



June 6, 2022

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

Re: Notice of Exempt Modification New Cingular Wireless PCS LLC ("AT&T") Site CT2081  
500 Highland Avenue, Cheshire, CT 06410 (the "Property")  
Latitude: 41.511198 N Longitude: 72.898496 W

Dear Ms. Bachman:

AT&T currently maintains (9) antennas at the 130' level on the existing 160' monopole tower ("Tower") at 500 Highland Avenue, Cheshire, CT. The tower & property are owned by the Town of Cheshire, but the Tower is managed by SBA Site Management, LLC. AT&T intends to modify its facility by removing (6) antennas and adding (3) AIR6449 B77 antennas at the 128' level, adding (2) DMP65R-BU8DA & (1) DMP65R-BU6DA antennas at the 130' level and adding (3) AIR6419 B77G antennas at the 132' level of the tower. The AIR6649 B77 & AIR6419 B77G antennas are stacked one on top of the other. The height of AT&T's existing antennas is 130' and proposed antennas is 128', 130' & 132' on the Tower. AT&T also intends on adding (3) 4415 B25 & (3) 4449 B5/B12 RRUs at the 130' level of the Tower.

This modification may include B2, B5, B17, B14, B29, B30, B66 & n77 hardware that is 4G(LTE) and/or 5G NR capable through remote software configuration and either or both services may be turned on or off at various times.

The Town of Cheshire Planning & Zoning Commission issued a zoning permit for the Tower on November 14, 1984. A building permit was issued in December 1984. AT&T received CT Siting Council Approval under TS-AT&T-025-030711 on July 22, 2003. There were no conditions that could be feasibility be violated by this modification, including total facility height and mounting restrictions. The AT&T modification complies with the above-mentioned approvals.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies ("R.C.S.A") §16-50j-73 for construction that constitutes an exempt modification pursuant to R.C.S.A §16-50j-72(b)(2). In accordance with to R.C.S.A §16-50j-73, a copy of this letter is being sent the Mr. Sean M. Kimball, Town Manager, chief elected official and tower & property owner, Town of Cheshire, Mr. Michael Glidden, Town Planner, Town of Cheshire and SBA Site Management, LLC, the tower manager.

The planned modification of the facility falls squarely within those activities explicitly provided for in R.C.S.A §16-50j-72(b)(2). Specifically:

1. The proposed modifications will not result in an increase in the height of the existing structure.
2. The proposed modifications will not require an extension of the site boundary.
3. The proposed modification will not increase noise levels at the facility by six decibels or more, or to levels that exceed state and local criteria.
4. The operation of the modified facility will not increase radio frequency emissions at the facility to a level at or above the Federal Communications Commission safety standard.
5. The proposed modifications will not cause a change or alteration in the physical or environmental characteristics of the site.
6. The existing structure and foundation can support the proposed loading.

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

Sincerely,

*Hollis M. Redding*

Hollis M. Redding  
SAI Communications, LLC  
12 Industrial Way  
Salem, NH 03079  
Mobile: 860-834-6964  
[hredding@saigrp.com](mailto:hredding@saigrp.com)

Enclosures

Cc:

Mr. Sean M. Kimball, Town Manager, Town of Cheshire, chief elected official, property & tower owner  
Mr. Michael Glidden, Town Planner, Town of Cheshire  
SBA Site Management, LLC, tower manager.



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

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## Calculated Radio Frequency Exposure



CT2081

500 Highland Avenue, Cheshire, CT

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June 6, 2022

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## 1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of existing AT&T antenna arrays on the existing monopole located at 500 Highland Avenue in Cheshire, CT. The coordinates of the existing monopole are 41-30-40.31 N, 72-53-54.59 W.

AT&T is proposing the following:

- 1) Install twelve (12) multi-band antennas (four (4) per sector) to support its commercial LTE network and the FirstNet National Public Safety Broadband Network (“NPSBN”).

This report considers the planned antenna configuration for AT&T<sup>1</sup> to derive the resulting % Maximum Permissible Exposure of its proposed installation.

## 2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm<sup>2</sup>). The general population exposure limits for the various frequency ranges are defined in the attached “FCC Limits for Maximum Permissible Exposure (MPE)” in Attachment B of this report.

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

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

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<sup>1</sup> As referenced to AT&T’s Radio Frequency Design Sheet dated 2/15/22.

### 3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65:

$$\text{Power Density} = \left( \frac{1.6^2 \times 1.64 \times \text{ERP}}{4\pi \times R^2} \right) \times \text{Off Beam Loss}$$

Where:

ERP = Effective Radiated Power

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

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

#### 4. Calculation Results

Table 1 below outlines the cumulative power density information for the proposed AT&T modification on the existing monopole at the site. The proposed antennas are directional in nature; therefore, the majority of the RF power is focused out towards the horizon. As a result, there will be less RF power directed below the antennas relative to the horizon, and consequently lower power density levels around the base of the monopole. Please refer to Attachment C for the vertical pattern of the proposed AT&T antennas. The calculated results for AT&T in Table 1 include a nominal 10 dB off-beam pattern loss to account for the lower relative gain below the antennas.

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm <sup>2</sup> )	Limit	% MPE
Sprint	157.5	850	1	438	0.0069	0.5667	0.12%
Sprint	157.5	850	2	438	0.0137	0.5667	0.24%
Sprint	157.5	1900	5	623	0.0488	1.0000	0.49%
Sprint	157.5	1900	2	1566	0.0491	1.0000	0.49%
Sprint	157.5	2500	8	778	0.0975	1.0000	0.98%
MetroPCS	137.5	2135	3	727	0.0454	1.0000	0.45%
MetroPCS LTE	137.5	2130	1	1200	0.0250	1.0000	0.25%
Town	167.5	450	1	1200	0.0165	0.3000	0.55%
T-Mobile	147	1900	4	1028	0.0744	1.0000	0.74%
T-Mobile	147	1900	2	2057	0.0744	1.0000	0.74%
T-Mobile	147	2100	2	2308	0.0835	1.0000	0.83%
T-Mobile	147	600	2	592	0.0214	0.4000	0.54%
T-Mobile	147	600	1	1578	0.0285	0.4000	0.71%
T-Mobile	147	700	2	695	0.0251	0.4667	0.54%
T-Mobile	147	1900	2	2105	0.0762	1.0000	0.76%
T-Mobile	147	2100	2	1325	0.0479	1.0000	0.48%
T-Mobile	147	2500	1	19239	0.3480	1.0000	3.48%
T-Mobile	147	2500	1	19239	0.3480	1.0000	3.48%
Verizon	122.5	751	4	628	0.0666	0.5007	1.33%
Verizon	122.5	874	4	725	0.0768	0.5827	1.32%
Verizon	122.5	1975	4	1525	0.1616	1.0000	1.62%
Verizon	122.5	2120	4	1493	0.1582	1.0000	1.58%
Verizon	122.5	3730	4	6531	0.6922	1.0000	6.92%
AT&T	130	739	1	3794	0.0089	0.4927	1.80%
AT&T	130	763	1	3156	0.0074	0.5087	1.45%
AT&T	130	885	1	3883	0.0091	0.5900	1.54%
AT&T	130	1900	3	5237	0.0368	1.0000	3.68%
AT&T	130	2100	2	8614	0.0403	1.0000	4.03%
AT&T	130	2300	1	6297	0.0147	1.0000	1.47%
AT&T	128	3500	1	24286	0.0587	1.0000	5.87%
AT&T	132	3500	1	24286	0.0550	1.0000	5.50%
						<b>Total</b>	<b>54.00%</b>

**Table 1: Carrier Information<sup>2</sup>**

<sup>2</sup> The existing record in the CSC Power Density Table for AT&T should be removed and replaced with the updated AT&T technologies and values provided in Table 1. The power density information for Sprint, Metro PCS, Town of Cheshire, Verizon and T-Mobile was taken directly from the CSC database dated 01/21/2022. Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

## 5. Conclusion

The above analysis concludes that RF exposure at ground level from the proposed facility will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the highest expected percent of Maximum Permissible Exposure at ground level for all occupants' equipment is **54.00% of the FCC General Population/Uncontrolled limit.**

As noted previously, the calculated % MPE levels are more conservative (higher) than the actual signal levels will be from the finished modifications.

## 6. Statement of Certification

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



June 6, 2022

Date

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



## **Attachment A: References**

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

IEEE C95.1-2005, IEEE Standard Safety Levels With Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz IEEE-SA Standards Board

IEEE C95.3-2002 (R2008), IEEE Recommended Practice for Measurements and Computations of Radio Frequency Electromagnetic Fields With Respect to Human Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

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

**(A) Limits for Occupational/Controlled Exposure<sup>3</sup>**

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

**(B) Limits for General Population/Uncontrolled Exposure<sup>4</sup>**

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

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

**Table 2: FCC Limits for Maximum Permissible Exposure (MPE)**

<sup>3</sup> Occupational/controlled limits apply in situations in which persons are exposed as a consequence of their employment provided those persons are fully aware of the potential for exposure and can exercise control over their exposure. Limits for occupational/controlled exposure also apply in situations when an individual is transient through a location where occupational/controlled limits apply provided he or she is made aware of the potential for exposure

<sup>4</sup> General population/uncontrolled exposures apply in situations in which the general public may be exposed, or in which persons that are exposed as a consequence of their employment may not be fully aware of the potential for exposure or cannot exercise control over their exposure

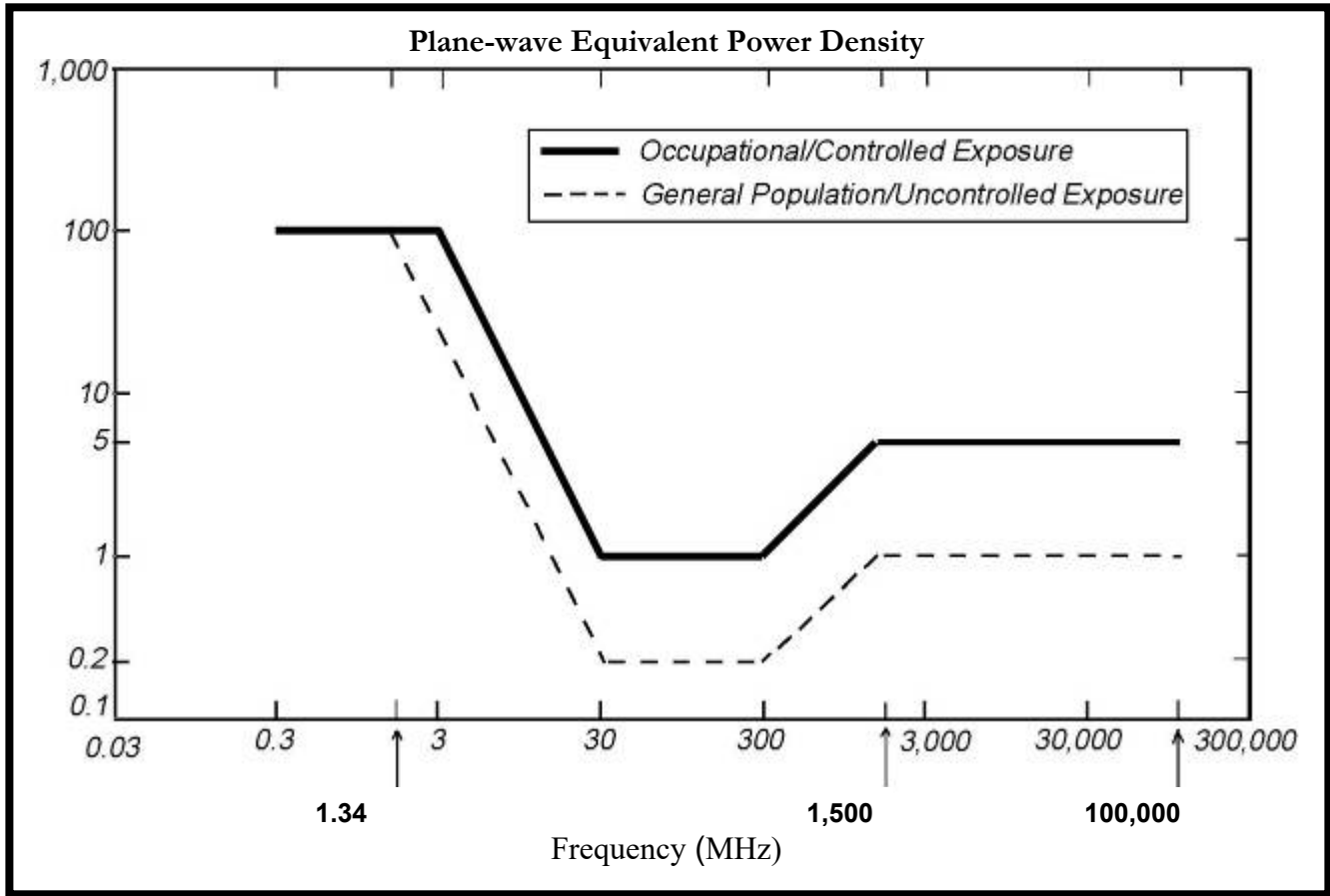
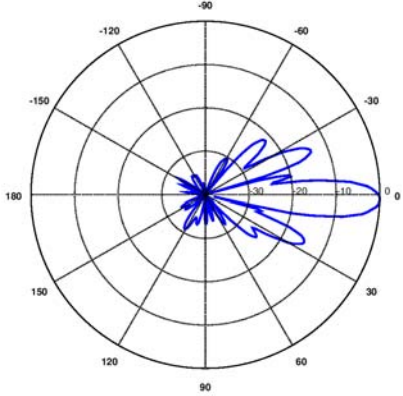
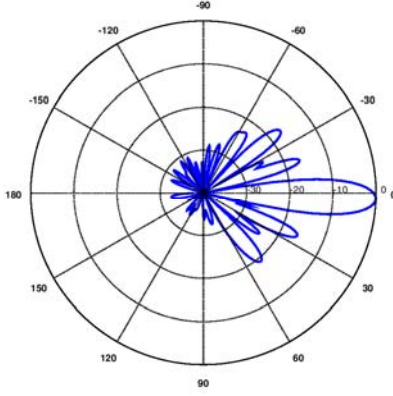
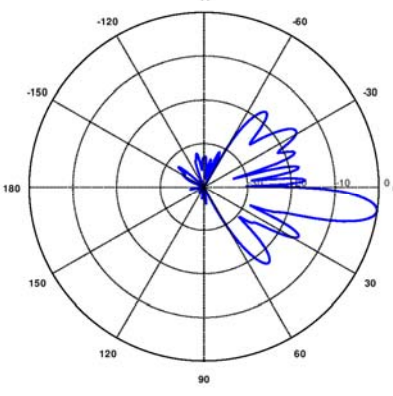
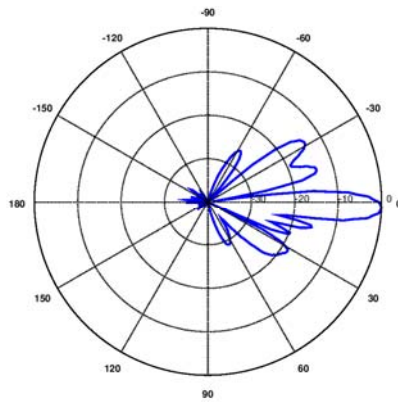
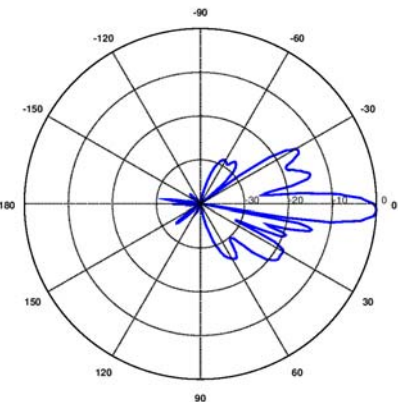
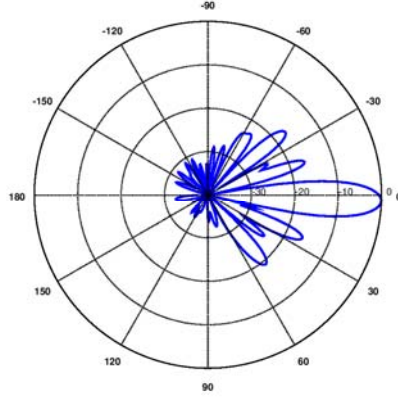


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

**Attachment C: AT&T Antenna Data Sheets and Electrical Patterns**

<p><b>700 MHz</b></p> <p>Manufacturer: CCI Products          Model #: EPBQ-654L8H8-L2          Frequency Band: 698-798 MHz          Gain: 15.9 dBi          Vertical Beamwidth: 9.3°          Horizontal Beamwidth: 67°          Polarization: Dual Linear 45°          Size L x W x D: 96.0" x 21.0" x 6.3"</p>	
<p><b>700 MHz</b></p> <p>Manufacturer: CCI Products          Model #: DMP65R-BU8D          Frequency Band: 698 - 806MHz          Gain: 15.1 dBi          Vertical Beamwidth: 9.5°          Horizontal Beamwidth: 75°          Polarization: Dual Linear 45°          Size L x W x D: 96.0" x 20.7" x 7.7"</p>	
<p><b>885 MHz</b></p> <p>Manufacturer: CCI Products          Model #: DMP65R-BU8D          Frequency Band: 824 - 896 MHz          Gain: 16.0 dBi          Vertical Beamwidth: 8.0°          Horizontal Beamwidth: 64°          Polarization: Dual Linear 45°          Size L x W x D: 96.0" x 20.7" x 7.7"</p>	

<p><b>1900 MHz</b></p> <p>Manufacturer: CCI Products            Model #: EPBQ-654L8H8-L2            Frequency Band: 1850-1990 MHz            Gain: 17.3 dBi            Vertical Beamwidth: 7.8°            Horizontal Beamwidth: 60°            Polarization: Dual Linear 45°            Size L x W x D: 96.0" x 21.0" x 6.3"</p>	
<p><b>2100 MHz</b></p> <p>Manufacturer: CCI Products            Model #: EPBQ-654L8H8-L2            Frequency Band: 1920-2180 MHz            Gain: 17.7 dBi            Vertical Beamwidth: 7.4°            Horizontal Beamwidth: 60°            Polarization: Dual Linear 45°            Size L x W x D: 96.0" x 21.0" x 6.3"</p>	
<p><b>2300 MHz</b></p> <p>Manufacturer: CCI Products            Model #: DMP65R-BU8D            Frequency Band: 2300-2400 MHz            Gain: 18.1 dBi            Vertical Beamwidth: 4.1°            Horizontal Beamwidth: 54°            Polarization: Dual Linear 45°            Size L x W x D: 96.0" x 20.7" x 7.7"</p>	

**PROJECT INFORMATION**

SCOPE OF WORK: **ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:**

- NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: AIR6449 B77 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: DMP65R-BUBDA (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- NEW AT&T ANTENNAS: DMP65R-BU6DA (TOTAL OF 1 PER BETA SECTOR).
- NEW AT&T RRUS: 4415 B25 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T RRUS: 4449 B5/B12 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T DC & FIBER SURGE ARRESTOR DC9-48-60-24-8C-EV (TOTAL OF 1) WITH (1) AWG6 DC TRUNK & (1) 24PAIR FIBER.
- ADD (3) Y-CABLES.
- EXISTING AT&T ANTENNAS: EPBQ-654L8H8-L2 (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T ANTENNAS: EPBQ-654L8H6-L2 (TOTAL OF 1 PER BETA SECTOR) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T RRUS: 4478 B14 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T RRUS: RRUS-32 B66A (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T RRUS: RRUS-32 B30 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 4).

**ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:**

- ADD (1) 6648 + XCODE CABLE.
- ADD (1) 6630 WITH IDLE.
- ADD (4) RECTIFIERS.
- ADD (12) UP-CONVERTER.

**ITEMS TO BE REMOVED:**


- EXISTING AT&T ANTENNAS: 800-10121 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: OPA-65R-LCUU-H8 (TYP. OF 1 PER ALPHA & GAMMA SECTOR, TOTAL OF 2).
- EXISTING AT&T ANTENNAS: OPA-65R-LCUU-H6 (TOTAL OF 1 PER BETA SECTOR).
- EXISTING AT&T SURGE ARRESTOR: DC6-48-60-18-8F (TOTAL OF 1).
- EXISTING AT&T DIPLEXERS: LQP21901 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T TMA'S: DTMABP7819VG12A (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING (6) COAX CABLES.
- DECOM UMITS AND REMOVE UNUSED LINE ELEMENTS.

**ITEMS TO REMAIN:**

- (3) ANTENNAS, (9) RRU'S, (2) SURGE ARRESTOR, (6) COAX CABLES, (6) DC POWER & (2) FIBER

SITE ADDRESS: 500 HIGHLAND AVENUE  
CHESHIRE, CT 06410

LATITUDE: 41.511198° N, 41° 30' 40.31" N  
LONGITUDE: 72.898496° W, 72° 53' 54.59" W  
TYPE OF SITE: MONOPOLE / OUTDOOR EQUIPMENT  
STRUCTURE HEIGHT: 160'-0"±  
RAD CENTER: 130'-0"±(LTE), 132'-0"± (DOD) & 128'-0"± (C-Band)  
CURRENT USE: TELECOMMUNICATIONS FACILITY  
PROPOSED USE: TELECOMMUNICATIONS FACILITY



**SITE NUMBER: CT2081**

**SITE NAME: CHESHIRE CENTRAL**

**FA CODE: 10050935**

**PACE ID: MRCTB055988, MRCTB055342, MRCTB055961, MRCTB054061, MRCTB054936, MRCTB055262, MRCTB055034**

**PROJECT: 5G NR 1SR CBAND BBU ADD 5G NR ACTIVATION\_ ANTENNA MODIFICATIONS\_ 5G NR TDR-1 UPGRADE**

**VICINITY MAP**

**DIRECTIONS TO SITE:**

START OUT GOING EAST ON ENTERPRISE DR TOWARD CAPITAL BLVD. TURN LEFT ONTO CAPITAL BLVD. TURN LEFT ONTO WEST ST. MERGE ONTO I-91 S VIA THE RAMP ON THE LEFT TOWARD NEW HAVEN. MERGE ONTO I-691 W VIA EXIT 18 TOWARD WATERBURY/MERIDEN. TAKE THE CT-10 EXIT, EXIT 3. TOWARD CHESHIRE/MILLDALE. TURN LEFT ONTO HIGHLAND AVE/CT-10. 500 HIGHLAND AVE, CHESHIRE, CT 06410-2249, 500 HIGHLAND AVE IS ON THE LEFT.



**GENERAL NOTES**

- THIS DOCUMENT IS THE CREATION, DESIGN, PROPERTY AND COPYRIGHTED WORK OF AT&T. ANY DUPLICATION OR USE WITHOUT EXPRESS WRITTEN CONSENT IS STRICTLY PROHIBITED. DUPLICATION AND USE BY GOVERNMENT AGENCIES FOR THE PURPOSES OF CONDUCTING THEIR LAWFULLY AUTHORIZED REGULATORY AND ADMINISTRATIVE FUNCTIONS IS SPECIFICALLY ALLOWED.
- THE FACILITY IS AN UNMANNED PRIVATE AND SECURED EQUIPMENT INSTALLATION. IT IS ONLY ACCESSED BY TRAINED TECHNICIANS FOR PERIODIC ROUTINE MAINTENANCE AND THEREFORE DOES NOT REQUIRE ANY WATER OR SANITARY SEWER SERVICE. THE FACILITY IS NOT GOVERNED BY REGULATIONS REQUIRING PUBLIC ACCESS PER ADA REQUIREMENTS.
- CONTRACTOR SHALL VERIFY ALL PLANS AND EXISTING DIMENSIONS AND CONDITIONS ON THE JOB SITE AND SHALL IMMEDIATELY NOTIFY THE AT&T MOBILITY REPRESENTATIVE IN WRITING OF DISCREPANCIES BEFORE PROCEEDING WITH THE WORK OR BE RESPONSIBLE FOR SAME.
- CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

**DRAWING INDEX**

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUT PLANS	1
A-3	ELEVATION	1
A-4	DETAILS	1
A-5	DETAILS	1
SN-1	STRUCTURAL NOTES	1
S-1	MOUNT MODIFICATION DESIGN	1
G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

**72 HOURS**

**CALL BEFORE YOU DIG**

CALL TOLL FREE **1-800-922-4455**  
OR CALL **811**

**UNDERGROUND SERVICE ALERT**



45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



12 INDUSTRIAL WAY  
SALEM, NH 03079

**SITE NUMBER: CT2081**  
**SITE NAME: CHESHIRE CENTRAL**

500 HIGHLAND AVENUE  
CHESHIRE, CT 06410  
NEW HAVEN COUNTY



500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	DESIGNED BY: HC	SCALE: AS SHOWN	DRAWN BY: [Signature]
1	04/22/22	ISSUED FOR CONSTRUCTION	HC		
A	01/25/22	ISSUED FOR REVIEW	HC		

STATE OF CONNECTICUT  
DAVID P. HAMM  
REGISTERED PROFESSIONAL ENGINEER  
NO. 4118

AT&T

TITLE SHEET  
5G NR 1SR CBAND\_BBU ADD\_5G NR ACTIVATION\_ ANTENNA MODIFICATIONS\_ 5G NR 1DR-1 UPGRADE

SITE NUMBER: CT2081  
DRAWING NUMBER: T-1  
REV: 1

**GROUNDING NOTES**

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.
2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.
3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.
4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.
5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.
6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.
7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.
8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.
9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.
10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.
11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.
12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

**GENERAL NOTES**

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:  
CONTRACTOR – SAI  
SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)  
OWNER – AT&T MOBILITY
2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.
3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.
4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.
5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.
6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.
7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.
8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.
9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.
10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.
11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.
12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.
13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.
15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.
16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."
17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.
18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.
19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.
20. **APPLICABLE BUILDING CODES:**  
SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

**BUILDING CODE: IBC 2015 WITH 2018 CT STATE BUILDING CODE AMENDMENTS**  
**ELECTRICAL CODE: 2017 NATIONAL ELECTRICAL CODE (NFPA 70-2017)**

SUBCONTRACTOR'S WORK SHALL COMPLY WITH THE LATEST EDITION OF THE FOLLOWING STANDARDS:

**AMERICAN CONCRETE INSTITUTE (ACI) 318; BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE;**

**AMERICAN INSTITUTE OF STEEL CONSTRUCTION (AISC) MANUAL OF STEEL CONSTRUCTION, ASD, FOURTEENTH EDITION;**

**TELECOMMUNICATIONS INDUSTRY ASSOCIATION (TIA) 222-H, STRUCTURAL STANDARDS FOR STEEL**

FOR ANY CONFLICTS BETWEEN SECTIONS OF LISTED CODES AND STANDARDS REGARDING MATERIAL, METHODS OF CONSTRUCTION, OR OTHER REQUIREMENTS, THE MOST RESTRICTIVE REQUIREMENT SHALL GOVERN. WHERE THERE IS CONFLICT BETWEEN A GENERAL REQUIREMENT AND A SPECIFIC REQUIREMENT, THE SPECIFIC REQUIREMENT SHALL GOVERN.

**ABBREVIATIONS**

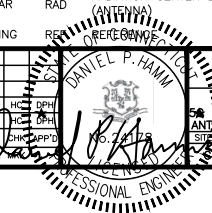
AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	TBR	TO BE REMOVED AND REPLACED
BTS	BASE TRANSCEIVER STATION	P	PROPOSED	TYP	TYPICAL
E	EXISTING	NTS	NOT TO SCALE	UG	UNDER GROUND
EGB	EQUIPMENT GROUND BAR	RAD	RADIATION CENTER LINE	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REQ	REQUIRED		

SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL

500 HIGHLAND AVENUE  
CHESHIRE, CT 06410  
NEW HAVEN COUNTY

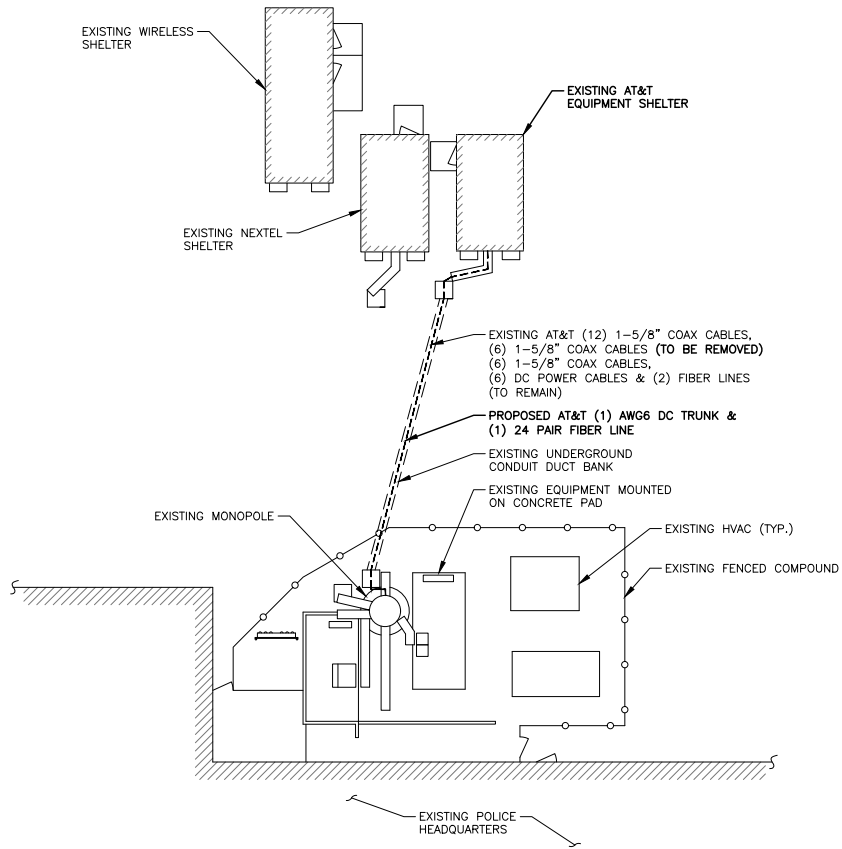


										AT&T	
	1	04/22/22	ISSUED FOR CONSTRUCTION		JJ	HC	DPV	GENERAL NOTES			
	A	01/25/22	ISSUED FOR REVIEW		MJ	HC	BA	5G NR 15R CBAND_BBU ADD_5G NR ACTIVATION ANTENNA MODIFICATIONS_5G NR 1DR-1 UPGRADE			
	NO.	DATE	REVISIONS		CHK	APPD	BY	SITE NUMBER		DRAWING NUMBER	REV
	SCALE:	AS SHOWN	DESIGNED BY:	HC	DRAWN BY:	DPV		2081		GN-1	1

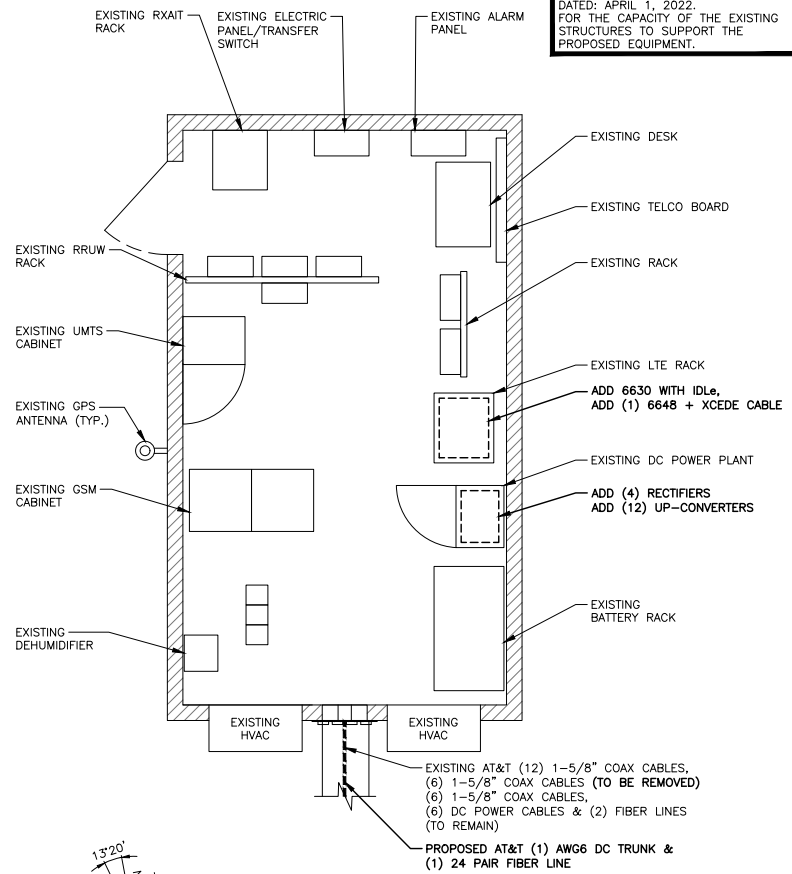


NOTE:  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:  
REFER TO **STRUCTURAL ANALYSIS** BY: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION, DATED: APRIL 1, 2022, FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



**COMPOUND PLAN**  
22x34 SCALE: 3/32"=1'-0"  
11x17 SCALE: 3/64"=1'-0"



**EQUIPMENT PLAN**  
22x34 SCALE: 1/2"=1'-0"  
11x17 SCALE: 1/4"=1'-0"

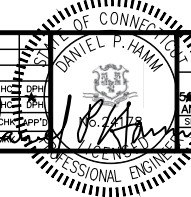
**HGD HUDSON Design Group LLC**  
45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553 FAX: (978) 336-5586

**SAI**  
12 INDUSTRIAL WAY SALEM, NH 03079

SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL  
500 HIGHLAND AVENUE CHESHIRE, CT 06410  
NEW HAVEN COUNTY

**at&t**  
500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

1	04/22/22	ISSUED FOR CONSTRUCTION	JL	HC	DPV
A	01/25/22	ISSUED FOR REVIEW	MR	HC	DPV
NO.	DATE	REVISIONS	BY	CHK	APPD
SCALE:	AS SHOWN	DESIGNED BY:	HC	DRAWN BY:	DPV



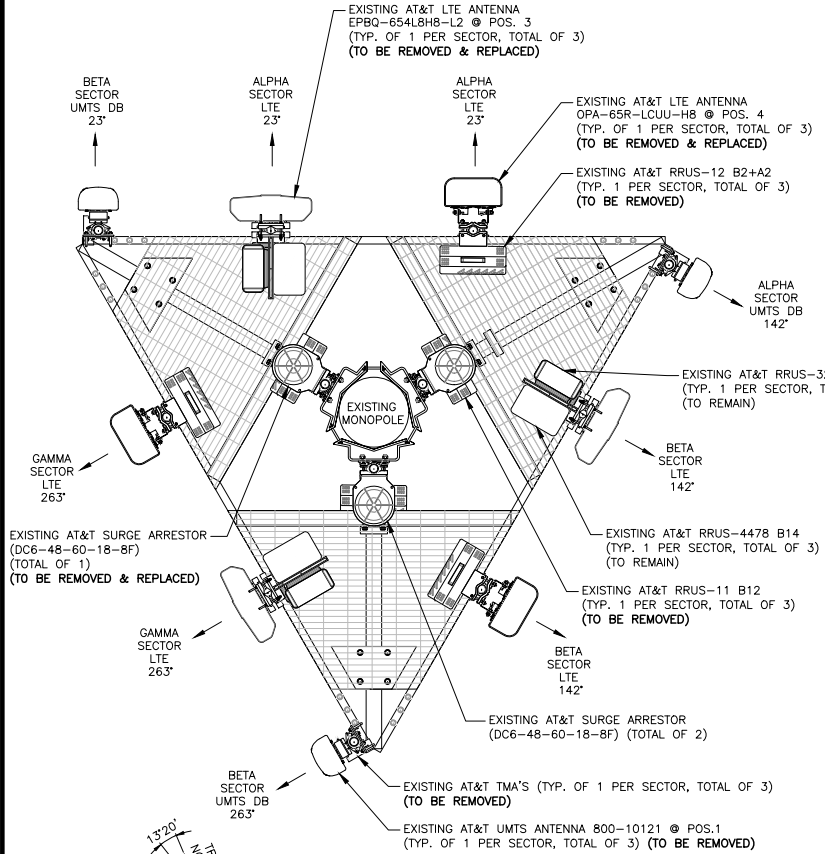
AT&T  
COMPOUND & EQUIPMENT PLANS  
5G NR 1SR CBAND\_BBU ADD\_5G NR ACTIVATION\_ ANTENNA MODIFICATIONS\_5G NR 1DR-1 UPGRADE  
SITE NUMBER: CT2081 DRAWING NUMBER: A-1 REV: 1



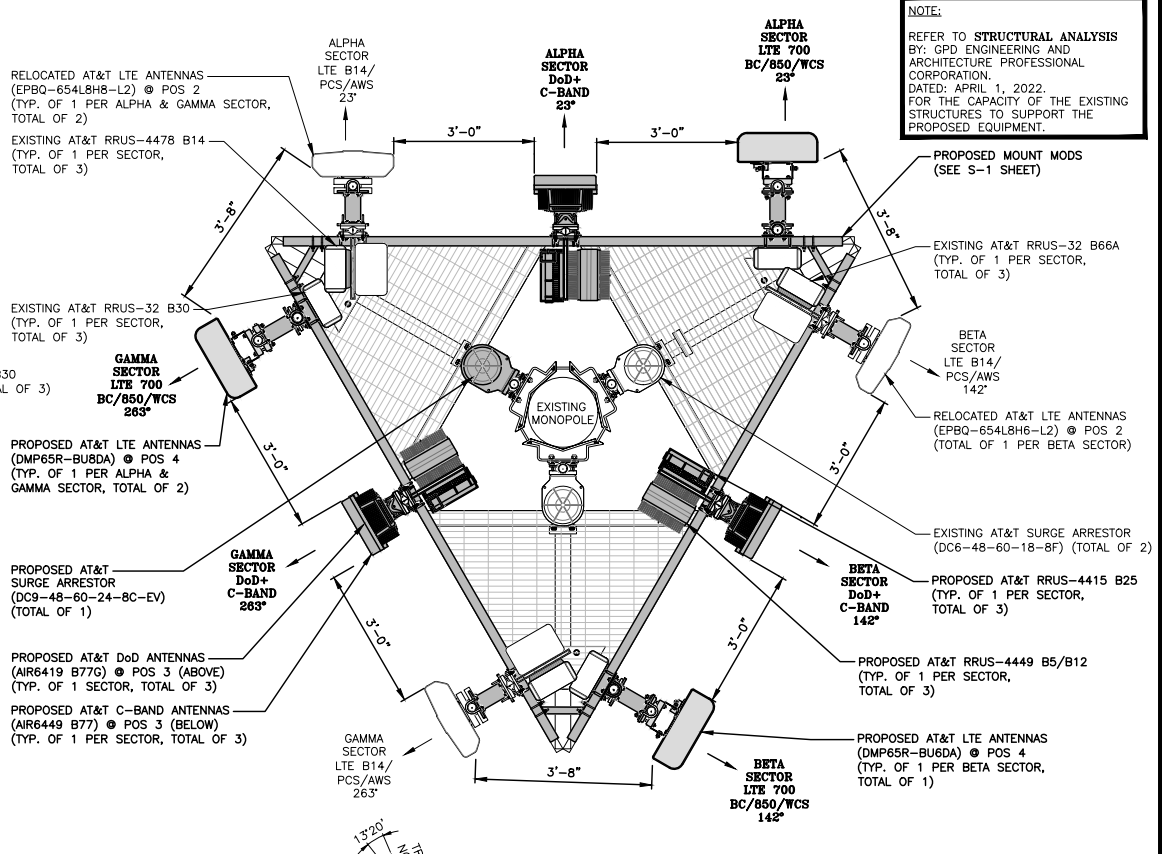
**NOTE:**  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 14, 2022

**NOTE:**  
REFER TO STRUCTURAL ANALYSIS BY: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION. DATED: APRIL 1, 2022. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



**EXISTING ANTENNA PLAN**  
SCALE: N.T.S.  
1  
A-2



**PROPOSED ANTENNA PLAN**  
SCALE: N.T.S.  
2  
A-2

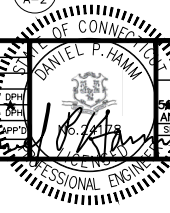
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**SAI**  
12 INDUSTRIAL WAY SALEM, NH 03079

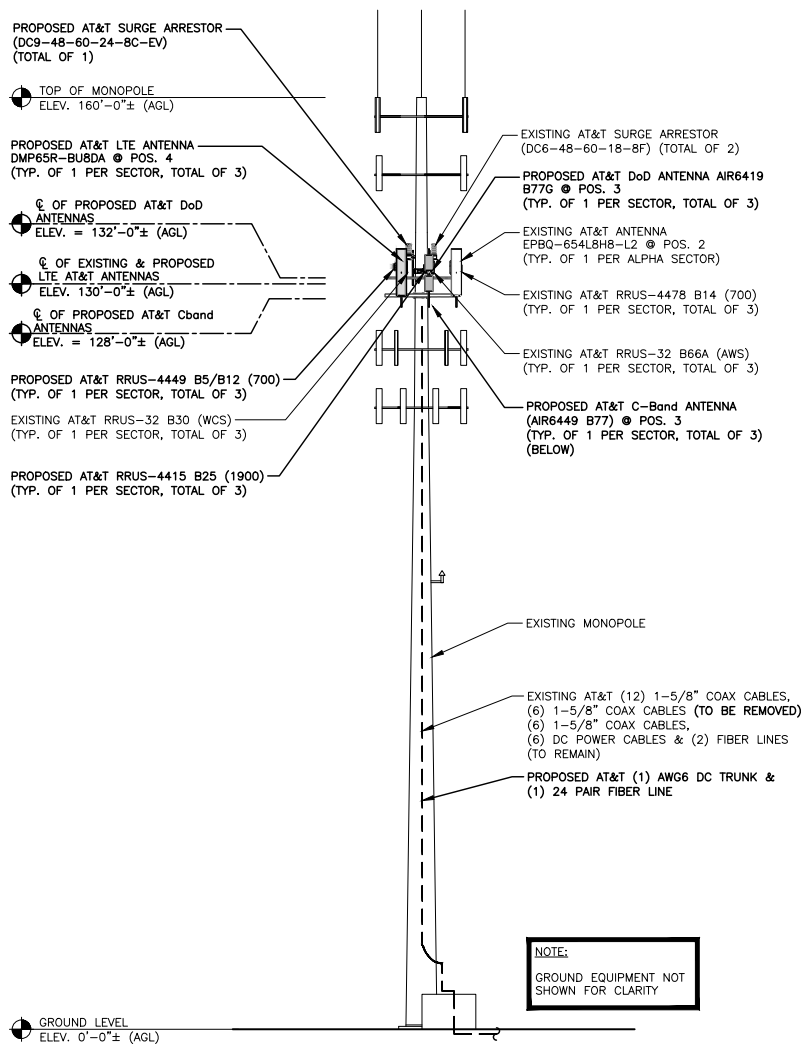
SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL  
500 HIGHLAND AVENUE CHESHIRE, CT 06410 NEW HAVEN COUNTY

