



March 16, 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 CT1270
51 Daniels Avenue, Waterford, CT 06385 (the "Property")
Latitude: 41.3305556 N Longitude: 72.1669444 W

Dear Ms. Bachman:

AT&T currently maintains (12) antennas at the 170-foot level on the existing 180-foot self-support tower ("Tower") at 51 Daniels Avenue, Waterford, CT. The Tower is owned by SBA Towers and the property is owned by the Town of Waterford. AT&T intends to modify its facility by removing (9) antennas and adding (3) AIR6449 N77D antennas at the 168'3" level, (3) DMP65R-BU4DA antennas at the 170' level, and (3) AIR6419 N77G antennas at the 171'8" level of the tower. The AIR6419 N77G & AIR6649 N77D antennas are stacked one on top of the other. AT&T also plans on swapping (6) RRUs with (3) 4449 B5/B12 and (3) 4415 B25 RRUs. The height of AT&T's existing antennas & RRUs is 170' and the proposed antennas is 168'3", 170' and 171'10" and proposed RRUs is 170' level on the Tower.

This modification includes B2, B5, 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 Waterford Planning & Zoning Commission granted Special Permit #PZ2008-033, approving the Tower on November 24, 2008. This approval contained no conditions that could feasibly be violated by this modification, including facility height or mounting restrictions. AT&T's modification complies with the above-mentioned approval.

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. Robert J. Brule, First Selectman, Town of Waterford, chief elected official & property owner, Ms. Abby Y. Piersall, AICP, Planning Director, Town of Waterford, and SBA Towers, 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. Robert J. Brule, First Selectman, chief elected official & property owner, Town of Waterford
Ms. Abby Y. Piersall, AICP, Planning Director, Town of Waterford
SBA Towers, the tower owner

Calculated Radio Frequency Exposure



CT1270

51 Daniels Avenue, Waterford, CT

March 15, 2022

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1. Introduction

The purpose of this report is to investigate compliance with applicable FCC regulations for the proposed modification of the AT&T antenna arrays on an existing tower located at 51 Daniels Avenue in Waterford, CT. The coordinates of the proposed tower are 41° 19' 50" N, 73° 10' 01" W.

AT&T is proposing the following:

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

This report considers the planned antenna configuration for AT&T¹ 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/cm²). 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 10/6/2021.

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:

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

Where:

ERP = Effective Radiated Power

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

H = Horizontal Distance from antenna

V = Vertical Distance from radiation center of antenna

Ground reflection factor of 1.6

Off Beam Loss is determined by the selected antenna pattern

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

4. Calculation Results

Table 1 below outlines the cumulative power density information for the 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
DISH	150	600	4	224	0.0155	0.4000	0.39%
DISH	150	1900	4	543	0.0377	1.0000	0.38%
DISH	150	2190	4	543	0.0377	1.0000	0.38%
Verizon	140	1970	11	408	0.0899	1.0000	0.90%
Verizon	140	869	9	416	0.0750	0.5793	1.29%
Verizon	140	746	1	1663	0.0333	0.4973	0.67%
Verizon	140	2145	1	4991	0.1000	1.0000	1.00%
T-Mobile	160	2100	2	1504	0.0456	1.0000	0.46%
T-Mobile	160	1900	1	960	0.0500	1.0000	0.50%
T-Mobile	160	1900	1	360	0.0055	1.0000	0.05%
T-Mobile	160	600	2	789	0.0239	0.4000	0.60%
T-Mobile	160	700	2	433	0.0131	0.4667	0.28%
AT&T	170	739	1	1816	0.0024	0.4927	0.49%
AT&T	170	763	1	2878	0.0038	0.5087	0.76%
AT&T	170	885	1	1946	0.0026	0.5900	0.44%
AT&T	170	1900	2	3883	0.0104	1.0000	1.04%
AT&T	170	2100	3	5960	0.0239	1.0000	2.39%
AT&T	170	2300	1	6153	0.0082	1.0000	0.82%
AT&T	168.25	3500	1	24286	0.0332	1.0000	3.32%
AT&T	171.83	3500	1	24286	0.0318	1.0000	3.18%
						Total	19.33%

Table 1: Carrier Information²

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 DISH, 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 **19.33% 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 15, 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 Exposure³

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 Exposure⁴

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

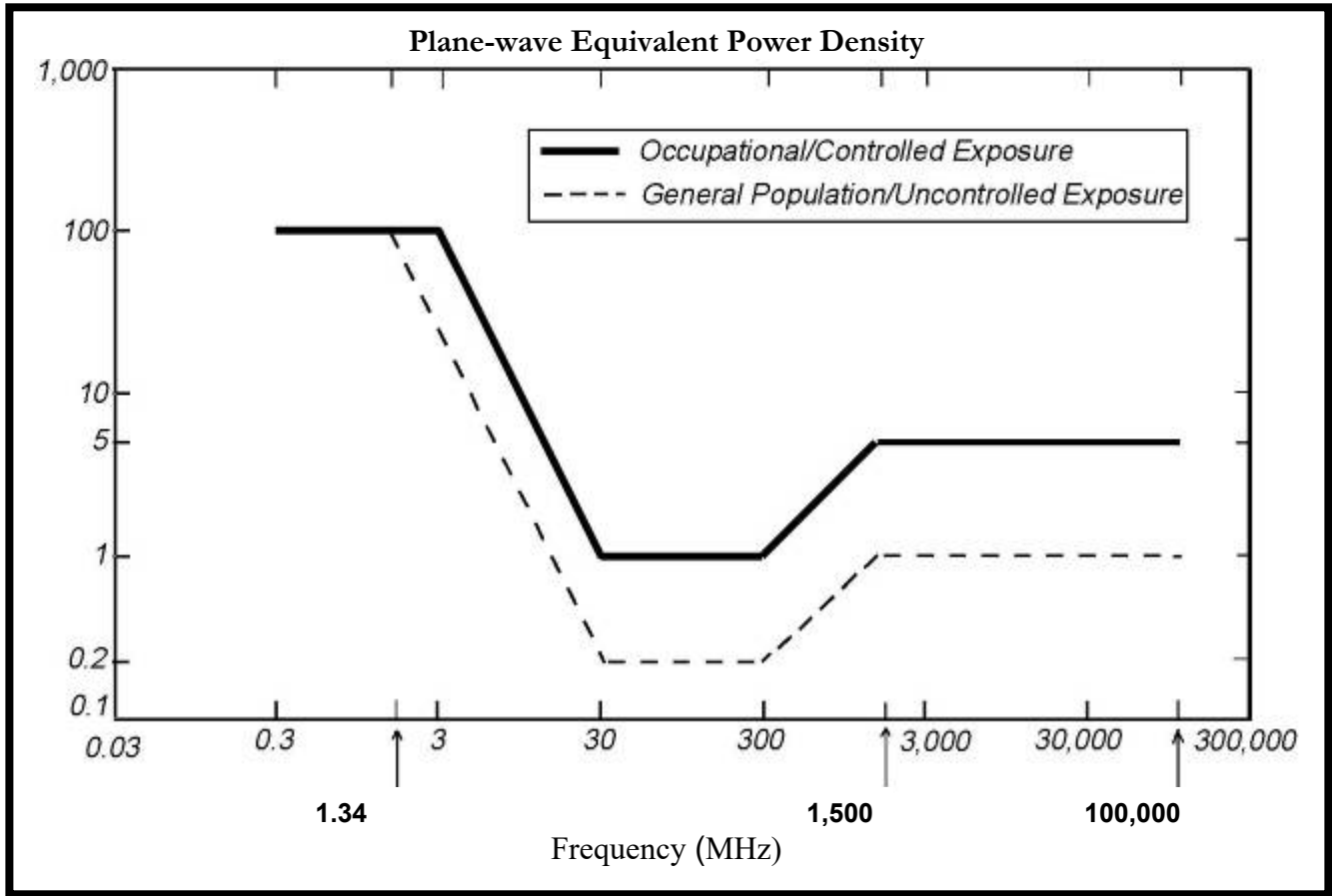
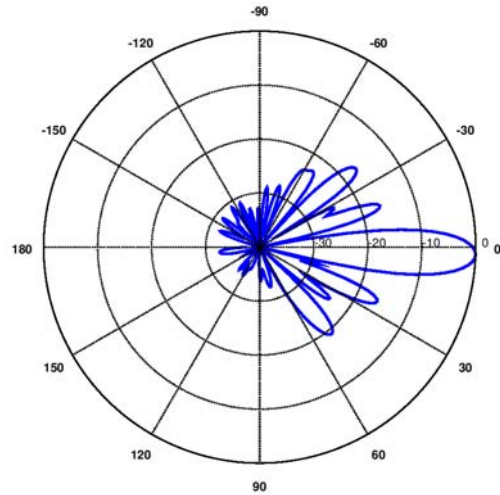


Figure 1: Graph of FCC Limits for Maximum Permissible Exposure (MPE)

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

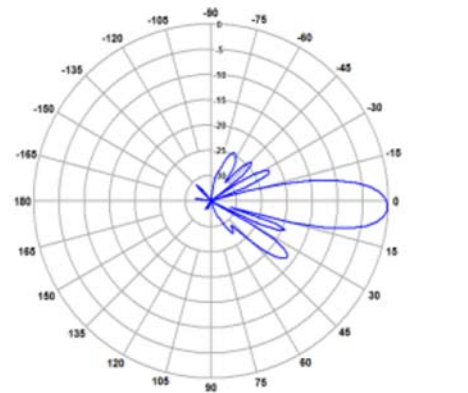
739 MHz

Manufacturer: CCI Products
 Model #: DMP65R-BU8D
 Frequency Band: 698-798 MHz
 Gain: 15.1 dBi
 Vertical Beamwidth: 9.5°
 Horizontal Beamwidth: 75°
 Polarization: Dual Linear 45°
 Size L x W x D: 96.0" x 20.7" x 7.7"



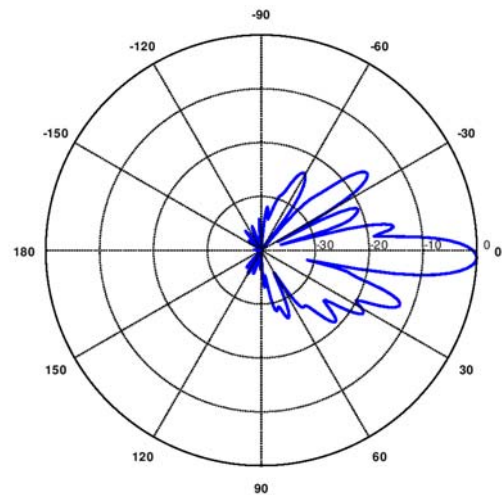
763 MHz

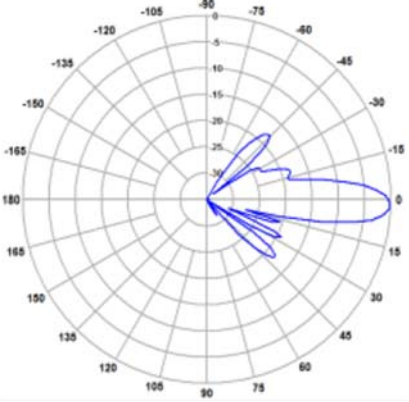
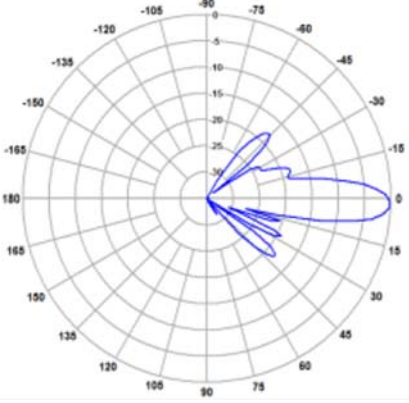
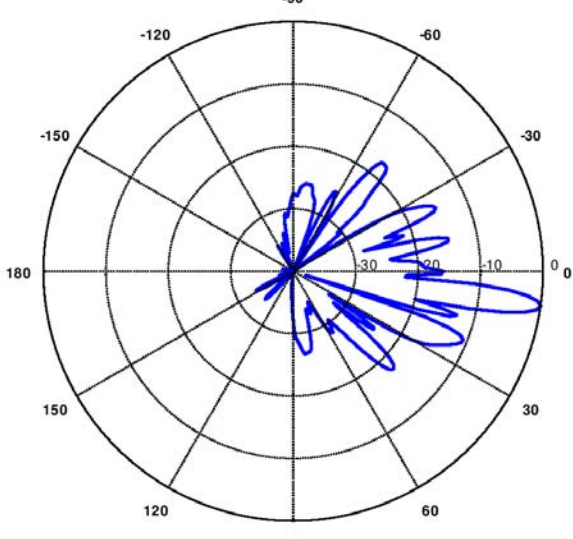
Manufacturer: KMW
 Model #: EPBQ-654L8H6
 Frequency Band: 698 - 806MHz
 Gain: dBi
 Vertical Beamwidth: 12.6°
 Horizontal Beamwidth: 66°
 Polarization: Dual Linear 45°
 Size L x W x D: 73" x 21" x 6.3"



885 MHz

Manufacturer: CCI Products
 Model #: DMP65R-BU8D
 Frequency Band: 824 - 896 MHz
 Gain: 16.0 dBi
 Vertical Beamwidth: 8.0°
 Horizontal Beamwidth: 64°
 Polarization: Dual Linear 45°
 Size L x W x D: 96.0" x 20.7" x 7.7"



<p>1900 MHz</p> <p>Manufacturer: KMW Model #: EPBQ-654L8H6 Frequency Band: 1920-2180 MHz Gain: 16.1 dBi Vertical Beamwidth: 9.5° Horizontal Beamwidth: 62° Polarization: Dual Linear 45° Size L x W x D: 73" x 21" x 6.3"</p>	
<p>2100 MHz</p> <p>Manufacturer: KMW Model #: EPBQ-654L8H6 Frequency Band: 1920-2180 MHz Gain: 16.1 dBi Vertical Beamwidth: 9.5° Horizontal Beamwidth: 62° Polarization: Dual Linear 45° Size L x W x D: 73" x 21" x 6.3"</p>	
<p>2300 MHz</p> <p>Manufacturer: CCI Products Model #: DMP65R-BU8D Frequency Band: 2300 - 2400 MHz Gain: 18.1 dBi Vertical Beamwidth: 4.1° Horizontal Beamwidth: 54° Polarization: Dual Linear 45° Size L x W x D: 96.0" x 20.7" x 7.7"</p>	

PROJECT INFORMATION

SCOPE OF WORK: ITEMS TO BE MOUNTED ON THE EXISTING SELF SUPPORT:

- NEW AT&T ANTENNAS: AIR6419 B77G (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: AIR6449 B77 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: DMP65R-BU4DA (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: EPBQ-654L8H6-L2 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- NEW AT&T RRUS: 4449 B5/B12 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 4415 B25 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: 32 B30 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 4).
- EXISTING AT&T RRUS: 32 B66A (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- EXISTING AT&T RRUS: 4478 B14 (TYP. OF 1 PER SECTOR, TOTAL OF 3) (TO BE RELOCATED TO POS. 2).
- NEW AT&T DC & FIBER SURGE ARRESTOR DC9-48-60-24-PC16-EV (TOTAL OF 1) WITH (1) DC POWER & (1) FIBER RUN.
- ADD (3) Y-CABLES.
- PROPOSED MOUNT MODS (SEE S-1 SHEET).

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:

- ADD (1) 6648 FHG + XCEDE CABLE

ITEMS TO BE REMOVED:

- EXISTING AT&T ANTENNAS: 7770 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: SBNHH-1D65A (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: AM-X-CD-14-65-00T-RET (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: 11 B2 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T RRUS: 11 B12 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T TMA'S: TT19-08BP111-001 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T DIPLEXER: LGP21901 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T SURGE ARRESTOR: DC6-48-60-08 (TOTAL OF 1).

ITEMS TO REMAIN:

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

SITE ADDRESS: 51 DANIELS AVE
WATERFORD, CT 06385

LATITUDE: 41.3305556° N, 41° 19' 50" N
LONGITUDE: 72.1669444° W, 72° 10' 01" W
TYPE OF SITE: SELF SUPPORT / INDOOR EQUIPMENT
STRUCTURE HEIGHT: 180'-0"±
RAD CENTER: 170'-0"± (LTE), 168'-3"± (DOD) & 171'-10"± (C-BAND)
CURRENT USE: TELECOMMUNICATIONS FACILITY
PROPOSED USE: TELECOMMUNICATIONS FACILITY



SITE NUMBER: CT1270

SITE NAME: WATERFORD DANIELS AVE

FA CODE: 10133917

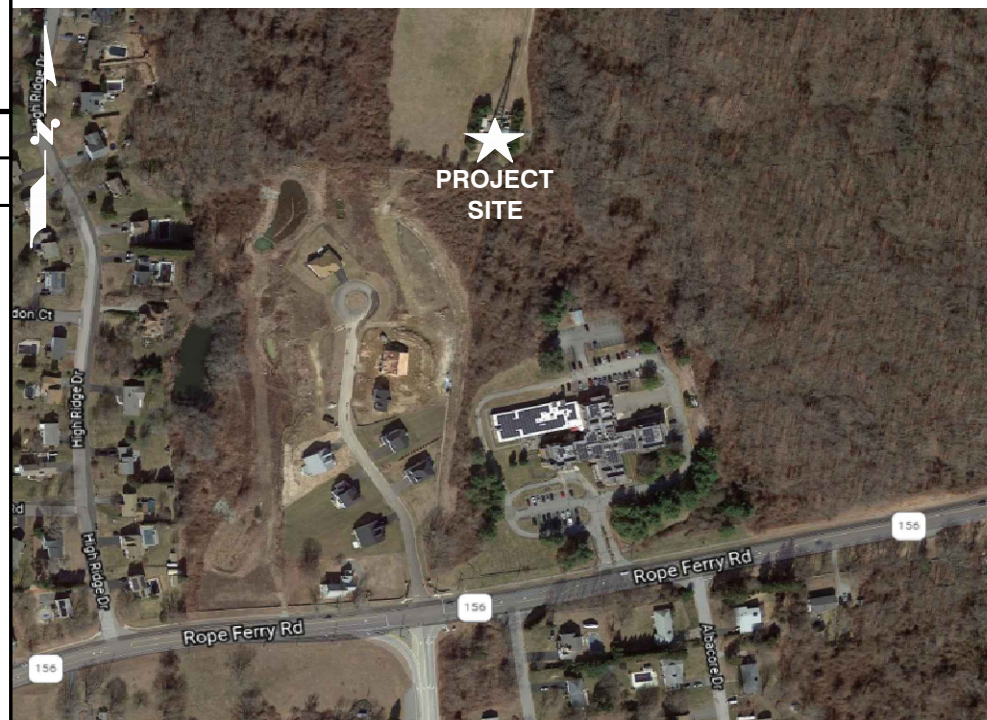
PACE ID: MRCTB055653, MRCTB056298, MRCTB055648, MRCTB054306, MRCTB055320, MRCTB055030, MRCTB053906

PROJECT: 5G NR 1SR C-BAND_BBU ADD_5G NG UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:

FROM ROCKY HILL, CT: HEAD NORTHEAST ON ENTERPRISE DR TOWARD CAPITAL BLVD. 0.3 MILES. TURN LEFT AT CAPITAL BLVD. 0.3 MILES. TURN LEFT AT WEST ST. 0.3 MILES. TURN LEFT TO MERGE ONTO I-91 S TOWARD NEW HAVEN. 1.5 MILES. TAKE EXIT 22S ON THE LEFT TO MERGE ONTO CT-9 S TOWARD MIDDLETOWN/OLD SAYBROOK. 5.8 MILES. CONTINUE ONTO CT-17 S. 0.5 MILES. CONTINUE ONTO CT-9 S. 22.9 MILES. TAKE THE EXIT ONTO I-95 N/US-1 N TOWARD NEW LON/PROVIDENCE. CONTINUE TO FOLLOW I-95 N. 10.1 MILES. TAKE EXIT 75 FOR US-1 TOWARD WATERFORD. 0.2 MILES. SLIGHT RIGHT AT US-1 N/BOSTON POST RD. 1.6 MILES. TURN RIGHT AT NIANTIC RIVER RD. 1.7 MILES. TURN LEFT AT DANIELS AVE. DESTINATION WILL BE ON THE RIGHT. 0.3 MILES.



