0.0168	93803
80.00	GPS	62	0.557	0.0511	0.0122	90141

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	195 - 175	12.538	24	0.5004	0.1381
T2	175 - 155	10.426	24	0.4860	0.1003
T3	155 - 135	8.329	24	0.4527	0.0761
T4	135 - 115	6.447	24	0.4005	0.0747
T5	115 - 95	4.780	24	0.3432	0.0690
T6	95 - 75	3.393	24	0.2777	0.0625
T7	75 - 55	2.256	24	0.2159	0.0530
T8	55 - 40	1.339	2	0.1589	0.0398
T9	40 - 20	0.763	2	0.1159	0.0258
T10	20 - 0	0.256	2	0.0555	0.0123

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
192.00	Top Triangular Mount	24	12.223	0.4988	0.1327	242336
180.00	SitePro VFA12-HD	24	10.957	0.4908	0.1094	80779
172.00	Pirod 12' T-Frame Sector Mount (1)	24	10.107	0.4825	0.0941	177143
160.00	Pirod 12' T-Frame Sector Mount (1)	24	8.840	0.4632	0.0790	22959
144.00	Pirod 12' T-Frame Sector Mount (1)	24	7.266	0.4252	0.0760	21272
80.00	GPS	24	2.518	0.2307	0.0556	20039

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	195	Leg	A325N	1.1250	4	4.61	67.10	0.069 ✓	1	Bolt Tension
T2	175	Leg	A325N	1.1250	6	9.82	67.10	0.146 ✓	1	Bolt Tension
		Diagonal	A325N	0.8750	1	8.30	11.09	0.748 ✓	1	Member Bearing
T3	155	Leg	A325N	1.1250	6	17.00	67.10	0.253 ✓	1	Bolt Tension
		Diagonal	A325N	0.8750	1	9.05	18.49	0.489 ✓	1	Member Bearing
T4	135	Leg	A325N	1.1250	6	24.26	67.10	0.362 ✓	1	Bolt Tension
		Diagonal	A325N	0.8750	1	8.75	14.79	0.592 ✓	1	Member Bearing
T5	115	Leg	A325N	1.1250	8	23.09	67.10	0.344 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	9.55	25.45	0.375 ✓	1	Member Bearing
T6	95	Leg	A325N	1.1250	8	27.71	67.10	0.413 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	10.59	21.21	0.499 ✓	1	Member Bearing
T7	75	Leg	A325N	1.2500	8	32.22	82.83	0.389 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11.73	16.97	0.691 ✓	1	Member Bearing
T8	55	Leg	A325N	1.2500	8	35.75	82.83	0.432 ✓	1	Bolt Tension
		Diagonal	A325N	1.0000	1	12.32	16.97	0.726 ✓	1	Member Bearing
T9	40	Leg	A325N	1.2500	8	39.98	82.83	0.483 ✓	1	Bolt Tension

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
T10	20	Diagonal	A325N	1.0000	1	13.63	21.21	0.643 ✔	1	Member Bearing
		Leg	A449	1.3750	8	44.22	87.70	0.504 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	14.59	25.45	0.573 ✔	1	Member Bearing

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	3	20.01	3.33	53.4 K=1.00	7.0686	-24.50	258.31	0.095 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5 K=1.00	11.0447	-70.17	291.32	0.241 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1 K=1.00	12.5664	-118.74	353.60	0.336 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-167.04	421.17	0.397 [1] ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4 K=1.00	14.1863	-211.76	421.17	0.503 [1] ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2 K=1.00	15.9043	-255.13	493.88	0.517 [1] ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-298.01	571.60	0.521 [1] ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6 K=1.00	17.7205	-332.33	661.23	0.503 [1] ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5 K=1.00	17.7205	-373.98	571.60	0.654 [1] ✔
T10	20 - 0	5	20.03	6.68	64.1 K=1.00	19.6350	-417.13	654.25	0.638 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	195 - 175	1 1/4	6.79	3.30	114.0 K=0.90	1.2272	-5.49	20.05	0.274 [1] ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	10.16	4.94	119.9	0.9020	-8.22	13.71	0.599 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	140.4 K=1.00	1.4600	-9.12	16.73	0.545 [1] ✔
T4	135 - 115	L3x3x1/4	13.44	6.56	132.9 K=1.00	1.4400	-8.85	18.41	0.481 [1] ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	151.8 K=1.00	2.1100	-9.69	20.69	0.469 [1] ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	144.8 K=1.00	2.0900	-10.68	22.53	0.474 [1] ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	139.5 K=1.00	1.9400	-11.86	22.52	0.526 [1] ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	146.5 K=1.00	1.9400	-12.44	20.43	0.609 [1] ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	165.3 K=1.00	2.4000	-13.83	19.84	0.697 [1] ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	180.4 K=1.00	2.8600	-14.87	19.86	0.749 [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	195 - 175	1 1/4	5.00	4.75	127.7 K=0.70	1.2272	-0.36	16.86	0.022 [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	195 - 175	1 1/4	6.00	5.75	154.6 K=0.70	1.2272	-0.20	11.61	0.017 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	195 - 175	3	20.01	3.33	53.4	7.0686	18.44	318.09	0.058 [1] ✔
T2	175 - 155	3 3/4	20.03	6.68	85.5	11.0447	58.94	497.01	0.119 [1] ✔
T3	155 - 135	4	20.03	6.68	80.1	12.5664	101.99	565.49	0.180 [1] ✔
T4	135 - 115	4 1/4	20.03	6.68	75.4	14.1863	145.58	638.38	0.228 [1] ✔
T5	115 - 95	4 1/4	20.03	6.68	75.4	14.1863	184.74	638.38	0.289 [1] ✔
T6	95 - 75	4 1/2	20.03	6.68	71.2	15.9043	221.68	715.69	0.310 [1] ✔
T7	75 - 55	4 3/4	20.03	6.68	67.5	17.7205	257.78	797.42	0.323 [1] ✔
T8	55 - 40	4 3/4	15.03	5.01	50.6	17.7205	286.01	797.42	0.359 [1] ✔
T9	40 - 20	4 3/4	20.03	6.68	67.5	17.7205	319.83	797.42	0.401 [1] ✔
T10	20 - 0	5	20.03	6.68	64.1	19.6350	353.78	883.57	0.400 [1] ✔

[1] P_u / ϕP_n controls

Diagonal Design Data (Tension)

Section No.	Elevation	Size	L	L_u	Kl/r	A	P_u	ϕP_n	Ratio $\frac{P_u}{\phi P_n}$
	ft		ft	ft		in^2	K	K	
T1	195 - 175	1 1/4	6.79	3.30	126.7	1.2272	5.42	39.76	0.136 [1] ✔
T2	175 - 155	L2 1/2x2 1/2x3/16	9.67	4.71	74.9	0.9020	8.30	29.22	0.284 [1] ✔
T3	155 - 135	L2 1/2x2 1/2x5/16	11.74	5.72	92.6	1.4600	9.05	47.30	0.191 [1] ✔
T4	135 - 115	L3x3x1/4	13.44	6.56	86.5	1.4400	8.75	46.66	0.188 [1] ✔
T5	115 - 95	L3x3x3/8	15.21	7.43	99.8	2.1100	9.55	68.36	0.140 [1] ✔
T6	95 - 75	L3 1/2x3 1/2x5/16	17.03	8.32	94.3	2.0900	10.59	67.72	0.156 [1] ✔
T7	75 - 55	L4x4x1/4	18.88	9.24	90.3	1.9400	11.73	62.86	0.187 [1] ✔
T8	55 - 40	L4x4x1/4	19.89	9.70	94.7	1.9400	12.32	62.86	0.196 [1] ✔
T9	40 - 20	L4x4x5/16	22.19	10.90	107.1	2.4000	13.63	77.76	0.175 [1] ✔
T10	20 - 0	L4x4x3/8	24.11	11.84	117.2	2.8600	14.59	92.66	0.157 [1] ✔

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

[1] P_u / ϕP_n controls

Top Girt Design Data (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	195 - 175	1 1/4	5.00	4.75	182.4	1.2272	0.34	39.76	0.009 [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	195 - 175	1 1/4	6.00	5.75	220.8	1.2272	0.19	39.76	0.005 [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	195 - 175	Leg	3	1	-24.50	258.31	9.5	Pass
T2	175 - 155	Leg	3 3/4	46	-70.17	291.32	24.1	Pass
T3	155 - 135	Leg	4	67	-118.74	353.60	33.6	Pass
T4	135 - 115	Leg	4 1/4	88	-167.04	421.17	39.7	Pass
T5	115 - 95	Leg	4 1/4	109	-211.76	421.17	50.3	Pass
T6	95 - 75	Leg	4 1/2	130	-255.13	493.88	51.7	Pass
T7	75 - 55	Leg	4 3/4	151	-298.01	571.60	52.1	Pass
T8	55 - 40	Leg	4 3/4	172	-332.33	661.23	50.3	Pass
T9	40 - 20	Leg	4 3/4	193	-373.98	571.60	65.4	Pass
T10	20 - 0	Leg	5	216	-417.13	654.25	63.8	Pass
T1	195 - 175	Diagonal	1 1/4	11	-5.49	20.05	27.4	Pass
T2	175 - 155	Diagonal	L2 1/2x2 1/2x3/16	50	-8.22	13.71	59.9 74.8 (b)	Pass
T3	155 - 135	Diagonal	L2 1/2x2 1/2x5/16	71	-9.12	16.73	54.5	Pass
T4	135 - 115	Diagonal	L3x3x1/4	95	-8.85	18.41	48.1 59.2 (b)	Pass
T5	115 - 95	Diagonal	L3x3x3/8	116	-9.69	20.69	46.9	Pass
T6	95 - 75	Diagonal	L3 1/2x3 1/2x5/16	137	-10.68	22.53	47.4	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							49.9 (b)	
T7	75 - 55	Diagonal	L4x4x1/4	158	-11.86	22.52	52.6	Pass
							69.1 (b)	
T8	55 - 40	Diagonal	L4x4x1/4	179	-12.44	20.43	60.9	Pass
							72.6 (b)	
T9	40 - 20	Diagonal	L4x4x5/16	200	-13.83	19.84	69.7	Pass
T10	20 - 0	Diagonal	L4x4x3/8	221	-14.87	19.86	74.9	Pass
T1	195 - 175	Top Girt	1 1/4	6	-0.36	16.86	2.2	Pass
T1	195 - 175	Bottom Girt	1 1/4	9	-0.20	11.61	1.7	Pass
							Summary	
						Leg (T9)	65.4	Pass
						Diagonal (T10)	74.9	Pass
						Top Girt (T1)	2.2	Pass
						Bottom Girt (T1)	1.7	Pass
						Bolt Checks	74.8	Pass
						RATING =	**74.9**	**Pass**

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

Subject:	FOUNDATION ANALYSIS
Location:	Northford, CT
Rev. 0: 4/14/21	Prepared by: T.J.L. Checked by: C.F.C. Job No. 20148.00

Pier and Mat Foundation Analysis:

Input Data:

Tower Data

Overturning Moment =	$OM := 8065 \cdot ft \cdot kips$	(User Input from tnxTower)	
Shear Force =	$S_t := 74 \cdot kip$	(User Input from tnxTower)	
Axial Force =	$WT_t := 82 \cdot kip$	(User Input from tnxTower)	
Max Compression Force =	$C_t := 424 \cdot kip$	(User Input from tnxTower)	
Max Uplift Force =	$U_t := 359 \cdot kip$	(User Input from tnxTower)	
Tower Height =	$H_t := 195 \cdot ft$	(User Input)	
Tower Width =	$W_t := 23.5 \cdot ft$	(User Input)	
Tower Position on Foundation (1=offset, 2=centered) =	$Pos_t := 2$	(User Input)	

Footing Data:

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

Material Properties:

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

Pier Reinforcement:

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

Pad Reinforcement:

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

Calculated Factors:

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

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

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

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

Load Factor = $LF := 1$

Stability of Footing:

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

Resisting Moment = $M_r := (WT_{tot}) \cdot \frac{W_f}{2} + 0.9WT_t \cdot \left(\frac{W_f}{2} - X_{off}\right) + 0.75\left(S_u \cdot \frac{T_p}{3}\right) = 13736 \cdot kip \cdot ft$

Overturning Moment = $M_{ot} := OM + S_t \cdot (L_p + T_f) = 8546 \cdot kip \cdot ft$

Factor of Safety Actual = $FS := \frac{M_r}{M_{ot}} = 1.61$

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

$OverTurning\_Moment\_Check = "Okay"$

Shear Capacity in Pier:

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

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

Shear_Check = "Okay"

Bearing Pressure Caused by Footing:

Total Load = $Load_{tot} := WT_c + WT_{s1} + WT_t = 965 \cdot kip$

Area of the Mat = $A_{mat} := W_f^2 = 1.156 \times 10^3$

Section Modulus of Mat = $S := \frac{W_f^3}{6} = 6550.67 \cdot ft^3$

Maximum Pressure in Mat = $P_{max} := \frac{Load_{tot}}{A_{mat}} + \frac{M_{ot}}{S} = 2.139 \cdot ksf$

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

Max_Pressure_Check = "Okay"

Minimum Pressure in Mat = $P_{min} := \frac{Load_{tot}}{A_{mat}} - \frac{M_{ot}}{S} = -0.47 \cdot ksf$

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

Min_Pressure_Check = "No Good"

Distance to Resultant of Pressure Distribution = $X_p := \frac{P_{max}}{\frac{P_{max} - P_{min}}{W_f}} \cdot \frac{1}{3} = 9.293$

Distance to Kern = $X_k := \frac{W_f}{6} = 5.667$

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

Eccentricity = $e := \frac{M_{ot}}{Load_{tot}} = 8.855$

Adjusted Soil Pressure = $P_a := \frac{2 \cdot Load_{tot}}{3 \cdot W_f \cdot \left(\frac{W_f}{2} - e\right)} = 2.323 \cdot ksf$

$q_{adj} := if(P_{min} < 0, P_a, P_{max}) = 2.323 \cdot ksf$

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

Pressure_Check = "Okay"

Concrete Bearing Capacity:

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

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

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

Bearing_Check = "Okay"

Shear Strength of Concrete:

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

$\phi_c := 0.85$ (ACI 9.3.2.5)

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

$FL := LF \cdot \frac{C_t}{W_f^2} = 0.367 \cdot ksf$

$V_{req} := FL \cdot (X_t - .5 \cdot d_p - d) \cdot W_f = 81.676 \cdot kips$

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

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

Beam_Shear_Check = "Okay"

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

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

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

Required Shear Strength = $V_{req} := FL \cdot (W_f^2 - A_{bo}) = 416 \cdot kips$

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

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

Punching_Shear_Check = "Okay"

Steel Reinforcement in Pad:

Required Reinforcement for Bending:

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

Maximum Moment in Pad = $M_{max} := 1300 \cdot kip \cdot ft$ (User Input)

Design Moment = $M_n := \frac{LF \cdot M_{max}}{\phi_m} = 1.444 \times 10^3 \cdot kips \cdot ft$

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

(ACI-200810.2.7.3)

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

$A_s := \frac{M_n}{(f_y \cdot d)} = 11.111 \cdot in^2$

$a := \frac{A_s \cdot f_y}{\beta \cdot f_c \cdot b_{eff}} = 0.933 \cdot in$

$A_s := \frac{M_n}{f_y \cdot \left(d - \frac{a}{2}\right)} = 11.314 \cdot in^2$

$\rho := \frac{A_s}{b_{eff} d} = 0.01864 \cdot in$

Required Reinforcement for Temperature and Shrinkage:

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

Check Bottom Bars:

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

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

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

Pad_Reinforcement_Bot = "Okay"

Check top Bars:

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

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

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

Pad_Reinforcement_Top = "Okay"

Developement Length Pad Reinforcement:

Bar Spacing =

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

Spacing or Cover Dimension =

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

Transverse Reinforcement Index =

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

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

Minimum Development Length =

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

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

Available Length in Pad =

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

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

Lpad_Check = "Okay"

Steel Reinforcement in Pier:

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

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

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

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

Steel_Area_Check = "Okay"

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

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

Maximum Moment in Pier = $M_p := S_t \cdot (L_p) \cdot LF = 3552 \cdot in \cdot kips$

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

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

$(D \; N \; n \; P_u \; M_{xu}) = (36 \;\; 20 \;\; 8 \;\; 565.192 \;\; 3.552 \times 10^3)$

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

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

$(\phi P_n \;\; \phi M_{xn} \;\; f_{sp} \;\; \rho) = (1.504 \times 10^3 \;\; 9.453 \times 10^3 \;\; -29.187 \;\; 0.016)$

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

Axial_Load_Check = "Okay"

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

Bending_Check = "Okay"

Development Length Pier Reinforcement:

Available Length in Foundation:

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

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

Tension: (ACI-2008 12.2.3)

Spacing or Cover Dimension =

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

Transverse Reinforcement =

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

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

Minimum Development Length =

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

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

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

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

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

Compression: (ACI-2008 12.3.2)

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

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

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

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

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

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Section 1 - Site Information

Site ID: CT11230A
Status: Draft
Version: 6
Project Type: Anchor
Approved: Not Approved
Approved By: Not Approved
Last Modified: 8/20/2020 7:18:16 PM
Last Modified By: Dominic.Kallas2@T-Mobile.com

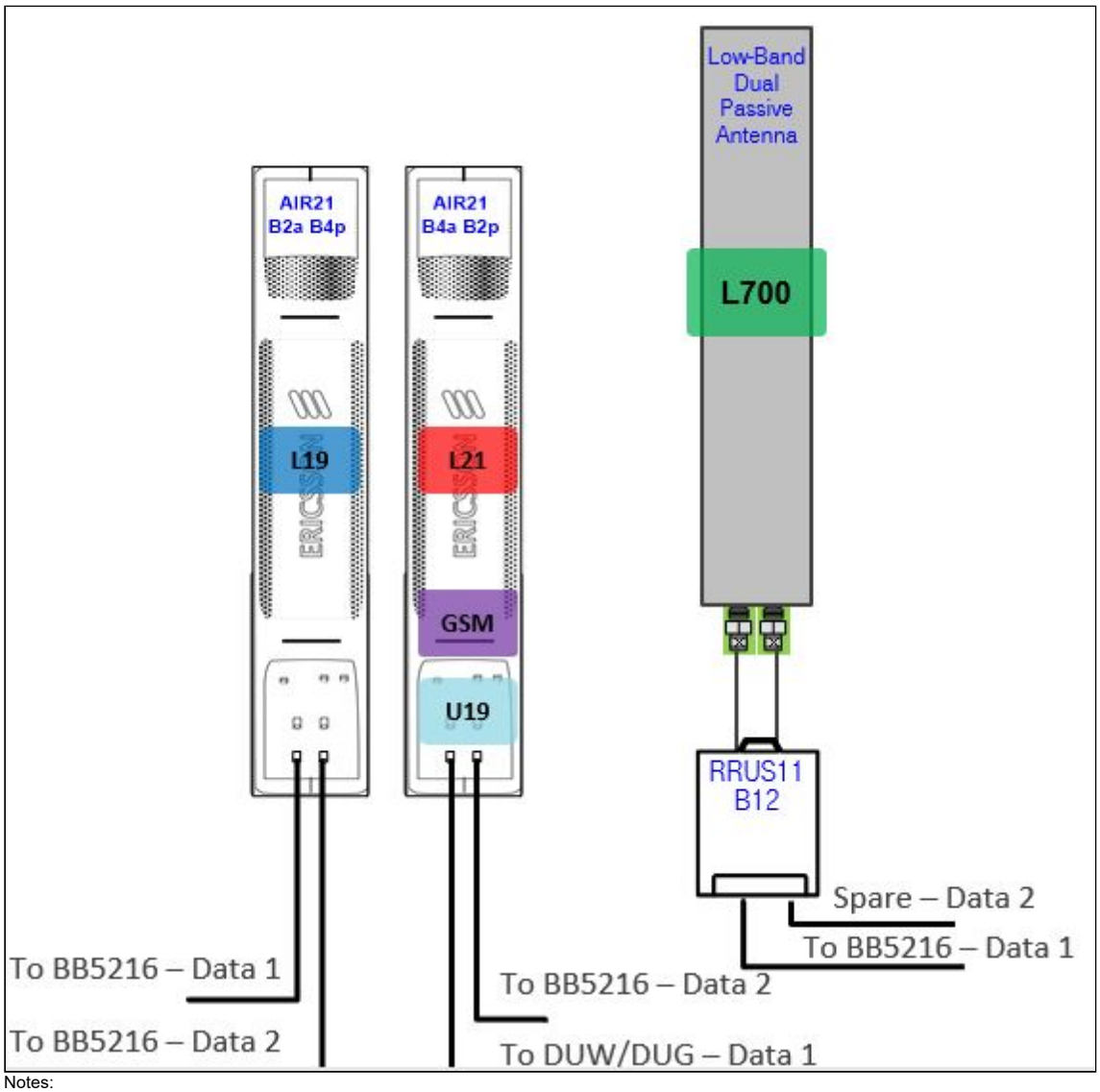
Site Name: North Haven/ Rt 17
Site Class: Self Support Tower
Site Type: Structure Non Building
Plan Year: 2020
Market: CONNECTICUT CT
Vendor: Ericsson
Landlord: Ochenkowski Tower LLC

Latitude: 41.36944000
Longitude: -72.81028000
Address: 88 Parsonage Hill Rd.
City, State: North Branford, CT
Region: NORTHEAST

RAN Template: 67D5A997DB Outdoor			AL Template: 67D5997DB_2xAIR+1OP (U21 Market)	
Sector Count: 3	**Antenna Count:** 9	**Coax Line Count:** 9	**TMA Count:** 3	**RRU Count:** 6

Section 2 - Existing Template Images

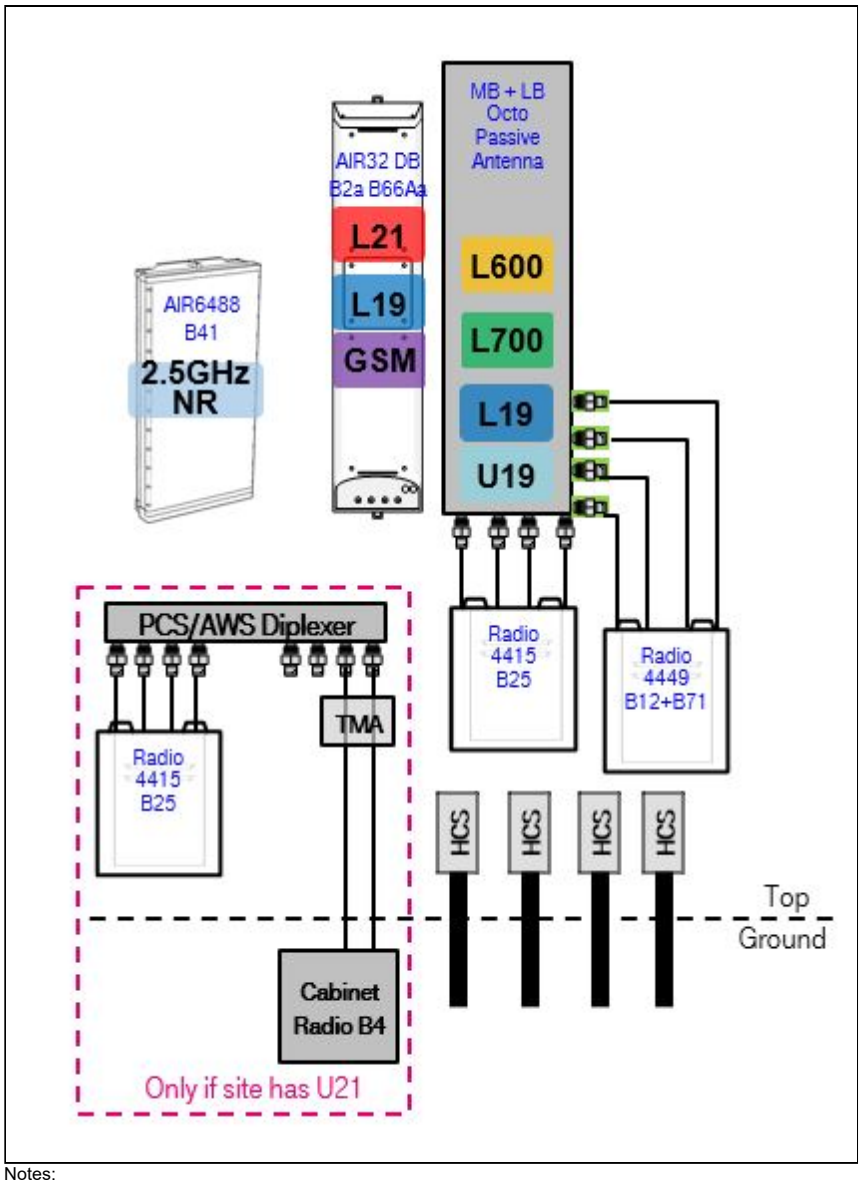
792Cu.JPG



Notes:

Section 3 - Proposed Template Images

67D5997DB_2xAIR+1OP.JPG



Notes:

Section 4 - Siteplan Images

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

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Section 5 - RAN Equipment

Existing RAN Equipment

Template: 792Cu Outdoor

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

Proposed RAN Equipment

Template: 67D5A997DB Outdoor

Enclosure	1	2	3
Enclosure Type	RBS 6131	Enclosure 6160	B160
Baseband	DUW30 [U2100]; DUG20 [G1900]; BB 6630 [L1900, L2100]; BB 6630 [L700, L600, N600]	BB 6630 [L2500]; BB 6648 [N2500]	
Hybrid Cable System	Ericsson 6x12 HCS *Select Length & AWG*	PSU 4813 Ericsson 6x12 HCS *Select Length & AWG* **(x 2)**	
Radio	RU22 **(x 6)** [U2100]		

RAN Scope of Work:

Add (1) Enclosure 6160.