**at&t**  
500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

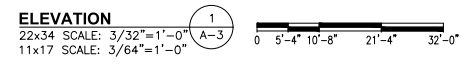
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A	01/25/22	ISSUED FOR REVIEW	ML	HC	DP
NO.	DATE	REVISIONS	BY	CHK	APPD
SCALE:	AS SHOWN	DESIGNED BY:	HC	DRAWN BY:	DP



**AT&T**  
ANTENNA LAYOUT PLANS  
5G NR 15R CBAND\_BBU ADD\_5G NR ACTIVATION ANTENNA MODIFICATIONS\_5G NR 1DR-1 UPGRADE  
SITE NUMBER: CT2081 DRAWING NUMBER: A-2 REV: 1



NOTE:  
GROUND EQUIPMENT NOT SHOWN FOR CLARITY



NOTE:  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:  
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 14, 2022

NOTE:  
REFER TO STRUCTURAL ANALYSIS BY: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION. DATED: APRIL 1, 2022. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

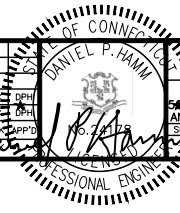
**HGD** HUDSON Design Group LLC  
45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845 TEL: (978) 557-5553 FAX: (978) 336-5586

**SAI**  
12 INDUSTRIAL WAY SALEM, NH 03079

SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL  
500 HIGHLAND AVENUE CHESHIRE, CT 06410 NEW HAVEN COUNTY

**at&t**  
500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

1	04/22/22	ISSUED FOR CONSTRUCTION	JLH	HC	DPV
A	01/25/22	ISSUED FOR REVIEW	MA	HC	DPV
NO.	DATE	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY
			HC		



AT&T	
ELEVATION	5G NR 1SR CBAND_BBU_ADD_5G NR ACTIVATION ANTENNA MODIFICATIONS_5G NR 1DR-1 UPGRADE
SITE NUMBER	CT2081
DRAWING NUMBER	A-3
REV	1

ANTENNA SCHEDULE												
SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA Ø HEIGHT	ANTENNA TIP HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
-	-	-	-	-	-	-	-	-	-	-	(2)1-5/8 COAX	-
A2	EXISTING	LTE 700 WCS/PCS	EPBQ-654L8H8-L2	96x21x6.3	130'-0"±	134'-0"±	23°	-	(E)(1) 4478 B14 (700) (E)(1) RRUS-32 B66A (AWS) (P)(1) 4415 B25 (1900)	-	(E)(2) DC POWER & (1) FIBER	(E)(1) RAYCAP DC9-48-60-18-8F
A3	PROPOSED	LTE B-14/AWS	AIR6419 B77G + AIR6449 B77D (STACKED)	31.1X16.1X7.3 30.6X15.9X10.6	132'-0"± 128'-0"±	133'-4"± 129'-3"±	23°	-	-	-	-	-
A4	PROPOSED	LTE 700 BC/850/PCS	DMP65R-BU8DA	96x20.7x7.7	130'-0"±	134'-0"±	23°	-	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	-	(P)(1) Y-CABLE	-
-	-	-	-	-	-	-	-	-	-	-	(2)1-5/8 COAX	-
B2	EXISTING	LTE 700 WCS/PCS	EPBQ-654L8H6-L2	73x21x6.3	130'-0"±	134'-0"±	142°	-	(E)(1) 4478 B14 (700) (E)(1) RRUS-32 B66A (AWS) (P)(1) 4415 B25 (1900)	-	(E)(2) DC POWER & (1) FIBER	(E)(1) RAYCAP DC9-48-60-18-8F
B3	PROPOSED	LTE B-14/AWS	AIR6419 B77G + AIR6449 B77D (STACKED)	31.1X16.1X7.3 30.6X15.9X10.6	132'-0"± 128'-0"±	133'-4"± 129'-3"±	142°	-	-	-	-	-
B4	PROPOSED	LTE 700 BC/850/PCS	DMP65R-BU6DA	71.2X20.7X7.7	130'-0"±	134'-0"±	142°	-	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	-	(P)(1) Y-CABLE	-
-	-	-	-	-	-	-	-	-	-	-	(2)1-5/8 COAX	-
C2	EXISTING	LTE 700 WCS/PCS	EPBQ-654L8H8-L2	96x21x6.3	130'-0"±	134'-0"±	263°	-	(E)(1) 4478 B14 (700) (E)(1) RRUS-32 B66A (AWS) (P)(1) 4415 B25 (1900)	-	(E)(2) DC POWER, (P)(1) DC POWER & (1) FIBER	(P)(1) RAYCAP DC9-48-60-24-8C-BY
C3	PROPOSED	LTE B-14/AWS	AIR6419 B77G + AIR6449 B77D (STACKED)	31.1X16.1X7.3 30.6X15.9X10.6	132'-0"± 128'-0"±	133'-4"± 129'-3"±	263°	-	-	-	-	-
C4	PROPOSED	LTE 700 BC/850/PCS	DMP65R-BU8DA	96x20.7x7.7	130'-0"±	134'-0"±	263°	-	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	-	(P)(1) Y-CABLE	-

NOTE:  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:  
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 14, 2022

NOTE:  
REFER TO STRUCTURAL ANALYSIS BY: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION. DATED: APRIL 1, 2022. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

**FINAL ANTENNA SCHEDULE** 1  
SCALE: N.T.S. A-4

RRU CHART		
QUANTITY	MODEL	SIZE (L x W x D)
P(3)	4449 (850/700)	17.9"x13.2"x10.4"
E(3)	4478 B14 (700)	18.1"x13.4"x8.3"
P(3)	4415 (PCS)	16.5"x13.4"x5.9"
E(3)	RRUS-32 (AWS)	27.2"x12.1"x7.0"
E(3)	RRUS-32 (WCS)	27.2"x12.1"x7.0"

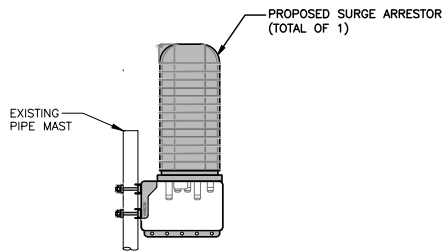
NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS



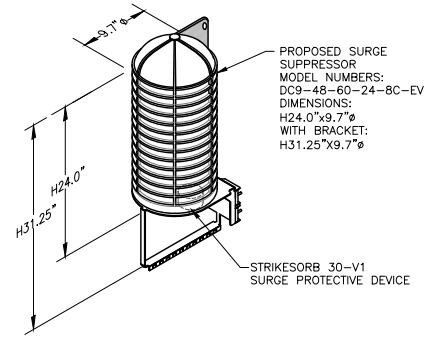
PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**PROPOSED RRUS DETAIL** 2  
SCALE: N.T.S. A-4



**SURGE SUPPRESSOR MOUNTING DETAIL** 3  
SCALE: N.T.S. A-4



NOTE:  
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

**DC SURGE SUPPRESSOR DETAIL** 4  
SCALE: N.T.S. A-4

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

**SAI**  
12 INDUSTRIAL WAY SALEM, NH 03079

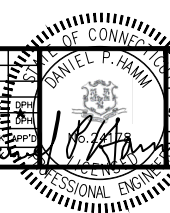
SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL

500 HIGHLAND AVENUE CHESHIRE, CT 06410  
NEW HAVEN COUNTY

**at&t**  
500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	DESIGNED BY	DRAWN BY	CHECKED BY	DATE
1	04/22/22	ISSUED FOR CONSTRUCTION	HC	HC	HC	04/22/22
A	01/25/22	ISSUED FOR REVIEW	HC	HC	HC	01/25/22

SCALE: AS SHOWN

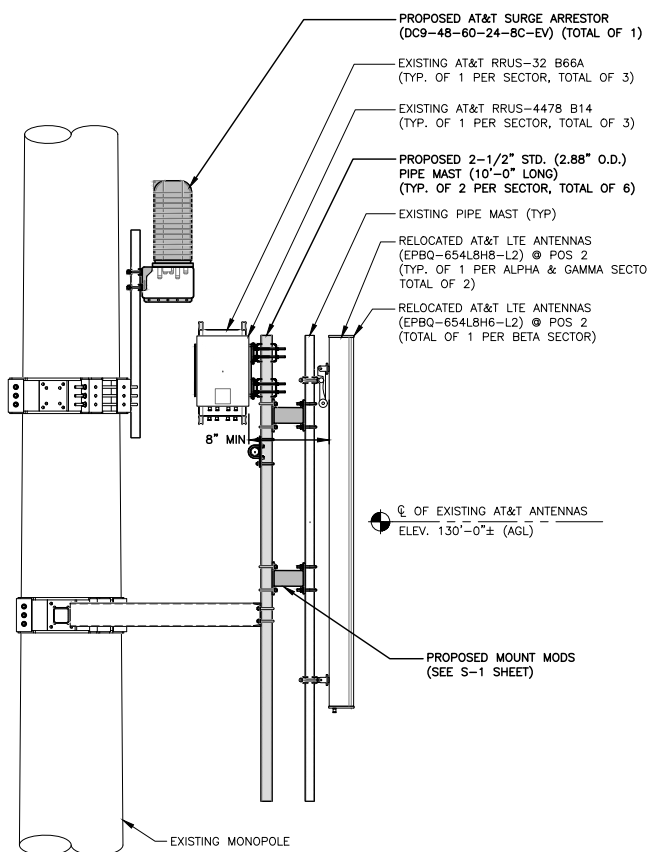


**AT&T**  
DETAILS  
5G NR 15R CBAND\_BBU\_ADD\_5G NR ACTIVATION\_ ANTENNA MODIFICATIONS\_5G NR 1DR-1 UPGRADE  
SITE NUMBER: CT2081  
DRAWING NUMBER: A-4  
REV: 1

**NOTE:**  
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

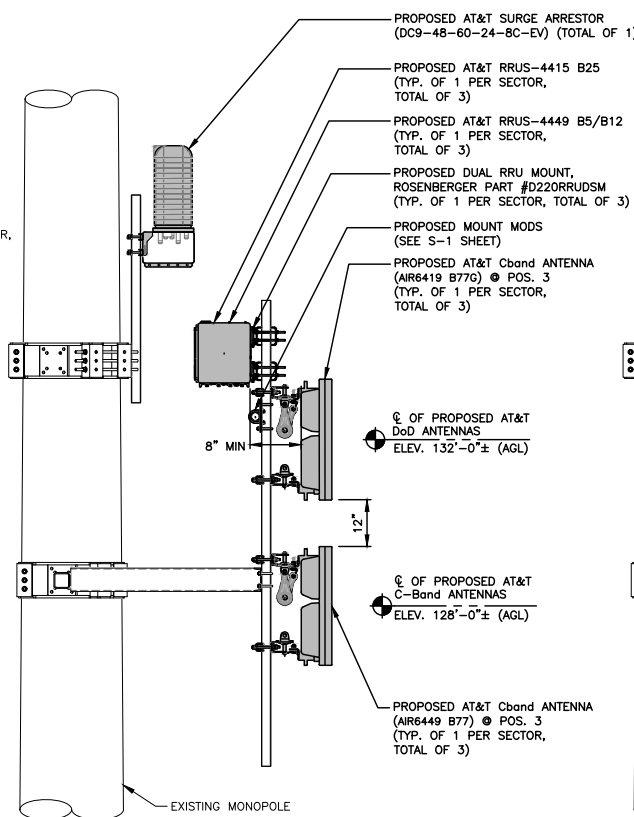
**NOTE:**  
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 14, 2022

**NOTE:**  
REFER TO **STRUCTURAL ANALYSIS** BY: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION. DATED: APRIL 1, 2022. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



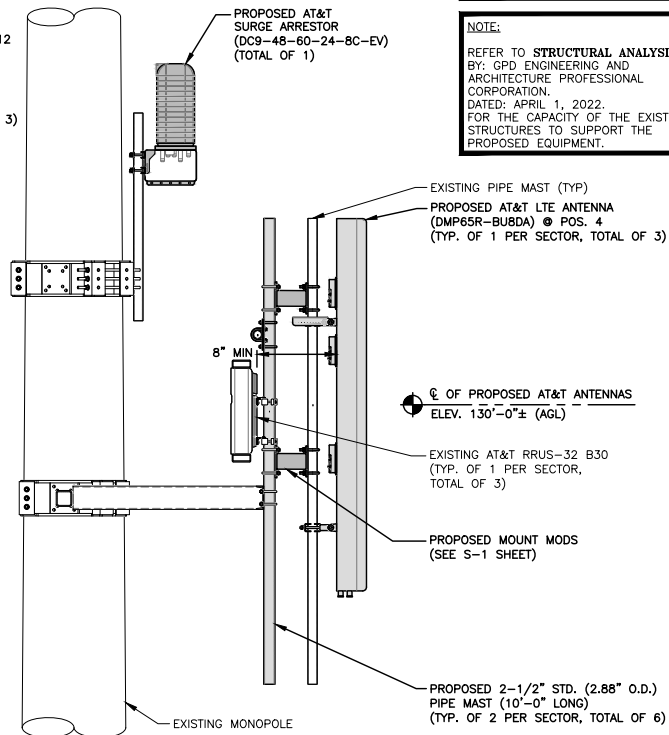
**EXISTING LTE ANTENNA MOUNTING DETAIL @ POS. 2**

22x34 SCALE: 3/4"=1'-0"  
11x17 SCALE: 3/8"=1'-0"



**PROPOSED C-BAND ANTENNA MOUNTING DETAIL @ POS. 3**

22x34 SCALE: 3/4"=1'-0"  
11x17 SCALE: 3/8"=1'-0"



**PROPOSED LTE ANTENNA MOUNTING DETAIL @ POS. 4**

22x34 SCALE: 3/4"=1'-0"  
11x17 SCALE: 3/8"=1'-0"



45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586



12 INDUSTRIAL WAY  
SALEM, NH 03079

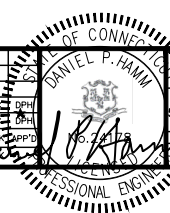
SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL

500 HIGHLAND AVENUE  
CHESHIRE, CT 06410  
NEW HAVEN COUNTY



500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

NO.		DATE	REVISIONS	DESIGNED BY: HC	DRAWN BY: [Signature]	SCALE: AS SHOWN	PROJECT: AT&T
1	04/22/22	ISSUED FOR CONSTRUCTION					
A	01/25/22	ISSUED FOR REVIEW					
DETAILS 5G NR 15R CBAND_BBU ADD_5G NR ACTIVATION ANTENNA MODIFICATIONS_5G NR 1DR-1 UPGRADE							SITE NUMBER: CT2081 DRAWING NUMBER: A-5 REV: 1



**STRUCTURAL NOTES:**

- DESIGN REQUIREMENTS ARE PER STATE BUILDING CODE AND APPLICABLE SUPPLEMENTS, INTERNATIONAL BUILDING CODE, EIA/TIA-222-H STRUCTURAL STANDARDS FOR STEEL ANTENNA, TOWERS AND ANTENNA SUPPORTING STRUCTURES.
- CONTRACTOR SHALL VERIFY ALL DIMENSIONS AND CONDITIONS IN THE FIELD PRIOR TO FABRICATION AND ERECTION OF ANY MATERIAL. ANY UNUSUAL CONDITIONS SHALL BE REPORTED TO THE ATTENTION OF THE CONSTRUCTION MANAGER AND ENGINEER OF RECORD.
- DESIGN AND CONSTRUCTION OF STRUCTURAL STEEL SHALL CONFORM TO THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION "SPECIFICATION FOR THE DESIGN, FABRICATION AND ERECTION OF STRUCTURAL STEEL FOR BUILDINGS".
- STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (99-50 ksi) MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
- STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B, PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
- STRUCTURAL CONNECTION BOLTS SHALL BE HIGH STRENGTH BOLTS (BEARING TYPE) AND CONFORM TO ASTM A325 TYPE-X "HIGH STRENGTH BOLTS FOR STRUCTURAL JOINTS, INCLUDING SUITABLE NUTS AND PLAIN HARDENED WASHERS". ALL BOLTS SHALL BE 3/4" DIA UON.
- ALL STEEL MATERIALS SHALL BE GALVANIZED AFTER FABRICATION IN ACCORDANCE WITH ASTM A123 "ZINC (HOT-DIP GALVANIZED) COATINGS ON IRON AND STEEL PRODUCTS", UNLESS OTHERWISE NOTED.
- ALL BOLTS, ANCHORS AND MISCELLANEOUS HARDWARE SHALL BE GALVANIZED IN ACCORDANCE WITH ASTM A153 "ZINC-COATING (HOT-DIP) ON IRON AND STEEL HARDWARE", UNLESS OTHERWISE NOTED.
- FIELD WELDS, DRILL HOLES, SAW CUTS AND ALL DAMAGED GALVANIZED SURFACES SHALL BE REPAIRED WITH AN ORGANIC ZINC REPAIR PAINT COMPLYING WITH REQUIREMENTS OF ASTM A780. GALVANIZING REPAIR PAINT SHALL HAVE 65 PERCENT ZINC BY WEIGHT, ZIRP BY DUNCAN GALVANIZING, GALVA BRIGHT PREMIUM BY CROWN OR EQUAL. THICKNESS OF APPLIED GALVANIZING REPAIR PAINT SHALL BE NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
- CONTRACTOR SHALL COMPLY WITH AWS CODE FOR PROCEDURES, APPEARANCE AND QUALITY OF WELDS, AND FOR METHODS USED IN CORRECTING WELDING. ALL WELDERS AND WELDING PROCESSES SHALL BE QUALIFIED IN ACCORDANCE WITH AWS "STANDARD QUALIFICATION PROCEDURES". ALL WELDING SHALL BE DONE USING E70XX ELECTRODES AND WELDING SHALL CONFORM TO AISC AND D.I.I. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL", 14TH EDITION.
- INCORRECTLY FABRICATED, DAMAGED OR OTHERWISE MISFITTING OR NON-CONFORMING MATERIALS OR CONDITIONS SHALL BE REPORTED TO THE CONSTRUCTION MANAGER PRIOR TO REMEDIAL OR CORRECTIVE ACTION. ANY SUCH ACTION SHALL REQUIRE CONSTRUCTION MANAGER APPROVAL.
- UNISTRUT SHALL BE FORMED STEEL CHANNEL STRUT FRAMING AS MANUFACTURED BY UNISTRUT CORP., WAYNE, MI OR EQUAL. STRUT MEMBERS SHALL BE 1 5/8"x1 5/8"x12GA, UNLESS OTHERWISE NOTED, AND SHALL BE HOT-DIP GALVANIZED AFTER FABRICATION.
- EPOXY ANCHOR ASSEMBLY SHALL CONSIST OF STAINLESS STEEL ANCHOR ROD WITH NUTS & WASHERS, AN INTERNALLY THREADED INSERT, A SCREEN TUBE AND A EPOXY ADHESIVE. THE ANCHORING SYSTEM SHALL BE THE HILT-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
- EXPANSION BOLTS SHALL CONFORM TO FEDERAL SPECIFICATION FF-S-325, GROUP II, TYPE 4, CLASS I, HILTI KWIK BOLT III OR APPROVED EQUAL. INSTALLATION SHALL BE IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
- LUMBER SHALL COMPLY WITH THE REQUIREMENTS OF THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTION AND THE NATIONAL FOREST PRODUCTS ASSOCIATION'S NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION. ALL LUMBER SHALL BE PRESSURE TREATED AND SHALL BE STRUCTURAL GRADE NO. 2 OR BETTER.
- WHERE ROOF PENETRATIONS ARE REQUIRED, THE CONTRACTOR SHALL CONTACT AND COORDINATE RELATED WORK WITH THE BUILDING OWNER AND THE EXISTING ROOF INSTALLER. WORK SHALL BE PERFORMED IN SUCH A MANNER AS TO NOT VOID THE EXISTING ROOF WARRANTY. ROOF SHALL BE WATERTIGHT.
- ALL FIBERGLASS MEMBERS USED ARE AS MANUFACTURED BY STRONGWELL COMPANY OF BRISTOL, VA 24203. ALL DESIGN CRITERIA FOR THESE MEMBERS IS BASED ON INFORMATION PROVIDED IN THE DESIGN MANUAL. ALL REQUIREMENTS PUBLISHED IN SAID MANUAL MUST BE STRICTLY ADHERED TO.
- NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
- SUBCONTRACTOR SHALL FIREPROOF ALL STEEL TO PRE-EXISTING CONDITIONS.

**SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):**

**GENERAL:** WHERE APPLICATION IS MADE FOR CONSTRUCTION, THE OWNER OR THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE ACTING AS THE OWNER'S AGENT SHALL EMPLOY ONE OR MORE APPROVED AGENCIES TO PERFORM INSPECTIONS DURING CONSTRUCTION ON THE TYPES OF WORK LISTED IN THE INSPECTION CHECKLIST ABOVE.

THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE AND ENGINEERS OF RECORD INVOLVED IN THE DESIGN OF THE PROJECT ARE PERMITTED TO ACT AS THE APPROVED AGENCY AND THEIR PERSONNEL ARE PERMITTED TO ACT AS THE SPECIAL INSPECTOR FOR THE WORK DESIGNED BY THEM, PROVIDED THOSE PERSONNEL MEET THE QUALIFICATION REQUIREMENTS.

STATEMENT OF SPECIAL INSPECTIONS: THE APPLICANT SHALL SUBMIT A STATEMENT OF SPECIAL INSPECTIONS PREPARED BY THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE IN ACCORDANCE WITH SECTION 107.1 AS A CONDITION FOR ISSUANCE. THIS STATEMENT SHALL BE IN ACCORDANCE WITH SECTION 1705.

REPORT REQUIREMENT: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS SHALL BE SUBMITTED.

SPECIAL INSPECTION CHECKLIST	
<b>BEFORE CONSTRUCTION</b>	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS <sup>1</sup>
N/A	MATERIAL SPECIFICATIONS REPORT <sup>2</sup>
N/A	FABRICATOR NDE INSPECTION
<b>REQUIRED</b>	PACKING SLIPS <sup>3</sup>
ADDITIONAL TESTING AND INSPECTIONS:	
<b>DURING CONSTRUCTION</b>	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
<b>REQUIRED</b>	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS <sup>4</sup>
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION <sup>5</sup>
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT
ADDITIONAL TESTING AND INSPECTIONS:	
<b>AFTER CONSTRUCTION</b>	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
<b>REQUIRED</b>	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS <sup>6</sup>
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
<b>REQUIRED</b>	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

45 BEECHWOOD DRIVE  
NORTH ANDOVER, MA 01845  
TEL: (978) 557-5553  
FAX: (978) 336-5586

12 INDUSTRIAL WAY  
SALEM, NH 03079

SITE NUMBER: CT2081  
SITE NAME: CHESHIRE CENTRAL

500 HIGHLAND AVENUE  
CHESHIRE, CT 06410  
NEW HAVEN COUNTY

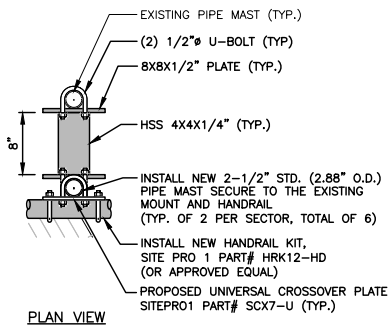
500 ENTERPRISE DRIVE, SUITE 3A  
ROCKY HILL, CT 06067

1	04/22/22	ISSUED FOR CONSTRUCTION	JL	HC	DRW
A	01/25/22	ISSUED FOR REVIEW	ML	HC	DRW
NO.	DATE	REVISIONS	BY	CHK	APPD

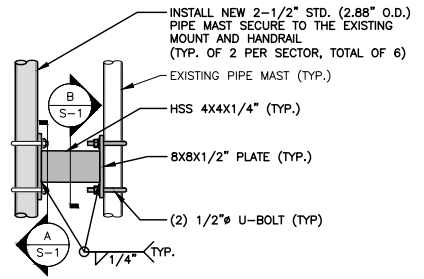
AT&T

STRUCTURAL NOTES  
OR 1SR CBAND\_BBU ADD\_5G NR ACTIVATION  
ANTENNA MODIFICATIONS\_5G NR 1DR-1 UPGRADE

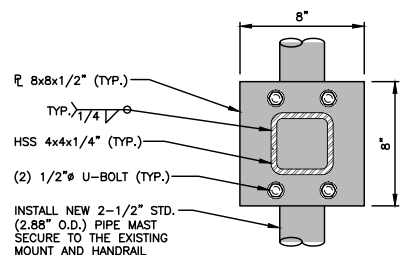
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CT2081	SN-1	1



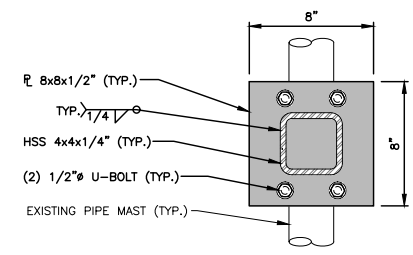
PLAN VIEW



SIDE VIEW

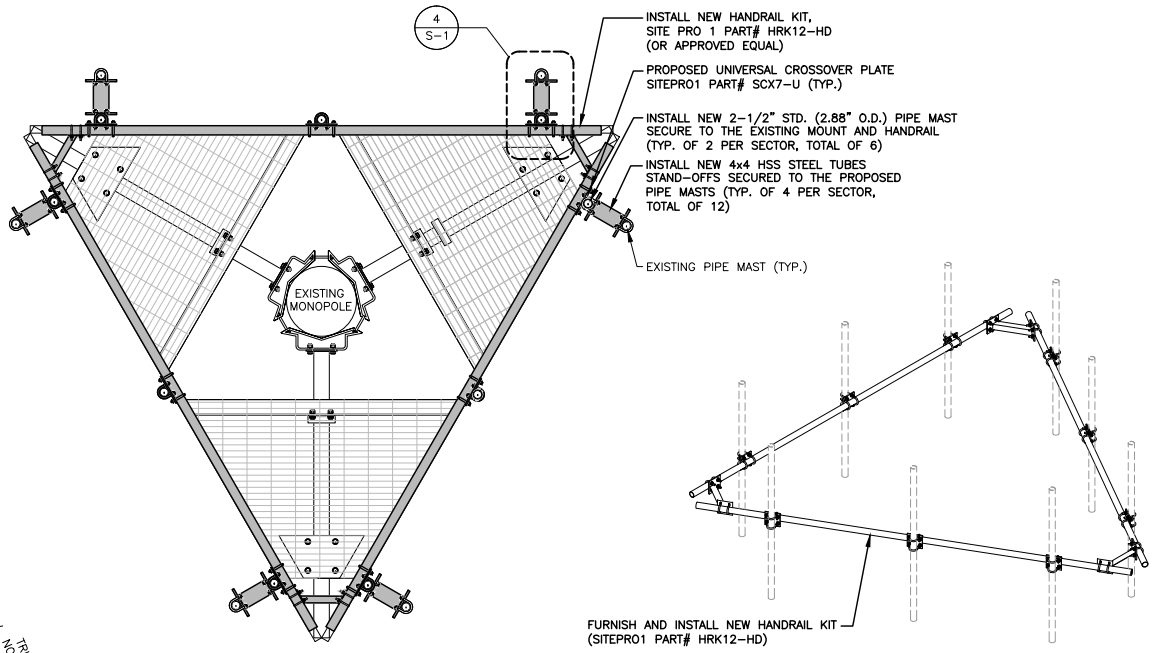


"A" DETAIL

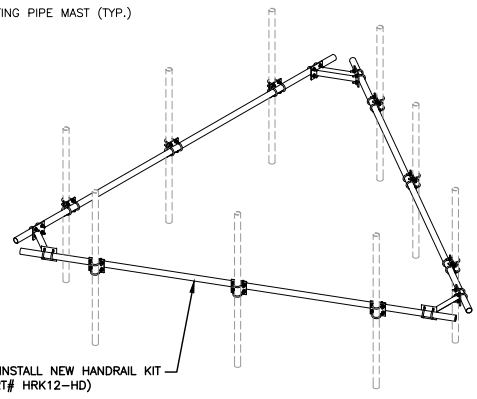


"B" DETAIL

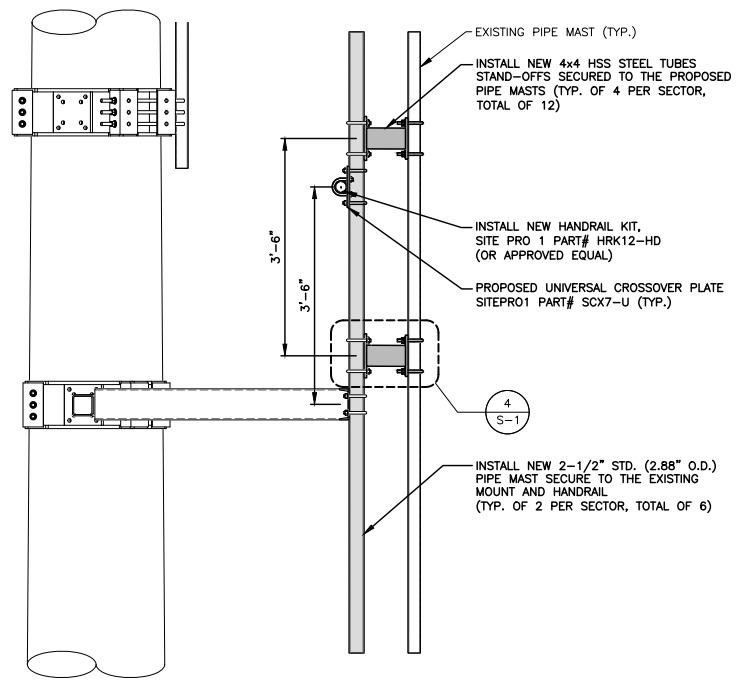
**CONNECTION DETAIL**  
 22x34 SCALE: 1-1/2"=1'-0"  
 11x17 SCALE: 3/4"=1'-0"



**PROPOSED MOUNT MODIFICATIONS PLAN**  
 22x34 SCALE: 3/4"=1'-0"  
 11x17 SCALE: 3/8"=1'-0"



**HANDRAIL KIT DETAIL**  
 SCALE: N.T.S.

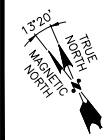


**PROPOSED MOUNT MODIFICATIONS DETAIL**  
 22x34 SCALE: 1"=1'-0"  
 11x17 SCALE: 1/2"=1'-0"

**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

**NOTE:**  
 AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 14, 2022

**NOTE:**  
 REFER TO **STRUCTURAL ANALYSIS** BY: GPD ENGINEERING AND ARCHITECTURE PROFESSIONAL CORPORATION. DATED: APRIL 1, 2022. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.



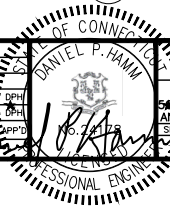
**HGD HUDSON Design Group LLC**  
 45 BEECHWOOD DRIVE NORTH ANDOVER, MA 01845  
 TEL: (978) 557-5553 FAX: (978) 336-5586

**SAI**  
 12 INDUSTRIAL WAY SALEM, NH 03079

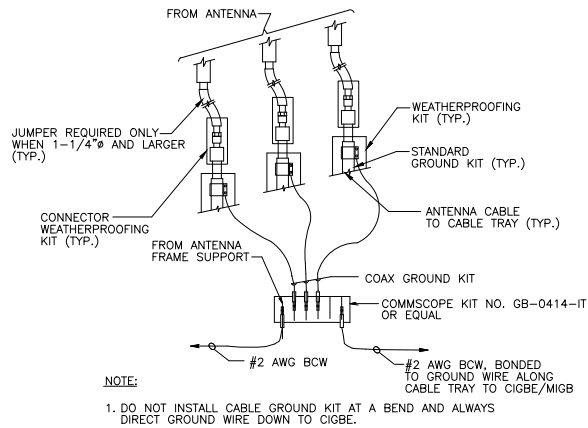
SITE NUMBER: CT2081  
 SITE NAME: CHESHIRE CENTRAL  
 500 HIGHLAND AVENUE CHESHIRE, CT 06410  
 NEW HAVEN COUNTY

**at&t**  
 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

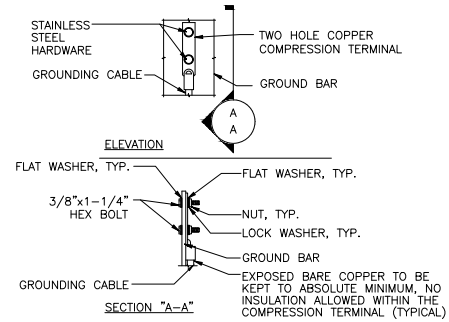
NO.	DATE	REVISIONS	DESIGNED BY	DRAWN BY
1	04/22/22	ISSUED FOR CONSTRUCTION	HC	HC
A	01/25/22	ISSUED FOR REVIEW	HC	HC



AT&T	
MOUNT MODIFICATION DESIGN	REV
5G NR 15R CBAND_BBU ADD_5G NR ACTIVATION ANTENNA MODIFICATIONS_5G NR 1DR-1 UPGRADE	1
SITE NUMBER: CT2081	DRAWING NUMBER: S-1

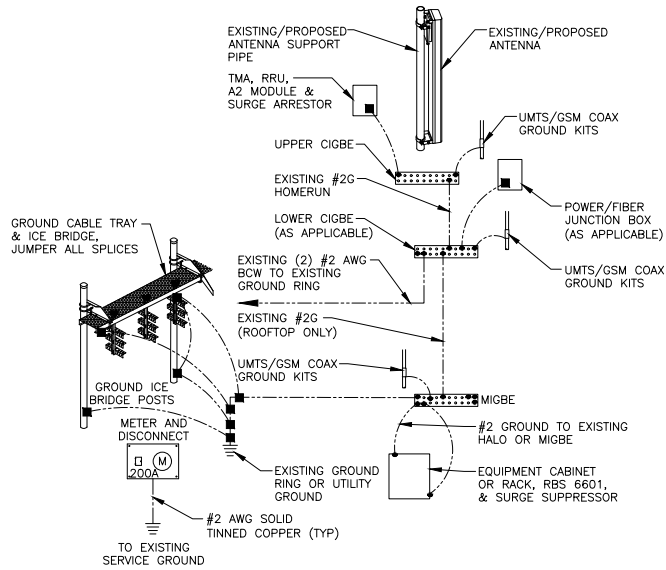


GROUND WIRE TO GROUND BAR CONNECTION DETAIL (1)  
SCALE: N.T.S.



- NOTES:
1. "DOUBLING UP" OR "STACKING" OF CONNECTION IS NOT PERMITTED.
  2. OXIDE INHIBITING COMPOUND TO BE USED AT ALL LOCATION.
  3. CADWELD DOWNLEADS FROM UPPER EGB, LOWER EGB, AND MGB

TYPICAL GROUND BAR CONNECTION DETAIL (3)  
SCALE: N.T.S.



GROUNDING RISER DIAGRAM (2)  
SCALE: N.T.S.

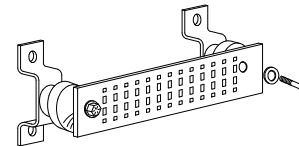
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

**SECTION "P" - SURGE PRODUCERS**

- CABLE ENTRY PORTS (HATCH PLATES) (#2 AWG)
- GENERATOR FRAMEWORK (IF AVAILABLE) (#2 AWG)
- TELCO GROUND BAR
- COMMERCIAL POWER COMMON NEUTRAL/GROUND BOND (#2 AWG)
- +24V POWER SUPPLY RETURN BAR (#2 AWG)
- 48V POWER SUPPLY RETURN BAR (#2 AWG)
- RECTIFIER FRAMES.

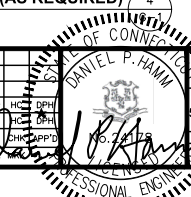
**SECTION "A" - SURGE ABSORBERS**

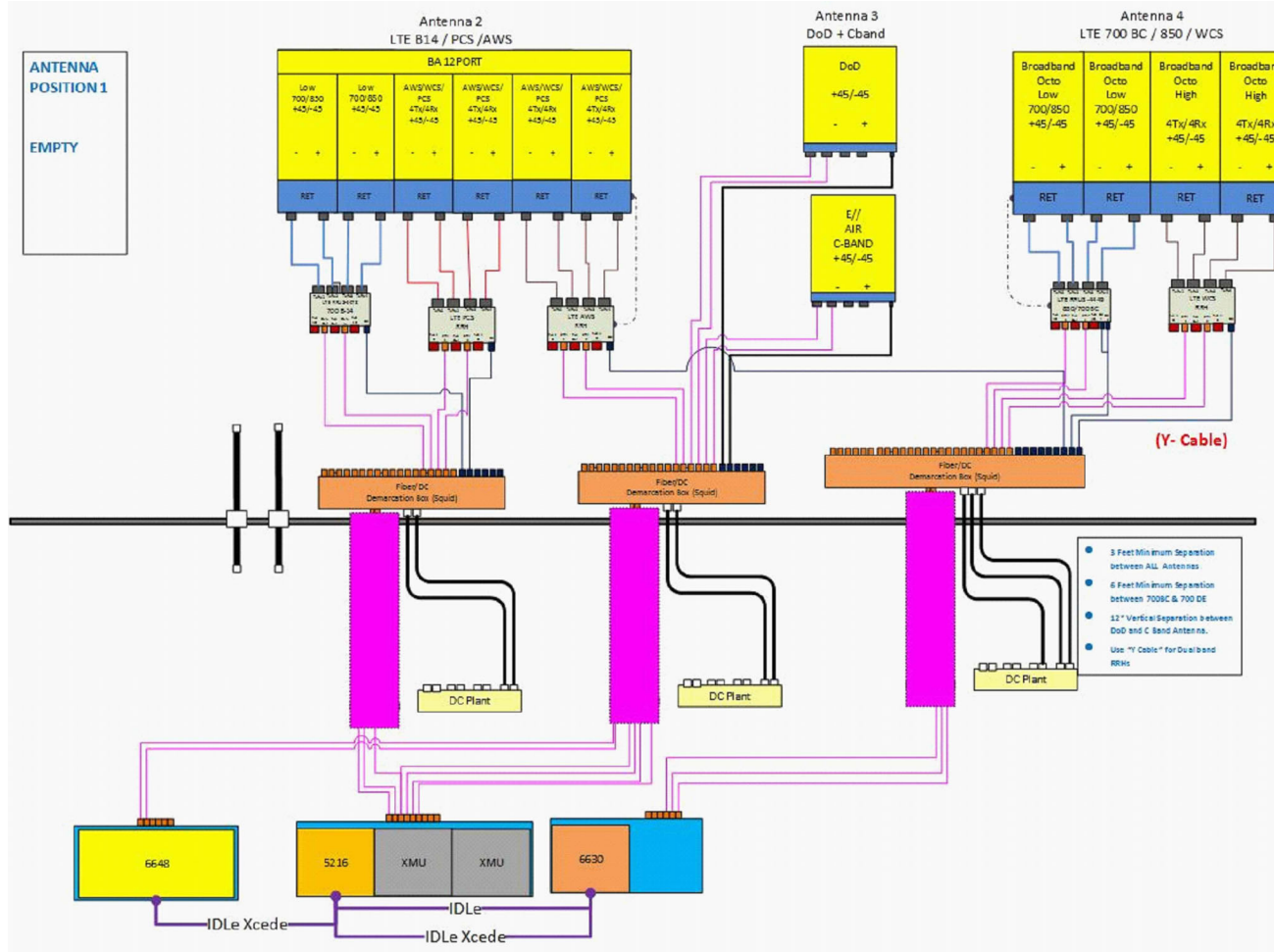
- INTERIOR GROUND RING (#2 AWG)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
- BUILDING STEEL (IF AVAILABLE) (#2 AWG)



GROUND BAR - DETAIL (AS REQUIRED) (4)  
SCALE: N.T.S.

1		04/22/22	ISSUED FOR CONSTRUCTION	JLJ	HC	DRW	AT&T	GROUNDING DETAILS 5G NR 15R CBAND_BBU ADD_5G NR ACTIVATION_ ANTENNA MODIFICATIONS_5G NR 15R-1 UPGRADE	SITE NUMBER 2081	DRAWING NUMBER G-1	REV 1
A		01/25/22	ISSUED FOR REVIEW	MJ	HC	DRW	AT&T				
NO.	DATE	REVISIONS		DESIGNED BY	DRAWN BY	CHECKED BY	APPROVED BY				
SCALE:		AS SHOWN		DESIGNED BY:		HC					





**NOTE:**  
 REV: 1  
 DATED: 12/06/2021  
 RFDS ID: 4541251

**RF PLUMBING DIAGRAM** 1  
 SCALE: N.T.S. RF-1

**NOTE:**  
 1. CONTRACTOR TO CONFIRM ALL PARTS.  
 2. INSTALL ALL EQUIPMENT TO MANUFACTURER'S RECOMMENDATIONS

**NOTE:**  
 REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

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 NEW HAVEN COUNTY

**at&t**  
 500 ENTERPRISE DRIVE, SUITE 3A ROCKY HILL, CT 06067

1	04/22/22	ISSUED FOR CONSTRUCTION	JJ	HC	DPH
A	01/25/22	ISSUED FOR REVIEW	MRK	HC	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D

SCALE: AS SHOWN    DESIGNED BY: HC    DRAWN BY: MRK

**AT&T**

**RF PLUMBING DIAGRAM**  
 5G NR 1SR CBAND\_BBU ADD\_5G NR ACTIVATION ANTENNA MODIFICATIONS\_5G NR 1DR-1 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2081	RF-1	1



# STRUCTURAL ANALYSIS REPORT

160' Monopole Tower

500 Highland Ave  
Cheshire, CT 06410  
41.5112 N, 72.8985 W

**SBA Site Name:** 500 Highland Ave / Light Tower  
**SBA Site ID:** CT33762-M

**AT&T Site Name:** C-74 CHESHIRE  
**AT&T Site ID:** CT2081  
**Application ID:** 187327, v4

**GPD Project Number:** 2022778.33762.16 Rev. 1

### Analysis Results


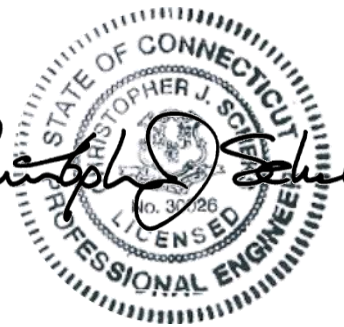
Tower Components	98.2%	Sufficient
Foundation	73.5%	Sufficient
Net Change in Tower Stress Ratio	+3.6%	As compared to the Previous Structural Analysis detailed on Page 2

### AT&T Mount Reinforcement

Net Change in Tower Stress Ratio due to Mount Reinforcement	+ 0.7%	See Page 5 for Additional Details
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April 1, 2022

Respectfully submitted by:

4/1/2022

Christopher J. Scheks, P.E.  
Connecticut P.E. #: 0030026

## Analysis Criteria

The purpose of this analysis is to verify whether the existing monopole tower is structurally capable of carrying the proposed antenna, mount, and feedline loads as specified by AT&T to SBA Site Management. This report was commissioned by Benjamin Walsh of SBA Site Management.

