May 2, 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 CT2419
148 Roberts Street, East Hartford, CT 06118 (the "Property")
Latitude: 41.773336 N Longitude: -72.613439 W

Dear Ms. Bachman:

AT&T currently maintains (12) antennas at the 90' level on the existing 130' monopole tower ("Tower") at 148 Roberts Street, East Hartford, CT. The Tower is owned by American Tower Corp and the property is owned by CARO LLC. AT&T intends to modify its facility by replacing all (12) antennas with (3) AIR6449 B77D at 89'2", (3) TPA-65R-BU8A & (3) DMP-65R-BU8DA antennas at 90' and (3) Air6419 B77G at 92'8" level of the tower. The Air6449 B77D & AIR6419 B77G antennas are stacked one on top of the other. AT&T also intends to replace (6) RRUs with (3) 4415 B25 & (3) 4449 B5/B12 RRUs at the 90' level of the tower. The height of AT&Ts proposed antennas is 89'2", 90' & 92'8" on the tower. The height of AT&T existing & proposed RRUs is the 90' level of the tower.

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

The CT Siting Council ("Council") approved the Tower on November 7, 2002, under Docket 228. The Council approved Petition 941 increasing the tower height to 130' on May 6, 2010. AT&T received Council approval under TS-CING-043-140417 on May 15, 2014. These approvals contained no conditions that could feasibly be violated by this modification, including facility height or mounting restrictions. AT&Ts 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 to the Hon. Michael P. Walsh, Mayor, Town of East Hartford, the chief elected official, Mr. Jeffrey Cormier, Town Planner, Town of East Hartford, CARO LLC, the property owner and American Tower Corp, the tower owner.

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

Enclosures

Cc:
Hon. Michael P. Walsh, Mayor, chief elected official, Town of East Hartford
Mr. Jeffery Cormier, Town Planner, Town of East Hartford
CARO LLC, the property owner
American Tower Corp, the tower owner

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

Calculated Radio Frequency Emissions Report

CT2419

148 Roberts Street, East Hartford, CT

April 29, 2022

Table of Contents

List of Figures

List of Tables

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed New Cingular Wireless (AT&T) wireless communications facility on the existing tower located at 148 Roberts Street, East Hartford, CT. The coordinates of the existing tower are 41° 46' 24.01" N, 72° 36' 48.38" W.

AT&T is proposing to install ground-based equipment cabinets and antennas mounted at 90 feet AGL on the existingtower. This report uses the planned antenna configuration for AT&T[1] to derive the resulting % MPE (Maximum Permissible Exposure), once the proposed installation has been completed.

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

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

[1] As referenced to AT&T’s preliminary Radio Frequency Design Sheet dated 1/24/2022.

3. RF Exposure Calculation Methods

The calculated ground-level power density results displayed in the following figures were generated using the following formula as outlined in FCC bulletin OET 65:

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

Where:

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 in meters

Off Beam Loss is determined by the selected antenna patterns

Ground Reflection Factor (GRF) of 1.6

These calculations assume that the transmitters are operating at full power and 100 percent capacity and that all radio 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 calculated power density and corresponding % MPE levels reported below are much higher than the actual signal levels will be from the final installation.

4. Calculated % MPE Results based on Antenna Patterns

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

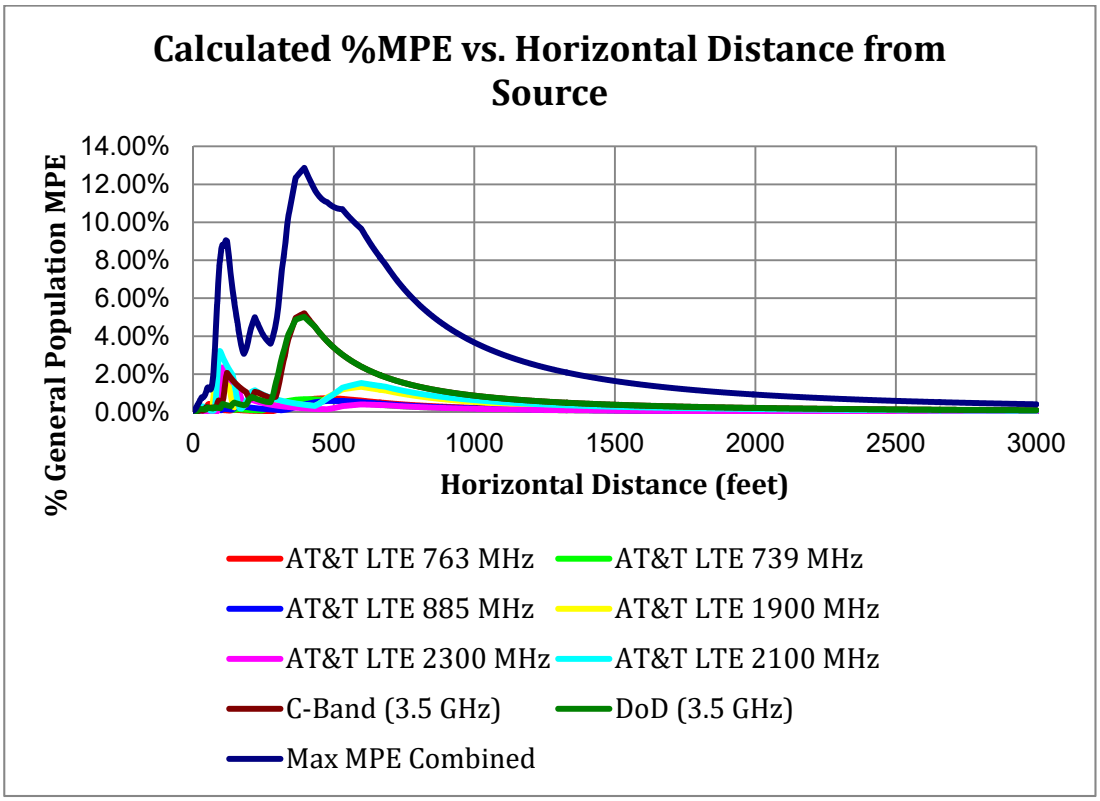

Figure 1: Graph of General Population % MPE vs. Distance for AT&T

The highest percent of MPE (**12.87%** of the General Population limit) is calculated to occur at a horizontal distance of 395 feet from antennas. Please note that the percent of MPE calculations close to the site take into account off beam loss, which is determined from the vertical pattern of the antennas used. Therefore, RF power density levels may increase as the distance from the site increases. At distances of approximately 900 feet and beyond, one would now be in the main beam of the antenna pattern and off beam loss is no longer considered. Beyond this point, RF levels become calculated solely on distance from the site and the percent of MPE decreases significantly as distance from the site increases.

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

Carrier	Number of Transmitters	Power out of Base Station Per Transmitter (Watts)	Antenna Height (Feet)	Distance to the Base of Antennas (Feet)	Power Density (mW/cm^2)	Limit (mW/cm^2)	% MPE
AT&T LTE 1900 MHz	3	160.0	90.0	395	0.003697	1.000	0.37%
AT&T LTE 2100 MHz	2	240.0	90.0	395	0.003871	1.000	0.39%
AT&T LTE 2300 MHz	1	160.0	90.0	395	0.001994	1.000	0.20%
AT&T LTE 739 MHz	1	160.0	90.0	395	0.003344	0.493	0.68%
AT&T LTE 763 MHz	1	160.0	90.0	395	0.003103	0.509	0.61%
AT&T LTE 885 MHz	1	160.0	90.0	395	0.002357	0.590	0.40%
C-Band (3.5 GHz)	1	108.5	90.0	395	0.052053	1.000	5.21%
DoD (3.5 GHz)	1	108.5	90.0	395	0.050175	1.000	5.02%
						Total	**12.87%**

Table 1: Maximum Percent of General Population Exposure Values for AT&T

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
DISH	79	600	4	224	0.0605	0.400	1.51%
DISH	79	1900	4	543	0.1466	1.000	1.47%
DISH	79	2100	4	543	0.1466	1.000	1.47%
T-Mobile	100	1900	2	2057	0.1674	1.000	1.67%
T-Mobile	100	2100	2	2308	0.1879	1.000	1.88%
T-Mobile	100	600	2	592	0.0482	0.400	1.20%
T-Mobile	100	600	1	1578	0.0642	0.400	1.61%
T-Mobile	100	700	2	695	0.0566	0.467	1.21%
T-Mobile	100	1900	2	2105	0.1713	1.000	1.71%
T-Mobile	100	2100	2	1325	0.1079	1.000	1.08%
T-Mobile	100	2500	1	11045	0.4495	1.000	4.50%
T-Mobile	100	2500	1	1074	0.0437	1.000	0.44%
T-Mobile	100	2500	1	22089	0.8990	1.000	8.99%
T-Mobile	100	2500	1	2148	0.0874	1.000	0.87%
Verizon	120	751	4	756	0.0837	0.501	1.67%
Verizon	120	869	2	402	0.0222	0.579	0.38%
Verizon	120	869	4	699	0.0774	0.579	1.34%
Verizon	120	1980	4	1496	0.1656	1.000	1.66%
Verizon	120	2125	4	1671	0.1850	1.000	1.85%
Verizon	120	3730	4	6531	0.7229	1.000	7.23%
Verizon	120	3625	4	12	0.0013	1.000	0.01%
Sprint	128	850	1	377	0.0091	0.567	0.16%
Sprint	128	850	2	942	0.0455	0.567	0.80%
Sprint	128	1900	5	512	0.0619	1.000	0.62%
Sprint	128	1900	2	1280	0.0619	1.000	0.62%
Sprint	128	2500	8	640	0.1237	1.000	1.24%
Sprint	128	18000	1	4416	0.1067	1.000	1.07%
Sprint	70	11000	1	1718	0.1508	1.000	1.51%
Sprint	110	1962.5	11	308.51	0.1128	1.000	1.13%
AT&T	90	739	1	3156	0.0033	0.4927	0.68%
AT&T	90	763	1	3541	0.0031	0.5087	0.61%
AT&T	90	885	1	3883	0.0024	0.5900	0.40%
AT&T	90	1900	3	6297	0.0037	1.0000	0.37%
AT&T	90	2100	2	9890	0.0039	1.0000	0.39%
AT&T	90	2300	1	6297	0.0020	1.0000	0.20%
AT&T	89.17	3500	1	24286	0.0521	1.0000	5.21%
AT&T	92.67	3500	1	24286	0.0502	1.0000	5.02%
						Total	**63.75%**

Table 2: Combined %MPE for all operators[2]

[2] 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 Verizon, Sprint, DISH 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 verifies that RF exposure levels from the site with AT&T's proposed antenna configuration will be well below the maximum permissible levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using the conservative calculation methods and parameters detailed above, the maximum cumulative percent of MPE at 6' above ground level and in consideration of AT&T's proposed antenna installation in conjunction with the other installations on the tower is calculated to be **63.75% of the FCC limit (General Population/Uncontrolled)**. This maximum cumulative percent of MPE value for AT&T's transmitters is calculated to occur 395 feet away from the site.

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, IEEE Std. C95.1, IEEE Std. C95.3, and IEEE Std. C95.7.

April 29, 2022

Reviewed/Approved By: _____ Date

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 Humhyan Exposure to Such Fields, 100 kHz-300 GHz IEEE-SA Standards Board

IEEE C95.7-2005 (R2014), IEEE Recommended Practice for Radio Frequency Safety Programs, 3 kHz to 300 GHz. IEEE-SA Standards Board

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

(A) Limits for Occupational/Controlled Exposure[3]

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

(B) Limits for General Population/Uncontrolled Exposure[4]

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

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

Table 3: FCC Limits for Maximum Permissible Exposure

[3] 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.

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

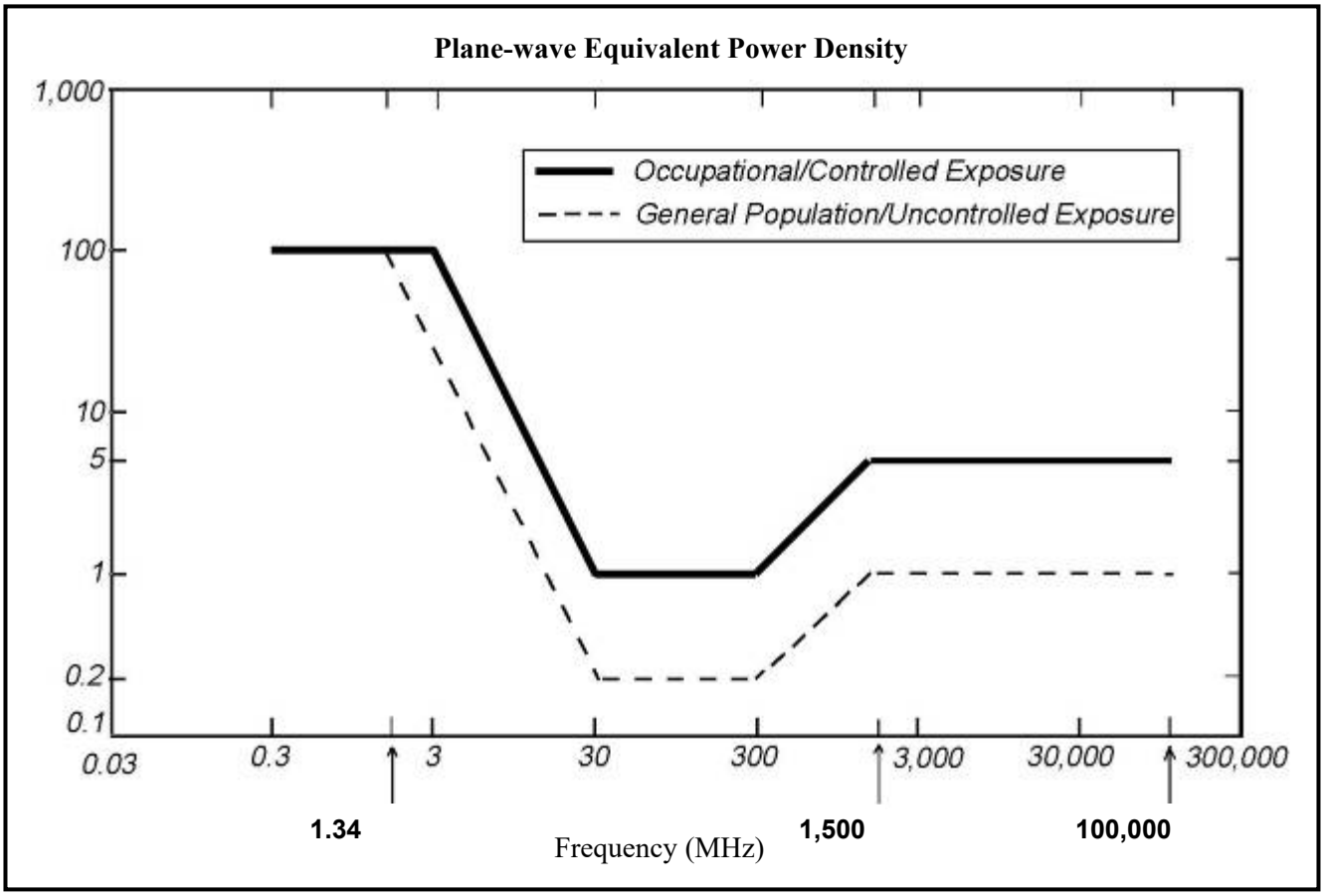

Figure 2: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE:
- NEW AT&T ANTENNAS: AIR AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: AIR AIR6449 B77D (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: TPA-65R-BU8A (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: DMP65R-BU8DA (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- 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).
- EXISTING AT&T 4478 B14 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS 2).
- EXISTING AT&T RRUS 32 B66A (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS 2).
- EXISTING AT&T RRUS 32 B30 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS 4).
- NEW AT&T SURGE ARRESTOR DC6-48-60-18-8F (TOTAL OF 1)
- ADD (1) 18-PAIR FIBER LINE.
- NEW 4x4 HSS STEEL TUBES STAND-OFFS SECURED TO THE EXISTING PIPE MASTS (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- NEW 2-1/2" STD. (2.88" O.D.) PIPE MAST SECURE TO THE EXISTING MOUNT AND HANDRAIL (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- ADD 2" CONDUIT WITH (2) 6GUAGE DC CABLES (TO REPLACE EXISTING).
- ADD (3) Y-CABLES.

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- ADD (1) 6630 + IDLE CABLE.
- ADD (1) 6648 + XCEDE CABLE.
- ADD (4) RECTIFIERS.

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNA: HPA-65R-BUU-H8 (TYP. OF 4 PER SECTOR, TOTAL OF 12).
- EXISTING AT&T RRUS 32 B2 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS 11 B5 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T (6) COAX CABLES.
- EXISTING 3" CONDUIT WITH (2) 8GUAGE DC CABLES.

ITEMS TO REMAIN:
- (9) RRU'S, (3) SURGE ARRESTOR, (8) DC POWER & (2) FIBER.

SITE ADDRESS:	148 ROBERTS STREET EAST HARTFORD, CT 06118
LATITUDE:	41.773336° N, 41° 46' 24.01" N
LONGITUDE:	72.613439° W, 72° 36' 48.38" W
TYPE OF SITE:	MONOPOLE / OUTDOOR EQUIPMENT
STRUCTURE HEIGHT:	130'-0"±
RAD CENTER:	90'-0"± (LTE) 92'-8"±, 89'-2"± (C-BAND)
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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A-2	ANTENNA LAYOUTS & ELEVATION	3
A-3	DETAILS	3
SN-1	STRUCTURAL NOTES	3
S-1	MOUNT MODIFICATION DESIGN	3
G-1	GROUNDING DETAILS	3
RF-1	RF PLUMBING DIAGRAM	3

SITE NUMBER: CT2419

SITE NAME: EAST HARTFORD

FA CODE: 10552892

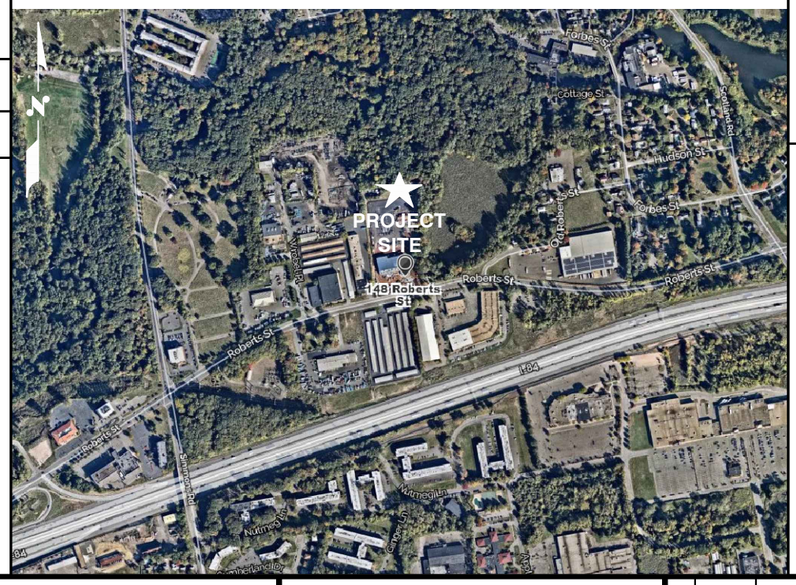
PACE ID: MRCTB052076, MRCTB051154, MRCTB051002, MRCTB051125, MRCTB051049

PROJECT: 5G NR 1SR_C-BAND_BBU ADD UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

TURN LEFT ONTO CAPITAL BLVD.TURN LEFT ONTO WEST ST. MERGE ONTO I-91 N VIA THE RAMP ON THE LEFT TOWARD HARTFORD. MERGE ONTO CT-15 N/WILBUR CROSS HWY N VIA EXIT 29 TOWARD I-84 E/E HARTFORD/BOSTON. TAKE THE SILVER LANE EXIT, EXIT 91. KEEP LEFT TO TAKE THE SILVER LANE RAMP. MERGE ONTO SILVER LN.TURN LEFT ONTO ROBERTS ST. 148 ROBERTS ST, EAST HARTFORD, CT 06108-3637, 148 ROBERTS ST IS ON THE LEFT.



GENERAL NOTES

1. 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.
2. 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.
3. 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.
4. CONSTRUCTION DRAWINGS ARE VALID FOR SIX MONTHS AFTER ENGINEER OF RECORD'S STAMPED AND SIGNED SUBMITTAL DATE LISTED HEREIN.

72 HOURS

CALL
BEFORE YOU DIG
CALL TOLL FREE 1-800-922-4455
OR CALL 811

UNDERGROUND SERVICE ALERT

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2419
SITE NAME: EAST HARTFORD

148 ROBERTS STREET
EAST HARTFORD, CT 06118
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	04/12/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
2	03/30/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	03/09/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
A	01/29/22	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

TITLE SHEET

5G NR 1SR_C-BAND_BBU ADD UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2419	T-1	3

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	TBRR	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 CL	RADIATION CENTER LINE (ANTENNAS)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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12 INDUSTRIAL WAY
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SITE NUMBER: CT2419
SITE NAME: EAST HARTFORD

148 ROBERTS STREET
EAST HARTFORD, CT 06118
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
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1	03/09/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
A	01/29/22	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

GENERAL NOTES

5G NR 1SR_C-BAND_BBU ADD UPGRADE

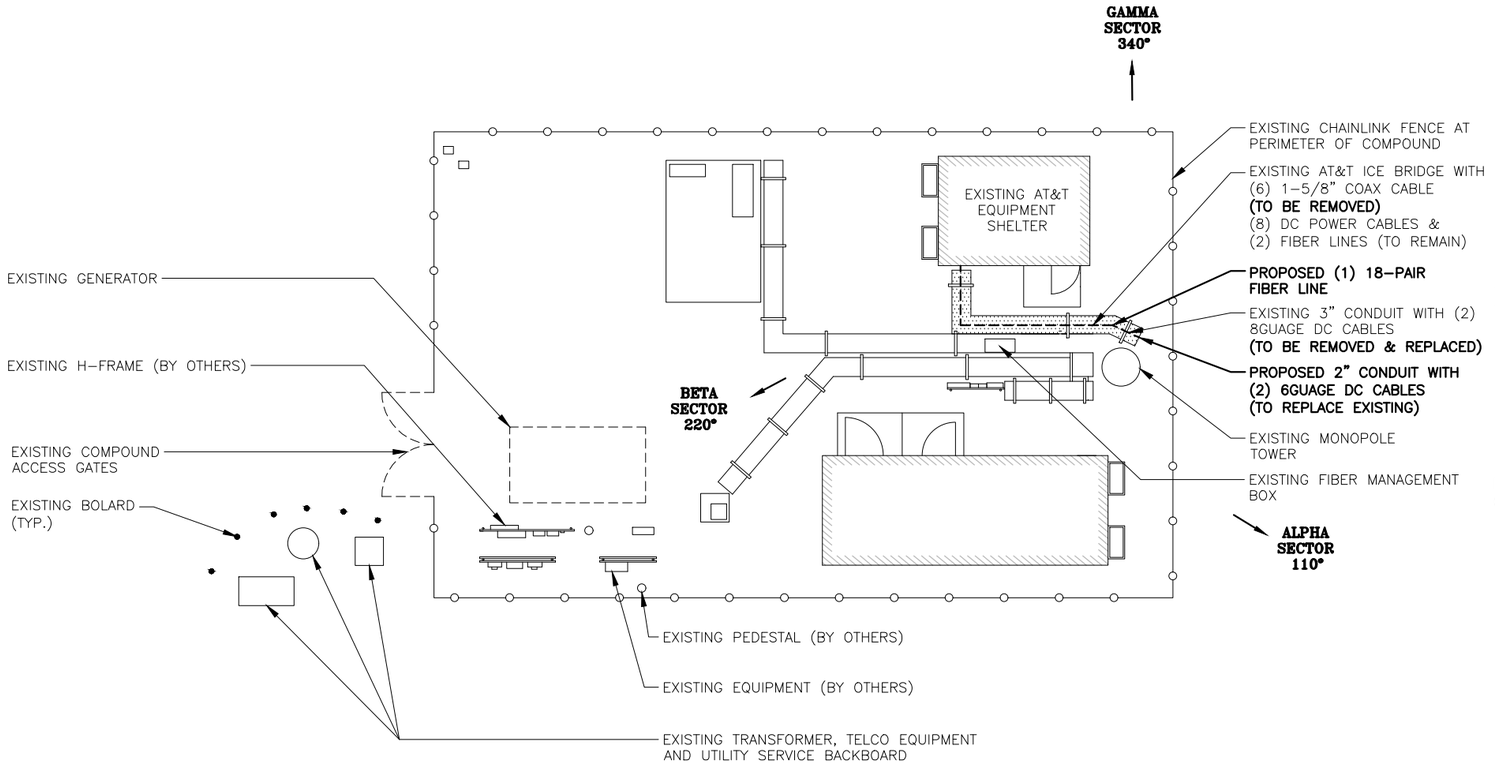
SITE NUMBER	DRAWING NUMBER	REV
CT2419	GN-1	3

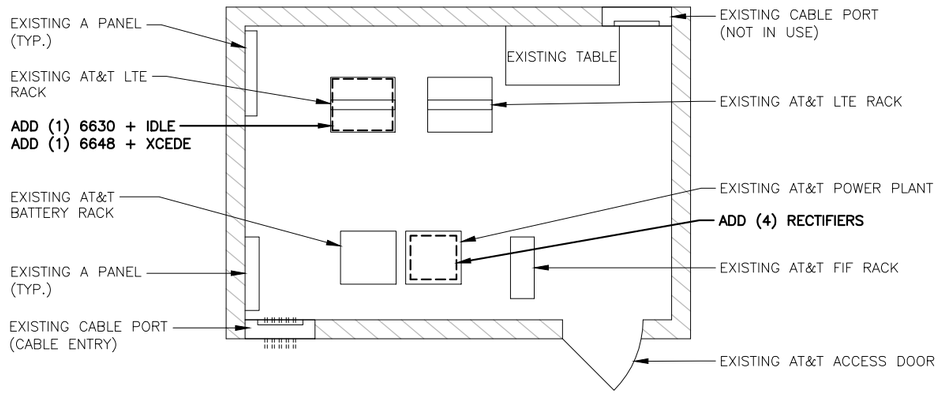
NOTE:

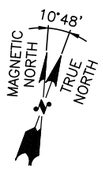
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: FEBRUARY 10, 2022

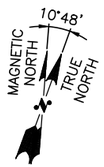






COMPOUND PLAN (1 / A–1)
22x34 SCALE: 1/8"=1'–0"
11x17 SCALE: 1/16"=1'–0"

0 4'–0" 8'–0" 16'–0" 24'–0"



EQUIPMENT PLAN (2 / A–1)
22x34 SCALE: 3/8"=1'–0"
11x17 SCALE: 3/16"=1'–0"

0 1'–4" 2'–8" 5'–4" 8'–0"

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SAI
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SALEM, NH 03079

SITE NUMBER: CT2419
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148 ROBERTS STREET
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HARTFORD COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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A	01/29/22	ISSUED FOR REVIEW	AM	HC	DPH

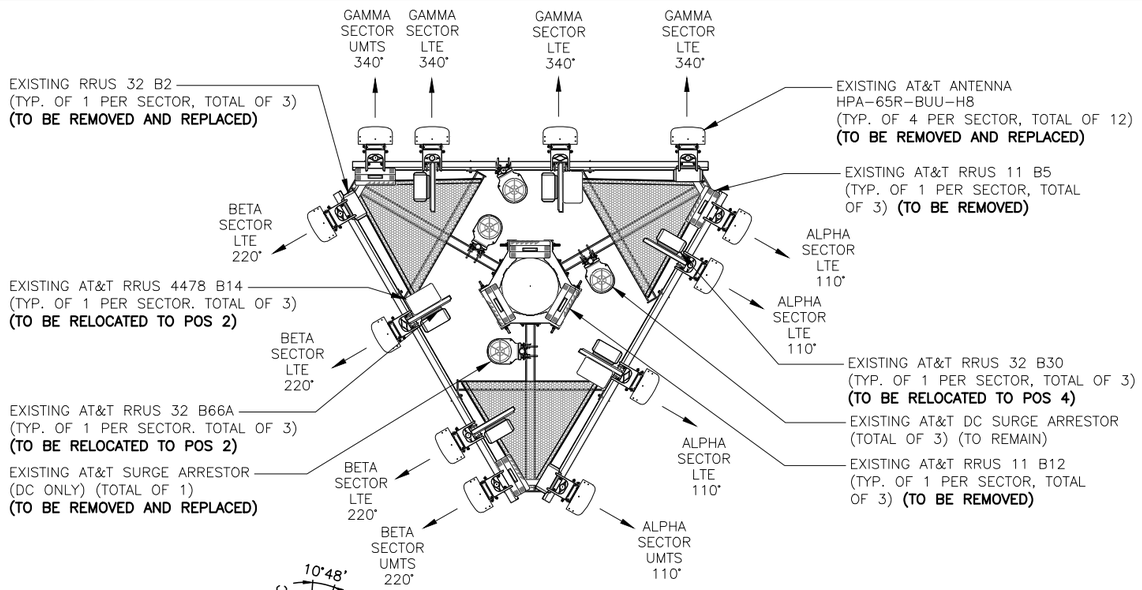
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLANS
5G NR 1SR_C–BAND_BBU ADD UPGRADE

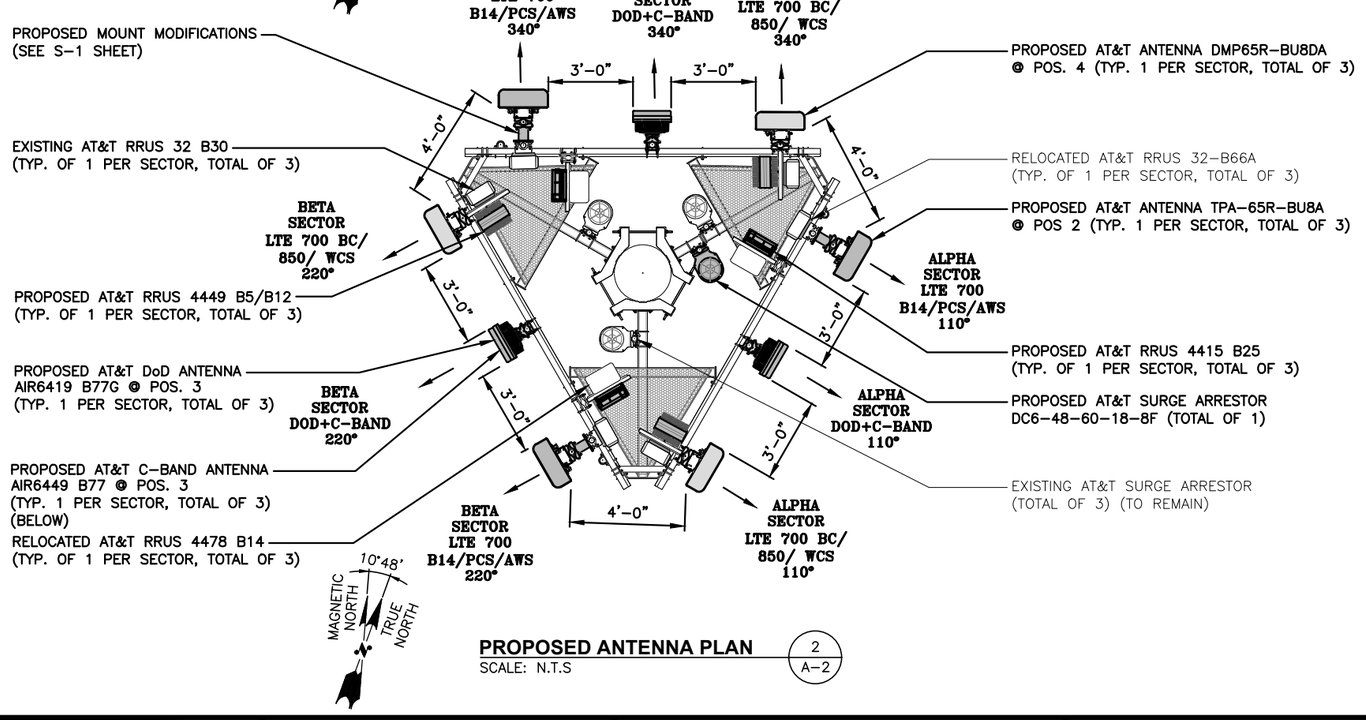
SITE NUMBER	DRAWING NUMBER	REV
CT2419	A–1	3



EXISTING ANTENNA PLAN

SCALE: N.T.S

1 / A-2



PROPOSED ANTENNA PLAN

SCALE: N.T.S

2 / A-2

NOTE:

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

NOTE:

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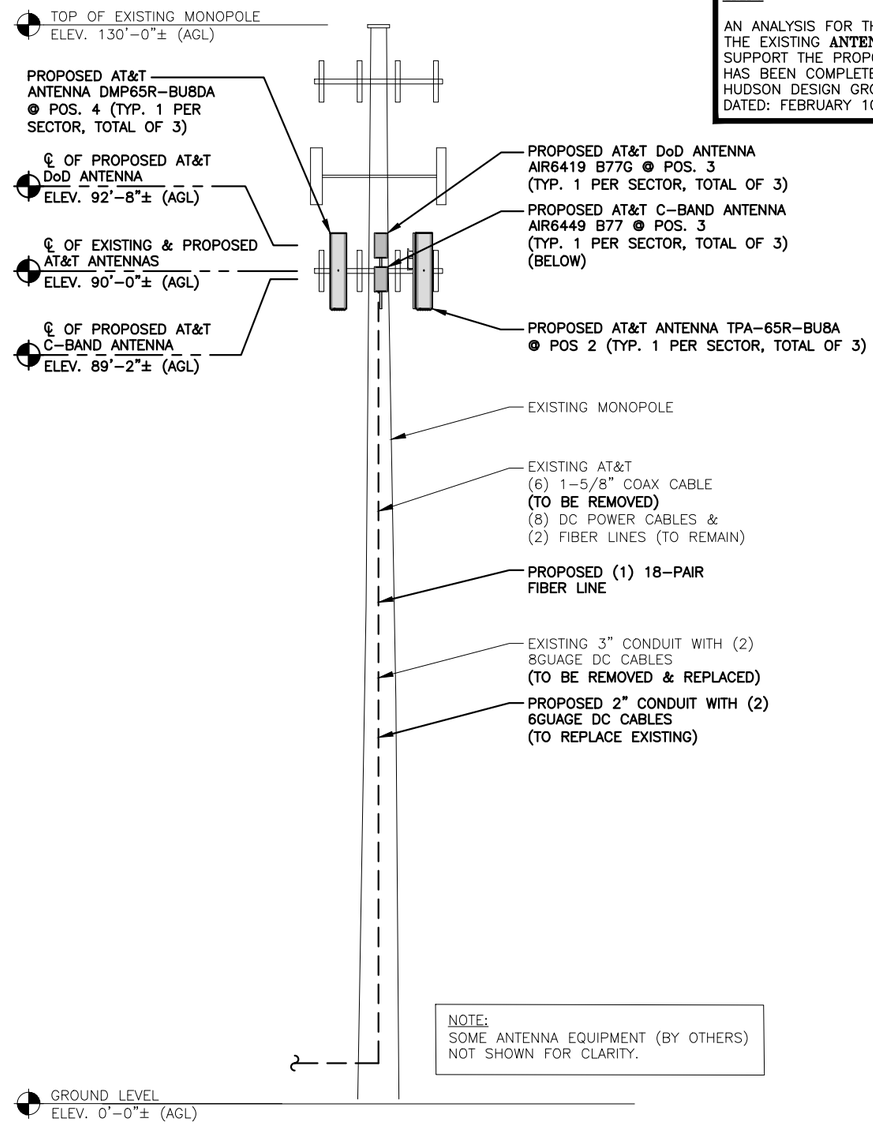

NOTE:
SOME ANTENNA EQUIPMENT (BY OTHERS) NOT SHOWN FOR CLARITY.

