March 30, 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 CT5310
60 Industrial Park Road, Vernon, CT 06066 (the "Property")
Latitude: 41.835291 N Longitude: 72.455000W

Dear Ms. Bachman:

AT&T currently maintains (12) antennas at the approx. 168' level on the existing 175' monopole tower ("Tower") at 60 Industrial Park Road, Vernon CT. The property is owned by Industrial Park Rd LLC and Tower is owned by Millenicom LLC. AT&T intends to modify its facility by removing (9) antennas and adding (3) AIR6449 B77 at the 166' level, adding (3) QD6616 -7 at the 168' level & adding (3) AIR6419 B77G antennas at the 169'8" level of the Tower. The AIR6649 N77D & AIR6419 N77G antennas are stacked one on top of the other. The height of AT&Ts existing antennas is 168'and proposed antennas is 166', 168' & 169'8" on the Tower.

This modification includes B2, B5, and B12 hardware that is both 4G (LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

The Town of Vernon issued a building permit/certificate of zoning compliance approving the Tower on March 8, 2000. The original permit did not include any conditions to the approval. AT&T received CT Siting Council approval under EM-AT&T-146-020521 on June 3, 2002. This approval 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. Daniel A. Champagne, Mayor, Town of Vernon, as chief elected official, Mr. George McGregor, Town Planner, Town of Vernon, Industrial Park Road LLC, the property owner and Millenicom LLC, 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. Daniel A. Champagne, Mayor, Town of Vernon, chief elected official
Mr. George McGregor, Town Planner, Town of Vernon
Industrial Park Road LLC, the property owner
Millenicom, the tower owner

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

Calculated Radio Frequency Exposure

CT5310

60 Industrial Park Road, Vernon Rockville, CT

March 28, 2022

Table of Contents

List of Tables

List of Figures

1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of the AT&T antenna arrays on an existing tower located at 60 Industrial Park Road in Vernon Rockville CT. The coordinates of the proposed tower are 41° 50' 7.05" N, 72° 27' 18.00" W.

AT&T is proposing the following:

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

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

2. FCC Guidelines for Evaluating RF Radiation Exposure Limits

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

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

Public exposure to radio frequencies is regulated and enforced in units of milliwatts per square centimeter (mW/cm^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 B of this report.

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

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

[1] As referenced to AT&T's Radio Frequency Design Sheet dated 2/11/22.

3. RF Exposure Calculation Methods

The power density calculation results were generated using the following formula as outlined in FCC bulletin OET 65, and Connecticut Siting Council recommendations:

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

Where:

ERP = Effective Radiated Power

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

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

4. Calculation Results

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

Carrier	Antenna Height (Feet)	Operating Frequency (MHz)	Number of Trans.	ERP Per Transmitter (Watts)	Power Density (mw/cm^2)	Limit	% MPE
Nextel	145	851	9	100	0.0168	0.5673	0.30%
Verizon	158.5	751	4	686	0.0424	0.5007	0.85%
Verizon	158.5	869	2	381	0.0118	0.5793	0.20%
Verizon	158.5	869	2	691	0.0214	0.5793	0.37%
Verizon	158.5	1980	4	1466	0.0907	1.0000	0.91%
Verizon	158.5	2125	4	1626	0.1006	1.0000	1.01%
Verizon	158.5	3730	4	6531	0.4040	1.0000	4.04%
Verizon	158.5	3625	4	12	0.0007	1.0000	0.01%
T-Mobile	178.6	600	2	592	0.0143	0.4000	0.36%
T-Mobile	178.6	600	1	1578	0.0190	0.4000	0.48%
T-Mobile	178.6	700	2	649	0.0157	0.4667	0.34%
T-Mobile	178.6	1900	2	2204	0.0532	1.0000	0.53%
T-Mobile	178.6	2100	2	1295	0.0313	1.0000	0.31%
T-Mobile	178.6	2500	2	6413	0.1548	1.0000	1.55%
T-Mobile	178.6	2500	2	6413	0.1548	1.0000	1.55%
T-Mobile	178.6	1900	4	1028	0.0496	1.0000	0.50%
T-Mobile	178.6	1900	2	2057	0.0497	1.0000	0.50%
T-Mobile	178.6	2100	2	2308	0.0557	1.0000	0.56%
AT&T	168	739	1	2450	0.0034	0.4927	0.68%
AT&T	168	763	1	2878	0.0039	0.5087	0.78%
AT&T	168	885	1	2813	0.0039	0.5900	0.65%
AT&T	168	1900	2	5118	0.0140	1.0000	1.40%
AT&T	168	2100	3	8614	0.0354	1.0000	3.54%
AT&T	168	2300	1	6747	0.0092	1.0000	0.92%
AT&T	169.67	3500	1	24286	0.0326	1.0000	3.26%
AT&T	166	3500	1	24286	0.0341	1.0000	3.41%
						Total	**28.99%**

Table 1: Carrier Information[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 Nextel, Verizon and T-Mobile was taken directly from the CSC database dated 01/21/2022. Please note that % MPE values listed are rounded to two decimal points and the total % MPE listed is a summation of each unrounded contribution. Therefore, summing each rounded value may not identically match the total value reflected in the table.

5. Conclusion

The above analysis concludes that RF exposure at ground level from the proposed site will be below the maximum power density levels as outlined by the FCC in the OET Bulletin 65 Ed. 97-01. Using conservative calculation methods, the highest expected percent of Maximum Permissible Exposure at ground level is **28.99% of the FCC General Population/Uncontrolled limit**.

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

6. Statement of Certification

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

March 28, 2022
Date

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

Attachment A: References

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

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

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

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

(A) Limits for Occupational/Controlled Exposure[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 2: FCC Limits for Maximum Permissible Exposure (MPE)

[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

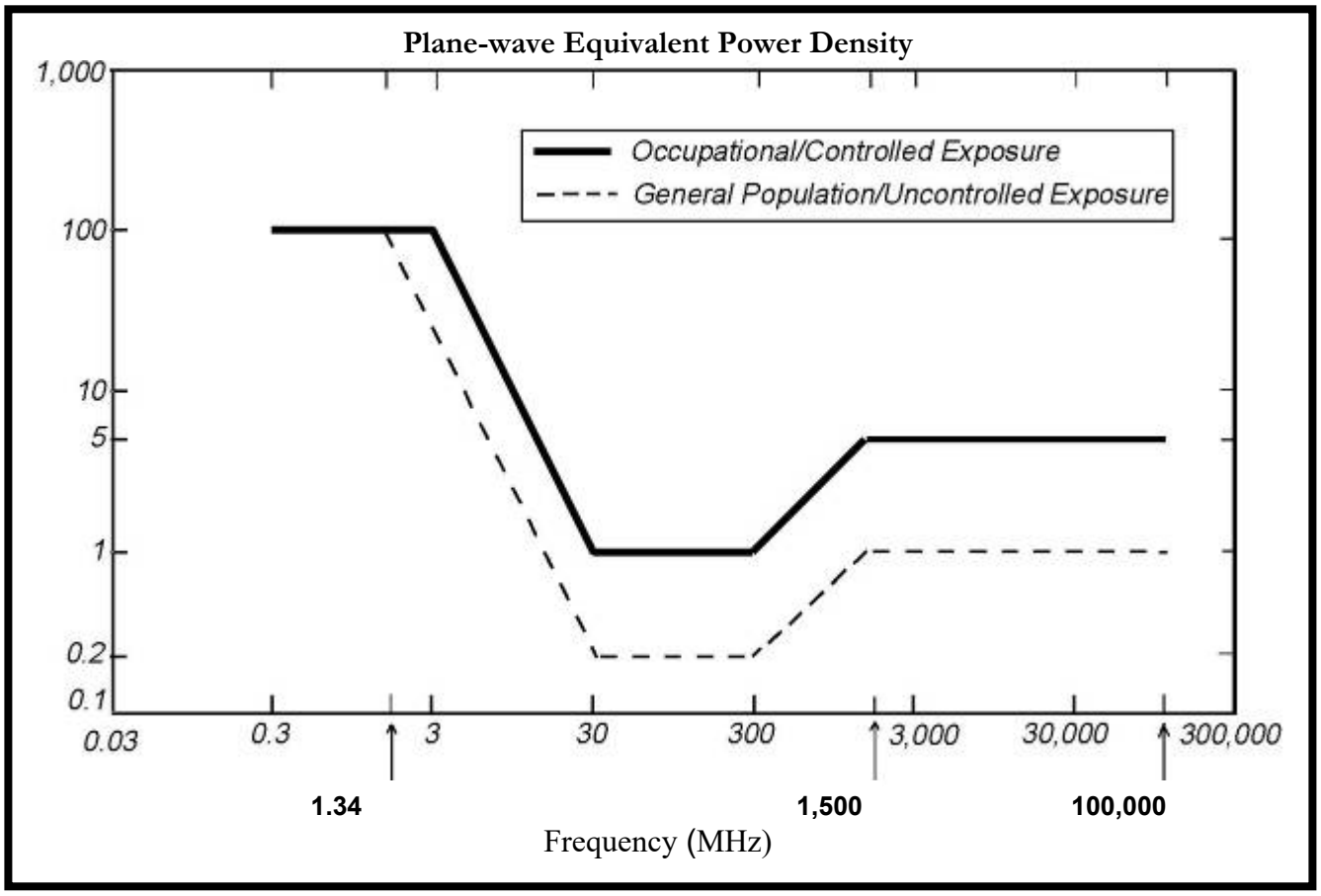
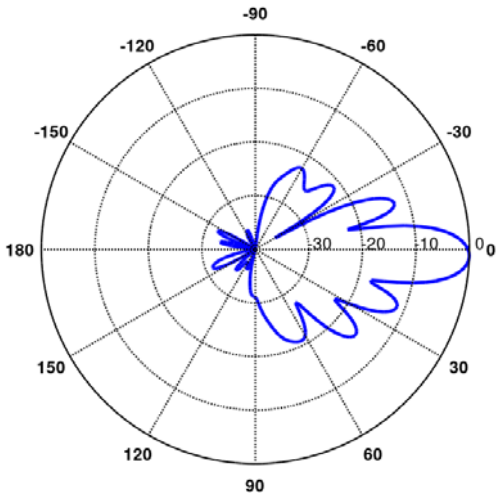
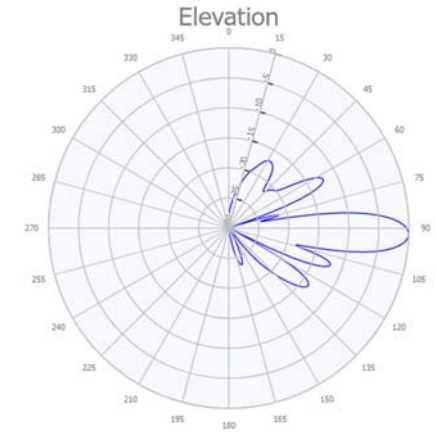
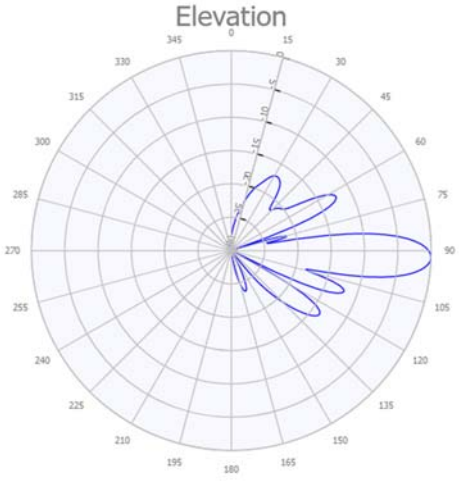


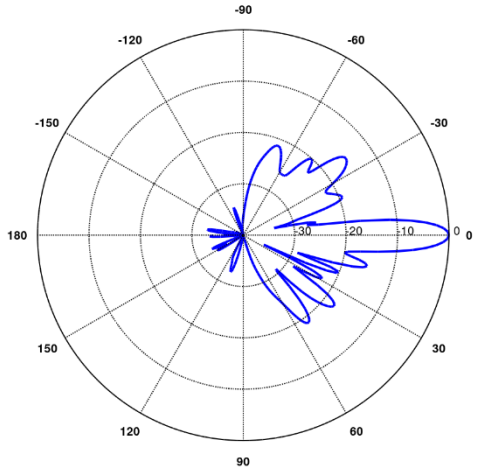
Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

700 MHz Manufacturer: Quintel Model #: QD6616-7 Frequency Band: 698-798 MHz Gain: 15.2 dBi Vertical Beamwidth: 9.1° Horizontal Beamwidth: 67° Polarization: Dual Linear 45° Size L x W x D: 96.0” x 22.0” x 9.6”	
700 MHz Manufacturer: CCI Model #: DMP65R-BU6DA Frequency Band: 698 - 806MHz Gain: 14.0 dBi Vertical Beamwidth: 13.0° Horizontal Beamwidth: 74° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 7.7”	
885 MHz Manufacturer: CCI Model #: DMP65R-BU6DA Frequency Band: 824 - 896 MHz Gain: 14.6 dBi Vertical Beamwidth: 11.1° Horizontal Beamwidth: 63° Polarization: Dual Linear 45° Size L x W x D: 71.2” x 20.7” x 7.7”	

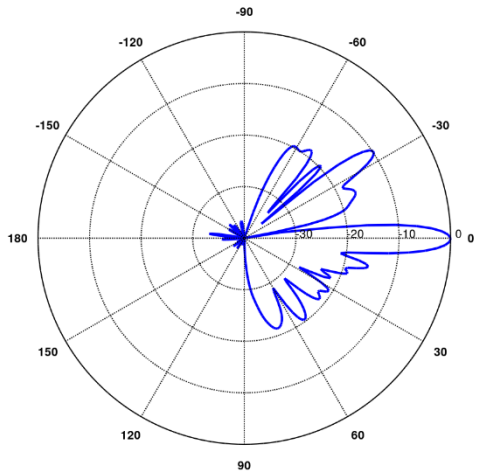
1900 MHz

Manufacturer:	Quintel
Model #:	QD6616-7
Frequency Band:	1920-1990 MHz
Gain:	17.2 dBi
Vertical Beamwidth:	6.2°
Horizontal Beamwidth:	62°
Polarization:	Dual Linear 45°
Size L x W x D:	96.0” x 22.0” x 9.6”



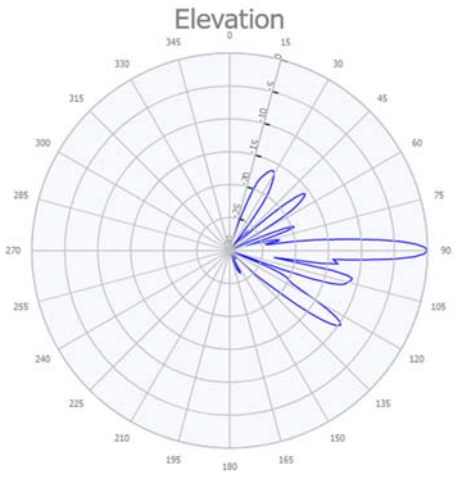
2100 MHz

Manufacturer:	Quintel
Model #:	QD6616-7
Frequency Band:	1920-2180 MHz
Gain:	17.5 dBi
Vertical Beamwidth:	5.5°
Horizontal Beamwidth:	62°
Polarization:	Dual Linear 45°
Size L x W x D:	96.0” x 22.0” x 9.6”



2300 MHz

Manufacturer:	CCI
Model #:	DMP65R-BU6DA
Frequency Band:	2300-2400 MHz
Gain:	18.4 dBi
Vertical Beamwidth:	4.1°
Horizontal Beamwidth:	54°
Polarization:	Dual Linear 45°
Size L x W x D:	71.2” x 20.7” x 7.7”



PROJECT INFORMATION

SCOPE OF WORK:	ITEMS TO BE MOUNTED ON THE EXISTING MONOPOLE: • NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T ANTENNAS: AIR6449 B77 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • NEW AT&T ANTENNAS: QD6616-7 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T ANTENNAS: DMP65R-BU6DA (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T RRUS: 4478 B14 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED @ POS. 2). • EXISTING AT&T RRUS: RRUS-32 B30 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED @ POS. 4). • NEW AT&T SURGE ARRESTOR: DC6-48-60-18-8F WITH (2) AWG6 DC TRUNK & (1) 18 PAIR FIBER LINE (TOTAL OF 1). ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION: • ADD (1) 6648 + XCEDE CABLE. • ADD (1) IDLE. • ADD (6) RECTIFIERS. • ADD BATTERY CABINET WITH (2) STRINGS. ITEMS TO BE REMOVED: • EXISTING AT&T ANTENNA: 800-10121 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T ANTENNA: QS66512-2 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T ANTENNA: HPA-65R-BUU-H6 (TYP. OF 1 PER SECTOR, TOTAL OF 3). • EXISTING AT&T DIPLEXER: LGP21901 (TYP. OF 2 PER SECTOR, TOTAL OF 6). • EXISTING AT&T TMAS: LGP-21401 (TYP. OF 2 PER SECTOR, TOTAL OF 6). • RIP & REPLACE EXISTING BATTERIES. • EXISTING (6) COAX LINES. ITEMS TO REMAIN: • (3) ANTENNAS, (15) RRU'S, (3) SURGE ARRESTOR, (6) DC POWER & (2) FIBER.
SITE ADDRESS:	60 INDUSTRIAL PARK ROAD VERNON ROCKVILLE, CT 06066
LATITUDE:	41.8352917° N, 41° 50' 7.05012" N
LONGITUDE:	72.4550000° W, 72° 27' 18" W
TYPE OF SITE:	MONOPOLE / INDOOR EQUIPMENT
STRUCTURE HEIGHT:	175'-0"±
RAD CENTER:	168'-0"±(LTE), 169'-8"± (DOD) & 166'-0"± (C-Band)
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

SHEET NO.	DESCRIPTION	REV.
T-1	TITLE SHEET	1
GN-1	GENERAL NOTES	1
A-1	COMPOUND & EQUIPMENT PLANS	1
A-2	ANTENNA LAYOUTS & ELEVATION	1
A-3	DETAILS	1
A-4	DETAILS	1
G-1	GROUNDING DETAILS	1
RF-1	RF PLUMBING DIAGRAM	1

SITE NUMBER: CT5310

SITE NAME: VERNON CENTER

FA CODE: 10071292

PACE ID: MRCTB053730,MRCTB055976,MRCTB055887,MRCTB054815

PROJECT: 5G NR 1SR CBAND UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

I-84 EAST GET OFF AT EXIT 66.AT THE END OF THE EXIT TAKE A LEFT THEN RIGHT ONTO BOLTON ROAD.GO ABOUT 500 FEET AND TAKE A LEFT ONTO CLARK ROAD AND THEN TAKE A RIGHT ON INDUSTRIAL PARK ROAD,FOLLOW THE ROAD TO THE END AND LOOK TO YOUR RIGHT AND YOU WILL SEE THE MONOPOLE TO THE SIDE OF THE WAREHOUSE..
DEMARC IS IN TELCO BOX ON INSIDE OF GATE, RIGHT AFTER ENTRANCE TO THE SITE.

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

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5310
SITE NAME: VERNON CENTER

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/22	ISSUED FOR REVIEW	JL	HC	DPH
A	01/22/22	ISSUED FOR REVIEW	MR	HC	DPH

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

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

AT&T

TITLE SHEET
5G NR 1SR CBAND UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5310	T-1	1

GROUNDING NOTES

1. THE SUBCONTRACTOR SHALL REVIEW AND INSPECT THE EXISTING FACILITY GROUNDING SYSTEM AND LIGHTNING PROTECTION SYSTEM (AS DESIGNED AND INSTALLED) FOR STRICT COMPLIANCE WITH THE NEC (AS ADOPTED BY THE AHJ), THE SITE-SPECIFIC (UL, LPI, OR NFPA) LIGHTING PROTECTION CODE, AND GENERAL COMPLIANCE WITH TELCORDIA AND TIA GROUNDING STANDARDS. THE SUBCONTRACTOR SHALL REPORT ANY VIOLATIONS OR ADVERSE FINDINGS TO THE CONTRACTOR FOR RESOLUTION.

2. ALL GROUND ELECTRODE SYSTEMS (INCLUDING TELECOMMUNICATION, RADIO, LIGHTNING PROTECTION, AND AC POWER GES'S) SHALL BE BONDED TOGETHER, AT OR BELOW GRADE, BY TWO OR MORE COPPER BONDING CONDUCTORS IN ACCORDANCE WITH THE NEC.

3. THE SUBCONTRACTOR SHALL PERFORM IEEE FALL-OF-POTENTIAL RESISTANCE TO EARTH TESTING (PER IEEE 1100 AND 81 STANDARDS) FOR NEW GROUND ELECTRODE SYSTEMS. THE SUBCONTRACTOR SHALL FURNISH AND INSTALL SUPPLEMENTAL GROUND ELECTRODES AS NEEDED TO ACHIEVE A TEST RESULT OF 5 OHMS OR LESS.

4. METAL RACEWAY SHALL NOT BE USED AS THE NEC REQUIRED EQUIPMENT GROUND CONDUCTOR. STRANDED COPPER CONDUCTORS WITH GREEN INSULATION, SIZED IN ACCORDANCE WITH THE NEC, SHALL BE FURNISHED AND INSTALLED WITH THE POWER CIRCUITS TO BTS EQUIPMENT.

5. EACH BTS CABINET FRAME SHALL BE DIRECTLY CONNECTED TO THE MASTER GROUND BAR WITH GREEN INSULATED SUPPLEMENTAL EQUIPMENT GROUND WIRES, #6 AWG STRANDED COPPER OR LARGER FOR INDOOR BTS AND #2 AWG STRANDED COPPER FOR OUTDOOR BTS.

6. EXOTHERMIC WELDS SHALL BE USED FOR ALL GROUNDING CONNECTIONS BELOW GRADE.

7. APPROVED ANTIOXIDANT COATINGS (I.E., CONDUCTIVE GEL OR PASTE) SHALL BE USED ON ALL COMPRESSION AND BOLTED GROUND CONNECTIONS.

8. ICE BRIDGE BONDING CONDUCTORS SHALL BE EXOTHERMICALLY BONDED OR BOLTED TO GROUND BAR.

9. ALUMINUM CONDUCTOR OR COPPER CLAD STEEL CONDUCTOR SHALL NOT BE USED FOR GROUNDING CONNECTIONS.

10. MISCELLANEOUS ELECTRICAL AND NON-ELECTRICAL METAL BOXES, FRAMES AND SUPPORTS SHALL BE BONDED TO THE GROUND RING, IN ACCORDANCE WITH THE NEC.

11. METAL CONDUIT SHALL BE MADE ELECTRICALLY CONTINUOUS WITH LISTED BONDING FITTINGS OR BY BONDING ACROSS THE DISCONTINUITY WITH #6 AWG COPPER WIRE UL APPROVED GROUNDING TYPE CONDUIT CLAMPS.

12. ALL NEW STRUCTURES WITH A FOUNDATION AND/OR FOOTING HAVING 20 FT. OR MORE OF 1/2 IN. OR GREATER ELECTRICALLY CONDUCTIVE REINFORCING STEEL MUST HAVE IT BONDED TO THE GROUND RING USING AN EXOTHERMIC WELD CONNECTION USING #2 AWG SOLID BARE TINNED COPPER GROUND WIRE, PER NEC 250.50

GENERAL NOTES

1. FOR THE PURPOSE OF CONSTRUCTION DRAWING, THE FOLLOWING DEFINITIONS SHALL APPLY:

   CONTRACTOR – SAI
   SUBCONTRACTOR – GENERAL CONTRACTOR (CONSTRUCTION)
   OWNER – AT&T MOBILITY

2. PRIOR TO THE SUBMISSION OF BIDS, THE BIDDING SUBCONTRACTOR SHALL VISIT THE CELL SITE TO FAMILIARIZE WITH THE EXISTING CONDITIONS AND TO CONFIRM THAT THE WORK CAN BE ACCOMPLISHED AS SHOWN ON THE CONSTRUCTION DRAWINGS. ANY DISCREPANCY FOUND SHALL BE BROUGHT TO THE ATTENTION OF CONTRACTOR.

3. ALL MATERIALS FURNISHED AND INSTALLED SHALL BE IN STRICT ACCORDANCE WITH ALL APPLICABLE CODES, REGULATIONS, AND ORDINANCES. SUBCONTRACTOR SHALL ISSUE ALL APPROPRIATE NOTICES AND COMPLY WITH ALL LAWS, ORDINANCES, RULES, REGULATIONS, AND LAWFUL ORDERS OF ANY PUBLIC AUTHORITY REGARDING THE PERFORMANCE OF THE WORK. ALL WORK CARRIED OUT SHALL COMPLY WITH ALL APPLICABLE MUNICIPAL AND UTILITY COMPANY SPECIFICATIONS AND LOCAL JURISDICTIONAL CODES, ORDINANCES AND APPLICABLE REGULATIONS.

4. DRAWINGS PROVIDED HERE ARE NOT TO BE SCALED AND ARE INTENDED TO SHOW OUTLINE ONLY.

5. UNLESS NOTED OTHERWISE, THE WORK SHALL INCLUDE FURNISHING MATERIALS, EQUIPMENT, APPURTENANCES, AND LABOR NECESSARY TO COMPLETE ALL INSTALLATIONS AS INDICATED ON THE DRAWINGS.

6. "KITTING LIST" SUPPLIED WITH THE BID PACKAGE IDENTIFIES ITEMS THAT WILL BE SUPPLIED BY CONTRACTOR. ITEMS NOT INCLUDED IN THE BILL OF MATERIALS AND KITTING LIST SHALL BE SUPPLIED BY THE SUBCONTRACTOR.

7. THE SUBCONTRACTOR SHALL INSTALL ALL EQUIPMENT AND MATERIALS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UNLESS SPECIFICALLY STATED OTHERWISE.

8. IF THE SPECIFIED EQUIPMENT CANNOT BE INSTALLED AS SHOWN ON THESE DRAWINGS, THE SUBCONTRACTOR SHALL PROPOSE AN ALTERNATIVE INSTALLATION SPACE FOR APPROVAL BY THE CONTRACTOR.

9. SUBCONTRACTOR SHALL DETERMINE ACTUAL ROUTING OF CONDUIT, POWER AND T1 CABLES, GROUNDING CABLES AS SHOWN ON THE POWER, GROUNDING AND TELCO PLAN DRAWING. SUBCONTRACTOR SHALL UTILIZE EXISTING TRAYS AND/OR SHALL ADD NEW TRAYS AS NECESSARY. SUBCONTRACTOR SHALL CONFIRM THE ACTUAL ROUTING WITH THE CONTRACTOR.

10. THE SUBCONTRACTOR SHALL PROTECT EXISTING IMPROVEMENTS, PAVEMENTS, CURBS, LANDSCAPING AND STRUCTURES. ANY DAMAGED PART SHALL BE REPAIRED AT SUBCONTRACTOR'S EXPENSE TO THE SATISFACTION OF OWNER.

11. SUBCONTRACTOR SHALL LEGALLY AND PROPERLY DISPOSE OF ALL SCRAP MATERIALS SUCH AS COAXIAL CABLES AND OTHER ITEMS REMOVED FROM THE EXISTING FACILITY. ANTENNAS REMOVED SHALL BE RETURNED TO THE OWNER'S DESIGNATED LOCATION.

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

13. ALL CONCRETE REPAIR WORK SHALL BE DONE IN ACCORDANCE WITH AMERICAN CONCRETE INSTITUTE (ACI) 301.

14. ANY NEW CONCRETE NEEDED FOR THE CONSTRUCTION SHALL BE AIR-ENTRAINED AND SHALL HAVE 4000 PSI STRENGTH AT 28 DAYS. ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318 CODE REQUIREMENTS.

15. ALL STRUCTURAL STEEL WORK SHALL BE DETAILED, FABRICATED AND ERECTED IN ACCORDANCE WITH AISC SPECIFICATIONS. ALL STRUCTURAL STEEL SHALL BE ASTM A36 (Fy = 36 ksi) UNLESS OTHERWISE NOTED. PIPES SHALL BE ASTM A53 TYPE E (Fy = 36 ksi). ALL STEEL EXPOSED TO WEATHER SHALL BE HOT DIPPED GALVANIZED. TOUCH UP ALL SCRATCHES AND OTHER MARKS IN THE FIELD AFTER STEEL IS ERECTED USING A COMPATIBLE ZINC RICH PAINT.

16. CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND "GENERAL CONSTRUCTION SERVICES FOR CONSTRUCTION OF AT&T SITES."

17. SUBCONTRACTOR SHALL VERIFY ALL EXISTING DIMENSIONS AND CONDITIONS PRIOR TO COMMENCING ANY WORK. ALL DIMENSIONS OF EXISTING CONSTRUCTION SHOWN ON THE DRAWINGS MUST BE VERIFIED. SUBCONTRACTOR SHALL NOTIFY THE CONTRACTOR OF ANY DISCREPANCIES PRIOR TO ORDERING MATERIAL OR PROCEEDING WITH CONSTRUCTION.

18. THE EXISTING CELL SITE IS IN FULL COMMERCIAL OPERATION. ANY CONSTRUCTION WORK BY SUBCONTRACTOR SHALL NOT DISRUPT THE EXISTING NORMAL OPERATION. ANY WORK ON EXISTING EQUIPMENT MUST BE COORDINATED WITH CONTRACTOR. ALSO, WORK SHOULD BE SCHEDULED FOR AN APPROPRIATE MAINTENANCE WINDOW USUALLY IN LOW TRAFFIC PERIODS AFTER MIDNIGHT.

19. SINCE THE CELL SITE IS ACTIVE, ALL SAFETY PRECAUTIONS MUST BE TAKEN WHEN WORKING AROUND HIGH LEVELS OF ELECTROMAGNETIC RADIATION. EQUIPMENT SHOULD BE SHUTDOWN PRIOR TO PERFORMING ANY WORK THAT COULD EXPOSE THE WORKERS TO DANGER. PERSONAL RF EXPOSURE MONITORS ARE ADVISED TO BE WORN TO ALERT OF ANY DANGEROUS EXPOSURE LEVELS.