The existing structure and its foundations have been analyzed per the following requirements:

<b>Governing Codes</b>	TIA-222-G & 2018 Connecticut Building Code
<b>Wind Speed*</b>	105 MPH Nominal 3-Second Gust
<b>Wind Speed w/ Ice</b>	50 MPH 3-Second Gust
<b>Radial Ice Thickness</b>	3/4"
<b>Risk Category</b>	III
<b>Exposure Category</b>	B
<b>Topographic Category</b>	1

\*Wind speed in nominal form is equivalent to a 135 MPH Ultimate 3-Second Gust.

This analysis utilizes an ultimate 3-second gust wind speed of 135 mph as required by the 2018 Connecticut State Building Code. Applicable Standard references and design criteria are listed in Analysis Criteria.

## Analysis Method

tnxTower (Version 8.1.1.0), a commercially available software program, was used to create a three-dimensional model of the tower and calculate member stresses for various dead, live, wind and ice load cases. Selected output from the analysis is included in the appendices of this report.

## Tower Description

The existing 160' monopole tower is located in Cheshire, CT. The tower was originally designed by Sabre Communications Corporation in September of 2003. The original design load for the tower was not provided or available at the time of this analysis. As a result, all structural information and loading has been taken from the following documents:

### Documents Provided

Document Type	Remarks	Source
Original Tower Drawings	Sabre Job #: 04-09077 Dated: 09/12/2003	SBA
Tower Mapping Report	ETS Project #: 193884 Dated: 07/31/2019	SBA
Geotechnical Report	GPD Project #: 2019778.33762.14 Dated: 11/15/2019	SBA
Foundation NDT Mapping Report	GPD Project #: 2019778.33762.14 Dated: 11/15/2019	SBA
Previous Structural Analysis	GPD Project #: 2021778.33762.15 Rev. 2 Dated: 09/15/2021	SBA
Application	SBA Application #: 187327, v4	SBA

### Tower Materials

Structural Components	Material Strength
Tower Shaft	ASTM A572 (65 KSI Yield Strength)
Anchor Rods	ASTM A615 (75 KSI Yield Strength)
Base Plate	ASTM A572 (60 KSI Yield Strength)

## Tower Loading

The following data shows the major loading that the tower supports. All existing, leased, and proposed loading information was provided by SBA or taken from the previous structural analysis.

### Existing/Leased Loading

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufacturer	Antenna/Mount Model	# of Coax	Coax Size (in)	Note	
Town of Cheshire	159.0	165.0	1		10' x 2.5" Omni	2	7/8 E105		
			1	DBSpectra	DS1F03F36U-D				
		164.0	1		DB224				
			1	DBSpectra	DS4C06F36U-D				
			2	RFS	SC3-W100A				
159.0	3		5' T-Arms						
Sprint	158.0	158.0	3	Alcatel Lucent	RRH8x20-25-FEU-8T8R	4	1-1/4 5/8		
			3	RFS	APXVSP18-C-A20				
			1		12.5' Platform w/ Handrail Kit				
			3	RFS	APXVTM14-ALU-I20				
	154.0	154.0	3	Alcatel Lucent	RRH2x50-800	-	-		
			3	Alcatel Lucent	RRH1900-4x45				
			1		Collar Mount				
T-Mobile	147.0	147.0	3	Ericsson	AIR32 KRD901146-1 B66A B2A (Octo)	15 3 12	1-5/8 1-5/8 Fiber 1/2		
			3	Ericsson	AIR6449 B41				
			3	RFS	APXVAALL24-43-U-NA20				
			3	Ericsson	KRY 112 144/1				
			3	RFS	ATMAA1413D1A20				
			3	Commscope	SDX1926Q-43				
			3	Ericsson	4449 B71 + B85				
			3	Ericsson	4415 B25				
			2	Site Pro 1	PRK-SFS Reinforcement Kit				
			2	Site Pro 1	HRK12-U Support Rail Kit				
AT&T	132.0	135.0	3	Raycap	DC6-48-60-18-8F	-	-		
			3	Ericsson	RRUS 11 B12				
			1		Collar Mount				
	127.0	131.0	129.0	6	Ericsson	RRUS 32	12 4	1-5/8 2-1/4	
				3		EPBQ-654L8H8-L2			
		128.0	3	Ericsson	RRUS 11 B2 + A2 Module				
			3		15"x7.5"x13" Box				
			3		OPA-65R-LCUU-H8				
		127.0	6	Powerwave	LGP21903				
			3	Kathrein	80010121				
		1		12.5' Platform					
Verizon	117.5	122.0	2	Raycap	DB-T1-6Z-8AB-OZ	6 2 2	1-5/8 1-5/8 Fiber 1/2		
			6	RFS	FD9R6004/2C-3L				
		119.0	3	Commscope	CBC78T-DS-43-2X				
			3	Samsung	B2/B66A				
			3	Samsung	B5/B13				
			3	Andrew	LNx 6514DS-VTM				
		118.0	6	Commscope	JAHH-65B-R3B				
			3	Samsung	MT6407-77A				
			3	Commscope	BSAMNT-SBS-2-2				
		117.5	1		VZWSmart PLK1 Support Rail Kit				
			3		VZWSmart MSK2 Crossover Plate				
			3		6' x P2.5 Std Mount Pipe				
1		12.5' Platform							

**Existing/Leased Loading, con't.**

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufacturer	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
Town of Cheshire	63.5	66.0	2	DBSpectra	DS4C03CS36U-N	2	1/2	
		63.5	1		Collar Mount			
	18.0	19.5	2	DBSpectra	SP7C03CS36U-N	3	1/2	
		18.0	1	DBSpectra	DS4C00F36U-D			
	14.5	17.0	1	DBSpectra	DS4C03CS36U-N	2	1/2	
		14.5	1	DBSpectra	DS1X00CS36U-N			

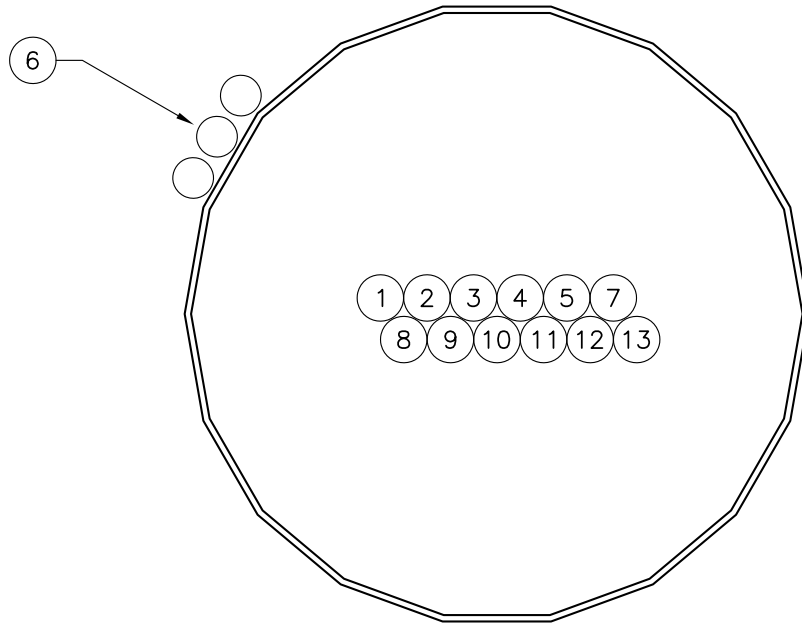
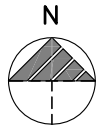
**Final Proposed Loading Configuration**

Carrier	Mounting Level (ft)	Center Line Elevation (ft)	# of Antennas	Antenna Manufacturer	Antenna/Mount Model	# of Coax	Coax Size (in)	Note
AT&T	130	132	3	Ericsson	AIR6419	11 1 6 2 1	1-5/8 1/2 Fiber 3/4 DC 7/16 Fiber 1 DC	1
		130	2	KMW	EPBQ-654L8H8-L2			
			1	KMW	EPBQ-654L8H6-L2			
			2	CCI	DMP65R-BU8DA			
			1	CCI	DMP65R-BU6DA			
			6	Powerwave	LGP21401 TMA			
			3	Powerwave	TT19-08BP111-001			
			6	Kathrein	860 10025			
			3	Ericsson	RRUS 4449 B5/B12			
			3	Ericsson	4415 B25			
			3	Ericsson	RRUS-32			
			3	Ericsson	RRUS 4478 B14			
			3	Ericsson	RRUS 32 B66A			
			3	Ericsson	RRUS A2			
			2	Raycap	DC6-48-60-18-8F			
			1	Raycap	DC9-48-60-24-8C-EV			
			1	Commscope	MTC3607 Platform			
			1	SitePro 1	HRK12-HD Handrail Kit			
			6		Mount Pipes			
12		Steel Tube Standoffs						
128	3	Ericsson	AIR6449					

Notes:

1. This loading represents AT&T's final configuration on the tower. See the next page for the proposed feedline layout.

# Proposed Feedline Configuration



#	CARRIER	SIZE	QTY.	ELEVATION	NOTES
1	Town of Cheshire	7/8"	2	159'	
2	Town of Cheshire	E105	2	159'	
3	Sprint	1-1/4"	4	158'	
4	Sprint	5/8"	2	158'	
5	T-Mobile	1-5/8"	15	147'	
6	T-Mobile	1-5/8"	3	147'	Fiber
7	T-Mobile	1/2"	12	147'	
8	AT&T	1-5/8"	11	130'	
9	AT&T	1/2", 3/4", 7/16"	1,6,2	130'	in (4) 2-1/4" conduit
10	AT&T	1"	1	130'	Proposed DC Power
11	Verizon	1/2"	2	117.5'	
12	Verizon	1-5/8"	8	117.5'	(2) Fiber
13	Town of Cheshire	1/2"	2,3,2	14.5', 18', 63.5'	

## Tower Section Results

### Capacity Summary of Structural Components

Notes	Component	% Capacity	Pass / Fail
	Monopole	98.2	Pass
	Anchor Rods	84.3	Pass
	Base Plate	62.8	Pass
	Tower Base Foundation	73.8	Pass

### AT&T Mount Reinforcement

Notes	Loading	Tower Capacity	Foundation Capacity
1	Existing Mount	97.5	73.3
	Reinforced Mount	98.2	73.8

Notes:

1. No analysis of the existing/reinforced mounts were performed in this analysis. This table is a summary of the tower and foundation capacity based on the proposed loading and the existing/reinforced mount.

## Conclusions & Recommendations

The designs of the tower and its foundations are sufficient to support the proposed loading configuration and will not require modification.

## Assumptions

This structural analysis is based on the theoretical capacity of the members and is not a condition assessment of the tower. This analysis is from information supplied, and therefore, its results are based on and are as accurate as that supplied data. GPD has made no independent determination, nor is it required to, of its accuracy. The following assumptions were made for this structural analysis.

- 1) Tower and structures were built in accordance with the manufacturer's specifications.
- 2) The tower and structures have been maintained in accordance with the manufacturer's specification.
- 3) The configuration of antennas, transmission cables, mounts and other appurtenances are as specified in the Existing/Reserved Loading and Proposed Loading Tables, and the specified documents.
- 4) All mounts, if applicable, are considered adequate to support the loading. No actual analysis of the mount(s) is performed. This analysis is limited to analyzing the tower only.
- 5) Mount sizes, weights, and manufacturers are best estimates based on photos provided and determined without the benefit of a site visit by GPD.
- 6) All member connections and foundation steel reinforcing are assumed designed to meet or exceed the load carrying capacity of the connected member and surrounding soils respectively unless otherwise specified in this report.
- 7) The existing feedline layout has been based upon the previous structural analysis and site photos.
- 8) Leased coax currently not installed shall be installed as illustrated in this report for the analysis results to be valid.
- 9) Proposed coax shall be installed as illustrated in this report for the analysis results to be valid.

If any of these assumptions are not valid or have been made in error, this analysis may be affected, and GPD should be allowed to review any new information to determine its effect on the structural integrity of the tower.



## Disclaimer of Warranties

GPD has not performed a site visit to the tower to verify the member sizes or antenna/coax loading. If the existing conditions are not as represented on the tower elevation contained in this report, we should be contacted immediately to evaluate the significance of the discrepancy. This is not a condition assessment of the tower or foundation. This report does not replace a full tower inspection. The tower and foundations are assumed to have been properly fabricated, erected, maintained, in good condition, twist free, and plumb.

The engineering services rendered by GPD in connection with this Structural Analysis are limited to a computer analysis of the tower structure and theoretical capacity of its main structural members. No allowance was made for any damaged, bent, missing, loose, or rusted members (above and below ground). No allowance was made for loose bolts or cracked welds.

This analysis is limited to the designated maximum wind and seismic conditions per the governing tower standards and code. Wind forces resulting in tower vibrations near the structure's resonant frequencies were not considered in this analysis and are outside the scope of this analysis. Lateral loading from any dynamic response was not evaluated under a time-domain based fatigue analysis.

GPD does not analyze the fabrication of the structure (including welding). It is not possible to have all the very detailed information needed to perform a thorough analysis of every structural sub-component and connection of an existing tower. GPD provides a limited scope of service in that we cannot verify the adequacy of every weld, plate connection detail, etc. The purpose of this report is to assess the capability of adding appurtenances usually accompanied by transmission lines to the structure.

It is the owner's responsibility to determine the amount of ice accumulation in excess of the code specified amount, if any, that should be considered in the structural analysis.

The attached sketches are a schematic representation of the analyzed tower. If any material is fabricated from these sketches, the contractor shall be responsible for field verifying the existing conditions, proper fit, and clearance in the field. Any mentions of structural modifications are reasonable estimates and should not be used as a precise construction document. Precise modification drawings are obtainable from GPD, but are beyond the scope of this report.

Miscellaneous items such as antenna mounts, etc., have not been designed or detailed as a part of our work. We recommend that material of adequate size and strength be purchased from a reputable tower manufacturer.

Towers are designed to carry gravity, wind, and ice loads. All members, legs, diagonals, struts, and redundant members provide structural stability to the tower with little redundancy. Absence or removal of a member can trigger catastrophic failure unless a substitute is provided before any removal. Legs carry axial loads and derive their strength from shorter unbraced lengths by the presence of redundant members and their connection to the diagonals with bolts or welds. If the bolts or welds are removed without providing any substitute to the frame, the leg is subjected to a higher unbraced length that immediately reduces its load carrying capacity. If a diagonal is also removed in addition to the connection, the unbraced length of the leg is greatly increased, jeopardizing its load carrying capacity. Failure of one leg can result in a tower collapse because there is no redundancy. Redundant members and diagonals are critical to the stability of the tower.

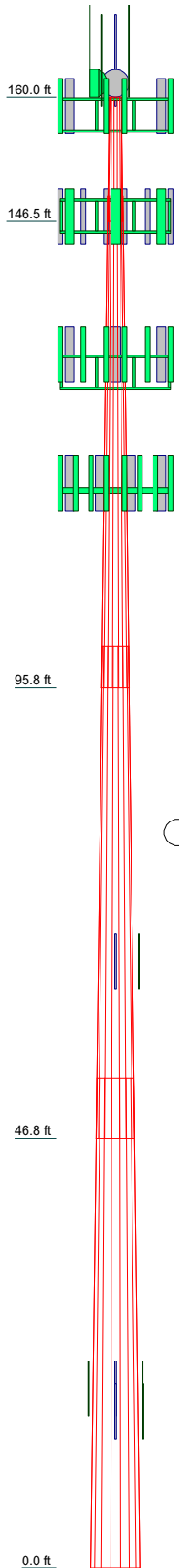
GPD makes no warranties, expressed and/or implied, in connection with this report and disclaims any liability arising from material, fabrication, and erection of this tower. GPD will not be responsible whatsoever for, or on account of, consequential or incidental damages sustained by any person, firm, or organization as a result of any data or conclusions contained in this report. The maximum liability of GPD pursuant to this report will be limited to the total fee received for preparation for this report.



**TNX TOWER OUTPUT**

**DESIGNED APPURTENANCE LOADING**

TYPE	ELEVATION	TYPE	ELEVATION
12.5' Handrail Kit	160.5	(2) LGP21401	130
10" Omni (2.5" Diam)	159	TT19-08BP111-001	130
DS1F03F36U-D	159	TT19-08BP111-001	130
DB224	159	TT19-08BP111-001	130
DS4C06F36U-D	159	(2) 860 10025	130
(3) Andrew 5' T-Arms	159	(2) 860 10025	130
SC3-W100A	159	(2) 860 10025	130
SC3-W100A	159	4415 B25	130
RRH8x20-25-FEU-8T8R	158	4415 B25	130
RRH8x20-25-FEU-8T8R	158	4415 B25	130
APXVSPP18-C-A20 w/ Mount Pipe	158	RRUS-32	130
APXVSPP18-C-A20 w/ Mount Pipe	158	RRUS-32	130
APXVSPP18-C-A20 w/ Mount Pipe	158	RRUS-32	130
APXVTM14-ALU-I20 w/ Mount Pipe	158	RRUS 4478 B14	130
APXVTM14-ALU-I20 w/ Mount Pipe	158	RRUS 4478 B14	130
APXVTM14-ALU-I20 w/ Mount Pipe	158	RRUS 4478 B14	130
Sabre 12' LP Platform	158	RRUS 4449 B5/B12	130
RRH8x20-25-FEU-8T8R	158	RRUS 4449 B5/B12	130
RRH2X50-800	154	RRUS 4449 B5/B12	130
RRH2X50-800	154	RRUS 32 B66A	130
RRH1900-4x45	154	RRUS 32 B66A	130
RRH1900-4x45	154	RRUS 32 B66A	130
RRH1900-4x45	154	RRUS A2	130
Andrew Collar Mount	154	RRUS A2	130
RRH2X50-800	154	RRUS A2	130
Site Pro 1 PRK-SFS Reinforcement Kit	149.5	DC6-48-60-18-8F Surge Suppression Unit	130
Collar Mount	149.5	DC6-48-60-18-8F Surge Suppression Unit	130
Site Pro 1 HRK12-U Support Rail Kit	149.5	DC9-48-60-24-8C-EV	130
AIR 32 KR0901146-1 B66A/B2A w/ Mount Pipe	147	Commscope MTC3607 Platform w/ Reinforcing Kit	130
AIR 32 KR0901146-1 B66A/B2A w/ Mount Pipe	147	Handrail Kit [NA 507-1]	130
AIR 32 KR0901146-1 B66A/B2A w/ Mount Pipe	147	VZWSmart MSK2 Crossover Plate	117.5
AIR 32 KR0901146-1 B66A/B2A w/ Mount Pipe	147	VZWSmart MSK2 Crossover Plate	117.5
AIR6449 B41 w/ Mount Pipe	147	DB-T1-6Z-8AB-0Z	117.5
AIR6449 B41 w/ Mount Pipe	147	DB-T1-6Z-8AB-0Z	117.5
AIR6449 B41 w/ Mount Pipe	147	(2) FD9R6004/2C-3L	117.5
APXVAALL24_43-U-NA20 w/ Mount Pipe	147	(2) FD9R6004/2C-3L	117.5
APXVAALL24_43-U-NA20 w/ Mount Pipe	147	(2) FD9R6004/2C-3L	117.5
APXVAALL24_43-U-NA20 w/ Mount Pipe	147	CBC78T-DS-43-2X	117.5
APXVAALL24_43-U-NA20 w/ Mount Pipe	147	CBC78T-DS-43-2X	117.5
APXVAALL24_43-U-NA20 w/ Mount Pipe	147	CBC78T-DS-43-2X	117.5
KRY 112 144/1	147	B2/B66A	117.5
KRY 112 144/1	147	B2/B66A	117.5
KRY 112 144/1	147	B2/B66A	117.5
ATMAA1413D-1A20	147	B5/B13 RRH	117.5
ATMAA1413D-1A20	147	B5/B13 RRH	117.5
ATMAA1413D-1A20	147	B5/B13 RRH	117.5
SDX1926Q-43	147	LNx-6514DS-VTM w/ Mount Pipe	117.5
SDX1926Q-43	147	LNx-6514DS-VTM w/ Mount Pipe	117.5
SDX1926Q-43	147	LNx-6514DS-VTM w/ Mount Pipe	117.5
4449 B71+B85	147	(2) JAHH-65B-R3B w/ Mount Pipe	117.5
4449 B71+B85	147	(2) JAHH-65B-R3B w/ Mount Pipe	117.5
4449 B71+B85	147	(2) JAHH-65B-R3B w/ Mount Pipe	117.5
4415 B25	147	MT6407-77A w/ 6' x P2.5 Std Mount Pipe	117.5
4415 B25	147	MT6407-77A w/ 6' x P2.5 Std Mount Pipe	117.5
4415 B25	147	MT6407-77A w/ 6' x P2.5 Std Mount Pipe	117.5
Sabre 12' LP Platform	147	MT6407-77A w/ 6' x P2.5 Std Mount Pipe	117.5
Collar Mount	146	BSAMNT-SBS-2-2	117.5
Site Pro 1 PRK-SFS Reinforcement Kit	146	BSAMNT-SBS-2-2	117.5
Site Pro 1 HRK12-U Support Rail Kit	146	BSAMNT-SBS-2-2	117.5
AIR6419 w/ Mount Pipe	130	MTS 12.5' Co-Locational Platform w/ VZWSmart PLK1 Support Rail Kit [LP 301-1]	117.5
AIR6419 w/ Mount Pipe	130	VZWSmart MSK2 Crossover Plate	117.5
EPBQ-654L8H8-L2 w/ Mount Pipe	130	DS4C03CS36U-N	63.5
EPBQ-654L8H8-L2 w/ Mount Pipe	130	Andrew Collar Mount	63.5
EPBQ-654L8H8-L2 w/ Mount Pipe	130	DS4C03CS36U-N	63.5
DMP65R-BU8DA w/ Mount Pipe	130	SP7C03CS36U-N	18
DMP65R-BU8DA w/ Mount Pipe	130	DS4C00F36U-D	18
DMP65R-BU8DA w/ Mount Pipe	130	Andrew Collar Mount	18
AIR6449	130	SP7C03CS36U-N	18
AIR6449	130	DS1X00CS36U-N	14.5
AIR6449	130	Andrew Collar Mount	14.5
(2) LGP21401	130	DS4C03CS36U-N	14.5
(2) LGP21401	130	DS4C03CS36U-N	14.5



Section	Length (ft)	Number of Sides	Thickness (in)	Socket Length (ft)	Top Dia (in)	Bot Dia (in)	Grade	Weight (K)
1	13.50	18	0.1875	2.75	16.7500	20.9100		0.5
2	53.50	18	0.2500	4.50	19.6676	36.1600	A572-65	4.0
3	53.50	18	0.3125	6.50	34.2745	50.7600	A572-65	7.6
4	53.25	18	0.3750	48.1321	64.5300			12.1
								24.2

**GPD**  
 520 South Main Street Suite 2531  
 Akron, Ohio 44311  
 Phone: (330) 572-2100  
 FAX: (330) 572-2101

Job: **CT33762-M 500 Highland Ave / Light Tower**  
 Project: **2022778.33762.16 Rev. 1**  
 Client: SBA Site Management  
 Code: TIA-222-G  
 Path: T:\SBA\33762116.SA.VZ\N15\_Structural\00\_Structure\09\_Rev 1\03\_Modeling\CT33762-M.rvt  
 Drawn by: EBoaz  
 Date: 04/01/22  
 App'd:  
 Scale: NTS  
 Dwg No. E-1

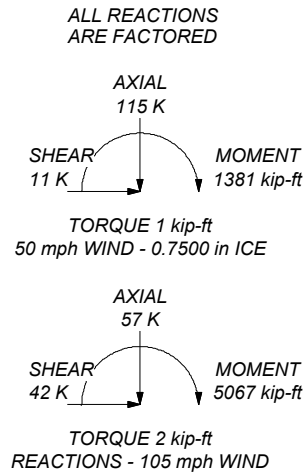
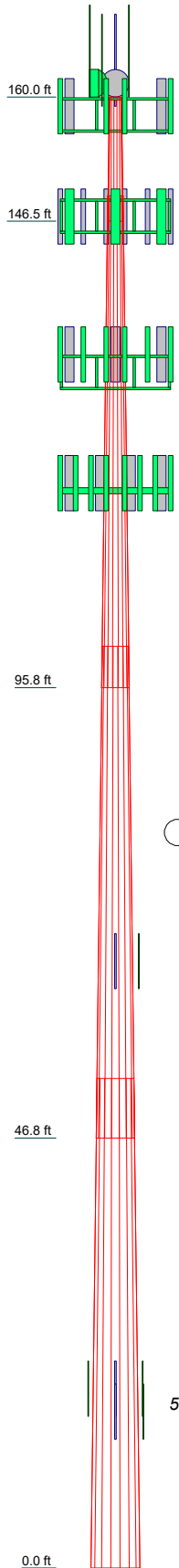
**MATERIAL STRENGTH**

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-65	65 ksi	80 ksi			

**TOWER DESIGN NOTES**

1. Tower is located in New Haven County, Connecticut.
2. Tower designed for Exposure B to the TIA-222-G Standard.
3. Tower designed for a 105 mph basic wind in accordance with the TIA-222-G Standard.
4. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
5. Deflections are based upon a 60 mph wind.
6. Tower Structure Class III.
7. Topographic Category 1 with Crest Height of 0.00 ft
8. TOWER RATING: 98.2%

Section	1	2	3	4	
Length (ft)	13.50	53.50	53.50	53.25	
Number of Sides	18	18	18	18	
Thickness (in)	0.1875	0.2500	0.3125	0.3750	
Socket Length (ft)	2.75	4.50	6.50		
Top Dia (in)	16.7500	19.6676	34.2745	48.1321	
Bot Dia (in)	20.9100	36.1600	50.7600	64.5300	
Grade			A572-65		
Weight (K)	0.5	4.0	7.6	12.1	24.2



**GPD**  
 520 South Main Street Suite 2531  
 Akron, Ohio 44311  
 Phone: (330) 572-2100  
 FAX: (330) 572-2101

Job: <b>CT33762-M 500 Highland Ave / Light Tower</b>		
Project: <b>2022778.33762.16 Rev. 1</b>		
Client: SBA Site Management	Drawn by: EBoaz	App'd:
Code: TIA-222-G	Date: 04/01/22	Scale: NTS
Path:		Dwg No. E-1

<b>tnxTower</b>  <b>GPD</b> 520 South Main Street Suite 2531 Akron, Ohio 44311 Phone: (330) 572-2100 FAX: (330) 572-2101	<b>Job</b> CT33762-M 500 Highland Ave / Light Tower	<b>Page</b> 1 of 16
	<b>Project</b> 2022778.33762.16 Rev. 1	<b>Date</b> 15:02:17 04/01/22
	<b>Client</b> SBA Site Management	<b>Designed by</b> EBoaz

## Tower Input Data

The tower is a monopole.

This tower is designed using the TIA-222-G standard.

The following design criteria apply:

- Tower is located in New Haven County, Connecticut.
- ASCE 7-10 Wind Data is used (wind speeds converted to nominal values).
- Basic wind speed of 105 mph.
- Structure Class III.
- Exposure Category B.
- Topographic Category 1.
- Crest Height 0.00 ft.
- Nominal ice thickness of 0.7500 in.
- Ice thickness is considered to increase with height.
- Ice density of 56 pcf.
- A wind speed of 50 mph is used in combination with ice.
- Temperature drop of 50 °F.
- Deflections calculated using a wind speed of 60 mph.
- A non-linear (P-delta) analysis was used.
- Pressures are calculated at each section.
- Stress ratio used in pole design is 1.
- Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

## Options

- |  |   |   |
|--|---|---|
| <ul style="list-style-type: none"> <li>Consider Moments - Legs</li> <li>Consider Moments - Horizontals</li> <li>Consider Moments - Diagonals</li> <li>Use Moment Magnification</li> <li>√ Use Code Stress Ratios</li> <li>√ Use Code Safety Factors - Guys</li> <li>Escalate Ice</li> <li>Always Use Max Kz</li> <li>Use Special Wind Profile</li> <li>Include Bolts In Member Capacity</li> <li>Leg Bolts Are At Top Of Section</li> <li>Secondary Horizontal Braces Leg</li> <li>Use Diamond Inner Bracing (4 Sided)</li> <li>SR Members Have Cut Ends</li> <li>SR Members Are Concentric</li> </ul> | <ul style="list-style-type: none"> <li>Distribute Leg Loads As Uniform</li> <li>Assume Legs Pinned</li> <li>Assume Rigid Index Plate</li> <li>Use Clear Spans For Wind Area</li> <li>Use Clear Spans For KL/r</li> <li>Retention Guys To Initial Tension</li> <li>√ Bypass Mast Stability Checks</li> <li>√ Use Azimuth Dish Coefficients</li> <li>√ Project Wind Area of Appurt.</li> <li>Autocalc Torque Arm Areas</li> <li>Add IBC .6D+W Combination</li> <li>√ Sort Capacity Reports By Component</li> <li>Triangulate Diamond Inner Bracing</li> <li>Treat Feed Line Bundles As Cylinder</li> <li>Ignore KL/ry For 60 Deg. Angle Legs</li> </ul> | <ul style="list-style-type: none"> <li>Use ASCE 10 X-Brace Ly Rules</li> <li>Calculate Redundant Bracing Forces</li> <li>Ignore Redundant Members in FEA</li> <li>SR Leg Bolts Resist Compression</li> <li>All Leg Panels Have Same Allowable</li> <li>Offset Girt At Foundation</li> <li>√ Consider Feed Line Torque</li> <li>Include Angle Block Shear Check</li> <li>Use TIA-222-G Bracing Resist. Exemption</li> <li>Use TIA-222-G Tension Splice Exemption</li> <li style="text-align: center;">Poles</li> <li>√ Include Shear-Torsion Interaction</li> <li>Always Use Sub-Critical Flow</li> <li>Use Top Mounted Sockets</li> <li>Pole Without Linear Attachments</li> <li>Pole With Shroud Or No Appurtenances</li> <li>Outside and Inside Corner Radii Are Known</li> </ul> |
|--|---|---|

## Tapered Pole Section Geometry

Section	Elevation <i>ft</i>	Section Length <i>ft</i>	Splice Length <i>ft</i>	Number of Sides	Top Diameter <i>in</i>	Bottom Diameter <i>in</i>	Wall Thickness <i>in</i>	Bend Radius <i>in</i>	Pole Grade
L1	160.00-146.50	13.50	2.75	18	16.7500	20.9100	0.1875	0.7500	A572-65 (65 ksi)
L2	146.50-95.75	53.50	4.50	18	19.6876	36.1600	0.2500	1.0000	A572-65

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Section	Elevation ft	Section Length ft	Splice Length ft	Number of Sides	Top Diameter in	Bottom Diameter in	Wall Thickness in	Bend Radius in	Pole Grade
L3	95.75-46.75	53.50	6.50	18	34.2745	50.7600	0.3125	1.2500	(65 ksi) A572-65
L4	46.75-0.00	53.25		18	48.1321	64.5300	0.3750	1.5000	(65 ksi) A572-65 (65 ksi)

### Tapered Pole Properties

Section	Tip Dia. in	Area in <sup>2</sup>	I in <sup>4</sup>	r in	C in	I/C in <sup>3</sup>	J in <sup>4</sup>	I/Q in <sup>2</sup>	w in	w/t
L1	16.9795	9.8568	341.6043	5.8797	8.5090	40.1462	683.6581	4.9293	2.6180	13.963
L2	21.2036	12.3325	669.0708	7.3565	10.6223	62.9875	1339.0220	6.1674	3.3502	17.868
L3	36.6793	28.4946	4642.2721	12.7480	18.3693	252.7193	9290.6527	14.2500	5.9242	23.697
L4	51.4948	50.0376	16088.4180	17.9089	25.7861	623.9187	32198.0056	25.0236	8.3838	26.828
	65.4676	76.3605	39707.0084	22.7750	32.7812	1211.2723	79466.2644	38.1875	10.6973	28.526

Tower Elevation ft	Gusset Area (per face) ft <sup>2</sup>	Gusset Thickness in	Gusset Grade	Adjust. Factor A <sub>f</sub>	Adjust. Factor A <sub>r</sub>	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
L1 160.00-146.50				1	1	1			
L2 146.50-95.75				1	1	1			
L3 95.75-46.75				1	1	1			
L4 46.75-0.00				1	1	1			

### Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Sector	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	Number Per Row	Start/End Position	Width or Diameter in	Perimeter in	Weight plf
Step Pegs	A	No	Surface Ar (CaAa)	160.00 - 0.00	1	1	0.000 0.000	0.8000		2.72
1-5/8" Fiber Cable	A	No	Surface Ar (CaAa)	147.00 - 6.00	3	3	-0.500 -0.250	1.9800		0.82

### Feed Line/Linear Appurtenances - Entered As Area

Description	Face or Shield Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number	C <sub>A</sub> A <sub>A</sub> ft <sup>2</sup> /ft	Weight plf
Safety Line (3/8")	A	No	No	CaAa (Out)	160.00 - 0.00	1	No Ice 0.04	0.22

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Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C <sub>AA</sub> ft <sup>2</sup> /ft	Weight plf
				Of Face)			1/2" Ice	0.14	0.75
							1" Ice	0.24	1.28
LDF5-50A (7/8 FOAM)	A	No	No	Inside Pole	159.00 - 4.00	2	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
E105	A	No	No	Inside Pole	159.00 - 2.00	2	No Ice	0.00	0.40
							1/2" Ice	0.00	0.40
							1" Ice	0.00	0.40
LDF6-50A (1-1/4 FOAM)	A	No	No	Inside Pole	158.00 - 2.00	4	No Ice	0.00	0.66
							1/2" Ice	0.00	0.66
							1" Ice	0.00	0.66
LDF4.5-50 (5/8 FOAM)	A	No	No	Inside Pole	158.00 - 2.00	2	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	147.00 - 6.00	15	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF4P-50A (1/2 FOAM)	A	No	No	Inside Pole	147.00 - 6.00	12	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	130.00 - 4.00	11	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
2-1/4" Conduit	A	No	No	Inside Pole	130.00 - 4.00	4	No Ice	0.00	0.32
							1/2" Ice	0.00	0.32
							1" Ice	0.00	0.32
1/2" Fiber Cable	A	No	No	Inside Pole	130.00 - 4.00	1	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
3/4" DC Power Line	A	No	No	Inside Pole	130.00 - 4.00	6	No Ice	0.00	0.33
							1/2" Ice	0.00	0.33
							1" Ice	0.00	0.33
7/16" Fiber Line	A	No	No	Inside Pole	130.00 - 4.00	2	No Ice	0.00	0.17
							1/2" Ice	0.00	0.17
							1" Ice	0.00	0.17
1" DC Power	A	No	No	Inside Pole	130.00 - 4.00	1	No Ice	0.00	0.80
							1/2" Ice	0.00	0.80
							1" Ice	0.00	0.80
LDF7-50A (1-5/8 FOAM)	A	No	No	Inside Pole	117.50 - 2.00	6	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
1-5/8" Fiber Cable	A	No	No	Inside Pole	117.50 - 2.00	2	No Ice	0.00	0.82
							1/2" Ice	0.00	0.82
							1" Ice	0.00	0.82
LDF4-50A (1/2 FOAM)	A	No	No	Inside Pole	117.50 - 2.00	2	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	No	Inside Pole	63.50 - 4.00	2	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	No	Inside Pole	18.00 - 4.00	3	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15
LDF4-50A (1/2 FOAM)	A	No	No	Inside Pole	14.50 - 4.00	2	No Ice	0.00	0.15
							1/2" Ice	0.00	0.15
							1" Ice	0.00	0.15

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### Feed Line/Linear Appurtenances Section Areas

Tower Section	Tower Elevation ft	Face	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	160.00-146.50	A	0.000	0.000	1.377	0.506	0.10
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L2	146.50-95.75	A	0.000	0.000	34.206	1.903	1.83
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L3	95.75-46.75	A	0.000	0.000	33.026	1.838	2.18
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
L4	46.75-0.00	A	0.000	0.000	27.945	1.753	1.92
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00

### Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	$A_R$ ft <sup>2</sup>	$A_F$ ft <sup>2</sup>	$C_{AA}$ In Face ft <sup>2</sup>	$C_{AA}$ Out Face ft <sup>2</sup>	Weight K
L1	160.00-146.50	A	2.186	0.000	0.000	7.626	6.408	0.25
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L2	146.50-95.75	A	2.132	0.000	0.000	91.661	24.089	3.29
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L3	95.75-46.75	A	2.023	0.000	0.000	87.311	22.730	3.54
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
L4	46.75-0.00	A	1.806	0.000	0.000	73.515	20.665	3.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00

### Feed Line Center of Pressure

Section	Elevation ft	$CP_x$ in	$CP_z$ in	$CP_x$ Ice in	$CP_z$ Ice in
L1	160.00-146.50	-0.7859	-0.5800	-1.4411	-2.0104
L2	146.50-95.75	-4.2802	0.5364	-3.9849	-0.8528
L3	95.75-46.75	-4.6957	0.5780	-4.7977	-1.0411
L4	46.75-0.00	-4.3889	0.4424	-4.8459	-1.2988

Note: For pole sections, center of pressure calculations do not consider feed line shielding.