ELEVATION

22x34 SCALE: 1/8"=1'-0"
11x17 SCALE: 1/16"=1'-0"

3 / A-2

0 4'-0" 8'-0" 16'-0" 24'-0"

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STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

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ANTENNA LAYOUTS & ELEVATION

5G NR 1SR_C-BAND_BBU ADD UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2419	A-2	3

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC6-48-60-18-8F (E) (1) DC6-48-60-0-8F SURGE ARRESTOR
A2	PROPOSED	LTE 700 B14/PCS/AWS	TPA-65R-BU8A	96X20.7X7.7	90'-0"±	110°	–	(E)(1) RRUS-32 B66A (AWS) (E)(1) 4478 B14 (700) **(P)(1) 4415 B25 (PCS)**	– – **16.5"x13.4"x5.9"**	(E)(2) DC POWER & (E)(1) FIBER, (E)(2) DC POWER	
A3	PROPOSED	DOD+C-BAND	AIR6419 B77G AIR6449 B77 (STACKED)	31.1X16.1X7.3 30.6X15.9X10.6	92'-8"± 89'-2"±	110°	–	–	–	–	
A4	PROPOSED	LTE 700 BC/ 850/ WCS	DMP65R-BU8DA	96.0X20.7X7.7	90'-0"±	110°	–	**(P)(1) 4449 B5/B12 (850/700)** (E)(1) RRUS-32 B30 (WCS)	**17.9"x13.2"x10.4"** –	–	
B1	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC6-48-60-18-8F
B2	PROPOSED	LTE 700 B14/PCS/AWS	TPA-65R-BU8A	96X20.7X7.7	90'-0"±	220°	–	(E)(1) RRUS-32 B66A (AWS) (E)(1) 4478 B14 (700) **(P)(1) 4415 B25 (PCS)**	– – **16.5"x13.4"x5.9"**	(E)(2) DC POWER & (E)(1) FIBER	
B3	PROPOSED	DOD+C-BAND	AIR6419 B77G AIR6449 B77 (STACKED)	31.1X16.1X7.3 30.6X15.9X10.6	92'-8"± 89'-2"±	220°	–	–	–	–	
B4	PROPOSED	LTE 700 BC/ 850/ WCS	DMP65R-BU8DA	96.0X20.7X7.7	90'-0"±	220°	–	**(P)(1) 4449 B5/B12 (850/700)** (E)(1) RRUS-32 B30 (WCS)	**17.9"x13.2"x10.4"** –	–	
C1	–	–	–	–	–	–	–	–	–	–	**(P) (1) RAYCAP DC6-48-60-18-8F**
C2	PROPOSED	LTE 700 B14/PCS/AWS	TPA-65R-BU8A	96X20.7X7.7	90'-0"±	340°	–	(E)(1) RRUS-32 B66A (AWS) (E)(1) 4478 B14 (700) **(P)(1) 4415 B25 (PCS)**	– – **16.5"x13.4"x5.9"**	(E)(2) DC POWER & **(P)(1) FIBER**	
C3	PROPOSED	DOD+C-BAND	AIR6419 B77G AIR6449 B77 (STACKED)	31.1X16.1X7.3 30.6X15.9X10.6	92'-8"± 89'-2"±	340°	–	–	–	–	
C4	PROPOSED	LTE 700 BC/ 850/ WCS	DMP65R-BU8DA	96.0X20.7X7.7	90'-0"±	340°	–	**(P)(1) 4449 B5/B12 (850/700)** (E)(1) RRUS-32 B30 (WCS)	**17.9"x13.2"x10.4"** –	–	

FINAL ANTENNA SCHEDULE (1 / A-3)
SCALE: N.T.S

RRU CHART

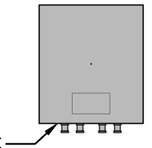
QUANTITY	MODEL	SIZE (L x W x D)
P(3)	**4449 B5/B12 (850/700)**	**17.9"x13.2"x10.4"**
E(3)	4478 B14 (700)	18.1"x13.4"x8.3"
P(3)	**4415 B25**	**16.5"x13.4"x5.9"**
E(3)	RRUS-32 B30(WCS)	27.2"x12.1"x7.0"
E(3)	RRUS-32 B66A	19.7"x17.0"x7.2"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY:
HUDSON DESIGN GROUP, LLC.
DATED: FEBRUARY 10, 2022

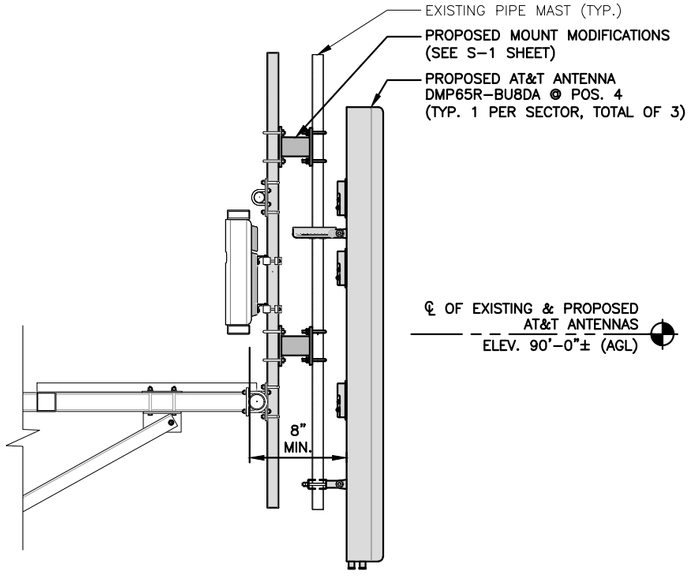
NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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

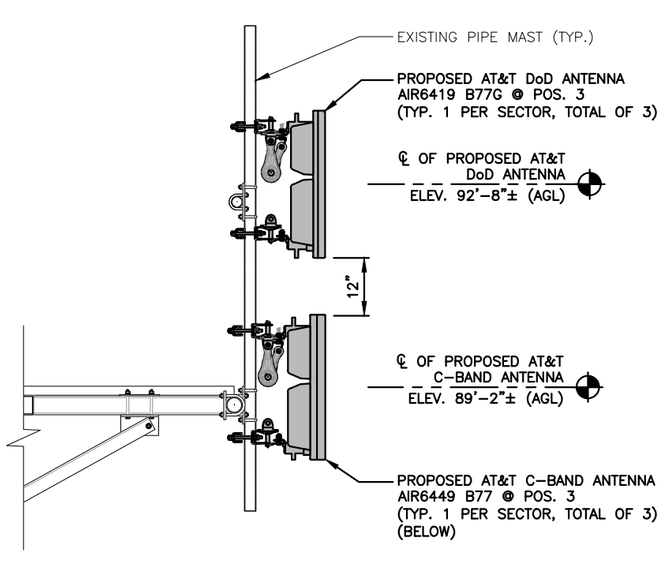
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRUS DETAIL (2 / A-3)
SCALE: N.T.S



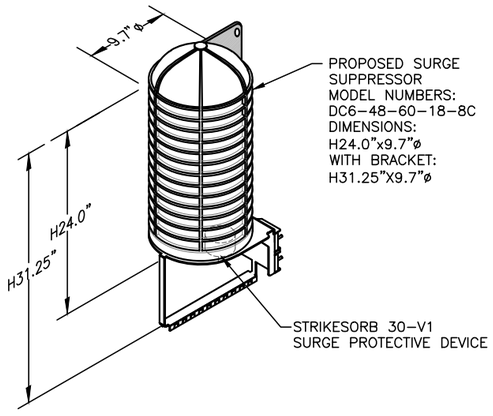
PROPOSED LTE ANTENNA MOUNTING DETAIL (3 / A-3)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

0 8" 1'-4" 2'-8" 4'-0"



PROPOSED C-BAND ANTENNA MOUNTING DETAIL (4 / A-3)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"

0 8" 1'-4" 2'-8" 4'-0"



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL (5 / A-3)
SCALE: N.T.S

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STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

DETAILS

5G NR 1SR_C-BAND_BBU ADD UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2419	A-3	3

STRUCTURAL NOTES:

1. 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.
2. 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.
3. 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".
4. STRUCTURAL STEEL SHALL CONFORM TO ASTM A992 (Fy=50 ksi), MISCELLANEOUS STEEL SHALL CONFORM TO ASTM A36 UNLESS OTHERWISE INDICATED.
5. STEEL PIPE SHALL CONFORM TO ASTM A500 "COLD-FORMED WELDED & SEAMLESS CARBON STEEL STRUCTURAL TUBING", GRADE B, OR ASTM A53 PIPE STEEL BLACK AND HOT-DIPPED ZINC-COATED WELDED AND SEAMLESS TYPE E OR S, GRADE B. PIPE SIZES INDICATED ARE NOMINAL. ACTUAL OUTSIDE DIAMETER IS LARGER.
6. 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.
7. 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.
8. 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.
9. 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 NOT LESS THAN 4 COATS (ALLOW TIME TO DRY BETWEEN COATS) WITH A RESULTING COATING THICKNESS REQUIRED BY ASTM A123 OR A153 AS APPLICABLE.
10. 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 D1.1. WHERE FILLET WELD SIZES ARE NOT SHOWN, PROVIDE THE MINIMUM SIZE PER TABLE J2.4 IN THE AISC "STEEL CONSTRUCTION MANUAL". 14TH EDITION.
11. 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.
12. 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.
13. 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 HILTI-HIT HY-270 AND OR HY-200 SYSTEMS (AS SPECIFIED IN DWG.) OR ENGINEERS APPROVED EQUAL.
14. 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.
15. 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.
16. 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.
17. 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.
18. NO MATERIALS TO BE ORDERED AND NO WORK TO BE COMPLETED UNTIL SHOP DRAWINGS HAVE BEEN REVIEWED AND APPROVED IN WRITING.
19. 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	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS [3]
ADDITIONAL TESTING AND INSPECTIONS:	
DURING CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS [4]
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION [5]
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:	
AFTER CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS [6]
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS
ADDITIONAL TESTING AND INSPECTIONS:	

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT2419
SITE NAME: EAST HARTFORD

148 ROBERTS STREET
EAST HARTFORD, CT 06118
HARTFORD COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
3	04/12/22	ISSUED FOR CONSTRUCTION	JF	HC	DPH
2	03/30/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
1	03/09/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
A	01/29/22	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

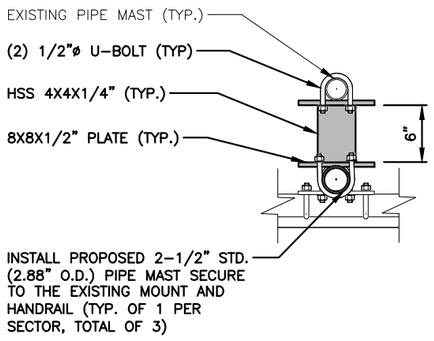
STATE OF CONNECTICUT · DANIEL P. HAMM · No. 24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

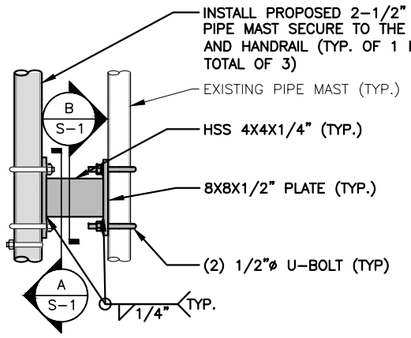
STRUCTURAL NOTES

5G NR 1SR_C-BAND_BBU ADD UPGRADE

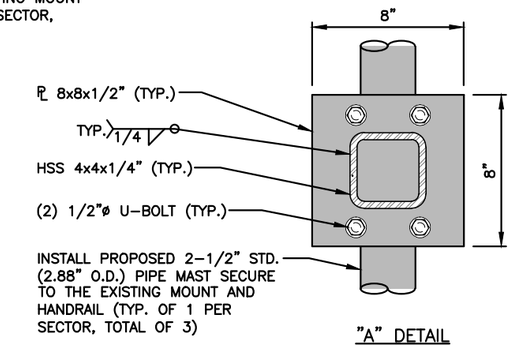
SITE NUMBER	DRAWING NUMBER	REV
CT2419	SN-1	3



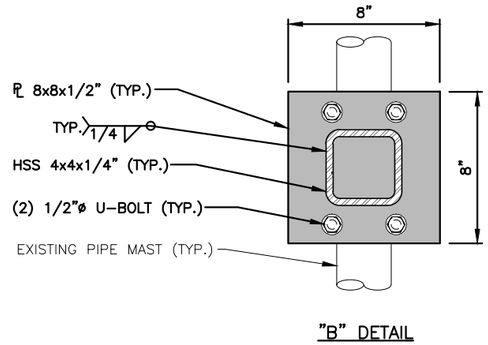
PLAN VIEW



SIDE VIEW



"A" DETAIL



"B" DETAIL

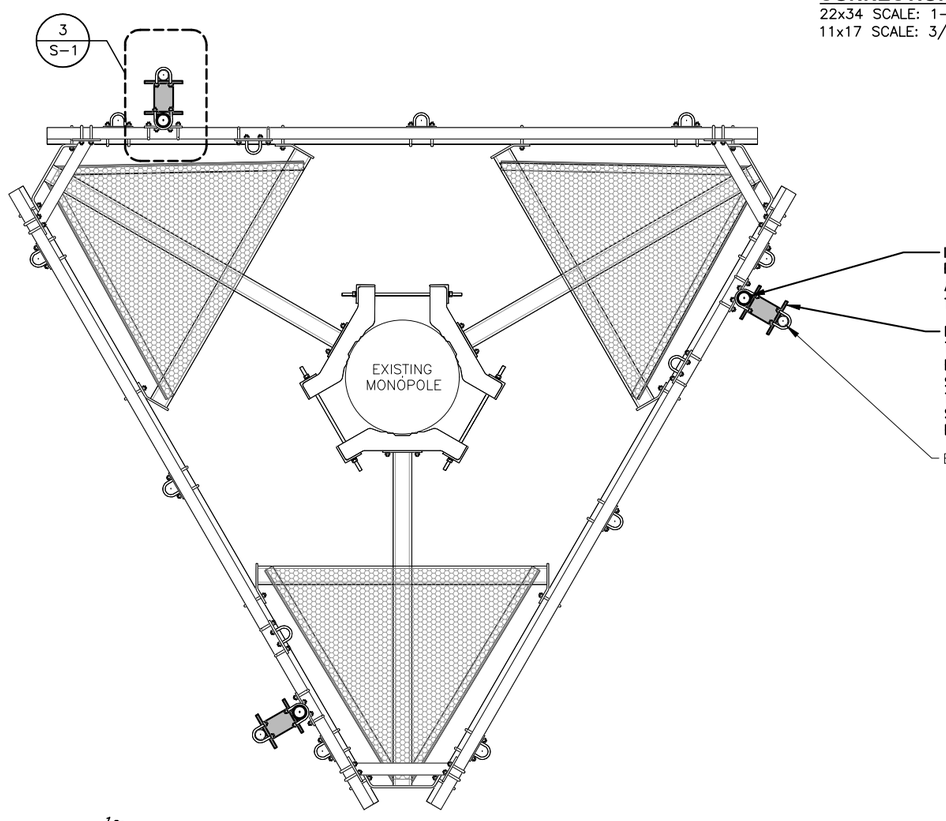
NOTE:

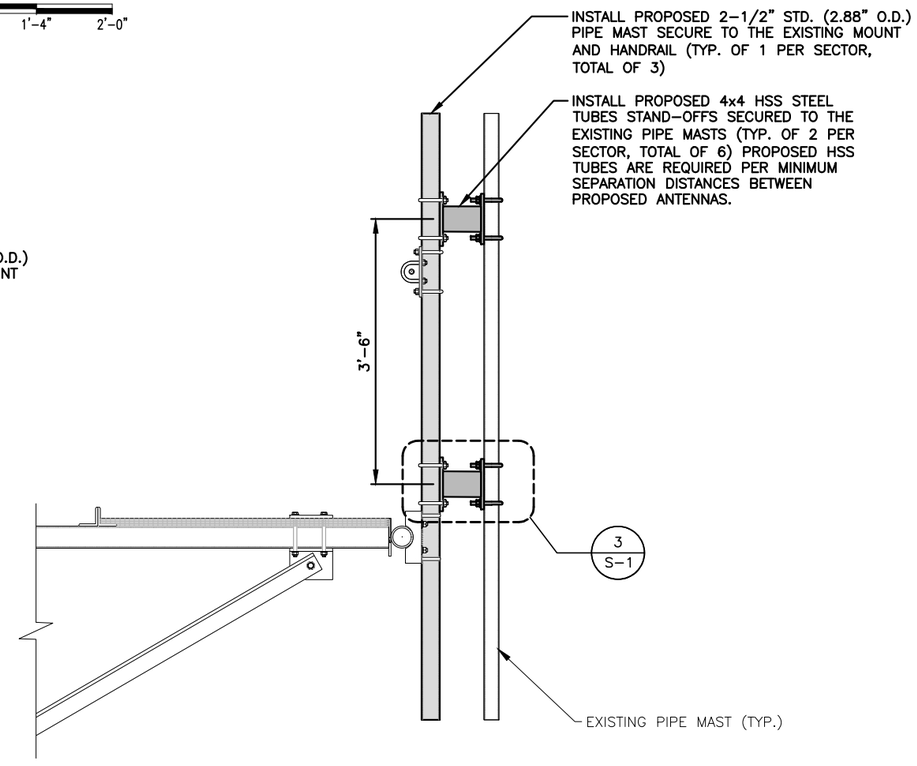
REFER TO THE FINAL RF DATA SHEET FOR FINAL ANTENNA SETTINGS.

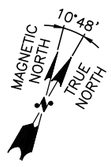
NOTE:

AN ANALYSIS FOR THE CAPACITY OF EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: JANUARY 21, 2022

CONNECTION DETAIL (3 / S-1)
22x34 SCALE: 1-1/2"=1'-0"
11x17 SCALE: 3/4"=1'-0"
0 0'-4" 0'-8" 1'-4" 2'-0"







PROPOSED MOUNT MODIFICATIONS PLAN (1 / S-1)
22x34 SCALE: 3/4"=1'-0"
11x17 SCALE: 3/8"=1'-0"
0 8" 1'-4" 2'-8" 4'-0"

PROPOSED MOUNT MODIFICATIONS DETAIL (2)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"
0 1'-0" 2'-0" 3'-0"

HDG HUDSON Design Group LLC
45 BEECHWOOD DRIVE
NORTH ANDOVER, MA 01845
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FAX: (978) 336-5586

SAI
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SALEM, NH 03079

SITE NUMBER: CT2419
SITE NAME: EAST HARTFORD

148 ROBERTS STREET
EAST HARTFORD, CT 06118
HARTFORD COUNTY

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

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1	03/09/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
A	01/29/22	ISSUED FOR REVIEW	AM	HC	DPH

SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

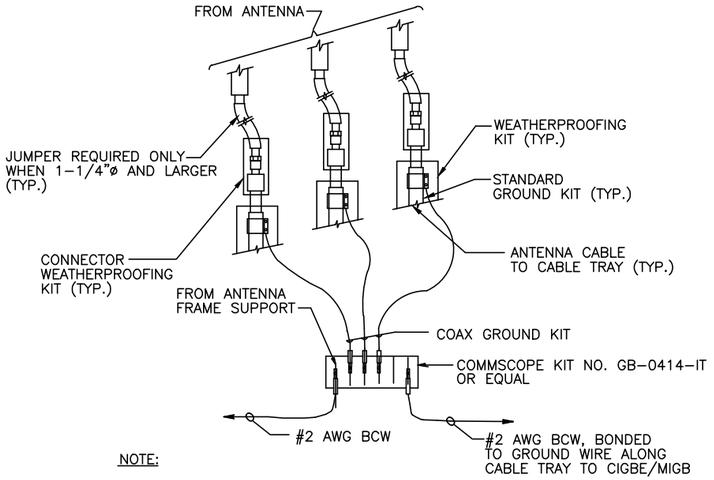
STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

MOUNT MODIFICATION DESIGN

5G NR 1SR_C-BAND_BBU ADD UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2419	S-1	3



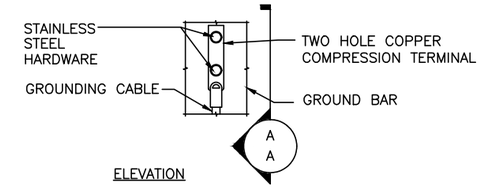
NOTE:

1. DO NOT INSTALL CABLE GROUND KIT AT A BEND AND ALWAYS DIRECT GROUND WIRE DOWN TO CIGBE.

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

1 / G-1



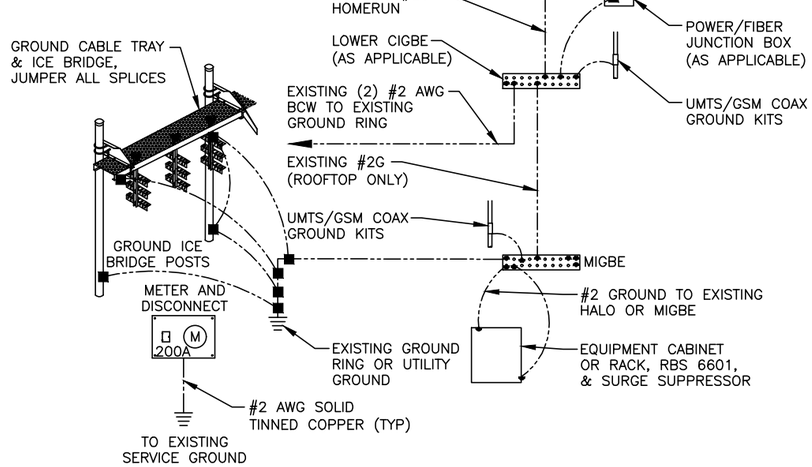
NOTES:

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

SCALE: N.T.S

3 / G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1

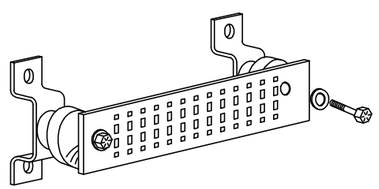
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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)

SCALE: N.T.S

HUDSON Design Group LLC
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

STATE OF CONNECTICUT
DANIEL P. HAMM
No. 24178
LICENSED PROFESSIONAL ENGINEER

AT&T

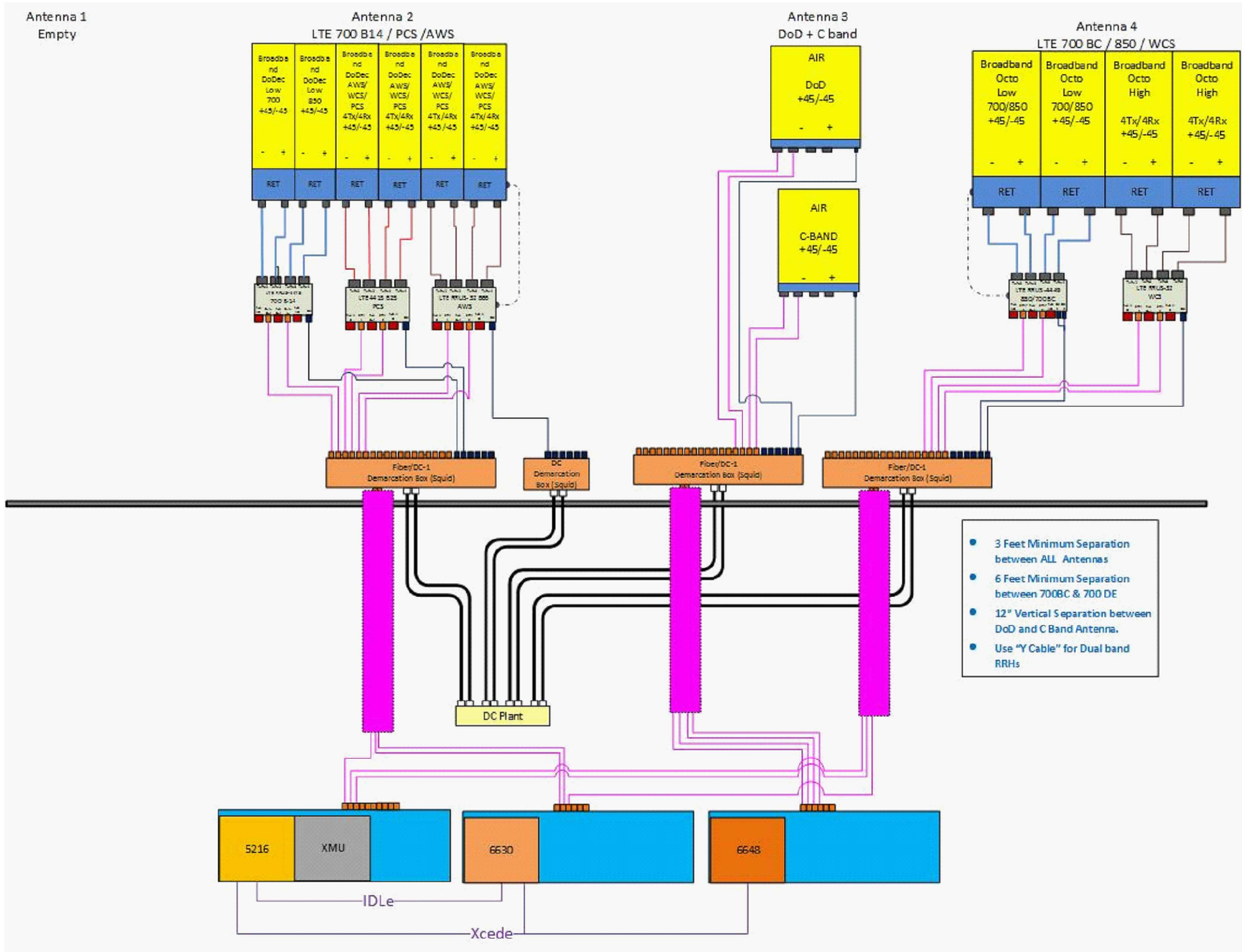
GROUNDING DETAILS

5G NR 1SR_C-BAND_BBU ADD UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2419	G-1	3

NOTE:

REV: 5
DATED: 3/2/2021
RFDS ID: 4391511



RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

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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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: AM

AT&T

RF PLUMBING DIAGRAM
5G NR 1SR_C–BAND_BBU ADD UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT2419	RF–1	3

AMERICAN TOWER®
CORPORATION

Structural Analysis Report

Structure	:	**130 ft Monopole**
ATC Site Name	:	**East Hartford,CT**
ATC Site Number	:	**370626**
Engineering Number	:	**OAA773532_C3_01**
Proposed Carrier	:	**AT&T MOBILITY**
Carrier Site Name	:	**EAST HARTFORD 148 ROBERTS STREET**
Carrier Site Number	:	**CT2419**
Site Location	:	**148 Roberts St.** **East Hartford, CT 06108-0000** **41.7734, -72.6134**
County	:	**Hartford**
Date	:	**March 10, 2022**
Max Usage	:	**70%**
Result	:	**Pass**

Prepared By:

Sarah Kramer
Structural Engineer

Sarah D. Kramer

Reviewed By:

COA : PEC.0001553

Table of Contents

Introduction

The purpose of this report is to summarize results of a structural analysis performed on the 130 ft Monopole to reflect the change in loading by AT&T MOBILITY.

Supporting Documents

Tower Drawings	Glen Martin Engineering Drawing #MP1400800-0001, dated August 20, 2003
Foundation Drawing	Glen Martin Engineering Drawing #GME-03309, dated August 26, 2003
Geotechnical Report	Geotechnical Engineering Project Name: The Marcus Group, dated April 25, 2003

Analysis

The tower was analyzed using American Tower Corporation's tower analysis software. This program considers an elastic three-dimensional model and second-order effects per ANSI/TIA-222.

Basic Wind Speed:	118 mph (3-second gust)
Basic Wind Speed w/ Ice:	50 mph (3-second gust) w/ 1.50" radial ice concurrent
Code:	ANSI/TIA-222-H / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	B
Risk Category:	II
Topographic Factor Procedure:	Method 1
Topographic Category:	1
Crest Height (H):	0 ft
Crest Length (L):	0 ft
Spectral Response:	Ss = 0.19, S_1 = 0.06
Site Class:	D - Stiff Soil - Default

Conclusion

Based on the analysis results, the structure meets the requirements per the applicable codes listed above. The tower and foundation can support the equipment as described in this report.

If you have any questions or require additional information, please contact American Tower via email at Engineering@americantower.com. Please include the American Tower site name, site number, and engineering number in the subject line for any questions.

Existing and Reserved Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
128.0	3	DragonWave Horizon Compact (11.5 lbs)	T-Arm	(2) 0.41" (10.3mm) Fiber (3) 1 1/4" Hybriflex Cable (1) 1.7" (43.2mm) Hybrid (3) 1/2" Coax (3) 5/8" Coax	CLEARWIRE CORPORATION
	6	Alcatel-Lucent RRH2x50-08			
	3	Alcatel-Lucent 1900 MHz 4X45 RRH			
	3	Nokia 2.5G MAA - AAHC(64T64R)			
	3	DragonWave A-ANT-18G-2-C			
	3	Commscope NNVV-65B-R4			
124.6	3	Generic RRH			
118.9	6	Andrew DB844G65ZAXY	Triangular Platform with Handrails	(6) 1 5/8" Coax (2) 1 5/8" Hybriflex	VERIZON WIRELESS
118.0	3	Nokia AHCA AirScale RRH 4T4R B5 160W			
	3	Alcatel-Lucent B25 RRH4x30			
	3	Alcatel-Lucent B13 RRH4x30-4R			
	3	Alcatel-Lucent RRH4X45-B66 w/ Solar Shield			
	6	Decibel DB844G65ZAXY			
	2	RFS DB-T1-6Z-8AB-0Z			
	6	Commscope JAHH-65B-R3B			
110.0	9	Generic 48" x 12" Panel	Triangular Low Profile Platform	(9) 1 5/8" Coax	SPRINT NEXTEL
100.0	3	Ericsson RRUS 4415 B66	Triangular Platform with Handrails	(4) 1 5/8" Hybriflex (6) 7/8" Coax	T-MOBILE
	3	Ericsson RRUS 4415 B25			
	3	Commscope SDX1926Q-43			
	3	Ericsson Radio 4449 B71 B85A			
	3	Ericsson Air6449 B41			
	3	Ericsson AIR32 B66Aa/B2a			
	3	RFS APXVAALL24 43-U-NA20			
90.0	2	Raycap DC6-48-60-18-8F	Triangular Platform with Handrails	(2) 0.39" (10mm) Fiber Trunk (6) 0.78" (19.7mm) 8 AWG 6	AT&T MOBILITY
	1	Raycap DC6-48-60-0-8F			
	3	Ericsson RRUS 4478 B14			
79.0	1	Commscope RDIDC-9181-PF-48	Triangular Platform with Handrails	(1) 1.60" (40.6mm) Hybrid	DISH WIRELESS L.L.C.
	3	Fujitsu TA08025-B605			
	3	Fujitsu TA08025-B604			
	3	JMA Wireless MX08FRO665-21			
70.3	1	Generic 24" x 24" Panel	Flush	(1) 1 5/8" Coax	SPRINT NEXTEL
70.0	1	Generic 2' Std. Dish			
50.0	1	Generic GPS	Side Arm	(1) 1/2" Coax	

Equipment to be Removed

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
90.0	1	Raycap DC6-48-60-0-8F	-	(2) 0.78" (19.7mm) 8 AWG 6 (3) 1/2" Coax	AT&T MOBILITY
	3	Ericsson RRUS-32 (77 lbs)			
	3	Ericsson RRUS 32 B2			
	12	CCI HPA-65R-BUU-H8			
	3	Ericsson RRUS E2 B29			
	6	Ericsson RRUS-11			
	3	Ericsson RRUS 32 B66			

Proposed Equipment

Elev.[1] (ft)	Qty	Equipment	Mount Type	Lines	Carrier
91.3	3	Ericsson Air 6449 B77D	-	(1) 0.39" (10mm) Fiber Trunk (1) 0.96" (24.3mm) Cable (5) 3" conduit	AT&T MOBILITY
90.0	1	Raycap DC6-48-60-18-8F			
	3	Ericsson RRUS 4415 B25			
	3	Ericsson RRUS 4449 B5, B12			
	3	Ericsson RRUS 32 B66A			
	3	Ericsson RRUS 32 B30 (53 lbs)			
	3	CCI DMP65R-BU8D			
	3	CCI TPA65R-BU8A			
88.7	3	Ericsson AIR 6419 B77G			

[1] Contracted elevations are shown for appurtenances within contracted installation tolerances. Appurtenances outside of contract limits are shown at installed elevations.