Add (1) Battery Cabinet B160.

Add (1) iXRe Router to new Enclosure 6160.

Add (1) BB6630 for L2500 to new Enclosure 6160.

Add (1) BB6648 for N2500 to new Enclosure 6160.

Add (1) PSU 4813 to new Enclosure 6160.

Existing: (1) 6X12 HCS.

Remove excess coaxial lines for new total of (6) coaxial lines.

Add (2) 6X12 HCS.

There will be (3) 6X12 HCS at the site ([1] per sector). DC and Fibers on each 6X12 HCS will be allocated among the A&L equipment on that sector.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Section 6 - A&L Equipment

Existing Template: 792Cu_2xAIR+1DP
Proposed Template: 67D5997DB_2xAIR+1OP (U21 Market)

Sector 1 (Existing) view from behind						
Coverage Type	A - Outdoor Macro					
Antenna	**1**	**2**		**3**		**4**
Antenna Model	Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)		Empty Antenna Mount (Empty mount)
Azimuth	30	30		30		
M. Tilt	0	0		0		
Height	180	180		180		
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	
Active Tech.	L700	L1900 G1900	U2100	L2100		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.		U1900				
E. Tilt	2	2	2	2		
Cables	Fiber Jumper - 15 ft. **(x2)**	Fiber Jumper - 15 ft. **(x2)** 1-5/8" LMU Coax - 200 ft. **(x2)**	1-5/8" Coax - 200 ft. **(x2)**	Fiber Jumper - 15 ft. **(x2)**		
TMAs			Generic Twin Style 1B - AWS (AtAntenna)			
Diplexers / Combiners						
Radio	RRUS11 B12 (At Antenna)					
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts Per Sector. ***
*** LNX in Position 1 ***
*** AIR21 B2A/B4P with TMAs in Position 2 ***
*** AIR21 B2P/B4A in Position 3 ***
*** Empty Mount at 4 ***

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Sector 1 (Proposed) view from behind

Coverage Type	A - Outdoor Macro										
Antenna	1		2				3				4
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				Empty Antenna Mount (Empty mount)
Azimuth	30		30				30				
M. Tilt	0		0				0				
Height	180		180				180				
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900	L1900 U2100	L2100	L2100	L1900 G1900	L1900	
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt	2	2	2	2	2	2	2	2	2	2	
Cables	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	1-5/8" Coax - 200 ft. **(x2)**	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		
TMAs						Generic Twin Style 1B - AWS (AtAntenna)					
Diplexers / Combiners					Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)					
Radio			Radio 4449 B71+B85 (AtAntenna)	SHARED Radio 4449 B71+B85 (AtAntenna)	Radio 4415 B25 (AtAntenna)	SHARED Radio 4415 B25 (AtAntenna)					
Sector Equipment											

Unconnected Equipment:

Cable: 1-5/8" Coax - 200 ft.

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 2 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect them to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of PCS/AWS diplexer for load balancing.

Remove AIR21 B2P/B4A for L2100 from Position 3.

Install (1) AIR32 B66A/B2A Dual Band for L2100, L1900 1st Carrier, and GSM in Position 3. GSM will share B2 Radios with L1900 1st Carrier.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Sector 2 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	**1**	**2**		**3**		**4**
Antenna Model	Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)		Empty Antenna Mount (Empty mount)
Azimuth	150	150		150		
M. Tilt	0	0		0		
Height	180	180		180		
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	
Active Tech.	L700	L1900 G1900	U2100	L2100		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.		U1900				
E. Tilt	2	2	2	2		
Cables	Fiber Jumper - 15 ft. **(x2)**	Fiber Jumper - 15 ft. **(x2)** 1-5/8" LMU Coax - 200 ft. **(x2)**	1-5/8" Coax - 200 ft. **(x2)**	Fiber Jumper - 15 ft. **(x2)**		
TMAs			Generic Twin Style 1B - AWS (AtAntenna)			
Diplexers / Combiners						
Radio	RRUS11 B12 (At Antenna)					
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts Per Sector. ***
*** LNX in Position 1 ***
*** AIR21 B2A/B4P with TMAs in Position 2 ***
*** AIR21 B2P/B4A in Position 3 ***
*** Empty Mount at 4 ***

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Sector 2 (Proposed) view from behind

Coverage Type	A - Outdoor Macro										
Antenna	1		2				3				4
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				Empty Antenna Mount (Empty mount)
Azimuth	150		150				150				
M. Tilt	0		0				0				
Height	180		180				180				
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900	L1900 U2100	L2100	L2100	L1900 G1900	L1900	
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt	2	2	2	2	2	2	2	2	2	2	
Cables	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	1-5/8" Coax - 200 ft. **(x2)**	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		
TMAs						Generic Twin Style 1B - AWS (AtAntenna)					
Diplexers / Combiners					Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)					
Radio			Radio 4449 B71+B85 (AtAntenna)	SHARED Radio 4449 B71+B85 (AtAntenna)	Radio 4415 B25 (AtAntenna)	SHARED Radio 4415 B25 (AtAntenna)					
Sector Equipment											

Unconnected Equipment:

Cable: 1-5/8" Coax - 200 ft.

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 2 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect them to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of PCS/AWS diplexer for load balancing.

Remove AIR21 B2P/B4A for L2100 from Position 3.

Install (1) AIR32 B66A/B2A Dual Band for L2100, L1900 1st Carrier, and GSM in Position 3. GSM will share B2 Radios with L1900 1st Carrier.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Sector 3 (Existing) view from behind

Coverage Type	A - Outdoor Macro					
Antenna	**1**	**2**		**3**		**4**
Antenna Model	Andrew - LNX-6515DS-A1M (Dual)	Ericsson - AIR21 KRC118023-1_B2A_B4P (Quad)		Ericsson - AIR21 KRC118023-1_B2P_B4A (Quad)		Empty Antenna Mount (Empty mount)
Azimuth	270	270		270		
M. Tilt	0	4		4		
Height	180	180		180		
Ports	**P1**	**P2**	**P3**	**P4**	**P5**	
Active Tech.	L700	L1900 G1900	U2100	L2100		
Dark Tech.						
Restricted Tech.						
Decomm. Tech.		U1900				
E. Tilt	2	2	2	2		
Cables	Fiber Jumper - 15 ft. **(x2)**	Fiber Jumper - 15 ft. **(x2)** 1-5/8" LMU Coax - 200 ft. **(x2)**	1-5/8" Coax - 200 ft. **(x2)**	Fiber Jumper - 15 ft. **(x2)**		
TMAs			Generic Twin Style 1B - AWS (AtAntenna)			
Diplexers / Combiners						
Radio	RRUS11 B12 (At Antenna)					
Sector Equipment						

Unconnected Equipment:

Scope of Work:

*** Existing Four Mounts Per Sector. ***
*** LNX in Position 1 ***
*** AIR21 B2A/B4P with TMAs in Position 2 ***
*** AIR21 B2P/B4A in Position 3 ***
*** Empty Mount at 4 ***

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Sector 3 (Proposed) view from behind

Coverage Type	A - Outdoor Macro										
Antenna	1		2				3				4
Antenna Model	Ericsson - AIR6449 B41 (Active Antenna - Massive MIMO)		RFS - APXVAALL24_43-U-NA20 (Octo)				Ericsson - AIR32 KRD901146-1_B66A_B2A (Octo)				Empty Antenna Mount (Empty mount)
Azimuth	270		270				270				
M. Tilt	0		0				4				
Height	180		180				180				
Ports	P1	P2	P3	P4	P5	P6	P7	P8	P9	P10	
Active Tech.	L2500 N2500	L2500 N2500	L700 L600 N600	L700 L600 N600	L1900	L1900 U2100	L2100	L2100	L1900 G1900	L1900	
Dark Tech.											
Restricted Tech.											
Decomm. Tech.											
E. Tilt	2	2	2	2	2	2	2	2	2	2	
Cables	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.	1-5/8" Coax - 200 ft. **(x2)**	Fiber Jumper - 15 ft.		Fiber Jumper - 15 ft.		
TMAs						Generic Twin Style 1B - AWS (AtAntenna)					
Diplexers / Combiners					Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)	SHARED Commscope - SDX1926Q-43 (E14F05P86) (AtAntenna)					
Radio			Radio 4449 B71+B85 (AtAntenna)	SHARED Radio 4449 B71+B85 (AtAntenna)	Radio 4415 B25 (AtAntenna)	SHARED Radio 4415 B25 (AtAntenna)					
Sector Equipment											

Unconnected Equipment:

Cable: 1-5/8" Coax - 200 ft.

Scope of Work:

Remove AIR21 B2A/B4P from Position 1.

Install AIR6449 B41 for L2500 and N2500 in Position 1.

Add (1) PCS/AWS 8:4 diplexer to Position 2 at antenna, and connect its four output ports to the Mid-Band ports of the Octo antenna.

Add (1) Radio 4415 B25 for L1900 2nd Carrier to Position 2 near antenna, and connect its ports to the four PCS input ports of the diplexer.

Move coaxial lines and AWS TMA for U2100 to Position 2, and connect them to two AWS input ports of the diplexer.

Make sure to install metal caps on all empty ports of PCS/AWS diplexer for load balancing.

Remove AIR21 B2P/B4A for L2100 from Position 3.

Install (1) AIR32 B66A/B2A Dual Band for L2100, L1900 1st Carrier, and GSM in Position 3. GSM will share B2 Radios with L1900 1st Carrier.

Ensure RET control is enabled for all technology layers according to the Design Documents.

*A dashed border indicates shared equipment. Any connected equipment is denoted with the SHARED keyword.

RAN Template:	A&L Template:
67D5A997DB Outdoor	67D5997DB_2xAIR+1OP (U21 Market)

CT11230A_Anchor_6_draft

Print Name: Preliminary (RFDS_for_Scoping)
PORs: Anchor_Phase 3
L600_CMP5

Section 7 - Power Systems Equipment

Existing Power Systems Equipment

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

Proposed Power Systems Equipment

Exhibit E

Date: 9/23/2020

To: T-Mobile Northeast, LLC
35 Griffin Road South
Bloomfield, CT 06002

Subject:	**Mount Structural Analysis Report – Replacement**	
T-Mobile Designation:	**Site Name:**	North Haven/ Rt 17
	Site Number:	CT11230A
EFI Designation:	**Project Number:**	049.00850 - 2075059
Site Data:	**88 Parsonage Hill Road, North Branford, CT 06472** **Latitude 41.369440°, Longitude -72.810280°**	

EFI Global, Inc. is pleased to submit this **"Mount Structural Analysis Report - Replacement"** to determine the structural capacity of the antenna mounts utilized by T-Mobile at the above referenced site.

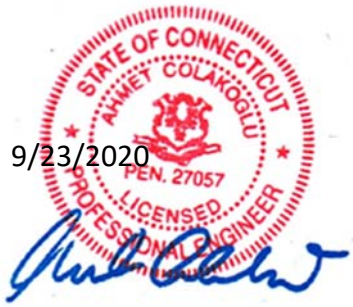
The purpose of the analysis is to determine acceptability of the mount stress level for the changes proposed by T-Mobile. Under the following load case we have determined the mounts to have:

Existing + Proposed Equipment **Adequate Capacity (56.8%)**
Note: See Analysis Criteria for loading configuration

The analysis has been performed in accordance with the TIA-222-G Standard and 2018 Connecticut State Building Code (2015 IBC).

We at *EFI Global, Inc.* appreciate the opportunity of providing our continuing professional services to you. If you have any questions or need further assistance on this or any other projects, please give us a call.

Sincerely,
EFI Global, Inc.
License No: PEC0001245



9/23/2020

Ahmet Colakoglu, PE
Connecticut Professional Engineer
License No: 27057

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

1) ANALYSIS CRITERIA

The analysis was performed for the existing and proposed appurtenances as specified in the loading information referenced below, and per the following loading criteria of Table 1.

Table 1 – Loading and Analysis Criteria

Rad Center	180’
Structure Type	Self-Support Tower
Exposure Category	C
Basic Wind Speed (3-Second Gust)	125 * √0.6 = 97 mph (Nominal)
Ice Loading	0.75” with 50 mph Wind
Risk Category	II
Topographic Factor	Kzt = 1.0

Table 1.1 – Existing Appurtenance Configuration

Qty	Model
3	Andrew LNX-6515DS-A1M – Antennas
3	Ericsson AIR21 B2A B4P – Antennas
3	Ericsson AIR21 B2P B4A – Antennas
3	RRUS 11 B12 – RRUs
3	Generic Twin Style 1B - AWS – TMAs

Table 1.2 – Proposed and Final Appurtenance Configuration

Qty	Model
3	Ericsson AIR6449 B41 – Antennas
3	RFS APXVAALL24_43-U-NA20 – Antennas
3	Ericsson AIR32 B66A B2A – Antennas
3	Radio 4449 B71 + B85 – RRUs*
3	Radio 4415 B25 – RRUs*
3	Generic Twin Style 1B - AWS – TMAs*
3	Commscope SDX1926Q-43 – Diplexers*
-	Valmont/Site Pro 1 12’-6” Heavy Duty V-Frame Assembly with Two Stiff Arms (P/N: VFA12-HD)

***To be mounted behind antennas**

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

Table 1.3 – Assumed Material Properties

Member Type	ASTM Material Designation	Fy (ksi)	Fu (ksi)
Pipes	A53 Gr. B	35	60
Angles/Channels	A36	36	58
Rectangular HSS	A500 Gr. B - 46	46	58
Round HSS	A500 Gr. B - 42	42	58
Others (UNO)	A572 Gr. 50	50	65

2) ANALYSIS PROCEDURE

The analysis is based on the following information:

Table 2 – Documents

Document	Provided By	Date
RFDS	T-Mobile	08/24/2020
Mount Structural Evaluation	Destek Engineering	07/16/2019
Structural Analysis Report	Destek Engineering	07/16/2019
Site Photographs	-	04/15/2019

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

2.1) Analysis Method

Risa-3D, a commercially available analysis software package, was used to create a three-dimensional model of the mount and calculate member stresses for various loading cases. Selected output from the analysis is included in the Appendix.

2.2) Analysis Conditions and Assumptions

1) The mount was built and installed in accordance with the manufacturer's specifications.
2) The mount has been maintained and will be maintained in accordance with the manufacturer's specifications. All structural members and connections of the mount are in good condition and can achieve theoretical strength.
3) The configuration of antennas is as specified in "1) Analysis Criteria".
4) The analysis was performed for the subject mount only. It does not include an evaluation of the other mounts or the tower, which should be analyzed by others.
5) The evaluation does not include any antenna rigging loads. The equipment should not be rigged using the subject antenna mount as the support.
6) The analysis includes a minimum 250 lbf maintenance point load at the worst-case location on the mount, as well as a minimum 500 lbf maintenance point load at each antenna location in conjunction with a 30 mph wind load.
7) Any steel grating represented in this model is for loading purposes only and it is not considered to provide any structural restraint or support.
8) Member sizes per the available mount specifications and assumed based on our experience with similar structures. Please refer to calculation output in the appendix of this report for sizes and lengths assumed.
9) 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.

EFI Global, Inc. (EFI), must be notified immediately if any of these assumptions are discovered to be incorrect. The results of this analysis may be affected if any of the assumptions are not valid or have been made in error.

3) ANALYSIS RESULTS AND CONCLUSION

The analysis results are shown on the table below.

Table 3.1 – Mount Component Stresses vs. Capacity

Component	% Capacity	Pass / Fail
Horizontal Face Pipe	27.7	Pass
Horizontal Standoff Pipe	34.6	Pass
Vertical Standoff Solid Rod	52.8	Pass
Diagonal Standoff Solid Rod	29.1	Pass
Antenna Mount Pipe	56.8	Pass
Connection Plates	41.6	Pass
Pipe Kicker	<20.0	Pass

Sector Mounts: The proposed sector mounts have **adequate** capacity for the proposed changes by T-Mobile. **The existing sector mount at each sector should be replaced with Valmont/Site Pro 1 12'-6" Heavy Duty V-Frame Assembly with Two Stiff Arms (P/N: VFA12-HD), specs as attached on appendix**. For the code specified load combinations and as a maximum, the mount members are stressed to **56.8%** of their structural capacity.

This analysis also assumes the following:

- **The mount centerline is equal to the antenna RAD centerline.**
- **(4) 96" long 2.0 STD mount pipes are equally spaced along the face.**
- **The (2) tieback arms are attached directly to the adjacent mount's tower legs.**

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

APPENDIX

INPUT LOADS
ANALYSIS OUTPUT
MOUNT SPECIFICATIONS

EFI Global, Inc.
1117 Perimeter Center West, Suite E500, Atlanta, GA 30338 - Tel: (770) 693-0835

CLIENT: Foresite LLC / T-Mobile

PROJECT: CT11230A

SUBJECT: Antenna Loads - G Code with Sections 16 Revisions

Tower Height	195.00	ft	Type of Mount: Sector
Basic Wind Speed, V	97	mph (=Ultimate Speed*Sqrt(0.6))	
Basic Wind Speed with Ice, V_i	50	mph	
Maintanence Load Factor, L_{FM}	0.0957	Load Factor for Maint. Load Cases (Basic Wind Speed=30 mph)	
Design Ice Thickness, t_i	0.75	inches	

Table 2-3 Importance Factors

Structure Classification	Wind Load Without Ice	Wind Load With Ice	Ice Thickness	Earthquake
II	1	1	1	1

Table 2-4 Exposure Category Coefficients

Exposure Category	Zg	α	Kzmin	Ke	m
C	900	9.5	0.85	1	0.6

Table 2-5 Topographic Categories

Kzt 1.000

Table 2-2 Wind Directionality Factor, Kd

Structure Type	Kd	
1 Lattice Tower	0.95	DOES NOT CHANGE

Gust Effect Factor Gh

Structure Type	Gh	
1 Lattice Tower	1.00	DOES NOT CHANGE

Shielding Factor, Ka

Structure Type	Ka	
Lattice Tower	0.90	DOES NOT CHANGE

CLIENT: Foresite LLC / T-Mobile

PROJECT: CT11230A

SUBJECT: Antenna Loads - G Code with Sections 16 Revisions

Rad Center **180.00** ft

Antenna AND Mount Without Ice

Mounting Pole	Height (ft)	Model Number	#	Weight (lbs)	H (in)	*W (in)	D (in)	Ka	**A_N (ft2)	***A_T (ft2)	Aspect (FRONT)	Aspect (SIDE)	Ca (FRONT)	Ca (SIDE)	K_z	q_z (psf)	Pounds: Wind Load (Front)	Wind Load (Side)	Dead Load	Total Wind Load (Front)	Total Wind Load (Side)	Total Dead Load
Pos. 1	**180.00**	Ericsson AIR6449 B41	1	114.6	33.1	20.5	8.5	0.90	4.72	1.96	1.61	3.88	1.20	1.26	1.432	32.8	166.9	73.0	114.63	167	73	115
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
																				84	**37**	**58**
Pos.2	**180.00**	RFS APXVAALL24_43-U-NA20	1	149.9	95.9	24.0	8.5	0.90	15.98	5.66	4.00	11.28	1.27	1.54	1.432	32.8	597.1	257.6	149.9	597	333	284
	180.00	Commscope SDX1926Q-43	1	6.2	4.2	N/A	2.9	0.90	-	0.08	-	1.43	-	1.20	1.432	32.8	0.0	3.0	6.17			
	180.00	Radio 4449 B71+B85	1	73.2	17.9	N/A	10.6	0.90	-	1.32	-	1.68	-	1.20	1.432	32.8	0.0	46.8	73.21			
	180.00	Radio 4415 B25	1	44.0	15.0	N/A	5.4	0.90	-	0.56	-	2.78	-	1.21	1.432	32.8	0.0	20.0	44			
	180.00	Generic Twin Style 1B - AWS	1	11.0	7.0	N/A	3.0	0.90	-	0.15	-	2.33	-	1.20	1.432	32.8	0.0	5.2	11			
																				299	**167**	**143**
Pos.3	**180.00**	Ericsson AIR32 B66A_B2A	1	172.0	59.3	12.9	8.7	0.90	5.30	3.58	4.60	6.81	1.29	1.39	1.432	32.8	202.0	146.9	171.96	202	147	172
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
																				102	**74**	**86**
Pos.4		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0	0	0	0
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
		Empty		0.0	-	-	-	0.90	-	-	-	-	-	-	-	-	0.0	0.0	0			
																				0	**0**	**0**

* Enter N/A in the W column for front sheilded apurtanances.

** A_N is the product of H and W

*** A_T is the product of H and D

DL #REF!