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### Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K <sub>a</sub> No Ice	K <sub>a</sub> Ice
L1	2	Step Pegs	146.50 - 160.00	1.0000	1.0000
L1	11	1-5/8" Fiber Cable	146.50 - 147.00	1.0000	1.0000
L2	2	Step Pegs	95.75 - 146.50	1.0000	1.0000
L2	11	1-5/8" Fiber Cable	95.75 - 146.50	1.0000	1.0000
L3	2	Step Pegs	46.75 - 95.75	1.0000	1.0000
L3	11	1-5/8" Fiber Cable	46.75 - 95.75	1.0000	1.0000
L4	2	Step Pegs	0.00 - 46.75	1.0000	1.0000
L4	11	1-5/8" Fiber Cable	6.00 - 46.75	1.0000	1.0000

### Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
(3) Andrew 5' T-Arms	A	None		0.0000	159.00	No Ice 5.31 1/2" Ice 7.30 1" Ice 9.29	5.31 7.30 9.29	0.62 0.81 0.99
10' Omni (2.5" Diam)	C	From Leg	2.50 0.00 6.00	0.0000	159.00	No Ice 2.50 1/2" Ice 3.53 1" Ice 4.58	2.50 3.53 4.58	0.03 0.04 0.07
DS1F03F36U-D	B	From Leg	1.00 0.00 6.00	0.0000	159.00	No Ice 3.78 1/2" Ice 5.07 1" Ice 6.38	3.78 5.07 6.38	0.04 0.06 0.10
DB224	A	From Leg	2.50 0.00 5.00	0.0000	159.00	No Ice 3.15 1/2" Ice 5.67 1" Ice 8.19	3.15 5.67 8.19	0.03 0.04 0.05
DS4C06F36U-D	C	From Leg	1.00 0.00 5.00	0.0000	159.00	No Ice 3.09 1/2" Ice 4.15 1" Ice 5.23	3.09 4.15 5.23	0.03 0.05 0.08
Sabre 12' LP Platform	A	None		0.0000	158.00	No Ice 28.50 1/2" Ice 31.69 1" Ice 34.87	28.50 31.69 34.87	1.12 1.68 2.28
12.5' Handrail Kit	A	None		0.0000	160.50	No Ice 4.56 1/2" Ice 6.39 1" Ice 8.18	4.56 6.39 8.18	0.34 0.44 0.54
RRH8x20-25-FEU-8T8R	A	From Centroid-Le g	4.00 0.00 3.00	0.0000	158.00	No Ice 3.70 1/2" Ice 3.95 1" Ice 4.20	1.29 1.46 1.64	0.07 0.09 0.12
RRH8x20-25-FEU-8T8R	B	From Centroid-Le g	4.00 0.00 3.00	0.0000	158.00	No Ice 3.70 1/2" Ice 3.95 1" Ice 4.20	1.29 1.46 1.64	0.07 0.09 0.12
RRH8x20-25-FEU-8T8R	C	From Centroid-Le g	4.00 0.00 3.00	0.0000	158.00	No Ice 3.70 1/2" Ice 3.95 1" Ice 4.20	1.29 1.46 1.64	0.07 0.09 0.12
APXVSPP18-C-A20 w/ Mount Pipe	A	From Centroid-Le	4.00 0.00	22.0000	158.00	No Ice 8.02 1/2" Ice 8.48	6.71 7.66	0.08 0.14

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
APXVSPP18-C-A20 w/ Mount Pipe	B	g	1.00			1" Ice	8.94	8.49	0.22	
		From	4.00		22.0000	158.00	No Ice	8.02	6.71	0.08
		Centroid-Le	0.00				1/2" Ice	8.48	7.66	0.14
APXVSPP18-C-A20 w/ Mount Pipe	C	g	1.00			1" Ice	8.94	8.49	0.22	
		From	4.00		22.0000	158.00	No Ice	8.02	6.71	0.08
		Centroid-Le	0.00				1/2" Ice	8.48	7.66	0.14
APXVTM14-ALU-I20 w/ Mount Pipe	A	g	1.00			1" Ice	8.94	8.49	0.22	
		From	4.00		22.0000	158.00	No Ice	6.58	4.96	0.08
		Centroid-Le	0.00				1/2" Ice	7.03	5.75	0.13
APXVTM14-ALU-I20 w/ Mount Pipe	B	g	-0.50			1" Ice	7.47	6.47	0.19	
		From	4.00		22.0000	158.00	No Ice	6.58	4.96	0.08
		Centroid-Le	0.00				1/2" Ice	7.03	5.75	0.13
APXVTM14-ALU-I20 w/ Mount Pipe	C	g	-0.50			1" Ice	7.47	6.47	0.19	
		From	4.00		22.0000	158.00	No Ice	6.58	4.96	0.08
		Centroid-Le	0.00				1/2" Ice	7.03	5.75	0.13
Andrew Collar Mount	A	g	-0.50			1" Ice	7.47	6.47	0.19	
		None			0.0000	154.00	No Ice	2.14	2.14	0.19
							1/2" Ice	2.35	2.35	0.25
RRH2X50-800	A	g	0.00			1" Ice	2.57	2.57	0.30	
		From	4.00		0.0000	154.00	No Ice	1.70	1.28	0.05
		Centroid-Le	0.00				1/2" Ice	1.86	1.43	0.07
RRH2X50-800	B	g	0.00			1" Ice	2.03	1.58	0.09	
		From	4.00		0.0000	154.00	No Ice	1.70	1.28	0.05
		Centroid-Le	0.00				1/2" Ice	1.86	1.43	0.07
RRH2X50-800	C	g	0.00			1" Ice	2.03	1.58	0.09	
		From	4.00		0.0000	154.00	No Ice	1.70	1.28	0.05
		Centroid-Le	0.00				1/2" Ice	1.86	1.43	0.07
RRH1900-4x45	A	g	0.00			1" Ice	2.03	1.58	0.09	
		From	4.00		0.0000	154.00	No Ice	2.29	2.29	0.06
		Centroid-Le	0.00				1/2" Ice	2.50	2.50	0.08
RRH1900-4x45	B	g	0.00			1" Ice	2.71	2.71	0.11	
		From	4.00		0.0000	154.00	No Ice	2.29	2.29	0.06
		Centroid-Le	0.00				1/2" Ice	2.50	2.50	0.08
RRH1900-4x45	C	g	0.00			1" Ice	2.71	2.71	0.11	
		From	4.00		0.0000	154.00	No Ice	2.29	2.29	0.06
		Centroid-Le	0.00				1/2" Ice	2.50	2.50	0.08
Sabre 12' LP Platform	A	g	0.00			1" Ice	2.71	2.71	0.11	
		None			0.0000	147.00	No Ice	28.47	28.47	1.12
							1/2" Ice	33.59	33.59	1.51
Site Pro 1 HRK12-U Support Rail Kit	A	g				1" Ice	38.71	38.71	1.91	
		None			0.0000	149.50	No Ice	4.56	4.56	0.30
							1/2" Ice	6.39	6.39	0.39
Site Pro 1 PRK-SFS Reinforcement Kit	A	g				1" Ice	8.18	8.18	0.48	
		None			0.0000	149.50	No Ice	6.20	6.20	0.20
							1/2" Ice	7.19	7.19	0.25
Collar Mount	A	g				1" Ice	8.18	8.18	0.31	
		None			0.0000	149.50	No Ice	2.14	2.14	0.19
							1/2" Ice	2.35	2.35	0.25
Site Pro 1 HRK12-U Support Rail Kit	A	g				1" Ice	2.57	2.57	0.30	
		None			0.0000	146.00	No Ice	4.56	4.56	0.30
							1/2" Ice	6.39	6.39	0.39
Site Pro 1 PRK-SFS Reinforcement Kit	A	g				1" Ice	8.18	8.18	0.48	
		None			0.0000	146.00	No Ice	6.20	6.20	0.20
							1/2" Ice	7.19	7.19	0.25
Collar Mount	A	g				1" Ice	8.18	8.18	0.31	
		None			0.0000	146.00	No Ice	2.14	2.14	0.19
							1/2" Ice	2.35	2.35	0.25

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz	Vert					
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
AIR 32 KRD901146-1 B66A/B2A w/ Mount Pipe	A	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	2.57	2.57	0.30
			0.00			No Ice	6.58	5.90	0.15
			0.00			1/2" Ice	6.97	6.56	0.21
AIR 32 KRD901146-1 B66A/B2A w/ Mount Pipe	B	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	7.37	7.24	0.28
			0.00			No Ice	6.58	5.90	0.15
			0.00			1/2" Ice	6.97	6.56	0.21
AIR 32 KRD901146-1 B66A/B2A w/ Mount Pipe	C	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	7.37	7.24	0.28
			0.00			No Ice	6.58	5.90	0.15
			0.00			1/2" Ice	6.97	6.56	0.21
AIR6449 B41 w/ Mount Pipe	A	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	7.37	7.24	0.28
			0.00			No Ice	6.45	3.92	0.13
			0.00			1/2" Ice	7.02	4.64	0.18
AIR6449 B41 w/ Mount Pipe	B	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	7.53	5.25	0.24
			0.00			No Ice	6.45	3.92	0.13
			0.00			1/2" Ice	7.02	4.64	0.18
AIR6449 B41 w/ Mount Pipe	C	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	7.53	5.25	0.24
			0.00			No Ice	6.45	3.92	0.13
			0.00			1/2" Ice	7.02	4.64	0.18
APXVAALL24_43-U-NA20 w/ Mount Pipe	A	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	21.99	13.94	0.46
			0.00			No Ice	20.48	10.87	0.18
			0.00			1/2" Ice	21.23	12.39	0.32
APXVAALL24_43-U-NA20 w/ Mount Pipe	B	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	21.99	13.94	0.46
			0.00			No Ice	20.48	10.87	0.18
			0.00			1/2" Ice	21.23	12.39	0.32
APXVAALL24_43-U-NA20 w/ Mount Pipe	C	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	21.99	13.94	0.46
			0.00			No Ice	20.48	10.87	0.18
			0.00			1/2" Ice	21.23	12.39	0.32
KRY 112 144/1	A	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	0.51	0.30	0.02
			0.00			No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
KRY 112 144/1	B	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	0.51	0.30	0.02
			0.00			No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
KRY 112 144/1	C	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	0.51	0.30	0.02
			0.00			No Ice	0.35	0.17	0.01
			0.00			1/2" Ice	0.43	0.23	0.01
ATMAA1413D-1A20	A	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	1.26	0.59	0.03
			0.00			No Ice	1.00	0.41	0.01
			0.00			1/2" Ice	1.13	0.50	0.02
ATMAA1413D-1A20	B	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	1.26	0.59	0.03
			0.00			No Ice	1.00	0.41	0.01
			0.00			1/2" Ice	1.13	0.50	0.02
ATMAA1413D-1A20	C	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	1.26	0.59	0.03
			0.00			No Ice	1.00	0.41	0.01
			0.00			1/2" Ice	1.13	0.50	0.02
SDX1926Q-43	A	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	0.37	0.19	0.01
			0.00			No Ice	0.24	0.10	0.01
			0.00			1/2" Ice	0.30	0.14	0.01
SDX1926Q-43	B	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	0.37	0.19	0.01
			0.00			No Ice	0.24	0.10	0.01
			0.00			1/2" Ice	0.30	0.14	0.01
SDX1926Q-43	C	From Centroid-Fa ce	4.00	0.0000	147.00	1" Ice	0.37	0.19	0.01
			0.00			No Ice	0.24	0.10	0.01
			0.00			1/2" Ice	0.30	0.14	0.01
4449 B71+B85	A	From Centroid-Fa	4.00	0.0000	147.00	1" Ice	0.37	0.19	0.01
			0.00			No Ice	1.97	1.41	0.07
						1/2" Ice	2.15	1.57	0.09

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
4449 B71+B85	B	ce	0.00				1" Ice	2.33	1.73	0.11
		From	4.00		0.0000	147.00	No Ice	1.97	1.41	0.07
		Centroid-Fa	0.00				1/2" Ice	2.15	1.57	0.09
4449 B71+B85	C	ce	0.00				1" Ice	2.33	1.73	0.11
		From	4.00		0.0000	147.00	No Ice	1.97	1.41	0.07
		Centroid-Fa	0.00				1/2" Ice	2.15	1.57	0.09
4415 B25	A	ce	0.00				1" Ice	2.33	1.73	0.11
		From	4.00		0.0000	147.00	No Ice	1.65	0.68	0.05
		Centroid-Fa	0.00				1/2" Ice	1.81	0.79	0.06
4415 B25	B	ce	0.00				1" Ice	1.98	0.92	0.07
		From	4.00		0.0000	147.00	No Ice	1.65	0.68	0.05
		Centroid-Fa	0.00				1/2" Ice	1.81	0.79	0.06
4415 B25	C	ce	0.00				1" Ice	1.98	0.92	0.07
		From	4.00		0.0000	147.00	No Ice	1.65	0.68	0.05
		Centroid-Fa	0.00				1/2" Ice	1.81	0.79	0.06
Commscope MTC3607 Platform w/ Reinforcing Kit	A	ce	0.00				1" Ice	1.98	0.92	0.07
		None			0.0000	130.00	No Ice	51.70	51.70	2.26
							1/2" Ice	62.70	62.70	2.94
Handrail Kit [NA 507-1]	A	ce					1" Ice	73.70	73.70	3.61
		None			0.0000	130.00	No Ice	4.80	4.80	0.25
							1/2" Ice	6.70	6.70	0.29
AIR6419 w/ Mount Pipe	A	g	2.00				1" Ice	8.60	8.60	0.34
		From	4.00		55.0000	130.00	No Ice	5.29	3.96	0.11
		Centroid-Le	0.00				1/2" Ice	6.13	4.98	0.16
AIR6419 w/ Mount Pipe	B	g	2.00				1" Ice	6.73	5.67	0.22
		From	4.00		55.0000	130.00	No Ice	5.29	3.96	0.11
		Centroid-Le	0.00				1/2" Ice	6.13	4.98	0.16
AIR6419 w/ Mount Pipe	C	g	2.00				1" Ice	6.73	5.67	0.22
		From	4.00		55.0000	130.00	No Ice	5.29	3.96	0.11
		Centroid-Le	0.00				1/2" Ice	6.13	4.98	0.16
EPBQ-654L8H8-L2 w/ Mount Pipe	A	g	2.00				1" Ice	6.73	5.67	0.22
		From	4.00		55.0000	130.00	No Ice	18.09	8.70	0.12
		Centroid-Le	0.00				1/2" Ice	18.72	10.01	0.23
EPBQ-654L8H8-L2 w/ Mount Pipe	B	g	0.00				1" Ice	19.36	11.04	0.36
		From	4.00		55.0000	130.00	No Ice	18.09	8.70	0.12
		Centroid-Le	0.00				1/2" Ice	18.72	10.01	0.23
EPBQ-654L8H6-L2 w/ Mount Pipe	C	g	0.00				1" Ice	19.36	11.04	0.36
		From	4.00		55.0000	130.00	No Ice	8.80	8.46	0.11
		Centroid-Le	0.00				1/2" Ice	9.29	9.46	0.19
DMP65R-BU8DA w/ Mount Pipe	A	g	0.00				1" Ice	9.78	10.32	0.27
		From	4.00		55.0000	130.00	No Ice	17.87	10.02	0.03
		Centroid-Le	0.00				1/2" Ice	18.50	11.44	0.15
DMP65R-BU8DA w/ Mount Pipe	B	g	0.00				1" Ice	19.14	12.72	0.28
		From	4.00		55.0000	130.00	No Ice	17.87	10.02	0.03
		Centroid-Le	0.00				1/2" Ice	18.50	11.44	0.15
DMP65R-BU6DA w/ Mount Pipe	C	g	0.00				1" Ice	19.14	12.72	0.28
		From	4.00		55.0000	130.00	No Ice	17.87	10.02	0.03
		Centroid-Le	0.00				1/2" Ice	18.50	11.44	0.15
AIR6449	A	g	0.00				1" Ice	19.14	12.72	0.28
		From	4.00		55.0000	130.00	No Ice	4.03	2.15	0.08
		Centroid-Le	0.00				1/2" Ice	4.29	2.36	0.11
AIR6449	B	g	-2.00				1" Ice	4.56	2.57	0.14
		From	4.00		55.0000	130.00	No Ice	4.03	2.15	0.08
		Centroid-Le	0.00				1/2" Ice	4.29	2.36	0.11
AIR6449	C	g	-2.00				1" Ice	4.56	2.57	0.14
		From	4.00		55.0000	130.00	No Ice	4.03	2.15	0.08
		Centroid-Le	0.00				1/2" Ice	4.29	2.36	0.11

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz	Vert						
			ft	ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K	
(2) LGP21401	A	g	-2.00				1" Ice	4.56	2.57	0.14
		From	4.00		0.0000	130.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00				1/2" Ice	1.24	0.27	0.02
(2) LGP21401	B	g	0.00				1" Ice	1.38	0.35	0.03
		From	4.00		0.0000	130.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00				1/2" Ice	1.24	0.27	0.02
(2) LGP21401	C	g	0.00				1" Ice	1.38	0.35	0.03
		From	4.00		0.0000	130.00	No Ice	1.10	0.21	0.01
		Centroid-Le	0.00				1/2" Ice	1.24	0.27	0.02
TT19-08BP111-001	A	g	0.00				1" Ice	1.38	0.35	0.03
		From	4.00		0.0000	130.00	No Ice	0.55	0.45	0.02
		Centroid-Le	0.00				1/2" Ice	0.65	0.53	0.02
TT19-08BP111-001	B	g	0.00				1" Ice	0.75	0.63	0.03
		From	4.00		0.0000	130.00	No Ice	0.55	0.45	0.02
		Centroid-Le	0.00				1/2" Ice	0.65	0.53	0.02
TT19-08BP111-001	C	g	0.00				1" Ice	0.75	0.63	0.03
		From	4.00		0.0000	130.00	No Ice	0.55	0.45	0.02
		Centroid-Le	0.00				1/2" Ice	0.65	0.53	0.02
(2) 860 10025	A	g	0.00				1" Ice	0.75	0.63	0.03
		From	4.00		0.0000	130.00	No Ice	0.14	0.12	0.00
		Centroid-Le	0.00				1/2" Ice	0.19	0.17	0.00
(2) 860 10025	B	g	0.00				1" Ice	0.25	0.23	0.01
		From	4.00		0.0000	130.00	No Ice	0.14	0.12	0.00
		Centroid-Le	0.00				1/2" Ice	0.19	0.17	0.00
(2) 860 10025	C	g	0.00				1" Ice	0.25	0.23	0.01
		From	4.00		0.0000	130.00	No Ice	0.14	0.12	0.00
		Centroid-Le	0.00				1/2" Ice	0.19	0.17	0.00
4415 B25	A	g	0.00				1" Ice	0.25	0.23	0.01
		From	4.00		0.0000	130.00	No Ice	1.65	0.68	0.05
		Centroid-Le	0.00				1/2" Ice	1.81	0.79	0.06
4415 B25	B	g	0.00				1" Ice	1.98	0.92	0.07
		From	4.00		0.0000	130.00	No Ice	1.65	0.68	0.05
		Centroid-Le	0.00				1/2" Ice	1.81	0.79	0.06
4415 B25	C	g	0.00				1" Ice	1.98	0.92	0.07
		From	4.00		0.0000	130.00	No Ice	1.65	0.68	0.05
		Centroid-Le	0.00				1/2" Ice	1.81	0.79	0.06
RRUS-32	A	g	0.00				1" Ice	1.98	0.92	0.07
		From	4.00		0.0000	130.00	No Ice	3.31	2.42	0.08
		Centroid-Le	0.00				1/2" Ice	3.56	2.64	0.10
RRUS-32	B	g	0.00				1" Ice	3.81	2.86	0.14
		From	4.00		0.0000	130.00	No Ice	3.31	2.42	0.08
		Centroid-Le	0.00				1/2" Ice	3.56	2.64	0.10
RRUS-32	C	g	0.00				1" Ice	3.81	2.86	0.14
		From	4.00		0.0000	130.00	No Ice	3.31	2.42	0.08
		Centroid-Le	0.00				1/2" Ice	3.56	2.64	0.10
RRUS 4478 B14	A	g	0.00				1" Ice	3.81	2.86	0.14
		From	4.00		0.0000	130.00	No Ice	1.84	1.06	0.06
		Centroid-Le	0.00				1/2" Ice	2.01	1.20	0.08
RRUS 4478 B14	B	g	0.00				1" Ice	2.19	1.34	0.09
		From	4.00		0.0000	130.00	No Ice	1.84	1.06	0.06
		Centroid-Le	0.00				1/2" Ice	2.01	1.20	0.08
RRUS 4478 B14	C	g	0.00				1" Ice	2.19	1.34	0.09
		From	4.00		0.0000	130.00	No Ice	1.84	1.06	0.06
		Centroid-Le	0.00				1/2" Ice	2.01	1.20	0.08
RRUS 4449 B5/B12	A	g	0.00				1" Ice	2.19	1.34	0.09
		From	4.00		0.0000	130.00	No Ice	1.97	1.41	0.07
		Centroid-Le	0.00				1/2" Ice	2.14	1.56	0.09

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Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight	
			Horz Lateral	Vert						°
RRUS 4449 B5/B12	B	g	0.00		0.0000	130.00	1" Ice	2.33	1.73	0.11
		From	4.00				No Ice	1.97	1.41	0.07
		Centroid-Le	0.00				1/2" Ice	2.14	1.56	0.09
RRUS 4449 B5/B12	C	g	0.00		0.0000	130.00	1" Ice	2.33	1.73	0.11
		From	4.00				No Ice	1.97	1.41	0.07
		Centroid-Le	0.00				1/2" Ice	2.14	1.56	0.09
RRUS 32 B66A	A	g	0.00		0.0000	130.00	1" Ice	2.33	1.73	0.11
		From	4.00				No Ice	2.86	1.78	0.06
		Centroid-Le	0.00				1/2" Ice	3.09	1.97	0.08
RRUS 32 B66A	B	g	0.00		0.0000	130.00	1" Ice	3.32	2.17	0.10
		From	4.00				No Ice	2.86	1.78	0.06
		Centroid-Le	0.00				1/2" Ice	3.09	1.97	0.08
RRUS 32 B66A	C	g	0.00		0.0000	130.00	1" Ice	3.32	2.17	0.10
		From	4.00				No Ice	2.86	1.78	0.06
		Centroid-Le	0.00				1/2" Ice	3.09	1.97	0.08
RRUS A2	A	g	0.00		0.0000	130.00	1" Ice	3.32	2.17	0.10
		From	4.00				No Ice	1.60	0.39	0.02
		Centroid-Le	0.00				1/2" Ice	1.76	0.48	0.03
RRUS A2	B	g	0.00		0.0000	130.00	1" Ice	1.92	0.58	0.04
		From	4.00				No Ice	1.60	0.39	0.02
		Centroid-Le	0.00				1/2" Ice	1.76	0.48	0.03
RRUS A2	C	g	0.00		0.0000	130.00	1" Ice	1.92	0.58	0.04
		From	4.00				No Ice	1.60	0.39	0.02
		Centroid-Le	0.00				1/2" Ice	1.76	0.48	0.03
DC6-48-60-18-8F Surge Suppression Unit	A	g	0.00		0.0000	130.00	1" Ice	1.92	0.58	0.04
		From	4.00				No Ice	0.92	0.92	0.02
		Centroid-Le	0.00				1/2" Ice	1.46	1.46	0.04
DC6-48-60-18-8F Surge Suppression Unit	B	g	0.00		0.0000	130.00	1" Ice	1.64	1.64	0.06
		From	4.00				No Ice	0.92	0.92	0.02
		Centroid-Le	0.00				1/2" Ice	1.46	1.46	0.04
DC9-48-60-24-8C-EV	C	g	0.00		0.0000	130.00	1" Ice	1.64	1.64	0.06
		From	4.00				No Ice	2.74	4.78	0.03
		Centroid-Le	0.00				1/2" Ice	2.96	5.06	0.06
MTS 12.5' Co-Locational Platform w/ VZWSmart PLK1 Support Rail Kit [LP 301-1]	A	g	0.00		0.0000	117.50	1" Ice	3.20	5.35	0.10
		None					No Ice	23.81	23.81	1.59
							1/2" Ice	30.24	30.24	2.10
VZWSmart MSK2 Crossover Plate	A	g	0.00		0.0000	117.50	1" Ice	36.33	36.33	2.73
		From	4.00				No Ice	0.83	0.03	0.01
		Centroid-Le	0.00				1/2" Ice	0.95	0.11	0.01
VZWSmart MSK2 Crossover Plate	B	g	0.00		0.0000	117.50	1" Ice	1.07	0.18	0.02
		From	4.00				No Ice	0.83	0.03	0.01
		Centroid-Le	0.00				1/2" Ice	0.95	0.11	0.01
VZWSmart MSK2 Crossover Plate	C	g	0.00		0.0000	117.50	1" Ice	1.07	0.18	0.02
		From	4.00				No Ice	0.83	0.03	0.01
		Centroid-Le	0.00				1/2" Ice	0.95	0.11	0.01
DB-T1-6Z-8AB-0Z	B	g	0.00		0.0000	117.50	1" Ice	1.07	0.18	0.02
		From	4.00				No Ice	4.80	2.00	0.05
		Centroid-Le	0.00				1/2" Ice	5.07	2.19	0.09
DB-T1-6Z-8AB-0Z	C	g	4.50		0.0000	117.50	1" Ice	5.35	2.39	0.13
		From	4.00				No Ice	4.80	2.00	0.05
		Centroid-Le	0.00				1/2" Ice	5.07	2.19	0.09
(2) FD9R6004/2C-3L	A	g	4.50		0.0000	117.50	1" Ice	5.35	2.39	0.13
		From	4.00				No Ice	0.31	0.08	0.00
		Centroid-Le	0.00				1/2" Ice	0.39	0.12	0.01
(2) FD9R6004/2C-3L	B	g	1.50		0.0000	117.50	1" Ice	0.47	0.17	0.01
		From	4.00				No Ice	0.31	0.08	0.00

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	<b>Client</b>	SBA Site Management	<b>Designed by</b>	EBoaz

Description	Face or Leg	Offset Type	Offsets:		Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			Horz Lateral	Vert					
(2) FD9R6004/2C-3L	C	Centroid-Le	0.00			1/2" Ice	0.39	0.12	0.01
		g	1.50			1" Ice	0.47	0.17	0.01
		From	4.00	0.0000	117.50	No Ice	0.31	0.08	0.00
CBC78T-DS-43-2X	A	Centroid-Le	0.00			1/2" Ice	0.39	0.12	0.01
		g	1.50			1" Ice	0.47	0.17	0.01
		From	4.00	0.0000	117.50	No Ice	0.37	0.51	0.02
CBC78T-DS-43-2X	B	Centroid-Le	0.00			1/2" Ice	0.45	0.60	0.03
		g	1.50			1" Ice	0.53	0.70	0.04
		From	4.00	0.0000	117.50	No Ice	0.37	0.51	0.02
CBC78T-DS-43-2X	C	Centroid-Le	0.00			1/2" Ice	0.45	0.60	0.03
		g	1.50			1" Ice	0.53	0.70	0.04
		From	4.00	0.0000	117.50	No Ice	0.37	0.51	0.02
B2/B66A	A	Centroid-Le	0.00			1/2" Ice	0.45	0.60	0.03
		g	1.50			1" Ice	0.53	0.70	0.04
		From	4.00	0.0000	117.50	No Ice	1.88	1.25	0.08
B2/B66A	B	Centroid-Le	0.00			1/2" Ice	2.05	1.39	0.10
		g	1.50			1" Ice	2.22	1.54	0.12
		From	4.00	0.0000	117.50	No Ice	1.88	1.25	0.08
B2/B66A	C	Centroid-Le	0.00			1/2" Ice	2.05	1.39	0.10
		g	1.50			1" Ice	2.22	1.54	0.12
		From	4.00	0.0000	117.50	No Ice	1.88	1.25	0.08
B5/B13 RRH	A	Centroid-Le	0.00			1/2" Ice	2.05	1.39	0.10
		g	1.50			1" Ice	2.22	1.54	0.12
		From	4.00	0.0000	117.50	No Ice	1.88	1.00	0.10
B5/B13 RRH	B	Centroid-Le	0.00			1/2" Ice	2.05	1.13	0.11
		g	1.50			1" Ice	2.22	1.27	0.13
		From	4.00	0.0000	117.50	No Ice	1.88	1.00	0.10
B5/B13 RRH	C	Centroid-Le	0.00			1/2" Ice	2.05	1.13	0.11
		g	1.50			1" Ice	2.22	1.27	0.13
		From	4.00	0.0000	117.50	No Ice	1.88	1.00	0.10
LNX-6514DS-VTM w/ Mount Pipe	A	Centroid-Le	0.00			1/2" Ice	2.05	1.13	0.11
		g	1.50			1" Ice	2.22	1.27	0.13
		From	4.00	0.0000	117.50	No Ice	8.17	6.83	0.06
LNX-6514DS-VTM w/ Mount Pipe	B	Centroid-Le	0.00			1/2" Ice	8.63	7.79	0.13
		g	0.50			1" Ice	9.10	8.62	0.20
		From	4.00	0.0000	117.50	No Ice	8.17	6.83	0.06
LNX-6514DS-VTM w/ Mount Pipe	C	Centroid-Le	0.00			1/2" Ice	8.63	7.79	0.13
		g	0.50			1" Ice	9.10	8.62	0.20
		From	4.00	0.0000	117.50	No Ice	8.17	6.83	0.06
(2) JAHH-65B-R3B w/ Mount Pipe	A	Centroid-Le	0.00			1/2" Ice	8.63	7.79	0.13
		g	0.50			1" Ice	9.10	8.62	0.20
		From	4.00	0.0000	117.50	No Ice	9.35	7.65	0.09
(2) JAHH-65B-R3B w/ Mount Pipe	B	Centroid-Le	0.00			1/2" Ice	9.92	8.83	0.16
		g	0.50			1" Ice	10.46	9.73	0.25
		From	4.00	0.0000	117.50	No Ice	9.35	7.65	0.09
(2) JAHH-65B-R3B w/ Mount Pipe	C	Centroid-Le	0.00			1/2" Ice	9.92	8.83	0.16
		g	0.50			1" Ice	10.46	9.73	0.25
		From	4.00	0.0000	117.50	No Ice	9.35	7.65	0.09
MT6407-77A w/ 6' x P2.5 Std Mount Pipe	A	Centroid-Le	0.00			1/2" Ice	9.92	8.83	0.16
		g	0.50			1" Ice	10.46	9.73	0.25
		From	4.00	0.0000	117.50	No Ice	4.91	2.68	0.10
MT6407-77A w/ 6' x P2.5 Std Mount Pipe	B	Centroid-Le	0.00			1/2" Ice	5.26	3.14	0.14
		g	0.50			1" Ice	5.61	3.62	0.18
		From	4.00	0.0000	117.50	No Ice	4.91	2.68	0.10
MT6407-77A w/ 6' x P2.5 Std	C	Centroid-Le	0.00			1/2" Ice	5.26	3.14	0.14
		g	0.50			1" Ice	5.61	3.62	0.18
		From	4.00	0.0000	117.50	No Ice	4.91	2.68	0.10

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Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	Placement	C <sub>AA</sub> Front	C <sub>AA</sub> Side	Weight
			ft ft ft	°	ft	ft <sup>2</sup>	ft <sup>2</sup>	K
Mount Pipe		Centroid-Le g	0.00 0.50			1/2" Ice 5.26 1" Ice 5.61	3.14 3.62	0.14 0.18
BSAMNT-SBS-2-2	A	From Centroid-Le g	4.00 0.00 0.50	0.0000	117.50	No Ice 0.11 1/2" Ice 0.15 1" Ice 0.21	0.00 0.03 0.08	0.01 0.02 0.02
BSAMNT-SBS-2-2	B	From Centroid-Le g	4.00 0.00 0.50	0.0000	117.50	No Ice 0.11 1/2" Ice 0.15 1" Ice 0.21	0.00 0.03 0.08	0.01 0.02 0.02
BSAMNT-SBS-2-2	C	From Centroid-Le g	4.00 0.00 0.50	0.0000	117.50	No Ice 0.11 1/2" Ice 0.15 1" Ice 0.21	0.00 0.03 0.08	0.01 0.02 0.02
Andrew Collar Mount	A	None		0.0000	63.50	No Ice 2.14 1/2" Ice 2.35 1" Ice 2.57	2.14 2.35 2.57	0.19 0.25 0.30
DS4C03CS36U-N	A	From Leg	1.00 0.00 2.50	0.0000	63.50	No Ice 1.06 1/2" Ice 1.51 1" Ice 1.84	1.06 1.51 1.84	0.01 0.02 0.03
DS4C03CS36U-N	B	From Leg	1.00 0.00 2.50	0.0000	63.50	No Ice 1.06 1/2" Ice 1.51 1" Ice 1.84	1.06 1.51 1.84	0.01 0.02 0.03
Andrew Collar Mount	A	None		0.0000	18.00	No Ice 2.14 1/2" Ice 2.35 1" Ice 2.57	2.14 2.35 2.57	0.19 0.25 0.30
SP7C03CS36U-N	A	From Leg	1.00 0.00 1.50	0.0000	18.00	No Ice 0.52 1/2" Ice 0.71 1" Ice 0.90	0.52 0.71 0.90	0.01 0.01 0.02
SP7C03CS36U-N	B	From Leg	1.00 0.00 1.50	0.0000	18.00	No Ice 0.52 1/2" Ice 0.71 1" Ice 0.90	0.52 0.71 0.90	0.01 0.01 0.02
DS4C00F36U-D	C	From Leg	1.00 0.00 1.50	0.0000	18.00	No Ice 0.47 1/2" Ice 0.65 1" Ice 0.83	0.47 0.65 0.83	0.01 0.01 0.02
Andrew Collar Mount	A	None		0.0000	14.50	No Ice 2.14 1/2" Ice 2.35 1" Ice 2.57	2.14 2.35 2.57	0.19 0.25 0.30
DS4C03CS36U-N	A	From Leg	1.00 0.00 2.50	0.0000	14.50	No Ice 1.06 1/2" Ice 1.51 1" Ice 1.84	1.06 1.51 1.84	0.01 0.02 0.03
DS1X00CS36U-N	B	From Leg	1.00 0.00 2.50	0.0000	14.50	No Ice 1.38 1/2" Ice 1.74 1" Ice 2.08	1.38 1.74 2.08	0.02 0.03 0.04

## Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert	Azimuth Adjustment	3 dB Beam Width	Elevation	Outside Diameter	Aperture Area	Weight
				ft ft ft	°	°	ft	ft	ft <sup>2</sup>	K
SC3-W100A	A	Paraboloid w/Shroud (HP)	From Centroid	1.00 0.00	44.5000		159.00	3.00	No Ice 7.07 1/2" Ice 7.47	0.40 0.44



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Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft	Aperture Area ft <sup>2</sup>	Weight K	
SC3-W100A	C	Paraboloid w/Shroud (HP)	-Leg	2.50	-15.6500		159.00	3.00	1" Ice	7.86	0.48
			From	1.00					No Ice	7.07	0.40
			Centroid	0.00					1/2" Ice	7.47	0.44
			-Leg	2.50					1" Ice	7.86	0.48

### Load Combinations

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

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<i>Comb. No.</i>	<i>Description</i>
48	Dead+Wind 270 deg - Service
49	Dead+Wind 300 deg - Service
50	Dead+Wind 330 deg - Service

### Maximum Tower Deflections - Service Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load Comb.</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>in</i>		<i>°</i>	<i>°</i>
L1	160 - 146.5	25.288	46	1.5670	0.0036
L2	149.25 - 95.75	21.793	46	1.5276	0.0024
L3	100.25 - 46.75	8.696	46	0.9330	0.0006
L4	53.25 - 0	2.175	46	0.3893	0.0002

### Critical Deflections and Radius of Curvature - Service Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
161.50	SC3-W100A	46	25.288	1.5670	0.0036	15477
160.50	12.5' Handrail Kit	46	25.288	1.5670	0.0036	15477
159.00	(3) Andrew 5' T-Arms	46	24.960	1.5641	0.0035	15477
158.00	Sabre 12' LP Platform	46	24.632	1.5613	0.0034	15477
154.00	Andrew Collar Mount	46	23.325	1.5484	0.0029	12898
149.50	Site Pro 1 HRK12-U Support Rail Kit	46	21.873	1.5289	0.0024	7804
147.00	Sabre 12' LP Platform	46	21.079	1.5146	0.0021	7006
146.00	Site Pro 1 HRK12-U Support Rail Kit	46	20.765	1.5080	0.0020	6842
130.00	Commscope MTC3607 Platform w/ Reinforcing Kit	46	15.989	1.3521	0.0012	5433
117.50	MTS 12.5' Co-Locational Platform w/ VZWSmart PLK1 Support Rail Kit [LP 301-1]	46	12.644	1.1840	0.0009	4686
63.50	Andrew Collar Mount	46	3.116	0.4879	0.0003	5006
18.00	Andrew Collar Mount	46	0.422	0.1174	0.0000	16030
14.50	Andrew Collar Mount	46	0.328	0.0941	0.0000	19899

### Maximum Tower Deflections - Design Wind

<i>Section No.</i>	<i>Elevation</i>	<i>Horz. Deflection</i>	<i>Gov. Load Comb.</i>	<i>Tilt</i>	<i>Twist</i>
	<i>ft</i>	<i>in</i>		<i>°</i>	<i>°</i>
L1	160 - 146.5	139.064	16	8.6414	0.0181
L2	149.25 - 95.75	119.897	16	8.4325	0.0126
L3	100.25 - 46.75	47.927	16	5.1496	0.0032
L4	53.25 - 0	11.988	16	2.1474	0.0009

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### Critical Deflections and Radius of Curvature - Design Wind

<i>Elevation</i>	<i>Appurtenance</i>	<i>Gov. Load Comb.</i>	<i>Deflection</i>	<i>Tilt</i>	<i>Twist</i>	<i>Radius of Curvature</i>
<i>ft</i>			<i>in</i>	<i>°</i>	<i>°</i>	<i>ft</i>
161.50	SC3-W100A	16	139.064	8.6414	0.0181	2983
160.50	12.5' Handrail Kit	16	139.064	8.6414	0.0181	2983
159.00	(3) Andrew 5' T-Arms	16	137.265	8.6266	0.0174	2983
158.00	Sabre 12' LP Platform	16	135.467	8.6117	0.0168	2983
154.00	Andrew Collar Mount	16	128.300	8.5444	0.0145	2485
149.50	Site Pro 1 HRK12-U Support Rail Kit	16	120.335	8.4397	0.0127	1501
147.00	Sabre 12' LP Platform	16	115.980	8.3609	0.0120	1345
146.00	Site Pro 1 HRK12-U Support Rail Kit	16	114.254	8.3249	0.0117	1312
130.00	Commscope MTC3607 Platform w/ Reinforcing Kit	16	88.031	7.4645	0.0077	1026
117.50	MTS 12.5' Co-Locational Platform w/ VZWSmart PLK1 Support Rail Kit [LP 301-1]	16	69.646	6.5364	0.0052	875
63.50	Andrew Collar Mount	16	17.179	2.6913	0.0014	912
18.00	Andrew Collar Mount	16	2.323	0.6473	0.0003	2905
14.50	Andrew Collar Mount	16	1.808	0.5186	0.0002	3606

### Compression Checks

#### Pole Design Data

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>L</i>	<i>L<sub>u</sub></i>	<i>Kl/r</i>	<i>A</i>	<i>P<sub>u</sub></i>	$\phi P_n$	<i>Ratio</i>
	<i>ft</i>		<i>ft</i>	<i>ft</i>		<i>in<sup>2</sup></i>	<i>K</i>	<i>K</i>	$\frac{P_u}{\phi P_n}$
L1	160 - 146.5 (1)	TP20.91x16.75x0.1875	13.50	0.00	0.0	11.8282	-5.28	865.69	0.006
L2	146.5 - 95.75 (2)	TP36.16x19.6876x0.25	53.50	0.00	0.0	27.3952	-24.02	1841.20	0.013
L3	95.75 - 46.75 (3)	TP50.76x34.2745x0.3125	53.50	0.00	0.0	48.0510	-36.65	3077.94	0.012
L4	46.75 - 0 (4)	TP64.53x48.1321x0.375	53.25	0.00	0.0	76.3605	-56.99	4662.89	0.012

#### Pole Bending Design Data

<i>Section No.</i>	<i>Elevation</i>	<i>Size</i>	<i>M<sub>ux</sub></i>	$\phi M_{ux}$	<i>Ratio</i>	<i>M<sub>uy</sub></i>	$\phi M_{uy}$	<i>Ratio</i>
	<i>ft</i>		<i>kip-ft</i>	<i>kip-ft</i>	$\frac{M_{ux}}{\phi M_{ux}}$	<i>kip-ft</i>	<i>kip-ft</i>	$\frac{M_{uy}}{\phi M_{uy}}$
L1	160 - 146.5 (1)	TP20.91x16.75x0.1875	73.20	353.25	0.207	0.00	353.25	0.000
L2	146.5 - 95.75 (2)	TP36.16x19.6876x0.25	1265.93	1307.93	0.968	0.00	1307.93	0.000
L3	95.75 - 46.75 (3)	TP50.76x34.2745x0.3125	2940.56	3070.47	0.958	0.00	3070.47	0.000
L4	46.75 - 0 (4)	TP64.53x48.1321x0.375	5067.18	6163.78	0.822	0.00	6163.78	0.000

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### Pole Shear Design Data

Section No.	Elevation ft	Size	Actual $V_u$ K	$\phi V_n$ K	Ratio $\frac{V_u}{\phi V_n}$	Actual $T_u$ kip-ft	$\phi T_n$ kip-ft	Ratio $\frac{T_u}{\phi T_n}$
L1	160 - 146.5 (1)	TP20.91x16.75x0.1875	8.49	432.84	0.020	0.56	708.37	0.001
L2	146.5 - 95.75 (2)	TP36.16x19.6876x0.25	33.72	920.60	0.037	1.18	2621.93	0.000
L3	95.75 - 46.75 (3)	TP50.76x34.2745x0.3125	37.66	1538.97	0.024	1.17	6154.45	0.000
L4	46.75 - 0 (4)	TP64.53x48.1321x0.375	42.27	2331.45	0.018	1.15	12353.58	0.000

### Pole Interaction Design Data

Section No.	Elevation ft	Ratio $\frac{P_u}{\phi P_n}$	Ratio $\frac{M_{ux}}{\phi M_{nx}}$	Ratio $\frac{M_{uy}}{\phi M_{ny}}$	Ratio $\frac{V_u}{\phi V_n}$	Ratio $\frac{T_u}{\phi T_n}$	Comb. Stress Ratio	Allow. Stress Ratio	Criteria
L1	160 - 146.5 (1)	0.006	0.207	0.000	0.020	0.001	0.214	1.000	4.8.2
L2	146.5 - 95.75 (2)	0.013	0.968	0.000	0.037	0.000	0.982	1.000	4.8.2
L3	95.75 - 46.75 (3)	0.012	0.958	0.000	0.024	0.000	0.970	1.000	4.8.2
L4	46.75 - 0 (4)	0.012	0.822	0.000	0.018	0.000	0.835	1.000	4.8.2

### Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P K	$\phi P_{allow}$ K	% Capacity	Pass Fail
L1	160 - 146.5	Pole	TP20.91x16.75x0.1875	1	-5.28	865.69	21.4	Pass
L2	146.5 - 95.75	Pole	TP36.16x19.6876x0.25	2	-24.02	1841.20	98.2	Pass
L3	95.75 - 46.75	Pole	TP50.76x34.2745x0.3125	3	-36.65	3077.94	97.0	Pass
L4	46.75 - 0	Pole	TP64.53x48.1321x0.375	4	-56.99	4662.89	83.5	Pass
Summary							ELC:	Proposed - Reinforced Mount
Pole (L2)							98.2	Pass
Rating =							98.2	Pass

## **ADDITIONAL CALCULATIONS**



**Anchor Rod and Base Plate Stresses, TIA-222-G-1  
CT33762-M 500 Highland Ave / Light Tower  
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Overturning Moment =	5067.00	k*ft
Axial Force =	57.00	k
Shear Force =	42.00	k

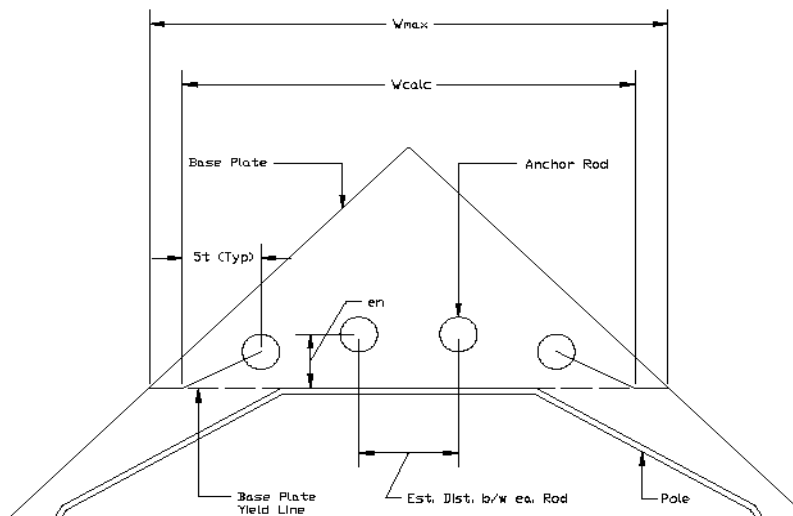
Acceptable Stress Ratio =	100.0%
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Anchor Rods	
Pole Diameter =	64.53 in
Number of Rods =	16
$\phi$ =	0.8
Rod Ultimate Strength ( $F_u$ ) =	100 ksi
Base Plate Detail Type* =	d
Rod Circle =	72 in
Rod Diameter =	2.25 in
Net Tensile Area =	3.25 in <sup>2</sup>
Max Tension on Rod =	206.73 kips
Max Compression on Rod =	213.85 kips
$P_u$ =	213.85 kips
$V_u$ =	2.63 kips
$\eta$ =	0.50
$P_u + V_u / \eta$ =	219.10 kips
$\phi R_{nt}$ =	260.00 kips
<b>Anchor Rod Capacity =</b>	<b>84.3% OK</b>

