August 28, 2022

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

Re:	**Notice of Exempt Modification – Antenna and RRU Add**
Property Address:	**6 Progress Ave, Seymour, CT 06483**
Applicant:	**AT&T Mobility, LLC**

Dear Ms. Bachman:

On behalf of AT&T, please accept this application as notification pursuant to R.C.S.A. §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. §16- 50j-72(b) (2).

AT&T currently maintains a wireless telecommunications facility consisting of nine (9) wireless telecommunication antennas at an antenna center line height of 160-feet on an existing 280-foot Self-Support Tower, owned by EDMAC LLC at 2702 Forset View Lane, Kissimmee, FL 34744. AT&T now intends to remove three (3) 4' Kathrein 800-10121 Panel Antennas, each currently installed in position [1], remove three (3) 6' Qunitel Qs66512-2 panel antennas installed in position [3] and remove three (3) 6' CCI HPA-65R-BU6AA Panel Antennas installed in positon [4]. AT&T then swap these for three (3) 6' CCI TPA65R-BU6DA-K Panel Antennas. Three (3) 6' CCI DMP65R-BU6DA Panel Antennas to be installed in positions [2+4], three (3) 2.5' Ericsson AIR6449 B77D Panel Antennas and three (3) 2.5' Ericsson AIR6419 B77G Panel Antennas each to be installed in position [3] stacked. In addition, AT&T intends to remove six (6) Remote Radio Units add three RRUS-4449 B5/B12 in position [4], for a total of three (3) new RRUs. AT&T is also proposing to replace (3) existing Raycap Squids with (3) new Raycap Squids, as well as three (3) fiber lines and (9) DC Power Cables to their equipment configuration. All of the changes will take place on the existing antenna mount. This modification/proposal includes B2, B5, and B12 hardware that is both 4G(LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times

Attached is a summary of the planned modifications including power density calculations reflecting the change in AT&T's operations at the site. Also included is documentation of the structural sufficiency of the tower to accommodate the revised antenna configuration.

Please accept this letter pursuant to Regulation of Connecticut State Agencies §16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-5I0j-72(b) (2). In accordance with R.C.S.A., a copy of this letter is being sent to Jim Baldwin – Town Building Official, Town of Essex, CT at 1 First Street Seymour, CT 06483and Annmarie Drugonis – First Selectwoman, Town of Essex, CT at 1 First Street Seymour, CT 06483. A copy of this letter is being sent to the property owner EDMAC LLC at 2702 Forset View Lane, Kissimmee, FL 34744.

The following is a list of subsequent decisions by the Connecticut Siting Council:

- **EM-AT&T-124-020628 -** AT&T Wireless notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.
- **EM-CING-045-059-124-131-152-070914** - New Cingular Wireless PCS, LLC notice of intent to modify existing telecommunications facilities located at Flanders Road, East Lyme; 725 (a.k.a. 741) Flanders Road, Groton; 6 Progress Avenue; Seymour; Shuttle Meadow Road, Southington; and 41 Manitock Hill Road, Waterford, Connecticut.
- **EM-CING-124-120621** - New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.
- **EM-AT&T-124-140203** - American Telephone & Telegraph (AT&T) notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.
- **EM-AT&T-124-150901** - AT&T Mobility (AT&T) notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.

- **EM-AT&T-124-160318** - AT&T notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.
- **EM-AT&T-124-161206** - AT&T notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.
- **EM-AT&T-124-170117** - AT&T notice of intent to modify an existing telecommunications facility located at 6 Progress Avenue, Seymour, Connecticut.
- **EM-AT&T-124-190328** - AT&T notice of intent to modify an existing telecommunications facility located at 6 Progress Lane, Seymour, Connecticut.

The planned modifications to AT&T's facility fall squarely within those activities explicitly provided for in R.C.S.A. §16-50j-72(b) (2).

1. The proposed modifications will not result in an increase in the height of the existing tower. AT&T's replacement antennas will be installed at the 160-foot level of the 280-foot self-support tower.
2. The proposed modifications will not involve any changes to ground-mounted equipment and, therefore, will not require and extension of the site boundary.
3. The proposed modifications will not increase the noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency (RF) emissions at the facility to a level at or above the Federal Communications Commission (FCC) safety standard. A cumulative worst-case RF emissions calculation for AT&T's modified facility is provided in the RF Emissions Compliance Report, included in Tab 2.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The tower and its foundation can support AT&T's proposed modifications. (See Structural Analysis Report included in Tab 3).

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

Sincerely,

Kristina Cottone

CC w/enclosures:
Jim Baldwin– Town Building Official, Town of Seymour CT
Annmarie Drugonis – First Selectwoman, Town of Seymour, CT
EDMAC LLC- Property Owner

ding Concrete Base for Tower Date 6-20 19 2000

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APPLICATION FOR BUILDING PERMIT

B-01711

No. 8571

CR #4502

Estimated Cost $ 126000

Fee . . . . $ ~~120~~

Occupancy Fee $ 20.00

Additional Cost $ 19.46

THE BUILDING DEPARTMENT, TOWN OF SEYMOUR, CONN.

undersigned, hereby applies for a permit to do work according to the following specifications:

2 Progress Ave Lot No. 13 Side of Street R Zone CI

est cross street Silvermine Road

er of building Emac Communication Corp. Address 50 olivia St.

ler Northeast Tower Address 170 River Rd. Unionville

itect Pirad Inc. Address 1545 Pidco Drive plymouth

Main Bldg.: No. ft. front overall No. ft. deep overall Area

of wings Garages No. of families No. of stories

truction Steel Concrete No. of rooms: 1st 2nd 3rd

of Lot 2.11 ac Dist. from Street Line 190' Dist. from Side Line Street

ose of building is concrete Tower base ~~and Steel Tower~~

as per plans and Specs. on file

Sewer ☐ Septic Tank ☐

ding ERECTION of Steel Tower. Date 6-29- 19 2002

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Dept.

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APPLICATION FOR BUILDING PERMIT

NO-FEE P.O. with Bldg. permit.

No. 8581

REC # B-01720.

Estimated Cost $ Included with Permit #

Fee . . . . $

Occupancy Fee $

Additional Cost $

THE BUILDING DEPARTMENT, TOWN OF SEYMOUR, CONN.

undersigned, hereby applies for a permit to do work according to the following specifications:

2 Progress Ave Lot No. 13 Side of Street R Zone CI 2

est cross street Silvermine Rd

er of building Emac Communications Corp. Address 50 olivia St Derby

ler Northeast Tower Address 170 River Rd Unionville CT

itect PiRad Inc Address 1545 Pidco DR - plymouth PA

Main Bldg.: No. ft. front overall No. ft. deep overall Area

of wings Garages No. of families No. of stories

truction Steel + Concrete No. of rooms: 1st 2nd 3rd

of Lot 2.11 ac Dist. from Street Line 190 Dist. from Side Line Street

ose of building is Erection of Steel Tower as per Plans & Specs on file

Sewer ☐ Septic Tank ☐

SEYMOUR PLANNING AND ZONING COMMISSION

TOWN HALL 1 FIRST STREET SEYMOUR, CONNECTICUT

ZONING PERMIT

PROPERTY IDENTIFICATION

Address 2 PROGRESS AV Zone GI-2

Tax Map 1-5 Parcel No 12N Developer's Lot No _____

Name of Applicant EMAC COMMUNICATION Tel No 735 7733

DESCRIPTION OF WORK

Construction of Bldgs and site improvements as shown on Site plan approved by PZ 11-4-99 & M Foundation plans for Tower on file with Town Engineer Construction of Tower not Authorized until bond for Tower received.

PLOT PLAN AND SURVEY

(1) Attach plot plan prepared at a scale of not more than 60 ft to one inch. Plot plan for a zoning/start permit shall be prepared using available data, but need not be an A-2 survey. on file with PZ

2. As Built- A-2 Survey

_____ Not required to assure zoning compliance

__X__ Required before a Certificate of Occupancy will be authorized.

SOIL EROSION CONTROL PLAN

_____ Not required

__X__ Required. Show on plot plan or attach separate plan.

APPROVALS

1. Zoning/Start permit approved. Building permit authorized.

Robert Lavita Asst ZEO 6-20-00 Date

2. Zoning/Development Completion Certificate
Based on a review of the zoning/start permit, building permit, A-2 survey as required and/or an inspection of the property, this development conforms to the zoning regulations and a certificate of occupancy is authorized.

_____ ZEO _____ Date

Town of Seymour, CT

Property Listing Report

Map Block Lot	1-05-12N-0	Building #	1	PID	43	Account	015124

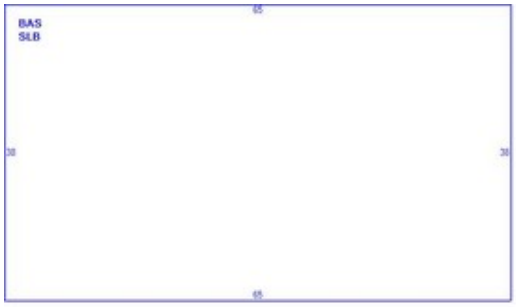
Property Information

Property Location	6 PROGRESS AVE
Owner	EDMAC LLC
Co-Owner	
Mailing Address	2702 FOREST VIEW LANE KISSIMMEE FL 34744
Land Use	4330 RAD/TV TR
Land Class	I
Zoning Code	GI-2
Census Tract	

Neighborhood	D
Acreage	2.15
Utilities	
Lot Setting/Desc	Level
Book / Page	285/679
Additional Info	

Photo

Sketch



Primary Construction Details

Year Built	2001
Building Desc.	RAD/TV TR
Building Style	Com Garage
Building Grade	Average
Stories	1
Occupancy	1.00
Exterior Walls	Concr/Cinder
Exterior Walls 2	NA
Roof Style	Flat
Roof Cover	Rolled Compos
Interior Walls	Minim/Masonry
Interior Walls 2	NA
Interior Floors 1	Precast Concr
Interior Floors 2	NA

Heating Fuel	Gas
Heating Type	Hot Air-no Duc
AC Type	Central
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	
Bath Style	NA
Kitchen Style	NA
Rec Rm Area	NA
Rec Rm Quality	NA
Bsmt Gar	NA
Fireplaces	NA

(*Industrial / Commercial Details)

Building Use	Comm/Ind
Building Condition	A
Sprinkler %	NA
Heat / AC	Heat /AC Split
Frame Type	Masonry
Baths / Plumbing	None
Ceiling / Wall	None
Rooms / Prtns	Light
Wall Height	16.00
First Floor Use	4330
Foundation	NA

Report Created On 8/28/2022

Town of Seymour, CT

Property Listing Report | Map Block Lot 1-05-12N-0 | Building # 1 | PID 43 | Account 015124

Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	61100	42770
Extras	0	0
Improvements		
Outbuildings	7000	4900
Land	163200	114240
Total	231300	161910

Outbuilding and Extra Features

Type	Description
Paving Asph.	7000 S.F.
Fence 8 Ft	215 L.F.

Sub Areas

Subarea Type	Gross Area (sq ft)	Living Area (sq ft)
First Floor	2470	2470
Slab	2470	0
Total Area	4940	2470

Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
EDMAC LLC	285/679	2001-09-25	0
MACCONNIE EDWARD H	269/272	2000-06-28	0
EMAC COMMUNICATIONS CO INC	266/50	2000-02-11	110000
HUBBELL REALTY DEVELOPMENT	150/777		0

Report Created On 8/28/2022

Radio Frequency Safety Survey Report Predictive (RFSSRP) Prepared For AT&T

Site Name:	SEYMOUR EAST
FA#	10099965
USID:	26042
Site ID:	CTL05633
Address:	6 PROGRESS AVENUE SEYMOUR, CT 06483
County:	NEW HAVEN
Latitude:	41.39172054
Longitude:	-73.05285747
Structure Type:	SELF-SUPPORT
Property Owner:	EMAC COMMUNICATIONS
Pace Job:	MRCTB053524
RFDS Technology:	5G NR 1SR CBAND

Report Information

Report Writer: Sunita Sati

Report Generated Date: 06-28-2022

Compliance Statement

AT&T Mobility Compliance Statement: Based on the information collected, AT&T Mobility will be Compliant when the remediation recommended in section 5 or appropriate remediation determined by AT&T is implemented

Table of Contents

1. Executive Summary

1.1 Site Summary

Max Predictive Spatial Average MPE% & Location on Site (General Public)	17515.8% on Antennas Centerline Level & at AT&T Sec-B antenna no. #B3-2
Max Predictive Spatial Average MPE% at Ground Level (General Public)	0.8%
AT&T Mobility Site Compliance	AT&T Mobility will be Compliant by implementing remediation recommended as per section 5 in this report.

TABLE 1: Site Summary

1.2 Signage Summary (Proposed)

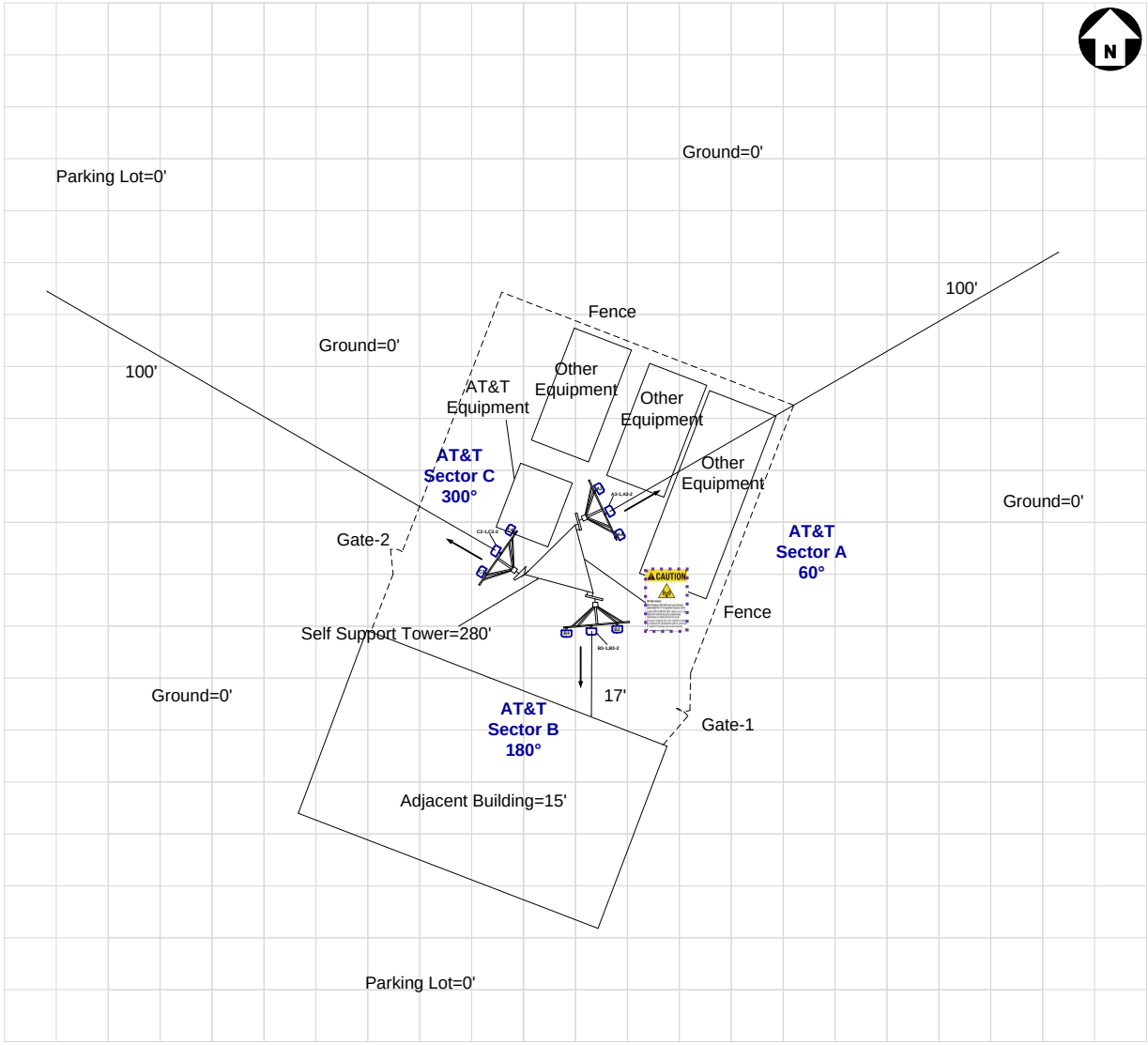
AT&T Signage Locations	Sign Type									
	Safety Instructions	Notice Sign 2	Caution Sign 2	Caution Sign 2B	Caution Sign 2C	Caution 7"x7"	Warning Sign 1B	RF Exposure Map	Lock	Barriers
Access Point(s)				1						
Alpha										
Beta										
Gamma										

TABLE 2: Signage Summary (Proposed)

1.3 List of Documents used to prepare this Report

- *10099965_AE201_220525_CTL05633_REV1*
- *NEW-ENGLAND_CONNECTICUT_CTL05633_2022-5G-mmWave_5G-NR-1SR-CBAND_mh705r_PTN_10099965_26042_05-17-2021_Final-Approved_v3.00*

2. Site Scale Map



AT&T Antenna	Proposed	Proposed Signage									
Panel	Barrier	Safety Instructions	Notice 2	Caution 2	Caution 2B	Caution 2C	Caution 7"x7"	Warning 1B	RF Exposure Map	Lock	***Map Scale = 10 ft***
OMNI	Posts										

3. Antenna Inventory

Ant ID	Operator	Antenna Mfg	Antenna Model	Antenna Type	FREQ. (MHz)	TECH.	AZ. (0)	HBW (0)	Antenna Gain (dBd)	Antenna Aperture (ft)	Transmitter Power (Watts)	Total Loss (dB)	Total ERP (Watts)	Total EIRP (Watts)
A2	AT&T	CCI	TPA65R-BU6D	Panel	700	LTE(FN)	60	73	12.35	6	120.00	0.5	1837.30	3014.26
A2	AT&T	CCI	TPA65R-BU6D	Panel	1900	LTE/5G	60	66	15.95	6	120.00	0.5	4209.02	6905.28
A2	AT&T	CCI	TPA65R-BU6D	Panel	2100	LTE/5G	60	66	16.25	6	180.00	0.5	6765.07	11098.71
A3-1	AT&T	Ericsson	AIR 6419 B77G^	Panel	3450	5G	60	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
A3-2	AT&T	Ericsson	AIR 6449 B77D^	Panel	3840	5G	60	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
A4	AT&T	CCI	DMP65R-BU6D	Panel	700	LTE(B12)	60	74	11.85	6	120.00	0.5	1637.50	2686.47
A4	AT&T	CCI	DMP65R-BU6D	Panel	850	5G	60	63	12.45	6	120.00	0.5	1880.10	3084.47
A4	AT&T	CCI	DMP65R-BU6D	Panel	2300	LTE	60	54	16.25	6	75.00	0.5	2818.78	4624.46
B2	AT&T	CCI	TPA65R-BU6D	Panel	700	LTE(FN)	180	73	12.35	6	120.00	0.5	1837.30	3014.26
B2	AT&T	CCI	TPA65R-BU6D	Panel	1900	LTE/5G	180	66	15.95	6	120.00	0.5	4209.02	6905.28
B2	AT&T	CCI	TPA65R-BU6D	Panel	2100	LTE/5G	180	66	16.25	6	180.00	0.5	6765.07	11098.71
B3-1	AT&T	Ericsson	AIR 6419 B77G^	Panel	3450	5G	180	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
B3-2	AT&T	Ericsson	AIR 6449 B77D^	Panel	3840	5G	180	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
B4	AT&T	CCI	DMP65R-BU6D	Panel	700	LTE(B12)	180	74	11.85	6	120.00	0.5	1637.50	2686.47
B4	AT&T	CCI	DMP65R-BU6D	Panel	850	5G	180	63	12.45	6	120.00	0.5	1880.10	3084.47
B4	AT&T	CCI	DMP65R-BU6D	Panel	2300	LTE	180	54	16.25	6	75.00	0.5	2818.78	4624.46
C2	AT&T	CCI	TPA65R-BU6D	Panel	700	LTE(FN)	300	73	12.35	6	120.00	0.5	1837.30	3014.26
C2	AT&T	CCI	TPA65R-BU6D	Panel	1900	LTE/5G	300	66	15.95	6	120.00	0.5	4209.02	6905.28
C2	AT&T	CCI	TPA65R-BU6D	Panel	2100	LTE/5G	300	66	16.25	6	180.00	0.5	6765.07	11098.71
C3-1	AT&T	Ericsson	AIR 6419 B77G^	Panel	3450	5G	300	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
C3-2	AT&T	Ericsson	AIR 6449 B77D^	Panel	3840	5G	300	11	23.5	2.55	108.44*	0	24277.05*	39828.68*
C4	AT&T	CCI	DMP65R-BU6D	Panel	700	LTE(B12)	300	74	11.85	6	120.00	0.5	1637.50	2686.47
C4	AT&T	CCI	DMP65R-BU6D	Panel	850	5G	300	63	12.45	6	120.00	0.5	1880.10	3084.47
C4	AT&T	CCI	DMP65R-BU6D	Panel	2300	LTE	300	54	16.25	6	75.00	0.5	2818.78	4624.46

Table 3.1: Antenna Inventory Table

Note: **^ <u>Mechanical Tilt value of "0°" MUST be retained for C-BAND and/or DoD AAS antenna(s) at all times to ensure that "EME (Predictive) Study" shall remain valid.</u>**
* 75% TDD duty Cycle, 1.5dB Power Tolerance & 0.32 Power Reduction factor[1] are used to calculate Transmitter Power & ERP/EiRP

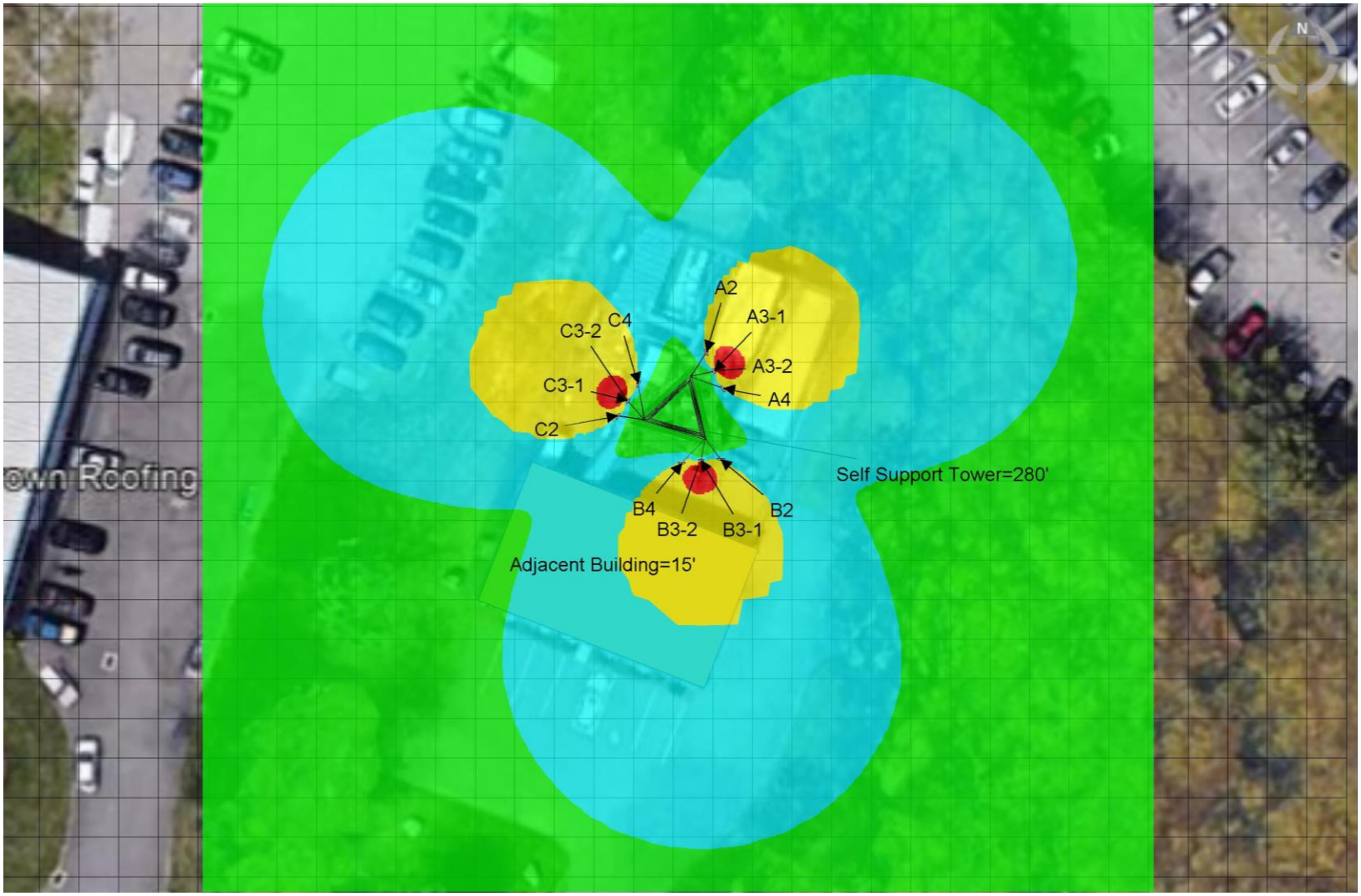
Antenna Heights (Z)

Ant ID	Operator	Antenna Radiation Centerline	Z-Height from Adj. Bldg	Z-Height from Ground
A2	AT&T	160.00	142.00	157.00
A3-1	AT&T	161.78	145.50	160.50
A3-2	AT&T	158.23	141.96	156.96
A4	AT&T	160.00	142.00	157.00
B2	AT&T	160.00	142.00	157.00
B3-1	AT&T	161.78	145.50	160.50
B3-2	AT&T	158.23	141.96	156.96
B4	AT&T	160.00	142.00	157.00
C2	AT&T	160.00	142.00	157.00
C3-1	AT&T	161.78	145.50	160.50
C3-2	AT&T	158.23	141.96	156.96
C4	AT&T	160.00	142.00	157.00

Table 3.2: Antenna Height(s) Summary Table

4. Predicted Emission

4.1 Predictive Cumulative MPE Contribution from All Sources at Antennas Centerline Level (160 ft.)



Max. Predictive Spatial Average MPE% = **17515.8%**

Proposed Barrier
Proposed Posts

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

4.2 Predictive Cumulative MPE Contribution from All Sources at Adjacent Building Level (15 ft.)

Max. Predictive Spatial Average MPE% = **0.5%**

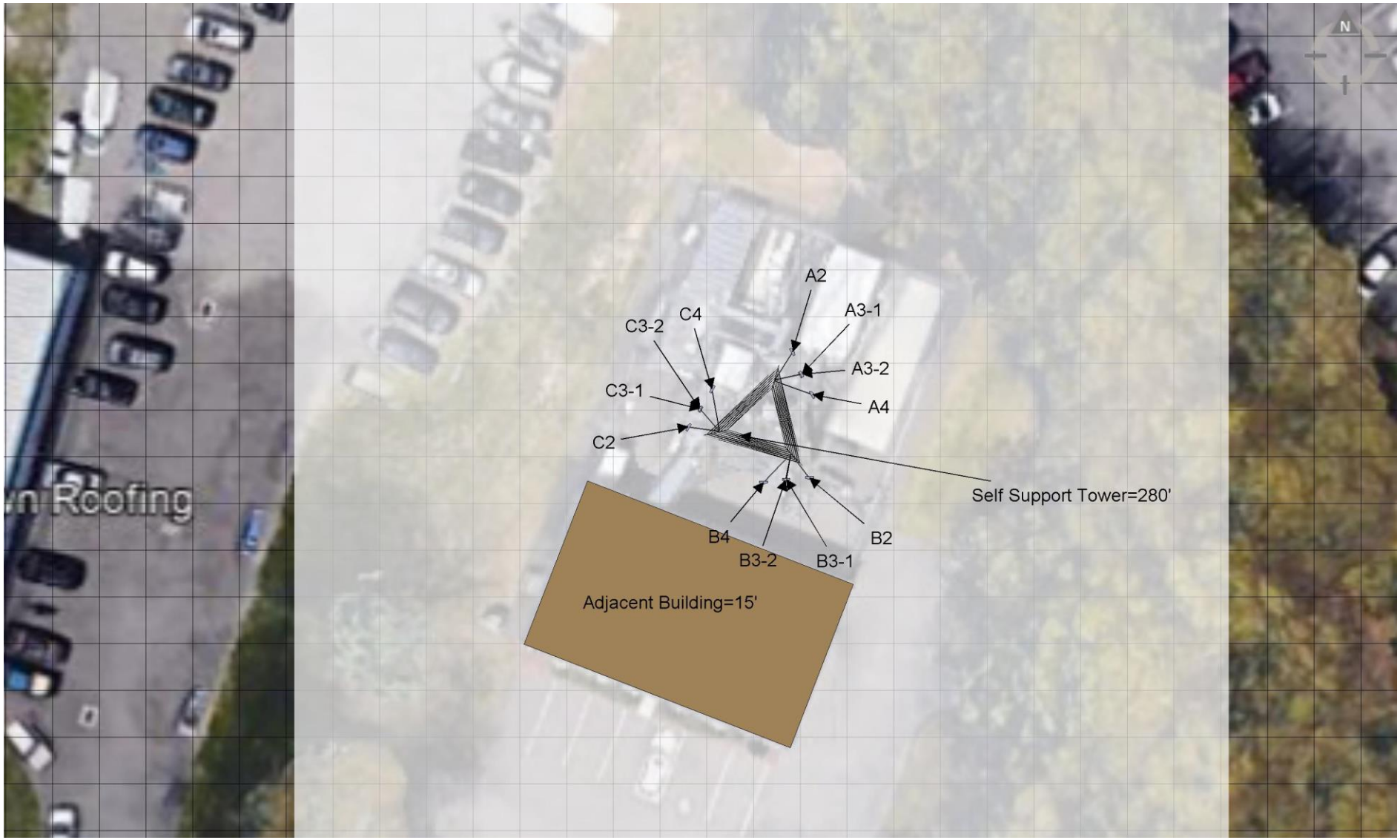
Proposed Barrier
Proposed Posts

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

4.3 Predictive Cumulative MPE Contribution from All Sources at Ground Level (0 ft.)



Max. Predictive Spatial Average MPE% = **0.8%**

Proposed Barrier

Proposed Posts

% of FCC General Public Exposure Limit (Predictive Spatial Average)

Non-Simulated	0-1	1-100	100-500	500-5000	>5000

Map Scale = 10 ft

5. Statement of Compliance

5.1 Statement of AT&T Mobility Compliance

At the time of our Analysis, AT&T Mobility is required to take action to fulfill their Obligations to comply with the FCC's mandate as defined in OET-65

Recommendations

AT&T Alpha Sector:

- No Action Required

AT&T Beta Sector:

- No Action Required

AT&T Gamma Sector:

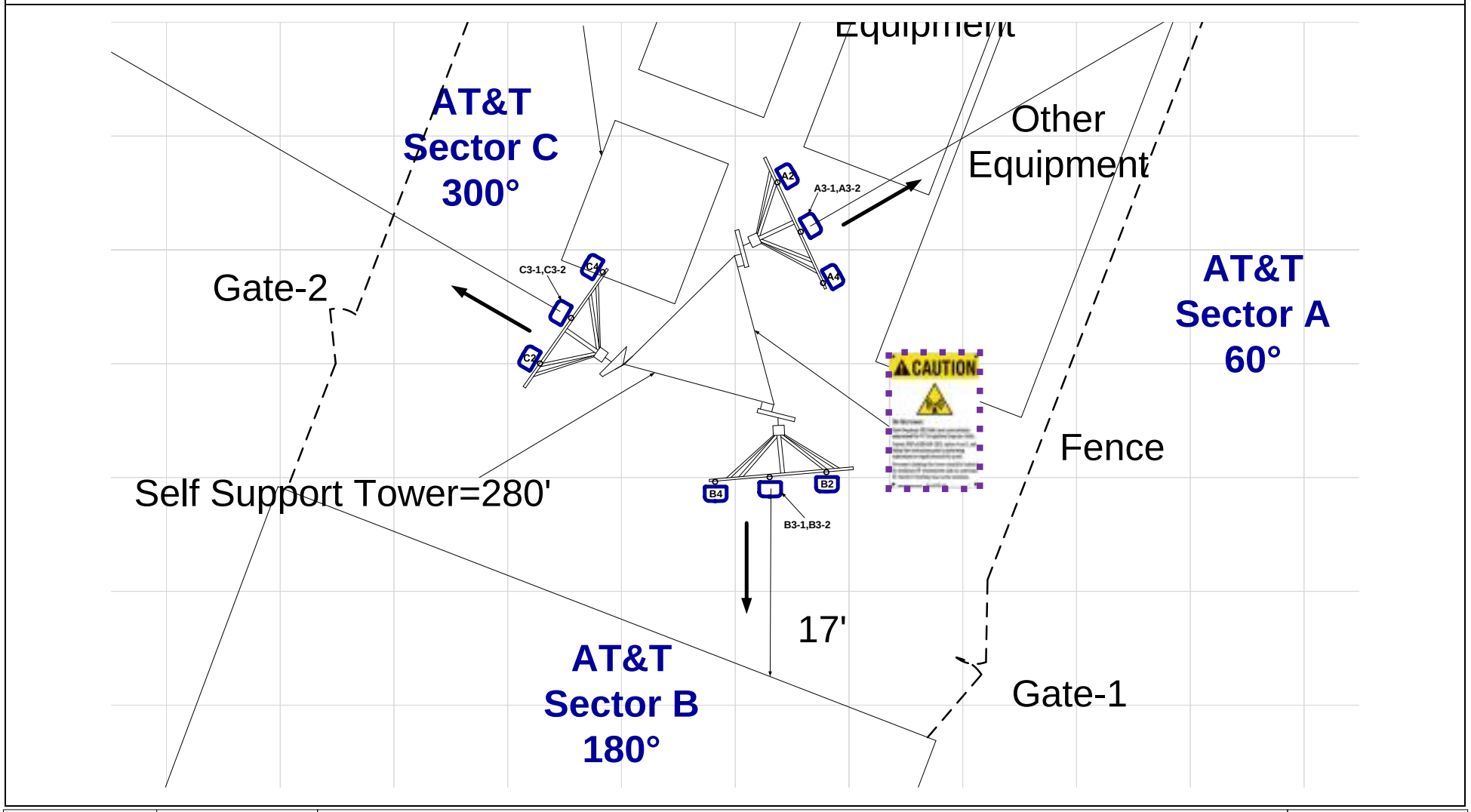
- No Action Required

Self-Support:

- One Caution 2B Sign to be posted on the Tower at climbing access, facing outwards so approaching people can see as shown in "Recommendations Map – Detailed View" on page 11. (1 Total Sign)

Recommendations Map – Detailed View

AT&T Alpha, Beta & Gamma Sectors



AT&T Antenna	Proposed	Proposed Signage									
Panel	Barrier	Safety Instructions	Notice 2	Caution 2	Caution 2B	Caution 2C	Caution 7"x7"	Warning 1B	RF Exposure Map	Lock	*Map Scale = 10 ft*
OMNI	Posts										

Appendix A – Statement of Limiting Conditions

General Model Assumptions

In this site compliance report, it is assumed that all antennas are operating at full power at all times. AT&T has further recommended to assume a 75% duty cycle of maximum radiated power for all LTE & 5G carriers (& consider 100% duty cycle for all UMTS carriers).

In this site compliance report, it is assumed that Mechanical Tilt value of "0°" MUST be retained for C-BAND and/or DoD AAS^ antenna(s) at all times to ensure that "EME (Predictive) Study" shall remain valid.

AT&T recommended to consider - For C-BAND and/or DoD AAS^ antenna(s) 75% TDD duty Cycle, 1.5dB Power Tolerance & 0.32 Power Reduction factor[1] are used to calculate Transmitter Power & ERP/EiRP.

AT&T recommended to use worst-case tilts for the simulations.

*[1] **Power Reduction Factor**: IEC Standard 62232: 2017 allows for a statistically conservative power density model to more realistically define the RF exposure area. AT&T recommends a "0.32" factor to calculate the "Actual Maximum" (time averaged) power value, which accounts for "Beam Scanning," "Scheduling," and "RBS Utilization" This recommended value is a conservative figure modelled and supported by other vendors and through measurements published in scientific articles and white papers by IEEE and others. Those publication are listed below:*

1. IEEE Access, Time-Averaged Realistic Maximum Power Levels for the Assessment of RF Exposure for 5G Radio Base Stations Using Massive MIMO (Published Sept. 18, 2017 / BJÖRN THORS, ANDERS FURUSKÄR, DAVIDE COLOMBI, AND CHRISTER TÖRNEVIK)
2. IEEE Explore, A Statistical Approach for RF Exposure Compliance Boundary Assessment in Massive MIMO Systems (Published Jan. 25, 2018 / Paolo Baracca, Andreas Weber, Thorsten Wild, Christophe Grangeat)
3. IEEE Access, In-situ Measurement Methodology for the Assessment of 5G NR Massive MIMO Base Station Exposure at Sub-6 GHz Frequencies (Published Dec. 20, 2019 / SAM AERTS, LEEN VERLOOCK, MATTHIAS VAN DEN BOSSCHE, DAVIDE COLOMBI, LUC MARTENS, CHRISTER TÖRNEVIK AND WOUT JOSEPH)
4. Applied Sciences, Analysis of the Actual Power and EMF Exposure from Base Stations in a Commercial 5G Network (Published July 30, 2020 / Davide Colombi, Paramananda Joshi, Bo Xu, Fatemeh Ghasemifard, Vignesh Narasaraju and Christer Törnevik)
5. Ofcom Technical Report, Electromagnetic Field (EMF) measurements near 5G mobile phone base stations (Published Feb. 21, 2020 / Davide Colombi, Paramananda Joshi, Bo Xu, Fatemeh Ghasemifard, Vignesh Narasaraju and Christer Törnevik)

MobileComm believes these areas to be safe for entry by occupationally trained personnel utilizing appropriate personal protective equipment (in most cases, a personal monitor). Thus, at any time, if power density measurements were made, we believe the real time measurements would indicate levels below those depicted in the RF emission diagram(s) in this report. By modelling in this way, MobileComm has conservatively shown exclusion areas – areas that should not be entered without the use of a personal monitor, carriers reducing power, or performing real-time measurements to indicate real-time exposure levels.

Use of Generic Antennas

For the purposes of this report, the use of "Generic" as an antenna model, or "Other Carrier" for an operator means the information about a carrier, their FCC license and/or antenna information was not provided and could not be obtained while on site. In the event of unknown information, MobileComm will use our industry specific knowledge of equipment, antenna models, and transmit power to model the site. Information about similar facilities is used when the service is identified and associated with a particular antenna. If no information is available regarding the transmitting service associated with an unidentified antenna, using the antenna manufacturer's published data regarding the antenna's physical characteristics makes more conservative assumptions.

Where the frequency is unknown, MobileComm uses the closest frequency in the antenna's range that corresponds to the highest Maximum Exposure Limit (MPE), resulting in a conservative analysis.

Appendix B – FCC Guidelines and Emissions Threshold Limits

All power density values used in this report were 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 (µW/cm2).The number of µW/cm2 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 public 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 public 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 (µW/cm2). The general population exposure limit for the 700 and 800 MHz Bands is approximately 467 µW/cm2 and 567 µW/cm2 respectively, and the general population exposure limit for the 1900 MHz PCS and 2100 MHz AWS bands is 1000 µW/cm2. 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, have been properly trained in RF safety 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, have been trained in RF safety and can exercise control over his or her exposure by leaving the area or by some other appropriate means. The Occupational/Controlled exposure limits all utilized frequency bands is five (5) times the FCC's General Public / Uncontrolled exposure limit.

Additional details can be found in FCC OET 65.

Table 1: Limits for Maximum Permissible Exposure (MPE)				
(A) Limits for Occupational/Controlled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-3.0	614	1.63	(100)*	6
3.0-30	1842/f	4.89/f	($900/f^2$)*	6
30-300	61.4	0.163	1.0	6
300-I,500	--	--	f/300	6
1,500-100,000	--	--	5	6
(B) Limits for General Public/Uncontrolled Exposure				
Frequency Range (MHz)	**Electric Field Strength (E) (V/m)**	**Magnetic Field Strength (H) (A/m)**	**Power Density (S) (mW/cm^2)**	**Averaging Time $[E]^2$, $[H]^2$, or S (minutes)**
0.3-1.34	614	1.63	(100)*	30
1.34-30	824/f	2.19/f	($180/f^2$)*	30
30-300	27.5	0.073	0.2	30
300-I,500	--	--	f/1,500	30
1,500-100,000	--	--	1.0	30

Appendix C – Rules & Regulations

Explanation of Applicable Rules and Regulations

FCC has set forth guidelines in OET Bulletin 65 for human exposure to radio frequency electromagnetic fields. Currently, there are two different levels of MPE - General Public MPE and Occupational MPE. An individual classified as Occupational can be defined as an individual who has received appropriate RF training and meets the conditions outlined below. General Public is defined as anyone who does not meet the conditions of being Occupational. FCC Rules and Regulations define compliance in terms of total exposure to total RF energy, regardless of location of or proximity to the sources of energy.

It is the responsibility of all licensees to ensure these guidelines are maintained at all times. It is the ongoing responsibility of all licensees composing the site to maintain ongoing compliance with FCC rules and regulations.

A building owner or site manager can use this report as part of an overall RF Health and Safety Policy. It is important for building owners/site managers to identify areas in excess of the General Population MPE and ensure that only persons qualified as Occupational are granted access to those areas.

Occupational Environment Explained

The FCC definition of Occupational exposure limits apply to persons who:

- *are exposed to RF energy as a consequence of their employment;*
- *have been made aware of the possibility of exposure; and*
- *can exercise control over their exposure.*

FCC guidelines go further to state that persons must complete RF Safety Awareness training and must be trained in the use of appropriate personal protective equipment.

In order to consider this site an Occupational Environment, the site must be controlled to prevent access by any individuals classified as the General Public. Compliance is also maintained when any non-occupational individuals (the General Public) are prevented from accessing areas indicated as Red or Yellow in the attached RF Emissions diagram. In addition, a person must be aware of the RF environment into which they are entering. This can be accomplished by an RF Safety Awareness class, and by appropriate written documentation such as this Site Compliance Report.

Appendix D – General Safety Recommendations

The following are general recommendations appropriate for any site with accessible areas in excess of 100% General Public MPE. These recommendations are not specific to this site. These are safety recommendations appropriate for typical site management, building management, and other tenant operations.

1. All individuals needing access to the main site should be instructed to read and obey all posted placards and signs.

2. The site should be routinely inspected and this or similar report updated with the addition of any antennas or upon any changes to the RF environment including:

- *adding new antennas that may have been located on the site*
- *removing of any existing antennas*
- *changes in the radiating power or number of RF emitters*

3. Post the appropriate SAFETY INSTRUCTIONS, NOTICE, CAUTION & WARNING sign at the main site access point(s) and other locations as required. Note: Please refer to RF Exposure Diagrams in the report section above, to inform everyone who has access to this site that beyond posted signs there may be levels in excess of the limits prescribed by the FCC. The signs below are examples of signs meeting FCC guidelines.

4. Ensure that the site door remains locked (or appropriately controlled) to deny access to the general public if deemed as policy by the building/site owner.

5. For a General Public environment the five color levels identified in measured RF emission diagram can be interpreted in the following manner:

- *White represents areas predicted to be greater than or equal to 0% and less than 1% of the MPE general public limits*
- *Green represents areas predicted to be greater than or equal to 1% and less than 100% of the MPE general public limits*
- *Blue represents areas predicted to be greater than or equal to 100% and lesser than 500% of the MPE general public limits.*
- *Yellow represents areas predicted to be greater than or equal to 500% and lesser than 5000% of the MPE general public limits.*
- *Red areas indicates predicted levels greater than or equal to 5000% of the MPE general public limits.*

Appendix E – References

1 - FCC Definition

FCC defines an Occupational or Controlled environment as one where persons are exposed to RF fields as a consequence of their employment and where those persons exposed have been made fully aware of the potential for exposure and can exercise control over their exposure. Typical criteria for an Occupational or Controlled environment is restricted access (i.e. locked doors, gates, etc.) to areas where antennas are located coupled with proper RF warning signage.

FCC defines a site as a General Public or Uncontrolled environment when human exposure to RF fields occurs to the general public or in which persons who are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over the exposure. Typical criteria for a General Public or Uncontrolled environment are unrestricted access (i.e. unlocked or no restrictions) to areas where antennas are located without proper RF warning signage being posted.

2 - Physical Testing measurement procedure and Tools

The Narda Broadband Field Meter NBM-550 can make rapid conformance measurements with evaluation in the time domain when used in conjunction EA5091 probe. This probe is a so-called Shaped Probe, i.e. it is frequency weighted so that it automatically takes account of the FCC Occupational limit values. To collect data, the probe is pointed towards the potential source(s) of EME radiation and moved slowly from ground level up to slightly above head height (approx. 6 ft).

Spatial Average Measurement A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.

3 - Site Safety Procedures

The following items are general safety recommendations that should be administered on a site by site basis as needed by the carrier.

General Maintenance Work: *Any maintenance personnel required to work immediately in front of antennas and / or in areas indicated as above 100% of the Occupational MPE limits should coordinate with the wireless operators to disable transmitters during their work activities.*

Training and Qualification Verification: *All personnel accessing areas indicated as exceeding the General Population MPE limits should have a basic understanding of EME awareness and RF Safety procedures when working around transmitting antennas. Awareness training increases a workers understanding to potential RF exposure scenarios. Awareness can be achieved in a number of ways (e.g. videos, formal classroom lecture or internet based courses).*

Physical Access Control: *Access restrictions to transmitting antennas locations is the primary element in a site safety plan. Examples of access restrictions are as follows:*

- *Locked door or gate*
- *Alarmed door*
- *Locked ladder access*
- *Restrictive Barrier at antenna locations (e.g. Chain link with posted RF Sign)*

RF Signage: *Everyone should obey all posted signs at all times. RF signs play an important role in properly warning a worker prior to entering into a potential RF Exposure area.*

Assume all antennas are active: *Due to the nature of telecommunications transmissions, an antenna transmits intermittently. Always assume an antenna is transmitting. Never stop in front of an antenna. If you have to pass by an antenna, move through as quickly and safely as possible thereby reducing any exposure to a minimum.*

Maintain a 3 foot clearance from all antennas: *There is a direct correlation between the strength of an EME field and the distance from the transmitting antenna. The further away from an antenna, the lower the corresponding EME field is.*

Rooftop RF Emissions Diagram: *Section 4 of this report contains an RF Emissions Diagram that outlines various theoretical Maximum Permissible Exposure (MPE) areas on the rooftop. This analysis is all theoretical and assumes a duty cycle of 75% for each transmitting antenna at full power. This analysis is a worst case scenario. This analysis is based on one of two access control criteria: General Public criteria means the access to the site is uncontrolled and anyone can gain access. Occupational criteria means the access is restricted and only properly trained individuals can gain access to the antenna locations.*

4 - Definitions

Compliance- *The determination of whether a site is safe or not with regards to Human Exposure to Radio Frequency Radiation from transmitting antennas.*

Decibel (dB) – *A unit for measuring power or strength of a signal.*

Duty Cycle – *The percent of pulse duration to the pulse period of a periodic pulse train. Also, may be a measure of the temporal transmission characteristic of an intermittently transmitting RF source such as a paging antenna by dividing average transmission duration by the average period for transmission. A duty cycle of 75% corresponds to continuous operation.*

Effective (or Equivalent) Isotropic Radiated Power (EIRP) – *The product of the power supplied to the antenna and the antenna gain in a given direction relative to an isotropic antenna, this product is divided by the cable losses*

Effective Radiated Power (ERP) – *In a given direction, the relative gain of a transmitting antenna with respect to the maximum directivity of a half wave dipole multiplied by the net power accepted by the antenna from the connecting transmitter.*

Gain (of an antenna in dbd) – *The ratio of the maximum intensity in a given direction to the maximum radiation in the same direction from a reference dipole. Gain is a measure of the relative efficiency of a directional antennas as compared to a reference dipole.*

General Population/Uncontrolled Environment – *Defined by the FCC, as an area where RFR exposure may occur to persons who are unaware of the potential for exposure and who have no control of their exposure. General Population is also referenced as General Public.*

Generic Antenna – *For the purposes of this report, the use of "Generic" as an antenna model means the antenna information was not provided and could not be obtained while on site. In the event of unknown information, MobileComm will use our industry specific knowledge of antenna models to select a worst case scenario antenna to model the site.*

Isotropic Antenna – *An antenna that is completely non-directional. In other words, an antenna that radiates energy equally in all directions.*

Maximum Measurement – *This measurement represents the single largest measurement recorded when performing a spatial average measurement.*

Maximum Exposure Limit (MPE) – *The RMS and peak electric and magnetic field strength, their squares, or the plane-wave equivalent power densities associated with these fields to which a person may be exposed without harmful effect and with acceptable safety factor.*

Occupational/Controlled Environment – *Defined by the FCC, as an area where Radio Frequency Radiation (RFR) exposure may occur to persons who are aware of the potential for exposure as a condition of employment or specific activity and can exercise control over their exposure.*

Radio Frequency Radiation – *Electromagnetic waves that are propagated from antennas through space.*

Spatial Average Measurement – *A technique used to average a minimum of ten (10) measurements taken in a ten (10) second interval from zero (0) to six (6) feet. This measurement is intended to model the average energy an average sized human body will absorb while present in an electromagnetic field of energy.*

Transmitter Power Output (TPO) – *The radio frequency output power of a transmitter's final radio frequency stage as measured at the output terminal while connected to a load.*

Appendix F – Proprietary Statement

This report was prepared for the use of AT&T Mobility, LLC to meet requirements specified in AT&T's corporate RF safety guidelines. It was performed in accordance with generally accepted practices of other consultants undertaking similar studies at the same time and in the same locale under like circumstances. The conclusions provided by MobileComm are based solely on the information provided by AT&T Mobility and all observations in this report are valid on the date of the investigation. Any additional information that becomes available concerning the site should be provided to MobileComm so that our conclusions may be revised and modified, if necessary. This report has been prepared in accordance with Standard Conditions for Engagement and authorized proposal, both of which are integral parts of this report. No other warranty, expressed or implied, is made.

STRUCTURAL ANALYSIS REPORT

STRUCTURE: SELF-SUPPORT TOWER

PREPARED FOR: SMLINK

CARRIER: AT&T

SITE NUMBER/NAME : CTL05633 / SEYMOUR EAST

SITE LOCATION:
6 Progress Avenue
Seymour, CT 06483
N41.3914919, W73.0532989

DATE: June 14, 2022

REV. 1: Project Summary Change

RESULTS
PASS (MAX STRESS RATIO: 75.0%)

Barbara T. Kotecki, P.E.

FULLERTON
NETWORK INTEGRITY STARTS HERE

Fullerton Engineering Consultants, LLC
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Tel: 847.908.8400
www.fullertonengineering.com

Project Number: 2021.0215.0018

Summary

A structural analysis was performed by Fullerton, as requested by the client, to determine the adequacy of the existing structure with the proposed appurtenance and equipment addition on the abovementioned structure. The analysis considers the tower properties, existing and proposed appurtenances, and the required loading criteria.

Conclusion

Component	% Capacity	Pass / Fail
Tower	61.6%	PASS
Anchor Rod	25.1%	PASS
Foundation	75.0%	PASS
Structural Rating (max from all components) = 75.0%		**PASS**

Analysis Criteria

	TIA-222-H Standard	
Wind Parameters:	Basic Wind Speed:	118 mph (3-Sec gust)
	Ice Wind Speed:	50 mph (3-Sec gust)
	Design Ice Thickness:	1 in.
	Risk Category	II
	Exposure Category:	B
	Topographic Category:	1

Sources

The following documents for the existing structure were made available for our structural analysis.

Reference Document	Date
Structural Analysis Report by Maser Consulting	05/01/2019
RFDS Ver. 3.00 provided by AT&T	03/01/2022
Site Visit Photos	02/09/2022

Final Proposed Appurtenance Loading Schedule

ANTENNA/EQUIPMENT				COAXIAL	
Elev. (Ft)	QTY.	MANUFACTURER/MODEL	MOUNT TYPE	QTY.	SIZE/TYPE.
160'-0"	3	(N) CCI TPA65R-BU6DA	(E) Sector Frames	3	(N) Fiber
	3	(N) AIR6449 B77D + AIR6419 B77G Stacked		3	(N) DC Cable
	3	(N) CCI DMP65R-BU6DA		6	(E) DC Cable
	3	(E) Ericsson RRUS 4478 B14		6	(E) 1-5/8"
	3	(E) Ericsson RRUS 4426 B66			
	3	(N) Ericsson RRUS 4449 B5/12			
	3	(E) Ericsson RRUS-32 B2			
	3	(N) Raycap DC9-48-60-24-8C-EV			
	3	(E) Ericsson RRUS-32 B30			

(E) denotes existing loading

(N) denotes proposed loading

Results

Tower

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	øP$_{allow}$ lb	% Capacity	Pass Fail
T1	280 - 270	Leg	1 3/4	3	-9.290	81.929	11.3	Pass
		Diagonal	7/8	17	-1.618	7.868	20.6	Pass
		Horizontal	7/8	36	-0.177	3.910	4.5	Pass
		Top Girt	1	4	-0.576	6.670	8.6	Pass
		Bottom Girt	1	7	-0.644	6.670	9.7	Pass
		Mid Girt	1	11	0.110	35.343	0.3	Pass
T2	270 - 250	Leg	2	45	-28.682	111.479	25.7	Pass
		Diagonal	7/8	59	-2.240	7.786	28.8	Pass
		Horizontal	7/8	62	-0.497	3.944	12.6	Pass
		Top Girt	1	48	-0.583	6.728	8.7	Pass
		Bottom Girt	1	49	-0.884	6.728	13.1	Pass
		Mid Girt	1	52	-0.178	6.728	2.6	Pass
T3	250 - 230	Leg	2 1/2	123	-79.317	189.738	41.8	Pass
		Diagonal	1	135	-5.764	13.514	42.7	Pass
		Horizontal	7/8	137	-1.374	4.012	34.2	Pass
		Top Girt	1 1/4	125	-1.374	16.712	8.2	Pass
		Bottom Girt	1 1/4	127	-1.581	16.712	9.5	Pass
T4	230 - 220	Leg	Pirod 105245	201	-82.654	214.859	38.5	Pass
		Diagonal	L3x3x5/16	207	-8.242	41.111	20.0 34.4 (b)	Pass
T5	220 - 200	Leg	Pirod 105218	210	-117.355	300.681	39.0	Pass
		Diagonal	L3x3x3/16	216	-6.909	22.519	30.7 53.0 (b)	Pass
T6	200 - 180	Leg	Pirod 105218	225	-144.438	300.681	48.0	Pass
		Diagonal	L3x3x5/16	237	-9.551	30.261	31.6 38.9 (b)	Pass
		Top Girt	L3x3x3/16	226	-4.008	17.316	23.1 38.3 (b)	Pass
		Mid Girt	L3x3x3/16	229	-5.500	14.785	37.2	Pass
T7	180 - 160	Leg	Pirod 105219	246	-177.858	399.868	44.5	Pass
		Diagonal	L3x3x5/16	258	-11.035	24.402	45.2	Pass
		Top Girt	L4x4x1/4	247	-5.691	32.919	17.3 32.6 (b)	Pass
		Mid Girt	L4x4x1/4	250	-4.518	28.726	15.7	Pass
T8	160 - 140	Leg	Pirod 105220	267	-228.448	512.375	44.6	Pass
		Diagonal	L3 1/2x3 1/2x5/16	276	-13.094	31.751	41.2 49.0 (b)	Pass
		Top Girt	L3 1/2x3 1/2x5/16	269	-3.962	17.588	22.5	Pass
T9	140 - 120	Leg	Pirod 105220	285	-280.443	512.375	54.7	Pass
		Diagonal	L3 1/2x3 1/2x5/16	291	-12.760	25.959	49.2 50.4 (b)	Pass
T10	120 - 100	Leg	Pirod 112743	300	-313.139	613.145	51.1	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	306	-18.974	66.615	28.5	Pass
T11	100 - 80	Leg	Pirod 112743	309	-364.850	613.145	59.5	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	315	-19.393	61.156	31.7	Pass
T12	80 - 60	Leg	Pirod 112744	318	-412.287	741.993	55.6	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	324	-19.018	56.126	33.9	Pass
T13	60 - 40	Leg	Pirod 112744	327	-456.780	741.993	61.6	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	333	-19.869	51.525	38.6	Pass
T14	40 - 20	Leg	Pirod 112745	336	-504.646	883.145	57.1	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	342	-18.646	47.338	39.4	Pass
T15	20 - 0	Leg	Pirod 112740	345	-542.562	883.145	61.4	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	351	-21.558	43.542	49.5	Pass

Results

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							Summary	
						Leg (T13)	61.6	Pass
						Diagonal (T5)	53.0	Pass
						Horizontal (T3)	34.2	Pass
						Top Girt (T6)	38.3	Pass
						Bottom Girt (T2)	13.1	Pass
						Mid Girt (T6)	37.2	Pass
						Bolt Checks	53.0	Pass
						RATING =	**61.6**	**Pass**

Foundation

Components	%Capacity	PASS/FAIL
ANCHOR RODS	25.1%	PASS
FOUNDATION	75.0%	PASS

Assumptions

This analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. The analysis is based solely on the information supplied, and the results, in turn, are only as accurate as data extracted from this information. Fullerton has been instructed by the client to assume the information supplied is accurate, and Fullerton has made no independent determination of its accuracy. The exception to the previous statement is if Fullerton has been contracted by the client to provide an independent structural mapping report of the tower and related appurtenances, in which case Fullerton has made an independent determination of the accuracy of the information resulting from the mapping report.