Mount	Height (ft)	Member	*L (in)	**W (in)	D (in)	*** Ca	K_z	q_z (psf)	Wind Load (PLF)
	180.00	2.5 STD Pipe	12.00	2.88	0.00	1.20	1.432	29.5	8
	180.00	2.0 STD Pipe	12.00	2.38	0.00	1.20	1.432	29.5	7
	180.00	5/8" SR	12.00	0.63	0.00	1.20	1.432	29.5	2
	180.00	3/4" SR	12.00	0.75	0.00	1.20	1.432	29.5	2
	180.00	L3x3x4	0.00	3.00	3.00	-	-	-	-
	180.00	L3x1.75x3	0.00	3.00	1.75	-	-	-	-
	180.00	Angle Diagonal	0.00	0.00	0.00	-	-	-	-
	180.00	Plate Horizontal (PL0.625x3.5)	12.00	0.63	3.50	2.00	1.432	29.5	3
	180.00	Plate Horizontal (PL2x0.625)	0.00	2.00	0.63	-	-	-	-
	180.00	Tube Radial (4x4)	0.00	4.00	4.00	-	-	-	-
	180.00	Double Angle (LL2x2x3x0)	0.00	2.00	2.00	-	-	-	-
	180.00	Double Angle (LL3x3x4x0)	0.00	3.00	3.00	-	-	-	-
	180.00	Channel (Weak Axis Bending)	0.00	0.00	0.00	-	-	-	-
	180.00	Invert U 5.375x3.625x.375	0.00	3.63	5.38	-	-	-	-

* The dimension L is the longest dimension of the member

** The dimension W is the height or width of the member that resists wind load

*** Ca will equal 1.2 for round members and 2.0 for flat members

CLIENT: Foresite LLC / T-Mobile

PROJECT: CT11230A

SUBJECT: Antenna Loads - G Code with Sections 16 Revisions

ti (in) 1.777326 Kiz 1.1848841 reduction 0.2657

Antenna AND Mount With Ice

Mounting Pole	Height (ft)	Model Number	#	H (in)	W (in)	D (in)	Ka	*A_N (ft2)	*A_T (ft2)	*Volume Ice (ft3)	*Weight Ice (lbs)	**Ca (FRONT)	**Ca (SIDE)	Kz	q_z (psf)	Pounds: Ice Wind Load (Front)	Ice Wind Load (Side)	Combined Wind Load (Front)	Combined Wind Load (Side)	Ice Dead Load	**Total Wind Load (Front)	**Total Wind Load (Side)	Total Ice Load
Pos. 1	**180.00**	Ericsson AIR6449 B41	1	33.1	20.5	8.5	0.90	1.41	1.12	2.82	157.89	0.70	0.71	1.432	8.7	7.7	6.2	52.1	25.6	158	52	26	158
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					27	**13**	**79**
Pos.2	**180.00**	RFS APXVAALL24_43-U-NA20	1	95.9	24.0	8.5	0.90	3.05	2.66	7.80	436.57	0.72	0.83	1.432	8.7	17.3	17.3	176.0	85.7	437	176	117	607
	180.00	Commscope SDX1926Q-43	1	4.2	6.9	2.9	0.90	-	0.26	0.25	14.25	0.70	0.70	1.432	8.7	0.0	1.4	0.0	2.2	14			
	180.00	Radio 4449 B71+B85	1	17.9	13.2	10.6	0.90	-	0.79	1.50	83.88	0.70	0.70	1.432	8.7	0.0	4.3	0.0	16.8	84			
	180.00	Radio 4415 B25	1	15.0	13.2	5.4	0.90	-	0.59	0.99	55.40	0.70	0.70	1.432	8.7	0.0	3.2	0.0	8.6	55			
	180.00	Generic Twin Style 1B - AWS	1	7.0	6.0	3.0	0.90	-	0.33	0.31	17.34	0.70	0.70	1.432	8.7	0.0	1.8	0.0	3.2	17			
																					88	**59**	**304**
Pos.3	**180.00**	Ericsson AIR32 B66A_B2A	1	59.3	12.9	8.7	0.90	1.87	1.77	3.48	194.67	0.73	0.76	1.432	8.7	10.7	10.5	64.4	49.5	195	64	50	195
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					33	**25**	**98**
Pos.4		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0	0	0	0
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
		Empty		-	-	-	0.90	-	-	-	0.00	-	-	-	-	0.0	0.0	0.0	0.0	0			
																					0	**0**	**0**

* A_N ,A_T, Volume Ice and Weight Ice are calculated per unit

** Ca will equal 1.2 for all ice load calculations

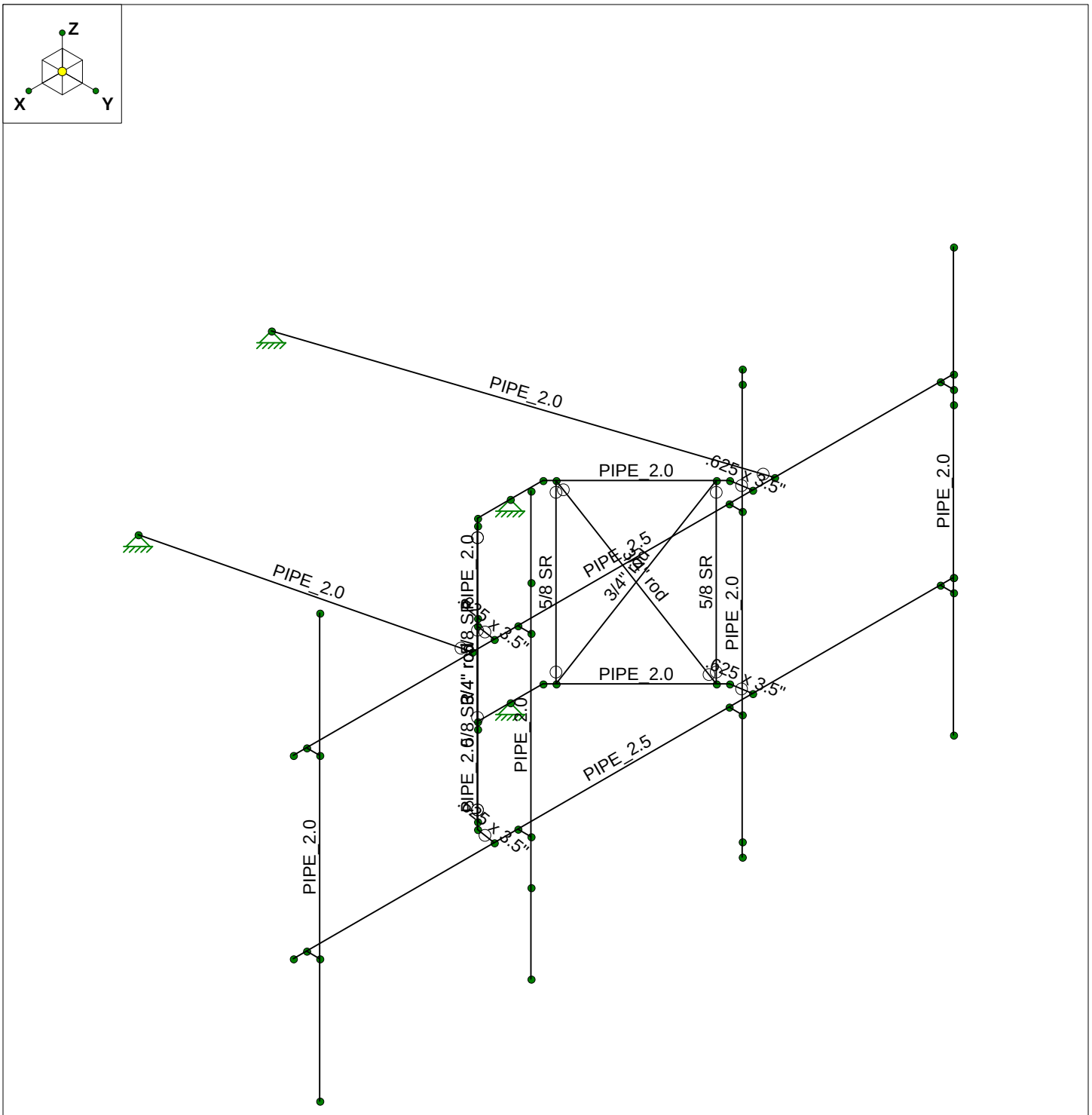
Mount	Height (ft)	Member	*L (in)	**W (in)	D (in)	***A_N (ft2)	Volume Ice (ft3)	Weight Ice (lbs)	****Ca (FRONT)	Kz	q_z (psf)	PLF: Ice Wind Load (Front)	Combined Wind Load (Front)	Ice Dead Load
	180.00	2.5 STD Pipe	12.00	2.88	0.00	0.45	0.18	10.10	1.20	1.432	7.8	4.3	6.5	10
	180.00	2.0 STD Pipe	12.00	2.38	0.00	0.44	0.16	9.02	1.20	1.432	7.8	4.2	6.0	9
	180.00	5/8" SR	12.00	0.63	0.00	0.40	0.09	5.22	1.20	1.432	7.8	3.8	4.2	5
	180.00	3/4" SR	12.00	0.75	0.00	0.40	0.10	5.49	1.20	1.432	7.8	3.8	4.4	5
	180.00	L3x3x4	0.00	3.00	3.00	-	-	-	-	-	-	-	-	-
	180.00	L3x1.75x3	0.00	3.00	1.75	-	-	-	-	-	-	-	-	-
	180.00	Angle Diagonal	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	180.00	Plate Horizontal (PL0.625x3.5)	12.00	0.63	3.50	0.40	0.25	14.01	1.20	1.432	7.8	3.8	4.6	14
	180.00	Plate Horizontal (PL2x0.625)	0.00	2.00	0.63	-	-	-	-	-	-	-	-	-
	180.00	Tube Radial (4x4)	0.00	4.00	4.00	-	-	-	-	-	-	-	-	-
	180.00	Double Angle (LL2x2x3x0)	0.00	2.00	2.00	-	-	-	-	-	-	-	-	-
	180.00	Double Angle (LL3x3x4x0)	0.00	3.00	3.00	-	-	-	-	-	-	-	-	-
	180.00	Channel (Weak Axis Bending)	0.00	0.00	0.00	-	-	-	-	-	-	-	-	-
	180.00	Invert U 5.375x3.625x.375	0.00	3.63	5.38	-	-	-	-	-	-	-	-	-

* The dimension L is the longest dimension of the member

** The dimension W is the height or width of the member that resists wind load

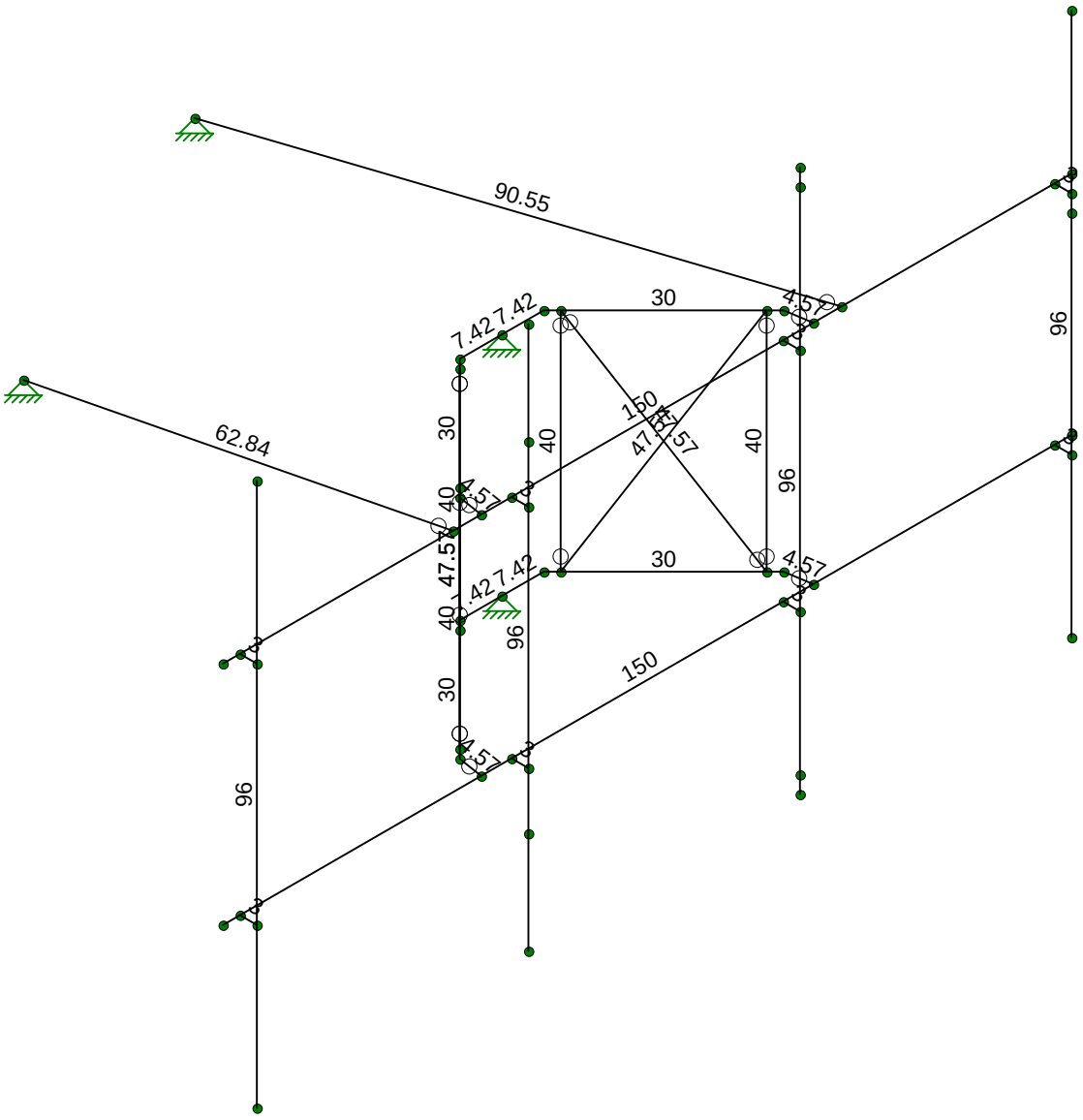
*** A_N is the area of ice built up on the LW plane

**** Ca will equal 1.2 for all ice load calculations

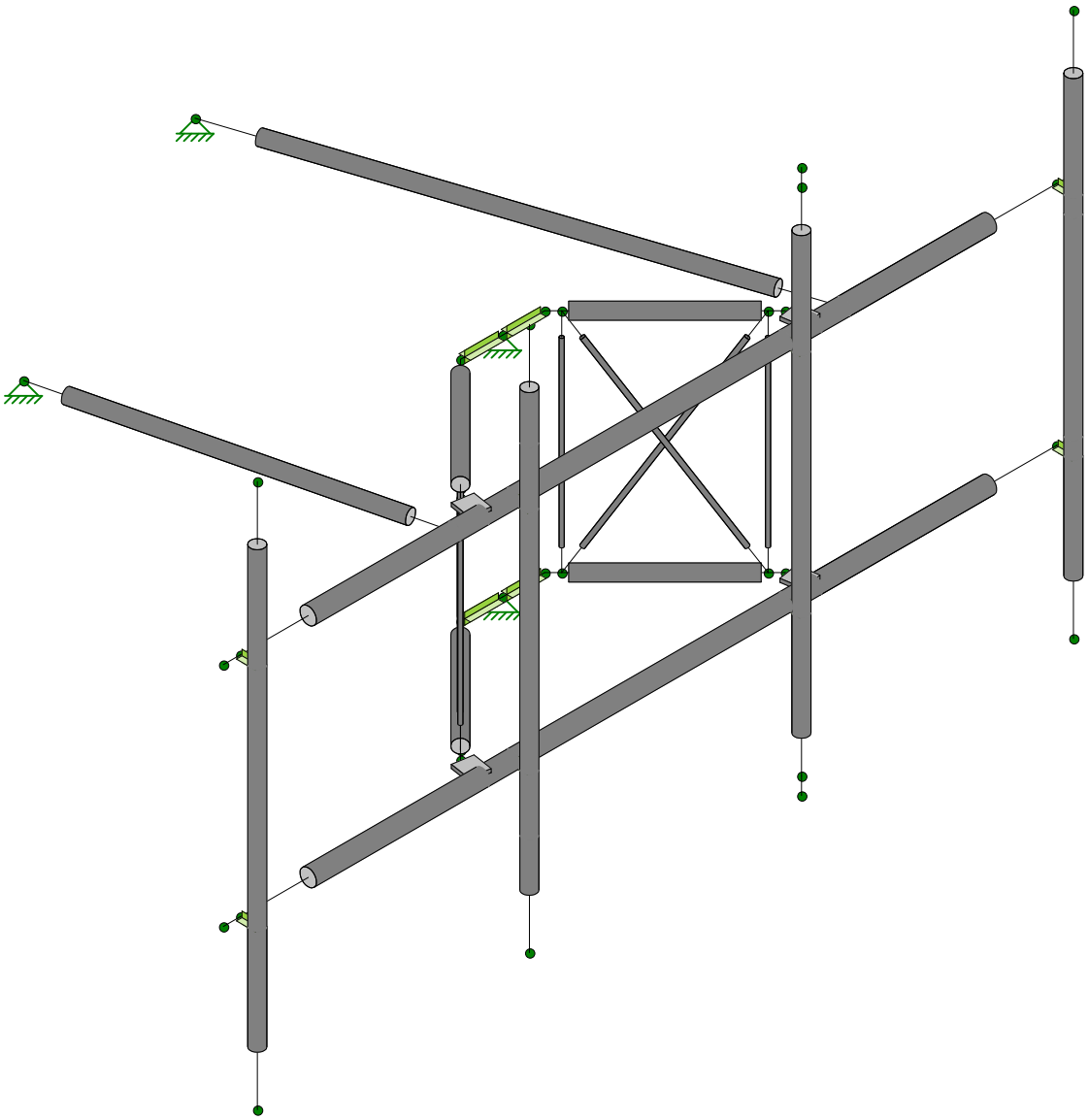


Envelope Only Solution

Foresite LLC / EFI Global ...	CT11230A	SK - 1
AG		Sept 21, 2020 at 10:23 AM
2075059		CT11230A - Replacement.r3d

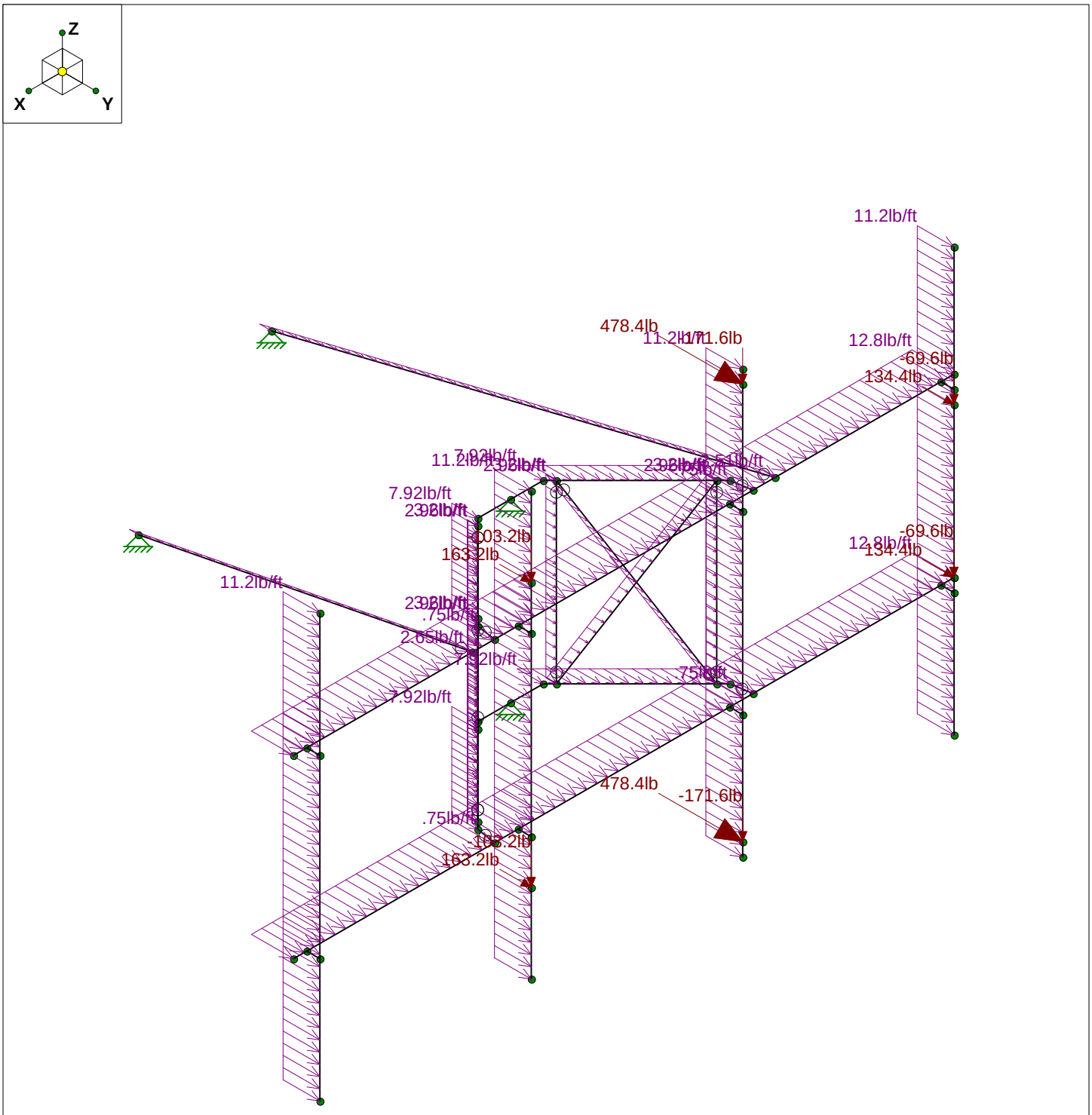


Foresite LLC / EFI Global ...		SK - 2
AG	CT11230A	Sept 21, 2020 at 10:25 AM
2075059		CT11230A - Replacement.r3d



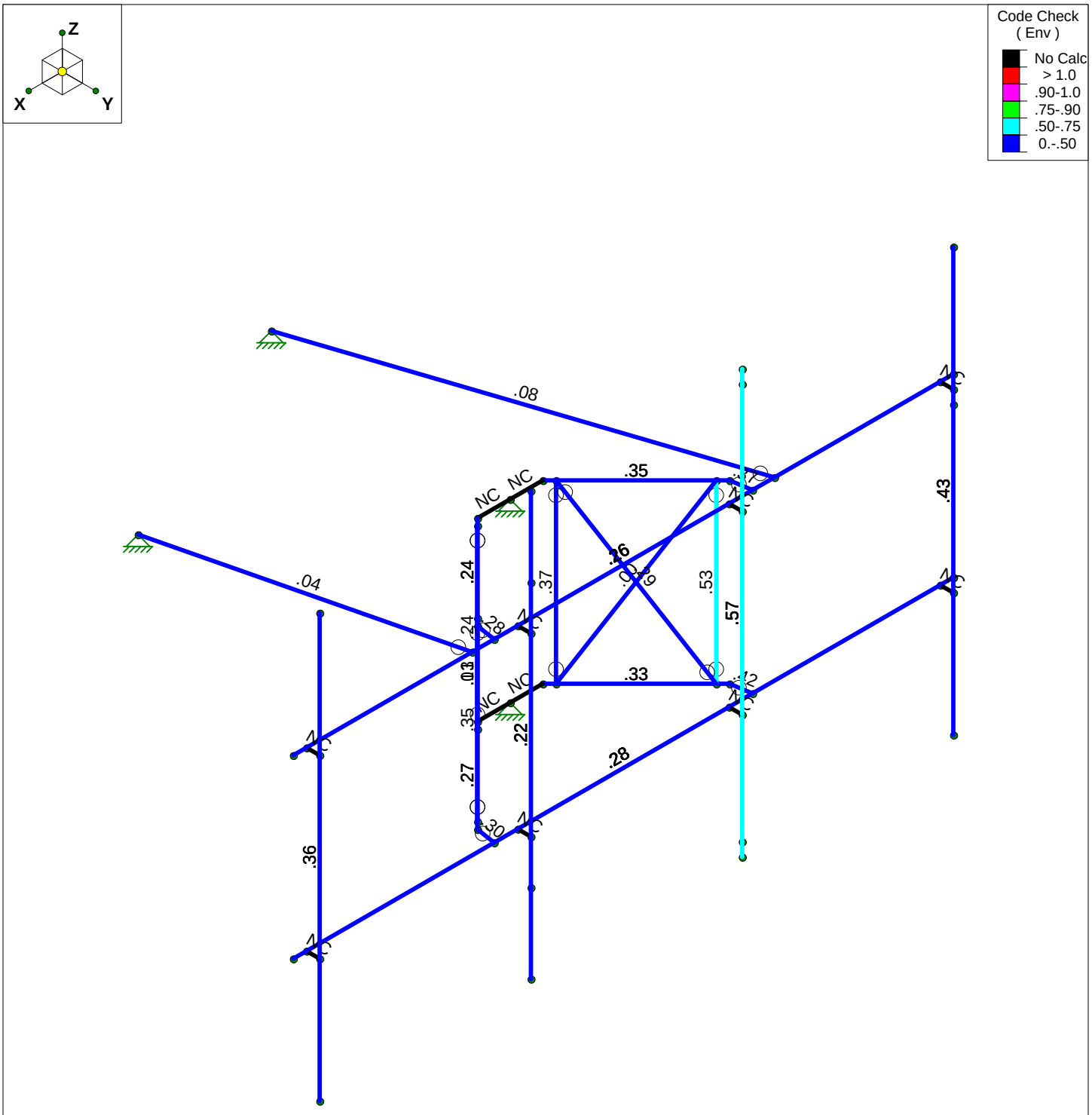
Envelope Only Solution

Foresite LLC / EFI Global ...		SK - 3
AG	CT11230A	Sept 21, 2020 at 10:26 AM
2075059		CT11230A - Replacement.r3d