Install proposed lines inside the pole shaft.

Structure Usages

Structural Component	Controlling Usage	Pass/Fail
Anchor Bolts	47%	Pass
Shaft	67%	Pass
Base Plate	21%	Pass
Flange	11%	Pass

Foundations

Reaction Component	Original Design Reactions	Factored Design Reactions*	Analysis Reactions	% of Design
Moment (Kips-Ft)	2740.2	3699.3	2540.6	69%
Shear (Kips)	28.5	38.4	26.8	70%
* The design reactions are factored by 1.35 per ANSI/TIA-222-H, Sec. 15.6.2				

The structure base reactions resulting from this analysis are acceptable when compared to those shown on the original structure drawings, therefore no modification or reinforcement of the foundation will be required.

Deflection and Sway*

Antenna Elevation (ft)	Antenna	Carrier	Deflection (ft)	Sway (Rotation) (°)
128.0	DragonWave A-ANT-18G-2-C	CLEARWIRE CORPORATION	1.382	1.070
91.3	Ericsson Air 6449 B77D	AT&T MOBILITY	0.727	0.920
90.0	Ericsson RRUS 4449 B5, B12		0.706	0.910
	Ericsson RRUS 4415 B25			
	Raycap DC6-48-60-18-8F			
	Ericsson RRUS 32 B66A			
	CCI TPA65R-BU8A			
	Ericsson RRUS 32 B30 (53 lbs)			
	CCI DMP65R-BU8D			
88.7	Ericsson AIR 6419 B77G		0.685	0.890
70.0	Generic 2' Std. Dish	SPRINT NEXTEL	0.422	0.720

***Deflection and Sway was evaluated considering a design wind speed of 60 mph (3-Second Gust) per ANSI/TIA-222-H**

Standard Conditions

All engineering services performed by A.T. Engineering Service, PLLC are prepared on the basis that the information used is current and correct. This information may consist of, but is not limited to the following:

- Information supplied by the client regarding antenna, mounts and feed line loading
- Information from drawings, design and analysis documents, and field notes in the possession of A.T. Engineering Service, PLLC

It is the responsibility of the client to ensure that the information provided to A.T. Engineering Service, PLLC and used in the performance of our engineering services is correct and complete.

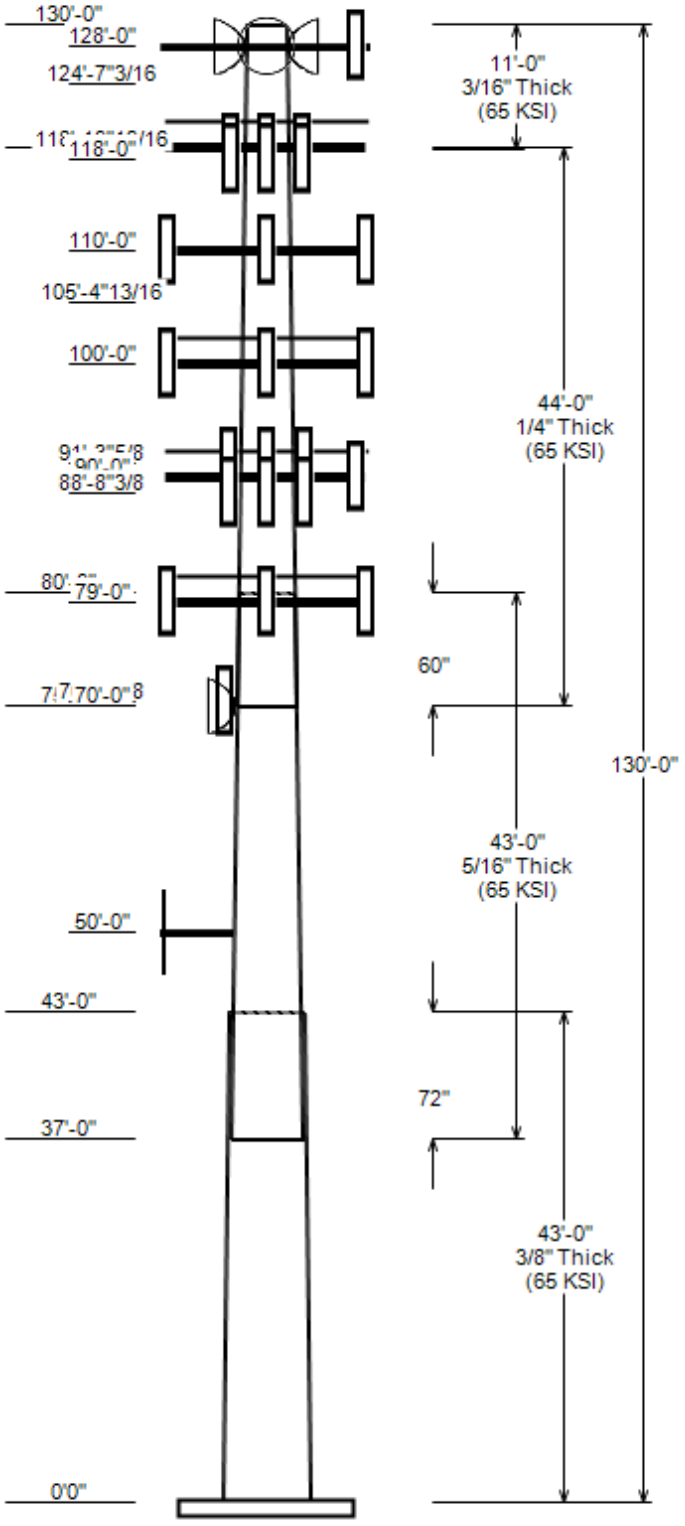
All assets of American Tower Corporation, its affiliates, and subsidiaries (collectively "American Tower") are inspected at regular intervals. Based upon these inspections and in the absence of information to the contrary, American Tower assumes that all structures were constructed in accordance with the drawings and specifications.

Unless explicitly agreed by both the client and A.T. Engineering Service, PLLC, all services will be performed in accordance with the current revision of ANSI/TIA-222.

All services are performed, results obtained, and recommendations made in accordance with generally accepted engineering principles and practices. A.T. Engineering Service, PLLC is not responsible for the conclusions, opinions and recommendations made by others based on the information supplied herein.

JOB INFORMATION

Asset :	370626, East Hartford	Height :	130 ft
Client :	AT&T MOBILITY	Base Width :	49.19
Code :	ANSI/TIA-222-H	Shape :	16 Sides



SITE PARAMETERS

Nominal Wind: 118 mph wind with no ice **Topo Category:** 1

Ice Wind: 50 mph wind with 1.5" radi **Topo Method:** Method 1

Base Elev (ft): 0.00 **Taper :** 0.23300(In/ft) **Topo Feature:**

Structure Class: II **Exposure :** B **S_s :** 0.189 **S_1** : 0.055

SECTION PROPERTIES

Shaft Section	Length (ft)	Diameter (in) Across Flats Top	Diameter (in) Across Flats Bottom	Thick (in)	Joint Type	Overlap Length (in)	Shape	Steel Grade (ksi)
1	43.000	39.16	49.19	0.375		0.000	16 Sides	65
2	43.000	31.16	41.19	0.312	Slip Joint	72.000	16 Sides	65
3	44.000	22.56	32.83	0.250	Slip Joint	60.000	16 Sides	65
4	11.000	20.00	22.56	0.188	Butt Joint	0.000	16 Sides	65

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
128.0	128.0	3	DragonWave Horizon Compact (11
128.0	128.0	6	Alcatel-Lucent RRH2x50-08
128.0	128.0	3	Alcatel-Lucent 1900 MHz 4X45 R
128.0	128.0	3	Nokia 2.5G MAA - AAHC(64T64R)
128.0	128.0	3	DragonWave A-ANT-18G-2-C
128.0	128.0	3	Generic Round T-Arm
128.0	128.0	3	Commscope NNVV-65B-R4
124.6	124.6	3	Generic RRH
119.0	119.0	1	Generic Round Platform with Ha
118.9	118.9	6	Andrew DB844G65ZAXY
118.0	118.0	3	Nokia AHCA AirScale RRH 4T4R B
118.0	118.0	3	Alcatel-Lucent B25 RRH4x30
118.0	118.0	3	Alcatel-Lucent B13 RRH4x30-4R
118.0	118.0	3	Alcatel-Lucent RRH4X45-B66 w/
118.0	118.0	6	Decibel DB844G65ZAXY
118.0	120.0	2	RFS DB-T1-6Z-8AB-0Z
118.0	118.0	6	Commscope JAHH-65B-R3B
110.0	110.0	9	Generic 48" x 12" Panel
110.0	110.0	1	Generic Round Low Profile Plat
105.5	105.5	3	Ericsson RRUS 4415 B66
105.4	105.4	3	Ericsson RRUS 4415 B25
100.0	100.0	3	Commscope SDX1926Q-43
100.0	100.0	3	Ericsson Radio 4449 B71 B85A
100.0	100.0	3	Ericsson Air6449 B41
100.0	100.0	3	Ericsson AIR32 B66Aa/B2a
100.0	100.0	3	RFS APXVAALL24 43-U-NA20
100.0	100.0	1	Generic Round Platform with Ha
91.3	91.3	3	Ericsson Air 6449 B77D
90.0	90.0	1	Raycap DC6-48-60-18-8F
90.0	90.0	2	Raycap DC6-48-60-18-8F
90.0	90.0	1	Raycap DC6-48-60-0-8F
90.0	90.0	3	Ericsson RRUS 4415 B25
90.0	90.0	3	Ericsson RRUS 4449 B5, B12
90.0	90.0	3	Ericsson RRUS 4478 B14
90.0	90.0	3	Ericsson RRUS 32 B66A
90.0	90.0	3	Ericsson RRUS 32 B30 (53 lbs)
90.0	90.0	3	CCI DMP65R-BU8D
90.0	90.0	3	CCI TPA65R-BU8A
90.0	90.0	1	Generic Round Platform with Ha
88.7	88.7	3	Ericsson AIR 6419 B77G
79.0	79.0	1	Commscope RDIDC-9181-PF-48
79.0	79.0	3	Fujitsu TA08025-B605
79.0	79.0	3	Fujitsu TA08025-B604

JOB INFORMATION

Asset :	370626, East Hartford	Height :	130 ft
Client :	AT&T MOBILITY	Base Width :	49.19
Code :	ANSI/TIA-222-H	Shape :	16 Sides

DISCRETE APPURTENANCE

Attach Elev (ft)	Force Elev (ft)	Qty	Description
79.0	79.0	3	JMA Wireless MX08FRO665-21
79.0	79.0	1	Generic Flat Platform with Han
70.3	70.3	1	Generic 24" x 24" Panel
70.0	70.0	1	Generic 2' Std. Dish
50.0	50.0	1	Generic GPS
50.0	50.0	1	Generic Round Side Arm

LINEAR APPURTENANCE

Elev From (ft)	Elev To (ft)	Description	Exp To Wind
0.0	128.0	5/8" Coax	No
0.0	128.0	1/2" Coax	No
0.0	128.0	1.7" (43.2mm) Hybrid	No
0.0	128.0	1 1/4" Hybriflex Cable	No
0.0	128.0	0.41" (10.3mm) Fiber	No
0.0	118.0	1 5/8" Hybriflex	No
0.0	118.0	1 5/8" Coax	No
0.0	110.0	1 5/8" Coax	No
0.0	100.0	7/8" Coax	Yes
0.0	100.0	1 5/8" Hybriflex	No
0.0	90.0	3" conduit	No
0.0	90.0	0.96" (24.3mm) Cable	No
0.0	90.0	0.78" (19.7mm) 8 AWG 6	No
0.0	90.0	0.39" (10mm) Fiber Trunk	No
0.0	90.0	0.39" (10mm) Fiber Trunk	No
0.0	79.0	1.60" (40.6mm) Hybrid	No
0.0	70.0	1 5/8" Coax	Yes
0.0	50.0	1/2" Coax	No

LOAD CASES

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Nor	50 mph wind with 1.5" radial ice
1.2D + 1.0Ev + 1.0Eh Nor	Seismic
0.9D - 1.0Ev + 1.0Eh Nor	Seismic (Reduced DL)
1.0D + 1.0W Service Norm	60 mph Wind with No Ice

REACTIONS

Load Case	Moment (kip-ft)	Shear (Kip)	Axial (Kip)
1.2D + 1.0W Normal	2540.59	26.83	52.69
0.9D + 1.0W Normal	2504.66	26.80	39.50
1.2D + 1.0Di + 1.0Wi Normal	725.66	7.45	82.56
1.2D + 1.0Ev + 1.0Eh Normal	138.52	1.32	52.83
0.9D - 1.0Ev + 1.0Eh Normal	136.05	1.32	36.62
1.0D + 1.0W Service Normal	582.64	6.20	43.94

DISH DEFLECTIONS

Load Case	Attach Elev (ft)	Deflection (in)	Rotation (deg)
1.0D + 1.0W Service Normal	70.00	5.064	0.715
1.0D + 1.0W Service Normal	128.00	16.578	1.073

ANALYSIS PARAMETERS

Location:	Hartford County,CT	**Height:**	130 ft
Type and Shape:	Taper, 16 Sides	**Base Diameter:**	49.19 in
Manufacturer:	Undetermined	**Top Diameter:**	20.00 in
K_d (non-service):	0.95	**Taper:**	0.2330 in/ft
K_e:	1.00	**Rotation:**	0.000°

ICE & WIND PARAMETERS

Exposure Category:	B	**Design Wind Speed w/o Ice:**	118 mph
Risk Category:	II	**Design Wind Speed w/Ice:**	50 mph
Topo Factor Procedure:	Method 1	**Operational Wind Speed:**	60 mph
Topographic Category:	1	**Design Ice Thickness:**	1.50 in
Crest Height:	0 ft	**HMSL:**	49.00 ft

SEISMIC PARAMETERS

Analysis Method:	Equivalent Lateral Force Method				
Site Class:	D - Stiff Soil			**Period Based on Rayleigh Method (sec):**	2.36
T_L (sec):	6	**P:**	1	**C_s:**	0.030
S_s:	0.189	**S_1:**	0.055	**C_s Max:**	0.030
F_a:	1.600	**F_v:**	2.400	**C_s Min:**	0.030
S_{ds}:	0.202	**S_{d1}:**	0.088		

LOAD CASES

1.2D + 1.0W Normal	118 mph wind with no ice
0.9D + 1.0W Normal	118 mph wind with no ice
1.2D + 1.0Di + 1.0Wi Normal	50 mph wind with 1.5" radial ice
1.2D + 1.0Ev + 1.0Eh Normal	Seismic
0.9D - 1.0Ev + 1.0Eh Normal	Seismic (Reduced DL)
1.0D + 1.0W Service Normal	60 mph Wind with No Ice

SHAFT SECTION PROPERTIES

Sect Info	Length (ft)	Thick (in)	Fy (ksi)	Joint Type	Slip Joint len (in)	Weight (lb)	Bottom Dia (in)	Bottom Elev (ft)	Bottom Area (in²)	Bottom Ix (in⁴)	Bottom W/t Ratio	Bottom D/t Ratio	Top Dia (in)	Top Elev (in)	Top Area (in²)	Top Ix (in⁴)	Top W/t Ratio	Top D/t Ratio	Taper (in/ft)
1-16	43.00	0.3750	65		0.00	7,667	49.19	0.000	58.39	17,579.1	24.10	131.17	39.16	43.00	46.40	8,819.0	18.78	104.43	0.2332
2-16	43.00	0.3125	65	Slip	72.00	5,231	41.19	37.000	40.75	8,600.2	24.23	131.80	31.16	80.00	30.75	3,696.6	17.84	99.71	0.2332
3-16	44.00	0.2500	65	Slip	60.00	3,277	32.83	75.000	25.98	3,482.7	24.13	131.30	22.56	119.00	17.80	1,119.5	15.96	90.26	0.2332
								119.00								587.7			
4-16	11.00	0.1875	65	Butt	0.00	472	22.56	0	13.38	846.7	21.95	120.35	20.00	130.00	11.85		19.23	106.67	0.2332

Shaft Weight 16,647

DISCRETE APPURTENANCE PROPERTIES

Attach Elev (ft)	Description	Qty	Ka	Vert Ecc (ft)	No Ice Weight (lb)	No Ice EPAa (sf)	No Ice Orientation Factor	Ice Weight (lb)	Ice EPAa (sf)	Ice Orientation Factor
128.00	Generic Round T-Arm	3	0.75	0.000	312.50	9.700	0.67	569.86	17.822	0.67
128.00	DragonWave A-ANT-18G-2-C	3	0.80	0.000	27.10	4.688	1.00	123.24	5.943	1.00
128.00	Nokia 2.5G MAA - AAHC(64T64R)	3	0.80	0.000	103.60	4.203	0.64	214.66	5.524	0.64
128.00	Alcatel-Lucent 1900 MHz 4X45 R	3	0.80	0.000	60.00	2.322	0.67	139.39	3.387	0.67
128.00	Alcatel-Lucent RRH2x50-08	6	0.80	0.000	52.90	1.701	0.50	111.28	2.551	0.50
128.00	Commscope NNVV-65B-R4	3	0.80	0.000	77.40	12.271	0.64	324.93	15.033	0.64
128.00	DragonWave Horizon Compact (11	3	1.00	0.000	11.50	0.721	0.50	33.65	1.282	0.50
124.60	Generic RRH	3	1.00	0.000	45.00	2.400	1.00	130.23	3.454	1.00
119.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4085.84	51.133	1.00
118.90	Andrew DB844G65ZAXY	6	0.80	0.000	12.00	4.341	0.75	145.82	5.258	0.75
118.00	Alcatel-Lucent B13 RRH4x30-4R	3	0.75	0.000	57.80	2.140	0.67	125.19	3.116	0.67
118.00	Alcatel-Lucent RRH4X45-B66 w/	3	0.75	0.000	64.00	2.660	0.67	133.31	3.783	0.67
118.00	Alcatel-Lucent B25 RRH4x30	3	0.75	0.000	53.00	2.120	0.67	111.98	3.090	0.67
118.00	Nokia AHCA AirScale RRH 4T4R B	3	0.75	0.000	35.30	1.286	0.50	73.72	2.021	0.50
118.00	Decibel DB844G65ZAXY	6	0.75	0.000	12.00	4.341	0.74	142.17	5.257	0.74
118.00	Commscope JAHH-65B-R3B	6	0.75	0.000	60.60	9.113	0.69	258.26	11.824	0.69
118.00	RFS DB-T1-6Z-8AB-0Z	2	0.75	2.000	44.00	4.800	0.72	166.97	6.189	0.72
110.00	Generic Round Low Profile Plat	1	1.00	0.000	1875.00	21.700	1.00	2660.12	40.313	1.00
110.00	Generic 48" x 12" Panel	9	0.80	0.000	30.00	5.067	0.66	139.75	6.881	0.66
105.50	Ericsson RRUS 4415 B66	3	0.75	0.000	46.00	1.650	0.50	87.88	2.472	0.50
105.40	Ericsson RRUS 4415 B25	3	0.75	0.000	46.00	1.842	0.50	93.42	2.709	0.50
100.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4054.62	50.662	1.00
100.00	RFS APXVAALL24 43-U-NA20	3	0.75	0.000	122.80	20.243	0.63	496.65	23.803	0.63
100.00	Ericsson AIR32 B66Aa/B2a	3	0.75	0.000	132.20	6.510	0.71	285.39	8.612	0.71
100.00	Ericsson Air6449 B41	3	0.75	0.000	104.00	5.682	0.63	234.80	7.206	0.63
100.00	Commscope SDX1926Q-43	3	0.75	0.000	6.20	0.242	0.50	14.45	0.580	0.50
100.00	Ericsson Radio 4449 B71 B85A	3	0.75	0.000	75.00	1.650	0.50	132.72	2.465	0.50
91.30	Ericsson Air 6449 B77D	3	0.75	0.000	81.60	4.028	0.65	179.59	5.338	0.65
90.00	Raycap DC6-48-60-18-8F	2	0.75	0.000	20.00	1.260	0.50	70.10	1.886	0.50
90.00	Generic Round Platform with Ha	1	1.00	0.000	2500.00	27.200	1.00	4041.11	50.458	1.00
90.00	CCI TPA65R-BU8A	3	0.75	0.000	108.00	21.356	0.61	484.05	24.895	0.61
90.00	CCI DMP65R-BU8D	3	0.75	0.000	95.70	17.871	0.63	419.09	21.377	0.63
90.00	Ericsson RRUS 32 B30 (53 lbs)	3	0.75	0.000	53.00	2.743	0.67	122.98	3.856	0.67
90.00	Ericsson RRUS 32 B66A	3	0.75	0.000	50.70	2.720	0.67	120.43	3.827	0.67
90.00	Ericsson RRUS 4478 B14	3	0.75	0.000	59.40	2.021	0.67	117.79	2.919	0.67
90.00	Ericsson RRUS 4449 B5, B12	3	0.75	0.000	71.00	1.969	0.50	132.32	2.856	0.50
90.00	Ericsson RRUS 4415 B25	3	0.75	0.000	46.00	1.842	0.50	92.65	2.695	0.50
90.00	Raycap DC6-48-60-0-8F	1	0.75	0.000	32.80	1.360	0.50	88.11	1.991	0.50
90.00	Raycap DC6-48-60-18-8F	1	0.75	0.000	20.00	1.260	0.50	70.10	1.886	0.50
88.70	Ericsson AIR 6419 B77G	3	0.75	0.000	66.10	3.797	0.65	158.15	5.047	0.65
79.00	Fujitsu TA08025-B604	3	0.75	0.000	63.90	1.962	0.50	118.57	2.824	0.50
79.00	Commscope RDIDC-9181-PF-48	1	0.75	0.000	21.90	1.867	1.00	75.25	2.711	1.00
79.00	Fujitsu TA08025-B605	3	0.75	0.000	75.00	1.962	0.50	133.73	2.824	0.50
79.00	JMA Wireless MX08FRO665-21	3	0.75	0.000	64.50	12.489	0.64	305.44	15.123	0.64
79.00	Generic Flat Platform with Han	1	1.00	0.000	2500.00	42.400	1.00	4165.29	62.060	1.00
70.30	Generic 24" x 24" Panel	1	1.00	0.000	30.00	4.800	1.00	126.35	6.120	1.00
70.00	Generic 2' Std. Dish	1	1.00	0.000	14.00	5.228	1.00	65.26	6.660	1.00
50.00	Generic Round Side Arm	1	1.00	0.000	187.50	5.200	1.00	269.17	7.627	1.00
50.00	Generic GPS	1	1.00	0.000	10.00	0.900	1.00	36.13	1.471	1.00
Totals	Num Loadings: 49	139			20,057.10			42,545.20		

LINEAR APPURTENANCE PROPERTIES

Load Case Azimuth (deg) : 0.00

Elev From (ft)	Elev To (ft)	Qty	Description	Coax Dia (in)	Coax Wt (lb/ft)	Flat	Max Coax/ Row	Dist Between Rows(in)	Dist Between Cols(in)	Azimuth (deg)	Dist From Face (in)	Exposed To Wind	Carrier
0.00	128.00	3	5/8" Coax	0.86	0.15	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	3	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	3	1 1/4" Hybriflex Cabl	1.54	1	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	2	0.41" (10.3mm) Fiber	0.41	0.09	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	128.00	1	1.7" (43.2mm) Hybrid	1.7	1.78	N	0	0	0	0	0	N	CLEARWIRE COR
0.00	118.00	6	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	VERIZON WIREL
0.00	118.00	2	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	VERIZON WIREL
0.00	110.00	9	1 5/8" Coax	1.98	0.82	N	0	0	0	0	0	N	SPRINT NEXTEL
0.00	100.00	6	7/8" Coax	1.09	0.33	N	6	1	1	330	1	Y	T-MOBILE
0.00	100.00	4	1 5/8" Hybriflex	1.98	1.3	N	0	0	0	0	0	N	T-MOBILE
0.00	90.00	6	0.78" (19.7mm) 8 AWG	0.78	0.59	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	5	3" conduit	3.5	7.58	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	2	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	1	0.96" (24.3mm) Cable	0.96	0.88	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	90.00	1	0.39" (10mm) Fiber Tr	0.39	0.06	N	0	0	0	0	0	N	AT&T MOBILITY
0.00	79.00	1	1.60" (40.6mm) Hybrid	1.6	2.34	N	0	0	0	0	0	N	DISH WIRELESS
0.00	70.00	1	1 5/8" Coax	1.98	0.82	N	1	1	1	0	1	Y	SPRINT NEXTEL
0.00	50.00	1	1/2" Coax	0.63	0.15	N	0	0	0	0	0	N	SPRINT NEXTEL

SEGMENT PROPERTIES

(Max Len: 5.ft)

Seg Top Elev (ft)	Description	Thick (in)	Flat Dia (in)	Area (in^2)	Ix (in^4)	W/t Ratio	D/t Ratio	F'y (ksi)	S (in^3)	Z (in^3)	Weight (lb)
0.00		0.3750	49.190	58.395	17,579.10	24.10	131.17	75.3	701.0	0.0	0.0
5.00		0.3750	48.024	57.000	16,349.30	23.48	128.06	76	667.8	0.0	981.7
10.00		0.3750	46.858	55.605	15,178.20	22.87	124.95	76.7	635.4	0.0	957.9
15.00		0.3750	45.692	54.211	14,064.50	22.25	121.85	77.4	603.8	0.0	934.2
20.00		0.3750	44.526	52.816	13,006.60	21.63	118.74	78.1	573.0	0.0	910.5
25.00		0.3750	43.360	51.421	12,003.10	21.01	115.63	78.8	543.0	0.0	886.7
30.00		0.3750	42.194	50.026	11,052.60	20.39	112.52	79.5	513.8	0.0	863.0
35.00		0.3750	41.028	48.631	10,153.70	19.77	109.41	80.2	485.4	0.0	839.3
37.00	Bot - Section 2	0.3750	40.562	48.074	9,808.20	19.53	108.17	80.5	474.3	0.0	329.1
40.00		0.3750	39.862	47.237	9,304.80	19.16	106.30	80.9	457.9	0.0	898.9
43.00	Top - Section 1	0.3125	39.788	39.352	7,746.90	23.34	127.32	76.2	381.9	0.0	883.2
45.00		0.3125	39.321	38.887	7,475.60	23.04	125.83	76.5	372.9	0.0	266.2
50.00		0.3125	38.155	37.725	6,825.10	22.30	122.10	77.3	350.9	0.0	651.7
55.00		0.3125	36.989	36.562	6,213.50	21.56	118.37	78.2	329.5	0.0	632.0
60.00		0.3125	35.823	35.400	5,639.50	20.81	114.64	79	308.8	0.0	612.2
65.00		0.3125	34.658	34.238	5,102.10	20.07	110.90	79.9	288.8	0.0	592.4
70.00		0.3125	33.492	33.075	4,599.90	19.33	107.17	80.7	269.4	0.0	572.6
70.30		0.3125	33.422	33.006	4,570.80	19.28	106.95	80.8	268.3	0.0	33.7
75.00	Bot - Section 3	0.3125	32.326	31.913	4,131.80	18.59	103.44	81.5	250.7	0.0	519.1
79.00		0.3125	31.393	30.983	3,781.00	17.99	100.46	82.2	236.3	0.0	776.6
80.00	Top - Section 2	0.2500	31.660	25.049	3,122.00	23.20	126.64	76.3	193.4	0.0	190.6
85.00		0.2500	30.494	24.119	2,787.10	22.27	121.97	77.4	179.3	0.0	418.3
88.70		0.2500	29.631	23.431	2,555.30	21.59	118.52	78.1	169.2	0.0	299.3
90.00		0.2500	29.328	23.189	2,477.00	21.35	117.31	78.4	165.7	0.0	103.1
91.30		0.2500	29.025	22.948	2,400.30	21.10	116.10	78.7	162.2	0.0	102.0
95.00		0.2500	28.162	22.260	2,190.80	20.42	112.65	79.5	152.6	0.0	284.6
100.00		0.2500	26.996	21.330	1,927.60	19.49	107.98	80.5	140.1	0.0	370.8
105.00		0.2500	25.830	20.400	1,686.30	18.56	103.32	81.6	128.1	0.0	355.0
105.40		0.2500	25.737	20.326	1,667.90	18.49	102.95	81.7	127.1	0.0	27.7
105.50		0.2500	25.713	20.307	1,663.40	18.47	102.85	81.7	126.9	0.0	6.9
110.00		0.2500	24.664	19.470	1,466.10	17.63	98.66	82.6	116.6	0.0	304.5
115.00		0.2500	23.498	18.540	1,265.90	16.71	93.99	82.6	105.7	0.0	323.4
118.00		0.2500	22.798	17.982	1,155.00	16.15	91.19	82.6	99.4	0.0	186.4
118.90		0.2500	22.588	17.815	1,123.10	15.98	90.35	82.6	97.5	0.0	54.8
119.00	Top - Section 3	0.2500	22.565	17.796	1,119.50	15.96	90.26	82.6	97.3	0.0	6.1
119.00	Bot - Section 4	0.1875	22.565	13.385	846.70	21.95	120.35	77.7	73.6	0.0	
120.00		0.1875	22.332	13.245	820.50	21.70	119.10	78	72.1	0.0	45.3
124.60		0.1875	21.259	12.604	707.00	20.56	113.38	79.3	65.2	0.0	202.3
125.00		0.1875	21.166	12.548	697.60	20.47	112.89	79.4	64.7	0.0	17.1
128.00		0.1875	20.466	12.129	630.10	19.72	109.15	80.3	60.4	0.0	126.0
130.00		0.1875	20.000	11.850	587.70	19.23	106.67	80.8	57.6	0.0	81.6
								Totals:			16,646.8