- The tower member sizes and geometry are considered accurate as supplied. The material grade is as per data supplied and/or as assumed and stated in the materials section.
- The existing tower is assumed to have been properly maintained in accordance with the TIA/EIA standard and/or its original manufacturer's recommendations. The existing tower is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The antenna configuration is as supplied and/or stated in the analysis section. It is assumed to be complete and accurate. All antennas, mounts, remote radios, cables, and cable supports are assumed to be properly installed and supported as per the manufacturer's requirements.
- The antennas, mounts, remote radios, cables, and cable supports, and lines stated in the appurtenance loading schedule represent Fullerton's understanding of the overall antenna configuration. If the actual configuration is different than above, then this analysis is invalid. Please refer to this report for the projected wind areas used in the calculations for antennas and mounts. If variations or discrepancies are identified, please inform Fullerton.
- Some assumptions are made regarding antenna and mount sizes and their projected areas based on a best interpretation of the data supplied and a best knowledge of antenna type and industry practice.
- The existing foundation is assumed to be in good condition with no structural defects and with no deterioration to its member capacities.
- The soil parameters are as per data supplied, or as assumed, and stated in the calculations.
- All welds and connections are assumed to develop at least the member capacity, unless determined otherwise and explicitly stated in this report.
- All prior structural modifications, if any, are assumed to be as per date supplied/ available, to be properly installed and to be fully effective.

Scope and Limitations

The engineering services rendered by Fullerton Engineering Consultants, LLC (Fullerton) in connection with this structural analysis are limited to an analysis of the structure, size, and capacity of its members. Fullerton does not analyze the fabrication, including welding and connection capacities, except as included in this report.

The information and conclusions contained in this report were determined by application of the current engineering standards and analysis procedures and formulae, and Fullerton assumes no obligation to revise any of the information or conclusions contained in this report in the event such engineering and analysis procedures and formulae are hereafter modified or revised.

Fullerton makes no warranties, expressed, or implied in connection with this report and disclaims any liability arising from original design, material, fabrication, and erection deficiencies or the “as-built” condition of this tower.

Installation procedures are not within the scope of this report and should be performed and evaluated by a competent tower erection contractor.

Structural Calculations

Tower Analysis Summary Form

General Info

Site Name	SEYMOUR EASY
Site Number	CTL05633
FA Number	10099965
Date of Analysis	5/11/2022
Company Performing Evaluation	Fullerton Engineering Consultants, LLC.

The information contained in this summary report is not to be used independently from the PE stamped tower analysis.

Tower Info	Description	Date
Tower Type (GT, SST, MP)	SST	N/A
Tower Height (Top of Steel)	280 ft	N/A
Tower Manufacturer	N/A	N/A
Tower Model	N/A	N/A
Tower Design	N/A	N/A
Foundation Design	N/A	N/A
Geotech Report	N/A	N/A
No Climb Site Visit	N/A	N/A
Previous Structural Analysis	Maser Consulting Connecticut	5/1/2019
Foundation Mapping	N/A	N/A

Design Parameters	
Design Code Used	REV H & ASCE 7-16
Location of Tower (County, State)	NEW HAVEN COUNTY, C
Basic Wind Speed (mph)	118
Ice Thickness (in)	1
Structure Classification (I, II, III)	II
Exposure Category (B, C, D)	B
Topographic Category (1 to 5)	1

Analysis Results (% Maximum Usage)	
Existing/Reserved + Proposed Condition	
Tower (%)	61.6%
Connection (%)	25.1%
Foundation (%)	75.0%
Foundation Adequate?	Yes

Steel Yield Strength (ksi)

Solid Rounds	A572-50
Anchor Bolts	F1554-105

Note: Material grade assumed based on preferred material specifications.

Existing / Reserved Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
UNKNOWN	280	280	2	DIPOLE		DB420-A		1	UNKNOWN	FRAME	2		1-5/8"	EXTERNAL
											1		1"	EXTERNAL
UNKNOWN	250	250	3	ANTENNA	RFS	APXV18-206516L-C		3	UNKNOWN	FRAME	12		1-5/8"	EXTERNAL
	250	250	3	ANTENNA	RFS	APXVAARR24_43-U-NA20					2		HCS 6X12	EXTERNAL
	250	250	6	TMA	RFS	ATMAP1412D-1A20								
	250	250	1	DIPLEXER		DIPLEXER								
	250	250	3	RRH		RRIS-4449 B71+B12								
UNKNOWN	235	245	1	DIPOLE		DB420-A		1	UNKNOWN	FRAME	1		1-5/8"	EXTERNAL
	235	235	1	DIPOLE		DB2252-F					1		1-5/8"	EXTERNAL
UNKNOWN	170	170	3	ANTENNA	RFS	APXVSPP18-C-AS20		3	UNKNOWN	FRAME	6		1-5/8"	EXTERNAL
	170	170	3	ANTENNA	RFS	APXVTM14-ALU-120								
	170	170	3	RRH		RRH2X50								
	170	170	3	RRH		RRH4X45								
	170	170	3	RRH		RRH8X20								
AT&T	160	160	3	RRH		RRUS 4478 B14		3	UNKNOWN	FRAME	6		1-5/8"	EXTERNAL
	160	160	3	RRH		RRUS-32 B2					6		DC POWER	EXTERNAL
	160	160	3	RRH		RRUS-4426 B66								
	160	160	3	RRH		RRUS-32 B30								
UNKNOWN	150	150	3	ANTENNA	COMMSCOPE	APXV18-206517S		3	UNKNOWN	FRAME	3		1-5/8"	EXTERNAL
	150	150	6	ANTENNA	COMMSCOPE	HBXX-6517DS-A2M								
	150	150	6	ANTENNA	COMMSCOPE	LNX-6514DS-A1M								
	150	150	6	DIPLEXER		DIPLEXER								
	150	150	3	RRH		RRH2-60-AWS								
	150	150	3	RRH		RRH2-60								
	150	150	3	DISTRIBUTION BOX		DB-T1-6Z-8AB-0Z								

Note: The existing loading shall be re-used, in addition to the proposed loading.

Proposed Loading

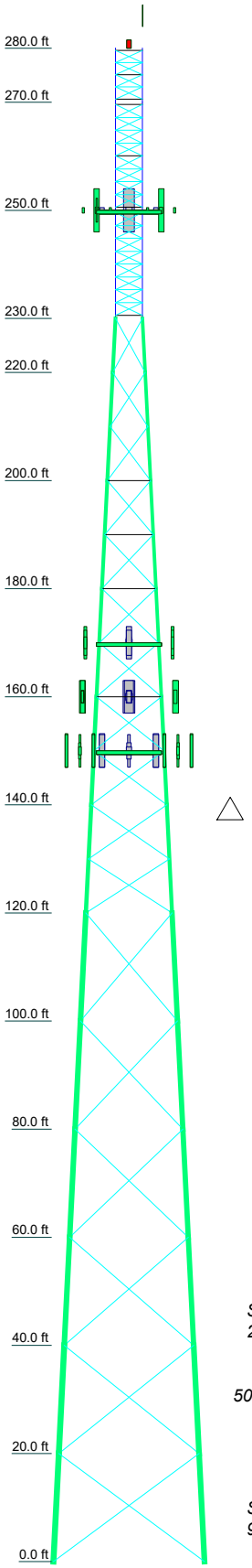
Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External
AT&T	160	160	3	ANTENNA	CCI	TPA65R-BU6DA-K					3		DC POWER	EXTERNAL
	160	160	3	ANTENNA	ERICSSON	AIR6449 B77D					3		FIBER	EXTERNAL
	160	160	3	ANTENNA	ERICSSON	AIR6419 B77G								
	160	160	3	ANTENNA	CCI	DMP65R-BU6DA								
	160	160	3	RRH		RRUS-4449 B5/B12								
	160	160	3	RAYCAP	RAYCAP	DC9-48-60-24-8C-EV								

Note: The proposed equipment shall be installed in addition to the existing/reserved loading at the same elevation.

Future Loading

Antenna								Mount			Transmission Line			
Antenna Owner	Mount Height (ft)	Antenna CL (ft)	Quantity	Type	Manufacturer	Model	Azimuth	Quantity	Manufacturer	Type	Quantity	Model	Size	Attachment Internal/External

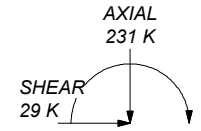
Section	T15	T14	T13	T12	T11	T10	T9	T8	T7	T6	T5	T4	T3	T2	T1
Legs	Pirod 112740	Pirod 112745	Pirod 112744	Pirod 112743	Pirod 105220	Pirod 105219	Pirod 105218	A	SR 2 1/2	SR 2	SR 1 3/4				
Leg Grade	A572-50														
Diagonals	2L3 1/2x3 1/2x5/16x3/8				L3 1/2x3 1/2x5/16		L3x3x5/16	B	SR 1	SR 7/8					
Diagonal Grade	A36								A572-50						
Top Girts	N.A.				C		L4x4x1/4	L3x3x3/16	N.A.		SR 1 1/4		SR 1		
Mid Girts	N.A.						L4x4x1/4	L3x3x3/16	N.A.				SR 1		
Bottom Girts	N.A.										SR 1 1/4		SR 1		
Horizontals	N.A.										SR 7/8				
Face Width (ft)	28	24	22	20	18	16	14	12	10	8	6	5			
# Panels @ (ft)	6 @ 20						11 @ 10				16 @ 2.375	4 @ 2.25			
Weight (K)	77.6	9.6	9.5	8.5	8.3	7.5	7.4	5.0	5.1	4.4	3.5	2.8	1.5	2.2	1.6	0.7



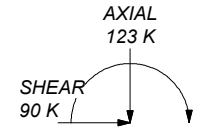
ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 566 K
SHEAR: 60 K

UPLIFT: -481 K
SHEAR: 52 K



TORQUE 5 kip-ft
50 mph WIND - 1.0000 in ICE



TORQUE 36 kip-ft
REACTIONS - 118 mph WIND

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105245	C	L3 1/2x3 1/2x5/16
B	L3x3x5/16		

MATERIAL STRENGTH

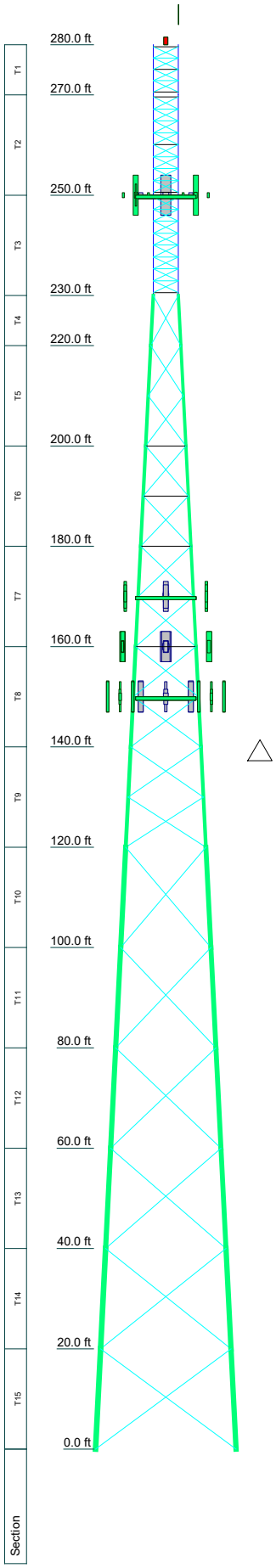
GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A36	36 ksi	58 ksi

TOWER DESIGN NOTES

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-H Standard.
3. Tower designed for a 118 mph basic wind in accordance with the TIA-222-H Standard.
4. Tower is also designed for a 50 mph basic wind with 1.00 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Risk Category II.
7. Topographic Category 1 with Crest Height of 0.000 ft

Fullerton Engineering
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Phone: (847) 908-8400
FAX:

Job: **CTL05633 - SEYMOUR EAST**			
Project: ***280' SELF-SUPPORT TOWER***			
Client: SMARTLINK - AT&T	Drawn by: FAD	App'd:	
Code: TIA-222-H	Page 10 of 72	Date: 05/11/22	Scale: NTS
Path: P:\Dept 4000\SMLINK\SMLINK-ATT-NEWEN II\CTL05633\Structural\Structural Analysis\Analysis\TNX\CTL05633.eri			Dwg No. E-1



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
Flash Beacon Lighting	280	RRUS-4426 B66 (ATI)	160
Lightning Rod	280	RRUS-32 B30 (ATI)	160
DB420-A	280	RRUS-4449 B5/B12 (ATI)	160
DB420-A	280	Raycap DC9-48-60-24-8C-EV (ATI)	160
SECTOR MOUNT	280	Commscope SF-QV12-B (ATI)	160
PIROD 15' T-FRAME SECTOR	250	CCI TPA65R-BU6D (ATI)	160
RFS APXV18-206516L-C	250	Ericsson Air6449 B77D (ATI)	160
RFS APXVAARR24_43-U-NA20	250	Ericsson Air6419 B77G (ATI)	160
(2) RFS ATMAP1412D-1A20 - TMA	250	CCI DMP65R-BU6DA (ATI)	160
Diplexer	250	RRUS-4478 B14 (ATI)	160
RRUS-4449 B71+B12	250	RRUS-32 B2 (ATI)	160
PIROD 15' T-FRAME SECTOR	250	RRUS-4426 B66 (ATI)	160
RFS APXV18-206516L-C	250	RRUS-32 B30 (ATI)	160
RFS APXVAARR24_43-U-NA20	250	RRUS-4449 B5/B12 (ATI)	160
(2) RFS ATMAP1412D-1A20 - TMA	250	Raycap DC9-48-60-24-8C-EV (ATI)	160
Diplexer	250	Commscope SF-QV12-B (ATI)	160
RRUS-4449 B71+B12	250	CCI TPA65R-BU6D (ATI)	160
PIROD 15' T-FRAME SECTOR	250	Ericsson Air6449 B77D (ATI)	160
RFS APXV18-206516L-C	250	Ericsson Air6419 B77G (ATI)	160
RFS APXVAARR24_43-U-NA20	250	CCI DMP65R-BU6DA (ATI)	160
(2) RFS ATMAP1412D-1A20 - TMA	250	RRUS-4478 B14 (ATI)	160
Diplexer	250	RRUS-32 B2 (ATI)	160
RRUS-4449 B71+B12	250	RRUS-4426 B66 (ATI)	160
DB420-A	245	RRUS-32 B30 (ATI)	160
DB2252-F	235	RRUS-4449 B5/B12 (ATI)	160
SECTOR MOUNT	235	Raycap DC9-48-60-24-8C-EV (ATI)	160
PIROD 15' T-FRAME SECTOR	170	PIROD 15' T-FRAME SECTOR	150
RFS APXVSPP18-C-A20	170	RFS APXV18-206517S	150
RFS APXVTM14-ALU-I20	170	(2) Commscope HBXX-6517DS-A2M	150
ALU RRH2x50-800	170	(2) Commscope LNX-6514DS-A1M	150
ALU RRH4x45-1900	170	(2) Diplexer	150
ALU TD-RRH8x20-25	170	ALU RRH2x60-AWS	150
PIROD 15' T-FRAME SECTOR	170	ALU RRH2x60	150
RFS APXVSPP18-C-A20	170	DB-T1-6Z-8AB-0Z	150
RFS APXVTM14-ALU-I20	170	PIROD 15' T-FRAME SECTOR	150
ALU RRH2x50-800	170	RFS APXV18-206517S	150
ALU RRH4x45-1900	170	(2) Commscope HBXX-6517DS-A2M	150
ALU TD-RRH8x20-25	170	(2) Commscope LNX-6514DS-A1M	150
PIROD 15' T-FRAME SECTOR	170	(2) Diplexer	150
RFS APXVSPP18-C-A20	170	ALU RRH2x60-AWS	150
RFS APXVTM14-ALU-I20	170	ALU RRH2x60	150
ALU RRH2x50-800	170	DB-T1-6Z-8AB-0Z	150
ALU RRH4x45-1900	170	PIROD 15' T-FRAME SECTOR	150
ALU TD-RRH8x20-25	170	RFS APXV18-206517S	150
Commscope SF-QV12-B (ATI)	160	(2) Commscope HBXX-6517DS-A2M	150
CCI TPA65R-BU6D (ATI)	160	(2) Commscope LNX-6514DS-A1M	150
Ericsson Air6449 B77D (ATI)	160	(2) Diplexer	150
Ericsson Air6419 B77G (ATI)	160	ALU RRH2x60-AWS	150
CCI DMP65R-BU6DA (ATI)	160	ALU RRH2x60	150
RRUS-4478 B14 (ATI)	160	DB-T1-6Z-8AB-0Z	150
RRUS-32 B2 (ATI)	160		

Fullerton Engineering
1100 E. Woodfield Road, Suite 500
Schaumburg, IL 60173
Phone: (847) 908-8400
FAX:

Job: ***CTL05633 - SEYMOUR EAST***			
Project: ***280' SELF-SUPPORT TOWER***			
Client: SMARTLINK - AT&T	Drawn by: FAD		App'd:
Code: TIA-222-H	Page 11 of 72	Date: 05/11/22	Scale: NTS
Path: P:\Dept 4000\SMLINK\SMLINK-ATT-NEWEN II\CTL05633\Structural\Structural Analysis\Analysis\TNX\CTL05633.eri			Dwg No. E-1

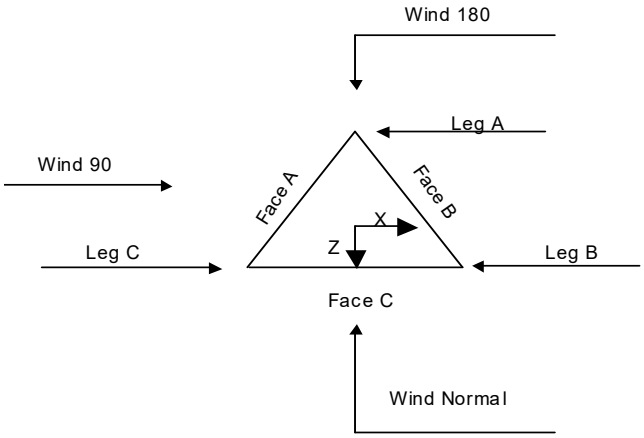
Tower Input Data

The main tower is a 3x free standing tower with an overall height of 280.000 ft above the ground line.
The base of the tower is set at an elevation of 0.000 ft above the ground line.
The face width of the tower is 5.000 ft at the top and 28.000 ft at the base.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower is located in New Haven County, Connecticut.
Tower base elevation above sea level: 474.000 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.000 ft.
Nominal ice thickness of 1.0000 in.
Ice thickness is considered to increase with height.
Ice density of 56.000 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50.000 °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-H Bracing Resist. Exemption
√	Include Bolts In Member Capacity	√	Autocalc Torque Arm Areas		Use TIA-222-H 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	280.000-270.000			5.000	1	10.000
T2	270.000-250.000			5.000	1	20.000
T3	250.000-230.000			5.000	1	20.000
T4	230.000-220.000			5.000	1	10.000
T5	220.000-200.000			6.000	1	20.000
T6	200.000-180.000			8.000	1	20.000
T7	180.000-160.000			10.000	1	20.000
T8	160.000-140.000			12.000	1	20.000
T9	140.000-120.000			14.000	1	20.000
T10	120.000-100.000			16.000	1	20.000
T11	100.000-80.000			18.000	1	20.000
T12	80.000-60.000			20.000	1	20.000
T13	60.000-40.000			22.000	1	20.000
T14	40.000-20.000			24.000	1	20.000
T15	20.000-0.000			26.000	1	20.000

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

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	280.000-270.000	2.250	X Brace	No	Yes	5.5000	6.5000
T2	270.000-250.000	2.375	X Brace	No	Yes	5.5000	6.5000
T3	250.000-230.000	2.375	X Brace	No	Yes	5.5000	6.5000
T4	230.000-220.000	10.000	X Brace	No	No	0.0000	0.0000
T5	220.000-200.000	10.000	X Brace	No	No	0.0000	0.0000
T6	200.000-180.000	10.000	X Brace	No	No	0.0000	0.0000
T7	180.000-160.000	10.000	X Brace	No	No	0.0000	0.0000
T8	160.000-140.000	10.000	X Brace	No	No	0.0000	0.0000
T9	140.000-120.000	10.000	X Brace	No	No	0.0000	0.0000
T10	120.000-100.000	20.000	X Brace	No	No	0.0000	0.0000
T11	100.000-80.000	20.000	X Brace	No	No	0.0000	0.0000
T12	80.000-60.000	20.000	X Brace	No	No	0.0000	0.0000
T13	60.000-40.000	20.000	X Brace	No	No	0.0000	0.0000
T14	40.000-20.000	20.000	X Brace	No	No	0.0000	0.0000
T15	20.000-0.000	20.000	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 280.000-270.000	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 270.000-250.000	Solid Round	2	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 250.000-230.000	Solid Round	2 1/2	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T4 230.000-220.000	Truss Leg	Pirod 105245	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T5 220.000-200.000	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x3/16	A36 (36 ksi)
T6 200.000-180.000	Truss Leg	Pirod 105218	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T7 180.000-160.000	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3x3x5/16	A36 (36 ksi)
T8 160.000-140.000	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T9 140.000-120.000	Truss Leg	Pirod 105220	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T10 120.000-100.000	Truss Leg	Pirod 112743	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T11 100.000-80.000	Truss Leg	Pirod 112743	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T12 80.000-60.000	Truss Leg	Pirod 112744	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T13 60.000-40.000	Truss Leg	Pirod 112744	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T14 40.000-20.000	Truss Leg	Pirod 112745	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	A36 (36 ksi)
T15 20.000-0.000	Truss Leg	Pirod 112740	A572-50 (50 ksi)	Double Angle	2L3 1/2x3 1/2x5/16x3/8	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 280.000-270.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T2 270.000-250.000	Solid Round	1	A572-50 (50 ksi)	Solid Round	1	A572-50 (50 ksi)
T3 250.000-230.000	Solid Round	1 1/4	A572-50 (50 ksi)	Solid Round	1 1/4	A572-50 (50 ksi)
T6 200.000-180.000	Equal Angle	L3x3x3/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T7 180.000-160.000	Equal Angle	L4x4x1/4	A36 (36 ksi)	Solid Round		A36 (36 ksi)
T8 160.000-140.000	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)	Solid Round		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T1 280.000-270.000	1	Solid Round	1	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 270.000-250.000	1	Solid Round	1	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T3 250.000-230.000	None	Flat Bar		A36 (36 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T6 200.000-180.000	1	Equal Angle	L3x3x3/16	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)
T7 180.000-160.000	1	Equal Angle	L4x4x1/4	A36 (36 ksi)	Solid Round		A572-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 280.000-270.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T2 270.000-250.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T3 250.000-230.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T4 230.000-220.0	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000

Tower Elevation ft	Gusset Area (per face) ft²	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
00									
T5 220.000-200.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T6 200.000-180.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T7 180.000-160.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T8 160.000-140.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T9 140.000-120.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T10 120.000-100.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T11 100.000-80.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T12 80.000-60.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T13 60.000-40.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T14 40.000-20.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	36.0000	36.0000	36.0000
T15 20.000-0.000	0.000	0.0000	A36 (36 ksi)	1	1	1.05	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 280.000-270.000	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T2 270.000-250.000	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T3 250.000-230.000	No	Yes	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T4 230.000-220.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T5 220.000-200.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T6	Yes	No	1	1	1	1	1	1	1	1

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
200.000-180.000				1	1	1	1	1	1	1
T7 180.000-160.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T8 160.000-140.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T9 140.000-120.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T10 120.000-100.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T11 100.000-80.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T12 80.000-60.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T13 60.000-40.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T14 40.000-20.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1
T15 20.000-0.000	Yes	No	1	1 1	1 1	1 1	1 1	1 1	1 1	1 1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T4 230.000-220.000	1	0.5	0.85	1	0.5	0.85
T5 220.000-200.000	1	0.5	0.85	1	0.5	0.85
T6 200.000-180.000	1	0.5	0.85	1	0.5	0.85
T7 180.000-160.000	1	0.5	0.85	1	0.5	0.85
T8 160.000-140.000	1	0.5	0.85	1	0.5	0.85
T9 140.000-120.000	1	0.5	0.85	1	0.5	0.85

T10 120.000-100.000	1	0.5	0.85	1	0.5	0.85
T11 100.000-80.000	1	0.5	0.85	1	0.5	0.85
T12 80.000-60.000	1	0.5	0.85	1	0.5	0.85
T13 60.000-40.000	1	0.5	0.85	1	0.5	0.85
T14 40.000-20.000	1	0.5	0.85	1	0.5	0.85
T15 20.000-0.000	1	0.5	0.85	1	0.5	0.85

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 280.000-270.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 270.000-250.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 250.000-230.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 230.000-220.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 220.000-200.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 200.000-180.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 180.000-160.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 160.000-140.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 140.000-120.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 120.000-100.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 100.000-80.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 80.000-60.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T13 60.000-40.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40.000-20.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T15 20.000-0.000	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 280.000-270.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 270.000-250.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T3 250.000-230.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T4 230.000-220.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T5 220.000-200.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T6 200.000-180.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T7 180.000-160.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T8 160.000-140.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T9 140.000-120.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T10 120.000-100.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T11 100.000-80.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T12 80.000-60.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T13 60.000-40.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T14 40.000-20.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Elevation ft	Redundant Horizontal		Redundant Diagonal		Redundant Sub-Diagonal		Redundant Sub-Horizontal		Redundant Vertical		Redundant Hip		Redundant Hip Diagonal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T15 20.000-0.000	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 280.000-270.000	Sleeve DS	0.6250 A325N	5	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 270.000-250.000	Sleeve DS	0.7500 A325N	5	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 250.000-230.000	Flange	1.0000 A325N	6	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 230.000-220.000	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T5 220.000-200.000	Flange	1.0000 A325N	6	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 200.000-180.000	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 180.000-160.000	Flange	1.2500 A325N	6	1.2500 A325N	1	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 160.000-140.000	Flange	1.2500 A325N	6	1.2500 A325N	1	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 140.000-120.000	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 120.000-100.000	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T11 100.000-80.000	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T12 80.000-60.000	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T13 60.000-40.000	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T14 40.000-20.000	Flange	1.2500 A325N	12	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T15 20.000-0.000	Flange	1.2500 A325N	0	1.0000 A325N	2	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight klf
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	280.000 - 6.000	-6.0000	0.45	2	2	1.9800	1.9800		0.001
LDF7-50A (1-5/8 FOAM)	A	No	No	Ar (CaAa)	250.000 - 6.000	-6.0000	0.45	12	6	1.9800	1.9800		0.001
HCS 6x12 Cable *	A	No	No	Ar (CaAa)	250.000 - 6.000	-6.0000	0.41	2	2	1.6250	1.6250		0.002
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	245.000 - 6.000	-6.0000	0.45	1	1	1.9800	1.9800		0.001
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	235.000 - 6.000	-6.0000	0.45	1	1	1.9800	1.9800		0.001
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	170.000 - 6.000	-6.0000	0.45	6	3	1.9800	1.9800		0.001
LDF7-50A (1-5/8 FOAM)	C	No	No	Ar (CaAa)	150.000 - 6.000	-6.0000	0.45	3	3	1.9800	1.9800		0.001
1" OD *	C	No	No	Ar (CaAa)	280.000 - 6.000	-6.0000	0.45	1	1	1.0000	1.0000		0.000
DC Cable (1")	B	No	No	Ar (CaAa)	160.000 - 6.000	-6.0000	0.45	3	3	0.9900	0.9900		0.000
Fiber Trunk	B	No	No	Ar (CaAa)	160.000 - 6.000	-6.0000	0.45	3	3	1.0000	1.0000		0.001
DC Cable (1")	B	No	No	Ar (CaAa)	160.000 - 6.000	-6.0000	0.45	6	6	0.9900	0.9900		0.000
LDF7-50A (1-5/8 FOAM)	B	No	No	Ar (CaAa)	160.000 - 6.000	-6.0000	0.45	6	3	1.9800	1.9800		0.001

Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	280.000-270.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	4.960	0.000	0.018
T2	270.000-250.000	A	0.000	0.000	0.000	0.000	0.000
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	9.920	0.000	0.037
T3	250.000-230.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	13.880	0.000	0.053
T4	230.000-220.000	A	0.000	0.000	27.010	0.000	0.146
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	8.920	0.000	0.035
T5	220.000-200.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	17.840	0.000	0.070
T6	200.000-180.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	17.840	0.000	0.070

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T7	180.000-160.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	0.000	0.000	0.000
		C	0.000	0.000	29.720	0.000	0.119
T8	160.000-140.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	47.540	0.000	0.193
T9	140.000-120.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	53.480	0.000	0.217
T10	120.000-100.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	53.480	0.000	0.217
T11	100.000-80.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	53.480	0.000	0.217
T12	80.000-60.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	53.480	0.000	0.217
T13	60.000-40.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	53.480	0.000	0.217
T14	40.000-20.000	A	0.000	0.000	54.020	0.000	0.293
		B	0.000	0.000	47.580	0.000	0.214
		C	0.000	0.000	53.480	0.000	0.217
T15	20.000-0.000	A	0.000	0.000	37.814	0.000	0.205
		B	0.000	0.000	33.306	0.000	0.150
		C	0.000	0.000	37.436	0.000	0.152

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
T1	280.000-270.000	A	1.236	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	15.370	0.000	0.157
T2	270.000-250.000	A	1.229	0.000	0.000	0.000	0.000	0.000
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	30.665	0.000	0.313
T3	250.000-230.000	A	1.219	0.000	0.000	84.986	0.000	1.723
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	39.398	0.000	0.422
T4	230.000-220.000	A	1.212	0.000	0.000	42.442	0.000	0.859
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	24.044	0.000	0.265
T5	220.000-200.000	A	1.203	0.000	0.000	84.774	0.000	1.712
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	47.932	0.000	0.526
T6	200.000-180.000	A	1.191	0.000	0.000	84.616	0.000	1.705
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	47.707	0.000	0.521
T7	180.000-160.000	A	1.178	0.000	0.000	84.443	0.000	1.697
		B		0.000	0.000	0.000	0.000	0.000
		C		0.000	0.000	65.961	0.000	0.872
T8	160.000-140.000	A	1.163	0.000	0.000	84.250	0.000	1.688
		B		0.000	0.000	111.076	0.000	1.417
		C		0.000	0.000	100.289	0.000	1.396
T9	140.000-120.000	A	1.147	0.000	0.000	84.033	0.000	1.677

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight K
		B		0.000	0.000	110.642	0.000	1.403
		C		0.000	0.000	115.963	0.000	1.558
T10	120.000-100.000	A	1.128	0.000	0.000	83.783	0.000	1.666
		B		0.000	0.000	110.144	0.000	1.388
		C		0.000	0.000	115.354	0.000	1.539
T11	100.000-80.000	A	1.106	0.000	0.000	83.489	0.000	1.652
		B		0.000	0.000	109.557	0.000	1.370
		C		0.000	0.000	114.636	0.000	1.518
T12	80.000-60.000	A	1.078	0.000	0.000	83.129	0.000	1.635
		B		0.000	0.000	108.839	0.000	1.348
		C		0.000	0.000	113.757	0.000	1.491
T13	60.000-40.000	A	1.042	0.000	0.000	82.662	0.000	1.613
		B		0.000	0.000	107.906	0.000	1.320
		C		0.000	0.000	112.615	0.000	1.458
T14	40.000-20.000	A	0.991	0.000	0.000	81.983	0.000	1.581
		B		0.000	0.000	106.552	0.000	1.279
		C		0.000	0.000	110.955	0.000	1.409
T15	20.000-0.000	A	0.887	0.000	0.000	76.153	0.000	0.814
		B		0.000	0.000	79.763	0.000	0.728
		C		0.000	0.000	72.224	0.000	0.747

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	280.000-270.000	-7.7000	2.9743	-8.4765	3.2779
T2	270.000-250.000	-7.5988	2.9352	-8.5538	3.3078
T3	250.000-230.000	-2.2687	-14.8291	-4.2159	-10.5414
T4	230.000-220.000	-2.9452	-12.0919	-4.7138	-8.4836
T5	220.000-200.000	-4.0633	-14.7565	-6.3235	-10.5542
T6	200.000-180.000	-5.1751	-17.3499	-8.0717	-12.7871
T7	180.000-160.000	-9.8374	-15.6930	-12.8784	-11.7957
T8	160.000-140.000	-0.2045	-2.0622	1.2632	4.0770
T9	140.000-120.000	-2.0412	-1.2890	-1.1968	6.0073
T10	120.000-100.000	-2.3037	-1.4136	-1.2430	6.5475
T11	100.000-80.000	-2.5390	-1.5362	-1.3109	7.2400
T12	80.000-60.000	-2.7472	-1.6430	-1.3600	7.8514
T13	60.000-40.000	-2.9687	-1.7593	-1.4017	8.4669
T14	40.000-20.000	-3.1505	-1.8520	-1.4023	8.9289
T15	20.000-0.000	-2.7839	-1.6376	2.3247	0.1536

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	1	LDF7-50A (1-5/8 FOAM)	270.00 - 280.00	1.0000	1.0000
T1	13	1" OD	270.00 - 280.00	1.0000	1.0000
T2	1	LDF7-50A (1-5/8 FOAM)	250.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T2	13	1" OD	270.00 - 250.00	1.0000	1.0000
T3	1	LDF7-50A (1-5/8 FOAM)	270.00 - 230.00	1.0000	1.0000
T3	2	LDF7-50A (1-5/8 FOAM)	250.00 - 230.00	1.0000	1.0000
T3	3	HCS 6x12 Cable	250.00 - 230.00	1.0000	1.0000
T3	5	LDF7-50A (1-5/8 FOAM)	250.00 - 230.00	1.0000	1.0000
T3	6	LDF7-50A (1-5/8 FOAM)	245.00 - 230.00	1.0000	1.0000
T3	13	1" OD	235.00 - 230.00	1.0000	1.0000
T4	1	LDF7-50A (1-5/8 FOAM)	250.00 - 220.00	1.0000	1.0000
T4	2	LDF7-50A (1-5/8 FOAM)	230.00 - 220.00	1.0000	1.0000
T4	3	HCS 6x12 Cable	230.00 - 220.00	1.0000	1.0000
T4	5	LDF7-50A (1-5/8 FOAM)	230.00 - 220.00	1.0000	1.0000
T4	6	LDF7-50A (1-5/8 FOAM)	230.00 - 220.00	1.0000	1.0000
T4	13	1" OD	230.00 - 220.00	1.0000	1.0000
T5	1	LDF7-50A (1-5/8 FOAM)	220.00 - 200.00	1.0000	1.0000
T5	2	LDF7-50A (1-5/8 FOAM)	220.00 - 200.00	1.0000	1.0000
T5	3	HCS 6x12 Cable	220.00 - 200.00	1.0000	1.0000
T5	5	LDF7-50A (1-5/8 FOAM)	220.00 - 200.00	1.0000	1.0000
T5	6	LDF7-50A (1-5/8 FOAM)	220.00 - 200.00	1.0000	1.0000
T5	13	1" OD	220.00 - 200.00	1.0000	1.0000
T6	1	LDF7-50A (1-5/8 FOAM)	200.00 - 180.00	1.0000	1.0000
T6	2	LDF7-50A (1-5/8 FOAM)	200.00 - 180.00	1.0000	1.0000
T6	3	HCS 6x12 Cable	200.00 - 180.00	1.0000	1.0000
T6	5	LDF7-50A (1-5/8 FOAM)	200.00 - 180.00	1.0000	1.0000
T6	6	LDF7-50A (1-5/8 FOAM)	200.00 - 180.00	1.0000	1.0000
T6	13	1" OD	200.00 - 180.00	1.0000	1.0000
T7	1	LDF7-50A (1-5/8 FOAM)	180.00 - 160.00	1.0000	1.0000
T7	2	LDF7-50A (1-5/8 FOAM)	180.00 - 160.00	1.0000	1.0000
T7	3	HCS 6x12 Cable	180.00 - 160.00	1.0000	1.0000
T7	5	LDF7-50A (1-5/8 FOAM)	180.00 - 160.00	1.0000	1.0000
T7	6	LDF7-50A (1-5/8 FOAM)	180.00 - 160.00	1.0000	1.0000
T7	10	LDF7-50A (1-5/8 FOAM)	180.00 - 160.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	13	1" OD	170.00 - 180.00	1.0000	1.0000
T8	1	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T8	2	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T8	3	HCS 6x12 Cable	140.00 - 160.00	1.0000	1.0000
T8	5	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T8	6	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T8	10	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T8	11	LDF7-50A (1-5/8 FOAM)	140.00 - 150.00	1.0000	1.0000
T8	13	1" OD	140.00 - 160.00	1.0000	1.0000
T8	15	DC Cable (1")	140.00 - 160.00	1.0000	1.0000
T8	16	Fiber Trunk	140.00 - 160.00	1.0000	1.0000
T8	17	DC Cable (1")	140.00 - 160.00	1.0000	1.0000
T8	18	LDF7-50A (1-5/8 FOAM)	140.00 - 160.00	1.0000	1.0000
T9	1	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T9	2	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T9	3	HCS 6x12 Cable	120.00 - 140.00	1.0000	1.0000
T9	5	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T9	6	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T9	10	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T9	11	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T9	13	1" OD	120.00 - 140.00	1.0000	1.0000
T9	15	DC Cable (1")	120.00 - 140.00	1.0000	1.0000
T9	16	Fiber Trunk	120.00 - 140.00	1.0000	1.0000
T9	17	DC Cable (1")	120.00 - 140.00	1.0000	1.0000
T9	18	LDF7-50A (1-5/8 FOAM)	120.00 - 140.00	1.0000	1.0000
T10	1	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T10	2	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T10	3	HCS 6x12 Cable	100.00 - 120.00	1.0000	1.0000
T10	5	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T10	6	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T10	10	LDF7-50A (1-5/8 FOAM)	100.00 -	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
			120.00		
T10	11	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T10	13	1" OD	100.00 - 120.00	1.0000	1.0000
T10	15	DC Cable (1")	100.00 - 120.00	1.0000	1.0000
T10	16	Fiber Trunk	100.00 - 120.00	1.0000	1.0000
T10	17	DC Cable (1")	100.00 - 120.00	1.0000	1.0000
T10	18	LDF7-50A (1-5/8 FOAM)	100.00 - 120.00	1.0000	1.0000
T11	1	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T11	2	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T11	3	HCS 6x12 Cable	80.00 - 100.00	1.0000	1.0000
T11	5	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T11	6	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T11	10	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T11	11	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T11	13	1" OD	80.00 - 100.00	1.0000	1.0000
T11	15	DC Cable (1")	80.00 - 100.00	1.0000	1.0000
T11	16	Fiber Trunk	80.00 - 100.00	1.0000	1.0000
T11	17	DC Cable (1")	80.00 - 100.00	1.0000	1.0000
T11	18	LDF7-50A (1-5/8 FOAM)	80.00 - 100.00	1.0000	1.0000
T12	1	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T12	2	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T12	3	HCS 6x12 Cable	60.00 - 80.00	1.0000	1.0000
T12	5	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T12	6	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T12	10	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T12	11	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T12	13	1" OD	60.00 - 80.00	1.0000	1.0000
T12	15	DC Cable (1")	60.00 - 80.00	1.0000	1.0000
T12	16	Fiber Trunk	60.00 - 80.00	1.0000	1.0000
T12	17	DC Cable (1")	60.00 - 80.00	1.0000	1.0000
T12	18	LDF7-50A (1-5/8 FOAM)	60.00 - 80.00	1.0000	1.0000
T13	1	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T13	2	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T13	3	HCS 6x12 Cable	40.00 - 60.00	1.0000	1.0000
T13	5	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T13	6	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T13	10	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T13	11	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T13	13	1" OD	40.00 - 60.00	1.0000	1.0000
T13	15	DC Cable (1")	40.00 - 60.00	1.0000	1.0000
T13	16	Fiber Trunk	40.00 - 60.00	1.0000	1.0000
T13	17	DC Cable (1")	40.00 - 60.00	1.0000	1.0000
T13	18	LDF7-50A (1-5/8 FOAM)	40.00 - 60.00	1.0000	1.0000
T14	1	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T14	2	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T14	3	HCS 6x12 Cable	20.00 - 40.00	1.0000	1.0000
T14	5	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T14	6	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T14	10	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T14	11	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T14	13	1" OD	20.00 - 40.00	1.0000	1.0000
T14	15	DC Cable (1")	20.00 - 40.00	1.0000	1.0000
T14	16	Fiber Trunk	20.00 - 40.00	1.0000	1.0000
T14	17	DC Cable (1")	20.00 - 40.00	1.0000	1.0000
T14	18	LDF7-50A (1-5/8 FOAM)	20.00 - 40.00	1.0000	1.0000
T15	1	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T15	2	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000
T15	3	HCS 6x12 Cable	6.00 - 20.00	1.0000	1.0000
T15	5	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000
T15	6	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000
T15	10	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000
T15	11	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000
T15	13	1" OD	6.00 - 20.00	1.0000	1.0000
T15	15	DC Cable (1")	6.00 - 20.00	1.0000	1.0000
T15	16	Fiber Trunk	6.00 - 20.00	1.0000	1.0000
T15	17	DC Cable (1")	6.00 - 20.00	1.0000	1.0000
T15	18	LDF7-50A (1-5/8 FOAM)	6.00 - 20.00	1.0000	1.0000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
Flash Beacon Lighting	B	None		0.0000	280.000	No Ice	2.700	2.700	0.050
						1/2" Ice	3.100	3.100	0.070
						1" Ice	3.500	3.500	0.090
Lightning Rod	B	From Leg	0.000 0.000 6.000	0.0000	280.000	No Ice 1/2" Ice 1" Ice	3.000 4.530 6.060	3.000 4.530 6.060	0.080 0.100 0.120
*									
DB420-A	B	From Centroid-Face	8.000 0.000 9.500	0.0000	280.000	No Ice 1/2" Ice 1" Ice	3.330 5.990 8.650	3.330 5.990 8.650	0.030 0.040 0.050
DB420-A	A	From Centroid-Face	8.000 0.000 3.000	0.0000	280.000	No Ice 1/2" Ice 1" Ice	3.330 5.990 8.650	3.330 5.990 8.650	0.030 0.040 0.050
SECTOR MOUNT	C	None		0.0000	280.000	No Ice 1/2" Ice 1" Ice	70.470 100.140 129.810	70.470 100.140 129.810	3.080 4.500 5.920
*									
PIROD 15' T-FRAME SECTOR	A	None		0.0000	250.000	No Ice 1/2" Ice 1" Ice	15.000 20.600 26.200	15.000 20.600 26.200	0.500 0.650 0.800
RFS APXV18-206516L-C	A	From Leg	4.000 0.000 0.000	0.0000	250.000	No Ice 1/2" Ice 1" Ice	3.644 4.022 4.402	3.190 3.822 4.464	0.048 0.081 0.120
RFS APXVAARR24_43-U-NA20	A	From Leg	4.000 0.000 0.000	0.0000	250.000	No Ice 1/2" Ice 1" Ice	20.243 20.890 21.544	8.889 9.487 10.092	0.070 0.182 0.303
(2) RFS ATMAP1412D-1A20 - TMA	A	From Leg	4.000 0.000 0.000	0.0000	250.000	No Ice 1/2" Ice 1" Ice	1.000 1.126 1.259	0.407 0.497 0.593	0.013 0.021 0.030
Diplexer	A	From Leg	4.000 0.000 0.000	0.0000	250.000	No Ice 1/2" Ice 1" Ice	0.518 0.617 0.725	0.142 0.207 0.280	0.004 0.008 0.012
RRUS-4449 B71+B12	A	From Leg	4.000 0.000	0.0000	250.000	No Ice 1/2" Ice	1.639 1.799	1.155 1.293	0.066 0.082

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	1.966	1.438	0.101
PIROD 15' T-FRAME SECTOR	B	None		0.0000	250.000	No Ice	15.000	15.000	0.500
						1/2" Ice	20.600	20.600	0.650
						1" Ice	26.200	26.200	0.800
RFS APXV18-206516L-C	B	From Leg	4.000	0.0000	250.000	No Ice	3.644	3.190	0.048
			0.000			1/2" Ice	4.022	3.822	0.081
			0.000			1" Ice	4.402	4.464	0.120
RFS APXVAARR24_43-U-NA20	B	From Leg	4.000	0.0000	250.000	No Ice	20.243	8.889	0.070
			0.000			1/2" Ice	20.890	9.487	0.182
			0.000			1" Ice	21.544	10.092	0.303
(2) RFS ATMAP1412D-1A20 - TMA	B	From Leg	4.000	0.0000	250.000	No Ice	1.000	0.407	0.013
			0.000			1/2" Ice	1.126	0.497	0.021
			0.000			1" Ice	1.259	0.593	0.030
Diplexer	B	From Leg	4.000	0.0000	250.000	No Ice	0.518	0.142	0.004
			0.000			1/2" Ice	0.617	0.207	0.008
			0.000			1" Ice	0.725	0.280	0.012
RRUS-4449 B71+B12	B	From Leg	4.000	0.0000	250.000	No Ice	1.639	1.155	0.066
			0.000			1/2" Ice	1.799	1.293	0.082
			0.000			1" Ice	1.966	1.438	0.101
PIROD 15' T-FRAME SECTOR	C	None		0.0000	250.000	No Ice	15.000	15.000	0.500
						1/2" Ice	20.600	20.600	0.650
						1" Ice	26.200	26.200	0.800
RFS APXV18-206516L-C	C	From Leg	4.000	0.0000	250.000	No Ice	3.644	3.190	0.048
			0.000			1/2" Ice	4.022	3.822	0.081
			0.000			1" Ice	4.402	4.464	0.120
RFS APXVAARR24_43-U-NA20	C	From Leg	4.000	0.0000	250.000	No Ice	20.243	8.889	0.070
			0.000			1/2" Ice	20.890	9.487	0.182
			0.000			1" Ice	21.544	10.092	0.303
(2) RFS ATMAP1412D-1A20 - TMA	C	From Leg	4.000	0.0000	250.000	No Ice	1.000	0.407	0.013
			0.000			1/2" Ice	1.126	0.497	0.021
			0.000			1" Ice	1.259	0.593	0.030
Diplexer	C	From Leg	4.000	0.0000	250.000	No Ice	0.518	0.142	0.004
			0.000			1/2" Ice	0.617	0.207	0.008
			0.000			1" Ice	0.725	0.280	0.012
RRUS-4449 B71+B12	C	From Leg	4.000	0.0000	250.000	No Ice	1.639	1.155	0.066
			0.000			1/2" Ice	1.799	1.293	0.082
			0.000			1" Ice	1.966	1.438	0.101
*									
DB420-A	B	From Centroid-Face	8.000	0.0000	245.000	No Ice	3.330	3.330	0.030
			0.000			1/2" Ice	5.990	5.990	0.040
			9.000			1" Ice	8.650	8.650	0.050
DB2252-F	A	From Centroid-Face	8.000	0.0000	235.000	No Ice	1.360	1.360	0.050
			0.000			1/2" Ice	2.450	2.450	0.070
			0.000			1" Ice	3.540	3.540	0.090
SECTOR MOUNT	C	None		0.0000	235.000	No Ice	70.470	70.470	3.080
						1/2" Ice	100.140	100.140	4.500
						1" Ice	129.810	129.810	5.920
*									
*									
*									
*									
PIROD 15' T-FRAME SECTOR	A	None		0.0000	170.000	No Ice	15.000	15.000	0.500
						1/2" Ice	20.600	20.600	0.650
						1" Ice	26.200	26.200	0.800
RFS APXVSPP18-C-A20	A	From Leg	3.000	0.0000	170.000	No Ice	8.024	5.283	0.065
			0.000			1/2" Ice	8.480	5.736	0.114
			0.000			1" Ice	8.943	6.196	0.170

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Horz Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
RFS APXVTM14-ALU-I20	A	From Leg	3.000	0.000	0.0000	170.000	No Ice	6.653	5.032	0.059
			0.000				1/2" Ice	7.136	5.892	0.114
			0.000				1" Ice	7.598	6.627	0.176
ALU RRH2x50-800	A	From Leg	3.000	0.000	0.0000	170.000	No Ice	1.706	1.293	0.053
			0.000				1/2" Ice	1.870	1.439	0.070
			0.000				1" Ice	2.041	1.592	0.090
ALU RRH4x45-1900	A	From Leg	3.000	0.000	0.0000	170.000	No Ice	2.600	2.817	0.060
			0.000				1/2" Ice	2.815	3.037	0.088
			0.000				1" Ice	3.037	3.265	0.119
ALU TD-RRH8x20-25	A	From Leg	3.000	0.000	0.0000	170.000	No Ice	4.720	1.700	0.070
			0.000				1/2" Ice	5.010	1.920	0.097
			0.000				1" Ice	5.300	2.140	0.124
PIROD 15' T-FRAME SECTOR	B	None			0.0000	170.000	No Ice	15.000	15.000	0.500
							1/2" Ice	20.600	20.600	0.650
							1" Ice	26.200	26.200	0.800
RFS APXVSPP18-C-A20	B	From Leg	3.000	0.000	0.0000	170.000	No Ice	8.024	5.283	0.065
			0.000				1/2" Ice	8.480	5.736	0.114
			0.000				1" Ice	8.943	6.196	0.170
RFS APXVTM14-ALU-I20	B	From Leg	3.000	0.000	0.0000	170.000	No Ice	6.653	5.032	0.059
			0.000				1/2" Ice	7.136	5.892	0.114
			0.000				1" Ice	7.598	6.627	0.176
ALU RRH2x50-800	B	From Leg	3.000	0.000	0.0000	170.000	No Ice	1.706	1.293	0.053
			0.000				1/2" Ice	1.870	1.439	0.070
			0.000				1" Ice	2.041	1.592	0.090
ALU RRH4x45-1900	B	From Leg	3.000	0.000	0.0000	170.000	No Ice	2.600	2.817	0.060
			0.000				1/2" Ice	2.815	3.037	0.088
			0.000				1" Ice	3.037	3.265	0.119
ALU TD-RRH8x20-25	B	From Leg	3.000	0.000	0.0000	170.000	No Ice	4.720	1.700	0.070
			0.000				1/2" Ice	5.010	1.920	0.097
			0.000				1" Ice	5.300	2.140	0.124
PIROD 15' T-FRAME SECTOR	C	None			0.0000	170.000	No Ice	15.000	15.000	0.500
							1/2" Ice	20.600	20.600	0.650
							1" Ice	26.200	26.200	0.800
RFS APXVSPP18-C-A20	C	From Leg	3.000	0.000	0.0000	170.000	No Ice	8.024	5.283	0.065
			0.000				1/2" Ice	8.480	5.736	0.114
			0.000				1" Ice	8.943	6.196	0.170
RFS APXVTM14-ALU-I20	C	From Leg	3.000	0.000	0.0000	170.000	No Ice	6.653	5.032	0.059
			0.000				1/2" Ice	7.136	5.892	0.114
			0.000				1" Ice	7.598	6.627	0.176
ALU RRH2x50-800	C	From Leg	3.000	0.000	0.0000	170.000	No Ice	1.706	1.293	0.053
			0.000				1/2" Ice	1.870	1.439	0.070
			0.000				1" Ice	2.041	1.592	0.090
ALU RRH4x45-1900	C	From Leg	3.000	0.000	0.0000	170.000	No Ice	2.600	2.817	0.060
			0.000				1/2" Ice	2.815	3.037	0.088
			0.000				1" Ice	3.037	3.265	0.119
ALU TD-RRH8x20-25	C	From Leg	3.000	0.000	0.0000	170.000	No Ice	4.720	1.700	0.070
			0.000				1/2" Ice	5.010	1.920	0.097
			0.000				1" Ice	5.300	2.140	0.124
*										
Commscope SF-QV12-B (AT&T)	A	None			0.0000	160.000	No Ice	15.350	15.350	0.417
							1/2" Ice	21.290	21.290	0.542
							1" Ice	27.230	27.230	0.667
CCI TPA65R-BU6D (AT&T)	A	From Leg	3.000	0.000	0.0000	160.000	No Ice	15.525	7.211	0.124
			0.000				1/2" Ice	16.157	8.389	0.229
			0.000				1" Ice	16.750	9.282	0.342
Ericsson Air6449 B77D (AT&T)	A	From Leg	3.000	0.000	0.0000	160.000	No Ice	4.028	2.147	0.082
			0.000				1/2" Ice	4.289	2.357	0.111

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1" Ice	4.557	2.574	0.145
Ericsson Air6419 B77G	A	From Leg	3.000	0.0000	160.000	No Ice	3.797	1.938	0.077
(AT&T)			0.000			1/2" Ice	4.047	2.135	0.105
			0.000			1" Ice	4.305	2.340	0.136
CCI DMP65R-BU6DA	A	From Leg	3.000	0.0000	160.000	No Ice	12.709	5.615	0.079
(AT&T)			0.000			1/2" Ice	13.206	6.067	0.153
			0.000			1" Ice	13.709	6.526	0.234
RRUS-4478 B14	A	From Leg	3.000	0.0000	160.000	No Ice	1.843	1.059	0.060
(AT&T)			0.000			1/2" Ice	2.012	1.197	0.076
			0.000			1" Ice	2.190	1.342	0.094
RRUS-32 B2	A	From Leg	3.000	0.0000	160.000	No Ice	2.743	1.668	0.060
(AT&T)			0.000			1/2" Ice	2.965	1.855	0.081
			0.000			1" Ice	3.194	2.049	0.105
RRUS-4426 B66	A	From Leg	3.000	0.0000	160.000	No Ice	1.644	0.725	0.048
(AT&T)			0.000			1/2" Ice	1.804	0.842	0.061
			0.000			1" Ice	1.972	0.969	0.076
RRUS-32 B30	A	From Leg	3.000	0.0000	160.000	No Ice	2.743	1.668	0.060
(AT&T)			0.000			1/2" Ice	2.965	1.855	0.081
			0.000			1" Ice	3.194	2.049	0.105
RRUS-4449 B5/B12	A	From Leg	3.000	0.0000	160.000	No Ice	1.644	1.300	0.073
(AT&T)			0.000			1/2" Ice	1.804	1.445	0.090
			0.000			1" Ice	1.972	1.597	0.110
Raycap	A	From Leg	3.000	0.0000	160.000	No Ice	0.929	0.929	0.026
DC9-48-60-24-8C-EV			0.000			1/2" Ice	1.479	1.479	0.044
(AT&T)			0.000			1" Ice	1.670	1.670	0.064
Commscope SF-QV12-B	B	None		0.0000	160.000	No Ice	15.350	15.350	0.417
(AT&T)						1/2" Ice	21.290	21.290	0.542
						1" Ice	27.230	27.230	0.667
CCI TPA65R-BU6D	B	From Leg	3.000	0.0000	160.000	No Ice	15.525	7.211	0.124
(AT&T)			0.000			1/2" Ice	16.157	8.389	0.229
			0.000			1" Ice	16.750	9.282	0.342
Ericsson Air6449 B77D	B	From Leg	3.000	0.0000	160.000	No Ice	4.028	2.147	0.082
(AT&T)			0.000			1/2" Ice	4.289	2.357	0.111
			0.000			1" Ice	4.557	2.574	0.145
Ericsson Air6419 B77G	B	From Leg	3.000	0.0000	160.000	No Ice	3.797	1.938	0.077
(AT&T)			0.000			1/2" Ice	4.047	2.135	0.105
			0.000			1" Ice	4.305	2.340	0.136
CCI DMP65R-BU6DA	B	From Leg	3.000	0.0000	160.000	No Ice	12.709	5.615	0.079
(AT&T)			0.000			1/2" Ice	13.206	6.067	0.153
			0.000			1" Ice	13.709	6.526	0.234
RRUS-4478 B14	B	From Leg	3.000	0.0000	160.000	No Ice	1.843	1.059	0.060
(AT&T)			0.000			1/2" Ice	2.012	1.197	0.076
			0.000			1" Ice	2.190	1.342	0.094
RRUS-32 B2	B	From Leg	3.000	0.0000	160.000	No Ice	2.743	1.668	0.060
(AT&T)			0.000			1/2" Ice	2.965	1.855	0.081
			0.000			1" Ice	3.194	2.049	0.105
RRUS-4426 B66	B	From Leg	3.000	0.0000	160.000	No Ice	1.644	0.725	0.048
(AT&T)			0.000			1/2" Ice	1.804	0.842	0.061
			0.000			1" Ice	1.972	0.969	0.076
RRUS-32 B30	B	From Leg	3.000	0.0000	160.000	No Ice	2.743	1.668	0.060
(AT&T)			0.000			1/2" Ice	2.965	1.855	0.081
			0.000			1" Ice	3.194	2.049	0.105
RRUS-4449 B5/B12	B	From Leg	3.000	0.0000	160.000	No Ice	1.644	1.300	0.073
(AT&T)			0.000			1/2" Ice	1.804	1.445	0.090
			0.000			1" Ice	1.972	1.597	0.110
Raycap	B	From Leg	3.000	0.0000	160.000	No Ice	0.929	0.929	0.026
DC9-48-60-24-8C-EV			0.000			1/2" Ice	1.479	1.479	0.044