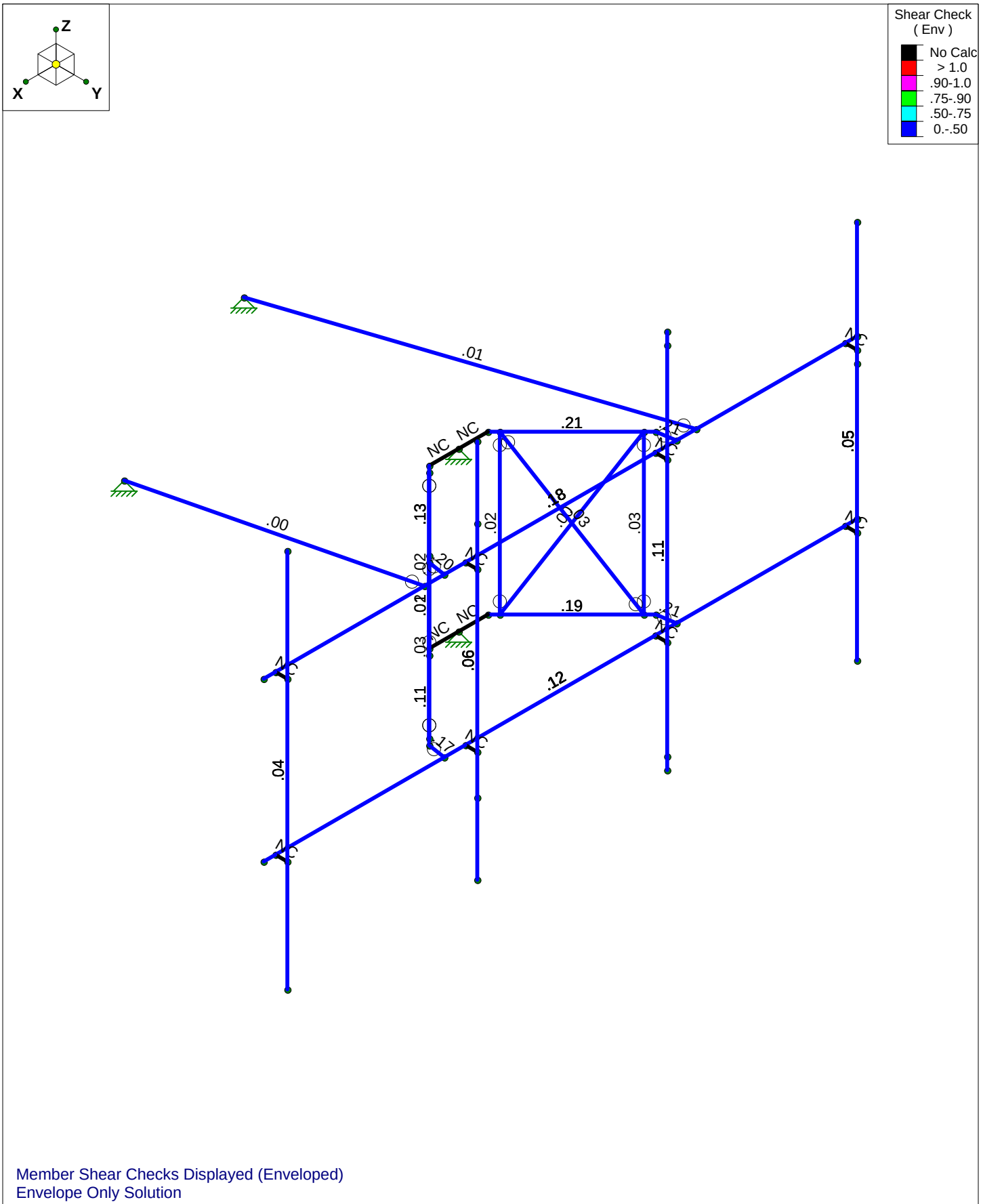
Loads: LC 1, DL + WL (NO ICE) 0 Degree
Envelope Only Solution

Foresite LLC / EFI Global ...		SK - 4
AG	CT11230A	Sept 21, 2020 at 10:29 AM
2075059		CT11230A - Replacement.r3d



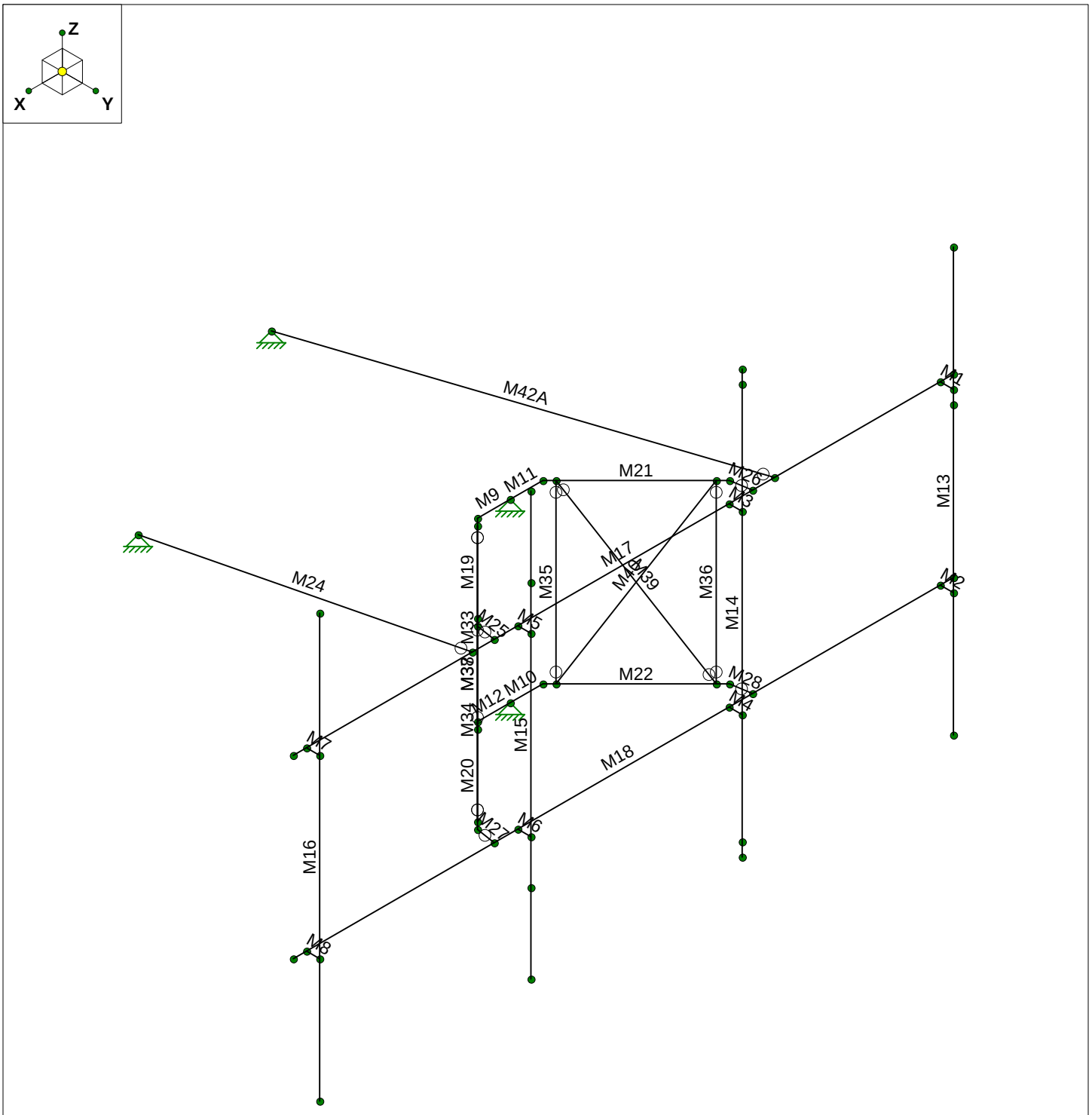
Member Code Checks Displayed (Enveloped)
Envelope Only Solution

Foresite LLC / EFI Global ...		SK - 5
AG	CT11230A	Sept 21, 2020 at 10:29 AM
2075059		CT11230A - Replacement.r3d



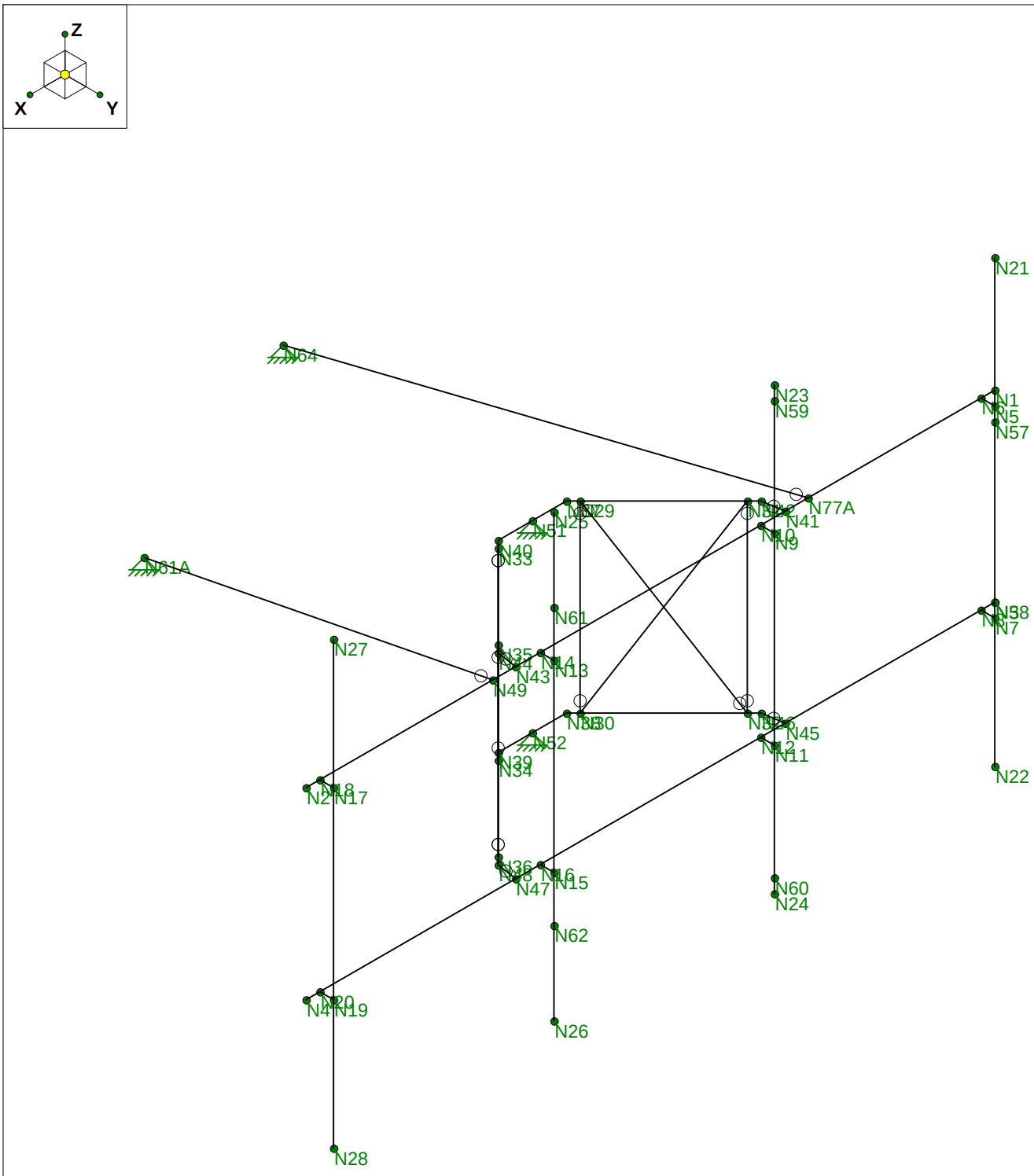
Member Shear Checks Displayed (Enveloped)
Envelope Only Solution

Foresite LLC / EFI Global ...		SK - 6
AG	CT11230A	Sept 21, 2020 at 10:30 AM
2075059		CT11230A - Replacement.r3d



Envelope Only Solution

Foresite LLC / EFI Global ...	CT11230A	SK - 7
AG		Sept 21, 2020 at 10:30 AM
2075059		CT11230A - Replacement.r3d



Envelope Only Solution

Foresite LLC / EFI Global ...	CT11230A	SK - 8
AG		Sept 21, 2020 at 10:30 AM
2075059		CT11230A - Replacement.r3d

(Global) Model Settings

Display Sections for Member Calcs	5
Max Internal Sections for Member Calcs	97
Include Shear Deformation?	Yes
Increase Nailing Capacity for Wind?	Yes
Include Warping?	Yes
Trans Load Btwn Intersecting Wood Wall?	Yes
Area Load Mesh (in^2)	144
Merge Tolerance (in)	.12
P-Delta Analysis Tolerance	0.50%
Include P-Delta for Walls?	Yes
Automatically Iterate Stiffness for Walls?	No
Max Iterations for Wall Stiffness	3
Gravity Acceleration (in/sec^2)	386.4
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Z
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 14th(360-10): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 14th(360-10): LRFD
Cold Formed Steel Code	AISI NAS-01: ASD
Wood Code	AF&PA NDS-05/08: ASD
Wood Temperature	< 100F
Concrete Code	ACI 318-05
Masonry Code	ACI 530-05: ASD
Aluminum Code	AA ADM1-05: ASD - Building AISC 14th(360-10): ASD

Number of Shear Regions	4
Region Spacing Increment (in)	4
Biaxial Column Method	Exact Integration
Parme Beta Factor (PCA)	.65
Concrete Stress Block	Rectangular
Use Cracked Sections?	Yes
Use Cracked Sections Slab?	No
Bad Framing Warnings?	No
Unused Force Warnings?	Yes
Min 1 Bar Diam. Spacing?	No
Concrete Rebar Set	REBAR_SET_ASTMA615
Min % Steel for Column	1
Max % Steel for Column	8

(Global) Model Settings, Continued

Seismic Code	ASCE 7-05
Seismic Base Elevation (in)	Not Entered
Add Base Weight?	Yes
Ct X	.035
Ct Z	.035
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	8.5
R Z	8.5
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	1
SDS	1
S1	1
TL (sec)	Not Entered
Occupancy Cat	I or II
Drift Cat	Other
Om Z	1
Om X	1
Cd Z	4
Cd X	4
Rho Z	1
Rho X	1

Project Grid Lines

	Label	Start X [in]	End X [in]	Start Y [in]	End Y [in]	Start Bubble	End Bubble
No Data to Print ...							

Hot Rolled Steel Properties

	Label	E [ksi]	G [ksi]	Nu	Therm (\1E...	Density[k/ft...	Yield[ksi]	Ry	Fu[ksi]	Rt
1	A36 Gr.36	29000	11154	.3	.65	.49	36	1.5	58	1.2
2	A572 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.2
3	A992	29000	11154	.3	.65	.49	50	1.1	65	1.2
4	A500 Gr.42	29000	11154	.3	.65	.49	42	1.3	58	1.1
5	A500 Gr.46	29000	11154	.3	.65	.49	46	1.2	58	1.1
6	A53 Gr.B	29000	11154	.3	.65	.49	35	1.5	60	1.2
7	A529 Gr.50	29000	11154	.3	.65	.49	50	1.1	65	1.2

Hot Rolled Steel Section Sets

	Label	Shape	Type	Design List	Material	Design Rules	A [in2]	Iyy [in4]	Izz [in4]	J [in4]
1	HR1A	C15x50	Beam	Wide Flange	A36 Gr.36	Typical	14.7	11	404	2.65

Member Primary Data

	Label	I Joint	J Joint	...	Rotate...	Section/Shape	Type	Design List	Material	Design ...
1	M12	N52	N39			RIGID	None	None	LINK	Typical
2	M11	N51	N37			RIGID	None	None	LINK	Typical
3	M10	N38	N52			RIGID	None	None	LINK	Typical
4	M9	N40	N51			RIGID	None	None	LINK	Typical
5	M8	N19	N20			RIGID	None	None	LINK	Typical
6	M7	N17	N18			RIGID	None	None	LINK	Typical
7	M6	N15	N16			RIGID	None	None	LINK	Typical
8	M5	N13	N14			RIGID	None	None	LINK	Typical

Member Primary Data (Continued)

	Label	I Joint	J Joint	...	Rotate...	Section/Shape	Type	Design List	Material	Design ...
9	M4	N11	N12			RIGID	None	None	LINK	Typical
10	M3	N9	N10			RIGID	None	None	LINK	Typical
11	M2	N7	N8			RIGID	None	None	LINK	Typical
12	M1	N5	N6			RIGID	None	None	LINK	Typical
13	M18	N3	N4			PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical
14	M17	N1	N2			PIPE_2.5	Beam	Pipe	A53 Gr.B	Typical
15	M24	N49	N61A			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
16	M22	N38	N46			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
17	M21	N37	N42			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
18	M20	N39	N48			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
19	M19	N40	N44			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
20	M16	N27	N28			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
21	M15	N25	N26			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
22	M14	N23	N24			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
23	M13	N21	N22			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
24	M42A	N77A	N64			PIPE_2.0	Beam	Pipe	A53 Gr.B	Typical
25	M36	N31	N32			5/8 SR	Beam	BAR	A36 Gr.36	Typical
26	M35	N29	N30			5/8 SR	Beam	BAR	A36 Gr.36	Typical
27	M34	N35	N36			5/8 SR	Beam	BAR	A36 Gr.36	Typical
28	M33	N33	N34			5/8 SR	Beam	BAR	A36 Gr.36	Typical
29	M40	N31	N30			3/4" rod	Beam	BAR	A36 Gr.36	Typical
30	M39	N29	N32			3/4" rod	Beam	BAR	A36 Gr.36	Typical
31	M38	N33	N36			3/4" rod	Beam	BAR	A36 Gr.36	Typical
32	M37	N35	N34			3/4" rod	Beam	BAR	A36 Gr.36	Typical
33	M28	N46	N45			.625 x 3.5"	None	None	A36 Gr.36	Typical
34	M27	N48	N47			.625 x 3.5"	None	None	A36 Gr.36	Typical
35	M26	N42	N41			.625 x 3.5"	None	None	A36 Gr.36	Typical
36	M25	N44	N43			.625 x 3.5"	None	None	A36 Gr.36	Typical

Member Advanced Data

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
1	M12						Yes			None
2	M11						Yes			None
3	M10						Yes			None
4	M9						Yes			None
5	M8						Yes			None
6	M7						Yes			None
7	M6						Yes			None
8	M5						Yes			None
9	M4						Yes			None
10	M3						Yes			None
11	M2						Yes			None
12	M1						Yes			None
13	M18						Yes			None
14	M17						Yes			None
15	M24	BenPIN					Yes			None
16	M22						Yes			None
17	M21						Yes			None
18	M20						Yes			None
19	M19						Yes			None
20	M16						Yes			None
21	M15						Yes			None
22	M14						Yes			None
23	M13						Yes			None
24	M42A	BenPIN					Yes			None

Member Advanced Data (Continued)

	Label	I Release	J Release	I Offset[in]	J Offset[in]	T/C Only	Physical	Analysis ...	Inactive	Seismic Design ...
25	M36	BenPIN	BenPIN				Yes			None
26	M35	BenPIN	BenPIN				Yes			None
27	M34	BenPIN	BenPIN				Yes			None
28	M33	BenPIN	BenPIN				Yes			None
29	M40					Tension O...	Yes			None
30	M39	BenPIN	BenPIN				Yes			None
31	M38	BenPIN	BenPIN				Yes			None
32	M37					Tension O...	Yes			None
33	M28		BenPIN				Yes			None
34	M27		BenPIN				Yes			None
35	M26		BenPIN				Yes			None
36	M25		BenPIN				Yes			None

Hot Rolled Steel Design Parameters

	Label	Shape	Length[in]	Lbyy[in]	Lbzz[in]	Lcomp top[in]	Lcomp bot[in]	L-torq...	Kyy	Kzz	Cb	Function
1	M18	PIPE_2.5	150									Lateral
2	M17	PIPE_2.5	150									Lateral
3	M24	PIPE_2.0	62.84									Lateral
4	M22	PIPE_2.0	30									Lateral
5	M21	PIPE_2.0	30									Lateral
6	M20	PIPE_2.0	30									Lateral
7	M19	PIPE_2.0	30									Lateral
8	M16	PIPE_2.0	96									Lateral
9	M15	PIPE_2.0	96									Lateral
10	M14	PIPE_2.0	96									Lateral
11	M13	PIPE_2.0	96									Lateral
12	M42A	PIPE_2.0	90.55									Lateral
13	M36	5/8 SR	40	33.62	33.62				.7	.7		Lateral
14	M35	5/8 SR	40	33.62	33.62				.7	.7		Lateral
15	M34	5/8 SR	40	33.62	33.62				.7	.7		Lateral
16	M33	5/8 SR	40	33.62	33.62				.7	.7		Lateral
17	M40	3/4" rod	47.57									Lateral
18	M39	3/4" rod	47.57						.7	.7		Lateral
19	M38	3/4" rod	47.57						.7	.7		Lateral
20	M37	3/4" rod	47.57									Lateral
21	M28	.625 x 3.5"	4.57									Lateral
22	M27	.625 x 3.5"	4.57									Lateral
23	M26	.625 x 3.5"	4.57									Lateral
24	M25	.625 x 3.5"	4.57									Lateral

Joint Coordinates and Temperatures

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
1	N1	-75	0	40	0	
2	N2	75	0	40	0	
3	N3	-75	0	0	0	
4	N4	75	0	0	0	
5	N5	-72	3	40	0	
6	N6	-72	0	40	0	
7	N7	-72	3	0	0	
8	N8	-72	0	0	0	
9	N9	-24	3	40	0	
10	N10	-24	0	40	0	
11	N11	-24	3	0	0	
12	N12	-24	0	0	0	

Joint Coordinates and Temperatures (Continued)