Base Plate	
Plate Strength ( $F_y$ ) =	60 ksi
$\phi$ =	0.9
Plate Thickness =	3 in
Plate Width =	70 in
Est. Dist. b/w ea. Rod =	6 in
$W_{calc}$ =	47.83 in
$W_{max}$ =	34.46 in
$w$ =	34.46 in
$Z$ =	77.55 in <sup>3</sup>
$M_u$ =	2631.07 k-in
$\phi M_n$ =	4187.49 k-in
<b>Base Plate Capacity =</b>	<b>62.8% OK</b>

(Section 4.9.9, TIA-222-G-1)

**\*This analysis assumes the clear distance from the top of the concrete to the bottom of the leveling nut is less than the diameter of the anchor rod. Notify GPD Group immediately if existing field conditions do not meet this assumption.**





**Mat Foundation Analysis**  
**CT33762-M ; 500 Highland Ave / Light Tower**  
**2022778.33762.16 Rev. 1**

General Info	
Foundation Criteria	GPD
TIA Code	TIA-222-G
Soil Code	AASHTO 2012
Concrete Code	ACI 318-11
Seismic Design Category	B
Tower Height	160 ft
Bearing On	Soil
Foundation Type	Monopole Pad
Pier Type	Round
Reinforcing Known	Yes
Max Bearing Capacity	100%
Max Overturning Capacity	100%

Tower Reactions	
Moment, M	5067 k-ft
Axial, P	57 k
Shear, V	42 k

Pad & Pier Geometry	
Pier Diameter, $\phi$	8 ft
Pad Length, L [y]	27 ft
Pad Width, W [x]	27 ft
Pad Thickness, t	5 ft
Depth, D	5 ft
Height Above Grade, HG	5 ft
Tower Centroid, X	13.5 ft
Tower Centroid, Y	13.5 ft
Tower Eccentricity	0.0000 ft

Pad & Pier Reinforcing	
Rebar Fy	60 ksi
Concrete F'c	4 ksi
Pier Reinforcing Clear Cover	4 in
Shear Rebar Type	Tie
Shear Rebar Size	# 4
Pad Reinforcing Clear Cover	3 in
Reinforced Top & Bottom?	Yes
Top and Bot. Reinf. Different?	No
Pad Reinforcing Size	# 8
Pad Quantity Per Layer	42
Pier Rebar Size	# 9
Pier Quantity of Rebar	38

Soil Properties	
Soil Type	Cohesive
Soil Unit Weight	120 pcf
Cohesion, Cu (ksf)	1.5
Base Friction Coeff. Provided in Geo?	Yes
Base Friction Coefficient, $\mu$	0.35
Bearing Type	Net
Ultimate Bearing	9 ksf
Water Table Depth	99 ft
Neglected Depth	3.5 ft

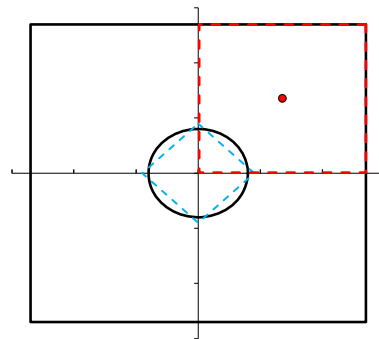
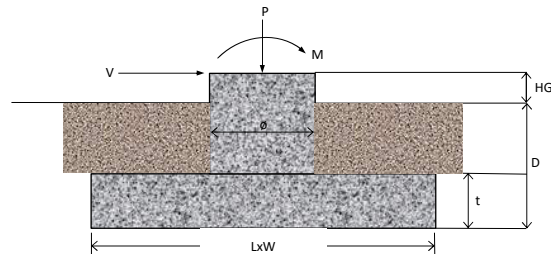
GPD Mat Foundation Analysis - V4.4

Bearing Summary					
Case	Demand/Limits	Capacity/Availability	Check	Eccentricity	Load Case
Q <sub>xmax</sub>	2.70 ksf	7.20 ksf	OK, <= 100%	L/2.8	0.9D+1.6W
Q <sub>ymax</sub>	2.70 ksf	7.20 ksf	OK, <= 100%	W/2.8	0.9D+1.6W
Q <sub>max @ 45°</sub>	3.15 ksf	7.20 ksf	OK, <= 100%	W/4.0	0.9D+1.6W
<b>Controlling Capacity</b>		<b>43.8%</b>	<b>Pass</b>		

Overturning Summary					
Case	Demand/Limits	Capacity/Availability	Check	Load Case	
O <sub>vtx</sub>	5455.8 k-ft	10237.6 k-ft	71.1% OK	0.9D+1.6W	
O <sub>vty</sub>	5455.8 k-ft	10237.6 k-ft	71.1% OK	0.9D+1.6W	
O <sub>vtxy</sub>	3857.8 k-ft	10237.6 k-ft	50.2% OK	0.9D+1.6W	
<b>Controlling Capacity</b>		<b>71.1%</b>	<b>Pass</b>		

Sliding Summary					
Case	Demand/Limits	Capacity/Availability	Check	Load Case	
Sliding <sub>x</sub>	42.0 k	255.9 k	16.4% OK	0.9D+1.6W	
Sliding <sub>y</sub>	42.0 k	255.9 k	16.4% OK	0.9D+1.6W	
<b>Controlling Capacity</b>		<b>16.4%</b>	<b>Pass</b>		

Reinforcement Summary					
Component	Demand/Limits	Capacity/Availability	Check	Load Case	
Pad Flexural Bending	2373.5 k-ft	8151.8 k-ft	29.1% OK	0.9D+1.6W	
One-Way Shear in Pad	285.8 k	1705.9 k	16.8% OK	0.9D+1.6W	
Two-Way Shear in Pad	716.1 k	5921.4 k	12.1% OK	0.9D+1.6W	
Compression on Pier	102.2 k	31993.0 k	0.3% OK	1.2D+1.6W	
Moment on Pier	5277.0 k-ft	7152.6 k-ft	73.8% OK	1.2D+1.6W	
As Min Pad Met?	2.46 sq. in.	0.24 sq. in.	Yes		
As Min Pier Met?	38.00 sq. in.	24.10 sq. in.	Yes		
<b>Controlling Capacity</b>		<b>73.8%</b>	<b>Pass</b>		



January 14, 2022



SAI Communications  
12 Industrial Way  
Salem NH, 03079

RE:      Site Number:                    CT2081  
            FA Number:                     10050935  
            PACE Number:                    MRCTB055988  
            PT Number:                      2051A11LM4  
            Site Name:                        CHESHIRE CENTRAL  
            Site Address:                    500 Highland Avenue  
   Cheshire, CT 06410

To Whom It May Concern:

Hudson Design Group LLC (HDG) has been authorized by SAI Communications to perform a mount analysis on the existing AT&T antenna/RRH mounts to determine their capability of supporting the following additional loading:

- (1) EPBQ-654L8H6-L2 Antennas (73.0"x21.0"x6.3" – Wt. = 73 lbs. /each)
- (2) EPBQ-654L8H8-L2 Antennas (96.0"x21.0"x6.3" – Wt. = 97 lbs. /each)
- (3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (3) RRUS-32 B66A RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (2) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs.) (Tower Mounted)
- **(1) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(2) DMP65R-BU8DA Antennas (96.0"x20.7"x7.7" – Wt. = 96 lbs. /each)**
- **(3) AIR6419 Antennas (31.0"x16.1"x7.3" – Wt. = 66 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. = 82 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(3) 4415 B25 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)**
- **(1) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs.) (Tower Mounted)**

*\*Proposed equipment shown in bold*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG conducted a ground audit of the existing AT&T antenna mounts on September 21, 2021. Mount mapping report prepared by B+T GRP dated December 16, 2019 was used to perform this analysis.

**THIS PAGE CONTAINS CONFIDENTIAL, PROPRIETARY OR TRADE SECRET INFORMATION EXEMPT FROM DISCLOSURE UNDER APPLICABLE LAW.**



Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R16.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 135 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.43 in was used for this analysis.
- HDG considers this site to be exposure category B; tower is located in an urban/suburban or wooded area with numerous closely spaced obstructions.
- HDG considers this site to be topographic category 1; tower is located on flat terrain or the bottom of a hill or ridge.
- HDG considers this site to have a spectral response acceleration parameter at short periods,  $S_s$ , of 0.186 and a spectral response acceleration parameter at a period of 1 second,  $S_1$ , of 0.063.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 1.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mounts are secured to the existing monopole with HSS members secured to ring mounts. The ring mounts are secured around the monopole using threaded rods. HDG considers the threaded rods to be the governing connection member.

Based on our evaluation, we have determined that the existing mounts **ARE NOT CAPABLE** of supporting the proposed installation. HDG recommends the following modifications:

- **Install new handrail kit, SitePro1 P/N HRK12-HD (or approved equal).**
- **Install new 2-1/2" std. (2.88" O.D.) pipe mast secured to the existing mount and handrail (typ. of 2 per sector, total of 6).**
- **Install new 4x4 HSS steel tubes stand-offs secured to the proposed pipe masts (typ. of 4 per sector, total of 12).**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
<b>Existing Mount Rating</b>	85	LC4	202%	<b>FAIL</b>
<b>Modified Mount Rating</b>	83	LC1	84%	<b>PASS</b>

Reference Documents:

- Mount mapping report prepared by B+T GRP dated December 16, 2019.

This determination was based on the following limitations and assumptions:

1. HDG is not responsible for any modifications completed prior to and hereafter which HDG was not directly involved.
2. All structural members and their connections are assumed to be in good condition and are free from defects with no deterioration to its member capacities.
3. All antennas, coax cables and waveguide cables are assumed to be properly installed and supported as per the manufacturer's requirements.
4. The existing mount has been adequately secured to the tower structure per the mount manufacturer's specifications.
5. All components pertaining to AT&T's mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

Please feel free to contact our office should you have any questions.

Respectfully Submitted,  
Hudson Design Group LLC



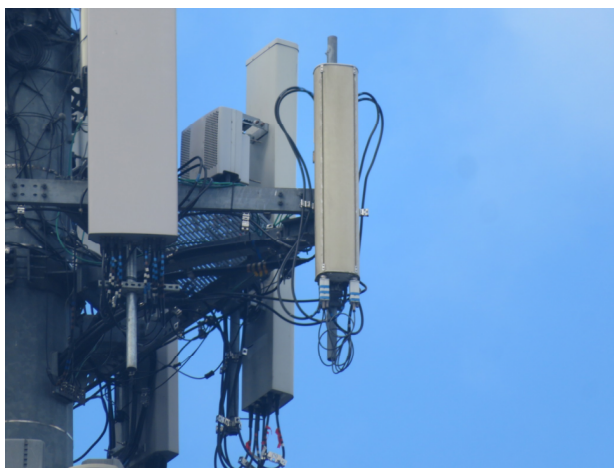
Michael Cabral  
Vice President



Daniel P. Hamm, PE  
Principal

**FIELD PHOTOS:**







**HUDSON**  
Design Group LLC

## Wind & Ice Calculations

**2.6.5.2 Velocity Pressure Coeff:**

$$K_z = 2.01 (z/z_g)^{2/\alpha}$$

$K_z =$  **1.060**       $z =$  128 (ft)  
 $z_g =$  1200 (ft)  
 $\alpha =$  7.0

$K_{zmin} \leq K_z \leq 2.01$

**Table 2-4**

Exposure	$Z_g$	$\alpha$	$K_{zmin}$	$K_c$
B	1200 ft	7.0	0.70	0.9
C	900 ft	9.5	0.85	1.0
D	700 ft	11.5	1.03	1.1

**2.6.6.2 Topographic Factor:**

**Table 2-5**

Topo. Category	$K_t$	f
2	0.43	1.25
3	0.53	2.0
4	0.72	1.5

$$K_{zt} = [1 + (K_c K_t / K_h)]^2$$

$K_{zt} =$  **1**

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

Category = **1**

$$K_h = e^{(fz/H)}$$

$K_h =$  1  
 $K_c =$  0.9 (from Table 2-4)  
 $K_t =$  0 (from Table 2-5)  
 $f =$  0 (from Table 2-5)  
 $z =$  128  
 $z_s =$  200 (Mean elevation of base of structure above sea level)  
 $H =$  0 (Ht. of the crest above surrounding terrain)  
 $K_{zt} =$  1.00 (from 2.6.6.2.1)  
 $K_e =$  0.99 (from 2.6.8)

**2.6.10 Design Ice Thickness**

Max Ice Thickness =  $t_i =$  1.00 in  
 Importance Factor =  $I =$  1.25 (from Table 2-3)  
 $K_{iz} =$  1.15 (from Sec. 2.6.10)

$$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$$

$t_{iz} =$  1.43 in

**2.6.9 Gust Effect Factor**

2.6.9.1 Self Supporting Lattice Structures

$G_h = 1.0$  Latticed Structures > 600 ft

$G_h = 0.85$  Latticed Structures 450 ft or less

$G_h = 0.85 + 0.15 [h/150 - 3.0]$

$h =$  ht. of structure

$h =$  160

$G_h =$  0.85

2.6.9.2 Guyed Masts

$G_h =$  0.85

2.6.9.3 Pole Structures

$G_h =$  1.1

2.6.9 Appurtenances

$G_h =$  1.0

2.6.9.4 Structures Supported on Other Structures

(Cantilivered tubular or latticed spines, pole, structures on buildings ( $ht. : width$  ratio > 5))

$G_h =$  1.35

$G_h =$  1.00

**2.6.11.2 Design Wind Force on Appurtenances**

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

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

$q_z =$	46.66
$q_z (ice) =$	6.40
$q_z (30) =$	2.30

$K_z =$	1.060 (from 2.6.5.2)
$K_{zt} =$	1.0 (from 2.6.6.2.1)
$K_s =$	1.0 (from 2.6.7)
$K_e =$	0.99 (from 2.6.8)
$K_d =$	0.95 (from Table 2-2)
$V_{max} =$	135 mph (Ultimate Wind Speed)
$V_{max (ice)} =$	50 mph
$V_{30} =$	30 mph

**Table 2-2**

Structure Type	Wind Direction Probability Factor, $K_d$
Latticed structures with triangular, square or rectangular cross sections	0.85
Tubular pole structures, latticed structures with other cross sections, appurtenances	0.95
Tubular pole structures supporting antennas enclosed within a cylindrical shroud	1.00

**Determine Ca:**

**Table 2-9**

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio $\leq 2.5$	Aspect Ratio = 7	Aspect Ratio $\geq 25$
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		$1.2 - 2.8(r_s) \geq 0.85$	$1.4 - 4.0(r_s) \geq 0.90$	$2.0 - 6.0(r_s) \geq 1.25$
Round	C < 39 (Subcritical)	0.7	0.8	1.2
	$39 \leq C \leq 78$ (Transitional)	$4.14/(C^{0.485})$	$3.66/(C^{0.415})$	$46.8/(C^{1.0})$
	C > 78 (Supercritical)	0.5	0.6	0.6

Aspect Ratio is the overall length/width ratio in the plane normal to the wind direction.  
 (Aspect ratio is independent of the spacing between support points of a linear appurtenance.)

Note: Linear interpolation may be used for aspect ratios other than those shown.

Ice Thickness = **1.43 in**      Angle = **0 (deg)**      Equivalent Angle = **180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.57	1.29	844	135	42
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.48	1.24	618	100	31
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	4.64	1.30	834	134	41
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	593	96	29
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.93	1.20	194	34	10
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	189	33	9
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	94	18	5
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	4.36	1.28	31	8	2
RRUS-32 RRH	27.2	12.1	7.0	2.29	2.25	1.20	128	24	6
RRUS-32 RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	44	12	2
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.36	1.20	92	18	5
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	3.81	1.26	34	9	2
4415 B25 RRH	16.5	13.4	5.9	1.54	1.23	1.20	86	17	4
4415 B25 RRH (Shielded)	16.5	3.0	13.4	0.34	5.59	1.34	21	7	1
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	53	11	3
2" Pipe	2.4	12.0		0.20	0.20	1.20	11	4	1
2-1/2" Pipe	2.9	12.0		0.24	0.24	2.00	22	8	1
2-1/2x2-1/2 Angle	2.5	12.0		0.21	0.21	1.25	12	4	1
HSS 4x4	4.0	12.0		0.33	0.33	2.00	31	9	2
C6x8.2	6.0	12.0		0.50	0.50	1.25	29	7	1



WIND LOADS

Angle = 30 (deg)

Ice Thickness = 1.43 in.

Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	844	328	715
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	618	231	521
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	834	379	720
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	593	262	510
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	194	94	169
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	189	128	174
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	94	58	85
B14 4478 RRH (Shielded)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	48	94	59
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	128	78	115
RRUS-32 RRH (Shielded)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	69	128	84
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	92	65	85
4449 B5/B12 RRH (Shielded)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	46	92	58
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	86	38	74
4415 B25 RRH (Shielded)	16.5	6.7	13.4	0.77	1.54	2.46	1.23	1.20	1.20	43	86	54

WIND LOADS WITH ICE:

EPBQ-654L8H8-L2 Antenna	98.9	23.9	9.2	16.38	6.29	4.14	10.79	1.27	1.53	133	61	115
EPBQ-654L8H6-L2 Antenna	75.9	23.9	9.2	12.57	4.83	3.18	8.28	1.23	1.44	99	45	85
DMP65R-BU8DA Antenna	98.9	23.6	10.6	16.18	7.25	4.20	9.36	1.28	1.48	132	69	116
DMP65R-BU6DA Antenna	74.1	23.6	10.6	12.12	5.43	3.14	7.01	1.23	1.40	95	49	84
AIR6419 Antenna	33.9	19.0	10.2	4.46	2.39	1.79	3.33	1.20	1.24	34	19	30
AIR6449 Antenna	33.5	18.8	13.5	4.36	3.13	1.78	2.49	1.20	1.20	33	24	31
B14 4478 RRH	21.0	16.3	11.2	2.37	1.63	1.29	1.88	1.20	1.20	18	12	17
B14 4478 RRH (Shielded)	21.0	8.1	16.3	1.18	2.37	2.58	1.29	1.20	1.20	9	18	11
RRUS-32 RRH	30.1	15.0	9.9	3.12	2.06	2.01	3.05	1.20	1.22	24	16	22
RRUS-32 RRH (Shielded)	30.1	7.5	15.0	1.56	3.12	4.02	2.01	1.27	1.20	13	24	16
4449 B5/B12 RRH	20.8	16.1	12.3	2.32	1.77	1.29	1.69	1.20	1.20	18	14	17
4449 B5/B12 RRH (Shielded)	20.8	8.0	16.1	1.16	2.32	2.59	1.29	1.20	1.20	9	18	11
4415 B25 RRH	19.4	16.3	8.8	2.19	1.18	1.19	2.21	1.20	1.20	17	9	15
4415 B25 RRH (Shielded)	19.4	8.1	16.3	1.09	2.19	2.38	1.19	1.20	1.20	8	17	10

WIND LOADS AT 30 MPH:

EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	42	16	35
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	31	11	26
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	41	19	36
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	25
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	8
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	9
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
B14 4478 RRH (Shielded)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	2	5	3
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	6
RRUS-32 RRH (Shielded)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	3	6	4
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	3	4
4449 B5/B12 RRH (Shielded)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	2	5	3
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	4
4415 B25 RRH (Shielded)	16.5	6.7	13.4	0.77	1.54	2.46	1.23	1.20	1.20	2	4	3

WIND LOADS

Angle = 60 (deg) Ice Thickness = 1.43 in. Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	844	328	457
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	618	231	328
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	834	379	493
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	593	262	345
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	194	94	119
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	189	128	143
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	94	58	67
B14 4478 RRH (Shielded)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	71	94	88
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	128	78	90
RRUS-32 RRH (Shielded)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	98	128	120
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	92	65	72
4449 B5/B12 RRH (Shielded)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	69	92	86
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	86	38	50
4415 B25 RRH (Shielded)	16.5	10.1	13.4	1.15	1.54	1.64	1.23	1.20	1.20	64	86	81

WIND LOADS WITH ICE:

EPBQ-654L8H8-L2 Antenna	98.9	23.9	9.2	16.38	6.29	4.14	10.79	1.27	1.53	133	61	79
EPBQ-654L8H6-L2 Antenna	75.9	23.9	9.2	12.57	4.83	3.18	8.28	1.23	1.44	99	45	58
DMP65R-BU8DA Antenna	98.9	23.6	10.6	16.18	7.25	4.20	9.36	1.28	1.48	132	69	84
DMP65R-BU6DA Antenna	74.1	23.6	10.6	12.12	5.43	3.14	7.01	1.23	1.40	95	49	60
AIR6419 Antenna	33.9	19.0	10.2	4.46	2.39	1.79	3.33	1.20	1.24	34	19	23
AIR6449 Antenna	33.5	18.8	13.5	4.36	3.13	1.78	2.49	1.20	1.20	33	24	26
B14 4478 RRH	21.0	16.3	11.2	2.37	1.63	1.29	1.88	1.20	1.20	18	12	14
B14 4478 RRH (Shielded)	21.0	12.2	16.3	1.78	2.37	1.72	1.29	1.20	1.20	14	18	17
RRUS-32 RRH	30.1	15.0	9.9	3.12	2.06	2.01	3.05	1.20	1.22	24	16	18
RRUS-32 RRH (Shielded)	30.1	11.2	15.0	2.34	3.12	2.68	2.01	1.21	1.20	18	24	23
4449 B5/B12 RRH	20.8	16.1	12.3	2.32	1.77	1.29	1.69	1.20	1.20	18	14	15
4449 B5/B12 RRH (Shielded)	20.8	12.0	16.1	1.74	2.32	1.72	1.29	1.20	1.20	13	18	17
4415 B25 RRH	19.4	16.3	8.8	2.19	1.18	1.19	2.21	1.20	1.20	17	9	11
4415 B25 RRH (Shielded)	19.4	12.2	16.3	1.64	2.19	1.59	1.19	1.20	1.20	13	17	16

WIND LOADS AT 30 MPH:

EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	42	16	23
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	31	11	16
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	41	19	24
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	17
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	6
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	7
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Shielded)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	3	5	4
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 RRH (Shielded)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	5	6	6
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	3	4
4449 B5/B12 RRH (Shielded)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	3	5	4
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	2
4415 B25 RRH (Shielded)	16.5	10.1	13.4	1.15	1.54	1.64	1.23	1.20	1.20	3	4	4

WIND LOADS

Angle = 90 (deg) Ice Thickness = 1.43 in. Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	844	328	328
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	618	231	231
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	834	379	379
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	593	262	262
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	194	94	94
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	189	128	128
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	94	58	58
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	31	94	94
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	128	78	78
RRUS-32 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	44	128	128
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	92	65	65
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	34	92	92
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	86	38	38
4415 B25 RRH (Shielded)	16.5	3.0	13.4	0.34	1.54	5.59	1.23	1.34	1.20	21	86	86

WIND LOADS WITH ICE:

EPBQ-654L8H8-L2 Antenna	98.9	23.9	9.2	16.38	6.29	4.14	10.79	1.27	1.53	133	61	61
EPBQ-654L8H6-L2 Antenna	75.9	23.9	9.2	12.57	4.83	3.18	8.28	1.23	1.44	99	45	45
DMP65R-BU8DA Antenna	98.9	23.6	10.6	16.18	7.25	4.20	9.36	1.28	1.48	132	69	69
DMP65R-BU6DA Antenna	74.1	23.6	10.6	12.12	5.43	3.14	7.01	1.23	1.40	95	49	49
AIR6419 Antenna	33.9	19.0	10.2	4.46	2.39	1.79	3.33	1.20	1.24	34	19	19
AIR6449 Antenna	33.5	18.8	13.5	4.36	3.13	1.78	2.49	1.20	1.20	33	24	24
B14 4478 RRH	21.0	16.3	11.2	2.37	1.63	1.29	1.88	1.20	1.20	18	12	12
B14 4478 RRH (Shielded)	21.0	7.0	16.3	1.02	2.37	2.99	1.29	1.22	1.20	8	18	18
RRUS-32 RRH	30.1	15.0	9.9	3.12	2.06	2.01	3.05	1.20	1.22	24	16	16
RRUS-32 RRH (Shielded)	30.1	6.4	15.0	1.33	3.12	4.72	2.01	1.30	1.20	11	24	24
4449 B5/B12 RRH	20.8	16.1	12.3	2.32	1.77	1.29	1.69	1.20	1.20	18	14	14
4449 B5/B12 RRH (Shielded)	20.8	7.6	16.1	1.09	2.32	2.75	1.29	1.21	1.20	8	18	18
4415 B25 RRH	19.4	16.3	8.8	2.19	1.18	1.19	2.21	1.20	1.20	17	9	9
4415 B25 RRH (Shielded)	19.4	5.8	16.3	0.78	2.19	3.33	1.19	1.24	1.20	6	17	17

WIND LOADS AT 30 MPH:

EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	42	16	16
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	31	11	11
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	41	19	19
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	13
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	5
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	6
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	5	5
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	2	6	6
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	3	3
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	3.81	1.36	1.26	1.20	2	5	5
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	2
4415 B25 RRH (Shielded)	16.5	3.0	13.4	0.34	1.54	5.59	1.23	1.34	1.20	1	4	4

WIND LOADS

Angle = 120 (deg)      Ice Thickness = 1.43 in.      Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	844	328	457
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	618	231	328
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	834	379	493
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	593	262	345
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	194	94	119
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	189	128	143
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	94	58	67
B14 4478 RRH (Shielded)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	71	94	88
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	128	78	90
RRUS-32 RRH (Shielded)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	98	128	120
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	92	65	72
4449 B5/B12 RRH (Shielded)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	69	92	86
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	86	38	50
4415 B25 RRH (Shielded)	16.5	10.1	13.4	1.15	1.54	1.64	1.23	1.20	1.20	64	86	81

WIND LOADS WITH ICE:

EPBQ-654L8H8-L2 Antenna	98.9	23.9	9.2	16.38	6.29	4.14	10.79	1.27	1.53	133	61	79
EPBQ-654L8H6-L2 Antenna	75.9	23.9	9.2	12.57	4.83	3.18	8.28	1.23	1.44	99	45	58
DMP65R-BU8DA Antenna	98.9	23.6	10.6	16.18	7.25	4.20	9.36	1.28	1.48	132	69	84
DMP65R-BU6DA Antenna	74.1	23.6	10.6	12.12	5.43	3.14	7.01	1.23	1.40	95	49	60
AIR6419 Antenna	33.9	19.0	10.2	4.46	2.39	1.79	3.33	1.20	1.24	34	19	23
AIR6449 Antenna	33.5	18.8	13.5	4.36	3.13	1.78	2.49	1.20	1.20	33	24	26
B14 4478 RRH	21.0	16.3	11.2	2.37	1.63	1.29	1.88	1.20	1.20	18	12	14
B14 4478 RRH (Shielded)	21.0	12.2	16.3	1.78	2.37	1.72	1.29	1.20	1.20	14	18	17
RRUS-32 RRH	30.1	15.0	9.9	3.12	2.06	2.01	3.05	1.20	1.22	24	16	18
RRUS-32 RRH (Shielded)	30.1	11.2	15.0	2.34	3.12	2.68	2.01	1.21	1.20	18	24	23
4449 B5/B12 RRH	20.8	16.1	12.3	2.32	1.77	1.29	1.69	1.20	1.20	18	14	15
4449 B5/B12 RRH (Shielded)	20.8	12.0	16.1	1.74	2.32	1.72	1.29	1.20	1.20	13	18	17
4415 B25 RRH	19.4	16.3	8.8	2.19	1.18	1.19	2.21	1.20	1.20	17	9	11
4415 B25 RRH (Shielded)	19.4	12.2	16.3	1.64	2.19	1.59	1.19	1.20	1.20	13	17	16

WIND LOADS AT 30 MPH:

EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	42	16	23
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	31	11	16
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	41	19	24
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	17
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	6
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	7
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
B14 4478 RRH (Shielded)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	3	5	4
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	4
RRUS-32 RRH (Shielded)	27.2	9.1	12.1	1.71	2.29	3.00	2.25	1.22	1.20	5	6	6
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	3	4
4449 B5/B12 RRH (Shielded)	17.9	9.9	13.2	1.23	1.64	1.81	1.36	1.20	1.20	3	5	4
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	2
4415 B25 RRH (Shielded)	16.5	10.1	13.4	1.15	1.54	1.64	1.23	1.20	1.20	3	4	4

WIND LOADS

Angle = 150 (deg) Ice Thickness = 1.43 in. Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	844	328	715
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	618	231	521
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	834	379	720
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	593	262	510
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	194	94	169
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	189	128	174
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	94	58	85
B14 4478 RRH (Shielded)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	48	94	59
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	128	78	115
RRUS-32 RRH (Shielded)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	69	128	84
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	92	65	85
4449 B5/B12 RRH (Shielded)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	46	92	58
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	86	38	74
4415 B25 RRH (Shielded)	16.5	6.7	13.4	0.77	1.54	2.46	1.23	1.20	1.20	43	86	54

WIND LOADS WITH ICE:

EPBQ-654L8H8-L2 Antenna	98.9	23.9	9.2	16.38	6.29	4.14	10.79	1.27	1.53	133	61	115
EPBQ-654L8H6-L2 Antenna	75.9	23.9	9.2	12.57	4.83	3.18	8.28	1.23	1.44	99	45	85
DMP65R-BU8DA Antenna	98.9	23.6	10.6	16.18	7.25	4.20	9.36	1.28	1.48	132	69	116
DMP65R-BU6DA Antenna	74.1	23.6	10.6	12.12	5.43	3.14	7.01	1.23	1.40	95	49	84
AIR6419 Antenna	33.9	19.0	10.2	4.46	2.39	1.79	3.33	1.20	1.24	34	19	30
AIR6449 Antenna	33.5	18.8	13.5	4.36	3.13	1.78	2.49	1.20	1.20	33	24	31
B14 4478 RRH	21.0	16.3	11.2	2.37	1.63	1.29	1.88	1.20	1.20	18	12	17
B14 4478 RRH (Shielded)	21.0	8.1	16.3	1.18	2.37	2.58	1.29	1.20	1.20	9	18	11
RRUS-32 RRH	30.1	15.0	9.9	3.12	2.06	2.01	3.05	1.20	1.22	24	16	22
RRUS-32 RRH (Shielded)	30.1	7.5	15.0	1.56	3.12	4.02	2.01	1.27	1.20	13	24	16
4449 B5/B12 RRH	20.8	16.1	12.3	2.32	1.77	1.29	1.69	1.20	1.20	18	14	17
4449 B5/B12 RRH (Shielded)	20.8	8.0	16.1	1.16	2.32	2.59	1.29	1.20	1.20	9	18	11
4415 B25 RRH	19.4	16.3	8.8	2.19	1.18	1.19	2.21	1.20	1.20	17	9	15
4415 B25 RRH (Shielded)	19.4	8.1	16.3	1.09	2.19	2.38	1.19	1.20	1.20	8	17	10

WIND LOADS AT 30 MPH:

EPBQ-654L8H8-L2 Antenna	96.0	21.0	6.3	14.00	4.20	4.57	15.24	1.29	1.67	42	16	35
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	31	11	26
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	41	19	36
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	29	13	25
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	8
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	9	6	9
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
B14 4478 RRH (Shielded)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	2	5	3
RRUS-32 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	4	6
RRUS-32 RRH (Shielded)	27.2	6.1	12.1	1.14	2.29	4.50	2.25	1.29	1.20	3	6	4
4449 B5/B12 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	3	4
4449 B5/B12 RRH (Shielded)	17.9	6.6	13.2	0.82	1.64	2.71	1.36	1.21	1.20	2	5	3
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	4	2	4
4415 B25 RRH (Shielded)	16.5	6.7	13.4	0.77	1.54	2.46	1.23	1.20	1.20	2	4	3

Date: 1/14/2022  
 Project Name: CHESHIRE CENTRAL  
 Project No.: CT2081  
 Designed By: ID Checked By: MSC



**ICE WEIGHT CALCULATIONS**

Thickness of ice: 1.43 in.  
 Density of ice: 56 pcf

**EPBQ-654L8H8-L2 Antenna**

Weight of ice based on total radial SF area:  
 Height (in): 96.0  
 Width (in): 21.0  
 Depth (in): 6.3  
 Total weight of ice on object: 326 lbs  
 Weight of object: 86.0 lbs  
 Combined weight of ice and object: 412 lbs

**EPBQ-654L8H6-L2 Antenna**

Weight of ice based on total radial SF area:  
 Height (in): 73.0  
 Width (in): 21.0  
 Depth (in): 6.3  
 Total weight of ice on object: 248 lbs  
 Weight of object: 73.0 lbs  
 Combined weight of ice and object: 321 lbs

**DMP65R-BU8DA Antenna**

Weight of ice based on total radial SF area:  
 Height (in): 96.0  
 Width (in): 20.7  
 Depth (in): 7.7  
 Total weight of ice on object: 329 lbs  
 Weight of object: 96.0 lbs  
 Combined weight of ice and object: 425 lbs

**DMP65R-BU6DA Antenna**

Weight of ice based on total radial SF area:  
 Height (in): 71.2  
 Width (in): 20.7  
 Depth (in): 7.7  
 Total weight of ice on object: 244 lbs  
 Weight of object: 80.0 lbs  
 Combined weight of ice and object: 324 lbs

**AIR6419 Antenna**

Weight of ice based on total radial SF area:  
 Height (in): 31.0  
 Width (in): 16.1  
 Depth (in): 7.3  
 Total weight of ice on object: 86 lbs  
 Weight of object: 66.0 lbs  
 Combined weight of ice and object: 152 lbs

**AIR6449 Antenna**

Weight of ice based on total radial SF area:  
 Height (in): 30.6  
 Width (in): 15.9  
 Depth (in): 10.6  
 Total weight of ice on object: 92 lbs  
 Weight of object: 82.0 lbs  
 Combined weight of ice and object: 174 lbs

**B14 4478 RRH**

Weight of ice based on total radial SF area:  
 Height (in): 18.1  
 Width (in): 13.4  
 Depth (in): 8.3  
 Total weight of ice on object: 45 lbs  
 Weight of object: 60.0 lbs  
 Combined weight of ice and object: 105 lbs

**RRUS-32 RRH**

Weight of ice based on total radial SF area:  
 Height (in): 27.2  
 Width (in): 12.1  
 Depth (in): 7.0  
 Total weight of ice on object: 61 lbs  
 Weight of object: 60.0 lbs  
 Combined weight of ice and object: 121 lbs

**4449 B5/B12 RRH**

Weight of ice based on total radial SF area:  
 Height (in): 17.9  
 Width (in): 13.2  
 Depth (in): 9.4  
 Total weight of ice on object: 46 lbs  
 Weight of object: 73.0 lbs  
 Combined weight of ice and object: 119 lbs

**4415 B25 RRH**

Weight of ice based on total radial SF area:  
 Height (in): 16.5  
 Width (in): 13.4  
 Depth (in): 5.9  
 Total weight of ice on object: 39 lbs  
 Weight of object: 46.0 lbs  
 Combined weight of ice and object: 85 lbs

**2" pipe**

Per foot weight of ice:  
 diameter (in): 2.38  
 Per foot weight of ice on object: 7 plf

**Squid Surge Arrestor**

Weight of ice based on total radial SF area:  
 Depth (in): 24.0  
 Diameter(in): 9.7  
 Total weight of ice on object: 39 lbs  
 Weight of object: 33 lbs  
 Combined weight of ice and object: 72 lbs

**L 2x2 Angles**

Weight of ice based on total radial SF area:  
 Height (in): 2  
 Width (in): 2  
 Per foot weight of ice on object: 7 plf

**2-1/2" pipe**

Per foot weight of ice:  
 diameter (in): 2.88  
 Per foot weight of ice on object: 8 plf

**HSS 4x4**

Weight of ice based on total radial SF area:  
 Height (in): 4  
 Width (in): 4  
 Per foot weight of ice on object: 12 plf

**L 2-1/2x2-1/2 Angles**

Weight of ice based on total radial SF area:  
 Height (in): 2.5  
 Width (in): 2.5  
 Per foot weight of ice on object: 9 plf

**PL 6x1/4**

Weight of ice based on total radial SF area:  
 Height (in): 6  
 Width (in): 0.25  
 Per foot weight of ice on object: 13 plf

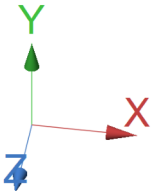
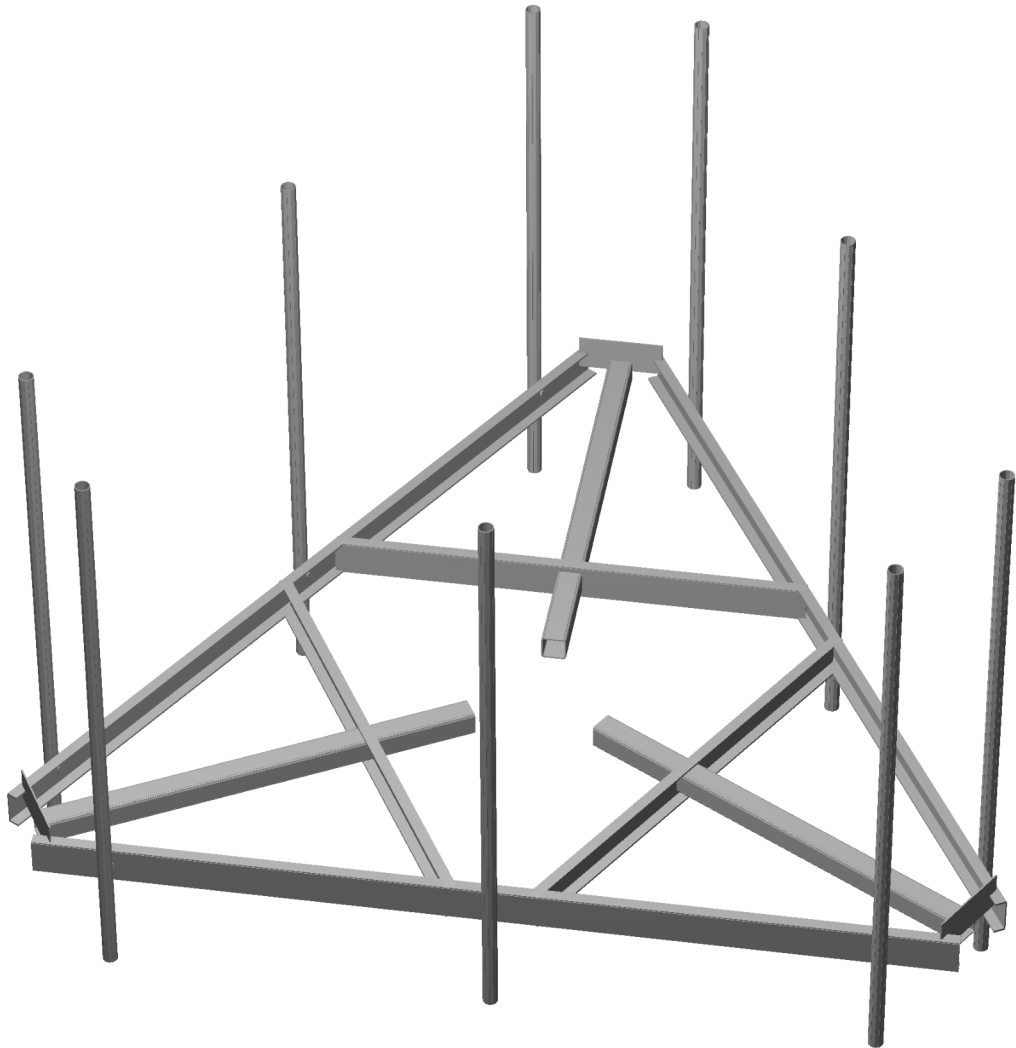
**C 6x8**

Weight of ice based on total radial SF area:  
 Height (in): 6  
 Width (in): 1.92  
 Per foot weight of ice on object: 14 plf

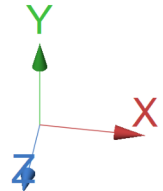
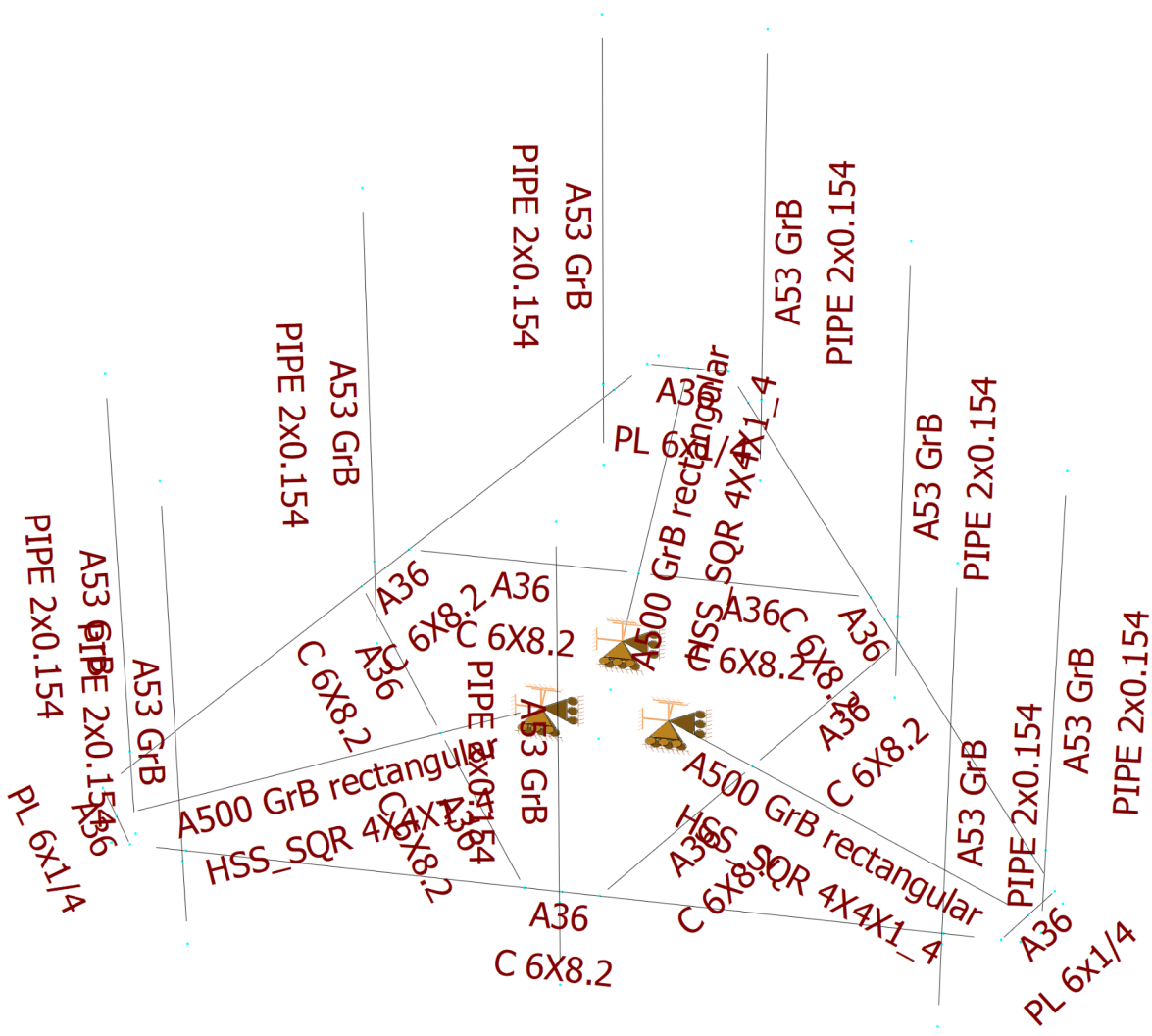