20. **APPLICABLE BUILDING CODES:**
    SUBCONTRACTOR'S WORK SHALL COMPLY WITH ALL APPLICABLE NATIONAL, STATE, AND LOCAL CODES AS ADOPTED BY THE LOCAL AUTHORITY HAVING JURISDICTION (AHJ) FOR THE LOCATION. THE EDITION OF THE AHJ ADOPTED CODES AND STANDARDS IN EFFECT ON THE DATE OF CONTRACT AWARD SHALL GOVERN THE DESIGN.

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

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

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

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

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

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

ABBREVIATIONS

AGL	ABOVE GRADE LEVEL	EQ	EQUAL	REQ	REQUIRED
AWG	AMERICAN WIRE GAUGE	GC	GENERAL CONTRACTOR	RF	RADIO FREQUENCY
BBU	BATTERY BACKUP UNIT	GRC	GALVANIZED RIGID CONDUIT	TBD	TO BE DETERMINED
BTCW	BARE TINNED SOLID COPPER WIRE	MGB	MASTER GROUND BAR	TBR	TO BE REMOVED
BGR	BURIED GROUND RING	MIN	MINIMUM	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	RADIATION CENTER LINE (ANTENNA)	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING	REF	REFERENCE		

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12 INDUSTRIAL WAY
SALEM, NH 03079

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

SITE NUMBER: CT5310
SITE NAME: VERNON CENTER

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/22	ISSUED FOR REVIEW	JJ	HC	DPH
A	01/22/22	ISSUED FOR REVIEW	MR	HC	DPH

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

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

AT&T

GENERAL NOTES
5G NR 1SR CBAND UPGRADE

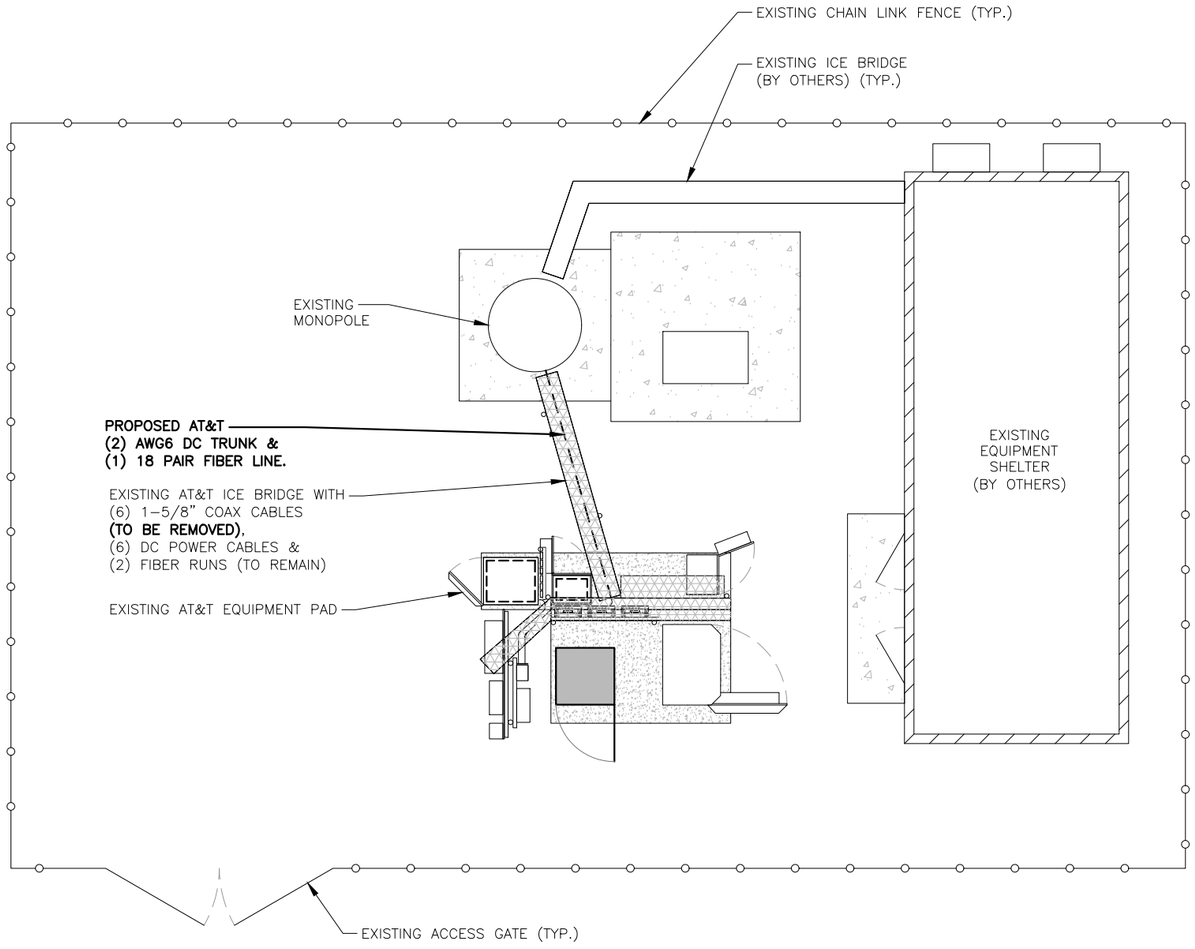
SITE NUMBER	DRAWING NUMBER	REV
CT5310	GN-1	1

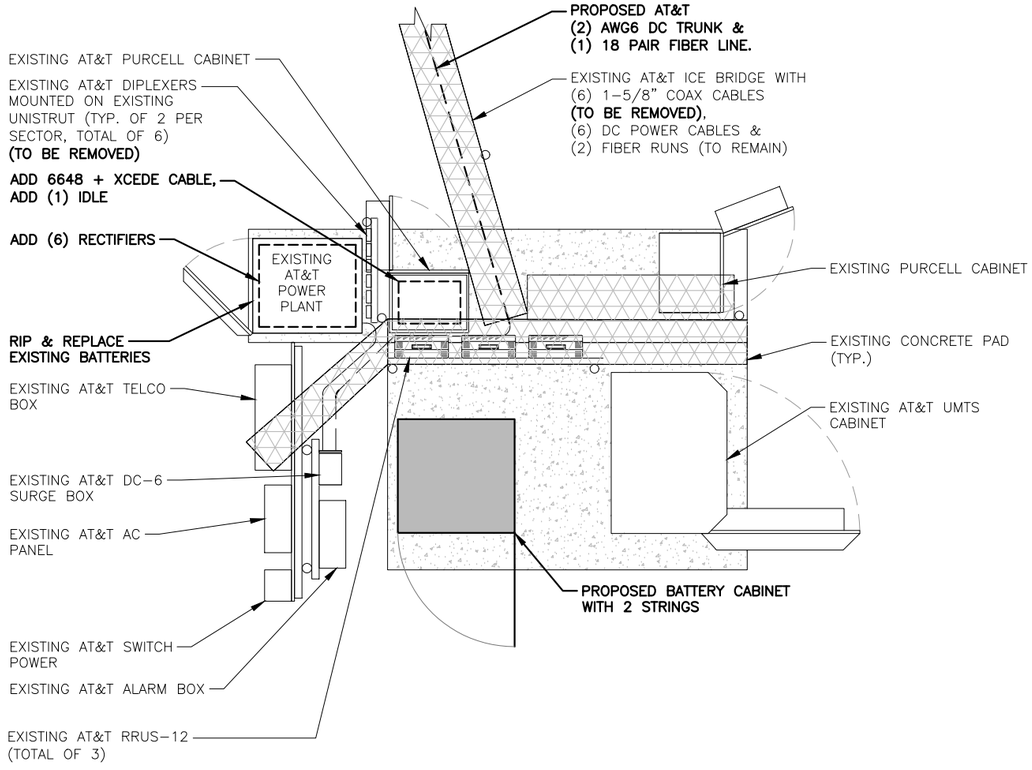
NOTE:

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

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.





MAGNETIC NORTH 13.68° TRUE NORTH

COMPOUND PLAN (1 / A–1)
22x34 SCALE: 1/4"=1'–0"
11x17 SCALE: 1/8"=1'–0"

0 2'–0" 4'–0" 8'–0" 12'–0"

MAGNETIC NORTH 13.68° TRUE NORTH

EQUIPMENT PLAN (2 / A–1)
22x34 SCALE: 1/2"=1'–0"
11x17 SCALE: 1/4"=1'–0"

0 1'–0" 2'–0" 4'–0" 6'–0"

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

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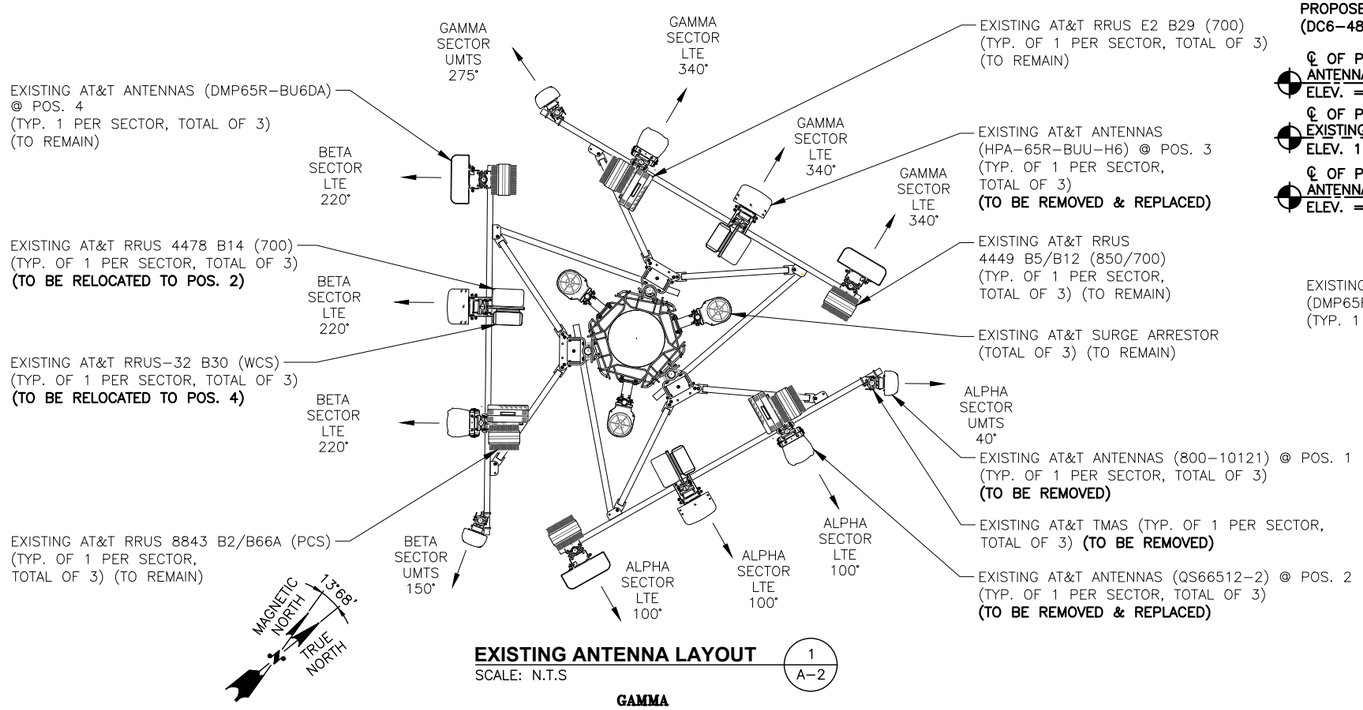
COMPOUND & EQUIPMENT PLANS
5G NR 1SR CBAND UPGRADE

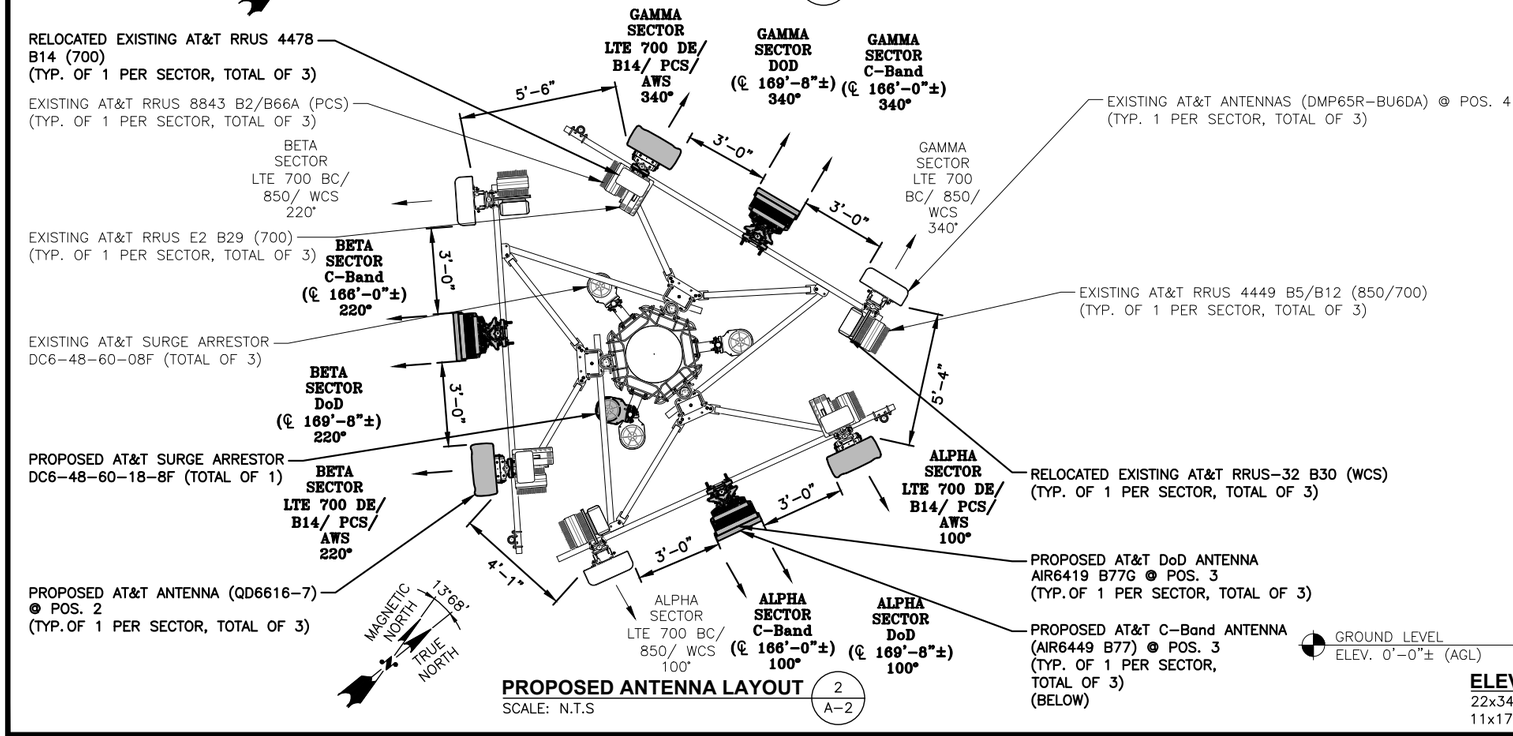
SITE NUMBER	DRAWING NUMBER	REV
CT5310	A–1	1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

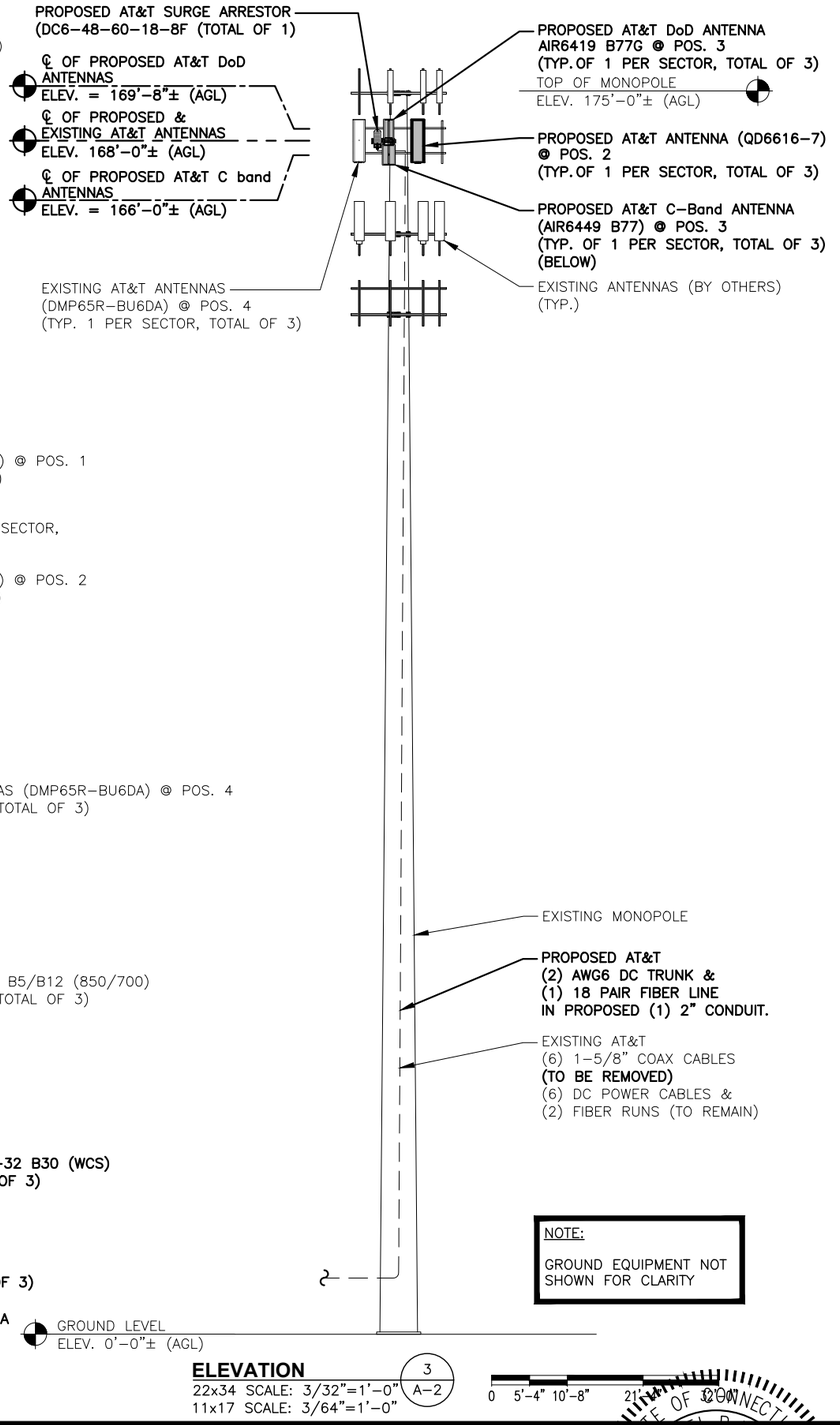
(1 / A-2)



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

(2 / A-2)



ELEVATION

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

(3 / A-2)

0 5'-4" 10'-8" 21'-4"

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.
DATE: JANUARY 20, 2022.

NOTE:

AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

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

STATE OF CONNECTICUT · DANIEL P. HAMM · No. 21178 · LICENSED PROFESSIONAL ENGINEER

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ANTENNA LAYOUTS & ELEVATION
5G NR 1SR CBAND UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5310	A-2	1

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	ANTENNA TIP HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	–	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC6-48-60-08F **(P) (1) RAYCAP DC6-48-60-18-8F**
A2	**PROPOSED**	**LTE 700 DE/ B14/ PCS/ AWS**	**QD6616-7**	**72X22X9.6**	**168'-0"±**	**171'-0"±**	**100°**	–	(E)(1) RRUS-E2 B29 (700) (E)(1) 8843 B2/B66A (PCS/AWS) (E)(1) 4478 B14 (700)	–	–	
A3	**PROPOSED**	**DoD C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**31.1"X16.1X7.3" 30.4"X15.9"X8.1"**	**169'-8"± 166'-0"±**	**171'-0"± 167'-4"±**	**100°**	–	–	–	(E)(2) DC POWER & (1) FIBER **(P)(2) DC POWER & (1) FIBER**	
A4	EXISTING	LTE 700 BC/ 850/ WCS	DMP65R-BU6DA	71.2X20.7X7.7	168'-0"±	171'-0"±	100°	–	(E)(1) RRUS-32 B30 (WCS) (E)(1) 4449 B5/B12 (850/700)	–	–	
B1	–	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC6-48-60-08F
B2	**PROPOSED**	**LTE 700 DE/ B14/ PCS/ AWS**	**QD6616-7**	**72X22X9.6**	**168'-0"±**	**171'-0"±**	**220°**	–	(E)(1) RRUS-E2 B29 (700) (E)(1) 8843 B2/B66A (PCS/AWS) (E)(1) 4478 B14 (700)	–	–	
B3	**PROPOSED**	**DoD C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**31.1"X16.1X7.3" 30.4"X15.9"X8.1"**	**169'-8"± 166'-0"±**	**171'-0"± 167'-4"±**	**220°**	–	–	–	(E)(2) DC POWER & (1) FIBER	
B4	EXISTING	LTE 700 BC/ 850/ WCS	DMP65R-BU6DA	71.2X20.7X7.7	168'-0"±	171'-0"±	220°	–	(E)(1) RRUS-32 B30 (WCS) (E)(1) 4449 B5/B12 (850/700)	–	–	
C1	–	–	–	–	–	–	–	–	–	–	–	(E) (1) RAYCAP DC6-48-60-08F
C2	**PROPOSED**	**LTE 700 DE/ B14/ PCS/ AWS**	**QD6616-7**	**72X22X9.6**	**168'-0"±**	**171'-0"±**	**340°**	–	(E)(1) RRUS-E2 B29 (700) (E)(1) 8843 B2/B66A (PCS/AWS) (E)(1) 4478 B14 (700)	–	–	
C3	**PROPOSED**	**DoD C-BAND**	**AIR6419 B77G AIR6449 B77 (STACKED)**	**31.1"X16.1X7.3" 30.4"X15.9"X8.1"**	**169'-8"± 166'-0"±**	**171'-0"± 167'-4"±**	**340°**	–	–	–	(E)(2) DC POWER	
C4	EXISTING	LTE 700 BC/ 850/ WCS	DMP65R-BU6DA	71.2X20.7X7.7	168'-0"±	171'-0"±	340°	–	(E)(1) RRUS-32 B30 (WCS) (E)(1) 4449 B5/B12 (850/700)	–	–	

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

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

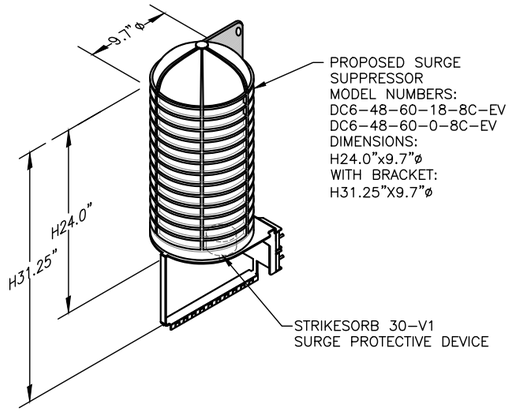
NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING **ANTENNA MOUNT** TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED
BY: HUDSON DESIGN GROUP, LLC.
DATE: JANUARY 20, 2022.

NOTE:
AN ANALYSIS FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT SHALL BE DETERMINED PRIOR TO CONSTRUCTION.

RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
E(3)	RRUS-E2 B29 (700)	20.4"x18.5"x7.5"
E(3)	RRUS-32 B30 (WCS)	27.2"x12.1"x7.0"
E(3)	4478 B14 (700)	18.1"x13.4"x8.3"
E(3)	8843 B2/B66A (PCS)	14.9"x13.2"x10.9"
E(3)	4449 B5/B12 (700/850/AWS)	17.9"x13.2"x10.4"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS



NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL (2 / A-3)
SCALE: N.T.S

PROPOSED OUTDOOR BATTERY CABINET
VERTIV XTE 601B WITH 2 STR BATT

NOTE:
MOUNT PROPOSED EQUIPMENT PER MANUFACTURER'S SPECIFICATIONS

PROPOSED VERTIV BATTERY RACK (3 / 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 CBAND UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5310	A-3	1

NOTE:

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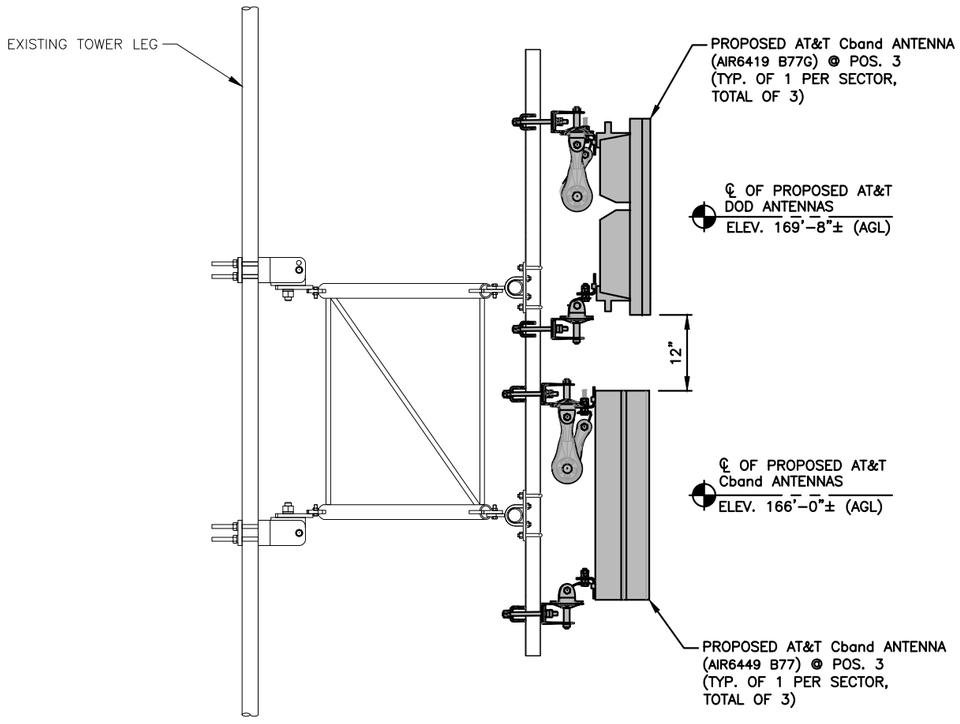
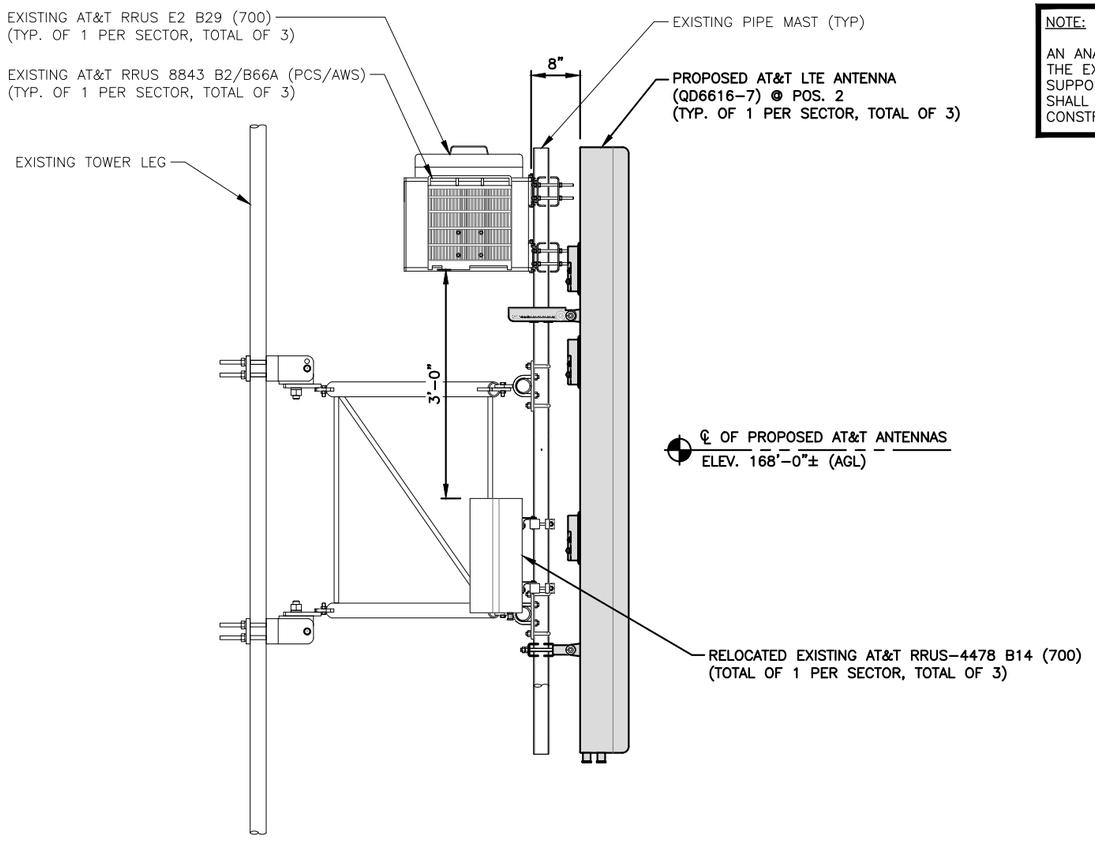


PROPOSED DoD + C-BAND ANTENNA MOUNTING DETAIL

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

1 A-4



PROPOSED LTE ANTENNA MOUNTING DETAIL

22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

0 0'-6" 1'-0" 2'-0" 3'-0"