	Label	X [in]	Y [in]	Z [in]	Temp [F]	Detach From Diap...
13	N13	24	3	40	0	
14	N14	24	0	40	0	
15	N15	24	3	0	0	
16	N16	24	0	0	0	
17	N17	72	3	40	0	
18	N18	72	0	40	0	
19	N19	72	3	0	0	
20	N20	72	0	0	0	
21	N21	-72	3	68	0	
22	N22	-72	3	-28	0	
23	N23	-24	3	68	0	
24	N24	-24	3	-28	0	
25	N25	24	3	68	0	
26	N26	24	3	-28	0	
27	N27	72	3	68	0	
28	N28	72	3	-28	0	
29	N29	-8.927223	-24.223102	40	0	
30	N30	-8.927223	-24.223102	0	0	
31	N31	-27.135223	-6.015102	40	0	
32	N32	-27.135223	-6.015102	0	0	
33	N33	8.927223	-24.223102	40	0	
34	N34	8.927223	-24.223102	0	0	
35	N35	27.135223	-6.015102	40	0	
36	N36	27.135223	-6.015102	0	0	
37	N37	-7.424621	-25.725704	40	0	
38	N38	-7.424621	-25.725704	0	0	
39	N39	7.424621	-25.725704	0	0	
40	N40	7.424621	-25.725704	40	0	
41	N41	-29.35	0	40	0	
42	N42	-28.637825	-4.5125	40	0	
43	N43	29.35	0	40	0	
44	N44	28.637825	-4.5125	40	0	
45	N45	-29.35	0	-7.1e-15	0	
46	N46	-28.637825	-4.5125	0	0	
47	N47	29.35	0	7.1e-15	0	
48	N48	28.637825	-4.5125	0	0	
49	N49	34.35	0	39.999996	0	
50	N51	0	-25.725704	40	0	
51	N52	0	-25.725704	0	0	
52	N77A	-34.35	0	39.999996	0	
53	N64	-6	-86	39.999998	0	
54	N57	-72	3	37	0	
55	N58	-72	3	3	0	
56	N59	-24	3	65	0	
57	N60	-24	3	-25	0	
58	N61	24	3	50	0	
59	N62	24	3	-10	0	
60	N61A	49.199072	-61.059004	40	0	

Joint Boundary Conditions

	Joint Label	X [k/in]	Y [k/in]	Z [k/in]	X Rot.[k-ft/rad]	Y Rot.[k-ft/rad]	Z Rot.[k-ft/rad]
1	N51	Reaction	Reaction	Reaction			
2	N52	Reaction	Reaction	Reaction			
3	N64	Reaction	Reaction	Reaction			
4	N61A	Reaction	Reaction	Reaction			

Basic Load Cases

	BLC Description	Category	X Gravi..	Y Gravi..	Z Gravity	Joint	Point	Distrib...	Area(M...	Surfac...
1	DEAD LOAD	None			-1	6				
2	DEAD LOAD ICE	None				6		24		
3	WIND LOAD (NO ICE) FRONT	None				6		24		
4	WIND LOAD (NO ICE) SIDE	None				6		24		
5	WIND LOAD (ICE) FRONT	None				6		24		
6	WIND LOAD (ICE) SIDE	None				6		24		
7	LIVE LOAD1	None				1				
8	LIVE LOAD2	None				1				
9	LIVE LOAD3	None								
10	MAINTENANCE LOAD 1	None				1				
11	MAINTENANCE LOAD 2	None				1				
12	MAINTENANCE LOAD 3	None				1				
13	MAINTENANCE LOAD 4	None				1				

Joint Loads and Enforced Displacements (BLC 1 : DEAD LOAD)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N57	L	Z	-58
2	N58	L	Z	-58
3	N60	L	Z	-143
4	N59	L	Z	-143
5	N61	L	Z	-86
6	N62	L	Z	-86

Joint Loads and Enforced Displacements (BLC 2 : DEAD LOAD ICE)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N57	L	Z	-79
2	N58	L	Z	-79
3	N60	L	Z	-304
4	N59	L	Z	-304
5	N61	L	Z	-98
6	N62	L	Z	-98

Joint Loads and Enforced Displacements (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N57	L	Y	84
2	N58	L	Y	84
3	N60	L	Y	299
4	N59	L	Y	299
5	N61	L	Y	102
6	N62	L	Y	102

Joint Loads and Enforced Displacements (BLC 4 : WIND LOAD (NO ICE) SIDE)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N57	L	X	37
2	N58	L	X	37
3	N60	L	X	167
4	N59	L	X	167
5	N61	L	X	74
6	N62	L	X	74

Joint Loads and Enforced Displacements (BLC 5 : WIND LOAD (ICE) FRONT)

Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...

Joint Loads and Enforced Displacements (BLC 5 : WIND LOAD (ICE) FRONT) (Continued)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N57	L	Y	27
2	N58	L	Y	27
3	N60	L	Y	88
4	N59	L	Y	88
5	N61	L	Y	33
6	N62	L	Y	33

Joint Loads and Enforced Displacements (BLC 6 : WIND LOAD (ICE) SIDE)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N57	L	X	13
2	N58	L	X	13
3	N60	L	X	59
4	N59	L	X	59
5	N61	L	X	25
6	N62	L	X	25

Joint Loads and Enforced Displacements (BLC 7 : LIVE LOAD1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N3	L	Z	-250

Joint Loads and Enforced Displacements (BLC 8 : LIVE LOAD2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N4	L	Z	-250

Joint Loads and Enforced Displacements (BLC 10 : MAINTENANCE LOAD 1)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N22	L	Z	-500

Joint Loads and Enforced Displacements (BLC 11 : MAINTENANCE LOAD 2)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N24	L	Z	-500

Joint Loads and Enforced Displacements (BLC 12 : MAINTENANCE LOAD 3)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N26	L	Z	-500

Joint Loads and Enforced Displacements (BLC 13 : MAINTENANCE LOAD 4)

	Joint Label	L,D,M	Direction	Magnitude[(lb,k-ft), (in,rad), (lb*s^2...
1	N28	L	Z	-500

Member Point Loads

Member Label	Direction	Magnitude[lb,k-ft]	Location[in,%]
No Data to Print ...			

Member Distributed Loads (BLC 2 : DEAD LOAD ICE)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M18	Z	-10	-10	0	0
2	M17	Z	-10	-10	0	0
3	M24	Z	-9	-9	0	0
4	M22	Z	-9	-9	0	0

Member Distributed Loads (BLC 2 : DEAD LOAD ICE) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
5	M21	Z	-9	-9	0	0
6	M20	Z	-9	-9	0	0
7	M19	Z	-9	-9	0	0
8	M16	Z	-9	-9	0	0
9	M15	Z	-9	-9	0	0
10	M14	Z	-9	-9	0	0
11	M13	Z	-9	-9	0	0
12	M42A	Z	-9	-9	0	0
13	M36	Z	-5	-5	0	0
14	M35	Z	-5	-5	0	0
15	M34	Z	-5	-5	0	0
16	M33	Z	-5	-5	0	0
17	M40	Z	-5	-5	0	0
18	M39	Z	-5	-5	0	0
19	M38	Z	-5	-5	0	0
20	M37	Z	-5	-5	0	0
21	M28	Z	-14	-14	0	0
22	M27	Z	-14	-14	0	0
23	M26	Z	-14	-14	0	0
24	M25	Z	-14	-14	0	0

Member Distributed Loads (BLC 3 : WIND LOAD (NO ICE) FRONT)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M18	PY	8	8	0	0
2	M17	PY	8	8	0	0
3	M24	PY	7	7	0	0
4	M22	PY	7	7	0	0
5	M21	PY	7	7	0	0
6	M20	PY	7	7	0	0
7	M19	PY	7	7	0	0
8	M16	PY	7	7	0	0
9	M15	PY	7	7	0	0
10	M14	PY	7	7	0	0
11	M13	PY	7	7	0	0
12	M42A	PY	7	7	0	0
13	M36	PY	2	2	0	0
14	M35	PY	2	2	0	0
15	M34	PY	2	2	0	0
16	M33	PY	2	2	0	0
17	M40	PY	2	2	0	0
18	M39	PY	2	2	0	0
19	M38	PY	2	2	0	0
20	M37	PY	2	2	0	0
21	M28	PY	3	3	0	0
22	M27	PY	3	3	0	0
23	M26	PY	3	3	0	0
24	M25	PY	3	3	0	0

Member Distributed Loads (BLC 4 : WIND LOAD (NO ICE) SIDE)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M18	PX	8	8	0	0
2	M17	PX	8	8	0	0
3	M24	PX	7	7	0	0
4	M22	PX	7	7	0	0
5	M21	PX	7	7	0	0
6	M20	PX	7	7	0	0

Member Distributed Loads (BLC 4 : WIND LOAD (NO ICE) SIDE) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
7	M19	PX	7	7	0	0
8	M16	PX	7	7	0	0
9	M15	PX	7	7	0	0
10	M14	PX	7	7	0	0
11	M13	PX	7	7	0	0
12	M42A	PX	7	7	0	0
13	M36	PX	2	2	0	0
14	M35	PX	2	2	0	0
15	M34	PX	2	2	0	0
16	M33	PX	2	2	0	0
17	M40	PX	2	2	0	0
18	M39	PX	2	2	0	0
19	M38	PX	2	2	0	0
20	M37	PX	2	2	0	0
21	M28	PX	3	3	0	0
22	M27	PX	3	3	0	0
23	M26	PX	3	3	0	0
24	M25	PX	3	3	0	0

Member Distributed Loads (BLC 5 : WIND LOAD (ICE) FRONT)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M18	PY	6.5	6.5	0	0
2	M17	PY	6.5	6.5	0	0
3	M24	PY	6	6	0	0
4	M22	PY	6	6	0	0
5	M21	PY	6	6	0	0
6	M20	PY	6	6	0	0
7	M19	PY	6	6	0	0
8	M16	PY	6	6	0	0
9	M15	PY	6	6	0	0
10	M14	PY	6	6	0	0
11	M13	PY	6	6	0	0
12	M42A	PY	6	6	0	0
13	M36	PY	4.2	4.2	0	0
14	M35	PY	4.2	4.2	0	0
15	M34	PY	4.2	4.2	0	0
16	M33	PY	4.2	4.2	0	0
17	M40	PY	4.4	4.4	0	0
18	M39	PY	4.4	4.4	0	0
19	M38	PY	4.4	4.4	0	0
20	M37	PY	4.4	4.4	0	0
21	M28	PY	4.6	4.6	0	0
22	M27	PY	4.6	4.6	0	0
23	M26	PY	4.6	4.6	0	0
24	M25	PY	4.6	4.6	0	0

Member Distributed Loads (BLC 6 : WIND LOAD (ICE) SIDE)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
1	M18	PX	6.5	6.5	0	0
2	M17	PX	6.5	6.5	0	0
3	M24	PX	6	6	0	0
4	M22	PX	6	6	0	0
5	M21	PX	6	6	0	0
6	M20	PX	6	6	0	0
7	M19	PX	6	6	0	0
8	M16	PX	6	6	0	0

Member Distributed Loads (BLC 6 : WIND LOAD (ICE) SIDE) (Continued)

	Member Label	Direction	Start Magnitude[lb/ft,...	End Magnitude[lb/ft,...	Start Location[in,%]	End Location[in,%]
9	M15	PX	6	6	0	0
10	M14	PX	6	6	0	0
11	M13	PX	6	6	0	0
12	M42A	PX	6	6	0	0
13	M36	PX	4.2	4.2	0	0
14	M35	PX	4.2	4.2	0	0
15	M34	PX	4.2	4.2	0	0
16	M33	PX	4.2	4.2	0	0
17	M40	PX	4.4	4.4	0	0
18	M39	PX	4.4	4.4	0	0
19	M38	PX	4.4	4.4	0	0
20	M37	PX	4.4	4.4	0	0
21	M28	PX	4.6	4.6	0	0
22	M27	PX	4.6	4.6	0	0
23	M26	PX	4.6	4.6	0	0
24	M25	PX	4.6	4.6	0	0

Member Area Loads

Joint A	Joint B	Joint C	Joint D	Direction	Distribution	Magnitude[ksf]
No Data to Print ...						

Load Combinations

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
1	DL + WL (NO ICE) 0 Degree	Yes	Y		1	1.2			3	1.6																
2	DL + WL (NO ICE) 30 Degree	Yes	Y		1	1.2			3	1.39	4	.8														
3	DL + WL (NO ICE) 60 Degree	Yes	Y		1	1.2			3	.8	4	1.39														
4	DL + WL (NO ICE) 90 Degree	Yes	Y		1	1.2					4	1.6														
5	DL + WL (NO ICE) 120 Degree	Yes	Y		1	1.2			3	-.8	4	1.39														
6	DL + WL (NO ICE) 150 Degree	Yes	Y		1	1.2			3	-1....	4	.8														
7	DL + WL (NO ICE) 180 Degree	Yes	Y		1	1.2			3	-1.6																
8	DL + WL (NO ICE) 210 Degree	Yes	Y		1	1.2			3	-1....	4	-.8														
9	DL + WL (NO ICE) 240 Degree	Yes	Y		1	1.2			3	-.8	4	-1....														
10	DL + WL (NO ICE) 270 Degree	Yes	Y		1	1.2					4	-1.6														
11	DL + WL (NO ICE) 300 Degree	Yes	Y		1	1.2			3	.8	4	-1....														
12	DL + WL (NO ICE) 330 Degree	Yes	Y		1	1.2			3	1.39	4	-.8														
13	DL + DL ICE + WL (ICE) 0 Degr...	Yes	Y		1	1.2	2	1	5	1																
14	DL + DL ICE + WL (ICE) 30 De...	Yes	Y		1	1.2	2	1	5	.87	6	.5														
15	DL + DL ICE + WL (ICE) 60 De...	Yes	Y		1	1.2	2	1	5	.5	6	.87														
16	DL + DL ICE + WL (ICE) 90 De...	Yes	Y		1	1.2	2	1			6	1														
17	DL + DL ICE + WL (ICE) 120 D...	Yes	Y		1	1.2	2	1	5	-.5	6	.87														
18	DL + DL ICE + WL (ICE) 150 D...	Yes	Y		1	1.2	2	1	5	-.87	6	.5														
19	DL + DL ICE + WL (ICE) 180 D...	Yes	Y		1	1.2	2	1	5	-1																
20	DL + DL ICE + WL (ICE) 210 D...	Yes	Y		1	1.2	2	1	5	-.87	6	-.5														
21	DL + DL ICE + WL (ICE) 240 D...	Yes	Y		1	1.2	2	1	5	-.5	6	-.87														
22	DL + DL ICE + WL (ICE) 270 D...	Yes	Y		1	1.2	2	1			6	-1														
23	DL + DL ICE + WL (ICE) 300 D...	Yes	Y		1	1.2	2	1	5	.5	6	-.87														
24	DL + DL ICE + WL (ICE) 330 D...	Yes	Y		1	1.2	2	1	5	.87	6	-.5														
25	DEAD LOAD + LIVE LOAD1	Yes	Y		1	1.2					7	1.5														
26	DEAD LOAD + LIVE LOAD2	Yes	Y		1	1.2					8	1.5														
27	DEAD LOAD + LIVE LOAD3	Yes	Y		1	1.2					9	1.5														
28	DL + MAIN L1+30MPH WL FR...	Yes	Y		1	1.2	10	1.5	3	.1																
29	DL + MAIN L2+30MPH WL FR...	Yes	Y		1	1.2	11	1.5	3	.1																
30	DL + MAIN L3+30MPH WL FR...	Yes	Y		1	1.2	12	1.5	3	.1																
31	DL + MAIN L4+30MPH WL FR...	Yes	Y		1	1.2	13	1.5	3	.1																

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...	B...	Fa...
32	DL + MAIN L1+30MPH WL SIDE	Yes	Y		1	1.2	10	1.5	4	.1																
33	DL + MAIN L2+30MPH WL SIDE	Yes	Y		1	1.2	11	1.5	4	.1																
34	DL + MAIN L3+30MPH WL SIDE	Yes	Y		1	1.2	12	1.5	4	.1																
35	DL + MAIN L4+30MPH WL SIDE	Yes	Y		1	1.2	13	1.5	4	.1																
36	DL + MAIN L1+30MPH WL FR...	Yes	Y		1	1.2	10	1.5	3	-.1																
37	DL + MAIN L2+30MPH WL FR...	Yes	Y		1	1.2	11	1.5	3	-.1																
38	DL + MAIN L3+30MPH WL FR...	Yes	Y		1	1.2	12	1.5	3	-.1																
39	DL + MAIN L4+30MPH WL FR...	Yes	Y		1	1.2	13	1.5	3	-.1																
40	DL + MAIN L1+30MPH WL SID...	Yes	Y		1	1.2	10	1.5	4	-.1																
41	DL + MAIN L2+30MPH WL SID...	Yes	Y		1	1.2	11	1.5	4	-.1																
42	DL + MAIN L3+30MPH WL SID...	Yes	Y		1	1.2	12	1.5	4	-.1																
43	DL + MAIN L4+30MPH WL SID...	Yes	Y		1	1.2	13	1.5	4	-.1																

Envelope Joint Reactions

	Joint		X [lb]	LC	Y [lb]	LC	Z [lb]	LC	MX [k-ft]	LC	MY [k-ft]	LC	MZ [k-ft]	LC
1	N51	max	1513.5563	40	-134.4136	10	2401.4374	24	0	1	0	1	0	1
2		min	-949.1075	35	-1725.3789	17	873.8622	4	0	1	0	1	0	1
3	N52	max	1052.0087	43	2320.675	19	557.343	18	0	1	0	1	0	1
4		min	-1724.0682	32	-452.8558	1	162.9308	10	0	1	0	1	0	1
5	N64	max	470.1828	1	1251.9901	7	50.5469	13	0	1	0	1	0	1
6		min	-408.7617	7	-1440.3025	1	14.6735	7	0	1	0	1	0	1
7	N61A	max	231.4276	10	710.8699	4	34.5558	23	0	1	0	1	0	1
8		min	-201.1489	4	-832.7096	10	10.5833	35	0	1	0	1	0	1
9	Totals:	max	1561.2171	10	2440.6675	7	3012.5701	18						
10		min	-1561.2174	4	-2440.6635	1	1140.2469	2						

Envelope Joint Displacements

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation ...	LC	Y Rotation ...	LC	Z Rotation [...	LC
1	N1	max	.0247	3	.2746	2	.0164	43	2.0015e-03	5	6.9271e-04	43	8.3184e-03	7
2		min	-.0366	9	-.2855	8	-.4912	32	-2.1967e-03	11	-6.7356e-03	32	-8.026e-03	1
3	N2	max	.0241	3	.0754	1	.1228	32	3.982e-03	8	5.2633e-03	43	2.0094e-03	1
4		min	-.0355	9	-.0937	7	-.3822	43	-4.3368e-03	2	-2.0726e-03	32	-2.419e-03	7
5	N3	max	.1048	3	.4303	2	.0164	43	6.2606e-03	2	6.3335e-04	43	8.5938e-03	7
6		min	-.0843	9	-.4413	8	-.4915	32	-6.626e-03	8	-6.7174e-03	32	-8.2857e-03	1
7	N4	max	.1041	3	.0873	10	.123	32	2.2392e-03	10	5.2927e-03	43	2.1495e-03	1
8		min	-.0839	9	-.1204	4	-.3827	43	-2.7213e-03	4	-2.0763e-03	32	-2.6442e-03	7
9	N5	max	.0461	2	.2505	2	.0104	43	2.0015e-03	5	6.9279e-04	43	8.3183e-03	7
10		min	-.0588	8	-.2607	8	-.4698	32	-2.1967e-03	11	-6.7355e-03	32	-8.0258e-03	1
11	N6	max	.0247	3	.2505	2	.0143	43	2.0015e-03	5	6.9279e-04	43	8.3183e-03	7
12		min	-.0366	9	-.2607	8	-.471	32	-2.1967e-03	11	-6.7355e-03	32	-8.0258e-03	1
13	N7	max	.1224	3	.4057	2	.0104	43	6.2606e-03	2	6.3342e-04	43	8.5937e-03	7
14		min	-.1027	9	-.4158	8	-.4704	32	-6.626e-03	8	-6.7173e-03	32	-8.2856e-03	1
15	N8	max	.1048	3	.4057	2	.0145	43	6.2606e-03	2	6.3342e-04	43	8.5937e-03	7
16		min	-.0843	9	-.4158	8	-.4714	32	-6.626e-03	8	-6.7173e-03	32	-8.2856e-03	1
17	N9	max	.0285	3	.0066	7	.0012	31	6.4471e-03	7	8.6222e-04	35	1.7418e-03	8
18		min	-.0413	9	-.0055	1	-.1003	20	-6.7711e-03	1	-4.2693e-03	40	-1.3859e-03	2
19	N10	max	.0246	3	.0066	7	.0046	31	6.4471e-03	7	8.6222e-04	35	1.7418e-03	8
20		min	-.0363	9	-.0055	1	-.102	19	-6.7711e-03	1	-4.2693e-03	40	-1.3859e-03	2
21	N11	max	.1175	3	.0756	3	.0013	31	8.5896e-03	1	9.2793e-04	43	4.7328e-03	8
22		min	-.0971	9	-.0704	9	-.1003	20	-9.1656e-03	7	-4.2416e-03	32	-4.728e-03	2
23	N12	max	.1046	3	.0756	3	.0037	39	8.5896e-03	1	9.2793e-04	43	4.7328e-03	8
24		min	-.0843	9	-.0704	9	-.095	23	-9.1656e-03	7	-4.2416e-03	32	-4.728e-03	2
25	N13	max	.0221	3	.0091	8	.0266	36	4.5729e-03	7	3.0892e-03	43	7.6816e-04	2
26		min	-.0326	9	-.0073	2	-.065	31	-5.0048e-03	1	-1.9336e-03	36	-1.1063e-03	8

Envelope Joint Displacements (Continued)