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.

DRAWING INDEX

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

72 HOURS



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

UNDERGROUND SERVICE ALERT

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

SAI
12 INDUSTRIAL WAY SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: WATERFORD DANIELS AVE

51 DANIELS AVE
WATERFORD, CT 06385
NEW LONDON COUNTY

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

1		03/09/22	ISSUED FOR CONSTRUCTION	HC	HC	DPA	No. 22118	AT&T	
A		02/07/22	ISSUED FOR REVIEW	SS	SS	SS		TITLE SHEET	
NO.	DATE	REVISIONS		BY	CHK	APP	5G NR 1SR C-BAND_BBU ADD_5G NG UPGRADE		
SCALE: AS SHOWN		DESIGNED BY: HC		DRAWN BY: SS		SITE NUMBER		DRAWING NUMBER	
						CT1270		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) LIGHTNING 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		RADIATION CENTER LINE	VIF	VERIFY IN FIELD
EGR	EQUIPMENT GROUND RING		SEE REFERENCE		

HG HUDSON Design Group LLC
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SAI
 12 INDUSTRIAL WAY SALEM, NH 03079

**SITE NUMBER: CT1270
 SITE NAME: WATERFORD DANIELS AVE**

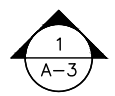
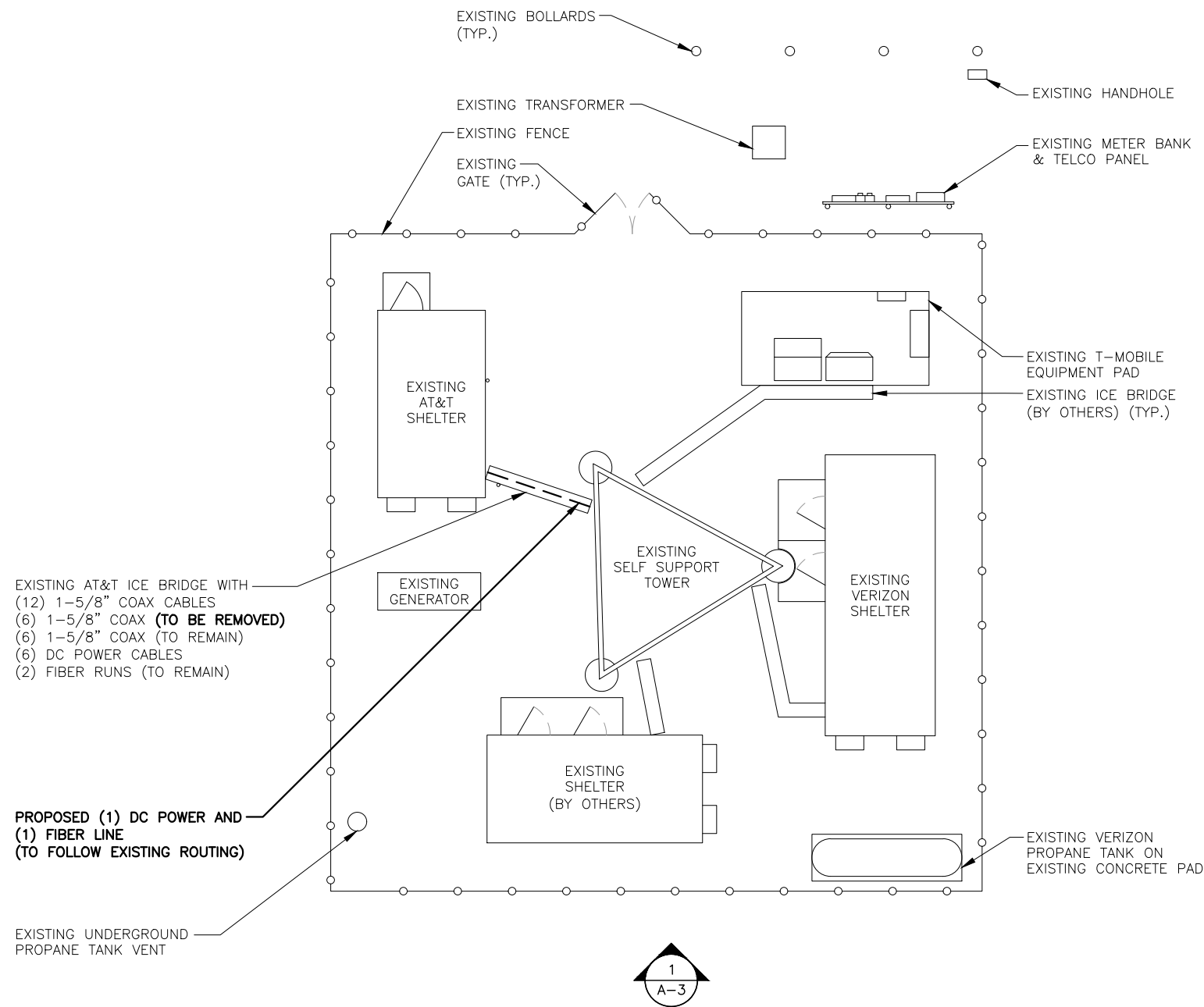
51 DANIELS AVE
 WATERFORD, CT 06385
 NEW LONDON COUNTY

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

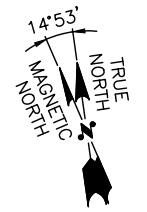
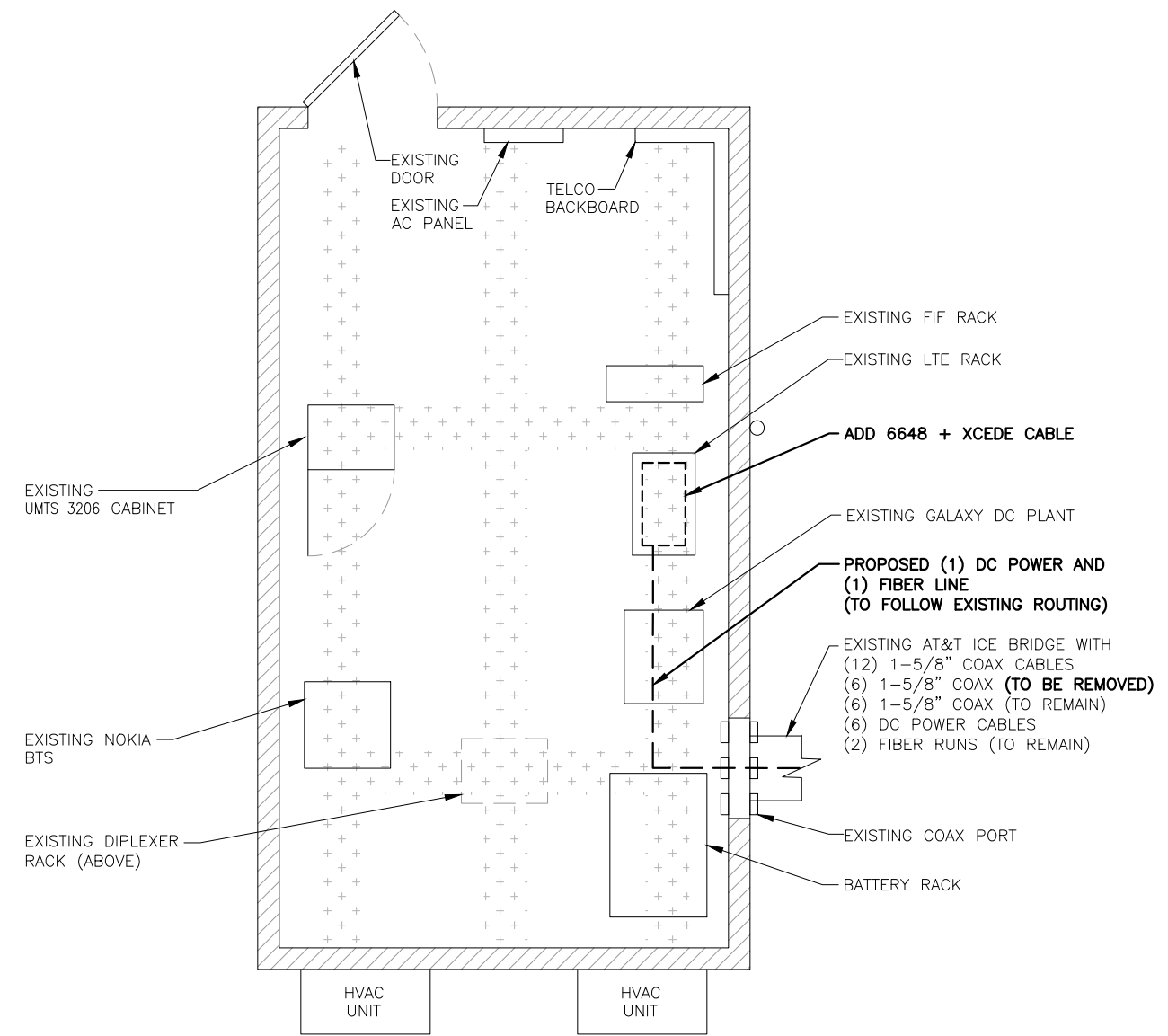
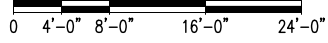
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NO. DATE REVISIONS		BY CHK		GENERAL NOTES	
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SITE NUMBER		DRAWING NUMBER		REV	
CT1270		GN-1		1	

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.



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



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

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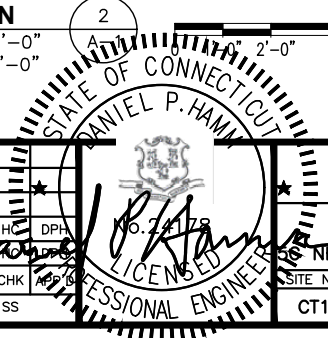
SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: WATERFORD DANIELS AVE

51 DANIELS AVE
WATERFORD, CT 06385
NEW LONDON COUNTY

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

1	03/09/22	ISSUED FOR CONSTRUCTION	HC	HC	DPA	No. 22122
A	02/07/22	ISSUED FOR REVIEW	SS	SS	SS	
NO.	DATE	REVISIONS	BY	CHK	APP	
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: SS			



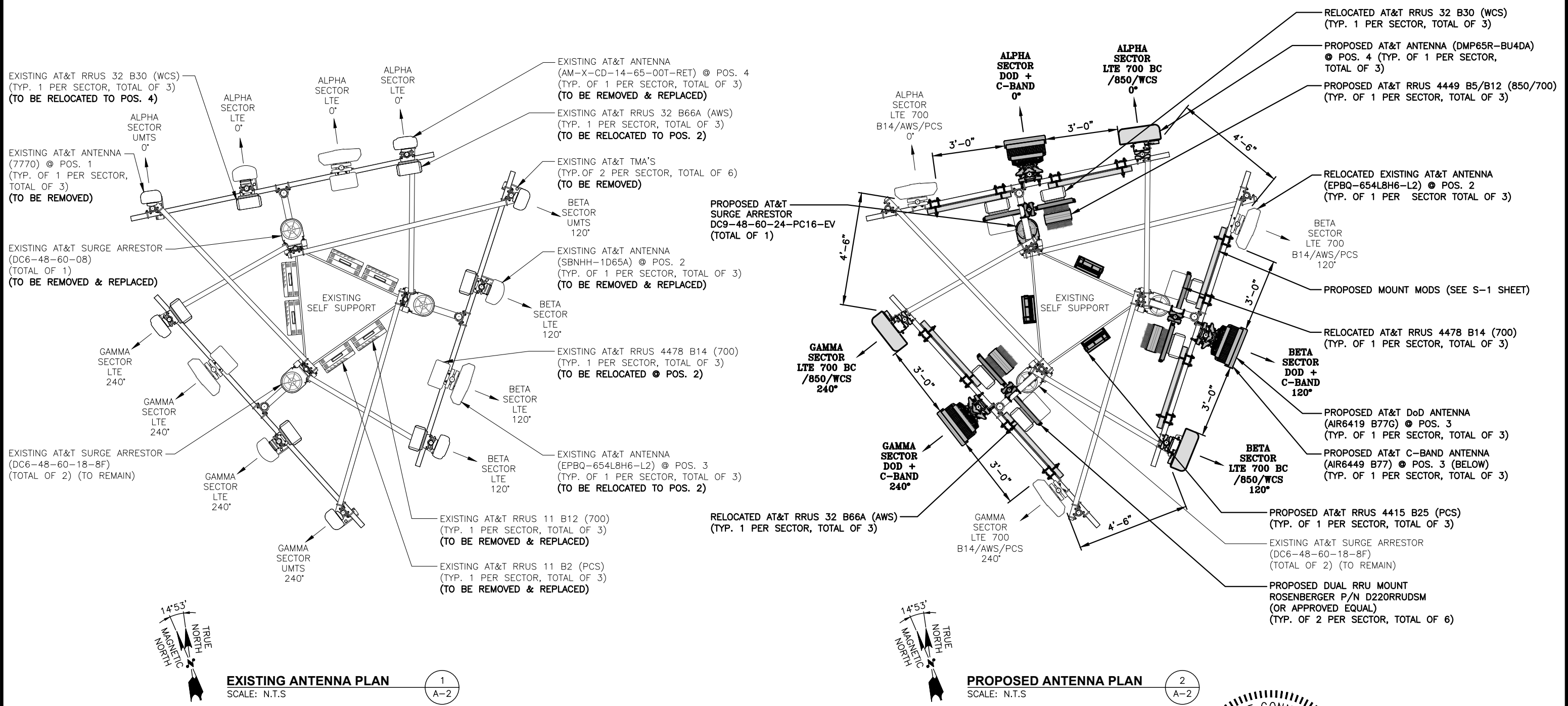
AT&T
COMPOUND & EQUIPMENT PLANS
NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1270	A-1	1

NOTE:
 AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED BY: HUDSON DESIGN GROUP, LLC. DATED: DECEMBER 6, 2021

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.



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

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

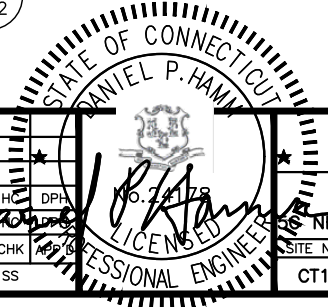
HG HUDSON Design Group LLC
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 NORTH ANDOVER, MA 01845
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SAI
 12 INDUSTRIAL WAY
 SALEM, NH 03079

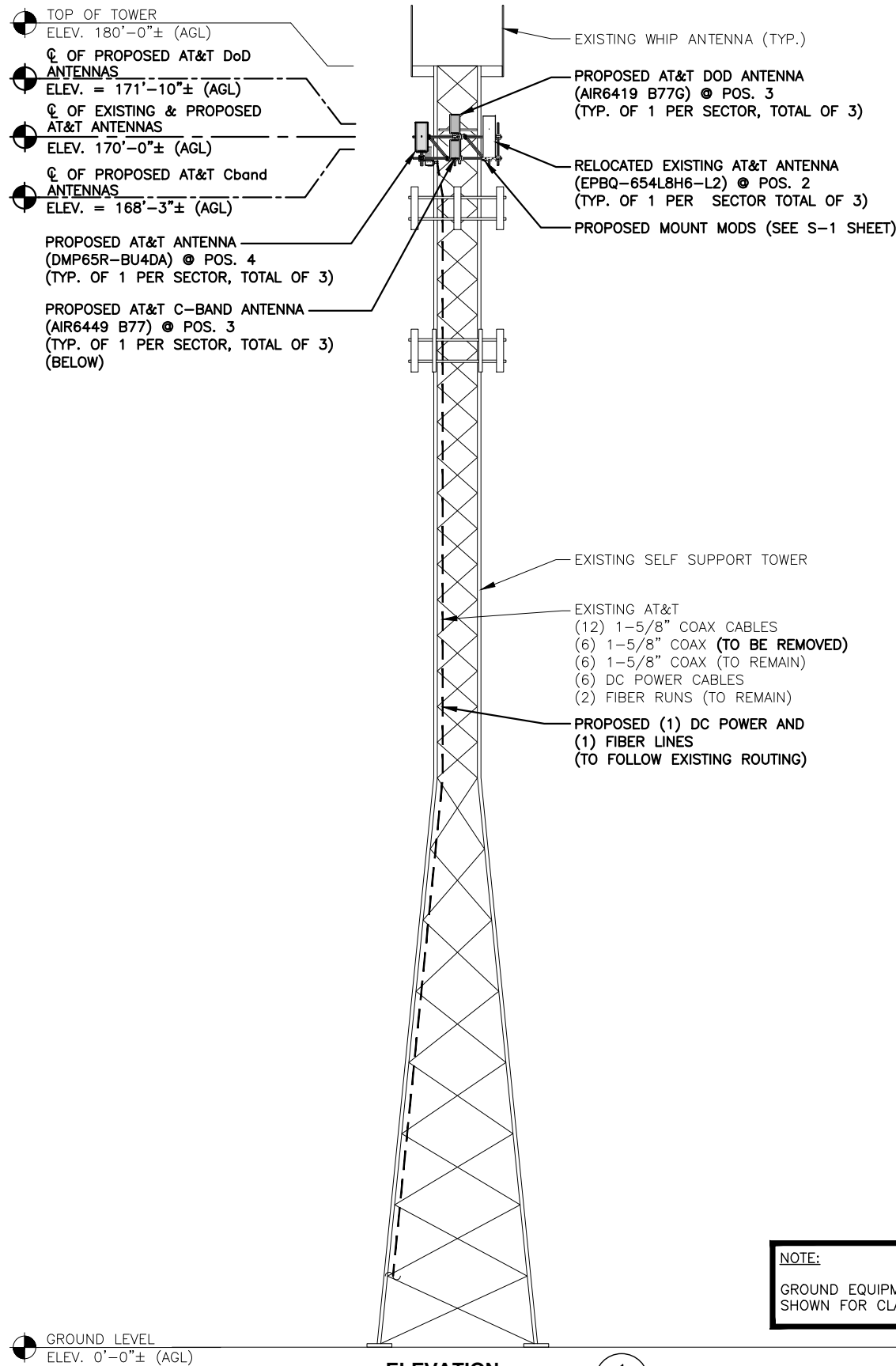
SITE NUMBER: CT1270
SITE NAME: WATERFORD DANIELS AVE
 51 DANIELS AVE
 WATERFORD, CT 06385
 NEW LONDON COUNTY