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 K
(AT&T)			0.000			1" Ice	1.670	1.670	0.064
Commscope SF-QV12-B	C	None		0.0000	160.000	No Ice	15.350	15.350	0.417
(AT&T)						1/2" Ice	21.290	21.290	0.542
						1" Ice	27.230	27.230	0.667
CCI TPA65R-BU6D	C	From Leg	3.000	0.0000	160.000	No Ice	15.525	7.211	0.124
(AT&T)			0.000			1/2" Ice	16.157	8.389	0.229
			0.000			1" Ice	16.750	9.282	0.342
Ericsson Air6449 B77D	C	From Leg	3.000	0.0000	160.000	No Ice	4.028	2.147	0.082
(AT&T)			0.000			1/2" Ice	4.289	2.357	0.111
			0.000			1" Ice	4.557	2.574	0.145
Ericsson Air6419 B77G	C	From Leg	3.000	0.0000	160.000	No Ice	3.797	1.938	0.077
(AT&T)			0.000			1/2" Ice	4.047	2.135	0.105
			0.000			1" Ice	4.305	2.340	0.136
CCI DMP65R-BU6DA	C	From Leg	3.000	0.0000	160.000	No Ice	12.709	5.615	0.079
(AT&T)			0.000			1/2" Ice	13.206	6.067	0.153
			0.000			1" Ice	13.709	6.526	0.234
RRUS-4478 B14	C	From Leg	3.000	0.0000	160.000	No Ice	1.843	1.059	0.060
(AT&T)			0.000			1/2" Ice	2.012	1.197	0.076
			0.000			1" Ice	2.190	1.342	0.094
RRUS-32 B2	C	From Leg	3.000	0.0000	160.000	No Ice	2.743	1.668	0.060
(AT&T)			0.000			1/2" Ice	2.965	1.855	0.081
			0.000			1" Ice	3.194	2.049	0.105
RRUS-4426 B66	C	From Leg	3.000	0.0000	160.000	No Ice	1.644	0.725	0.048
(AT&T)			0.000			1/2" Ice	1.804	0.842	0.061
			0.000			1" Ice	1.972	0.969	0.076
RRUS-32 B30	C	From Leg	3.000	0.0000	160.000	No Ice	2.743	1.668	0.060
(AT&T)			0.000			1/2" Ice	2.965	1.855	0.081
			0.000			1" Ice	3.194	2.049	0.105
RRUS-4449 B5/B12	C	From Leg	3.000	0.0000	160.000	No Ice	1.644	1.300	0.073
(AT&T)			0.000			1/2" Ice	1.804	1.445	0.090
			0.000			1" Ice	1.972	1.597	0.110
Raycap	C	From Leg	3.000	0.0000	160.000	No Ice	0.929	0.929	0.026
DC9-48-60-24-8C-EV			0.000			1/2" Ice	1.479	1.479	0.044
(AT&T)			0.000			1" Ice	1.670	1.670	0.064
*									
PIROD 15' T-FRAME	A	None		0.0000	150.000	No Ice	15.000	15.000	0.500
SECTOR						1/2" Ice	20.600	20.600	0.650
						1" Ice	26.200	26.200	0.800
RFS APXV18-206517S	A	From Leg	3.000	0.0000	150.000	No Ice	5.167	4.463	0.057
			0.000			1/2" Ice	5.618	5.394	0.099
			0.000			1" Ice	6.077	6.203	0.149
(2) Commscope	A	From Leg	3.000	0.0000	150.000	No Ice	8.720	6.914	0.081
HBXX-6517DS-A2M			0.000			1/2" Ice	9.271	8.109	0.150
			0.000			1" Ice	9.797	9.018	0.227
(2) Commscope	A	From Leg	3.000	0.0000	150.000	No Ice	8.397	7.068	0.079
LNX-6514DS-A1M			0.000			1/2" Ice	8.955	8.253	0.148
			0.000			1" Ice	9.480	9.152	0.225
(2) Diplexer	A	From Leg	3.000	0.0000	150.000	No Ice	0.518	0.142	0.044
			0.000			1/2" Ice	0.617	0.207	0.076
			0.000			1" Ice	0.725	0.280	0.108
ALU RRH2x60-AWS	A	From Leg	3.000	0.0000	150.000	No Ice	3.347	2.005	0.055
			0.000			1/2" Ice	3.604	2.237	0.078
			0.000			1" Ice	3.867	2.476	0.105
ALU RRH2x60	A	From Leg	3.000	0.0000	150.000	No Ice	1.811	1.418	0.050
			0.000			1/2" Ice	1.984	1.576	0.067
			0.000			1" Ice	2.164	1.742	0.087
DB-T1-6Z-8AB-0Z	A	From Leg	3.000	0.0000	150.000	No Ice	5.600	2.330	0.040

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight K
			0.000			1/2" Ice	5.600	2.330	0.080
			0.000			1" Ice	5.600	2.330	0.120
PIROD 15' T-FRAME SECTOR	B	None		0.0000	150.000	No Ice	15.000	15.000	0.500
						1/2" Ice	20.600	20.600	0.650
						1" Ice	26.200	26.200	0.800
RFS APXV18-206517S	B	From Leg	3.000	0.0000	150.000	No Ice	5.167	4.463	0.057
			0.000			1/2" Ice	5.618	5.394	0.099
			0.000			1" Ice	6.077	6.203	0.149
(2) Commscope HBXX-6517DS-A2M	B	From Leg	3.000	0.0000	150.000	No Ice	8.720	6.914	0.081
			0.000			1/2" Ice	9.271	8.109	0.150
			0.000			1" Ice	9.797	9.018	0.227
(2) Commscope LNX-6514DS-A1M	B	From Leg	3.000	0.0000	150.000	No Ice	8.397	7.068	0.079
			0.000			1/2" Ice	8.955	8.253	0.148
			0.000			1" Ice	9.480	9.152	0.225
(2) Diplexer	B	From Leg	3.000	0.0000	150.000	No Ice	0.518	0.142	0.044
			0.000			1/2" Ice	0.617	0.207	0.076
			0.000			1" Ice	0.725	0.280	0.108
ALU RRH2x60-AWS	B	From Leg	3.000	0.0000	150.000	No Ice	3.347	2.005	0.055
			0.000			1/2" Ice	3.604	2.237	0.078
			0.000			1" Ice	3.867	2.476	0.105
ALU RRH2x60	B	From Leg	3.000	0.0000	150.000	No Ice	1.811	1.418	0.050
			0.000			1/2" Ice	1.984	1.576	0.067
			0.000			1" Ice	2.164	1.742	0.087
DB-T1-6Z-8AB-0Z	B	From Leg	3.000	0.0000	150.000	No Ice	5.600	2.330	0.040
			0.000			1/2" Ice	5.600	2.330	0.080
			0.000			1" Ice	5.600	2.330	0.120
PIROD 15' T-FRAME SECTOR	C	None		0.0000	150.000	No Ice	15.000	15.000	0.500
						1/2" Ice	20.600	20.600	0.650
						1" Ice	26.200	26.200	0.800
RFS APXV18-206517S	C	From Leg	3.000	0.0000	150.000	No Ice	5.167	4.463	0.057
			0.000			1/2" Ice	5.618	5.394	0.099
			0.000			1" Ice	6.077	6.203	0.149
(2) Commscope HBXX-6517DS-A2M	C	From Leg	3.000	0.0000	150.000	No Ice	8.720	6.914	0.081
			0.000			1/2" Ice	9.271	8.109	0.150
			0.000			1" Ice	9.797	9.018	0.227
(2) Commscope LNX-6514DS-A1M	C	From Leg	3.000	0.0000	150.000	No Ice	8.397	7.068	0.079
			0.000			1/2" Ice	8.955	8.253	0.148
			0.000			1" Ice	9.480	9.152	0.225
(2) Diplexer	C	From Leg	3.000	0.0000	150.000	No Ice	0.518	0.142	0.044
			0.000			1/2" Ice	0.617	0.207	0.076
			0.000			1" Ice	0.725	0.280	0.108
ALU RRH2x60-AWS	C	From Leg	3.000	0.0000	150.000	No Ice	3.347	2.005	0.055
			0.000			1/2" Ice	3.604	2.237	0.078
			0.000			1" Ice	3.867	2.476	0.105
ALU RRH2x60	C	From Leg	3.000	0.0000	150.000	No Ice	1.811	1.418	0.050
			0.000			1/2" Ice	1.984	1.576	0.067
			0.000			1" Ice	2.164	1.742	0.087
DB-T1-6Z-8AB-0Z	C	From Leg	3.000	0.0000	150.000	No Ice	5.600	2.330	0.040
			0.000			1/2" Ice	5.600	2.330	0.080
			0.000			1" Ice	5.600	2.330	0.120

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	K	K	in	in	in^2
Pirod 105245	1090.3344	2961.8666	0.677	0.350	7.5718	20.5685	5.3014
Pirod 105218	2263.4687	6168.7540	0.755	0.686	7.8593	21.4193	7.2158
Pirod 105218	2263.4687	6158.1611	0.755	0.676	7.8593	21.3825	7.2158
Pirod 105219	2441.8688	6218.5127	0.944	0.698	8.4787	21.5921	9.4248
Pirod 105220	2578.8005	6277.5586	1.121	0.701	8.9542	21.7971	11.9282
Pirod 105220	2578.8005	6262.9453	1.121	0.687	8.9542	21.7463	11.9282
Pirod 112743	3466.5160	8441.0592	1.689	0.925	12.0365	29.3092	14.7262
Pirod 112743	3466.5160	8278.4068	1.689	0.899	12.0365	28.7445	14.7262
Pirod 112744	3599.5585	8320.2582	1.904	0.882	12.4985	28.8898	17.8187
Pirod 112744	3599.5585	8071.5473	1.904	0.841	12.4985	28.0262	17.8187
Pirod 112745	3789.3331	8102.3364	2.194	0.812	13.1574	28.1331	21.2058
Pirod 112740	3789.3331	7438.8962	2.194	0.699	13.1574	25.8295	21.2058

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		ksf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	275.000	1.319	0.039	51.458	A	0.000	7.943	2.917	36.72	0.000	0.000
280.000-270.0					B	0.000	7.943		36.72	0.000	0.000
00					C	0.000	7.943		36.72	4.960	0.000
T2	260.000	1.298	0.039	103.333	A	0.000	16.232	6.667	41.07	0.000	0.000
270.000-250.0					B	0.000	16.232		41.07	0.000	0.000
00					C	0.000	16.232		41.07	9.920	0.000
T3	240.000	1.269	0.038	104.167	A	0.000	18.850	8.333	44.21	54.020	0.000
250.000-230.0					B	0.000	18.850		44.21	0.000	0.000
00					C	0.000	18.850		44.21	13.880	0.000
T4	225.000	1.246	0.037	66.264	A	4.672	12.641	12.641	73.01	27.010	0.000
230.000-220.0					B	4.672	12.641		73.01	0.000	0.000
00					C	4.672	12.641		73.01	8.920	0.000
T5	210.000	1.222	0.036	162.945	A	10.467	26.241	26.241	71.49	54.020	0.000
220.000-200.0					B	10.467	26.241		71.49	0.000	0.000
00					C	10.467	26.241		71.49	17.840	0.000
T6	190.000	1.187	0.035	202.945	A	15.714	26.241	26.241	62.55	54.020	0.000
200.000-180.0					B	15.714	26.241		62.55	0.000	0.000
00					C	15.714	26.241		62.55	17.840	0.000
T7	170.000	1.15	0.034	243.362	A	19.853	28.309	28.309	58.78	54.020	0.000
180.000-160.0					B	19.853	28.309		58.78	0.000	0.000
00					C	19.853	28.309		58.78	29.720	0.000
T8	150.000	1.11	0.033	283.780	A	20.877	29.897	29.897	58.88	54.020	0.000
160.000-140.0					B	20.877	29.897		58.88	47.580	0.000
00					C	20.877	29.897		58.88	47.540	0.000
T9	130.000	1.065	0.032	323.780	A	19.635	29.897	29.897	60.36	54.020	0.000
140.000-120.0					B	19.635	29.897		60.36	47.580	0.000
00					C	19.635	29.897		60.36	53.480	0.000
T10	110.000	1.016	0.030	374.209	A	13.965	40.189	40.189	74.21	54.020	0.000
120.000-100.0					B	13.965	40.189		74.21	47.580	0.000
00					C	13.965	40.189		74.21	53.480	0.000
T11	90.000	0.959	0.029	414.209	A	14.825	40.189	40.189	73.05	54.020	0.000
100.000-80.00					B	14.825	40.189		73.05	47.580	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	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
0					C	14.825	40.189		73.05	53.480	0.000
T12	70.000	0.892	0.027	454.627	A	15.712	41.731	41.731	72.65	54.020	0.000
80.000-60.000					B	15.712	41.731		72.65	47.580	0.000
					C	15.712	41.731		72.65	53.480	0.000
T13	50.000	0.811	0.024	494.627	A	16.624	41.731	41.731	71.51	54.020	0.000
60.000-40.000					B	16.624	41.731		71.51	47.580	0.000
					C	16.624	41.731		71.51	53.480	0.000
T14	30.000	0.701	0.021	535.044	A	17.558	43.931	43.931	71.44	54.020	0.000
40.000-20.000					B	17.558	43.931		71.44	47.580	0.000
					C	17.558	43.931		71.44	53.480	0.000
T15	10.000	0.7	0.021	575.044	A	18.514	43.931	43.931	70.35	37.814	0.000
20.000-0.000					B	18.514	43.931		70.35	33.306	0.000
					C	18.514	43.931		70.35	37.436	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	275.000	1.319	0.007	1.2362	53.519	A	0.000	25.838	7.037	27.24	0.000	0.000
280.000-270.000						B	0.000	25.838		27.24	0.000	0.000
						C	0.000	25.838		27.24	15.370	0.000
T2	260.000	1.298	0.007	1.2293	107.431	A	0.000	50.880	14.862	29.21	0.000	0.000
270.000-250.000						B	0.000	50.880		29.21	0.000	0.000
						C	0.000	50.880		29.21	30.665	0.000
T3	240.000	1.269	0.007	1.2195	108.232	A	0.000	52.996	16.463	31.07	84.986	0.000
250.000-230.000						B	0.000	52.996		31.07	0.000	0.000
						C	0.000	52.996		31.07	39.398	0.000
T4	225.000	1.246	0.007	1.2116	68.286	A	4.672	38.112	34.338	80.26	42.442	0.000
230.000-220.000						B	4.672	38.112		80.26	0.000	0.000
						C	4.672	38.112		80.26	24.044	0.000
T5	210.000	1.222	0.007	1.2033	166.961	A	10.467	79.913	71.517	79.13	84.774	0.000
220.000-200.000						B	10.467	79.913		79.13	0.000	0.000
						C	10.467	79.913		79.13	47.932	0.000
T6	190.000	1.187	0.006	1.1913	206.921	A	15.714	83.874	71.394	71.69	84.616	0.000
200.000-180.000						B	15.714	83.874		71.69	0.000	0.000
						C	15.714	83.874		71.69	47.707	0.000
T7	170.000	1.15	0.006	1.1781	247.294	A	19.853	86.443	72.093	67.82	84.443	0.000
180.000-160.000						B	19.853	86.443		67.82	0.000	0.000
						C	19.853	86.443		67.82	65.961	0.000
T8	150.000	1.11	0.006	1.1635	287.663	A	20.877	86.658	72.778	67.68	84.250	0.000
160.000-140.000						B	20.877	86.658		67.68	111.076	0.000
						C	20.877	86.658		67.68	100.289	0.000
T9	130.000	1.065	0.006	1.1469	327.608	A	19.635	85.477	72.609	69.08	84.033	0.000
140.000-120.000						B	19.635	85.477		69.08	110.642	0.000
						C	19.635	85.477		69.08	115.963	0.000
T10	110.000	1.016	0.005	1.1279	377.974	A	13.965	106.861	97.860	80.99	83.783	0.000
120.000-100.000						B	13.965	106.861		80.99	110.144	0.000
						C	13.965	106.861		80.99	115.354	0.000
T11	90.000	0.959	0.005	1.1055	417.899	A	14.825	105.340	95.974	79.87	83.489	0.000
100.000-80.000						B	14.825	105.340		79.87	109.557	0.000
						C	14.825	105.340		79.87	114.636	0.000
T12	70.000	0.892	0.005	1.0781	458.225	A	15.712	106.139	96.460	79.16	83.129	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	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
80.000-60.000						B	15.712	106.139		79.16	108.839	0.000
						C	15.712	106.139		79.16	113.757	0.000
T13	50.000	0.811	0.004	1.0424	498.106	A	16.624	103.478	93.576	77.91	82.662	0.000
60.000-40.000						B	16.624	103.478		77.91	107.906	0.000
						C	16.624	103.478		77.91	112.615	0.000
T14	30.000	0.701	0.004	0.9905	538.350	A	17.558	103.871	93.933	77.36	81.983	0.000
40.000-20.000						B	17.558	103.871		77.36	106.552	0.000
						C	17.558	103.871		77.36	110.955	0.000
T15	10.000	0.7	0.004	0.8875	578.006	A	18.514	95.631	86.242	75.55	76.153	0.000
20.000-0.000						B	18.514	95.631		75.55	79.763	0.000
						C	18.514	95.631		75.55	72.224	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z ksf	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	275.000	1.319	0.010	51.458	A	0.000	7.943	2.917	36.72	0.000	0.000
280.000-270.0					B	0.000	7.943		36.72	0.000	0.000
00					C	0.000	7.943		36.72	4.960	0.000
T2	260.000	1.298	0.010	103.333	A	0.000	16.232	6.667	41.07	0.000	0.000
270.000-250.0					B	0.000	16.232		41.07	0.000	0.000
00					C	0.000	16.232		41.07	9.920	0.000
T3	240.000	1.269	0.010	104.167	A	0.000	18.850	8.333	44.21	54.020	0.000
250.000-230.0					B	0.000	18.850		44.21	0.000	0.000
00					C	0.000	18.850		44.21	13.880	0.000
T4	225.000	1.246	0.010	66.264	A	4.672	12.641	12.641	73.01	27.010	0.000
230.000-220.0					B	4.672	12.641		73.01	0.000	0.000
00					C	4.672	12.641		73.01	8.920	0.000
T5	210.000	1.222	0.009	162.945	A	10.467	26.241	26.241	71.49	54.020	0.000
220.000-200.0					B	10.467	26.241		71.49	0.000	0.000
00					C	10.467	26.241		71.49	17.840	0.000
T6	190.000	1.187	0.009	202.945	A	15.714	26.241	26.241	62.55	54.020	0.000
200.000-180.0					B	15.714	26.241		62.55	0.000	0.000
00					C	15.714	26.241		62.55	17.840	0.000
T7	170.000	1.15	0.009	243.362	A	19.853	28.309	28.309	58.78	54.020	0.000
180.000-160.0					B	19.853	28.309		58.78	0.000	0.000
00					C	19.853	28.309		58.78	29.720	0.000
T8	150.000	1.11	0.009	283.780	A	20.877	29.897	29.897	58.88	54.020	0.000
160.000-140.0					B	20.877	29.897		58.88	47.580	0.000
00					C	20.877	29.897		58.88	47.540	0.000
T9	130.000	1.065	0.008	323.780	A	19.635	29.897	29.897	60.36	54.020	0.000
140.000-120.0					B	19.635	29.897		60.36	47.580	0.000
00					C	19.635	29.897		60.36	53.480	0.000
T10	110.000	1.016	0.008	374.209	A	13.965	40.189	40.189	74.21	54.020	0.000
120.000-100.0					B	13.965	40.189		74.21	47.580	0.000
00					C	13.965	40.189		74.21	53.480	0.000
T11	90.000	0.959	0.007	414.209	A	14.825	40.189	40.189	73.05	54.020	0.000
100.000-80.00					B	14.825	40.189		73.05	47.580	0.000
0					C	14.825	40.189		73.05	53.480	0.000
T12	70.000	0.892	0.007	454.627	A	15.712	41.731	41.731	72.65	54.020	0.000
80.000-60.000					B	15.712	41.731		72.65	47.580	0.000

Section Elevation ft	z ft	K_Z	q_z ksf	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	15.712	41.731		72.65	53.480	0.000
T13	50.000	0.811	0.006	494.627	A	16.624	41.731	41.731	71.51	54.020	0.000
60.000-40.000					B	16.624	41.731		71.51	47.580	0.000
					C	16.624	41.731		71.51	53.480	0.000
T14	30.000	0.701	0.005	535.044	A	17.558	43.931	43.931	71.44	54.020	0.000
40.000-20.000					B	17.558	43.931		71.44	47.580	0.000
					C	17.558	43.931		71.44	53.480	0.000
T15	10.000	0.7	0.005	575.044	A	18.514	43.931	43.931	70.35	37.814	0.000
20.000-0.000					B	18.514	43.931		70.35	33.306	0.000
					C	18.514	43.931		70.35	37.436	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.018	0.731	A	0.154	2.756	0.039	1	1	4.512	0.581	0.058	C
280.000-270.0			B	0.154	2.756		1	1	4.512			
00			C	0.154	2.756		1	1	4.512			
T2	0.037	1.564	A	0.157	2.746	0.039	1	1	9.225	1.159	0.058	C
270.000-250.0			B	0.157	2.746		1	1	9.225			
00			C	0.157	2.746		1	1	9.225			
T3	0.346	2.155	A	0.181	2.661	0.038	1	1	10.771	3.102	0.155	C
250.000-230.0			B	0.181	2.661		1	1	10.771			
00			C	0.181	2.661		1	1	10.771			
T4	0.181	1.453	A	0.261	2.404	0.037	1	1	12.102	2.051	0.205	C
230.000-220.0			B	0.261	2.404		1	1	12.102			
00			C	0.261	2.404		1	1	12.102			
T5	0.362	2.838	A	0.225	2.514	0.036	1	1	25.670	4.218	0.211	C
220.000-200.0			B	0.225	2.514		1	1	25.670			
00			C	0.225	2.514		1	1	25.670			
T6	0.362	3.493	A	0.207	2.574	0.035	1	1	30.821	4.544	0.227	C
200.000-180.0			B	0.207	2.574		1	1	30.821			
00			C	0.207	2.574		1	1	30.821			
T7	0.412	4.409	A	0.198	2.603	0.034	1	1	36.106	5.174	0.259	C
180.000-160.0			B	0.198	2.603		1	1	36.106			
00			C	0.198	2.603		1	1	36.106			
T8	0.700	5.108	A	0.179	2.668	0.033	1	1	37.951	7.034	0.352	C
160.000-140.0			B	0.179	2.668		1	1	37.951			
00			C	0.179	2.668		1	1	37.951			
T9	0.724	4.985	A	0.153	2.761	0.032	1	1	36.612	6.907	0.345	C
140.000-120.0			B	0.153	2.761		1	1	36.612			
00			C	0.153	2.761		1	1	36.612			
T10	0.724	7.429	A	0.145	2.791	0.030	1	1	36.753	6.624	0.331	C
120.000-100.0			B	0.145	2.791		1	1	36.753			
00			C	0.145	2.791		1	1	36.753			
T11	0.724	7.549	A	0.133	2.836	0.029	1	1	37.573	6.351	0.318	C
100.000-80.00			B	0.133	2.836		1	1	37.573			
0			C	0.133	2.836		1	1	37.573			
T12	0.724	8.322	A	0.126	2.86	0.027	1	1	39.313	6.045	0.302	C
80.000-60.000			B	0.126	2.86		1	1	39.313			
			C	0.126	2.86		1	1	39.313			
T13	0.724	8.454	A	0.118	2.893	0.024	1	1	40.204	5.570	0.278	C
60.000-40.000			B	0.118	2.893		1	1	40.204			
			C	0.118	2.893		1	1	40.204			
T14	0.724	9.462	A	0.115	2.905	0.021	1	1	42.375	4.934	0.247	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.115	2.905		1	1	42.375			
			C	0.115	2.905		1	1	42.375			
T15	0.507	9.604	A	0.109	2.93	0.021	1	1	43.319	4.173	0.209	C
20.000-0.000			B	0.109	2.93		1	1	43.319			
			C	0.109	2.93		1	1	43.319			
Sum Weight:	7.271	77.557						OTM	8440.178 kip-ft	68.465		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.018	0.731	A	0.154	2.756	0.039	0.8	1	4.512	0.581	0.058	C
280.000-270.0			B	0.154	2.756		0.8	1	4.512			
00			C	0.154	2.756		0.8	1	4.512			
T2	0.037	1.564	A	0.157	2.746	0.039	0.8	1	9.225	1.159	0.058	C
270.000-250.0			B	0.157	2.746		0.8	1	9.225			
00			C	0.157	2.746		0.8	1	9.225			
T3	0.346	2.155	A	0.181	2.661	0.038	0.8	1	10.771	3.102	0.155	C
250.000-230.0			B	0.181	2.661		0.8	1	10.771			
00			C	0.181	2.661		0.8	1	10.771			
T4	0.181	1.453	A	0.261	2.404	0.037	0.8	1	11.168	1.980	0.198	C
230.000-220.0			B	0.261	2.404		0.8	1	11.168			
00			C	0.261	2.404		0.8	1	11.168			
T5	0.362	2.838	A	0.225	2.514	0.036	0.8	1	23.577	4.055	0.203	C
220.000-200.0			B	0.225	2.514		0.8	1	23.577			
00			C	0.225	2.514		0.8	1	23.577			
T6	0.362	3.493	A	0.207	2.574	0.035	0.8	1	27.678	4.300	0.215	C
200.000-180.0			B	0.207	2.574		0.8	1	27.678			
00			C	0.207	2.574		0.8	1	27.678			
T7	0.412	4.409	A	0.198	2.603	0.034	0.8	1	32.135	4.873	0.244	C
180.000-160.0			B	0.198	2.603		0.8	1	32.135			
00			C	0.198	2.603		0.8	1	32.135			
T8	0.700	5.108	A	0.179	2.668	0.033	0.8	1	33.776	6.721	0.336	C
160.000-140.0			B	0.179	2.668		0.8	1	33.776			
00			C	0.179	2.668		0.8	1	33.776			
T9	0.724	4.985	A	0.153	2.761	0.032	0.8	1	32.685	6.615	0.331	C
140.000-120.0			B	0.153	2.761		0.8	1	32.685			
00			C	0.153	2.761		0.8	1	32.685			
T10	0.724	7.429	A	0.145	2.791	0.030	0.8	1	33.960	6.424	0.321	C
120.000-100.0			B	0.145	2.791		0.8	1	33.960			
00			C	0.145	2.791		0.8	1	33.960			
T11	0.724	7.549	A	0.133	2.836	0.029	0.8	1	34.608	6.147	0.307	C
100.000-80.00			B	0.133	2.836		0.8	1	34.608			
0			C	0.133	2.836		0.8	1	34.608			
T12	0.724	8.322	A	0.126	2.86	0.027	0.8	1	36.171	5.842	0.292	C
80.000-60.000			B	0.126	2.86		0.8	1	36.171			
			C	0.126	2.86		0.8	1	36.171			
T13	0.724	8.454	A	0.118	2.893	0.024	0.8	1	36.879	5.372	0.269	C
60.000-40.000			B	0.118	2.893		0.8	1	36.879			
			C	0.118	2.893		0.8	1	36.879			
T14	0.724	9.462	A	0.115	2.905	0.021	0.8	1	38.864	4.753	0.238	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.115	2.905		0.8	1	38.864			
			C	0.115	2.905		0.8	1	38.864			
T15	0.507	9.604	A	0.109	2.93	0.021	0.8	1	39.616	3.980	0.199	C
20.000-0.000			B	0.109	2.93		0.8	1	39.616			
			C	0.109	2.93		0.8	1	39.616			
Sum Weight:	7.271	77.557						OTM	8135.933 kip-ft	65.904		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.018	0.731	A	0.154	2.756	0.039	0.85	1	4.512	0.581	0.058	C
280.000-270.0			B	0.154	2.756		0.85	1	4.512			
00			C	0.154	2.756		0.85	1	4.512			
T2	0.037	1.564	A	0.157	2.746	0.039	0.85	1	9.225	1.159	0.058	C
270.000-250.0			B	0.157	2.746		0.85	1	9.225			
00			C	0.157	2.746		0.85	1	9.225			
T3	0.346	2.155	A	0.181	2.661	0.038	0.85	1	10.771	3.102	0.155	C
250.000-230.0			B	0.181	2.661		0.85	1	10.771			
00			C	0.181	2.661		0.85	1	10.771			
T4	0.181	1.453	A	0.261	2.404	0.037	0.85	1	11.402	1.998	0.200	C
230.000-220.0			B	0.261	2.404		0.85	1	11.402			
00			C	0.261	2.404		0.85	1	11.402			
T5	0.362	2.838	A	0.225	2.514	0.036	0.85	1	24.100	4.096	0.205	C
220.000-200.0			B	0.225	2.514		0.85	1	24.100			
00			C	0.225	2.514		0.85	1	24.100			
T6	0.362	3.493	A	0.207	2.574	0.035	0.85	1	28.464	4.361	0.218	C
200.000-180.0			B	0.207	2.574		0.85	1	28.464			
00			C	0.207	2.574		0.85	1	28.464			
T7	0.412	4.409	A	0.198	2.603	0.034	0.85	1	33.128	4.948	0.247	C
180.000-160.0			B	0.198	2.603		0.85	1	33.128			
00			C	0.198	2.603		0.85	1	33.128			
T8	0.700	5.108	A	0.179	2.668	0.033	0.85	1	34.819	6.799	0.340	C
160.000-140.0			B	0.179	2.668		0.85	1	34.819			
00			C	0.179	2.668		0.85	1	34.819			
T9	0.724	4.985	A	0.153	2.761	0.032	0.85	1	33.667	6.688	0.334	C
140.000-120.0			B	0.153	2.761		0.85	1	33.667			
00			C	0.153	2.761		0.85	1	33.667			
T10	0.724	7.429	A	0.145	2.791	0.030	0.85	1	34.658	6.474	0.324	C
120.000-100.0			B	0.145	2.791		0.85	1	34.658			
00			C	0.145	2.791		0.85	1	34.658			
T11	0.724	7.549	A	0.133	2.836	0.029	0.85	1	35.349	6.198	0.310	C
100.000-80.00			B	0.133	2.836		0.85	1	35.349			
0			C	0.133	2.836		0.85	1	35.349			
T12	0.724	8.322	A	0.126	2.86	0.027	0.85	1	36.956	5.892	0.295	C
80.000-60.000			B	0.126	2.86		0.85	1	36.956			
			C	0.126	2.86		0.85	1	36.956			
T13	0.724	8.454	A	0.118	2.893	0.024	0.85	1	37.710	5.422	0.271	C
60.000-40.000			B	0.118	2.893		0.85	1	37.710			
			C	0.118	2.893		0.85	1	37.710			
T14	0.724	9.462	A	0.115	2.905	0.021	0.85	1	39.741	4.798	0.240	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.115	2.905		0.85	1	39.741			
			C	0.115	2.905		0.85	1	39.741			
T15	0.507	9.604	A	0.109	2.93	0.021	0.85	1	40.542	4.029	0.201	C
20.000-0.000			B	0.109	2.93		0.85	1	40.542			
			C	0.109	2.93		0.85	1	40.542			
Sum Weight:	7.271	77.557						OTM	8211.994 kip-ft	66.544		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.157	1.534	A	0.483	1.923	0.007	1	1	17.463	0.294	0.029	C
280.000-270.0			B	0.483	1.923		1	1	17.463			
00			C	0.483	1.923		1	1	17.463			
T2	0.313	3.130	A	0.474	1.937	0.007	1	1	34.146	0.571	0.029	C
270.000-250.0			B	0.474	1.937		1	1	34.146			
00			C	0.474	1.937		1	1	34.146			
T3	2.145	3.804	A	0.49	1.914	0.007	1	1	36.009	1.115	0.056	C
250.000-230.0			B	0.49	1.914		1	1	36.009			
00			C	0.49	1.914		1	1	36.009			
T4	1.124	2.532	A	0.627	1.79	0.007	1	1	33.669	0.718	0.072	C
230.000-220.0			B	0.627	1.79		1	1	33.669			
00			C	0.627	1.79		1	1	33.669			
T5	2.239	6.074	A	0.541	1.852	0.007	1	1	67.058	1.426	0.071	C
220.000-200.0			B	0.541	1.852		1	1	67.058			
00			C	0.541	1.852		1	1	67.058			
T6	2.226	7.205	A	0.481	1.926	0.006	1	1	72.335	1.466	0.073	C
200.000-180.0			B	0.481	1.926		1	1	72.335			
00			C	0.481	1.926		1	1	72.335			
T7	2.568	8.518	A	0.43	2.008	0.006	1	1	76.011	1.584	0.079	C
180.000-160.0			B	0.43	2.008		1	1	76.011			
00			C	0.43	2.008		1	1	76.011			
T8	4.500	9.239	A	0.374	2.118	0.006	1	1	75.064	2.293	0.115	C
160.000-140.0			B	0.374	2.118		1	1	75.064			
00			C	0.374	2.118		1	1	75.064			
T9	4.638	8.898	A	0.321	2.242	0.006	1	1	71.407	2.279	0.114	C
140.000-120.0			B	0.321	2.242		1	1	71.407			
00			C	0.321	2.242		1	1	71.407			
T10	4.593	12.056	A	0.32	2.245	0.005	1	1	78.647	2.243	0.112	C
120.000-100.0			B	0.32	2.245		1	1	78.647			
00			C	0.32	2.245		1	1	78.647			
T11	4.539	12.147	A	0.288	2.33	0.005	1	1	77.518	2.128	0.106	C
100.000-80.00			B	0.288	2.33		1	1	77.518			
0			C	0.288	2.33		1	1	77.518			
T12	4.474	12.909	A	0.266	2.391	0.005	1	1	78.235	1.999	0.100	C
80.000-60.000			B	0.266	2.391		1	1	78.235			
			C	0.266	2.391		1	1	78.235			
T13	4.390	12.941	A	0.241	2.464	0.004	1	1	76.939	1.816	0.091	C
60.000-40.000			B	0.241	2.464		1	1	76.939			
			C	0.241	2.464		1	1	76.939			
T14	4.270	13.847	A	0.226	2.513	0.004	1	1	77.744	1.576	0.079	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.226	2.513		1	1	77.744			
			C	0.226	2.513		1	1	77.744			
T15	2.289	13.511	A	0.197	2.604	0.004	1	1	73.411	1.334	0.067	C
20.000-0.000			B	0.197	2.604		1	1	73.411			
			C	0.197	2.604		1	1	73.411			
Sum Weight:	44.465	128.345						OTM	2875.433 kip-ft	22.841		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.157	1.534	A	0.483	1.923	0.007	0.8	1	17.463	0.294	0.029	C
280.000-270.0			B	0.483	1.923		0.8	1	17.463			
00			C	0.483	1.923		0.8	1	17.463			
T2	0.313	3.130	A	0.474	1.937	0.007	0.8	1	34.146	0.571	0.029	C
270.000-250.0			B	0.474	1.937		0.8	1	34.146			
00			C	0.474	1.937		0.8	1	34.146			
T3	2.145	3.804	A	0.49	1.914	0.007	0.8	1	36.009	1.115	0.056	C
250.000-230.0			B	0.49	1.914		0.8	1	36.009			
00			C	0.49	1.914		0.8	1	36.009			
T4	1.124	2.532	A	0.627	1.79	0.007	0.8	1	32.734	0.708	0.071	C
230.000-220.0			B	0.627	1.79		0.8	1	32.734			
00			C	0.627	1.79		0.8	1	32.734			
T5	2.239	6.074	A	0.541	1.852	0.007	0.8	1	64.964	1.405	0.070	C
220.000-200.0			B	0.541	1.852		0.8	1	64.964			
00			C	0.541	1.852		0.8	1	64.964			
T6	2.226	7.205	A	0.481	1.926	0.006	0.8	1	69.192	1.433	0.072	C
200.000-180.0			B	0.481	1.926		0.8	1	69.192			
00			C	0.481	1.926		0.8	1	69.192			
T7	2.568	8.518	A	0.43	2.008	0.006	0.8	1	72.041	1.542	0.077	C
180.000-160.0			B	0.43	2.008		0.8	1	72.041			
00			C	0.43	2.008		0.8	1	72.041			
T8	4.500	9.239	A	0.374	2.118	0.006	0.8	1	70.889	2.248	0.112	C
160.000-140.0			B	0.374	2.118		0.8	1	70.889			
00			C	0.374	2.118		0.8	1	70.889			
T9	4.638	8.898	A	0.321	2.242	0.006	0.8	1	67.480	2.236	0.112	C
140.000-120.0			B	0.321	2.242		0.8	1	67.480			
00			C	0.321	2.242		0.8	1	67.480			
T10	4.593	12.056	A	0.32	2.245	0.005	0.8	1	75.854	2.214	0.111	C
120.000-100.0			B	0.32	2.245		0.8	1	75.854			
00			C	0.32	2.245		0.8	1	75.854			
T11	4.539	12.147	A	0.288	2.33	0.005	0.8	1	74.553	2.098	0.105	C
100.000-80.00			B	0.288	2.33		0.8	1	74.553			
0			C	0.288	2.33		0.8	1	74.553			
T12	4.474	12.909	A	0.266	2.391	0.005	0.8	1	75.093	1.968	0.098	C
80.000-60.000			B	0.266	2.391		0.8	1	75.093			
			C	0.266	2.391		0.8	1	75.093			
T13	4.390	12.941	A	0.241	2.464	0.004	0.8	1	73.614	1.786	0.089	C
60.000-40.000			B	0.241	2.464		0.8	1	73.614			
			C	0.241	2.464		0.8	1	73.614			
T14	4.270	13.847	A	0.226	2.513	0.004	0.8	1	74.232	1.548	0.077	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.226	2.513		0.8	1	74.232			
			C	0.226	2.513		0.8	1	74.232			
T15	2.289	13.511	A	0.197	2.604	0.004	0.8	1	69.708	1.304	0.065	C
20.000-0.000			B	0.197	2.604		0.8	1	69.708			
			C	0.197	2.604		0.8	1	69.708			
Sum Weight:	44.465	128.345						OTM	2832.574 kip-ft	22.470		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.157	1.534	A	0.483	1.923	0.007	0.85	1	17.463	0.294	0.029	C
280.000-270.0			B	0.483	1.923		0.85	1	17.463			
00			C	0.483	1.923		0.85	1	17.463			
T2	0.313	3.130	A	0.474	1.937	0.007	0.85	1	34.146	0.571	0.029	C
270.000-250.0			B	0.474	1.937		0.85	1	34.146			
00			C	0.474	1.937		0.85	1	34.146			
T3	2.145	3.804	A	0.49	1.914	0.007	0.85	1	36.009	1.115	0.056	C
250.000-230.0			B	0.49	1.914		0.85	1	36.009			
00			C	0.49	1.914		0.85	1	36.009			
T4	1.124	2.532	A	0.627	1.79	0.007	0.85	1	32.968	0.711	0.071	C
230.000-220.0			B	0.627	1.79		0.85	1	32.968			
00			C	0.627	1.79		0.85	1	32.968			
T5	2.239	6.074	A	0.541	1.852	0.007	0.85	1	65.488	1.410	0.071	C
220.000-200.0			B	0.541	1.852		0.85	1	65.488			
00			C	0.541	1.852		0.85	1	65.488			
T6	2.226	7.205	A	0.481	1.926	0.006	0.85	1	69.978	1.441	0.072	C
200.000-180.0			B	0.481	1.926		0.85	1	69.978			
00			C	0.481	1.926		0.85	1	69.978			
T7	2.568	8.518	A	0.43	2.008	0.006	0.85	1	73.033	1.553	0.078	C
180.000-160.0			B	0.43	2.008		0.85	1	73.033			
00			C	0.43	2.008		0.85	1	73.033			
T8	4.500	9.239	A	0.374	2.118	0.006	0.85	1	71.933	2.259	0.113	C
160.000-140.0			B	0.374	2.118		0.85	1	71.933			
00			C	0.374	2.118		0.85	1	71.933			
T9	4.638	8.898	A	0.321	2.242	0.006	0.85	1	68.462	2.247	0.112	C
140.000-120.0			B	0.321	2.242		0.85	1	68.462			
00			C	0.321	2.242		0.85	1	68.462			
T10	4.593	12.056	A	0.32	2.245	0.005	0.85	1	76.552	2.221	0.111	C
120.000-100.0			B	0.32	2.245		0.85	1	76.552			
00			C	0.32	2.245		0.85	1	76.552			
T11	4.539	12.147	A	0.288	2.33	0.005	0.85	1	75.294	2.106	0.105	C
100.000-80.00			B	0.288	2.33		0.85	1	75.294			
0			C	0.288	2.33		0.85	1	75.294			
T12	4.474	12.909	A	0.266	2.391	0.005	0.85	1	75.879	1.976	0.099	C
80.000-60.000			B	0.266	2.391		0.85	1	75.879			
			C	0.266	2.391		0.85	1	75.879			
T13	4.390	12.941	A	0.241	2.464	0.004	0.85	1	74.445	1.793	0.090	C
60.000-40.000			B	0.241	2.464		0.85	1	74.445			
			C	0.241	2.464		0.85	1	74.445			
T14	4.270	13.847	A	0.226	2.513	0.004	0.85	1	75.110	1.555	0.078	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.226	2.513		0.85	1	75.110			
			C	0.226	2.513		0.85	1	75.110			
T15	2.289	13.511	A	0.197	2.604	0.004	0.85	1	70.633	1.311	0.066	C
20.000-0.000			B	0.197	2.604		0.85	1	70.633			
			C	0.197	2.604		0.85	1	70.633			
Sum Weight:	44.465	128.345						OTM	2843.288 kip-ft	22.563		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.018	0.731	A	0.154	2.756	0.010	1	1	4.512	0.150	0.015	C
280.000-270.0			B	0.154	2.756		1	1	4.512			
00			C	0.154	2.756		1	1	4.512			
T2	0.037	1.564	A	0.157	2.746	0.010	1	1	9.225	0.300	0.015	C
270.000-250.0			B	0.157	2.746		1	1	9.225			
00			C	0.157	2.746		1	1	9.225			
T3	0.346	2.155	A	0.181	2.661	0.010	1	1	10.771	0.802	0.040	C
250.000-230.0			B	0.181	2.661		1	1	10.771			
00			C	0.181	2.661		1	1	10.771			
T4	0.181	1.453	A	0.261	2.404	0.010	1	1	12.102	0.530	0.053	C
230.000-220.0			B	0.261	2.404		1	1	12.102			
00			C	0.261	2.404		1	1	12.102			
T5	0.362	2.838	A	0.225	2.514	0.009	1	1	25.670	1.091	0.055	C
220.000-200.0			B	0.225	2.514		1	1	25.670			
00			C	0.225	2.514		1	1	25.670			
T6	0.362	3.493	A	0.207	2.574	0.009	1	1	30.821	1.175	0.059	C
200.000-180.0			B	0.207	2.574		1	1	30.821			
00			C	0.207	2.574		1	1	30.821			
T7	0.412	4.409	A	0.198	2.603	0.009	1	1	36.106	1.338	0.067	C
180.000-160.0			B	0.198	2.603		1	1	36.106			
00			C	0.198	2.603		1	1	36.106			
T8	0.700	5.108	A	0.179	2.668	0.009	1	1	37.951	1.819	0.091	C
160.000-140.0			B	0.179	2.668		1	1	37.951			
00			C	0.179	2.668		1	1	37.951			
T9	0.724	4.985	A	0.153	2.761	0.008	1	1	36.612	1.786	0.089	C
140.000-120.0			B	0.153	2.761		1	1	36.612			
00			C	0.153	2.761		1	1	36.612			
T10	0.724	7.429	A	0.145	2.791	0.008	1	1	36.753	1.713	0.086	C
120.000-100.0			B	0.145	2.791		1	1	36.753			
00			C	0.145	2.791		1	1	36.753			
T11	0.724	7.549	A	0.133	2.836	0.007	1	1	37.573	1.642	0.082	C
100.000-80.00			B	0.133	2.836		1	1	37.573			
0			C	0.133	2.836		1	1	37.573			
T12	0.724	8.322	A	0.126	2.86	0.007	1	1	39.313	1.563	0.078	C
80.000-60.000			B	0.126	2.86		1	1	39.313			
			C	0.126	2.86		1	1	39.313			
T13	0.724	8.454	A	0.118	2.893	0.006	1	1	40.204	1.440	0.072	C
60.000-40.000			B	0.118	2.893		1	1	40.204			
			C	0.118	2.893		1	1	40.204			
T14	0.724	9.462	A	0.115	2.905	0.005	1	1	42.375	1.276	0.064	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.115	2.905		1	1	42.375			
			C	0.115	2.905		1	1	42.375			
T15	0.507	9.604	A	0.109	2.93	0.005	1	1	43.319	1.079	0.054	C
20.000-0.000			B	0.109	2.93		1	1	43.319			
			C	0.109	2.93		1	1	43.319			
Sum Weight:	7.271	77.557						OTM	2182.178 kip-ft	17.701		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.018	0.731	A	0.154	2.756	0.010	0.8	1	4.512	0.150	0.015	C
280.000-270.0			B	0.154	2.756		0.8	1	4.512			
00			C	0.154	2.756		0.8	1	4.512			
T2	0.037	1.564	A	0.157	2.746	0.010	0.8	1	9.225	0.300	0.015	C
270.000-250.0			B	0.157	2.746		0.8	1	9.225			
00			C	0.157	2.746		0.8	1	9.225			
T3	0.346	2.155	A	0.181	2.661	0.010	0.8	1	10.771	0.802	0.040	C
250.000-230.0			B	0.181	2.661		0.8	1	10.771			
00			C	0.181	2.661		0.8	1	10.771			
T4	0.181	1.453	A	0.261	2.404	0.010	0.8	1	11.168	0.512	0.051	C
230.000-220.0			B	0.261	2.404		0.8	1	11.168			
00			C	0.261	2.404		0.8	1	11.168			
T5	0.362	2.838	A	0.225	2.514	0.009	0.8	1	23.577	1.048	0.052	C
220.000-200.0			B	0.225	2.514		0.8	1	23.577			
00			C	0.225	2.514		0.8	1	23.577			
T6	0.362	3.493	A	0.207	2.574	0.009	0.8	1	27.678	1.112	0.056	C
200.000-180.0			B	0.207	2.574		0.8	1	27.678			
00			C	0.207	2.574		0.8	1	27.678			
T7	0.412	4.409	A	0.198	2.603	0.009	0.8	1	32.135	1.260	0.063	C
180.000-160.0			B	0.198	2.603		0.8	1	32.135			
00			C	0.198	2.603		0.8	1	32.135			
T8	0.700	5.108	A	0.179	2.668	0.009	0.8	1	33.776	1.738	0.087	C
160.000-140.0			B	0.179	2.668		0.8	1	33.776			
00			C	0.179	2.668		0.8	1	33.776			
T9	0.724	4.985	A	0.153	2.761	0.008	0.8	1	32.685	1.710	0.086	C
140.000-120.0			B	0.153	2.761		0.8	1	32.685			
00			C	0.153	2.761		0.8	1	32.685			
T10	0.724	7.429	A	0.145	2.791	0.008	0.8	1	33.960	1.661	0.083	C
120.000-100.0			B	0.145	2.791		0.8	1	33.960			
00			C	0.145	2.791		0.8	1	33.960			
T11	0.724	7.549	A	0.133	2.836	0.007	0.8	1	34.608	1.589	0.079	C
100.000-80.00			B	0.133	2.836		0.8	1	34.608			
0			C	0.133	2.836		0.8	1	34.608			
T12	0.724	8.322	A	0.126	2.86	0.007	0.8	1	36.171	1.510	0.076	C
80.000-60.000			B	0.126	2.86		0.8	1	36.171			
			C	0.126	2.86		0.8	1	36.171			
T13	0.724	8.454	A	0.118	2.893	0.006	0.8	1	36.879	1.389	0.069	C
60.000-40.000			B	0.118	2.893		0.8	1	36.879			
			C	0.118	2.893		0.8	1	36.879			
T14	0.724	9.462	A	0.115	2.905	0.005	0.8	1	38.864	1.229	0.061	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.115	2.905		0.8	1	38.864			
			C	0.115	2.905		0.8	1	38.864			
T15	0.507	9.604	A	0.109	2.93	0.005	0.8	1	39.616	1.029	0.051	C
20.000-0.000			B	0.109	2.93		0.8	1	39.616			
			C	0.109	2.93		0.8	1	39.616			
Sum Weight:	7.271	77.557						OTM	2103.516 kip-ft	17.039		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
T1	0.018	0.731	A	0.154	2.756	0.010	0.85	1	4.512	0.150	0.015	C
280.000-270.0			B	0.154	2.756		0.85	1	4.512			
00			C	0.154	2.756		0.85	1	4.512			
T2	0.037	1.564	A	0.157	2.746	0.010	0.85	1	9.225	0.300	0.015	C
270.000-250.0			B	0.157	2.746		0.85	1	9.225			
00			C	0.157	2.746		0.85	1	9.225			
T3	0.346	2.155	A	0.181	2.661	0.010	0.85	1	10.771	0.802	0.040	C
250.000-230.0			B	0.181	2.661		0.85	1	10.771			
00			C	0.181	2.661		0.85	1	10.771			
T4	0.181	1.453	A	0.261	2.404	0.010	0.85	1	11.402	0.517	0.052	C
230.000-220.0			B	0.261	2.404		0.85	1	11.402			
00			C	0.261	2.404		0.85	1	11.402			
T5	0.362	2.838	A	0.225	2.514	0.009	0.85	1	24.100	1.059	0.053	C
220.000-200.0			B	0.225	2.514		0.85	1	24.100			
00			C	0.225	2.514		0.85	1	24.100			
T6	0.362	3.493	A	0.207	2.574	0.009	0.85	1	28.464	1.128	0.056	C
200.000-180.0			B	0.207	2.574		0.85	1	28.464			
00			C	0.207	2.574		0.85	1	28.464			
T7	0.412	4.409	A	0.198	2.603	0.009	0.85	1	33.128	1.279	0.064	C
180.000-160.0			B	0.198	2.603		0.85	1	33.128			
00			C	0.198	2.603		0.85	1	33.128			
T8	0.700	5.108	A	0.179	2.668	0.009	0.85	1	34.819	1.758	0.088	C
160.000-140.0			B	0.179	2.668		0.85	1	34.819			
00			C	0.179	2.668		0.85	1	34.819			
T9	0.724	4.985	A	0.153	2.761	0.008	0.85	1	33.667	1.729	0.086	C
140.000-120.0			B	0.153	2.761		0.85	1	33.667			
00			C	0.153	2.761		0.85	1	33.667			
T10	0.724	7.429	A	0.145	2.791	0.008	0.85	1	34.658	1.674	0.084	C
120.000-100.0			B	0.145	2.791		0.85	1	34.658			
00			C	0.145	2.791		0.85	1	34.658			
T11	0.724	7.549	A	0.133	2.836	0.007	0.85	1	35.349	1.603	0.080	C
100.000-80.00			B	0.133	2.836		0.85	1	35.349			
0			C	0.133	2.836		0.85	1	35.349			
T12	0.724	8.322	A	0.126	2.86	0.007	0.85	1	36.956	1.523	0.076	C
80.000-60.000			B	0.126	2.86		0.85	1	36.956			
			C	0.126	2.86		0.85	1	36.956			
T13	0.724	8.454	A	0.118	2.893	0.006	0.85	1	37.710	1.402	0.070	C
60.000-40.000			B	0.118	2.893		0.85	1	37.710			
			C	0.118	2.893		0.85	1	37.710			
T14	0.724	9.462	A	0.115	2.905	0.005	0.85	1	39.741	1.240	0.062	C

Section Elevation ft	Add Weight K	Self Weight K	Face	e	C_F	q_z ksf	D_F	D_R	A_E ft²	F K	w klf	Ctrl. Face
40.000-20.000			B	0.115	2.905		0.85	1	39.741			
			C	0.115	2.905		0.85	1	39.741			
T15	0.507	9.604	A	0.109	2.93	0.005	0.85	1	40.542	1.042	0.052	C
20.000-0.000			B	0.109	2.93		0.85	1	40.542			
			C	0.109	2.93		0.85	1	40.542			
Sum Weight:	7.271	77.557						OTM	2123.181 kip-ft	17.205		

Force Totals

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Leg Weight	51.895					
Bracing Weight	25.663					
Total Member Self-Weight	77.557			-10.491	1.594	
Total Weight	102.469			-10.491	1.594	
Wind 0 deg - No Ice		0.000	-89.666	-12658.105	1.594	-18.050
Wind 30 deg - No Ice		43.872	-75.989	-10766.032	-6208.121	-31.097
Wind 60 deg - No Ice		75.435	-43.552	-6182.175	-10688.077	-35.811
Wind 90 deg - No Ice		87.745	0.000	-10.491	-12417.836	-30.930
Wind 120 deg - No Ice		77.653	44.833	6313.317	-10951.561	-17.761
Wind 150 deg - No Ice		43.872	75.989	10745.051	-6208.121	0.167
Wind 180 deg - No Ice		0.000	87.105	12332.878	1.594	18.050
Wind 210 deg - No Ice		-43.872	75.989	10745.051	6211.309	31.097
Wind 240 deg - No Ice		-77.653	44.833	6313.317	10954.749	35.811
Wind 270 deg - No Ice		-87.745	0.000	-10.491	12421.024	30.930
Wind 300 deg - No Ice		-75.435	-43.552	-6182.175	10691.264	17.761
Wind 330 deg - No Ice		-43.872	-75.989	-10766.032	6211.309	-0.167
Member Ice	50.788					
Total Weight Ice	210.673			-40.961	18.685	
Wind 0 deg - Ice		0.000	-28.922	-4165.409	18.685	-5.194
Wind 30 deg - Ice		14.322	-24.806	-3584.999	-2027.466	-3.591
Wind 60 deg - Ice		24.726	-14.275	-2081.755	-3516.074	-1.026
Wind 90 deg - Ice		28.644	0.000	-40.961	-4073.618	1.814
Wind 120 deg - Ice		25.047	14.461	2021.263	-3553.191	4.168
Wind 150 deg - Ice		14.322	24.806	3503.078	-2027.466	5.405
Wind 180 deg - Ice		0.000	28.551	4040.628	18.685	5.194
Wind 210 deg - Ice		-14.322	24.806	3503.078	2064.837	3.591
Wind 240 deg - Ice		-25.047	14.461	2021.263	3590.562	1.026
Wind 270 deg - Ice		-28.644	0.000	-40.961	4110.989	-1.814
Wind 300 deg - Ice		-24.726	-14.275	-2081.755	3553.445	-4.168
Wind 330 deg - Ice		-14.322	-24.806	-3584.999	2064.837	-5.405
Total Weight	102.469			-10.491	1.594	
Wind 0 deg - Service		0.000	-23.187	-3271.085	-0.061	-4.667
Wind 30 deg - Service		11.345	-19.650	-2781.810	-1605.884	-8.040
Wind 60 deg - Service		19.507	-11.262	-1596.434	-2764.396	-9.259
Wind 90 deg - Service		22.690	0.000	-0.445	-3211.706	-7.997
Wind 120 deg - Service		20.080	11.593	1634.876	-2832.519	-4.592
Wind 150 deg - Service		11.345	19.650	2780.921	-1605.884	0.043
Wind 180 deg - Service		0.000	22.525	3191.534	-0.061	4.667
Wind 210 deg - Service		-11.345	19.650	2780.921	1605.761	8.040
Wind 240 deg - Service		-20.080	11.593	1634.876	2832.396	9.259

Load Case	Vertical Forces K	Sum of Forces X K	Sum of Forces Z K	Sum of Overturning Moments, M_x kip-ft	Sum of Overturning Moments, M_z kip-ft	Sum of Torques kip-ft
Wind 270 deg - Service		-22.690	0.000	-0.445	3211.583	7.997
Wind 300 deg - Service		-19.507	-11.262	-1596.434	2764.273	4.592
Wind 330 deg - Service		-11.345	-19.650	-2781.810	1605.761	-0.043