	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation ...	LC	Y Rotation ...	LC	Z Rotation [...	LC
27	N14	max	.0241	3	.0091	8	.0283	40	4.5729e-03	7	3.0892e-03	43	7.6816e-04	2
28		min	-.0356	9	-.0073	2	-.0649	39	-5.0048e-03	1	-1.9336e-03	36	-1.1063e-03	8
29	N15	max	.1098	3	.081	9	.0266	36	2.9798e-03	12	3.0478e-03	39	1.4976e-03	10
30		min	-.0883	9	-.0876	3	-.0649	31	-3.6023e-03	6	-1.9458e-03	28	-1.9279e-03	4
31	N16	max	.1042	3	.081	9	.0295	36	2.9798e-03	12	3.0478e-03	39	1.4976e-03	10
32		min	-.0839	9	-.0876	3	-.065	31	-3.6023e-03	6	-1.9458e-03	28	-1.9279e-03	4
33	N17	max	.0222	3	.0694	1	.1137	32	3.982e-03	8	5.2632e-03	43	2.0092e-03	1
34		min	-.0324	9	-.0864	7	-.3668	43	-4.3368e-03	2	-2.0727e-03	32	-2.4188e-03	7
35	N18	max	.0241	3	.0694	1	.1166	32	3.982e-03	8	5.2632e-03	43	2.0092e-03	1
36		min	-.0355	9	-.0864	7	-.3664	43	-4.3368e-03	2	-2.0727e-03	32	-2.4188e-03	7
37	N19	max	.1022	3	.0869	10	.1137	32	2.2392e-03	10	5.2926e-03	43	2.1493e-03	1
38		min	-.0806	9	-.1185	4	-.3674	43	-2.7213e-03	4	-2.0764e-03	32	-2.6441e-03	7
39	N20	max	.1041	3	.0869	10	.1168	32	2.2392e-03	10	5.2926e-03	43	2.1493e-03	1
40		min	-.0839	9	-.1185	4	-.3668	43	-2.7213e-03	4	-2.0764e-03	32	-2.6441e-03	7
41	N21	max	.0375	31	.2795	1	.0104	43	2.1192e-03	5	6.7883e-04	43	8.3183e-03	7
42		min	-.2201	36	-.2845	7	-.4698	32	-2.3144e-03	11	-6.7224e-03	32	-8.0258e-03	1
43	N22	max	.2548	32	.5853	2	.0104	43	6.4631e-03	2	6.4738e-04	43	8.5937e-03	7
44		min	-.0977	9	-.6056	8	-.4713	32	-6.8285e-03	8	-6.5964e-03	32	-8.2856e-03	1
45	N23	max	.1422	4	.3942	1	.001	31	1.7011e-02	7	6.0415e-03	4	1.7418e-03	8
46		min	-.1943	10	-.384	7	-.1008	20	-1.7336e-02	1	-7.4489e-03	10	-1.3859e-03	2
47	N24	max	.2758	4	.4978	1	.0011	31	1.9042e-02	1	6.793e-03	10	4.7328e-03	8
48		min	-.2175	10	-.5085	7	-.1008	20	-1.9616e-02	7	-8.1121e-03	4	-4.728e-03	2
49	N25	max	.1054	31	.1536	1	.0265	36	5.3709e-03	7	3.0861e-03	31	7.6816e-04	2
50		min	-.0821	36	-.1396	7	-.065	31	-5.803e-03	1	-1.9344e-03	36	-1.1063e-03	8
51	N26	max	.1521	3	.0966	11	.0265	36	3.6676e-03	12	3.0747e-03	43	1.4976e-03	10
52		min	-.1371	43	-.1212	5	-.0649	31	-4.2897e-03	6	-1.9741e-03	32	-1.9279e-03	4
53	N27	max	.1641	39	.1892	2	.1137	32	4.1859e-03	8	5.2499e-03	43	2.0092e-03	1
54		min	-.0825	28	-.196	8	-.3668	43	-4.5408e-03	2	-2.0589e-03	32	-2.4188e-03	7
55	N28	max	.149	3	.1496	10	.1137	32	2.2836e-03	11	5.2002e-03	43	2.1493e-03	1
56		min	-.1976	43	-.1947	4	-.3683	43	-2.7684e-03	5	-2.0901e-03	32	-2.6441e-03	7
57	N29	max	.003	40	.0213	40	.0234	43	-8.4033e-04	25	2.7638e-03	43	1.1111e-03	35
58		min	-.002	35	-.0136	35	-.0442	32	-2.3432e-03	21	-4.1892e-03	32	-1.746e-03	40
59	N30	max	.0037	2	.0204	2	.0231	43	1.5962e-04	28	2.5426e-03	43	3.2906e-03	8
60		min	-.0048	8	-.0284	8	-.0391	32	-9.0733e-04	21	-3.8421e-03	32	-2.6369e-03	2
61	N31	max	.0107	35	.0033	7	.0265	31	7.1068e-04	1	1.4502e-03	31	3.1229e-03	9
62		min	-.0162	40	-.0022	1	-.0831	36	-4.1322e-03	20	-2.8401e-03	36	-2.1622e-03	3
63	N32	max	.076	3	.0894	2	.0279	31	-1.9595e-04	7	1.0775e-03	43	3.2771e-03	9
64		min	-.0653	9	-.0882	8	-.0762	36	-4.3086e-03	13	-3.1105e-03	32	-4.7676e-03	3
65	N33	max	.0032	40	.0138	35	.0401	32	-8.1088e-04	9	2.4827e-03	43	1.2315e-03	35
66		min	-.002	35	-.0213	40	-.0276	43	-2.7168e-03	15	-4.4505e-03	32	-1.8858e-03	40
67	N34	max	.0035	2	.028	8	.0386	32	-2.4288e-05	31	2.2668e-03	43	3.0051e-03	8
68		min	-.0047	8	-.0202	2	-.0238	43	-1.1829e-03	15	-4.0853e-03	32	-2.393e-03	2
69	N35	max	.008	3	.005	35	.0535	36	-9.9068e-04	12	1.845e-03	43	3.3759e-03	9
70		min	-.0124	9	-.0071	40	-.0555	31	-4.4781e-03	18	-2.2442e-03	32	-2.2962e-03	3
71	N36	max	.0719	3	.0796	9	.0539	36	-7.7906e-04	7	2.135e-03	31	3.6509e-03	9
72		min	-.061	9	-.085	3	-.0501	31	-4.4094e-03	14	-1.9278e-03	36	-5.1375e-03	3
73	N37	max	0	2	.0181	40	.0214	43	-9.1472e-04	9	2.8873e-03	43	1.5633e-03	35
74		min	0	20	-.0116	35	-.0354	32	-2.6394e-03	15	-4.7694e-03	32	-2.4346e-03	40
75	N38	max	0	18	.0167	2	.0197	43	-1.6485e-04	28	2.6559e-03	43	3.162e-03	8
76		min	0	12	-.0235	8	-.0326	32	-1.0491e-03	21	-4.3965e-03	32	-2.2519e-03	2
77	N39	max	0	2	.0235	8	.0326	32	-1.6485e-04	28	2.6559e-03	43	3.162e-03	8
78		min	0	39	-.0167	2	-.0197	43	-1.0491e-03	21	-4.3965e-03	32	-2.2519e-03	2
79	N40	max	0	35	.0116	35	.0354	32	-9.1472e-04	9	2.8873e-03	43	1.5633e-03	35
80		min	0	40	-.0181	40	-.0214	43	-2.6394e-03	15	-4.7694e-03	32	-2.4346e-03	40
81	N41	max	.0246	3	.0042	4	.0082	31	5.799e-03	7	6.3543e-04	39	2.1543e-03	8
82		min	-.0363	9	-.0052	9	-.1174	36	-6.134e-03	1	-5.6355e-03	28	-1.7602e-03	2
83	N42	max	.0134	3	.0029	4	.0243	31	6.9333e-04	1	1.3166e-03	31	3.38e-03	9

Envelope Joint Displacements (Continued)

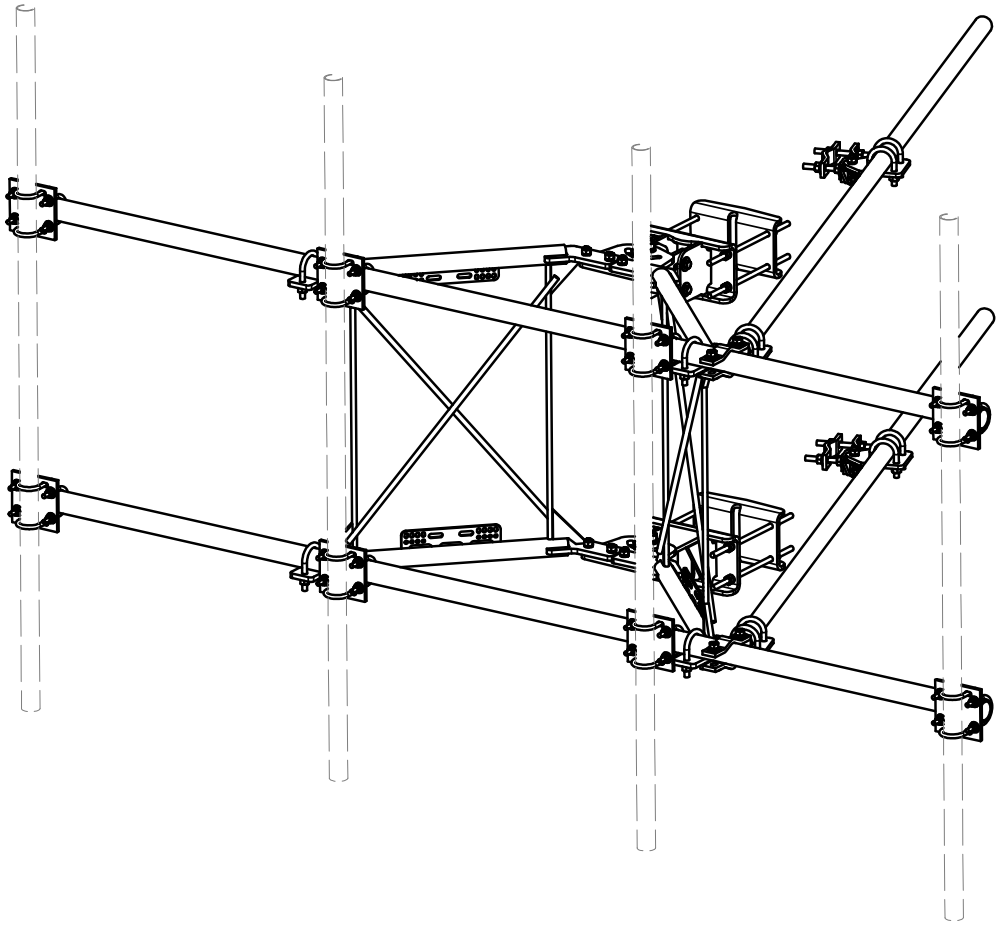
	Joint		X [in]	LC	Y [in]	LC	Z [in]	LC	X Rotation ...	LC	Y Rotation ...	LC	Z Rotation [...	LC
84		min	-.0208	9	-.0032	10	-.0907	36	-4.7619e-03	20	-3.2437e-03	36	-2.4084e-03	3
85	N43	max	.024	3	.0021	8	.0383	40	4.4156e-03	7	4.2816e-03	43	1.1373e-03	2
86		min	-.0355	9	-.0023	2	-.0842	39	-4.8564e-03	1	-1.8988e-03	32	-1.5494e-03	8
87	N44	max	.0117	3	.0018	35	.0522	36	-9.9164e-04	12	2.1885e-03	43	3.7936e-03	9
88		min	-.0178	9	-.0026	28	-.0614	31	-4.798e-03	18	-2.1726e-03	32	-2.6292e-03	3
89	N45	max	.1046	3	.0991	3	.0076	39	8.289e-03	1	6.6878e-04	43	5.4081e-03	8
90		min	-.0843	9	-.094	9	-.1152	28	-8.8576e-03	7	-5.612e-03	32	-5.3004e-03	2
91	N46	max	.0832	3	.0957	3	.0248	31	-1.3506e-04	7	9.7361e-04	43	3.1719e-03	9
92		min	-.0702	9	-.0917	9	-.0846	36	-5.0442e-03	13	-3.5101e-03	32	-4.7602e-03	3
93	N47	max	.1041	3	.0878	9	.0395	36	2.803e-03	12	4.2534e-03	39	1.2424e-03	10
94		min	-.0839	9	-.0966	3	-.084	31	-3.4185e-03	6	-1.8953e-03	28	-1.6969e-03	4
95	N48	max	.0798	3	.0851	9	.0525	36	-8.6086e-04	7	2.4667e-03	31	3.7963e-03	9
96		min	-.0666	9	-.0928	3	-.0573	31	-4.7698e-03	13	-1.881e-03	36	-5.3301e-03	3
97	N49	max	.024	3	.0046	31	.0473	40	4.3028e-03	8	5.5316e-03	43	1.3884e-03	2
98		min	-.0355	9	-.0068	8	-.1088	39	-4.7222e-03	2	-1.8245e-03	32	-1.814e-03	8
99	N51	max	0	35	0	17	0	4	-9.1472e-04	9	2.8873e-03	43	1.5633e-03	35
100		min	0	40	0	10	0	24	-2.6394e-03	15	-4.7694e-03	32	-2.4346e-03	40
101	N52	max	0	32	0	1	0	10	-1.6485e-04	28	2.6559e-03	43	3.162e-03	8
102		min	0	43	0	19	0	18	-1.0491e-03	21	-4.3965e-03	32	-2.2519e-03	2
103	N77A	max	.0246	3	.0132	2	.0102	31	5.2112e-03	7	3.4539e-04	39	3.111e-03	8
104		min	-.0364	9	-.0163	8	-.1493	36	-5.5319e-03	1	-7.0845e-03	28	-2.7627e-03	2
105	N64	max	0	7	0	1	0	7	-1.2318e-04	32	3.977e-04	31	2.1536e-03	10
106		min	0	1	0	7	0	13	-2.686e-03	22	-7.2307e-03	36	-2.0205e-03	4
107	N57	max	.0535	2	.2521	2	.0103	43	1.9927e-03	4	1.0866e-03	43	8.339e-03	7
108		min	-.0601	8	-.2627	8	-.4698	32	-2.0772e-03	10	-5.0042e-03	32	-8.0453e-03	1
109	N58	max	.1163	3	.3873	2	.0104	43	6.0416e-03	2	1.0319e-03	43	8.573e-03	7
110		min	-.1029	9	-.3965	8	-.4704	32	-6.2747e-03	8	-4.9847e-03	32	-8.2661e-03	1
111	N59	max	.1241	4	.3422	1	.001	31	1.7011e-02	7	6.0412e-03	4	1.7418e-03	8
112		min	-.172	10	-.333	7	-.1008	20	-1.7336e-02	1	-7.4486e-03	10	-1.3859e-03	2
113	N60	max	.2515	4	.4407	1	.0011	31	1.9042e-02	1	6.7927e-03	10	4.7328e-03	8
114		min	-.1974	9	-.4497	7	-.1008	20	-1.9616e-02	7	-8.1118e-03	4	-4.728e-03	2
115	N61	max	.0501	35	.0494	1	.0265	36	5.3084e-03	7	3.086e-03	31	7.6816e-04	2
116		min	-.0475	40	-.0432	7	-.065	31	-5.7404e-03	1	-1.9344e-03	36	-1.1063e-03	8
117	N62	max	.1236	3	.0718	9	.0265	36	3.6137e-03	12	3.0711e-03	43	1.4976e-03	10
118		min	-.0926	9	-.0845	3	-.0649	31	-4.2358e-03	6	-1.9705e-03	32	-1.9279e-03	4
119	N61A	max	0	4	0	10	0	35	8.7997e-04	36	4.8105e-03	31	1.1354e-03	9
120		min	0	10	0	4	0	23	-3.2017e-03	31	-1.4926e-03	7	-9.4916e-04	3

Envelope AISC 14th(360-10): LRFD Steel Code Checks

	Member	Shape	Code Check	Loc[in]	LC	Shear ...	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
1	M18	PIPE_2.5	.277	45.3...	40	.119	51.5...		2	14558.7...	50715	3.5963	3.5963	2...	H1-1b
2	M17	PIPE_2.5	.257	45.3...	32	.176	42.1...		1	14558.7...	50715	3.5963	3.5963	1...	H1-1b
3	M24	PIPE_2.0	.037	31.4...	4	.004	62.8...		22	23127.2...	32130	1.8716	1.8716	1...	H1-1b
4	M22	PIPE_2.0	.329	2.18...	32	.190	28.1...		14	29810.2...	32130	1.8716	1.8716	1...	H1-1b
5	M21	PIPE_2.0	.346	1.875	40	.209	0		18	29810.2...	32130	1.8716	1.8716	1...	H1-1b
6	M20	PIPE_2.0	.266	0	32	.114	28.1...		30	29810.2...	32130	1.8716	1.8716	1...	H1-1b
7	M19	PIPE_2.0	.235	1.875	39	.128	0		38	29810.2...	32130	1.8716	1.8716	1...	H1-1b
8	M16	PIPE_2.0	.360	68	31	.043	28		31	14916.0...	32130	1.8716	1.8716	4...	H1-1b
9	M15	PIPE_2.0	.219	68	8	.062	28		9	14916.0...	32130	1.8716	1.8716	1...	H1-1b
10	M14	PIPE_2.0	.568	28	1	.106	28		2	14916.0...	32130	1.8716	1.8716	1...	H1-1b
11	M13	PIPE_2.0	.426	68	36	.054	28		40	14916.0...	32130	1.8716	1.8716	4...	H1-1b
12	M42A	PIPE_2.0	.081	90.5...	7	.006	0		22	16233.2...	32130	1.8716	1.8716	1...	H1-1b*
13	M36	5/8 SR	.528	20.8...	18	.031	0		32	2855.26...	9946.8	.0968	.0968	1...	H1-1a
14	M35	5/8 SR	.365	20.8...	15	.023	0		8	2855.26...	9946.8	.0968	.0968	1...	H1-1a
15	M34	5/8 SR	.350	22.9...	39	.032	0		32	2855.26...	9946.8	.0968	.0968	1...	H1-1a

Envelope AISC 14th(360-10): LRFD Steel Code Checks (Continued)

	Member	Shape	Code Check	Loc[in]	LC	Shear ..	Loc[in]	Dir	LC	phi*Pnc ...	phi*Pnt [...	phi*Mn ...	phi*Mn ...	Cb	Eqn
16	M33	5/8 SR	.240	22.9...	43	.022	0		8	2855.26...	9946.8	.0968	.0968	1	H1-1a
17	M40	3/4" rod	.000	0	1	.000	0		1	1550.49...	14313.8...	.1789	.1789	1	H1-1a
18	M39	3/4" rod	.291	23.7...	16	.027	0		3	3164.27...	14313.8...	.1789	.1789	1....	H1-1a
19	M38	3/4" rod	.134	23.7...	21	.024	0		3	3164.27...	14313.8...	.1789	.1789	1....	H1-1b
20	M37	3/4" rod	.006	47.5...	2	.007	0		40	1550.49...	14313.8...	.1789	.1789	2....	H1-1b*
21	M28	.625 x 3.5"	.416	0	15	.205	0	y	28	68522.7...	70875	.9229	5.168	1....	H1-1b
22	M27	.625 x 3.5"	.303	0	43	.175	0	y	43	68522.7...	70875	.9229	5.168	1....	H1-1b
23	M26	.625 x 3.5"	.368	0	19	.212	0	y	36	68522.7...	70875	.9229	5.168	1....	H1-1b
24	M25	.625 x 3.5"	.280	0	39	.198	0	y	39	68522.7...	70875	.9229	5.168	1....	H1-1b



PARTS LIST

ITEM	QTY	PART NO.	PART DESCRIPTION	LENGTH	UNIT WT.	NET WT.
1	2	X-VFAW	SUPPORT ARM		71.41	142.81
2	1	X-HDCAMTBW	CLAMP WELDMENT FOR BCAM-HD		33.86	33.86
3	1	X-MHTPHD	MULTI-HOLE TAPER PLATE WELDMENT		36.24	36.24
4	2	X-VFAPL4	VFA-HD PIVOT PLATE	12 in	15.88	31.77
5	2	X-LCBP4	BENT BACKING PLATE	13 in	19.00	38.01
6	1	X-HDCAMSS	ANGLE ADJUSTMENT WELDMENT FOR BCAM-HD		16.39	16.39
7	4	X-SPTB	SLIDING PIPE TIE BACK PLATE	5 1/2 in	5.87	23.49
8	1	X-HDCAMSP	POSITIONING PLATE WELDMENT FOR BCAM-HD		2.58	2.58
9	4	X-TBCA	TIE BACK CLIP ANGLE		2.01	8.02
10	8	SCX2	CROSSOVER PLATE	7 in	4.80	38.37
11	4	MCP	CLAMP HALF 1/2" THICK, 11-5/8" LONG	12 1/16 in	3.59	14.37
12	8	DCP	1/2" THICK, 5-3/4" CNTER TO CENTER CLAMP HALF	8 1/8 in	2.36	18.90
13	2	P2126	2-3/8" X 126" (2" SCH. 40) GALVANIZED PIPE	126 in	40.75	81.50
14	2	P30150	2-7/8" X 150" (2-1/2" SCH. 40) GALVANIZED PIPE	150 in	76.94	153.87
15	4	A34212	3/4" x 2-1/2" UNC HEX BOLT (A325)	2 1/2 in	0.48	1.92
16	4	G34FW	3/4" HDG USS FLATWASHER		0.06	0.24
17	4	G34LW	3/4" HDG LOCKWASHER		0.04	0.17
18	4	G34NUT	3/4" HDG HEAVY 2H HEX NUT		0.21	0.85
19	8	G58R-18	5/8" x 18" THREADED ROD (HDG.)	18 in	0.40	3.19
20	4	G58R-12	5/8" x 12" THREADED ROD (HDG.)		1.05	4.18
21	4	G58R-8	5/8" x 8" THREADED ROD (HDG.)		0.70	2.79
22	4	X-UB5300	5/8" X 3" X 5-1/4" X 2-1/2" U-BOLT (HDG.)		1.15	4.60
23	8	X-UB5258	5/8" X 2-5/8" X 4-1/2" X 2" U-BOLT (HDG.)		1.00	8.00
24	2	G5807	5/8" x 7" HDG HEX BOLT GR5 FULL THREAD	7 in	0.70	1.41
25	1	G5806	5/8" x 6" HDG HEX BOLT GR5 FULL THREAD	6 in	0.62	0.62
26	8	G5804	5/8" x 4" HDG HEX BOLT GR5		0.44	3.55
27	4	G5802	5/8" x 2" HDG HEX BOLT GR5		0.27	1.08
28	8	A582114	5/8" x 2-1/4" HDG A325 HEX BOLT	2 1/4 in	0.31	2.50
29	25	G58FW	5/8" HDG USS FLATWASHER	1/8 in	0.07	1.76
30	66	G58LW	5/8" HDG LOCKWASHER		0.03	1.72
31	71	G58NUT	5/8" HDG HEAVY 2H HEX NUT		0.13	9.22
32	32	X-UB1300	1/2" X 3" X 5" X 2" GALV U-BOLT		0.74	23.64
33	16	X-UB1212	1/2" X 2" X 3" X 1-1/4" U-BOLT (HDG.)		0.60	9.56
34	64	G12FW	1/2" HDG USS FLATWASHER	3/32 in	0.03	2.18
35	64	G12LW	1/2" HDG LOCKWASHER	1/8 in	0.01	0.89
36	64	G12NUT	1/2" HDG HEAVY 2H HEX NUT		0.07	4.58
					TOTAL WT. #	738.06

REVISION HISTORY

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION TO B-CAM CONNECTION		CEK	12/7/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
12' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1 — A valmont COMPANY

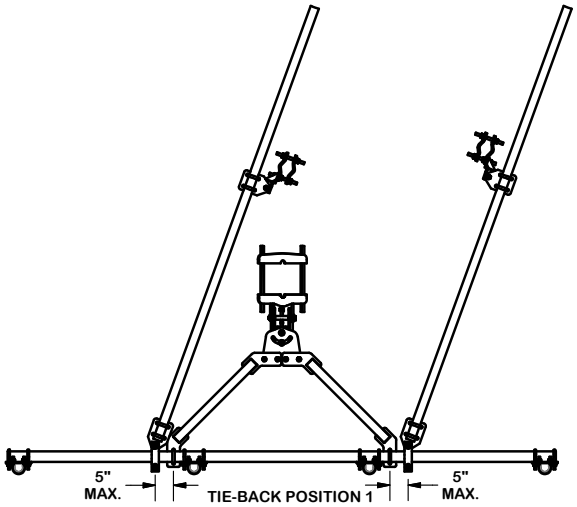
Engineering Support Team: 1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

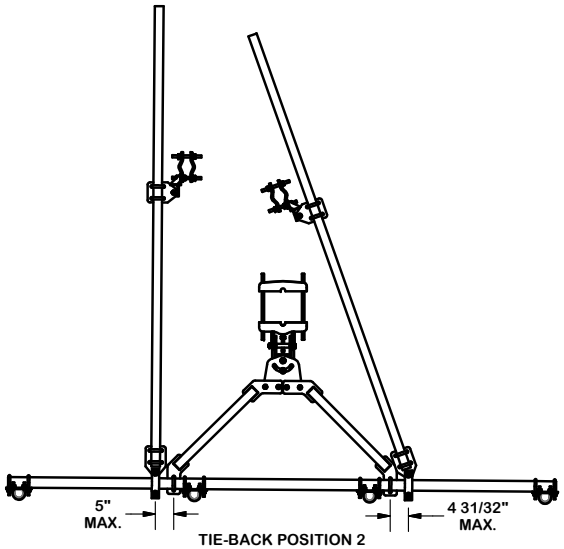
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA12-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA12-HD