Load Case: 1.2D + 1.0W Normal 118 mph wind with no ice 24 Iterations
Gust Response Factor: 1.10
Dead load Factor: 1.20
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-52.69	-26.83	0.00	-2,540.6	0.00	2,540.59	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.656
5.00	-50.97	-26.61	0.00	-2,406.4	0.00	2,406.44	3,898.74	1,000.35	4,346.37	3,806.37	0.11	-0.2	0.646
10.00	-49.29	-26.39	0.00	-2,273.4	0.00	2,273.41	3,838.36	975.87	4,136.30	3,655.01	0.43	-0.4	0.636
15.00	-47.63	-26.17	0.00	-2,141.5	0.00	2,141.47	3,776.22	951.40	3,931.43	3,504.92	0.96	-0.61	0.624
20.00	-46.01	-25.95	0.00	-2,010.6	0.00	2,010.63	3,712.33	926.92	3,731.76	3,356.23	1.71	-0.82	0.612
25.00	-44.41	-25.73	0.00	-1,880.9	0.00	1,880.89	3,646.67	902.44	3,537.29	3,209.08	2.69	-1.03	0.599
30.00	-42.85	-25.51	0.00	-1,752.2	0.00	1,752.23	3,579.26	877.96	3,348.03	3,063.58	3.89	-1.25	0.585
35.00	-41.34	-25.34	0.00	-1,624.7	0.00	1,624.68	3,510.10	853.48	3,163.97	2,919.87	5.31	-1.47	0.569
37.00	-40.72	-25.22	0.00	-1,574.0	0.00	1,574.00	3,481.94	843.69	3,091.80	2,862.92	5.94	-1.56	0.562
40.00	-39.32	-25.06	0.00	-1,498.3	0.00	1,498.34	3,439.17	829.00	2,985.11	2,778.07	6.97	-1.69	0.552
43.00	-37.96	-24.91	0.00	-1,423.2	0.00	1,423.17	2,697.55	690.63	2,485.92	2,181.76	8.07	-1.82	0.668
45.00	-37.39	-24.75	0.00	-1,373.4	0.00	1,373.35	2,677.43	682.47	2,427.54	2,139.70	8.85	-1.91	0.657
50.00	-35.85	-24.30	0.00	-1,249.6	0.00	1,249.62	2,625.91	662.07	2,284.61	2,035.31	10.99	-2.16	0.629
55.00	-34.56	-24.04	0.00	-1,128.1	0.00	1,128.11	2,572.64	641.67	2,146.02	1,932.08	13.39	-2.41	0.599
60.00	-33.30	-23.77	0.00	-1,007.9	0.00	1,007.92	2,517.61	621.27	2,011.77	1,830.13	16.05	-2.66	0.565
65.00	-32.07	-23.48	0.00	-889.1	0.00	889.10	2,460.82	600.87	1,881.85	1,729.60	18.96	-2.89	0.529
70.00	-30.90	-23.13	0.00	-771.7	0.00	771.69	2,402.27	580.47	1,756.27	1,630.62	22.11	-3.13	0.488
70.30	-30.77	-22.85	0.00	-764.8	0.00	764.75	2,398.71	579.25	1,748.87	1,624.73	22.31	-3.14	0.485
75.00	-29.68	-22.58	0.00	-657.4	0.00	657.38	2,341.97	560.07	1,635.02	1,533.30	25.51	-3.35	0.443
79.00	-24.76	-19.88	0.00	-567.1	0.00	567.06	2,292.47	543.75	1,541.15	1,456.74	28.39	-3.52	0.401
80.00	-24.42	-19.70	0.00	-547.2	0.00	547.18	1,720.57	439.61	1,259.08	1,107.21	29.13	-3.56	0.510
85.00	-23.46	-19.42	0.00	-448.7	0.00	448.67	1,679.48	423.29	1,167.35	1,040.33	32.96	-3.75	0.447
88.70	-22.54	-19.03	0.00	-376.8	0.00	376.83	1,647.95	411.22	1,101.71	991.44	35.93	-3.91	0.396
90.00	-17.70	-15.08	0.00	-352.1	0.00	352.09	1,636.64	406.98	1,079.09	974.39	37	-3.96	0.374
91.30	-17.24	-14.70	0.00	-332.5	0.00	332.48	1,625.21	402.73	1,056.72	957.41	38.08	-4.01	0.359
95.00	-16.76	-14.43	0.00	-278.1	0.00	278.09	1,592.04	390.66	994.30	909.51	41.24	-4.14	0.318
100.00	-11.78	-10.96	0.00	-205.9	0.00	205.94	1,545.69	374.34	912.98	845.81	45.67	-4.3	0.252
105.00	-11.23	-10.76	0.00	-151.2	0.00	151.15	1,497.58	358.02	835.13	783.43	50.24	-4.43	0.201
105.40	-11.03	-10.66	0.00	-146.8	0.00	146.85	1,493.65	356.71	829.05	778.50	50.61	-4.44	0.197
105.50	-10.86	-10.44	0.00	-145.8	0.00	145.78	1,492.67	356.39	827.54	777.27	50.71	-4.45	0.196
110.00	-7.97	-8.21	0.00	-98.8	0.00	98.78	1,446.53	341.70	760.75	721.90	54.94	-4.54	0.143
115.00	-7.51	-7.95	0.00	-57.7	0.00	57.72	1,377.44	325.38	689.83	654.26	59.74	-4.62	0.094
118.00	-6.05	-5.41	0.00	-33.5	0.00	33.46	1,335.99	315.59	648.95	615.27	62.64	-4.65	0.059
118.90	-5.94	-4.77	0.00	-28.6	0.00	28.59	1,323.56	312.65	636.93	603.81	63.52	-4.65	0.052
119.00	-3.03	-3.45	0.00	-28.1	0.00	28.11	1,322.18	312.33	635.60	602.54	63.62	-4.65	0.049
119.00	-3.03	-3.45	0.00	-28.1	0.00	28.11	936.41	234.90	479.32	429.14	63.62	-4.65	0.069
120.00	-2.98	-3.29	0.00	-24.7	0.00	24.66	929.99	232.45	469.38	421.71	64.59	-4.66	0.062
124.60	-2.58	-2.84	0.00	-9.5	0.00	9.50	899.55	221.19	425.02	387.98	69.09	-4.69	0.028
125.00	-2.57	-2.75	0.00	-8.4	0.00	8.37	896.83	220.21	421.26	385.08	69.49	-4.69	0.025
128.00	-0.09	-0.05	0.00	-0.1	0.00	0.10	876.09	212.87	393.64	363.52	72.43	-4.69	0.000
130.00	0.00	-0.04	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	74.4	-4.69	0.000

Load Case: 0.9D + 1.0W Normal 118 mph wind with no ice 24 Iterations
Gust Response Factor: 1.10
Dead load Factor: 0.90
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-39.50	-26.80	0.00	-2,504.7	0.00	2,504.66	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.643
5.00	-38.20	-26.54	0.00	-2,370.6	0.00	2,370.64	3,898.74	1,000.35	4,346.37	3,806.37	0.11	-0.2	0.633
10.00	-36.91	-26.27	0.00	-2,238.0	0.00	2,237.96	3,838.36	975.87	4,136.30	3,655.01	0.42	-0.4	0.623
15.00	-35.65	-26.01	0.00	-2,106.6	0.00	2,106.60	3,776.22	951.40	3,931.43	3,504.92	0.95	-0.6	0.611
20.00	-34.41	-25.75	0.00	-1,976.5	0.00	1,976.54	3,712.33	926.92	3,731.76	3,356.23	1.69	-0.81	0.599
25.00	-33.19	-25.50	0.00	-1,847.8	0.00	1,847.78	3,646.67	902.44	3,537.29	3,209.08	2.65	-1.02	0.586
30.00	-32.00	-25.24	0.00	-1,720.3	0.00	1,720.30	3,579.26	877.96	3,348.03	3,063.58	3.83	-1.23	0.571
35.00	-30.85	-25.05	0.00	-1,594.1	0.00	1,594.10	3,510.10	853.48	3,163.97	2,919.87	5.23	-1.44	0.556
37.00	-30.38	-24.91	0.00	-1,544.0	0.00	1,544.00	3,481.94	843.69	3,091.80	2,862.92	5.85	-1.53	0.549
40.00	-29.32	-24.73	0.00	-1,469.3	0.00	1,469.26	3,439.17	829.00	2,985.11	2,778.07	6.85	-1.66	0.538
43.00	-28.29	-24.58	0.00	-1,395.1	0.00	1,395.06	2,697.55	690.63	2,485.92	2,181.76	7.94	-1.79	0.651
45.00	-27.85	-24.39	0.00	-1,345.9	0.00	1,345.90	2,677.43	682.47	2,427.54	2,139.70	8.71	-1.88	0.641
50.00	-26.67	-23.92	0.00	-1,224.0	0.00	1,223.96	2,625.91	662.07	2,284.61	2,035.31	10.81	-2.13	0.613
55.00	-25.69	-23.62	0.00	-1,104.4	0.00	1,104.38	2,572.64	641.67	2,146.02	1,932.08	13.17	-2.37	0.583
60.00	-24.73	-23.33	0.00	-986.3	0.00	986.27	2,517.61	621.27	2,011.77	1,830.13	15.78	-2.61	0.550
65.00	-23.79	-23.02	0.00	-869.6	0.00	869.64	2,460.82	600.87	1,881.85	1,729.60	18.63	-2.84	0.514
70.00	-22.90	-22.66	0.00	-754.5	0.00	754.53	2,402.27	580.47	1,756.27	1,630.62	21.73	-3.07	0.474
70.30	-22.80	-22.37	0.00	-747.7	0.00	747.73	2,398.71	579.25	1,748.87	1,624.73	21.92	-3.08	0.471
75.00	-21.97	-22.09	0.00	-642.6	0.00	642.60	2,341.97	560.07	1,635.02	1,533.30	25.06	-3.28	0.430
79.00	-18.31	-19.46	0.00	-554.2	0.00	554.24	2,292.47	543.75	1,541.15	1,456.74	27.88	-3.45	0.390
80.00	-18.05	-19.27	0.00	-534.8	0.00	534.79	1,720.57	439.61	1,259.08	1,107.21	28.61	-3.49	0.495
85.00	-17.32	-18.98	0.00	-438.4	0.00	438.43	1,679.48	423.29	1,167.35	1,040.33	32.37	-3.68	0.434
88.70	-16.63	-18.60	0.00	-368.2	0.00	368.20	1,647.95	411.22	1,101.71	991.44	35.28	-3.83	0.384
90.00	-13.06	-14.74	0.00	-344.0	0.00	344.02	1,636.64	406.98	1,079.09	974.39	36.33	-3.88	0.362
91.30	-12.71	-14.36	0.00	-324.9	0.00	324.86	1,625.21	402.73	1,056.72	957.41	37.39	-3.93	0.348
95.00	-12.35	-14.08	0.00	-271.7	0.00	271.73	1,592.04	390.66	994.30	909.51	40.49	-4.06	0.308
100.00	-8.66	-10.71	0.00	-201.3	0.00	201.31	1,545.69	374.34	912.98	845.81	44.83	-4.22	0.244
105.00	-8.25	-10.52	0.00	-147.8	0.00	147.78	1,497.58	358.02	835.13	783.43	49.31	-4.34	0.195
105.40	-8.10	-10.41	0.00	-143.6	0.00	143.58	1,493.65	356.71	829.05	778.50	49.68	-4.35	0.191
105.50	-7.97	-10.20	0.00	-142.5	0.00	142.54	1,492.67	356.39	827.54	777.27	49.77	-4.36	0.190
110.00	-5.84	-8.03	0.00	-96.6	0.00	96.62	1,446.53	341.70	760.75	721.90	53.92	-4.45	0.138
115.00	-5.50	-7.78	0.00	-56.5	0.00	56.46	1,377.44	325.38	689.83	654.26	58.62	-4.52	0.091
118.00	-4.45	-5.27	0.00	-32.7	0.00	32.72	1,335.99	315.59	648.95	615.27	61.47	-4.55	0.057
118.90	-4.38	-4.64	0.00	-28.0	0.00	27.98	1,323.56	312.65	636.93	603.81	62.32	-4.56	0.050
119.00	-2.22	-3.38	0.00	-27.5	0.00	27.51	1,322.18	312.33	635.60	602.54	62.42	-4.56	0.047
119.00	-2.22	-3.38	0.00	-27.5	0.00	27.51	936.41	234.90	479.32	429.14	62.42	-4.56	0.067
120.00	-2.18	-3.23	0.00	-24.1	0.00	24.13	929.99	232.45	469.38	421.71	63.37	-4.57	0.060
124.60	-1.89	-2.78	0.00	-9.3	0.00	9.30	899.55	221.19	425.02	387.98	67.79	-4.59	0.026
125.00	-1.88	-2.69	0.00	-8.2	0.00	8.18	896.83	220.21	421.26	385.08	68.17	-4.6	0.023
128.00	-0.07	-0.05	0.00	-0.1	0.00	0.10	876.09	212.87	393.64	363.52	71.06	-4.6	0.000
130.00	0.00	-0.04	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	72.98	-4.6	0.000

Load Case: 1.2D + 1.0Di + 1.0Wi Normal		50 mph wind with 1.5" radial ice			24 Iterations
Gust Response Factor:	1.10	Ice Dead Load Factor	1.00		
Dead load Factor:	1.20			Ice Importance Factor	1.00
Wind Load Factor:	1.00				

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-82.56	-7.45	0.00	-725.7	0.00	725.66	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.204
5.00	-80.52	-7.41	0.00	-688.4	0.00	688.43	3,898.74	1,000.35	4,346.37	3,806.37	0.03	-0.06	0.202
10.00	-78.46	-7.37	0.00	-651.4	0.00	651.40	3,838.36	975.87	4,136.30	3,655.01	0.12	-0.12	0.199
15.00	-76.41	-7.33	0.00	-614.6	0.00	614.57	3,776.22	951.40	3,931.43	3,504.92	0.27	-0.17	0.196
20.00	-74.39	-7.28	0.00	-577.9	0.00	577.94	3,712.33	926.92	3,731.76	3,356.23	0.49	-0.24	0.192
25.00	-72.40	-7.24	0.00	-541.5	0.00	541.52	3,646.67	902.44	3,537.29	3,209.08	0.77	-0.3	0.189
30.00	-70.43	-7.20	0.00	-505.3	0.00	505.31	3,579.26	877.96	3,348.03	3,063.58	1.11	-0.36	0.185
35.00	-68.50	-7.16	0.00	-469.3	0.00	469.31	3,510.10	853.48	3,163.97	2,919.87	1.52	-0.42	0.180
37.00	-67.74	-7.14	0.00	-455.0	0.00	454.98	3,481.94	843.69	3,091.80	2,862.92	1.7	-0.45	0.178
40.00	-66.10	-7.10	0.00	-433.6	0.00	433.56	3,439.17	829.00	2,985.11	2,778.07	2	-0.49	0.175
43.00	-64.48	-7.07	0.00	-412.2	0.00	412.25	2,697.55	690.63	2,485.92	2,181.76	2.32	-0.52	0.213
45.00	-63.79	-7.04	0.00	-398.1	0.00	398.12	2,677.43	682.47	2,427.54	2,139.70	2.54	-0.55	0.210
50.00	-61.76	-6.93	0.00	-362.9	0.00	362.92	2,625.91	662.07	2,284.61	2,035.31	3.16	-0.62	0.202
55.00	-60.10	-6.88	0.00	-328.3	0.00	328.26	2,572.64	641.67	2,146.02	1,932.08	3.85	-0.7	0.193
60.00	-58.46	-6.81	0.00	-293.9	0.00	293.88	2,517.61	621.27	2,011.77	1,830.13	4.61	-0.77	0.184
65.00	-56.85	-6.75	0.00	-259.8	0.00	259.81	2,460.82	600.87	1,881.85	1,729.60	5.46	-0.84	0.173
70.00	-55.23	-6.66	0.00	-226.1	0.00	226.08	2,402.27	580.47	1,756.27	1,630.62	6.37	-0.9	0.162
70.30	-55.01	-6.59	0.00	-224.1	0.00	224.08	2,398.71	579.25	1,748.87	1,624.73	6.42	-0.91	0.161
75.00	-53.58	-6.53	0.00	-193.1	0.00	193.09	2,341.97	560.07	1,635.02	1,533.30	7.35	-0.97	0.149
79.00	-45.87	-5.79	0.00	-167.0	0.00	166.99	2,292.47	543.75	1,541.15	1,456.74	8.18	-1.02	0.135
80.00	-45.47	-5.75	0.00	-161.2	0.00	161.19	1,720.57	439.61	1,259.08	1,107.21	8.4	-1.03	0.172
85.00	-44.14	-5.67	0.00	-132.5	0.00	132.46	1,679.48	423.29	1,167.35	1,040.33	9.51	-1.09	0.154
88.70	-42.70	-5.56	0.00	-111.5	0.00	111.49	1,647.95	411.22	1,101.71	991.44	10.37	-1.13	0.139
90.00	-33.49	-4.46	0.00	-104.3	0.00	104.26	1,636.64	406.98	1,079.09	974.39	10.68	-1.15	0.128
91.30	-32.68	-4.36	0.00	-98.5	0.00	98.46	1,625.21	402.73	1,056.72	957.41	11	-1.16	0.123
95.00	-31.93	-4.28	0.00	-82.3	0.00	82.33	1,592.04	390.66	994.30	909.51	11.92	-1.2	0.111
100.00	-23.21	-3.27	0.00	-60.9	0.00	60.94	1,545.69	374.34	912.98	845.81	13.2	-1.25	0.087
105.00	-22.37	-3.20	0.00	-44.6	0.00	44.59	1,497.58	358.02	835.13	783.43	14.53	-1.29	0.072
105.40	-22.01	-3.17	0.00	-43.3	0.00	43.31	1,493.65	356.71	829.05	778.50	14.64	-1.29	0.070
105.50	-21.72	-3.11	0.00	-43.0	0.00	42.99	1,492.67	356.39	827.54	777.27	14.67	-1.29	0.070
110.00	-16.92	-2.42	0.00	-29.0	0.00	29.01	1,446.53	341.70	760.75	721.90	15.9	-1.32	0.052
115.00	-16.19	-2.33	0.00	-16.9	0.00	16.93	1,377.44	325.38	689.83	654.26	17.3	-1.34	0.038
118.00	-11.78	-1.65	0.00	-9.8	0.00	9.85	1,335.99	315.59	648.95	615.27	18.15	-1.35	0.025
118.90	-10.78	-1.48	0.00	-8.4	0.00	8.36	1,323.56	312.65	636.93	603.81	18.4	-1.35	0.022
119.00	-6.42	-1.02	0.00	-8.2	0.00	8.22	1,322.18	312.33	635.60	602.54	18.43	-1.35	0.019
119.00	-6.42	-1.02	0.00	-8.2	0.00	8.22	936.41	234.90	479.32	429.14	18.43	-1.35	0.026
120.00	-6.31	-0.96	0.00	-7.2	0.00	7.20	929.99	232.45	469.38	421.71	18.71	-1.36	0.024
124.60	-5.43	-0.83	0.00	-2.8	0.00	2.76	899.55	221.19	425.02	387.98	20.02	-1.36	0.013
125.00	-5.39	-0.80	0.00	-2.4	0.00	2.43	896.83	220.21	421.26	385.08	20.14	-1.36	0.012
128.00	-0.19	-0.02	0.00	-0.0	0.00	0.04	876.09	212.87	393.64	363.52	21	-1.37	0.000
130.00	0.00	-0.02	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	21.57	-1.37	0.000

Load Case: 1.0D + 1.0W Service Normal 60 mph Wind with No Ice 23 Iterations
Gust Response Factor: 1.10
Dead load Factor: 1.00
Wind Load Factor: 1.00

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (ft-kips)	Mu MX (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (ft-kips)	Phi Mn (ft-kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-43.94	-6.20	0.00	-582.6	0.00	582.64	3,957.37	1,024.83	4,561.65	3,958.89	0	0	0.158
5.00	-42.59	-6.14	0.00	-551.6	0.00	551.63	3,898.74	1,000.35	4,346.37	3,806.37	0.02	-0.05	0.156
10.00	-41.26	-6.09	0.00	-520.9	0.00	520.91	3,838.36	975.87	4,136.30	3,655.01	0.1	-0.09	0.153
15.00	-39.95	-6.03	0.00	-490.5	0.00	490.48	3,776.22	951.40	3,931.43	3,504.92	0.22	-0.14	0.151
20.00	-38.66	-5.97	0.00	-460.3	0.00	460.34	3,712.33	926.92	3,731.76	3,356.23	0.39	-0.19	0.148
25.00	-37.40	-5.92	0.00	-430.5	0.00	430.48	3,646.67	902.44	3,537.29	3,209.08	0.62	-0.24	0.144
30.00	-36.17	-5.86	0.00	-400.9	0.00	400.89	3,579.26	877.96	3,348.03	3,063.58	0.89	-0.29	0.141
35.00	-34.96	-5.82	0.00	-371.6	0.00	371.59	3,510.10	853.48	3,163.97	2,919.87	1.22	-0.34	0.137
37.00	-34.48	-5.79	0.00	-360.0	0.00	359.95	3,481.94	843.69	3,091.80	2,862.92	1.36	-0.36	0.136
40.00	-33.36	-5.75	0.00	-342.6	0.00	342.59	3,439.17	829.00	2,985.11	2,778.07	1.6	-0.39	0.133
43.00	-32.25	-5.71	0.00	-325.3	0.00	325.34	2,697.55	690.63	2,485.92	2,181.76	1.85	-0.42	0.161
45.00	-31.83	-5.67	0.00	-313.9	0.00	313.92	2,677.43	682.47	2,427.54	2,139.70	2.03	-0.44	0.159
50.00	-30.61	-5.57	0.00	-285.6	0.00	285.56	2,625.91	662.07	2,284.61	2,035.31	2.52	-0.5	0.152
55.00	-29.60	-5.50	0.00	-257.7	0.00	257.73	2,572.64	641.67	2,146.02	1,932.08	3.07	-0.55	0.145
60.00	-28.62	-5.43	0.00	-230.2	0.00	230.23	2,517.61	621.27	2,011.77	1,830.13	3.68	-0.61	0.137
65.00	-27.66	-5.37	0.00	-203.0	0.00	203.05	2,460.82	600.87	1,881.85	1,729.60	4.34	-0.66	0.129
70.00	-26.70	-5.28	0.00	-176.2	0.00	176.22	2,402.27	580.47	1,756.27	1,630.62	5.06	-0.72	0.119
70.30	-26.61	-5.22	0.00	-174.6	0.00	174.63	2,398.71	579.25	1,748.87	1,624.73	5.11	-0.72	0.119
75.00	-25.75	-5.16	0.00	-150.1	0.00	150.10	2,341.97	560.07	1,635.02	1,533.30	5.84	-0.77	0.109
79.00	-21.55	-4.54	0.00	-129.5	0.00	129.48	2,292.47	543.75	1,541.15	1,456.74	6.5	-0.8	0.098
80.00	-21.29	-4.50	0.00	-124.9	0.00	124.94	1,720.57	439.61	1,259.08	1,107.21	6.67	-0.81	0.125
85.00	-20.52	-4.43	0.00	-102.4	0.00	102.45	1,679.48	423.29	1,167.35	1,040.33	7.54	-0.86	0.111
88.70	-19.76	-4.35	0.00	-86.0	0.00	86.05	1,647.95	411.22	1,101.71	991.44	8.22	-0.89	0.099
90.00	-15.54	-3.44	0.00	-80.4	0.00	80.40	1,636.64	406.98	1,079.09	974.39	8.47	-0.91	0.092
91.30	-15.15	-3.36	0.00	-75.9	0.00	75.92	1,625.21	402.73	1,056.72	957.41	8.72	-0.92	0.089
95.00	-14.76	-3.29	0.00	-63.5	0.00	63.51	1,592.04	390.66	994.30	909.51	9.44	-0.95	0.079
100.00	-10.44	-2.50	0.00	-47.0	0.00	47.05	1,545.69	374.34	912.98	845.81	10.45	-0.98	0.062
105.00	-9.99	-2.46	0.00	-34.5	0.00	34.54	1,497.58	358.02	835.13	783.43	11.5	-1.01	0.051
105.40	-9.81	-2.43	0.00	-33.6	0.00	33.56	1,493.65	356.71	829.05	778.50	11.59	-1.02	0.050
105.50	-9.66	-2.39	0.00	-33.3	0.00	33.31	1,492.67	356.39	827.54	777.27	11.61	-1.02	0.049
110.00	-7.13	-1.88	0.00	-22.6	0.00	22.58	1,446.53	341.70	760.75	721.90	12.58	-1.04	0.036
115.00	-6.74	-1.82	0.00	-13.2	0.00	13.19	1,377.44	325.38	689.83	654.26	13.67	-1.06	0.025
118.00	-5.37	-1.23	0.00	-7.6	0.00	7.65	1,335.99	315.59	648.95	615.27	14.34	-1.06	0.016
118.90	-5.24	-1.09	0.00	-6.5	0.00	6.54	1,323.56	312.65	636.93	603.81	14.54	-1.06	0.015
119.00	-2.74	-0.79	0.00	-6.4	0.00	6.43	1,322.18	312.33	635.60	602.54	14.56	-1.06	0.013
119.00	-2.74	-0.79	0.00	-6.4	0.00	6.43	936.41	234.90	479.32	429.14	14.56	-1.06	0.018
120.00	-2.69	-0.75	0.00	-5.6	0.00	5.64	929.99	232.45	469.38	421.71	14.78	-1.07	0.016
124.60	-2.33	-0.65	0.00	-2.2	0.00	2.17	899.55	221.19	425.02	387.98	15.81	-1.07	0.008
125.00	-2.31	-0.63	0.00	-1.9	0.00	1.91	896.83	220.21	421.26	385.08	15.9	-1.07	0.008
128.00	-0.08	-0.01	0.00	-0.0	0.00	0.02	876.09	212.87	393.64	363.52	16.58	-1.07	0.000
130.00	0.00	-0.01	0.00	0.0	0.00	0.00	861.91	207.97	375.75	349.34	17.03	-1.07	0.000

EQUIVALENT LATERAL FORCES METHOD ANALYSIS

(Based on ASCE7-16 Chapters 11, 12 and 15)

Spectral Response Acceleration for Short Period (S_S):	0.189
Spectral Response Acceleration at 1.0 Second Period (S_1):	0.055
Long-Period Transition Period (T_L – Seconds):	6
Importance Factor (I_e):	1.000
Site Coefficient F_a:	1.600
Site Coefficient F_v:	2.400
Response Modification Coefficient (R):	1.500
Design Spectral Response Acceleration at Short Period (S_{ds}):	0.202
Design Spectral Response Acceleration at 1.0 Second Period (S_{d1}):	0.088
Seismic Response Coefficient (C_s):	0.030
Upper Limit C_S:	0.030
Lower Limit C_S:	0.030
Period based on Rayleigh Method (sec):	2.360
Redundancy Factor (p):	1.000
Seismic Force Distribution Exponent (k):	1.930
Total Unfactored Dead Load:	43.950 k
Seismic Base Shear (E):	1.320 k

1.2D + 1.0Ev + 1.0Eh Normal **Seismic**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
39	129	82	970	0.004	6	101
38	126.5	144	1,643	0.008	10	178
37	124.8	19	217	0.001	1	24
36	122.3	229	2,459	0.011	15	284
35	119.5	51	525	0.002	3	63
34	118.95	7	68	0.000	0	8
33	118.45	60	606	0.003	4	75
32	116.5	227	2,212	0.010	13	281
31	112.5	390	3,562	0.016	22	484
30	107.75	398	3,342	0.015	20	494
29	105.45	9	72	0.000	0	11
28	105.2	36	289	0.001	2	45
27	102.5	459	3,499	0.016	21	569
26	97.5	511	3,535	0.016	21	633
25	93.15	388	2,460	0.011	15	481
24	90.65	138	832	0.004	5	172
23	89.35	195	1,139	0.005	7	241
22	86.85	560	3,101	0.014	19	695
21	82.5	770	3,864	0.018	23	956
20	79.5	261	1,219	0.006	7	324
19	77	1,068	4,687	0.022	28	1,324
18	72.65	861	3,379	0.016	21	1,068
17	70.15	56	204	0.001	1	69
16	67.5	941	3,202	0.015	19	1,167
15	62.5	960	2,818	0.013	17	1,191
14	57.5	980	2,448	0.011	15	1,216
13	52.5	1,000	2,095	0.010	13	1,240
12	47.5	1,020	1,763	0.008	11	1,266
11	44	414	616	0.003	4	513
10	41.5	1,104	1,470	0.007	9	1,370
9	38.5	1,120	1,290	0.006	8	1,389
8	36	477	482	0.002	3	591
7	32.5	1,208	1,003	0.005	6	1,498
6	27.5	1,232	741	0.003	4	1,528

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
5	22.5	1,255	512	0.002	3	1,557
4	17.5	1,279	321	0.002	2	1,587
3	12.5	1,303	171	0.001	1	1,616
2	7.5	1,327	65	0.000	0	1,646
1	2.5	1,350	8	0.000	0	1,675
DragonWave Horizon Compact (11.5 lbs)	128	34	404	0.002	2	43
Alcatel-Lucent RRH2x50-08	128	317	3,717	0.017	23	394
Alcatel-Lucent 1900 MHz 4X45 RRH	128	180	2,108	0.010	13	223
Nokia 2.5G MAA - AAHC(64T64R)	128	311	3,639	0.017	22	385
DragonWave A-ANT-18G-2-C	128	81	952	0.004	6	101
Generic Round T-Arm	128	938	10,978	0.051	67	1,163
Commscope NNVV-65B-R4	128	232	2,719	0.012	17	288
Generic RRH	124.6	135	1,501	0.007	9	167
Generic Round Platform with Handrails	119	2,500	25,431	0.117	155	3,101
Generic Round Platform with Handrails	100	2,500	18,176	0.084	110	3,101
Generic Round Platform with Handrails	90	2,500	14,830	0.068	90	3,101
Andrew DB844G65ZAXY	118.9	72	731	0.003	4	89
Nokia AHCA AirScale RRH 4T4R B5 160W	118	106	1,060	0.005	6	131
Alcatel-Lucent B25 RRH4x30	118	159	1,591	0.007	10	197
Alcatel-Lucent B13 RRH4x30-4R	118	173	1,735	0.008	11	215
Alcatel-Lucent RRH4X45-B66 w/ Solar Shield	118	192	1,922	0.009	12	238
Decibel DB844G65ZAXY	118	72	721	0.003	4	89
RFS DB-T1-6Z-8AB-0Z	118	88	881	0.004	5	109
Commscope JAHH-65B-R3B	118	364	3,639	0.017	22	451
Generic 48" x 12" Panel	110	270	2,360	0.011	14	335
Generic Round Low Profile Platform	110	1,875	16,386	0.076	100	2,326
Ericsson RRUS 4415 B66	105.5	138	1,113	0.005	7	171
Ericsson RRUS 4415 B25	105.4	138	1,111	0.005	7	171
Ericsson RRUS 4415 B25	90	138	819	0.004	5	171
Commscope SDX1926Q-43	100	19	135	0.001	1	23
Ericsson Radio 4449 B71 B85A	100	225	1,636	0.008	10	279
Ericsson Air6449 B41	100	312	2,268	0.010	14	387
Ericsson AIR32 B66Aa/B2a	100	397	2,883	0.013	18	492
RFS APXVAALL24 43-U-NA20	100	368	2,678	0.012	16	457
Ericsson Air 6449 B77D	91.3	245	1,493	0.007	9	304
Raycap DC6-48-60-18-8F	90	40	237	0.001	1	50
Raycap DC6-48-60-18-8F	90	20	119	0.000	1	25
Raycap DC6-48-60-0-8F	90	33	195	0.001	1	41
Ericsson RRUS 4449 B5, B12	90	213	1,264	0.006	8	264
Ericsson RRUS 4478 B14	90	178	1,057	0.005	6	221
Ericsson RRUS 32 B66A	90	152	902	0.004	5	189
Ericsson RRUS 32 B30 (53 lbs)	90	159	943	0.004	6	197
CCI DMP65R-BU8D	90	287	1,703	0.008	10	356
CCI TPA65R-BU8A	90	324	1,922	0.009	12	402
Ericsson AIR 6419 B77G	88.7	198	1,144	0.005	7	246
Commscope RDIDC-9181-PF-48	79	22	101	0.000	1	27
Fujitsu TA08025-B605	79	225	1,038	0.005	6	279
Fujitsu TA08025-B604	79	192	884	0.004	5	238
JMA Wireless MX08FRO665-21	79	194	892	0.004	5	240
Generic Flat Platform with Handrails	79	2,500	11,530	0.053	70	3,101
Generic 24" x 24" Panel	70.3	30	110	0.000	1	37
Generic 2' Std. Dish	70	14	51	0.000	0	17
Generic GPS	50	10	19	0.000	0	12
Generic Round Side Arm	50	188	358	0.002	2	233
		43,946	216,971	1.000	1,318	54,507

0.9D - 1.0Ev + 1.0Eh Normal **Seismic (Reduced DL)**

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
39	129	82	970	0.004	6	70
38	126.5	144	1,643	0.008	10	123
37	124.8	19	217	0.001	1	17

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
36	122.3	229	2,459	0.011	15	197
35	119.5	51	525	0.002	3	44
34	118.95	7	68	0.000	0	6
33	118.45	60	606	0.003	4	52
32	116.5	227	2,212	0.010	13	195
31	112.5	390	3,562	0.016	22	335
30	107.75	398	3,342	0.015	20	342
29	105.45	9	72	0.000	0	8
28	105.2	36	289	0.001	2	31
27	102.5	459	3,499	0.016	21	394
26	97.5	511	3,535	0.016	21	439
25	93.15	388	2,460	0.011	15	334
24	90.65	138	832	0.004	5	119
23	89.35	195	1,139	0.005	7	167
22	86.85	560	3,101	0.014	19	481
21	82.5	770	3,864	0.018	23	662
20	79.5	261	1,219	0.006	7	224
19	77	1,068	4,687	0.022	28	918
18	72.65	861	3,379	0.016	21	740
17	70.15	56	204	0.001	1	48
16	67.5	941	3,202	0.015	19	809
15	62.5	960	2,818	0.013	17	826
14	57.5	980	2,448	0.011	15	843
13	52.5	1,000	2,095	0.010	13	860
12	47.5	1,020	1,763	0.008	11	877
11	44	414	616	0.003	4	356
10	41.5	1,104	1,470	0.007	9	949
9	38.5	1,120	1,290	0.006	8	963
8	36	477	482	0.002	3	410
7	32.5	1,208	1,003	0.005	6	1,039
6	27.5	1,232	741	0.003	4	1,059
5	22.5	1,255	512	0.002	3	1,079
4	17.5	1,279	321	0.002	2	1,100
3	12.5	1,303	171	0.001	1	1,120
2	7.5	1,327	65	0.000	0	1,141
1	2.5	1,350	8	0.000	0	1,161
DragonWave Horizon Compact (11.5 lbs)	128	34	404	0.002	2	30
Alcatel-Lucent RRH2x50-08	128	317	3,717	0.017	23	273
Alcatel-Lucent 1900 MHz 4X45 RRH	128	180	2,108	0.010	13	155
Nokia 2.5G MAA - AAHC(64T64R)	128	311	3,639	0.017	22	267
DragonWave A-ANT-18G-2-C	128	81	952	0.004	6	70
Generic Round T-Arm	128	938	10,978	0.051	67	806
Commscope NNVV-65B-R4	128	232	2,719	0.012	17	200
Generic RRH	124.6	135	1,501	0.007	9	116
Generic Round Platform with Handrails	119	2,500	25,431	0.117	155	2,149
Generic Round Platform with Handrails	100	2,500	18,176	0.084	110	2,149
Generic Round Platform with Handrails	90	2,500	14,830	0.068	90	2,149
Andrew DB844G65ZAXY	118.9	72	731	0.003	4	62
Nokia AHCA AirScale RRH 4T4R B5 160W	118	106	1,060	0.005	6	91
Alcatel-Lucent B25 RRH4x30	118	159	1,591	0.007	10	137
Alcatel-Lucent B13 RRH4x30-4R	118	173	1,735	0.008	11	149
Alcatel-Lucent RRH4X45-B66 w/ Solar Shield	118	192	1,922	0.009	12	165
Decibel DB844G65ZAXY	118	72	721	0.003	4	62
RFS DB-T1-6Z-8AB-0Z	118	88	881	0.004	5	76
Commscope JAHH-65B-R3B	118	364	3,639	0.017	22	313
Generic 48" x 12" Panel	110	270	2,360	0.011	14	232
Generic Round Low Profile Platform	110	1,875	16,386	0.076	100	1,612
Ericsson RRUS 4415 B66	105.5	138	1,113	0.005	7	119
Ericsson RRUS 4415 B25	105.4	138	1,111	0.005	7	119
Ericsson RRUS 4415 B25	90	138	819	0.004	5	119
Commscope SDX1926Q-43	100	19	135	0.001	1	16
Ericsson Radio 4449 B71 B85A	100	225	1,636	0.008	10	193
Ericsson Air6449 B41	100	312	2,268	0.010	14	268
Ericsson AIR32 B66Aa/B2a	100	397	2,883	0.013	18	341
RFS APXVAALL24 43-U-NA20	100	368	2,678	0.012	16	317
Ericsson Air 6449 B77D	91.3	245	1,493	0.007	9	210
Raycap DC6-48-60-18-8F	90	40	237	0.001	1	34
Raycap DC6-48-60-18-8F	90	20	119	0.000	1	17
Raycap DC6-48-60-0-8F	90	33	195	0.001	1	28
Ericsson RRUS 4449 B5, B12	90	213	1,264	0.006	8	183