2 A-4

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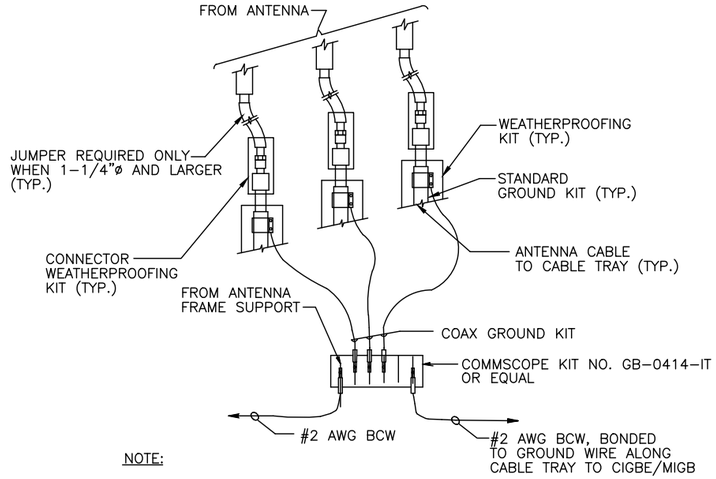
DETAILS
5G NR 1SR CBAND UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5310	A-4	1



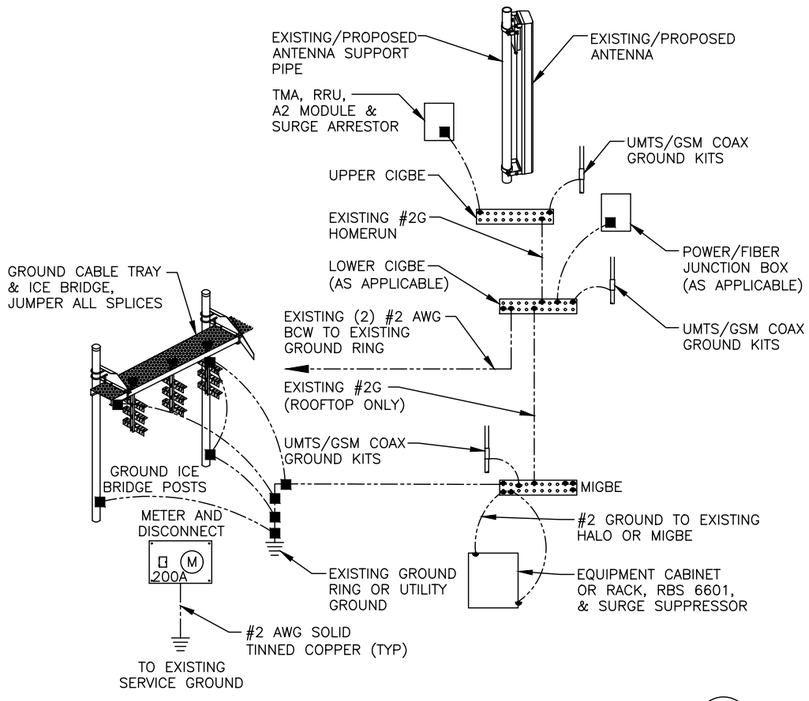
NOTE:

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

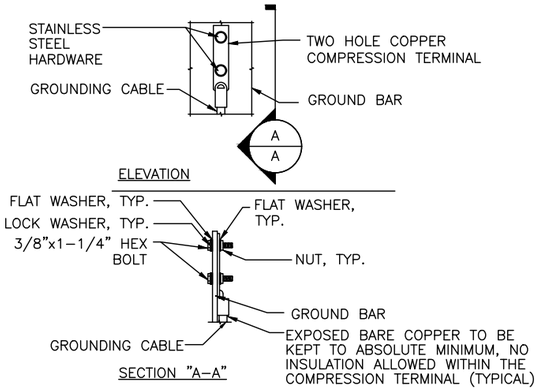
1 / G–1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / 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

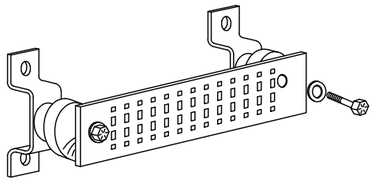
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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

4 / G–1

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

SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT5310
SITE NAME: VERNON CENTER

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/22	ISSUED FOR REVIEW	JV	HC	DPH
A	01/22/22	ISSUED FOR REVIEW	MR	HC	DPH

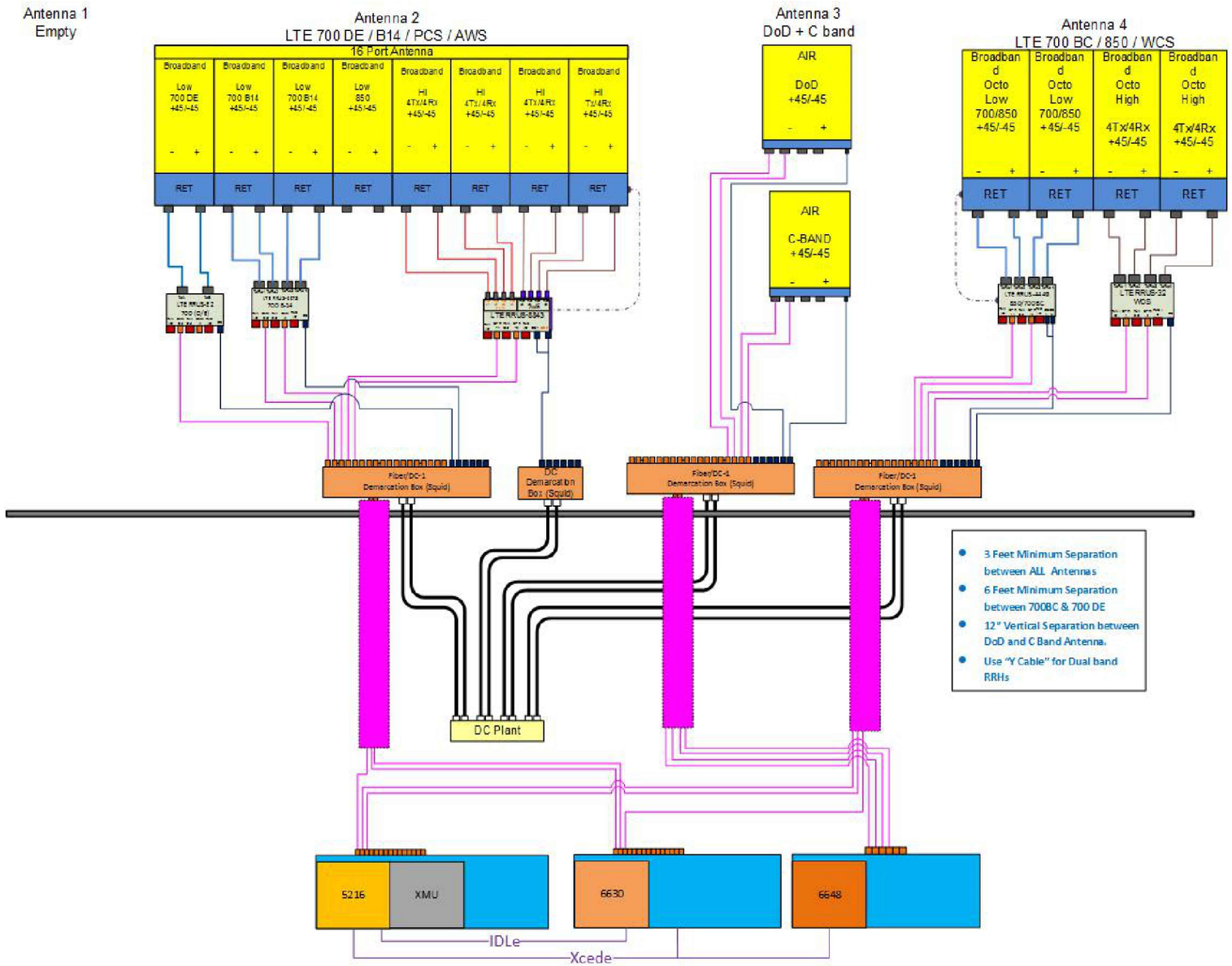
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: MR

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

AT&T

GROUNDING DETAILS
5G NR 1SR CBAND UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5310	G–1	1



NOTE:

REV: 2
DATED: 01/19/2022
RFDS ID: 4852159

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.
3. RFDS USED FOR REFERENCE.

NOTE:

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

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: CT5310
SITE NAME: VERNON CENTER

60 INDUSTRIAL PARK ROAD
VERNON ROCKVILLE, CT 06066
TOLLAND COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	03/09/22	ISSUED FOR REVIEW	JJ	HC	DPH
A	01/22/22	ISSUED FOR REVIEW	MR	HC	DPH

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

AT&T

RF PLUMBING DIAGRAM
5G NR 1SR CBAND UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT5310	RF–1	1

STRUCTURAL ANALYSIS REPORT
175-ft MONOPOLE TOWER
VERNON ROCKVILLE, CONNECTICUT

Prepared for
SAI Communications

AT&T Site Ref:
CT5310; Vernon Center

Site Address: 60 Industrial Park Road, Vernon Rockville, CT 06066
FA Location Code: 10071292
Pace ID: MRCTB055887
PT Number: 2051A11MF7
Project: 5G NR Radio

APT Filing No. CT1931630.P02

February 24, 2022

ALL-POINTS TECHNOLOGY CORPORATION, P.C.
567 VAUXHALL STREET EXTENSION · SUITE 311 · WATERFORD, CT 06385 · PHONE 860-663-1697

STRUCTURAL ANALYSIS REPORT
175-ft MONOPOLE TOWER
VERNON ROCKVILLE, CONNECTICUT
prepared for
SAI Communications

EXECUTIVE SUMMARY:

All-Points Technology Corporation, P.C. (APT) performed a structural analysis of an existing 175-ft monopole tower structure to support a proposed AT&T equipment modification.

The proposed AT&T antenna and appurtenance modification consists of the replacement of six (6) existing panel antennas with three (3) new panel antennas and six (6) new panel antennas with integrated radios. Additionally, one (1) new "squid" surge suppressor is to be installed. Equipment shall be installed on existing sector mounts by Sabre Industries, and fed by two (3) fiber cables and eight (8) DC trunk cables, as referenced in the table below. It should be noted that one (1) fiber cable and two (2) DC trunk cables are proposed. All feed lines shall run vertically up the interior of the monopole structure and inside 2" conduit lines.

Our analysis indicates that the monopole tower structure meets the requirements of the 2015 International Building Code (IBC), as amended by the 2018 Connecticut State Building Code, and the ANSI/TIA-222-H standard with AT&T's proposed equipment and the existing equipment loading.

Evaluation of the existing foundation was performed based solely on foundation dimensions provided to APT. Geometric information was included in a Structural Analysis Report prepared by Malouf Engineering International, Inc. (MEI Project ID CT00842M-07V0) dated 08/07/07. Based on this information, our analysis determined the existing base foundation is adequately sized to support the existing and proposed equipment configuration.

INTRODUCTION:

A structural analysis of this communications tower was performed by APT for SAI Communications. The tower is located at 60 Industrial Park Road in Vernon Rockville, Connecticut.

The following information was utilized in the preparation of this analysis:

- Photos taken during a site visit conducted at-grade by APT on 01/27/22.
- Structural Analysis Report prepared by Malouf Engineering International, Inc. (MEI Project ID CT00842M-07V0) dated 08/07/07.
- Structural Analysis Report prepared by Tectonic (Tectonic Project No. 10473.CT11140J) marked Rev. 1, dated 08/19/20.
- Structural Analysis Report prepared by APT (APT Project No. CT1931631) marked Rev. 1, dated 10/13/20.
- Structural Analysis Report prepared by Hudson Design Group, LLC dated 08/03/21.
- Mount Analysis prepared by Hudson Design Group, LLC dated 01/20/22.
- RFDS detailing AT&T's proposed equipment changes, latest version.

The structure is a 175-foot, 18-sided monopole tower likely manufactured by PiROD.

The analysis was conducted using the following antenna inventory (proposed equipment changes shown in **bold** text:

Carrier	Antenna and Appurtenance Make/Model	Elevation	Status	Mount Type	Coax/Feed-Line
T-Mobile	(3) RFS APXVARR24_43-C-NA20, (3) Ericsson Air 32 B66Aa B2a & (3) Ericsson Air 6449 B41 panel antennas, (3) Ericsson 4449 RRHs, (3) Ericsson RRUS 4415 RRHs, (3) Twin TMAs, (3) Commscope SDX1926W-43 diplexers	178.5'	ETR	10' low-profile platform w/ SitePro1 HRK12 handrail kit	(6) 1-5/8", (3) 6x12 hybrid
AT&T	**(3) Ericsson AIR6419 B77D,** **(3) Ericsson AIR6449 B77G,** **(3) Quintel QD6616-7 &** (3) CCI DMP65R-BU6DA panel antennas, (3) Ericsson B5/B12 4449 RRHs, (3) Ericsson RRUS-E2 B29 RRHs, (3) Ericsson B2/B66A 8843 RRHs, (3) Ericsson B14 4478 RRHs, (3) Ericsson RRUS-32 B30 RRHs, (3) Raycap DC6-48-60 SA's **(1) Raycap DC6-48-60-18-8C SA**	168'	**P** **P** **P** ETR ETR ETR ETR ETR ETR ETR **P**	(3) Sabre C10857001C sector mounts	**(3)** fiber, **(8)** DC trunks, in **(4)** 2" conduit,
Verizon Wireless	(1) GPS (3) Samsung MT6407-77A antennas w/ integrated RRHs, (3) Samsung XXDWMM-12.5-65-8T CBRS antenna w/ integrated RRH, (3) Commscope LNX6513DS-A1M & (6) Commscope NHH-65B-R2B panel antennas, (3) Samsung B2/B66A RRH BR049 RRHs, (3) Samsung B5/B13 RRH BR04C RRHs, (1) OVP	162' 160' 156.5' 158.5'	ETR	14' platform w/ rails & kicker kit	(1) 1/2" (6) 1-5/8", (2) 6x12 hybrid
-	Vacant Mount	144.6'	ETR	14' low-profile platform w/ (12) 6' x 2-3/8" pipes	N/A

Notes:

1. ETR = Existing to Remain; ERL= Existing to be Relocated; P = Proposed.
2. All feed-lines noted above shall be routed within interior of the pole unless otherwise noted.

STRUCTURAL ANALYSIS:

Methodology:

This structural analysis has been prepared in accordance with the ANSI/TIA-222-H standard entitled "Structural Standard for Antenna Supporting Structures, Antennas and Small Wind Turbine Support Structures"; American Institute of Steel Construction (AISC) Manual of Steel Construction, and the 2015 International Building Code (IBC), as amended by the 2018 Connecticut State Building Code.

Antenna, appurtenance and mount assembly loads were evaluated utilizing the ANSI/TIA-222-H standard.

- Load Case 1: 118 mph (3-second gust) Ultimate wind speed, 0" ice
- Load Case 2: 50mph (3-second gust) w/ 1.50" ice thickness required
- Load Case 3: 60mph (3-second gust) (Service Load)
- Risk Category: II
- Exposure Category: B
- Topographic Category: 1

Analysis Results:

The following table summarizes the capacity of the monopole based on combined axial and bending stresses:

Elevation	Capacity [1]
160'-175'	22%
140'-160'	51%
120'-140'	66%
100'-120'	73%
80'-100'	76%
60'-80'	78%
40'-60'	79%
20'-40'	69%
0'-20'	64%

Notes:
1. Based on ASTM A53 Gr. B round monopole. Pole diameter and thickness vary.

Base Foundation:

Evaluation of the base foundation was performed based on geometric information included within the aforementioned Structural Analysis Report prepared by Malouf Engineering International, Inc. Our calculations indicate the existing base foundation is adequately sized to support the existing and proposed equipment loading. It should be noted that foundation capacity is governed by the overturning moment capacity.

The calculated base reactions utilized in the analysis of the foundation system with the proposed loading are as follows:

Load Effect	Calculated Reactions	Usage
Compression	65.3 k	Pass
Base Shear	29.0 k	Pass
Overturning Moment	3,834 ft-k	(FS = 1.33 > 1.0) Pass

CONCLUSIONS:

In conclusion, our analysis indicates that the existing 175-ft monopole tower structure located at 60 Industrial Park Road in Vernon Rockville, Connecticut meets the requirements of the 2015 International Building Code (IBC), as amended by the 2018 Connecticut State Building Code, and the ANSI/TIA-222-H standard with AT&T's proposed equipment and the existing equipment loading.

Sincerely,
All-Points Technology Corp. P.C.

Michael T. Larson, P.E.
Project Engineer

LIMITATIONS:

This report is based on the following:

1. Tower/structure is properly installed and maintained.
2. All members and components are in a non-deteriorated condition.
3. All required members are in place.
4. All bolts are in place and are properly tightened.
5. Tower/structure is in plumb condition.
6. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.
7. Material yield stress values as follows:
   Monopole: 42 ksi
   Base plate: 36 ksi
   Anchor bolts: 75 ksi

All-Points Technology Corporation, P.C. (APT) is not responsible for any modifications completed prior to or hereafter which APT is not or was not directly involved. Modifications include but are not limited to:

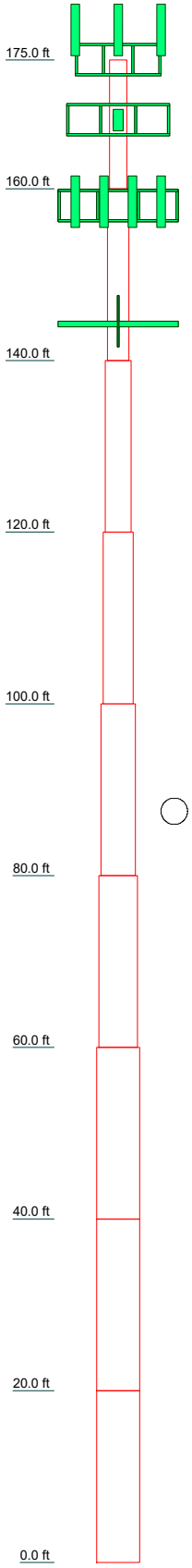
1. Replacing or reinforcing bracing members.
2. Reinforcing members in any manner.
3. Adding or relocating antennas.
4. Installing antenna mounts or waveguide cables.
5. Extending tower.

APT hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon the information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies, you should disregard this report and immediately contact APT. APT disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Appendix A

Tower Schematic

Section	Size	Length (ft)	Grade	Weight (lb)
1	P24x3/8	15.00	A53-B-42	1420.6
2	P30x3/8	20.00		2375.2
3	P36x3/8	20.00		2856.3
4	P42x3/8	20.00		3337.3
5	P48x3/8	20.00		3818.4
6	P54x3/8	20.00		4299.5
7	P60x3/8	20.00		4780.5
8	P60x1/2	20.00		6360.7
9	P60x5/8	20.00		7934.1
				37182.6



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
APXVARR24_43-C-NA20 (T-Mobile)	178.5	Raycap DC6-48-60-18-8F squid (ATI)	168
APXVARR24_43-C-NA20 (T-Mobile)	178.5	Raycap DC6-48-60-0-8F squid (ATI)	168
APXVARR24_43-C-NA20 (T-Mobile)	178.5	Raycap DC6-48-60-18-8F squid (ATI)	168
AIR32 B66Aa B2a (T-Mobile)	178.5	Sabre C10857001 12' sector mount (ATI)	168
AIR32 B66Aa B2a (T-Mobile)	178.5		
AIR32 B66Aa B2a (T-Mobile)	178.5	Sabre C10857001 12' sector mount (ATI)	168
AIR 6449 B41 (T-Mobile)	178.5		
AIR 6449 B41 (T-Mobile)	178.5	Sabre C10857001 12' sector mount (ATI)	168
AIR 6449 B41 (T-Mobile)	178.5		
Ericsson Radio 4449 (T-Mobile)	178.5	GPS on 3' standoff	162
Ericsson Radio 4449 (T-Mobile)	178.5	MT6407-77A (Verizon Wireless)	160
Ericsson Radio 4449 (T-Mobile)	178.5	MT6407-77A (Verizon Wireless)	160
Ericsson Radio 4415 (T-Mobile)	178.5	MT6407-77A (Verizon Wireless)	160
Ericsson Radio 4415 (T-Mobile)	178.5	LNX-6513DS (Verizon Wireless)	158.5
Ericsson Radio 4415 (T-Mobile)	178.5	LNX-6513DS (Verizon Wireless)	158.5
SDX1926W-43 diplexer (T-Mobile)	178.5	LNX-6513DS (Verizon Wireless)	158.5
SDX1926W-43 diplexer (T-Mobile)	178.5	(2) NHH-65B-R2B (Verizon Wireless)	158.5
SDX1926W-43 diplexer (T-Mobile)	178.5	(2) NHH-65B-R2B (Verizon Wireless)	158.5
RFS twin TMA (T-Mobile)	178.5	(2) NHH-65B-R2B (Verizon Wireless)	158.5
RFS twin TMA (T-Mobile)	178.5	B2/B66A RRHBRO49 (RFV01U-D1A) (Verizon Wireless)	158.5
RFS twin TMA (T-Mobile)	178.5	B2/B66A RRHBRO49 (RFV01U-D1A) (Verizon Wireless)	158.5
10' low-profile platform (T-Mobile)	175	B2/B66A RRHBRO49 (RFV01U-D1A) (Verizon Wireless)	158.5
12'x2 3/8" Pipe Mount (T-Mobile)	175	B5/B13 RRHBR04C (RFV01UD2A) (Verizon Wireless)	158.5
12'x2 3/8" Pipe Mount (T-Mobile)	175	B5/B13 RRHBR04C (RFV01UD2A) (Verizon Wireless)	158.5
12'x2 3/8" Pipe Mount (T-Mobile)	175	B5/B13 RRHBR04C (RFV01UD2A) (Verizon Wireless)	158.5
AIR 6449 B77 (ATI)	168	RVZDC-6627-PF-48 (Verizon Wireless)	158.5
AIR 6449 B77 (ATI)	168	14' platform w/rails (Verizon Wireless)	158
AIR 6449 B77 (ATI)	168	SitePro1 PRK-1245 kicker kit (Verizon Wireless)	158
AIR 6419 B77 (ATI)	168	CBRS RRH-RT4401-48A w/XXDWMM-12.5-65-8T-CBRS antenna (Verizon Wireless)	156.5
AIR 6419 B77 (ATI)	168	CBRS RRH-RT4401-48A w/XXDWMM-12.5-65-8T-CBRS antenna (Verizon Wireless)	156.5
AIR 6419 B77 (ATI)	168	CBRS RRH-RT4401-48A w/XXDWMM-12.5-65-8T-CBRS antenna (Verizon Wireless)	156.5
QD6616-7 (ATI)	168	14' low-profile platform (Vacant Mounts)	144.6
QD6616-7 (ATI)	168	(4) 6'x2 3/8" Pipe Mount (Vacant Mounts)	144.6
QD6616-7 (ATI)	168	(4) 6'x2 3/8" Pipe Mount (Vacant Mounts)	144.6
cci DMP65R-BU6DA (ATI)	168	(4) 6'x2 3/8" Pipe Mount (Vacant Mounts)	144.6
cci DMP65R-BU6DA (ATI)	168		
cci DMP65R-BU6DA (ATI)	168		
Ericsson RRUS-32 (ATI)	168		
Ericsson RRUS-32 (ATI)	168		
Ericsson RRUS-32 (ATI)	168		
Ericsson Radio 4478 B14 (ATI)	168		
Ericsson Radio 4478 B14 (ATI)	168		
Ericsson Radio 4478 B14 (ATI)	168		
Ericsson RRUS-E2 (ATI)	168		
Ericsson RRUS-E2 (ATI)	168		
Ericsson RRUS-E2 (ATI)	168		
Ericsson B2/B66A 8843 RRH (ATI)	168		
Ericsson B2/B66A 8843 RRH (ATI)	168		
Ericsson B2/B66A 8843 RRH (ATI)	168		
Ericsson B5/B12 4449 RRH (ATI)	168		
Ericsson B5/B12 4449 RRH (ATI)	168		
Ericsson B5/B12 4449 RRH (ATI)	168		
Raycap DC6-48-60-18-8F squid (ATI)	168		

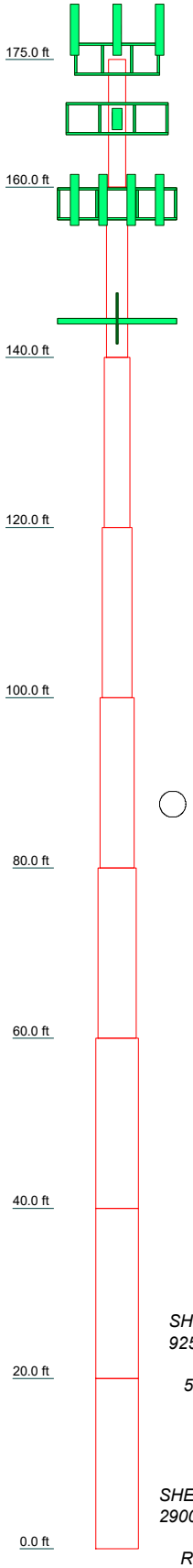
MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

All-Points Technology Corp.
567 Vauxhall St. Ext. Suite 311
Waterford, CT 06385
Phone: (860) 663-1697
FAX: (860) 663-0935

Job:	***175' Monopole Tower***		
Project:	***CT1931630.P02 Vernon***		
Client: SAI Comm; AT&T Site #CTL05310		Drawn by: M. Larson	App'd:
Code: TIA-222-H		Date: 02/24/22	Scale: NTS
Path: C:\Users\APT User\Desktop\Work\Jobs\AT&T\CT1931630 Vernon Rockville CT5310\CT1931630.P02 Vernon.ERI			Dwg No. E-1

Section	Size	Length (ft)	Grade	Weight (lb)
1	P24x3/8	15.00	A53-B-42	1420.6
2	P30x3/8	20.00		2375.2
3	P36x3/8	20.00		2856.3
4	P42x3/8	20.00		3337.3
5	P48x3/8	20.00		3818.4
6	P54x3/8	20.00		4299.5
7	P60x3/8	20.00		4780.5
8	P60x1/2	20.00		6360.7
9	P60x5/8	20.00		7934.1
				37182.6



MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A53-B-42	42 ksi	63 ksi			

ALL REACTIONS ARE FACTORED

AXIAL 103337 lb

SHEAR 9251 lb *MOMENT 1195036 lb-ft*

50 mph WIND - 1.5000 in ICE

AXIAL 65304 lb

SHEAR 29005 lb *MOMENT 3834262 lb-ft*

REACTIONS - 118 mph WIND

All-Points Technology Corp.
567 Vauxhall St. Ext. Suite 311
Waterford, CT 06385
Phone: (860) 663-1697
FAX: (860) 663-0935

Job:	***175' Monolopole Tower***		
Project:	***CT1931630.P02 Vernon***		
Client: SAI Comm; AT&T Site #CTL05310		Drawn by: M. Larson	App'd:
Code: TIA-222-H		Date: 02/24/22	Scale: NTS
Path: C:\Users\APT User\Desktop\Work\Jobs\AT&T\CT1931630 Vernon Rockville CT5310\CT1931630.P02 Vernon.ERI			Dwg No. E-1

Appendix B

Calculations

Tower Input Data

The tower is a monopole.
This tower is designed using the TIA-222-H standard.
The following design criteria apply:

Tower base elevation above sea level: 0.00 ft.
Basic wind speed of 118 mph.
Risk Category II.
Exposure Category B.
Simplified Topographic Factor Procedure for wind speed-up calculations is used.
Topographic Category: 1.
Crest Height: 0.00 ft.
Nominal ice thickness of 1.5000 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
A non-linear (P-delta) analysis was used.
Pressures are calculated at each section.
Stress ratio used in pole design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

Feed Line/Linear Appurtenances - Entered As Area

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement* *ft*	*Total Number*		C_AA_A *ft²/ft*	*Weight* *plf*
6x12 hybrid (T-Mobile)	C	No	Yes	Inside Pole	175.00 - 5.00	3	No Ice	0.00	1.88
							1/2" Ice	0.00	1.88
							1" Ice	0.00	1.88
							2" Ice	0.00	1.88
1 5/8 (T-Mobile)	C	No	Yes	Inside Pole	175.00 - 5.00	6	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04
							2" Ice	0.00	1.04
DC Trunks (AT&T)	C	No	Yes	Inside Pole	168.00 - 5.00	8	No Ice	0.00	0.40
							1/2" Ice	0.00	0.40
							1" Ice	0.00	0.40
							2" Ice	0.00	0.40
Fiberoptic cable (AT&T)	C	No	Yes	Inside Pole	168.00 - 5.00	3	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
							2" Ice	0.00	0.25
2" conduit (AT&T)	C	No	Yes	Inside Pole	168.00 - 5.00	4	No Ice	0.00	2.00
							1/2" Ice	0.00	2.00
							1" Ice	0.00	2.00
							2" Ice	0.00	2.00
1/2	C	No	Yes	Inside Pole	162.00 - 5.00	1	No Ice	0.00	0.25
							1/2" Ice	0.00	0.25
							1" Ice	0.00	0.25
							2" Ice	0.00	0.25
1 5/8 (VzW)	C	No	Yes	Inside Pole	158.50 - 5.00	6	No Ice	0.00	1.04
							1/2" Ice	0.00	1.04
							1" Ice	0.00	1.04

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Total Number		C_AA_A ft^2/ft	Weight plf
6x12 hybrid (VzW)	C	No	Yes	Inside Pole	158.50 - 5.00	2	2" Ice No Ice 1/2" Ice 1" Ice 2" Ice	0.00 0.00 0.00 0.00 0.00	1.04 1.88 1.88 1.88 1.88