Load Combinations

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

Comb. No.	Description
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
T1	280 - 270	Leg	Max Tension	7	6.492	0.409	-0.267
			Max. Compression	2	-9.290	-0.002	0.175
			Max. Mx	20	-1.320	0.482	-0.000
			Max. My	2	-9.285	0.004	-0.495
			Max. Vy	8	1.165	-0.164	-0.018
			Max. Vx	2	-1.238	-0.002	0.175
		Diagonal	Max Tension	4	1.567	0.000	0.000
			Max. Compression	4	-1.618	0.000	0.000
			Max. Mx	28	0.620	-0.005	-0.000
			Max. My	22	-1.259	-0.002	0.000
			Max. Vy	28	0.009	-0.005	-0.000
			Max. Vx	8	-0.000	0.000	0.000
		Horizontal	Max Tension	6	0.266	0.000	0.000
			Max. Compression	11	-0.177	0.000	0.000
			Max. Mx	26	0.100	0.018	0.000
			Max. My	20	0.044	0.000	-0.000
			Max. Vy	26	-0.014	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Top Girt	Max Tension	18	0.605	0.000	0.000
			Max. Compression	14	-0.576	0.000	0.000
			Max. Mx	26	0.031	0.021	0.000
			Max. My	20	0.029	0.000	-0.000
			Max. Vy	26	-0.017	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Bottom Girt	Max Tension	6	0.705	0.000	0.000
			Max. Compression	3	-0.644	0.000	0.000
			Max. Mx	26	0.075	0.021	0.000
			Max. My	20	0.053	0.000	-0.000
			Max. Vy	26	-0.017	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Mid Girt	Max Tension	29	0.110	0.000	0.000
			Max. Compression	3	-0.015	0.000	0.000
			Max. Mx	26	0.088	0.021	0.000
			Max. My	20	0.046	0.000	-0.000
			Max. Vy	26	-0.017	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
T2	270 - 250	Leg	Max Tension	7	24.622	0.591	-0.371
			Max. Compression	2	-28.682	-0.022	0.255
			Max. Mx	8	-8.246	-0.697	-0.074
			Max. My	2	-9.296	-0.009	0.741
			Max. Vy	20	-1.658	0.224	-0.051
			Max. Vx	2	-1.788	-0.022	0.255
		Diagonal	Max Tension	4	2.192	0.000	0.000
			Max. Compression	4	-2.240	0.000	0.000
			Max. Mx	36	0.801	-0.005	-0.000
			Max. My	6	-1.532	-0.002	-0.000
			Max. Vy	36	0.009	-0.005	-0.000
			Max. Vx	6	-0.000	0.000	0.000
		Horizontal	Max Tension	6	0.426	0.000	0.000
			Max. Compression	3	-0.338	0.000	0.000
			Max. Mx	26	0.118	0.018	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. My	20	0.048	0.000	-0.000
			Max. Vy	26	-0.014	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Top Girt	Max Tension	18	0.632	0.000	0.000
			Max. Compression	22	-0.583	0.000	0.000
			Max. Mx	26	0.037	0.021	0.000
			Max. My	20	0.003	0.000	-0.000
			Max. Vy	26	0.017	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Bottom Girt	Max Tension	6	0.938	0.000	0.000
			Max. Compression	3	-0.884	0.000	0.000
			Max. Mx	26	0.085	0.021	0.000
			Max. My	20	0.093	0.000	-0.000
			Max. Vy	26	0.017	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Mid Girt	Max Tension	6	0.272	0.000	0.000
			Max. Compression	3	-0.178	0.000	0.000
			Max. Mx	26	0.105	0.021	0.000
			Max. My	20	0.051	0.000	-0.000
			Max. Vy	26	0.017	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
T3	250 - 230	Leg	Max Tension	23	69.463	-0.313	-0.188
			Max. Compression	2	-79.317	-0.064	2.799
			Max. Mx	20	-68.913	2.354	-0.763
			Max. My	2	-79.317	-0.064	2.799
			Max. Vy	8	4.937	0.319	0.031
			Max. Vx	2	-5.793	-0.064	2.799
		Diagonal	Max Tension	16	5.600	0.000	0.000
			Max. Compression	16	-5.764	0.000	0.000
			Max. Mx	27	1.409	-0.007	0.000
			Max. My	6	-5.060	-0.002	-0.001
			Max. Vy	27	0.011	-0.007	0.000
			Max. Vx	6	-0.001	0.000	0.000
		Horizontal	Max Tension	6	0.771	0.000	0.000
			Max. Compression	3	-0.644	0.000	0.000
			Max. Mx	26	0.190	0.018	0.000
			Max. My	20	0.065	0.000	-0.000
			Max. Vy	26	-0.014	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Top Girt	Max Tension	18	1.387	0.000	0.000
			Max. Compression	15	-1.297	0.000	0.000
			Max. Mx	26	0.067	0.028	0.000
			Max. My	20	-0.018	0.000	-0.000
			Max. Vy	26	-0.022	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
		Bottom Girt	Max Tension	22	1.787	0.000	0.000
			Max. Compression	3	-1.581	0.000	0.000
			Max. Mx	26	0.207	0.028	0.000
			Max. My	20	0.065	0.000	-0.000
			Max. Vy	26	-0.022	0.000	0.000
			Max. Vx	20	0.000	0.000	0.000
T4	230 - 220	Leg	Max Tension	23	73.542	-2.735	-0.217
			Max. Compression	2	-82.654	2.755	-0.043
			Max. Mx	22	72.525	-3.378	0.088
			Max. My	4	-4.793	-0.303	-6.939
			Max. Vy	14	0.182	-3.358	0.027
			Max. Vx	20	0.690	-0.297	-6.643
		Diagonal	Max Tension	7	7.301	0.153	0.033
			Max. Compression	18	-8.242	0.000	0.000
			Max. Mx	22	4.958	0.158	0.011
			Max. My	6	-3.831	-0.059	0.057

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vy	22	0.037	0.158	0.011
			Max. Vx	6	-0.012	0.000	0.000
T5	220 - 200	Leg	Max Tension	23	104.752	-4.303	-0.067
			Max. Compression	2	-117.355	5.770	0.108
			Max. Mx	2	-117.355	5.770	0.108
			Max. My	4	-6.125	-0.303	-6.939
			Max. Vy	10	-0.275	4.377	0.050
			Max. Vx	20	-0.425	-0.297	-6.643
		Diagonal	Max Tension	18	6.738	0.000	0.000
			Max. Compression	18	-6.909	0.000	0.000
			Max. Mx	18	4.248	0.096	-0.017
			Max. My	21	-4.016	-0.046	-0.024
			Max. Vy	38	0.035	0.061	0.011
			Max. Vx	20	0.005	-0.042	-0.024
T6	200 - 180	Leg	Max Tension	23	129.286	-3.725	-0.059
			Max. Compression	2	-144.438	4.631	0.040
			Max. Mx	2	-128.680	5.770	0.108
			Max. My	20	-7.623	-0.110	-5.264
			Max. Vy	10	0.333	5.753	0.310
			Max. Vx	20	0.378	-0.110	-5.264
		Diagonal	Max Tension	7	8.240	0.000	0.000
			Max. Compression	18	-9.551	0.000	0.000
			Max. Mx	2	1.290	0.117	0.008
			Max. My	6	-4.017	-0.026	0.023
			Max. Vy	37	0.052	0.095	0.011
			Max. Vx	6	-0.004	0.000	0.000
		Top Girt	Max Tension	22	4.879	0.000	0.000
			Max. Compression	3	-4.008	0.000	0.000
			Max. Mx	26	1.048	-0.101	0.000
			Max. My	29	0.105	0.000	0.003
			Max. Vy	26	0.050	0.000	0.000
			Max. Vx	29	0.001	0.000	0.000
		Mid Girt	Max Tension	22	6.776	0.000	0.000
			Max. Compression	3	-5.500	0.000	0.000
			Max. Mx	26	1.529	-0.127	0.000
			Max. My	29	0.244	0.000	0.004
			Max. Vy	26	0.057	0.000	0.000
			Max. Vx	29	-0.002	0.000	0.000
T7	180 - 160	Leg	Max Tension	23	157.224	-3.691	-0.038
			Max. Compression	2	-177.858	4.995	0.074
			Max. Mx	2	-177.858	4.995	0.074
			Max. My	20	-9.637	-0.092	-4.427
			Max. Vy	14	-1.135	-3.719	-0.045
			Max. Vx	20	-1.372	-0.092	-4.427
		Diagonal	Max Tension	7	9.695	0.000	0.000
			Max. Compression	18	-11.035	0.000	0.000
			Max. Mx	37	1.762	0.108	0.013
			Max. My	18	-10.995	-0.012	-0.020
			Max. Vy	37	0.060	0.108	0.013
			Max. Vx	35	0.004	0.000	0.000
		Top Girt	Max Tension	22	6.943	0.000	0.000
			Max. Compression	3	-5.691	0.000	0.000
			Max. Mx	26	1.531	-0.227	0.000
			Max. My	29	0.207	0.000	0.007
			Max. Vy	26	0.091	0.000	0.000
			Max. Vx	29	-0.003	0.000	0.000
		Mid Girt	Max Tension	22	5.686	0.000	0.000
			Max. Compression	3	-4.518	0.000	0.000
			Max. Mx	26	1.397	-0.274	0.000
			Max. My	29	0.357	0.000	0.008
			Max. Vy	26	0.100	0.000	0.000

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
			Max. Vx	29	-0.003	0.000	0.000
T8	160 - 140	Leg	Max Tension	23	197.032	-3.484	-0.006
			Max. Compression	2	-228.448	4.495	0.007
			Max. Mx	2	-199.324	4.995	0.074
			Max. My	20	-17.181	-0.139	-5.801
			Max. Vy	14	-1.807	-4.590	-0.075
			Max. Vx	20	-1.731	-0.172	-4.736
		Diagonal	Max Tension	16	13.047	0.000	0.000
			Max. Compression	16	-13.094	0.000	0.000
			Max. Mx	27	3.077	0.158	0.018
			Max. My	6	-8.999	0.019	0.035
			Max. Vy	37	0.079	0.149	0.018
			Max. Vx	6	-0.006	0.000	0.000
		Top Girt	Max Tension	22	4.446	0.000	0.000
			Max. Compression	3	-3.537	0.000	0.000
			Max. Mx	26	1.101	-0.318	0.000
			Max. My	29	0.282	0.000	0.009
			Max. Vy	26	0.106	0.000	0.000
			Max. Vx	29	-0.003	0.000	0.000
T9	140 - 120	Leg	Max Tension	23	242.753	-4.477	0.031
			Max. Compression	2	-280.443	10.039	0.151
			Max. Mx	2	-280.443	10.039	0.151
			Max. My	20	-19.455	0.051	-9.682
			Max. Vy	14	0.677	-9.740	-0.150
			Max. Vx	20	0.995	0.051	-9.682
		Diagonal	Max Tension	16	13.422	0.000	0.000
			Max. Compression	16	-13.867	0.000	0.000
			Max. Mx	37	2.959	0.178	-0.020
			Max. My	6	-11.977	0.051	0.043
			Max. Vy	37	0.089	0.178	-0.020
			Max. Vx	6	-0.006	0.000	0.000
T10	120 - 100	Leg	Max Tension	23	271.911	-9.729	-0.215
			Max. Compression	2	-313.138	9.977	0.039
			Max. Mx	22	266.118	-11.687	-0.004
			Max. My	24	-21.043	-1.014	18.092
			Max. Vy	14	0.464	-11.667	-0.056
			Max. Vx	24	-0.764	-1.014	18.092
		Diagonal	Max Tension	16	17.780	0.000	0.000
			Max. Compression	16	-18.973	0.000	0.000
			Max. Mx	37	4.101	-0.497	0.065
			Max. My	4	-18.539	-0.077	-0.138
			Max. Vy	37	-0.169	-0.497	0.065
			Max. Vx	4	0.014	0.000	0.000
T11	100 - 80	Leg	Max Tension	23	315.794	-11.409	0.002
			Max. Compression	2	-364.850	14.497	0.061
			Max. Mx	2	-364.850	14.497	0.061
			Max. My	24	-22.770	-1.014	18.092
			Max. Vy	10	-0.488	14.475	0.015
			Max. Vx	24	0.815	-1.014	18.092
		Diagonal	Max Tension	16	18.691	0.000	0.000
			Max. Compression	16	-19.393	0.000	0.000
			Max. Mx	37	4.981	-0.567	-0.089
			Max. My	29	4.886	-0.566	-0.091
			Max. Vy	37	-0.186	-0.567	-0.089
			Max. Vx	28	-0.013	0.000	0.000
T12	80 - 60	Leg	Max Tension	23	355.622	-13.094	-0.024
			Max. Compression	2	-412.287	10.519	0.045
			Max. Mx	2	-409.917	14.497	0.061
			Max. My	24	-28.354	-1.192	16.258
			Max. Vy	33	-0.515	-6.101	-0.029
			Max. Vx	24	-0.715	-1.192	16.258

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial K	Major Axis Moment kip-ft	Minor Axis Moment kip-ft
		Diagonal	Max Tension	16	18.398	0.000	0.000
			Max. Compression	16	-19.018	0.000	0.000
			Max. Mx	37	3.619	-0.643	-0.093
			Max. My	27	-1.121	-0.618	-0.097
			Max. Vy	37	-0.202	-0.643	-0.093
			Max. Vx	27	-0.013	0.000	0.000
T13	60 - 40	Leg	Max Tension	23	392.959	-12.118	-0.017
			Max. Compression	2	-456.780	15.111	0.041
			Max. Mx	2	-456.780	15.111	0.041
			Max. My	24	-29.403	-1.192	16.258
			Max. Vy	33	0.871	-13.443	-0.021
			Max. Vx	24	0.786	-1.192	16.258
		Diagonal	Max Tension	16	18.740	0.000	0.000
			Max. Compression	16	-19.869	0.000	0.000
			Max. Mx	37	6.106	-0.690	-0.094
			Max. My	33	6.171	-0.689	0.095
			Max. Vy	37	-0.215	-0.690	-0.094
			Max. Vx	28	-0.013	0.000	0.000
T14	40 - 20	Leg	Max Tension	23	431.497	-13.148	-0.009
			Max. Compression	2	-504.646	10.825	0.031
			Max. Mx	27	-222.777	15.432	-0.041
			Max. My	24	-36.456	-1.742	24.814
			Max. Vy	33	-1.214	-13.443	-0.021
			Max. Vx	24	-1.188	-1.742	24.814
		Diagonal	Max Tension	16	18.502	0.000	0.000
			Max. Compression	16	-18.646	0.000	0.000
			Max. Mx	37	1.440	-0.815	-0.118
			Max. My	38	-5.839	-0.661	-0.129
			Max. Vy	37	-0.231	-0.815	-0.118
			Max. Vx	38	0.015	0.000	0.000
T15	20 - 0	Leg	Max Tension	23	462.576	-13.329	-0.017
			Max. Compression	2	-542.562	0.000	-0.000
			Max. Mx	27	-243.223	15.432	-0.041
			Max. My	24	-36.962	-1.742	24.814
			Max. Vy	14	-1.006	-13.763	-0.040
			Max. Vx	24	1.492	-1.742	24.814
		Diagonal	Max Tension	7	19.428	0.000	0.000
			Max. Compression	18	-21.558	0.000	0.000
			Max. Mx	38	8.566	-0.780	-0.106
			Max. My	4	3.521	-0.581	-0.113
			Max. Vy	38	-0.233	-0.780	-0.106
			Max. Vx	27	-0.013	0.000	0.000

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg C	Max. Vert	18	565.744	51.342	-30.496
	Max. H_x	18	565.744	51.342	-30.496
	Max. H_z	7	-480.907	-44.927	26.795
	Min. Vert	7	-480.907	-44.927	26.795
	Min. H_x	7	-480.907	-44.927	26.795
	Min. H_z	18	565.744	51.342	-30.496
Leg B	Max. Vert	10	565.606	-51.523	-30.175
	Max. H_x	23	-481.010	45.117	26.470
	Max. H_z	23	-481.010	45.117	26.470

Location	Condition	Gov. Load Comb.	Vertical K	Horizontal, X K	Horizontal, Z K
Leg A	Min. Vert	23	-481.010	45.117	26.470
	Min. H_x	10	565.606	-51.523	-30.175
	Min. H_z	10	565.606	-51.523	-30.175
	Max. Vert	2	566.461	-0.368	59.727
	Max. H_x	21	31.140	3.960	2.524
	Max. H_z	2	566.461	-0.368	59.727
	Min. Vert	15	-480.370	0.377	-52.293
	Min. H_x	9	31.140	-3.962	2.524
	Min. H_z	15	-480.370	0.377	-52.293

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	102.469	0.000	-0.000	-10.492	1.594	0.000
1.2 Dead+1.0 Wind 0 deg - No Ice	122.963	0.000	-89.662	-12742.059	2.008	-18.071
0.9 Dead+1.0 Wind 0 deg - No Ice	92.222	0.000	-89.663	-12718.218	1.521	-18.066
1.2 Dead+1.0 Wind 30 deg - No Ice	122.963	43.870	-75.986	-10838.115	-6247.927	-31.117
0.9 Dead+1.0 Wind 30 deg - No Ice	92.222	43.871	-75.987	-10817.308	-6238.238	-31.091
1.2 Dead+1.0 Wind 60 deg - No Ice	122.963	75.431	-43.550	-6224.651	-10757.069	-35.916
0.9 Dead+1.0 Wind 60 deg - No Ice	92.222	75.432	-43.551	-6211.326	-10740.022	-35.890
1.2 Dead+1.0 Wind 90 deg - No Ice	122.963	87.741	0.000	-12.891	-12498.069	-31.096
0.9 Dead+1.0 Wind 90 deg - No Ice	92.222	87.742	0.000	-9.676	-12478.222	-31.073
1.2 Dead+1.0 Wind 120 deg - No Ice	122.963	77.649	44.831	6351.848	-11022.069	-17.854
0.9 Dead+1.0 Wind 120 deg - No Ice	92.222	77.650	44.831	6344.732	-11004.681	-17.830
1.2 Dead+1.0 Wind 150 deg - No Ice	122.963	43.871	75.986	10812.583	-6248.097	0.179
0.9 Dead+1.0 Wind 150 deg - No Ice	92.222	43.871	75.987	10798.171	-6238.427	0.196
1.2 Dead+1.0 Wind 180 deg - No Ice	122.963	0.000	87.100	12410.818	2.012	18.068
0.9 Dead+1.0 Wind 180 deg - No Ice	92.222	0.000	87.101	12393.775	1.524	18.064
1.2 Dead+1.0 Wind 210 deg - No Ice	122.963	-43.871	75.986	10812.519	6252.085	31.118
0.9 Dead+1.0 Wind 210 deg - No Ice	92.222	-43.871	75.987	10798.108	6241.437	31.091
1.2 Dead+1.0 Wind 240 deg - No Ice	122.963	-77.649	44.831	6351.784	11025.979	35.924
0.9 Dead+1.0 Wind 240 deg - No Ice	92.222	-77.650	44.831	6344.667	11007.616	35.895
1.2 Dead+1.0 Wind 270 deg - No Ice	122.963	-87.741	0.000	-12.887	12501.935	31.096
0.9 Dead+1.0 Wind 270 deg - No Ice	92.222	-87.742	0.000	-9.672	12481.114	31.073
1.2 Dead+1.0 Wind 300 deg -	122.963	-75.431	-43.550	-6224.582	10760.968	17.849

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
No Ice 0.9 Dead+1.0 Wind 300 deg - No Ice	92.222	-75.432	-43.551	-6211.258	10742.948	17.827
1.2 Dead+1.0 Wind 330 deg - No Ice	122.963	-43.870	-75.986	-10838.047	6251.899	-0.179
0.9 Dead+1.0 Wind 330 deg - No Ice	92.222	-43.871	-75.987	-10817.241	6241.236	-0.196
1.2 Dead+1.0 Ice+1.0 Temp	231.167	0.001	0.002	-43.308	19.056	-0.001
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	231.167	0.000	-28.920	-4223.963	19.424	-5.254
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	231.167	14.321	-24.805	-3635.607	-2054.165	-3.718
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	231.167	24.724	-14.275	-2112.260	-3562.742	-1.191
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	231.167	28.642	0.000	-44.118	-4127.719	1.654
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	231.167	25.046	14.460	2045.851	-3600.468	4.061
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	231.167	14.321	24.805	3547.418	-2054.139	5.379
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	231.167	0.000	28.549	4092.206	19.419	5.252
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	231.167	-14.321	24.805	3547.414	2092.968	3.718
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	231.167	-25.046	14.460	2045.827	3639.290	1.193
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	231.167	-28.642	0.000	-44.108	4166.515	-1.654
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	231.167	-24.724	-14.275	-2112.246	3601.533	-4.057
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	231.167	-14.321	-24.805	-3635.593	2092.961	-5.379
Dead+Wind 0 deg - Service	102.469	0.000	-23.186	-3298.890	1.612	-4.670
Dead+Wind 30 deg - Service	102.469	11.345	-19.649	-2807.028	-1612.910	-8.056
Dead+Wind 60 deg - Service	102.469	19.506	-11.262	-1615.241	-2777.724	-9.282
Dead+Wind 90 deg - Service	102.469	22.689	0.000	-10.589	-3227.447	-8.021
Dead+Wind 120 deg - Service	102.469	20.080	11.593	1633.570	-2846.158	-4.612
Dead+Wind 150 deg - Service	102.469	11.345	19.649	2785.862	-1612.922	0.034
Dead+Wind 180 deg - Service	102.469	0.000	22.524	3198.724	1.614	4.672
Dead+Wind 210 deg - Service	102.469	-11.345	19.649	2785.859	1616.147	8.056
Dead+Wind 240 deg - Service	102.469	-20.080	11.593	1633.566	2849.378	9.283
Dead+Wind 270 deg - Service	102.469	-22.689	0.000	-10.588	3230.663	8.021
Dead+Wind 300 deg - Service	102.469	-19.506	-11.262	-1615.236	2780.942	4.611
Dead+Wind 330 deg - Service	102.469	-11.345	-19.649	-2807.023	1616.132	-0.034

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	0.000	-102.469	0.000	-0.000	102.469	0.000	0.000%
2	0.000	-122.963	-89.666	-0.000	122.963	89.662	0.003%
3	0.000	-92.222	-89.666	-0.000	92.222	89.663	0.002%
4	43.872	-122.963	-75.989	-43.870	122.963	75.986	0.003%
5	43.872	-92.222	-75.989	-43.871	92.222	75.987	0.002%
6	75.435	-122.963	-43.552	-75.431	122.963	43.550	0.003%
7	75.435	-92.222	-43.552	-75.432	92.222	43.551	0.003%
8	87.745	-122.963	0.000	-87.741	122.963	-0.000	0.003%

Load Comb.	Sum of Applied Forces PX K	PY K	PZ K	Sum of Reactions PX K	PY K	PZ K	% Error
9	87.745	-92.222	0.000	-87.742	92.222	-0.000	0.002%
10	77.653	-122.963	44.833	-77.649	122.963	-44.831	0.003%
11	77.653	-92.222	44.833	-77.650	92.222	-44.831	0.002%
12	43.872	-122.963	75.989	-43.871	122.963	-75.986	0.003%
13	43.872	-92.222	75.989	-43.871	92.222	-75.987	0.002%
14	0.000	-122.963	87.105	-0.000	122.963	-87.100	0.003%
15	0.000	-92.222	87.105	-0.000	92.222	-87.101	0.003%
16	-43.872	-122.963	75.989	43.871	122.963	-75.986	0.003%
17	-43.872	-92.222	75.989	43.871	92.222	-75.987	0.002%
18	-77.653	-122.963	44.833	77.649	122.963	-44.831	0.003%
19	-77.653	-92.222	44.833	77.650	92.222	-44.831	0.002%
20	-87.745	-122.963	0.000	87.741	122.963	-0.000	0.003%
21	-87.745	-92.222	0.000	87.742	92.222	-0.000	0.002%
22	-75.435	-122.963	-43.552	75.431	122.963	43.550	0.003%
23	-75.435	-92.222	-43.552	75.432	92.222	43.551	0.003%
24	-43.872	-122.963	-75.989	43.870	122.963	75.986	0.003%
25	-43.872	-92.222	-75.989	43.871	92.222	75.987	0.002%
26	0.000	-231.167	0.000	-0.001	231.167	-0.002	0.001%
27	0.000	-231.167	-28.922	-0.000	231.167	28.920	0.001%
28	14.322	-231.167	-24.806	-14.321	231.167	24.805	0.001%
29	24.726	-231.167	-14.275	-24.724	231.167	14.275	0.001%
30	28.644	-231.167	0.000	-28.642	231.167	-0.000	0.001%
31	25.047	-231.167	14.461	-25.046	231.167	-14.460	0.001%
32	14.322	-231.167	24.806	-14.321	231.167	-24.805	0.001%
33	0.000	-231.167	28.551	-0.000	231.167	-28.549	0.001%
34	-14.322	-231.167	24.806	14.321	231.167	-24.805	0.001%
35	-25.047	-231.167	14.461	25.046	231.167	-14.460	0.001%
36	-28.644	-231.167	0.000	28.642	231.167	-0.000	0.001%
37	-24.726	-231.167	-14.275	24.724	231.167	14.275	0.001%
38	-14.322	-231.167	-24.806	14.321	231.167	24.805	0.001%
39	0.000	-102.469	-23.187	-0.000	102.469	23.186	0.001%
40	11.345	-102.469	-19.650	-11.345	102.469	19.649	0.001%
41	19.507	-102.469	-11.262	-19.506	102.469	11.262	0.001%
42	22.690	-102.469	0.000	-22.689	102.469	-0.000	0.001%
43	20.080	-102.469	11.593	-20.080	102.469	-11.593	0.001%
44	11.345	-102.469	19.650	-11.345	102.469	-19.649	0.001%
45	0.000	-102.469	22.525	-0.000	102.469	-22.524	0.001%
46	-11.345	-102.469	19.650	11.345	102.469	-19.649	0.001%
47	-20.080	-102.469	11.593	20.080	102.469	-11.593	0.001%
48	-22.690	-102.469	0.000	22.689	102.469	-0.000	0.001%
49	-19.507	-102.469	-11.262	19.506	102.469	11.262	0.001%
50	-11.345	-102.469	-19.650	11.345	102.469	19.649	0.001%

Non-Linear Convergence Results

Load Combination	Converged?	Number of Cycles	Displacement Tolerance	Force Tolerance
1	Yes	6	0.00000001	0.00000001
2	Yes	14	0.00007115	0.00012447
3	Yes	14	0.00005126	0.00009012
4	Yes	14	0.00007686	0.00013438
5	Yes	14	0.00005678	0.00009976
6	Yes	14	0.00008208	0.00014335
7	Yes	14	0.00006172	0.00010833
8	Yes	14	0.00007691	0.00013443
9	Yes	14	0.00005682	0.00009981

10	Yes	14	0.00007115	0.00012441
11	Yes	14	0.00005126	0.00009009
12	Yes	14	0.00007684	0.00013429
13	Yes	14	0.00005677	0.00009971
14	Yes	14	0.00008204	0.00014324
15	Yes	14	0.00006169	0.00010827
16	Yes	14	0.00007684	0.00013428
17	Yes	14	0.00005677	0.00009970
18	Yes	14	0.00007115	0.00012442
19	Yes	14	0.00005127	0.00009010
20	Yes	14	0.00007692	0.00013445
21	Yes	14	0.00005682	0.00009982
22	Yes	14	0.00008207	0.00014335
23	Yes	14	0.00006171	0.00010833
24	Yes	14	0.00007686	0.00013440
25	Yes	14	0.00005678	0.00009977
26	Yes	8	0.00000001	0.00012978
27	Yes	15	0.00008507	0.00013382
28	Yes	15	0.00008618	0.00013509
29	Yes	15	0.00008731	0.00013623
30	Yes	15	0.00008611	0.00013389
31	Yes	15	0.00008477	0.00013150
32	Yes	15	0.00008587	0.00013274
33	Yes	15	0.00008704	0.00013447
34	Yes	15	0.00008592	0.00013319
35	Yes	15	0.00008490	0.00013232
36	Yes	15	0.00008623	0.00013478
37	Yes	15	0.00008739	0.00013695
38	Yes	15	0.00008624	0.00013553
39	Yes	14	0.00000001	0.00010345
40	Yes	14	0.00000001	0.00010580
41	Yes	14	0.00000001	0.00010797
42	Yes	14	0.00000001	0.00010568
43	Yes	14	0.00000001	0.00010316
44	Yes	14	0.00000001	0.00010545
45	Yes	14	0.00000001	0.00010766
46	Yes	14	0.00000001	0.00010548
47	Yes	14	0.00000001	0.00010321
48	Yes	14	0.00000001	0.00010573
49	Yes	14	0.00000001	0.00010802
50	Yes	14	0.00000001	0.00010583

Maximum Tower Deflections - Service Wind

Section No.	*Elevation* *ft*	*Horz. Deflection* *in*	*Gov. Load Comb.*	*Tilt* °	*Twist* °
T1	280 - 270	8.990	39	0.3317	0.0571
T2	270 - 250	8.279	39	0.3287	0.0546
T3	250 - 230	6.908	39	0.3099	0.0510
T4	230 - 220	5.638	39	0.2748	0.0431
T5	220 - 200	5.077	39	0.2511	0.0375
T6	200 - 180	4.083	39	0.2159	0.0251
T7	180 - 160	3.241	39	0.1810	0.0186
T8	160 - 140	2.524	39	0.1542	0.0130
T9	140 - 120	1.900	39	0.1321	0.0090
T10	120 - 100	1.368	39	0.1081	0.0059
T11	100 - 80	0.937	39	0.0876	0.0043
T12	80 - 60	0.601	39	0.0665	0.0031
T13	60 - 40	0.342	39	0.0486	0.0021

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T14	40 - 20	0.160	39	0.0306	0.0013
T15	20 - 0	0.044	39	0.0151	0.0006

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
280.000	Flash Beacon Lighting	39	8.990	0.3317	0.0571	119588
250.000	PIROD 15' T-FRAME SECTOR	39	6.908	0.3099	0.0510	62331
245.000	DB420-A	39	6.577	0.3028	0.0496	42058
235.000	DB2252-F	39	5.939	0.2855	0.0455	23432
170.000	PIROD 15' T-FRAME SECTOR	39	2.869	0.1664	0.0158	44959
160.000	Commscope SF-QV12-B	39	2.524	0.1542	0.0130	55207
150.000	PIROD 15' T-FRAME SECTOR	39	2.201	0.1432	0.0108	54953

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	280 - 270	34.666	2	1.2783	0.2210
T2	270 - 250	31.925	2	1.2669	0.2114
T3	250 - 230	26.641	2	1.1942	0.1976
T4	230 - 220	21.746	2	1.0586	0.1668
T5	220 - 200	19.588	2	0.9676	0.1451
T6	200 - 180	15.755	2	0.8323	0.0971
T7	180 - 160	12.506	2	0.6978	0.0722
T8	160 - 140	9.742	2	0.5949	0.0504
T9	140 - 120	7.336	2	0.5094	0.0347
T10	120 - 100	5.282	2	0.4170	0.0227
T11	100 - 80	3.620	2	0.3381	0.0167
T12	80 - 60	2.319	2	0.2566	0.0121
T13	60 - 40	1.322	2	0.1876	0.0083
T14	40 - 20	0.618	2	0.1179	0.0051
T15	20 - 0	0.171	2	0.0585	0.0024

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
280.000	Flash Beacon Lighting	2	34.666	1.2783	0.2210	31102
250.000	PIROD 15' T-FRAME SECTOR	2	26.641	1.1942	0.1976	16104
245.000	DB420-A	2	25.365	1.1668	0.1919	10882
235.000	DB2252-F	2	22.907	1.0997	0.1762	6078
170.000	PIROD 15' T-FRAME SECTOR	2	11.073	0.6418	0.0611	11687
160.000	Commscope SF-QV12-B	2	9.742	0.5949	0.0504	14334

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
150.000	PIROD 15' T-FRAME SECTOR	2	8.497	0.5524	0.0418	14269

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	280	Leg	A325N	0.6250	5	1.299	27.612	0.047 ✔	1	Bolt DS
T2	270	Leg	A325N	0.7500	5	4.924	39.761	0.124 ✔	1	Bolt DS
T3	250	Leg	A325N	1.0000	6	11.577	54.517	0.212 ✔	1	Bolt Tension
T4	230	Leg	A325N	1.0000	6	12.257	54.517	0.225 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	7.301	21.206	0.344 ✔	1	Member Bearing
T5	220	Leg	A325N	1.0000	6	17.459	54.517	0.320 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	6.738	12.724	0.530 ✔	1	Member Bearing
T6	200	Leg	A325N	1.0000	6	21.548	54.517	0.395 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	8.240	21.206	0.389 ✔	1	Member Bearing
		Top Girt	A325N	1.0000	1	4.879	12.724	0.383 ✔	1	Member Bearing
T7	180	Leg	A325N	1.2500	6	26.095	87.220	0.299 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	9.695	26.644	0.364 ✔	1	Member Bearing
		Top Girt	A325N	1.2500	1	6.943	21.315	0.326 ✔	1	Member Bearing
T8	160	Leg	A325N	1.2500	6	32.691	87.220	0.375 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	13.047	26.644	0.490 ✔	1	Member Bearing
		Top Girt	A325N	1.2500	1	4.446	26.644	0.167 ✔	1	Member Bearing
T9	140	Leg	A325N	1.2500	6	40.459	87.220	0.464 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	13.422	26.644	0.504 ✔	1	Member Bearing
T10	120	Leg	A325N	1.2500	12	22.659	87.220	0.260 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	8.890	56.006	0.159 ✔	1	Member Bearing
T11	100	Leg	A325N	1.2500	12	26.316	87.220	0.302 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	9.345	56.006	0.167 ✔	1	Member Bearing
T12	80	Leg	A325N	1.2500	12	29.635	87.220	0.340 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	9.199	56.006	0.164 ✔	1	Member Bearing
T13	60	Leg	A325N	1.2500	12	32.747	87.220	0.375 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	9.370	56.006	0.167 ✔	1	Member Bearing
T14	40	Leg	A325N	1.2500	12	35.958	87.220	0.412 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	2	9.251	56.006	0.165 ✔	1	Member Bearing
T15	20	Diagonal	A325N	1.0000	2	9.714	56.006	0.173 ✔	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	280 - 270	1 3/4	10.000	2.250	61.7 K=1.00	2.4053	-9.290	81.929	0.113 [1] ✔
T2	270 - 250	2	20.000	2.375	57.0 K=1.00	3.1416	-28.682	111.479	0.257 [1] ✔
T3	250 - 230	2 1/2	20.000	2.375	45.6 K=1.00	4.9087	-79.317	189.738	0.418 [1] ✔
T4	230 - 220	Pirod 105245	10.017	10.017	37.8 K=1.00	5.3014	-82.654	214.859	0.385 [1] ✔
T5	220 - 200	Pirod 105218	20.033	10.017	32.4 K=1.00	7.2158	-117.355	300.681	0.390 [1] ✔
T6	200 - 180	Pirod 105218	20.033	10.017	32.4 K=1.00	7.2158	-144.438	300.681	0.480 [1] ✔
T7	180 - 160	Pirod 105219	20.033	10.017	28.4 K=1.00	9.4248	-177.858	399.868	0.445 [1] ✔
T8	160 - 140	Pirod 105220	20.033	10.017	25.2 K=1.00	11.9282	-228.448	512.375	0.446 [1] ✔
T9	140 - 120	Pirod 105220	20.033	10.017	25.2 K=1.00	11.9282	-280.443	512.375	0.547 [1] ✔
T10	120 - 100	Pirod 112743	20.033	20.033	32.6 K=1.00	14.7262	-313.139	613.145	0.511 [1] ✔
T11	100 - 80	Pirod 112743	20.033	20.033	32.6 K=1.00	14.7262	-364.850	613.145	0.595 [1] ✔
T12	80 - 60	Pirod 112744	20.033	20.033	32.6 K=1.00	17.8187	-412.287	741.993	0.556 [1] ✔
T13	60 - 40	Pirod 112744	20.033	20.033	32.6 K=1.00	17.8187	-456.780	741.993	0.616 [1] ✔
T14	40 - 20	Pirod 112745	20.033	20.033	32.5 K=1.00	21.2057	-504.646	883.145	0.571 [1] ✔
T15	20 - 0	Pirod 112740	20.033	20.033	32.5 K=1.00	21.2057	-542.562	883.145	0.614 [1] ✔

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	230 - 220	0.5	1.471	120.0	238.565	0.1963	0.692	3.446	0.202 ✔
T5	220 - 200	0.5	1.459	119.0	324.713	0.1963	0.427	3.378	0.128 ✔
T6	200 - 180	0.5	1.459	119.0	324.713	0.1963	0.380	3.378	0.114 ✔

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T7	180 - 160	0.625	1.446	94.4	424.115	0.3068	0.354	6.958	0.052 ✓
T8	160 - 140	0.625	1.435	93.6	536.771	0.3068	1.807	7.011	0.258 ✓
T9	140 - 120	0.625	1.435	93.6	536.771	0.3068	0.996	7.011	0.143 ✓
T10	120 - 100	0.75	1.727	93.9	662.680	0.4418	0.772	14.364	0.055 ✓
T11	100 - 80	0.75	1.727	93.9	662.680	0.4418	0.824	14.364	0.059 ✓
T12	80 - 60	0.75	1.711	93.1	801.842	0.4418	0.732	14.531	0.052 ✓
T13	60 - 40	0.75	1.711	93.1	801.842	0.4418	0.871	14.531	0.060 ✓
T14	40 - 20	0.875	1.696	79.1	954.259	0.6013	1.206	23.594	0.052 ✓
T15	20 - 0	0.875	1.696	79.1	954.259	0.6013	1.500	23.594	0.065 ✓

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	280 - 270	7/8	5.483	2.662	131.4 K=0.90	0.6013	-1.618	7.868	0.206 [1] ✓
T2	270 - 250	7/8	5.535	2.675	132.1 K=0.90	0.6013	-2.240	7.786	0.288 [1] ✓
T3	250 - 230	1	5.535	2.652	114.6 K=0.90	0.7854	-5.764	13.514	0.427 [1] ✓
T4	230 - 220	L3x3x5/16	11.416	5.024	106.8 K=1.04	1.7800	-8.242	41.111	0.200 [1] ✓
T5	220 - 200	L3x3x3/16	12.503	5.669	115.6 K=1.01	1.0900	-6.909	22.519	0.307 [1] ✓
T6	200 - 180	L3x3x5/16	13.796	6.369	129.8 K=1.00	1.7800	-9.551	30.261	0.316 [1] ✓
T7	180 - 160	L3x3x5/16	15.243	7.092	144.5 K=1.00	1.7800	-11.035	24.402	0.452 [1] ✓
T8	160 - 140	L3 1/2x3 1/2x5/16	16.803	7.892	137.3 K=1.00	2.0900	-13.094	31.751	0.412 [1] ✓
T9	140 - 120	L3 1/2x3 1/2x5/16	18.448	8.729	151.8 K=1.00	2.0900	-12.760	25.959	0.492 [1] ✓
T10	120 - 100	2L3 1/2x3 1/2x5/16x3/8	26.255	12.451	134.0 K=0.97	4.1800	-18.974	66.615	0.285 [1] ✓
T11	100 - 80	2L3 1/2x3 1/2x5/16x3/8	27.592	13.142	139.9 K=0.96	4.1800	-19.393	61.156	0.317 [1] ✓
T12	80 - 60	2L3 1/2x3 1/2x5/16x3/8	29.006	13.866	146.0 K=0.95	4.1800	-19.018	56.126	0.339 [1] ✓
T13	60 - 40	2L3 1/2x3 1/2x5/16x3/8	30.485	14.620	152.4 K=0.94	4.1800	-19.869	51.525	0.386 [1] ✓
T14	40 - 20	2L3 1/2x3 1/2x5/16x3/8	32.021	15.399	159.0	4.1800	-18.646	47.338	0.394 [1]

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T15	20 - 0	2L3 1/2x3 1/2x5/16x3/8	33.606	16.200	K=0.93 165.8 K=0.92	4.1800	-21.558	43.542	0.495 [1]

[1] P_u / ϕP_n controls

Horizontal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 270	7/8	5.000	4.854	186.4 K=0.70	0.6013	-0.177	3.910	0.045 [1]
T2	270 - 250	7/8	5.000	4.833	185.6 K=0.70	0.6013	-0.497	3.944	0.126 [1]
T3	250 - 230	7/8	5.000	4.792	184.0 K=0.70	0.6013	-1.374	4.012	0.342 [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	280 - 270	1	5.000	4.854	163.1 K=0.70	0.7854	-0.576	6.670	0.086 [1]
T2	270 - 250	1	5.000	4.833	162.4 K=0.70	0.7854	-0.583	6.728	0.087 [1]
T3	250 - 230	1 1/4	5.000	4.792	128.8 K=0.70	1.2272	-1.374	16.712	0.082 [1]
T6	200 - 180	L3x3x3/16	8.000	6.667	134.2 K=1.00	1.0900	-4.008	17.316	0.231 [1]
T7	180 - 160	L4x4x1/4	10.000	8.604	129.9 K=1.00	1.9400	-5.691	32.919	0.173 [1]
T8	160 - 140	L3 1/2x3 1/2x5/16	12.000	10.604	184.4 K=1.00	2.0900	-3.962	17.588	0.225 [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	280 - 270	1	5.000	4.854	163.1 K=0.70	0.7854	-0.644	6.670	0.097 [1] ✔
T2	270 - 250	1	5.000	4.833	162.4 K=0.70	0.7854	-0.884	6.728	0.131 [1] ✔
T3	250 - 230	1 1/4	5.000	4.792	128.8 K=0.70	1.2272	-1.581	16.712	0.095 [1] ✔

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 270	1	5.000	4.854	163.1 K=0.70	0.7854	-0.015	6.670	0.002 [1] ✔
T2	270 - 250	1	5.000	4.833	162.4 K=0.70	0.7854	-0.178	6.728	0.026 [1] ✔
T6	200 - 180	L3x3x3/16	9.000	8.000	145.3 K=0.90	1.0900	-5.500	14.785	0.372 [1] ✔
T7	180 - 160	L4x4x1/4	11.000	10.000	139.0 K=0.92	1.9400	-4.518	28.726	0.157 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 270	1 3/4	10.000	2.250	61.7	1.7942	6.492	87.466	0.074 [1 #] ✔
T2	270 - 250	2	20.000	2.375	57.0	3.1416	24.622	141.372	0.174 [1 #] ✔
T3	250 - 230	2 1/2	20.000	2.375	45.6	4.9087	69.463	220.893	0.314 [1] ✔
T4	230 - 220	Pirod 105245	10.017	10.017	37.8	5.3014	73.542	238.565	0.308 [1] ✔
T5	220 - 200	Pirod 105218	20.033	10.017	32.4	7.2158	104.752	324.713	0.323 [1] ✔
T6	200 - 180	Pirod 105218	20.033	10.017	32.4	7.2158	129.286	324.713	0.398 [1] ✔
T7	180 - 160	Pirod 105219	20.033	10.017	28.4	9.4248	156.569	424.115	0.369 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T8	160 - 140	Pirod 105220	20.033	10.017	25.2	11.9282	196.148	536.771	0.365 [1]
T9	140 - 120	Pirod 105220	20.033	10.017	25.2	11.9282	242.754	536.771	0.452 [1]
T10	120 - 100	Pirod 112743	20.033	20.033	32.6	14.7262	271.911	662.680	0.410 [1]
T11	100 - 80	Pirod 112743	20.033	20.033	32.6	14.7262	315.794	662.680	0.477 [1]
T12	80 - 60	Pirod 112744	20.033	20.033	32.6	17.8187	355.622	801.842	0.444 [1]
T13	60 - 40	Pirod 112744	20.033	20.033	32.6	17.8187	392.959	801.842	0.490 [1]
T14	40 - 20	Pirod 112745	20.033	20.033	32.5	21.2057	431.497	954.259	0.452 [1]
T15	20 - 0	Pirod 112740	20.033	20.033	32.5	21.2057	462.576	954.259	0.485 [1]

[1] P_u / ϕP_n controls
[#] Based on net area of leg in section below

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio
T4	230 - 220	0.5	1.471	120.0	238.565	0.1963	0.692	3.446	0.202
T5	220 - 200	0.5	1.459	119.0	324.713	0.1963	0.427	3.378	0.128
T6	200 - 180	0.5	1.459	119.0	324.713	0.1963	0.380	3.378	0.114
T7	180 - 160	0.625	1.446	94.4	424.115	0.3068	0.354	6.958	0.052
T8	160 - 140	0.625	1.435	93.6	536.771	0.3068	1.807	7.011	0.258
T9	140 - 120	0.625	1.435	93.6	536.771	0.3068	0.996	7.011	0.143
T10	120 - 100	0.75	1.727	93.9	662.680	0.4418	0.772	14.364	0.055
T11	100 - 80	0.75	1.727	93.9	662.680	0.4418	0.824	14.364	0.059
T12	80 - 60	0.75	1.711	93.1	801.842	0.4418	0.732	14.531	0.052
T13	60 - 40	0.75	1.711	93.1	801.842	0.4418	0.871	14.531	0.060
T14	40 - 20	0.875	1.696	79.1	954.259	0.6013	1.206	23.594	0.052
T15	20 - 0	0.875	1.696	79.1	954.259	0.6013	1.500	23.594	0.065

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n K	A in^2	V_u K	ϕV_n K	Stress Ratio

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 270	7/8	5.483	2.662	146.0	0.6013	1.567	27.059	0.058 [1] ✔
T2	270 - 250	7/8	5.535	2.675	146.8	0.6013	2.192	27.059	0.081 [1] ✔
T3	250 - 230	1	5.535	2.652	127.3	0.7854	5.600	35.343	0.158 [1] ✔
T4	230 - 220	L3x3x5/16	11.416	5.024	67.6	1.0713	7.301	46.603	0.157 [1] ✔
T5	220 - 200	L3x3x3/16	11.930	5.424	71.5	0.6593	6.738	28.679	0.235 [1] ✔
T6	200 - 180	L3x3x5/16	13.796	6.369	85.1	1.0713	8.240	46.603	0.177 [1] ✔
T7	180 - 160	L3x3x5/16	15.243	7.092	94.9	1.0127	9.695	44.054	0.220 [1] ✔
T8	160 - 140	L3 1/2x3 1/2x5/16	16.803	7.892	89.9	1.2452	13.047	54.168	0.241 [1] ✔
T9	140 - 120	L3 1/2x3 1/2x5/16	17.616	8.319	94.6	1.2452	13.422	54.168	0.248 [1] ✔
T10	120 - 100	2L3 1/2x3 1/2x5/16x3/8	26.255	12.451	141.6	2.6077	17.780	113.433	0.157 [1] ✔
T11	100 - 80	2L3 1/2x3 1/2x5/16x3/8	27.592	13.142	149.3	2.6077	18.691	113.433	0.165 [1] ✔
T12	80 - 60	2L3 1/2x3 1/2x5/16x3/8	29.006	13.866	157.3	2.6077	18.398	113.433	0.162 [1] ✔
T13	60 - 40	2L3 1/2x3 1/2x5/16x3/8	30.485	14.620	165.7	2.6077	18.740	113.433	0.165 [1] ✔
T14	40 - 20	2L3 1/2x3 1/2x5/16x3/8	32.021	15.399	174.3	2.6077	18.502	113.433	0.163 [1] ✔
T15	20 - 0	2L3 1/2x3 1/2x5/16x3/8	33.606	16.200	183.2	2.6077	19.428	113.433	0.171 [1] ✔

[1] P_u / ϕP_n controls

Horizontal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 270	7/8	5.000	4.854	266.3	0.6013	0.266	27.059	0.010 [1] ✔
T2	270 - 250	7/8	5.000	4.833	265.1	0.6013	0.497	27.059	0.018 [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	250 - 230	7/8	5.000	4.792	262.9	0.6013	1.374	27.059	0.051 [1] ✔

[1] $P_u / \phi P_n$ 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	280 - 270	1	5.000	4.854	233.0	0.7854	0.605	35.343	0.017 [1] ✔
T2	270 - 250	1	5.000	4.833	232.0	0.7854	0.632	35.343	0.018 [1] ✔
T3	250 - 230	1 1/4	5.000	4.792	184.0	1.2272	1.387	55.223	0.025 [1] ✔
T6	200 - 180	L3x3x3/16	8.000	6.667	89.5	0.6593	4.879	28.679	0.170 [1] ✔
T7	180 - 160	L4x4x1/4	10.000	8.604	86.4	1.1972	6.943	52.078	0.133 [1] ✔
T8	160 - 140	L3 1/2x3 1/2x5/16	12.000	10.604	122.2	1.2452	4.446	54.168	0.082 [1] ✔

[1] $P_u / \phi P_n$ 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	280 - 270	1	5.000	4.854	233.0	0.7854	0.705	35.343	0.020 [1] ✔
T2	270 - 250	1	5.000	4.833	232.0	0.7854	0.938	35.343	0.027 [1] ✔
T3	250 - 230	1 1/4	5.000	4.792	184.0	1.2272	1.787	55.223	0.032 [1] ✔

[1] $P_u / \phi P_n$ controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u K	ϕP_n K	Ratio $\frac{P_u}{\phi P_n}$
T1	280 - 270	1	5.000	4.854	233.0	0.7854	0.110	35.343	0.003 [1]
T2	270 - 250	1	5.000	4.833	232.0	0.7854	0.272	35.343	0.008 [1]
T6	200 - 180	L3x3x3/16	9.000	8.000	102.2	1.0900	6.776	35.316	0.192 [1]
T7	180 - 160	L4x4x1/4	11.000	10.000	96.0	1.9400	5.686	62.856	0.090 [1]

[1] $P_u / \phi P_n$ controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
T1	280 - 270	Leg	1 3/4	3	-9.290	81.929	11.3	Pass
		Diagonal	7/8	17	-1.618	7.868	20.6	Pass
		Horizontal	7/8	36	-0.177	3.910	4.5	Pass
		Top Girt	1	4	-0.576	6.670	8.6	Pass
		Bottom Girt	1	7	-0.644	6.670	9.7	Pass
		Mid Girt	1	11	0.110	35.343	0.3	Pass
T2	270 - 250	Leg	2	45	-28.682	111.479	25.7	Pass
		Diagonal	7/8	59	-2.240	7.786	28.8	Pass
		Horizontal	7/8	62	-0.497	3.944	12.6	Pass
		Top Girt	1	48	-0.583	6.728	8.7	Pass
		Bottom Girt	1	49	-0.884	6.728	13.1	Pass
		Mid Girt	1	52	-0.178	6.728	2.6	Pass
T3	250 - 230	Leg	2 1/2	123	-79.317	189.738	41.8	Pass
		Diagonal	1	135	-5.764	13.514	42.7	Pass
		Horizontal	7/8	137	-1.374	4.012	34.2	Pass
		Top Girt	1 1/4	125	-1.374	16.712	8.2	Pass
		Bottom Girt	1 1/4	127	-1.581	16.712	9.5	Pass
T4	230 - 220	Leg	Pirod 105245	201	-82.654	214.859	38.5	Pass
		Diagonal	L3x3x5/16	207	-8.242	41.111	20.0	Pass
							34.4 (b)	
T5	220 - 200	Leg	Pirod 105218	210	-117.355	300.681	39.0	Pass
		Diagonal	L3x3x3/16	216	-6.909	22.519	30.7	Pass
							53.0 (b)	
T6	200 - 180	Leg	Pirod 105218	225	-144.438	300.681	48.0	Pass
		Diagonal	L3x3x5/16	237	-9.551	30.261	31.6	Pass
							38.9 (b)	
		Top Girt	L3x3x3/16	226	-4.008	17.316	23.1	Pass
							38.3 (b)	
		Mid Girt	L3x3x3/16	229	-5.500	14.785	37.2	Pass
T7	180 - 160	Leg	Pirod 105219	246	-177.858	399.868	44.5	Pass
		Diagonal	L3x3x5/16	258	-11.035	24.402	45.2	Pass
		Top Girt	L4x4x1/4	247	-5.691	32.919	17.3	Pass
							32.6 (b)	
		Mid Girt	L4x4x1/4	250	-4.518	28.726	15.7	Pass
T8	160 - 140	Leg	Pirod 105220	267	-228.448	512.375	44.6	Pass
		Diagonal	L3 1/2x3 1/2x5/16	276	-13.094	31.751	41.2	Pass
							49.0 (b)	
		Top Girt	L3 1/2x3 1/2x5/16	269	-3.962	17.588	22.5	Pass
T9	140 - 120	Leg	Pirod 105220	285	-280.443	512.375	54.7	Pass
		Diagonal	L3 1/2x3 1/2x5/16	291	-12.760	25.959	49.2	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	ϕP_{allow} K	% Capacity	Pass Fail
							50.4 (b)	
T10	120 - 100	Leg	Pirod 112743	300	-313.139	613.145	51.1	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	306	-18.974	66.615	28.5	Pass
T11	100 - 80	Leg	Pirod 112743	309	-364.850	613.145	59.5	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	315	-19.393	61.156	31.7	Pass
T12	80 - 60	Leg	Pirod 112744	318	-412.287	741.993	55.6	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	324	-19.018	56.126	33.9	Pass
T13	60 - 40	Leg	Pirod 112744	327	-456.780	741.993	61.6	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	333	-19.869	51.525	38.6	Pass
T14	40 - 20	Leg	Pirod 112745	336	-504.646	883.145	57.1	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	342	-18.646	47.338	39.4	Pass
T15	20 - 0	Leg	Pirod 112740	345	-542.562	883.145	61.4	Pass
		Diagonal	2L3 1/2x3 1/2x5/16x3/8	351	-21.558	43.542	49.5	Pass
							Summary	
						Leg (T13)	61.6	Pass
						Diagonal (T5)	53.0	Pass
						Horizontal (T3)	34.2	Pass
						Top Girt (T6)	38.3	Pass
						Bottom Girt (T2)	13.1	Pass
						Mid Girt (T6)	37.2	Pass
						Bolt Checks	53.0	Pass
						RATING =	**61.6**	**Pass**

Program Version 8.1.1.0 - 6/3/2021 File:P:/Dept 4000/SMLINK/SMLINK-ATT-NEWEN 8/CTL05633/Structural/Structural Analysis/Analysis/TNX/CTL05633.eri

Self Support Anchor Rod Capacity

Site Info	
Site Number	CTL05633
Site Name	SEYMOUR EAST

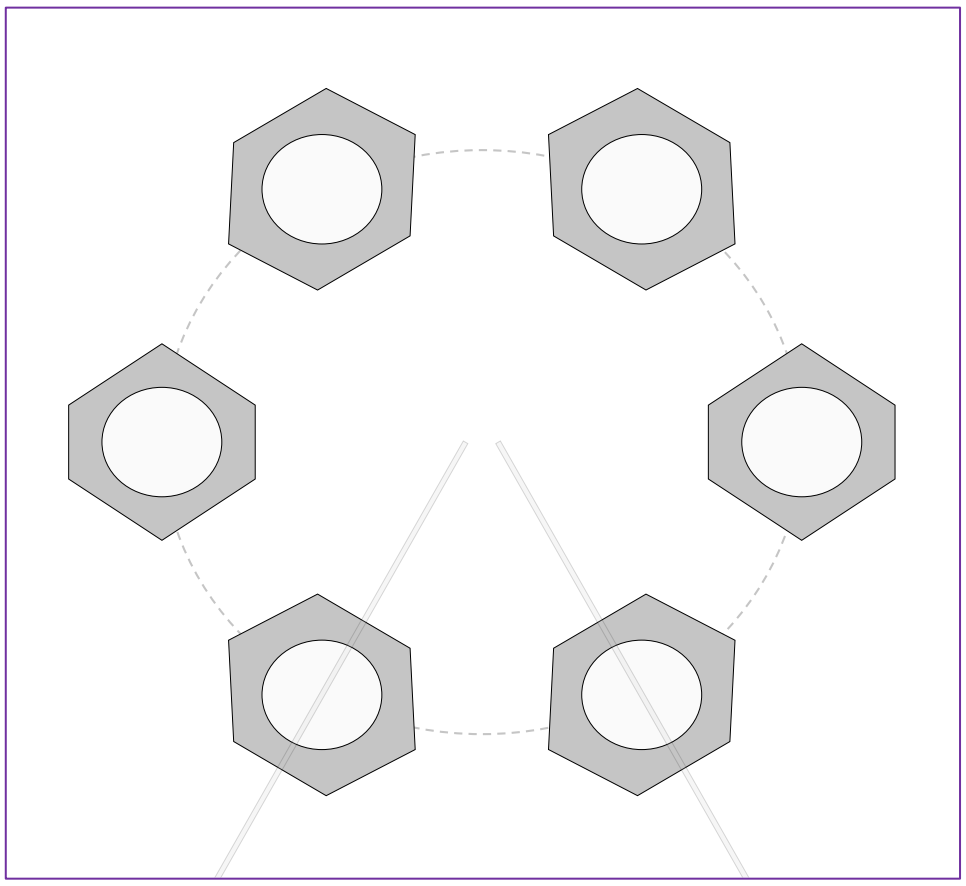
Analysis Considerations	
TIA-222 Revision	H
Grout Considered:	Yes
l_{ar} (in)	0

Applied Loads		
	Comp.	Uplift
Axial Force (kips)	566.46	481.01
Shear Force (kips)	59.73	52.31

**TIA-222-H Section 15.5 Applied*

Considered Eccentricity	
Leg Mod Eccentricity (in)	0.000
Anchor Rod N.A Shift (in)	0.000
Total Eccentricity (in)	0.000

**Anchor Rod Eccentricity Applied*



Connection Properties

Anchor Rod Data

(6) 2-1/4" ø bolts (A687 N; Fy=105 ksi, Fu=125 ksi)

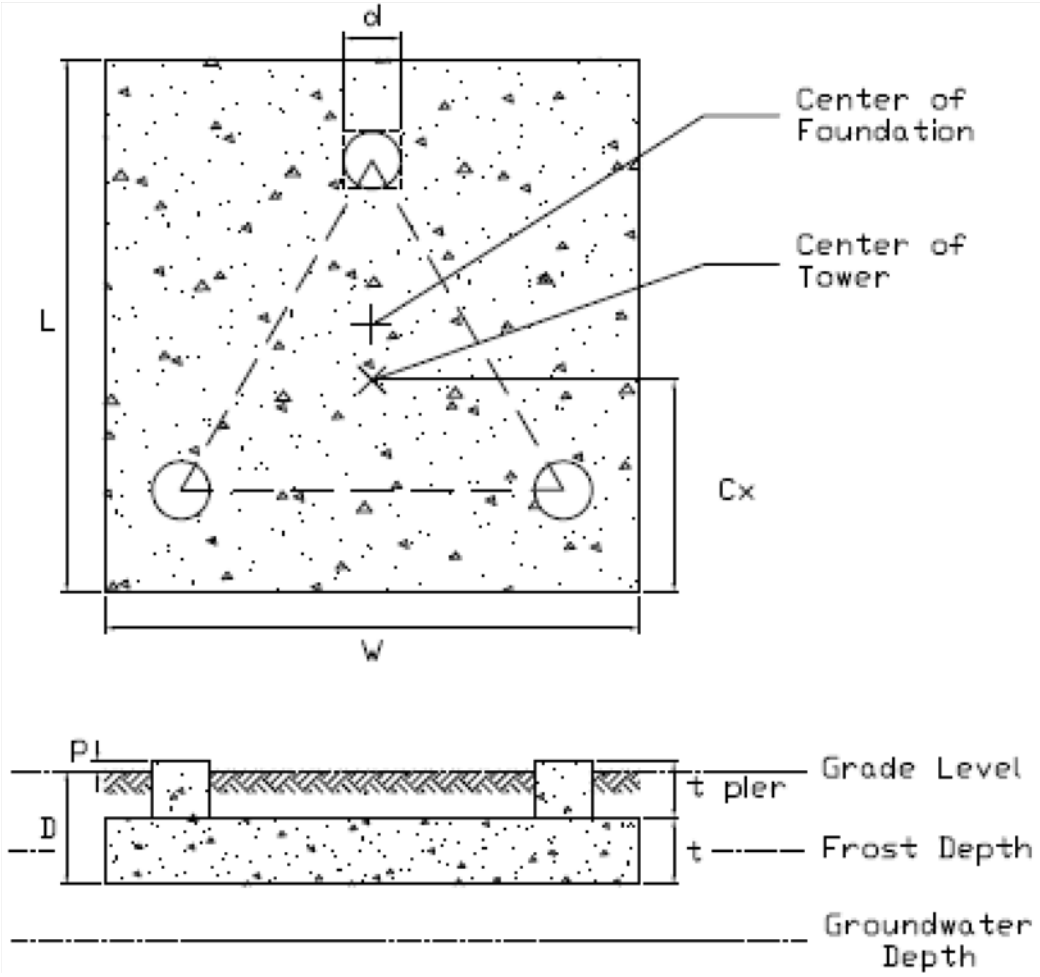
l_{ar} (in): 0

Analysis Results

Anchor Rod Summary *(units of kips, kip-in)*

Pu_t = 80.17	ϕPn_t = 304.69	**Stress Rating**
Vu = 8.72	ϕVn = 186.38	**25.1%**
Mu = n/a	ϕMn = n/a	**Pass**

Self-Supporting Tower Foundation - Pad & 3 Piers



Existing Tower Base Dimensions

$D := 6\,ft$ — *Depth from grade to the bottom of foundation*

$p := 6\,in$ — *Projection of Pier above grade*

$L := 38.50\,ft$ — *Length of Pad*

$W := 38.50\,ft$ — *Width of Pad*

$t := 3.25\,ft$ — *Thickness of Pad*

$d := 5\,ft$ — *Diameter of Pier*

$t_{pier} := D + p - t$ $\quad t_{pier} = 3.25\ ft$ — *Length of Pier*

$Cx := 19.25\,ft$ — *Minimum distance to center of gravity of tower from outer edge (based on foundation drawings)*

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Tower Reactions

$P_{u\_no\_ice} := 123kip$ — *Factored download reaction*

$M_{u\_no\_ice} := 12742kip \cdot ft$ — *Factored moment reaction*

$V_{u\_no\_ice} := 90kip$ — *Factored shear reaction*

$P_{u\_ice} := 231kip$ — *Factored download reaction - ice*

$M_{u\_ice} := 4224kip \cdot ft$ — *Factored moment reaction - ice*

$V_{u\_ice} := 29kip$ — *Factored shear reaction - ice*

Soil Properties

$Bearing := 5ksf$ — *Allowable bearing pressure*

$SF_{Bearing} := 2$ — *Factor of safety for allowable bearing pressure*

$Bearing_{Ult} := Bearing \cdot SF_{Bearing}$ $Bearing_{Ult} = 10 \cdot ksf$ — *Ultimate bearing pressure*

$\phi_{soil} := 30deg$ — *Angle of internal friction*

$P_p := 250psf$ — *Passive pressure*

$\mu := 0.4$ — *Coefficient of friction*

$H_{water} := 99ft$ — *Depth to groundwater table*

$H_{frost} := 4ft$ — *Depth to frost line*

$\gamma_{conc} := 150pcf$

$\gamma_{soil} := 115pcf$

$\gamma_{H20} := 62.4pcf$

$\phi_o := 0.75$ — *Reduction factor for Overturning*

$\phi_b := 0.75$ — *Reduction factor for Bearing*

$\phi_l := 0.75$ — *Reduction factor for Lateral*

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(847) 908-8400

Overturning Calculations

$A_{pad} := W \cdot L$ $A_{pad} = 1482.25\ ft^2$ *Area of pad*

$A_{pier} := \begin{cases} \pi \frac{d^2}{4} & \text{if Pier\_Type = "Circular"} \\ d^2 & \text{if Pier\_Type = "Square"} \end{cases}$ $A_{pier} = 25\ ft^2$ *Area of pier*

$Wt_{pad} := 0.9 \gamma_{conc} \cdot t \cdot A_{pad}$ $Wt_{pad} = 650.34 \cdot kip$ *Factored weight of concrete pad*

$Wt_{piers} := 0.9 \gamma_{conc} \cdot 3 \cdot t_{pier} \cdot A_{pier}$ $Wt_{piers} = 32.91 \cdot kip$ *Factored weight of concrete piers*

$D_{tpad} := t_{pier} - p$ $D_{tpad} = 2.75\ ft$ *Depth of soil to top of pad*

$V_{soil} = 4125.72 \cdot ft^3$ *Total volume of soil acting in overturning*

$Wt_{soil} := 0.9 V_{soil} \cdot \gamma_{soil}$ $Wt_{soil} = 427.01 \cdot kip$ *Factored weight of soil*

$M_{v\_no\_ice} := V_{u\_no\_ice} \cdot (D + p)$ $M_{v\_no\_ice} = 585 \cdot kip \cdot ft$ *Moment due to shear*

$M_{v\_ice} := V_{u\_ice} \cdot (D + p)$ $M_{v\_ice} = 188.5 \cdot kip \cdot ft$ *Moment due to shear - ice*

Check overturning capacity - no ice

$\phi M_n := \phi_o \cdot \left[\left(P_{u\_no\_ice} + Wt_{piers} \right) \cdot Cx + \left(Wt_{pad} + Wt_{soil} \right) \cdot \frac{\min(W, L)}{2} \right]$ $\phi M_n = 17805 \cdot kip \cdot ft$

$M_u := M_{u\_no\_ice} + M_{v\_no\_ice}$ $M_u = 1.33 \times 10^4 \cdot kip \cdot ft$

$\frac{M_u}{\phi M_n} = 0.75$

OverturningCheck = "Overturning capacity of foundation is adequate."