Segment	Height Above Base (ft)	Weight (lb)	W_z (lb-ft)	C_{vx}	Horizontal Force (lb)	Vertical Force (lb)
Ericsson RRUS 4478 B14	90	178	1,057	0.005	6	153
Ericsson RRUS 32 B66A	90	152	902	0.004	5	131
Ericsson RRUS 32 B30 (53 lbs)	90	159	943	0.004	6	137
CCI DMP65R-BU8D	90	287	1,703	0.008	10	247
CCI TPA65R-BU8A	90	324	1,922	0.009	12	279
Ericsson AIR 6419 B77G	88.7	198	1,144	0.005	7	170
Commscope RDIDC-9181-PF-48	79	22	101	0.000	1	19
Fujitsu TA08025-B605	79	225	1,038	0.005	6	193
Fujitsu TA08025-B604	79	192	884	0.004	5	165
JMA Wireless MX08FRO665-21	79	194	892	0.004	5	166
Generic Flat Platform with Handrails	79	2,500	11,530	0.053	70	2,149
Generic 24" x 24" Panel	70.3	30	110	0.000	1	26
Generic 2' Std. Dish	70	14	51	0.000	0	12
Generic GPS	50	10	19	0.000	0	9
Generic Round Side Arm	50	188	358	0.002	2	161
		43,946	216,971	1.000	1,318	37,779

1.2D + 1.0Ev + 1.0Eh Normal **Seismic**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-52.83	-1.32	0.00	-138.52	0.00	138.52	3,957.37	1,024.83	4,562	3,958.89	0.00	0.00	0.05
5.00	-51.19	-1.33	0.00	-131.90	0.00	131.90	3,898.74	1,000.35	4,346	3,806.37	0.01	-0.01	0.05
10.00	-49.57	-1.34	0.00	-125.24	0.00	125.24	3,838.36	975.87	4,136	3,655.01	0.02	-0.02	0.05
15.00	-47.98	-1.35	0.00	-118.54	0.00	118.54	3,776.22	951.40	3,931	3,504.92	0.05	-0.03	0.05
20.00	-46.43	-1.35	0.00	-111.81	0.00	111.81	3,712.33	926.92	3,732	3,356.23	0.09	-0.05	0.05
25.00	-44.90	-1.36	0.00	-105.04	0.00	105.04	3,646.67	902.44	3,537	3,209.08	0.15	-0.06	0.05
30.00	-43.40	-1.36	0.00	-98.26	0.00	98.26	3,579.26	877.96	3,348	3,063.58	0.21	-0.07	0.04
35.00	-42.81	-1.36	0.00	-91.47	0.00	91.47	3,510.10	853.48	3,164	2,919.87	0.29	-0.08	0.04
37.00	-41.42	-1.36	0.00	-88.75	0.00	88.75	3,481.94	843.69	3,092	2,862.92	0.33	-0.09	0.04
40.00	-40.05	-1.35	0.00	-84.69	0.00	84.69	3,439.17	829.00	2,985	2,778.07	0.38	-0.09	0.04
43.00	-39.53	-1.35	0.00	-80.64	0.00	80.64	2,697.55	690.63	2,486	2,181.76	0.45	-0.10	0.05
45.00	-38.27	-1.34	0.00	-77.94	0.00	77.94	2,677.43	682.47	2,428	2,139.70	0.49	-0.11	0.05
50.00	-36.78	-1.33	0.00	-71.23	0.00	71.23	2,625.91	662.07	2,285	2,035.31	0.61	-0.12	0.05
55.00	-35.57	-1.32	0.00	-64.56	0.00	64.56	2,572.64	641.67	2,146	1,932.08	0.74	-0.13	0.05
60.00	-34.38	-1.31	0.00	-57.94	0.00	57.94	2,517.61	621.27	2,012	1,830.13	0.89	-0.15	0.05
65.00	-33.21	-1.30	0.00	-51.37	0.00	51.37	2,460.82	600.87	1,882	1,729.60	1.06	-0.16	0.04
70.00	-33.12	-1.30	0.00	-44.88	0.00	44.88	2,402.27	580.47	1,756	1,630.62	1.23	-0.18	0.04
70.30	-32.02	-1.28	0.00	-44.49	0.00	44.49	2,398.71	579.25	1,749	1,624.73	1.24	-0.18	0.04
75.00	-30.69	-1.25	0.00	-38.48	0.00	38.48	2,341.97	560.07	1,635	1,533.30	1.43	-0.19	0.04
79.00	-26.48	-1.15	0.00	-33.47	0.00	33.47	2,292.47	543.75	1,541	1,456.74	1.59	-0.20	0.04
80.00	-25.53	-1.12	0.00	-32.32	0.00	32.32	1,720.57	439.61	1,259	1,107.21	1.63	-0.20	0.04
85.00	-24.83	-1.11	0.00	-26.71	0.00	26.71	1,679.48	423.29	1,167	1,040.33	1.85	-0.21	0.04
88.70	-24.35	-1.09	0.00	-22.62	0.00	22.62	1,647.95	411.22	1,102	991.44	2.02	-0.22	0.04
90.00	-19.16	-0.92	0.00	-21.20	0.00	21.20	1,636.64	406.98	1,079	974.39	2.08	-0.23	0.03
91.30	-18.37	-0.90	0.00	-20.00	0.00	20.00	1,625.21	402.73	1,057	957.41	2.14	-0.23	0.03
95.00	-17.74	-0.88	0.00	-16.68	0.00	16.68	1,592.04	390.66	994	909.51	2.32	-0.24	0.03
100.00	-12.43	-0.67	0.00	-12.30	0.00	12.30	1,545.69	374.34	913	845.81	2.57	-0.25	0.02
105.00	-12.39	-0.66	0.00	-8.97	0.00	8.97	1,497.58	358.02	835	783.43	2.83	-0.25	0.02
105.40	-12.21	-0.66	0.00	-8.70	0.00	8.70	1,493.65	356.71	829	778.50	2.86	-0.25	0.02
105.50	-11.54	-0.63	0.00	-8.64	0.00	8.64	1,492.67	356.39	828	777.27	2.86	-0.25	0.02
110.00	-8.40	-0.48	0.00	-5.82	0.00	5.82	1,446.53	341.70	761	721.90	3.10	-0.26	0.01
115.00	-8.12	-0.46	0.00	-3.43	0.00	3.43	1,377.44	325.38	690	654.26	3.38	-0.26	0.01
118.00	-6.61	-0.38	0.00	-2.03	0.00	2.03	1,335.99	315.59	649	615.27	3.55	-0.27	0.01
118.90	-6.51	-0.38	0.00	-1.69	0.00	1.69	1,323.56	312.65	637	603.81	3.60	-0.27	0.01
119.00	-3.35	-0.21	0.00	-1.65	0.00	1.65	1,322.18	312.33	636	602.54	3.60	-0.27	0.01
119.00	-3.35	-0.21	0.00	-1.65	0.00	1.65	936.41	234.90	479	429.14	3.60	-0.27	0.01
120.00	-3.07	-0.19	0.00	-1.45	0.00	1.45	929.99	232.45	469	421.71	3.66	-0.27	0.01
124.60	-2.88	-0.18	0.00	-0.57	0.00	0.57	899.55	221.19	425	387.98	3.92	-0.27	0.01
125.00	-2.70	-0.17	0.00	-0.50	0.00	0.50	896.83	220.21	421	385.08	3.94	-0.27	0.00
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	212.87	394	363.52	4.11	-0.27	0.00
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	207.97	376	349.34	4.22	-0.27	0.00

0.9D - 1.0Ev + 1.0Eh Normal **Seismic (Reduced DL)**

CALCULATED FORCES

Seg Elev (ft)	Pu FY (-) (kips)	Vu FX (-) (kips)	Tu MY (ft-kips)	Mu MZ (fr-kips)	Mu Mx (ft-kips)	Resultant Moment (ft-kips)	Phi Pn (kips)	Phi Vn (kips)	Phi Tn (kips)	Phi Mn (kips)	Total Deflect (in)	Rotation (deg)	Ratio
0.00	-36.62	-1.32	0.00	-136.05	0.00	136.05	3,957.37	1,024.83	4,562	3,958.89	0.00	0.00	0.04
5.00	-35.48	-1.33	0.00	-129.44	0.00	129.44	3,898.74	1,000.35	4,346	3,806.37	0.01	-0.01	0.04
10.00	-34.36	-1.33	0.00	-122.80	0.00	122.80	3,838.36	975.87	4,136	3,655.01	0.02	-0.02	0.04
15.00	-33.26	-1.34	0.00	-116.14	0.00	116.14	3,776.22	951.40	3,931	3,504.92	0.05	-0.03	0.04
20.00	-32.18	-1.34	0.00	-109.46	0.00	109.46	3,712.33	926.92	3,732	3,356.23	0.09	-0.04	0.04
25.00	-31.12	-1.34	0.00	-102.76	0.00	102.76	3,646.67	902.44	3,537	3,209.08	0.14	-0.06	0.04
30.00	-30.08	-1.34	0.00	-96.06	0.00	96.06	3,579.26	877.96	3,348	3,063.58	0.21	-0.07	0.04
35.00	-29.67	-1.34	0.00	-89.36	0.00	89.36	3,510.10	853.48	3,164	2,919.87	0.29	-0.08	0.04
37.00	-28.71	-1.33	0.00	-86.68	0.00	86.68	3,481.94	843.69	3,092	2,862.92	0.32	-0.08	0.04
40.00	-27.76	-1.33	0.00	-82.68	0.00	82.68	3,439.17	829.00	2,985	2,778.07	0.38	-0.09	0.04
43.00	-27.40	-1.33	0.00	-78.70	0.00	78.70	2,697.55	690.63	2,486	2,181.76	0.44	-0.10	0.05
45.00	-26.52	-1.32	0.00	-76.05	0.00	76.05	2,677.43	682.47	2,428	2,139.70	0.48	-0.10	0.05
50.00	-25.49	-1.31	0.00	-69.46	0.00	69.46	2,625.91	662.07	2,285	2,035.31	0.60	-0.12	0.04
55.00	-24.65	-1.30	0.00	-62.92	0.00	62.92	2,572.64	641.67	2,146	1,932.08	0.73	-0.13	0.04
60.00	-23.83	-1.28	0.00	-56.44	0.00	56.44	2,517.61	621.27	2,012	1,830.13	0.87	-0.15	0.04
65.00	-23.02	-1.27	0.00	-50.02	0.00	50.02	2,460.82	600.87	1,882	1,729.60	1.03	-0.16	0.04
70.00	-22.96	-1.27	0.00	-43.69	0.00	43.69	2,402.27	580.47	1,756	1,630.62	1.21	-0.17	0.04
70.30	-22.19	-1.25	0.00	-43.31	0.00	43.31	2,398.71	579.25	1,749	1,624.73	1.22	-0.17	0.04
75.00	-21.27	-1.22	0.00	-37.45	0.00	37.45	2,341.97	560.07	1,635	1,533.30	1.39	-0.18	0.03
79.00	-18.36	-1.12	0.00	-32.57	0.00	32.57	2,292.47	543.75	1,541	1,456.74	1.55	-0.19	0.03
80.00	-17.69	-1.09	0.00	-31.46	0.00	31.46	1,720.57	439.61	1,259	1,107.21	1.59	-0.20	0.04
85.00	-17.21	-1.08	0.00	-25.99	0.00	25.99	1,679.48	423.29	1,167	1,040.33	1.81	-0.21	0.04
88.70	-16.87	-1.06	0.00	-22.01	0.00	22.01	1,647.95	411.22	1,102	991.44	1.97	-0.22	0.03
90.00	-13.28	-0.90	0.00	-20.63	0.00	20.63	1,636.64	406.98	1,079	974.39	2.03	-0.22	0.03
91.30	-12.73	-0.87	0.00	-19.47	0.00	19.47	1,625.21	402.73	1,057	957.41	2.09	-0.22	0.03
95.00	-12.30	-0.85	0.00	-16.24	0.00	16.24	1,592.04	390.66	994	909.51	2.27	-0.23	0.03
100.00	-8.62	-0.65	0.00	-11.98	0.00	11.98	1,545.69	374.34	913	845.81	2.51	-0.24	0.02
105.00	-8.59	-0.65	0.00	-8.74	0.00	8.74	1,497.58	358.02	835	783.43	2.77	-0.25	0.02
105.40	-8.46	-0.64	0.00	-8.48	0.00	8.48	1,493.65	356.71	829	778.50	2.79	-0.25	0.02
105.50	-8.00	-0.61	0.00	-8.41	0.00	8.41	1,492.67	356.39	828	777.27	2.80	-0.25	0.02
110.00	-5.82	-0.47	0.00	-5.67	0.00	5.67	1,446.53	341.70	761	721.90	3.03	-0.25	0.01
115.00	-5.63	-0.45	0.00	-3.34	0.00	3.34	1,377.44	325.38	690	654.26	3.30	-0.26	0.01
118.00	-4.58	-0.37	0.00	-1.98	0.00	1.98	1,335.99	315.59	649	615.27	3.46	-0.26	0.01
118.90	-4.51	-0.37	0.00	-1.65	0.00	1.65	1,323.56	312.65	637	603.81	3.51	-0.26	0.01
119.00	-2.32	-0.20	0.00	-1.61	0.00	1.61	1,322.18	312.33	636	602.54	3.52	-0.26	0.00
119.00	-2.32	-0.20	0.00	-1.61	0.00	1.61	936.41	234.90	479	429.14	3.52	-0.26	0.01
120.00	-2.13	-0.18	0.00	-1.41	0.00	1.41	929.99	232.45	469	421.71	3.57	-0.26	0.01
124.60	-1.99	-0.17	0.00	-0.56	0.00	0.56	899.55	221.19	425	387.98	3.83	-0.26	0.00
125.00	-1.87	-0.16	0.00	-0.49	0.00	0.49	896.83	220.21	421	385.08	3.85	-0.26	0.00
128.00	0.00	0.00	0.00	0.00	0.00	0.00	876.09	212.87	394	363.52	4.01	-0.26	0.00
130.00	0.00	0.00	0.00	0.00	0.00	0.00	861.91	207.97	376	349.34	4.12	-0.26	0.00

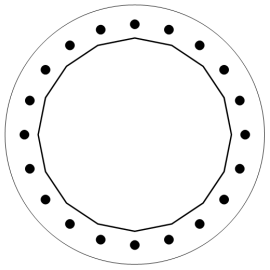
ANALYSIS SUMMARY

	Reactions						Max Usage	
Load Case	Shear FX (kips)	Shear FZ (kips)	Axial FY (kips)	Moment MX (ft-kips)	Moment MY (ft-kips)	Moment MZ (ft-kips)	Elev (ft)	Interaction Ratio
1.2D + 1.0W Normal	26.83	0.00	52.69	0.00	0.00	2540.59	43.00	0.67
0.9D + 1.0W Normal	26.80	0.00	39.50	0.00	0.00	2504.66	43.00	0.65
1.2D + 1.0Di + 1.0Wi Normal	7.45	0.00	82.56	0.00	0.00	725.66	43.00	0.21
1.2D + 1.0Ev + 1.0Eh Normal	1.36	0.00	52.83	0.00	0.00	138.52	43.00	0.05
0.9D - 1.0Ev + 1.0Eh Normal	1.34	0.00	36.62	0.00	0.00	136.05	43.00	0.05
1.0D + 1.0W Service Normal	6.20	0.00	43.94	0.00	0.00	582.64	43.00	0.16

BASE PLATE ANALYSIS @ 0 FT

PLATE PARAMETERS (ID# 9139)

Diameter:	67	in
Shape:	Round	
Thickness:	2.5	in
Grade:	A572-55	
Yield Strength:	55	ksi
Tensile Strength:	70	ksi
Rod Detail Type:	d	
Clear Distance	4	in
Base Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	252	°



ANCHOR ROD PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 6578]	Radial	20	2.5	57	A572-55	55	70	-	-

ANCHOR ROD GEOMETRY AND APPLIED LOADS --- ORIGINAL (20) 2.5"ø [ID 6578]

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in^4)	Axial Load (k)	Shear Load (k)
1	0.314	27.10	8.81	21.894	1918.104	94.48	1.25
2	0.628	23.06	16.75	15.907	1013.097	94.48	1.72
3	0.942	16.75	23.06	8.363	280.934	94.48	2.02
4	1.257	8.81	27.10	0.000	1.272	94.48	2.12
5	1.571	0.00	28.50	-8.363	280.934	-83.94	2.02
6	1.885	-8.81	27.10	-15.907	1013.100	-83.94	1.72
7	2.199	-16.75	23.06	-21.894	1918.104	-83.94	1.25
8	2.513	-23.06	16.75	-25.738	2650.268	-83.94	0.66
9	2.827	-27.10	8.81	-27.063	2929.930	-83.94	0.00
10	3.142	-28.50	0.00	-25.738	2650.267	-83.94	0.66
11	3.456	-27.10	-8.81	-21.894	1918.103	-83.94	1.25
12	3.770	-23.06	-16.75	-15.907	1013.099	-83.94	1.72
13	4.084	-16.75	-23.06	-8.363	280.935	-83.94	2.02
14	4.398	-8.81	-27.10	0.000	1.272	94.48	2.12
15	4.712	0.00	-28.50	8.363	280.934	94.48	2.02
16	5.027	8.81	-27.10	15.907	1013.098	94.48	1.72
17	5.341	16.75	-23.06	21.894	1918.105	94.48	1.25
18	5.655	23.06	-16.75	25.738	2650.268	94.48	0.66
19	5.969	27.10	-8.81	27.063	2929.930	94.48	0.00
20	6.283	28.50	0.00	25.738	2650.268	94.48	0.66

REACTION DISTRIBUTION

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	49.19"ø x 0.375" (16 Sides)	2540.6	52.69	26.83	1.000
Bolt Group	Original (20) 2.5"ø	2540.6	-	26.83	1.000
	TOTALS	**2540.59**	**52.69**	**26.83**	

COMPONENT PROPERTIES

Component	ID	Gross Area (in^2)	Net Area (in^2)	Individual Inertia (in^4)	Moment of Inertia (in^4)	Threads/in
Pole	49.19"ø x 0.375" (16 Sides)	57.1400	-	-	17022.58	-
Bolt Group	Original (20) 2.5"ø	4.9087	3.9988	1.2725	29312.02	4.0

EXTERNAL BASE PLATE BEND LINE ANALYSIS @ 0 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	49.32	in
Point-to-Point Diameter:	50.28	in
Flat Width:	9.809	in
Flat Radians:	0.393	rad

PLATE PROPERTIES

Neutral Axis:	252	°
Bend Line Lower Limit:	5.501	rad
Bend Line Upper Limit:	0.154	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in^3)	Applied Moment Mu (k-in)	Moment Capacity ϕMn (k-in)	Ratio
Flat	35.477	0.00	55.432	514.1	2743.9	0.187
Corner	34.094	0.00	53.271	352.4	2636.9	0.134
Circumferential	39.739	0.00	62.092	643.0	3073.6	0.209

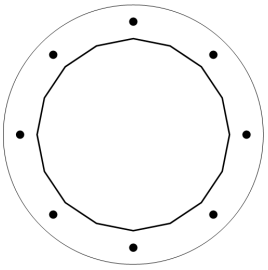
PLASTIC ANCHOR ROD ANALYSIS

Class	Group Quantity	Rod Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity ϕPn (k)	Ratio
Original	20	2.5	94.5	2.1	209.9	0.470

UPPER FLANGE PLATE ANALYSIS @ 119 FT

PLATE PARAMETERS (ID# 7841)

Diameter:	31	in
Shape:	Round	
Thickness:	1	in
Grade:	A36	
Yield Strength:	36	ksi
Tensile Strength:	58	ksi
Pole Weld Size:	0.125	in
Orientation Offset:	-	°
Analysis Type:	Plastic	
Neutral Axis:	270	°



FLANGE BOLT PARAMETERS

Class	Arrangement	Quantity	Diameter (in)	Circle (in)	Grade	Fy (ksi)	Fu (ksi)	Spacing (in)	Offset (°)
Original [ID# 6579]	Radial	8	1	27	A325	92	120	-	-

FLANGE BOLT GEOMETRY AND APPLIED LOADS --- ORIGINAL (8) 1"ø [ID 6579]

Position	Radians	X (in)	Y (in)	Moment Arm (in)	Inertia (in^4)	Axial Load (k)	Shear Load (k)
1	0.785	9.55	9.55	9.104	50.235	6.18	0.50
2	1.571	0.00	13.50	0.000	0.029	6.18	0.72
3	2.356	-9.55	9.55	-9.104	50.235	-4.67	0.50
4	3.142	-13.50	0.00	-12.875	100.441	-4.67	0.00
5	3.927	-9.55	-9.55	-9.104	50.235	-4.67	0.50
6	4.712	0.00	-13.50	0.000	0.029	6.18	0.72
7	5.498	9.55	-9.55	9.104	50.235	6.18	0.50
8	6.283	13.50	0.00	12.875	100.441	6.18	0.00

REACTION DISTRIBUTION

Component	ID	Moment Mu (k-ft)	Axial Load Pu (k)	Shear Vu (k)	Moment Factor
Pole	22.5651"ø x 0.1875" (16 Sides)	28.1	3.03	3.45	1.000
Bolt Group	Original (8) 1"ø	28.1	-	3.45	1.000
	TOTALS	**28.11**	**3.03**	**3.45**	

COMPONENT PROPERTIES

Component	ID	Gross Area (in^2)	Net Area (in^2)	Individual Inertia (in^4)	Moment of Inertia (in^4)	Threads/in
Pole	22.5651"ø x 0.1875" (16 Sides)	13.0970	-	-	819.95	-
Bolt Group	Original (8) 1"ø	0.7854	0.6057	0.0292	401.88	8.0

EXTERNAL UPPER FLANGE PLATE BEND LINE ANALYSIS @ 119 FT

POLE PROPERTIES

Flat-to-Flat Diameter:	22.69	in
Point-to-Point Diameter:	23.14	in
Flat Width:	4.513	in
Flat Radians:	0.393	rad

PLATE PROPERTIES

Neutral Axis:	270	°
Bend Line Lower Limit:	5.697	rad
Bend Line Upper Limit:	0.586	rad

Bend Line	Chord Length (in)	Additional Length (in)	Section Modulus (in^3)	Applied Moment Mu (k-in)	Moment Capacity ϕMn (k-in)	Ratio
Flat	17.369	0.00	4.342	10.6	140.7	0.075
Corner	16.773	0.00	4.193	9.1	135.9	0.067
Circumferential	21.976	0.00	5.494	9.1	178.0	0.051

PLASTIC FLANGE BOLT ANALYSIS

Class	Group Quantity	Bolt Diameter (in)	Applied Axial Load Pu (k)	Applied Shear Load Vu (k)	Compressive Capacity ϕPn (k)	Ratio
Original	8	1	6.2	0.7	54.5	0.113

January 25, 2022
February 10, 2022 (Rev.1)

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:		
	Site Number:	CT2419
	FA Number:	10552892
	PACE Number:	MRCTB051002
	PT Number:	2051A0Z7XY
	Site Name:	EAST HARTFORD 148 ROBERTS STREET
	Site Address:	148 Roberts Street East Hartford, CT 06118

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 mount to determine their capability of supporting the following additional loading:

- (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) DC6-48-60-18 Surge Arrestor (24.0"x9.7" Ø – Wt. = 33 lbs.)
- **(3) TPA65R-BU8DA Antennas (96.0"x20.7"x7.7" – Wt. = 87 lbs. /each)**
- **(3) AIR6449 Antennas (30.4"x15.9"x8.1" – Wt. = 82 lbs. /each)**
- **(3) AIR6419 Antennas (28.0"x15.7"x6.7" – Wt. = 66 lbs. /each)**
- **(3) DMP65R-BU8DA Antennas (96.0"x20.7"x7.7" – Wt. = 96 lbs. /each)**
- **(3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)**
- **(3) 4415 B25 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)**
- **(3) B5/B12 4449 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(1) DC6-48-60-18 Surge Arrestor (24.0"x9.7" Ø – Wt. = 33 lbs.)**

**Proposed equipment shown in bold.*

Mount fabrication drawings prepared by CommScope P/N MTC3607R, dated October 18, 2013, were used to perform this analysis. HDG conducted a ground audit of the existing antenna mounts on March 24, 2021.

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 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.66 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 0.180 and a spectral response acceleration parameter at a period of 1 second, S_1, of 0.064.

- 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 3.

- 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 mount is secured to the existing monopole with 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 mount **IS CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	12	LC1	97%	**PASS**

Reference Documents:

- Fabrication drawings prepared by CommScope P/N MTC3607R, dated October 18, 2013.

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 mount 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.

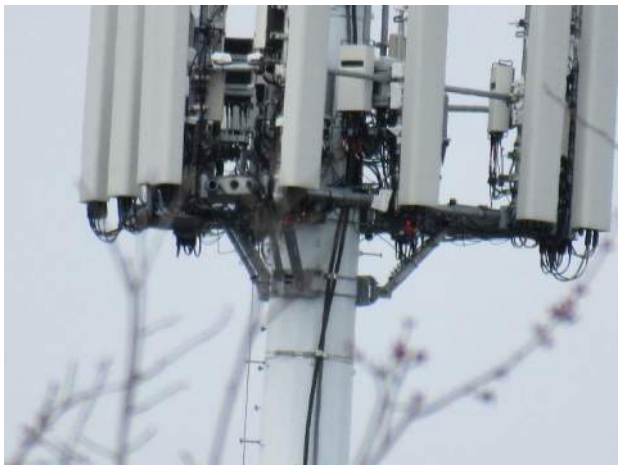
Please feel free to contact our office should you have any questions.

Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:








HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	90	(ft)
z_g=	1200	(ft)
α=	7.0	

K_z= 0.959

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

Table 2-4

Exposure	Z_g	α	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

$K_{zt} = [1+(K_c K_t/K_h)]^2$ $\quad K_h = e^{(f*z/H)}$

K_{zt}= 1

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

Category= **1**

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=	90	
z_s=	42	(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=	1.00	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i =	1.50	in
Importance Factor = I=	1.0	(from Table 2-3)
K_{iz} =	1.11	(from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ $\quad t_{iz}$ = 1.66 in

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

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=	130	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	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

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

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

		K_z=	0.959	(from 2.6.5.2)
		K_{zt}=	1.0	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**36.38**	K_e=	1.00	(from 2.6.8)
$q_{z\ (ice)}$=	**5.82**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.10**	V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

Structure Type	Wind Direction Probability Factor, Kd
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

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

Determine Ca:

Table 2-9

Force Coefficients (Ca) for Appurtenances				
Member Type		Aspect Ratio ≤ 2.5	Aspect Ratio = 7	Aspect Ratio ≥ 25
		Ca	Ca	Ca
Flat		1.2	1.4	2.0
Square/Rectangular HSS		1.2 - 2.8(r_s) ≥ 0.85	1.4 - 4.0(r_s) ≥ 0.90	2.0 - 6.0(r_s) ≥ 1.25
Round	**C < 39** (Subcritical)	0.7	0.8	1.2
	39 ≤ C ≤ 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 = 1.66 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)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	4.64	1.30	650	125	37
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.91	1.20	147	31	8
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.78	1.20	133	29	8
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	4.64	1.30	650	125	37
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	74	17	4
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	2.18	1.20	46	12	3
4415 B25 RRH	16.5	13.5	6.3	1.55	1.22	1.20	68	16	4
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	2.62	1.21	32	9	2
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	2.25	1.20	100	23	6
RRUS-32 B66A RRH (Shielded)	27.2	0.0	7.0	0.00	0.00	1.20	0	5	0
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.90	1.20	51	13	3
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	3.81	1.26	27	9	2
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	3.89	1.26	61	16	3
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	7.77	1.43	34	12	2
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	41	10	2
PL 6x1/2	0.5	12.0	-	0.04	0.04	2.00	3		
HSS 4x4	4.0	12.0	-	0.33	0.33	1.25	15		
C 3x2	3.0	12.0	-	0.25	0.25	1.25	11		
L 3x3 Angle	3.0	12.0	-	0.25	0.25	1.25	11		
L 2x2 Angle	2.0	12.0	-	0.17	0.17	1.25	8		
3" Pipe	3.5	12.0	-	0.29	0.29	0.70	7		
2-1/2" Pipe	2.9	12.0	-	0.24	0.24	0.70	6		
2" Pipe	2.4	12.0	-	0.20	0.20	0.70	5		

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 30 (deg) | Ice Thickness = 1.66 in. | Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	562
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	147	78	129
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	133	60	115
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	562
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	74	46	67
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	37	74	46
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	68	32	59
4415 B25 RRH (Side)	16.5	6.8	13.5	0.77	1.55	2.44	1.22	1.20	1.20	34	68	42
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	100	61	90
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	54	61	55
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	51	72	56
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	1.17	3.81	1.90	1.26	1.20	27	51	33
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	61	100	70
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	1.32	7.77	3.89	1.43	1.26	34	61	41

WIND LOADS WITH ICE:

TPA65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	108
AIR6449 Antenna	33.7	19.2	11.4	4.50	2.67	1.75	2.95	1.20	1.22	31	19	28
AIR6419 Antenna	31.3	19.0	10.0	4.14	2.18	1.65	3.13	1.20	1.23	29	16	26
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	108
B14 4478 RRH	21.4	16.7	11.6	2.49	1.73	1.28	1.84	1.20	1.20	17	12	16
B14 4478 RRH (Side)	21.4	8.4	16.7	1.24	2.49	2.56	1.28	1.20	1.20	9	17	11
4415 B25 RRH	19.8	16.8	9.6	2.31	1.32	1.18	2.06	1.20	1.20	16	9	14
4415 B25 RRH (Side)	19.8	8.4	16.8	1.16	2.31	2.36	1.18	1.20	1.20	8	16	10
RRUS-32 B66A RRH	30.5	15.4	10.3	3.27	2.19	1.98	2.96	1.20	1.22	23	16	21
RRUS-32 B66A RRH (Shielded)	30.5	7.7	10.3	1.63	2.19	3.96	2.96	1.26	1.22	12	16	13
B5/B12 4449 RRH	21.2	12.7	16.5	1.87	2.43	1.67	1.28	1.20	1.20	13	17	14
B5/B12 4449 RRH (Shielded)	21.2	6.4	12.7	0.94	1.87	3.34	1.67	1.24	1.20	7	13	8
RRUS-32 B30 RRH	30.5	10.3	15.4	2.19	3.27	2.96	1.98	1.22	1.20	16	23	17
RRUS-32 B30 RRH (Shielded)	30.5	5.2	10.3	1.09	2.19	5.92	2.96	1.35	1.22	9	16	10

WIND LOADS AT 30 MPH:

TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	32
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	8	4	7
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	8	3	7
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	32
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	4	3	4
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	2	4	3
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	4	2	3
4415 B25 RRH (Side)	16.5	6.8	13.5	0.77	1.55	2.44	1.22	1.20	1.20	2	4	2
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	3	5
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	3	3
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	3
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	1.17	3.81	1.90	1.26	1.20	2	3	2
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	4
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	1.32	7.77	3.89	1.43	1.26	2	3	2

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.66	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	384
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	147	78	95
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	133	60	79
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	384
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	74	46	53
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	55	74	69
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	68	32	41
4415 B25 RRH (Side)	16.5	10.1	13.5	1.16	1.55	1.63	1.22	1.20	1.20	51	68	63
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	100	61	70
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	76	61	65
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	51	72	66
B5/B12 4449 RRH (Shielded)	17.9	7.1	9.4	0.88	1.17	2.54	1.90	1.20	1.20	38	51	48
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	61	100	90
RRUS-32 B30 RRH (Shielded)	27.2	5.3	7.0	0.99	1.32	5.18	3.89	1.32	1.26	48	61	57

WIND LOADS WITH ICE:

TPA65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	79
AIR6449 Antenna	33.7	19.2	11.4	4.50	2.67	1.75	2.95	1.20	1.22	31	19	22
AIR6419 Antenna	31.3	19.0	10.0	4.14	2.18	1.65	3.13	1.20	1.23	29	16	19
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	79
B14 4478 RRH	21.4	16.7	11.6	2.49	1.73	1.28	1.84	1.20	1.20	17	12	13
B14 4478 RRH (Side)	21.4	12.5	16.7	1.86	2.49	1.71	1.28	1.20	1.20	13	17	16
4415 B25 RRH	19.8	16.8	9.6	2.31	1.32	1.18	2.06	1.20	1.20	16	9	11
4415 B25 RRH (Side)	19.8	12.6	16.8	1.74	2.31	1.57	1.18	1.20	1.20	12	16	15
RRUS-32 B66A RRH	30.5	15.4	10.3	3.27	2.19	1.98	2.96	1.20	1.22	23	16	17
RRUS-32 B66A RRH (Shielded)	30.5	11.6	10.3	2.45	2.19	2.64	2.96	1.21	1.22	17	16	16
B5/B12 4449 RRH	21.2	12.7	16.5	1.87	2.43	1.67	1.28	1.20	1.20	13	17	16
B5/B12 4449 RRH (Shielded)	21.2	9.5	12.7	1.41	1.87	2.22	1.67	1.20	1.20	10	13	12
RRUS-32 B30 RRH	30.5	10.3	15.4	2.19	3.27	2.96	1.98	1.22	1.20	16	23	21
RRUS-32 B30 RRH (Shielded)	30.5	7.7	10.3	1.64	2.19	3.94	2.96	1.26	1.22	12	16	15