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

1	03/09/22	ISSUED FOR CONSTRUCTION	HC	HC	DPA	No. 22112
A	02/07/22	ISSUED FOR REVIEW				
NO.	DATE	REVISIONS	BY	CHK	APP	
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: SS			



AT&T
 ANTENNA LAYOUT PLANS
 NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE
 SITE NUMBER: CT1270
 DRAWING NUMBER: A-2
 REV: 1



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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED
BY: HUDSON DESIGN GROUP, LLC.
DATED: DECEMBER 6, 2021

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

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

1
A-3

0 5'-4" 10'-8" 21'-4" 32'-0"

HGD HUDSON Design Group LLC
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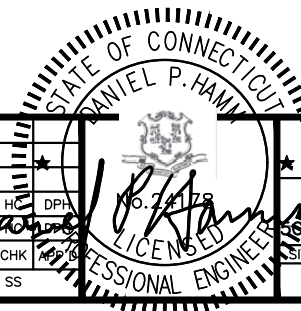
SAI
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SITE NAME: WATERFORD DANIELS AVE

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ROCKY HILL, CT 06067

				AT&T	
				ELEVATION	
				NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE	
NO.	DATE	REVISIONS	BY	CHK	REV
1	03/09/22	ISSUED FOR CONSTRUCTION	HC	DPA	
A	02/07/22	ISSUED FOR REVIEW	SS		
SCALE: AS SHOWN			DESIGNED BY: HC	DRAWN BY: SS	
SITE NUMBER			DRAWING NUMBER		REV
CT1270			A-3		1



ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA Ø HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	-	-	-	-	-	-	-	-	-	(2)1-5/8 COAX	(E) (1) RAYCAP DC6-48-60-18-8F
A2	EXISTING	LTE 700 B14/AWS/PCS	EPBQ-654L8H6-L2	73X21X6.3	170'-0"±	0°	-	(E)(1) 4478 B14 (700) (P)(1) 4415 B25 (PCS) (E)(1) RRUS-32 B66A (AWS)	16.5"x13.4"x5.9"	(E)(2) DC POWER & (1) FIBER	
A3	PROPOSED	DOD C-BAND	AIR6449 B77D + AIR6419 B77G (STACKED)	30.4X15.9X8.1	171'-8"± 168'-0"±	0°	-	-	-	-	
A4	PROPOSED	LTE 700 BC/850/WCS	DMP65R-BU4DA	48.0X20.7X7.7	170'-0"±	0°	-	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	17.9"x13.2"x10.4"	-	
B1	-	-	-	-	-	-	-	-	-	(2)1-5/8 COAX	(E) (1) RAYCAP DC6-48-60-18-8F
B2	EXISTING	LTE 700 B14/AWS/PCS	EPBQ-654L8H6-L2	73X21X6.3	170'-0"±	120°	-	(E)(1) 4478 B14 (700) (P)(1) 4415 B25 (PCS) (E)(1) RRUS-32 B66A (AWS)	16.5"x13.4"x5.9"	(E)(2) DC POWER & (1) FIBER	
B3	PROPOSED	DOD C-BAND	AIR6449 B77D + AIR6419 B77G (STACKED)	30.4X15.9X8.1	171'-8"± 168'-0"±	120°	-	-	-	-	
B4	PROPOSED	LTE 700 BC/850/WCS	DMP65R-BU4DA	48.0X20.7X7.7	170'-0"±	120°	-	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	17.9"x13.2"x10.4"	-	
C1	-	-	-	-	-	-	-	-	-	(2)1-5/8 COAX	(P) (1) DC9-48-60-24-PC16-EV
C2	EXISTING	LTE 700 B14/AWS/PCS	EPBQ-654L8H6-L2	73X21X6.3	170'-0"±	240°	-	(E)(1) 4478 B14 (700) (P)(1) 4415 B25 (PCS) (E)(1) RRUS-32 B66A (AWS)	16.5"x13.4"x5.9"	(E)(2) DC POWER (P)(1) DC POWER (P)(1) FIBER	
C3	PROPOSED	DOD C-BAND	AIR6449 B77D + AIR6419 B77G (STACKED)	30.4X15.9X8.1	171'-8"± 168'-0"±	240°	-	-	-	-	
C4	PROPOSED	LTE 700 BC/850/WCS	DMP65R-BU4DA	48.0X20.7X7.7	170'-0"±	240°	-	(P)(1) 4449 B5/B12 (850/700) (E)(1) RRUS-32 B30 (WCS)	17.9"x13.2"x10.4"	-	

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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED.
BY: HUDSON DESIGN GROUP, LLC.
DATED: DECEMBER 6, 2021

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

FINAL ANTENNA SCHEDULE

SCALE: N.T.S

1
A-4

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

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

NOTE:
SEE RFDS FOR RRU FREQUENCY AND MODEL NUMBER

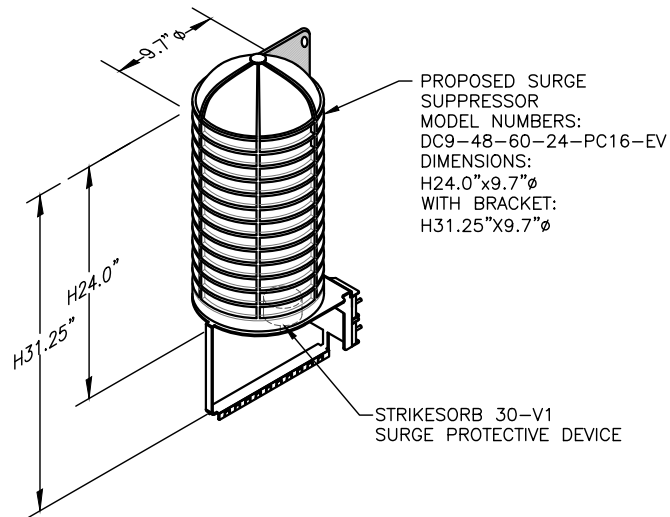
PROPOSED RRU REFER TO THE FINAL RFDS AND CHART FOR QUANTITY, MODEL AND DIMENSIONS

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

PROPOSED RRU DETAIL

SCALE: N.T.S

2
A-4

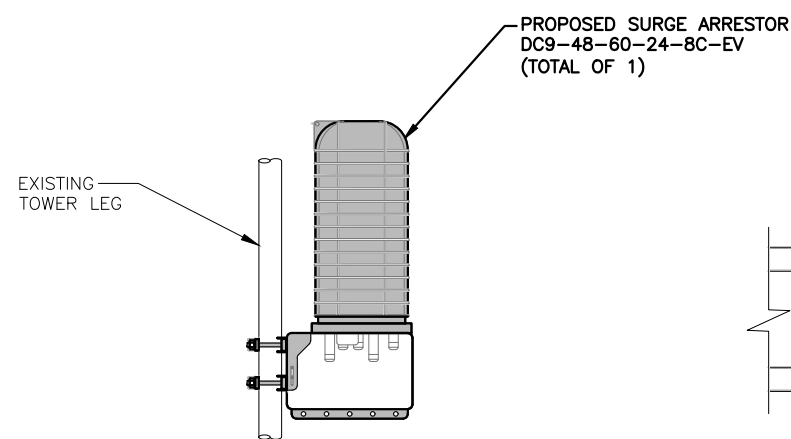


NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

DC SURGE SUPPRESSOR DETAIL

SCALE: N.T.S

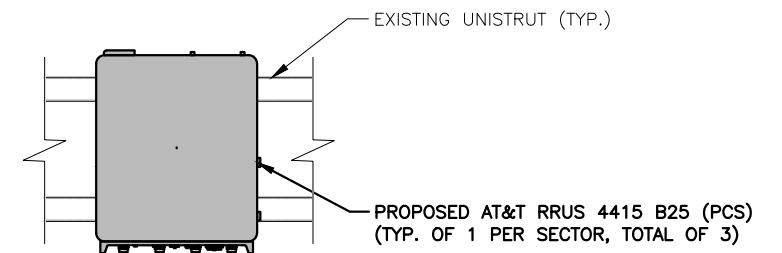
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A-4



SURGE SUPPRESSOR MOUNTING DETAIL

SCALE: N.T.S

4
A-4



PROPOSED RRU MOUNTING DETAIL

SCALE: N.T.S

5
A-4



HGD HUDSON Design Group LLC
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12 INDUSTRIAL WAY SALEM, NH 03079

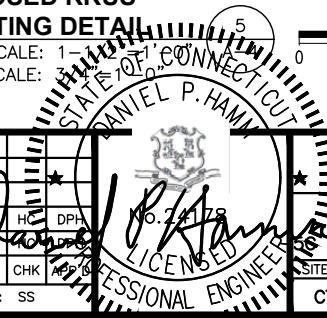
SITE NUMBER: CT1270
SITE NAME: WATERFORD DANIELS AVE

51 DANIELS AVE WATERFORD, CT 06385 NEW LONDON COUNTY

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

1 03/09/22 ISSUED FOR CONSTRUCTION		BY: HC		CHK: DPP		NO. 22122	
A 02/07/22 ISSUED FOR REVIEW		BY: HC		CHK: DPP		NO. 22122	
NO.	DATE	REVISIONS	BY	CHK	APP	SITE NUMBER	DRAWING NUMBER
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: SS		CT1270		
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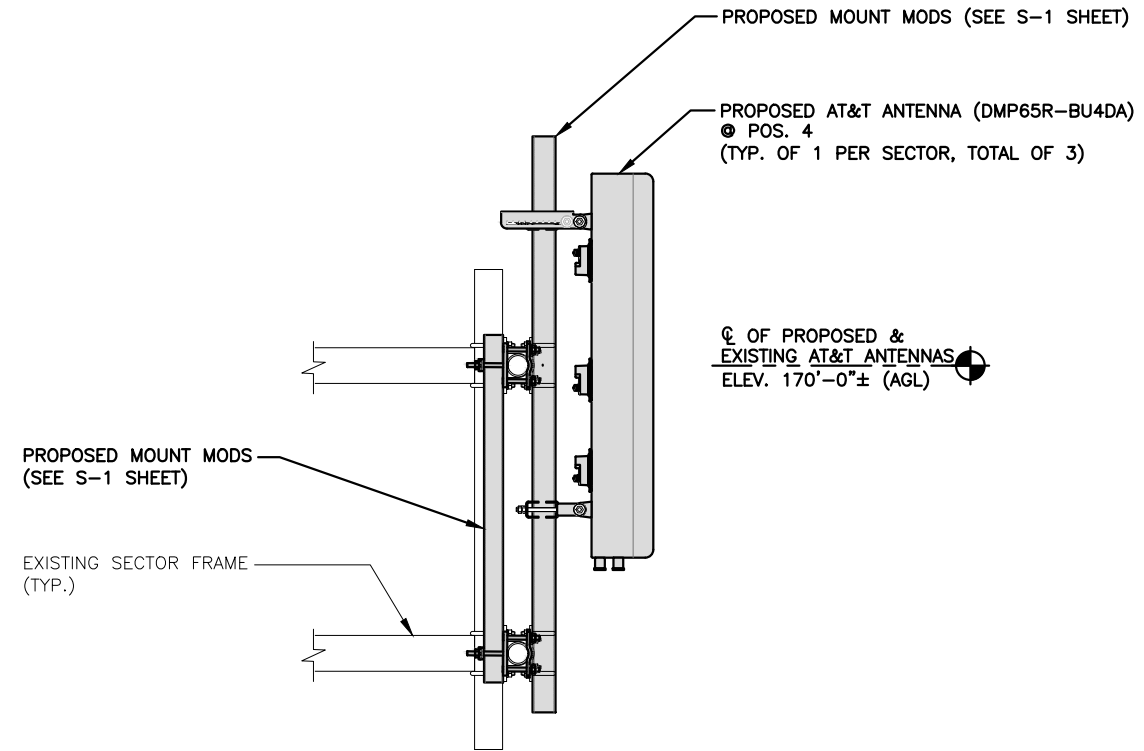
AT&T
DETAILS
NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE



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

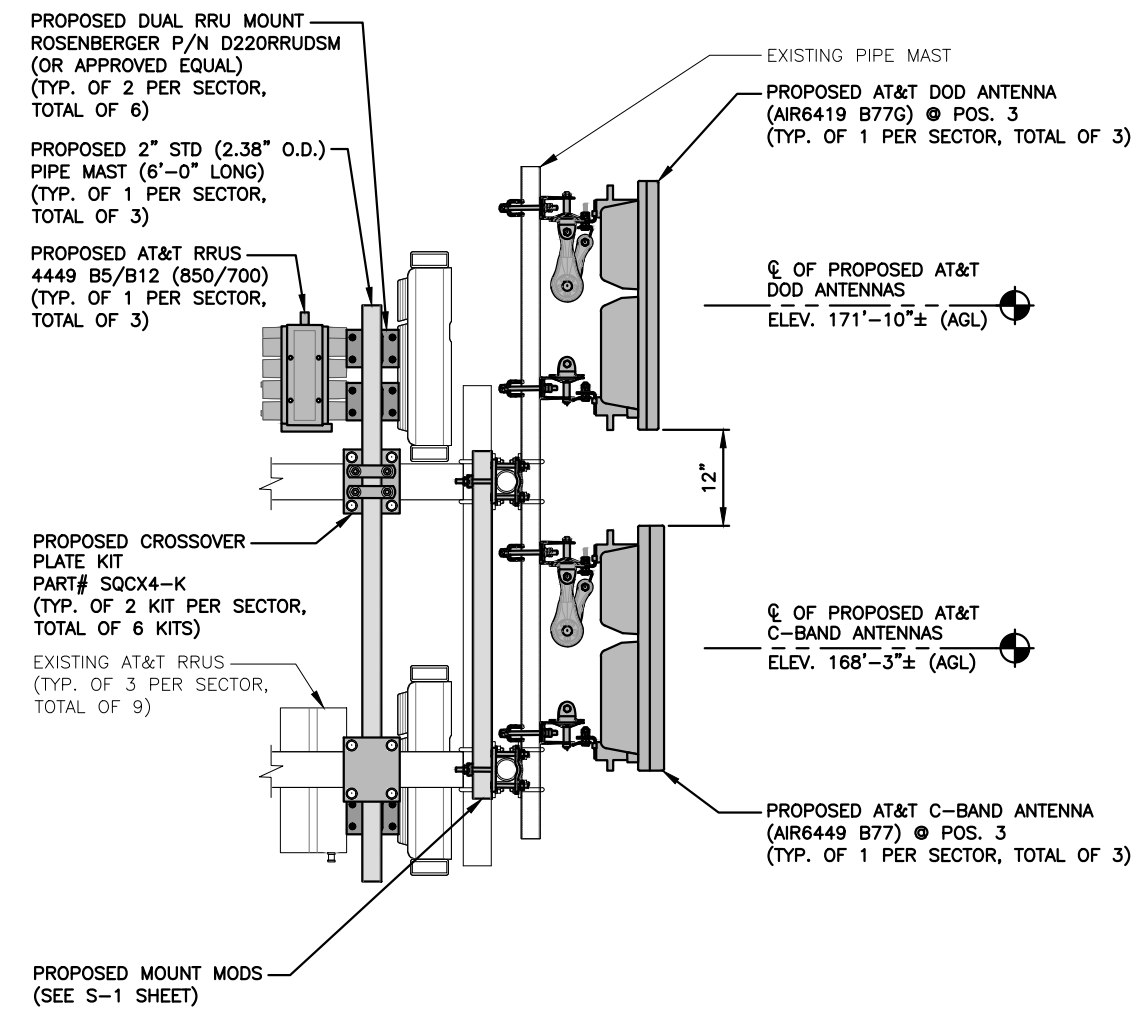
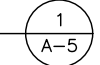
NOTE:
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED
BY: HUDSON DESIGN GROUP, LLC.
DATED: DECEMBER 6, 2021

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



PROPOSED LTE ANTENNA MOUNTING DETAIL

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

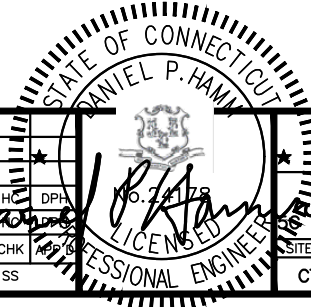


PROPOSED C-BAND ANTENNA MOUNTING DETAIL

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



1	03/09/22	ISSUED FOR CONSTRUCTION	HC	DPA	No. 24128
A	02/07/22	ISSUED FOR REVIEW			
NO.	DATE	REVISIONS	BY	CHK	APP
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: SS		



STRUCTURAL NOTES:

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

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

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

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

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

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

SPECIAL INSPECTION CHECKLIST

BEFORE CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS ¹
N/A	MATERIAL SPECIFICATIONS REPORT ²
N/A	FABRICATOR NDE INSPECTION
REQUIRED	PACKING SLIPS ³

ADDITIONAL TESTING AND INSPECTIONS:
DURING CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	STEEL INSPECTIONS
N/A	HIGH STRENGTH BOLT INSPECTIONS
N/A	HIGH WIND ZONE INSPECTIONS ⁴
N/A	FOUNDATION INSPECTIONS
N/A	CONCRETE COMP. STRENGTH, SLUMP TESTS AND PLACEMENT
N/A	POST INSTALLED ANCHOR VERIFICATION ⁵
N/A	GROUT VERIFICATION
N/A	CERTIFIED WELD INSPECTION
N/A	EARTHWORK: LIFT AND DENSITY
N/A	ON SITE COLD GALVANIZING VERIFICATION
N/A	GUY WIRE TENSION REPORT

ADDITIONAL TESTING AND INSPECTIONS:
AFTER CONSTRUCTION

CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
REQUIRED	MODIFICATION INSPECTOR REDLINE OR RECORD DRAWINGS ⁶
N/A	POST INSTALLED ANCHOR PULL-OUT TESTING
REQUIRED	PHOTOGRAPHS