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Azimuth Adjustment ° Vert ft	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
APXVARR24_43-C-NA20 (T-Mobile)	A	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	17.15 17.77 18.40 19.69	8.74 9.34 9.95 11.18	89.30 186.52 291.98 528.41
APXVARR24_43-C-NA20 (T-Mobile)	B	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	17.15 17.77 18.40 19.69	8.74 9.34 9.95 11.18	89.30 186.52 291.98 528.41
APXVARR24_43-C-NA20 (T-Mobile)	C	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	17.15 17.77 18.40 19.69	8.74 9.34 9.95 11.18	89.30 186.52 291.98 528.41
AIR32 B66Aa B2a (T-Mobile)	A	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	6.51 6.89 7.27 8.06	4.71 5.07 5.43 6.18	133.00 178.82 229.91 348.65
AIR32 B66Aa B2a (T-Mobile)	B	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	6.51 6.89 7.27 8.06	4.71 5.07 5.43 6.18	133.00 178.82 229.91 348.65
AIR32 B66Aa B2a (T-Mobile)	C	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	6.51 6.89 7.27 8.06	4.71 5.07 5.43 6.18	133.00 178.82 229.91 348.65
AIR 6449 B41 (T-Mobile)	A	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	5.68 5.98 6.29 6.93	2.49 2.72 2.95 3.44	128.00 167.12 210.46 310.63
AIR 6449 B41 (T-Mobile)	B	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	5.68 5.98 6.29 6.93	2.49 2.72 2.95 3.44	128.00 167.12 210.46 310.63
AIR 6449 B41 (T-Mobile)	C	From Face	4.00 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	5.68 5.98 6.29 6.93	2.49 2.72 2.95 3.44	128.00 167.12 210.46 310.63
Ericsson Radio 4449 (T-Mobile)	A	From Face	3.50 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.16 1.30 1.45 1.76	80.00 96.16 114.95 161.18
Ericsson Radio 4449 (T-Mobile)	B	From Face	3.50 0.0000 0.00	178.50	No Ice 1/2" Ice 1" Ice	1.65 1.81 1.98	1.16 1.30 1.45	80.00 96.16 114.95

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	2.34	1.76	161.18
Ericsson Radio 4449 (T-Mobile)	C	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.65 1.81 1.98 2.34	1.16 1.30 1.45 1.76	80.00 96.16 114.95 161.18
Ericsson Radio 4415 (T-Mobile)	A	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	50.00 62.41 77.18 114.61
Ericsson Radio 4415 (T-Mobile)	B	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	50.00 62.41 77.18 114.61
Ericsson Radio 4415 (T-Mobile)	C	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.64 1.80 1.97 2.32	0.68 0.79 0.91 1.18	50.00 62.41 77.18 114.61
SDX1926W-43 diplexer (T-Mobile)	A	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	0.32 0.39 0.47 0.66	0.07 0.12 0.17 0.30	5.00 7.24 10.57 21.25
SDX1926W-43 diplexer (T-Mobile)	B	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	0.32 0.39 0.47 0.66	0.07 0.12 0.17 0.30	5.00 7.24 10.57 21.25
SDX1926W-43 diplexer (T-Mobile)	C	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	0.32 0.39 0.47 0.66	0.07 0.12 0.17 0.30	5.00 7.24 10.57 21.25
RFS twin TMA (T-Mobile)	A	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.13 1.26 1.55	0.41 0.50 0.59 0.81	13.00 20.62 30.11 55.52
RFS twin TMA (T-Mobile)	B	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.13 1.26 1.55	0.41 0.50 0.59 0.81	13.00 20.62 30.11 55.52
RFS twin TMA (T-Mobile)	C	From Face	3.50 0.00 0.00	0.0000	178.50	No Ice 1/2" Ice 1" Ice 2" Ice	1.00 1.13 1.26 1.55	0.41 0.50 0.59 0.81	13.00 20.62 30.11 55.52
10' low-profile platform (T-Mobile)	C	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice	6.00 6.70 7.41 8.86	5.20 5.81 6.43 7.70	800.00 1255.07 1725.24 2711.65
12'x2 3/8" Pipe Mount (T-Mobile)	A	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.85 4.08 5.32 7.60	2.85 4.08 5.32 7.60	43.80 65.16 94.25 176.22
12'x2 3/8" Pipe Mount (T-Mobile)	B	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.85 4.08 5.32 7.60	2.85 4.08 5.32 7.60	43.80 65.16 94.25 176.22
12'x2 3/8" Pipe Mount (T-Mobile)	C	None		0.0000	175.00	No Ice 1/2" Ice 1" Ice 2" Ice	2.85 4.08 5.32 7.60	2.85 4.08 5.32 7.60	43.80 65.16 94.25 176.22

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
AIR 6449 B77	A	From Face	4.00	0.0000	168.00	No Ice	4.05	2.74	100.00
(AT&T)			0.00			1/2" Ice	4.32	2.97	133.62
			0.00			1" Ice	4.59	3.20	171.14
						2" Ice	5.15	3.68	258.65
AIR 6449 B77	B	From Face	4.00	0.0000	168.00	No Ice	4.05	2.74	100.00
(AT&T)			0.00			1/2" Ice	4.32	2.97	133.62
			0.00			1" Ice	4.59	3.20	171.14
						2" Ice	5.15	3.68	258.65
AIR 6449 B77	C	From Face	4.00	0.0000	168.00	No Ice	4.05	2.74	100.00
(AT&T)			0.00			1/2" Ice	4.32	2.97	133.62
			0.00			1" Ice	4.59	3.20	171.14
						2" Ice	5.15	3.68	258.65
AIR 6419 B77	A	From Face	4.00	0.0000	168.00	No Ice	4.17	2.02	60.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	89.19
			0.00			1" Ice	4.71	2.44	122.11
						2" Ice	5.28	2.90	199.91
AIR 6419 B77	B	From Face	4.00	0.0000	168.00	No Ice	4.17	2.02	60.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	89.19
			0.00			1" Ice	4.71	2.44	122.11
						2" Ice	5.28	2.90	199.91
AIR 6419 B77	C	From Face	4.00	0.0000	168.00	No Ice	4.17	2.02	60.00
(AT&T)			0.00			1/2" Ice	4.44	2.23	89.19
			0.00			1" Ice	4.71	2.44	122.11
						2" Ice	5.28	2.90	199.91
QD6616-7	A	From Face	4.00	0.0000	168.00	No Ice	13.58	6.80	140.00
(AT&T)			0.00			1/2" Ice	14.08	7.27	223.97
			0.00			1" Ice	14.60	7.72	314.84
						2" Ice	15.65	8.65	518.10
QD6616-7	B	From Face	4.00	0.0000	168.00	No Ice	13.58	6.80	140.00
(AT&T)			0.00			1/2" Ice	14.08	7.27	223.97
			0.00			1" Ice	14.60	7.72	314.84
						2" Ice	15.65	8.65	518.10
QD6616-7	C	From Face	4.00	0.0000	168.00	No Ice	13.58	6.80	140.00
(AT&T)			0.00			1/2" Ice	14.08	7.27	223.97
			0.00			1" Ice	14.60	7.72	314.84
						2" Ice	15.65	8.65	518.10
cci DMP65R-BU6DA	A	From Face	4.00	0.0000	168.00	No Ice	12.71	5.62	83.00
(AT&T)			0.00			1/2" Ice	13.21	6.07	156.96
			0.00			1" Ice	13.71	6.53	237.56
						2" Ice	14.74	7.47	419.50
cci DMP65R-BU6DA	B	From Face	4.00	0.0000	168.00	No Ice	12.71	5.62	83.00
(AT&T)			0.00			1/2" Ice	13.21	6.07	156.96
			0.00			1" Ice	13.71	6.53	237.56
						2" Ice	14.74	7.47	419.50
cci DMP65R-BU6DA	C	From Face	4.00	0.0000	168.00	No Ice	12.71	5.62	83.00
(AT&T)			0.00			1/2" Ice	13.21	6.07	156.96
			0.00			1" Ice	13.71	6.53	237.56
						2" Ice	14.74	7.47	419.50
Ericsson RRUS-32	A	From Face	3.50	0.0000	168.00	No Ice	3.31	2.42	80.00
(AT&T)			0.00			1/2" Ice	3.56	2.64	107.93
			0.00			1" Ice	3.81	2.86	139.47
						2" Ice	4.33	3.32	214.15
Ericsson RRUS-32	B	From Face	3.50	0.0000	168.00	No Ice	3.31	2.42	80.00
(AT&T)			0.00			1/2" Ice	3.56	2.64	107.93
			0.00			1" Ice	3.81	2.86	139.47
						2" Ice	4.33	3.32	214.15
Ericsson RRUS-32	C	From Face	3.50	0.0000	168.00	No Ice	3.31	2.42	80.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)			0.00			1/2" Ice	3.56	2.64	107.93
			0.00			1" Ice	3.81	2.86	139.47
						2" Ice	4.33	3.32	214.15
Ericsson Radio 4478 B14	A	From Face	3.50	0.0000	168.00	No Ice	2.02	1.25	65.00
(AT&T)			0.00			1/2" Ice	2.20	1.40	82.66
			0.00			1" Ice	2.39	1.56	103.08
						2" Ice	2.78	1.90	153.04
Ericsson Radio 4478 B14	B	From Face	3.50	0.0000	168.00	No Ice	2.02	1.25	65.00
(AT&T)			0.00			1/2" Ice	2.20	1.40	82.66
			0.00			1" Ice	2.39	1.56	103.08
						2" Ice	2.78	1.90	153.04
Ericsson Radio 4478 B14	C	From Face	3.50	0.0000	168.00	No Ice	2.02	1.25	65.00
(AT&T)			0.00			1/2" Ice	2.20	1.40	82.66
			0.00			1" Ice	2.39	1.56	103.08
						2" Ice	2.78	1.90	153.04
Ericsson RRUS-E2	A	From Face	3.50	0.0000	168.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
						2" Ice	4.07	1.95	172.88
Ericsson RRUS-E2	B	From Face	3.50	0.0000	168.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
						2" Ice	4.07	1.95	172.88
Ericsson RRUS-E2	C	From Face	3.50	0.0000	168.00	No Ice	3.15	1.29	60.00
(AT&T)			0.00			1/2" Ice	3.36	1.44	83.22
			0.00			1" Ice	3.59	1.60	109.64
						2" Ice	4.07	1.95	172.88
Ericsson B2/B66A 8843 RRH	A	From Face	3.50	0.0000	168.00	No Ice	1.98	1.70	75.00
(AT&T)			0.00			1/2" Ice	2.16	1.86	95.54
			0.00			1" Ice	2.34	2.04	119.02
						2" Ice	2.73	2.41	175.61
Ericsson B2/B66A 8843 RRH	B	From Face	3.50	0.0000	168.00	No Ice	1.98	1.70	75.00
(AT&T)			0.00			1/2" Ice	2.16	1.86	95.54
			0.00			1" Ice	2.34	2.04	119.02
						2" Ice	2.73	2.41	175.61
Ericsson B2/B66A 8843 RRH	C	From Face	3.50	0.0000	168.00	No Ice	1.98	1.70	75.00
(AT&T)			0.00			1/2" Ice	2.16	1.86	95.54
			0.00			1" Ice	2.34	2.04	119.02
						2" Ice	2.73	2.41	175.61
Ericsson B5/B12 4449 RRH	A	From Face	3.50	0.0000	168.00	No Ice	1.98	1.41	80.00
(AT&T)			0.00			1/2" Ice	2.16	1.57	98.55
			0.00			1" Ice	2.34	1.73	119.93
						2" Ice	2.73	2.08	171.94
Ericsson B5/B12 4449 RRH	B	From Face	3.50	0.0000	168.00	No Ice	1.98	1.41	80.00
(AT&T)			0.00			1/2" Ice	2.16	1.57	98.55
			0.00			1" Ice	2.34	1.73	119.93
						2" Ice	2.73	2.08	171.94
Ericsson B5/B12 4449 RRH	C	From Face	3.50	0.0000	168.00	No Ice	1.98	1.41	80.00
(AT&T)			0.00			1/2" Ice	2.16	1.57	98.55
			0.00			1" Ice	2.34	1.73	119.93
						2" Ice	2.73	2.08	171.94
Raycap DC6-48-60-18-8F squid	A	None		0.0000	168.00	No Ice	0.74	0.74	30.00
(AT&T)						1/2" Ice	1.20	1.20	44.34
						1" Ice	1.37	1.37	60.93
						2" Ice	1.73	1.73	101.52
Raycap DC6-48-60-18-8F squid	B	None		0.0000	168.00	No Ice	0.74	0.74	30.00
						1/2" Ice	1.20	1.20	44.34

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T)						1" Ice	1.37	1.37	60.93
						2" Ice	1.73	1.73	101.52
Raycap DC6-48-60-0-8F	C	None		0.0000	168.00	No Ice	0.74	0.74	30.00
squid						1/2" Ice	1.20	1.20	44.34
(AT&T)						1" Ice	1.37	1.37	60.93
						2" Ice	1.73	1.73	101.52
Raycap DC6-48-60-18-8F	C	None		0.0000	168.00	No Ice	0.74	0.74	30.00
squid						1/2" Ice	1.20	1.20	44.34
(AT&T)						1" Ice	1.37	1.37	60.93
						2" Ice	1.73	1.73	101.52
Sabre C10857001 12' sector	A	None		0.0000	168.00	No Ice	9.12	5.23	600.00
mount						1/2" Ice	13.79	8.15	780.00
(AT&T)						1" Ice	18.46	11.07	960.00
						2" Ice	27.80	17.17	1320.00
Sabre C10857001 12' sector	C	None		0.0000	168.00	No Ice	9.12	5.23	600.00
mount						1/2" Ice	13.79	8.15	780.00
(AT&T)						1" Ice	18.46	11.07	960.00
						2" Ice	27.80	17.17	1320.00
Sabre C10857001 12' sector	C	None		0.0000	168.00	No Ice	9.12	5.23	600.00
mount						1/2" Ice	13.79	8.15	780.00
(AT&T)						1" Ice	18.46	11.07	960.00
						2" Ice	27.80	17.17	1320.00
GPS on 3' standoff	B	None		0.0000	162.00	No Ice	0.60	0.60	50.00
						1/2" Ice	0.79	0.79	55.81
						1" Ice	0.99	0.99	63.86
						2" Ice	1.41	1.41	87.29
MT6407-77A	A	From Face	4.00	0.0000	160.00	No Ice	4.69	1.84	90.00
(Verizon Wireless)			0.00			1/2" Ice	4.98	2.06	119.24
			0.00			1" Ice	5.28	2.29	152.35
						2" Ice	5.89	2.77	230.94
MT6407-77A	B	From Face	4.00	0.0000	160.00	No Ice	4.69	1.84	90.00
(Verizon Wireless)			0.00			1/2" Ice	4.98	2.06	119.24
			0.00			1" Ice	5.28	2.29	152.35
						2" Ice	5.89	2.77	230.94
MT6407-77A	C	From Face	4.00	0.0000	160.00	No Ice	4.69	1.84	90.00
(Verizon Wireless)			0.00			1/2" Ice	4.98	2.06	119.24
			0.00			1" Ice	5.28	2.29	152.35
						2" Ice	5.89	2.77	230.94
CBRS RRH-RT4401-48A	A	From Face	4.00	0.0000	156.50	No Ice	1.54	0.75	160.00
w/XXDWMM-12.5-65-8T-C			0.00			1/2" Ice	1.70	0.87	172.01
BRS antenna			0.00			1" Ice	1.86	1.00	186.36
(Verizon Wireless)						2" Ice	2.21	1.28	222.85
CBRS RRH-RT4401-48A	B	From Face	4.00	0.0000	156.50	No Ice	1.54	0.75	160.00
w/XXDWMM-12.5-65-8T-C			0.00			1/2" Ice	1.70	0.87	172.01
BRS antenna			0.00			1" Ice	1.86	1.00	186.36
(Verizon Wireless)						2" Ice	2.21	1.28	222.85
CBRS RRH-RT4401-48A	C	From Face	4.00	0.0000	156.50	No Ice	1.54	0.75	160.00
w/XXDWMM-12.5-65-8T-C			0.00			1/2" Ice	1.70	0.87	172.01
BRS antenna			0.00			1" Ice	1.86	1.00	186.36
(Verizon Wireless)						2" Ice	2.21	1.28	222.85
LNX-6513DS	A	From Face	4.00	0.0000	158.50	No Ice	5.85	3.84	30.00
(Verizon Wireless)			0.00			1/2" Ice	6.21	4.19	68.84
			0.00			1" Ice	6.58	4.54	112.65
						2" Ice	7.33	5.25	215.97
LNX-6513DS	B	From Face	4.00	0.0000	158.50	No Ice	5.85	3.84	30.00
(Verizon Wireless)			0.00			1/2" Ice	6.21	4.19	68.84
			0.00			1" Ice	6.58	4.54	112.65

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
						2" Ice	7.33	5.25	215.97
LNX-6513DS	C	From Face	4.00	0.0000	158.50	No Ice	5.85	3.84	30.00
(Verizon Wireless)			0.00			1/2" Ice	6.21	4.19	68.84
			0.00			1" Ice	6.58	4.54	112.65
						2" Ice	7.33	5.25	215.97
(2) NHH-65B-R2B	A	From Face	4.00	0.0000	158.50	No Ice	8.08	5.34	50.00
(Verizon Wireless)			0.00			1/2" Ice	8.53	5.79	100.05
			0.00			1" Ice	9.00	6.26	156.20
						2" Ice	9.95	7.20	287.55
(2) NHH-65B-R2B	B	From Face	4.00	0.0000	158.50	No Ice	8.08	5.34	50.00
(Verizon Wireless)			0.00			1/2" Ice	8.53	5.79	100.05
			0.00			1" Ice	9.00	6.26	156.20
						2" Ice	9.95	7.20	287.55
(2) NHH-65B-R2B	C	From Face	4.00	0.0000	158.50	No Ice	8.08	5.34	50.00
(Verizon Wireless)			0.00			1/2" Ice	8.53	5.79	100.05
			0.00			1" Ice	9.00	6.26	156.20
						2" Ice	9.95	7.20	287.55
B2/B66A RRHBRO49	A	From Face	3.50	0.0000	158.50	No Ice	1.88	1.25	85.00
(RFV01U-D1A)			0.00			1/2" Ice	2.05	1.39	103.34
(Verizon Wireless)			0.00			1" Ice	2.22	1.54	124.47
						2" Ice	2.60	1.86	175.87
B2/B66A RRHBRO49	B	From Face	3.50	0.0000	158.50	No Ice	1.88	1.25	85.00
(RFV01U-D1A)			0.00			1/2" Ice	2.05	1.39	103.34
(Verizon Wireless)			0.00			1" Ice	2.22	1.54	124.47
						2" Ice	2.60	1.86	175.87
B2/B66A RRHBRO49	C	From Face	3.50	0.0000	158.50	No Ice	1.88	1.25	85.00
(RFV01U-D1A)			0.00			1/2" Ice	2.05	1.39	103.34
(Verizon Wireless)			0.00			1" Ice	2.22	1.54	124.47
						2" Ice	2.60	1.86	175.87
B5/B13 RRHBR04C	A	From Face	3.50	0.0000	158.50	No Ice	1.88	1.01	100.00
(RFV01UD2A)			0.00			1/2" Ice	2.05	1.14	116.43
(Verizon Wireless)			0.00			1" Ice	2.22	1.28	135.53
						2" Ice	2.60	1.59	182.50
B5/B13 RRHBR04C	B	From Face	3.50	0.0000	158.50	No Ice	1.88	1.01	100.00
(RFV01UD2A)			0.00			1/2" Ice	2.05	1.14	116.43
(Verizon Wireless)			0.00			1" Ice	2.22	1.28	135.53
						2" Ice	2.60	1.59	182.50
B5/B13 RRHBR04C	C	From Face	3.50	0.0000	158.50	No Ice	1.88	1.01	100.00
(RFV01UD2A)			0.00			1/2" Ice	2.05	1.14	116.43
(Verizon Wireless)			0.00			1" Ice	2.22	1.28	135.53
						2" Ice	2.60	1.59	182.50
RVZDC-6627-PF-48	C	None		0.0000	158.50	No Ice	6.13	5.25	45.00
(Verizon Wireless)						1/2" Ice	6.44	5.55	103.92
						1" Ice	6.76	5.85	167.82
						2" Ice	7.43	6.49	311.39
14' platform w/rails	C	None		0.0000	158.00	No Ice	20.92	18.11	1400.00
(Verizon Wireless)						1/2" Ice	21.94	19.01	2354.63
						1" Ice	22.96	19.91	3330.74
						2" Ice	25.04	21.74	5348.19
SitePro1 PRK-1245 kicker kit	C	None		0.0000	158.00	No Ice	3.38	3.38	466.00
(Verizon Wireless)						1/2" Ice	5.06	5.06	616.00
						1" Ice	6.75	6.75	766.00
						2" Ice	10.13	10.13	1066.00
14' low-profile platform	C	None		0.0000	144.60	No Ice	8.40	7.28	1200.00
(Vacant Mounts)						1/2" Ice	9.37	8.12	2063.51
						1" Ice	10.35	8.97	2947.93
						2" Ice	12.33	10.70	4780.24

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(4) 6'x2 3/8" Pipe Mount (Vacant Mounts)	A	None		0.0000	144.60	No Ice	1.43	1.43	21.90
						1/2" Ice	1.92	1.92	32.73
						1" Ice	2.29	2.29	47.61
						2" Ice	3.06	3.06	90.18
(4) 6'x2 3/8" Pipe Mount (Vacant Mounts)	B	None		0.0000	144.60	No Ice	1.43	1.43	21.90
						1/2" Ice	1.92	1.92	32.73
						1" Ice	2.29	2.29	47.61
						2" Ice	3.06	3.06	90.18
(4) 6'x2 3/8" Pipe Mount (Vacant Mounts)	C	None		0.0000	144.60	No Ice	1.43	1.43	21.90
						1/2" Ice	1.92	1.92	32.73
						1" Ice	2.29	2.29	47.61
						2" Ice	3.06	3.06	90.18

Solution Summary

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 160	17.056	39	0.9124	0.0000
L2	160 - 140	14.220	39	0.8825	0.0000
L3	140 - 120	10.692	39	0.7830	0.0000
L4	120 - 100	7.656	39	0.6538	0.0000
L5	100 - 80	5.173	39	0.5233	0.0000
L6	80 - 60	3.225	39	0.4006	0.0000
L7	60 - 40	1.774	39	0.2878	0.0000
L8	40 - 20	0.776	39	0.1848	0.0000
L9	20 - 0	0.194	39	0.0903	0.0000

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.50	APXVARR24_43-C-NA20	39	17.056	0.9124	0.0000	51170
175.00	10' low-profile platform	39	17.056	0.9124	0.0000	51170
168.00	AIR 6449 B77	39	15.723	0.9018	0.0000	36550
162.00	GPS on 3' standoff	39	14.593	0.8885	0.0000	19774
160.00	MT6407-77A	39	14.220	0.8825	0.0000	17387
158.50	LNX-6513DS	39	13.943	0.8775	0.0000	16103
158.00	14' platform w/rails	39	13.851	0.8757	0.0000	15742
156.50	CBRS RRH-RT4401-48A w/XXDWMM-12.5-65-8T-CBRS antenna	39	13.576	0.8699	0.0000	14795
144.60	14' low-profile platform	39	11.466	0.8105	0.0000	10184

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
L1	175 - 160	74.277	2	3.9763	0.0000
L2	160 - 140	61.930	2	3.8463	0.0000
L3	140 - 120	46.564	2	3.4126	0.0000
L4	120 - 100	33.341	2	2.8494	0.0000
L5	100 - 80	22.524	2	2.2803	0.0000
L6	80 - 60	14.041	6	1.7450	0.0000
L7	60 - 40	7.720	6	1.2532	0.0000
L8	40 - 20	3.379	6	0.8045	0.0000
L9	20 - 0	0.845	6	0.3929	0.0000

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
178.50	APXVARR24_43-C-NA20	2	74.277	3.9763	0.0000	11866
175.00	10' low-profile platform	2	74.277	3.9763	0.0000	11866
168.00	AIR 6449 B77	2	68.473	3.9301	0.0000	8475
162.00	GPS on 3' standoff	2	63.552	3.8722	0.0000	4584
160.00	MT6407-77A	2	61.930	3.8463	0.0000	4030
158.50	LNX-6513DS	2	60.722	3.8243	0.0000	3731
158.00	14' platform w/rails	2	60.321	3.8164	0.0000	3647
156.50	CBRS RRH-RT4401-48A w/XXDWMM-12.5-65-8T-CBRS antenna	2	59.122	3.7914	0.0000	3427
144.60	14' low-profile platform	2	49.934	3.5323	0.0000	2354

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
L1	**175 - 160**	**Pole**	**P24x3/8**	**1**	**-9239.47**	**1052070.00**	**22.2**	**Pass**
L2	**160 - 140**	**Pole**	**P30x3/8**	**2**	**-18633.00**	**1311060.00**	**50.9**	**Pass**
L3	**140 - 120**	**Pole**	**P36x3/8**	**3**	**-22984.30**	**1490100.00**	**65.7**	**Pass**
L4	**120 - 100**	**Pole**	**P42x3/8**	**4**	**-27939.00**	**1668870.00**	**72.9**	**Pass**
L5	**100 - 80**	**Pole**	**P48x3/8**	**5**	**-33486.10**	**1847490.00**	**76.4**	**Pass**
L6	**80 - 60**	**Pole**	**P54x3/8**	**6**	**-39621.90**	**2026000.00**	**78.1**	**Pass**
L7	**60 - 40**	**Pole**	**P60x3/8**	**7**	**-46344.90**	**2204430.00**	**78.7**	**Pass**
L8	**40 - 20**	**Pole**	**P60x1/2**	**8**	**-54974.60**	**3125690.00**	**69.1**	**Pass**
L9	**20 - 0**	**Pole**	**P60x5/8**	**9**	**-65298.70**	**4139150.00**	**63.5**	**Pass**
							Summary	
						Pole (L7)	78.7	Pass
						Base Plate	76.1	Pass
						RATING =	**78.7**	**Pass**

All-Points Technology Corp., P.C.
567 Vauxhall St. Ext., Suite 311
Waterford, CT 06385
(860) 663-1697

Client:	**SAI Communications**	Site No.:	**CT5310**
Job:	**Vernon Rockville**	Job No.:	**CT1931630.P02**
Calculated By:	**M. Larson**	Date:	**24-Feb-22**

Program assumes:

Mat is square in plan view.
Water table is below bottom of mat.
Unit weight of concrete = 150 pcf
Unit weight of soil = 100 pcf
Monopole tower with center pier

Information to be provided:

Pier is round or square in plan dimension ("R" or "S")	Shape =	R	
OTM = Overturning Moment to be resisted	OTM =	4135.5	ft-kips
H = Height from ground surface to top of mat (if buried)	H =	7.00	ft.
P_M = Projection of pier above mat	P_M =	7.50	ft.
y = Thickness of mat	y =	3.00	ft.
x = Width of mat	x =	20.00	ft.
d = Diameter of round pier	d =	7.0	ft.
S = Size of tension bars	S =	9	

Mass of tower and appurtenances (below)

Results:

Component	Mass	Moment Arm	Moment Resist.
Pier	39.0 kips	10 ft.	389.7 ft-kips
Overburden	350.1 kips	10 ft.	3500.9 ft-kips
Mat	162.0 kips	10 ft.	1620.0 ft-kips

Overturning Moment Resistance = 5510.58 ft-kips
Factor of Safety = 1.33 SATISFACTORY
Concrete Quantity = 76.5 c.y.

January 20, 2022

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:	Site Number:	CT5310
	FA Number:	10071292
	PACE Number:	MRCTB055887
	PT Number:	2051A11MF7
	Site Name:	VERNON CENTER
	Site Address:	60 Industrial Park Road Vernon Rockville, CT 06066

To Whom It May Concern:

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

- (3) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)
- (3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (3) B2/B66A 8843 RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)
- (3) RRUS-E2 B29 RRH's (20.4"x18.5"x7.5" – Wt. = 53 lbs. /each)
- (3) 4449 B5/B12 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs.) (Tower Mounted)
- **(3) QD6616-7 Antennas (72.0"x22.0"x9.6" – Wt. = 60 lbs. /each)**
- **(3) AIR6419 Antennas (31.0"x16.1"x7.3" – Wt. = 66 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. = 82 lbs. /each)**
- **(1) Squid Surge Arrestors (24.0"x9.7" Ø – Wt. = 33 lbs.) (Tower Mounted)**

*Proposed equipment shown in bold.

Mount fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10857001C, dated December 22, 2015 were used to perform this analysis. HDG conducted at ground audit of the existing AT&T antenna mounts on November 11, 2021.

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

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R16.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 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 1.77 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 0.177 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 mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing Mount Rating	39	LC34	64%	**PASS**

Reference Documents:

- Fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10857001C, dated December 22, 2015.

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 mounts have 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.

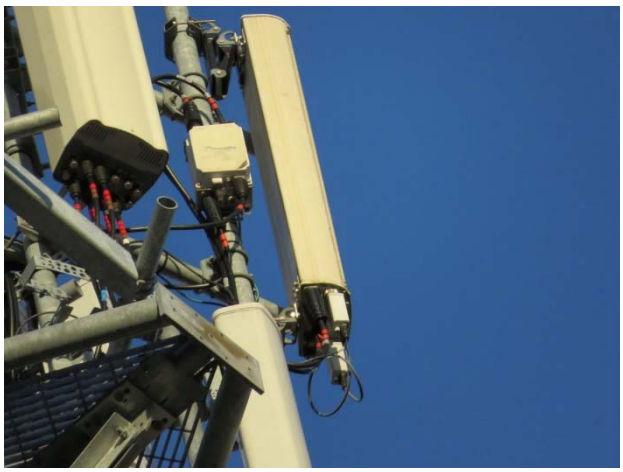
Please feel free to contact our office should you have any questions.