WIND LOADS AT 30 MPH:

TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	22
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	8	4	5
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	8	3	5
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	22
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	4	3	3
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	3	4	4
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	4	2	2
4415 B25 RRH (Side)	16.5	10.1	13.5	1.16	1.55	1.63	1.22	1.20	1.20	3	4	4
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	3	4
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	4	3	4
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
B5/B12 4449 RRH (Shielded)	17.9	7.1	9.4	0.88	1.17	2.54	1.90	1.20	1.20	2	3	3
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	5
RRUS-32 B30 RRH (Shielded)	27.2	5.3	7.0	0.99	1.32	5.18	3.89	1.32	1.26	3	3	3

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 90 (deg) | Ice Thickness = 1.66 in. | Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	296
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	147	78	78
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	133	60	60
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	296
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	74	46	46
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	46	74	74
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	68	32	32
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	32	68	68
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	100	61	61
RRUS-32 B66A RRH (Shielded)	27.2	0.0	7.0	0.00	1.32	0.00	3.89	1.20	1.26	0	61	61
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	51	72	72
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	1.17	3.81	1.90	1.26	1.20	27	51	51
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	61	100	100
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	1.32	7.77	3.89	1.43	1.26	34	61	61

WIND LOADS WITH ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	65
AIR6449 Antenna	33.7	19.2	11.4	4.50	2.67	1.75	2.95	1.20	1.22	31	19	19
AIR6419 Antenna	31.3	19.0	10.0	4.14	2.18	1.65	3.13	1.20	1.23	29	16	16
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	65
B14 4478 RRH	21.4	16.7	11.6	2.49	1.73	1.28	1.84	1.20	1.20	17	12	12
B14 4478 RRH (Side)	21.4	11.6	16.7	1.73	2.49	1.84	1.28	1.20	1.20	12	17	17
4415 B25 RRH	19.8	16.8	9.6	2.31	1.32	1.18	2.06	1.20	1.20	16	9	9
4415 B25 RRH (Side)	19.8	9.6	16.8	1.32	2.31	2.06	1.18	1.20	1.20	9	16	16
RRUS-32 B66A RRH	30.5	15.4	10.3	3.27	2.19	1.98	2.96	1.20	1.22	23	16	16
RRUS-32 B66A RRH (Shielded)	30.5	3.3	10.3	0.70	2.19	9.20	2.96	1.47	1.22	6	16	16
B5/B12 4449 RRH	21.2	12.7	16.5	1.87	2.43	1.67	1.28	1.20	1.20	13	17	17
B5/B12 4449 RRH (Shielded)	21.2	8.0	12.7	1.18	1.87	2.65	1.67	1.21	1.20	8	13	13
RRUS-32 B30 RRH	30.5	10.3	15.4	2.19	3.27	2.96	1.98	1.22	1.20	16	23	23
RRUS-32 B30 RRH (Shielded)	30.5	6.8	10.3	1.44	2.19	4.48	2.96	1.29	1.22	11	16	16

WIND LOADS AT 30 MPH:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	17
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	8	4	4
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	8	3	3
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	17
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	4	3	3
B14 4478 RRH (Side)	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	4	4
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	4	2	2
4415 B25 RRH (Side)	16.5	6.3	13.5	0.72	1.55	2.62	1.22	1.21	1.20	2	4	4
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	3	3
RRUS-32 B66A RRH (Shielded)	27.2	0.0	7.0	0.00	1.32	0.00	3.89	1.20	1.26	0	3	3
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	1.17	3.81	1.90	1.26	1.20	2	3	3
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	6
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	1.32	7.77	3.89	1.43	1.26	2	3	3

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.66	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	384
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	147	78	95
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	133	60	79
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	384
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	74	46	53
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	55	74	69
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	68	32	41
4415 B25 RRH (Side)	16.5	10.1	13.5	1.16	1.55	1.63	1.22	1.20	1.20	51	68	63
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	100	61	70
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	76	61	65
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	51	72	66
B5/B12 4449 RRH (Shielded)	17.9	7.1	9.4	0.88	1.17	2.54	1.90	1.20	1.20	38	51	48
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	61	100	90
RRUS-32 B30 RRH (Shielded)	27.2	5.3	7.0	0.99	1.32	5.18	3.89	1.32	1.26	48	61	57

WIND LOADS WITH ICE:

TPA65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	79
AIR6449 Antenna	33.7	19.2	11.4	4.50	2.67	1.75	2.95	1.20	1.22	31	19	22
AIR6419 Antenna	31.3	19.0	10.0	4.14	2.18	1.65	3.13	1.20	1.23	29	16	19
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	79
B14 4478 RRH	21.4	16.7	11.6	2.49	1.73	1.28	1.84	1.20	1.20	17	12	13
B14 4478 RRH (Side)	21.4	12.5	16.7	1.86	2.49	1.71	1.28	1.20	1.20	13	17	16
4415 B25 RRH	19.8	16.8	9.6	2.31	1.32	1.18	2.06	1.20	1.20	16	9	11
4415 B25 RRH (Side)	19.8	12.6	16.8	1.74	2.31	1.57	1.18	1.20	1.20	12	16	15
RRUS-32 B66A RRH	30.5	15.4	10.3	3.27	2.19	1.98	2.96	1.20	1.22	23	16	17
RRUS-32 B66A RRH (Shielded)	30.5	11.6	10.3	2.45	2.19	2.64	2.96	1.21	1.22	17	16	16
B5/B12 4449 RRH	21.2	12.7	16.5	1.87	2.43	1.67	1.28	1.20	1.20	13	17	16
B5/B12 4449 RRH (Shielded)	21.2	9.5	12.7	1.41	1.87	2.22	1.67	1.20	1.20	10	13	12
RRUS-32 B30 RRH	30.5	10.3	15.4	2.19	3.27	2.96	1.98	1.22	1.20	16	23	21
RRUS-32 B30 RRH (Shielded)	30.5	7.7	10.3	1.64	2.19	3.94	2.96	1.26	1.22	12	16	15

WIND LOADS AT 30 MPH:

TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	22
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	8	4	5
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	8	3	5
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	22
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	4	3	3
B14 4478 RRH (Side)	18.1	10.1	13.4	1.26	1.68	1.80	1.35	1.20	1.20	3	4	4
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	4	2	2
4415 B25 RRH (Side)	16.5	10.1	13.5	1.16	1.55	1.63	1.22	1.20	1.20	3	4	4
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	3	4
RRUS-32 B66A RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	4	3	4
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	4
B5/B12 4449 RRH (Shielded)	17.9	7.1	9.4	0.88	1.17	2.54	1.90	1.20	1.20	2	3	3
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	5
RRUS-32 B30 RRH (Shielded)	27.2	5.3	7.0	0.99	1.32	5.18	3.89	1.32	1.26	3	3	3

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 150 (deg) | Ice Thickness = 1.66 in. | Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	562
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	147	78	129
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	133	60	115
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	650	296	562
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	74	46	67
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	37	74	46
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	68	32	59
4415 B25 RRH (Side)	16.5	6.8	13.5	0.77	1.55	2.44	1.22	1.20	1.20	34	68	42
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	100	61	90
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	54	61	55
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	51	72	56
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	1.17	3.81	1.90	1.26	1.20	27	51	33
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	61	100	70
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	1.32	7.77	3.89	1.43	1.26	34	61	41

WIND LOADS WITH ICE:

TPA65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	108
AIR6449 Antenna	33.7	19.2	11.4	4.50	2.67	1.75	2.95	1.20	1.22	31	19	28
AIR6419 Antenna	31.3	19.0	10.0	4.14	2.18	1.65	3.13	1.20	1.23	29	16	26
DMP65R-BU8DA Antenna	99.3	24.0	11.0	16.56	7.60	4.14	9.02	1.27	1.47	123	65	108
B14 4478 RRH	21.4	16.7	11.6	2.49	1.73	1.28	1.84	1.20	1.20	17	12	16
B14 4478 RRH (Side)	21.4	8.4	16.7	1.24	2.49	2.56	1.28	1.20	1.20	9	17	11
4415 B25 RRH	19.8	16.8	9.6	2.31	1.32	1.18	2.06	1.20	1.20	16	9	14
4415 B25 RRH (Side)	19.8	8.4	16.8	1.16	2.31	2.36	1.18	1.20	1.20	8	16	10
RRUS-32 B66A RRH	30.5	15.4	10.3	3.27	2.19	1.98	2.96	1.20	1.22	23	16	21
RRUS-32 B66A RRH (Shielded)	30.5	7.7	10.3	1.63	2.19	3.96	2.96	1.26	1.22	12	16	13
B5/B12 4449 RRH	21.2	12.7	16.5	1.87	2.43	1.67	1.28	1.20	1.20	13	17	14
B5/B12 4449 RRH (Shielded)	21.2	6.4	12.7	0.94	1.87	3.34	1.67	1.24	1.20	7	13	8
RRUS-32 B30 RRH	30.5	10.3	15.4	2.19	3.27	2.96	1.98	1.22	1.20	16	23	17
RRUS-32 B30 RRH (Shielded)	30.5	5.2	10.3	1.09	2.19	5.92	2.96	1.35	1.22	9	16	10

WIND LOADS AT 30 MPH:

TPA65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	32
AIR6449 Antenna	30.4	15.9	8.1	3.36	1.71	1.91	3.75	1.20	1.26	8	4	7
AIR6419 Antenna	28.0	15.7	6.7	3.05	1.30	1.78	4.18	1.20	1.27	8	3	7
DMP65R-BU8DA Antenna	96.0	20.7	7.7	13.80	5.13	4.64	12.47	1.30	1.58	37	17	32
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	4	3	4
B14 4478 RRH (Side)	18.1	6.7	13.4	0.84	1.68	2.70	1.35	1.21	1.20	2	4	3
4415 B25 RRH	16.5	13.5	6.3	1.55	0.72	1.22	2.62	1.20	1.21	4	2	3
4415 B25 RRH (Side)	16.5	6.8	13.5	0.77	1.55	2.44	1.22	1.20	1.20	2	4	2
RRUS-32 B66A RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	6	3	5
RRUS-32 B66A RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	3	3	3
B5/B12 4449 RRH	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	4	3
B5/B12 4449 RRH (Shielded)	17.9	4.7	9.4	0.58	1.17	3.81	1.90	1.26	1.20	2	3	2
RRUS-32 B30 RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	3	6	4
RRUS-32 B30 RRH (Shielded)	27.2	3.5	7.0	0.66	1.32	7.77	3.89	1.43	1.26	2	3	2

Date: 2/9/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.66 in.
Density of ice: 56 pcf

TPA65R-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: 385 lbs
Weight of object: 87.0 lbs
Combined weight of ice and object: 472 lbs

AIR6449 Antenna
Weight of ice based on total radial SF area:
Height (in): 30.4
Width (in): 15.9
Depth (in): 8.1
Total weight of ice on object: 100 lbs
Weight of object: 82.0 lbs
Combined weight of ice and object: 182 lbs

AIR6419 Antenna
Weight of ice based on total radial SF area:
Height (in): 28.0
Width (in): 15.7
Depth (in): 6.7
Total weight of ice on object: 89 lbs
Weight of object: 66.0 lbs
Combined weight of ice and object: 155 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: 385 lbs
Weight of object: 96.0 lbs
Combined weight of ice and object: 481 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: 53 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 113 lbs

4415 B25 RRH
Weight of ice based on total radial SF area:
Height (in): 16.5
Width (in): 13.5
Depth (in): 6.3
Total weight of ice on object: 46 lbs
Weight of object: 50.0 lbs
Combined weight of ice and object: 96 lbs

RRUS-32 B66A 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: 72 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 132 lbs

B5/B12 4449 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: 54 lbs
Weight of object: 73.0 lbs
Combined weight of ice and object: 127 lbs

RRUS-32 B30 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: 72 lbs
Weight of object: 60.0 lbs
Combined weight of ice and object: 132 lbs

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: 46 lbs
Weight of object: 33 lbs
Combined weight of ice and object: 79 lbs

PL 6x1/2
Weight of ice based on total radial SF area:
Height (in): 6
Width (in): 0.5
Per foot weight of ice on object: 16 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: 15 plf

C 3x2
Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 2
Per foot weight of ice on object: 11 plf

L 3x3 Angles
Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 3
Per foot weight of ice on object: 12 plf

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: 9 plf

3" Pipe
Per foot weight of ice:
diameter (in): 3.5
Per foot weight of ice on object: 10 plf

2-1/2" pipe
Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 9 plf

2" pipe
Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 8 plf

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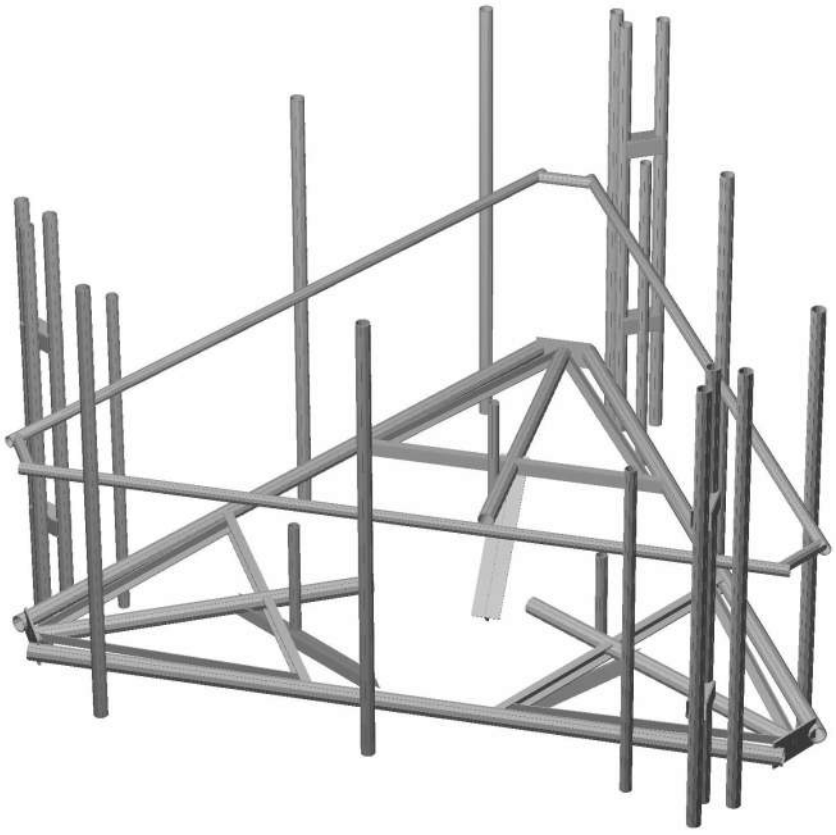
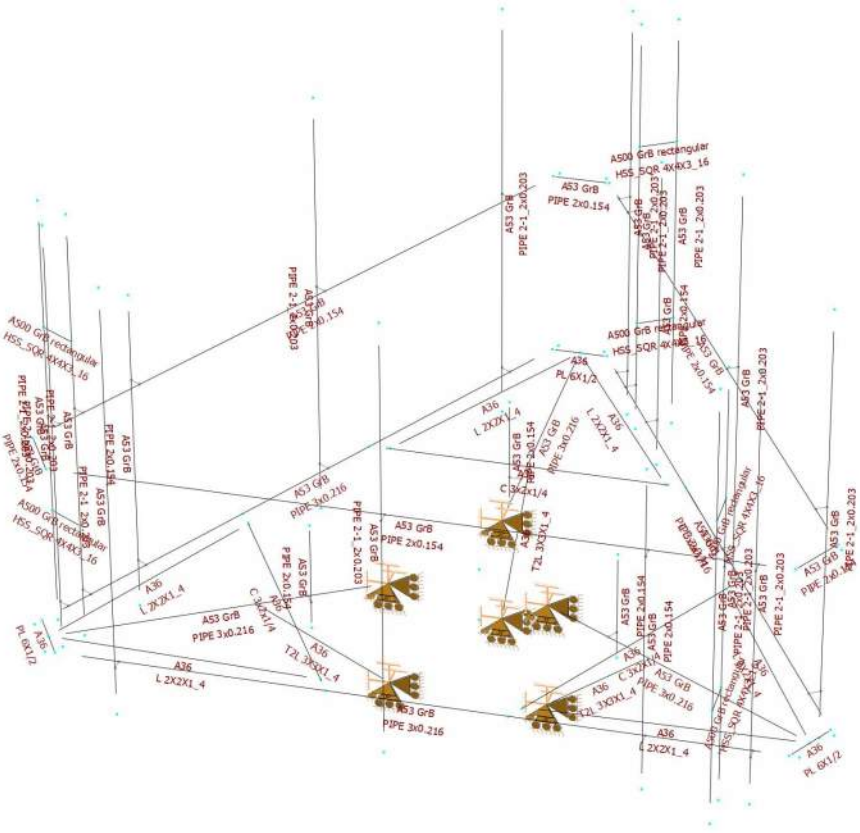
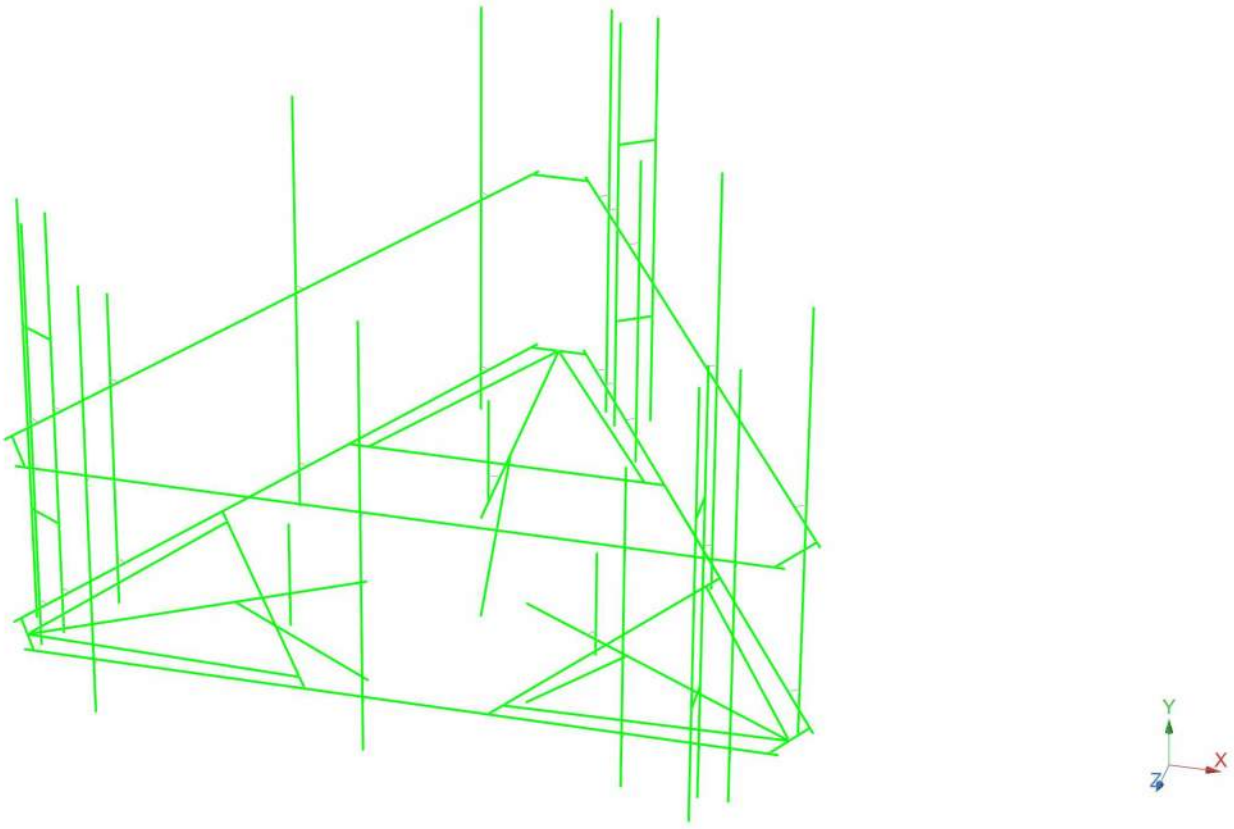
Design Group LLC

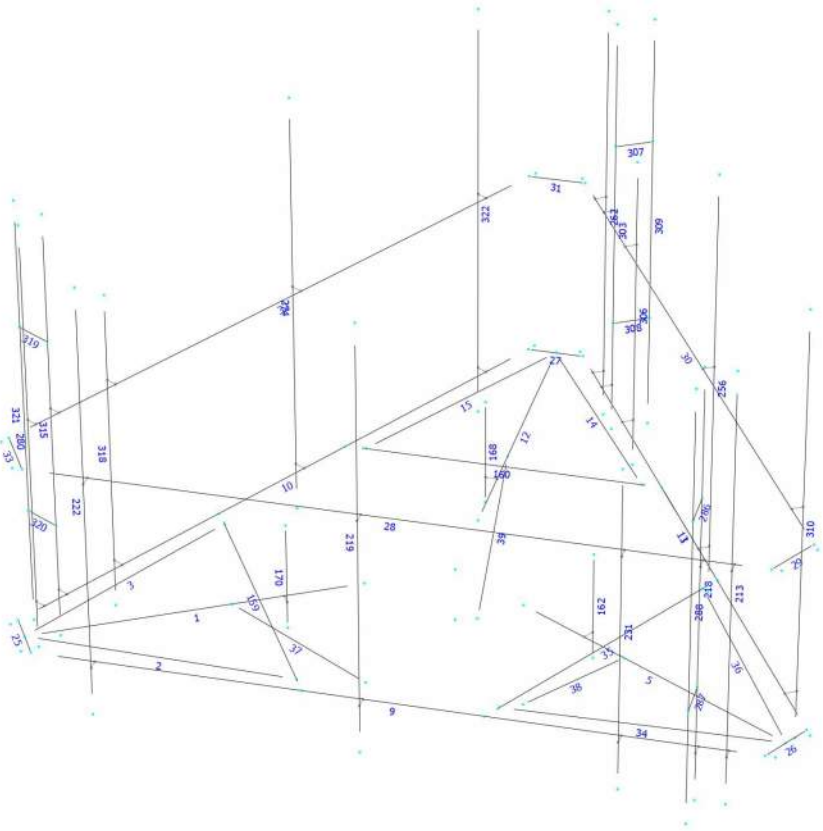
Mount Calculations
(Existing Conditions)


Y
X
Z


A500 GrB rectangular
HSS_SQR 4X4X3_16
A53 GrB
PIPE 2x0.154
PIPE 2-1_2x0.203
A36
PL 6X1/2
L 2X2X1_4
PIPE 3x0.216
C 3X2X1/4
T2L 3X3X1_4
Y
X
Z


Design status
Not designed
Error on design
Design O.K.
With warnings
Y
X
Z

Current Date: 2/9/2022 4:56 PM
Units system: English



Current Date: 2/9/2022 5:00 PM
Units system: English

Load data

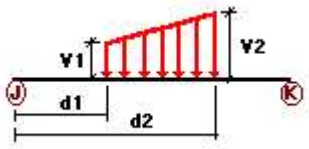
GLOSSARY

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

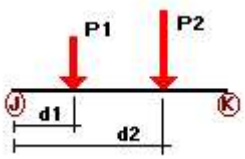


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
DL	2	y	-0.01	-0.01	0.00	No	100.00	Yes
	3	y	-0.01	-0.01	0.00	No	100.00	Yes
	14	y	-0.01	-0.01	0.00	No	100.00	Yes
	15	y	-0.01	-0.01	0.00	No	100.00	Yes
	34	y	-0.01	-0.01	0.00	No	100.00	Yes
	35	y	-0.01	-0.01	0.00	No	100.00	Yes
	36	y	-0.01	-0.01	0.00	No	100.00	Yes
	159	y	-0.01	-0.01	0.00	No	100.00	Yes
	160	y	-0.01	-0.01	0.00	No	100.00	Yes
W0	9	z	-0.007	-0.007	0.00	No	100.00	Yes
	10	z	-0.007	-0.007	0.00	No	100.00	Yes
	11	z	-0.007	-0.007	0.00	No	100.00	Yes
	13	z	-0.013	-0.013	0.00	No	100.00	Yes
	25	z	-0.003	-0.003	0.00	No	100.00	Yes
	26	z	-0.003	-0.003	0.00	No	100.00	Yes
	27	z	-0.003	-0.003	0.00	No	100.00	Yes

	28	z	-0.005	-0.005	0.00	No	100.00	Yes
	30	z	-0.005	-0.005	0.00	No	100.00	Yes
	32	z	-0.005	-0.005	0.00	No	100.00	Yes
	37	z	-0.011	-0.011	0.00	No	100.00	Yes
	38	z	-0.011	-0.011	0.00	No	100.00	Yes
	39	z	-0.011	-0.011	0.00	No	100.00	Yes
	162	z	-0.005	-0.005	0.00	No	100.00	Yes
	168	z	-0.005	-0.005	0.00	No	100.00	Yes
	170	z	-0.005	-0.005	0.00	No	100.00	Yes
	213	z	-0.006	-0.006	0.00	No	100.00	Yes
	231	z	-0.005	-0.005	0.00	No	100.00	Yes
	256	z	-0.006	-0.006	0.00	No	100.00	Yes
	262	z	-0.006	-0.006	0.00	No	100.00	Yes
	274	z	-0.006	-0.006	0.00	No	100.00	Yes
	280	z	-0.006	-0.006	0.00	No	100.00	Yes
	303	z	-0.006	-0.006	0.00	No	100.00	Yes
	306	z	-0.005	-0.005	0.00	No	100.00	Yes
	307	z	-0.015	-0.015	0.00	No	100.00	Yes
	308	z	-0.015	-0.015	0.00	No	100.00	Yes
	309	z	-0.006	-0.006	0.00	No	100.00	Yes
	315	z	-0.006	-0.006	0.00	No	100.00	Yes
	318	z	-0.005	-0.005	0.00	No	100.00	Yes
	319	z	-0.015	-0.015	0.00	No	100.00	Yes
	320	z	-0.015	-0.015	0.00	No	100.00	Yes
	321	z	-0.006	-0.006	0.00	No	100.00	Yes
	322	z	-0.006	-0.006	0.00	No	100.00	Yes
W30	10	x	-0.007	-0.007	0.00	No	100.00	Yes
	11	x	-0.007	-0.007	0.00	No	100.00	Yes
	13	x	-0.013	-0.013	0.00	No	100.00	Yes
	25	x	-0.003	-0.003	0.00	No	100.00	Yes
	26	x	-0.003	-0.003	0.00	No	100.00	Yes
	30	x	-0.005	-0.005	0.00	No	100.00	Yes
	32	x	-0.005	-0.005	0.00	No	100.00	Yes
	37	x	-0.011	-0.011	0.00	No	100.00	Yes
	38	x	-0.011	-0.011	0.00	No	100.00	Yes
	39	x	-0.011	-0.011	0.00	No	100.00	Yes
	162	x	-0.005	-0.005	0.00	No	100.00	Yes
	168	x	-0.005	-0.005	0.00	No	100.00	Yes
	170	x	-0.005	-0.005	0.00	No	100.00	Yes
	213	x	-0.006	-0.006	0.00	No	100.00	Yes
	218	x	-0.006	-0.006	0.00	No	100.00	Yes
	219	x	-0.006	-0.006	0.00	No	100.00	Yes
	222	x	-0.01	-0.01	0.00	No	100.00	Yes
	231	x	-0.005	-0.005	0.00	No	100.00	Yes
	262	x	-0.006	-0.006	0.00	No	100.00	Yes
	274	x	-0.006	-0.006	0.00	No	100.00	Yes
	280	x	-0.006	-0.006	0.00	No	100.00	Yes
	286	x	-0.015	-0.015	0.00	No	100.00	Yes
	287	x	-0.015	-0.015	0.00	No	100.00	Yes
	288	x	-0.006	-0.006	0.00	No	100.00	Yes
	306	x	-0.005	-0.005	0.00	No	100.00	Yes
	315	x	-0.006	-0.006	0.00	No	100.00	Yes
	318	x	-0.005	-0.005	0.00	No	100.00	Yes
	319	x	-0.015	-0.015	0.00	No	100.00	Yes
	320	x	-0.015	-0.015	0.00	No	100.00	Yes
	321	x	-0.006	-0.006	0.00	No	100.00	Yes
	322	x	-0.006	-0.006	0.00	No	100.00	Yes
Di	1	y	-0.01	-0.01	0.00	No	100.00	Yes
	2	y	-0.009	-0.009	0.00	No	100.00	Yes
	3	y	-0.009	-0.009	0.00	No	100.00	Yes

5	y	-0.01	-0.01	0.00	No	100.00	Yes
9	y	-0.01	-0.01	0.00	No	100.00	Yes
10	y	-0.01	-0.01	0.00	No	100.00	Yes
11	y	-0.01	-0.01	0.00	No	100.00	Yes
12	y	-0.01	-0.01	0.00	No	100.00	Yes
14	y	-0.009	-0.009	0.00	No	100.00	Yes
15	y	-0.009	-0.009	0.00	No	100.00	Yes
25	y	-0.016	-0.016	0.00	No	100.00	Yes
26	y	-0.016	-0.016	0.00	No	100.00	Yes
27	y	-0.016	-0.016	0.00	No	100.00	Yes
28	y	-0.008	-0.008	0.00	No	100.00	Yes
29	y	-0.008	-0.008	0.00	No	100.00	Yes
30	y	-0.008	-0.008	0.00	No	100.00	Yes
31	y	-0.008	-0.008	0.00	No	100.00	Yes
32	y	-0.008	-0.008	0.00	No	100.00	Yes
33	y	-0.008	-0.008	0.00	No	100.00	Yes
34	y	-0.009	-0.009	0.00	No	100.00	Yes
35	y	-0.011	-0.011	0.00	No	100.00	Yes
36	y	-0.009	-0.009	0.00	No	100.00	Yes
37	y	-0.012	-0.012	0.00	No	100.00	Yes
38	y	-0.012	-0.012	0.00	No	100.00	Yes
39	y	-0.012	-0.012	0.00	No	100.00	Yes
159	y	-0.011	-0.011	0.00	No	100.00	Yes
160	y	-0.011	-0.011	0.00	No	100.00	Yes
162	y	-0.008	-0.008	0.00	No	100.00	Yes
168	y	-0.008	-0.008	0.00	No	100.00	Yes
170	y	-0.008	-0.008	0.00	No	100.00	Yes
213	y	-0.009	-0.009	0.00	No	100.00	Yes
218	y	-0.009	-0.009	0.00	No	100.00	Yes
219	y	-0.009	-0.009	0.00	No	100.00	Yes
231	y	-0.008	-0.008	0.00	No	100.00	Yes
256	y	-0.009	-0.009	0.00	No	100.00	Yes
262	y	-0.009	-0.009	0.00	No	100.00	Yes
274	y	-0.009	-0.009	0.00	No	100.00	Yes
280	y	-0.009	-0.009	0.00	No	100.00	Yes
286	y	-0.015	-0.015	0.00	No	100.00	Yes
287	y	-0.015	-0.015	0.00	No	100.00	Yes
288	y	-0.009	-0.009	0.00	No	100.00	Yes
303	y	-0.009	-0.009	0.00	No	100.00	Yes
306	y	-0.008	-0.008	0.00	No	100.00	Yes
307	y	-0.015	-0.015	0.00	No	100.00	Yes
308	y	-0.015	-0.015	0.00	No	100.00	Yes
309	y	-0.009	-0.009	0.00	No	100.00	Yes
315	y	-0.009	-0.009	0.00	No	100.00	Yes
318	y	-0.008	-0.008	0.00	No	100.00	Yes
319	y	-0.015	-0.015	0.00	No	100.00	Yes
320	y	-0.015	-0.015	0.00	No	100.00	Yes
321	y	-0.009	-0.009	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
DL	162	y	-0.033	1.00	No
		y	-0.033	1.00	No
	168	y	-0.033	1.00	No
	170	y	-0.033	1.00	No
		y	-0.033	1.00	No
	218	y	-0.06	5.00	No
	219	y	-0.041	1.00	No
		y	-0.041	3.00	No
		y	-0.033	5.00	No
		y	-0.033	7.00	No
	222	y	-0.048	0.50	No
		y	-0.048	7.50	No
		y	-0.073	5.00	No
		y	-0.06	5.00	No
	231	y	-0.06	3.00	No
		y	-0.05	3.00	No
	256	y	-0.041	1.00	No
		y	-0.041	3.00	No
		y	-0.033	5.00	No
		y	-0.033	7.00	No
	274	y	-0.041	1.00	No
		y	-0.041	3.00	No
		y	-0.033	5.00	No
		y	-0.033	7.00	No
	288	y	-0.044	0.50	No
		y	-0.044	7.50	No
	303	y	-0.06	5.00	No
	306	y	-0.06	3.00	No
		y	-0.05	3.00	No
	309	y	-0.044	0.50	No
		y	-0.044	7.50	No
	310	y	-0.048	0.50	No
		y	-0.048	7.50	No
		y	-0.073	5.00	No
		y	-0.06	5.00	No
	315	y	-0.06	5.00	No
	318	y	-0.06	3.00	No
		y	-0.05	3.00	No
	321	y	-0.044	0.50	No
		y	-0.044	7.50	No
	322	y	-0.048	0.50	No
		y	-0.048	7.50	No
		y	-0.073	5.00	No
		y	-0.06	5.00	No
W0	162	z	-0.041	1.00	No
	168	z	-0.041	1.00	No
	170	z	-0.041	1.00	No
	219	z	-0.074	1.00	No
		z	-0.074	3.00	No
		z	-0.067	5.00	No
		z	-0.067	7.00	No
	222	z	-0.325	0.50	No
		z	-0.325	7.50	No
		z	-0.027	5.00	No
		z	-0.034	5.00	No
	231	z	-0.046	3.00	No
		z	-0.032	3.00	No
	256	z	-0.048	1.00	No
		z	-0.048	3.00	No
		z	-0.04	5.00	No

		z	-0.04	7.00	No
	274	z	-0.048	1.00	No
		z	-0.048	3.00	No
		z	-0.04	5.00	No
		z	-0.04	7.00	No
	288	z	-0.325	0.50	No
		z	-0.325	7.50	No
	303	z	-0.065	5.00	No
	306	z	-0.069	3.00	No
	309	z	-0.192	0.50	No
		z	-0.192	7.50	No
	310	z	-0.192	0.50	No
		z	-0.192	7.50	No
		z	-0.057	5.00	No
	315	z	-0.065	5.00	No
	318	z	-0.069	3.00	No
	321	z	-0.192	0.50	No
		z	-0.192	7.50	No
	322	z	-0.192	0.50	No
		z	-0.192	7.50	No
		z	-0.057	5.00	No
W30	162	x	-0.041	1.00	No
	168	x	-0.041	1.00	No
	170	x	-0.041	1.00	No
	218	x	-0.061	5.00	No
	219	x	-0.039	1.00	No
		x	-0.039	3.00	No
		x	-0.03	5.00	No
		x	-0.03	7.00	No
	222	x	-0.148	0.50	No
		x	-0.148	7.50	No
		x	-0.061	5.00	No
	231	x	-0.074	3.00	No
	256	x	-0.065	1.00	No
		x	-0.065	3.00	No
		x	-0.058	5.00	No
		x	-0.058	7.00	No
	274	x	-0.065	1.00	No
		x	-0.065	3.00	No
		x	-0.058	5.00	No
		x	-0.058	7.00	No
	288	x	-0.148	0.50	No
		x	-0.148	7.50	No
	303	x	-0.055	5.00	No
	306	x	-0.046	3.00	No
	309	x	-0.281	0.50	No
		x	-0.281	7.50	No
	310	x	-0.281	0.50	No
		x	-0.281	7.50	No
		x	-0.041	5.00	No
	315	x	-0.055	5.00	No
	318	x	-0.046	3.00	No
	321	x	-0.281	0.50	No
		x	-0.281	7.50	No
	322	x	-0.281	0.50	No
		x	-0.281	7.50	No
		x	-0.041	5.00	No
Di	162	y	-0.046	1.00	No
		y	-0.046	1.00	No
	168	y	-0.046	1.00	No