ADDITIONAL TESTING AND INSPECTIONS:

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

12 INDUSTRIAL WAY
SALEM, NH 03079

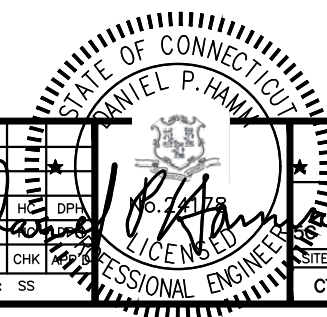
SITE NUMBER: CT1270
SITE NAME: WATERFORD DANIELS AVE

51 DANIELS AVE
WATERFORD, CT 06385
NEW LONDON COUNTY

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

NO.	DATE	REVISIONS	BY	CHK
1	03/09/22	ISSUED FOR CONSTRUCTION	HC	DPA
A	02/07/22	ISSUED FOR REVIEW	SS	HC

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



AT&T

STRUCTURAL NOTES

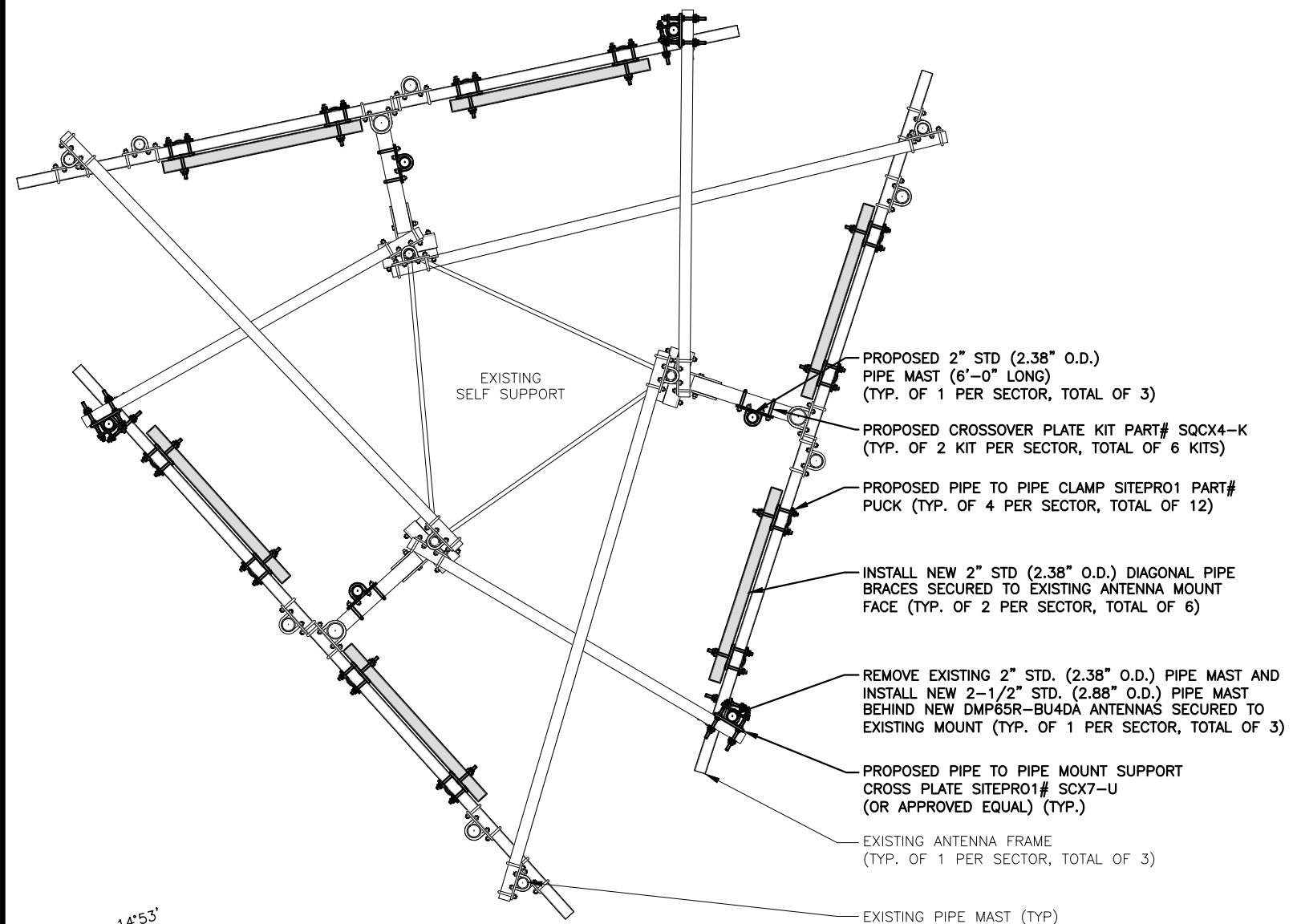
5G NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1270	SN-1	1

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

NOTE:
AN ANALYSIS FOR THE CAPACITY OF EXISTING ANTENNA MOUNT TO SUPPORT THE PROPOSED LOADING HAS BEEN COMPLETED.
BY: HUDSON DESIGN GROUP, LLC.
DATED: DECEMBER 6, 2021

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

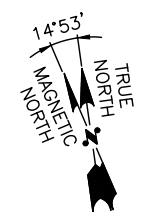
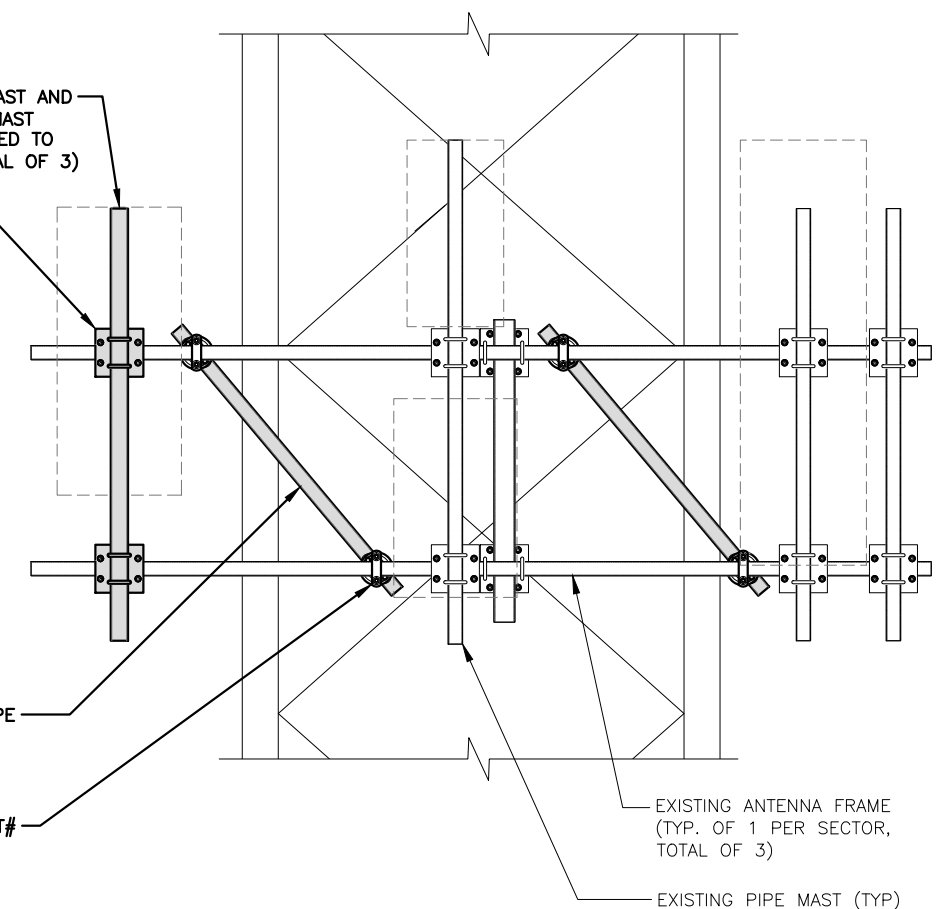


REMOVE EXISTING 2" STD. (2.38" O.D.) PIPE MAST AND INSTALL NEW 2-1/2" STD. (2.88" O.D.) PIPE MAST BEHIND NEW DMP65R-BU4DA ANTENNAS SECURED TO EXISTING MOUNT (TYP. OF 1 PER SECTOR, TOTAL OF 3)

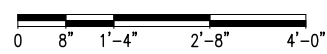
PROPOSED PIPE TO PIPE MOUNT SUPPORT CROSS PLATE SITEPRO1# SCX7-U (OR APPROVED EQUAL) (TYP.)

INSTALL NEW 2" STD (2.38" O.D.) DIAGONAL PIPE BRACES SECURED TO EXISTING ANTENNA MOUNT FACE (TYP. OF 2 PER SECTOR, TOTAL OF 6)

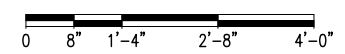
PROPOSED PIPE TO PIPE CLAMP SITEPRO1 PART# PUCK (TYP. OF 4 PER SECTOR, TOTAL OF 12)



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



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



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

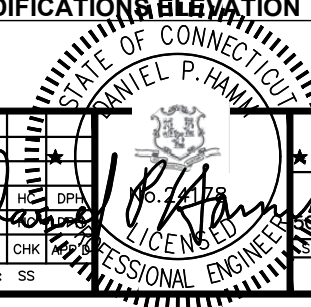
SAI
12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT1270
SITE NAME: WATERFORD DANIELS AVE
51 DANIELS AVE
WATERFORD, CT 06385
NEW LONDON COUNTY

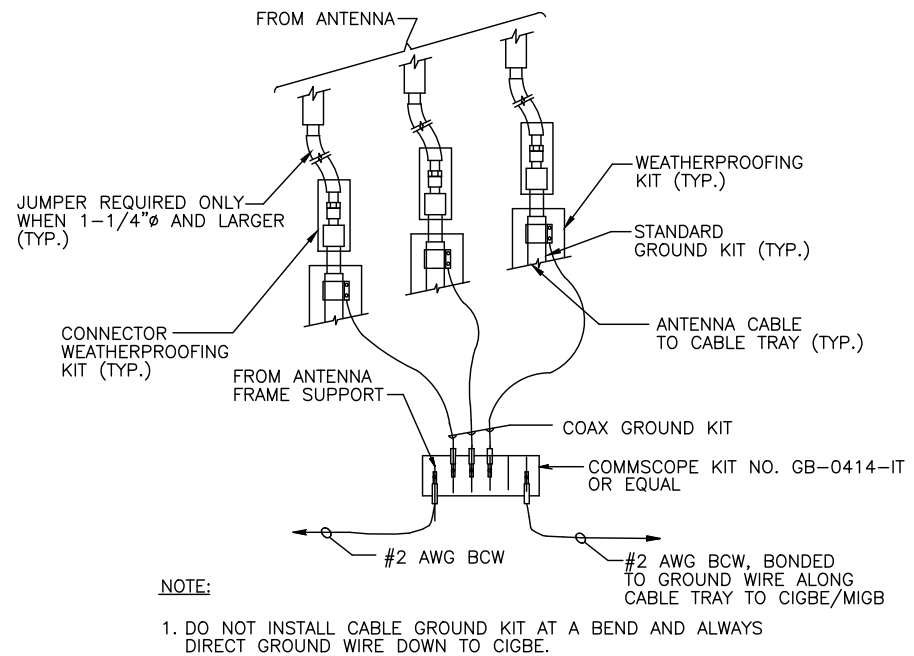
at&t
500 ENTERPRISE DRIVE, SUITE 3A
ROCKY HILL, CT 06067

NO.	DATE	REVISIONS	BY	CHK	APP
1	03/09/22	ISSUED FOR CONSTRUCTION	HC	HC	DPA
A	02/07/22	ISSUED FOR REVIEW			

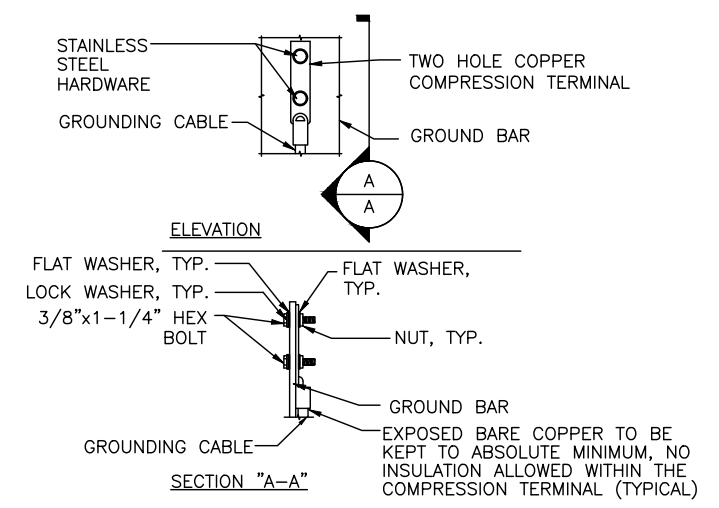
SCALE: AS SHOWN DESIGNED BY: HC DRAWN BY: SS



AT&T
DETAILS
NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE
SITE NUMBER: CT1270
DRAWING NUMBER: S-1
REV: 1

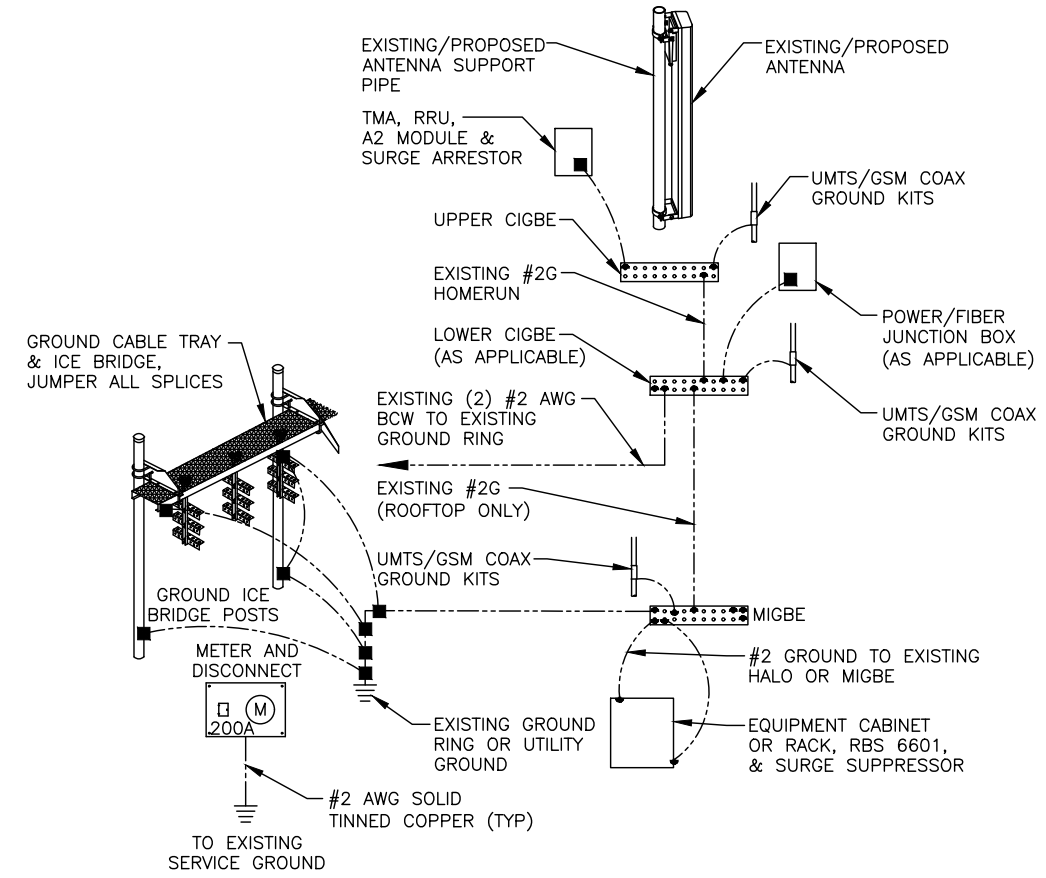


GROUND WIRE TO GROUND BAR CONNECTION DETAIL 1
SCALE: N.T.S. G-1



- 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 3
SCALE: N.T.S. G-1



GROUNDING RISER DIAGRAM 2
SCALE: N.T.S. G-1

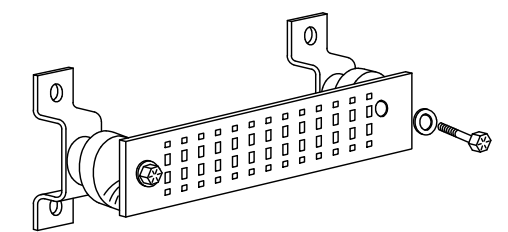
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

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

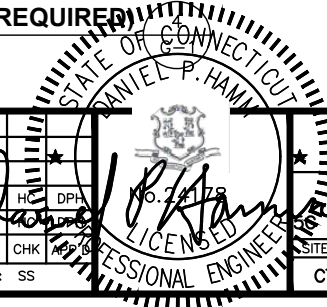
- INTERIOR GROUND RING (#2 AWG)
- EXTERNAL EARTH GROUND FIELD (BURIED GROUND RING) (#2 AWG)
- METALLIC COLD WATER PIPE (IF AVAILABLE) (#2 AWG)
- BUILDING STEEL (IF AVAILABLE) (#2 AWG)

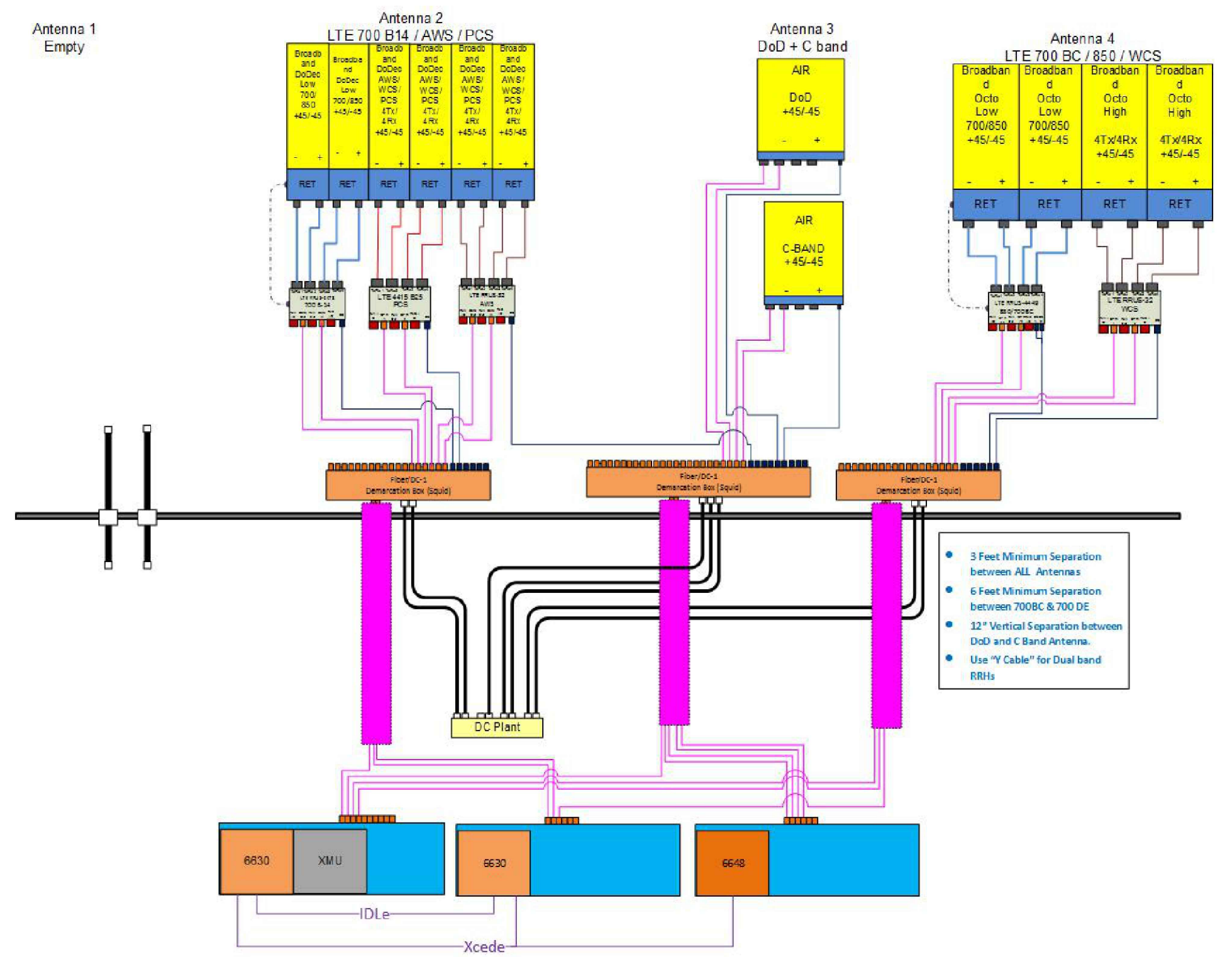


GROUND BAR - DETAIL (AS REQUIRED)
SCALE: N.T.S.