Check overturning capacity - with ice

$\phi M_n := \phi_o \cdot \left[\left(P_{u\_ice} + Wt_{piers} \right) \cdot Cx + \left(Wt_{pad} + Wt_{soil} \right) \cdot \frac{\min(W, L)}{2} \right]$ $\phi M_n = 19364 \cdot kip \cdot ft$

$M_u := M_{u\_ice} + M_{v\_ice}$ $M_u = 4412.5 \cdot kip \cdot ft$

$\frac{M_u}{\phi M_n} = 0.23$

$OverturningCheck_{ice}$ = "Overturning capacity of foundation is adequate."

Soil Bearing Calculations

$S := \frac{A_{pad} \cdot \min(W, L)}{6}$ $S = 9511.1 \cdot ft^3$ *Section Modulus of base*

$Wt_{pad} = 722.6 \cdot kip$ *Weight of concrete pad*

$Wt_{piers} = 36.56 \cdot kip$ *Weight of concrete piers*

$Wt_{soils} = 445.04 \cdot kip$ *Weight of soil is ignored if Net Bearing Pressure is given*

$Wt_{total} := 1.2Wt_{pad} + 1.2Wt_{piers} + 1.2Wt_{soils}$ $Wt_{total} = 1445.04 \cdot kip$ *Total factored weight of foundation*

Check soil bearing capacity - no ice

$\phi R_s := \phi_b \cdot Bearing_{Ult}$ $\phi R_s = 7.5 \cdot ksf$

$R_u := \frac{(P_{u\_no\_ice} + Wt_{total})}{A_{pad}} + \frac{M_{u\_no\_ice} + M_{v\_no\_ice}}{S}$ $R_u = 2.46 \cdot ksf$

$\frac{R_u}{\phi R_s} = 0.33$

BearingCheck = "Bearing of soil is adequate."

Check soil bearing capacity - with ice

$R_u := \frac{(P_{u\_ice} + Wt_{total})}{A_{pad}} + \frac{M_{u\_ice} + M_{v\_ice}}{S}$ $R_u = 1.59 \cdot ksf$

$\frac{R_u}{\phi R_s} = 0.21$

$BearingCheck_{ice}$ = "Bearing of soil is adequate."

Lateral Calculations

$Wt_{total} := 0.9Wt_{pad} + 0.9Wt_{piers} + 0.9Wt_{soils}$ $\quad Wt_{total} = 1083.78 \cdot kip$ *Total factored weight of foundation*

$P_{resist} := P_p \cdot \min(L, W) \cdot (D - H_{frost})$ $\quad P_{resist} = 19.25 \cdot kip$ *Resisting lateral force from soil*

$f := \mu \cdot (P_{u\_no\_ice} + Wt_{total})$ $\quad f = 482.71 \cdot kip$ *Resisting friction force from soil*

$f_{ice} := \mu \cdot (P_{u\_ice} + Wt_{total})$ $\quad f_{ice} = 525.91 \cdot kip$ *Resisting friction force from soil with ice*

Check lateral capacity - no ice

$\phi R_s := \phi_l \cdot (f + P_{resist})$ $\quad \phi R_s = 376.47 \cdot kip$

$R_u := V_{u\_no\_ice}$ $\quad R_u = 90 \cdot kip$

$$\frac{R_u}{\phi R_s} = 0.24$$

SlidingCheck = "Lateral capacity of foundation is adequate."

Check lateral capacity - with ice

$\phi R_s := \phi_l \cdot (f_{ice} + P_{resist})$ $\quad \phi R_s = 408.87 \cdot kip$

$R_u := V_{u\_ice}$ $\quad R_u = 29 \cdot kip$

$$\frac{R_u}{\phi R_s} = 0.07$$

$SlidingCheck_{ice}$ = "Lateral capacity of foundation is adequate."

FULLERTON
NETWORK INTEGRITY STARTS HERE

April 27, 2022

Scope:	**MOUNT ANALYSIS REPORT**
Prepared for:	SmartLink
Carrier:	AT&T
Site Number:	CTL05633
FA Number:	10099965
Site Name:	Seymour East
Site Address:	6 Progress Avenue Seymour, CT 06483
Latitude/ Longitude:	41.3914919° / -73.0532989°

Structure Type:	SELF-SUPPORT TOWER
Mount Type:	Existing Commscope SF-QV Sector Frames
Rad Center:	160'-0"

Fullerton Engineering, P.C. is pleased to submit this "Mount Analysis Report" to determine the adequacy of the antenna mounting system with the proposed appurtenance and equipment addition on the abovementioned structure.

Analysis Criteria:

Reference Standard:	TIA-222-H Standard	
Wind Parameters:	Basic Wind Speed:	118 mph (3-Sec gust)
	Ice Wind Speed:	50 mph (3-Sec gust)
	Design Ice Thickness:	1.00 in.
	Risk Category	II
	Exposure Category:	B
	Topographic Feature:	None
	Topographic Method:	Method 2
	Ground Elevation Factor, K_e:	0.98
Seismic Parameters:	S_s:	0.200
	S_1:	0.054
Analysis Software:	RISA-3D (V17)	

Appurtenance Loads:
The antenna mounting system was analyzed with the final loading configuration shown in Page 2 of this report.

Summary of Analysis Result: PASS (MAX STRESS RATIO = 79.7%)

Barbara T. Kotecki, P.E.

Summary:

This structural assessment is in regards to the adequacy of the antenna mounting system for the final loading configuration described below. The purpose was to determine conformance of the antenna mounting system under the applicable codes and standards.

This PE certification completed by Fullerton Engineering, P.C. is inclusive of the antenna mounting system that will support the existing and proposed loading provided by the client.

This certification assumes that all structural members of the antenna mounting system are in good condition and have not been altered from the manufacturer's original design. Prior to installation of new equipment, contractor shall inspect the condition of all relevant members and connectors. The contractor shall be responsible for the means and methods of construction.

Sources:

Reference Document	Date
RFDS Ver. 3.00 provided by AT&T	03/01/2022
Mount Mapping Report by FDH Infrastructure Services, LLC	04/11/2022
Previous Structural Analysis by Maser Consulting Connecticut	05/01/2019
Previous Mount Analysis by Maser Consulting Connecticut	09/27/2018
Site Visit Photos	02/09/2022

Final Loading Configuration:

Mount Elevation (ft)	Antenna Rad Center (Ft)	QTY.	MANUFACTURER	MODEL	Status
160'-0"	160'-0"	3	CCI	TPA65R-BU6DA-K	Proposed
		3	Ericsson	AIR6449 B7DD+AIR6419 B77G Stacked	Proposed
		3	CCI	DMP65R-BU6DA	Proposed
		3	Ericsson	RRUS-4478 B14	Existing
		3	Ericsson	RRUS-32 B2	Existing
		3	Ericsson	RRUS-4426 B66	Existing
		3	Ericsson	RRUS-4449 B5/B12	Proposed
		3	Ericsson	RRUS-32 B30	Existing
		3	Raycap	DC9-48-60-24-8C-EV	Proposed

Member Component Capacity Table:

Component	% Capacity	Pass / Fail
Face Horizontals	32.8%	Pass
Standoff Members	79.7%	Pass
Tie-Backs	4.7%	Pass
Mounting Pipes	21.1%	Pass
RRH Pipe-to-Pipe, Threaded Rods	40.3%	Pass
Mast Pipe-to-Tower, Threaded Rods	28.1%	Pass
Mount-to-Mast Pipe Connection, Threaded Rods	54.1%	Pass
Structural Rating (max from all components) = 79.7%		Pass

FULLERTON
NETWORK INTEGRITY STARTS HERE

Site Number: **CTL05633**
Site Name: Seymour East
Created By: GM
Checked By: BTK
Date: 4/26/2022
Code: ANSI/TIA-222-H

Base Structure Type	**Type**	Self Support Tower	
Structure Height Above Grade (ft)	**Ht**	280.00	
RAD Center (ft)	**z**	160.00	
Windspeed no ice (mph, 3-sec gust)	**V**	118.00	see wind maps
Windspeed with ice (mph, 3-sec gust)	**Vi**	50.00	see ice maps
Windspeed for maintenance (mph, 3-sec gust)	**Vm**	30.00	Section 16.6
Ice Thickness	**ti**	1.00	see ice maps
Exposure Category (B/C/D)	**Exposure**	B	Section 2.6.5.1.2
Risk Category (I,II,III, IV)	**Cat**	II	Table 2-1
Topographic Feature	**K.1'**	None	Figure 2-1
Crest Height	**H**	0.00	Section 2.6.6.2.1
Length of Feature	**L**	0.00	
Distance from Crest to Tower	**x**	0.00	
Escarpment Downwind?		No	
Height above sea level	**Zs**	474.00	
Exposure Category Coefficient	**zg**	1200.00	Table 2-4
Mid-Point of Structure	**Ht.mid**	140.00	
Min Velocity Pressure Coefficient	**Kzmin**	0.70	Table 2-4
Exposure Category Coefficient	**α'**	7.00	Table 2-4
Velocity Pressure Coefficient	**Kz**	1.13	Section 2.6.5.2
Ground Elevation Factor	**Ke**	0.98	Section 2.6.8
Topographic Feature Factor Adjusted for Slope	**K1**	#DIV/0!	Figure 2-1
Horizontal Distance Factor	**K2**	#DIV/0!	Figure 2-1
Vertical Distance Factor	**K3**	#DIV/0!	Figure 2-1
Topographic Factor	**Kzt**	1.00	Section 2.6.6.2.1
Rooftop Wind Speed-Up Factor	**Ks**	1.00	Section 2.6.7
Ice Load Importance Factor	**Iti**	1.00	Table 2-3
Wind Direction Probability Factor	**Kd**	0.95	Table 2-2
Height Escalation Factor	**Kiz**	1.17	Section 2.6.10
Gust Effect Factor	**Gh**	1.00	Section 16.6
Design Ice Thickness	**tiz**	1.17	Section 2.6.10
Ice Density	**p.ice**	56.00	lbf/ft^3
Velocity Pressure for Maintenance	**qzm**	2.43	Section 2.6.11.6
Velocity Pressure With Ice	**qzi**	6.76	Section 2.6.11.6
Velocity Pressure No Ice	**qz**	37.62	Section 2.6.11.6

Ka=	0.9	

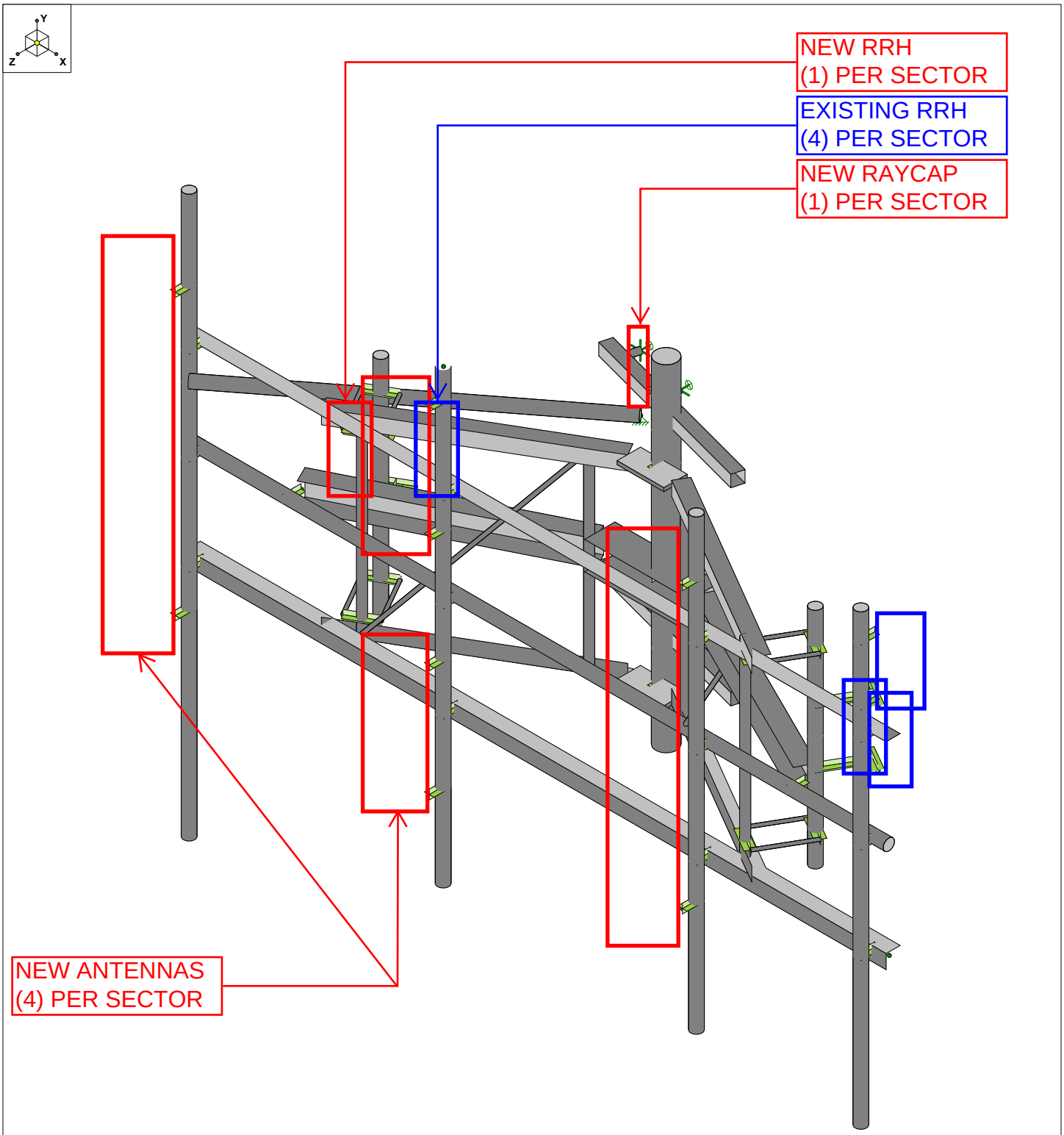
Importance Factor (Earthquake)	I_e	1.00	Table 2-3
Site Class	**Class**	D - Default	
Seismic Design Category	**Cat**	B	
MCE_R Ground Motion (period=0.2s)	S_S	0.200	
MCE_R Ground Motion (period=1.0s)	S_1	0.054	
Seismic Design Value at 0.2s	S_{DS}	0.214	
Long-Period Site Coefficient Fv	**Fv**	0.80	Table 2-12
Seismic Design Value at 1.0s	S_{D1}	0.029	Sec. 2.7.5
Long-period Transition Period (s)	T_L	6	

Sesimic Shear		
R	2.000	See 16.7
$C_{s\text{-calc}}$	0.107	See 2.7.7.1.1
$C_{s\text{-min}}$	0.009	See 2.7.7.1.1
C_s	0.107	See 2.7.7.1.1
A_s	1.000	See 16.7

Rooftop Wind Speed-Up Factor	Ks	No	
Horizontal distance from windward face to center of structure	Xb (ft)	1	Section 2.6.7
Width of windward face of the building	Ws (ft)	100	Section 2.6.7
Height of the parapet wall	Hp (ft)	5	Section 2.6.7
Height of windward face of the building	Hs (ft)	280.00	Section 2.6.7
Height of structure above roof	Zr (ft)	10.00	Section 2.6.7
	H1 (ft)	5.2	Section 2.6.7
	H2 (ft)	105.00	Section 2.6.7

Appurtenance Properties								Loads (force per connection)									
Manufacturer	**Model**	**R/F**	**L**	**W**	**D**	**Weight**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**	**Eh**	**Ev**	**EPA.F**
CCIAntennas	TPA65R-BU6DA-K	Flat	71.2	20.7	7.7	69	2	34.5	45.1	215	95	44	22	14	6	4	1	13
Ericsson	AIR 6449 B77D	Flat	30.4	15.9	8.1	81.6	2	40.8	22.1	68	36	15	9	4	2	4	2	4
Ericsson	AIR 6419 B77G	Flat	28.3	16.1	7.9	77	2	38.5	20.6	64	33	14	8	4	2	4	2	4
CCIAntennas	DMP65R-BU6DA	Flat	71.2	20.7	7.7	79.4	2	39.7	45.1	215	95	44	22	14	6	4	2	13
Ericsson	Radio 4478 B14	Flat	16.5	13.4	7.7	44	2	22.0	13.4	31	18	8	5	2	1	2	1	2
Ericsson	RRUS-32 B2	Flat	27.2	12.1	7	60	2	30.0	17.2	46	28	11	7	3	2	3	1	3
Ericsson	RRUS 4426 B66	Flat	14.96	13.19	5.8	48.4	2	24.2	10.2	28	12	7	4	2	1	3	1	2
Raycap	DC9-48-60-24-8C-EV	Round	17.91	10.24	10.24	26.2	1	26.2	17.1	22	22	5	5	1	1	3	1	1
Ericsson	Radio 4449 B5 & B12	Flat	15	13.2	9.3	70	2	35.0	14.7	28	20	7	5	2	1	4	1	2
Ericsson	RRUS-32 B30	Flat	27.2	12.1	7	60	2	30.0	17.2	46	28	11	7	3	2	3	1	3

Shape Properties								Loads (force per connection)									
Shape Type	**Shape**	**R/F**	**L**	**W**	**D**	**Wt (plf)**	**# Conn**	**Wt**	**Ice Wt**	**F no ice**	**S no ice**	**F ice**	**S ice**	**Fm**	**Sm**	**Eh**	**Ev**	**EPA.F**
Pipe	Pipe 2 Std.	Round	120	2.38	2.38	3.66	10	36.60	5.1	8	8	3	3	1	1	0.4	0.2	2
Pipe	Pipe 2 Std.	Round	96	2.38	2.38	3.66	8	29.28	5.1	8	8	3	3	1	1	0.4	0.2	2
Pipe	Pipe 2 Std.	Round	150	2.38	2.38	3.66	12.5	45.75	5.1	8	8	3	3	1	1	0.4	0.2	3
Angle	L3X3X¼	Flat	150	3	3	4.90	12.5	61.25	7.7	17	17	5	5	1	1	1	0.2	6
Angle	L3X3X¼	Flat	48	3	3	4.90	4	19.60	7.7	14	14	4	4	1	1	1	0.2	2
Pipe	Pipe 1¼ Std.	Round	40.5	1.66	1.66	2.27	3.375	7.66	4.1	6	6	2	2	0.4	0.4	0.2	0.1	1
Solid_Rod	SR ¾" Dia.	Round	53.922	0.75	0.75	1.50	4.4935	6.76	2.7	3	3	2	2	0.2	0.2	0.2	0.1	0.3
Channel	V-Stabilizer	Flat	47.5	5.44	3.7	7.97	3.95833	31.55	11.1	22	17	6	5	1	1	1	0.3	3
Channel	C6x6.5	Flat	22.5	6	6.5	15.74	1.875	29.51	14.3	21	23	6	6	1	1	2	1	1
Pipe	Pipe 2 Std.	Round	48	2.38	2.38	3.66	4	14.64	5.1	7	7	2	2	0.5	0.5	0.4	0.2	1
Pipe	Pipe 4 Std.	Round	72	4.5	4.5	10.80	6	64.80	8.1	11	11	3	3	1	1	1	0.5	2
HSS	HSS2½X2½X¼	Flat	40	2.5	2.5	7.11	3.33333	23.70	6.7	12	12	4	4	1	1	1	0.3	1
Solid_Rod	SR 1 1/4" Dia.	Round	4	1.25	1.25	4.18	0.33333	1.39	3.5	3	3	2	2	0.2	0.2	0.4	0.2	0.02
Pipe	Pipe 2 Std.	Round	68.97	2.38	2.38	3.66	5.7475	21.04	5.1	8	8	2	2	1	1	0.4	0.2	1
Plate	PL¾"x5"	Flat	10	5	0.75	12.76	0.83333	10.63	8.9	17	3	6	2	1	0.2	1	1	0.4
Solid_Rod	SR 5/8" Dia.	Round	11	0.625	0.625	1.04	0.91667	0.96	2.6	2	2	1	1	0.1	0.1	0.1	0.04	0.05



Envelope Only Solution

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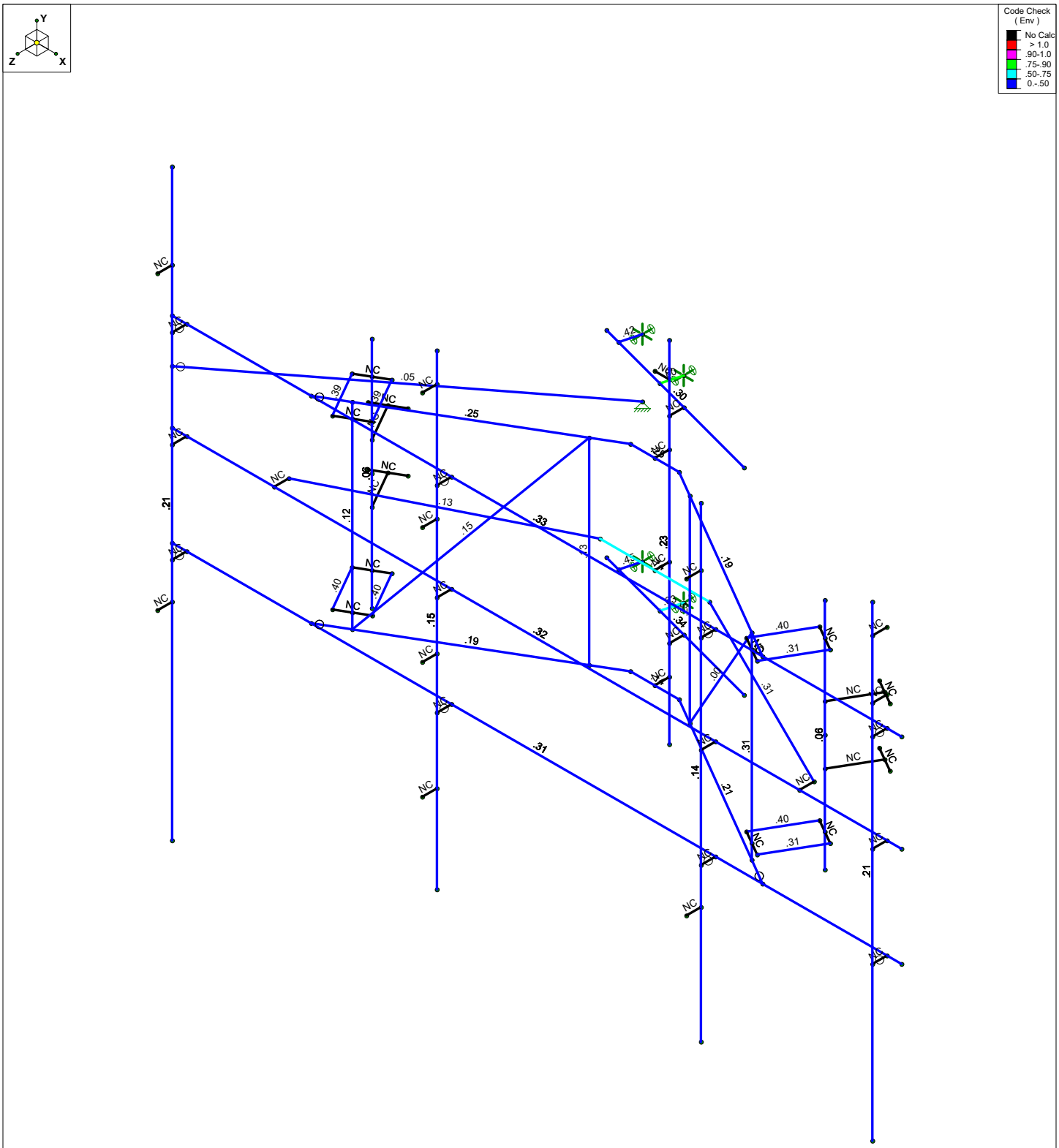
GM	Mount Analysis	Apr 27, 2022 at 9:35 AM
CTL05633	3D Render	CTL05633 - Mount Analysis - Rev ...



Member Code Checks Displayed (Enveloped)
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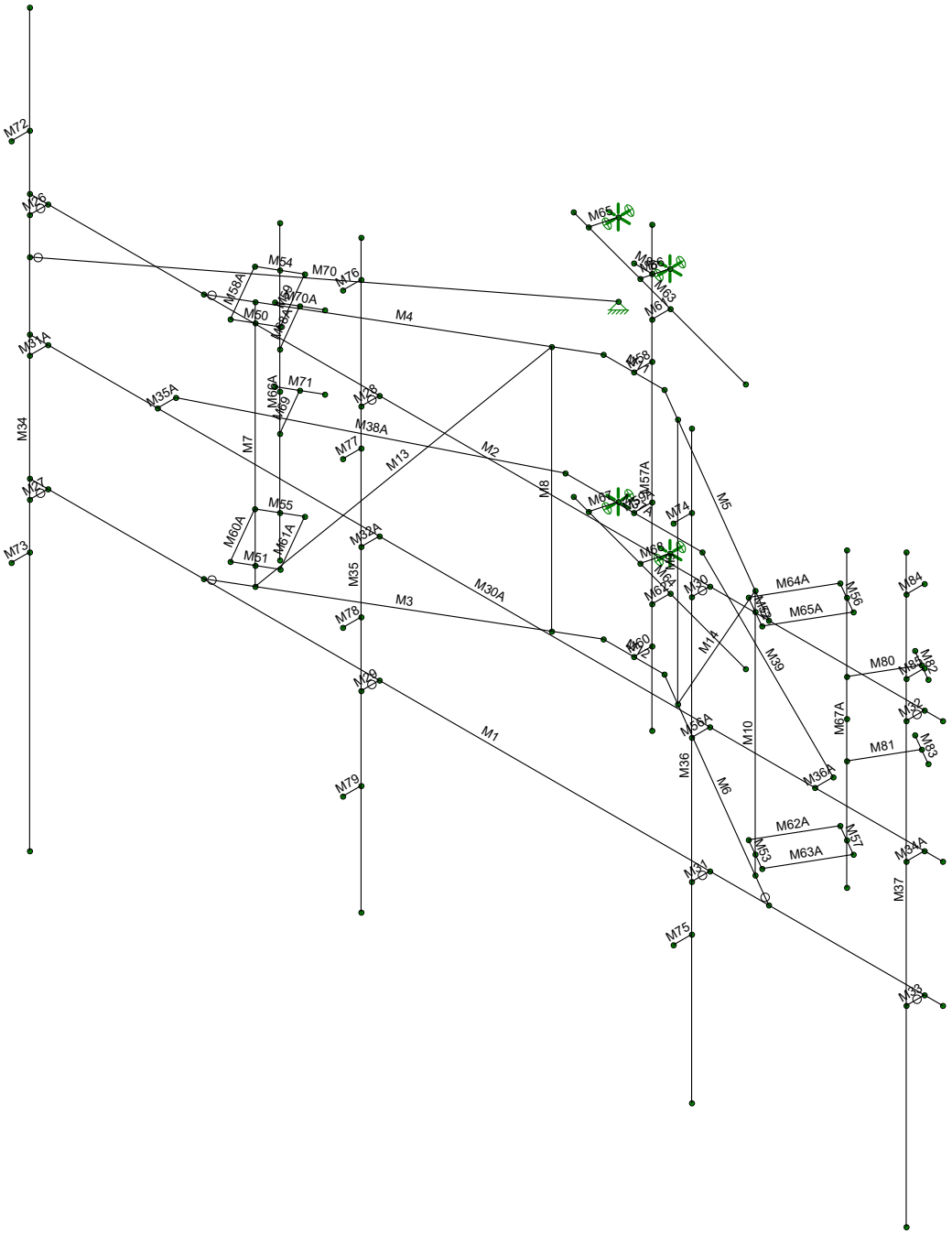

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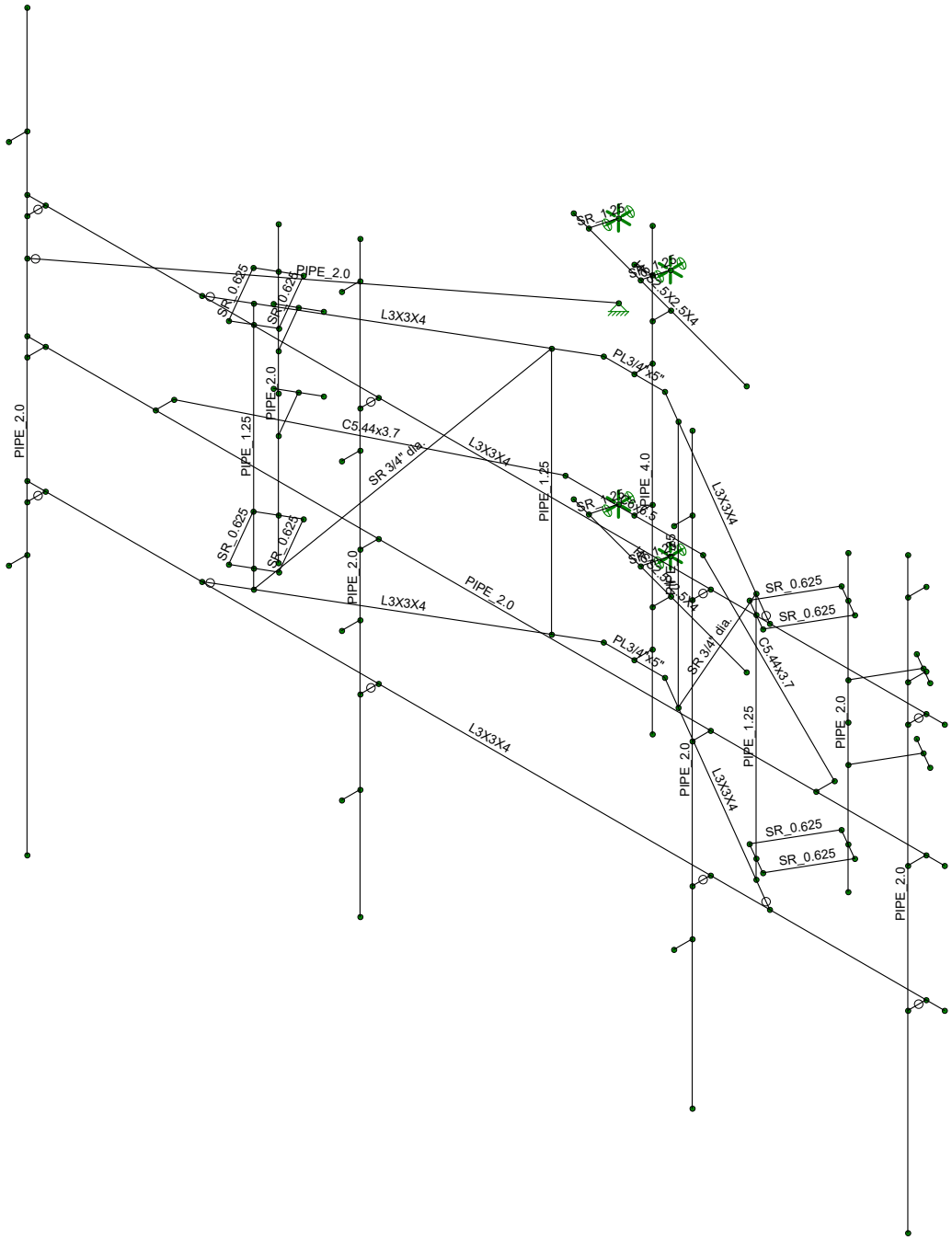

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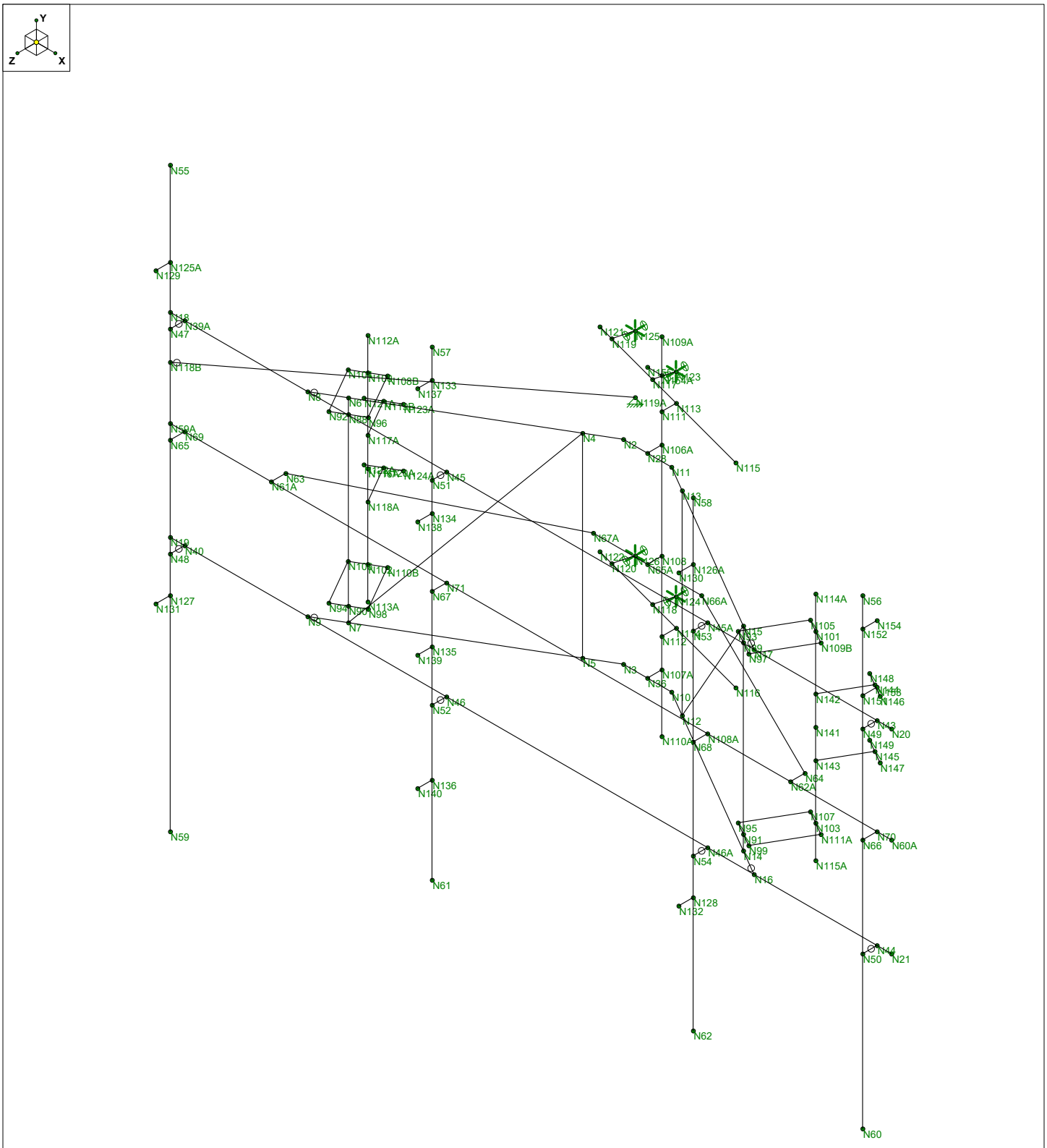

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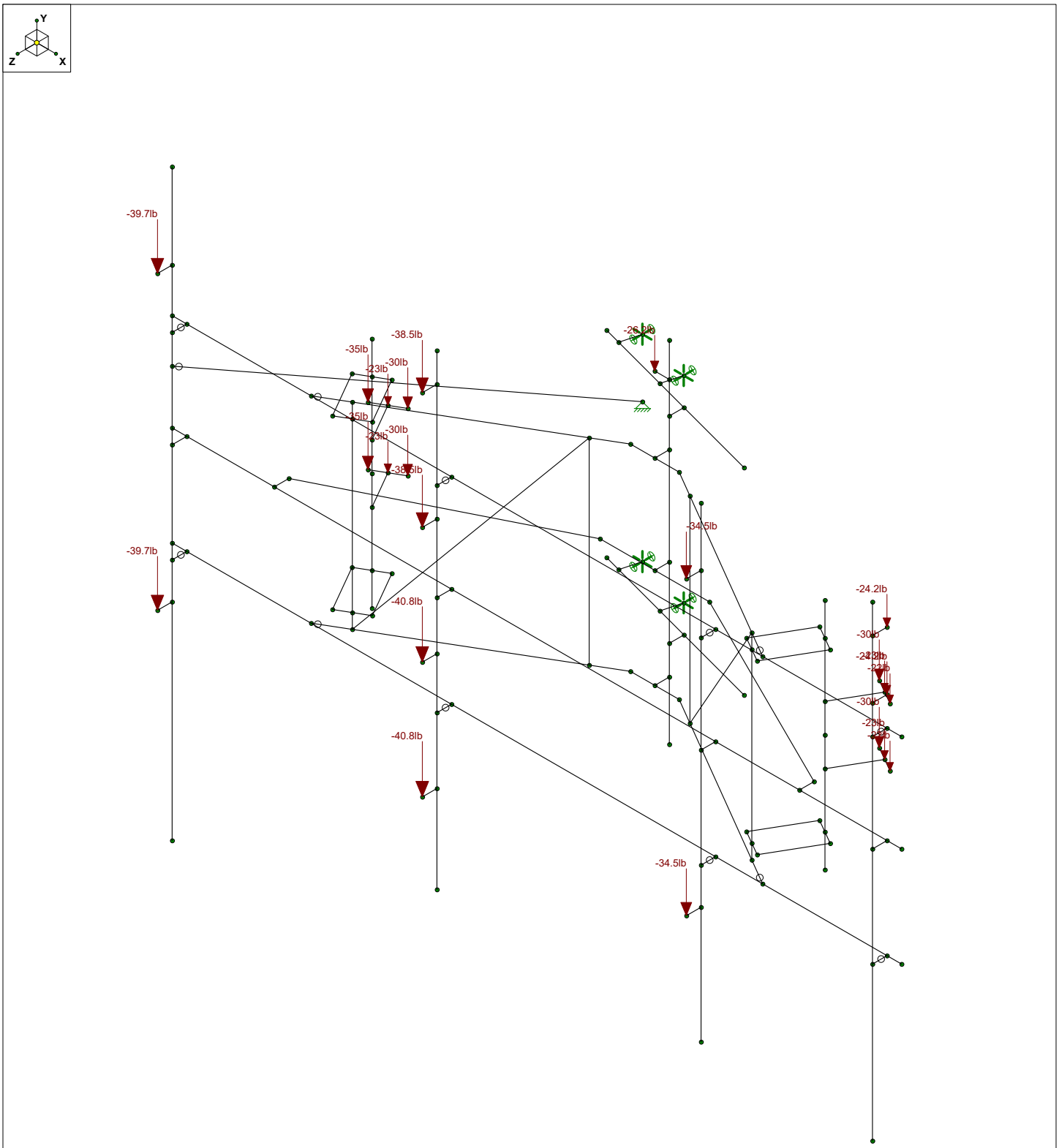

Loads: BLC 1, DL
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Fullerton Engineering, P.C.		SK - 6
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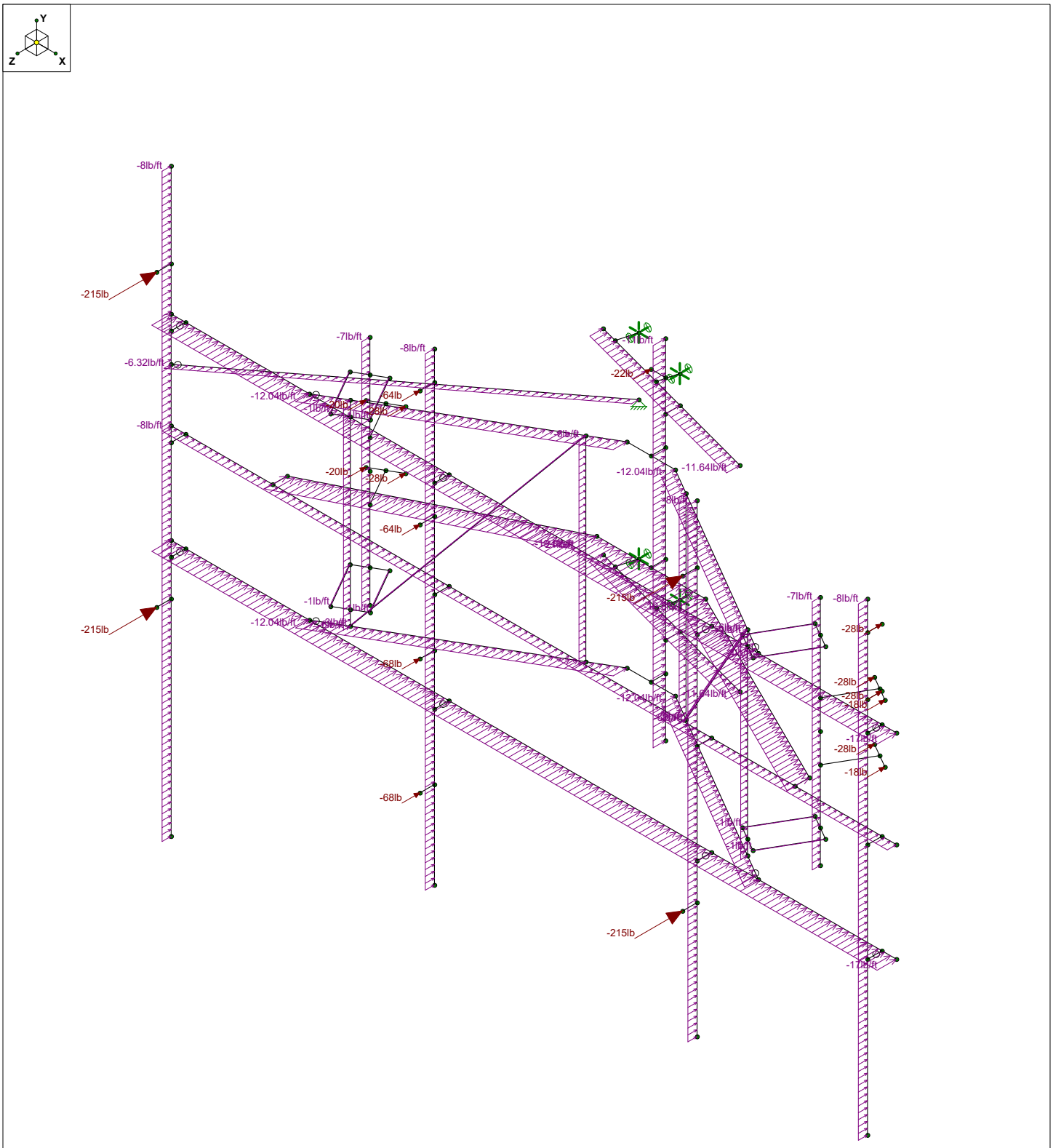
CTL05633	Dead Load	CTL05633 - Mount Analysis - Rev ...



Loads: BLC 3, WL(0)
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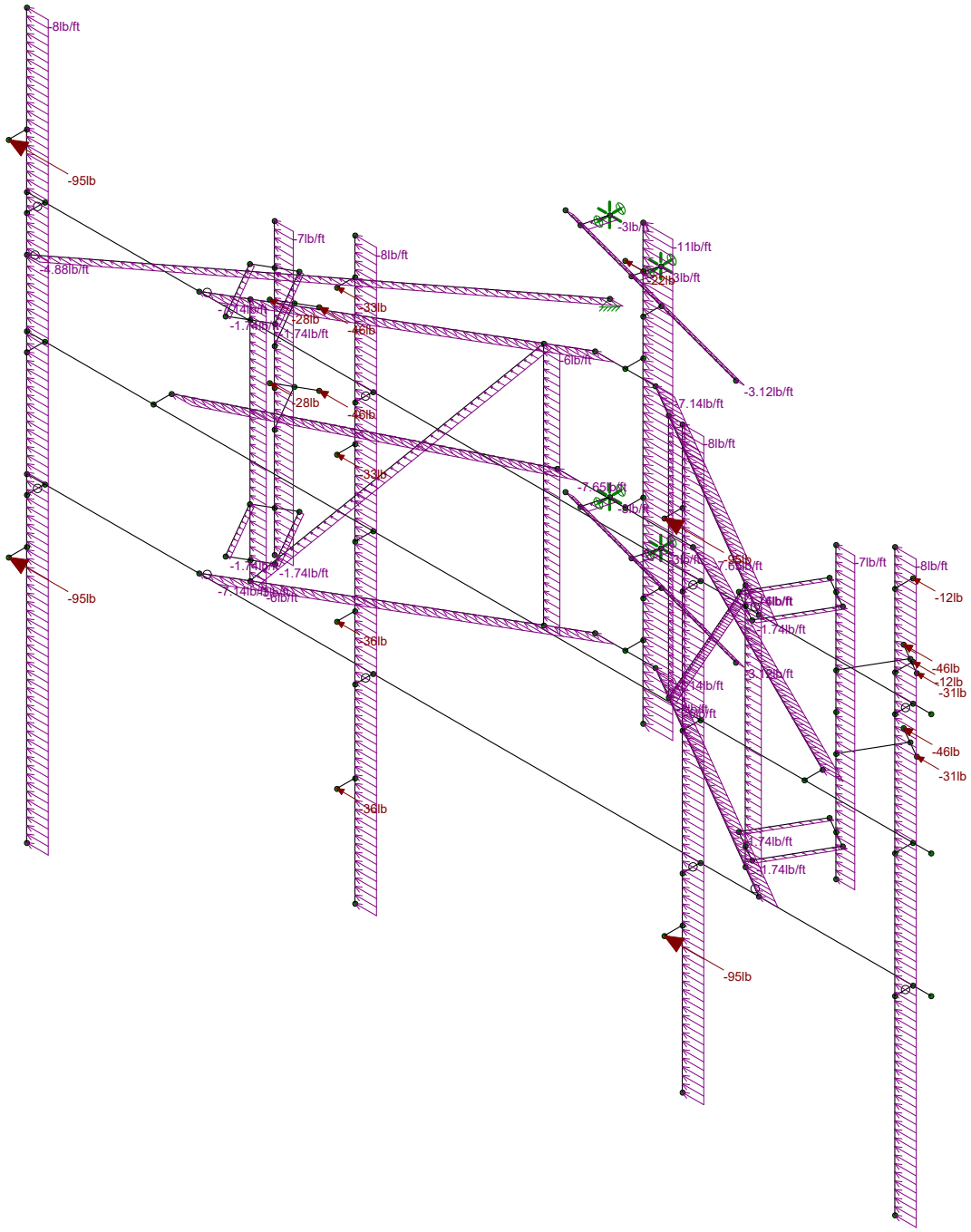
Fullerton Engineering, P.C.		SK - 7
GM	Mount Analysis	Apr 27, 2022 at 9:37 AM
CTL05633	Wind Load (Z-Direction)	CTL05633 - Mount Analysis - Rev ...



Loads: BLC 4, WL(90)
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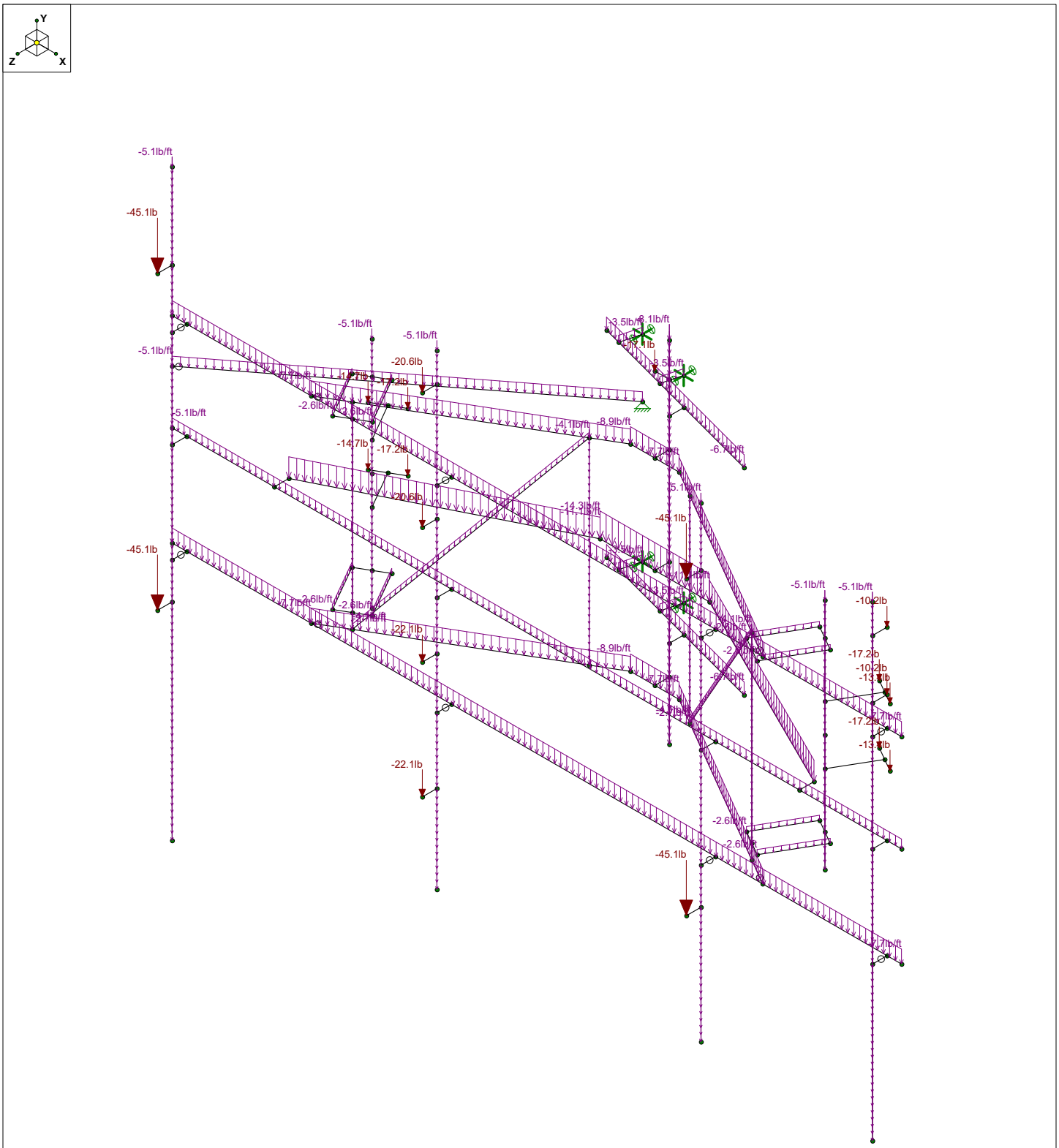
Fullerton Engineering, P.C.		SK - 8
GM	Mount Analysis	Apr 27, 2022 at 9:37 AM
CTL05633	Wind Load (X-Direction)	CTL05633 - Mount Analysis - Rev ...