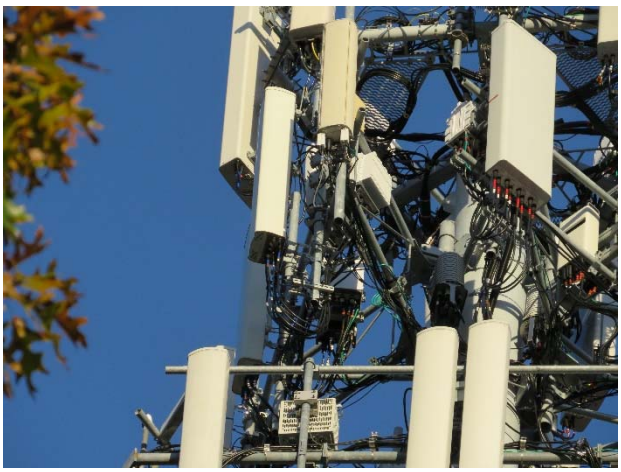
Respectfully Submitted,
Hudson Design Group LLC

Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:





FIELD PHOTOS (CONT.):






HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	168	(ft)
z_g=	1200	(ft)
α=	7	

K_z= 1.146

Kzmin ≤ Kz ≤ 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

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

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=	168	
z_s=	378	(Mean elevation of base of structure above sea level)
H=	0	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.00	(from 2.6.6.2.1)
K_e=	0.99	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i =	1.50	in
Importance Factor = I=	1.00	(from Table 2-3)
K_{iz} =	1.18	(from Sec. 2.6.10)

$t_{iz} = t_i * I * K_{iz} * (K_{zt})^{0.35}$ t_{iz} = 1.77 in

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM 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=	175	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=	1.146	(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=	**42.96**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**6.87**	K_d=	0.95	(from Table 2-2)
$q_{z\ (30)}$=	**2.47**	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: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM 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 = **1.77** 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)
QD6616-7 Antenna	72.0	22.0	9.6	11.00	3.27	1.23	**583**	**114**	**34**
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.93	1.20	**179**	**39**	**10**
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	**174**	**38**	**10**
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	**546**	**107**	**31**
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.72	1.21	**55**	**15**	**3**
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	5.44	1.33	**30**	**11**	**2**
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.20	**58**	**15**	**3**
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	2.73	1.21	**29**	**10**	**2**
B14 4478 RRH	18.1	13.4	8.3	1.68	1.35	1.20	**87**	**21**	**5**
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.90	1.20	**60**	**16**	**3**
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	3.81	1.26	**32**	**11**	**2**
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	3.89	1.26	**72**	**19**	**4**
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	**40**	**15**	**2**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**49**	**12**	**3**
Plate 11-1/4x5/8	0.6	12.0		0.05	0.05	2.00	**4**		
3/4" RoundBar	0.8	12.0		0.06	0.06	1.20	**3**		
2" Pipe	2.4	12.0		0.20	0.20	1.20	**10**		
3" Pipe	3.5	12.0		0.29	0.29	1.20	**15**		

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	30	(deg)	Ice Thickness =	1.77	in.	Equivalent Angle =	210	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	583	292	511
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	179	86	156
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	174	118	160
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	546	241	470
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	55	135	75
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	30	135	57
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	58	70	61
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	29	70	40
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	87	54	79
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	60	85	66
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	30	85	44
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	72	118	83
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	34	118	55

WIND LOADS WITH ICE:

QD6616-7 Antenna	75.5	25.5	13.1	13.39	6.89	2.96	5.75	1.22	1.34	112	64	100
AIR6419 Antenna	34.5	19.6	10.8	4.71	2.60	1.76	3.19	1.20	1.23	39	22	35
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.42	1.20	1.20	38	28	35
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.57	5.83	3.08	6.65	1.23	1.38	106	55	93
RRUS-E2 B29 RRH (Side)	23.9	11.0	22.0	1.83	3.66	2.17	1.09	1.20	1.20	15	30	19
RRUS-E2 B29 RRH (Shielded)	23.9	7.3	22.0	1.21	3.66	3.29	1.09	1.23	1.20	10	30	15
B2/B66A 8843 RRH (Side)	18.4	14.4	16.7	1.85	2.14	1.28	1.10	1.20	1.20	15	18	16
B2/B66A 8843 RRH (Shielded)	18.4	9.0	16.7	1.15	2.14	2.05	1.10	1.20	1.20	9	18	12
B14 4478 RRH	21.6	16.9	11.8	2.54	1.78	1.28	1.83	1.20	1.20	21	15	19
4449 B5/B12 RRH (Side)	21.4	12.9	16.7	1.92	2.49	1.66	1.28	1.20	1.20	16	21	17
4449 B5/B12 RRH (Shielded)	21.4	8.2	16.7	1.22	2.49	2.60	1.28	1.20	1.20	10	21	13
RRUS-32 B30 RRH (Side)	30.7	10.5	15.6	2.25	3.34	2.92	1.97	1.22	1.20	19	28	21
RRUS-32 B30 RRH (Shielded)	30.7	7.0	15.6	1.50	3.34	4.37	1.97	1.28	1.20	13	28	17

WIND LOADS AT 30 MPH:

QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	34	17	29
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	9
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	9
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	31	14	27
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	8	4
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	8	3
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	2	4	2
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	5
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	4
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	2	5	3
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	5
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	3

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.77	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	583	292	365
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	179	86	109
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	174	118	132
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	546	241	317
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	55	135	115
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	30	135	109
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	58	70	67
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	29	70	60
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	87	54	62
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	60	85	79
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	30	85	71
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	72	118	106
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	34	118	97

WIND LOADS WITH ICE:

QD6616-7 Antenna	75.5	25.5	13.1	13.39	6.89	2.96	5.75	1.22	1.34	112	64	76
AIR6419 Antenna	34.5	19.6	10.8	4.71	2.60	1.76	3.19	1.20	1.23	39	22	26
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.42	1.20	1.20	38	28	30
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.57	5.83	3.08	6.65	1.23	1.38	106	55	68
RRUS-E2 B29 RRH (Side)	23.9	11.0	22.0	1.83	3.66	2.17	1.09	1.20	1.20	15	30	26
RRUS-E2 B29 RRH (Shielded)	23.9	7.3	22.0	1.21	3.66	3.29	1.09	1.23	1.20	10	30	25
B2/B66A 8843 RRH (Side)	18.4	14.4	16.7	1.85	2.14	1.28	1.10	1.20	1.20	15	18	17
B2/B66A 8843 RRH (Shielded)	18.4	9.0	16.7	1.15	2.14	2.05	1.10	1.20	1.20	9	18	16
B14 4478 RRH	21.6	16.9	11.8	2.54	1.78	1.28	1.83	1.20	1.20	21	15	16
4449 B5/B12 RRH (Side)	21.4	12.9	16.7	1.92	2.49	1.66	1.28	1.20	1.20	16	21	19
4449 B5/B12 RRH (Shielded)	21.4	8.2	16.7	1.22	2.49	2.60	1.28	1.20	1.20	10	21	18
RRUS-32 B30 RRH (Side)	30.7	10.5	15.6	2.25	3.34	2.92	1.97	1.22	1.20	19	28	25
RRUS-32 B30 RRH (Shielded)	30.7	7.0	15.6	1.50	3.34	4.37	1.97	1.28	1.20	13	28	24

WIND LOADS AT 30 MPH:

QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	34	17	21
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	6
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	31	14	18
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	8	7
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	8	6
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	2	4	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	5
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	2	5	4
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	6
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	6

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.77	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	583	292	292
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	179	86	86
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	174	118	118
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	546	241	241
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	55	135	135
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	30	135	135
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	58	70	70
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	29	70	70
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	87	54	54
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	60	85	85
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	30	85	85
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	72	118	118
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	34	118	118

WIND LOADS WITH ICE:

QD6616-7 Antenna	75.5	25.5	13.1	13.39	6.89	2.96	5.75	1.22	1.34	112	64	64
AIR6419 Antenna	34.5	19.6	10.8	4.71	2.60	1.76	3.19	1.20	1.23	39	22	22
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.42	1.20	1.20	38	28	28
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.57	5.83	3.08	6.65	1.23	1.38	106	55	55
RRUS-E2 B29 RRH (Side)	23.9	11.0	22.0	1.83	3.66	2.17	1.09	1.20	1.20	15	30	30
RRUS-E2 B29 RRH (Shielded)	23.9	7.3	22.0	1.21	3.66	3.29	1.09	1.23	1.20	10	30	30
B2/B66A 8843 RRH (Side)	18.4	14.4	16.7	1.85	2.14	1.28	1.10	1.20	1.20	15	18	18
B2/B66A 8843 RRH (Shielded)	18.4	9.0	16.7	1.15	2.14	2.05	1.10	1.20	1.20	9	18	18
B14 4478 RRH	21.6	16.9	11.8	2.54	1.78	1.28	1.83	1.20	1.20	21	15	15
4449 B5/B12 RRH (Side)	21.4	12.9	16.7	1.92	2.49	1.66	1.28	1.20	1.20	16	21	21
4449 B5/B12 RRH (Shielded)	21.4	8.2	16.7	1.22	2.49	2.60	1.28	1.20	1.20	10	21	21
RRUS-32 B30 RRH (Side)	30.7	10.5	15.6	2.25	3.34	2.92	1.97	1.22	1.20	19	28	28
RRUS-32 B30 RRH (Shielded)	30.7	7.0	15.6	1.50	3.34	4.37	1.97	1.28	1.20	13	28	28

WIND LOADS AT 30 MPH:

QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	34	17	17
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	5
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	7
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	31	14	14
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	8	8
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	8	8
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	2	4	4
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	3
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	5
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	2	5	5
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	7
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	7

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	120	(deg)	Ice Thickness =	1.77	in.	Equivalent Angle =	300	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	583	292	365
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	179	86	109
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	174	118	132
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	546	241	317
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	55	135	115
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	30	135	109
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	58	70	67
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	29	70	60
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	87	54	62
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	60	85	79
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	30	85	71
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	72	118	106
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	34	118	97

WIND LOADS WITH ICE:

QD6616-7 Antenna	75.5	25.5	13.1	13.39	6.89	2.96	5.75	1.22	1.34	112	64	76
AIR6419 Antenna	34.5	19.6	10.8	4.71	2.60	1.76	3.19	1.20	1.23	39	22	26
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.42	1.20	1.20	38	28	30
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.57	5.83	3.08	6.65	1.23	1.38	106	55	68
RRUS-E2 B29 RRH (Side)	23.9	11.0	22.0	1.83	3.66	2.17	1.09	1.20	1.20	15	30	26
RRUS-E2 B29 RRH (Shielded)	23.9	7.3	22.0	1.21	3.66	3.29	1.09	1.23	1.20	10	30	25
B2/B66A 8843 RRH (Side)	18.4	14.4	16.7	1.85	2.14	1.28	1.10	1.20	1.20	15	18	17
B2/B66A 8843 RRH (Shielded)	18.4	9.0	16.7	1.15	2.14	2.05	1.10	1.20	1.20	9	18	16
B14 4478 RRH	21.6	16.9	11.8	2.54	1.78	1.28	1.83	1.20	1.20	21	15	16
4449 B5/B12 RRH (Side)	21.4	12.9	16.7	1.92	2.49	1.66	1.28	1.20	1.20	16	21	19
4449 B5/B12 RRH (Shielded)	21.4	8.2	16.7	1.22	2.49	2.60	1.28	1.20	1.20	10	21	18
RRUS-32 B30 RRH (Side)	30.7	10.5	15.6	2.25	3.34	2.92	1.97	1.22	1.20	19	28	25
RRUS-32 B30 RRH (Shielded)	30.7	7.0	15.6	1.50	3.34	4.37	1.97	1.28	1.20	13	28	24

WIND LOADS AT 30 MPH:

QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	34	17	21
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	6
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	8
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	31	14	18
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	8	7
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	8	6
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	2	4	3
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	4
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	5
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	2	5	4
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	6
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	6

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.77	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	583	292	511
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	179	86	156
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	174	118	160
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	546	241	470
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	55	135	75
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	30	135	57
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	58	70	61
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	29	70	40
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	87	54	79
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	60	85	66
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	30	85	44
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	72	118	83
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	34	118	55

WIND LOADS WITH ICE:

QD6616-7 Antenna	75.5	25.5	13.1	13.39	6.89	2.96	5.75	1.22	1.34	112	64	100
AIR6419 Antenna	34.5	19.6	10.8	4.71	2.60	1.76	3.19	1.20	1.23	39	22	35
AIR6449 Antenna	34.1	19.4	14.1	4.61	3.35	1.76	2.42	1.20	1.20	38	28	35
DMP65R-BU6DA Antenna	74.7	24.2	11.2	12.57	5.83	3.08	6.65	1.23	1.38	106	55	93
RRUS-E2 B29 RRH (Side)	23.9	11.0	22.0	1.83	3.66	2.17	1.09	1.20	1.20	15	30	19
RRUS-E2 B29 RRH (Shielded)	23.9	7.3	22.0	1.21	3.66	3.29	1.09	1.23	1.20	10	30	15
B2/B66A 8843 RRH (Side)	18.4	14.4	16.7	1.85	2.14	1.28	1.10	1.20	1.20	15	18	16
B2/B66A 8843 RRH (Shielded)	18.4	9.0	16.7	1.15	2.14	2.05	1.10	1.20	1.20	9	18	12
B14 4478 RRH	21.6	16.9	11.8	2.54	1.78	1.28	1.83	1.20	1.20	21	15	19
4449 B5/B12 RRH (Side)	21.4	12.9	16.7	1.92	2.49	1.66	1.28	1.20	1.20	16	21	17
4449 B5/B12 RRH (Shielded)	21.4	8.2	16.7	1.22	2.49	2.60	1.28	1.20	1.20	10	21	13
RRUS-32 B30 RRH (Side)	30.7	10.5	15.6	2.25	3.34	2.92	1.97	1.22	1.20	19	28	21
RRUS-32 B30 RRH (Shielded)	30.7	7.0	15.6	1.50	3.34	4.37	1.97	1.28	1.20	13	28	17

WIND LOADS AT 30 MPH:

QD6616-7 Antenna	72.0	22.0	9.6	11.00	4.80	3.27	7.50	1.23	1.42	34	17	29
AIR6419 Antenna	31.0	16.1	7.3	3.47	1.57	1.93	4.25	1.20	1.28	10	5	9
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	10	7	9
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	31	14	27
RRUS-E2 B29 RRH (Side)	20.4	7.5	18.5	1.06	2.62	2.72	1.10	1.21	1.20	3	8	4
RRUS-E2 B29 RRH (Shielded)	20.4	3.8	18.5	0.53	2.62	5.44	1.10	1.33	1.20	2	8	3
B2/B66A 8843 RRH (Side)	14.9	10.9	13.2	1.13	1.37	1.37	1.13	1.20	1.20	3	4	4
B2/B66A 8843 RRH (Shielded)	14.9	5.5	13.2	0.56	1.37	2.73	1.13	1.21	1.20	2	4	2
B14 4478 RRH	18.1	13.4	8.3	1.68	1.04	1.35	2.18	1.20	1.20	5	3	5
4449 B5/B12 RRH (Side)	17.9	9.4	13.2	1.17	1.64	1.90	1.36	1.20	1.20	3	5	4
4449 B5/B12 RRH (Shielded)	17.9	4.7	13.2	0.58	1.64	0.00	1.36	1.20	1.20	2	5	3
RRUS-32 B30 RRH (Side)	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	4	7	5
RRUS-32 B30 RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	0.00	2.25	1.20	1.20	2	7	3

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice: 1.77 in.
Density of ice: 56 pcf

QD6616-7 Antenna

Weight of ice based on total radial SF area:

Height (in):	72.0	
Width (in):	22.0	
Depth (in):	9.6	
Total weight of ice on object:		334 lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:		394 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:

Height (in):	31.0	
Width (in):	16.1	
Depth (in):	7.3	
Total weight of ice on object:		109 lbs
Weight of object:	66.0	lbs
Combined weight of ice and object:		175 lbs

AIR6449 Antenna

Weight of ice based on total radial SF area:

Height (in):	30.6	
Width (in):	15.9	
Depth (in):	10.6	
Total weight of ice on object:		115 lbs
Weight of object:	82.0	lbs
Combined weight of ice and object:		197 lbs

DMP65R-BU6DA Antenna

Weight of ice based on total radial SF area:

Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:		306 lbs
Weight of object:	80.0	lbs
Combined weight of ice and object:		386 lbs

RRUS-E2 B29 RRH

Weight of ice based on total radial SF area:

Height (in):	20.4	
Width (in):	18.5	
Depth (in):	7.5	
Total weight of ice on object:		80 lbs
Weight of object:	53.0	lbs
Combined weight of ice and object:		133 lbs

B2/B66A 8843 RRH

Weight of ice based on total radial SF area:

Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.9	
Total weight of ice on object:		51 lbs
Weight of object:	72.0	lbs
Combined weight of ice and object:		123 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:		57 lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:		117 lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:

Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.4	
Total weight of ice on object:		58 lbs
Weight of object:	73.0	lbs
Combined weight of ice and object:		131 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:		77 lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:		137 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:		50 lbs
Weight of object:	33	lbs
Combined weight of ice and object:		83 lbs

PL 11-1/4x5/8

Weight of ice based on total radial SF area:

Height (in):	11.25	
Width (in):	0.63	
Per foot weight of ice on object:		28 plf

3/4" Round Bar

Per foot weight of ice:

diameter (in):	0.75	
Per foot weight of ice on object:		5 plf

2" pipe

Per foot weight of ice:

diameter (in):	2.38	
Per foot weight of ice on object:		9 plf

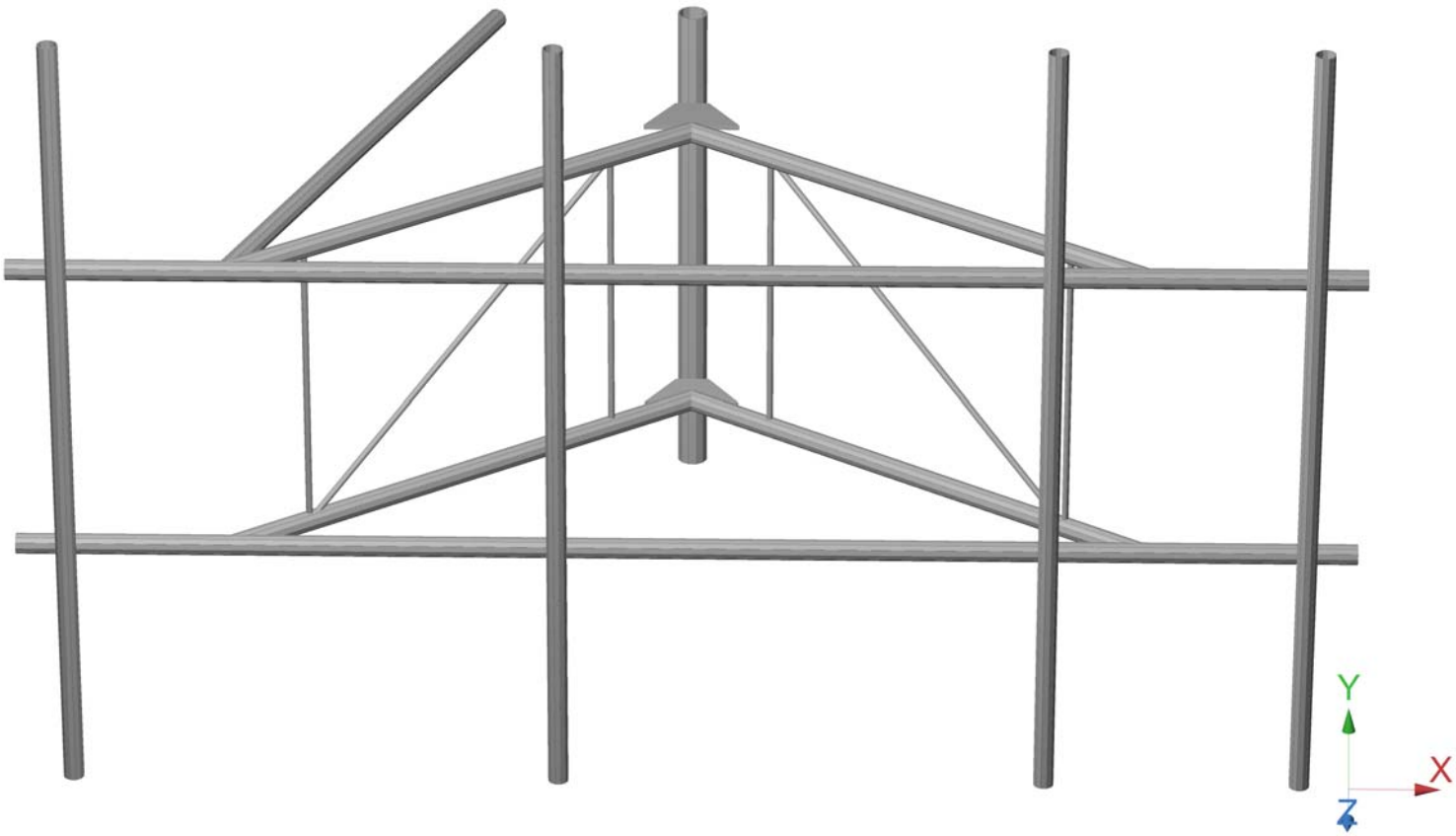
3" Pipe

Per foot weight of ice:

diameter (in):	3.5	
Per foot weight of ice on object:		11 plf

HUDSON
Design Group LLC

Mount Calculations
(Existing Conditions)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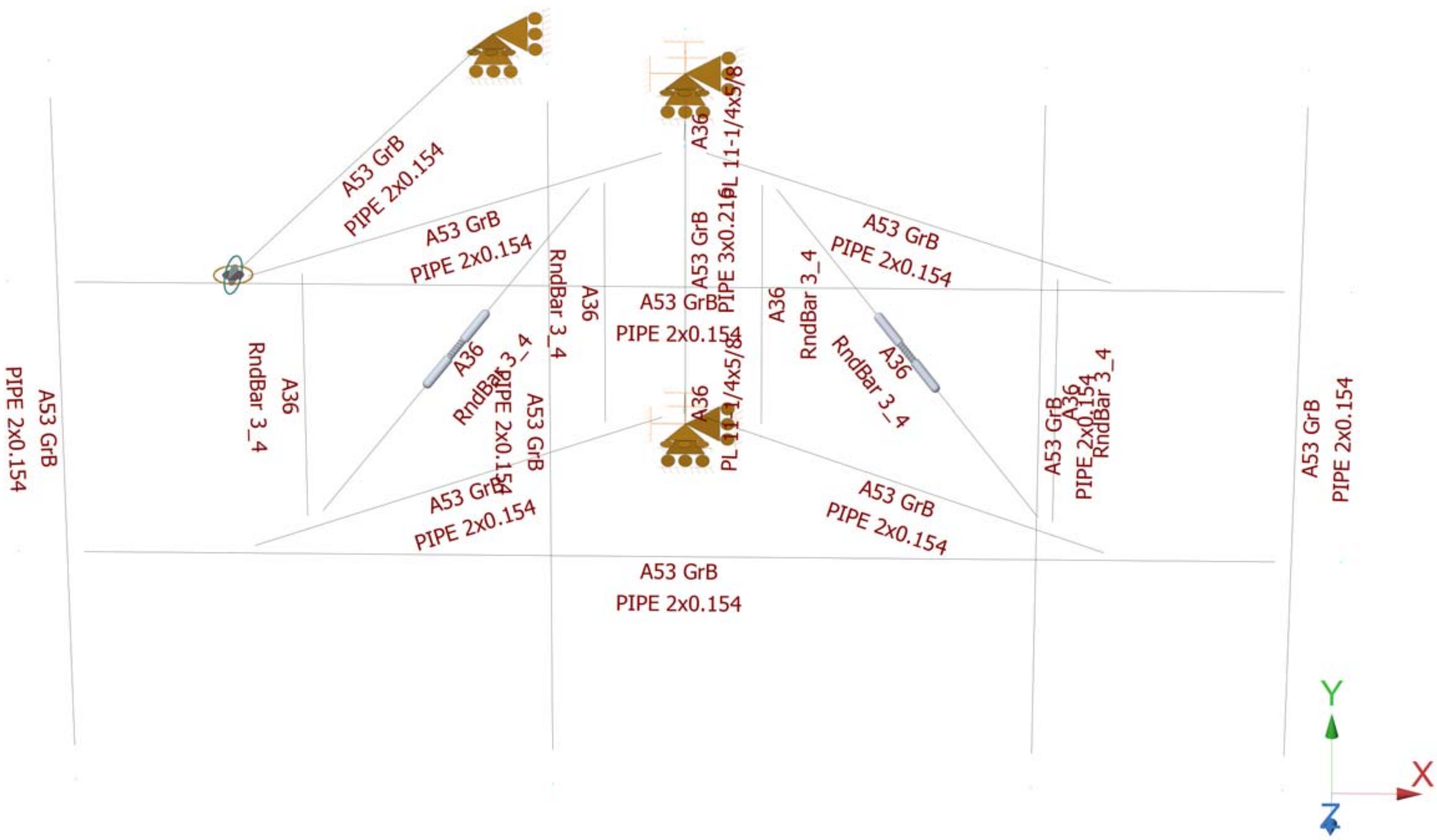
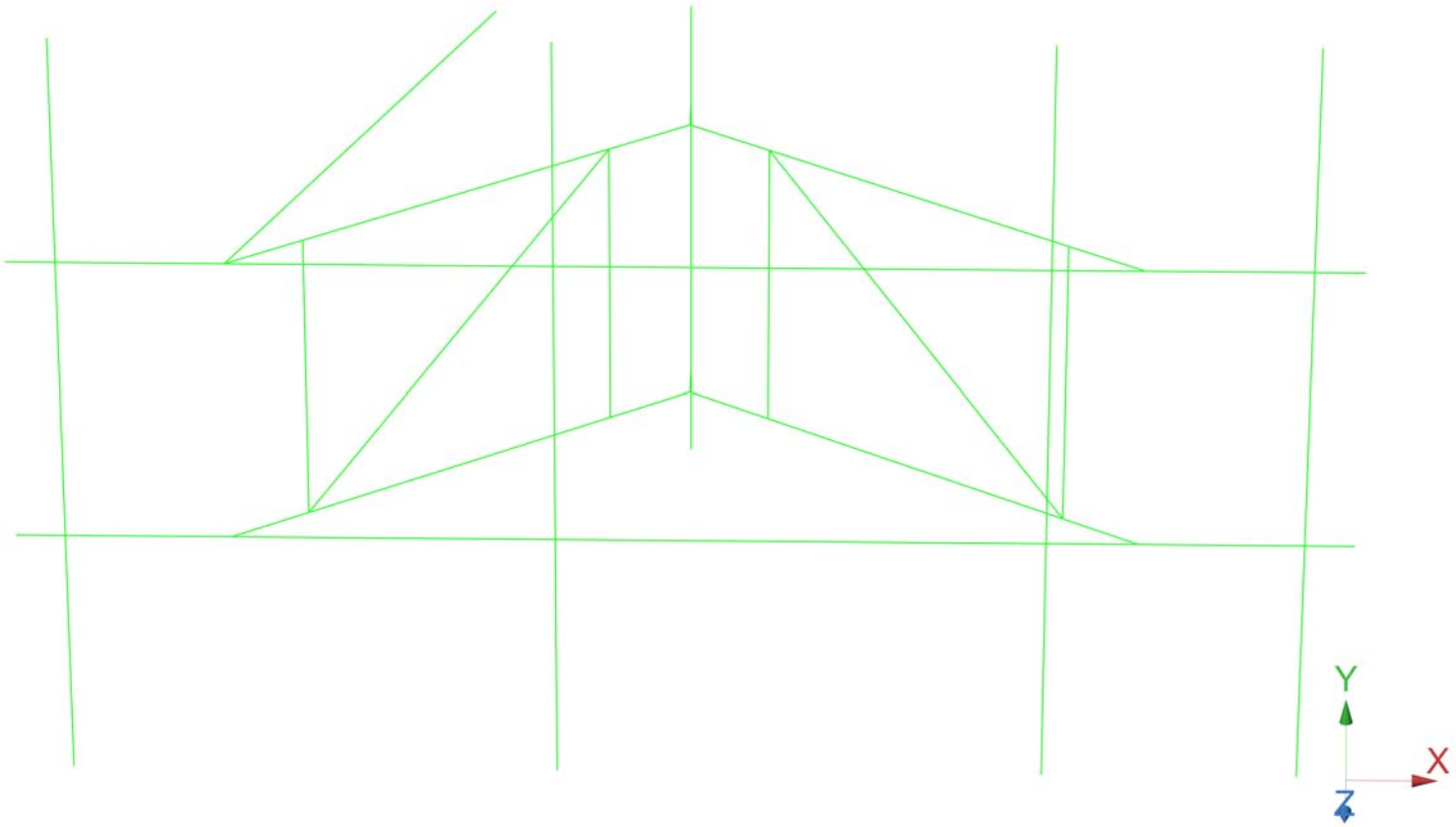
RAM® Elements
CONNECT Edition

Current Date: 1/20/2022 10:44 AM
Units system: English

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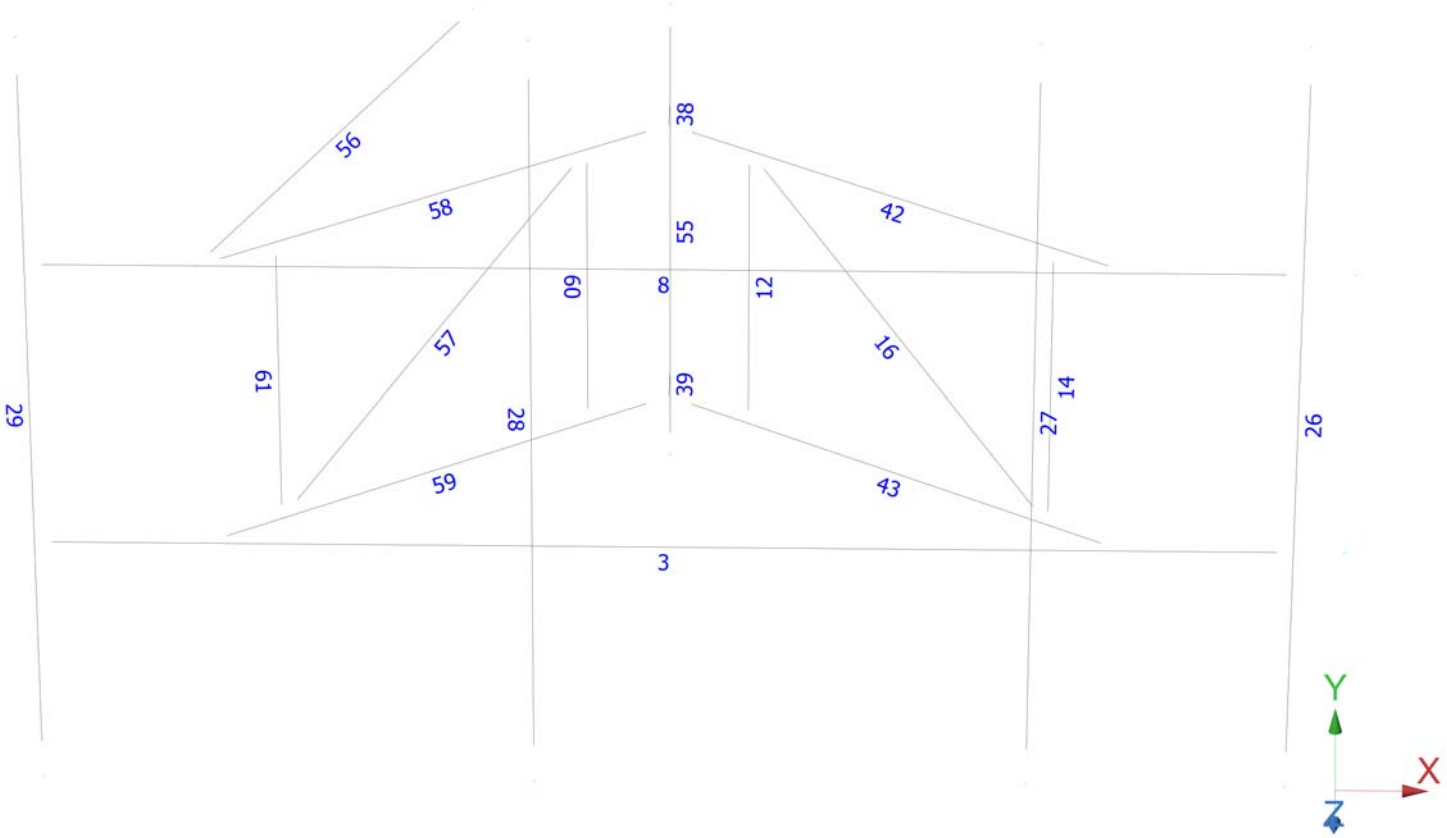
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Z