NO.	DATE	REVISIONS	BY	CHK	APP
1	03/09/22	ISSUED FOR CONSTRUCTION	HC	HC	DPA
A	02/07/22	ISSUED FOR REVIEW	HC	HC	DPA

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





- 3 Feet Minimum Separation between ALL Antennas
- 6 Feet Minimum Separation between 700BC & 700 DE
- 12" Vertical Separation between DoD and C Band Antenna.
- Use "Y Cable" for Dual band RRHs

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

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

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

1	03/09/22	ISSUED FOR CONSTRUCTION	JC	HC	DPH
A	02/07/22	ISSUED FOR REVIEW	SS	HC	DPH
NO.	DATE	REVISIONS	BY	CHK	APP'D
SCALE: AS SHOWN		DESIGNED BY: HC	DRAWN BY: SS		

AT&T		
RF PLUMBING DIAGRAM		
5G NR 1SR C-BAND_BBU ADD_ 5G NG UPGRADE		
SITE NUMBER	DRAWING NUMBER	REV
CT1270	RF-1	1



Tower Engineering Solutions

Phone (972) 483-0607, Fax (972) 975-9615
1320 Greenway Drive, Suite 600, Irving, Texas 75038

Structural Analysis Report

Existing 180 ft Sabre Self Supporting Tower

Customer Name: SBA Communications Corp

Customer Site Number: CT09865-S

Customer Site Name: Niantic

Carrier Name: AT&T (App#: 183282, V2)

Carrier Site ID / Name: CT1270 / Waterford-Route 156

Site Location: 51 Daniel'S Avenue

Waterford, Connecticut

New London County

Latitude: 41.330263

Longitude: -72.166672

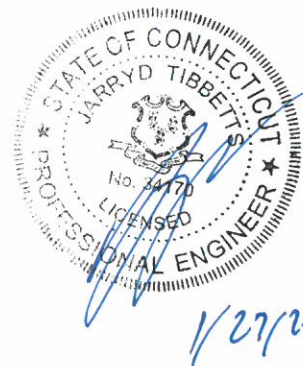
Analysis Result:

Max Structural Usage: 81.2% [Pass]

Max Foundation Usage: 84.0% [Pass]

Additional Usage Caused by Mount Modification: +0.5%

Report Prepared By: Younus Alkarawi





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Report Prepared By: Younus Alkarawi

Introduction

The purpose of this report is to summarize the analysis results on the 180 ft Sabre Self Supporting Tower to support the proposed antennas and transmission lines in addition to those currently installed. Any modification listed under Sources of Information was assumed completed and was included in this analysis.

Sources of Information

Tower Drawings	Tower Innovations, Project Number 5210 dated 11/05/2008
Foundation Drawing	Tower Innovations, Project Number 5210 dated 11/05/2008
Geotechnical Report	Dr. Clearance Welti, P.E., P.C. Geotechnical Engineering (Ref: Geotechnical Study for proposed Cell Tower at Southwest School 51 Daniels Road, Waterford, CT) dated 10/23/2008
Modification Drawings	N/A
Mount Analysis	AT&T MA by SAI# MRCTB054306, Dated 12/06/2021

Analysis Criteria

The rigorous analysis was performed in accordance with the requirements and stipulations of the TIA-222-G-2. In accordance with this standard, the structure was analyzed using **TESTowers**, a proprietary analysis software. The program considers the structure as an elastic 3-D model with second-order effects and temperature effects incorporated in the analysis. The analysis was performed using multiple wind directions.

Wind Speed Used in the Analysis:	Ultimate Design Wind Speed $V_{ult} = 135.0$ mph (3-Sec. Gust)/ Nominal Design Wind Speed $V_{asd} = 105.0$ mph (3-Sec. Gust)
Wind Speed with Ice:	50 mph (3-Sec. Gust) with 3/4" radial ice concurrent
Operational Wind Speed:	60 mph + 0" Radial ice
Standard/Codes:	TIA-222-G-2 / 2015 IBC / 2018 Connecticut State Building Code
Exposure Category:	C
Structure Class:	II
Topographic Category:	1
Crest Height:	0 ft
Seismic Parameters:	$S_S = 0.161$, $S_1 = 0.058$

This structural analysis is based upon the tower being classified as a Structure Class II; however, if a different classification is required subsequent to the date hereof, the tower classification will be changed to meet such requirement and a new structural analysis will be run.

Existing Antennas, Mounts and Transmission Lines

The table below summarizes the antennas, mounts and transmission lines that were considered in the analysis as existing on the tower.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
1	180.0	2	Sinclair SC488-HF2LNF Omnis	(2) 6' Standoffs (SitePRO1 HM6)	(2) 1 5/8"	Town of Waterford
2		1	DBSpectra ATS8TMA10 TMA			
-	170.0	3	Powerwave 7770 - Panel	(3) Modified T-Frame (6) Crossover Plate – SitePro1 SCX2-K (3) 2 1/2" Pipe Mast	(12) 1 5/8" (2) 1/2" Fiber (6) 3/4" DC (1) 7/16" Fiber	AT&T
-		3	Commscope SBNHH-1D65A Panel			
-		3	KMW AM-X-CD-14-65-00T-RET Panel			
-		3	KMW EPBQ-654L8H6-L2 - Panel			
-		6	Powerwave TT19-08BP111-001 TTA			
-		6	Ericsson RRUS-11 RRU/RRH			
-		6	Ericsson RRUS-32 RRU/RRH			
-		3	Ericsson 4478 RRU/RRH			
-		2	Raycap DC6-48-60-18-8F			
14	160.0	3	RFS APX16DWV-16DWV-S-E-A20	(3) Modified T-Frame (3) Custom Mount Augmentations (3) Stabilizer Kits (3) 2.5STD x 8' Pipe Mounts	(16) 1 5/8" (3) 1 5/8" Fiber (1) 1/2"	T-Mobile
15		3	RFS APXVAARR24_43-U-NA20 Panel			
16		3	Ericsson KRY 112 144/1 TMA			
17		3	Ericsson KRY 112 489/2 TMA			
18		3	Ericsson Radio 4449 B71+B12 RRU			
19		3	Kathrein 782 11056 – Bias T			
20	150.0	3	JMA Wireless MX08FRO665-21 Panel	Commscope MTC3975083 Sector Mount	(1) 1.6" Hybrid	Dish Wireless
21		3	Fujitsu TA08025-B605 RRU			
22		3	Fujitsu TA08025-B604 RRU			
23		1	Raycap RDIDC-9181-PF-48 OVP			
24	140.0	3	Antel BXA-80063-6CF - Panel	(3) T-Frames	(16) 1 5/8" (2) 1 5/8" Fiber	Verizon
25		3	Antel BXA-70063-6CF-EDIN-0 Panel			
26		6	Commscope SBNHH-1D65B Panel			
27		3	Alcatel Lucent B66 RRH4X45 AWS Remote Radio			
28		3	Alcatel Lucent RRH 700 4X30 B13 Remote Radio			
29		2	Rfs Celwave DB-T1-6Z-8AB-0Z ODU			

Proposed Carrier's Final Configuration of Antennas, Mounts and Transmission Lines

Information pertaining to the proposed carrier's final configuration of antennas and transmission lines was provided by SBA Communications Corp. The proposed antennas and lines are listed below.

Items	Elevation (ft)	Qty.	Antenna Descriptions	Mount Type & Qty.	Transmission Lines	Owner
3	171.8	3	Ericsson AIR 6419 B77G - Panel	(3) Modified T-Frame W/ (3) 2.88" Pipe mast & (6) 2" std (2.38" O.D.) diagonal pipe brace	(11) 1 5/8" (1) 1" DC Power (2) 1/2" Fiber (6) 3/4" DC (1) 7/16" Fiber	AT&T
4	170.0	3	Cci DMP65R-BU4DA - Panel			
5		3	KMW EPBQ-654L8H6-L2 - Panel			
6		6	Powerwave TT19-08BP111-001 TMA			
7		6	Ericsson RRUS 32			
8		3	Ericsson RRUS 4478 B14			
9		3	Ericsson 4415 B25 RRU -			
10		3	Ericsson RRUS 4449 B5/B12 -			
11		2	Raycap DC6-48-60-18-8F-OVP			
12		1	Raycap DC9-48-60-24-8C-EV - OVP			
13		168.0	3			

*Stacked below AIR6419 B77G.

See the attached coax layout for the line placement considered in the analysis.

Analysis Results

The results of the structural analysis, performed for the wind and ice loading and antenna equipment as defined above, are summarized as the following:

Tower Component	Legs	Diagonals	Horizontals
Max. Usage:	81.2%	58.6%	34.8%
Pass/Fail	Pass	Pass	Pass

Foundations

	Compression (Kips)	Uplift (Kips)	Shear (Kips)
Analysis Reactions	434.9	380.4	51.5

The foundation has been investigated using the supplied documents and soils report and was found adequate. Therefore, no modification to the foundation will be required.

Operational Condition (Rigidity):

Operational characteristics of the tower are found to be within the limits prescribed by TIA-222 for the installed antennas. The maximum twist/sway at the elevation of the proposed equipment is 0.2323 degrees under the operational wind speed as specified in the Analysis Criteria.

Conclusions

Based on the analysis results, the existing structure and its foundation were found to be adequate to safely support the existing and proposed equipment and meet the minimum requirements per the TIA-222 Standard under the design basic wind speed as specified in the Analysis Criteria.

Standard Conditions

1. This analysis was performed based on the information supplied to **(TES) Tower Engineering Solutions, LLC**. Verification of the information provided was not included in the Scope of Work for **TES**. The accuracy of the analysis is dependent on the accuracy of the information provided.
2. The structural analysis was performance based upon the evidence available at the time of this report. All information provided by the client is considered to be accurate.
3. The analyses will be performed based on the codes as specified by the client or based on the best knowledge of the engineering staff of **TES**. In the absence of information to the contrary, all work will be performed in accordance with the latest relevant revision of ANSI/TIA-222. If wind speed and/or ice loads are different from the minimum values recommended by the ANSI/TIA-222 standard or other codes, **TES** should be notified in writing and the applicable minimum values provided by the client.
4. The configuration of the existing mounts, antennas, coax and other appurtenances were supplied by the customer for the current structural analysis. **TES** has not visited the tower site to verify the adequacy of the information provided. If there is any discrepancy found in the report regarding the existing conditions, **TES** should be notified immediately to evaluate the effect of the discrepancy on the analysis results.
5. The client will assume responsibility for rework associated with the differences in initially provided information, including tower and foundation information, existing and/or proposed equipment and transmission lines.
6. If a feasibility analysis was performed, final acceptance of changed conditions shall be based upon a rigorous structural analysis.

Structure: CT09865-S-SBA

Site Name: Niantic	Code: TIA-222-G	1/27/2022
Type: Self Support	Base Shape: Triangle	Basic WS: 105.00
Height: 180.00 (ft)	Base Width: 23.00	Basic Ice WS: 50.00
Base Elev: 0.00 (ft)	Top Width: 5.00	Operational WS: 60.00



Page: 1

Section Properties

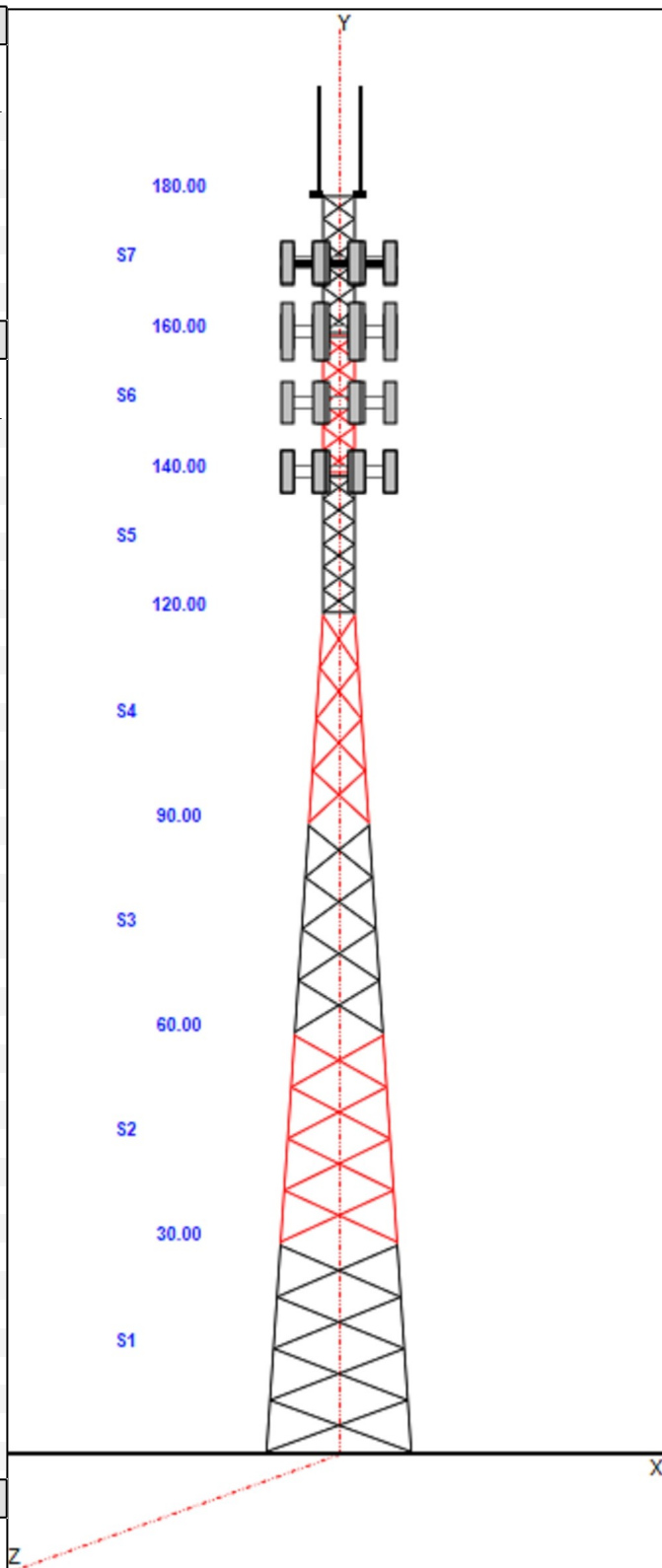
Sect	Leg Members	Diagonal Members	Horizontal Members
1	SOL 4 3/4" SOLID	SAE 4X4X0.3125	
2	SOL 4 3/4" SOLID	SAE 3.5X3.5X0.25	
3	SOL 4 1/2" SOLID	SAE 3X3X0.1875	
4	SOL 4 1/4" SOLID	SAE 2.5X2.5X0.1875	
5	SOL 3 1/2" SOLID	SAE 3X3X0.1875	SOL 1 1/8" SOLID
6	SOL 2 1/2" SOLID	SAE 2.5X2.5X0.1875	SOL 1" SOLID
7	SOL 1 3/4" SOLID	SAE 2X2X0.1875	SOL 7/8" SOLID

Discrete Appurtenances

Attach Elev (ft)	Force Elev (ft)	Qty	Description
180.00	187.63	2	SC488-HF2LNF
180.00	180.00	1	ATS8TMA10
180.00	180.00	1	Lightning Rod
180.00	180.00	1	Beacon
180.00	180.00	2	SitePRO1 HM6 6' Standoffs
170.00	170.00	3	EPBQ-654L8H6-L2
170.00	170.00	6	TT19-08BP111-001 TMA-TTA
170.00	170.00	6	RRUS-32 RRU/RRH
170.00	170.00	3	4478 RRU/RRH
170.00	170.00	2	DC6-48-60-18-8F
170.00	170.00	3	Modified T-Frame
170.00	171.80	3	Ericsson AIR 6419 B77G
170.00	170.00	3	Cci DMP65R-BU4DA
170.00	168.00	3	Ericsson AIR 6449 B77D
170.00	170.00	1	(6) 2" Diagonal Pipe braces
170.00	170.00	3	Ericsson 4415 B25 RRU
170.00	170.00	3	Ericsson RRUS 4449 B5/B12
170.00	170.00	1	Raycap DC9-48-60-24-8C-EV
160.00	160.00	3	APX16DWV-16DWV-S-E-A20
160.00	160.00	3	APXVAARR24_43-U-NA20
160.00	160.00	3	KRY 112 144/1
160.00	160.00	3	KRY 112 489/2
160.00	160.00	3	Radio 4449 B71+B12
160.00	160.00	3	782 11056
160.00	160.00	3	Modified T-Frame
150.00	150.00	3	MX08FRO665-21
150.00	150.00	1	(3) MTC3975083
150.00	150.00	3	TA08025-B605
150.00	150.00	3	TA08025-B604
150.00	150.00	1	RDIDC-9181-PF-48
140.00	140.00	3	BXA-80063-6CF
140.00	140.00	3	BXA-70063-6CF-EDIN-0
140.00	140.00	6	SBNHH-1D65B
140.00	140.00	3	B66 RRH4X45 AWS
140.00	140.00	3	RRH 700 4X30 B13 Remote
140.00	140.00	2	DB-T1-6Z-8AB-0Z ODU
140.00	140.00	3	T-Frame