**HUDSON**  
Design Group LLC

**Mount Calculations  
(Existing Conditions)**

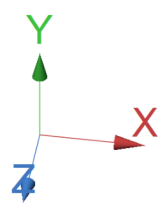
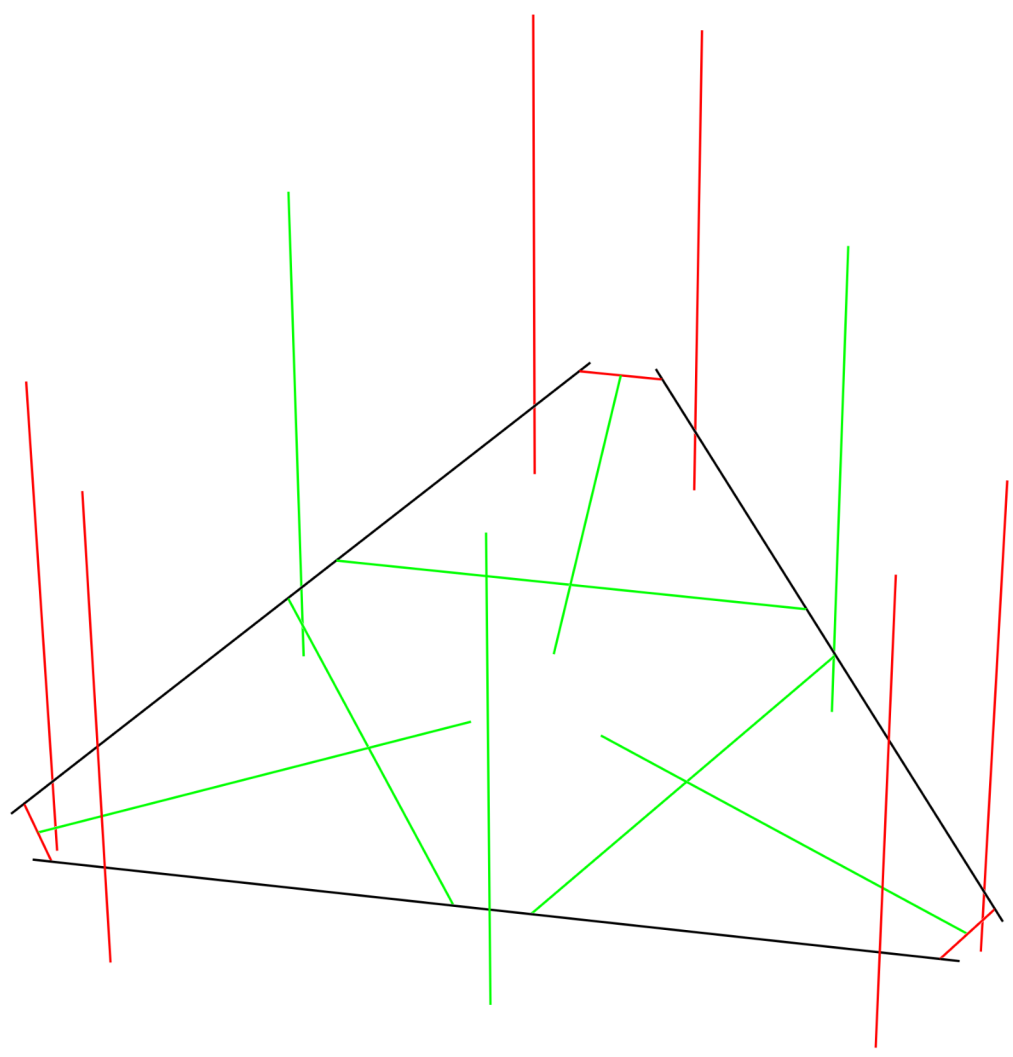


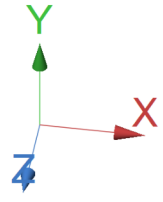
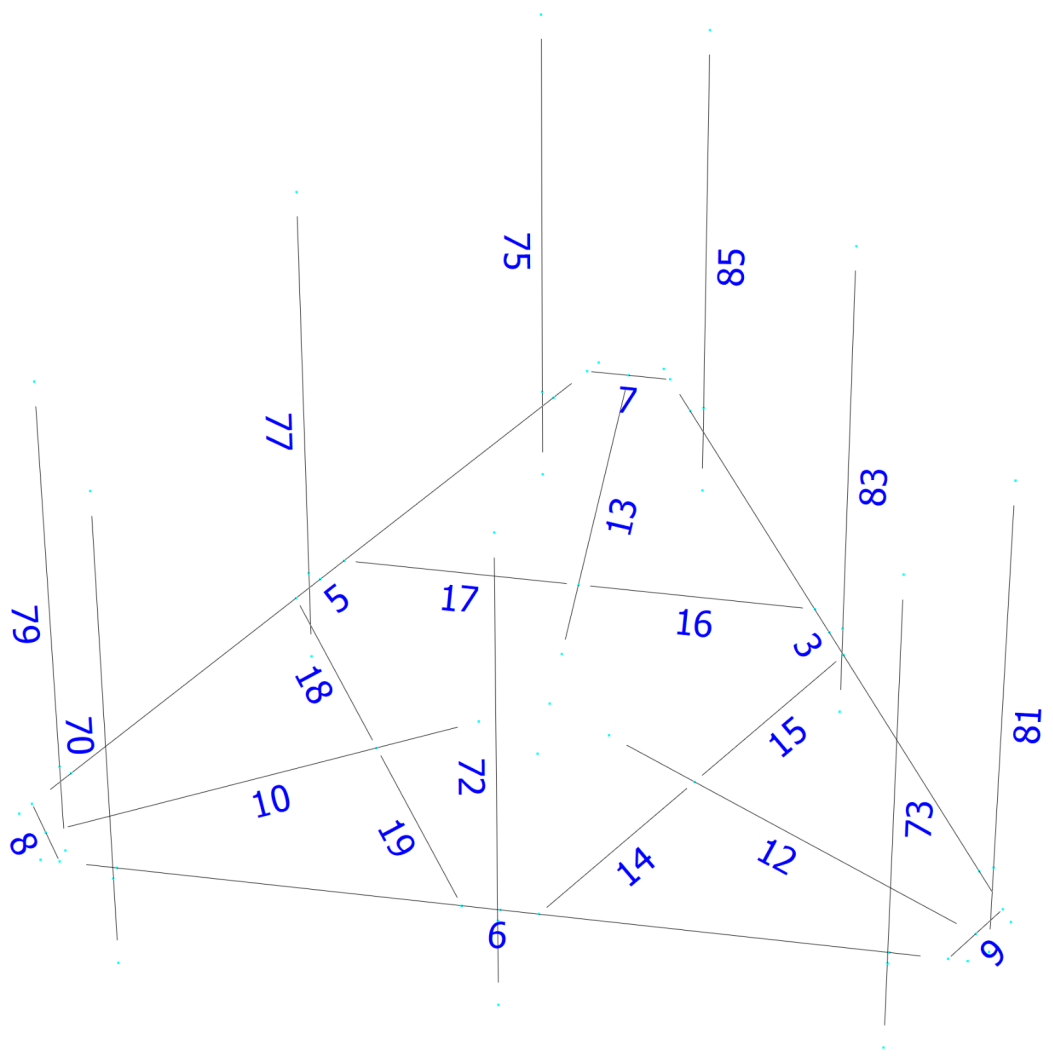




Design status

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





## Load data

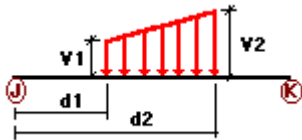
### GLOSSARY

Comb : Indicates if load condition is a load combination

### Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

### Distributed force on members

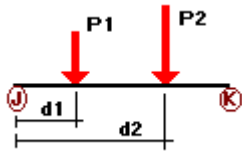


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	10	y	-0.01	0.00	0.00	No	0.00	No
	12	y	-0.01	0.00	0.00	No	0.00	No
	13	y	-0.01	0.00	0.00	No	0.00	No
	14	y	-0.01	0.00	0.00	No	0.00	No
	15	y	-0.01	0.00	0.00	No	0.00	No
	16	y	-0.01	0.00	0.00	No	0.00	No
	17	y	-0.01	0.00	0.00	No	0.00	No
	18	y	-0.01	0.00	0.00	No	0.00	No
	19	y	-0.01	0.00	0.00	No	0.00	No
W0	3	z	-0.029	0.00	0.00	No	0.00	No
	5	z	-0.029	0.00	0.00	No	0.00	No
	6	z	-0.029	0.00	0.00	No	0.00	No
	10	z	-0.031	0.00	0.00	No	0.00	No
	12	z	-0.031	0.00	0.00	No	0.00	No
	13	z	-0.031	0.00	0.00	No	0.00	No
	14	z	-0.029	0.00	0.00	No	0.00	No

	15	z	-0.029	0.00	0.00	No	0.00	No
	16	z	-0.029	0.00	0.00	No	0.00	No
	17	z	-0.029	0.00	0.00	No	0.00	No
	18	z	-0.029	0.00	0.00	No	0.00	No
	19	z	-0.029	0.00	0.00	No	0.00	No
	70	z	-0.011	0.00	0.00	No	0.00	No
	72	z	-0.011	0.00	0.00	No	0.00	No
	73	z	-0.011	0.00	0.00	No	0.00	No
	75	z	-0.011	0.00	0.00	No	0.00	No
	77	z	-0.011	0.00	0.00	No	0.00	No
	79	z	-0.011	0.00	0.00	No	0.00	No
	81	z	-0.011	0.00	0.00	No	0.00	No
	83	z	-0.011	0.00	0.00	No	0.00	No
	85	z	-0.011	0.00	0.00	No	0.00	No
W30	3	x	-0.029	0.00	0.00	No	0.00	No
	5	x	-0.029	0.00	0.00	No	0.00	No
	6	x	-0.029	0.00	0.00	No	0.00	No
	10	x	-0.031	0.00	0.00	No	0.00	No
	12	x	-0.031	0.00	0.00	No	0.00	No
	13	x	-0.031	0.00	0.00	No	0.00	No
	14	x	-0.029	0.00	0.00	No	0.00	No
	15	x	-0.029	0.00	0.00	No	0.00	No
	16	x	-0.029	0.00	0.00	No	0.00	No
	17	x	-0.029	0.00	0.00	No	0.00	No
	18	x	-0.029	0.00	0.00	No	0.00	No
	19	x	-0.029	0.00	0.00	No	0.00	No
	70	x	-0.011	0.00	0.00	No	0.00	No
	72	x	-0.011	0.00	0.00	No	0.00	No
	73	x	-0.011	0.00	0.00	No	0.00	No
	75	x	-0.011	0.00	0.00	No	0.00	No
	77	x	-0.011	0.00	0.00	No	0.00	No
	79	x	-0.011	0.00	0.00	No	0.00	No
	81	x	-0.011	0.00	0.00	No	0.00	No
	83	x	-0.011	0.00	0.00	No	0.00	No
	85	x	-0.011	0.00	0.00	No	0.00	No
Di	3	y	-0.014	0.00	0.00	No	0.00	No
	5	y	-0.014	0.00	0.00	No	0.00	No
	6	y	-0.014	0.00	0.00	No	0.00	No
	7	y	-0.013	0.00	0.00	No	0.00	No
	8	y	-0.013	0.00	0.00	No	0.00	No
	9	y	-0.013	0.00	0.00	No	0.00	No
	10	y	-0.012	0.00	0.00	No	0.00	No
	12	y	-0.012	0.00	0.00	No	0.00	No
	13	y	-0.012	0.00	0.00	No	0.00	No
	14	y	-0.014	0.00	0.00	No	0.00	No
	15	y	-0.014	0.00	0.00	No	0.00	No
	16	y	-0.014	0.00	0.00	No	0.00	No
	17	y	-0.014	0.00	0.00	No	0.00	No
	18	y	-0.014	0.00	0.00	No	0.00	No
	19	y	-0.014	0.00	0.00	No	0.00	No
	70	y	-0.007	0.00	0.00	No	0.00	No
	72	y	-0.007	0.00	0.00	No	0.00	No
	73	y	-0.007	0.00	0.00	No	0.00	No
	75	y	-0.007	0.00	0.00	No	0.00	No
	77	y	-0.007	0.00	0.00	No	0.00	No
	79	y	-0.007	0.00	0.00	No	0.00	No
	81	y	-0.007	0.00	0.00	No	0.00	No
	83	y	-0.007	0.00	0.00	No	0.00	No
	85	y	-0.007	0.00	0.00	No	0.00	No

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### Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	70	y	-0.048	0.50	No
		y	-0.048	7.50	No
		y	-0.06	50.00	Yes
	72	y	-0.033	0.50	No
		y	-0.033	3.50	No
		y	-0.041	4.50	No
		y	-0.041	7.50	No
		y	-0.073	50.00	Yes
		y	-0.046	50.00	Yes
	73	y	-0.049	0.50	No
		y	-0.049	7.50	No
		y	-0.06	50.00	Yes
		y	-0.06	50.00	Yes
	75	y	-0.04	0.50	No
		y	-0.04	7.50	No
		y	-0.06	50.00	Yes
		y	-0.041	7.50	No
		y	-0.073	50.00	Yes
		y	-0.046	50.00	Yes
	77	y	-0.033	0.50	No
		y	-0.033	3.50	No
		y	-0.041	4.50	No
		y	-0.041	7.50	No
		y	-0.073	50.00	Yes
		y	-0.046	50.00	Yes
	79	y	-0.037	0.50	No
		y	-0.037	7.50	No
		y	-0.06	50.00	Yes
		y	-0.06	50.00	Yes
	81	y	-0.048	0.50	No
		y	-0.048	7.50	No
		y	-0.06	50.00	Yes
	83	y	-0.033	0.50	No
		y	-0.033	3.50	No
		y	-0.041	4.50	No
		y	-0.041	7.50	No
y		-0.073	50.00	Yes	
y		-0.046	50.00	Yes	
85	y	-0.049	0.50	No	
	y	-0.049	7.50	No	
	y	-0.06	50.00	Yes	
	y	-0.06	50.00	Yes	
W0	70	z	-0.417	0.50	No
		z	-0.417	7.50	No
		z	-0.044	50.00	Yes
	72	z	-0.098	0.50	No
		z	-0.098	3.50	No
		z	-0.095	4.50	No
		z	-0.095	7.50	No
		z	-0.034	50.00	Yes
		z	-0.021	50.00	Yes
	73	z	-0.423	0.50	No

		z	-0.423	7.50	No
		z	-0.031	50.00	Yes
		z	-0.044	50.00	Yes
75		z	-0.173	0.50	No
		z	-0.173	7.50	No
		z	-0.12	50.00	Yes
77		z	-0.06	0.50	No
		z	-0.06	3.50	No
		z	-0.072	4.50	No
		z	-0.072	7.50	No
		z	-0.086	50.00	Yes
79		z	-0.164	0.50	No
		z	-0.164	7.50	No
		z	-0.12	50.00	Yes
81		z	-0.247	0.50	No
		z	-0.247	7.50	No
		z	-0.12	50.00	Yes
83		z	-0.06	0.50	No
		z	-0.06	3.50	No
		z	-0.072	4.50	No
		z	-0.072	7.50	No
		z	-0.086	50.00	Yes
85		z	-0.229	0.50	No
		z	-0.229	7.50	No
		z	-0.12	50.00	Yes
W30	70	x	-0.19	0.50	No
		x	-0.19	7.50	No
		x	-0.128	50.00	Yes
72		x	-0.047	0.50	No
		x	-0.047	3.50	No
		x	-0.064	4.50	No
		x	-0.064	7.50	No
		x	-0.092	50.00	Yes
73		x	-0.165	0.50	No
		x	-0.165	7.50	No
		x	-0.128	50.00	Yes
75		x	-0.256	0.50	No
		x	-0.256	7.50	No
		x	-0.084	50.00	Yes
77		x	-0.085	0.50	No
		x	-0.085	3.50	No
		x	-0.087	4.50	No
		x	-0.087	7.50	No
		x	-0.058	50.00	Yes
79		x	-0.261	0.50	No
		x	-0.261	7.50	No
		x	-0.084	50.00	Yes
81		x	-0.361	0.50	No
		x	-0.361	7.50	No
		x	-0.084	50.00	Yes
83		x	-0.085	0.50	No
		x	-0.085	3.50	No
		x	-0.087	4.50	No
		x	-0.087	7.50	No
		x	-0.058	50.00	Yes
85		x	-0.358	0.50	No
		x	-0.358	7.50	No
		x	-0.084	50.00	Yes
Di	70	y	-0.165	0.50	No
		y	-0.165	7.50	No

		y	-0.061	50.00	Yes
72		y	-0.043	0.50	No
		y	-0.043	3.50	No
		y	-0.046	4.50	No
		y	-0.046	7.50	No
		y	-0.046	50.00	Yes
		y	-0.039	50.00	Yes
73		y	-0.163	0.50	No
		y	-0.163	7.50	No
		y	-0.045	50.00	Yes
		y	-0.061	50.00	Yes
75		y	-0.122	0.50	No
		y	-0.122	7.50	No
		y	-0.061	50.00	Yes
77		y	-0.043	0.50	No
		y	-0.043	3.50	No
		y	-0.046	4.50	No
		y	-0.046	7.50	No
		y	-0.046	50.00	Yes
		y	-0.039	50.00	Yes
79		y	-0.124	0.50	No
		y	-0.124	7.50	No
		y	-0.045	50.00	Yes
		y	-0.061	50.00	Yes
81		y	-0.165	0.50	No
		y	-0.165	7.50	No
		y	-0.061	50.00	Yes
83		y	-0.043	0.50	No
		y	-0.043	3.50	No
		y	-0.046	4.50	No
		y	-0.046	7.50	No
		y	-0.046	50.00	Yes
		y	-0.039	50.00	Yes
85		y	-0.163	0.50	No
		y	-0.163	7.50	No
		y	-0.045	50.00	Yes
		y	-0.061	50.00	Yes
Wi0	70	z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.012	50.00	Yes
72		z	-0.018	0.50	No
		z	-0.018	3.50	No
		z	-0.017	4.50	No
		z	-0.017	7.50	No
		z	-0.009	50.00	Yes
		z	-0.007	50.00	Yes
73		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
75		z	-0.031	0.50	No
		z	-0.031	7.50	No
		z	-0.023	50.00	Yes
77		z	-0.012	0.50	No
		z	-0.012	3.50	No
		z	-0.014	4.50	No
		z	-0.014	7.50	No
		z	-0.017	50.00	Yes
79		z	-0.03	0.50	No
		z	-0.03	7.50	No



		z	-0.023	50.00	Yes
	81	z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.023	50.00	Yes
	83	z	-0.012	0.50	No
		z	-0.012	3.50	No
		z	-0.014	4.50	No
		z	-0.014	7.50	No
		z	-0.017	50.00	Yes
	85	z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.023	50.00	Yes
Wi30	70	x	-0.035	0.50	No
		x	-0.035	7.50	No
		x	-0.024	50.00	Yes
	72	x	-0.01	0.50	No
		x	-0.01	3.50	No
		x	-0.013	4.50	No
		x	-0.013	7.50	No
		x	-0.018	50.00	Yes
	73	x	-0.031	0.50	No
		x	-0.031	7.50	No
		x	-0.024	50.00	Yes
	75	x	-0.042	0.50	No
		x	-0.042	7.50	No
		x	-0.016	50.00	Yes
	77	x	-0.016	0.50	No
		x	-0.016	3.50	No
		x	-0.016	4.50	No
		x	-0.016	7.50	No
		x	-0.011	50.00	Yes
	79	x	-0.043	0.50	No
		x	-0.043	7.50	No
		x	-0.016	50.00	Yes
	81	x	-0.059	0.50	No
		x	-0.059	7.50	No
		x	-0.016	50.00	Yes
	83	x	-0.016	0.50	No
		x	-0.016	3.50	No
		x	-0.016	4.50	No
		x	-0.016	7.50	No
		x	-0.011	50.00	Yes
	85	x	-0.058	0.50	No
		x	-0.058	7.50	No
		x	-0.016	50.00	Yes
WLO	70	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
	72	z	-0.005	0.50	No
		z	-0.005	3.50	No
		z	-0.005	4.50	No
		z	-0.005	7.50	No
		z	-0.002	50.00	Yes
		z	-0.001	50.00	Yes
	73	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
	75	z	-0.009	0.50	No
		z	-0.009	7.50	No

		z	-0.006	50.00	Yes
	77	z	-0.003	0.50	No
		z	-0.003	3.50	No
		z	-0.004	4.50	No
		z	-0.004	7.50	No
		z	-0.004	50.00	Yes
	79	z	-0.009	0.50	No
		z	-0.009	7.50	No
		z	-0.006	50.00	Yes
	81	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.006	50.00	Yes
	83	z	-0.003	0.50	No
		z	-0.003	3.50	No
		z	-0.004	4.50	No
		z	-0.004	7.50	No
		z	-0.004	50.00	Yes
	85	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.006	50.00	Yes
WL30	70	x	-0.01	0.50	No
		x	-0.01	7.50	No
		x	-0.006	50.00	Yes
	72	x	-0.003	0.50	No
		x	-0.003	3.50	No
		x	-0.004	4.50	No
		x	-0.004	7.50	No
		x	-0.005	50.00	Yes
	73	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	75	x	-0.013	0.50	No
		x	-0.013	7.50	No
		x	-0.004	50.00	Yes
	77	x	-0.005	0.50	No
		x	-0.005	3.50	No
		x	-0.005	4.50	No
		x	-0.005	7.50	No
		x	-0.003	50.00	Yes
	79	x	-0.013	0.50	No
		x	-0.013	7.50	No
		x	-0.004	50.00	Yes
	81	x	-0.018	0.50	No
		x	-0.018	7.50	No
		x	-0.004	50.00	Yes
	83	x	-0.005	0.50	No
		x	-0.005	3.50	No
		x	-0.005	4.50	No
		x	-0.005	7.50	No
		x	-0.003	50.00	Yes
	85	x	-0.018	0.50	No
		x	-0.018	7.50	No
		x	-0.004	50.00	Yes
LL1	6	y	-0.25	50.00	Yes
LL2	6	y	-0.25	100.00	Yes
LLa1	73	y	-0.50	50.00	Yes
LLa2	72	y	-0.50	50.00	Yes
LLa3	70	y	-0.50	50.00	Yes

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## Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

## Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

## Steel Code Check

**Report: Summary - Group by member**

**Load conditions to be included in design :**

- LC1=1.2DL+W0
- LC2=1.2DL+W30
- LC3=1.2DL-W0
- LC4=1.2DL-W30
- LC5=0.9DL+W0
- LC6=0.9DL+W30
- LC7=0.9DL-W0
- LC8=0.9DL-W30
- LC9=1.2DL+Di+Wi0
- LC10=1.2DL+Di+Wi30
- LC11=1.2DL+Di-Wi0
- LC12=1.2DL+Di-Wi30
- LC13=1.4DL
- LC14=1.2DL+1.6LL1
- LC15=1.2DL+1.6LL2
- LC16=1.2DL+W0+1.6LLa1
- LC17=1.2DL+W30+1.6LLa1
- LC18=1.2DL-W0+1.6LLa1
- LC19=1.2DL-W30+1.6LLa1
- LC20=1.2DL+W0+1.6LLa2
- LC21=1.2DL+W30+1.6LLa2
- LC22=1.2DL-W0+1.6LLa2
- LC23=1.2DL-W30+1.6LLa2
- LC24=1.2DL+W0+1.6LLa3
- LC25=1.2DL+W30+1.6LLa3
- LC26=1.2DL-W0+1.6LLa3
- LC27=1.2DL-W30+1.6LLa3
- LC28=1.2DL+W0+1.6LLa4
- LC29=1.2DL+W30+1.6LLa4
- LC30=1.2DL-W0+1.6LLa4
- LC31=1.2DL-W30+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<b>C 6X8.2</b>	<b>3</b>	LC4 at 53.91%	<b>0.68</b>	<b>With warnings</b>	
		<b>5</b>	LC2 at 45.31%	0.62	With warnings	
		<b>6</b>	LC3 at 54.69%	0.66	With warnings	
		<b>14</b>	LC4 at 100.00%	0.50	OK	
		<b>15</b>	LC4 at 0.00%	0.64	OK	
		<b>16</b>	LC1 at 100.00%	0.68	OK	
		<b>17</b>	LC1 at 0.00%	0.66	OK	
		<b>18</b>	LC2 at 100.00%	0.63	OK	
		<b>19</b>	LC2 at 0.00%	0.51	OK	
	<b>HSS_SQR 4X4X1_4</b>	<b>10</b>	LC3 at 0.00%	0.54	OK	
		<b>12</b>	LC3 at 0.00%	<b>0.60</b>	<b>OK</b>	
		<b>13</b>	LC2 at 0.00%	0.52	OK	
	<b>PIPE 2x0.154</b>	<b>70</b>	LC1 at 78.13%	<b>1.57</b>	N.G.	
		<b>72</b>	LC3 at 78.13%	0.77	OK	
		<b>73</b>	LC3 at 78.13%	<b>1.67</b>	N.G.	
		<b>75</b>	LC2 at 78.13%	<b>1.16</b>	N.G.	
		<b>77</b>	LC2 at 78.13%	0.71	OK	

<b>79</b>	LC2 at 78.13%	<b>1.14</b>	N.G.
<b>81</b>	LC4 at 78.13%	<b>1.99</b>	N.G.
<b>83</b>	LC4 at 78.13%	0.98	OK
<b>85</b>	LC4 at 78.13%	<b>2.02</b>	<b>N.G.</b>

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***PL 6x1/4***

<b>7</b>	LC2 at 50.00%	<b>1.36</b>	N.G.
<b>8</b>	LC1 at 50.00%	<b>1.52</b>	<b>N.G.</b>
<b>9</b>	LC1 at 46.88%	<b>1.44</b>	N.G.

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## Geometry data

### GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member    0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

### Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	0.00	0.00	1.00	0
9	3.4641	0.00	-2.00	0
10	0.4641	0.00	-7.1962	0
11	6.4641	0.00	3.1962	0
15	-3.4641	0.00	-2.00	0
16	-6.4641	0.00	3.1962	0
17	-0.4641	0.00	-7.1962	0
19	6.00	0.00	4.00	0
20	-6.00	0.00	4.00	0
21	-0.866	0.00	0.50	0
22	-6.3391	0.00	2.9796	0
23	-0.5891	0.00	-6.9796	0
26	6.3391	0.00	2.9796	0
27	0.5891	0.00	-6.9796	0
28	-5.75	0.00	4.00	0
29	5.75	0.00	4.00	0
30	-6.0446	0.00	3.4898	0
33	0.866	0.00	0.50	0
34	6.0446	0.00	3.4898	0
35	0.00	0.00	-1.00	0
36	0.00	0.00	-6.9796	0
37	-3.7141	0.00	-1.567	0

38	-3.2141	0.00	-2.433	0
41	3.7141	0.00	-1.567	0
42	3.2141	0.00	-2.433	0
43	-0.50	0.00	4.00	0
44	0.50	0.00	4.00	0
45	2.1071	0.00	1.2165	0
46	-2.1071	0.00	1.2165	0
47	0.00	0.00	-2.433	0
134	-5.00	0.00	4.00	0
135	-5.00	0.00	4.20	0
142	0.00	0.00	4.00	0
143	0.00	0.00	4.20	0
146	5.00	0.00	4.00	0
147	5.00	0.00	4.20	0
148	-5.00	6.50	4.20	0
149	-5.00	-1.50	4.20	0
152	0.00	6.50	4.20	0
153	0.00	-1.50	4.20	0
154	5.00	6.50	4.20	0
155	5.00	-1.50	4.20	0
156	-0.9641	0.00	-6.3301	0
157	5.9641	0.00	2.3301	0
158	-1.1373	0.00	-6.4301	0
159	6.1373	0.00	2.2301	0
160	-1.1373	6.50	-6.4301	0
161	6.1373	6.50	2.2301	0
162	-1.1373	-1.50	-6.4301	0
163	6.1373	-1.50	2.2301	0
164	-3.6373	0.00	-2.10	0
165	3.6373	0.00	-2.10	0
166	-3.6373	6.50	-2.10	0
167	3.6373	6.50	-2.10	0
168	-3.6373	-1.50	-2.10	0
169	3.6373	-1.50	-2.10	0
170	-5.9641	0.00	2.3301	0
171	0.9641	0.00	-6.3301	0
172	-6.1373	0.00	2.2301	0
173	1.1373	0.00	-6.4301	0
174	-6.1373	6.50	2.2301	0
175	1.1373	6.50	-6.4301	0
176	-6.1373	-1.50	2.2301	0
177	1.1373	-1.50	-6.4301	0

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## Restraints

Node	TX	TY	TZ	RX	RY	RZ
21	1	1	1	1	1	1
33	1	1	1	1	1	1
35	1	1	1	1	1	1

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## Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
3	11	10		C 6X8.2	A36	0.00	0.00	0.00
5	17	16		C 6X8.2	A36	0.00	0.00	0.00
6	20	19		C 6X8.2	A36	0.00	0.00	0.00
7	23	27		PL 6x1/4	A36	0.00	0.00	0.00
8	22	28		PL 6x1/4	A36	0.00	0.00	0.00
9	29	26		PL 6x1/4	A36	0.00	0.00	0.00
10	21	30		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
12	33	34		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
13	35	36		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
14	44	45		C 6X8.2	A36	0.00	0.00	0.00
15	45	41		C 6X8.2	A36	0.00	0.00	0.00
16	42	47		C 6X8.2	A36	0.00	0.00	0.00
17	47	38		C 6X8.2	A36	0.00	0.00	0.00
18	37	46		C 6X8.2	A36	0.00	0.00	0.00
19	46	43		C 6X8.2	A36	0.00	0.00	0.00
70	148	149		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
72	152	153		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
73	154	155		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
75	160	162		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
77	166	168		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
79	174	176		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
81	161	163		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
83	167	169		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
85	175	177		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

### Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
3	180.00	0	0.00	0.00	0.00
5	180.00	0	0.00	0.00	0.00
6	180.00	0	0.00	0.00	0.00
81	315.00	0	0.00	0.00	0.00
83	315.00	0	0.00	0.00	0.00
85	315.00	0	0.00	0.00	0.00

### Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
7	0.00	3.10	0.00	0.00	3.10	0.00
8	0.00	3.10	0.00	0.00	3.10	0.00
9	0.00	3.10	0.00	0.00	3.10	0.00



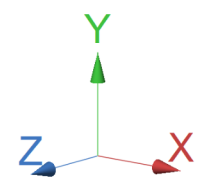
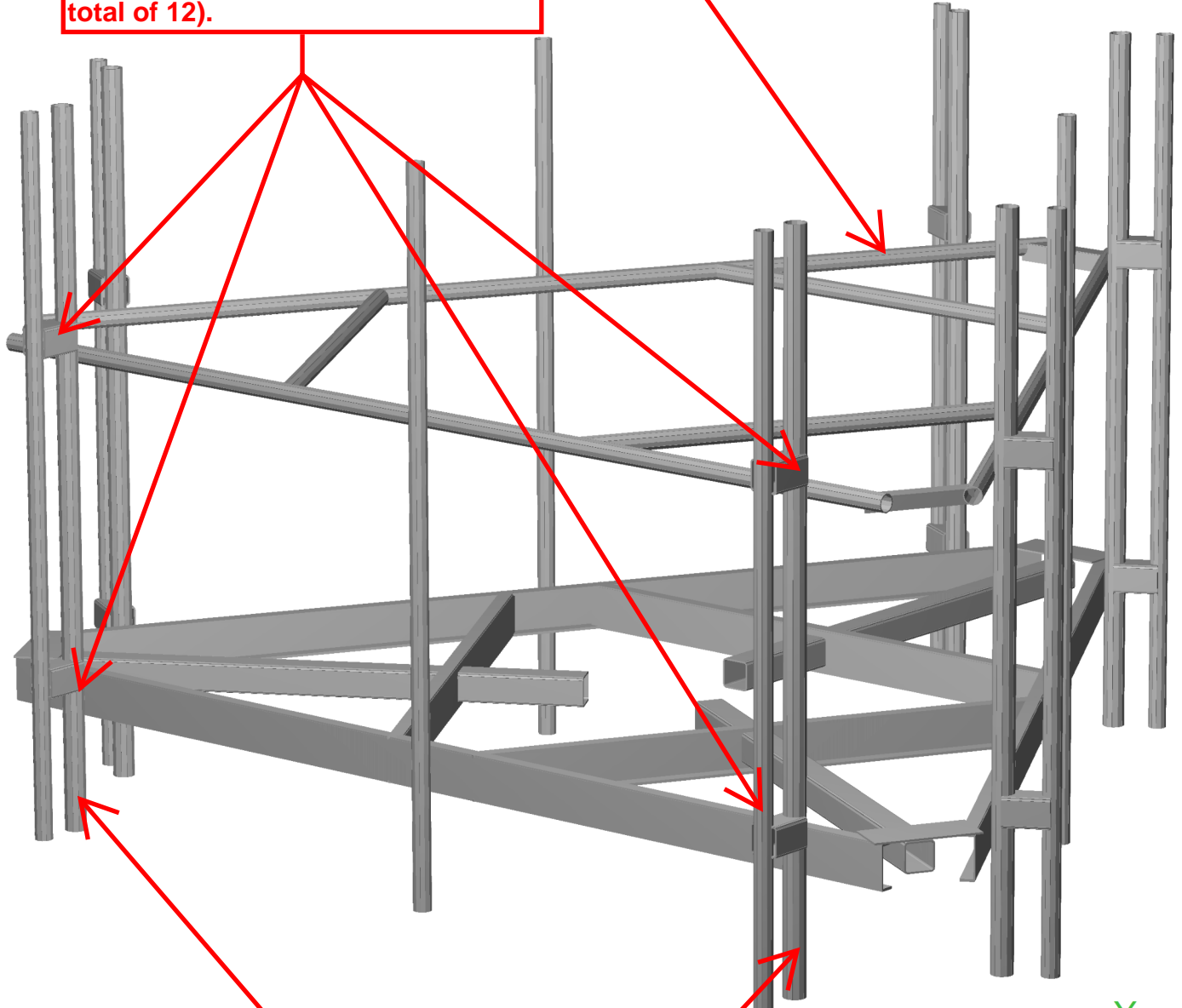


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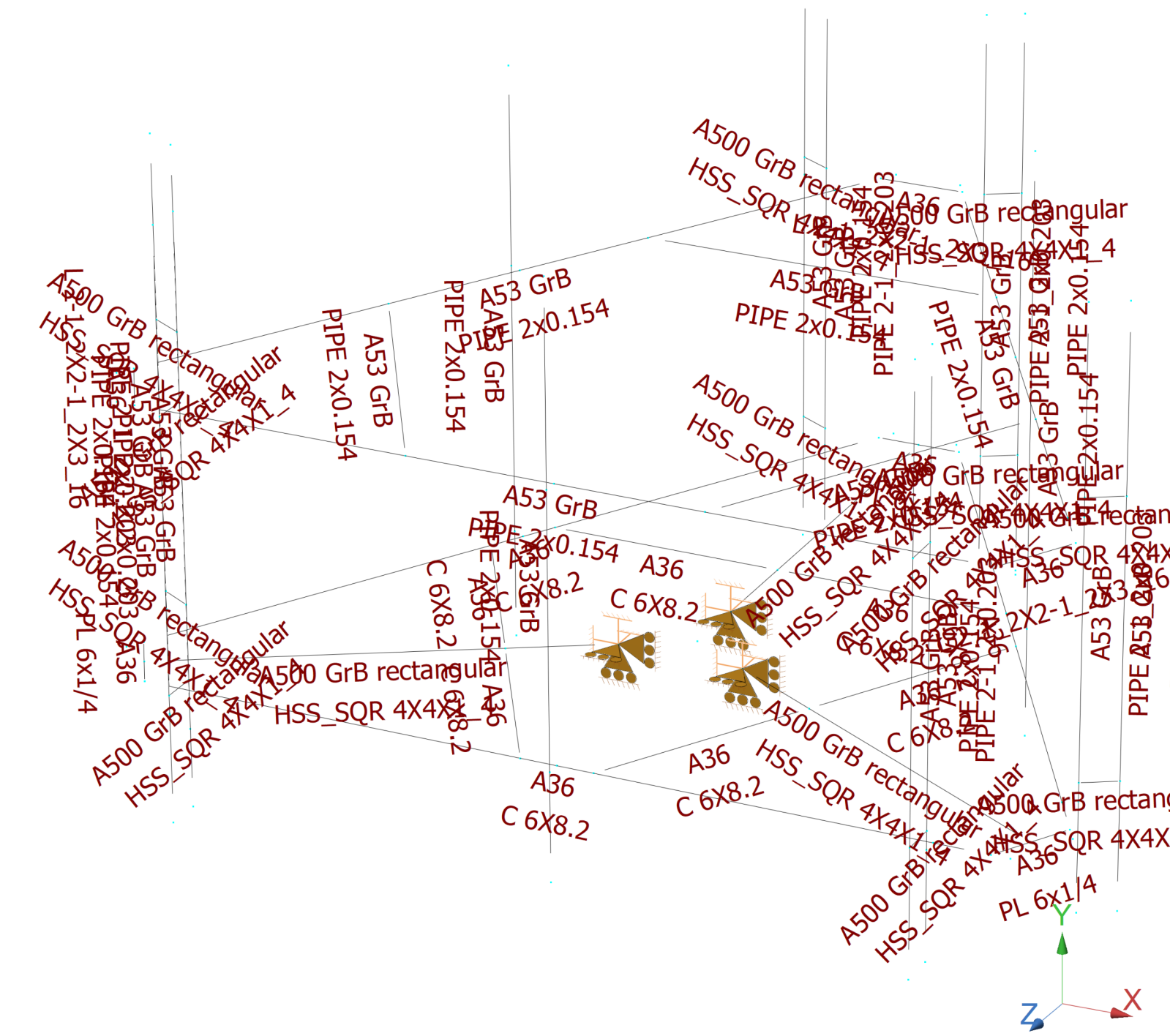
**Mount Calculations  
(Modified Conditions)**

**Install new handrail kit, SitePro1  
P/N HRK12-HD (or approved equal).**

**Install new 4x4 HSS steel tubes  
stand-offs secured to the proposed  
pipe masts (typ. of 4 per sector,  
total of 12).**