RAM® Elements
CONNECT Edition

Current Date: 1/20/2022 1:21 PM
Units system: English

Load data

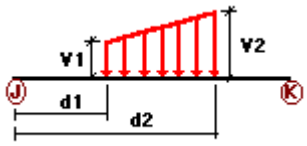
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left 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

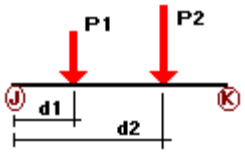


Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	3	z	-0.01	0.00	0.00	No	0.00	No
	8	z	-0.01	0.00	0.00	No	0.00	No
	12	z	-0.003	0.00	0.00	No	0.00	No
	14	z	-0.003	0.00	0.00	No	0.00	No
	16	z	-0.003	0.00	0.00	No	0.00	No
	26	z	-0.01	0.00	0.00	No	0.00	No
	38	z	-0.004	0.00	0.00	No	0.00	No
	39	z	-0.004	0.00	0.00	No	0.00	No
	42	z	-0.01	0.00	0.00	No	0.00	No
	43	z	-0.01	0.00	0.00	No	0.00	No
	55	z	-0.015	0.00	0.00	No	0.00	No
	56	z	-0.01	0.00	0.00	No	0.00	No
	57	z	-0.003	0.00	0.00	No	0.00	No
	58	z	-0.01	0.00	0.00	No	0.00	No
	59	z	-0.01	0.00	0.00	No	0.00	No
	60	z	-0.003	0.00	0.00	No	0.00	No
	61	z	-0.003	0.00	0.00	No	0.00	No
W30	3	z	-0.01	0.00	0.00	No	0.00	No
	8	z	-0.01	0.00	0.00	No	0.00	No
	12	z	-0.003	0.00	0.00	No	0.00	No
	14	z	-0.003	0.00	0.00	No	0.00	No
	16	z	-0.003	0.00	0.00	No	0.00	No
	26	z	-0.01	0.00	0.00	No	0.00	No
	38	z	-0.004	0.00	0.00	No	0.00	No
	39	z	-0.004	0.00	0.00	No	0.00	No
	42	z	-0.01	0.00	0.00	No	0.00	No
	43	z	-0.01	0.00	0.00	No	0.00	No
	55	z	-0.015	0.00	0.00	No	0.00	No
	56	z	-0.01	0.00	0.00	No	0.00	No
	57	z	-0.003	0.00	0.00	No	0.00	No
	58	z	-0.01	0.00	0.00	No	0.00	No
	59	z	-0.01	0.00	0.00	No	0.00	No
	60	z	-0.003	0.00	0.00	No	0.00	No
	61	z	-0.003	0.00	0.00	No	0.00	No
W60	3	x	-0.01	0.00	0.00	No	0.00	No
	8	x	-0.01	0.00	0.00	No	0.00	No
	12	x	-0.003	0.00	0.00	No	0.00	No
	14	x	-0.003	0.00	0.00	No	0.00	No
	16	x	-0.003	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
	27	x	-0.01	0.00	0.00	No	0.00	No
	28	x	-0.01	0.00	0.00	No	0.00	No
	29	x	-0.01	0.00	0.00	No	0.00	No
	38	x	-0.004	0.00	0.00	No	0.00	No
	39	x	-0.004	0.00	0.00	No	0.00	No
	42	x	-0.01	0.00	0.00	No	0.00	No
	43	x	-0.01	0.00	0.00	No	0.00	No
	55	x	-0.015	0.00	0.00	No	0.00	No
	56	x	-0.01	0.00	0.00	No	0.00	No
	57	x	-0.003	0.00	0.00	No	0.00	No
	58	x	-0.01	0.00	0.00	No	0.00	No
	59	x	-0.01	0.00	0.00	No	0.00	No
	60	x	-0.003	0.00	0.00	No	0.00	No
	61	x	-0.003	0.00	0.00	No	0.00	No
W90	12	x	-0.003	0.00	0.00	No	0.00	No
	14	x	-0.003	0.00	0.00	No	0.00	No
	16	x	-0.003	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
	27	x	-0.01	0.00	0.00	No	0.00	No
	28	x	-0.01	0.00	0.00	No	0.00	No

	29	x	-0.01	0.00	0.00	No	0.00	No
	38	x	-0.004	0.00	0.00	No	0.00	No
	39	x	-0.004	0.00	0.00	No	0.00	No
	42	x	-0.01	0.00	0.00	No	0.00	No
	43	x	-0.01	0.00	0.00	No	0.00	No
	55	x	-0.015	0.00	0.00	No	0.00	No
	56	x	-0.01	0.00	0.00	No	0.00	No
	57	x	-0.003	0.00	0.00	No	0.00	No
	58	x	-0.01	0.00	0.00	No	0.00	No
	59	x	-0.01	0.00	0.00	No	0.00	No
	60	x	-0.003	0.00	0.00	No	0.00	No
	61	x	-0.003	0.00	0.00	No	0.00	No
W120	3	x	-0.01	0.00	0.00	No	0.00	No
	8	x	-0.01	0.00	0.00	No	0.00	No
	12	x	-0.003	0.00	0.00	No	0.00	No
	14	x	-0.003	0.00	0.00	No	0.00	No
	16	x	-0.003	0.00	0.00	No	0.00	No
	26	x	-0.01	0.00	0.00	No	0.00	No
	27	x	-0.01	0.00	0.00	No	0.00	No
	28	x	-0.01	0.00	0.00	No	0.00	No
	29	x	-0.01	0.00	0.00	No	0.00	No
	38	x	-0.004	0.00	0.00	No	0.00	No
	39	x	-0.004	0.00	0.00	No	0.00	No
	42	x	-0.01	0.00	0.00	No	0.00	No
	43	x	-0.01	0.00	0.00	No	0.00	No
	55	x	-0.015	0.00	0.00	No	0.00	No
	56	x	-0.01	0.00	0.00	No	0.00	No
	57	x	-0.003	0.00	0.00	No	0.00	No
	58	x	-0.01	0.00	0.00	No	0.00	No
	59	x	-0.01	0.00	0.00	No	0.00	No
	60	x	-0.003	0.00	0.00	No	0.00	No
	61	x	-0.003	0.00	0.00	No	0.00	No
W150	3	z	0.01	0.00	0.00	No	0.00	No
	8	z	0.01	0.00	0.00	No	0.00	No
	12	z	0.003	0.00	0.00	No	0.00	No
	14	z	0.003	0.00	0.00	No	0.00	No
	16	z	0.003	0.00	0.00	No	0.00	No
	26	z	0.01	0.00	0.00	No	0.00	No
	27	z	0.01	0.00	0.00	No	0.00	No
	28	z	0.01	0.00	0.00	No	0.00	No
	29	z	0.01	0.00	0.00	No	0.00	No
	38	z	0.004	0.00	0.00	No	0.00	No
	39	z	0.004	0.00	0.00	No	0.00	No
	42	z	0.01	0.00	0.00	No	0.00	No
	43	z	0.01	0.00	0.00	No	0.00	No
	55	z	0.015	0.00	0.00	No	0.00	No
	56	z	0.01	0.00	0.00	No	0.00	No
	57	z	0.003	0.00	0.00	No	0.00	No
	58	z	0.01	0.00	0.00	No	0.00	No
	59	z	0.01	0.00	0.00	No	0.00	No
	60	z	0.003	0.00	0.00	No	0.00	No
	61	z	0.003	0.00	0.00	No	0.00	No
Di	3	y	-0.009	0.00	0.00	No	0.00	No
	8	y	-0.009	0.00	0.00	No	0.00	No
	12	y	-0.005	0.00	0.00	No	0.00	No
	14	y	-0.005	0.00	0.00	No	0.00	No
	16	y	-0.005	0.00	0.00	No	0.00	No
	26	y	-0.009	0.00	0.00	No	0.00	No
	27	y	-0.009	0.00	0.00	No	0.00	No
	28	y	-0.009	0.00	0.00	No	0.00	No

29	y	-0.009	0.00	0.00	No	0.00	No
38	y	-0.028	0.00	0.00	No	0.00	No
39	y	-0.028	0.00	0.00	No	0.00	No
42	y	-0.009	0.00	0.00	No	0.00	No
43	y	-0.009	0.00	0.00	No	0.00	No
55	y	-0.011	0.00	0.00	No	0.00	No
56	y	-0.009	0.00	0.00	No	0.00	No
57	y	-0.005	0.00	0.00	No	0.00	No
58	y	-0.009	0.00	0.00	No	0.00	No
59	y	-0.009	0.00	0.00	No	0.00	No
60	y	-0.005	0.00	0.00	No	0.00	No
61	y	-0.005	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	27	y	-0.03	1.50	No
		y	-0.03	6.50	No
		y	-0.053	4.00	No
		y	-0.072	4.00	No
	28	y	-0.033	1.25	No
		y	-0.033	3.00	No
		y	-0.041	5.00	No
		y	-0.041	6.75	No
		y	-0.06	4.00	No
	29	y	-0.04	1.50	No
		y	-0.04	6.50	No
		y	-0.073	4.00	No
		y	-0.06	4.00	No
Wo	27	z	-0.292	1.50	No
		z	-0.292	6.50	No
		z	-0.03	4.00	No
		z	-0.029	4.00	No
	28	z	-0.09	1.25	No
		z	-0.09	3.00	No
		z	-0.088	5.00	No
		z	-0.088	6.75	No
		z	-0.087	4.00	No
	29	z	-0.274	1.50	No
		z	-0.274	6.50	No
		z	-0.032	4.00	No
		z	-0.04	4.00	No
W30	27	3	-0.256	1.50	No
		3	-0.256	6.50	No
		3	-0.057	4.00	No
	28	3	-0.078	1.25	No
		3	-0.078	3.00	No
		3	-0.081	5.00	No
		3	-0.081	6.75	No

		3	-0.079	4.00	No
	29	3	-0.235	1.50	No
		3	-0.235	6.50	No
		3	-0.055	4.00	No
W60	27	3	-0.183	1.50	No
		3	-0.183	6.50	No
		3	-0.109	4.00	No
	28	3	-0.055	1.25	No
		3	-0.055	3.00	No
		3	-0.066	5.00	No
		3	-0.066	6.75	No
		3	-0.062	4.00	No
	29	3	-0.159	1.50	No
		3	-0.159	6.50	No
		3	-0.097	4.00	No
W90	27	x	-0.147	1.50	No
		x	-0.147	6.50	No
		x	-0.135	4.00	No
	28	x	-0.044	1.25	No
		x	-0.044	3.00	No
		x	-0.059	5.00	No
		x	-0.059	6.75	No
		x	-0.054	4.00	No
	29	x	-0.121	1.50	No
		x	-0.121	6.50	No
		x	-0.118	4.00	No
W120	27	2	-0.183	1.50	No
		2	-0.183	6.50	No
		2	-0.109	4.00	No
	28	2	-0.055	1.25	No
		2	-0.055	3.00	No
		2	-0.066	5.00	No
		2	-0.066	6.75	No
		2	-0.062	4.00	No
	29	2	-0.159	1.50	No
		2	-0.159	6.50	No
		2	-0.097	4.00	No
W150	27	2	-0.256	1.50	No
		2	-0.256	6.50	No
		2	-0.057	4.00	No
	28	2	-0.078	1.25	No
		2	-0.078	3.00	No
		2	-0.081	5.00	No
		2	-0.081	6.75	No
		2	-0.079	4.00	No
	29	2	-0.235	1.50	No
		2	-0.235	6.50	No
		2	-0.055	4.00	No
Di	27	y	-0.168	1.50	No
		y	-0.168	6.50	No
		y	-0.08	4.00	No
		y	-0.051	4.00	No
	28	y	-0.055	1.25	No
		y	-0.055	3.00	No
		y	-0.058	5.00	No
		y	-0.058	6.75	No
		y	-0.057	4.00	No
	29	y	-0.154	1.50	No
		y	-0.154	6.50	No
		y	-0.058	4.00	No

		y	-0.077	4.00	No
WI0	27	z	-0.057	1.50	No
		z	-0.057	6.50	No
		z	-0.011	4.00	No
		z	-0.01	4.00	No
	28	z	-0.02	1.25	No
		z	-0.02	3.00	No
		z	-0.019	5.00	No
		z	-0.019	6.75	No
		z	-0.021	4.00	No
	29	z	-0.054	1.50	No
		z	-0.054	6.50	No
		z	-0.011	4.00	No
		z	-0.015	4.00	No
WI30	27	3	-0.051	1.50	No
		3	-0.051	6.50	No
		3	-0.015	4.00	No
	28	3	-0.018	1.25	No
		3	-0.018	3.00	No
		3	-0.018	5.00	No
		3	-0.018	6.75	No
		3	-0.019	4.00	No
	29	3	-0.047	1.50	No
		3	-0.047	6.50	No
		3	-0.017	4.00	No
WI60	27	3	-0.038	1.50	No
		3	-0.038	6.50	No
		3	-0.025	4.00	No
	28	3	-0.014	1.25	No
		3	-0.014	3.00	No
		3	-0.016	5.00	No
		3	-0.016	6.75	No
		3	-0.016	4.00	No
	29	3	-0.035	1.50	No
		3	-0.035	6.50	No
		3	-0.024	4.00	No
WI90	27	x	-0.032	1.50	No
		x	-0.032	6.50	No
		x	-0.03	4.00	No
	28	x	-0.011	1.25	No
		x	-0.011	3.00	No
		x	-0.014	5.00	No
		x	-0.014	6.75	No
		x	-0.015	4.00	No
	29	x	-0.028	1.50	No
		x	-0.028	6.50	No
		x	-0.028	4.00	No
WI120	27	2	-0.038	1.50	No
		2	-0.038	6.50	No
		2	-0.025	4.00	No
	28	2	-0.014	1.25	No
		2	-0.014	3.00	No
		2	-0.016	5.00	No
		2	-0.016	6.75	No
		2	-0.016	4.00	No
	29	2	-0.035	1.50	No
		2	-0.035	6.50	No
		2	-0.024	4.00	No
WI150	27	2	-0.051	1.50	No
		2	-0.051	6.50	No

		2	-0.015	4.00	No
	28	2	-0.018	1.25	No
		2	-0.018	3.00	No
		2	-0.018	5.00	No
		2	-0.018	6.75	No
		2	-0.019	4.00	No
	29	2	-0.047	1.50	No
		2	-0.047	6.50	No
		2	-0.017	4.00	No
WL0	27	z	-0.017	1.50	No
		z	-0.017	6.50	No
		z	-0.002	4.00	No
		z	-0.002	4.00	No
	28	z	-0.006	1.25	No
		z	-0.006	3.00	No
		z	-0.006	5.00	No
		z	-0.006	6.75	No
		z	-0.005	4.00	No
	29	z	-0.016	1.50	No
		z	-0.016	6.50	No
		z	-0.002	4.00	No
		z	-0.002	4.00	No
WL30	27	3	-0.015	1.50	No
		3	-0.015	6.50	No
		3	-0.003	4.00	No
	28	3	-0.005	1.25	No
		3	-0.005	3.00	No
		3	-0.005	5.00	No
		3	-0.005	6.75	No
		3	-0.005	4.00	No
	29	3	-0.014	1.50	No
		3	-0.014	6.50	No
		3	-0.003	4.00	No
WL60	27	3	-0.011	1.50	No
		3	-0.011	6.50	No
		3	-0.006	4.00	No
	28	3	-0.004	1.25	No
		3	-0.004	3.00	No
		3	-0.004	5.00	No
		3	-0.004	6.75	No
		3	-0.004	4.00	No
	29	3	-0.01	1.50	No
		3	-0.01	6.50	No
		3	-0.006	4.00	No
WL90	27	x	-0.009	1.50	No
		x	-0.009	6.50	No
		x	-0.008	4.00	No
	28	x	-0.003	1.25	No
		x	-0.003	3.00	No
		x	-0.004	5.00	No
		x	-0.004	6.75	No
		x	-0.003	4.00	No
	29	x	-0.007	1.50	No
		x	-0.007	6.50	No
		x	-0.007	4.00	No
WL120	27	2	-0.011	1.50	No
		2	-0.011	6.50	No
		2	-0.006	4.00	No
	28	2	-0.004	1.25	No
		2	-0.004	3.00	No

		2	-0.004	5.00	No
		2	-0.004	6.75	No
		2	-0.004	4.00	No
	29	2	-0.01	1.50	No
		2	-0.01	6.50	No
		2	-0.006	4.00	No
WL150	27	2	-0.015	1.50	No
		2	-0.015	6.50	No
		2	-0.003	4.00	No
	28	2	-0.005	1.25	No
		2	-0.005	3.00	No
		2	-0.005	5.00	No
		2	-0.005	6.75	No
		2	-0.005	4.00	No
	29	2	-0.014	1.50	No
		2	-0.014	6.50	No
		2	-0.003	4.00	No
LL1	8	y	-0.25	50.00	Yes
LL2	8	y	-0.25	100.00	Yes
LL3	8	y	-0.25	0.00	Yes
LLa1	26	y	-0.50	50.00	Yes
LLa2	27	y	-0.50	50.00	Yes
LLa3	28	y	-0.50	50.00	Yes
LLa4	29	y	-0.50	50.00	Yes

Self weight multipliers for load conditions

Condition	Description	Self weight multiplier			
		Comb.	**MultX**	**MultY**	**MultZ**
D	Dead Load	No	0.00	-1.00	0.00
Wo	Wind Load (NO ICE)	No	0.00	0.00	0.00
W30	WL 30deg	No	0.00	0.00	0.00
W60	WL 60deg	No	0.00	0.00	0.00
W90	WL 90deg	No	0.00	0.00	0.00
W120	WL 120deg	No	0.00	0.00	0.00
W150	WL 150deg	No	0.00	0.00	0.00
Di	Ice Load	No	0.00	0.00	0.00
WI0	WL ICE 0deg	No	0.00	0.00	0.00
WI30	WL ICE 30deg	No	0.00	0.00	0.00
WI60	WL ICE 60deg	No	0.00	0.00	0.00
WI90	WL ICE 90deg	No	0.00	0.00	0.00
WI120	WL ICE 120deg	No	0.00	0.00	0.00
WI150	WL ICE 150deg	No	0.00	0.00	0.00
WL0	WL 30 mph 0deg	No	0.00	0.00	0.00
WL30	WL 30 mph 30deg	No	0.00	0.00	0.00
WL60	WL 30 mph 60deg	No	0.00	0.00	0.00
WL90	WL 30 mph 90deg	No	0.00	0.00	0.00
WL120	WL 30 mph 120deg	No	0.00	0.00	0.00
WL150	WL 30 mph 150deg	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 Right End of Mount	No	0.00	0.00	0.00
LL3	250 lb Live Load Left 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. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	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
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	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

RAM® Elements
CONNECT Edition

Current Date: 1/20/2022 1:22 PM
Units system: English

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+WL0+1.6LLa1
LC41=1.2D+WL30+1.6LLa1
LC42=1.2D+WL60+1.6LLa1
LC43=1.2D+WL90+1.6LLa1
LC44=1.2D+WL120+1.6LLa1
LC45=1.2D+WL150+1.6LLa1
LC46=1.2D-WL0+1.6LLa1
LC47=1.2D-WL30+1.6LLa1
LC48=1.2D-WL60+1.6LLa1
LC49=1.2D-WL90+1.6LLa1
LC50=1.2D-WL120+1.6LLa1
LC51=1.2D-WL150+1.6LLa1
LC52=1.2D+WL0+1.6LLa2
LC53=1.2D+WL30+1.6LLa2
LC54=1.2D+WL60+1.6LLa2

LC55=1.2D+WL90+1.6LLa2
LC56=1.2D+WL120+1.6LLa2
LC57=1.2D+WL150+1.6LLa2
LC58=1.2D-WL0+1.6LLa2
LC59=1.2D-WL30+1.6LLa2
LC60=1.2D-WL60+1.6LLa2
LC61=1.2D-WL90+1.6LLa2
LC62=1.2D-WL120+1.6LLa2
LC63=1.2D-WL150+1.6LLa2
LC64=1.2D+WL0+1.6LLa3
LC65=1.2D+WL30+1.6LLa3
LC66=1.2D+WL60+1.6LLa3
LC67=1.2D+WL90+1.6LLa3
LC68=1.2D+WL120+1.6LLa3
LC69=1.2D+WL150+1.6LLa3
LC70=1.2D-WL0+1.6LLa3
LC71=1.2D-WL30+1.6LLa3
LC72=1.2D-WL60+1.6LLa3
LC73=1.2D-WL90+1.6LLa3
LC74=1.2D-WL120+1.6LLa3
LC75=1.2D-WL150+1.6LLa3
LC76=1.2D+WL0+1.6LLa4
LC77=1.2D+WL30+1.6LLa4
LC78=1.2D+WL60+1.6LLa4
LC79=1.2D+WL90+1.6LLa4
LC80=1.2D+WL120+1.6LLa4
LC81=1.2D+WL150+1.6LLa4
LC82=1.2D-WL0+1.6LLa4
LC83=1.2D-WL30+1.6LLa4
LC84=1.2D-WL60+1.6LLa4
LC85=1.2D-WL90+1.6LLa4
LC86=1.2D-WL120+1.6LLa4
LC87=1.2D-WL150+1.6LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	PIPE 2x0.154	**3**	LC7 at 16.96%	0.43	OK	
		8	LC6 at 16.96%	**0.45**	**OK**	
		26	LC47 at 31.25%	0.25	OK	
		27	LC4 at 31.25%	0.26	OK	
		28	LC10 at 31.25%	0.29	OK	
		29	LC77 at 31.25%	0.34	OK	
		42	LC47 at 83.33%	0.30	OK	
		43	LC40 at 81.25%	0.30	OK	
		56	LC3 at 0.00%	0.09	OK	
		58	LC81 at 83.33%	0.37	OK	
		59	LC76 at 81.25%	0.36	OK	
	PIPE 3x0.216	**55**	LC25 at 80.00%	**0.23**	**OK**	
	PL 11-1/4x5/8	**38**	LC30 at 100.00%	0.63	OK	
		39	LC34 at 100.00%	**0.64**	**OK**	
	RndBar 3_4	**12**	LC41 at 100.00%	0.46	OK	
		14	LC40 at 0.00%	0.43	OK	
		16	LC41 at 0.00%	0.23	OK	
		57	LC32 at 0.00%	0.40	OK	
		60	LC34 at 100.00%	**0.59**	**OK**	
		61	LC32 at 100.00%	0.55	OK	

RAM® Elements
CONNECT Edition

Current Date: 1/20/2022 1:22 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
52	-2.00	3.00	-5.50	0
86	0.00	3.50	-3.6208	0
87	0.00	-0.50	-3.6208	0
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
9	4.40	0.00	0.00	0
12	3.6771	0.00	-0.4929	0
13	0.7853	0.00	-2.4646	0
16	6.50	3.00	0.00	0
17	-6.50	3.00	0.00	0
23	4.40	3.00	0.00	0
26	3.6771	3.00	-0.4929	0
27	0.7853	3.00	-2.4646	0
33	-6.00	5.50	0.20	0
34	6.00	5.50	0.20	0
35	-6.00	-2.50	0.20	0
36	6.00	-2.50	0.20	0
42	3.50	5.50	0.20	0
43	3.50	-2.50	0.20	0
48	-1.25	5.50	0.20	0
49	-1.25	-2.50	0.20	0
53	0.00	3.00	-3.4792	0
62	0.00	3.00	-3.00	0

63	0.00	0.00	-3.00	0
64	0.00	0.00	-3.4792	0
83	0.00	4.00	-3.6208	0
84	0.00	-1.00	-3.6208	0
88	-0.7853	3.00	-2.4646	0
89	-3.6771	0.00	-0.4929	0
90	-4.40	3.00	0.00	0
91	-4.40	0.00	0.00	0
92	-0.7853	0.00	-2.4646	0
93	-3.6771	3.00	-0.4929	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
52	1	1	1	0	0	0
86	1	1	1	1	1	1
87	1	1	1	1	1	1

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
3	3	2		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
8	17	16		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
12	27	13		RndBar 3_4	A36	0.00	0.00	0.00
14	12	26		RndBar 3_4	A36	0.00	0.00	0.00
16	27	12		RndBar 3_4	A36	0.00	0.00	0.00
26	34	36		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
27	42	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
28	48	49		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
29	33	35		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
38	62	53		PL 11-1/4x5/8	A36	11.25	4.00	0.00
39	63	64		PL 11-1/4x5/8	A36	11.25	4.00	0.00
42	23	62		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
43	9	63		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
55	83	84		PIPE 3x0.216	A53 GrB	0.00	0.00	0.00
56	90	52		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
57	88	89		RndBar 3_4	A36	0.00	0.00	0.00
58	90	62		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
59	91	63		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
60	88	92		RndBar 3_4	A36	0.00	0.00	0.00
61	89	93		RndBar 3_4	A36	0.00	0.00	0.00

Orientation of local axes

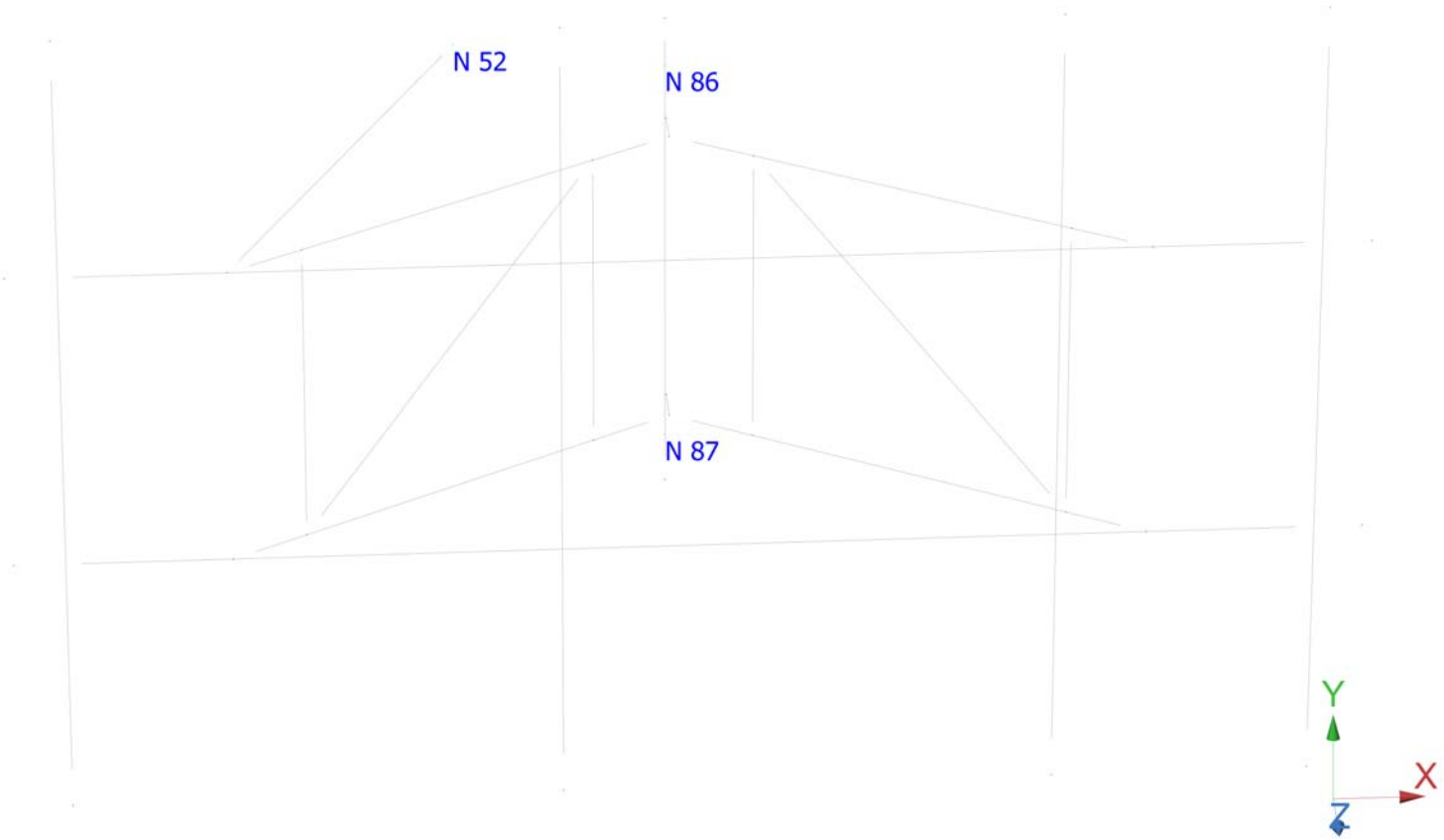
Member	Rotation [Deg]	Axes23	NX	NY	NZ
26	315.00	0	0.00	0.00	0.00
27	315.00	0	0.00	0.00	0.00
28	315.00	0	0.00	0.00	0.00
29	315.00	0	0.00	0.00	0.00
38	90.00	0	0.00	0.00	0.00
39	90.00	0	0.00	0.00	0.00
55	315.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
38	0.00	0.625	0.00	0.00	0.625	0.00
39	0.00	-0.625	0.00	0.00	-0.625	0.00