Loads: BLC 2, DLi
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Fullerton Engineering, P.C.		SK - 9
GM	Mount Analysis	Apr 27, 2022 at 9:38 AM
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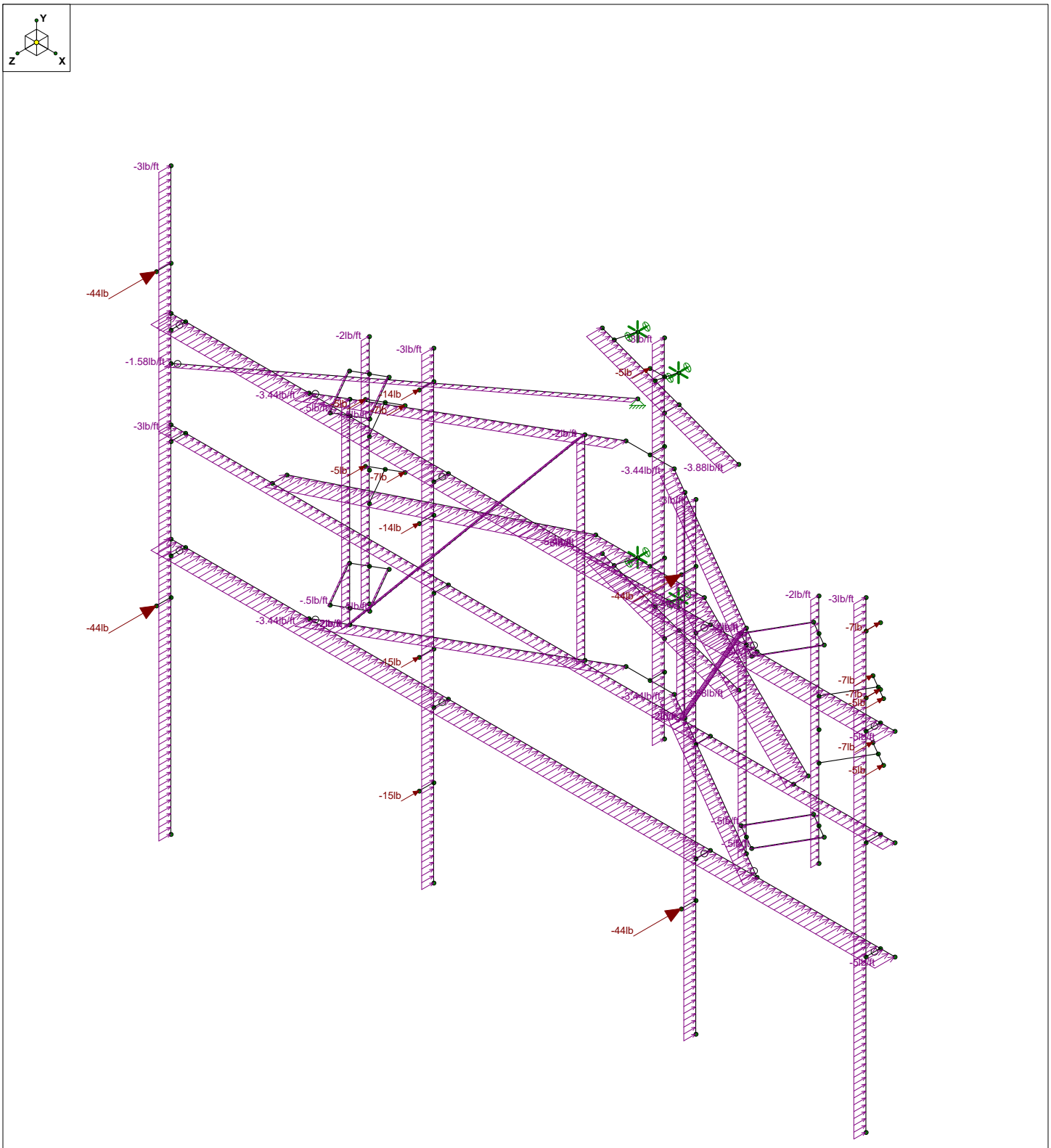

Loads: BLC 5, WL.i(0)
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Fullerton Engineering, P.C.		SK - 10
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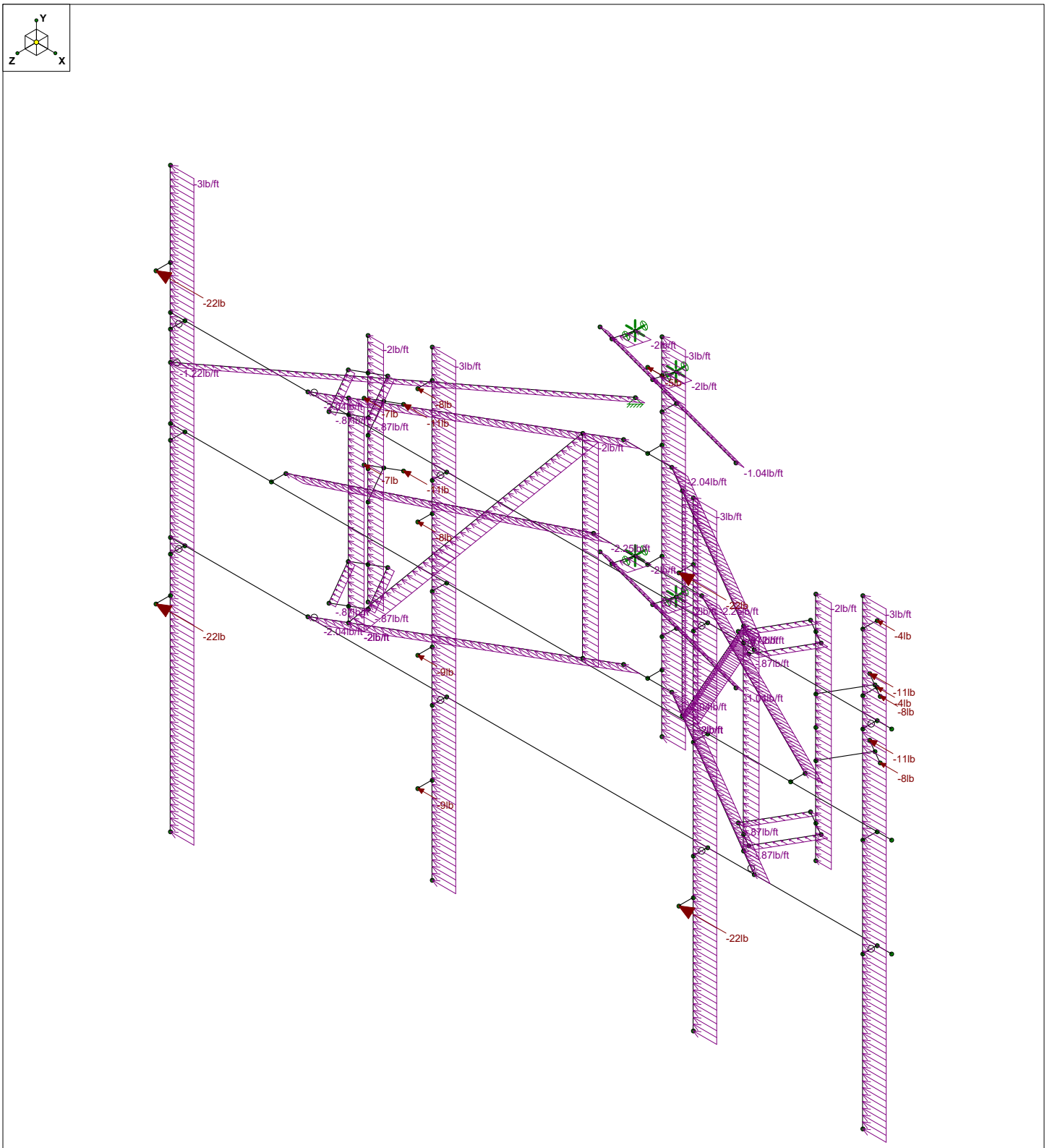

Loads: BLC 6, WL.i(90)
Envelope Only Solution

Fullerton Engineering, P.C.		SK - 11
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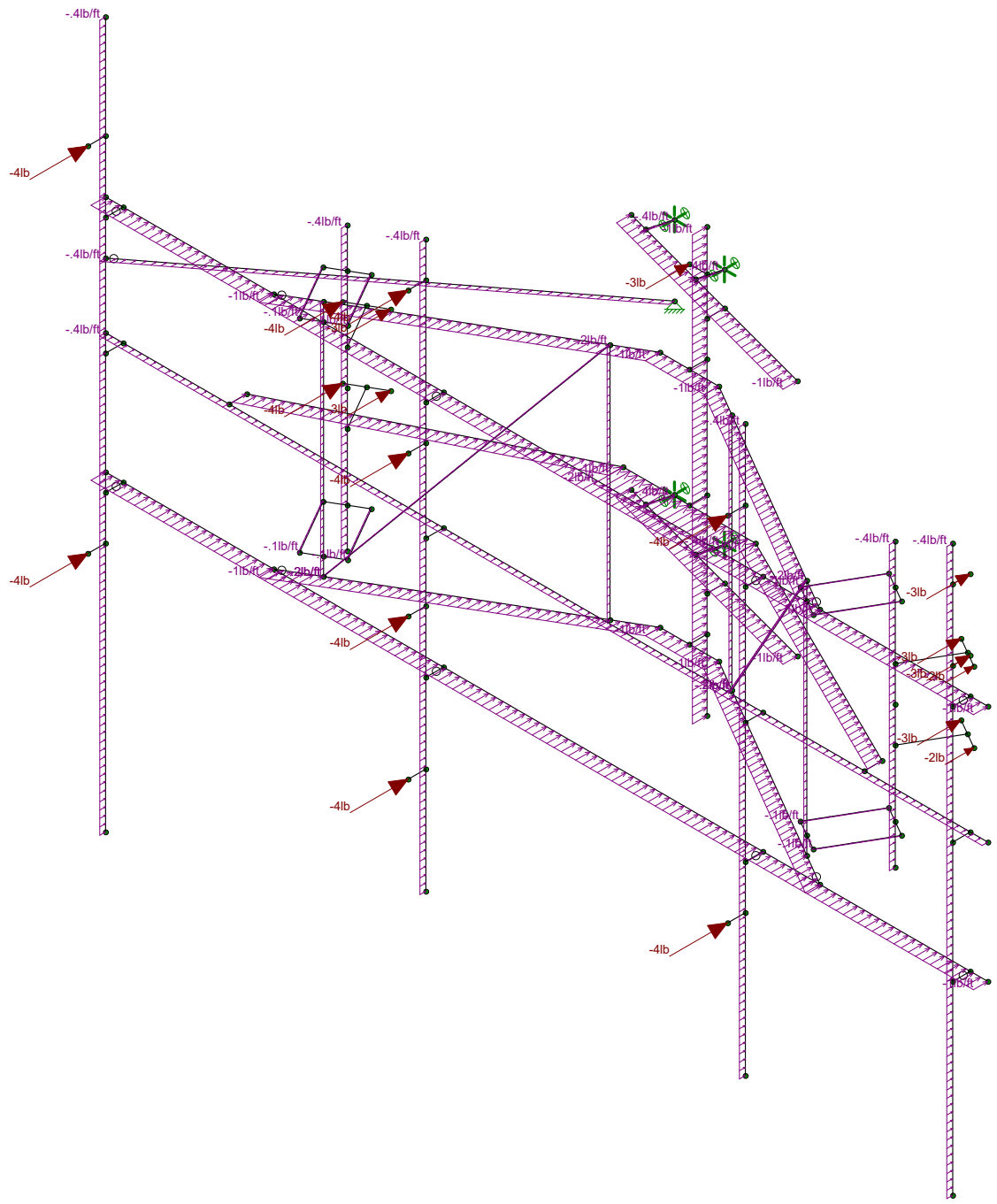
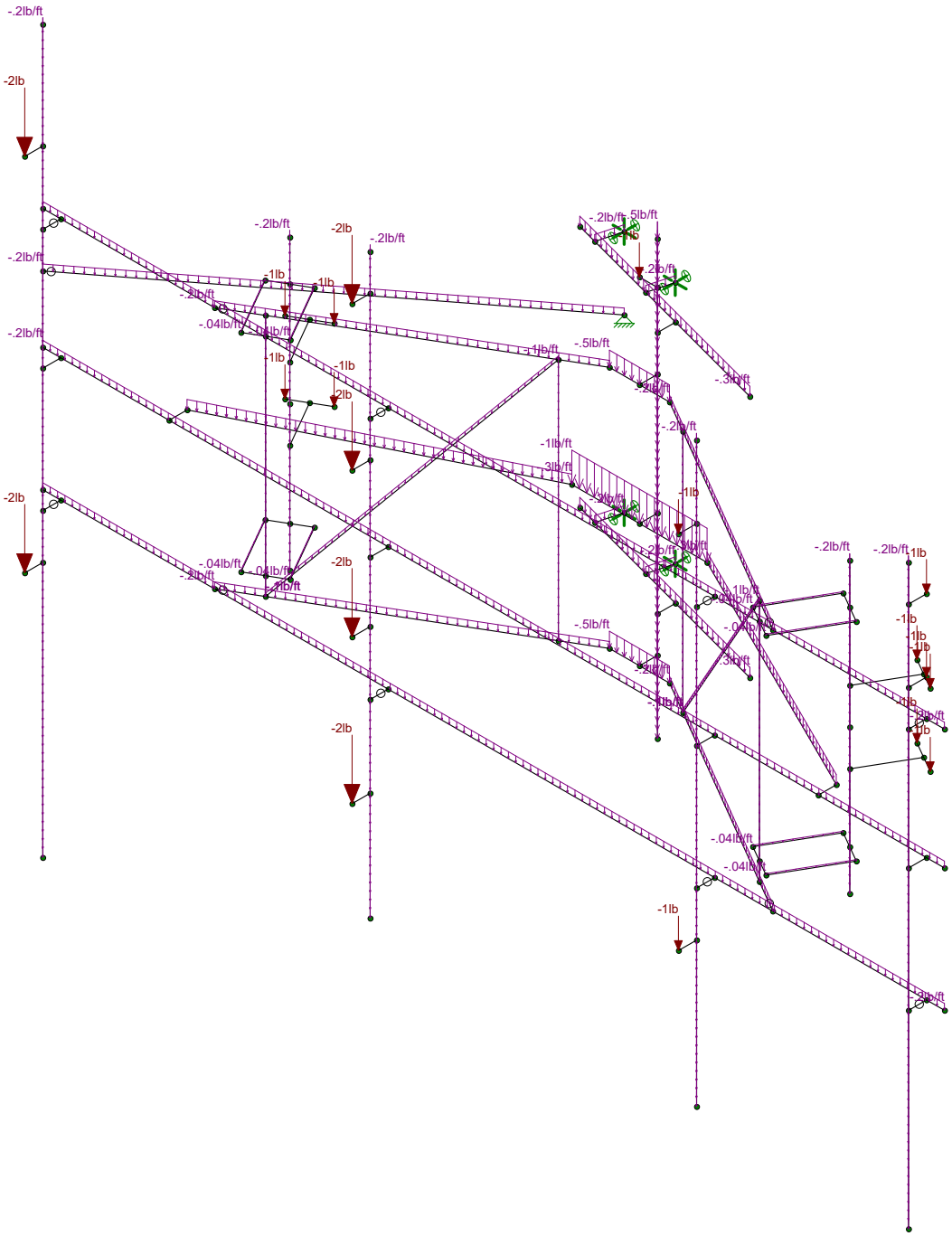
CTL05633	Wind Load w/ Ice (X-Direction)	CTL05633 - Mount Analysis - Rev ...



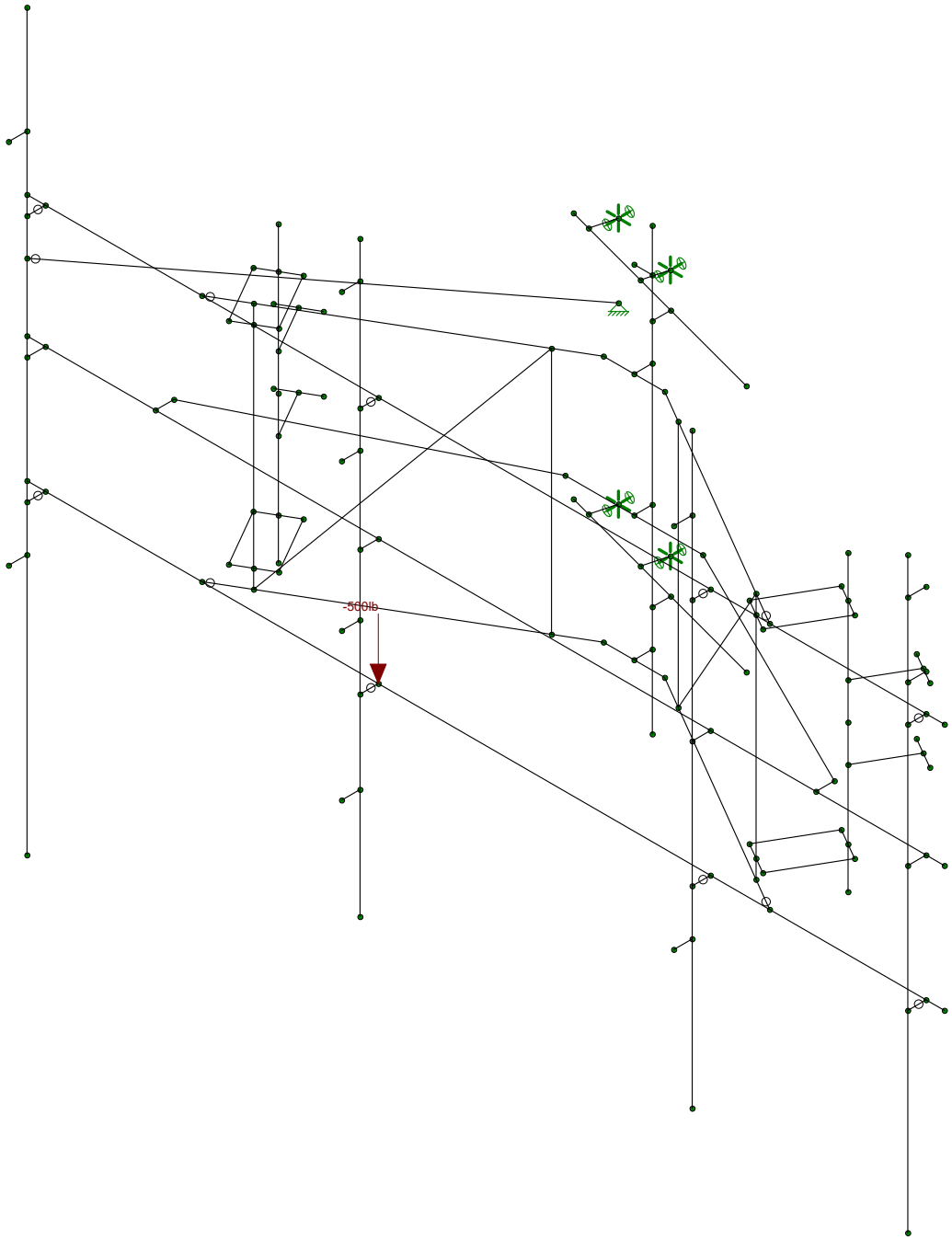
Loads: BLC 8, EH(0)
Envelope Only Solution

Fullerton Engineering, P.C.		SK - 12
GM	Mount Analysis	Apr 27, 2022 at 9:39 AM
CTL05633	Horizontal Seismic	CTL05633 - Mount Analysis - Rev ...



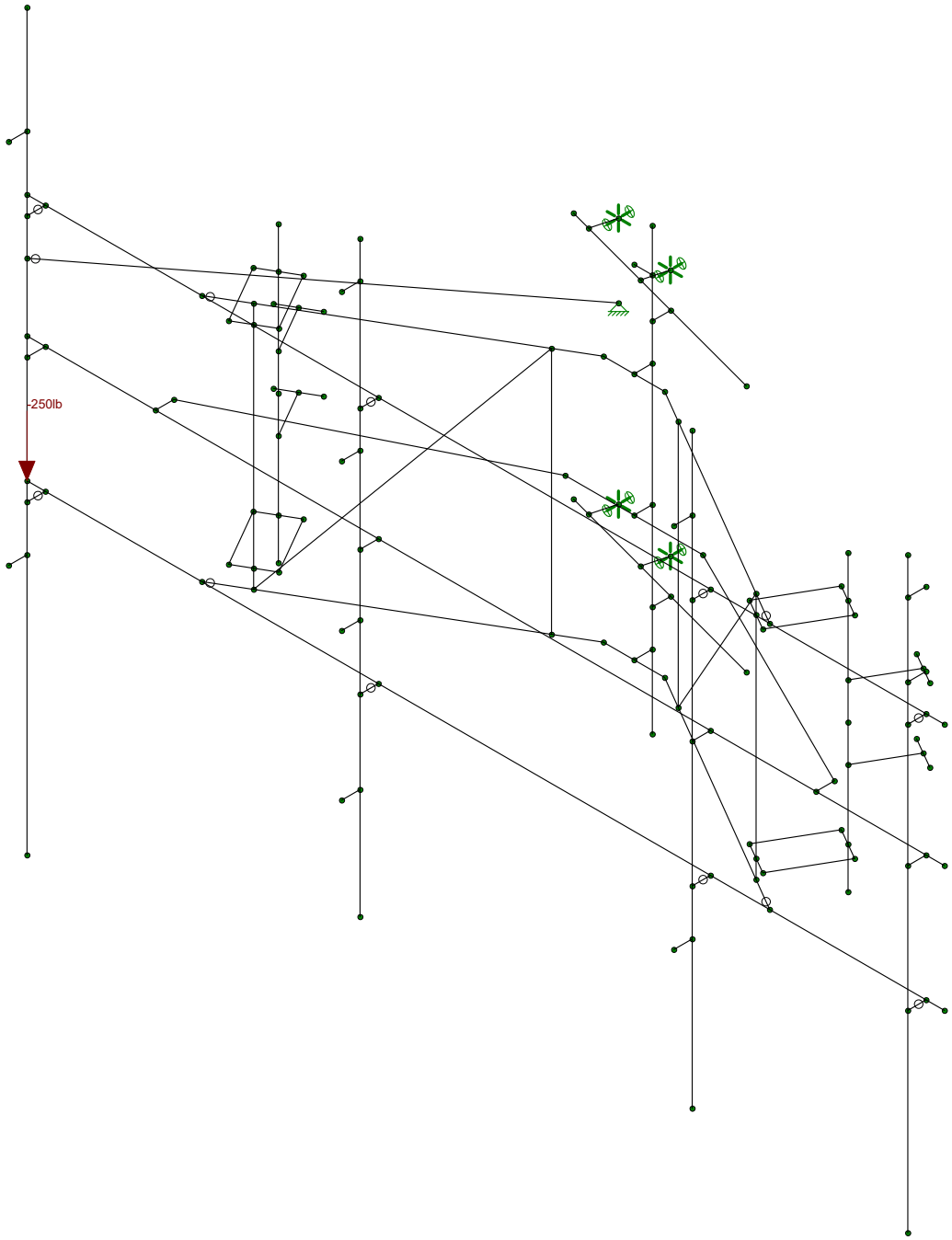
Loads: BLC 10, EV
Envelope Only Solution

Fullerton Engineering, P.C.		SK - 13
GM	Mount Analysis	Apr 27, 2022 at 9:39 AM
CTL05633	Vertical Seismic	CTL05633 - Mount Analysis - Rev ...



Loads: BLC 15, LM3
Envelope Only Solution

Fullerton Engineering, P.C.		SK - 14
GM	Mount Analysis	Apr 27, 2022 at 9:39 AM
CTL05633	500lbs Live Load	CTL05633 - Mount Analysis - Rev ...



Loads: BLC 26, LV2
Envelope Only Solution

Fullerton Engineering, P.C.		SK - 15
GM	Mount Analysis	Apr 27, 2022 at 9:40 AM
CTL05633	250lbs Live Load	CTL05633 - Mount Analysis - Rev ...

(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?	Yes
Max Iterations for Wall Stiffness	3
Gravity Acceleration (ft/sec^2)	32.2
Wall Mesh Size (in)	12
Eigensolution Convergence Tol. (1.E-)	4
Vertical Axis	Y
Global Member Orientation Plane	XZ
Static Solver	Sparse Accelerated
Dynamic Solver	Accelerated Solver

Hot Rolled Steel Code	AISC 15th(360-16): LRFD
Adjust Stiffness?	Yes(Iterative)
RISAConnection Code	AISC 15th(360-16): LRFD
Cold Formed Steel Code	None
Wood Code	None
Wood Temperature	< 100F
Concrete Code	None
Masonry Code	None
Aluminum Code	None - Building
Stainless Steel Code	AISC 14th(360-10): ASD
Adjust Stiffness?	Yes(Iterative)

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?	Yes
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 7-16
Seismic Base Elevation (ft)	474
Add Base Weight?	Yes
Ct X	.02
Ct Z	.02
T X (sec)	Not Entered
T Z (sec)	Not Entered
R X	3
R Z	3
Ct Exp. X	.75
Ct Exp. Z	.75
SD1	.087
SDS	.214
S1	.054
TL (sec)	6
Risk 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

Hot Rolled Steel Design Parameters

	Label	Shape	Length[...	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot...	L-torq...	Kyy	Kzz	Cb	Funct...
1	M1	Face Horizontals	12.5	4.525	4.525	4.525	4.525	4.525	2.1	2.1		Lateral
2	M2	Face Horizontals	12.5	4.525	4.525	4.525	4.525	4.525	2.1	2.1		Lateral
3	M3	L3X3X4	4			Lbyy			.8	.8		Lateral
4	M4	L3X3X4	4			Lbyy			.8	.8		Lateral
5	M5	L3X3X4	4			Lbyy			.8	.8		Lateral
6	M6	L3X3X4	4			Lbyy			.8	.8		Lateral
7	M7	PIPE_1.25	3.375			Lbyy			.65	.65		Lateral
8	M8	PIPE_1.25	3.375			Lbyy			.65	.65		Lateral
9	M9	PIPE_1.25	3.375			Lbyy			.65	.65		Lateral
10	M10	PIPE_1.25	3.375			Lbyy			.65	.65		Lateral
11	M11	PL3/4"x5"	.833			Lbyy			.65	.65		Lateral
12	M12	PL3/4"x5"	.833			Lbyy			.65	.65		Lateral
13	M13	SR 3/4" dia.	4.494			Lbyy			.65	.65		Lateral
14	M14	SR 3/4" dia.	4.494			Lbyy			.65	.65		Lateral
15	M34	Mounting Pipes	10	4.167	4.167	4.167	4.167	4.167	2.1	2.1		Lateral
16	M35	Mounting Pipes	8	3.375	3.375	3.375	3.375	3.375	2.1	2.1		Lateral
17	M36	Mounting Pipes	8	3.375	3.375	3.375	3.375	3.375	2.1	2.1		Lateral
18	M37	Mounting Pipes	8	3.375	3.375	3.375	3.375	3.375	2.1	2.1		Lateral
19	M30A	V-Stabilizer Horizontal	12.5	4.525	4.525	4.525	4.525	4.525	2.1	2.1		Lateral
20	M37A	V-Stabilizer connection chan...	1.875			Lbyy			.65	.65		Lateral
21	M38A	V-Stabilizer arm	3.978			Lbyy			.65	.65		Lateral
22	M39	V-Stabilizer arm	3.978			Lbyy			.65	.65		Lateral
23	M57A	Sector Frame Mast Pipe	6	1.667	1.667	1.667	1.667	1.667	2.1	2.1		Lateral
24	M63	Tower Leg Connection HSS	3.333	1.458	1.458	1.458	1.458	1.458	2.1	2.1		Lateral
25	M64	Tower Leg Connection HSS	3.333	1.458	1.458	1.458	1.458	1.458	2.1	2.1		Lateral

Hot Rolled Steel Design Parameters (Continued)

	Label	Shape	Length[...	Lbyy[ft]	Lbzz[ft]	Lcomp top...	Lcomp bot...	L-torq...	Kyy	Kzz	Cb	Funct...
26	M65	Tower Leg Connection Solid ...	.333			Lbyy			.65	.65		Lateral
27	M66	Tower Leg Connection Solid ...	.333			Lbyy			.65	.65		Lateral
28	M67	Tower Leg Connection Solid ...	.333			Lbyy			.65	.65		Lateral
29	M68	Tower Leg Connection Solid ...	.333			Lbyy			.65	.65		Lateral
30	M58A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
31	M59	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
32	M60A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
33	M61A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
34	M62A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
35	M63A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
36	M64A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
37	M65A	RRH Pipe-to-pipe Threaded ...	.917			Lbyy			.65	.65		Lateral
38	M66A	Mounting Pipes	4	2.875	2.875	2.875	2.875	2.875	2.1	2.1		Lateral
39	M67A	Mounting Pipes	4	2.875	2.875	2.875	2.875	2.875	2.1	2.1		Lateral
40	M70	Stabilizer Pipe	5.747			Lbyy			1	1		Lateral

Material Takeoff

	Material	Size	Pieces	Length[ft]	Weight[K]
1	General				
2	RIGID		46	16.5	0
3	Total General		46	16.5	0
4					
5	Hot Rolled Steel				
6	A36 Gr.36	C5.44x3.7	2	8	.063
7	A36 Gr.36	C6x6.5	1	1.9	.03
8	A36 Gr.36	L3X3X4	6	41	.201
9	A36 Gr.36	PL3/4"x5"	2	1.7	.021
10	A36 Gr.36	SR 3/4" dia.	2	9	.014
11	A36 Gr.36	SR_1.25	4	1.3	.006
12	A36 Gr.36	SR_0.625	8	7.3	.008
13	A500 Gr.46	HSS2.5X2.5X4	2	6.7	.045
14	A53 Gr. B	PIPE_1.25	4	13.5	.029
15	A53 Gr. B	PIPE_2.0	8	60.2	.209
16	A53 Gr. B	PIPE_4.0	1	6	.06
17	Total HR Steel		40	156.6	.685

Basic Load Cases

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
1	DL	None		-1		23				
2	DLi	None				19		40		
3	WL(0)	None				19		34		
4	WL(90)	None				19		34		
5	WL.i(0)	None				19		34		
6	WL.i(90)	None				19		42		
7	T	None								
8	EH(0)	None				19		40		
9	EH(90)	None				19		40		
10	EV	None				19		40		
11	WM(0)	None				19		34		

Basic Load Cases (Continued)

	BLC Description	Category	X Gravity	Y Gravity	Z Gravity	Joint	Point	Distributed	Area(Me...	Surface(P...
12	WM(90)	None				19		34		
13	LM1	None				1				
14	LM2	None				1				
15	LM3	None				1				
16	LM4	None				1				
25	LV1	None				1				
26	LV2	None				1				
27	LV3	None				1				
28	LV4	None				1				

Load Combinations

	Description	S...	P...	S...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...
1	1.4*DL	Yes	Y		1	1.4																		
2	1.2*DL + 1.0* WL(0)	Yes	Y		1	1.2	3	1																
3	1.2*DL + 1.0* WL(30)	Yes	Y		1	1.2	3	.869	4	.5														
4	1.2*DL + 1.0* WL(60)	Yes	Y		1	1.2	3	.5	4	.869														
5	1.2*DL + 1.0*WL(90)	Yes	Y		1	1.2	4	1																
6	1.2*DL + 1.0*WL(120)	Yes	Y		1	1.2	3	-.5	4	.869														
7	1.2*DL +1.0*WL(150)	Yes	Y		1	1.2	3	-.869	4	.5														
8	1.2*DL + 1.0 * WL(180)	Yes	Y		1	1.2	3	-1																
9	1.2*DL + 1.0* WL(210)	Yes	Y		1	1.2	3	-.869	4	-.5														
10	1.2*DL + 1.0* WL(240)	Yes	Y		1	1.2	3	-.5	4	-.869														
11	1.2*DL + 1.0*WL(270)	Yes	Y		1	1.2	4	-1																
12	1.2*DL + 1.0*WL(300)	Yes	Y		1	1.2	3	.5	4	-.869														
13	1.2*DL +1.0*WL(330)	Yes	Y		1	1.2	3	.869	4	-.5														
14	1.2*DL+1.0*DLi+1.0*WL.i(0)...	Yes	Y		1	1.2	2	1	5	1	7	1												
15	1.2*DL+1.0*DLi+1.0*WL.i(3...	Yes	Y		1	1.2	2	1	5	.866	6	.5	7	1										
16	1.2*DL+1.0*DLi+1.0*WL.i(6...	Yes	Y		1	1.2	2	1	5	.5	6	.866	7	1										
17	1.2*DL+1.0*DLi+1.0*WL.i(9...	Yes	Y		1	1.2	2	1	6	1	7	1												
18	1.2*DL+1.0*DLi+1.0*WL.i(1...	Yes	Y		1	1.2	2	1	5	-.5	6	.866	7	1										
19	1.2*DL+1.0*DLi+1.0*WL.i(1...	Yes	Y		1	1.2	2	1	5	-.866	6	.5	7	1										
20	1.2*DL+1.0*DLi+1.0*WL.i(1...	Yes	Y		1	1.2	2	1	5	-1	7	1												
21	1.2*DL+1.0*DLi+1.0*WL.i(2...	Yes	Y		1	1.2	2	1	5	-.866	6	-.5	7	1										
22	1.2*DL+1.0*DLi+1.0*WL.i(2...	Yes	Y		1	1.2	2	1	5	-.5	6	-.866	7	1										
23	1.2*DL+1.0*DLi+1.0*WL.i(2...	Yes	Y		1	1.2	2	1	6	-1	7	1												
24	1.2*DL+1.0*DLi+1.0*WL.i(3...	Yes	Y		1	1.2	2	1	5	.5	6	-.866	7	1										
25	1.2*DL+1.0*DLi+1.0*WL.i(3...	Yes	Y		1	1.2	2	1	5	.866	6	-.5	7	1										
26	1.2*DL+1.0*EH(0)+1.0*EV(+)	Yes	Y		1	1.2	8	1	10	1														
27	1.2*DL+1.0*EH(0)+1.0*EV(-)	Yes	Y		1	1.2	8	1	10	-1														
28	1.2*DL+1.0*EH(90)+1.0*EV(..	Yes	Y		1	1.2	9	1	10	1														
29	1.2*DL+1.0*EH(90)+1.0*EV(-)	Yes	Y		1	1.2	9	1	10	-1														
30	1.2*DL+1.0*EH(180)+1.0*E...	Yes	Y		1	1.2	8	-1	10	1														
31	1.2*DL+1.0*EH(180)+1.0*E...	Yes	Y		1	1.2	8	-1	10	-1														
32	1.2*DL+1.0*EH(270)+1.0*E...	Yes	Y		1	1.2	9	-1	10	1														
33	1.2*DL+1.0*EH(270)+1.0*E...	Yes	Y		1	1.2	9	-1	10	-1														
34	0.9*DL+1.0*EH(0)-1.0*EV(+)	Yes	Y		1	.9	8	1	10	-1														
35	0.9*DL+1.0*EH(0)-1.0*EV(-)	Yes	Y		1	.9	8	1	10	1														
36	0.9*DL+1.0*EH(90)-1.0*EV(+)	Yes	Y		1	.9	9	1	10	-1														
37	0.9*DL+1.0*EH(90)-1.0*EV(-)	Yes	Y		1	.9	9	1	10	1														
38	0.9*DL+1.0*EH(180)-1.0*EV..	Yes	Y		1	.9	8	-1	10	-1														

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac..	B...	Fac...
39	0.9*DL+1.0*EH(180)-1.0*EV..	Yes	Y		1	.9	8	-1	10	1																
40	0.9*DL+1.0*EH(270)-1.0*EV..	Yes	Y		1	.9	9	-1	10	-1																
41	0.9*DL+1.0*EH(270)-1.0*EV..	Yes	Y		1	.9	9	-1	10	1																
42	1.2*DL+1.5*LM1+1.0*WM(0)	Yes	Y		1	1.2	13	1.5	11	1																
43	1.2*DL+1.5*LM1+1.0*WM(30)	Yes	Y		1	1.2	13	1.5	11	.866	12	.5														
44	1.2*DL+1.5*LM1+1.0*WM(60)	Yes	Y		1	1.2	13	1.5	11	.5	12	.866														
45	1.2*DL+1.5*LM1+1.0*WM(90)	Yes	Y		1	1.2	13	1.5	12	1																
46	1.2*DL+1.5*LM1+1.0*WM(1...	Yes	Y		1	1.2	13	1.5	11	-.5	12	.866														
47	1.2*DL+1.5*LM1+1.0*WM(1...	Yes	Y		1	1.2	13	1.5	11	-.866	12	.5														
48	1.2*DL+1.5*LM1+1.0*WM(1...	Yes	Y		1	1.2	13	1.5	11	-1																
49	1.2*DL+1.5*LM1+1.0*WM(2...	Yes	Y		1	1.2	13	1.5	11	-.866	12	-.5														
50	1.2*DL+1.5*LM1+1.0*WM(2...	Yes	Y		1	1.2	13	1.5	11	-.5	12	-.866														
51	1.2*DL+1.5*LM1+1.0*WM(2...	Yes	Y		1	1.2	13	1.5	12	-1																
52	1.2*DL+1.5*LM1+1.0*WM(3...	Yes	Y		1	1.2	13	1.5	11	.5	12	-.866														
53	1.2*DL+1.5*LM1+1.0*WM(3...	Yes	Y		1	1.2	13	1.5	11	.866	12	-.5														
54	1.2*DL+1.5*LM2+1.0*WM(0)	Yes	Y		1	1.2	14	1.5	11	1																
55	1.2*DL+1.5*LM2+1.0*WM(30)	Yes	Y		1	1.2	14	1.5	11	.866	12	.5														
56	1.2*DL+1.5*LM2+1.0*WM(60)	Yes	Y		1	1.2	14	1.5	11	.5	12	.866														
57	1.2*DL+1.5*LM2+1.0*WM(90)	Yes	Y		1	1.2	14	1.5	12	1																
58	1.2*DL+1.5*LM2+1.0*WM(1...	Yes	Y		1	1.2	14	1.5	11	-.5	12	.866														
59	1.2*DL+1.5*LM2+1.0*WM(1...	Yes	Y		1	1.2	14	1.5	11	-.866	12	.5														
60	1.2*DL+1.5*LM2+1.0*WM(1...	Yes	Y		1	1.2	14	1.5	11	-1																
61	1.2*DL+1.5*LM2+1.0*WM(2...	Yes	Y		1	1.2	14	1.5	11	-.866	12	-.5														
62	1.2*DL+1.5*LM2+1.0*WM(2...	Yes	Y		1	1.2	14	1.5	11	-.5	12	-.866														
63	1.2*DL+1.5*LM2+1.0*WM(2...	Yes	Y		1	1.2	14	1.5	12	-1																
64	1.2*DL+1.5*LM2+1.0*WM(3...	Yes	Y		1	1.2	14	1.5	11	.5	12	-.866														
65	1.2*DL+1.5*LM2+1.0*WM(3...	Yes	Y		1	1.2	14	1.5	11	.866	12	-.5														
66	1.2*DL+1.5*LM3+1.0*WM(0)	Yes	Y		1	1.2	15	1.5	11	1																
67	1.2*DL+1.5*LM3+1.0*WM(30)	Yes	Y		1	1.2	15	1.5	11	.866	12	.5														
68	1.2*DL+1.5*LM3+1.0*WM(60)	Yes	Y		1	1.2	15	1.5	11	.5	12	.866														
69	1.2*DL+1.5*LM3+1.0*WM(90)	Yes	Y		1	1.2	15	1.5	12	1																
70	1.2*DL+1.5*LM3+1.0*WM(1...	Yes	Y		1	1.2	15	1.5	11	-.5	12	.866														
71	1.2*DL+1.5*LM3+1.0*WM(1...	Yes	Y		1	1.2	15	1.5	11	-.866	12	.5														
72	1.2*DL+1.5*LM3+1.0*WM(1...	Yes	Y		1	1.2	15	1.5	11	-1																
73	1.2*DL+1.5*LM3+1.0*WM(2...	Yes	Y		1	1.2	15	1.5	11	-.866	12	-.5														
74	1.2*DL+1.5*LM3+1.0*WM(2...	Yes	Y		1	1.2	15	1.5	11	-.5	12	-.866														
75	1.2*DL+1.5*LM3+1.0*WM(2...	Yes	Y		1	1.2	15	1.5	12	-1																
76	1.2*DL+1.5*LM3+1.0*WM(3...	Yes	Y		1	1.2	15	1.5	11	.5	12	-.866														
77	1.2*DL+1.5*LM3+1.0*WM(3...	Yes	Y		1	1.2	15	1.5	11	.866	12	-.5														
78	1.2*DL+1.5*LM4+1.0*WM(0)	Yes	Y		1	1.2	16	1.5	11	1																
79	1.2*DL+1.5*LM4+1.0*WM(30)	Yes	Y		1	1.2	16	1.5	11	.866	12	.5														
80	1.2*DL+1.5*LM4+1.0*WM(60)	Yes	Y		1	1.2	16	1.5	11	.5	12	.866														
81	1.2*DL+1.5*LM4+1.0*WM(90)	Yes	Y		1	1.2	16	1.5	12	1																
82	1.2*DL+1.5*LM4+1.0*WM(1...	Yes	Y		1	1.2	16	1.5	11	-.5	12	.866														
83	1.2*DL+1.5*LM4+1.0*WM(1...	Yes	Y		1	1.2	16	1.5	11	-.866	12	.5														
84	1.2*DL+1.5*LM4+1.0*WM(1...	Yes	Y		1	1.2	16	1.5	11	-1																
85	1.2*DL+1.5*LM4+1.0*WM(2...	Yes	Y		1	1.2	16	1.5	11	-.866	12	-.5														
86	1.2*DL+1.5*LM4+1.0*WM(2...	Yes	Y		1	1.2	16	1.5	11	-.5	12	-.866														
87	1.2*DL+1.5*LM4+1.0*WM(2...	Yes	Y		1	1.2	16	1.5	12	-1																
88	1.2*DL+1.5*LM4+1.0*WM(3...	Yes	Y		1	1.2	16	1.5	11	.5	12	-.866														
89	1.2*DL+1.5*LM4+1.0*WM(3...	Yes	Y		1	1.2	16	1.5	11	.866	12	-.5														
90	1.2*DL+1.5*LV1	Yes	Y		1	1.2	25	1.5																		

Load Combinations (Continued)

	Description	S...	P...	S...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...	B...	Fac...
91	1.2*DL+1.5*LV2	Yes	Y		1	1.2	26	1.5																		
92	1.2*DL+1.5*LV3	Yes	Y		1	1.2	27	1.5																		
93	1.2*DL+1.5*LV4	Yes	Y		1	1.2	28	1.5																		

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	N123	max	779.028	81	1811.568	17	1102.698	12	0	93	0	93	-.003	5
2		min	-860.944	51	682.312	40	-3600.039	6	0	1	0	1	-.034	23
3	N124	max	800.136	45	1349.792	24	3946.032	12	0	93	0	93	-.006	50
4		min	-911.643	87	524.726	36	-1449.18	6	0	1	0	1	-.053	80
5	N125	max	395.685	4	35.78	10	1946.57	5	0	93	0	93	.037	17
6		min	-762.052	50	-84.066	4	-1557.121	11	0	1	0	1	.005	11
7	N126	max	752.456	44	59.681	82	1702.818	5	0	93	0	93	.026	50
8		min	-448.214	10	-148.597	52	-1951.302	11	0	1	0	1	-.006	80
9	N119A	max	919.013	10	27.244	22	620.716	4	0	93	0	93	0	93
10		min	-789.418	4	8.389	36	-729.851	10	0	1	0	1	0	1
11	Totals:	max	1608.677	5	3048.747	15	2927.785	2						
12		min	-1608.677	11	1195.017	40	-2927.779	8						

STRESS RATIO<1.0,
MEMBERS ARE ADEQUATE

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

	Member	Shape	Code ...	Loc[ft]	LC	Shear...	Loc[...	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
1	M14	SR 3/4" dia.	.000	0	93	.000	0		93	2856.3...	14313....	.179	.179	1	H1-1a
2	M70	PIPE_2.0	.047	0	4	.003	0		21	21622....	32130	1.872	1.872	1...	H1-1b*
3	M67A	PIPE_2.0	.056	2.5	10	.049	3.417		4	20754....	32130	1.872	1.872	1	H1-1b
4	M66A	PIPE_2.0	.059	2.5	12	.054	2.5		5	20754....	32130	1.872	1.872	1	H1-1b
5	M7	PIPE_1.25	.117	.246	6	.238	0		6	17452....	19687.5	.801	.801	1...	H3-6
6	M8	PIPE_1.25	.126	0	19	.026	3.375		87	17452....	19687.5	.801	.801	2...	H1-1b
7	M38A	C5.44x3.7	.127	0	79	.026	1.906	y	68	59711....	75920....	5.617	13.118	1...	H1-1b
8	M12	PL3/4"x5"	.142	.417	25	.066	.417	y	52	115869...	121500	1.898	12.656	1...	H1-1b
9	M36	PIPE_2.0	.145	3.667	54	.066	2		49	17593....	32130	1.872	1.872	1	H1-1b
10	M35	PIPE_2.0	.145	2	59	.063	3.667		58	17593....	32130	1.872	1.872	1	H1-1b
11	M13	SR 3/4" dia.	.152	4.494	84	.007	0		2	2856.3...	14313....	.179	.179	2...	H1-1b*
12	M3	L3X3X4	.191	3.5	87	.041	4	z	9	37187....	46656	1.688	3.756	2...	H2-1
13	M5	L3X3X4	.193	.542	48	.040	0	y	25	37187....	46656	1.688	3.756	1...	H2-1
14	M34	PIPE_2.0	.207	2.917	9	.131	2.5		4	12830....	32130	1.872	1.872	1	H1-1b
15	M37	PIPE_2.0	.211	3.667	46	.076	3.667		51	17593....	32130	1.872	1.872	1	H1-1b
16	M6	L3X3X4	.213	.542	42	.024	.542	z	53	37187....	46656	1.688	3.756	1...	H2-1
17	M57A	PIPE_4.0	.225	3.25	43	.140	1.625		83	89657....	93240	10.631	10.631	1	H1-1b
18	M11	PL3/4"x5"	.245	.417	81	.098	.417	y	47	115869...	121500	1.898	12.656	1...	H1-1b
19	M4	L3X3X4	.247	3.5	80	.081	4	y	16	37187....	46656	1.688	3.756	2...	H2-1
20	M9	PIPE_1.25	.254	3.375	52	.038	0		44	17452....	19687.5	.801	.801	2...	H1-1b
21	M63	HSS2.5X2.5X4	.295	1.458	11	.221	2.014	z	19	73077....	81558	5.623	5.623	1	H1-1b
22	M39	C5.44x3.7	.306	0	44	.057	1.865	y	44	59711....	75920....	4.02	13.118	1...	H1-1b
23	M10	PIPE_1.25	.311	3.375	44	.235	3.375		4	17452....	19687.5	.801	.801	2...	H1-1b
24	M1	L3X3X4	.313	10.026	8	.027	2.474	y	2	8562.0...	46656	1.688	3.303	1	H2-1
25	M65A	SR_0.625	.314	0	11	.060	0		53	8839.3...	9946.8	.097	.097	2...	H1-1b
26	M63A	SR_0.625	.315	0	19	.062	0		46	8839.3...	9946.8	.097	.097	2...	H1-1b
27	M30A	PIPE_2.0	.321	10.677	55	.217	10.6...		56	10893....	32130	1.872	1.872	1	H1-1b
28	M2	L3X3X4	.328	10.026	7	.033	2.474	z	8	8562.0...	46656	1.688	3.303	1	H2-1

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

	Member	Shape	Code ...	Loc[ft]	LC	Shear..	Loc[..	Dir	LC	phi*Pn...	phi*Pnt...	phi*Mn...	phi*Mn...	Cb	Eqn
29	M64	HSS2.5X2.5X4	.337	1.458	4	.205	2.014	z	25	73077....	81558	5.623	5.623	1	H1-1b
30	M58A	SR_0.625	.390	.917	16	.023	0		78	8839.3...	9946.8	.097	.097	2...	H1-1b
31	M59	SR_0.625	.391	.917	16	.024	0		78	8839.3...	9946.8	.097	.097	2...	H1-1b
32	M60A	SR_0.625	.397	.917	22	.027	0		84	8839.3...	9946.8	.097	.097	2...	H1-1b
33	M64A	SR_0.625	.398	0	24	.066	0		53	8839.3...	9946.8	.097	.097	2...	H1-1b
34	M62A	SR_0.625	.400	0	18	.068	0		46	8839.3...	9946.8	.097	.097	2...	H1-1b
35	M61A	SR_0.625	.403	.917	22	.029	0		84	8839.3...	9946.8	.097	.097	2...	H1-1b
36	M65	SR_1.25	.422	.333	11	.096	0		5	39616....	39760....	.828	.828	1...	H1-1b
37	M67	SR_1.25	.452	.333	5	.091	.333		45	39616....	39760....	.828	.828	1...	H1-1b
38	M68	SR_1.25	.626	.333	25	.145	0		15	39616....	39760....	.828	.828	1...	H1-1b
39	M37A	C6x6.5	.740	1.875	44	.185	.938	z	43	117672...	149850	11.09	30.333	1...	H1-1b
40	M66	SR_1.25	.797	.333	18	.157	0		23	39616....	39760....	.828	.828	1...	H1-1b

STRESS RATIO<1.0,
MEMBERS ARE ADEQUATE

Site Name: Seymour East
Site No. : CTL05633
Prepared By: GM
Checked By: BTK

Fullerton Engineering, P.C.

Date: 4/27/2022

Mast Pipe-to-Tower Connection Calculations

Existing Mast Pipe is connected to tower leg via Threaded Rods 1/2" Ø (tensile strength Fu=58 ksi conservatively assumed)

Maximum Reactions from Risa Mount Analysis per mount connection:

1	N123	max	779.028	81	1811.568	17	1102.698	12	0	93	0	93	-.003	5
2		min	-860.944	51	682.312	40	-3600.039	6	0	1	0	1	-.034	23
3	N124	max	800.136	45	1349.792	24	3946.032	12	0	93	0	93	-.006	50
4		min	-911.643	87	524.726	36	-1449.18	6	0	1	0	1	-.053	80
5	N125	max	395.685	4	35.78	10	1946.57	5	0	93	0	93	.037	17
6		min	-762.052	50	-84.066	4	-1557.121	11	0	1	0	1	.005	11
7	N126	max	752.456	44	59.681	82	1702.818	5	0	93	0	93	.026	50
8		min	-448.214	10	-148.597	52	-1951.302	11	0	1	0	1	-.006	80

$X := 911.643lbf$ — *Maximum Factored Reaction - X direction*

$Y := 1349.792lbf$ — *Maximum Factored Reaction - Y direction*

$Z := 3600.039lbf$ — *Maximum Factored Reaction - Z direction*

$M_z := 0.053\,kip \cdot ft$ — *Maximum Factored Moment - Z direction*

$d := 3in$ — *Horizontal spacing between the Threaded Rods*

$P_t := \frac{Z}{2}$ $\quad P_t = 1800.02 \cdot lbf$ — *Factored Tensile Force*

$P_v := \frac{\sqrt{X^2 + Y^2}}{2} + \frac{M_z}{2 \cdot d}$ $\quad P_v = 920.41 \cdot lbf$ — *Factored Shear Force*

$d_b := 0.5in$ — *Diameter of Threaded Rod*

$A_b := 0.25\pi \cdot d_b^2$ $\quad A_b = 0.2 \cdot in^2$ — *Area of Threaded Rod*

$P_{t\_rod} := P_t$ $\quad P_{t\_rod} = 1800.02 \cdot lbf$ — *Tension at Threaded Rod*

$P_{v\_rod} := P_v$ $\quad P_{v\_rod} = 920.41 \cdot lbf$ — *Shear at Threaded Rod*

Site Name: Seymour East
Site No. : CTL05633
Prepared By: GM
Checked By: BTK

Fullerton Engineering, P.C.

Date: 4/27/2022

Tensile and Shear Strength of Rods and Threaded Parts

$F_u := 58ksi$ — *Ultimate Tensile Strength*

$F_{nt} := 0.75 \cdot F_u$ $\quad F_{nt} = 43.5 \cdot ksi$ — *Nominal tensile strength per AISC 360, Table J3.2*

$F_{nv} := 0.45 \cdot F_u$ $\quad F_{nv} = 26.1 \cdot ksi$ — *Nominal shear strength per AISC 360, Table J3.2*

$\phi_{rod} := 0.75$ — *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{rod} \cdot F_{nt} \cdot A_b$ $\quad R_{nt} = 6.41 \cdot kip$ — *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{rod} \cdot F_{nv} \cdot A_b$ $\quad R_{nv} = 3.84 \cdot kip$ — *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$\frac{P_{t\_rod}}{R_{nt}} = 28.1 \cdot \%$ ***< 30%*** $\quad \frac{P_{v\_rod}}{R_{nv}} = 23.95 \cdot \%$ ***< 30%***

Check = "Threaded Rods are adequate. Effects of combined stress don't need to be investigated because ratio of either tension or shear is $\leq$ 30%"

Site Name: Seymour East
Site No. : CTL05633
Prepared By: GM
Checked By: BTK

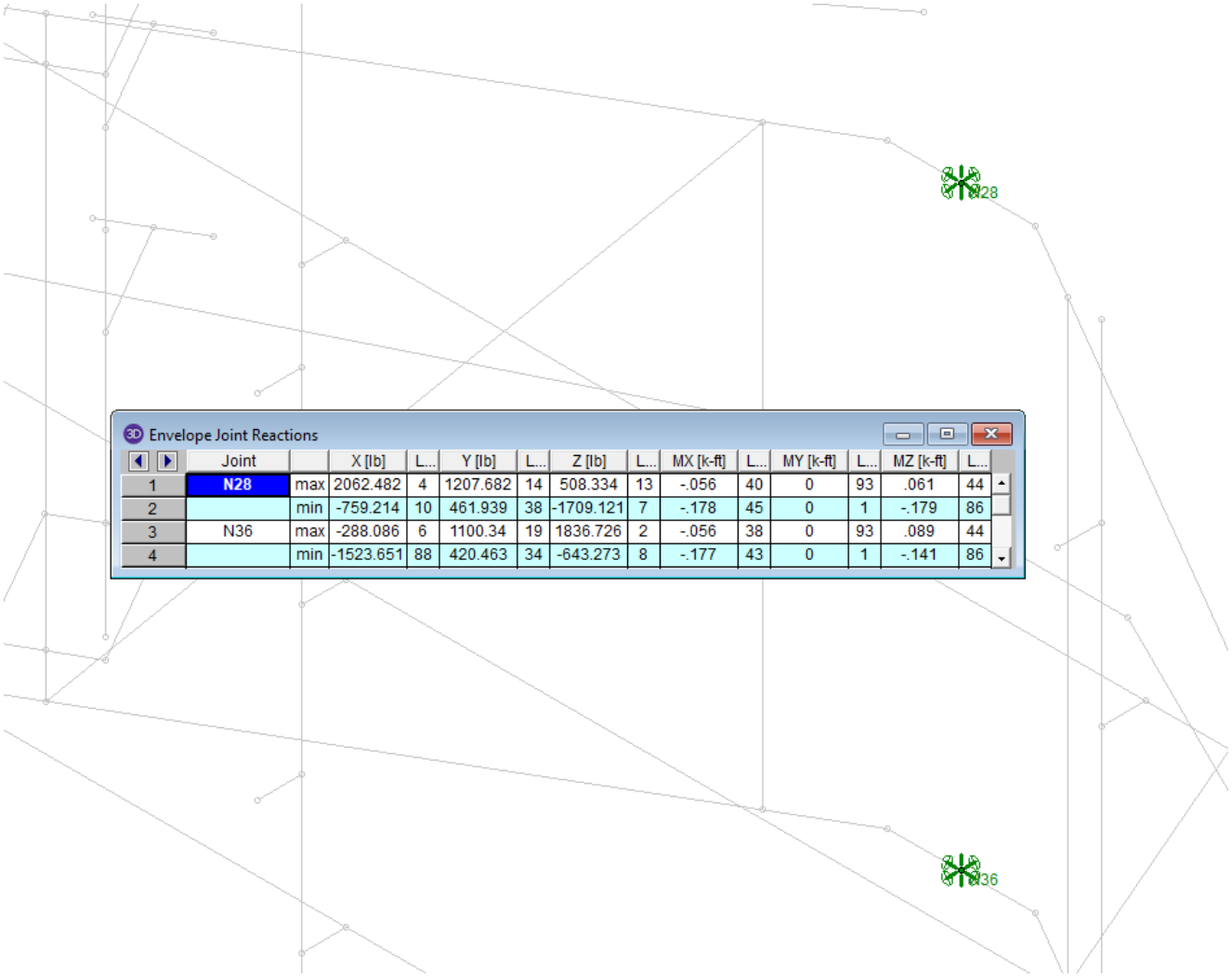
Fullerton Engineering, P.C.