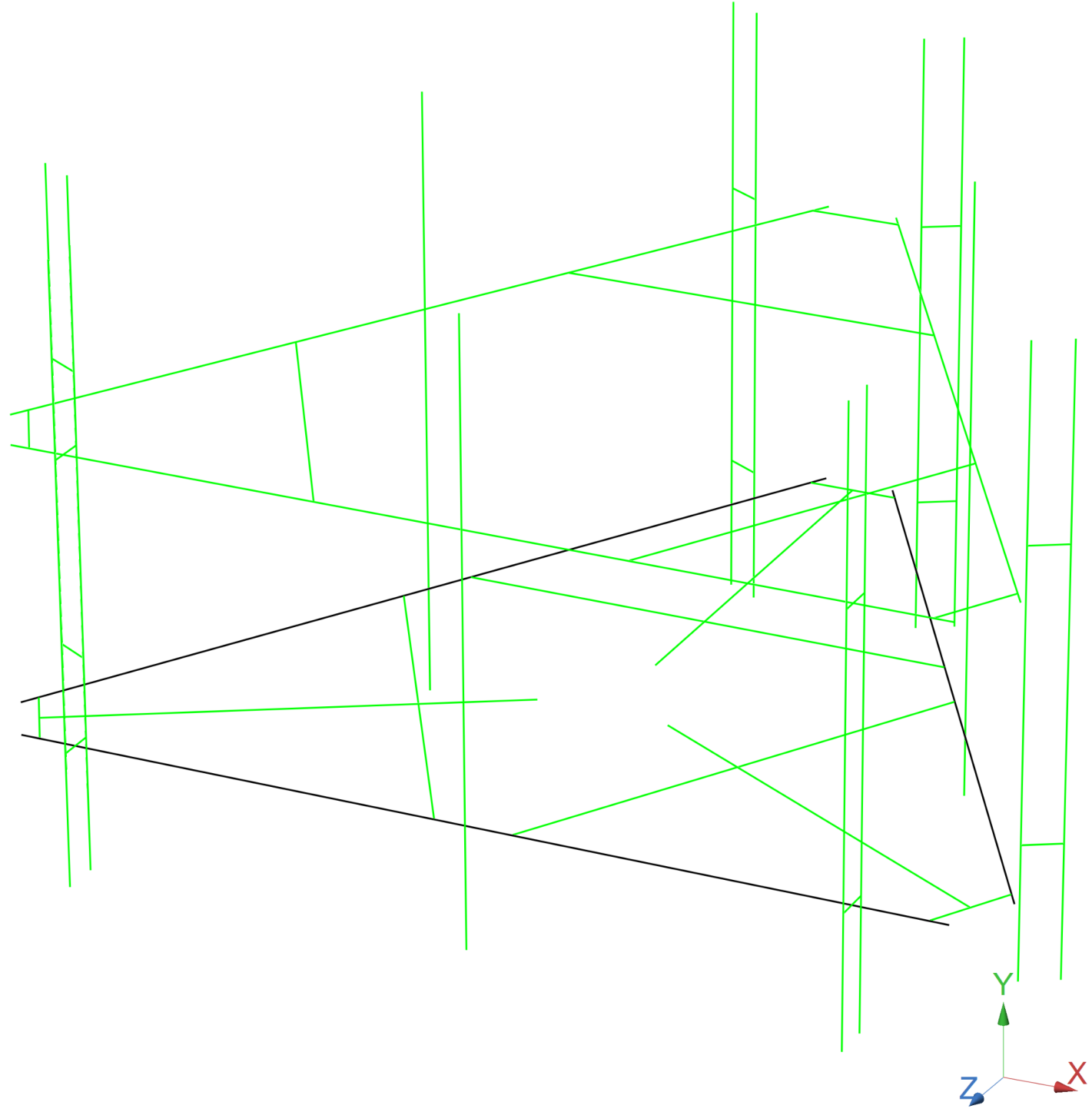


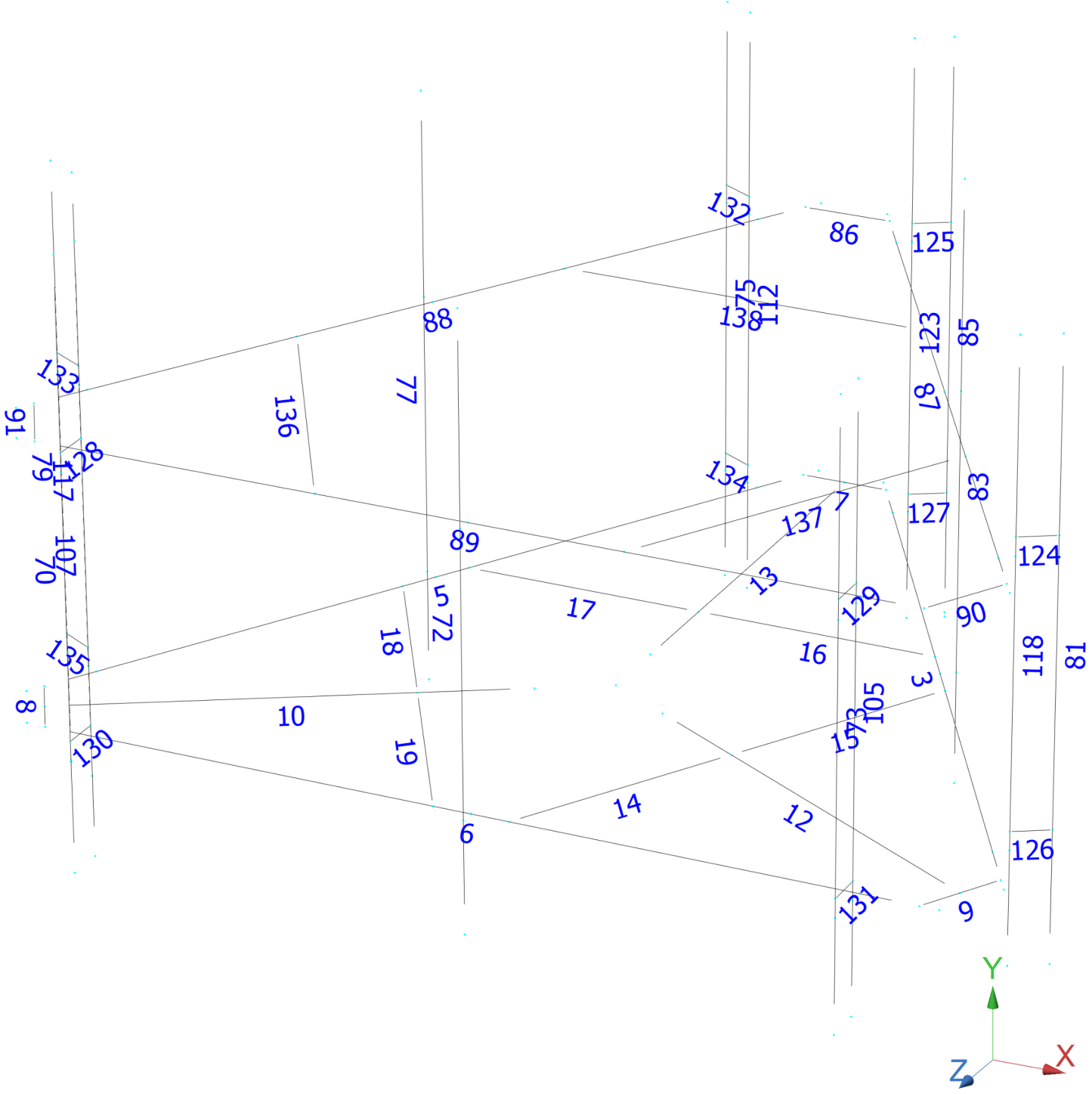
**Install new 2-1/2" std. (2.88" O.D.) pipe mast  
secured to the existing mount and handrail  
(typ. of 2 per sector, total of 6).**



Design status

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





## Load data

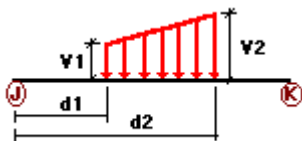
### GLOSSARY

Comb : Indicates if load condition is a load combination

### Load Conditions

Condition	Description	Comb.	Category
DL	Dead Load	No	DL
W0	Wind Load 0/60/120 deg	No	WIND
W30	Wind Load 30/90/150 deg	No	WIND
Di	Ice Load	No	LL
Wi0	Ice Wind Load 0/60/120 deg	No	WIND
Wi30	Ice Wind Load 30/90/150 deg	No	WIND
WL0	WL 30 mph 0/60/120 deg	No	WIND
WL30	WL 30 mph 30/90/150 deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load End of Mount	No	LL
LLa1	500 lb Live Load Antenna 1	No	LL
LLa2	500 lb Live Load Antenna 2	No	LL
LLa3	500 lb Live Load Antenna 3	No	LL
LLa4	500 lb Live Load Antenna 4	No	LL

### Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	10	y	-0.01	0.00	0.00	No	0.00	No
	12	y	-0.01	0.00	0.00	No	0.00	No
	13	y	-0.01	0.00	0.00	No	0.00	No
	14	y	-0.01	0.00	0.00	No	0.00	No
	15	y	-0.01	0.00	0.00	No	0.00	No
	16	y	-0.01	0.00	0.00	No	0.00	No
	17	y	-0.01	0.00	0.00	No	0.00	No
	18	y	-0.01	0.00	0.00	No	0.00	No
	19	y	-0.01	0.00	0.00	No	0.00	No
W0	3	z	-0.029	0.00	0.00	No	0.00	No
	5	z	-0.029	0.00	0.00	No	0.00	No
	6	z	-0.029	0.00	0.00	No	0.00	No
	10	z	-0.031	0.00	0.00	No	0.00	No
	12	z	-0.031	0.00	0.00	No	0.00	No
	14	z	-0.031	0.00	0.00	No	0.00	No

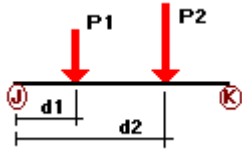
	15	z	-0.029	0.00	0.00	No	0.00	No
	16	z	-0.029	0.00	0.00	No	0.00	No
	17	z	-0.029	0.00	0.00	No	0.00	No
	18	z	-0.029	0.00	0.00	No	0.00	No
	19	z	-0.029	0.00	0.00	No	0.00	No
	75	z	-0.011	0.00	0.00	No	0.00	No
	77	z	-0.011	0.00	0.00	No	0.00	No
	79	z	-0.011	0.00	0.00	No	0.00	No
	81	z	-0.011	0.00	0.00	No	0.00	No
	83	z	-0.011	0.00	0.00	No	0.00	No
	85	z	-0.011	0.00	0.00	No	0.00	No
	86	z	-0.012	0.00	0.00	No	0.00	No
	87	z	-0.011	0.00	0.00	No	0.00	No
	88	z	-0.011	0.00	0.00	No	0.00	No
	89	z	-0.011	0.00	0.00	No	0.00	No
	90	z	-0.012	0.00	0.00	No	0.00	No
	91	z	-0.012	0.00	0.00	No	0.00	No
	112	z	-0.013	0.00	0.00	No	0.00	No
	117	z	-0.013	0.00	0.00	No	0.00	No
	118	z	-0.013	0.00	0.00	No	0.00	No
	123	z	-0.013	0.00	0.00	No	0.00	No
	124	z	-0.031	0.00	0.00	No	0.00	No
	125	z	-0.031	0.00	0.00	No	0.00	No
	126	z	-0.031	0.00	0.00	No	0.00	No
	127	z	-0.031	0.00	0.00	No	0.00	No
	132	z	-0.031	0.00	0.00	No	0.00	No
	133	z	-0.031	0.00	0.00	No	0.00	No
	134	z	-0.031	0.00	0.00	No	0.00	No
	135	z	-0.031	0.00	0.00	No	0.00	No
W30	3	x	-0.029	0.00	0.00	No	0.00	No
	5	x	-0.029	0.00	0.00	No	0.00	No
	6	x	-0.029	0.00	0.00	No	0.00	No
	10	x	-0.031	0.00	0.00	No	0.00	No
	12	x	-0.031	0.00	0.00	No	0.00	No
	13	x	-0.031	0.00	0.00	No	0.00	No
	14	x	-0.029	0.00	0.00	No	0.00	No
	15	x	-0.029	0.00	0.00	No	0.00	No
	16	x	-0.029	0.00	0.00	No	0.00	No
	17	x	-0.029	0.00	0.00	No	0.00	No
	18	x	-0.029	0.00	0.00	No	0.00	No
	19	x	-0.029	0.00	0.00	No	0.00	No
	70	x	-0.011	0.00	0.00	No	0.00	No
	72	x	-0.011	0.00	0.00	No	0.00	No
	73	x	-0.011	0.00	0.00	No	0.00	No
	75	x	-0.011	0.00	0.00	No	0.00	No
	77	x	-0.011	0.00	0.00	No	0.00	No
	79	x	-0.011	0.00	0.00	No	0.00	No
	81	x	-0.011	0.00	0.00	No	0.00	No
	83	x	-0.011	0.00	0.00	No	0.00	No
	85	x	-0.011	0.00	0.00	No	0.00	No
	86	x	-0.012	0.00	0.00	No	0.00	No
	87	x	-0.011	0.00	0.00	No	0.00	No
	88	x	-0.011	0.00	0.00	No	0.00	No
	89	x	-0.011	0.00	0.00	No	0.00	No
	90	x	-0.012	0.00	0.00	No	0.00	No
	91	x	-0.012	0.00	0.00	No	0.00	No
	105	x	-0.013	0.00	0.00	No	0.00	No
	107	x	-0.013	0.00	0.00	No	0.00	No
	112	x	-0.013	0.00	0.00	No	0.00	No
	117	x	-0.013	0.00	0.00	No	0.00	No

	118	x	-0.013	0.00	0.00	No	0.00	No
	123	x	-0.013	0.00	0.00	No	0.00	No
	124	x	-0.031	0.00	0.00	No	0.00	No
	125	x	-0.031	0.00	0.00	No	0.00	No
	126	x	-0.031	0.00	0.00	No	0.00	No
	127	x	-0.031	0.00	0.00	No	0.00	No
	128	x	-0.031	0.00	0.00	No	0.00	No
	129	x	-0.031	0.00	0.00	No	0.00	No
	130	x	-0.031	0.00	0.00	No	0.00	No
	131	x	-0.031	0.00	0.00	No	0.00	No
	132	x	-0.031	0.00	0.00	No	0.00	No
	133	x	-0.031	0.00	0.00	No	0.00	No
	134	x	-0.031	0.00	0.00	No	0.00	No
	135	x	-0.031	0.00	0.00	No	0.00	No
Di	3	y	-0.014	0.00	0.00	No	0.00	No
	5	y	-0.014	0.00	0.00	No	0.00	No
	6	y	-0.014	0.00	0.00	No	0.00	No
	7	y	-0.013	0.00	0.00	No	0.00	No
	8	y	-0.013	0.00	0.00	No	0.00	No
	9	y	-0.013	0.00	0.00	No	0.00	No
	10	y	-0.012	0.00	0.00	No	0.00	No
	12	y	-0.012	0.00	0.00	No	0.00	No
	13	y	-0.012	0.00	0.00	No	0.00	No
	14	y	-0.014	0.00	0.00	No	0.00	No
	15	y	-0.014	0.00	0.00	No	0.00	No
	16	y	-0.014	0.00	0.00	No	0.00	No
	17	y	-0.014	0.00	0.00	No	0.00	No
	18	y	-0.014	0.00	0.00	No	0.00	No
	19	y	-0.014	0.00	0.00	No	0.00	No
	70	y	-0.007	0.00	0.00	No	0.00	No
	72	y	-0.007	0.00	0.00	No	0.00	No
	73	y	-0.007	0.00	0.00	No	0.00	No
	75	y	-0.007	0.00	0.00	No	0.00	No
	77	y	-0.007	0.00	0.00	No	0.00	No
	79	y	-0.007	0.00	0.00	No	0.00	No
	81	y	-0.007	0.00	0.00	No	0.00	No
	83	y	-0.007	0.00	0.00	No	0.00	No
	85	y	-0.007	0.00	0.00	No	0.00	No
	86	y	-0.009	0.00	0.00	No	0.00	No
	87	y	-0.007	0.00	0.00	No	0.00	No
	88	y	-0.007	0.00	0.00	No	0.00	No
	89	y	-0.007	0.00	0.00	No	0.00	No
	90	y	-0.009	0.00	0.00	No	0.00	No
	91	y	-0.009	0.00	0.00	No	0.00	No
	105	y	-0.008	0.00	0.00	No	0.00	No
	107	y	-0.008	0.00	0.00	No	0.00	No
	112	y	-0.008	0.00	0.00	No	0.00	No
	117	y	-0.008	0.00	0.00	No	0.00	No
	118	y	-0.008	0.00	0.00	No	0.00	No
	123	y	-0.008	0.00	0.00	No	0.00	No
	124	y	-0.012	0.00	0.00	No	0.00	No
	125	y	-0.012	0.00	0.00	No	0.00	No
	126	y	-0.012	0.00	0.00	No	0.00	No
	127	y	-0.012	0.00	0.00	No	0.00	No
	128	y	-0.012	0.00	0.00	No	0.00	No
	129	y	-0.012	0.00	0.00	No	0.00	No
	130	y	-0.012	0.00	0.00	No	0.00	No
	131	y	-0.012	0.00	0.00	No	0.00	No
	132	y	-0.012	0.00	0.00	No	0.00	No
	133	y	-0.012	0.00	0.00	No	0.00	No



134	y	-0.012	0.00	0.00	No	0.00	No
135	y	-0.012	0.00	0.00	No	0.00	No

### Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	70	y	-0.048	0.50	No
		y	-0.048	7.50	No
		y	-0.06	50.00	Yes
	72	y	-0.033	0.50	No
		y	-0.033	3.50	No
		y	-0.041	4.50	No
		y	-0.041	7.50	No
		y	-0.073	50.00	Yes
		y	-0.046	50.00	Yes
	73	y	-0.049	0.50	No
		y	-0.049	7.50	No
		y	-0.06	50.00	Yes
		y	-0.06	50.00	Yes
	75	y	-0.04	0.50	No
		y	-0.04	7.50	No
		y	-0.06	50.00	Yes
		y	-0.041	7.50	No
		y	-0.073	50.00	Yes
		y	-0.046	50.00	Yes
	77	y	-0.033	0.50	No
		y	-0.033	3.50	No
		y	-0.041	4.50	No
		y	-0.041	7.50	No
		y	-0.073	50.00	Yes
		y	-0.046	50.00	Yes
	79	y	-0.037	0.50	No
		y	-0.037	7.50	No
		y	-0.06	50.00	Yes
		y	-0.06	50.00	Yes
	81	y	-0.048	0.50	No
y		-0.048	7.50	No	
y		-0.06	50.00	Yes	
83	y	-0.033	0.50	No	
	y	-0.033	3.50	No	
	y	-0.041	4.50	No	
	y	-0.041	7.50	No	
	y	-0.073	50.00	Yes	
	y	-0.046	50.00	Yes	
85	y	-0.049	0.50	No	
	y	-0.049	7.50	No	
	y	-0.06	50.00	Yes	
	y	-0.06	50.00	Yes	
W0	70	z	-0.417	0.50	No

		z	-0.417	7.50	No
		z	-0.044	50.00	Yes
72		z	-0.098	0.50	No
		z	-0.098	3.50	No
		z	-0.095	4.50	No
		z	-0.095	7.50	No
		z	-0.034	50.00	Yes
		z	-0.021	50.00	Yes
73		z	-0.423	0.50	No
		z	-0.423	7.50	No
		z	-0.031	50.00	Yes
		z	-0.044	50.00	Yes
75		z	-0.173	0.50	No
		z	-0.173	7.50	No
		z	-0.12	50.00	Yes
77		z	-0.06	0.50	No
		z	-0.06	3.50	No
		z	-0.072	4.50	No
		z	-0.072	7.50	No
		z	-0.086	50.00	Yes
79		z	-0.164	0.50	No
		z	-0.164	7.50	No
		z	-0.12	50.00	Yes
81		z	-0.247	0.50	No
		z	-0.247	7.50	No
		z	-0.12	50.00	Yes
83		z	-0.06	0.50	No
		z	-0.06	3.50	No
		z	-0.072	4.50	No
		z	-0.072	7.50	No
		z	-0.086	50.00	Yes
85		z	-0.229	0.50	No
		z	-0.229	7.50	No
		z	-0.12	50.00	Yes
W30	70	x	-0.19	0.50	No
		x	-0.19	7.50	No
		x	-0.128	50.00	Yes
72		x	-0.047	0.50	No
		x	-0.047	3.50	No
		x	-0.064	4.50	No
		x	-0.064	7.50	No
		x	-0.092	50.00	Yes
73		x	-0.165	0.50	No
		x	-0.165	7.50	No
		x	-0.128	50.00	Yes
75		x	-0.256	0.50	No
		x	-0.256	7.50	No
		x	-0.084	50.00	Yes
77		x	-0.085	0.50	No
		x	-0.085	3.50	No
		x	-0.087	4.50	No
		x	-0.087	7.50	No
		x	-0.058	50.00	Yes
79		x	-0.261	0.50	No
		x	-0.261	7.50	No
		x	-0.084	50.00	Yes
81		x	-0.361	0.50	No
		x	-0.361	7.50	No
		x	-0.084	50.00	Yes
83		x	-0.085	0.50	No

		x	-0.085	3.50	No
		x	-0.087	4.50	No
		x	-0.087	7.50	No
	85	x	-0.058	50.00	Yes
		x	-0.358	0.50	No
		x	-0.358	7.50	No
Di	70	x	-0.084	50.00	Yes
		y	-0.165	0.50	No
		y	-0.165	7.50	No
	72	y	-0.061	50.00	Yes
		y	-0.043	0.50	No
		y	-0.043	3.50	No
		y	-0.046	4.50	No
		y	-0.046	7.50	No
		y	-0.046	50.00	Yes
	73	y	-0.039	50.00	Yes
		y	-0.163	0.50	No
		y	-0.163	7.50	No
		y	-0.045	50.00	Yes
	75	y	-0.061	50.00	Yes
		y	-0.122	0.50	No
		y	-0.122	7.50	No
	77	y	-0.061	50.00	Yes
		y	-0.043	0.50	No
		y	-0.043	3.50	No
		y	-0.046	4.50	No
		y	-0.046	7.50	No
		y	-0.046	50.00	Yes
	79	y	-0.039	50.00	Yes
		y	-0.124	0.50	No
		y	-0.124	7.50	No
		y	-0.045	50.00	Yes
	81	y	-0.061	50.00	Yes
		y	-0.165	0.50	No
		y	-0.165	7.50	No
	83	y	-0.061	50.00	Yes
		y	-0.043	0.50	No
		y	-0.043	3.50	No
		y	-0.046	4.50	No
		y	-0.046	7.50	No
		y	-0.046	50.00	Yes
	85	y	-0.039	50.00	Yes
		y	-0.163	0.50	No
		y	-0.163	7.50	No
		y	-0.045	50.00	Yes
Wi0	70	y	-0.061	50.00	Yes
		z	-0.068	0.50	No
		z	-0.068	7.50	No
	72	z	-0.012	50.00	Yes
		z	-0.018	0.50	No
		z	-0.018	3.50	No
		z	-0.017	4.50	No
		z	-0.017	7.50	No
		z	-0.009	50.00	Yes
	73	z	-0.007	50.00	Yes
		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
	75	z	-0.012	50.00	Yes
		z	-0.031	0.50	No

		z	-0.031	7.50	No
		z	-0.023	50.00	Yes
77		z	-0.012	0.50	No
		z	-0.012	3.50	No
		z	-0.014	4.50	No
		z	-0.014	7.50	No
		z	-0.017	50.00	Yes
79		z	-0.03	0.50	No
		z	-0.03	7.50	No
		z	-0.023	50.00	Yes
81		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.023	50.00	Yes
83		z	-0.012	0.50	No
		z	-0.012	3.50	No
		z	-0.014	4.50	No
		z	-0.014	7.50	No
		z	-0.017	50.00	Yes
85		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.023	50.00	Yes
105		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
107		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
112		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
117		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
118		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
123		z	-0.068	0.50	No
		z	-0.068	7.50	No
		z	-0.008	50.00	Yes
		z	-0.012	50.00	Yes
Wi30	70	x	-0.035	0.50	No
		x	-0.035	7.50	No
		x	-0.024	50.00	Yes
72		x	-0.01	0.50	No
		x	-0.01	3.50	No
		x	-0.013	4.50	No
		x	-0.013	7.50	No
		x	-0.018	50.00	Yes
73		x	-0.031	0.50	No
		x	-0.031	7.50	No
		x	-0.024	50.00	Yes
75		x	-0.042	0.50	No
		x	-0.042	7.50	No
		x	-0.016	50.00	Yes
77		x	-0.016	0.50	No

	x	-0.016	3.50	No
	x	-0.016	4.50	No
	x	-0.016	7.50	No
79	x	-0.011	50.00	Yes
	x	-0.043	0.50	No
	x	-0.043	7.50	No
81	x	-0.016	50.00	Yes
	x	-0.059	0.50	No
	x	-0.059	7.50	No
83	x	-0.016	50.00	Yes
	x	-0.016	0.50	No
	x	-0.016	3.50	No
	x	-0.016	4.50	No
	x	-0.016	7.50	No
85	x	-0.011	50.00	Yes
	x	-0.058	0.50	No
	x	-0.058	7.50	No
105	x	-0.016	50.00	Yes
	x	-0.031	0.50	No
	x	-0.031	7.50	No
107	x	-0.024	50.00	Yes
	x	-0.031	0.50	No
	x	-0.031	7.50	No
112	x	-0.024	50.00	Yes
	x	-0.031	0.50	No
	x	-0.031	7.50	No
117	x	-0.024	50.00	Yes
	x	-0.031	0.50	No
	x	-0.031	7.50	No
118	x	-0.024	50.00	Yes
	x	-0.031	0.50	No
	x	-0.031	7.50	No
123	x	-0.024	50.00	Yes
	x	-0.031	0.50	No
	x	-0.031	7.50	No
WLO 70	x	-0.024	50.00	Yes
	z	-0.021	0.50	No
	z	-0.021	7.50	No
72	z	-0.002	50.00	Yes
	z	-0.005	0.50	No
	z	-0.005	3.50	No
	z	-0.005	4.50	No
	z	-0.005	7.50	No
	z	-0.002	50.00	Yes
73	z	-0.001	50.00	Yes
	z	-0.021	0.50	No
	z	-0.021	7.50	No
	z	-0.002	50.00	Yes
75	z	-0.002	50.00	Yes
	z	-0.009	0.50	No
	z	-0.009	7.50	No
77	z	-0.006	50.00	Yes
	z	-0.003	0.50	No
	z	-0.003	3.50	No
	z	-0.004	4.50	No
	z	-0.004	7.50	No
79	z	-0.004	50.00	Yes
	z	-0.009	0.50	No
	z	-0.009	7.50	No
	z	-0.006	50.00	Yes

	81	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.006	50.00	Yes
	83	z	-0.003	0.50	No
		z	-0.003	3.50	No
		z	-0.004	4.50	No
		z	-0.004	7.50	No
		z	-0.004	50.00	Yes
	85	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.006	50.00	Yes
	105	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
	107	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
	112	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
	117	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
	118	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
	123	z	-0.021	0.50	No
		z	-0.021	7.50	No
		z	-0.002	50.00	Yes
		z	-0.002	50.00	Yes
WL30	70	x	-0.01	0.50	No
		x	-0.01	7.50	No
		x	-0.006	50.00	Yes
	72	x	-0.003	0.50	No
		x	-0.003	3.50	No
		x	-0.004	4.50	No
		x	-0.004	7.50	No
		x	-0.005	50.00	Yes
	73	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	75	x	-0.013	0.50	No
		x	-0.013	7.50	No
		x	-0.004	50.00	Yes
	77	x	-0.005	0.50	No
		x	-0.005	3.50	No
		x	-0.005	4.50	No
		x	-0.005	7.50	No
		x	-0.003	50.00	Yes
	79	x	-0.013	0.50	No
		x	-0.013	7.50	No
		x	-0.004	50.00	Yes
	81	x	-0.018	0.50	No
		x	-0.018	7.50	No
		x	-0.004	50.00	Yes

	83	x	-0.005	0.50	No
		x	-0.005	3.50	No
		x	-0.005	4.50	No
		x	-0.005	7.50	No
		x	-0.003	50.00	Yes
	85	x	-0.018	0.50	No
		x	-0.018	7.50	No
		x	-0.004	50.00	Yes
	105	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	107	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	112	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	117	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	118	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
	123	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.006	50.00	Yes
LL1	6	y	-0.25	50.00	Yes
LL2	6	y	-0.25	100.00	Yes
LLa1	73	y	-0.50	50.00	Yes
LLa2	72	y	-0.50	50.00	Yes
LLa3	70	y	-0.50	50.00	Yes

### Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	MultX	MultY	MultZ
DL	Dead Load	No	0.00	-1.00	0.00
W0	Wind Load 0/60/120 deg	No	0.00	0.00	0.00
W30	Wind Load 30/90/150 deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
Wi0	Ice Wind Load 0/60/120 deg	No	0.00	0.00	0.00
Wi30	Ice Wind Load 30/90/150 deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0/60/120 deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30/90/150 deg	No	0.00	0.00	0.00
LL1	250 lb Live Load Center of Mount	No	0.00	0.00	0.00
LL2	250 lb Live Load End of Mount	No	0.00	0.00	0.00
LLa1	500 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	500 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	500 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	500 lb Live Load Antenna 4	No	0.00	0.00	0.00

## Earthquake (Dynamic analysis only)

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Condition	a/g	Ang. [Deg]	Damp. [%]
DL	0.00	0.00	0.00
W0	0.00	0.00	0.00
W30	0.00	0.00	0.00
Di	0.00	0.00	0.00
Wi0	0.00	0.00	0.00
Wi30	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

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## Steel Code Check

**Report: Summary - Group by member**

**Load conditions to be included in design :**

- LC1=1.2DL+W0
- LC2=1.2DL+W30
- LC3=1.2DL-W0
- LC4=1.2DL-W30
- LC5=0.9DL+W0
- LC6=0.9DL+W30
- LC7=0.9DL-W0
- LC8=0.9DL-W30
- LC9=1.2DL+Di+Wi0
- LC10=1.2DL+Di+Wi30
- LC11=1.2DL+Di-Wi0
- LC12=1.2DL+Di-Wi30
- LC13=1.4DL
- LC14=1.2DL+1.6LL1
- LC15=1.2DL+1.6LL2
- LC16=1.2DL+W0+1.6LLa1
- LC17=1.2DL+W30+1.6LLa1
- LC18=1.2DL-W0+1.6LLa1
- LC19=1.2DL-W30+1.6LLa1
- LC20=1.2DL+W0+1.6LLa2
- LC21=1.2DL+W30+1.6LLa2
- LC22=1.2DL-W0+1.6LLa2
- LC23=1.2DL-W30+1.6LLa2
- LC24=1.2DL+W0+1.6LLa3
- LC25=1.2DL+W30+1.6LLa3
- LC26=1.2DL-W0+1.6LLa3
- LC27=1.2DL-W30+1.6LLa3
- LC28=1.2DL+W0+1.6LLa4
- LC29=1.2DL+W30+1.6LLa4
- LC30=1.2DL-W0+1.6LLa4
- LC31=1.2DL-W30+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<b>C 6X8.2</b>	<b>3</b>	LC4 at 54.69%	0.56	With warnings	
		<b>5</b>	LC2 at 45.31%	0.53	With warnings	
		<b>6</b>	LC3 at 54.69%	<b>0.57</b>	<b>With warnings</b>	
		<b>14</b>	LC3 at 100.00%	0.40	OK	
		<b>15</b>	LC4 at 0.00%	0.52	OK	
		<b>16</b>	LC1 at 100.00%	0.51	OK	
		<b>17</b>	LC1 at 0.00%	0.49	OK	
		<b>18</b>	LC2 at 100.00%	0.52	OK	
		<b>19</b>	LC3 at 0.00%	0.41	OK	
	<b>HSS_SQR 4X4X1_4</b>	<b>10</b>	LC2 at 0.00%	0.51	OK	
		<b>12</b>	LC4 at 0.00%	0.52	OK	
		<b>13</b>	LC1 at 0.00%	<b>0.60</b>	<b>OK</b>	
		<b>124</b>	LC2 at 100.00%	0.04	OK	
		<b>125</b>	LC4 at 0.00%	0.05	OK	
		<b>126</b>	LC4 at 100.00%	0.03	OK	
		<b>127</b>	LC4 at 100.00%	0.03	OK	
		<b>128</b>	LC1 at 100.00%	0.05	OK	
		<b>129</b>	LC1 at 100.00%	0.05	OK	

	<b>130</b>	LC3 at 100.00%	0.04	OK
	<b>131</b>	LC3 at 100.00%	0.04	OK
	<b>132</b>	LC2 at 0.00%	0.04	OK
	<b>133</b>	LC1 at 0.00%	0.03	OK
	<b>134</b>	LC4 at 0.00%	0.03	OK
	<b>135</b>	LC5 at 0.00%	0.02	OK
<hr/>				
<b>L 2-1_2X2-1_2X3_16</b>	<b>86</b>	LC4 at 100.00%	<b>0.67</b>	<b>OK</b>
	<b>90</b>	LC1 at 100.00%	0.56	OK
	<b>91</b>	LC1 at 100.00%	0.51	OK
<hr/>				
<b>PIPE 2-1_2x0.203</b>	<b>105</b>	LC2 at 80.00%	0.58	OK
	<b>107</b>	LC4 at 80.00%	0.56	OK
	<b>112</b>	LC2 at 80.00%	0.63	OK
	<b>117</b>	LC1 at 80.00%	0.78	OK
	<b>118</b>	LC1 at 80.00%	<b>0.80</b>	<b>OK</b>
	<b>123</b>	LC4 at 80.00%	0.61	OK
<hr/>				
<b>PIPE 2x0.154</b>	<b>70</b>	LC1 at 30.00%	0.43	OK
	<b>72</b>	LC2 at 79.17%	0.75	OK
	<b>73</b>	LC1 at 30.00%	0.43	OK
	<b>75</b>	LC3 at 77.50%	0.31	OK
	<b>77</b>	LC1 at 79.17%	0.78	OK
	<b>79</b>	LC1 at 77.50%	0.37	OK
	<b>81</b>	LC1 at 77.08%	0.38	OK
	<b>83</b>	LC1 at 79.17%	<b>0.84</b>	<b>OK</b>
	<b>85</b>	LC4 at 29.17%	0.37	OK
	<b>87</b>	LC4 at 92.19%	0.81	OK
	<b>88</b>	LC2 at 7.81%	0.78	OK
	<b>89</b>	LC7 at 92.19%	0.66	OK
	<b>136</b>	LC1 at 0.00%	0.34	OK
	<b>137</b>	LC1 at 0.00%	0.35	OK
	<b>138</b>	LC2 at 0.00%	0.38	OK
<hr/>				
<b>PL 6x1/4</b>	<b>7</b>	LC1 at 50.00%	<b>0.55</b>	<b>OK</b>
	<b>8</b>	LC6 at 46.88%	0.48	OK
	<b>9</b>	LC8 at 50.00%	0.53	OK

## Geometry data

### GLOSSARY

Cb22, Cb33	: Moment gradient coefficients
Cm22, Cm33	: Coefficients applied to bending term in interaction formula
d0	: Tapered member section depth at J end of member
DJX	: Rigid end offset distance measured from J node in axis X
DJY	: Rigid end offset distance measured from J node in axis Y
DJZ	: Rigid end offset distance measured from J node in axis Z
DKX	: Rigid end offset distance measured from K node in axis X
DKY	: Rigid end offset distance measured from K node in axis Y
DKZ	: Rigid end offset distance measured from K node in axis Z
dL	: Tapered member section depth at K end of member
Ig factor	: Inertia reduction factor (Effective Inertia/Gross Inertia) for reinforced concrete members
K22	: Effective length factor about axis 2
K33	: Effective length factor about axis 3
L22	: Member length for calculation of axial capacity
L33	: Member length for calculation of axial capacity
LB pos	: Lateral unbraced length of the compression flange in the positive side of local axis 2
LB neg	: Lateral unbraced length of the compression flange in the negative side of local axis 2
RX	: Rotation about X
RY	: Rotation about Y
RZ	: Rotation about Z
TO	: 1 = Tension only member    0 = Normal member
TX	: Translation in X
TY	: Translation in Y
TZ	: Translation in Z

### Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
9	3.4641	0.00	-2.00	0
10	0.4641	0.00	-7.1962	0
11	6.4641	0.00	3.1962	0
15	-3.4641	0.00	-2.00	0
16	-6.4641	0.00	3.1962	0
17	-0.4641	0.00	-7.1962	0
19	6.00	0.00	4.00	0
20	-6.00	0.00	4.00	0
21	-0.866	0.00	0.50	0
22	-6.3391	0.00	2.9796	0
23	-0.5891	0.00	-6.9796	0
26	6.3391	0.00	2.9796	0
27	0.5891	0.00	-6.9796	0
28	-5.75	0.00	4.00	0
29	5.75	0.00	4.00	0
30	-6.0446	0.00	3.4898	0
33	0.866	0.00	0.50	0
34	6.0446	0.00	3.4898	0
35	0.00	0.00	-1.00	0
36	0.00	0.00	-6.9796	0
37	-3.7141	0.00	-1.567	0
38	-3.2141	0.00	-2.433	0
41	3.7141	0.00	-1.567	0

42	3.2141	0.00	-2.433	0
43	-0.50	0.00	4.00	0
44	0.50	0.00	4.00	0
45	2.1071	0.00	1.2165	0
46	-2.1071	0.00	1.2165	0
47	0.00	0.00	-2.433	0
142	0.00	0.00	4.00	0
143	0.00	0.00	4.20	0
147	5.00	0.00	4.70	0
148	-5.00	6.50	4.70	0
149	-5.00	-1.50	4.70	0
152	0.00	6.50	4.20	0
153	0.00	-1.50	4.20	0
154	5.00	6.50	4.70	0
155	5.00	-1.50	4.70	0
156	-0.9641	0.00	-6.3301	0
157	5.9641	0.00	2.3301	0
158	-1.1373	0.00	-6.4301	0
159	6.1373	0.00	2.2301	0
161	6.5703	6.50	1.9801	0
163	6.5703	-1.50	1.9801	0
164	-3.6373	0.00	-2.10	0
165	3.6373	0.00	-2.10	0
166	-3.6373	6.50	-2.10	0
167	3.6373	6.50	-2.10	0
168	-3.6373	-1.50	-2.10	0
169	3.6373	-1.50	-2.10	0
170	-5.9641	0.00	2.3301	0
171	0.9641	0.00	-6.3301	0
172	-6.1373	0.00	2.2301	0
173	1.1373	0.00	-6.4301	0
174	-6.5703	6.50	1.9801	0
175	1.5703	6.50	-6.6801	0
176	-6.5703	-1.50	1.9801	0
177	1.5703	-1.50	-6.6801	0
178	-0.5891	3.75	-6.9796	0
179	0.5891	3.75	-6.9796	0
180	6.4641	3.75	3.1962	0
181	0.4641	3.75	-7.1962	0
182	-0.4641	3.75	-7.1962	0
183	-6.4641	3.75	3.1962	0
184	-6.00	3.75	4.00	0
185	6.00	3.75	4.00	0
186	5.75	3.75	4.00	0
187	6.3391	3.75	2.9796	0
188	-6.3391	3.75	2.9796	0
189	-5.75	3.75	4.00	0
190	-0.9641	3.75	-6.3301	0
191	-1.1373	3.75	-6.4301	0
192	-3.4641	3.75	-2.00	0
193	-3.6373	3.75	-2.10	0
194	-5.9641	3.75	2.3301	0
195	-6.1373	3.75	2.2301	0
198	0.00	3.75	4.00	0
199	0.00	3.75	4.20	0
201	5.00	3.75	4.70	0
202	5.9641	3.75	2.3301	0
203	6.1373	3.75	2.2301	0
204	3.4641	3.75	-2.00	0
205	3.6373	3.75	-2.10	0

206	0.9641	3.75	-6.3301	0
207	1.1373	3.75	-6.4301	0
214	5.00	0.00	4.00	0
215	5.00	0.00	4.20	0
216	5.00	6.50	4.20	0
217	5.00	-1.50	4.20	0
218	5.00	3.75	4.00	0
219	5.00	3.75	4.20	0
220	-5.00	6.50	4.20	0
221	-5.00	-1.50	4.20	0
222	-5.00	3.75	4.00	0
223	-5.00	3.75	4.20	0
224	-5.00	0.00	4.00	0
225	-5.00	0.00	4.20	0
226	-5.00	0.00	4.70	0
227	-5.00	3.75	4.70	0
228	-1.5703	6.50	-6.6801	0
230	-1.5703	-1.50	-6.6801	0
236	-1.1373	6.50	-6.4301	0
237	-1.1373	-1.50	-6.4301	0
238	-1.5703	3.75	-6.6801	0
239	-1.5703	0.00	-6.6801	0
240	-6.5703	3.75	1.9801	0
241	-6.5703	0.00	1.9801	0
242	-6.1373	6.50	2.2301	0
243	-6.1373	-1.50	2.2301	0
244	6.1373	6.50	2.2301	0
245	6.1373	-1.50	2.2301	0
250	1.1373	6.50	-6.4301	0
251	1.1373	-1.50	-6.4301	0
252	0.00	0.00	0.00	0
253	6.1373	4.00	2.2301	0
254	6.5703	4.00	1.9801	0
255	1.1373	4.00	-6.4301	0
256	1.5703	4.00	-6.6801	0
257	1.5703	0.25	-6.6801	0
258	6.1373	0.25	2.2301	0
259	6.5703	0.25	1.9801	0
260	1.1373	0.25	-6.4301	0
261	-5.00	4.00	4.20	0
262	-5.00	4.00	4.70	0
263	5.00	4.00	4.20	0
264	5.00	4.00	4.70	0
265	-5.00	0.25	4.20	0
266	-5.00	0.25	4.70	0
267	5.00	0.25	4.20	0
268	5.00	0.25	4.70	0
269	-1.1373	4.00	-6.4301	0
270	-1.5703	4.00	-6.6801	0
271	-6.1373	4.00	2.2301	0
272	-6.5703	4.00	1.9801	0
273	-1.1373	0.25	-6.4301	0
274	-1.5703	0.25	-6.6801	0
275	-6.1373	0.25	2.2301	0
276	-6.5703	0.25	1.9801	0
277	-4.4641	3.75	-0.2679	0
278	-2.4641	3.75	-3.7321	0
279	-2.00	3.75	4.00	0
280	2.00	3.75	4.00	0
281	4.4641	3.75	-0.2679	0

### Restraints

Node	TX	TY	TZ	RX	RY	RZ
21	1	1	1	1	1	1
33	1	1	1	1	1	1
35	1	1	1	1	1	1

### Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
3	11	10		C 6X8.2	A36	0.00	0.00	0.00
5	17	16		C 6X8.2	A36	0.00	0.00	0.00
6	20	19		C 6X8.2	A36	0.00	0.00	0.00
7	23	27		PL 6x1/4	A36	0.00	0.00	0.00
8	22	28		PL 6x1/4	A36	0.00	0.00	0.00
9	29	26		PL 6x1/4	A36	0.00	0.00	0.00
10	21	30		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
12	33	34		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
13	35	36		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
14	44	45		C 6X8.2	A36	0.00	0.00	0.00
15	45	41		C 6X8.2	A36	0.00	0.00	0.00
16	42	47		C 6X8.2	A36	0.00	0.00	0.00
17	47	38		C 6X8.2	A36	0.00	0.00	0.00
18	37	46		C 6X8.2	A36	0.00	0.00	0.00
19	46	43		C 6X8.2	A36	0.00	0.00	0.00
70	148	149		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
72	152	153		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
73	154	155		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
75	228	230		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
77	166	168		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
79	174	176		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
81	161	163		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
83	167	169		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
85	175	177		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
86	178	179		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
87	180	181		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
88	182	183		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
89	184	185		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
90	186	187		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
91	188	189		L 2-1_2X2-1_2X3_16	A36	0.00	0.00	0.00
105	216	217		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
107	220	221		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
112	236	237		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
117	242	243		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
118	244	245		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
123	250	251		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
124	253	254		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
125	255	256		HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00