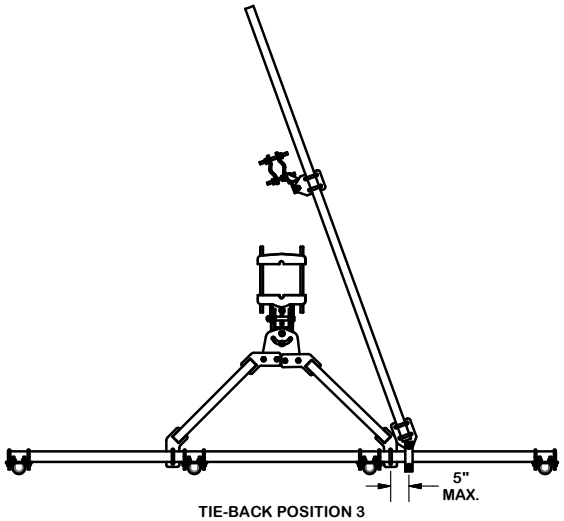
TIE-BACK POSITIONS



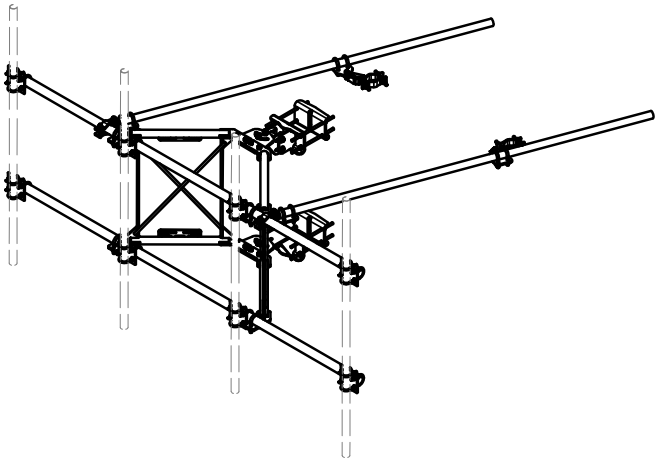
TIE-BACK POSITION 1
-20° / +20° TOP PARALLEL

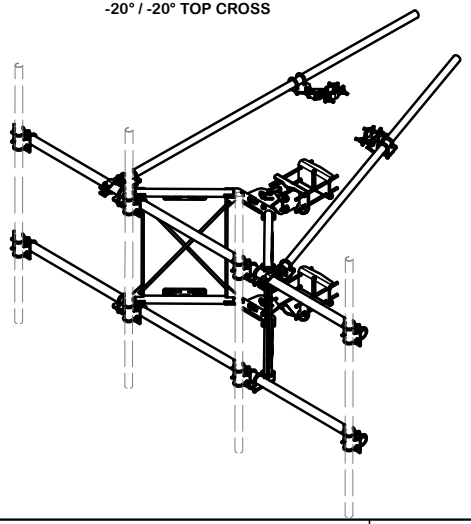


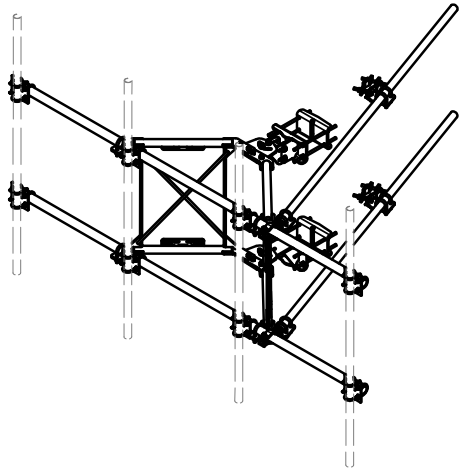
TIE-BACK POSITION 2
-20° / -20° TOP CROSS



TIE-BACK POSITION 3
-20° SAME SIDE STACKED







REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION TO B-CAM CONNECTION		CEK	12/7/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
12' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

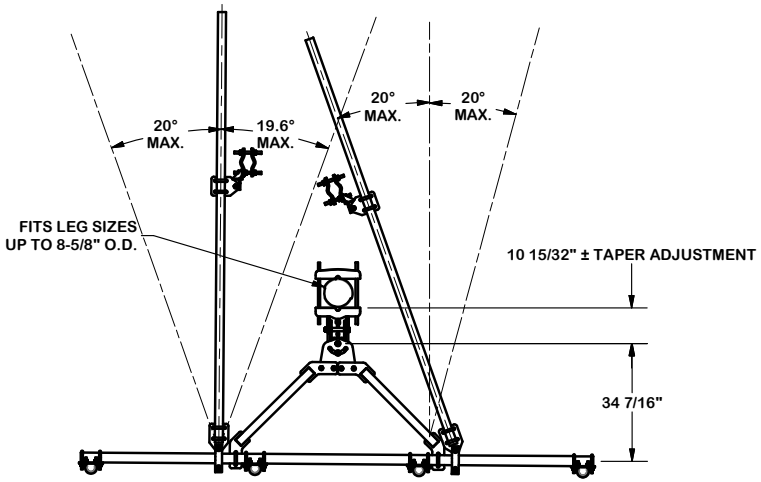
SITE PRO 1
A valmont COMPANY

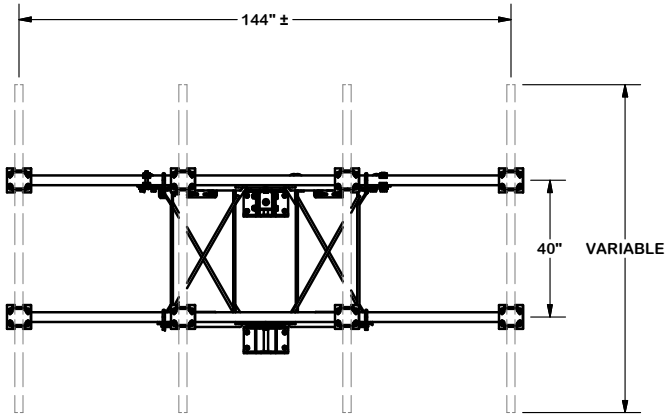
Engineering Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA12-HD

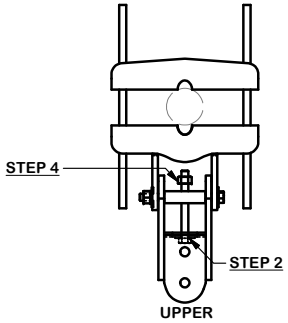
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA12-HD

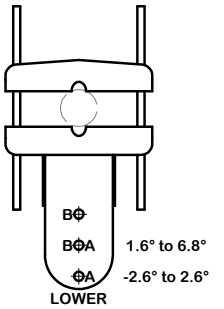


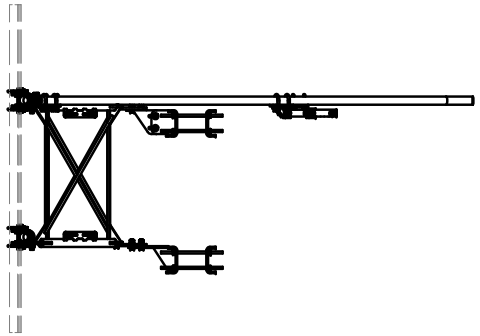


ANGLE CALIBRATING PROCEDURE:

1. MEASURE TOWER TAPER AND PICK LOWER BRACKET HOLE:
   - HOLE A = -2.6° TO 2.6°
   - HOLE B = 1.6° TO 6.8°
2. USE CALIBRATING BOLT TO ADJUST FRAME TO DESIRED TAPER
3. TORQUE LOCKING BOLTS TO 100 ft.-lbs.
4. ADVANCE LOCKING NUT TO POSITIONING PLATE, THEN TIGHTEN.







REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION TO B-CAM CONNECTION		CEK	12/7/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

TOLERANCE NOTES

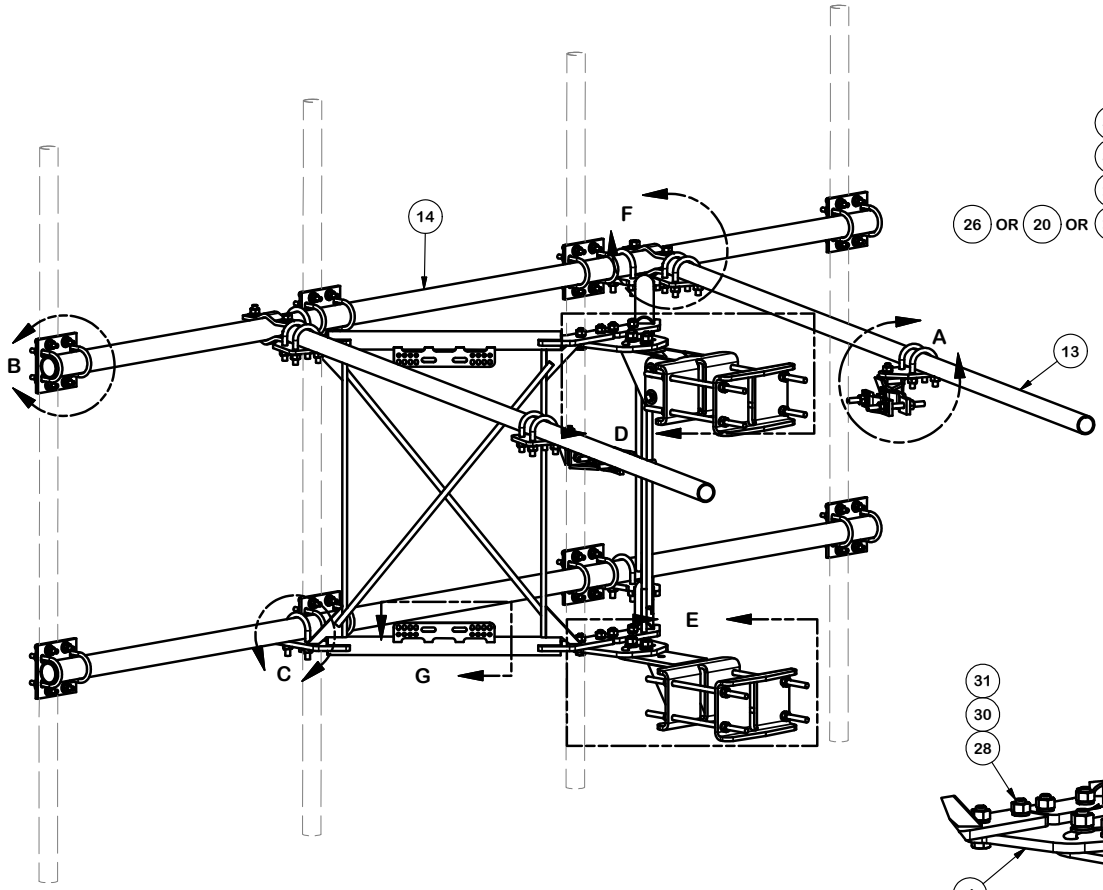
TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

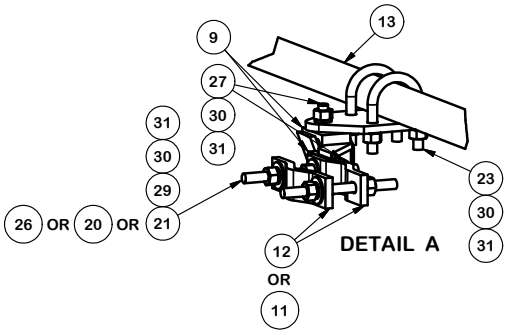
DESCRIPTION
12' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

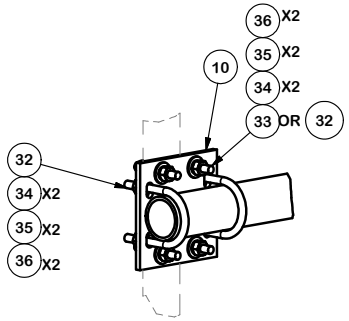
SITE PRO 1
A valmont COMPANY
Engineering Support Team:
1-888-753-7446
Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

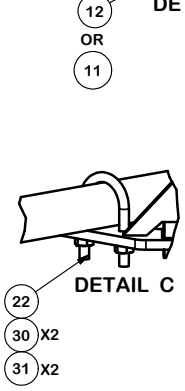
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA12-HD

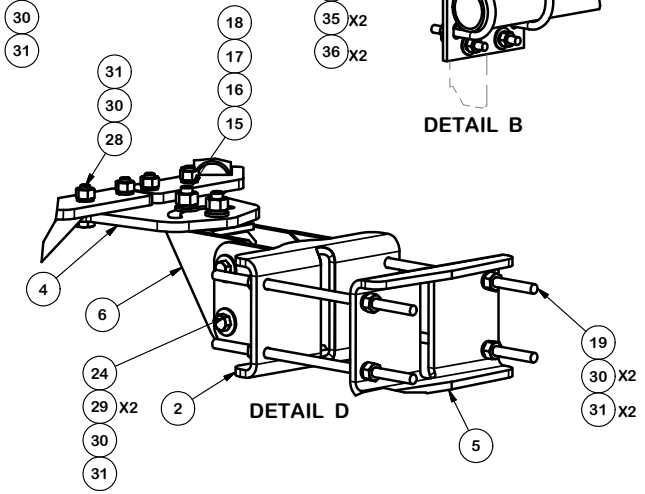
CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA12-HD

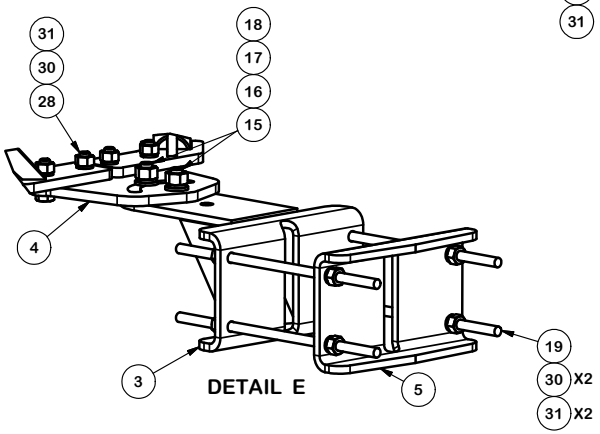


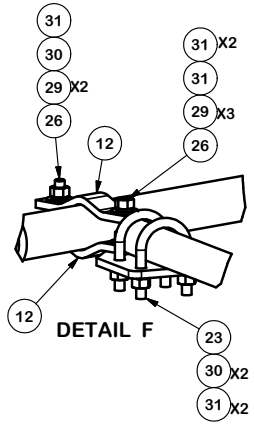








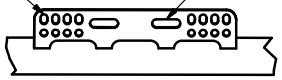




7/16" LUG HOLES

REVIEW CARRIER STANDARDS FOR PROPER SURFACE PREPARTION AND ASSEMBLY OF ELECTRICAL CONNECTIONS

9/16" SLOTTED HOLE FOR EQUIPMENT PIPE U-BOLT



DETAIL G

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION TO B-CAM CONNECTION		CEK	12/7/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
12' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

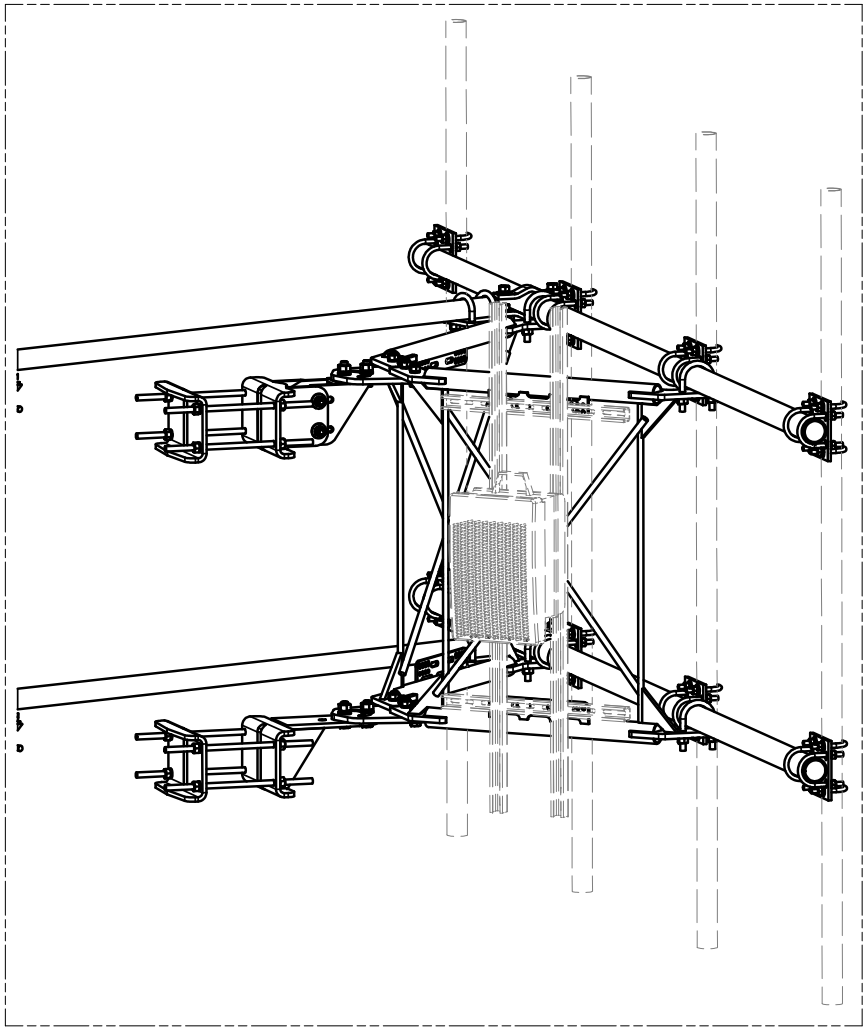
SITE PRO 1 — A valmont COMPANY

Engineering Support Team: 1-888-753-7446

Locations: New York, NY; Atlanta, GA; Los Angeles, CA; Plymouth, IN; Salem, OR; Dallas, TX

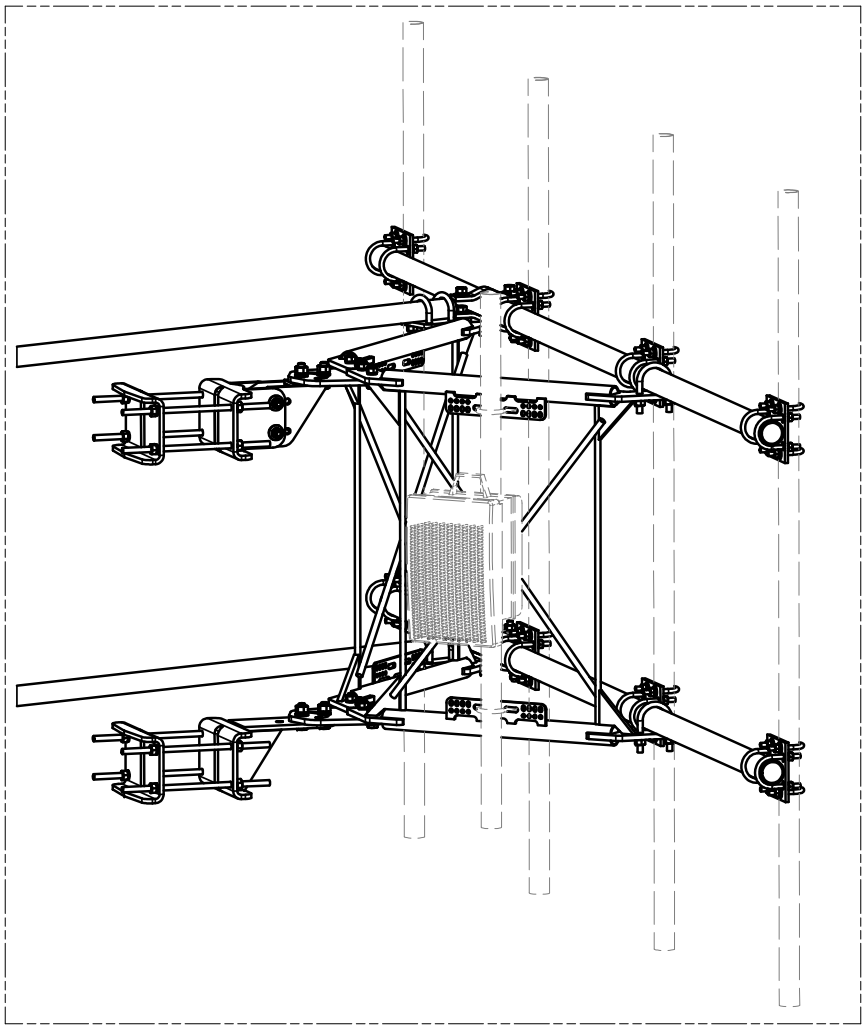
CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA12-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA12-HD



UNISTRUT AND HARDWARE
SOLD SEPARATELY.

REQUIRES 3/8" HARDWARE



EQUIPMENT PIPE AND HARDWARE
SOLD SEPARATELY.

REQUIRES 1/2" HARDWARE
AND 2-3/8" TO 4-1/2" O.D. PIPE

REV	DESCRIPTION OF REVISIONS	CPD	BY	DATE
D	UPDATED BCAM VERSION 1 TO BCAM VERSION 2		CEK	6/29/2018
C	UPDATED PIN LEG CONNECTION TO B-CAM CONNECTION		CEK	12/7/2017
B	CHANGED TIE-BACK BACK CONNECTION		CEK	7/31/2017
A	CHANGED TIE-BACK FRONT CONNECTION		CEK	2/2/2017

REVISION HISTORY

TOLERANCE NOTES

TOLERANCES ON DIMENSIONS, UNLESS OTHERWISE NOTED ARE:
SAWED, SHEARED AND GAS CUT EDGES *(± 0.030")*
DRILLED AND GAS CUT HOLES *(± 0.030")* - NO CONING OF HOLES
LASER CUT EDGES AND HOLES *(± 0.010")* - NO CONING OF HOLES
BENDS ARE ± 1/2 DEGREE
ALL OTHER MACHINING *(± 0.030")*
ALL OTHER ASSEMBLY *(± 0.060")*

DESCRIPTION
12' 6" HEAVY DUTY
V-FRAME ASSEMBLY
WITH TWO STIFF ARMS

SITE PRO 1
A valmont COMPANY

Engineering Support Team:
1-888-753-7446

Locations:
New York, NY
Atlanta, GA
Los Angeles, CA
Plymouth, IN
Salem, OR
Dallas, TX

CPD NO.	DRAWN BY	ENG. APPROVAL	PART NO.
	CEK 1/25/2017		VFA12-HD

CLASS	SUB	DRAWING USAGE	CHECKED BY	DWG. NO.
81	02	CUSTOMER	BMC 12/13/2017	VFA12-HD

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: CT11230A

North Haven/ Rt 17
88 Parsonage Hill Road
Northford, Connecticut 06472

June 18, 2021

EBI Project Number: 6221003172

Site Compliance Summary	
Compliance Status:	**COMPLIANT**
Site total MPE% of FCC general population allowable limit:	**16.27%**

21 B Street, Burlington, MA 01803 · Tel: (781) 273.2500 · Fax: (781) 273.3311

June 18, 2021

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

Emissions Analysis for Site: CT11230A - North Haven/ Rt 17

EBI Consulting was directed to analyze the proposed T-Mobile facility located at **88 Parsonage Hill Road** in **Northford, 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 88 Parsonage Hill Road in Northford, 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 power density calculations, the broadcast footprint of the AIR6449 antenna has been considered. Due to the beamforming nature of this antenna, the actual beam locations vary depending on demand and are narrow in nature. Using the broadcast footprint accounts for the potential location of beams at any given time.

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 Traffic channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 60 Watts.

9) 1 LTE Broadcast channel (LTE 1C and 2C BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 20 Watts.

10) 1 NR Traffic channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 120 Watts.

11) 1 NR Broadcast channel (BRS Band - 2500 MHz) was considered for each sector of the proposed installation. This Channel has a transmit power of 40 Watts.

12) 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.

13) 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.

14) The antennas used in this modeling are the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_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) in Sector A, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_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) in Sector B, the Ericsson AIR 6449 for the 2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz channel(s), the RFS APXVAALL24_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) 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.