Date: 4/27/2022

Mount-to-Mast Pipe Connection Calculations

Existing Commscope sector frame is connected to Mast Pipe via Threaded Rods 1/2" Ø (tensile strength Fu=125 ksi according to manufacturer specification)

Maximum Reactions from Risa Mount Analysis per mount connection:



Envelope Joint Reactions

	Joint		X [lb]	L...	Y [lb]	L...	Z [lb]	L...	MX [k-ft]	L...	MY [k-ft]	L...	MZ [k-ft]	L...
1	N28	max	2062.482	4	1207.682	14	508.334	13	-.056	40	0	93	.061	44
2		min	-759.214	10	461.939	38	-1709.121	7	-.178	45	0	1	-.179	86
3	N36	max	-288.086	6	1100.34	19	1836.726	2	-.056	38	0	93	.089	44
4		min	-1523.651	88	420.463	34	-643.273	8	-.177	43	0	1	-.141	86

$X := 2062.482 lbf$ — *Maximum Factored Reaction - X direction*

$Y := 1207.682 lbf$ — *Maximum Factored Reaction - Y direction*

$Z := 1709.121 lbf$ — *Maximum Factored Reaction - Z direction*

$M_X := 0.178 \, kip \cdot ft$ — *Maximum Factored Moment - X direction*

$M_Z := 0.179 \, kip \cdot ft$ — *Maximum Factored Moment - Z direction*

$d := 3 in$ — *Vertical spacing between the Threaded Rods*

Site Name: Seymour East
Site No. : CTL05633
Prepared By: GM
Checked By: BTK

Fullerton Engineering, P.C.

Date: 4/27/2022

$P_t := \frac{Z}{4} + \frac{M_x}{2.d}$ $P_t = 783.28 \cdot lbf$ *Factored Tensile Force*

$P_v := \frac{\sqrt{X^2 + Y^2}}{4} + \frac{M_z}{2 \cdot d}$ $P_v = 955.51 \cdot lbf$ *Factored Shear Force*

$d_b := 0.5in$ *Diameter of Threaded Rod*

$A_b := 0.25\pi \cdot d_b^2$ $A_b = 0.2 \cdot in^2$ *Area of Threaded Rod*

$P_{t\_rod} := P_t$ $P_{t\_rod} = 783.28 \cdot lbf$ *Tension at Threaded Rod*

$P_{v\_rod} := P_v$ $P_{v\_rod} = 955.51 \cdot lbf$ *Shear at Threaded Rod*

Tensile and Shear Strength of Rods and Threaded Parts

$F_u := 125ksi$ *Ultimate Tensile Strength*

$F_{nt} := 0.75 \cdot F_u$ $F_{nt} = 93.75 \cdot ksi$ *Nominal tensile strength per AISC 360, Table J3.2*

$F_{nv} := 0.45 \cdot F_u$ $F_{nv} = 56.25 \cdot ksi$ *Nominal shear strength per AISC 360, Table J3.2*

$\phi_{rod} := 0.75$ *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{rod} \cdot F_{nt} \cdot A_b$ $R_{nt} = 13.81 \cdot kip$ *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{rod} \cdot F_{nv} \cdot A_b$ $R_{nv} = 8.28 \cdot kip$ *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$\frac{P_{t\_rod}}{R_{nt}} = 5.67 \cdot \%$ ***< 30%*** $\frac{P_{v\_rod}}{R_{nv}} = 11.54 \cdot \%$ ***< 30%***

Check = "Threaded Rods are adequate. Effects of combined stress don't need to be investigated because ratio of either tension or shear is $\leq$ 30%"

Site Name: Seymour East
Site No. : CTL05633
Prepared By: GM
Checked By: BTK

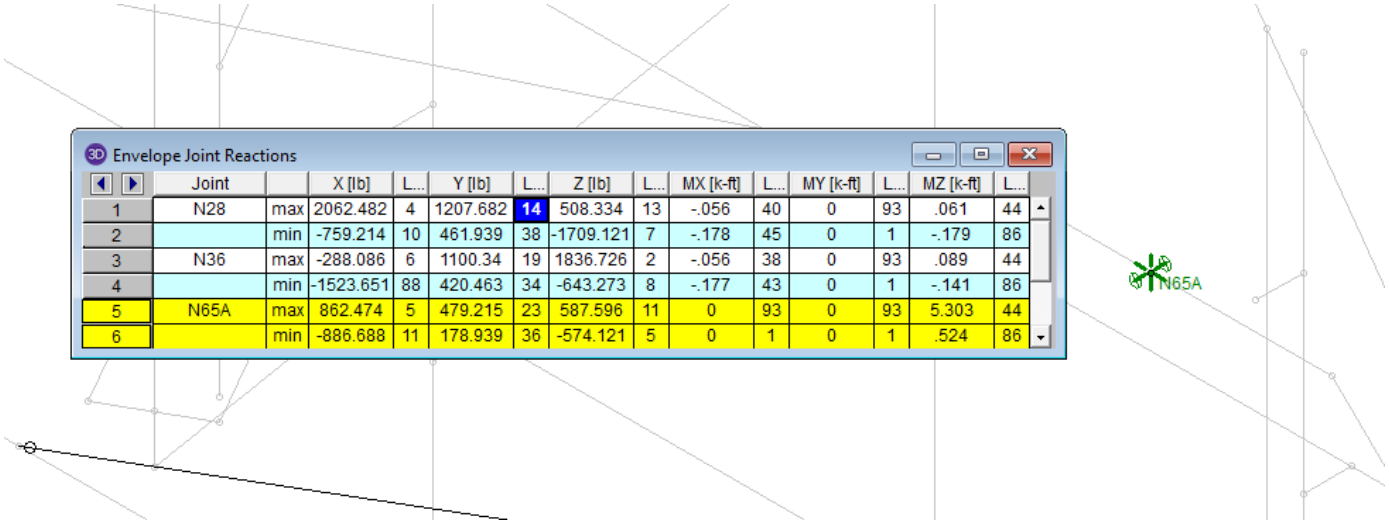
Fullerton Engineering, P.C.

Date: 4/27/2022

Mount-to-Mast Pipe Connection Calculations

Existing CommScope V-Stabilizer is connected to Mast Pipe via Threaded Rods 1/2" Ø (tensile strength Fu=125 ksi)

Maximum Reactions from Risa Mount Analysis per mount connection:



	Joint		X [lb]	L...	Y [lb]	L...	Z [lb]	L...	MX [k-ft]	L...	MY [k-ft]	L...	MZ [k-ft]	L...
1	N28	max	2062.482	4	1207.682	14	508.334	13	-.056	40	0	93	.061	44
2		min	-759.214	10	461.939	38	-1709.121	7	-.178	45	0	1	-.179	86
3	N36	max	-288.086	6	1100.34	19	1836.726	2	-.056	38	0	93	.089	44
4		min	-1523.651	88	420.463	34	-643.273	8	-.177	43	0	1	-.141	86
5	N65A	max	862.474	5	479.215	23	587.596	11	0	93	0	93	5.303	44
6		min	-886.688	11	178.939	36	-574.121	5	0	1	0	1	.524	86

$X := 886.688 lbf$ — *Maximum Factored Reaction - X direction*

$Y := 479.215 lbf$ — *Maximum Factored Reaction - Y direction*

$Z := 574.121 lbf$ — *Maximum Factored Reaction - Z direction*

$M_z := 5.303\ kip \cdot ft$ — *Maximum Factored Moment - Z direction*

$d := 8 in$ — *Horizontal spacing between the Threaded Rods*

$P_t := \frac{Z}{2}$ $\quad P_t = 287.06 \cdot lbf$ — *Factored Tensile Force*

$P_v := \frac{\sqrt{X^2 + Y^2}}{2} + \frac{M_z}{2 \cdot d}$ $\quad P_v = 4481.2 \cdot lbf$ — *Factored Shear Force*

$d_b := 0.5 in$ — *Diameter of Threaded Rod*

$A_b := 0.25 \pi \cdot d_b^2$ $\quad A_b = 0.2 \cdot in^2$ — *Area of Threaded Rod*

$P_{t\_rod} := P_t$ $\quad P_{t\_rod} = 287.06 \cdot lbf$ — *Tension at Threaded Rod*

$P_{v\_rod} := P_v$ $\quad P_{v\_rod} = 4481.2 \cdot lbf$ — *Shear at Threaded Rod*

Site Name: Seymour East
Site No. : CTL05633
Prepared By: GM
Checked By: BTK

Fullerton Engineering, P.C.

Date: 4/27/2022

Tensile and Shear Strength of Rods and Threaded Parts

$F_u := 125ksi$ — *Ultimate Tensile Strength*

$F_{nt} := 0.75 \cdot F_u$ $\quad F_{nt} = 93.75 \cdot ksi$ — *Nominal tensile strength per AISC 360, Table J3.2*

$F_{nv} := 0.45 \cdot F_u$ $\quad F_{nv} = 56.25 \cdot ksi$ — *Nominal shear strength per AISC 360, Table J3.2*

$\phi_{rod} := 0.75$ — *Resistance Factor (LRFD - AISC 360, Section J3-6)*

$R_{nt} := \phi_{rod} \cdot F_{nt} \cdot A_b$ $\quad R_{nt} = 13.81 \cdot kip$ — *Design Nominal Tensile Strength (AISC 360, Section J3-1)*

$R_{nv} := \phi_{rod} \cdot F_{nv} \cdot A_b$ $\quad R_{nv} = 8.28 \cdot kip$ — *Design Nominal Shear Strength (AISC 360, Section J3-1)*

$\frac{P_{t\_rod}}{R_{nt}} = 2.08 \cdot \%$ **< 30%** $\quad \frac{P_{v\_rod}}{R_{nv}} = 54.1 \cdot \%$ **> 30%**

Check = "Threaded Rods need to be investigated for effects of combined tension and shear stress"

Combined Tension and Shear in Bearing-Type Connections

$f_v := \frac{P_v}{A_b}$ $\quad f_v = 22.82 \cdot ksi$ — *Shear stress*

$f_t := \frac{P_t}{A_b}$ $\quad f_t = 1.46 \cdot ksi$ — *Tensile/Compressive stress*

$F_v := \phi_{rod} \cdot F_{nv}$ $\quad F_v = 42.19 \cdot ksi$ — *Design shear stress*

$F_t := \phi_{rod} \cdot F_{nt}$ $\quad F_t = 70.31 \cdot ksi$ — *Design tensile/compressive stress*

$F'_{nt} := 1.3 \cdot F_{nt} - \frac{F_{nt}}{\phi_{rod} \cdot F_{nv}} \cdot f_v$ $\quad F'_{nt} = 71.16 \cdot ksi$ — *AISC 360 - J3 - 3a*

$F'_{nt} := if\left(F'_{nt} > F_{nt}, F_{nt}, F'_{nt}\right)$

AISC 360 - J3.7
Available Combined Tension and Shear strength in Bearing-Type Connection

$\frac{P_t}{\phi_{rod} \cdot F'_{nt} \cdot A_b} = 2.74 \cdot \%$ $\quad \frac{P_v}{\phi_{rod} \cdot F_{nv} \cdot A_b} = 54.1 \cdot \%$

Check = "Threaded Rods are sufficient"

ANTENNA MOUNT MAPPING CHECKLIST

Mount Detail	
Mount Type	Heavy Duty Sector Frame
Mount Model Number	Commscope SF-QV
If RT, then how is it attached	
If WT, then how is it attached	

Mount Mapping Detail	
Material condition (discoloration, cracks, pitting)	Good
Mfg. drawing, cutsheet, spec. available?	Yes
Date of mount mapping (if one exists)	
Searched prior OOM for material?	
Photos of installation available?	
Original tower drawings show mounts?	
Searched for previous mapping?	
Is latest mod design (dwgs) available?	
Is the latest structural analysis available?	

Project Detail	
Market	CONNECTICUT
PACE Project ID	MRCTB053524/MRCTB054678/MRCTB056044/MRCTB056584/MRCTB056069/MRCTB053431/MRCTB062519
Site Name	Seymour East
City, State	Seymour, CT
RFDS Version Number	3
Initiative (list mult., if applicable)	5G
Tower Owner	
SA Vendor	
A&E firm (for structural analysis)	
A&E firm (for mapping, if different)	
Last amendment date or last site visit	
Is a site audit required on this project	

Site Information	
Original Lease Date	
FA Code	10099965
Tower Type	Self Support Tower
Tower Height (Ft)	280
AT&T Rad Center # 1	160
AT&T Rad Center # 2	

Measurements and Deliverables on sketches	
Pipe / Angle dimenions and lengths	
bolt diameters and lengths	
U-Bolt diameters and lengths	
Steel Grade if indicated	
welds :length and sizes	
appurtenance relative locations	
Grounding Condition	

Equipment Detail	Model	Height	Approz Az	mount location
Antennas	CCI TPA65R-BU8DA-K	160'-0"	60°/180°/300°	A2/B2/C2
Antennas	Ericsson AIR6449	160'-0"	60°/180°/300°	A3/B3/C3
Antennas	Ericsson AIR6419	160'-0"	60°/180°/300°	A3/B3/C3
Antennas	CCI DMP65R-BU6DA	160'-0"	60°/180°/300°	A4/B4/C4
RRU	Ericsson RRUS-4478 B14	160'-0"		Stand-off
RRU	Ericsson RRUS-32 B2	160'-0"		Stand-off
RRU	Ericsson RRUS-4426 B66	160'-0"		Stand-off
RRU	Ericsson RRUS-4449 B5/B12	160'-0"		Stand-off
RRU	Ericsson RRUS-32 B30	160'-0"		Stand-off
TMA				
Coax				
RET (not imbedded in antenna)				
DC Cable				
Fiber Cable				
Squid	(3)DC9-48-60-24-8C-EV	160'-0"		Mast Pipe

Comments

Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 31, 2022 10:09 AM
To: Kristina Cottone
Subject: FedEx Shipment 777785993412: Your package has been delivered

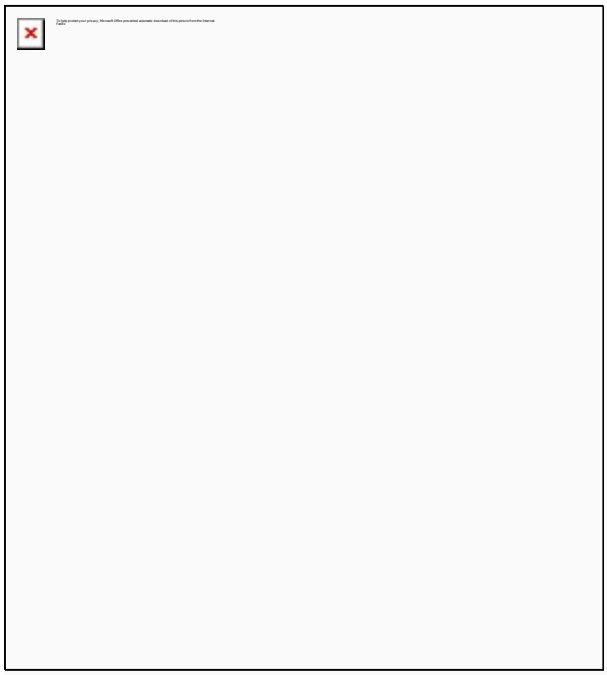
Hi. Your package was delivered Wed, 08/31/2022 at 10:00am.

Delivered to 1 FIRST ST 4, SEYMOUR, CT 06483
Received by L.MCMURRAY

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER	777785993412
FROM	Smartlink LLC 85 Rangeway Road Building 3 Suite 102 NORTH BILLERICA, MA, US, 01862
TO	Town of Seymour ATTN: First Selectwoman Annmarie D.

	1 First Street SEYMOUR, CT, US, 06483
REFERENCE	CTL05633 - Seymour
SHIPPER REFERENCE	CTL05633 - Seymour
SHIP DATE	Mon 8/29/2022 06:25 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	NORTH BILLERICA, MA, US, 01862
DESTINATION	SEYMOUR, CT, US, 06483
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx 2Day



Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 31, 2022 10:09 AM
To: Kristina Cottone
Subject: FedEx Shipment 777785716441: Your package has been delivered

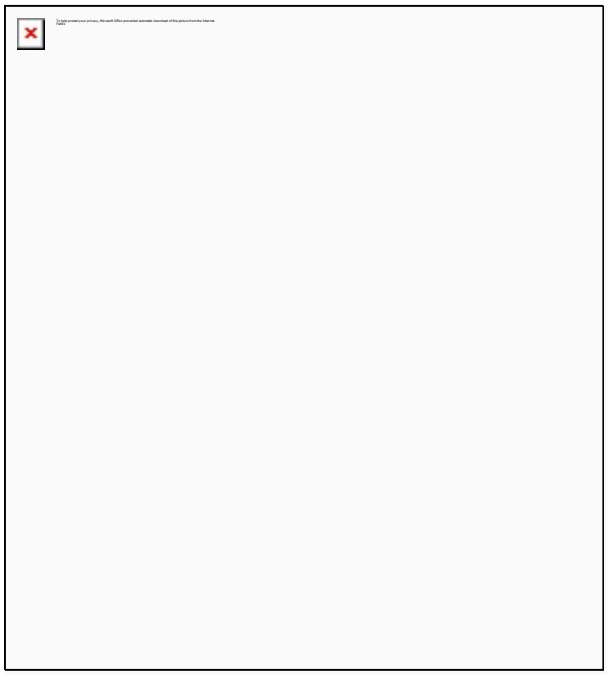
Hi. Your package was delivered Wed, 08/31/2022 at 10:00am.

Delivered to 1 FIRST ST 4, SEYMOUR, CT 06483
Received by L.MCMURRAY

OBTAIN PROOF OF DELIVERY

TRACKING NUMBER	777785716441
FROM	Smartlink LLC 85 Rangeway Road Building 3 Suite 102 NORTH BILLERICA, MA, US, 01862
TO	Town of Seymour ATTN: Building Department Jim B.

	1 First Street SEYMOUR, CT, US, 06483
REFERENCE	CTL05633 - Seymour
SHIPPER REFERENCE	CTL05633 - Seymour
SHIP DATE	Mon 8/29/2022 06:25 PM
DELIVERED TO	Receptionist/Front Desk
PACKAGING TYPE	FedEx Envelope
ORIGIN	NORTH BILLERICA, MA, US, 01862
DESTINATION	SEYMOUR, CT, US, 06483
SPECIAL HANDLING	Deliver Weekday
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx 2Day



Kristina Cottone

From: TrackingUpdates@fedex.com
Sent: Wednesday, August 31, 2022 6:06 PM
To: Kristina Cottone
Subject: FedEx Shipment 777788422150: Your package has been delivered
Attachments: DeliveryPicture.jpeg

Hi. Your package was delivered Wed, 08/31/2022 at 6:00pm.

Delivered to 2702 FOREST VIEW LN, KISSIMMEE, FL 34744

OBTAIN PROOF OF DELIVERY

Delivery picture not showing? View in browser.

TRACKING NUMBER	777788422150
FROM	Smartlink LLC 85 Rangeway Road Building 3 Suite 102 NORTH BILLERICA, MA, US, 01862
TO	EDMAC ATTN: EDMAC 2702 Forest View Lane KISSIMMEE, FL, US, 34744
REFERENCE	CTL05633 - Seymour
SHIPPER REFERENCE	CTL05633 - Seymour
SHIP DATE	Mon 8/29/2022 06:25 PM
DELIVERED TO	Residence
PACKAGING TYPE	FedEx Envelope
ORIGIN	NORTH BILLERICA, MA, US, 01862
DESTINATION	KISSIMMEE, FL, US, 34744
SPECIAL HANDLING	Deliver Weekday Residential Delivery
NUMBER OF PIECES	1
TOTAL SHIPMENT WEIGHT	1.00 LB
SERVICE TYPE	FedEx 2Day

PROJECT:	LTE 5G NR CBAND + DoD + 4T4RX RETROFIT + BBU RECONFIGURATION
SITE NUMBER:	CTL05633
USID:	26042
FA NUMBER:	10099965
PTN NUMBER:	2051A11NM3/2051A11P1D/2051A11P1C/2051A11M9X/2051A149JL
PACE NUMBER:	MRCTB053524/MRCTB054678/MRCTB056044/ MRCTB056584/MRCTB056069/MRCTB053431/MRCTB062519
SITE NAME:	SEYMOUR EAST
SITE ADDRESS:	6 PROGRESS AVENUE SEYMOUR, CT 06483

PROJECT INFORMATION

SITE NAME:	SEYMOUR EAST
SITE NUMBER:	CTL05633
SITE ADDRESS:	6 PROGRESS AVENUE SEYMOUR, CT 06483
FA NUMBER:	10099965
PTN NUMBER:	2051A11NM3/2051A11P1D/2051A11P1C/2051A11M9X/2051A149JL
PACE NUMBER:	MRCTB053524/MRCTB054678/MRCTB056044/ MRCTB056584/MRCTB056069/MRCTB053431/MRCTB062519
USID NUMBER:	26042
APPLICANT:	AT&T WIRELESS 550 COCHITUATE ROAD SUITE 550 13 AND 14 FRAMINGHAM, MA 01701
OWNER:	EMAC COMMUNICATIONS 6 PROGRESS AVE SEYMOUR, CT 06483
JURISDICTION;/ ZONING:	NEW HAVEN COUNTY
COUNTY:	NEW HAVEN
SITE COORDINATES FROM	(RFDS)
LATITUDE:	41.3914919° / 41°23'29.37084"
LONGITUDE:	-73.0532989° / -73°3'11.87604"
GROUND ELEV.:	475'
PROPOSED USE:	TELECOMMUNICATIONS FACILITY
AT&T RF MANAGER:	DEEPAK RATHORE
PHONE:	(860) 965-3068
EMAIL:	dr701e@att.com

PROJECT CONSULTANTS

PROJECT MANAGER:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	SHARON KEEFE (978) 930-3918
EMAIL:	Sharon.Keefe@smartlinkllc.com
SITE AQUISITION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	KRISTINA COTTONE (978) 551-8627
EMAIL:	Kristina.Cottone@smartlinkllc.com
ENGINEER/ARCHITECT:	FULLERTON ENGINEERING, P.C.
ADDRESS:	1100 E. WOODFIELD ROAD, SUITE 500 SCHAUMBURG, IL 60173
CONTACT:	KIP HITTER (847) 908-8400
EMAIL:	KHitter@FullertonEngineering.com
CONSTRUCTION:	SMARTLINK
ADDRESS:	85 RANGEWAY ROAD, SUITE 102 NORTH BILLERICA, MA 01862
CONTACT:	KRISTINA COTTONE (978) 551-8627
EMAIL:	kristina.cottone@smartlinkgroup.com

SCOPE OF WORK

PROJECT SCOPE HEREIN BASED ON RFDS ID # 4541461, VERSION 3.00 LAST UPDATED 03/01/2022.

EXISTING TOWER EQUIPMENT TO BE REMOVED:
- (6) LGP21401 TMAs
- (3) CCI HPA-65R-BU6AA ANTENNAS
- (3) KATHREIN 800-10121 ANTENNAS
- (3) QUINTEL QS66512-2 ANTENNAS
- (3) RRUS-11 B12
- (3) RRUS-4478 B5
- (3) DC6-48-60-18-8F RAYCAP UNITS
- (3) FIBER CABLES

EXISTING TOWER EQUIPMENT TO REMAIN:
- (3) RRUS-32 B30
- (3) RRUS-32 B2
- (3) RRUS-4478 B14
- (3) RRUS-4426 B66
- (6) DC POWER CABLES
- (12) 1-5/8" COAX CABLES

NEW TOWER EQUIPMENT TO BE INSTALLED:
- (3) CCI DMP65R-BU6DA ANTENNAS
- (3) CCI TPA65R-BU6DA-K ANTENNAS
- (3) ERICSSON AIR6419 B77G STACKED ANTENNAS
- (3) ERICSSON AIR6449 B77D STACKED ANTENNAS
- (3) DC9-48-60-24-8C-EV RAYCAP UNITS
- (3) RRUS-4449 B5/B12
- (3) Y-CABLES
- (3) 24-PAIR FIBER AND (3) DC POWER CABLES

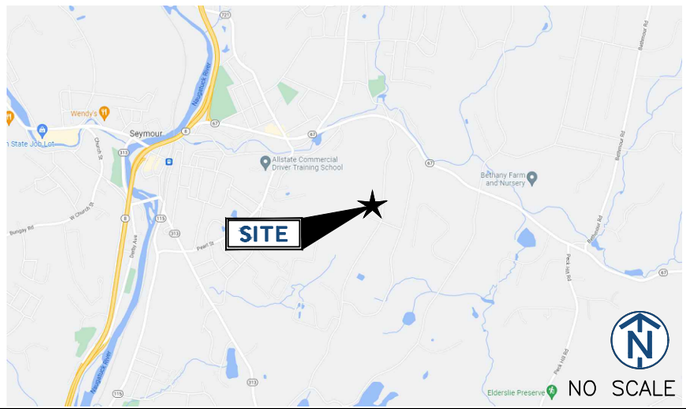
GROUND EQUIPMENT TO BE REMOVED:
- (3) RRUWS
- (6) 78210250 DIPLEXERS

EXISTING POWER PLANT
DECOMMISSION EXISTING UMTS

GROUND EQUIPMENT TO BE INSTALLED:
- (1) NEW OUTDOOR DC12
- (1) NEW RBS 6648 AND XCEDE CABLES
- (1) NEW RBS 6630 FOR 5G AND IDLE CABLES
- (1) NEW NETSURE 5100 POWER PLANT
- (10) NEW RECTIFIERS IN NEW POWER PLANT
- (1) NEW BATTERY CABINET

- CONTRACTOR SHALL FURNISH ALL MATERIAL WITH THE EXCEPTION OF AT&T SUPPLIED MATERIAL.
- ALL MATERIAL SHALL BE INSTALLED BY THE CONTRACTOR, UNLESS STATED OTHERWISE.

SITE LOCATION MAP



DIRECTIONS

SCAN QR CODE FOR LINK TO SITE LOCATION MAP

APPLICABLE BUILDING CODES AND STANDARDS

ALL WORK AND MATERIALS SHALL BE PERFORMED AND INSTALLED IN ACCORDANCE WITH THE CURRENT EDITIONS OF THE FOLLOWING CODES AS ADOPTED BY THE LOCAL GOVERNING AUTHORITIES.

BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE
2018 CONNECTICUT STATE BUILDING CODE SUPPLEMENT

ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE

- FACILITY IS UNMANNED AND NOT FOR HUMAN HABITATION.
- ADA ACCESS REQUIREMENTS ARE NOT REQUIRED.
- THIS FACILITY DOES NOT REQUIRE POTABLE WATER AND WILL NOT PRODUCE ANY SEWAGE

DRAWING INDEX

NOTE: DRAWING SCALES ARE FOR 11"x17" SHEETS UNLESS OTHERWISE NOTED

at&t
550 COCHITUATE ROAD
SUITE 550 13 AND 14
FRAMINGHAM, MA 01701

smartlink
1362 MELLON ROAD
SUITE 140
HANOVER, MD 21076

FULLERTON
1100 E. WOODFIELD ROAD, SUITE 500
SCHAUMBURG, ILLINOIS 60173
TEL: 847-908-8400
COA# PEC.0001899
www.FullertonEngineering.com

REV	DATE	DESCRIPTION	BY
0	04/26/22	90% REVIEW	SM
1	05/25/22	REVISED 90%	SM
2	08/11/22	FOR CONSTRUCTION	KR

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME
SEYMOUR EAST

SITE NUMBER:
CTL05633

SITE ADDRESS
6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME
TITLE SHEET

SHEET NUMBER
T1

PROJECT# 2021.0215.0018

GENERAL CONSTRUCTION

1. FOR THE PURPOSE OF CONSTRUCTION DRAWINGS, THE FOLLOWING DEFINITIONS SHALL APPLY:
   CONTRACTOR/CM – SMARTLINK
   OWNER – AT&T WIRELESS
2. ALL SITE WORK SHALL BE COMPLETED AS INDICATED ON THE DRAWINGS AND AT&T PROJECT SPECIFICATIONS.
3. GENERAL CONTRACTOR SHALL VISIT THE SITE AND SHALL FAMILIARIZE HIMSELF WITH ALL CONDITIONS AFFECTING THE PROPOSED WORK AND SHALL MAKE PROVISIONS. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR FAMILIARIZING HIMSELF WITH ALL CONTRACT DOCUMENTS, FIELD CONDITIONS, DIMENSIONS, AND CONFIRMING THAT THE WORK MAY BE ACCOMPLISHED AS SHOWN PRIOR TO PROCEEDING WITH CONSTRUCTION. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER PRIOR TO THE COMMENCEMENT OF WORK.
4. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. GENERAL CONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF WORK.
5. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES, AND APPLICABLE REGULATIONS.
6. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
7. PLANS ARE NOT TO BE SCALED. THESE PLANS ARE INTENDED TO BE A DIAGRAMMATIC OUTLINE ONLY UNLESS OTHERWISE NOTED. DIMENSIONS SHOWN ARE TO FINISH SURFACES UNLESS OTHERWISE NOTED. SPACING BETWEEN EQUIPMENT IS THE MINIMUM REQUIRED CLEARANCE. THEREFORE, IT IS CRITICAL TO FIELD VERIFY DIMENSIONS, SHOULD THERE BE ANY QUESTIONS REGARDING THE CONTRACT DOCUMENTS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A CLARIFICATION FROM THE ENGINEER PRIOR TO PROCEEDING WITH THE WORK. DETAILS ARE INTENDED TO SHOW DESIGN INTENT. MODIFICATIONS MAY BE REQUIRED TO SUIT JOB DIMENSIONS OR CONDITIONS AND SUCH MODIFICATIONS SHALL BE INCLUDED AS PART OF WORK AND PREPARED BY THE ENGINEER PRIOR TO PROCEEDING WITH WORK.
8. THE CONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
9. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE CONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE ENGINEER PRIOR TO PROCEEDING.
10. GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR THE SAFETY OF WORK AREA, ADJACENT AREAS AND BUILDING OCCUPANTS THAT ARE LIKELY TO BE AFFECTED BY THE WORK UNDER THIS CONTRACT. WORK SHALL CONFIRM TO ALL OSHA REQUIREMENTS AND THE LOCAL JURISDICTION.
11. GENERAL CONTRACTOR SHALL COORDINATE WORK AND SCHEDULE WORK ACTIVITIES WITH OTHER DISCIPLINES.
12. ERECTION SHALL BE DONE IN A WORKMANLIKE MANNER BY COMPETENT EXPERIENCED WORKMAN IN ACCORDANCE WITH APPLICABLE CODES AND THE BEST ACCEPTED PRACTICE. ALL MEMBERS SHALL BE LAID PLUMB AND TRUE AS INDICATED ON THE DRAWINGS.
13. SEAL PENETRATIONS THROUGH FIRE RATED AREAS WITH UL LISTED MATERIALS APPROVED BY LOCAL JURISDICTION. CONTRACTOR SHALL KEEP AREA CLEAN, HAZARD FREE, AND DISPOSE OF ALL DEBRIS.
14. WORK PREVIOUSLY COMPLETED IS REPRESENTED BY LIGHT SHADED LINES AND NOTES. THE SCOPE OF WORK FOR THIS PROJECT IS REPRESENTED BY DARK SHADED LINES AND NOTES. CONTRACTOR SHALL NOTIFY THE GENERAL CONTRACTOR OF ANY EXISTING CONDITIONS THAT DEVIATE FROM THE DRAWINGS PRIOR TO BEGINNING CONSTRUCTION.
15. CONTRACTOR SHALL PROVIDE WRITTEN NOTICE TO THE CONSTRUCTION MANAGER 48 HOURS PRIOR TO COMMENCEMENT OF WORK.
16. THE CONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT CONTRACTOR'S EXPENSE TO THE SATISFACTION OF THE OWNER.
17. THE CONTRACTOR SHALL CONTACT UTILITY LOCATING SERVICES PRIOR TO THE START OF CONSTRUCTION.
18. GENERAL CONTRACTOR SHALL COORDINATE AND MAINTAIN ACCESS FOR ALL TRADES AND CONTRACTORS TO THE SITE AND/OR BUILDING.
19. THE GENERAL CONTRACTOR SHALL BE RESPONSIBLE FOR SECURITY OF THE SITE FOR THE DURATION OF CONSTRUCTION UNTIL JOB COMPLETION.
20. THE GENERAL CONTRACTOR SHALL MAINTAIN IN GOOD CONDITION ONE COMPLETE SET OF PLANS WITH ALL REVISIONS, ADDENDA, AND CHANGE ORDERS ON THE PREMISES AT ALL TIMES.
21. THE GENERAL CONTRACTOR SHALL PROVIDE PORTABLE FIRE EXTINGUISHERS WITH A RATING OF NOT LESS THAN 2–A OT 2–A:10–B:C AND SHALL BE WITHIN 25 FEET OF TRAVEL DISTANCE TO ALL PORTIONS OF WHERE THE WORK IS BEING COMPLETED DURING CONSTRUCTION.
22. ALL EXISTING ACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES SHALL BE PROTECTED AT ALL TIMES, AND WHERE REQUIRED FOR THE PROPER EXECUTION OF THE WORK, SHALL BE RELOCATED AS DIRECTED BY THE ENGINEER. EXTREME CAUTION SHOULD BE USED BY THE CONTRACTOR WHEN EXCAVATING OR DRILLING PIERS AROUND OR NEAR UTILITIES. CONTRACTOR SHALL PROVIDE SAFETY TRAINING FOR THE WORKING CREW. THIS SHALL INCLUDE BUT NOT BE LIMITED TO A) FALL PROTECTION, B) CONFINED SPACE, C) ELECTRICAL SAFETY, AND D) TRENCHING & EXCAVATION.
23. ALL EXISTING INACTIVE SEWER, WATER, GAS, ELECTRIC, AND OTHER UTILITIES, WHICH INTERFERE WITH THE EXECUTION OF THE WORK, SHALL BE REMOVED, CAPPED, PLUGGED OR OTHERWISE DISCONNECTED AT POINTS WHICH WILL NOT INTERFERE WITH THE EXECUTION OF THE WORK, AS DIRECTED BY THE RESPONSIBLE ENGINEER, AND SUBJECT TO THE APPROVAL OF THE OWNER AND/OR LOCAL UTILITIES.
24. THE AREAS OF THE OWNER'S PROPERTY DISTURBED BY THE WORK AND NOT COVERED BY THE TOWER, EQUIPMENT OR DRIVEWAY, SHALL BE GRADED TO A UNIFORM SLOPE, AND STABILIZED TO PREVENT EROSION.
25. CONTRACTOR SHALL MINIMIZE DISTURBANCE TO THE EXISTING SITE DURING CONSTRUCTION. EROSION CONTROL MEASURES, IF REQUIRED DURING CONSTRUCTION, SHALL BE IN CONFORMANCE WITH THE FEDERAL AND LOCAL JURISDICTION FOR EROSION AND SEDIMENT CONTROL.
26. NO FILL OR EMBANKMENT MATERIAL SHALL BE PLACED ON FROZEN GROUNDING. FROZEN MATERIALS, SNOW OR ICE SHALL NOT BE PLACED IN ANY FILL OR EMBANKMENT.
27. THE SUBGRADE SHALL BE BROUGHT TO A SMOOTH UNIFORM GRADE AND COMPACTED TO 95 PERCENT STANDARD PROCTOR DENSITY UNDER PAVEMENT AND STRUCTURES AND 80 PERCENT STANDARD PROCTOR DENSITY IN OPEN SPACE. ALL TRENCHES IN PUBLIC RIGHT OF WAY SHALL BE BACKFILLED WITH FLOWABLE FILL OR OTHER MATERIAL PRE–APPROVED BY THE LOCAL JURISDICTION.
28. ALL NECESSARY RUBBISH, STUMPS, DEBRIS, STICKS, STONES, AND OTHER REFUSE SHALL BE REMOVED FROM THE SITE AND DISPOSED OF IN A LAWFUL MANNER.
29. ALL BROCHURES, OPERATING AND MAINTENANCE MANUALS, CATALOGS, SHOP DRAWINGS, AND OTHER DOCUMENTS SHALL BE TURNED OVER TO THE GENERAL CONTRACTOR AT COMPLETION OF CONSTRUCTION AND PRIOR TO PAYMENT.
30. CONTRACTOR SHALL SUBMIT A COMPLETE SET OF AS–BUILT REDLINES TO THE GENERAL CONTRACTOR UPON COMPLETION OF PROJECT AND PRIOR TO FINAL PAYMENT.
31. CONTRACTOR SHALL LEAVE PREMISES IN A CLEAN CONDITION.
32. THE PROPOSED FACILITY WILL BE UNMANNED AND DOES NOT REQUIRE POTABLE WATER OR SEWER SERVICE, AND IS NOT FOR HUMAN HABITAT (NO HANDICAP ACCESS REQUIRED).
33. OCCUPANCY IS LIMITED TO PERIODIC MAINTENANCE AND INSPECTION, APPROXIMATELY 2 TIMES PER MONTH, BY AT&T TECHNICIANS.
34. NO OUTDOOR STORAGE OR SOLID WASTE CONTAINERS ARE PROPOSED.
35. ALL MATERIAL SHALL BE FURNISHED AND WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE LATEST REVISION AT&T MOBILITY GROUNDING STANDARD "TECHNICAL SPECIFICATION FOR CONSTRUCTION OF GSM/GPRS WIRELESS SITES" AND "TECHNICAL SPECIFICATION FOR FACILITY GROUNDING". IN CASE OF A CONFLICT BETWEEN THE CONSTRUCTION SPECIFICATION AND THE DRAWINGS, THE DRAWINGS SHALL GOVERN.
36. CONTRACTORS SHALL BE RESPONSIBLE FOR OBTAINING ALL PERMITS AND INSPECTIONS REQUIRED FOR CONSTRUCTION. IF CONTRACTOR CANNOT OBTAIN A PERMIT, THEY MUST NOTIFY THE GENERAL CONTRACTOR IMMEDIATELY.
37. CONTRACTOR SHALL REMOVE ALL TRASH AND DEBRIS FROM THE SITE ON A DAILY BASIS.
38. INFORMATION SHOWN ON THESE DRAWINGS WAS OBTAINED FROM SITE VISITS AND/OR DRAWINGS PROVIDED BY THE SITE OWNER. CONTRACTORS SHALL NOTIFY THE ENGINEER OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
39. NO WHITE STROBE LIGHTS ARE PERMITTED. LIGHTING IF REQUIRED, WILL MEET FAA STANDARDS AND REQUIREMENTS.

ANTENNA MOUNTING

40. DESIGN AND CONSTRUCTION OF ANTENNA SUPPORTS SHALL CONFORM TO CURRENT ANSI/TIA–222 OR APPLICABLE LOCAL CODES.
41. ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT–DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS NOTED OTHERWISE.
42. ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC–COATING (HOT–DIP) ON IRON AND STEEL HARDWARE", UNLESS NOTED OTHERWISE.
43. DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED BY COLD GALVANIZING IN ACCORDANCE WITH ASTM A780.
44. ALL ANTENNA MOUNTS SHALL BE INSTALLED WITH LOCK NUTS, DOUBLE NUTS AND SHALL BE TORQUED TO MANUFACTURER'S RECOMMENDATIONS.
45. CONTRACTOR SHALL INSTALL ANTENNA PER MANUFACTURER'S RECOMMENDATION FOR INSTALLATION AND GROUNDING.
46. ALL UNUSED PORTS ON ANY ANTENNAS SHALL BE TERMINATED WITH A 50–OHM LOAD TO ENSURE ANTENNAS PERFORM AS DESIGNED.
47. PRIOR TO SETTING ANTENNA AZIMUTHS AND DOWNTILTS, ANTENNA CONTRACTOR SHALL CHECK THE ANTENNA MOUNT FOR TIGHTNESS AND ENSURE THAT THEY ARE PLUMB. ANTENNA AZIMUTHS SHALL BE SET FROM TRUE NORTH AND BE ORIENTED WITHIN +/– 5% AS DEFINED BY THE RFDS. ANTENNA DOWNTILTS SHALL BE WITHIN +/– 0.5% AS DEFINED BY THE RFDS. REFER TO ND–00246.
48. JUMPERS FROM THE TMA'S MUST TERMINATE TO OPPOSITE POLARIZATION'S IN EACH SECTOR.
49. CONTRACTOR SHALL RECORD THE SERIAL #, SECTOR, AND POSITION OF EACH ACTUATOR INSTALLED AT THE ANTENNAS AND PROVIDE THE INFORMATION TO AT&T.
50. TMA'S SHALL BE MOUNTED ON PIPE DIRECTLY BEHIND ANTENNAS AS CLOSE TO ANTENNA AS FEASIBLE IN A VERTICAL POSITION.

TORQUE REQUIREMENTS

51. ALL RF CONNECTIONS SHALL BE TIGHTENED BY A TORQUE WRENCH.
52. ALL RF CONNECTIONS, GROUNDING HARDWARE AND ANTENNA HARDWARE SHALL HAVE A TORQUE MARK INSTALLED IN A CONTINUOUS STRAIGHT LINE FROM BOTH SIDES OF THE CONNECTION.
    A. RF CONNECTION BOTH SIDES OF THE CONNECTOR.
    B. GROUNDING AND ANTENNA HARDWARE ON THE NUT SIDE STARTING FROM THE THREADS TO THE SOLID SURFACE. EXAMPLE OF SOLID SURFACE: GROUND BAR, ANTENNA BRACKET METAL.

FIBER & POWER CABLE MOUNTING

53. THE FIBER OPTIC TRUNK CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY. WHEN INSTALLING FIBER OPTIC TRUNK CABLES INTO A CABLE TRAY SYSTEM, THEY SHALL BE INSTALLED INTO AN INTER DUCT AND A PARTITION BARRIER SHALL BE INSTALLED BETWEEN THE 600 VOLT CABLES AND THE INTER DUCT IN ORDER TO SEGREGATE CABLE TYPES. OPTIC FIBER TRUNK CABLES SHALL HAVE APPROVED CABLE RESTRAINTS EVERY (60) SIXTY FEET AND SECURELY FASTENED TO THE CABLE TRAY SYSTEM. NFPA 70 (NEC) ARTICLE 770 RULES SHALL APPLY.
54. THE TYPE TC–ER CABLES SHALL BE INSTALLED INTO CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY AND SHALL BE SECURED AT INTERVALS NOT EXCEEDING (6) SIX FEET. AN EXCEPTION; WHERE TYPE TC–ER CABLES ARE NOT SUBJECT TO PHYSICAL DAMAGE, CABLES SHALL BE PERMITTED TO MAKE A TRANSITION BETWEEN CONDUITS, CHANNEL CABLE TRAYS, OR CABLE TRAY WHICH ARE SERVING UTILIZATION EQUIPMENT OR DEVICES, A DISTANCE (6) SIX FEET SHALL NOT BE EXCEEDED WITHOUT CONTINUOUS SUPPORTING. NFPA 70 (NEC) ARTICLES 336 AND 392 RULES SHALL APPLY.
55. WHEN INSTALLING OPTIC FIBER TRUNK CABLES OR TYPE TC–ER CABLES INTO CONDUITS, NFPA 70 (NEC) ARTICLE 300 RULES SHALL APPLY.

COAXIAL CABLE NOTES

62. TYPES AND SIZES OF THE ANTENNA CABLE ARE BASED ON ESTIMATED LENGTHS. PRIOR TO

    ORDERING CABLE, CONTRACTOR SHALL VERIFY ACTUAL LENGTH BASED ON CONSTRUCTION LAYOUT AND NOTIFY THE PROJECT MANAGER IF ACTUAL LENGTHS EXCEED ESTIMATED LENGTHS.
63. CONTRACTOR SHALL VERIFY THE DOWN–TILT OF EACH ANTENNA WITH A DIGITAL LEVEL.
64. CONTRACTOR SHALL CONFIRM COAX COLOR CODING PRIOR TO CONSTRUCTION.
65. ALL JUMPERS TO THE ANTENNAS FROM THE MAIN TRANSMISSION LINE SHALL BE 1/2" DIA. LDF AND SHALL NOT EXCEED 6'–0".
66. ALL COAXIAL CABLE SHALL BE SECURED TO THE DESIGNED SUPPORT STRUCTURE, IN AN APPROVED MANNER, AT DISTANCES NOT TO EXCEED 4'–0" OC.
67. CONTRACTOR SHALL FOLLOW ALL MANUFACTURER'S RECOMMENDATIONS REGARDING BOTH THE INSTALLATION AND GROUNDING OF ALL COAXIAL CABLES, CONNECTORS, ANTENNAS, AND ALL OTHER EQUIPMENT.
68. CONTRACTOR SHALL GROUND ALL EQUIPMENT. INCLUDING ANTENNAS, RET MOTORS, TMA'S, COAX CABLES, AND RET CONTROL CABLES AS A COMPLETE SYSTEM. GROUNDING SHALL BE EXECUTED BY QUALIFIED WIREMEN IN COMPLIANCE WITH MANUFACTURER'S SPECIFICATION AND RECOMMENDATION.
69. CONTRACTOR SHALL PROVIDE STRAIN–RELIEF AND CABLE SUPPORTS FOR ALL CABLE ASSEMBLIES, COAX CABLES, AND RET CONTROL CABLES. CABLE STRAIN–RELIEFS AND CABLE SUPPORTS SHALL BE APPROVED FOR THE PURPOSE. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS AND RECOMMENDATIONS.
70. CONTRACTOR TO VERIFY THAT EXISTING COAX HANGERS ARE STACKABLE SNAP IN HANGERS. IF EXISTING HANGERS ARE NOT STACKABLE SNAP IN HANGERS THE CONTRACTOR SHALL REPLACE EXISTING HANGERS WITH NEW SNAP IN HANGERS IF APPLICABLE.

GENERAL CABLE AND EQUIPMENT NOTES

71. CONTRACTOR SHALL BE RESPONSIBLE TO VERIFY ANTENNA, TMAS, DIPLEXERS, AND COAX CONFIGURATION, MAKE AND MODELS PRIOR TO INSTALLATION.
72. ALL CONNECTIONS FOR HANGERS, SUPPORTS, BRACING, ETC. SHALL BE INSTALLED PER TOWER MANUFACTURER'S RECOMMENDATIONS.
73. CONTRACTOR SHALL REFERENCE THE TOWER STRUCTURAL ANALYSIS/DESIGN DRAWINGS FOR DIRECTIONS ON CABLE DISTRIBUTION/ROUTING.
74. ALL OUTDOOR RF CONNECTORS/CONNECTIONS SHALL BE WEATHERPROOFED, EXCEPT THE RET CONNECTORS, USING BUTYL TAPE AFTER INSTALLATION AND FINAL CONNECTIONS ARE MADE. BUTYL TAPE SHALL HAVE A MINIMUM OF ONE–HALF TAPE WIDTH OVERLAP ON EACH TURN AND EACH LAYER SHALL BE WRAPPED THREE TIMES. WEATHERPROOFING SHALL BE SMOOTH WITHOUT BUCKLING. BUTYL BLEEDING IS NOT ALLOWED.
75. IF REQUIRED TO PAINT ANTENNAS AND/OR COAX:
    A. TEMPERATURE SHALL BE ABOVE 50° F.
    B. PAINT COLOR MUST BE APPROVED BY BUILDING OWNER/LANDLORD.
    C. FOR REGULATED TOWERS, FAA/FCC APPROVED PAINT IS REQUIRED.
    D. DO NOT PAINT OVER COLOR CODING OR ON EQUIPMENT MODEL NUMBERS
76. ALL CABLES SHALL BE GROUNDED WITH COAXIAL CABLE GROUND KITS. FOLLOW THE MANUFACTURER'S RECOMMENDATIONS.
    A. GROUNDING AT THE ANTENNA LEVEL.
    B. GROUNDING AT MID LEVEL, TOWERS WHICH ARE OVER 200'–0", ADDITIONAL CABLE GROUNDING REQUIRED.
    C. GROUNDING AT BASE OF TOWER PRIOR TO TURNING HORIZONTAL.
    D. GROUNDING OUTSIDE THE EQUIPMENT SHELTER AT ENTRY PORT.
    E. GROUNDING INSIDE THE EQUIPMENT SHELTER AT THE ENTRY PORT.
77. ALL PROPOSED GROUND BAR DOWNLEADS ARE TO BE TERMINATED TO THE EXISTING ADJACENT GROUND BAR DOWNLEADS A MINIMUM DISTANCE OF 4'–0" BELOW GROUND BAR. TERMINATIONS MAY BE EXOTHERMIC OR COMPRESSION.

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STATE OF CONNECTICUT
KATHLEEN TAYLOR COFFEY
36017
LICENSED
PROFESSIONAL ENGINEER

SITE NAME
SEYMOUR EAST

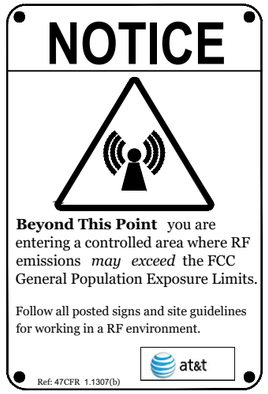
SITE NUMBER:
CTL05633

SITE ADDRESS
6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME
NOTES AND SPECIFICATIONS

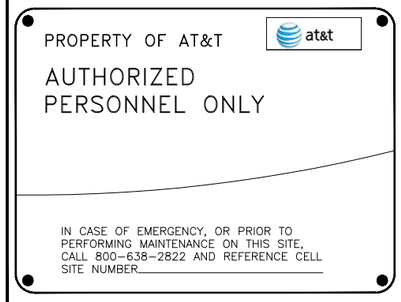
SHEET NUMBER
SP1

PROJECT# 2021.0215.0018



ALERTING SIGNS

ALERTING SIGN



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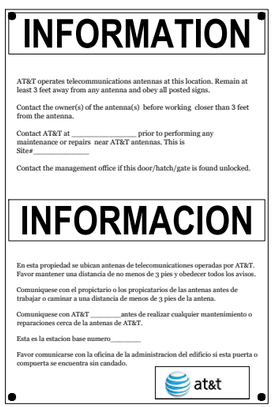

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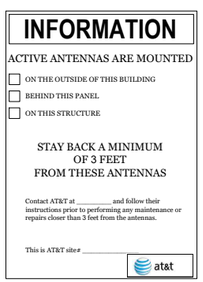

INFO SIGN #2

INFO SIGN #3

ALERTING SIGN
(FOR CELL SITE BATTERIES)

ALERTING SIGN
(FOR DIESEL FUEL)

ALERTING SIGN
(FOR PROPANE)

GENERAL SIGNAGE GUIDELINES

STRUCTURE TYPE	INFO SIGN #1	INFO SIGN #2	INFO SIGN #3	INFO SIGN #4	STRIPING	NOTICE SIGN	CAUTION SIGN
TOWERS							
MONOPOLE/MONOPINE/MONOPALM	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			AT THE HEIGHT OF THE FIRST CLIMBING STEP, MIN 9 FT ABOVE GROUND
SEC TOWERS/TOWERS WITH HIGH VOLTAGE	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	CLIMBING SIDE OF THE TOWER	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
LIGHT POLES/FLAG POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS			
UTILITY WOOD POLES (JPA)	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		IF GP MAX VALUE OF MPE AT ANTENNA LEVEL IS: 0-99%; NOTICE SIGN; OVER 99%: CAUTION SIGN AT NO LESS THAN 3FT BELOW ANTENNA AND 9FT ABOVE GROUND	
MICROCELLS MOUNTED ON NON-JPA POLES	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS	ON THE POLE, NO LESS THAN 3FT BELOW THE ANTENNA AND LESS THAN 9FT ABOVE GROUND	ON BACKSIDE OF ANTENNAS	ENTRANCE GATES, SHELTER DOORS OR ON THE OUTDOOR CABINETS		NOTICE OR CAUTION SIGN AT NO LESS THAN 9FT ABOVE GROUND: ONLY IF THE EXPOSURE EXCEEDS 90% OF THE GENERAL PUBLIC EXPOSURE AT EXPOSURE AT 6FT ABOVE GROUND OR AT OUTSIDE OF SURFACE OF ADJACENT BUILDING	
TOWERS							
AT ALL ACCESS POINTS TO THE ROOF	X			X			
ON ANTENNAS	X		X	X			
CONCEALED ANTENNAS	X	X		X			
ANTENNAS MOUNTED FACING OUTSIDE THE BUILDING	X	X		X			
ANTENNAS ON SUPPORT STRUCTURE	X	X		X			
ROOFVIEW GRAPH							
RADIATION AREA IS WITHIN 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X		EITHER NOTICE OR CAUTION SIGN (BASED ON ROOFVIEW RESULTS) AT ANTENNA /BARRIER	
RADIATION AREA IS BEYOND 3FT FROM ANTENNA	X	ADJACENT TO EACH ANTENNA		X	DIAGONAL, YELLOW STRIPING AS TO ROOFVIEW GRAPH		
CHURCH STEEPLES	ACCESS TO STEEPLE	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO STEEPLE			CAUTION SIGN AT THE ANTENNAS
WATER STATIONS	ACCESS TO LADDER	ADJACENT TO ANTENNAS IF ANTENNAS ARE CONCEALED	ON BACKSIDE OF ANTENNAS	ACCESS TO LADDER			CAUTION SIGN BESIDE INFO SIGN #1, MIN. 9FT ABOVE GROUND

NOTES FOR ROOFTOP SITES:

1. EITHER NOTICE OR CAUTION SIGNS NEED TO BE POSTED AT EACH SECTOR AS CLOSE AS POSSIBLE TO: THE OUTER EDGE OF THE STRIPED OFF AREA OR THE OUTER ANTENNAS OF THE SECTOR
2. IF ROOFVIEWS SHOWS: ONLY BLUE = NOTICE SIGN, BLUE AND YELLOW = CAUTION SIGN, ONLY YELLOW = CAUTION SIGN TO BE INSTALLED
3. SHOULD THE REQUIRED STRIPING AREAS INTERFERE WITH ANY STRUCTURE OR EQUIPMENT (A/C, VENTS, ROOF HATCH, DOORS, OTHER ANTENNAS, DISHES, ETC.). PLEASE NOTIFY AT&T TO MODIFY THE STRIPING AREA, PRIOR TO STARTING THE WORK.