	170	y	-0.046	1.00	No
		y	-0.046	1.00	No
	218	y	-0.072	5.00	No
	219	y	-0.05	1.00	No
		y	-0.05	3.00	No
		y	-0.045	5.00	No
		y	-0.045	7.00	No
	222	y	-0.193	0.50	No
		y	-0.193	7.50	No
		y	-0.054	5.00	No
		y	-0.072	5.00	No
	231	y	-0.053	3.00	No
		y	-0.046	3.00	No
	256	y	-0.05	1.00	No
		y	-0.05	3.00	No
		y	-0.045	5.00	No
		y	-0.045	7.00	No
	274	y	-0.05	1.00	No
		y	-0.05	3.00	No
		y	-0.045	5.00	No
		y	-0.045	7.00	No
	288	y	-0.193	0.50	No
		y	-0.193	7.50	No
	303	y	-0.072	5.00	No
	306	y	-0.053	3.00	No
		y	-0.046	3.00	No
	309	y	-0.193	0.50	No
		y	-0.193	7.50	No
	310	y	-0.193	0.50	No
		y	-0.193	7.50	No
		y	-0.054	5.00	No
		y	-0.072	5.00	No
	315	y	-0.072	5.00	No
	318	y	-0.053	3.00	No
		y	-0.046	3.00	No
	321	y	-0.193	0.50	No
		y	-0.193	7.50	No
	322	y	-0.193	0.50	No
		y	-0.193	7.50	No
		y	-0.054	5.00	No
		y	-0.072	5.00	No
Wi0	162	z	-0.01	1.00	No
	168	z	-0.01	1.00	No
	170	z	-0.01	1.00	No
	219	z	-0.016	1.00	No
		z	-0.016	3.00	No
		z	-0.015	5.00	No
		z	-0.015	7.00	No
	222	z	-0.062	0.50	No
		z	-0.062	7.50	No
		z	-0.009	5.00	No
		z	-0.012	5.00	No
	231	z	-0.012	3.00	No
		z	-0.009	3.00	No
	256	z	-0.011	1.00	No
		z	-0.011	3.00	No
		z	-0.01	5.00	No
		z	-0.01	7.00	No
	274	z	-0.011	1.00	No
		z	-0.011	3.00	No

		z	-0.01	5.00	No
		z	-0.01	7.00	No
	288	z	-0.062	0.50	No
		z	-0.062	7.50	No
	303	z	-0.016	5.00	No
	306	z	-0.016	3.00	No
	309	z	-0.04	0.50	No
		z	-0.04	7.50	No
	310	z	-0.04	0.50	No
		z	-0.04	7.50	No
		z	-0.015	5.00	No
	315	z	-0.016	5.00	No
	318	z	-0.016	3.00	No
	321	z	-0.04	0.50	No
		z	-0.04	7.50	No
	322	z	-0.04	0.50	No
		z	-0.04	7.50	No
		z	-0.015	5.00	No
Wi30	162	x	-0.01	1.00	No
	168	x	-0.01	1.00	No
	170	x	-0.01	1.00	No
	218	x	-0.016	5.00	No
	219	x	-0.01	1.00	No
		x	-0.01	3.00	No
		x	-0.008	5.00	No
		x	-0.008	7.00	No
	222	x	-0.033	0.50	No
		x	-0.033	7.50	No
		x	-0.016	5.00	No
	231	x	-0.017	3.00	No
	256	x	-0.014	1.00	No
		x	-0.014	3.00	No
		x	-0.013	5.00	No
		x	-0.013	7.00	No
	274	x	-0.014	1.00	No
		x	-0.014	3.00	No
		x	-0.013	5.00	No
		x	-0.013	7.00	No
	288	x	-0.033	0.50	No
		x	-0.033	7.50	No
	303	x	-0.013	5.00	No
	306	x	-0.011	3.00	No
	309	x	-0.054	0.50	No
		x	-0.054	7.50	No
	310	x	-0.054	0.50	No
		x	-0.054	7.50	No
		x	-0.01	5.00	No
	315	x	-0.013	5.00	No
	318	x	-0.011	3.00	No
	321	x	-0.054	0.50	No
		x	-0.054	7.50	No
	322	x	-0.054	0.50	No
		x	-0.054	7.50	No
		x	-0.01	5.00	No
WL0	162	z	-0.002	1.00	No
	168	z	-0.002	1.00	No
	170	z	-0.002	1.00	No
	219	z	-0.004	1.00	No
		z	-0.004	3.00	No
		z	-0.004	5.00	No

		z	-0.004	7.00	No
	222	z	-0.019	0.50	No
		z	-0.019	7.50	No
		z	-0.002	5.00	No
		z	-0.002	5.00	No
	231	z	-0.003	3.00	No
		z	-0.002	3.00	No
	256	z	-0.003	1.00	No
		z	-0.003	3.00	No
		z	-0.003	5.00	No
		z	-0.003	7.00	No
	274	z	-0.003	1.00	No
		z	-0.003	3.00	No
		z	-0.003	5.00	No
		z	-0.003	7.00	No
	288	z	-0.019	0.50	No
		z	-0.019	7.50	No
	303	z	-0.004	5.00	No
	306	z	-0.004	3.00	No
	309	z	-0.011	0.50	No
		z	-0.011	7.50	No
	310	z	-0.011	0.50	No
		z	-0.011	7.50	No
		z	-0.003	5.00	No
	315	z	-0.004	5.00	No
	318	z	-0.004	3.00	No
	321	z	-0.011	0.50	No
		z	-0.011	7.50	No
	322	z	-0.011	0.50	No
		z	-0.011	7.50	No
		z	-0.003	5.00	No
WL30	162	x	-0.002	1.00	No
	168	x	-0.002	1.00	No
	170	x	-0.002	1.00	No
	218	x	-0.003	5.00	No
	219	x	-0.002	1.00	No
		x	-0.002	3.00	No
		x	-0.002	5.00	No
		x	-0.002	7.00	No
	222	x	-0.009	0.50	No
		x	-0.009	7.50	No
		x	-0.003	5.00	No
	231	x	-0.004	3.00	No
	256	x	-0.004	1.00	No
		x	-0.004	3.00	No
		x	-0.004	5.00	No
		x	-0.004	7.00	No
	274	x	-0.004	1.00	No
		x	-0.004	3.00	No
		x	-0.004	5.00	No
		x	-0.004	7.00	No
	288	x	-0.009	0.50	No
		x	-0.009	7.50	No
	303	x	-0.003	5.00	No
	306	x	-0.003	3.00	No
	309	x	-0.016	0.50	No
		x	-0.016	7.50	No
	310	x	-0.016	0.50	No
		x	-0.016	7.50	No
		x	-0.002	5.00	No

	315	x	-0.003	5.00	No
	318	x	-0.003	3.00	No
	321	x	-0.016	0.50	No
		x	-0.016	7.50	No
	322	x	-0.016	0.50	No
		x	-0.016	7.50	No
		x	-0.002	5.00	No
LL1	9	y	-0.25	50.00	Yes
LL2	9	y	-0.25	100.00	Yes
LLa1	213	y	-0.50	50.00	Yes
LLa2	288	y	-0.50	50.00	Yes
LLa3	219	y	-0.50	50.00	Yes
LLa4	222	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)

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

Current Date: 2/9/2022 5:00 PM
Units system: English

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+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

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	C 3x2x1/4	**13**	LC1 at 100.00%	0.17	OK	Eq. H1-1b
		35	LC11 at 50.00%	0.79	OK	Eq. H1-1b
		159	LC10 at 48.44%	0.76	OK	Eq. H1-1b
		160	LC9 at 48.44%	**0.79**	**OK**	Eq. H1-1b
	HSS_SQR 4X4X3_16	**286**	LC1 at 100.00%	0.07	OK	Eq. H1-1b
		287	LC3 at 100.00%	**0.08**	**OK**	Eq. H1-1b
		307	LC2 at 100.00%	0.05	OK	Eq. H1-1b
		308	LC4 at 100.00%	0.06	OK	Eq. H1-1b
		319	LC4 at 100.00%	0.06	OK	Eq. H1-1b
		320	LC2 at 100.00%	0.06	OK	Eq. H1-1b
	L 2X2X1_4	**2**	LC2 at 0.00%	**0.57**	**OK**	Eq. H2-1
		3	LC3 at 0.00%	0.51	OK	Sec. F1
		14	LC1 at 100.00%	0.50	OK	Eq. H2-1
		15	LC1 at 100.00%	0.56	OK	Eq. H2-1
		34	LC4 at 0.00%	0.50	OK	Eq. H2-1
		36	LC3 at 0.00%	0.53	OK	Sec. F1

PIPE 2-1_2x0.203	**213**	LC2 at 87.50%	0.21	OK	Eq. H1-1b
	218	LC2 at 87.50%	0.28	OK	Eq. H1-1b
	219	LC2 at 87.50%	0.59	OK	Eq. H1-1b
	222	LC1 at 43.75%	0.41	OK	Eq. H1-1b
	256	LC3 at 87.50%	**0.68**	**OK**	Eq. H1-1b
	262	LC3 at 87.50%	0.25	OK	Eq. H1-1b
	274	LC4 at 87.50%	0.67	OK	Eq. H1-1b
	280	LC1 at 87.50%	0.26	OK	Eq. H1-1b
	288	LC3 at 29.17%	0.25	OK	Eq. H1-1b
	303	LC3 at 87.50%	0.32	OK	Eq. H1-1b
	309	LC4 at 29.17%	0.30	OK	Eq. H1-1b
	310	LC2 at 43.75%	0.49	OK	Eq. H1-1b
	315	LC4 at 87.50%	0.32	OK	Eq. H1-1b
	321	LC2 at 29.17%	0.31	OK	Eq. H1-1b
	322	LC4 at 43.75%	0.51	OK	Eq. H1-1b
PIPE 2x0.154	**28**	LC4 at 10.16%	**0.68**	**OK**	Eq. H1-1b
	29	LC3 at 100.00%	0.47	OK	Eq. H3-6
	30	LC5 at 89.84%	0.63	OK	Eq. H1-1b
	31	LC2 at 0.00%	0.58	OK	Eq. H3-6
	32	LC1 at 6.25%	0.62	OK	Eq. H1-1b
	33	LC3 at 0.00%	0.60	OK	Eq. H3-6
	162	LC1 at 71.88%	0.03	OK	Eq. H1-1b
	168	LC4 at 71.88%	0.03	OK	Eq. H1-1b
	170	LC1 at 71.88%	0.02	OK	Eq. H1-1b
	231	LC2 at 83.33%	0.56	OK	Eq. H1-1b
	306	LC3 at 83.33%	0.62	OK	Eq. H1-1b
	318	LC4 at 83.33%	0.60	OK	Eq. H1-1b
PIPE 3x0.216	**1**	LC2 at 59.38%	0.86	OK	Eq. H1-1b
	5	LC4 at 59.38%	0.89	OK	Eq. H1-1b
	9	LC2 at 79.38%	0.42	OK	Eq. H1-1b
	10	LC1 at 20.63%	0.43	OK	Eq. H1-1b
	11	LC3 at 20.00%	0.43	OK	Eq. H1-1b
	12	LC1 at 37.50%	**0.97**	**OK**	Eq. H1-1b
PL 6X1/2	**25**	LC2 at 50.00%	0.23	OK	Eq. H1-1b
	26	LC4 at 50.00%	0.22	OK	Eq. H1-1b
	27	LC1 at 50.00%	**0.25**	**OK**	Eq. H1-1b
T2L 3X3X1_4	**37**	LC2 at 0.00%	0.80	OK	Eq. H2-1
	38	LC4 at 0.00%	**0.88**	**OK**	Eq. H2-1
	39	LC1 at 0.00%	0.81	OK	Eq. H2-1

Current Date: 2/9/2022 5:00 PM
Units system: English

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
3	-6.0833	0.00	0.00	0
4	-6.25	0.00	0.00	0
5	-6.3333	0.00	-0.433	0
6	-6.5833	0.00	-0.866	0
10	-6.6667	0.00	-0.7217	0
13	-0.50	0.00	-11.4027	0
14	-0.4167	0.00	-11.547	0
18	6.0833	0.00	0.00	0
19	6.25	0.00	0.00	0
20	6.3333	0.00	-0.433	0
21	6.5833	0.00	-0.866	0
25	6.6667	0.00	-0.7217	0
28	0.50	0.00	-11.4027	0
29	0.4167	0.00	-11.547	0
32	0.00	0.00	-11.4027	0
72	-6.25	3.50	0.00	0
73	6.25	3.50	0.00	0
74	6.0833	3.50	0.00	0
75	6.5833	3.50	-0.866	0
76	0.4167	3.50	-11.547	0
77	6.6667	3.50	-0.7217	0
78	0.50	3.50	-11.4027	0
79	-0.50	3.50	-11.4027	0

80	-6.6667	3.50	-0.7217	0
81	-0.4167	3.50	-11.547	0
82	-6.5833	3.50	-0.866	0
83	-6.0833	3.50	0.00	0
95	1.3574	0.00	-3.3059	0
107	0.00	0.00	-5.6569	0
108	-1.3574	0.00	-3.3059	0
120	-4.2989	0.00	-4.8227	0
121	-4.1249	0.00	-4.5213	0
135	-1.6886	0.00	-0.3014	0
136	1.6886	0.00	-0.3014	0
137	4.2989	0.00	-4.8227	0
138	1.5145	0.00	0.00	0
139	4.1249	0.00	-4.5213	0
140	-2.7844	0.00	-7.446	0
151	2.7844	0.00	-7.446	0
152	-2.4363	0.00	-7.446	0
166	2.4363	0.00	-7.446	0
168	-3.3086	0.00	-2.1794	0
170	3.3086	0.00	-2.1794	0
172	0.00	0.00	-7.80	0
173	1.3574	-1.975	-3.3059	0
174	0.00	-1.975	-5.6569	0
175	-1.3574	-1.975	-3.3059	0
209	0.00	0.00	-4.0896	0
387	-1.5145	0.00	0.00	0
417	2.648	1.50	-2.7985	0
418	2.648	-0.50	-2.7985	0
429	-0.2059	1.50	-7.0284	0
430	-0.2059	-0.50	-7.0284	0
433	-2.4421	1.50	-2.4419	0
434	-2.4421	-0.50	-2.4419	0
519	5.50	7.10	0.20	0
520	5.50	-0.90	0.20	0
525	5.00	7.10	0.20	0
526	5.00	-0.90	0.20	0
531	-0.50	7.10	0.20	0
532	-0.50	-0.90	0.20	0
537	-5.00	7.10	0.20	0
538	-5.00	-0.90	0.20	0
554	3.75	-0.90	0.20	0
556	3.75	5.10	0.20	0
593	0.00	-1.00	-4.0896	0
606	3.9649	7.10	-5.8014	0
607	3.9649	-0.90	-5.8014	0
618	0.9649	7.10	-10.9975	0
619	0.9649	-0.90	-10.9975	0
642	-3.4649	7.10	-6.6674	0
643	-3.4649	-0.90	-6.6674	0
654	-6.4649	7.10	-1.4712	0
655	-6.4649	-0.90	-1.4712	0
667	5.00	1.25	0.20	0
668	5.00	4.75	0.20	0
669	5.00	4.75	0.8667	0
670	5.00	1.25	0.8667	0
671	5.00	7.10	0.8667	0
672	5.00	-0.90	0.8667	0
697	1.2149	7.10	-10.5645	0
698	1.2149	-0.90	-10.5645	0
707	1.8399	-0.90	-9.482	0

708	1.8399	5.10	-9.482	0
709	1.2149	1.25	-10.5645	0
710	1.2149	4.75	-10.5645	0
711	1.7922	4.75	-10.8978	0
712	1.7922	1.25	-10.8978	0
713	1.7922	7.10	-10.8978	0
714	1.7922	-0.90	-10.8978	0
715	6.2149	7.10	-1.9042	0
716	6.2149	-0.90	-1.9042	0
721	-6.2149	7.10	-1.9042	0
722	-6.2149	-0.90	-1.9042	0
731	-5.5899	-0.90	-2.9868	0
732	-5.5899	5.10	-2.9868	0
733	-6.2149	1.25	-1.9042	0
734	-6.2149	4.75	-1.9042	0
735	-6.7922	4.75	-2.2376	0
736	-6.7922	1.25	-2.2376	0
737	-6.7922	7.10	-2.2376	0
738	-6.7922	-0.90	-2.2376	0
739	-1.2149	7.10	-10.5645	0
740	-1.2149	-0.90	-10.5645	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
95	1	1	1	1	1	1
107	1	1	1	1	1	1
108	1	1	1	1	1	1
173	1	1	1	1	1	1
174	1	1	1	1	1	1
175	1	1	1	1	1	1

Members

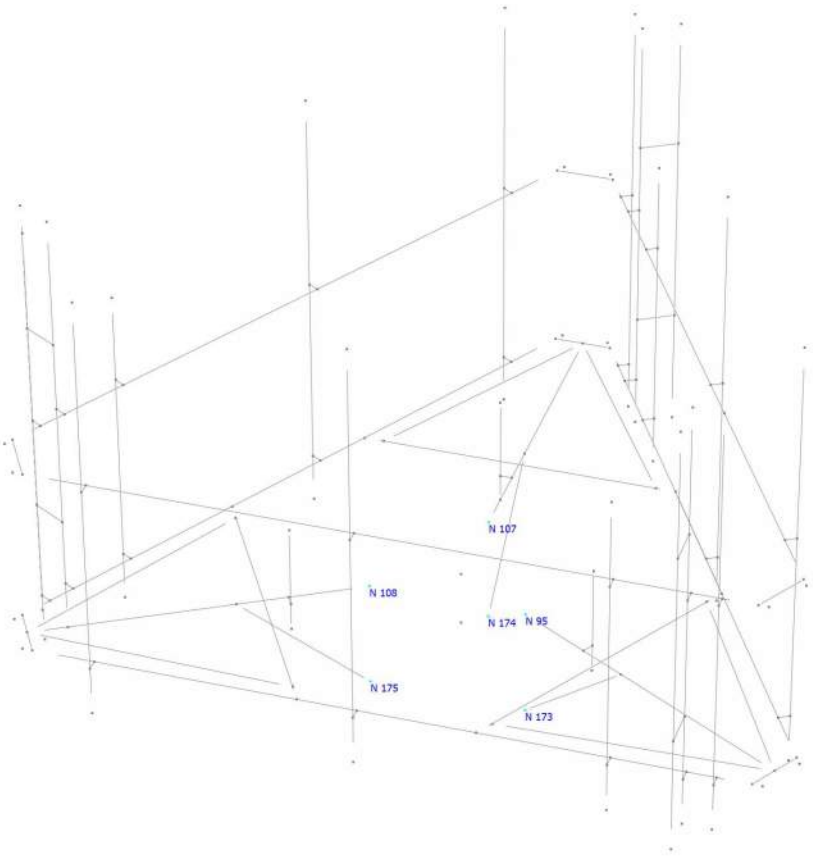
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
1	5	108		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
2	5	135		L 2X2X1_4	A36	0.00	0.00	0.00
3	5	121		L 2X2X1_4	A36	0.00	0.00	0.00
5	20	95		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
9	4	19		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
10	10	14		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
11	29	25		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
12	107	32		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
13	137	151		C 3x2x1/4	A36	0.00	0.00	0.00
14	166	32		L 2X2X1_4	A36	0.00	0.00	0.00
15	152	32		L 2X2X1_4	A36	0.00	0.00	0.00
25	6	3		PL 6X1/2	A36	0.00	0.00	0.00
26	18	21		PL 6X1/2	A36	0.00	0.00	0.00
27	28	13		PL 6X1/2	A36	0.00	0.00	0.00
28	72	73		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

29	74	75	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
30	76	77	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	78	79	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
32	80	81	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
33	82	83	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
34	20	136	L 2X2X1_4	A36	0.00	0.00	0.00
35	137	138	C 3x2x1/4	A36	0.00	0.00	0.00
36	20	139	L 2X2X1_4	A36	0.00	0.00	0.00
37	168	175	T2L 3X3X1_4	A36	0.00	0.00	0.00
38	170	173	T2L 3X3X1_4	A36	0.00	0.00	0.00
39	172	174	T2L 3X3X1_4	A36	0.00	0.00	0.00
159	120	387	C 3x2x1/4	A36	0.00	0.00	0.00
160	151	140	C 3x2x1/4	A36	0.00	0.00	0.00
162	417	418	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
168	429	430	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
170	433	434	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
213	519	520	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
218	525	526	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
219	531	532	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
222	537	538	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
231	556	554	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
256	606	607	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
262	618	619	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
274	642	643	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
280	654	655	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
286	668	669	HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
287	667	670	HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
288	671	672	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
303	697	698	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
306	708	707	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
307	710	711	HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
308	709	712	HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
309	713	714	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
310	715	716	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
315	721	722	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
318	732	731	PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
319	734	735	HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
320	733	736	HSS_SQR 4X4X3_16	A500 GrB rectangular	0.00	0.00	0.00
321	737	738	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
322	739	740	PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
2	270.00	0	0.00	0.00	0.00
13	180.00	0	0.00	0.00	0.00
14	270.00	0	0.00	0.00	0.00
29	180.00	0	0.00	0.00	0.00
31	180.00	0	0.00	0.00	0.00
33	180.00	0	0.00	0.00	0.00
35	180.00	0	0.00	0.00	0.00
36	270.00	0	0.00	0.00	0.00
162	0.00	2	0.50	0.00	0.866
168	0.00	2	0.50	0.00	-0.866
256	0.00	2	-0.50	0.00	-0.866

262	0.00	2	-0.50	0.00	-0.866
274	0.00	2	-0.50	0.00	0.866
280	0.00	2	-0.50	0.00	0.866
303	0.00	2	-0.50	0.00	-0.866
306	0.00	2	-0.50	0.00	-0.866
309	0.00	2	-0.50	0.00	-0.866
310	0.00	2	-0.50	0.00	-0.866
315	0.00	2	-0.50	0.00	0.866
318	0.00	2	-0.50	0.00	0.866
321	0.00	2	-0.50	0.00	0.866
322	0.00	2	-0.50	0.00	0.866

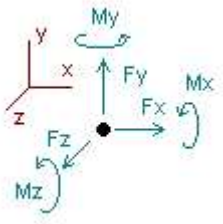

N 107
N 108
N 174
N 95
N 175
N 173


Y
X
Z

Current Date: 2/9/2022 5:01 PM
Units system: English

Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2DL+W0**						
95	0.32687	0.13879	1.24597	0.37890	-0.92513	0.33011
107	-0.08927	-0.93850	7.78857	-0.45390	0.13196	-0.05733
108	-0.34964	0.26782	1.43547	0.45275	1.12313	-0.47283
173	0.82171	0.71603	0.17402	-0.00486	0.00588	0.00524
174	-0.09017	4.23150	-5.48130	-0.51139	0.10841	0.09947
175	-0.61949	0.57083	-0.00559	-0.02006	0.01474	-0.06868
SUM	0.00000	4.98647	5.15713	-0.15854	0.45898	-0.16403
Condition **LC2=1.2DL+W30**						
95	2.86899	0.46129	1.19376	-0.48704	0.30141	0.04422
107	1.33205	-0.31734	2.02850	-0.15091	-1.45832	-0.61189
108	6.31230	-0.68916	-3.13209	0.37614	0.36624	0.17440
173	-0.61921	-0.19532	0.00528	0.07438	-0.21828	0.24779
174	-0.25060	1.96942	-2.47615	-0.20042	-0.17765	-0.16728
175	-4.47935	3.75758	2.38071	0.15432	-0.09462	0.42858
SUM	5.16419	4.98647	0.00000	-0.23353	-1.28122	0.11582
Condition **LC3=1.2DL-W0**						
95	-3.75797	-0.40497	-3.24005	-0.33812	0.92537	-0.40300
107	0.04003	0.50036	-3.85113	0.27855	-0.09803	0.11445
108	3.78894	-0.54881	-3.39045	-0.37645	-1.10176	0.53758
173	3.18215	2.89983	2.14707	0.15668	-0.01518	-0.25205
174	0.13898	-0.48841	0.88592	0.20085	-0.14108	-0.12917
175	-3.39213	3.02848	2.29150	0.15274	-0.03474	0.33301
SUM	0.00000	4.98647	-5.15713	0.07426	-0.46541	0.20081
Condition **LC4=1.2DL-W30**						
95	-6.30089	-0.72545	-3.18510	0.52660	-0.29857	-0.11542
107	-1.38055	-0.12429	1.91068	-0.02769	1.49296	0.67023
108	-2.87214	0.40929	1.18082	-0.30175	-0.34830	-0.10984
173	4.62408	3.81216	2.31278	0.07486	0.21218	-0.49575
174	0.29891	1.77281	-2.12076	-0.11039	0.14507	0.13766
175	0.46641	-0.15805	-0.09842	-0.02428	0.07120	-0.16281
SUM	-5.16419	4.98647	0.00000	0.13736	1.27454	-0.07593

Condition **LC5=0.9DL+W0**

95	0.75496	0.17203	1.49348	0.37327	-0.92486	0.33898
107	-0.08322	-0.88207	7.29036	-0.43097	0.12769	-0.06440
108	-0.77877	0.30274	1.67784	0.44254	1.12017	-0.48051
173	0.32173	0.26514	-0.11430	-0.02311	0.00617	0.03635
174	-0.09616	3.75987	-4.90125	-0.47155	0.11241	0.10310
175	-0.11854	0.12214	-0.28899	-0.03563	0.01842	-0.10201
SUM	0.00000	3.73985	5.15713	-0.14544	0.45999	-0.16849

Condition **LC6=0.9DL+W30**

95	3.29473	0.49400	1.44131	-0.49144	0.30092	0.05344
107	1.33688	-0.26161	1.53505	-0.12827	-1.46201	-0.61828
108	5.87732	-0.65299	-2.88569	0.36612	0.36352	0.16587
173	-1.11659	-0.64489	-0.28348	0.05549	-0.21687	0.27807
174	-0.25500	1.50099	-1.90038	-0.16123	-0.17451	-0.16443
175	-3.97315	3.30435	2.09319	0.13774	-0.09153	0.39452
SUM	5.16419	3.73985	0.00000	-0.22159	-1.28049	0.10919

Condition **LC7=0.9DL-W0**

95	-3.32637	-0.37113	-2.98858	-0.34276	0.92465	-0.39325
107	0.04604	0.55491	-4.33922	0.30061	-0.10231	0.10704
108	3.35605	-0.51271	-3.14376	-0.38551	-1.10374	0.52850
173	2.67940	2.44576	1.85468	0.13711	-0.01357	-0.22094
174	0.13286	-0.95323	1.45662	0.23913	-0.13691	-0.12538
175	-2.88798	2.57625	2.00313	0.13540	-0.03277	0.29957
SUM	0.00000	3.73985	-5.15713	0.08398	-0.46465	0.19554

Condition **LC8=0.9DL-W30**

95	-5.86695	-0.69108	-2.93369	0.52073	-0.29852	-0.10603
107	-1.37332	-0.06903	1.41779	-0.00533	1.48810	0.66215
108	-3.29918	0.44413	1.42346	-0.31100	-0.35052	-0.11806
173	4.11874	3.35678	2.02085	0.05594	0.21266	-0.46380
174	0.29122	1.30477	-1.54575	-0.07145	0.15009	0.14224
175	0.96530	-0.60571	-0.38267	-0.04061	0.07376	-0.19553
SUM	-5.16419	3.73985	0.00000	0.14828	1.27557	-0.07904

Condition **LC9=1.2DL+Di+Wi0**

95	-3.32543	-0.28792	-1.73707	0.12720	-0.16841	-0.04326
107	-0.04818	-0.65147	5.23754	-0.29022	0.04046	0.03836
108	3.34340	-0.28294	-1.68382	0.17269	0.20968	0.01360
173	4.09923	3.66045	2.31295	0.15759	-0.00453	-0.26387
174	0.02545	4.40977	-5.51214	-0.42143	-0.01275	-0.01148
175	-4.09448	3.63943	2.26254	0.13462	-0.02405	0.27338
SUM	0.00000	10.48732	0.88000	-0.11955	0.04039	0.00672

Condition **LC10=1.2DL+Di+Wi30**

95	-2.88698	-0.23308	-1.75953	-0.02816	0.05566	-0.09664
107	0.18469	-0.54017	4.23276	-0.23566	-0.21738	-0.05738
108	4.49042	-0.45108	-2.48178	0.15485	0.07305	0.12994
173	3.84986	3.50652	2.29349	0.17287	-0.04522	-0.22136
174	-0.01160	4.00628	-4.97391	-0.36497	-0.05148	-0.04773
175	-4.77139	4.19885	2.68897	0.16989	-0.03796	0.35956
SUM	0.85500	10.48732	0.00000	-0.13118	-0.22333	0.06640

Condition **LC11=1.2DL+Di-Wi0**

95	-4.03100	-0.38581	-2.52975	-0.00358	0.16897	-0.17654
107	-0.04090	-0.39494	3.19531	-0.15958	0.01981	0.07136
108	4.07599	-0.42943	-2.53434	0.02253	-0.17462	0.19572
173	4.52000	4.05099	2.67429	0.18840	-0.00988	-0.31043
174	0.06258	3.56717	-4.37200	-0.29271	-0.04849	-0.04420
175	-4.58667	4.07934	2.68649	0.17632	-0.01952	0.34053
SUM	0.00000	10.48732	-0.88000	-0.06862	-0.06373	0.07643

Condition **LC12=1.2DL+Di-Wi30**

95	-4.46948	-0.44060	-2.50722	0.15174	-0.05501	-0.12313
107	-0.27375	-0.50635	4.20012	-0.21424	0.27766	0.16713
108	2.92904	-0.26126	-1.73631	0.04032	-0.03809	0.07939
173	4.76942	4.20496	2.69366	0.17304	0.03090	-0.35298
174	0.09962	3.97062	-4.91024	-0.34918	-0.00976	-0.00795
175	-3.90984	3.51995	2.25999	0.14098	-0.00571	0.25439
SUM	-0.85500	10.48732	0.00000	-0.05734	0.19999	0.01684

Condition **LC13=1.4DL**

95	-2.00561	-0.15642	-1.16413	0.02393	0.00109	-0.04338
107	-0.02814	-0.25882	2.30097	-0.10491	0.02000	0.03374
108	2.01110	-0.16562	-1.14095	0.04492	0.01157	0.03905
173	2.33935	2.11147	1.35476	0.08806	-0.00439	-0.14492
174	0.02821	2.18490	-2.68463	-0.18196	-0.01901	-0.01728
175	-2.34491	2.10203	1.33398	0.07666	-0.01315	0.15551
SUM	0.00000	5.81755	0.00000	-0.05330	-0.00389	0.02272