Hinges

	Node-J				Node-K						
Member	M33	M22	V3	V2	M33	M22	V3	V2	TOR	AXL	Axial rigidity
16	0	0	0	0	0	0	0	0	0	0	Tension only
56	1	1	0	0	0	0	0	0	0	0	Full
57	0	0	0	0	0	0	0	0	0	0	Tension only


N 52
N 86
N 87
Y
X
Z

RAM® Elements
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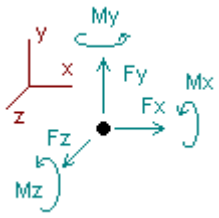
Current Date: 1/20/2022 1:23 PM
Units system: English

Analysis result

Reactions



Direction of positive forces and moments

	Forces [Kip]			Moments [Kip*ft]		
Node	**FX**	**FY**	**FZ**	**MX**	**MY**	**MZ**
Condition **LC1=1.2D+Wo**						
52	-0.24814	0.01156	0.58049	0.00000	0.00000	0.00000
86	0.54572	0.57215	-0.45671	-0.07180	0.11212	0.18453
87	-0.29759	0.60242	2.25823	0.64980	-0.11623	0.08530
SUM	0.00000	1.18613	2.38200	0.57800	-0.00411	0.26982
Condition **LC2=1.2D+W30**						
52	-0.61082	0.01080	1.40981	0.00000	0.00000	0.00000
86	1.42439	0.59385	-1.57480	0.34738	0.52370	0.54395
87	0.24073	0.58147	1.89528	0.48497	0.30901	-0.13035
SUM	1.05430	1.18613	1.73030	0.83235	0.83270	0.41361
Condition **LC3=1.2D+W60**						
52	-0.69669	0.01057	1.65655	0.00000	0.00000	0.00000
86	1.73834	0.61846	-2.26914	0.61436	0.66279	0.67457
87	0.43401	0.55710	1.45688	0.30528	0.44895	-0.21068
SUM	1.47566	1.18613	0.84429	0.91963	1.11174	0.46389
Condition **LC4=1.2D+W90**						
52	-0.66149	0.01066	1.57577	0.00000	0.00000	0.00000
86	1.79827	0.62850	-2.60513	0.74984	0.73529	0.69962
87	0.54359	0.54696	1.02936	0.14026	0.52816	-0.25449
SUM	1.68037	1.18613	0.00000	0.89010	1.26345	0.44513
Condition **LC5=1.2D+W120**						
52	-0.43679	0.01112	1.06219	0.00000	0.00000	0.00000
86	1.48421	0.62915	-2.52973	0.73537	0.64801	0.56975
87	0.42824	0.54586	0.62325	-0.00576	0.42672	-0.21020
SUM	1.47566	1.18613	-0.84429	0.72962	1.07472	0.35954

Condition	**LC6=1.2D+W150**					
52	-0.33265	0.01142	0.74922	0.00000	0.00000	0.00000
86	1.15304	0.64282	-2.81210	0.85670	0.52462	0.43302
87	0.23391	0.53189	0.09259	-0.20865	0.30971	-0.12889
SUM	1.05430	1.18613	-1.97030	0.64805	0.83433	0.30413
Condition	**LC7=1.2D-Wo**					
52	0.23908	0.01279	-0.55979	0.00000	0.00000	0.00000
86	0.07029	0.62232	-1.77863	0.48466	0.09144	-0.00981
87	-0.30937	0.55102	-0.04358	-0.22894	-0.13893	0.08794
SUM	0.00000	1.18613	-2.38200	0.25572	-0.04748	0.07813
Condition	**LC8=1.2D-W30**					
52	0.60075	0.01387	-1.39006	0.00000	0.00000	0.00000
86	-0.80724	0.60011	-0.66044	0.06545	-0.32045	-0.36889
87	-0.84780	0.57215	0.32020	-0.06399	-0.56276	0.30352
SUM	-1.05430	1.18613	-1.73030	0.00146	-0.88320	-0.06537
Condition	**LC9=1.2D-W60**					
52	0.68590	0.01421	-1.63715	0.00000	0.00000	0.00000
86	-1.12072	0.57521	0.03393	-0.20160	-0.46165	-0.49955
87	-1.04083	0.59671	0.75893	0.11565	-0.70303	0.38353
SUM	-1.47566	1.18613	-0.84429	-0.08594	-1.16468	-0.11601
Condition	**LC10=1.2D-W90**					
52	0.65146	0.01412	-1.55839	0.00000	0.00000	0.00000
86	-1.18135	0.56512	0.37193	-0.33790	-0.53663	-0.52511
87	-1.15048	0.60689	1.18646	0.28067	-0.78366	0.42716
SUM	-1.68037	1.18613	0.00000	-0.05723	-1.32028	-0.09796
Condition	**LC11=1.2D-W120**					
52	0.42795	0.01344	-1.04507	0.00000	0.00000	0.00000
86	-0.86846	0.56484	0.29740	-0.32375	-0.44935	-0.39564
87	-1.03515	0.60784	1.59195	0.42663	-0.68334	0.38295
SUM	-1.47566	1.18613	0.84429	0.10288	-1.13269	-0.01269
Condition	**LC12=1.2D-W150**					
52	0.32472	0.01308	-0.73290	0.00000	0.00000	0.00000
86	-0.53806	0.55136	0.58063	-0.44543	-0.32542	-0.25925
87	-0.84095	0.62168	2.12257	0.62960	-0.56717	0.30169
SUM	-1.05430	1.18613	1.97030	0.18417	-0.89259	0.04244
Condition	**LC13=0.9D+Wo**					
52	-0.24715	0.00867	0.57825	0.00000	0.00000	0.00000
86	0.46871	0.42205	-0.17723	-0.12315	0.08652	0.16272
87	-0.22156	0.45887	1.98098	0.59706	-0.08411	0.06361
SUM	0.00000	0.88959	2.38200	0.47391	0.00241	0.22633

Condition **LC14=0.9D+W30**

52	-0.60980	0.00814	1.40756	0.00000	0.00000	0.00000
86	1.34727	0.44347	-1.29562	0.29607	0.49818	0.52204
87	0.31682	0.43798	1.61836	0.43223	0.34078	-0.15211
SUM	1.05430	0.88959	1.73030	0.72831	0.83896	0.36993

Condition **LC15=0.9D+W60**

52	-0.69566	0.00799	1.65429	0.00000	0.00000	0.00000
86	1.66112	0.46799	-1.99017	0.56305	0.63731	0.65260
87	0.51020	0.41361	1.18016	0.25254	0.48061	-0.23249
SUM	1.47566	0.88959	0.84429	0.81559	1.11792	0.42011

Condition **LC16=0.9D+W90**

52	-0.66045	0.00805	1.57349	0.00000	0.00000	0.00000
86	1.72112	0.47808	-2.32633	0.69853	0.70994	0.67767
87	0.61971	0.40346	0.75284	0.08754	0.55967	-0.27629
SUM	1.68037	0.88959	0.00000	0.78607	1.26961	0.40138

Condition **LC17=0.9D+W120**

52	-0.43576	0.00837	1.05988	0.00000	0.00000	0.00000
86	1.40719	0.47892	-2.25101	0.68403	0.62283	0.54785
87	0.50422	0.40231	0.34685	-0.05846	0.45817	-0.23195
SUM	1.47566	0.88959	-0.84429	0.62557	1.08100	0.31590

Condition **LC18=0.9D+W150**

52	-0.33161	0.00859	0.74688	0.00000	0.00000	0.00000
86	1.07610	0.49272	-2.53352	0.80532	0.49946	0.41117
87	0.30981	0.38829	-0.18366	-0.26134	0.34119	-0.15061
SUM	1.05430	0.88959	-1.97030	0.54398	0.84065	0.26056

Condition **LC19=0.9D-Wo**

52	0.24010	0.00960	-0.56215	0.00000	0.00000	0.00000
86	-0.00639	0.47267	-1.49991	0.43322	0.06641	-0.03151
87	-0.23370	0.40733	-0.31994	-0.28161	-0.10724	0.06636
SUM	0.00000	0.88959	-2.38200	0.15161	-0.04083	0.03486

Condition **LC20=0.9D-W30**

52	0.60174	0.01044	-1.39240	0.00000	0.00000	0.00000
86	-0.88382	0.45074	-0.38142	0.01397	-0.34557	-0.39049
87	-0.77221	0.42841	0.04353	-0.11666	-0.53073	0.28203
SUM	-1.05430	0.88959	-1.73030	-0.10269	-0.87630	-0.10846

Condition **LC21=0.9D-W60**

52	0.68687	0.01071	-1.63948	0.00000	0.00000	0.00000
86	-1.19720	0.42593	0.31315	-0.25308	-0.48680	-0.52109
87	-0.96534	0.45296	0.48205	0.06298	-0.67090	0.36209
SUM	-1.47566	0.88959	-0.84429	-0.19010	-1.15770	-0.15900

Condition **LC22=0.9D-W90**

52	0.65243	0.01065	-1.56071	0.00000	0.00000	0.00000
86	-1.25788	0.41579	0.65133	-0.38937	-0.56191	-0.54666
87	-1.07492	0.46315	0.90937	0.22798	-0.75137	0.40570
SUM	-1.68037	0.88959	0.00000	-0.16140	-1.31328	-0.14096

Condition **LC23=0.9D-W120**

52	0.42892	0.01011	-1.04735	0.00000	0.00000	0.00000
86	-0.94513	0.41533	0.57689	-0.37519	-0.47481	-0.41725
87	-0.95945	0.46415	1.31475	0.37393	-0.65099	0.36144
SUM	-1.47566	0.88959	0.84429	-0.00126	-1.12580	-0.05581

Condition **LC24=0.9D-W150**

52	0.32568	0.00983	-0.73515	0.00000	0.00000	0.00000
86	-0.61480	0.40172	0.86025	-0.49685	-0.35090	-0.28089
87	-0.76518	0.47805	1.84520	0.57689	-0.53484	0.28014
SUM	-1.05430	0.88959	1.97030	0.08004	-0.88574	-0.00075

Condition **LC25=1.2D+Di+WI0**

52	-0.08004	0.03867	0.18332	0.00000	0.00000	0.00000
86	0.81727	1.47657	-2.74917	0.49146	0.25429	0.24038
87	-0.73722	1.40544	2.93384	0.58873	-0.31750	0.21078
SUM	0.00000	2.92068	0.36800	1.08019	-0.06321	0.45117

Condition **LC26=1.2D+Di+WI30**

52	-0.15602	0.03820	0.35724	0.00000	0.00000	0.00000
86	1.00426	1.48196	-2.98620	0.58039	0.34210	0.31688
87	-0.62268	1.40053	2.85453	0.55315	-0.22683	0.16491
SUM	0.22557	2.92068	0.22557	1.13354	0.11527	0.48178

Condition **LC27=1.2D+Di+WI60**

52	-0.13341	0.03834	0.30550	0.00000	0.00000	0.00000
86	0.96364	1.48102	-2.95559	0.56967	0.32661	0.30050
87	-0.63860	1.40132	2.84172	0.54932	-0.24101	0.17145
SUM	0.19163	2.92068	0.19163	1.11899	0.08560	0.47196

Condition **LC28=1.2D+Di+WI90**

52	-0.12491	0.03839	0.28602	0.00000	0.00000	0.00000
86	0.97914	1.48328	-3.03092	0.60016	0.34333	0.30700
87	-0.61123	1.39901	2.74490	0.51205	-0.22245	0.16055
SUM	0.24300	2.92068	0.00000	1.11221	0.12088	0.46755

Condition **LC29=1.2D+Di+WI120**

52	-0.06887	0.03874	0.15770	0.00000	0.00000	0.00000
86	0.90020	1.48298	-3.00296	0.59296	0.31949	0.27439
87	-0.63971	1.39896	2.65364	0.47958	-0.24908	0.17152
SUM	0.19163	2.92068	-0.19163	1.07254	0.07040	0.44590

Condition	**LC30=1.2D+Di+WI150**					
52	-0.07795	0.03869	0.17849	0.00000	0.00000	0.00000
86	0.92759	1.48330	-3.04119	0.60755	0.33255	0.28541
87	-0.62407	1.39869	2.63713	0.47234	-0.23683	0.16506
SUM	0.22557	2.92068	-0.22557	1.07989	0.09572	0.45047
Condition	**LC31=1.2D+Di-WI0**					
52	0.05552	0.03953	-0.12716	0.00000	0.00000	0.00000
86	0.68417	1.47866	-2.82317	0.52989	0.23711	0.18579
87	-0.73969	1.40248	2.58233	0.45849	-0.33506	0.21114
SUM	0.00000	2.92068	-0.36800	0.98838	-0.09794	0.39693
Condition	**LC32=1.2D+Di-WI30**					
52	0.13146	0.04003	-0.30118	0.00000	0.00000	0.00000
86	0.49721	1.47325	-2.58608	0.44094	0.14923	0.10930
87	-0.85424	1.40741	2.66170	0.49407	-0.42570	0.25701
SUM	-0.22557	2.92068	-0.22557	0.93501	-0.27646	0.36631
Condition	**LC33=1.2D+Di-WI60**					
52	0.10889	0.03988	-0.24945	0.00000	0.00000	0.00000
86	0.53780	1.47419	-2.61666	0.45165	0.16474	0.12567
87	-0.83831	1.40661	2.67449	0.49791	-0.41152	0.25046
SUM	-0.19163	2.92068	-0.19163	0.94956	-0.24678	0.37613
Condition	**LC34=1.2D+Di-WI90**					
52	0.10041	0.03982	-0.23005	0.00000	0.00000	0.00000
86	0.52227	1.47193	-2.54126	0.42112	0.14795	0.11915
87	-0.86569	1.40893	2.77131	0.53518	-0.43012	0.26136
SUM	-0.24300	2.92068	0.00000	0.95630	-0.28218	0.38051
Condition	**LC35=1.2D+Di-WI120**					
52	0.04439	0.03946	-0.10170	0.00000	0.00000	0.00000
86	0.60119	1.47225	-2.56922	0.42833	0.17180	0.15176
87	-0.83720	1.40897	2.86254	0.56764	-0.40352	0.25039
SUM	-0.19163	2.92068	0.19163	0.99597	-0.23172	0.40215
Condition	**LC36=1.2D+Di-WI150**					
52	0.05347	0.03952	-0.12249	0.00000	0.00000	0.00000
86	0.57381	1.47192	-2.53100	0.41374	0.15869	0.14073
87	-0.85284	1.40924	2.87905	0.57488	-0.41579	0.25684
SUM	-0.22557	2.92068	0.22557	0.98863	-0.25709	0.39758
Condition	**LC37=1.2D+1.6LL1**					
52	-0.00349	0.01216	0.00800	0.00000	0.00000	0.00000
86	0.30686	0.80335	-1.51157	0.27238	0.10216	0.08638
87	-0.30337	0.77061	1.50357	0.28032	-0.12489	0.08633
SUM	0.00000	1.58613	0.00000	0.55270	-0.02273	0.17271

Condition **LC38=1.2D+1.6LL2**

52	0.00720	0.01219	-0.01651	0.00000	0.00000	0.00000
86	-0.45870	0.80089	-1.49655	0.28082	-0.14063	-0.12702
87	0.45150	0.77305	1.51306	0.29814	0.18821	-0.12573
SUM	0.00000	1.58613	0.00000	0.57896	0.04759	-0.25275

Condition **LC39=1.2D+1.6LL3**

52	-0.01302	0.01211	0.02982	0.00000	0.00000	0.00000
86	1.07218	0.80339	-1.54060	0.29646	0.34532	0.30116
87	-1.05916	0.77062	1.51079	0.29606	-0.43133	0.30002
SUM	0.00000	1.58613	0.00000	0.59251	-0.08601	0.60118

Condition **LC40=1.2D+WL0+1.6LLa1**

52	-0.00771	0.01217	0.01768	0.00000	0.00000	0.00000
86	-1.08536	1.00800	-1.92902	0.36775	-0.34710	-0.30294
87	1.09307	0.96597	2.01433	0.41740	0.41889	-0.31009
SUM	0.00000	1.98613	0.10300	0.78515	0.07179	-0.61303

Condition **LC41=1.2D+WL30+1.6LLa1**

52	-0.02984	0.01214	0.06843	0.00000	0.00000	0.00000
86	-1.03226	1.00940	-1.99731	0.39336	-0.32223	-0.28124
87	1.12504	0.96459	1.99182	0.40724	0.44425	-0.32292
SUM	0.06293	1.98613	0.06293	0.80060	0.12202	-0.60416

Condition **LC42=1.2D+WL60+1.6LLa1**

52	-0.02298	0.01215	0.05269	0.00000	0.00000	0.00000
86	-1.04427	1.00913	-1.98762	0.38998	-0.32690	-0.28616
87	1.11958	0.96485	1.98726	0.40585	0.43943	-0.32075
SUM	0.05233	1.98613	0.05233	0.79583	0.11253	-0.60691

Condition **LC43=1.2D+WL90+1.6LLa1**

52	-0.01953	0.01215	0.04477	0.00000	0.00000	0.00000
86	-1.04289	1.00968	-2.00621	0.39755	-0.32334	-0.28546
87	1.12642	0.96429	1.96143	0.39593	0.44400	-0.32340
SUM	0.06400	1.98613	0.00000	0.79348	0.12066	-0.60886

Condition **LC44=1.2D+WL120+1.6LLa1**

52	-0.00536	0.01217	0.01229	0.00000	0.00000	0.00000
86	-1.06148	1.00965	-2.00140	0.39660	-0.32864	-0.29324
87	1.11917	0.96431	1.93678	0.38705	0.43737	-0.32069
SUM	0.05233	1.98613	-0.05233	0.78365	0.10873	-0.61392

Condition **LC45=1.2D+WL150+1.6LLa1**

52	-0.00833	0.01217	0.01910	0.00000	0.00000	0.00000
86	-1.05328	1.00973	-2.01318	0.40112	-0.32462	-0.28988
87	1.12454	0.96423	1.93114	0.38461	0.44144	-0.32285
SUM	0.06293	1.98613	-0.06293	0.78573	0.11682	-0.61273

Condition **LC46=1.2D-WL0+1.6LLa1**

52	0.02790	0.01221	-0.06398	0.00000	0.00000	0.00000
86	-1.12015	1.00855	-1.95410	0.38011	-0.35119	-0.31724
87	1.09225	0.96537	1.91508	0.38041	0.41412	-0.30998
SUM	0.00000	1.98613	-0.10300	0.76052	0.06293	-0.62722

Condition **LC47=1.2D-WL30+1.6LLa1**

52	0.05003	0.01224	-0.11473	0.00000	0.00000	0.00000
86	-1.17325	1.00715	-1.88581	0.35449	-0.37606	-0.33894
87	1.06029	0.96674	1.93760	0.39057	0.38877	-0.29716
SUM	-0.06293	1.98613	-0.06293	0.74506	0.01271	-0.63609

Condition **LC48=1.2D-WL60+1.6LLa1**

52	0.04316	0.01223	-0.09899	0.00000	0.00000	0.00000
86	-1.16123	1.00742	-1.89549	0.35787	-0.37139	-0.33403
87	1.06574	0.96648	1.94215	0.39196	0.39359	-0.29932
SUM	-0.05233	1.98613	-0.05233	0.74983	0.02219	-0.63335

Condition **LC49=1.2D-WL90+1.6LLa1**

52	0.03972	0.01222	-0.09108	0.00000	0.00000	0.00000
86	-1.16262	1.00687	-1.87690	0.35030	-0.37496	-0.33472
87	1.05890	0.96704	1.96798	0.40188	0.38901	-0.29668
SUM	-0.06400	1.98613	0.00000	0.75218	0.01405	-0.63140

Condition **LC50=1.2D-WL120+1.6LLa1**

52	0.02555	0.01221	-0.05860	0.00000	0.00000	0.00000
86	-1.14403	1.00690	-1.88171	0.35125	-0.36966	-0.32695
87	1.06615	0.96702	1.99263	0.41076	0.39565	-0.29939
SUM	-0.05233	1.98613	0.05233	0.76201	0.02598	-0.62633

Condition **LC51=1.2D-WL150+1.6LLa1**

52	0.02852	0.01221	-0.06541	0.00000	0.00000	0.00000
86	-1.15224	1.00682	-1.86993	0.34673	-0.37368	-0.33030
87	1.06078	0.96710	1.99827	0.41320	0.39157	-0.29722
SUM	-0.06293	1.98613	0.06293	0.75993	0.01789	-0.62753

Condition **LC52=1.2D+WL0+1.6LLa2**

52	-0.02570	0.01211	0.05891	0.00000	0.00000	0.00000
86	-0.48616	1.00884	-1.95798	0.36266	-0.15537	-0.13177
87	0.51186	0.96517	2.00208	0.39576	0.10818	-0.14424
SUM	0.00000	1.98613	0.10300	0.75842	-0.04719	-0.27602

Condition **LC53=1.2D+WL30+1.6LLa2**

52	-0.04785	0.01206	0.10966	0.00000	0.00000	0.00000
86	-0.43308	1.01026	-2.02624	0.38826	-0.13058	-0.11007
87	0.54385	0.96380	1.97951	0.38559	0.13354	-0.15707
SUM	0.06293	1.98613	0.06293	0.77385	0.00296	-0.26715

Condition **LC54=1.2D+WL60+1.6LLa2**

52	-0.04098	0.01208	0.09394	0.00000	0.00000	0.00000
86	-0.44508	1.00999	-2.01658	0.38490	-0.13523	-0.11499
87	0.53839	0.96406	1.97497	0.38420	0.12873	-0.15491
SUM	0.05233	1.98613	0.05233	0.76909	-0.00650	-0.26989

Condition **LC55=1.2D+WL90+1.6LLa2**

52	-0.03755	0.01209	0.08607	0.00000	0.00000	0.00000
86	-0.44369	1.01054	-2.03520	0.39248	-0.13168	-0.11429
87	0.54524	0.96350	1.94914	0.37428	0.13332	-0.15756
SUM	0.06400	1.98613	0.00000	0.76676	0.00164	-0.27184

Condition **LC56=1.2D+WL120+1.6LLa2**

52	-0.02340	0.01212	0.05364	0.00000	0.00000	0.00000
86	-0.46227	1.01051	-2.03048	0.39156	-0.13695	-0.12205
87	0.53800	0.96350	1.92450	0.36541	0.12673	-0.15485
SUM	0.05233	1.98613	-0.05233	0.75697	-0.01023	-0.27690

Condition **LC57=1.2D+WL150+1.6LLa2**

52	-0.02638	0.01211	0.06046	0.00000	0.00000	0.00000
86	-0.45407	1.01059	-2.04225	0.39608	-0.13295	-0.11870
87	0.54338	0.96343	1.91886	0.36297	0.13080	-0.15701
SUM	0.06293	1.98613	-0.06293	0.75905	-0.00215	-0.27571

Condition **LC58=1.2D-WL0+1.6LLa2**

52	0.00984	0.01220	-0.02256	0.00000	0.00000	0.00000
86	-0.52091	1.00939	-1.98330	0.37512	-0.15943	-0.14605
87	0.51107	0.96454	1.90286	0.35879	0.10354	-0.14414
SUM	0.00000	1.98613	-0.10300	0.73390	-0.05590	-0.29019

Condition **LC59=1.2D-WL30+1.6LLa2**

52	0.03199	0.01225	-0.07333	0.00000	0.00000	0.00000
86	-0.57399	1.00797	-1.91503	0.34951	-0.18423	-0.16775
87	0.47907	0.96591	1.92543	0.36896	0.07819	-0.13131
SUM	-0.06293	1.98613	-0.06293	0.71847	-0.10604	-0.29905

Condition **LC60=1.2D-WL60+1.6LLa2**

52	0.02513	0.01224	-0.05760	0.00000	0.00000	0.00000
86	-0.56199	1.00824	-1.92469	0.35287	-0.17958	-0.16284
87	0.48454	0.96565	1.92997	0.37035	0.08299	-0.13347
SUM	-0.05233	1.98613	-0.05233	0.72322	-0.09658	-0.29631

Condition **LC61=1.2D-WL90+1.6LLa2**

52	0.02169	0.01223	-0.04973	0.00000	0.00000	0.00000
86	-0.56338	1.00769	-1.90607	0.34528	-0.18314	-0.16354
87	0.47768	0.96621	1.95580	0.38027	0.07840	-0.13083
SUM	-0.06400	1.98613	0.00000	0.72555	-0.10474	-0.29436

Condition **LC62=1.2D-WL120+1.6LLa2**

52	0.00755	0.01219	-0.01731	0.00000	0.00000	0.00000
86	-0.54480	1.00773	-1.91079	0.34621	-0.17786	-0.15577
87	0.48493	0.96621	1.98043	0.38914	0.08499	-0.13353
SUM	-0.05233	1.98613	0.05233	0.73535	-0.09287	-0.28931

Condition **LC63=1.2D-WL150+1.6LLa2**

52	0.01052	0.01220	-0.02412	0.00000	0.00000	0.00000
86	-0.55301	1.00765	-1.89902	0.34169	-0.18186	-0.15913
87	0.47955	0.96628	1.98608	0.39158	0.08091	-0.13137
SUM	-0.06293	1.98613	0.06293	0.73327	-0.10095	-0.29050

Condition **LC64=1.2D+WL0+1.6LLa3**

52	-0.02010	0.01209	0.04604	0.00000	0.00000	0.00000
86	0.61346	1.00920	-1.94003	0.34640	0.19722	0.17336
87	-0.59336	0.96484	1.99700	0.38466	-0.20834	0.16749
SUM	0.00000	1.98613	0.10300	0.73107	-0.01112	0.34086

Condition **LC65=1.2D+WL30+1.6LLa3**

52	-0.04225	0.01200	0.09677	0.00000	0.00000	0.00000
86	0.66652	1.01063	-2.00818	0.37198	0.22191	0.19507
87	-0.56134	0.96350	1.97434	0.37446	-0.18296	0.15467
SUM	0.06293	1.98613	0.06293	0.74644	0.03895	0.34973

Condition **LC66=1.2D+WL60+1.6LLa3**

52	-0.03538	0.01203	0.08105	0.00000	0.00000	0.00000
86	0.65451	1.01035	-1.99854	0.36861	0.21727	0.19015
87	-0.56680	0.96374	1.96982	0.37308	-0.18776	0.15683
SUM	0.05233	1.98613	0.05233	0.74169	0.02951	0.34698

Condition **LC67=1.2D+WL90+1.6LLa3**

52	-0.03194	0.01204	0.07316	0.00000	0.00000	0.00000
86	0.65587	1.01090	-2.01713	0.37619	0.22080	0.19085
87	-0.55993	0.96318	1.94398	0.36316	-0.18312	0.15418
SUM	0.06400	1.98613	0.00000	0.73935	0.03768	0.34503

Condition **LC68=1.2D+WL120+1.6LLa3**

52	-0.01778	0.01210	0.04072	0.00000	0.00000	0.00000
86	0.63727	1.01087	-2.01242	0.37527	0.21553	0.18307
87	-0.56716	0.96315	1.91937	0.35430	-0.18967	0.15689
SUM	0.05233	1.98613	-0.05233	0.72957	0.02586	0.33996

Condition **LC69=1.2D+WL150+1.6LLa3**

52	-0.02075	0.01209	0.04753	0.00000	0.00000	0.00000
86	0.64546	1.01095	-2.02418	0.37978	0.21951	0.18643
87	-0.56178	0.96308	1.91372	0.35186	-0.18558	0.15472
SUM	0.06293	1.98613	-0.06293	0.73164	0.03393	0.34115

Condition **LC70=1.2D-WL0+1.6LLa3**

52	0.01549	0.01224	-0.03549	0.00000	0.00000	0.00000
86	0.57860	1.00975	-1.96533	0.35885	0.19313	0.15906
87	-0.59409	0.96414	1.89782	0.34772	-0.21280	0.16759
SUM	0.00000	1.98613	-0.10300	0.70658	-0.01968	0.32665

Condition **LC71=1.2D-WL30+1.6LLa3**

52	0.03764	0.01233	-0.08623	0.00000	0.00000	0.00000
86	0.52555	1.00832	-1.89718	0.33328	0.16843	0.13736
87	-0.62612	0.96548	1.92048	0.35793	-0.23818	0.18042
SUM	-0.06293	1.98613	-0.06293	0.69121	-0.06975	0.31778

Condition **LC72=1.2D-WL60+1.6LLa3**

52	0.03078	0.01230	-0.07051	0.00000	0.00000	0.00000
86	0.53755	1.00859	-1.90682	0.33664	0.17307	0.14227
87	-0.62066	0.96523	1.92500	0.35931	-0.23338	0.17825
SUM	-0.05233	1.98613	-0.05233	0.69595	-0.06031	0.32052

Condition **LC73=1.2D-WL90+1.6LLa3**

52	0.02733	0.01229	-0.06262	0.00000	0.00000	0.00000
86	0.53619	1.00804	-1.88822	0.32906	0.16954	0.14157
87	-0.62752	0.96580	1.95085	0.36923	-0.23802	0.18090
SUM	-0.06400	1.98613	0.00000	0.69829	-0.06848	0.32248

Condition **LC74=1.2D-WL120+1.6LLa3**

52	0.01318	0.01223	-0.03019	0.00000	0.00000	0.00000
86	0.55479	1.00807	-1.89293	0.32998	0.17480	0.14935
87	-0.62029	0.96582	1.97544	0.37809	-0.23147	0.17820
SUM	-0.05233	1.98613	0.05233	0.70807	-0.05667	0.32755