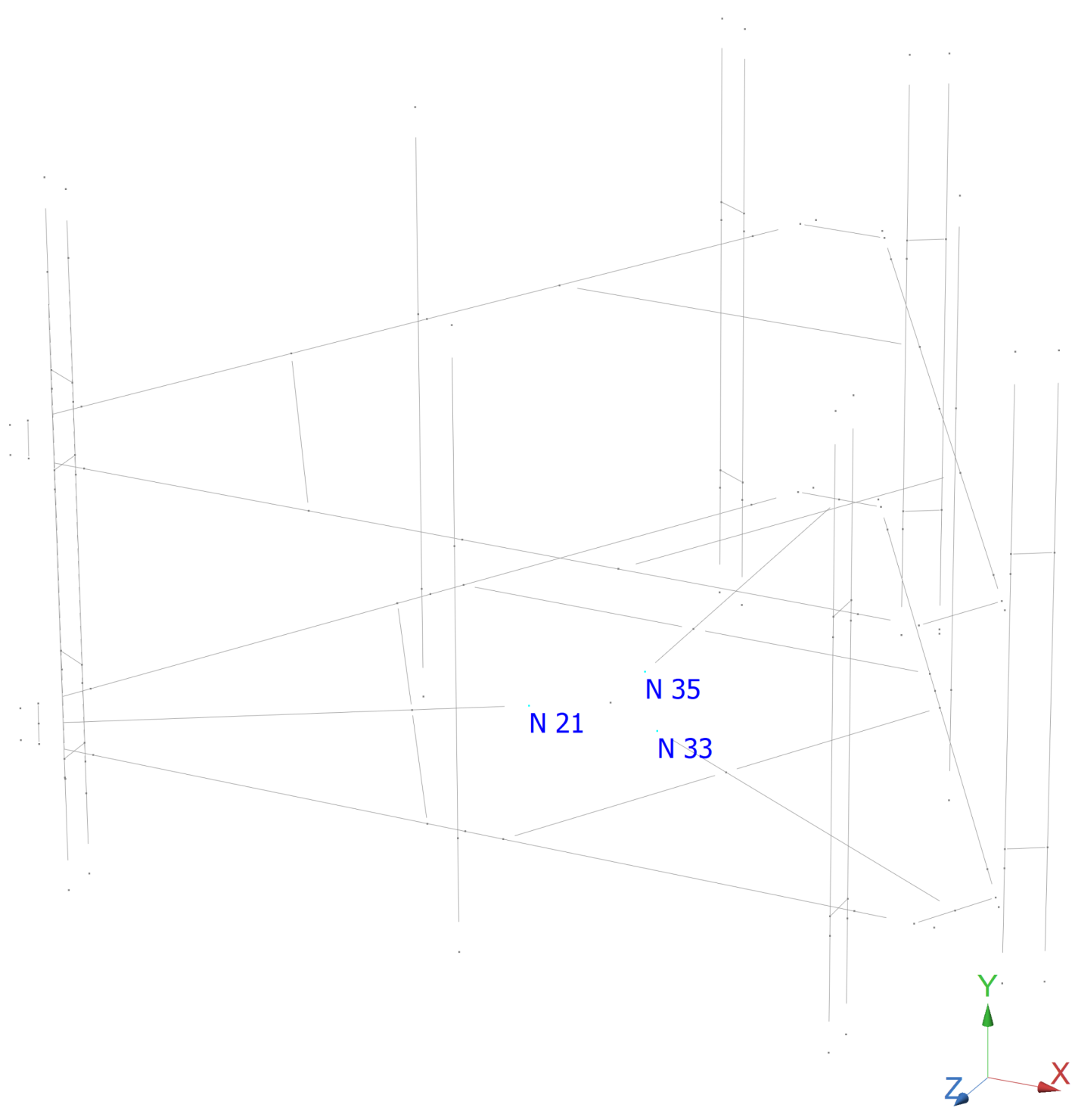
126	258	259	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
127	260	257	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
128	261	262	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
129	263	264	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
130	265	266	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
131	267	268	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
132	269	270	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
133	271	272	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
134	273	274	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
135	275	276	HSS_SQR 4X4X1_4	A500 GrB rectangular	0.00	0.00	0.00
136	279	277	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
137	280	281	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
138	282	278	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

### Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
3	180.00	0	0.00	0.00	0.00
5	180.00	0	0.00	0.00	0.00
6	180.00	0	0.00	0.00	0.00
7	90.00	0	0.00	0.00	0.00
8	90.00	0	0.00	0.00	0.00
9	90.00	0	0.00	0.00	0.00
86	180.00	0	0.00	0.00	0.00
87	180.00	0	0.00	0.00	0.00
88	180.00	0	0.00	0.00	0.00
89	180.00	0	0.00	0.00	0.00
90	90.00	0	0.00	0.00	0.00
91	90.00	0	0.00	0.00	0.00

### Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
7	0.00	3.10	0.00	0.00	3.10	0.00
8	0.00	3.10	0.00	0.00	3.10	0.00
9	0.00	3.10	0.00	0.00	3.10	0.00

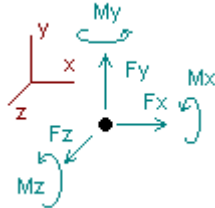




## Analysis result

### Envelope for nodal reactions

Note.-  $I_c$  is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

- LC1=1.2DL+W0
- LC2=1.2DL+W30
- LC3=1.2DL-W0
- LC4=1.2DL-W30
- LC5=0.9DL+W0
- LC6=0.9DL+W30
- LC7=0.9DL-W0
- LC8=0.9DL-W30
- LC9=1.2DL+Di+Wi0
- LC10=1.2DL+Di+Wi30
- LC11=1.2DL+Di-Wi0
- LC12=1.2DL+Di-Wi30
- LC13=1.4DL
- LC14=1.2DL+1.6LL1
- LC15=1.2DL+1.6LL2
- LC16=1.2DL+WL0+1.6LLa1
- LC17=1.2DL+WL30+1.6LLa1
- LC18=1.2DL-WL0+1.6LLa1
- LC19=1.2DL-WL30+1.6LLa1
- LC20=1.2DL+WL0+1.6LLa2
- LC21=1.2DL+WL30+1.6LLa2
- LC22=1.2DL-WL0+1.6LLa2
- LC23=1.2DL-WL30+1.6LLa2
- LC24=1.2DL+WL0+1.6LLa3
- LC25=1.2DL+WL30+1.6LLa3
- LC26=1.2DL-WL0+1.6LLa3
- LC27=1.2DL-WL30+1.6LLa3
- LC28=1.2DL+WL0+1.6LLa4
- LC29=1.2DL+WL30+1.6LLa4
- LC30=1.2DL-WL0+1.6LLa4
- LC31=1.2DL-WL30+1.6LLa4

Node		Forces						Moments					
		Fx	$I_c$	Fy	$I_c$	Fz	$I_c$	Mx	$I_c$	My	$I_c$	Mz	$I_c$
		[Kip]		[Kip]		[Kip]		[Kip*ft]		[Kip*ft]		[Kip*ft]	
21	Max	2.761	LC6	3.907	LC2	2.020	LC1	2.21381	LC5	1.35424	LC1	3.85008	LC8
	Min	-3.276	LC4	-1.326	LC8	-1.696	LC7	-4.04868	LC3	-1.32998	LC7	-7.41583	LC2
33	Max	3.304	LC2	3.873	LC4	2.417	LC1	2.20336	LC5	1.92328	LC7	7.41045	LC4
	Min	-2.777	LC8	-1.355	LC6	-2.073	LC7	-4.08352	LC3	-1.97308	LC1	-3.89259	LC6

35	Max	2.003	LC6	4.463	LC1	3.448	LC5	9.28009	LC1	2.70210	LC4	1.96638	LC8
	Min	-2.013	LC4	-1.369	LC7	-4.120	LC3	-3.97233	LC7	-2.67978	LC6	-2.02687	LC2

---

Date: 1/11/2022  
Project Name: CHESHIRE CENTRAL  
Project No.: CT2081  
Designed By: ID Checked By: MSC



**CHECK CONNECTION CAPACITY (Worst Case)**

**Reference:** AISC Steel Construction Manual 14th Edition (ASD)

**Bolt Type =** A36 5/8" (Threaded Rod)

**Allowable Tensile Load =**

$F_{Tall} = 6673$  lbs.

**Allowable Shear Load =**

$F_{Vall} = 4004$  lbs.

**TENSILE FORCES**

**Reaction**  $F = 4120$  lbs. (See Bentley Output)

**SHEAR FORCES**

**Reactions in X direction:** 2013 lbs. (See Bentley Output)

**Reactions in Y direction:** 4463 lbs. (See Bentley Output)

**Resultant:** 4896 lbs.

**No. of Supports =** 1

**No. of Bolts / Support =** 3

**Tension Design Load /Bolts =**

$f_t = 1373.33$  lbs. < 6673 lbs. **Therefore, OK !**

**Shear Design Load / Bolts=**

$f_v = 1631.99$  lbs. < 4004 lbs. **Therefore, OK !**

**CHECK COMBINED TENSION AND SHEAR**

$f_t / F_T + f_v / F_V \leq 1.0$   
0.206 + 0.408 = 0.613 < 1.0 **Therefore, OK !**



# Town of Cheshire, CT

## Property Listing Report

Map Block Lot **51 2**

Building # **1** Unique Identifier **00478600**

### Property Information

Property Location	<b>490 HIGHLAND AVE</b>
Mailing Address	<b>POLICE STATION</b> <b>CHESHIRE CT 06410</b>
Land Use	<b>Elementary School</b>
Zoning Code	<b>R-20A</b>
Neighborhood	<b>CHL-1</b>

Owner	<b>CHESHIRE TOWN OF</b>
Co-Owner	<b>HIGHLAND SCHOOL</b>
Book / Page	<b>169/ 675</b>
Land Class	<b>Commercial</b>
Census Tract	<b>3431</b>
Acreage	<b>24.8</b>

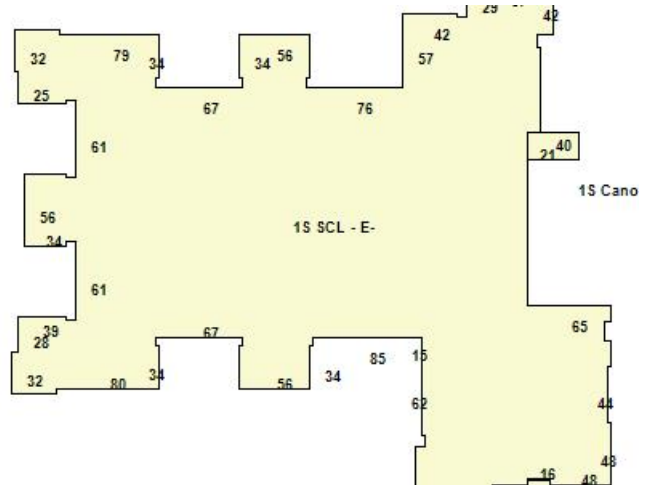
### Valuation Summary

(Assessed value = 70% of Appraised Value)

Item	Appraised	Assessed
Buildings	<b>17917074</b>	<b>12541950</b>
Outbuildings	<b>55211</b>	<b>38650</b>
Land	<b>2353916</b>	<b>1647740</b>
Total	<b>20326201</b>	<b>14228340</b>

### Utility Information

Electric	<b>No</b>
Gas	<b>No</b>
Sewer	<b>No</b>
Public Water	<b>No</b>
Well	<b>No</b>



### Primary Construction Details

Year Built	<b>1971</b>
Building Desc.	<b>Commercial</b>
Building Style	
Stories	<b>1.00</b>
Exterior Walls	<b>Stucco</b>
Exterior Walls 2	
Interior Walls	<b>Drywall</b>
Interior Walls 2	
Interior Floors 1	<b>Composite</b>
Interior Floors 2	

Heating Fuel	<b>Gas</b>
Heating Type	<b>FHA</b>
AC Type	<b>Central</b>
Bedrooms	<b>0</b>
Full Bathrooms	<b>0</b>
Half Bathrooms	<b>0</b>
Extra Fixtures	<b>0</b>
Total Rooms	<b>0</b>
Bath Style	<b>NA</b>
Kitchen Style	
Occupancy	<b>0</b>

Building Use	<b>Elementary School</b>
Building Condition	<b>Average</b>
Frame Type	<b>Good</b>
Fireplaces	<b>0</b>
Bsmt Gar	<b>0</b>
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	<b>0</b>
Roof Style	<b>Flat</b>
Roof Cover	<b>Composite Built Up</b>

Report Created On

**3/9/2022**



# Town of Cheshire, CT

Property Listing Report

Map Block Lot **51 2**

Building # **1**

Unique Identifier

**00478600**

## Detached Outbuildings

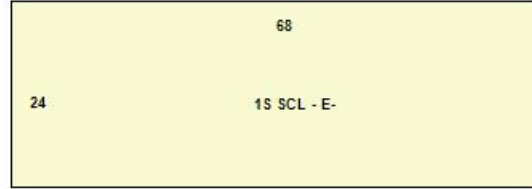
Type	Description	Area (sq ft)	Condition	Year Built
Paving	Paving	80000	Average	1988
Fencing	Fencing	2404	Average	1971
Utility	Building	240	Good	2004

## Attached Extra Features

Type	Description	Area (sq ft)	Condition	Year Built
Porch	Open	208	Average	1971
Canopy	Metal	840	Average	1971

## Sales History

Owner of Record	Book/ Page	Sale Date	Sale Price
CHESHIRE TOWN OF	169_ 675	3/8/2019	0



Primary Construction Details

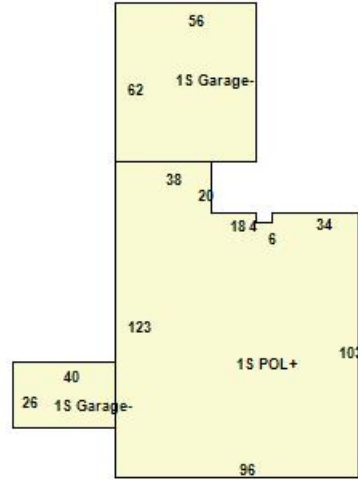
Year Built	1988
Building Desc.	Elementary School
Building Style	
Stories	1.00
Exterior Walls	Vertical Wood
Exterior Walls 2	
Interior Walls	Drywall
Interior Walls 2	
Interior Floors 1	Carpet
Interior Floors 2	

Heating Fuel	Electric
Heating Type	Electric Baseboard
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	
Occupancy	0

Building Use	Commercial
Building Condition	Average
Frame Type	Average
Fireplaces	0
Bsmt Gar	0
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	0
Roof Style	Gable
Roof Cover	Asphalt

Attached Extra Features

Type	Description	Area (sq ft)	Condition	Year Built



**Primary Construction Details**

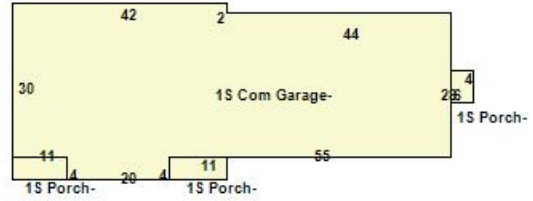
Year Built	1971
Building Desc.	Jail - Police Station
Building Style	
Stories	1.00
Exterior Walls	B. V. Solid
Exterior Walls 2	
Interior Walls	Drywall
Interior Walls 2	
Interior Floors 1	Carpet
Interior Floors 2	

Heating Fuel	Gas
Heating Type	FHA
AC Type	Central
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	
Occupancy	0

Building Use	Commercial
Building Condition	Average
Frame Type	Average
Fireplaces	0
Bsmt Gar	0
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	0
Roof Style	
Roof Cover	Asphalt

**Attached Extra Features**

Type	Description	Area (sq ft)	Condition	Year Built
Garage	Concrete Block/Frame	1040	Average	1992
Garage	Concrete Block/Frame	3472	Average	1971



**Primary Construction Details**

Year Built	1987
Building Desc.	Commercial Garage
Building Style	
Stories	1.00
Exterior Walls	Concrete Block
Exterior Walls 2	
Interior Walls	
Interior Walls 2	
Interior Floors 1	
Interior Floors 2	

Heating Fuel	
Heating Type	
AC Type	
Bedrooms	0
Full Bathrooms	0
Half Bathrooms	0
Extra Fixtures	0
Total Rooms	0
Bath Style	NA
Kitchen Style	
Occupancy	0

Building Use	Commercial
Building Condition	Average
Frame Type	Average
Fireplaces	0
Bsmt Gar	0
Fin Bsmt Area	
Fin Bsmt Quality	
Building Grade	0
Roof Style	
Roof Cover	

**Attached Extra Features**

Type	Description	Area (sq ft)	Condition	Year Built
Porch	Open	24	Average	1987
Porch	Open	44	Average	1987
Porch	Open	44	Average	1987

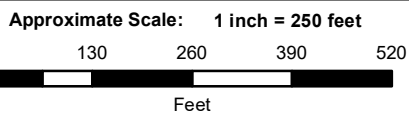
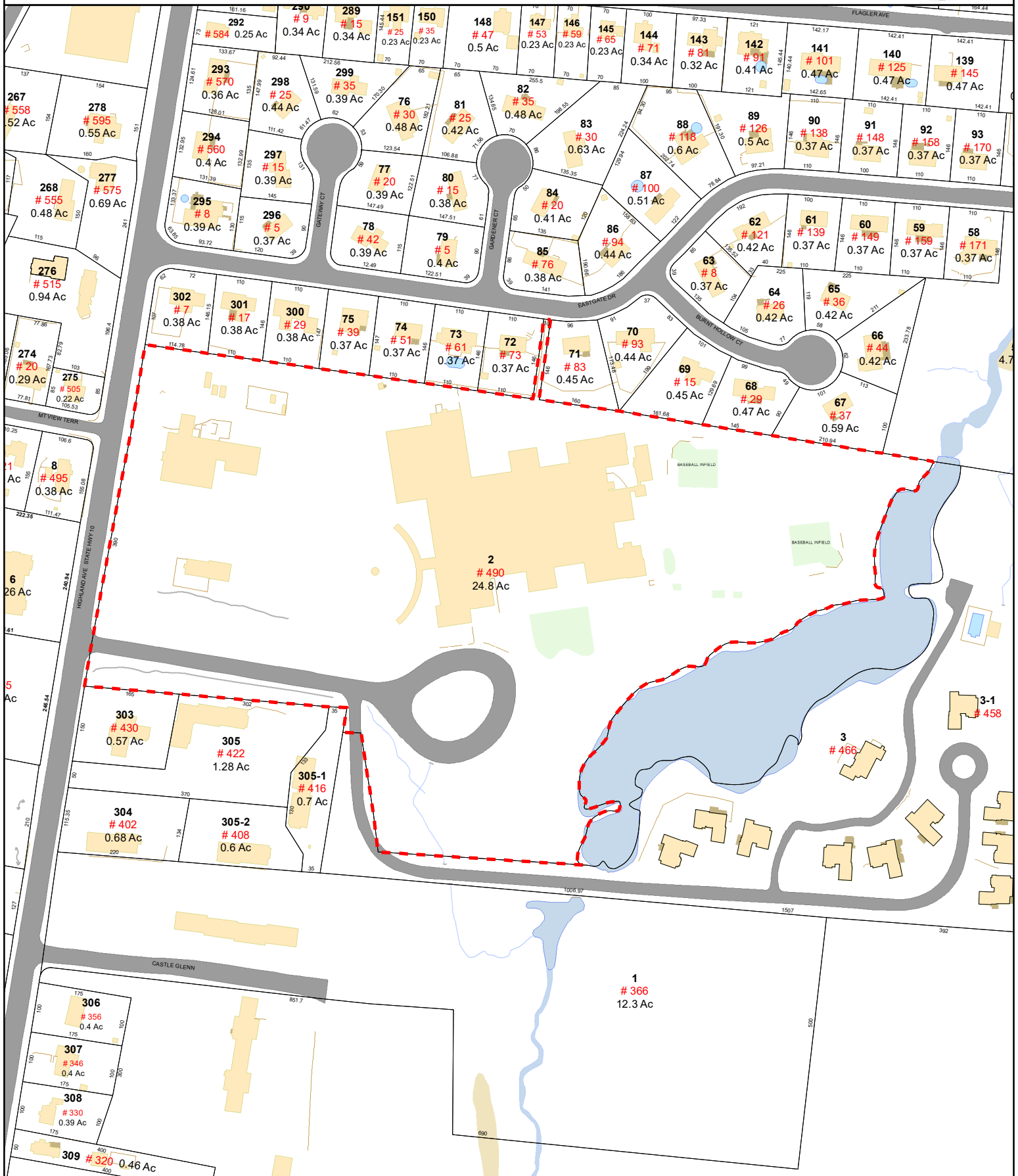


# Town of Cheshire, Connecticut - Assessment Parcel Map



Parcel: 00478600

Location: 490 HIGHLAND AVE



Map Produced: July 2021

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

ZONING PERMIT  
PLANNING AND ZONING COMMISSION

NO. 17985

DATE Nov. 14, 1989

PERMISSION TO:

(BUILD) (REPAIR) (MAKE ALTERATIONS TO) (BUILD ON ADDITION TO)

A \_\_\_\_\_ FAMILY DWELLING, OR OTHER \_\_\_\_\_

ERECT TOWER.

DESCRIPTION OF PREMISES:

ZONE R-2

VALUE \$ 13,000.

TO ERECT 140' HIGH. COMMUNICATION  
TOWER FOR POLICE RADIO

GRANTED:

John A. Quastky

APPLICANT: I hereby certify that the information contained herein is accurate.

George R. Merriam 64 St. 57 Edw. Ave  
Signature of Applicant

George R. Merriam, Chief of Police  
Name of Applicant (Print)

500 Highland Ave, Cheshire, CT  
Address

272-5333

Telephone No.

\*\*\*\*\*  
THIS APPROVAL IS SUBJECT TO COMPLIANCE (PRIOR TO OCCUPANCY) WITH THE PROVISIONS OF THE ZONING REGULATIONS AND THE SUBDIVISION REGULATIONS (WHERE APPLICABLE) OF THE TOWN OF CHESHIRE AND AS AUTHORIZED UNDER 8-3f OF THE CONNECTICUT GENERAL STATUTES, AS AMENDED.

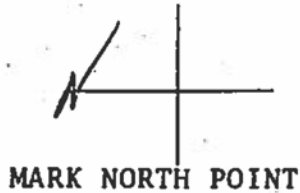
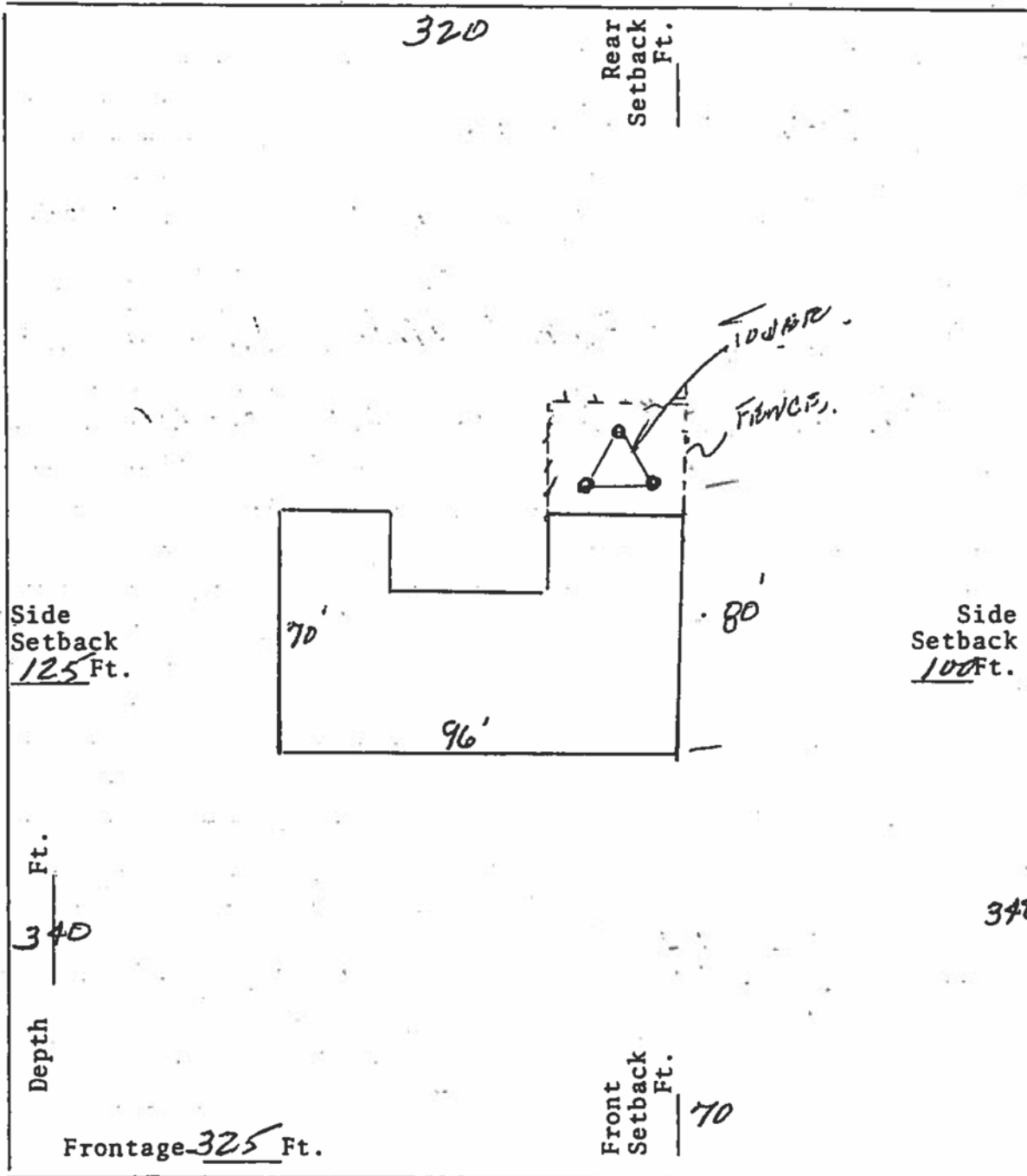
A \$5.00 Fee has been paid by the applicant.

PLOT PLAN

LOCATION: N S ~~W~~ SIDE OF HIGHLAND ~~STREET/ROAD~~ AVENUE

HOUSE NO. 500 LOT NO. \_\_\_\_\_ OWNER OF LAND TOWN OF CHESHIRE

INTERIOR OR ~~CORNER~~ LOT \_\_\_\_\_ ZONE R-2



INFORMATION SUPPLIED BY:

NAME \_\_\_\_\_

ZONING PERMIT  
PLANNING AND ZONING COMMISSION

NO. 23339

DATE 7-31-03

PERMISSION TO:

(BUILD) (REPAIR) (MAKE ALTERATIONS TO) (BUILD ON ADDITION TO)

A \_\_\_\_\_ FAMILY DWELLING, OR OTHER 100' TOWER

DESCRIPTION OF PREMISES:

ZONE R-40 VALUE \$ 90,000 + 80,000 TENANTS

- 100' TOWER
- INSTALL ANTENNAE FOR:
  - TOWN
  - T-MOBILE
  - CINGULAR
  - SPRINT
  - AT&T

GRANTED: July 31, 03  
[Signature]

APPLICANT: I hereby certify that the information contained herein is accurate.

[Signature]  
Signature of Applicant

Holistic Tower Ventures  
Name of Applicant (Print)

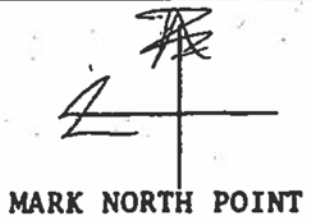
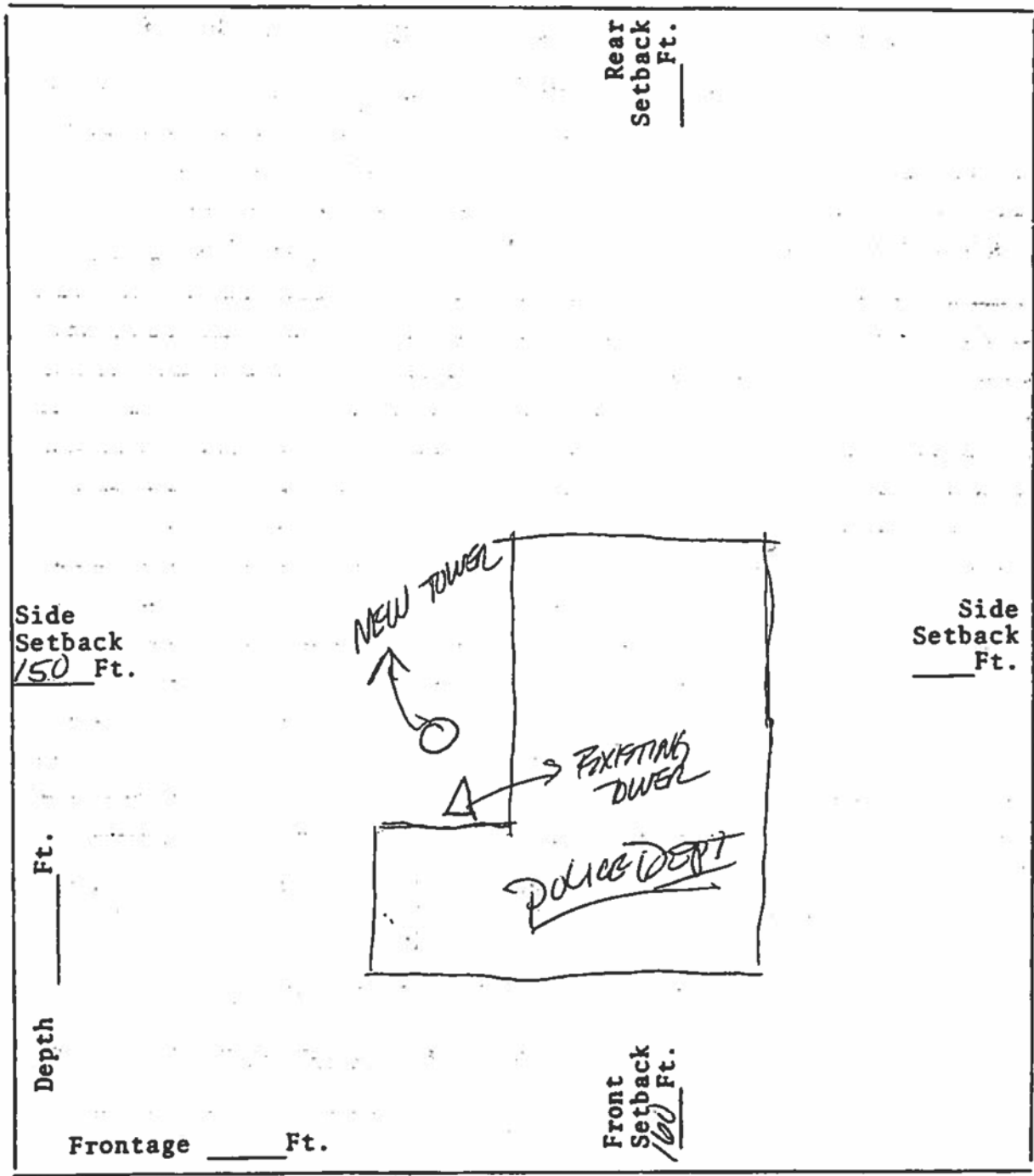
170 WESTMINSTER ST. PROV, RI 02903  
Address

401-854-1850  
Telephone No.

\*\*\*\*\*  
THIS APPROVAL IS SUBJECT TO COMPLIANCE (PRIOR TO OCCUPANCY) WITH THE PROVISIONS OF THE ZONING REGULATIONS AND THE SUBDIVISION REGULATIONS (WHERE APPLICABLE) OF THE TOWN OF CHESHIRE AND AS AUTHORIZED UNDER 8-3f OF THE CONNECTICUT GENERAL STATUTES, AS AMENDED.

A \$25.00 Fee has been paid by the applicant.

HOUSE NO. 500 HIGHLAND AVE STREET  
LOT NO. 2 OWNER OF LAND TOWN OF CHESTER  
INTERIOR OR CORNER LOT \_\_\_\_\_ ZONE R40



INFORMATION SUPPLIED BY:  
Habitat 10 Pros-Mgr.  
NAME TV2, LLC

No 11985

TOWN OF CHESHIRE, CONN.

Total Estimated Cost \$.....

Estimated Cost (structural) \$ 13,000.00

Fee \$ WAIVED.....

BUILDING PERMIT

OFFICE COPY OF PERMIT

December..... 19 84

Permission is hereby granted to Town of Cheshire - Police Dept. to erect a radio tower building on the side of 500 Highland Avenue

as follows:—Size ft. long, ft. wide, stories high; supported on walls to be; roof covered with; No. of house-keeping units Distance from nearest building feet; distance from street line feet; distance from each side of lot line E. feet; W. feet; S. feet; N. feet.

BUILDING LINE

Owner Town of Cheshire

Footing forms must be inspected before pouring of concrete. All sewage systems, rough electrical and rough plumbing must be inspected before covered. Certificate of Occupancy must be obtained before building is occupied.

FOR ADDITIONAL REQUIREMENTS TO THE BUILDING DEPARTMENT TOWN OF CHESHIRE, CONN. OF THIS PERMIT SEE OTHER SIDE.

John Buzzuto Building Inspector

Permission must be obtained from the Office of the Town Engineer before Building Material can be placed in the highway. Surface and roof water must not be connected with the sewer.

10-1-03 Footings and Rebar - OK R.S.  
 10-7-03 Tiers OK. Room  
 10-21-03 underground piping OK. R.S.  
 6-28-04 Final - OK R.S.

Building 500 Highland Avenue Date August 13, 2003

**BUILDING PERMIT**

Plumbing .....  
 Heating/AC .....  
 Electric 17942 .....  
 Oil Tank .....  
 Water .....  
 Septic .....  
 Sewer .....

23339

Estimated Cost \$ 180,000.00  
 Fee . . . . \$ 1980.00  
 Zoning Fee \$ 25.00  
 Total Cost \$ 2005.00

TO BUILDING DEPARTMENT, TOWN OF CHESHIRE, CONN.

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

No. 500 Highland Ave Lot No. \_\_\_\_\_ Zone R-40

Owner of building Town of Cheshire Address 84 So. Main St.

Builder Tower Ventures II Lbc. Address 170 Westminister St, Prov. Bk

Architect URS Address 795 Brook St. Rocky Hill

Size Main Bldg.: Ft. Front Overall \_\_\_\_\_ Ft. Deep Overall \_\_\_\_\_ Net Area \_\_\_\_\_ Garages \_\_\_\_\_

No. of Families \_\_\_\_\_ No. of Stories \_\_\_\_\_ Construction \_\_\_\_\_ No. of rooms: 1st \_\_\_\_\_ 2nd \_\_\_\_\_ 3rd \_\_\_\_\_

Purpose of this Permit To Erect a 160' Manopole Communication Tower and Attach (Install) Atft, Sprint, T-Mobile, Cingular wireless and Municipal Antennae. Erect a Retaining wall for future Equipment Buildings.

Dist. from lot line E. W. 160, S. N. 150, Dist. nearest bldg. ft.

Height of stories—cellar 1st 2nd 3rd 4th 5th

Found. depth below grade 47" min. Above grade

Size footing Material for found. Found. thickness 1/3"

Roof Outside studs Dist. centers Size sill Size of plate

No. of Stairways Piers Dist. apart No. of rows Size of pier found. 8' Larson

Materials for Exterior Walls Interior Walls Ceiling

Size of girders

Species of lumber—Floor joists Framing Sheath. R. Pl. Fin. Pl.

Floor joists, size: 1st 2nd 3rd stories. Dist. on center

Longest span of floor joist: 1st 2nd 3rd If not wood joist const. what type of floor?

Size of studs carrying partitions Size of Roof Rafters Longest span on center

Chimney Size of Flue How many? Tyle stark

I hereby agree to conform to all the requirements of the Laws of the State of Connecticut and the Ordinances of the Town of Cheshire, and to notify the Building Inspector of any alteration in the plans or specifications of the Building for which this permit is asked. And agree that this building is to be located the proper distance from all streets, sidewalks, side yard lines and required distances from all other zones and is located in a zone in which this building and its use is allowed.

Signed *[Signature]* HOK 5/14/10

Address 170 WESTMINSTER ST. POB. CT

Telephone 860 345-4602

**TOWN OF CHESHIRE, CONN.**

No 23339

Total Estimated Cost \$180,000.00

**BUILDING PERMIT**

Fee \$ 1,980.00

August 20, 2003

Permission is hereby granted to Tower Ventures II

to erect a communication tower, antennae and retaining wall

Address: 500 HIGHLAND AVENUE

as follows:—Size \_\_\_\_\_ ft. long, \_\_\_\_\_ ft. wide, \_\_\_\_\_ stories high;

supported on \_\_\_\_\_ walls to be \_\_\_\_\_;

roof covered with \_\_\_\_\_

E. \_\_\_\_\_ feet; W. \_\_\_\_\_ feet; S. \_\_\_\_\_ feet; N. \_\_\_\_\_ feet.

Owner Town of Cheshire

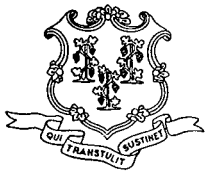
Footing forms must be inspected before pouring of concrete.  
 All sewage systems, rough electrical and rough plumbing must be inspected before covered.  
 Certificate of Occupancy must be obtained before building is occupied.

**BUILDING DEPARTMENT, TOWN OF CHESHIRE, CONN.**

*[Signature]* Building Inspector

Permission must be obtained from the Office of the Town Engineer before Building Material can be placed in the highway. Surface and roof water must not be connected with the sewer.





# STATE OF CONNECTICUT

## CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051

Phone: (860) 827-2935 Fax: (860) 827-2950

E-Mail: [siting.council@po.state.ct.us](mailto:siting.council@po.state.ct.us)

Web Site: [www.state.ct.us/csc/index.htm](http://www.state.ct.us/csc/index.htm)

July 25, 2003

Christopher B. Fisher, Esq.  
Cuddy & Feder LLP  
90 Maple Avenue  
White Plains, NY 10601-5196

RE: **TS-AT&T-025-030711** - AT&T Wireless PCS LLC, request for an order to approve tower sharing at an existing telecommunications facility located at 500 Highland Avenue, Cheshire, Connecticut.

Dear Attorney Fisher:

At a public meeting held July 22, 2003, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

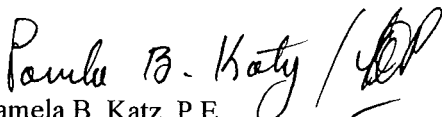
This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility may require an explicit request to this agency pursuant to General Statutes § 16-50aa or notice pursuant to Regulations of Connecticut State Agencies Section 16-50j-73, as applicable. Such request or notice shall include all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

This decision applies only to this request for tower sharing and is not applicable to any other request or construction.

The proposed shared use is to be implemented as specified in your letter dated July 11, 2003.

Thank you for your attention and cooperation.

Very truly yours,

  
Pamela B. Katz, P.E.  
Chairman

PBK/laf

c: Honorable Sandra R. Mouris, Council Chairman, Town of Cheshire  
Richard A. Pfurr, Town Planner, Town of Cheshire  
Thomas Regan, Esq., Brown Rudnick Berlack Israels LLP  
Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae

# Letter of Authorization (LOA)

## CT33762-M Site Reference

Site # CT33762-M

Site Name: 500 Highlnd Avenue/Light Tower

Site Address: 500 Highland Avenue, Cheshire,CT  
06410

## Property Reference

Site ID # CT2081

Name: C-74 CHESHIRE

## Authorization

Town of Cheshire CT, for itself and on behalf of its affiliates, ("Owner") authorizes New Cingular Wireless PCS, LLC d/b/a AT&T ("Tenant") and/or its authorized agents and contractors, to act as Owner nonexclusive agent for the sole purpose of applying for FAA applications or FAA filings and consummating any land use or building permit application(s) necessary to obtain approval of the applicable jurisdiction for Tenant's installation of a new wireless telecommunications facility and related equipment on the above-described site.

In granting this authorization it is understood that: (a) Tenant will hold harmless and indemnify Owner and its affiliates from any claims arising out of the above mentioned activities, and (b) signing this LOA does not constitute a legally binding agreement to license or lease the site.

Owner understands that this application may be denied, modified or approved with conditions, and that any such conditions of approval or modifications will be the sole responsibility of the carrier and will be complied with prior to issuance of a building permit.

## Owner Signature

Signature:



Print Name:

Sean M. Kimball

Title:

Town Manager



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Expected Delivery Date: 06/08/22

Ref#: CT2081

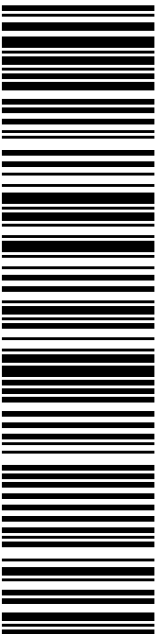
**0004**

**C010**



SEAN KIMBALL TOWN MANAGER MICHAEL  
TOWN OF CHESHIRE TOWN HALL  
84 S MAIN ST  
CHESHIRE CT 06410-3108

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SAI GROUP  
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SALEM NH 03079-2837

Expected Delivery Date: 06/09/22

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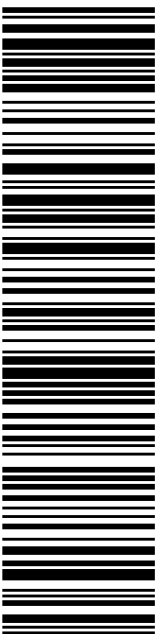
**0004**

**C036**



SBA COMMUNICATIONS CORP  
8051 CONGRESS AVE  
BOCA RATON FL 33487-1307

**USPS TRACKING #**



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Electronic Rate Approved #038555749



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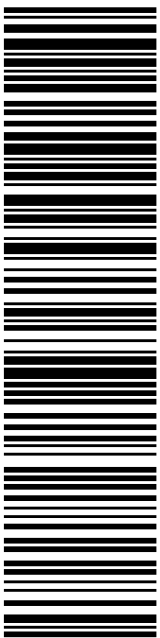
**0004**

**C006**



MELANIE BACHMAN EXECUTIVE DIRECTOR  
CT SITING COUNCIL  
10 FRANKLIN SQ  
NEW BRITAIN CT 06051-2655

**USPS TRACKING #**



**9405 5036 9930 0266 0003 31**

Electronic Rate Approved #038555749



Cut on dotted line.



**From:** auto-reply@usps.com  
**Sent:** Monday, June 6, 2022 2:16 PM  
**To:** Hollis Redding  
**Subject:** USPS® Expected Delivery by Tuesday, June 7, 2022 arriving by 9:00pm 9405503699300266000270

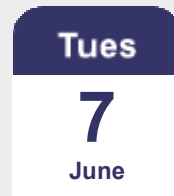


Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 2:00 pm on June 6, 2022 in MERIDEN

Tracking Number: [9405503699300266000270](#)

**Expected Delivery By**



**By 9:00pm**



**Tracking & Delivery Options**

[My Account](#)

**From:** [auto-reply@usps.com](mailto:auto-reply@usps.com)  
**To:** [Hollis Redding](#)  
**Subject:** USPS® Expected Delivery by Thursday, June 9, 2022 arriving by 9:00pm 9405503699300266000317  
**Date:** Monday, June 6, 2022 2:15:38 PM

SBA Copy



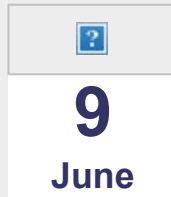
Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 2:00 pm on June 6, 2022 in MERIDEN, CT 06450.

Tracking Number:

[9405503699300266000317](#)

**Expected Delivery By**



**By 9:00pm**

By 9:00pm