Linear Appurtenances

Elev From (ft)	Elev To (ft)	Qty	Description
0.00	180.00	2	1 5/8" Coax
0.00	180.00	1	W/G Ladder



Structure: CT09865-S-SBA

Site Name: Niantic	Code: TIA-222-G	1/27/2022
Type: Self Support	Base Shape: Triangle	Basic WS: 105.00
Height: 180.00 (ft)	Base Width: 23.00	Basic Ice WS: 50.00
Base Elev: 0.00 (ft)	Top Width: 5.00	Operational WS: 60.00



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0.00	170.00	11	1 5/8" Coax
0.00	170.00	1	1" DC Power
0.00	170.00	2	1/2" Fiber
0.00	170.00	6	3/4" DC
0.00	170.00	1	7/16" Fiber
0.00	170.00	1	W/G Ladder
0.00	160.00	16	1 5/8" Coax
0.00	160.00	3	1 5/8" Fiber
0.00	160.00	1	1/2" Coax
0.00	160.00	1	W/G Ladder
0.00	150.00	1	1.6" Hybrid
0.00	140.00	16	1 5/8" Coax
0.00	140.00	2	1 5/8" Fiber
0.00	140.00	1	W/G Ladder

Base Reactions

	Leg	Overturning
Max Uplift:	-380.44 (kips)	Moment: 8211.32 (ft-kips)
Max Down:	434.91 (kips)	Total Down: 67.99 (kips)
Max Shear:	51.54 (kips)	Total Shear: 82.02 (kips)

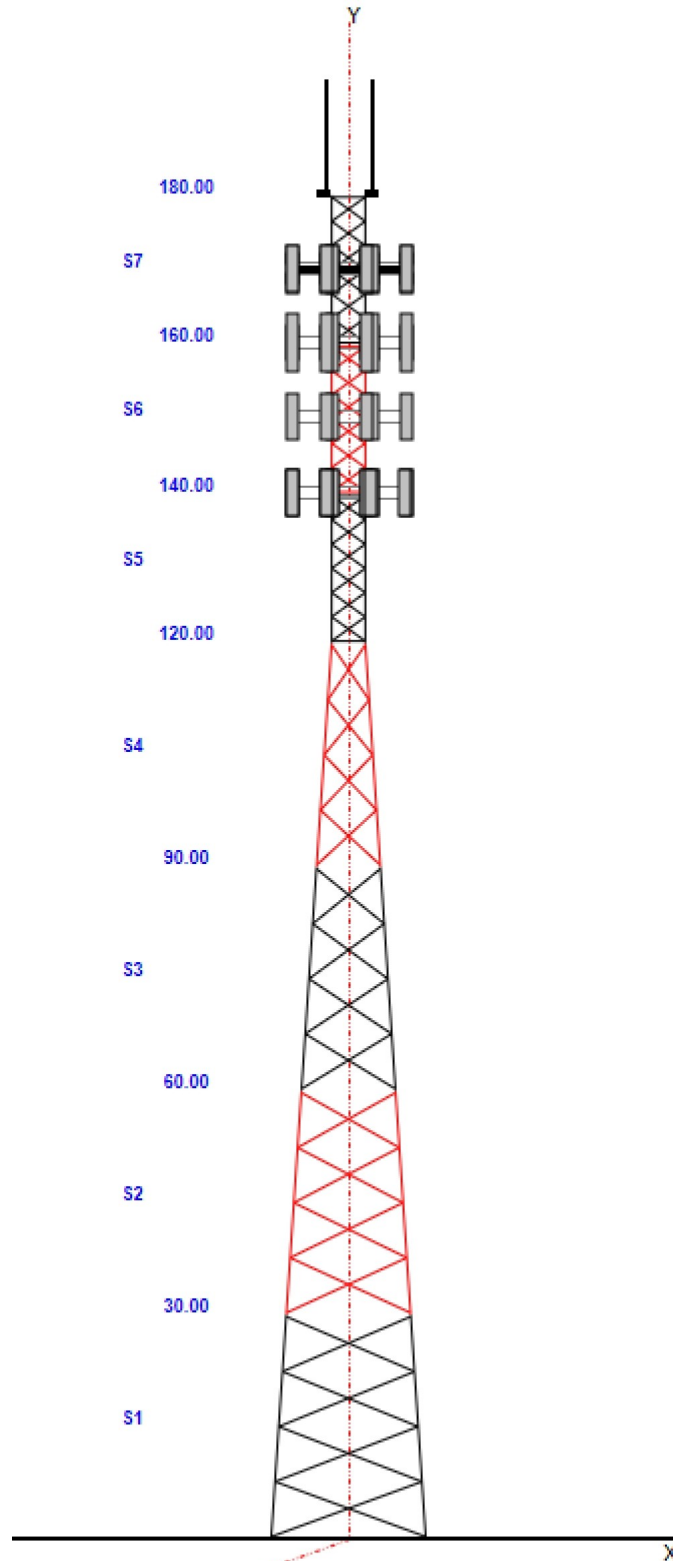
Structure: CT09865-S-SBA

Site Name: Niantic
Type: Self Support
Height: 180.00 (ft)
Base Elev: 0.00 (ft)

Base Shape: Triangle
Base Width: 23.00
Top Width: 5.00

Code: TIA-222-G
Basic WS: 105.00
Basic Ice WS: 50.00
Operational WS: 60.00

1/27/2022
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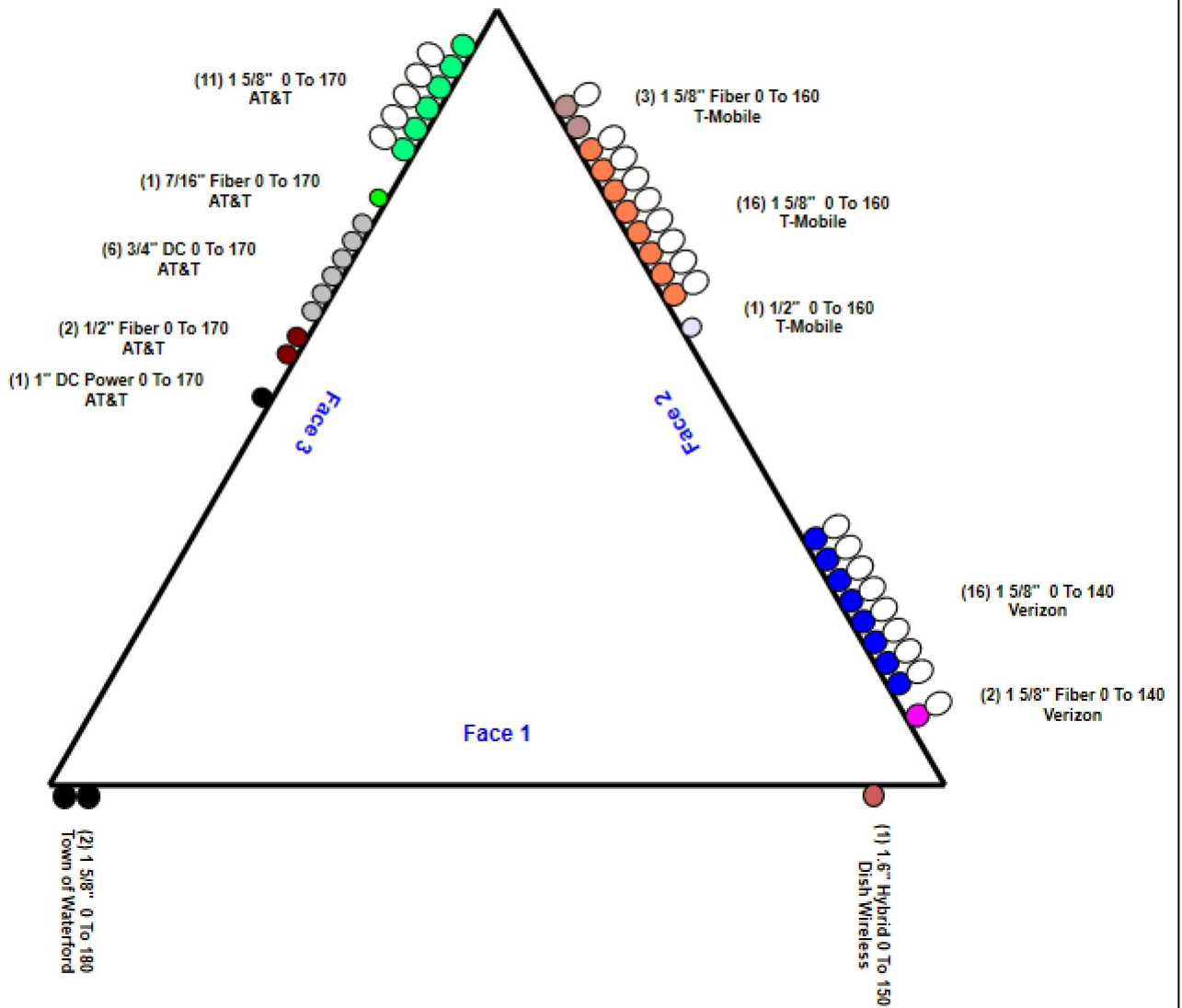
Structure: CT09865-S-SBA - Coax Line Placement

Type: Self Support
Site Name: Niantic
Height: 180.00 (ft)

1/27/2022



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Loading Summary

Structure: CT09865-S-SBA	Code: TIA-222-G	1/27/2022
Site Name: Niantic	Exposure: C	
Height: 180.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II



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Discrete Appurtenances Properties

Attach Elev (ft)	Description	Qty	No Ice		Ice		Len (in)	Width (in)	Depth (in)	Ka	Orientation Factor	Vert Ecc (ft)
			Weight (lb)	CaAa (sf)	Weight (lb)	CaAa (sf)						
180.00	SC488-HF2LNF	2	30.00	3.810	213.06	9.380	183.000	2.500	2.500	1.00	1.00	7.625
180.00	ATS8TMA10	1	25.00	1.560	82.26	2.255	21.200	9.000	13.200	1.00	1.00	0.000
180.00	Lightning Rod	1	5.00	0.500	26.21	2.267	72.000	1.000	1.000	1.00	1.00	0.000
180.00	Beacon	1	36.00	2.720	170.87	3.681	28.000	17.500	17.500	1.00	1.00	0.000
180.00	SitePRO1 HM6 6' Standoffs	2	120.00	4.500	226.03	9.812	0.000	0.000	0.000	1.00	1.00	0.000
170.00	EPBQ-654L8H6-L2	3	54.90	8.270	266.12	9.594	73.000	12.000	7.400	0.80	0.84	0.000
170.00	TT19-08BP111-001 TMA-TTA	6	16.00	0.640	36.49	1.240	9.900	6.700	5.400	0.80	0.50	0.000
170.00	RRUS-32 RRU/RRH	6	77.00	3.870	192.32	4.117	29.900	13.300	9.500	0.80	0.67	0.000
170.00	4478 RRU/RRH	3	59.90	1.840	107.49	2.373	16.500	13.400	7.700	0.80	0.67	0.000
170.00	DC6-48-60-18-8F	2	31.80	0.920	94.40	1.363	24.000	11.000	11.000	0.80	1.00	0.000
170.00	Modified T-Frame	3	360.00	20.540	868.95	37.092	0.000	0.000	0.000	0.75	0.75	0.000
170.00	Ericsson AIR 6419 B77G	3	66.10	3.800	163.52	4.606	28.300	16.100	7.900	0.80	0.76	1.800
170.00	Cci DMP65R-BU4DA	3	67.70	8.000	394.75	9.250	48.000	20.700	7.700	0.80	0.71	0.000
170.00	Ericsson AIR 6449 B77D	3	88.00	4.130	227.60	4.999	30.800	16.100	10.800	0.80	0.85	-2.000
170.00	(6) 2" Diagonal Pipe braces	1	87.60	9.000	174.29	20.451	0.000	0.000	0.000	0.75	1.00	0.000
170.00	Ericsson 4415 B25 RRU	3	49.60	1.860	112.89	2.432	16.500	13.500	6.300	0.80	0.67	0.000
170.00	Ericsson RRUS 4449 B5/B12	3	73.20	1.970	131.67	2.546	17.900	13.200	10.600	0.80	0.67	0.000
170.00	Raycap DC9-48-60-24-8C-EV	1	26.20	1.140	133.52	2.747	31.400	10.200	18.200	1.00	1.00	0.000
160.00	APX16DWV-16DWV-S-E-A20	3	40.70	6.460	177.69	7.574	55.900	13.000	3.200	0.80	0.62	0.000
160.00	APXVAARR24_43-U-NA20	3	128.00	20.240	545.93	22.140	95.900	24.000	7.800	0.80	0.70	0.000
160.00	KRY 112 144/1	3	11.00	0.410	21.78	0.885	6.900	6.100	2.700	0.80	0.50	0.000
160.00	KRY 112 489/2	3	15.40	0.650	33.02	1.262	11.000	6.100	3.900	0.80	0.50	0.000
160.00	Radio 4449 B71+B12	3	70.00	1.650	138.25	2.188	15.000	13.200	9.300	0.80	0.85	0.000
160.00	782 11056	3	11.00	0.550	28.64	1.148	11.700	4.800	4.700	0.80	0.50	0.000
160.00	Modified T-Frame	3	517.00	20.600	1238.82	36.994	0.000	0.000	0.000	0.75	0.75	0.000
150.00	MX08FRO665-21	3	64.50	12.490	355.37	13.955	72.000	20.000	8.000	0.80	0.74	0.000
150.00	(3) MTC3975083	1	1056.4	29.450	2088.86	66.456	0.000	0.000	0.000	0.75	1.00	0.000
150.00	TA08025-B605	3	75.00	1.960	127.30	2.521	15.800	15.000	9.100	0.80	0.67	0.000
150.00	TA08025-B604	3	63.90	1.960	114.53	2.521	15.800	15.000	7.900	0.80	0.67	0.000
150.00	RDIDC-9181-PF-48	1	21.85	2.010	74.98	2.578	16.570	14.570	8.460	1.00	1.00	0.000
140.00	BXA-80063-6CF	3	17.00	7.570	163.19	10.294	71.000	11.200	5.200	0.80	0.73	0.000
140.00	BXA-70063-6CF-EDIN-0	3	17.00	7.570	163.19	10.294	71.000	11.200	5.200	0.80	0.73	0.000
140.00	SBNHH-1D65B	6	40.00	8.160	239.70	9.440	72.600	11.900	7.100	0.80	0.83	0.000
140.00	B66 RRH4X45 AWS	3	56.80	2.540	111.91	3.204	25.800	11.800	7.200	0.80	0.82	0.000
140.00	RRH 700 4X30 B13 Remote	3	57.20	2.160	118.61	2.762	21.600	12.000	9.000	0.80	0.88	0.000
140.00	DB-T1-6Z-8AB-OZ ODU	2	18.90	4.800	160.23	5.660	24.000	24.000	10.000	0.80	0.71	0.000
140.00	T-Frame	3	260.00	10.600	617.85	18.916	0.000	0.000	0.000	0.75	0.75	0.000
Totals:		102	9,129.16		25,636.75						Number of Appurtenances :	37

Loading Summary

Structure: CT09865-S-SBA	Code: TIA-222-G	1/27/2022
Site Name: Niantic	Exposure: C	
Height: 180.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II



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Linear Appurtenances Properties

Elev. From (ft)	Elev. To (ft)	Description	Qty	Width (in)	Weight (lb/ft)	Pct In Block	Spread On Faces	Bundling Arrangement	Cluster Dia (in)	Out of Zone	Spacing (in)	Orientation Factor	Ka Override
0.00	180.00	1 5/8" Coax	2	1.98	1.04	100.00	1	Individual NR		N	1.00	1.00	
0.00	180.00	W/G Ladder	1	2.00	6.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	170.00	1 5/8" Coax	11	1.98	1.04	50.00	3	Block		N	1.00	1.00	
0.00	170.00	1" DC Power	1	1.00	1.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	1/2" Fiber	2	0.65	0.16	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	3/4" DC	6	0.75	0.40	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	7/16" Fiber	1	0.43	0.15	100.00	3	Individual NR		N	1.00	1.00	
0.00	170.00	W/G Ladder	1	2.00	6.00	100.00	3	Individual NR		N	1.00	1.00	
0.00	160.00	1 5/8" Coax	16	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	160.00	1 5/8" Fiber	3	2.00	1.10	66.60	2	Block		N	1.00	1.00	
0.00	160.00	1/2" Coax	1	0.65	0.16	100.00	2	Individual NR		N	1.00	1.00	
0.00	160.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	
0.00	150.00	1.6" Hybrid	1	1.60	1.00	100.00	1	Individual NR		N	1.00	1.00	
0.00	140.00	1 5/8" Coax	16	1.98	1.04	50.00	2	Block		N	1.00	1.00	
0.00	140.00	1 5/8" Fiber	2	2.00	1.10	50.00	2	Block		N	1.00	1.00	
0.00	140.00	W/G Ladder	1	2.00	6.00	100.00	2	Individual NR		N	1.00	1.00	

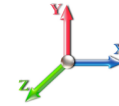
Section Forces

Structure: CT09865-S-SBA
Site Name: Niantic
Height: 180.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Topography: 1

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

1/27/2022



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Load Case: 1.2D + 1.6W Normal Wind - P1

1.2D + 1.6W 105 mph Wind at Normal To Face - P1

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	230.00	0.00	14,666.	0.0	5570.84	5664.50	11,235.34
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	230.00	0.00	12,447.	0.0	5264.39	7129.15	12,393.54
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	230.00	0.00	10,279.	0.0	4236.98	7938.58	12,175.56
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	230.00	0.00	9,078.7	0.0	3156.58	8521.31	11,677.89
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	153.33	0.00	5,386.7	0.0	2501.08	5942.13	8,443.22
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	107.27	0.00	3,433.5	0.0	2225.61	4225.12	6,450.73
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,741.2	0.0	1900.46	1281.32	3,181.78
														57,033.2	0.0			65,558.05