Condition **LC75=1.2D-WL150+1.6LLa3**

52	0.01615	0.01224	-0.03699	0.00000	0.00000	0.00000
86	0.54660	1.00799	-1.88118	0.32547	0.17082	0.14599
87	-0.62568	0.96589	1.98110	0.38053	-0.23556	0.18036
SUM	-0.06293	1.98613	0.06293	0.70600	-0.06474	0.32636

Condition **LC76=1.2D+WL0+1.6LLa4**

52	-0.03207	0.01194	0.07341	0.00000	0.00000	0.00000
86	1.73252	1.01075	-1.98242	0.38690	0.55931	0.49183
87	-1.70045	0.96343	2.01201	0.41579	-0.64999	0.48528
SUM	0.00000	1.98613	0.10300	0.80268	-0.09068	0.97711

Condition **LC77=1.2D+WL30+1.6LLa4**

52	-0.05428	0.01179	0.12425	0.00000	0.00000	0.00000
86	1.78565	1.01216	-2.05052	0.41246	0.58392	0.51355
87	-1.66843	0.96218	1.98921	0.40551	-0.62457	0.47245
SUM	0.06293	1.98613	0.06293	0.81796	-0.04065	0.98600

Condition **LC78=1.2D+WL60+1.6LLa4**

52	-0.04740	0.01184	0.10850	0.00000	0.00000	0.00000
86	1.77361	1.01190	-2.04088	0.40910	0.57928	0.50863
87	-1.67388	0.96240	1.98471	0.40414	-0.62936	0.47461
SUM	0.05233	1.98613	0.05233	0.81323	-0.05007	0.98324

Condition **LC79=1.2D+WL90+1.6LLa4**

52	-0.04397	0.01186	0.10063	0.00000	0.00000	0.00000
86	1.77498	1.01245	-2.05946	0.41667	0.58278	0.50933
87	-1.66701	0.96182	1.95883	0.39421	-0.62469	0.47196
SUM	0.06400	1.98613	0.00000	0.81088	-0.04191	0.98129

Condition **LC80=1.2D+WL120+1.6LLa4**

52	-0.02978	0.01196	0.06817	0.00000	0.00000	0.00000
86	1.75631	1.01244	-2.05475	0.41574	0.57750	0.50154
87	-1.67420	0.96173	1.93425	0.38538	-0.63121	0.47466
SUM	0.05233	1.98613	-0.05233	0.80112	-0.05370	0.97619

Condition **LC81=1.2D+WL150+1.6LLa4**

52	-0.03277	0.01194	0.07500	0.00000	0.00000	0.00000
86	1.76452	1.01252	-2.06649	0.42025	0.58147	0.50489
87	-1.66882	0.96167	1.92857	0.38293	-0.62711	0.47249
SUM	0.06293	1.98613	-0.06293	0.80318	-0.04564	0.97739

Condition **LC82=1.2D-WL0+1.6LLa4**

52	0.00355	0.01220	-0.00813	0.00000	0.00000	0.00000
86	1.69754	1.01135	-2.00768	0.39932	0.55513	0.47749
87	-1.70110	0.96257	1.91281	0.37888	-0.65433	0.48536
SUM	0.00000	1.98613	-0.10300	0.77821	-0.09920	0.96286

Condition **LC83=1.2D-WL30+1.6LLa4**

52	0.02576	0.01236	-0.05898	0.00000	0.00000	0.00000
86	1.64442	1.00994	-1.93957	0.37376	0.53051	0.45577
87	-1.73312	0.96383	1.93561	0.38916	-0.67975	0.49820
SUM	-0.06293	1.98613	-0.06293	0.76293	-0.14924	0.95397

Condition **LC84=1.2D-WL60+1.6LLa4**

52	0.01889	0.01231	-0.04324	0.00000	0.00000	0.00000
86	1.65645	1.01021	-1.94920	0.37712	0.53515	0.46069
87	-1.72766	0.96361	1.94011	0.39053	-0.67496	0.49603
SUM	-0.05233	1.98613	-0.05233	0.76765	-0.13981	0.95672

Condition **LC85=1.2D-WL90+1.6LLa4**

52	0.01545	0.01229	-0.03537	0.00000	0.00000	0.00000
86	1.65508	1.00965	-1.93062	0.36955	0.53164	0.45999
87	-1.73453	0.96419	1.96599	0.40046	-0.67963	0.49868
SUM	-0.06400	1.98613	0.00000	0.77001	-0.14798	0.95867

Condition **LC86=1.2D-WL120+1.6LLa4**

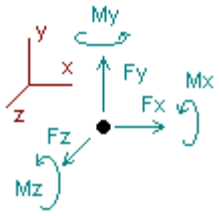
52	0.00127	0.01218	-0.00291	0.00000	0.00000	0.00000
86	1.67375	1.00966	-1.93533	0.37047	0.53693	0.46778
87	-1.72734	0.96428	1.99057	0.40929	-0.67312	0.49598
SUM	-0.05233	1.98613	0.05233	0.77976	-0.13619	0.96377

Condition **LC87=1.2D-WL150+1.6LLa4**

52	0.00425	0.01221	-0.00973	0.00000	0.00000	0.00000
86	1.66554	1.00958	-1.92359	0.36597	0.53296	0.46443
87	-1.73272	0.96434	1.99625	0.41174	-0.67721	0.49815
SUM	-0.06293	1.98613	0.06293	0.77771	-0.14426	0.96257

Envelope for nodal reactions

Note.- **Ic** is the controlling load condition



Direction of positive forces and moments

Envelope of nodal reactions for :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120

LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+WL0+1.6LLa1
LC41=1.2D+WL30+1.6LLa1
LC42=1.2D+WL60+1.6LLa1
LC43=1.2D+WL90+1.6LLa1
LC44=1.2D+WL120+1.6LLa1
LC45=1.2D+WL150+1.6LLa1
LC46=1.2D-WL0+1.6LLa1
LC47=1.2D-WL30+1.6LLa1
LC48=1.2D-WL60+1.6LLa1
LC49=1.2D-WL90+1.6LLa1
LC50=1.2D-WL120+1.6LLa1
LC51=1.2D-WL150+1.6LLa1
LC52=1.2D+WL0+1.6LLa2
LC53=1.2D+WL30+1.6LLa2
LC54=1.2D+WL60+1.6LLa2
LC55=1.2D+WL90+1.6LLa2
LC56=1.2D+WL120+1.6LLa2
LC57=1.2D+WL150+1.6LLa2
LC58=1.2D-WL0+1.6LLa2
LC59=1.2D-WL30+1.6LLa2
LC60=1.2D-WL60+1.6LLa2
LC61=1.2D-WL90+1.6LLa2
LC62=1.2D-WL120+1.6LLa2
LC63=1.2D-WL150+1.6LLa2
LC64=1.2D+WL0+1.6LLa3
LC65=1.2D+WL30+1.6LLa3
LC66=1.2D+WL60+1.6LLa3
LC67=1.2D+WL90+1.6LLa3
LC68=1.2D+WL120+1.6LLa3
LC69=1.2D+WL150+1.6LLa3
LC70=1.2D-WL0+1.6LLa3
LC71=1.2D-WL30+1.6LLa3
LC72=1.2D-WL60+1.6LLa3
LC73=1.2D-WL90+1.6LLa3
LC74=1.2D-WL120+1.6LLa3
LC75=1.2D-WL150+1.6LLa3
LC76=1.2D+WL0+1.6LLa4
LC77=1.2D+WL30+1.6LLa4
LC78=1.2D+WL60+1.6LLa4
LC79=1.2D+WL90+1.6LLa4
LC80=1.2D+WL120+1.6LLa4
LC81=1.2D+WL150+1.6LLa4
LC82=1.2D-WL0+1.6LLa4
LC83=1.2D-WL30+1.6LLa4
LC84=1.2D-WL60+1.6LLa4
LC85=1.2D-WL90+1.6LLa4
LC86=1.2D-WL120+1.6LLa4
LC87=1.2D-WL150+1.6LLa4

Node		Forces						Moments					
		Fx [Kip]	**lc**	**Fy** [Kip]	**lc**	**Fz** [Kip]	**lc**	**Mx** [Kip*ft]	**lc**	**My** [Kip*ft]	**lc**	**Mz** [Kip*ft]	**lc**
52	Max	0.687	LC21	0.040	LC32	1.657	LC3	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.697	LC3	0.008	LC15	-1.639	LC21	0.00000	LC1	0.00000	LC1	0.00000	LC1
86	Max	1.798	LC4	1.483	LC30	0.860	LC24	0.85670	LC6	0.73529	LC4	0.69962	LC4
	Min	-1.258	LC22	0.402	LC24	-3.041	LC30	-0.49685	LC24	-0.56191	LC22	-0.54666	LC22
87	Max	1.126	LC43	1.409	LC36	2.934	LC25	0.64980	LC1	0.55967	LC16	0.49868	LC85
	Min	-1.735	LC85	0.388	LC18	-0.320	LC19	-0.28161	LC19	-0.78366	LC10	-0.32340	LC43

HUDSON
Design Group LLC

Connection Check

Date: 1/20/2022
Project Name: VERNON CENTER
Project No.: CT5310
Designed By: KSBM **Checked By:** MSC

HUDSON Design Group LLC

CHECK CONNECTION CAPACITY (Worst Case)

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

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

Allowable Tensile Load =

F_{Tall} = 6673 lbs.

Allowable Shear Load =

F_{Vall} = 4004 lbs.

TENSILE FORCES

Reaction **F =** 3041 lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 1798 lbs. (See Bentley Output)
Reactions in Y direction: 1483 lbs. (See Bentley Output)

Resultant: 2331 lbs.

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

Tension Design Load /Bolts =

f_t = 1520.50 lbs. < 6673 lbs. **Therefore, OK !**

Shear Design Load / Bolts=

f_v = 1165.34 lbs. < 4004 lbs. **Therefore, OK !**

CHECK COMBINED TENSION AND SHEAR

f_t / F_T	+	f_v / F_V	≤	1.0			
0.228	+	0.291	=	0.519	<	1.0	**Therefore, OK !**

Tax ID 30-0133-0005G Printed 11/28/2020 Card No. 1 of 1

INDUSTRIAL PARK ROAD LLC
75 GERBER ROAD EAST
SOUTH WINDSOR, CT 06074
CENSUS TRACT: 530600

Neighborhood Number
12100
Neighborhood Name
General Commercial
TAXING DISTRICT INFORMATION

Jurisdiction Name	Town of Vernon
Area	146
Routing Number	5044

Site Description

Topography

Public Utilities
Water, Sewer, Gas, Electric
Street or Road
Paved
Neighborhood

Zoning:
Industrial
Legal Acres:
5.3340

Transfer of Ownership

Owner	Consideration	Transfer Date	Deed Type	Deed Book	Page
DJV REAL ESTATE LLC	0	03/22/2018	W	2546	253
LILYMAXJACK LLC	700000	10/30/2017	W	2529	193
BEAUREGARD GEORGE W	0	07/05/2005	Q	1744	267
BEAUREGARD GEORGE W & KAREN S	0	07/05/2005	Q	1744	264
BEAUREGARD KAREN S & GEORGE W	0	03/07/2000	Q	1244	40
BEAUREGARD GEORGE W	0	04/13/1999	Q	1200	11

Valuation Record

Assessment Year		2011	2016	2017	2018				
Reason for Change		2011 REVAL	2016 Reval	BAA	2018 ASMT				
Market	L	313380	245720	245720	245720				
	I	668250	1449820	754280	574280				
	T	981630	1695540	1000000	820000				
70% Assessed/Use	L	219370	172000	172000	172000				
	I	467770	1014880	528000	401990				
	T	687140	1186880	700000	573990				

Land Size

Land Type	Rating, Soil ID - or - Actual Frontage	Acreage - or - Effective Frontage	Square Feet - or - Effective Depth	Influence Factor

Tax ID 30-0133-0005G Printed 11/28/2020

Physical Characteristics

ROOFING

Built-up
Insulation

WALLS

	B	1	2	U
Frame		Yes		
Guard	Yes	Yes	Yes	Yes

FRAMING

	B	1	2	U
F Res	0	34908	0	4000

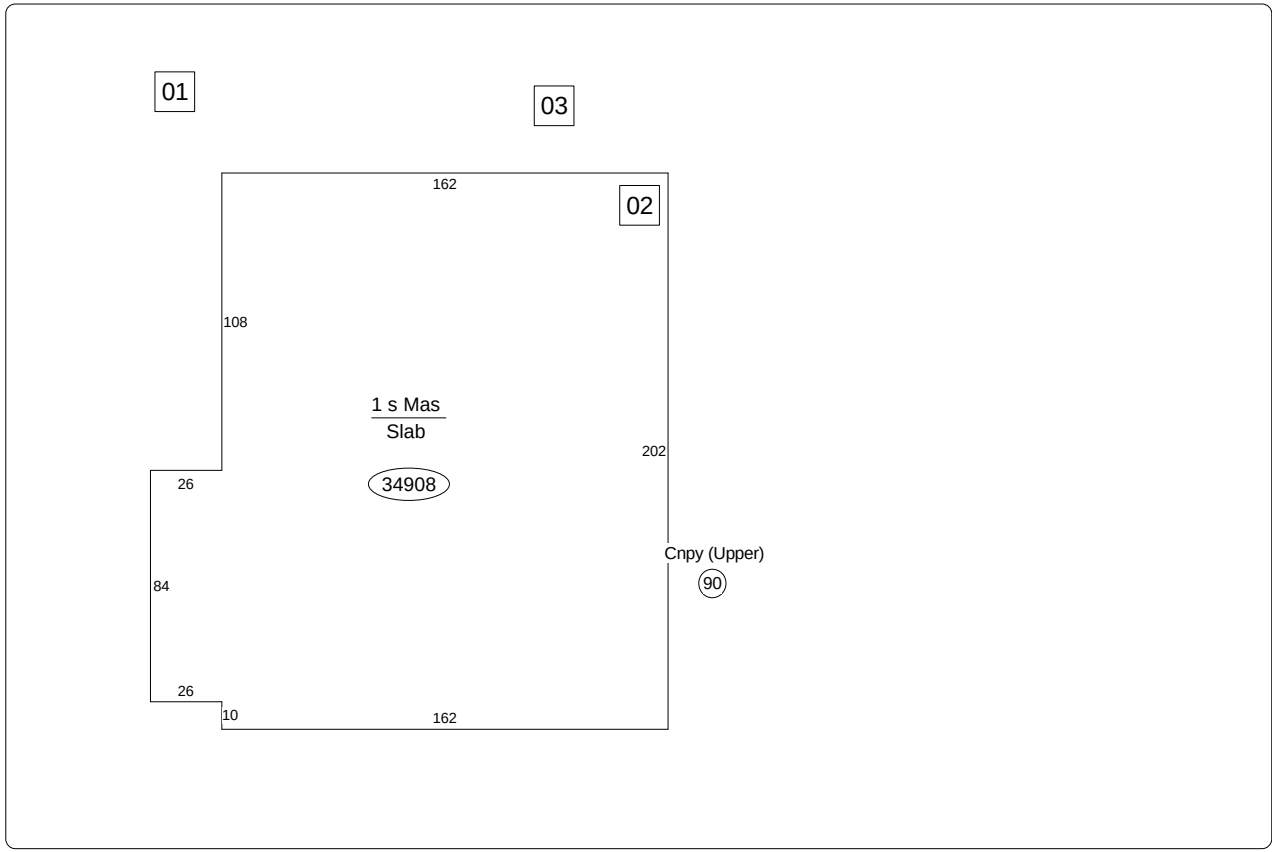
FINISH

	UF	SF	FO	FD
1	34908	0	0	0
U	4000	0	0	0
Total	38908	0	0	0

HEATING AND AIR CONDITIONING

	B	1	2	U
Heat	0	34908	0	4000
Sprink	0	34908	0	4000

PLUMBING	Residential		Commercial	
	#	TF	#	TF
Full Baths				
Half Baths			3	6
Extra Fixtures				
TOTAL		0		6



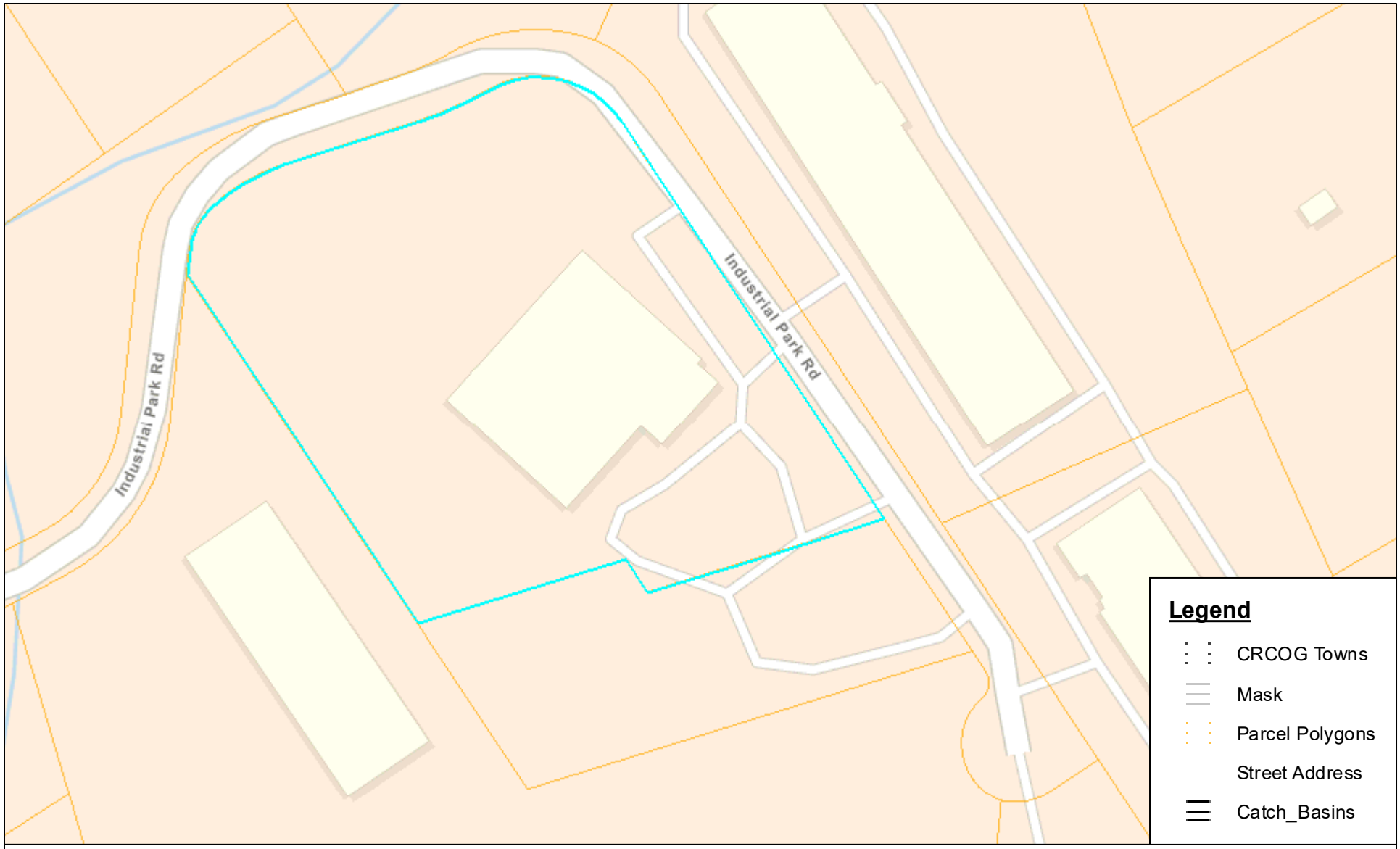
Special Features

Description

Summary of Improvements

ID	USE	Story Height	Const Type	Grade	Year Cons	Eff Year	Cond	Size or Area
C	LMFG	0.00		Fair	1968	1970	FR	34908
01	PAVING	0.00	85	Avg	1968	1968	AV	23800
02	MEZZSF	1.00		Fair	1968	1968	AV	4000
03	TOWERMON	0.00		Avg	2000	2000	AV	380

ArcGIS Web Map



N
W E
S

CRCOG CAPITOL REGION COUNCIL OF GOVERNMENTS
Working together for a better region.

Scale
1:2,257
Created: 3/29/2022

Town of Vernon, Conn.

BUILDING PERMIT and CERTIFICATE OF ZONING COMPLIANCE

№ 29885

ESTIMATED COST

Structual $ 95,000.00

Plumbing

Heating

Wiring

FINAL COST: $

FEE $ 950.00

March 8 19 2000

APPLICANT'S PERMIT

Permission is hereby granted to Omnipoint Communications

To installation of telecommunications tower

on the side of No. 60 Industrial Park Road Owner: Beauregard

Class		Size			Air Condition
Type				Heating	Oil Burner
Foundations		Porch	X		Cement
Ext. Walls				Basement	Earth
Roof				Plumbing	
Roofing				Bath	Lavatory
Interior		Ceiling Height		Fire Places	
No. of Rooms	1st Floor		2nd Floor	Weatherstrip	Insulation
Floors				Attach. Garage	Cement
Flooring				Interior Finish	
Joists				Breezeway	X

This permit expires six (6) months from the above date.

All building permits are approved subject to field inspection.

BUILDING DEPARTMENT, TOWN OF VERNON, CONN.

Glenn F. Bolles

Building Official/ Zoning Enforcement Officer

APPLICATION FOR BUILDING PERMIT

(Continued from the other side)

9. Size of building _____ (No of stories) Height 175' Depth _____ Front _____

10. Material of footing _____ Depth below grade _____ Width _____ Thickness _____

11. Material of foundation _____ Below Grade (DEPTH) _____ (Thickness)_____
Above Grade (HEIGHT) _____ (Thickness)_____

12. Material of chimney _____ Foundation_____ Height_____ Width_____ Depth_____

13. No. of flues _____ Size_____ Thickness of lining_____ City Sewer_____ Septic Tank_____

14. MASONRY CONSTRUCTION

	Front Wall	Side Wall	Rear Wall	Partition Wall	Veneer
Basement					
1st Story					
2nd Story					

15. WOOD CONSTRUCTION

		Joists			Girders			Columns or Piers			
Floors	Size	Longest Span	Centers	Bridging	Size	Longest Span	Centers	Size	Length	Centers	Footing
1st											
2nd											

16. Size of sill _____ Size of outside studs _____ Distance on centers _____

17. Size studs of bearing partitions _____ Centers_____ Are joists doubled under partitions?____

18. Size of plate_____ Size of headers_____ Will firestops be provided?_____

19. Size of rafters_____ Distances on centers_____ Size of hip or valley rafter_____

20. Species and grade of framing _____
Type and grade of sheathing _____

21. Further Details Installation of a telecommunications monopole with antennas and an associated equipment compound

Call Before You Dig #: _____

22. ***All work covered by this application has been authorized by the (owner) or (agent) of this property and will be done according to approved plans and all local codes and regulations. Notice must be given to the Building Department when job is ready for inspection and when job is completed.***

25 February, 2020
DATE

J. Brendan Shanley
APPLICANT

Print name under signature J. Brendan Shanley, Attorney for Omnipoint Communications, Inc.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square, New Britain, CT 06051
Phone: (860) 827-2935 Fax: (860) 827-2950
E-Mail: siting.council@po.state.ct.us
Web Site: www.state.ct.us/csc/index.htm

June 5, 2002

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

RE: **EM-AT&T-146-020521** - AT&T Wireless notice of intent to modify an existing telecommunications facility located at 60 Industrial Park Road, Vernon, Connecticut.

Dear Attorney Fisher:

At a public meeting held on June 3, 2002, the Connecticut Siting Council (Council) acknowledged your notice to modify this existing telecommunications facility, pursuant to Section 16-50j-73 of the Regulations of Connecticut State Agencies.

The proposed modifications are to be implemented as specified here and in your notice received May 21, 2002. The modifications are in compliance with the exception criteria in Section 16-50j-72 (b) of the Regulations of Connecticut State Agencies as changes to an existing facility site that would not increase tower height, extend the boundaries of the tower site, increase noise levels at the tower site boundary by six decibels, and increase the total radio frequencies electromagnetic radiation power density measured at the tower site boundary to or above the standard adopted by the State Department of Environmental Protection pursuant to General Statutes § 22a-162. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

This decision is under the exclusive jurisdiction of the Council. Any additional change to this facility will require explicit notice to this agency pursuant to Regulations of Connecticut State Agencies Section 16-50j-73. Such notice shall include 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. Any deviation from this format may result in the Council implementing enforcement proceedings pursuant to General Statutes § 16-50u including, without limitation, imposition of expenses resulting from such failure and of civil penalties in an amount not less than one thousand dollars per day for each day of construction or operation in material violation.

Thank you for your attention and cooperation.

Very truly yours,

Mortimer A. Gelston
Chairman

MAG/DM/laf

c: Honorable Diane Wheelock, Mayor, Town of Vernon
Gene F. Bolles, Zoning Enforcement Officer, Town of Vernon
Millenicom, Inc.
Thomas F. Flynn III, Nextel Communications
Sandy M. Carter, Verizon Wireless
Stephen J. Humes, Esq., LeBoeuf, Lamb, Greene & MacRae

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PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 04/02/22
Ref#: CT5310
0006

C025

SHIP TO: HON. DANIEL A CHAMPAGNE, MAYOR
VERNON TOWN HALL
14 PARK PL # 3
VERNON CT 06066-3291

USPS TRACKING #

9405 5036 9930 0206 4112 72

Electronic Rate Approved #038555749

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03/30/2022 Mailed from 03079

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 04/02/22
Ref#: CT5310
0006

C025

SHIP TO: MR. GEORGE MCGREGOR, TOWN PLANNER
TOWN OF VERNON
55 W MAIN ST
2
VERNON CT 06066-3504

USPS TRACKING #

9405 5036 9930 0206 4112 89

Electronic Rate Approved #038555749

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9405 5036 9930 0206 4113 19 0089 5000 0020 6074

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03/30/2022 Mailed from 03079

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 04/02/22
Ref#: CT5310
0006

C004

SHIP TO:

INDUSTRIAL PARK ROAD LLC
75 GERBER RD E
SOUTH WINDSOR CT 06074-3202

USPS TRACKING #

9405 5036 9930 0206 4113 19

Electronic Rate Approved #038555749

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US POSTAGE
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9405 5036 9930 0206 4113 33 0089 5000 0020 6066

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03/30/2022 Mailed from 03079

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 04/02/22
Ref#: CT5310
0006

R006

SHIP TO:

MILLENICOM LLC
60 INDUSTRIAL PARK RD
VERNON CT 06066-5523

USPS TRACKING #

9405 5036 9930 0206 4113 33

Electronic Rate Approved #038555749

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Legal Flat Rt Env

9405 5036 9930 0206 4113 57 0092 5000 0020 6051

U.S. POSTAGE PAID
Click-N-Ship®

03/30/2022 Mailed from 03079

PRIORITY MAIL 2-DAY™

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

Expected Delivery Date: 04/02/22
Ref#: CT5310
0006

C006

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

USPS TRACKING #

9405 5036 9930 0206 4113 57

Electronic Rate Approved #038555749

Cut on dotted line.

From: auto-reply@usps.com
Sent: Wednesday, March 30, 2022 9:57 AM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, March 31, 2022 arriving by 9:00pm 9405503699300206411272

UNITED STATES POSTAL SERVICE®

Hello **HOLLIS M REDDING**,

Your item was accepted at 9:46 am on March 30, 2022 in MERIDEN, CT 06450.

Tracking Number: **9405503699300206411272**

Expected Delivery By

Thurs
31
Mar

By 9:00pm

Tracking & Delivery Options

My Account

Visit USPS Tracking® to check the most up-to-date status of your package. Sign up for Informed Delivery® to digitally preview the address side of your incoming letter-sized mail and manage your packages scheduled to arrive soon! To update how frequently you receive emails from USPS, log in to your USPS.com account.

From: auto-reply@usps.com
Sent: Wednesday, March 30, 2022 9:57 AM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, March 31, 2022 arriving by 9:00pm 9405503699300206411289

UNITED STATES POSTAL SERVICE®

Hello **HOLLIS M REDDING**,

Your item was accepted at 9:46 am on March 30, 2022 in MERIDEN, CT 06450.

Tracking Number: **9405503699300206411289**

Expected Delivery By

Thurs
31
Mar

By 9:00pm

Tracking & Delivery Options

My Account

Visit USPS Tracking® to check the most up-to-date status of your package. Sign up for Informed Delivery® to digitally preview the address side of your incoming letter-sized mail and manage your packages scheduled to arrive soon! To update how frequently you receive emails from USPS, log in to your USPS.com account.

Hollis Redding Property Owner

From: auto-reply@usps.com
Sent: Wednesday, March 30, 2022 9:57 AM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, March 31, 2022 arriving by 9:00pm 9405503699300206411319

UNITED STATES POSTAL SERVICE®

Hello **HOLLIS M REDDING**,

Your item was accepted at 9:46 am on March 30, 2022 in MERIDEN, CT 06450.

Tracking Number: **9405503699300206411319**

Expected Delivery By

Thurs
31
Mar

By 9:00pm

Tracking & Delivery Options

My Account

Visit USPS Tracking® to check the most up-to-date status of your package. Sign up for Informed Delivery® to digitally preview the address side of your incoming letter-sized mail and manage your packages scheduled to arrive soon! To update how frequently you receive emails from USPS, log in to your USPS.com account.

Hollis Redding Tower Owner

From: auto-reply@usps.com
Sent: Wednesday, March 30, 2022 9:57 AM
To: Hollis Redding
Subject: USPS® Expected Delivery by Thursday, March 31, 2022 arriving by 9:00pm 9405503699300206411333

UNITED STATES POSTAL SERVICE®

Hello **HOLLIS M REDDING**,

Your item was accepted at 9:46 am on March 30, 2022 in MERIDEN, CT 06450.

Tracking Number: **9405503699300206411333**

Expected Delivery By

Thurs
31
Mar

By 9:00pm

Tracking & Delivery Options

My Account

Visit USPS Tracking® to check the most up-to-date status of your package. Sign up for Informed Delivery® to digitally preview the address side of your incoming letter-sized mail and manage your packages scheduled to arrive soon! To update how frequently you receive emails from USPS, log in to your USPS.com account.