SIGNAGE GUIDELINES CHART

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SHEET NAME
NOTES AND SPECIFICATIONS

SHEET NUMBER
SP2

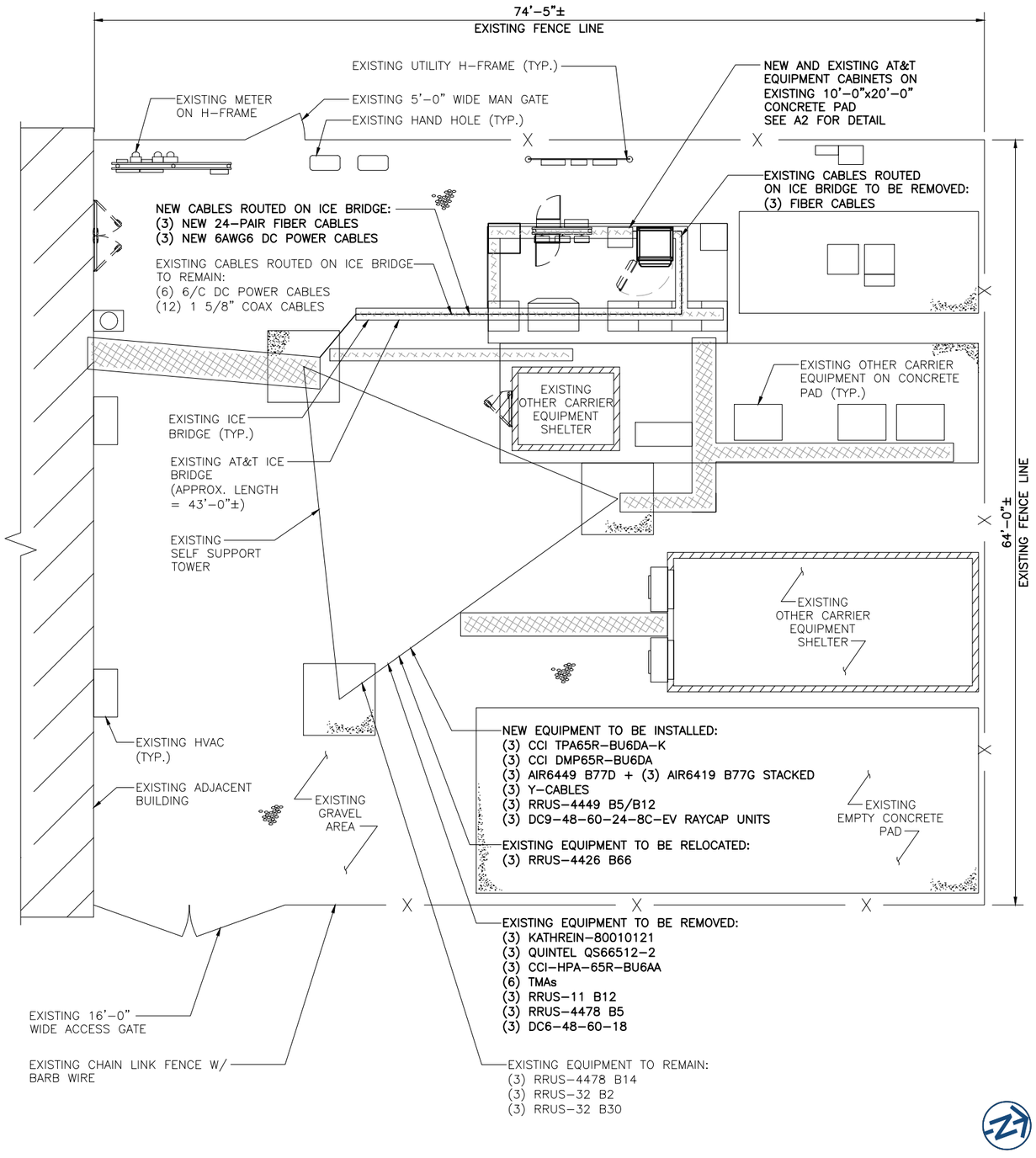
PROJECT# 2021.0215.0018

ABBREVIATIONS

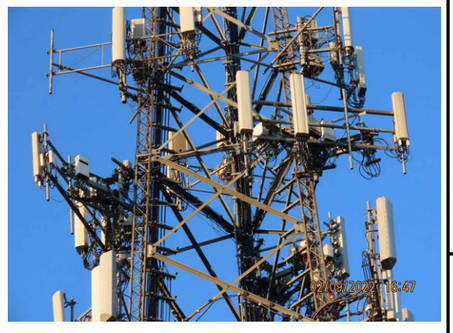
AFF	ABOVE FINISHED FLOOR
AGL	ABOVE GRADE LEVEL
AMSL	ABOVE MEAN SEA LEVEL
APPROX	APPROXIMATE
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BLDG	BUILDING
BTS	BASE TRANSMISSION STATION
℄	CENTERLINE
CLR	CLEAR
COL	COLUMN
CONC	CONCRETE
CND	CONDUIT
DWG	DRAWING
FT	FOOT(FEET)
EGB	EQUIPMENT GROUND BAR
ELEC	ELECTRICAL
EMT	ELECTRICAL METALLIC TUBING
ELEV	ELEVATION
EQUIP	EQUIPMENT
(E)	EXISTING
EXT	EXTERIOR
FND	FOUNDATION
F	FIBER
FIF	FACILITY INTERFACE FRAME
GA	GAUGE
GALV	GALVANIZED
GPS	GLOBAL POSITIONING SYSTEM
GND	GROUND
GSM	GLOBAL SYSTEM FOR MOBILE COMMUNICATION
LTE	LONG TERM EVOLUTION
MAX	MAXIMUM
MCPA	MULTI-CARRIER POWER AMPLIFIER
MFR	MANUFACTURER
MGB	MASTER GROUND BAR
MIN	MINIMUM
MTS	MANUAL TRANSFER SWITCH
N.T.S.	NOT TO SCALE
O.C.	ON CENTER
OE/OT	OVERHEAD ELECTRIC/TELCO
PPC	POWER PROTECTION CABINET
PL	PROPERY LINE
RBS	RADIO BASED STATION
RET	REMOTE ELECTRIC TILT
RRU	REMOTE RADIO UNIT
RGS	RIGID GALVANIZED STEEL
IN	INCH(ES)
INT	INTERIOR
LB(S), #	POUND(S)
SF	SQUARE FOOT
STL	STEEL
TMA	TOWER MOUNTED AMPLIFIER
TYP	TYPICAL
UE/UT	UNDERGROUND ELECTRIC/TELCO
UNO	UNLESS NOTED OTHERWISE
UMTS	UNIVERSAL MOBILE TELE-COMMUNICATION SYSTEM
VIF	VERIFY IN FIELD
W/	WITH
XFMR	TRANSFORMER

SYMBOLS

- REVISION
- WORK POINT
- UTILITY POLE
- COMPRESSED STONE
- BRICK
- CONCRETE
- EARTH
- GRAVEL
- MASONRY
- STEEL
- CENTERLINE
- PROPERTY LINE
- LEASE LINE
- EASEMENT LINE
- CHAIN LINK FENCE
- WOOD FENCE
- UE — BELOW GRADE ELECTRIC
- UT — BELOW GRADE TELEPHONE
- OE/OT — OVERHEAD ELECTRIC/TELEPHONE
- SECTION REFERENCE



COMPOUND PLAN — 0 2' 4' 8' 16' — SCALE: 3/32" = 1'-0" — 1



SITE PHOTO 1 — SCALE: N.T.S. — 2

SITE PHOTO 2 — SCALE: N.T.S. — 3

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STATE OF CONNECTICUT · KATHLEEN TAYLOR COFFEY · 36017 · LICENSED PROFESSIONAL ENGINEER

SITE NAME
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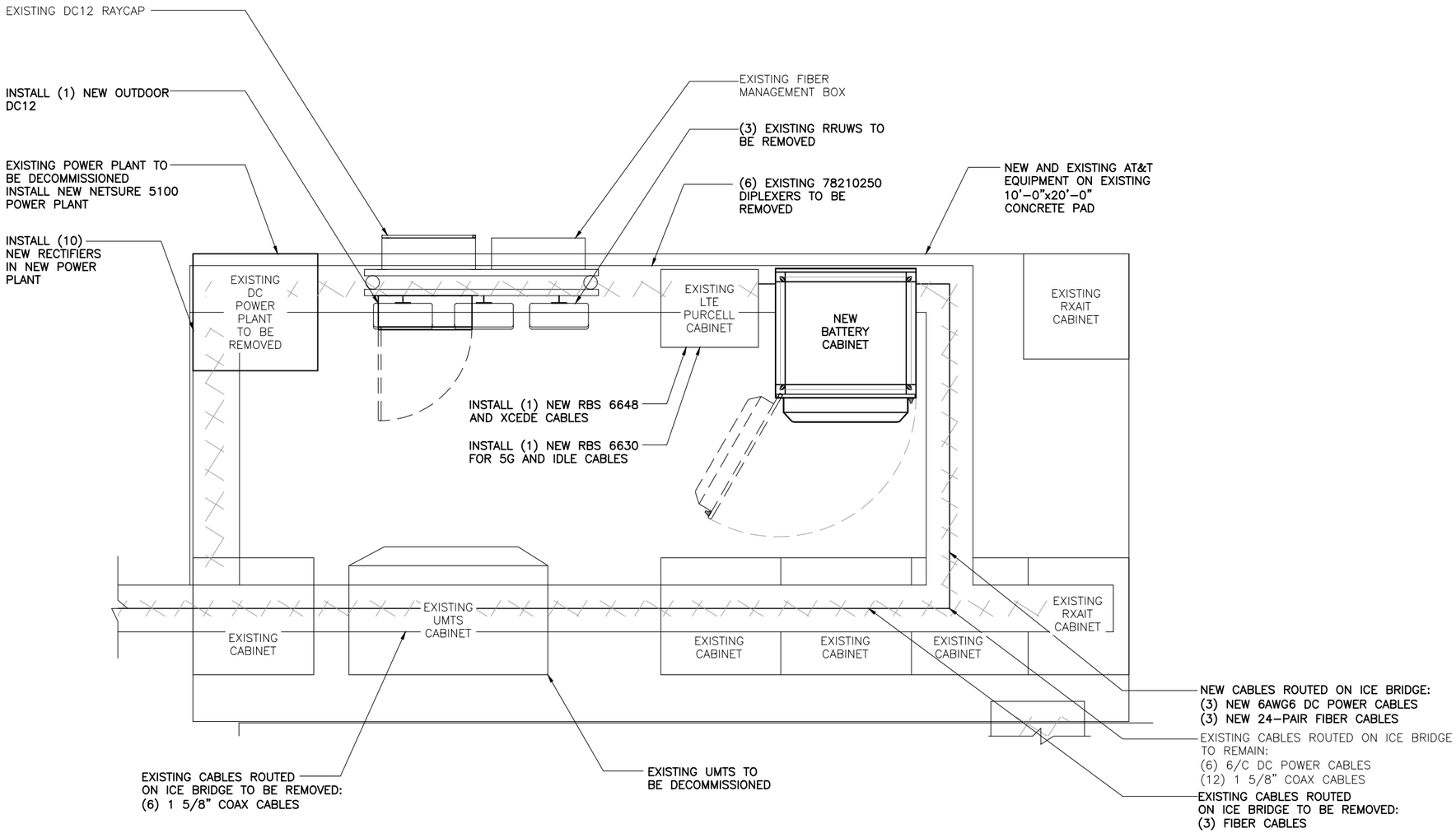
6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME
COMPOUND PLAN

SHEET NUMBER
A1

PROJECT# 2021.0215.0018



EQUIPMENT PLAN

0 6" 1' 2' 4'

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

1

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SITE ADDRESS

6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME

EQUIPMENT PLAN

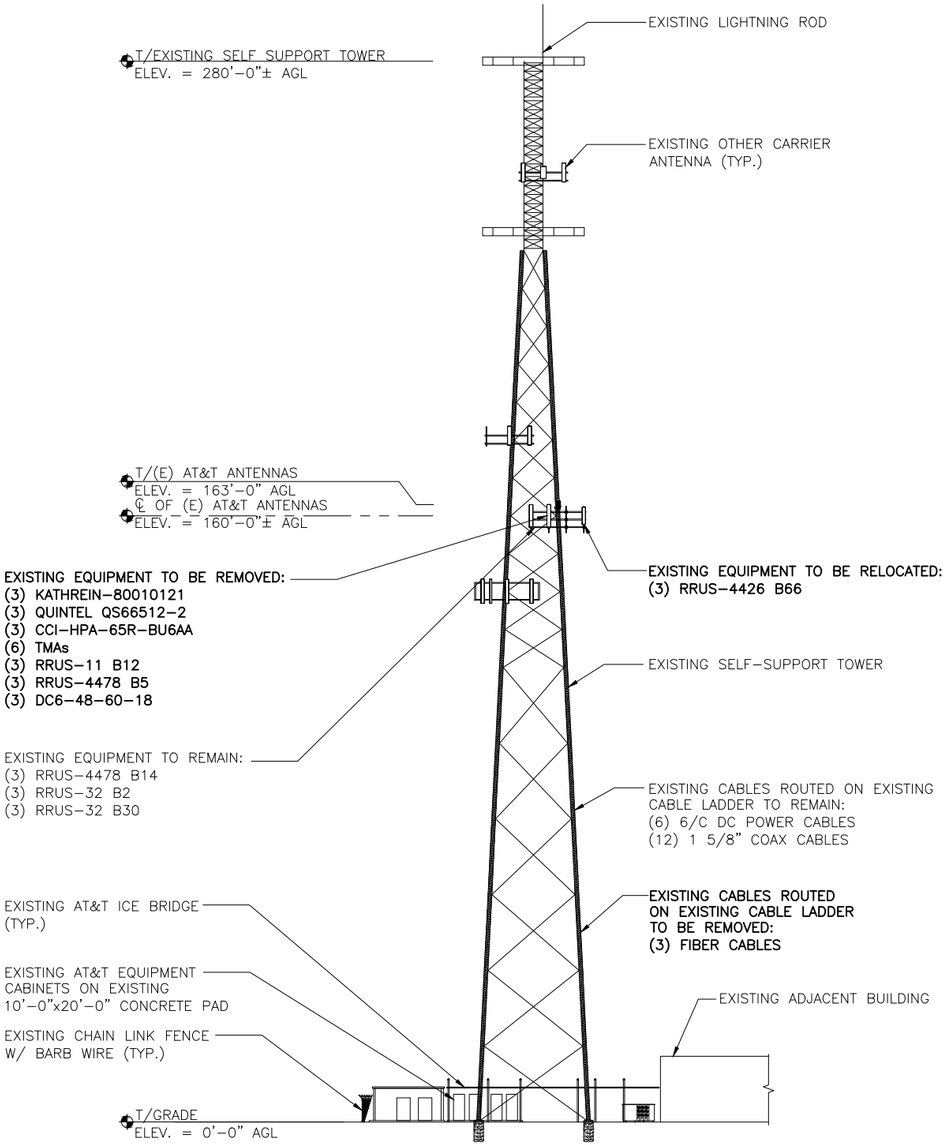
SHEET NUMBER

A2

PROJECT# 2021.0215.0018

NOTES:

1. CALCULATIONS FOR THE STRUCTURE AND ANTENNA MOUNTS WERE PREPARED BY FULLERTON AND THOSE CALCULATIONS CERTIFY THE CAPACITY OF THE STRUCTURE TO SUPPORT THE NEW EQUIPMENT
2. CABLES NOT SHOWN FOR CLARITY



EXISTING ELEVATION

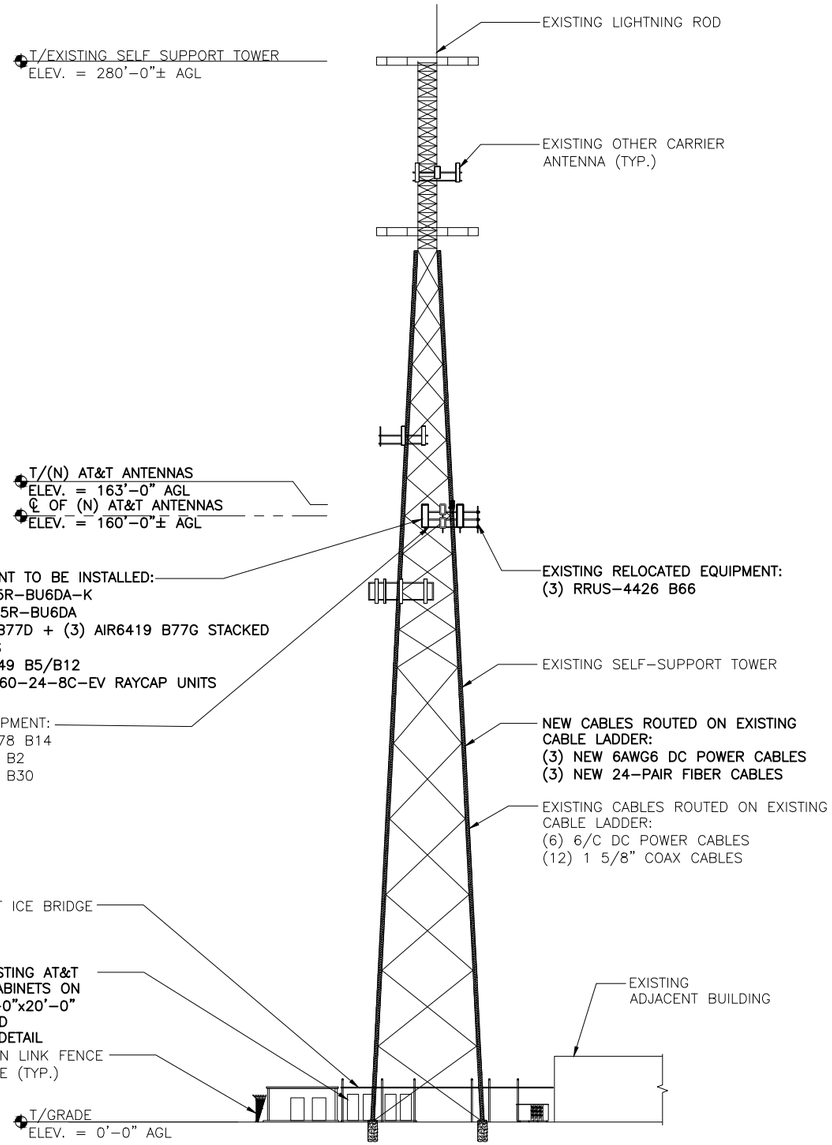
0 20 40 60

SCALE: 1" = 40'-0"

1

NOTES:

1. 3 FEET MINIMUM SEPARATION BETWEEN LTE ANTENNAS
2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC
3. 4 FEET MINIMUM INTERSECTOR SEPARATION BETWEEN ANTENNAS EDGE TO EDGE



NEW ELEVATION

0 20 40 60

SCALE: 1" = 40'-0"

2

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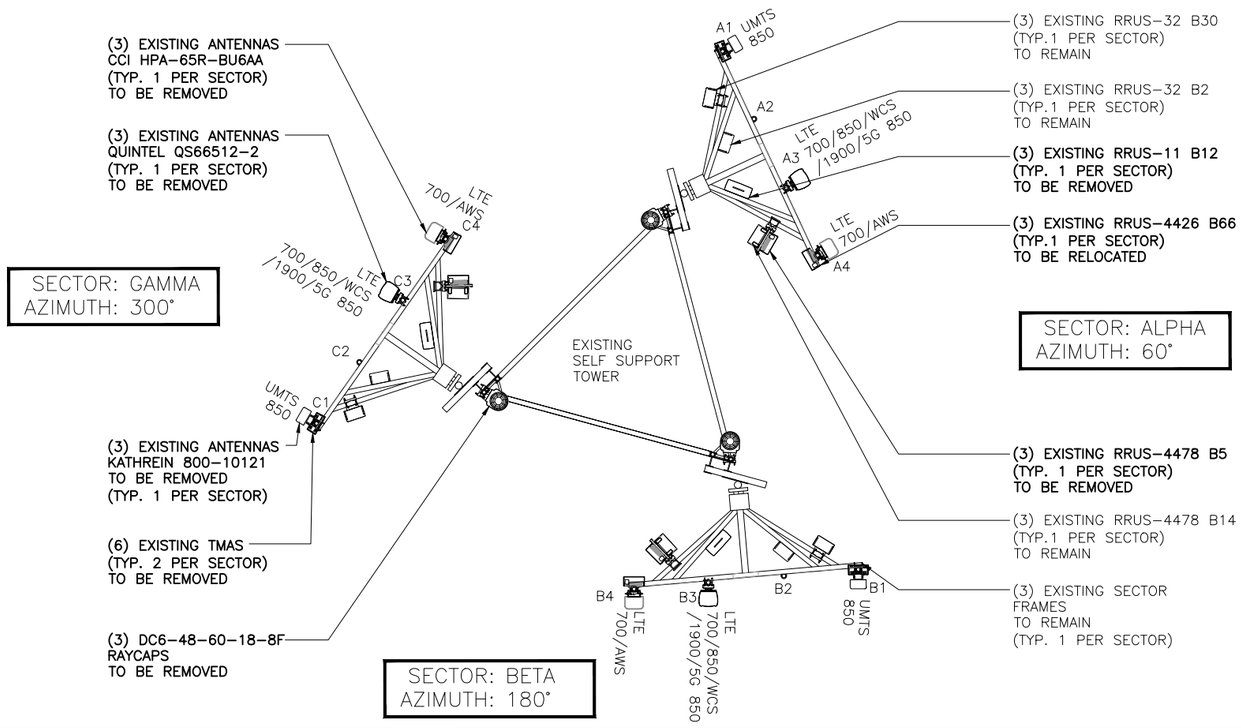
SHEET NAME
ELEVATIONS

SHEET NUMBER
A3

PROJECT# 2021.0215.0018

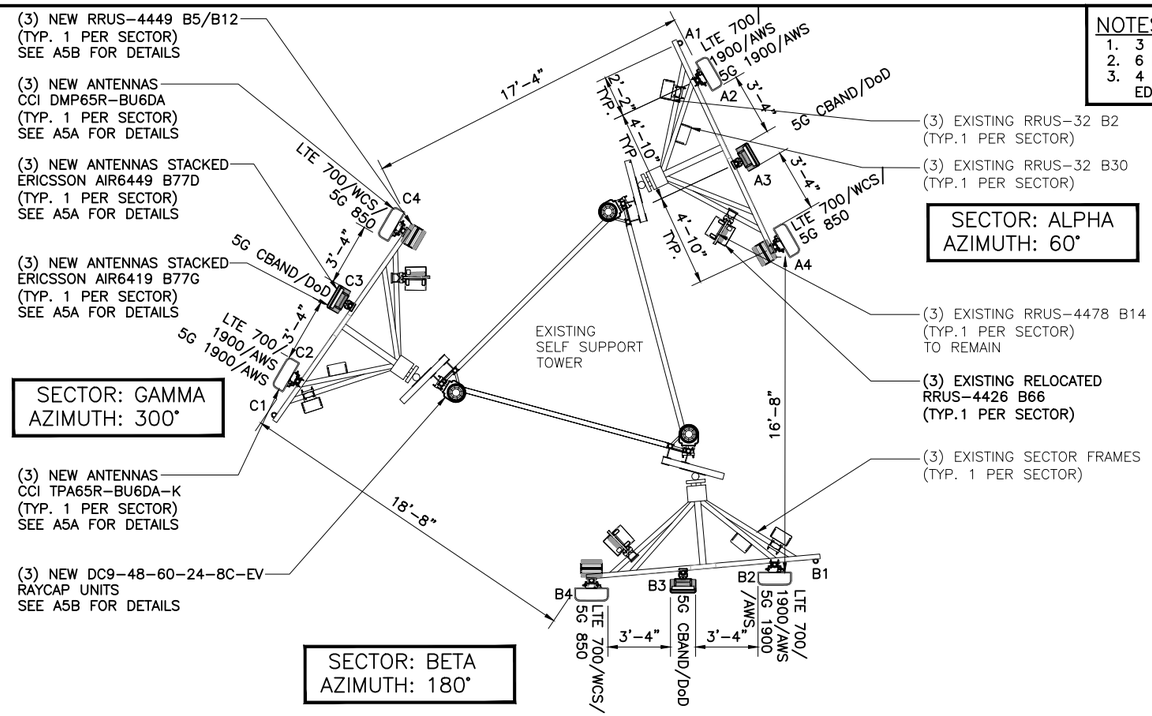


EXISTING ANTENNA PLAN

0 2' 4' 8' 12'

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

NOTES:
1. EXISTING ANTENNA MOUNTING PIPE TO BE REUSED, RELOCATED OR REPLACED AS REQUIRED
2. IF REQUIRED INSTALL NEW GALV. MOUNTING PIPE(S) 2.5 STD. (2-7/8" O.D.)



NOTES:
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2. 6 FEET MINIMUM SEPARATION BETWEEN 700DE & 700BC
3. 4 FEET MINIMUM INTERSECTOR SEPARATION BETWEEN ANTENNAS EDGE TO EDGE

FINAL ANTENNA PLAN

0 2' 4' 8' 12'

SCALE: 1/8" = 1'-0" | 2

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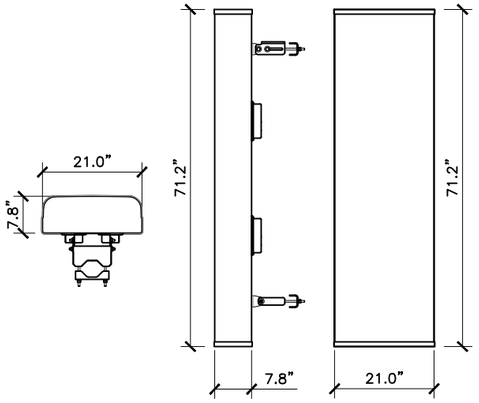
SHEET NAME
ANTENNA PLANS

SHEET NUMBER
A4

PROJECT# 2021.0215.0018



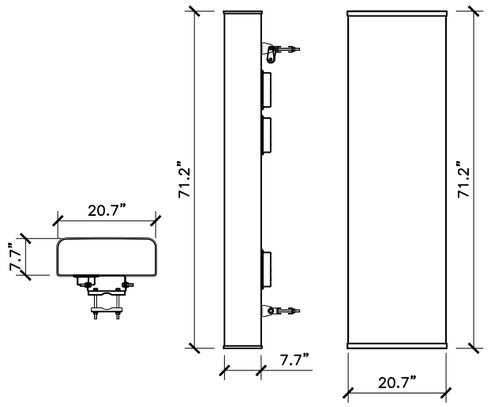
PLAN VIEW SIDE VIEW FRONT VIEW

CCI – TPA65R–BU6DA–K

MULTI–BAND TWELVE ANTENNA

FREQUENCY RANGE	4 LOW x 698–896 MHz 8 HIGH 1695–2400 MHz
ANTENNA	67.5 Lbs
(3) RETS	15 Lbs
BRACKET	~20.0 Lbs
TOTAL WEIGHT	102.5 Lbs

ANTENNA SPEC SCALE: N.T.S. 1



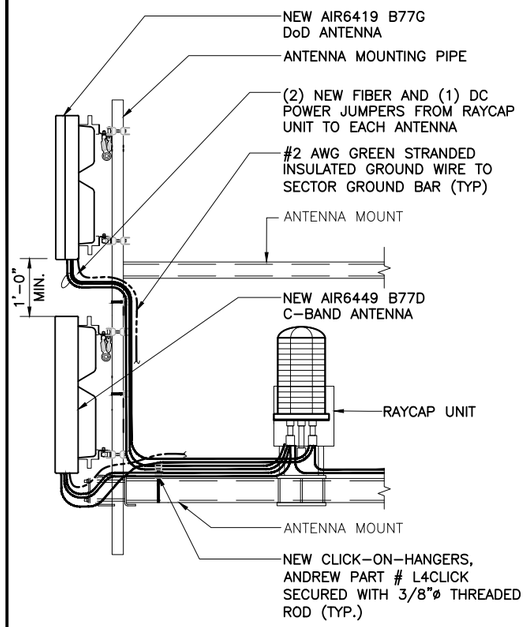
PLAN VIEW SIDE VIEW FRONT VIEW

CCI – DMP65R–BU6DA

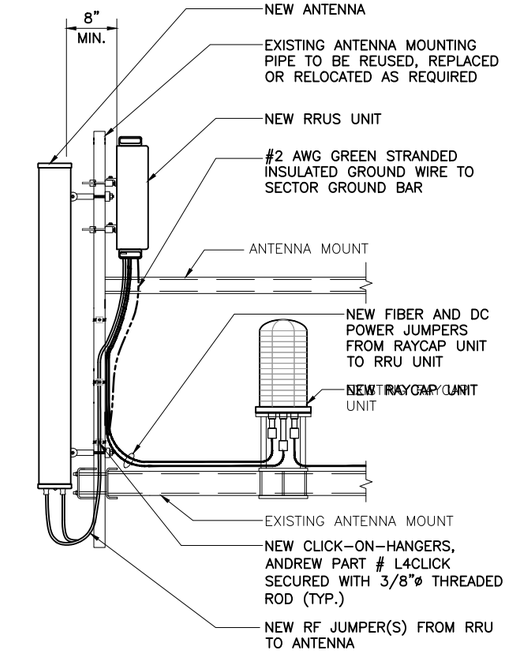
8–PORT DIPLEXED MULTI–BAND ANTENNA

FREQUENCY RANGE	4 x 698–896 MHz 4 x 1695–2400 MHz
ANTENNA WEIGHT	79.4 Lbs

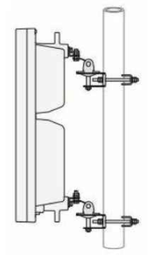
ANTENNA SPEC SCALE: N.T.S. 2

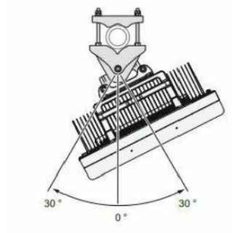


ANTENNA SCHEMATIC SCALE: N.T.S. 3



ANTENNA SCHEMATIC SCALE: N.T.S. 4



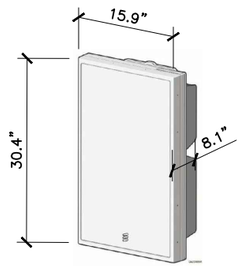


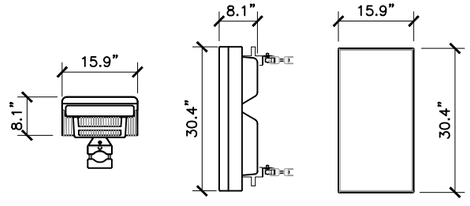
Pole	Circular	Square	90° Angle
Minimum outer dimension	Ø76 mm	50 × 50 mm	50 × 50 mm
Maximum outer dimension	Ø114 mm	80 × 80 mm	80 × 80 mm

ERICSSON – AIR 6449 B77D MOUNT

BRACKET SUPPORTING AIR WITH TILTING +/–20 DEGREE AND RIGHT/LEFT 30 DEGREE

ANTENNA SPEC SCALE: N.T.S. 5





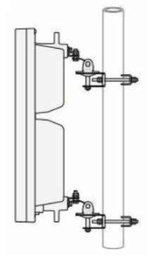
PLAN VIEW SIDE VIEW FRONT VIEW

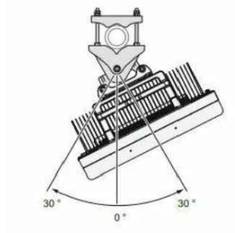
ERICSSON – AIR6449 B77D

MASSIVE MIMO MID–BAND

WEIGHT W/ HARDWARE 81.6 Lbs

ANTENNA SPEC SCALE: N.T.S. 6



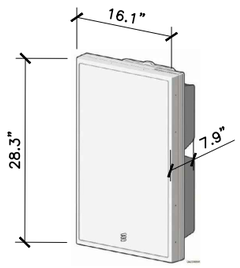


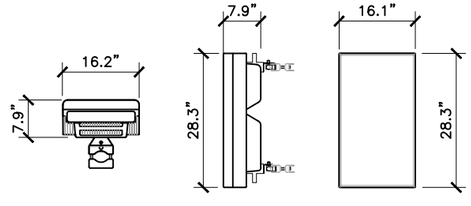
Pole	Circular	Square	90° Angle
Minimum outer dimension	Ø76 mm	50 × 50 mm	50 × 50 mm
Maximum outer dimension	Ø114 mm	80 × 80 mm	80 × 80 mm

ERICSSON – AIR 6419 B77G MOUNT

BRACKET SUPPORTING AIR WITH TILTING +/–20 DEGREE AND RIGHT/LEFT 30 DEGREE

ANTENNA SPEC SCALE: N.T.S. 7





PLAN VIEW SIDE VIEW FRONT VIEW

ERICSSON – AIR6419 B77G

MASSIVE MIMO MID–BAND

WEIGHT W/ HARDWARE 77 Lbs

ANTENNA SPEC SCALE: N.T.S. 8

at&t

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TEL: 847-908-8400
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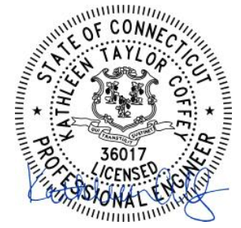


SITE NAME

SEYMOUR EAST

SITE NUMBER:

CTL05633

SITE ADDRESS

6 PROGRESS AVENUE
SEYMOUR, CT 06483

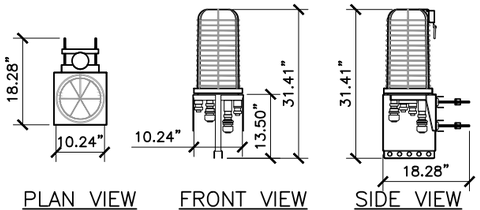
SHEET NAME

EQUIPMENT DETAILS

SHEET NUMBER

A5A

PROJECT# 2021.0215.0018



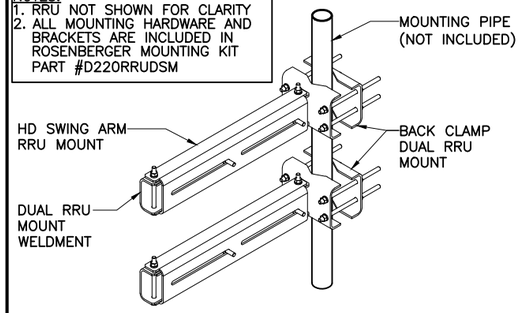
RAYCAP – DC9-48-60-24-8C-EV

SYSTEM WEIGHT	16.0 Lbs
MOUNT WEIGHT	10.2 Lbs
TOTAL WEIGHT	26.2 Lbs

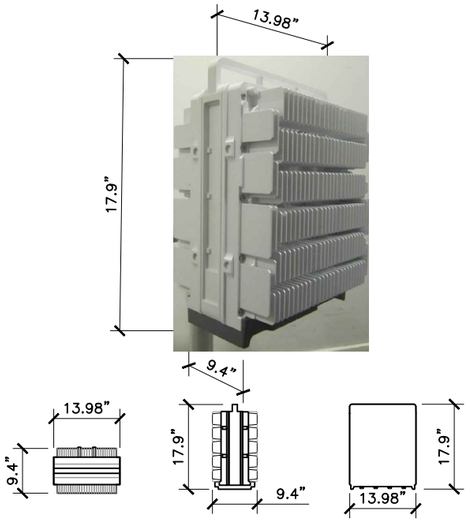
DIMENSIONS (LxWxH) 18.28"x10.24"x31.4"

RAYCAP SPEC SCALE: N.T.S. 1

NOTES:
1. RRU NOT SHOWN FOR CLARITY
2. ALL MOUNTING HARDWARE AND BRACKETS ARE INCLUDED IN ROSENBERGER MOUNTING KIT PART #D220RRUDSM



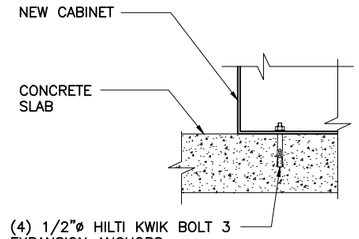
RRU DOUBLE MOUNT DETAIL SCALE: N.T.S. 2



ERICSSON –
Dual Band Radio 4449 B5, B12

FREQUENCY RANGE	B5 TX	869–894 MHz
	B12 TX	729–746 MHz
	B5 RX	824–849 MHz
	B12 RX	699–716 MHz
TOTAL WEIGHT		71 Lbs

RRU SPEC SCALE: N.T.S. 3



CABINET CONNECTION SCALE: N.T.S. 4

NOT USED SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

NOT USED SCALE: N.T.S. 7

NOT USED SCALE: N.T.S. 8

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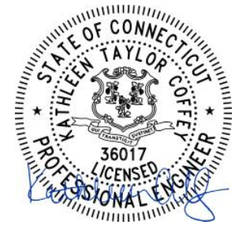

SITE NAME
SEYMOUR EAST

SITE NUMBER:
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SITE ADDRESS
6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME
EQUIPMENT DETAILS

SHEET NUMBER
A5B

PROJECT# 2021.0215.0018

FINAL ANTENNA CONFIGURATION AND CABLE SCHEDULE
SUPPLIED BY AT&T WIRELESS, FROM RF CONFIG. DATED (03/01/22, V3)

SECTOR	ANTENNA NUMBER	ANTENNA STATUS & TYPE	ANTENNA MODEL NUMBER	ANTENNA VENDOR	TMA/RRU UNIT	AZIMUTH	ANTENNA CL FROM GROUND	CABLE FEEDER TYPE	CABLE FEEDER LENGTH	RAYCAP UNIT
ALPHA	A-1	-	-	-	-	-	-	1-5/8"ø LDF7-50A	230'-0"	(1) (N) DC9-48-60-24-8C-EV UNIT
								1-5/8"ø LDF7-50A	230'-0"	
	A-2	(N) LTE 700 B14 /PCS/AWS	TPA65R-BU6DA-K	CCI	(1) EXISTING RRUS 4478 B14 (1) EXISTING RRUS-32 B2 (1) EXISTING RRUS-4426 B66	60°	160'-0"	SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
	A-3	(N) 5G CBAND 5G DoD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	60°	160'-0"	(1) NEW 24-PAIR FIBER CABLE	230'-0"	
								(4) EXISTING 6/C DC POWER CABLES	230'-0"	
	A-4	(N) LTE 700 BC /850/WCS	DMP65R-BU6DA	CCI	(1) EXISTING RRUS-32 B30 (1) NEW RRUS-4449 B5/B12 (1) NEW Y-CABLE	60°	160'-0"	(1) NEW 6AWG6 DC POWER CABLE	230'-0"	
								SEE ANTENNA A-3 FOR CABLE TYPE AND LENGTH		
BETA	B-1	-	-	-	-	-	-	1-5/8"ø LDF7-50A	230'-0"	(1) (N) DC9-48-60-24-8C-EV UNIT
								1-5/8"ø LDF7-50A	230'-0"	
	B-2	(N) LTE 700 B14 /PCS/AWS	TPA65R-BU6DA-K	CCI	(1) EXISTING RRUS 4478 B14 (1) EXISTING RRUS-32 B2 (1) EXISTING RRUS-4426 B66	180°	160'-0"	SEE ANTENNA B-3 FOR CABLE TYPE AND LENGTH		
	B-3	(N) 5G CBAND 5G DoD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	180°	160'-0"	(1) NEW 24-PAIR FIBER CABLE	230'-0"	
								(4) EXISTING 6/C DC POWER CABLES	230'-0"	
	B-4	(N) LTE 700 BC /850/WCS	DMP65R-BU6DA	CCI	(1) EXISTING RRUS-32 B30 (1) NEW RRUS-4449 B5/B12 (1) NEW Y-CABLE	180°	160'-0"	(1) NEW 6AWG6 DC POWER CABLE	230'-0"	
								SEE ANTENNA B-3 FOR CABLE TYPE AND LENGTH		
GAMMA	C-1	-	-	-	-	-	-	1-5/8"ø LDF7-50A	230'-0"	(1) (N) DC9-48-60-24-8C-EV UNIT
								1-5/8"ø LDF7-50A	230'-0"	
	C-2	(N) LTE 700 B14 /PCS/AWS	TPA65R-BU6DA-K	CCI	(1) EXISTING RRUS 4478 B14 (1) EXISTING RRUS-32 B2 (1) EXISTING RRUS-4426 B66	300°	160'-0"	SEE ANTENNA C-3 FOR CABLE TYPE AND LENGTH		
	C-3	(N) 5G CBAND 5G DoD	AIR6449 B77D + AIR6419 B77G STACKED	ERICSSON	-	300°	160'-0"	(1) NEW 24-PAIR FIBER CABLE	230'-0"	
								(4) EXISTING 6/C DC POWER CABLES	230'-0"	
	C-4	(N) LTE 700 BC /850/WCS	DMP65R-BU6DA	CCI	(1) EXISTING RRUS-32 B30 (1) NEW RRUS-4449 B5/B12 (1) NEW Y-CABLE	300°	160'-0"	(1) NEW 6AWG6 DC POWER CABLE	230'-0"	
								SEE ANTENNA C-3 FOR CABLE TYPE AND LENGTH		

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SITE NAME
SEYMOUR EAST

SITE NUMBER:
CTL05633

SITE ADDRESS
6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME
ANTENNA & CABLE CONFIGURATION

SHEET NUMBER
A6

1. CONTRACTOR IS TO REFER TO AT&T'S MOST CURRENT RADIO FREQUENCY DATA SHEET (RFDS) PRIOR TO CONSTRUCTION.
2. THE SIZE, HEIGHT, AND DIRECTION OF THE ANTENNAS SHALL BE ADJUSTED TO ACHIEVE THE AZIMUTHS SPECIFIED AND LIMIT SHADOWING AND TO MEET THE SYSTEM REQUIREMENTS.
3. CONTRACTOR SHALL VERIFY THE HEIGHT OF THE ANTENNA WITH THE AT&T WIRELESS PROJECT MANAGER.
4. VERIFY TYPE AND SIZE OF TOWER LEG PRIOR TO ORDERING ANY ANTENNA MOUNT.
5. UNLESS NOTED OTHERWISE THE CONTRACTOR MUST PROVIDE ALL MATERIAL NECESSARY.
6. ANTENNA AZIMUTHS ARE DEGREES OFF OF TRUE NORTH, BEARING CLOCKWISE, IN WHICH ANTENNA FACE IS DIRECTED. ALL ANTENNAS (AND SUPPORTING STRUCTURES AS PRACTICAL) SHALL BE ACCURATELY ORIENTED IN THE SPECIFIED DIRECTION.
7. CONTRACTOR SHALL VERIFY ALL RF INFORMATION PRIOR TO CONSTRUCTION.
8. SWEEP TEST SHALL BE PERFORMED BY GENERAL CONTRACTOR AND SUBMITTED TO AT&T WIRELESS CONSTRUCTION SPECIALIST. TEST SHALL BE PERFORMED PER AT&T WIRELESS STANDARDS.
9. CABLE LENGTHS WERE DETERMINED BASED ON THE DESIGN DRAWING. CONTRACTOR TO VERIFY ACTUAL LENGTH DURING PRE-CONSTRUCTION WALK.
10. CONTRACTOR TO USE ROSENBERGER FIBER LINE HANGER COMPONENTS (OR ENGINEER APPROVED EQUAL).

ANTENNA AND CABLING NOTES

SCALE: N.T.S. | 1

RF, DC, & COAX CABLE MARKING LOCATIONS TABLE	
NO	LOCATIONS
1	EACH TOP-JUMPER SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS.
2	EACH MAIN COAX SHALL BE COLOR CODED WITH (1) SET OF 3" WIDE BANDS NEAR THE TOP-JUMPER CONNECTION AND WITH (1) SET OF 3/4" WIDE COLOR BANDS JUST PRIOR TO ENTERING THE BTS OR TRANSMITTER BUILDING.
3	CABLE ENTRY PORT ON THE INTERIOR OF THE SHELTER.
4	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.
5	ALL BOTTOM JUMPERS SHALL BE COLOR CODED WITH (1) SET OF 3/4" WIDE BANDS ON EACH END OF THE BOTTOM JUMPER.

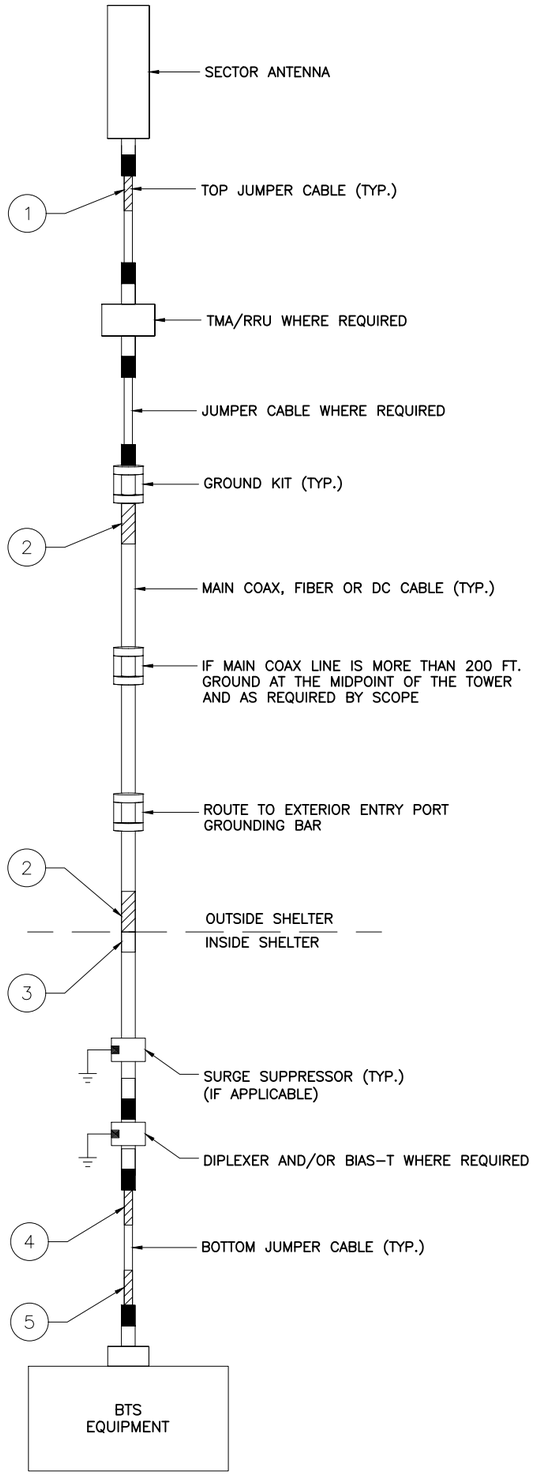
CABLE MARKING DIAGRAM

SCALE: N.T.S. | 2

1. THE ANTENNA SYSTEM COAX SHALL BE LABELED WITH VINYL TAPE.
2. THE STANDARD IS BASED ON EIGHT COLORED TAPES-RED, BLUE, GREEN, YELLOW, ORANGE, BROWN, WHITE, AND VIOLET. THESE TAPES MUST BE 3/4" WIDE & UV RESISTANT SUCH AS SCOTCH 35 VINYL ELECTRICAL COLOR CODING TAPE AND SHOULD BE READILY AVAILABLE TO THE ELECTRICIAN OR CONTRACTOR ON SITE.
3. USING COLOR BANDS ON THE CABLES, MARK ALL RF CABLE BY SECTOR AND CABLE NUMBER AS SHOWN ON "CABLE COLOR CHART".
4. WHEN AN EXISTING COAXIAL LINE THAT IS INTENDED TO BE A SHARED LINE BETWEEN TECHNOLOGIES IS ENCOUNTERED, THE CONTRACTOR SHALL REMOVE THE EXISTING COLOR CODING SCHEME AND REPLACE IT WITH THE COLOR CODING STANDARD. IN THE ABSENCE OF AN EXISTING COLOR CODING AND TAGGING SCHEME, OR WHEN INSTALLING PROPOSED COAXIAL CABLES, THIS GUIDELINE SHALL BE IMPLEMENTED AT THAT SITE REGARDLESS OF TECHNOLOGY.
5. ALL COLOR CODE TAPE SHALL BE 3M-35 AND SHALL BE INSTALLED USING A MINIMUM OF (3) THREE WRAPS OF TAPE AND SHALL BE NEATLY TRIMMED AND SMOOTHED OUT SO AS TO AVOID UNRAVELING.
6. ALL COLOR BANDS INSTALLED AT THE TOP OF THE TOWER SHALL BE A MINIMUM OF 3" WIDE, AND SHALL HAVE A MINIMUM OF 3/4" OF SPACE BETWEEN EACH COLOR.
7. ALL COLOR CODES SHALL BE INSTALLED SO AS TO ALIGN NEATLY WITH ONE ANOTHER FROM SIDE-TO-SIDE.
8. IF EXISTING CABLES AT THE SITE ALREADY HAVE A COLOR CODING SCHEME AND THEY ARE NOT INTENDED TO BE REUSED OR SHARED WITH THE NEW TECHNOLOGY, THE EXISTING COLOR CODING SCHEME SHALL REMAIN UNTOUCHED.

CABLE MARKING NOTES

SCALE: N.T.S. | 3



CABLE COLOR CODING DIAGRAM

SCALE: N.T.S. | 4

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STATE OF CONNECTICUT · KATHLEEN TAYLOR COFFEY · 36017 LICENSED PROFESSIONAL ENGINEER

SITE NAME
SEYMOUR EAST

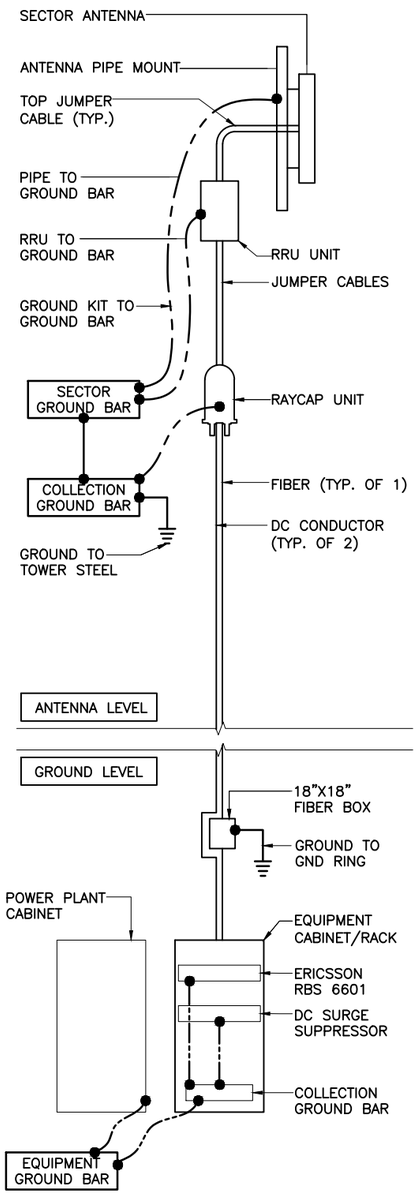
SITE NUMBER:
CTL05633

SITE ADDRESS
6 PROGRESS AVENUE
SEYMOUR, CT 06483

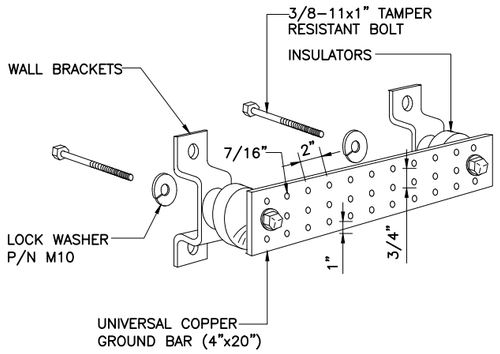
SHEET NAME
CABLE NOTES AND COLOR CODING

SHEET NUMBER
A7

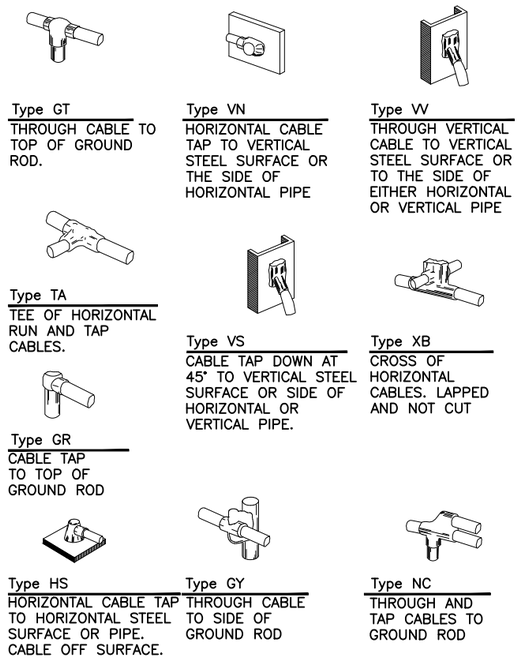
PROJECT# 2021.0215.0018



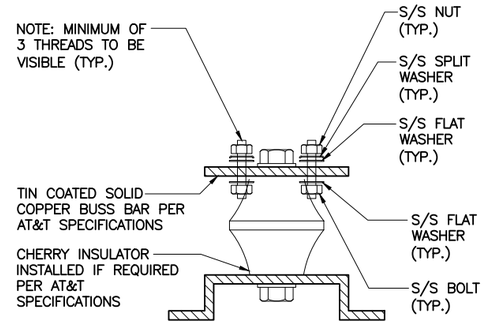
GROUNDING SCHEMATIC SCALE: N.T.S. 1



GROUND BAR DETAIL SCALE: N.T.S. 2



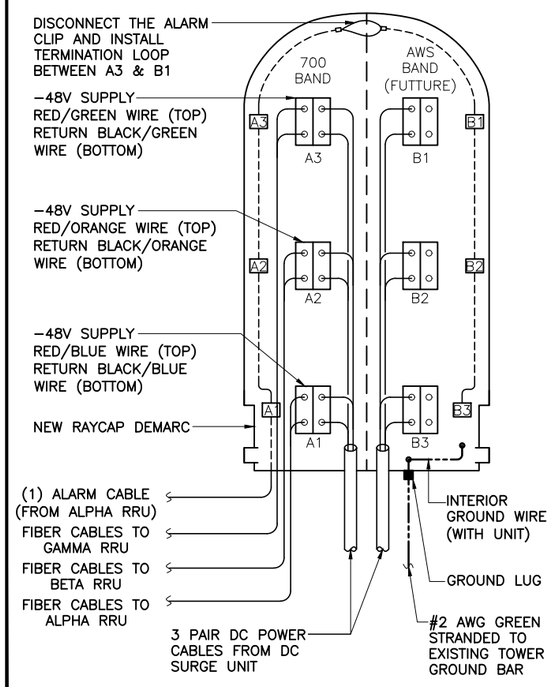
EXOTHERMIC WELD DETAILS SCALE: N.T.S. 4



NOTES:

1. ALL HARDWARE 18–8 STAINLESS STEEL INCLUDING SPLIT WASHERS.
2. COAT WIRE END WITH ANTI–OXIDATION COMPOUND PRIOR TO INSERTION INTO LUG BARREL AND CRIMPING.
3. APPLY ANTI–OXIDATION COMPOUND BETWEEN ALL LUGS AND BUSS BARS PRIOR TO MATING AND BOLTING.

LUG DETAIL SCALE: N.T.S. 3



RAYCAP DC POWER AND ALARM DET. SCALE: N.T.S. 5

NOT USED SCALE: N.T.S. 6

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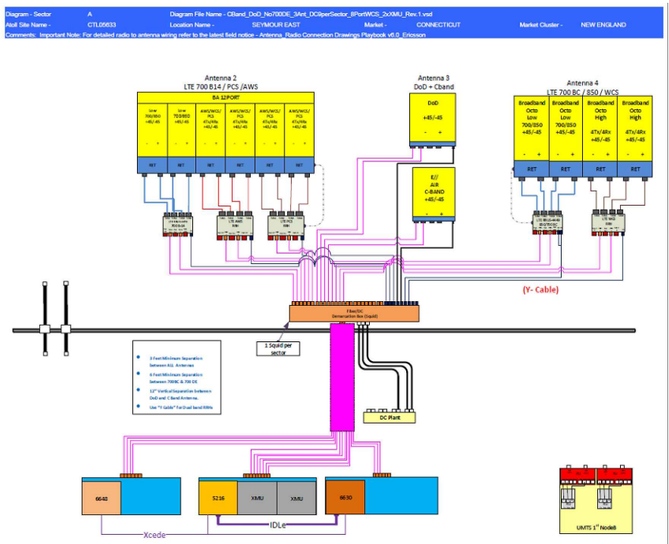
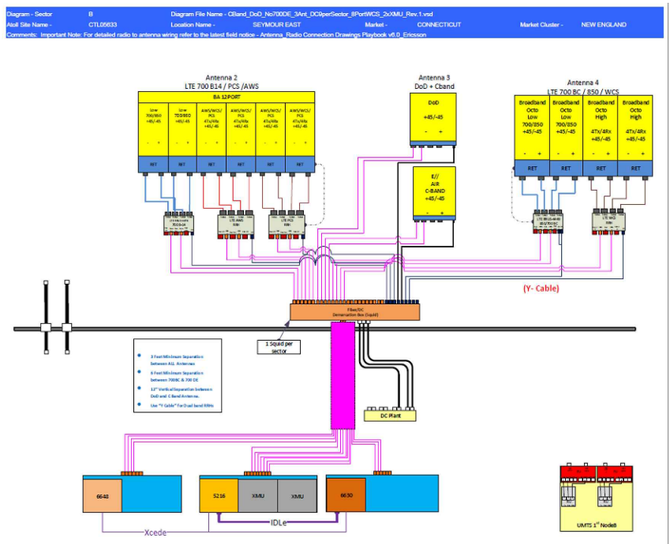
SEYMOUR, CT 06483

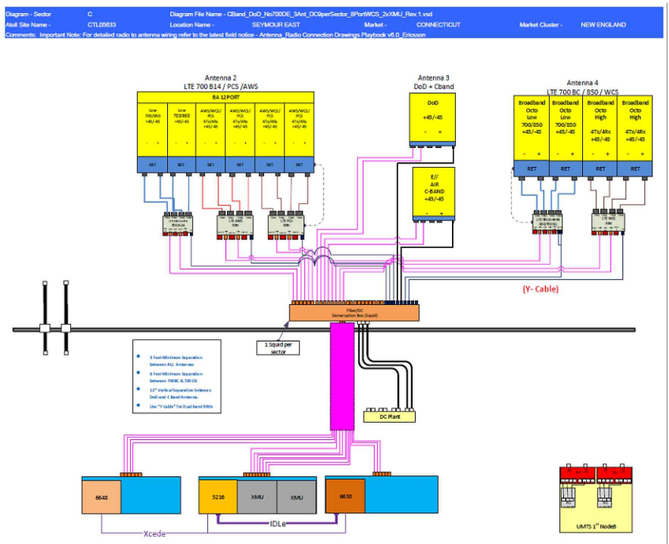
SHEET NAME
GROUNDING DETAILS

SHEET NUMBER
A8

PROJECT# 2021.0215.0018







*BASED ON RFDS V3.0, DATED (03/01/22)

PLUMBING DIAGRAMS

SCALE: N.T.S. | 1

at&t

550 COCHITUATE ROAD
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REV	DATE	DESCRIPTION	BY
0	04/26/22	90% REVIEW	SM
1	05/25/22	REVISED 90%	SM
2	08/11/22	FOR CONSTRUCTION	KR

I HEREBY CERTIFY THAT THESE DRAWINGS WERE PREPARED BY ME OR UNDER MY DIRECT SUPERVISION AND CONTROL, AND TO THE BEST OF MY KNOWLEDGE AND BELIEF COMPLY WITH THE REQUIREMENTS OF ALL APPLICABLE CODES.

SITE NAME

SEYMOUR EAST

SITE NUMBER:

CTL05633

SITE ADDRESS

6 PROGRESS AVENUE
SEYMOUR, CT 06483

SHEET NAME

PLUMBING DIAGRAMS

SHEET NUMBER

A9

PROJECT# 2021.0215.0018