Condition **LC14=1.2DL+1.6LL1**

95	-1.90413	-0.11851	-1.18497	-0.07767	0.06113	-0.07284
107	-0.02353	-0.21070	1.82938	-0.08607	0.01598	0.03017
108	1.90315	-0.12170	-1.16283	-0.06531	-0.05121	0.06862
173	2.19721	2.03323	1.35956	0.11353	-0.05211	-0.10659
174	0.02544	1.77845	-2.18467	-0.14829	-0.01767	-0.01607
175	-2.19814	2.02571	1.34354	0.10455	0.03945	0.11294
SUM	0.00000	5.38647	0.00000	-0.15926	-0.00444	0.01624

Condition **LC15=1.2DL+1.6LL2**

95	-2.51633	-0.30090	-1.47775	0.04961	0.01541	-0.12816
107	-0.04879	-0.19443	1.78801	-0.07591	0.04112	0.05238
108	1.59779	-0.12895	-0.93808	0.00911	-0.01803	0.04297
173	2.84105	2.51073	1.66601	0.13683	-0.01625	-0.20889
174	0.04471	1.76485	-2.15809	-0.14097	-0.02598	-0.02358
175	-1.91843	1.73517	1.11991	0.07146	0.00215	0.12014
SUM	0.00000	5.38647	0.00000	0.05013	-0.00159	-0.14514

Condition **LC16=1.2DL+WL0+1.6LLa1**

95	-3.06380	-0.39708	-1.80517	0.03511	0.01765	-0.19409
107	-0.06063	-0.19967	1.86178	-0.07888	0.05575	0.05775
108	1.46095	-0.10696	-0.83862	-0.00539	0.00449	0.03676
173	3.45578	3.05671	2.07703	0.19976	-0.05539	-0.24992
174	0.04863	1.75210	-2.14640	-0.14199	-0.02453	-0.02221
175	-1.84094	1.68137	1.09238	0.07939	0.02006	0.10261
SUM	0.00000	5.78647	0.24100	0.08800	0.01803	-0.26910

Condition **LC17=1.2DL+WL30+1.6LLa1**

95	-2.94439	-0.38212	-1.80948	-0.00767	0.07552	-0.20889
107	0.00760	-0.16927	1.58610	-0.06394	-0.02122	0.03067
108	1.77563	-0.15320	-1.05985	-0.01026	-0.03684	0.06882
173	3.38615	3.01402	2.07271	0.20589	-0.06913	-0.23712
174	0.03957	1.64122	-1.99849	-0.12652	-0.03793	-0.03471
175	-2.02855	1.83582	1.20901	0.08725	0.01375	0.12747
SUM	0.23600	5.78647	0.00000	0.08475	-0.07583	-0.25376

Condition **LC18=1.2DL-WL0+1.6LLa1**

95	-3.25712	-0.42380	-2.02371	-0.00105	0.11169	-0.23075
107	-0.05906	-0.12933	1.30106	-0.04296	0.05096	0.06682
108	1.66212	-0.14687	-1.07115	-0.04676	-0.10018	0.08668
173	3.57146	3.16406	2.17637	0.20790	-0.05643	-0.26291
174	0.05852	1.52023	-1.83255	-0.10660	-0.03377	-0.03066
175	-1.97592	1.80218	1.20898	0.09115	0.02179	0.12074
SUM	0.00000	5.78647	-0.24100	0.10168	-0.00595	-0.25009

Condition **LC19=1.2DL-WL30+1.6LLa1**

95	-3.37654	-0.43875	-2.01940	0.04173	0.05382	-0.21595
107	-0.12728	-0.15974	1.57674	-0.05790	0.12793	0.09390
108	1.34745	-0.10062	-0.84992	-0.04190	-0.05887	0.05461
173	3.64109	3.20675	2.18068	0.20177	-0.04269	-0.27570
174	0.06759	1.63110	-1.98046	-0.12207	-0.02037	-0.01817
175	-1.78831	1.64773	1.09235	0.08329	0.02809	0.09589
SUM	-0.23600	5.78647	0.00000	0.10490	0.08791	-0.26542

Condition **LC20=1.2DL+WL0+1.6LLa2**

95	-2.99389	-0.37223	-1.81371	-0.01815	0.05456	-0.20606
107	-0.05704	-0.17493	1.74743	-0.06543	0.05472	0.05201
108	1.55897	-0.12479	-0.91411	-0.01780	-0.00852	0.05495
173	3.38370	3.02525	2.09097	0.21668	-0.08612	-0.22613
174	0.04245	1.66752	-2.03221	-0.12872	-0.01936	-0.01749
175	-1.93419	1.76565	1.16264	0.09219	0.02952	0.10844
SUM	0.00000	5.78647	0.24100	0.07877	0.02480	-0.23428

Condition **LC21=1.2DL+WL30+1.6LLa2**

95	-2.87449	-0.35728	-1.81802	-0.06093	0.11243	-0.22087
107	0.01118	-0.14453	1.47172	-0.05049	-0.02225	0.02492
108	1.87364	-0.17103	-1.13535	-0.02267	-0.04984	0.08701
173	3.31408	2.98257	2.08666	0.22281	-0.09986	-0.21333
174	0.03339	1.55663	-1.88428	-0.11325	-0.03275	-0.02998
175	-2.12179	1.92010	1.27927	0.10005	0.02322	0.13330
SUM	0.23600	5.78647	0.00000	0.07552	-0.06904	-0.21895

Condition **LC22=1.2DL-WL0+1.6LLa2**

95	-3.18722	-0.39897	-2.03227	-0.05431	0.14860	-0.24274
107	-0.05547	-0.10458	1.18666	-0.02950	0.04993	0.06106
108	1.76013	-0.16469	-1.14667	-0.05918	-0.11320	0.10487
173	3.49939	3.13262	2.19034	0.22484	-0.08718	-0.23911
174	0.05233	1.43562	-1.71833	-0.09334	-0.02858	-0.02594
175	-2.06916	1.88646	1.27926	0.10396	0.03126	0.12657
SUM	0.00000	5.78647	-0.24100	0.09246	0.00083	-0.21528

Condition **LC23=1.2DL-WL30+1.6LLa2**

95	-3.30663	-0.41391	-2.02796	-0.01154	0.09074	-0.22794
107	-0.12368	-0.13499	1.46238	-0.04445	0.12689	0.08815
108	1.44546	-0.11845	-0.92543	-0.05432	-0.07188	0.07281
173	3.56902	3.17530	2.19465	0.21870	-0.07344	-0.25191
174	0.06140	1.54651	-1.86625	-0.10880	-0.01519	-0.01344
175	-1.88157	1.73202	1.16262	0.09609	0.03756	0.10172
SUM	-0.23600	5.78647	0.00000	0.09568	0.09467	-0.23060

Condition **LC24=1.2DL+WL0+1.6LLa3**

95	-1.95354	-0.09852	-1.23754	-0.14775	0.07139	-0.09329
107	-0.02403	-0.22998	1.93723	-0.09777	0.01597	0.02945
108	2.06546	-0.09157	-1.29794	-0.16744	-0.07381	0.09477
173	2.28895	2.15700	1.48007	0.14716	-0.09837	-0.08459
174	0.02426	1.77900	-2.19771	-0.15568	-0.01707	-0.01552
175	-2.40111	2.27053	1.55688	0.15173	0.10288	0.08465
SUM	0.00000	5.78647	0.24100	-0.26975	0.00099	0.01546

Condition **LC25=1.2DL+WL30+1.6LLa3**

95	-1.83418	-0.08356	-1.24189	-0.19058	0.12929	-0.10811
107	0.04424	-0.19960	1.66151	-0.08285	-0.06107	0.00236
108	2.38016	-0.13779	-1.51928	-0.17239	-0.11518	0.12688
173	2.21931	2.11430	1.47574	0.15330	-0.11210	-0.07180
174	0.01520	1.66807	-2.04974	-0.14021	-0.03050	-0.02805
175	-2.58873	2.42504	1.67366	0.15967	0.09666	0.10948
SUM	0.23600	5.78647	0.00000	-0.27307	-0.09291	0.03076

Condition **LC26=1.2DL-WL0+1.6LLa3**

95	-2.14715	-0.12529	-1.45626	-0.18397	0.16547	-0.13005
107	-0.02241	-0.15966	1.37641	-0.06187	0.01107	0.03852
108	2.26671	-0.13148	-1.53070	-0.20898	-0.17857	0.14480
173	2.40475	2.26442	1.57948	0.15532	-0.09943	-0.09757
174	0.03420	1.54701	-1.88373	-0.12030	-0.02639	-0.02405
175	-2.53611	2.39147	1.67381	0.16365	0.10479	0.10273
SUM	0.00000	5.78647	-0.24100	-0.25615	-0.02307	0.03438

Condition **LC27=1.2DL-WL30+1.6LLa3**

95	-2.26650	-0.14025	-1.45191	-0.14115	0.10757	-0.11523
107	-0.09067	-0.19005	1.65214	-0.07680	0.08810	0.06561
108	1.95202	-0.08525	-1.30936	-0.20403	-0.13721	0.11269
173	2.47440	2.30712	1.58381	0.14919	-0.08569	-0.11036
174	0.04325	1.65794	-2.03170	-0.13577	-0.01296	-0.01153
175	-2.34849	2.23696	1.55702	0.15571	0.11101	0.07789
SUM	-0.23600	5.78647	0.00000	-0.25285	0.07083	0.01909

Condition **LC28=1.2DL+WL0+1.6LLa4**

95	-1.51712	-0.11058	-0.90103	-0.02809	0.01142	-0.05040
107	0.00153	-0.21039	1.87911	-0.08572	-0.01025	0.00429
108	2.96655	-0.36586	-1.73854	0.03172	-0.01691	0.17411
173	1.89741	1.74225	1.14979	0.09454	-0.03738	-0.09891
174	-0.00036	1.75887	-2.16135	-0.14676	-0.00556	-0.00509
175	-3.34801	2.97218	2.01303	0.18739	0.05052	0.23690
SUM	0.00000	5.78647	0.24100	0.05308	-0.00815	0.26090

Condition **LC29=1.2DL+WL30+1.6LLa4**

95	-1.39768	-0.09561	-0.90526	-0.07084	0.06930	-0.06516
107	0.06975	-0.18001	1.60346	-0.07079	-0.08725	-0.02279
108	3.28108	-0.41205	-1.95982	0.02678	-0.05829	0.20615
173	1.82777	1.69952	1.14534	0.10060	-0.05103	-0.08616
174	-0.00940	1.64799	-2.01345	-0.13130	-0.01899	-0.01762
175	-3.53552	3.12663	2.12975	0.19531	0.04428	0.26175
SUM	0.23600	5.78647	0.00000	0.04976	-0.10198	0.27618

Condition **LC30=1.2DL-WL0+1.6LLa4**

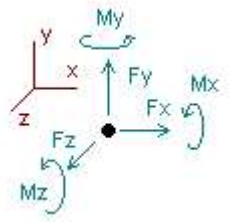
95	-1.71062	-0.13737	-1.11952	-0.06417	0.10543	-0.08709
107	0.00310	-0.14007	1.31841	-0.04981	-0.01510	0.01337
108	3.16762	-0.40575	-1.97127	-0.00978	-0.12168	0.22406
173	2.01322	1.84961	1.24898	0.10258	-0.03830	-0.11195
174	0.00959	1.52698	-1.84750	-0.11139	-0.01487	-0.01361
175	-3.48291	3.09306	2.12990	0.19929	0.05242	0.25499
SUM	0.00000	5.78647	-0.24100	0.06674	-0.03211	0.27979

Condition **LC31=1.2DL-WL30+1.6LLa4**

95	-1.83006	-0.15233	-1.11529	-0.02142	0.04756	-0.07231
107	-0.06513	-0.17045	1.59406	-0.06474	0.06190	0.04045
108	2.85309	-0.35956	-1.74999	-0.00483	-0.08030	0.19202
173	2.08286	1.89234	1.25343	0.09651	-0.02465	-0.12470
174	0.01863	1.63785	-1.99539	-0.12685	-0.00144	-0.00109
175	-3.29540	2.93861	2.01319	0.19136	0.05865	0.23014
SUM	-0.23600	5.78647	0.00000	0.07004	0.06172	0.26451

Envelope for nodal reactions

Note.- **Ic** 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

		Forces						Moments					
Node		**Fx** [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
95	Max	3.295	LC6	0.494	LC6	1.493	LC5	0.52660	LC4	0.92537	LC3	0.33898	LC5
	Min	-6.301	LC4	-0.725	LC4	-3.240	LC3	-0.49144	LC6	-0.92513	LC1	-0.40300	LC3
107	Max	1.337	LC6	0.555	LC7	7.789	LC1	0.30061	LC7	1.49296	LC4	0.67023	LC4
	Min	-1.381	LC4	-0.939	LC1	-4.339	LC7	-0.45390	LC1	-1.46201	LC6	-0.61828	LC6
108	Max	6.312	LC2	0.444	LC8	1.678	LC5	0.45275	LC1	1.12313	LC1	0.53758	LC3
	Min	-3.299	LC8	-0.689	LC2	-3.390	LC3	-0.38551	LC7	-1.10374	LC7	-0.48051	LC5
173	Max	4.769	LC12	4.205	LC12	2.694	LC12	0.22484	LC22	0.21266	LC8	0.27807	LC6
	Min	-1.117	LC6	-0.645	LC6	-0.283	LC6	-0.02311	LC5	-0.21828	LC2	-0.49575	LC4
174	Max	0.299	LC4	4.410	LC9	1.457	LC7	0.23913	LC7	0.15009	LC8	0.14224	LC8
	Min	-0.255	LC6	-0.953	LC7	-5.512	LC9	-0.51139	LC1	-0.17765	LC2	-0.16728	LC2
175	Max	0.965	LC8	4.199	LC10	2.689	LC10	0.19929	LC30	0.11101	LC27	0.42858	LC2
	Min	-4.771	LC10	-0.606	LC8	-0.383	LC8	-0.04061	LC8	-0.09462	LC2	-0.19553	LC8

Date: 2/10/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

CHECK CONNECTION CAPACITY (Worst Case) → ANTENNA MOUNT

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

Bolt Type = A36 3/4" Threaded Rod

Allowable Tensile Load =

F_{Tall} = 9609 lbs.

Allowable Shear Load =

F_{Vall}= 5765 lbs.

TENSILE FORCES

Reaction **F =** 3390 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 6312 lbs. (See Bentley Output)
Reactions in Y direction: 689 lbs. (See Bentley Output)

Resultant: 6349 lbs.

No. of Supports = 1
No. of Bolts / Support = 2

Tension Design Load /Bolts =

f_t= 1695.00 lbs. < 9609 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v= 3174.75 lbs. < 5765 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.176	+	0.551	=	0.727	<	1.0	**Therefore, OK !**

Date: 2/10/2022
Project Name: EAST HARTFORD 148 ROBERTS STREET
Project No.: CT2419
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

CHECK CONNECTION CAPACITY (Worst Case) → STABILIER MOUNT

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

Bolt Type = A36 3/4" Threaded Rod

Allowable Tensile Load =

F_{Tall} = 9609 lbs.

Allowable Shear Load =

F_{Vall}= 5765 lbs.

TENSILE FORCES

Reaction **F =** 2694 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 4769 lbs. (See Bentley Output)
Reactions in Y direction: 4205 lbs. (See Bentley Output)

Resultant: 6358 lbs.

No. of Supports = 1
No. of Bolts / Support = 2

Tension Design Load /Bolts =

f_t= 1347.00 lbs. < 9609 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v= 3179.05 lbs. < 5765 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.140	+	0.551	=	0.692	<	1.0	**Therefore, OK !**

Town of East Hartford Property Summary Report

148 ROBERTS ST

MAP LOT:	35-18A	**CAMA PID:**	50278
LOCATION:	148 ROBERTS ST		
OWNER NAME:	CARO LLC / C/O PROPERTY TAX DEPT		

OWNER OF RECORD
CARO LLC C/O PROPERTY TAX DEPT P O BOX 723597 ATLANTA, GA 31139

LIVING AREA:		**ZONING:**		**ACREAGE:**	1.07

SALES HISTORY

OWNER	BOOK / PAGE	SALE DATE	SALE PRICE
CARO LLC C/O PROPERTY TAX DEPT	3560/0154	26-Sep-2015	$0.00
DOUBLE E PROPERTIES OF MIDDLETOWN LLC C/O CARMINE	3442/0174	28-Dec-2013	$0.00
DOUBLE E PROPERTIES OF EAST HARTFORD LLC C/O CARMINE	3205/0125	05-Oct-2010	$0.00

CURRENT PARCEL ASSESSMENT

TOTAL:	$91,520.00	**IMPROVEMENTS:**	$2,790.00	**LAND:**	$88,730.00

ASSESSING HISTORY

FISCAL YEAR	TOTAL VALUE	IMPROVEMENT VALUE	LAND VALUE
2019	$91,520.00	$2,790.00	$88,730.00
2018	$91,520.00	$2,790.00	$88,730.00
2017	$91,520.00	$2,790.00	$88,730.00
2016	$91,520.00	$2,790.00	$88,730.00
2015	$91,510.00	$2,780.00	$88,730.00

Town of East Hartford Property Summary Report

148 ROBERTS ST

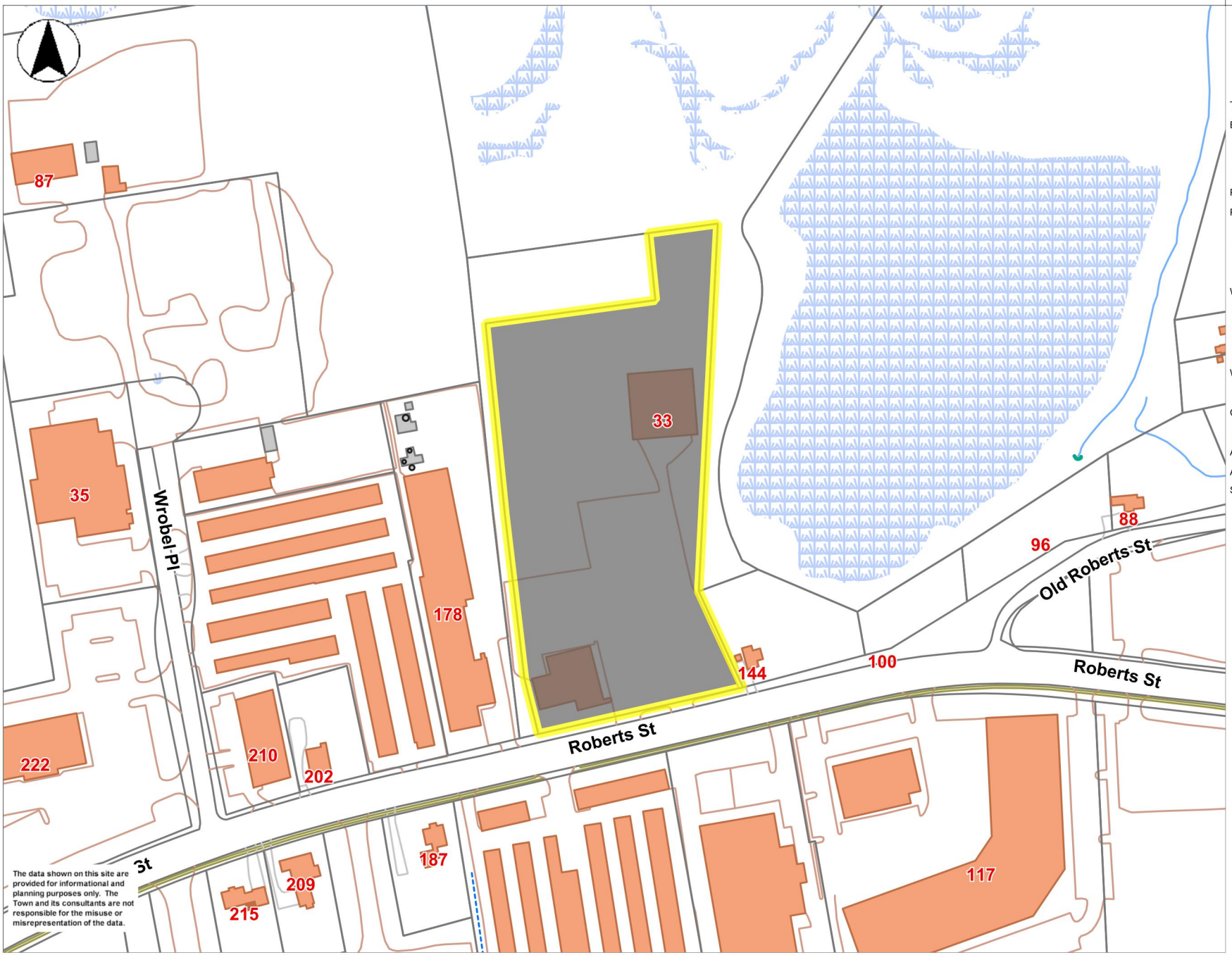
MAP LOT:	35-18A	**CAMA PID:**	50278
LOCATION:	148 ROBERTS ST		
OWNER NAME:	CARO LLC / C/O PROPERTY TAX DEPT		

BUILDING # 1

YEAR BUILT		**EXT WALL 1**	
STYLE		**INT WALLS 1**	
MODEL	Vacant	**HEAT FUEL**	
STORIES		**HEAT TYPE**	
OCCUPANCY	Comm w/ OB	**AC TYPE**	
ROOF		**BEDROOMS**	
ROOF COVER		**FULL BATHS**	
FLOOR COVER 1		**HALF BATHS**	
% BSMT	null	**TOTAL ROOMS**	
% FIN BSMT	null	**% REC RM**	null
% SEMI FIN		**% ATTIC FINISH**	null
BSMT GARAGE	null	**FIREPLACES**	null

EXTRA FEATURES

DESCRIPTION	CODE	UNITS
Fence-C/L	FN1	260.00 L.F.



0 280 560 ft

Printed on 01/20/2022 at 10:00 AM

East Hartford MapsOnline

Connecticut Siting Council(/CSC)

DOCKET NO. 228 – The Marcus Group, LLC application for a Certificate of Environmental Compatibility and Public Need for the construction, maintenance and operation of a cellular telecommunications facility at 148 Roberts Street, East Hartford, Connecticut.	}	Connecticut
	}	Siting
	}	Council
	}	November 7, 2002

Decision and Order

Pursuant to the foregoing Findings of Fact and Opinion, the Connecticut Siting Council (Council) finds that the effects associated with the construction, operation, and maintenance of a telecommunications facility including effects on the natural environment; ecological integrity and balance; public health and safety; scenic, historic, and recreational values; forests and parks; air and water purity; and fish and wildlife are not disproportionate either alone or cumulatively with other effects when compared to need, are not in conflict with the policies of the State concerning such effects, and are not sufficient reason to deny the application and therefore directs that a Certificate of Environmental Compatibility and Public Need, as provided by General Statutes **§** 16-50k, be issued to The Marcus Group (Marcus) for the construction, maintenance and operation of a wireless telecommunications facility at the proposed prime site located at 148 Roberts Street, East Hartford, Connecticut.

The facility shall be constructed, operated, and maintained substantially as specified in the Council's record in this matter, and subject to the following conditions:

1. The tower shall be constructed as a monopole, no taller than necessary to provide the proposed telecommunications services, sufficient to accommodate the antennas of AT&T Wireless LLC, Cellco Partnership b/b/a Verizon Wireless, Nextel Communications of the Mid-Atlantic, and other entities, both public and private, but such tower shall not exceed a height of 120 feet above ground level. The access road to the facility shall be finished with gravel. The north edge of the facility compound shall be a minimum distance of 52 feet to the nearest wetland area.

2. The Certificate Holder shall prepare a Development and Management (D&M) Plan for this site in compliance with Sections 16-50j-75 through 16-50j-77 of the Regulations of Connecticut State Agencies. The D&M Plan shall be submitted to and approved by the Council prior to the commencement of facility construction and shall include: a final site plan(s) for site development to include the location and specifications for the tower, tower foundation, antennas, equipment buildings, security fence, access road, utility line, and landscaping plan. The D&M Plan shall also include construction plans to be submitted prior to construction for site clearing, water drainage, and erosion and sedimentation control consistent with the Connecticut Guidelines for Soil Erosion and Sediment Control, as amended.

3. The Certificate Holder shall, prior to the commencement of operation, provide the Council worst-case modeling of electromagnetic radio frequency power density of all proposed entities' antennas at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin No. 65, August 1997. The Certificate Holder shall provide a recalculated report of electromagnetic radio frequency power density if and when circumstances in operation cause a change in power density above the levels calculated and provided pursuant to this Decision and Order.

4. Upon the establishment of any new state or federal radio frequency standards applicable to frequencies of this facility, the facility granted herein shall be brought into compliance with such standards.

5. The Certificate Holder shall permit public or private entities to share space on the proposed tower for fair consideration, or shall provide any requesting entity with specific

legal, technical, environmental, or economic reasons precluding such tower sharing.

6. If the facility does not initially provide, or permanently ceases to provide wireless services following completion of construction, this Decision and Order shall be void, and the Certificate Holder shall dismantle the tower and remove all associated equipment or reapply for any continued or new use to the Council before any such use is made.

7. Any antenna that becomes obsolete and ceases to function shall be removed within 60 days after such antennas become obsolete and ceases to function.

8. Unless otherwise approved by the Council, this Decision and Order shall be void if the facility authorized herein is not operational within one year of the effective date of this Decision and Order or within one year after all appeals to this Decision and Order have been resolved.

Pursuant to General Statutes § 16-50p, we hereby direct that a copy of the Findings of Fact, Opinion, and Decision and Order be served on each person listed below, and notice of issuance shall be published in The Hartford Courant,, and The East Hartford Gazette.

By this Decision and Order, the Council disposes of the legal rights, duties, and privileges of each party named or admitted to the proceeding in accordance with Section 16-50j-17 of the Regulations of Connecticut State Agencies.

The parties and intervenors to this proceeding are:

Applicant	**Its Representative**
The Marcus Group, LLC	Julie Donaldson Kohler, Esq. Hurwitz & Sagarin, LLC 147 N. Broad Street Milford, CT 06460 (203) 877-8000
Intervenor	**Its Representative**
Cellco Partnership d/b/a Verizon Wireless	Kenneth C. Baldwin, Esq. Robinson & Cole LLP 280 Trumbull Street Hartford, CT 06103-3597 (860) 275-8200

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

May 16, 2014

Steven L Levine
Centek Engineering, Inc.
63-2 North Branford Road
North Branford, CT 06405

RE: **TS-CING-043-140417** – New Cingular Wireless PCS, LLC notice of intent to modify an existing telecommunications facility located at 148 Roberts Street, East Hartford, Connecticut.

Dear Mr. Levine:

At a public meeting held May 15, 2014, 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 with the following conditions:

- Any deviation from the proposed installation as specified in the original tower share request and supporting materials with the Council shall render this decision invalid;
- Any material changes to the proposed installation as specified in the original tower share request and supporting materials filed with the Council shall require an explicit request for modification to the Council pursuant to Connecticut General Statutes § 16-50aa, including all relevant information regarding the proposed change with cumulative worst-case modeling of radio frequency exposure at the closest point of uncontrolled access to the tower base, consistent with Federal Communications Commission, Office of Engineering and Technology, Bulletin 65;
- Not less than 45 days after completion of the proposed installation, the Council shall be notified in writing that the installation has been completed;
- The validity of this action shall expire one year from the date of this letter; and
- The applicant may file a request for an extension of time beyond the one year deadline provided that such request is submitted to the Council not less than 60 days prior to the expiration.

This decision is under the exclusive jurisdiction of the Council and applies only to this request for tower sharing dated April 16, 2014. This facility has 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. Any deviation from the approved tower sharing request is enforceable under the provisions of Connecticut General Statutes § 16-50u.

The proposed shared use is to be implemented as specified in your letter dated April 16, 2014, including the placement of all necessary equipment and shelters within the tower compound.

Please be advised that the validity of this action shall expire one year from the date of this letter.

Thank you for your attention and cooperation.

Very truly yours,

Robert Stein MMB

Robert Stein
Chairman

RS/CDM/cm

c: The Honorable Marcia A. Leclerc, Mayor, Town of East Hartford
Michael J. Dayton, Town Planner, Town of East Hartford
American Tower Corporation

Petition No. 941
Clear Wireless LLC
East Hartford, Connecticut
Staff Report
May 6, 2010

On April 7, 2010, the Connecticut Siting Council (Council) received a petition from Clear Wireless LLC (Clearwire) for a declaratory ruling that no Certificate of Environmental Compatibility and Public Need is required for the modification of an existing wireless telecommunications facility at 148 Roberts Street in East Hartford, Connecticut. This facility was originally approved by the Council under Docket 228 on November 7, 2002. Council member Dan Lynch visited the site with staff member David Martin on April 28, 2010 to review the proposal. Tom Flynn represented Clearwire at the field review.

Clearwire seeks to extend the height of an existing 120-foot monopole tower by ten feet to an overall height of 130 feet. Clearwire would install three panel antennas, three remote radio heads, and three microwave dishes at a centerline height of 128 feet on the proposed extension. Clearwire's ground equipment would consist of cabinets on a seven-foot by seven-foot concrete pad to be installed within the existing fenced in compound. Clearwire's installation is part of its overall build out plan for providing service to this general area of East Hartford.

The existing tower currently hosts Verizon antennas at a centerline height of 117 feet, Sprint antennas at a centerline height of 107 feet, and Nextel antennas at a centerline height of 90 feet. Sprint also has a microwave antenna at a centerline height of 70 feet.

The existing tower is located at the rear of a property that was formerly used as an Elks Club. The Elks Club building is still on the property, which is currently being marketed. The property fronts on Roberts Street, which runs closely parallel to I-84. Although there are a few residences scattered nearby, the surrounding area is primarily commercial and industrial in character. There are residential neighborhoods to the north of the tower, but they are separated by a large area of mature, deciduous trees. These trees block any views of the tower from the north. Most of the area from which the tower is visible is localized along Roberts Street.

Staff calculates that the addition of Clearwire's antennas to this tower would bring its power density to 27.83% of the FCC's maximum permissible exposure.

A structural analysis of the tower concluded that it was structurally capable of supporting the proposed extension.

Staff recommends approval of this petition.

View of Existing Tower

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Click-N-Ship®

05/02/2022 Mailed from 03079

PRIORITY MAIL 2-DAY™

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 05/05/22
Ref#: CT2419
0006

C066

SHIP TO: HON MICHAEL WALSH, MAYOR JEFFREY CORMIER,
EAST HARTFORD TOWN HALL
740 MAIN ST
EAST HARTFORD CT 06108-3140

USPS TRACKING #

9405 5036 9930 0237 9006 22

Electronic Rate Approved #038555749

Cut on dotted line.

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usps.com
$8.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0237 9006 39 0089 5000 0010 1801

U.S. POSTAGE PAID
Click-N-Ship®

05/02/2022 Mailed from 03079

PRIORITY MAIL 1-DAY™

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 05/03/22
Ref#: CT2419
0006

C046

SHIP TO:
AMERICAN TOWER CORP
10 PRESIDENTIAL WAY
WOBURN MA 01801-1053

USPS TRACKING #

9405 5036 9930 0237 9006 39

Electronic Rate Approved #038555749

UNITED STATES POSTAL SERVICE®

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P

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$8.95
US POSTAGE
Flat Rate Env

9405 5036 9930 0237 9006 46 0089 5000 0053 1139

U.S. POSTAGE PAID
Click-N-Ship®

05/02/2022 Mailed from 03079

PRIORITY MAIL 2-DAY™

HOLLIS M REDDING
SAI GROUP
12 INDUSTRIAL WAY
SALEM NH 03079-2837

Expected Delivery Date: 05/05/22
Ref#: CT2419
0006

B006

SHIP TO:

CARO LLC
PO BOX 723597
ATLANTA GA 31139-0597

USPS TRACKING #

9405 5036 9930 0237 9006 46

Electronic Rate Approved #038555749

Cut on dotted line.

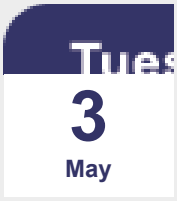
From: auto-reply@usps.com
Sent: Monday, May 2, 2022 3:12 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Tuesday, May 3, 2022 arriving by 9:00pm 9405503699300237900622

Hello **HOLLIS M REDDING**,

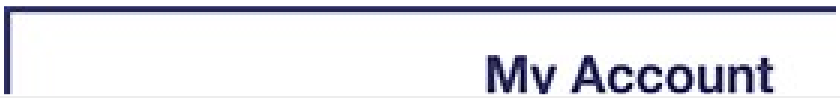
USPS is now in possession of your item as of 2:51 pm on May 2, 2022 in MERIDEN, CT 06450.

Tracking Number: **9405503699300237900622**

Expected Delivery By



By 9:00pm



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From: auto-reply@usps.com
Sent: Monday, May 2, 2022 3:12 PM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, May 5, 2022 arriving by 9:00pm 9405503699300237900646

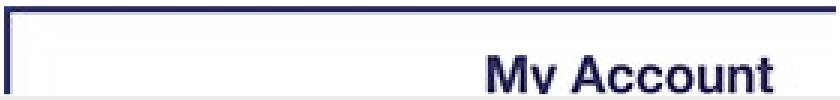
Hello **HOLLIS M REDDING**,

USPS is now in possession of your item as of 2:51 pm on May 2, 2022 in MERIDEN, CT 06450.

Tracking Number: **9405503699300237900646**

Expected Delivery By

By 9:00pm



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Tower Owner Copy

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Tracking Number: 9405503699300237900639

Expected Delivery by

THURSDAY

5 MAY 2022 ⓘ

by **9:00pm** ⓘ

USPS Tracking Plus® Available ⌄

Feedback

USPS in possession of item

May 2, 2022 at 2:51 pm
MERIDEN, CT 06450

Change Delivery Instructions ⌄

Text & Email Updates ⌄

Delivery Instructions ⌄

Tracking History ⌄

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