Load Case: 1.2D + 1.6W Normal Wind - P2

1.2D + 1.6W 105 mph Wind at Normal To Face - P2

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	230.00	0.00	14,666.	0.0	3342.50	3398.70	6,741.21
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	230.00	0.00	12,447.	0.0	3158.63	4277.49	7,436.12
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	230.00	0.00	10,279.	0.0	2542.19	4763.15	7,305.33
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	230.00	0.00	9,078.7	0.0	1893.95	5112.79	7,006.73
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	153.33	0.00	5,386.7	0.0	1500.65	3565.28	5,065.93
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	107.27	0.00	3,433.5	0.0	1335.37	2535.07	3,870.44
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,741.2	0.0	1900.46	1281.32	3,181.78
														57,033.2	0.0			40,607.54

Section Forces

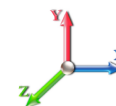
Structure: CT09865-S-SBA

Code: TIA-222-G

1/27/2022

Site Name: Niantic

Exposure: C



Height: 180.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 8

Load Case: 1.2D + 1.6W Normal Wind - P3

1.2D + 1.6W 105 mph Wind at Normal To Face - P3

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	230.00	0.00	14,666.	0.0	5570.84	5664.50	11,235.34
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	230.00	0.00	12,447.	0.0	5264.39	7129.15	12,393.54
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	230.00	0.00	10,279.	0.0	4236.98	7938.58	12,175.56
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	230.00	0.00	9,078.7	0.0	3156.58	8521.31	11,677.89
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	153.33	0.00	5,386.7	0.0	2501.08	5942.13	8,443.22
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	107.27	0.00	3,433.5	0.0	2225.61	4225.12	6,450.73
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,741.2	0.0	1140.28	768.79	1,909.07
														57,033.2	0.0			64,285.34

Load Case: 1.2D + 1.6W 60° Wind - P1

1.2D + 1.6W 105 mph Wind at 60° From Face - P1

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	230.00	0.00	14,666.	0.0	4658.28	5664.50	10,322.78
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	230.00	0.00	12,447.	0.0	4454.14	7129.15	11,583.29
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	230.00	0.00	10,279.	0.0	3643.91	7938.58	11,582.49
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	230.00	0.00	9,078.7	0.0	2778.46	8521.31	11,299.78
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	153.33	0.00	5,386.7	0.0	2151.75	5942.13	8,093.88
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	107.27	0.00	3,433.5	0.0	1900.51	4225.12	6,125.63
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,741.2	0.0	1612.93	1281.32	2,894.25
														57,033.2	0.0			61,902.10

Section Forces

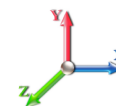
Structure: CT09865-S-SBA

Code: TIA-222-G

1/27/2022

Site Name: Niantic

Exposure: C



Height: 180.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 9

Load Case: 1.2D + 1.6W 60° Wind - P2

1.2D + 1.6W 105 mph Wind at 60° From Face - P2

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	230.00	0.00	14,666.	0.0	2794.97	3398.70	6,193.67
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	230.00	0.00	12,447.	0.0	2672.49	4277.49	6,949.98
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	230.00	0.00	10,279.	0.0	2186.35	4763.15	6,949.50
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	230.00	0.00	9,078.7	0.0	1667.08	5112.79	6,779.87
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	153.33	0.00	5,386.7	0.0	1291.05	3565.28	4,856.33
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	107.27	0.00	3,433.5	0.0	1140.31	2535.07	3,675.38
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,741.2	0.0	1612.93	1281.32	2,894.25
														57,033.2	0.0			38,298.96

Load Case: 1.2D + 1.6W 60° Wind - P3

1.2D + 1.6W 105 mph Wind at 60° From Face - P3

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	230.00	0.00	14,666.	0.0	4658.28	5664.50	10,322.78
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	230.00	0.00	12,447.	0.0	4454.14	7129.15	11,583.29
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	230.00	0.00	10,279.	0.0	3643.91	7938.58	11,582.49
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	230.00	0.00	9,078.7	0.0	2778.46	8521.31	11,299.78
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	153.33	0.00	5,386.7	0.0	2151.75	5942.13	8,093.88
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	107.27	0.00	3,433.5	0.0	1900.51	4225.12	6,125.63
2 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,741.2	0.0	967.76	768.79	1,736.55
														57,033.2	0.0			60,744.40

Section Forces

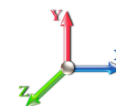
Structure: CT09865-S-SBA

Code: TIA-222-G

1/27/2022

Site Name: Niantic

Exposure: C



Height: 180.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 10

Load Case: 1.2D + 1.6W 90° Wind - P1

1.2D + 1.6W 105 mph Wind at 90° From Face - P1

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	230.00	0.00	14,666.	0.0	4886.42	5664.50	10,550.92
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	230.00	0.00	12,447.	0.0	4656.70	7129.15	11,785.85
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	230.00	0.00	10,279.	0.0	3792.18	7938.58	11,730.76
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	230.00	0.00	9,078.7	0.0	2872.99	8521.31	11,394.30
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	153.33	0.00	5,386.7	0.0	2239.08	5942.13	8,181.22
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	107.27	0.00	3,433.5	0.0	1981.79	4225.12	6,206.90
1 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,741.2	0.0	1684.81	1281.32	2,966.13
57,033.2														0.0	62,816.09			

Load Case: 1.2D + 1.6W 90° Wind - P2

1.2D + 1.6W 105 mph Wind at 90° From Face - P2

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	12.24	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	230.00	0.00	14,666.	0.0	2931.85	3398.70	6,330.55
1 2	45.0	15.40	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	230.00	0.00	12,447.	0.0	2794.02	4277.49	7,071.51
1 3	75.0	17.15	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	230.00	0.00	10,279.	0.0	2275.31	4763.15	7,038.45
1 4	105.0	18.41	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	230.00	0.00	9,078.7	0.0	1723.79	5112.79	6,836.58
1 5	130.0	19.25	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	153.33	0.00	5,386.7	0.0	1343.45	3565.28	4,908.73
1 6	150.0	19.84	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	107.27	0.00	3,433.5	0.0	1189.07	2535.07	3,724.14
1 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,741.2	0.0	1684.81	1281.32	2,966.13
57,033.2														0.0	38,876.11			

Section Forces

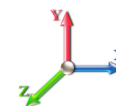
Structure: CT09865-S-SBA

Code: TIA-222-G

1/27/2022

Site Name: Niantic

Exposure: C



Height: 180.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 11

Load Case: 1.2D + 1.6W 90° Wind - P3

1.2D + 1.6W 105 mph Wind at 90° From Face - P3

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 1.20

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)			
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	230.00	0.00	14,666.	0.0	4886.42	5664.50	10,550.92			
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	230.00	0.00	12,447.	0.0	4656.70	7129.15	11,785.85			
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	230.00	0.00	10,279.	0.0	3792.18	7938.58	11,730.76			
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	230.00	0.00	9,078.7	0.0	2872.99	8521.31	11,394.30			
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	153.33	0.00	5,386.7	0.0	2239.08	5942.13	8,181.22			
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	107.27	0.00	3,433.5	0.0	1981.79	4225.12	6,206.90			
1 7	170.0	20.37	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,741.2	0.0	1010.89	768.79	1,779.68			
														57,033.2	0.0			61,629.63			

Load Case: 0.9D + 1.6W Normal Wind

0.9D + 1.6W 105 mph Wind at Normal To Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)			
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	70.43	230.00	0.00	11,000.	0.0	5570.84	5664.50	11,235.34			
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	52.94	230.00	0.00	9,335.4	0.0	5264.39	7129.15	12,393.54			
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	38.63	230.00	0.00	7,709.3	0.0	4236.98	7938.58	12,175.56			
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	27.91	230.00	0.00	6,809.0	0.0	3156.58	8521.31	11,677.89			
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.36	153.33	0.00	4,040.0	0.0	2501.08	5942.13	8,443.22			
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	107.27	0.00	2,575.1	0.0	2225.61	4225.12	6,450.73			
1 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,305.9	0.0	1900.46	1281.32	3,181.78			
														42,774.9	0.0			65,558.05			

Section Forces

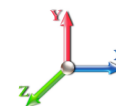
Structure: CT09865-S-SBA

Code: TIA-222-G

1/27/2022

Site Name: Niantic

Exposure: C



Height: 180.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II

Page: 12

Load Case: 0.9D + 1.6W 60° Wind

0.9D + 1.6W 105 mph Wind at 60° From Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	58.89	230.00	0.00	11,000.0	0.0	4658.28	5664.50	10,322.78
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	44.79	230.00	0.00	9,335.4	0.0	4454.14	7129.15	11,583.29
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	33.22	230.00	0.00	7,709.3	0.0	3643.91	7938.58	11,582.49
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	24.57	230.00	0.00	6,809.0	0.0	2778.46	8521.31	11,299.78
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	20.96	153.33	0.00	4,040.0	0.0	2151.75	5942.13	8,093.88
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	107.27	0.00	2,575.1	0.0	1900.51	4225.12	6,125.63
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,305.9	0.0	1612.93	1281.32	2,894.25
														42,774.9	0.0			61,902.10

Load Case: 0.9D + 1.6W 90° Wind

0.9D + 1.6W 105 mph Wind at 90° From Face

Wind Load Factor: 1.60

Wind Importance Factor: 1.00

Dead Load Factor: 0.90

Ice Dead Load Factor: 0.00

Ice Importance Factor: 1.00

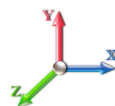
Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	20.39	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	61.78	230.00	0.00	11,000.0	0.0	4886.42	5664.50	10,550.92
1 2	45.0	25.66	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	46.83	230.00	0.00	9,335.4	0.0	4656.70	7129.15	11,785.85
1 3	75.0	28.58	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	34.57	230.00	0.00	7,709.3	0.0	3792.18	7938.58	11,730.76
1 4	105.0	30.68	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	25.40	230.00	0.00	6,809.0	0.0	2872.99	8521.31	11,394.30
1 5	130.0	32.09	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.81	153.33	0.00	4,040.0	0.0	2239.08	5942.13	8,181.22
1 6	150.0	33.07	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	107.27	0.00	2,575.1	0.0	1981.79	4225.12	6,206.90
2 7	170.0	33.95	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,305.9	0.0	1684.81	1281.32	2,966.13
														42,774.9	0.0			62,816.09

Section Forces

Structure: CT09865-S-SBA
Site Name: Niantic
Height: 180.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Topography: 1

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

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Load Case: 1.2D + 1.0Di + 1.0Wi Normal Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	1.00	1.00	1.39	102.94	289.88	97.04	27,508.	12841.5	1033.93	1448.18	2,482.11
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	1.00	1.00	1.55	84.98	297.13	108.3	25,352.	12904.8	1049.60	1896.93	2,946.53
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	1.00	1.00	1.63	67.60	300.78	113.9	22,478.	12199.5	898.24	2134.76	3,033.00
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	1.00	1.00	1.68	54.21	303.28	117.8	20,560.	11481.7	710.64	2249.48	2,937.08
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	1.00	1.00	1.72	51.65	203.28	80.29	14,047.	8661.2	581.24	1078.54	1,659.79
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	1.00	1.00	1.75	45.76	140.50	78.53	10,175.	6742.3	542.05	925.23	1,467.28
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	1.00	1.00	1.77	40.57	43.47	41.23	5,481.1	3739.9	505.75	388.51	894.25
														125,604.1	68570.9			15,420.03

Load Case: 1.2D + 1.0Di + 1.0Wi 60° Wind

1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face

Wind Load Factor: 1.00
Dead Load Factor: 1.20
Ice Dead Load Factor: 1.00

Wind Importance Factor: 1.00
Ice Importance Factor: 1.00

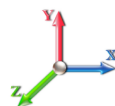
Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear Area (sqft)	Ice Linear Area (sqft)	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	0.80	1.00	1.39	91.40	289.88	97.04	27,508.	12841.5	918.05	1448.18	2,366.23
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	0.80	1.00	1.55	76.83	297.13	108.3	25,352.	12904.8	948.96	1896.93	2,845.89
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	0.80	1.00	1.63	62.19	300.78	113.9	22,478.	12199.5	826.39	2134.76	2,961.15
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	0.80	1.00	1.68	50.87	303.28	117.8	20,560.	11481.7	666.81	2249.48	2,916.29
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	0.80	1.00	1.72	48.24	203.28	80.29	14,047.	8661.2	542.94	1078.54	1,621.49
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	0.80	1.00	1.75	42.89	140.50	78.53	10,175.	6742.3	507.97	925.23	1,433.20
2 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	0.80	1.00	1.77	38.24	43.47	41.23	5,481.1	3739.9	476.74	388.51	865.24
														125,604.1	68570.9			15,009.49

Section Forces

Structure: CT09865-S-SBA
Site Name: Niantic
Height: 180.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Topography: 1

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

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Load Case: 1.2D + 1.0Di + 1.0Wi 90° Wind	1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face
Wind Load Factor: 1.00	Wind Importance Factor: 1.00
Dead Load Factor: 1.20	
Ice Dead Load Factor: 1.00	Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
												Linear Area (sqft)	Linear Area (sqft)					
1 1	15.0	4.62	57.685	78.47	54.63	0.21	2.56	0.85	1.00	1.39	94.29	289.88	97.04	27,508.	12841.5	947.02	1448.18	2,395.20
1 2	45.0	5.82	40.739	76.21	52.37	0.23	2.50	0.85	1.00	1.55	78.87	297.13	108.3	25,352.	12904.8	974.12	1896.93	2,871.05
1 3	75.0	6.48	27.034	69.09	46.51	0.26	2.41	0.85	1.00	1.63	63.54	300.78	113.9	22,478.	12199.5	844.36	2134.76	2,979.11
1 4	105.0	6.96	16.718	61.55	40.22	0.33	2.22	0.85	1.00	1.68	51.70	303.28	117.8	20,560.	11481.7	677.77	2249.48	2,927.25
1 5	130.0	7.28	17.015	47.41	34.86	0.58	1.82	0.85	1.00	1.72	49.09	203.28	80.29	14,047.	8661.2	552.52	1078.54	1,631.06
1 6	150.0	7.50	14.388	44.49	35.36	0.54	1.86	0.85	1.00	1.75	43.61	140.50	78.53	10,175.	6742.3	516.49	925.23	1,441.72
1 7	170.0	7.70	11.635	42.34	35.80	0.50	1.91	0.85	1.00	1.77	38.82	43.47	41.23	5,481.1	3739.9	483.99	388.51	872.50
														125,604.1	68570.9	15,117.89		

Load Case: 1.0D + 1.0W Normal Wind	1.0D + 1.0W 60 mph Wind at Normal To Face
Wind Load Factor: 1.00	Wind Importance Factor: 1.00
Dead Load Factor: 1.00	
Ice Dead Load Factor: 0.00	Ice Importance Factor: 1.00

Sect Seq	Wind Height (ft)	qz (psf)	Total Flat Area (sqft)	Total Round Area (sqft)	Ice Round Area (sqft)	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Ice		Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
												Linear Area (sqft)	Linear Area (sqft)					
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	1.00	1.00	0.00	71.17	230.00	0.00	12,222.	0.0	1148.88	1156.02	2,304.90
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	1.00	1.00	0.00	54.23	230.00	0.00	10,372.	0.0	1100.49	1454.93	2,555.42
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	1.00	1.00	0.00	39.82	230.00	0.00	8,565.9	0.0	891.46	1620.12	2,511.58
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	1.00	1.00	0.00	28.86	230.00	0.00	7,565.6	0.0	666.16	1739.04	2,405.21
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	1.00	1.00	0.00	24.49	153.33	0.00	4,488.9	0.0	512.99	1212.68	1,725.67
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	1.00	1.00	0.00	19.70	107.27	0.00	2,861.2	0.0	454.21	862.27	1,316.47
1 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	1.00	1.00	0.00	15.38	31.69	0.00	1,451.0	0.0	387.85	261.49	649.34
														47,527.7	0.0	13,468.59		

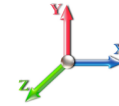
Section Forces

Structure: CT09865-S-SBA
Site Name: Niantic
Height: 180.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Topography: 1

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

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Load Case: 1.0D + 1.0W 60° Wind				1.0D + 1.0W 60 mph Wind at 60° From Face			
Wind Load Factor: 1.00				Wind Importance Factor: 1.00			
Dead Load Factor: 1.00				Ice Importance Factor: 1.00			
Ice Dead Load Factor: 0.00							

Sect Seq	Wind Height (ft)	qz (psf)	Total	Total	Ice	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear	Linear	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat Area (sqft)	Round Area (sqft)	Round Area (sqft)							Area (sqft)	Area (sqft)					
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	0.80	1.00	0.00	59.63	230.00	0.00	12,222.	0.0	962.64	1156.02	2,118.67
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	0.80	1.00	0.00	46.08	230.00	0.00	10,372.	0.0	935.14	1454.93	2,390.07
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	0.80	1.00	0.00	34.42	230.00	0.00	8,565.9	0.0	770.42	1620.12	2,390.54
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	0.80	1.00	0.00	25.52	230.00	0.00	7,565.6	0.0	589.00	1739.04	2,328.04
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	0.80	1.00	0.00	21.08	153.33	0.00	4,488.9	0.0	441.70	1212.68	1,654.38
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	0.80	1.00	0.00	16.82	107.27	0.00	2,861.2	0.0	387.86	862.27	1,250.13
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	0.80	1.00	0.00	13.05	31.69	0.00	1,451.0	0.0	329.17	261.49	590.66
														47,527.7	0.0			12,722.48

Load Case: 1.0D + 1.0W 90° Wind				1.0D + 1.0W 60 mph Wind at 90° From Face			
Wind Load Factor: 1.00				Wind Importance Factor: 1.00			
Dead Load Factor: 1.00				Ice Importance Factor: 1.00			
Ice Dead Load Factor: 0.00							

Sect Seq	Wind Height (ft)	qz (psf)	Total	Total	Ice	Sol Ratio	Cf	Df	Dr	Ice Thick (in)	Eff Area (sqft)	Linear	Linear	Total Weight (lb)	Weight Ice (lb)	Struct Force (lb)	Linear Force (lb)	Total Force (lb)
			Flat Area (sqft)	Round Area (sqft)	Round Area (sqft)							Area (sqft)	Area (sqft)					
1 1	15.0	6.66	57.685	23.84	0.00	0.13	2.85	0.85	1.00	0.00	62.52	230.00	0.00	12,222.	0.0	1009.20	1156.02	2,165.22
1 2	45.0	8.38	40.739	23.84	0.00	0.13	2.85	0.85	1.00	0.00	48.12	230.00	0.00	10,372.	0.0	976.48	1454.93	2,431.40
1 3	75.0	9.33	27.034	22.58	0.00	0.14	2.82	0.85	1.00	0.00	35.77	230.00	0.00	8,565.9	0.0	800.68	1620.12	2,420.80
1 4	105.0	10.02	16.718	21.33	0.00	0.17	2.71	0.85	1.00	0.00	26.36	230.00	0.00	7,565.6	0.0	608.29	1739.04	2,347.33
1 5	130.0	10.48	17.015	12.55	0.00	0.28	2.35	0.85	1.00	0.00	21.93	153.33	0.00	4,488.9	0.0	459.52	1212.68	1,672.20
1 6	150.0	10.80	14.388	9.13	0.00	0.23	2.51	0.85	1.00	0.00	17.54	107.27	0.00	2,861.2	0.0	404.45	862.27	1,266.71
2 7	170.0	11.09	11.635	6.54	0.00	0.18	2.68	0.85	1.00	0.00	13.64	31.69	0.00	1,451.0	0.0	343.84	261.49	605.33
														47,527.7	0.0			12,909.01