15) The antenna mounting height centerline of the proposed antennas is 180 feet above ground level (AGL).

16) 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.

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

EBI Consulting

environmental | engineering | due diligence

T-Mobile Site Inventory and Power Data

Sector:	A	Sector:	B	Sector:	C
Antenna #:	1	Antenna #:	1	Antenna #:	1
Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449	Make / Model:	Ericsson AIR 6449
Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz	Frequency Bands:	2500 MHz / 2500 MHz / 2500 MHz / 2500 MHz
Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd	Gain:	22.65 dBd / 17.3 dBd / 22.65 dBd / 17.3 dBd
Height (AGL):	180 feet	Height (AGL):	180 feet	Height (AGL):	180 feet
Channel Count:	4	Channel Count:	4	Channel Count:	4
Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts	Total TX Power (W):	240 Watts
ERP (W):	36,356.09	ERP (W):	36,356.09	ERP (W):	36,356.09
Antenna A1 MPE %:	**4.32%**	Antenna B1 MPE %:	**4.32%**	Antenna C1 MPE %:	**4.32%**
Antenna #:	**2**	Antenna #:	**2**	Antenna #:	**2**
Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_43-U-NA20	Make / Model:	RFS APXVAALL24_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 / 13.65 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd	Gain:	12.95 dBd / 12.95 dBd / 13.65 dBd / 15.45 dBd / 16.45 dBd
Height (AGL):	180 feet	Height (AGL):	180 feet	Height (AGL):	180 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):	11,010.27	ERP (W):	11,010.27	ERP (W):	11,010.27
Antenna A2 MPE %:	**1.99%**	Antenna B2 MPE %:	**1.99%**	Antenna C2 MPE %:	**1.99%**
Antenna #:	**3**	Antenna #:	**3**	Antenna #:	**3**
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):	180 feet	Height (AGL):	180 feet	Height (AGL):	180 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 A3 MPE %:	**1.52%**	Antenna B3 MPE %:	**1.52%**	Antenna C3 MPE %:	**1.52%**

Site Composite MPE %	
Carrier	MPE %
T-Mobile (Max at Sector A):	7.83%
Nextel	0.24%
Motient	0.54%
Sprint	1.56%
AT&T	4.04%
Verizon	2.06%
Site Total MPE % :	16.27%

T-Mobile MPE % Per Sector	
T-Mobile Sector A Total:	7.83%
T-Mobile Sector B Total:	7.83%
T-Mobile Sector C Total:	7.83%
Site Total MPE % :	16.27%

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 2500 MHz LTE 1C & 2C Traffic	1	11044.63	180.0	13.12	2500 MHz LTE 1C & 2C Traffic	1000	1.31%
T-Mobile 2500 MHz LTE 1C & 2C Broadcast	1	1074.06	180.0	1.28	2500 MHz LTE 1C & 2C Broadcast	1000	0.13%
T-Mobile 2500 MHz NR Traffic	1	22089.26	180.0	26.23	2500 MHz NR Traffic	1000	2.62%
T-Mobile 2500 MHz NR Broadcast	1	2148.13	180.0	2.55	2500 MHz NR Broadcast	1000	0.26%
T-Mobile 600 MHz LTE	2	591.73	180.0	1.41	600 MHz LTE	400	0.35%
T-Mobile 600 MHz NR	1	1577.94	180.0	1.87	600 MHz NR	400	0.47%
T-Mobile 700 MHz LTE	2	695.22	180.0	1.65	700 MHz LTE	467	0.35%
T-Mobile 1900 MHz LTE	2	2104.51	180.0	5.00	1900 MHz LTE	1000	0.50%
T-Mobile 2100 MHz UMTS	2	1324.71	180.0	3.15	2100 MHz UMTS	1000	0.31%
T-Mobile 1900 MHz GSM	4	1028.30	180.0	4.88	1900 MHz GSM	1000	0.49%
T-Mobile 1900 MHz LTE	2	2056.61	180.0	4.88	1900 MHz LTE	1000	0.49%
T-Mobile 2100 MHz LTE	2	2307.55	180.0	5.48	2100 MHz LTE	1000	0.55%
						Total:	**7.83%**

• 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.

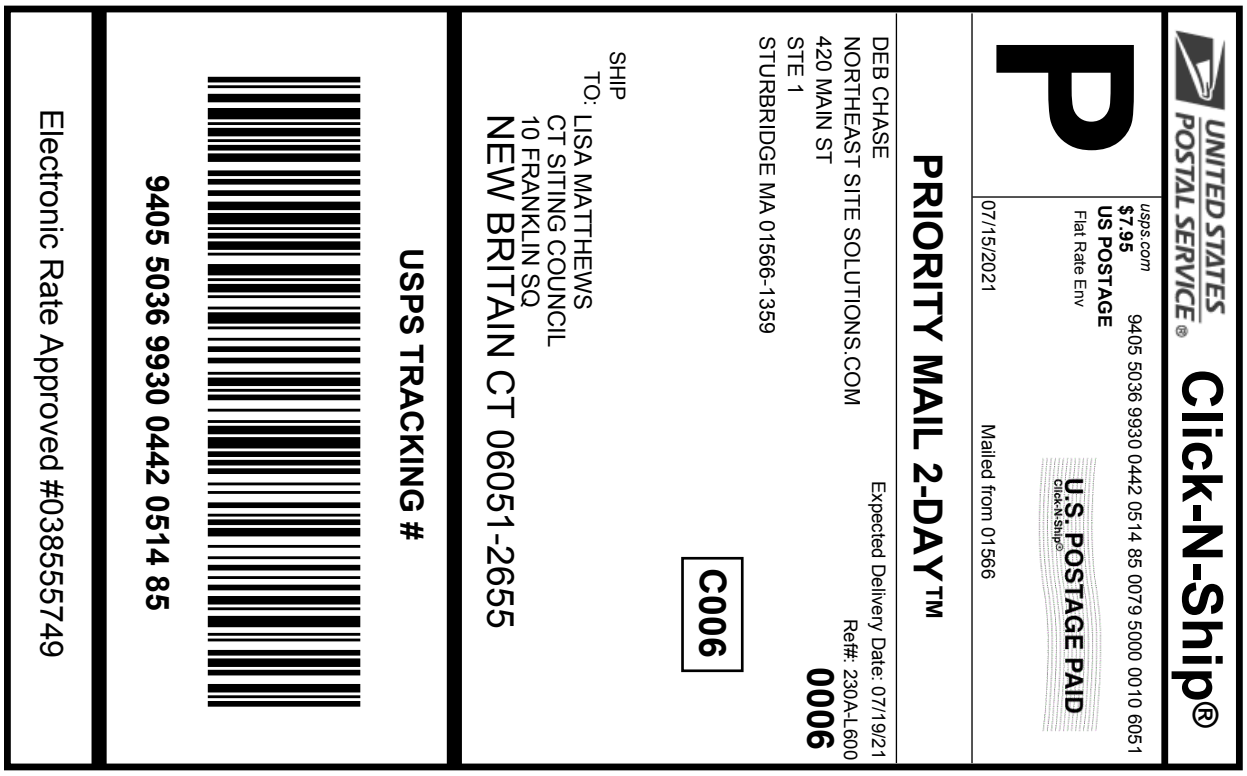
The anticipated maximum composite contributions from the T-Mobile facility as well as the site composite emissions value with regards to compliance with FCC's allowable limits for general population exposure to RF Emissions are shown here:

T-Mobile Sector	Power Density Value (%)
Sector A:	7.83%
Sector B:	7.83%
Sector C:	7.83%
T-Mobile Maximum MPE % (Sector A):	7.83%
Site Total:	16.27%
Site Compliance Status:	**COMPLIANT**

The anticipated composite MPE value for this site assuming all carriers present is **16.27%** 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 0442 0514 85

Trans. #:	538176465
Print Date:	07/12/2021
Ship Date:	07/15/2021
Expected Delivery Date:	07/19/2021

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

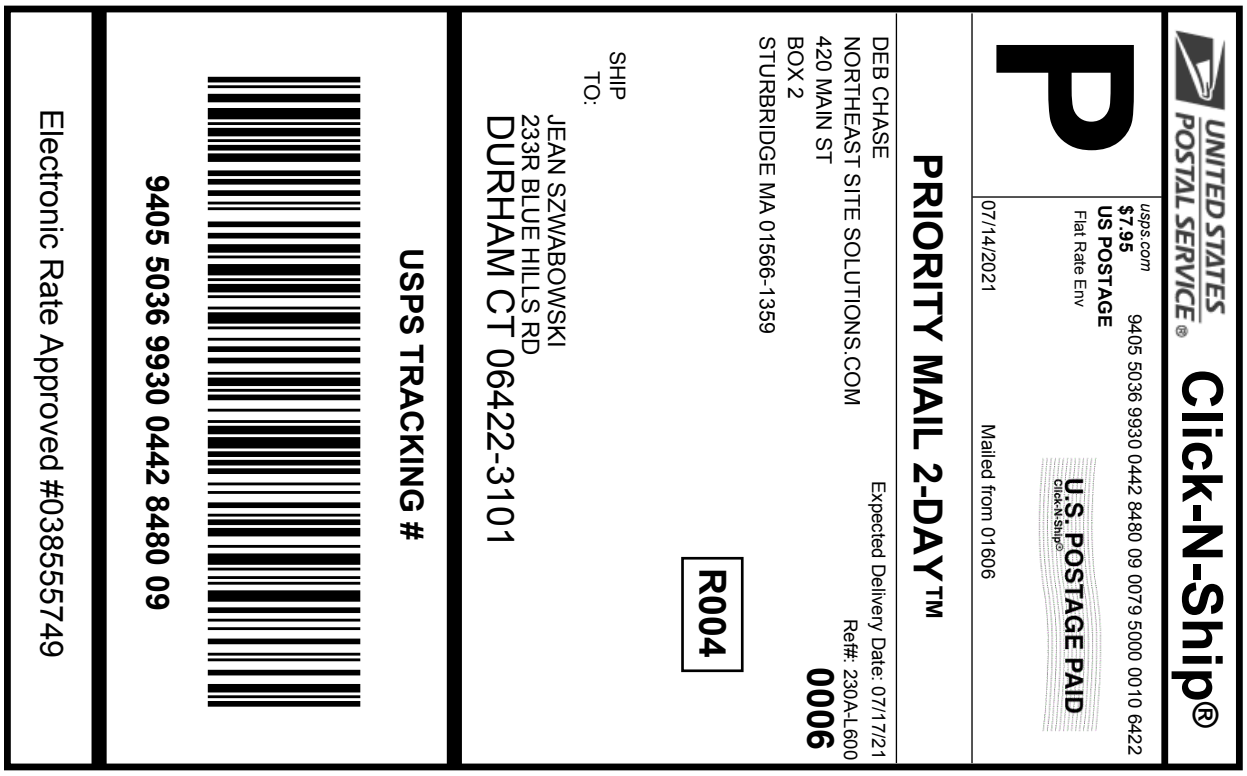
From: DEB CHASE Ref#: 230A-L600
NORTHEAST SITE SOLUTIONS.COM
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

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

Exhibit H



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 0442 8480 09

Trans. #:	538241081
Print Date:	07/13/2021
Ship Date:	07/14/2021
Expected Delivery Date:	07/17/2021

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

From: DEB CHASE Ref#: 230A-L600
NORTHEAST SITE SOLUTIONS.COM
420 MAIN ST
BOX 2
STURBRIDGE MA 01566-1359

To: JEAN SZWABOWSKI
233R BLUE HILLS RD
DURHAM CT 06422-3101

* 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

Tracking Number: 9405503699300442848009

Rer

Your item was delivered in or at the mailbox at 9:21 am on July 15, 2021 in DURHAM, CT 06422.

USPS Tracking Plus™ Available

Status

Delivered, In/At Mailbox

July 15, 2021 at 9:21 am
DURHAM, CT 06422

Get Updates

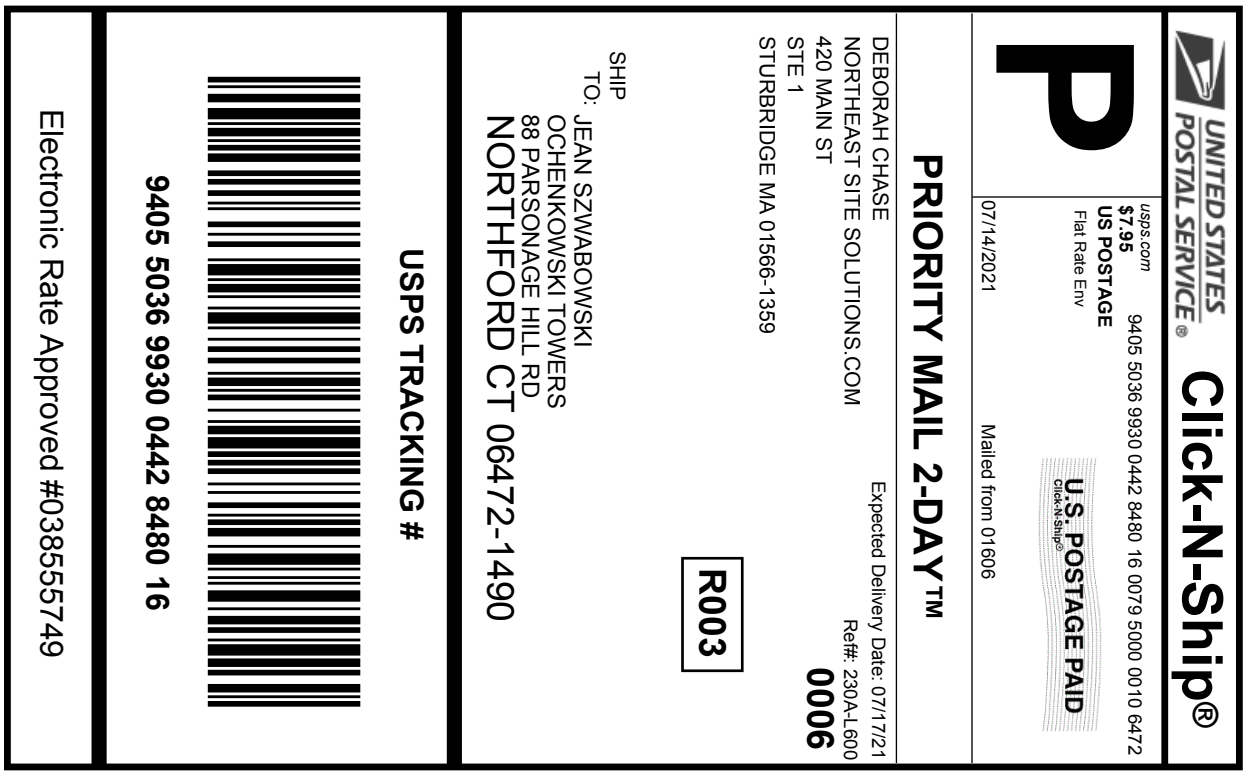
Delivered

Text & Email Updates

Tracking History

USPS Tracking Plus™

Product Information



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 0442 8480 16

Trans. #:	538241081
Print Date:	07/13/2021
Ship Date:	07/14/2021
Expected Delivery Date:	07/17/2021

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

From: DEBORAH CHASE Ref#: 230A-L600
NORTHEAST SITE SOLUTIONS.COM
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

To: JEAN SZWABOWSKI
OCHENKOWSKI TOWERS
88 PARSONAGE HILL RD
NORTHFORD CT 06472-1490

* 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

Tracking Number: 9405503699300442848016

Remove ×

Your item was delivered in or at the mailbox at 1:04 pm on July 16, 2021 in NORTHFORD, CT 06472.

USPS Tracking Plus™ Available

Status

Delivered, In/At Mailbox

July 16, 2021 at 1:04 pm
NORTHFORD, CT 06472

Get Updates

Delivered

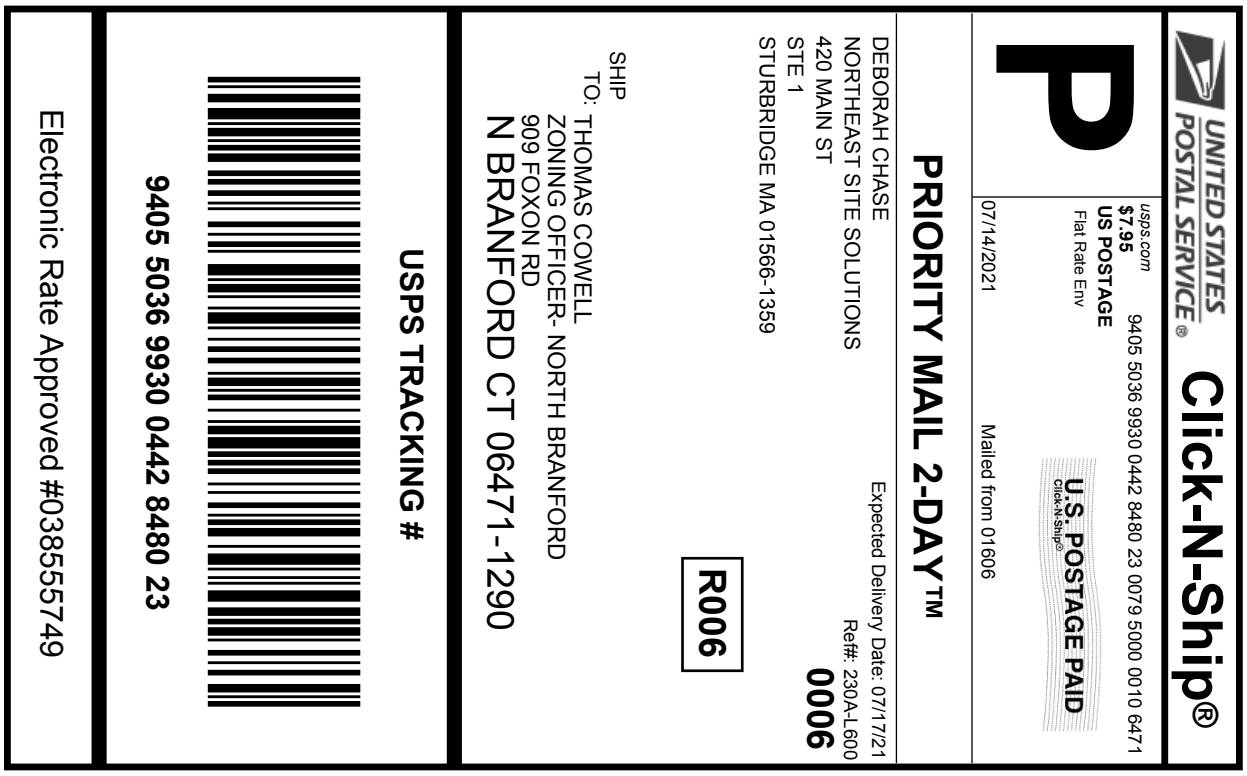
Text & Email Updates

Tracking History

USPS Tracking Plus™

Product Information

See Less



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 0442 8480 23

Trans. #:	538241081
Print Date:	07/13/2021
Ship Date:	07/14/2021
Expected Delivery Date:	07/17/2021

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

From: DEBORAH CHASE
NORTHEAST SITE SOLUTIONS
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

Ref#: 230A-L600

To: THOMAS COWELL
ZONING OFFICER- NORTH BRANFORD
909 FOXON RD
N BRANFORD CT 06471-1290

* 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

Tracking Number: 9405503699300442848023

R

Your item was delivered in or at the mailbox at 8:34 am on July 15, 2021 in NORTH BRANFORD, CT 06471.

USPS Tracking Plus™ Available

Status

Delivered, In/At Mailbox

July 15, 2021 at 8:34 am
NORTH BRANFORD, CT 06471

Get Updates

Delivered

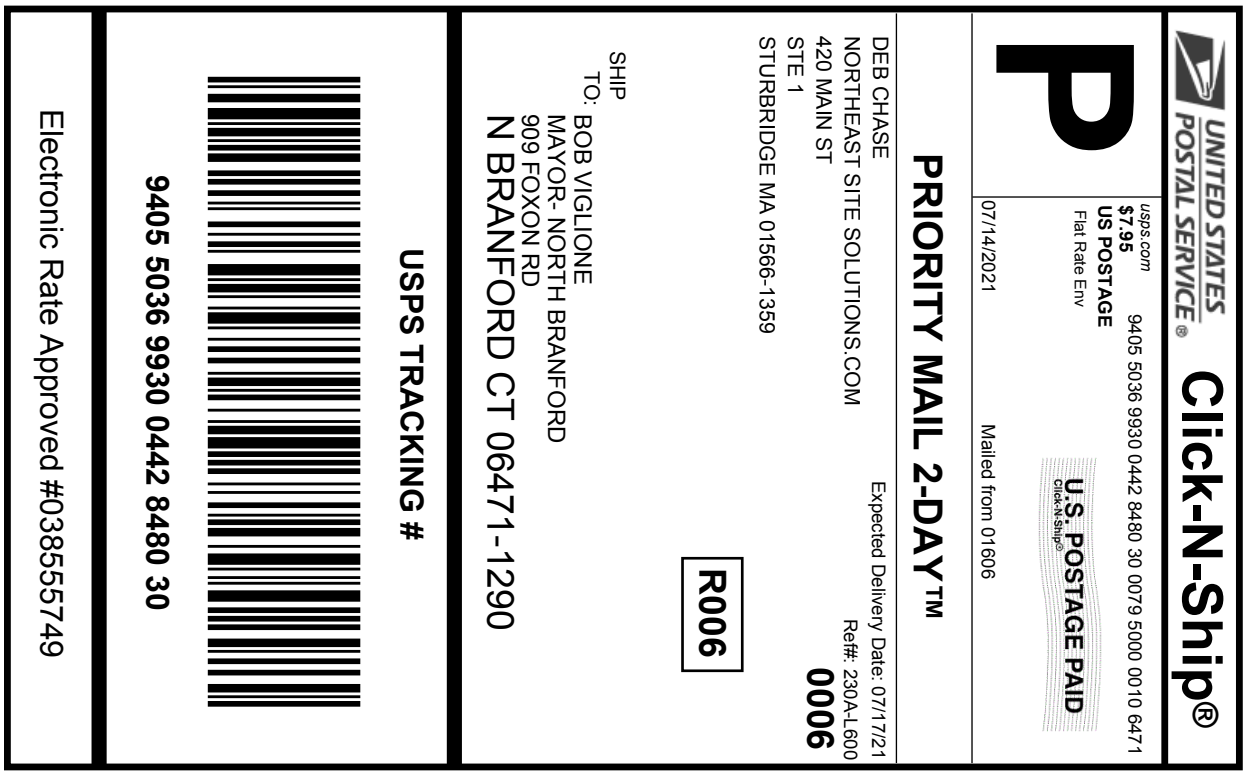
Text & Email Updates

Tracking History

USPS Tracking Plus™

Product Information

See Less



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 0442 8480 30

Trans. #:	538241081
Print Date:	07/13/2021
Ship Date:	07/14/2021
Expected Delivery Date:	07/17/2021

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

From: DEB CHASE Ref#: 230A-L600
NORTHEAST SITE SOLUTIONS.COM
420 MAIN ST
STE 1
STURBRIDGE MA 01566-1359

To: BOB VIGLIONE
MAYOR- NORTH BRANFORD
909 FOXON RD
N BRANFORD CT 06471-1290

* 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

Tracking Number: 9405503699300442848030

Ren

Your item was delivered in or at the mailbox at 8:34 am on July 15, 2021 in NORTH BRANFORD, CT 06471.

USPS Tracking Plus™ Available

Status

Delivered, In/At Mailbox

July 15, 2021 at 8:34 am
NORTH BRANFORD, CT 06471

Get Updates

Delivered

Text & Email Updates

Tracking History

USPS Tracking Plus™

Product Information

See Less