Force/Stress Compression Summary

Structure: CT09865-S-SBA
Site Name: Niantic
Height: 180.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Topography: 1

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

1/27/2022

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LEG MEMBERS

Sect	Top Elev	Member	Force		Load Case	Len (ft)	Bracing %			Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls	
			(kips)				X	Y	Z					KL/R
1	30	SOL - 4 3/4" SOLID	-430.02	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	74.81	50.00	529.67	81.2	Member X
2	60	SOL - 4 3/4" SOLID	-382.70	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	74.81	50.00	529.67	72.3	Member X
3	90	SOL - 4 1/2" SOLID	-334.87	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	78.96	50.00	453.66	73.8	Member X
4	120	SOL - 4 1/4" SOLID	-291.33	1.2D + 1.6W	Normal Wind - P1	7.40	100	100	100	83.61	50.00	382.92	76.1	Member X
5	140	SOL - 3 1/2" SOLID	-244.78	1.2D + 1.6W	Normal Wind - P1	3.25	100	100	100	44.57	50.00	374.41	65.4	Member X
6	160	SOL - 2 1/2" SOLID	-105.04	1.2D + 1.6W	Normal Wind - P1	3.25	100	100	100	62.40	50.00	166.16	63.2	Member X
7	180	SOL - 1 3/4" SOLID	-23.55	1.2D + 1.6W	Normal Wind - P1	3.25	100	100	100	89.14	50.00	60.54	38.9	Member X

Splices

Sect	Top Elev	Load Case	Top Splice				Bolt Type	Num Bolts	Load Case	Bottom Splice			
			Force (kips)	Cap (kips)	Use %					Force (kips)	Cap (kips)	Use %	Bolt Type
1	30	1.2D + 1.6W Normal Wind - P1	390.69	0.00	0.0			1.2D + 1.6W Normal Wind - P1	437.00	0.00			
2	60	1.2D + 1.6W Normal Wind - P1	342.16	0.00	0.0			1.2D + 1.6W Normal Wind - P1	390.69	0.00		1/4 A325	6
3	90	1.2D + 1.6W Normal Wind - P1	297.37	0.00	0.0			1.2D + 1.6W Normal Wind - P1	342.16	0.00		1/4 A325	6
4	120	1.2D + 1.6W Normal Wind - P1	261.04	0.00	0.0			1.2D + 1.6W Normal Wind - P1	297.37	0.00		1/4 A325	6
5	140	1.2D + 1.6W Normal Wind - P1	114.80	0.00	0.0			1.2D + 1.6W Normal Wind - P1	261.04	0.00		1/8 A325	6
6	160	1.2D + 1.6W Normal Wind - P1	28.54	0.00	0.0			1.2D + 1.6W Normal Wind - P1	114.80	0.00		1/8 A325	6
7	180	1.2D + 1.0Di + 1.0Wi 90° Wind	0.60	0.00	0.0			1.2D + 1.6W Normal Wind - P1	28.54	0.00		7/8 A325	6

HORIZONTAL MEMBERS

Sect	Top Elev	Member	Force		Len (ft)	Bracing %			Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Bear		Use %	Controls	
			(kips)			X	Y	Z					KL/R	(kips)			(kips)
1	30								0.00	0	0						
2	60								0.00	0	0						
3	90								0.00	0	0						
4	120								0.00	0	0						
5	140	SOL - 1 1/8" SOLID	-3.51	1.2D + 1.6W	60° Wind - P1	5.00	100	100	100	149.31	36.00	10.07	0	0		35	Member X
6	160	SOL - 1" SOLID	-1.62	1.2D + 1.6W	60° Wind - P1	5.00	100	100	100	168.00	36.00	6.29	0	0		26	Member X
7	180	SOL - 7/8" SOLID	-1.16	1.2D + 1.6W	Normal Wind - P2	5.00	100	100	100	191.96	36.00	3.69	0	0		31	Member X

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force		Len (ft)	Bracing %			Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Bear		Use %	Controls		
			(kips)			X	Y	Z					KL/R	(kips)			(kips)	
1	30	SAE - 4X4X0.3125	-8.78	1.2D + 1.6W	90° Wind - P3	23.59	50	50	50	178.97	36.00	16.93	1	1	24.35	21.7	52	Member Z
2	60	SAE - 3.5X3.5X0.25	-7.97	1.2D + 1.6W	90° Wind - P3	19.37	50	50	50	167.47	36.00	13.61	1	1	24.35	17.4	59	Member Z
3	90	SAE - 3X3X0.1875	-5.96	1.2D + 1.6W	90° Wind - P3	15.31	50	50	50	154.10	36.00	10.37	1	1	17.89	10.7	57	Member Z
4	120	SAE - 2.5X2.5X0.1875	-4.74	1.2D + 1.6W	Normal Wind - P3	9.26	50	50	50	114.18	36.00	14.71	1	1	17.89	10.7	44	Bolt Bear
5	140	SAE - 3X3X0.1875	-14.0	1.2D + 1.6W	90° Wind - P1	5.96	50	50	50	54.03	36.00	30.28	0	0			46	Member Z
6	160	SAE - 2.5X2.5X0.1875	-8.86	1.2D + 1.6W	90° Wind - P1	5.96	50	50	50	65.06	36.00	23.39	0	0			38	Member Z
7	180	SAE - 2X2X0.1875	-3.75	1.2D + 1.6W	90° Wind - P1	5.96	50	50	50	81.73	36.00	16.18	0	0			23	Member Z

Force/Stress Tension Summary

Structure: CT09865-S-SBA

Code: TIA-222-G

1/27/2022

Site Name: Niantic

Exposure: C

Height: 180.00 (ft)

Crest Height: 0.00

Base Elev: 0.000 (ft)

Site Class: D - Stiff Soil

Gh: 0.85

Topography: 1

Struct Class: II



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LEG MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Leg Use %	Controls
1	30	SOL - 4 3/4" SOLID	383.51	0.9D + 1.6W 60° Wind	50	797.45	48.1	Member
2	60	SOL - 4 3/4" SOLID	346.41	0.9D + 1.6W 60° Wind	50	797.45	43.4	Member
3	90	SOL - 4 1/2" SOLID	307.29	0.9D + 1.6W 60° Wind	50	715.68	42.9	Member
4	120	SOL - 4 1/4" SOLID	270.18	0.9D + 1.6W 60° Wind	50	638.37	42.3	Member
5	140	SOL - 3 1/2" SOLID	239.05	0.9D + 1.6W 60° Wind	50	432.95	55.2	Member
6	160	SOL - 2 1/2" SOLID	101.83	0.9D + 1.6W 60° Wind	50	220.89	46.1	Member
7	180	SOL - 1 3/4" SOLID	22.44	0.9D + 1.6W 60° Wind	50	108.24	20.7	Member

Splices

Sect	Top Elev	Load Case	Top Splice				Load Case	Bottom Splice						
			Force (kips)	Cap (kips)	Use %	Bolt Type		Num Bolts	Force (kips)	Cap (kips)	Use %	Bolt Type	Num Bolts	
1	30	0.9D + 1.6W 60° Wind	345.93	0.00	0.0		0.9D + 1.6W 60° Wind	383.5	0.00					
2	60	0.9D + 1.6W 60° Wind	306.83	0.00	0.0		0.9D + 1.6W 60° Wind	345.9	457.92	75.5	1 1/4	A325	6	
3	90	0.9D + 1.6W 60° Wind	269.81	0.00	0.0		0.9D + 1.6W 60° Wind	306.8	457.92	67.0	1 1/4	A325	6	
4	120	0.9D + 1.6W 60° Wind	239.57	0.00	0.0		0.9D + 1.6W 60° Wind	269.8	457.92	58.9	1 1/4	A325	6	
5	140	0.9D + 1.6W 60° Wind	101.24	0.00	0.0		0.9D + 1.6W 60° Wind	239.5	360.65	66.4	1 1/8	A325	6	
6	160	0.9D + 1.6W 60° Wind	21.65	0.00	0.0		0.9D + 1.6W 60° Wind	101.2	360.65	28.1	1 1/8	A325	6	
7	180		0.00	0.00	0.0		0.9D + 1.6W 60° Wind	21.65	249.36	8.7	7/8	A325	6	

HORIZONTAL MEMBERS

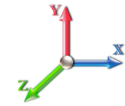
Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	30	-			36	0.00	0	0					
2	60	-			36	0.00	0	0					
3	90	-			36	0.00	0	0					
4	120	-			36	0.00	0	0					
5	140	SOL - 1 1/8" SOLID	2.95	0.9D + 1.6W Normal Wi	36	32.21	0	0				9.2	Member
6	160	SOL - 1" SOLID	1.72	1.2D + 1.6W Normal Wi	36	25.45	0	0				6.8	Member
7	180	SOL - 7/8" SOLID	1.21	1.2D + 1.6W 60° Wind -	36	19.48	0	0				6.2	Member

DIAGONAL MEMBERS

Sect	Top Elev	Member	Force (kips)	Load Case	Fy (ksi)	Mem Cap (kips)	Num Bolts	Num Holes	Shear Cap (kips)	Bear Cap (kips)	B.S. Cap (kips)	Use %	Controls
1	30	SAE - 4X4X0.3125	8.88	1.2D + 1.6W 90° Wind -	36	68.10	1	1	24.35	21.75	21.19	41.9	Blck Shear
2	60	SAE - 3.5X3.5X0.25	7.81	1.2D + 1.6W 90° Wind -	36	46.98	1	1	24.35	17.40	16.95	46.1	Blck Shear
3	90	SAE - 3X3X0.1875	5.74	1.2D + 1.6W 90° Wind -	36	30.21	1	1	17.89	10.77	10.42	55.1	Blck Shear
4	120	SAE - 2.5X2.5X0.1875	4.17	1.2D + 1.6W 60° Wind -	36	24.08	1	1	17.89	10.77	9.40	44.4	Blck Shear
5	140	SAE - 3X3X0.1875	13.69	1.2D + 1.6W 90° Wind -	36	35.32	0	0				38.8	Member
6	160	SAE - 2.5X2.5X0.1875	8.78	1.2D + 1.6W 90° Wind -	36	29.22	0	0				30.0	Member
7	180	SAE - 2X2X0.1875	3.73	1.2D + 1.6W 90° Wind -	36	23.00	0	0				16.2	Member

Seismic Section Forces

Structure: CT09865-S-SBA	Code: TIA-222-G	1/27/2022
Site Name: Niantic	Exposure: C	
Height: 180.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II



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Load Case: 1.2D + 1.0E

Dead Load Factor	1.20	Sds 0.171	Ss 0.1610	Fa 1.6000	Ke 0.0000
Seismic Load Factor	1.00	Sd1 0.092	S1 0.0580	Fv 2.4000	Kg 0.0000
Seismic Importance Factor	1.00	SA 0.140	R 3.0000	Vs 3.1837	f1 1.5130

Sect #	Elev (ft)	Wz (lb)	Lateral			Fsz (lb)
			a	b	c	
1	15.00	12222.	0.01	0.06	0.03	56.36
2	45.00	10372.	0.12	0.07	0.03	105.59
3	75.00	8565.8	0.33	0.04	0.01	153.59
4	105.00	7565.6	0.64	-0.07	0.02	188.83
5	130.00	5990.7	0.99	-0.11	0.12	210.33
6	150.00	6929.0	1.31	0.14	0.35	399.89
7	170.00	5010.6	1.69	1.07	0.79	521.34

Load Case: 0.9D + 1.0E

Dead Load Factor	0.90	Sds 0.171	Ss 0.1610	Fa 1.6000	Ke 0.0000
Seismic Load Factor	1.00	Sd1 0.092	S1 0.0580	Fv 2.4000	Kg 0.0000
Seismic Importance Factor	1.00	SA 0.140	R 3.0000	Vs 3.1837	f1 1.5130

Sect #	Elev (ft)	Wz (lb)	Lateral			Fsz (lb)
			a	b	c	
1	15.00	12222.	0.01	0.06	0.03	56.36
2	45.00	10372.	0.12	0.07	0.03	105.59
3	75.00	8565.8	0.33	0.04	0.01	153.59
4	105.00	7565.6	0.64	-0.07	0.02	188.83
5	130.00	5990.7	0.99	-0.11	0.12	210.33
6	150.00	6929.0	1.31	0.14	0.35	399.89
7	170.00	5010.6	1.69	1.07	0.79	521.34

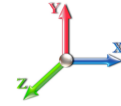
Support Forces Summary

Structure: CT09865-S-SBA
Site Name: Niantic
Height: 180.00 (ft)
Base Elev: 0.000 (ft)
Gh: 0.85

Topography: 1

Code: TIA-222-G
Exposure: C
Crest Height: 0.00
Site Class: D - Stiff Soil
Struct Class: II

1/27/2022



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Load Case	Node	FX (kips)	FY (kips)	FZ (kips)	(-) = Uplift (+) = Down
1.2D + 1.6W Normal Wind - P1	1	0.00	434.91	-51.54	
	1a	17.90	-183.46	-15.24	
	1b	-17.90	-183.46	-15.24	
1.2D + 1.6W Normal Wind - P2	1	0.00	333.58	-37.11	
	1a	12.48	-132.80	-9.98	
	1b	-12.48	-132.80	-9.98	
1.2D + 1.6W Normal Wind - P3	1	0.00	423.90	-50.66	
	1a	17.49	-177.96	-15.05	
	1b	-17.49	-177.96	-15.05	
1.2D + 1.6W 60° Wind - P1	1	-3.91	221.67	-25.64	
	1a	-24.15	221.48	9.44	
	1b	-39.81	-375.16	-22.98	
1.2D + 1.6W 60° Wind - P2	1	-2.23	173.36	-18.81	
	1a	-17.40	173.16	7.48	
	1b	-27.80	-278.53	-16.05	
1.2D + 1.6W 60° Wind - P3	1	-3.94	216.67	-25.24	
	1a	-23.82	216.47	9.21	
	1b	-39.10	-365.15	-22.57	
1.2D + 1.6W 90° Wind - P1	1	-4.63	22.67	-1.81	
	1a	-38.83	370.21	19.78	
	1b	-35.82	-324.89	-17.97	
1.2D + 1.6W 90° Wind - P2	1	-2.63	22.66	-1.85	
	1a	-27.94	285.51	14.62	
	1b	-24.77	-240.19	-12.77	
1.2D + 1.6W 90° Wind - P3	1	-4.67	22.67	-1.81	
	1a	-38.22	361.33	19.41	
	1b	-35.21	-316.01	-17.60	
0.9D + 1.6W Normal Wind	1	0.00	428.84	-51.06	
	1a	18.30	-188.92	-15.48	
	1b	-18.30	-188.92	-15.48	
0.9D + 1.6W 60° Wind	1	-3.92	215.81	-25.17	
	1a	-23.74	215.62	9.19	
	1b	-40.21	-380.44	-23.21	
0.9D + 1.6W 90° Wind	1	-4.64	17.00	-1.33	
	1a	-38.41	364.21	19.54	
	1b	-36.23	-330.22	-18.20	
1.2D + 1.0Di + 1.0Wi Normal Wind	1	0.00	144.43	-12.73	
	1a	3.45	2.12	-3.09	
	1b	-3.45	2.12	-3.09	
1.2D + 1.0Di + 1.0Wi 60° Wind	1	-0.91	96.25	-6.86	
	1a	-6.40	96.18	2.64	
	1b	-8.71	-43.75	-5.03	

1.2D + 1.0Di + 1.0Wi 90° Wind	1	-1.06	49.56	-1.22
	1a	-9.82	130.69	5.06
	1b	-7.71	-31.58	-3.84
1.2D + 1.0E	1	0.00	33.31	3.49
	1a	4.38	17.34	-2.55
	1b	-4.38	17.34	-2.55
0.9D + 1.0E	1	0.00	27.64	3.99
	1a	4.81	11.68	-2.79
	1b	-4.81	11.68	-2.79
1.0D + 1.0W Normal Wind	1	0.00	103.28	-11.79
	1a	2.62	-23.31	-2.52
	1b	-2.62	-23.31	-2.52
1.0D + 1.0W 60° Wind	1	-0.81	59.63	-6.47
	1a	-6.01	59.59	2.54
	1b	-7.11	-62.56	-4.10
1.0D + 1.0W 90° Wind	1	-0.95	18.89	-1.58
	1a	-9.02	90.04	4.66
	1b	-6.29	-52.27	-3.08

Max Reactions

Leg		Overturning	
Max Uplift:	-380.44 (kips)	Moment:	8211.32 (ft-kips)
Max Down:	434.91 (kips)	Total Down:	67.99 (kips)
Max Shear:	51.54 (kips)	Total Shear:	82.02 (kips)

Analysis Summary

Structure: CT09865-S-SBA	Code: TIA-222-G	1/27/2022
Site Name: Niantic	Exposure: C	
Height: 180.00 (ft)	Crest Height: 0.00	
Base Elev: 0.000 (ft)	Site Class: D - Stiff Soil	
Gh: 0.85	Topography: 1	Struct Class: II
		Page: 21



Max Reactions

	Leg	Overturning
Max Uplift:	-380.44 (kips)	Moment: 8211.32 (ft-kips)
Max Down:	434.91 (kips)	Total Down: 67.99 (kips)
Max Shear:	51.54 (kips)	Total Shear: 82.02 (kips)

Anchor Bolts

Bolt Size (in.): 1.50	Number Bolts: 8
Yield Strength (Ksi): 105.00	Tensile Strength (Ksi): 125.00
Detail Type: A	

Interaction Ratio: 0.39

Max Usages

Max Leg: 81.2% (1.2D + 1.6W Normal Wind - P1 - Sect 1)
 Max Diag: 58.6% (1.2D + 1.6W 90° Wind - P3 - Sect 2)
 Max Horiz: 34.8% (1.2D + 1.6W 60° Wind - P1 - Sect 5)

Max Deflection, Twist and Sway


Load Case	Elevation (ft)	Deflection (ft)	Twist (deg)	Sway (deg)
0.9D + 1.0E - Normal To Face	140.00	0.0274	0.0009	0.0397
	150.00	0.0337	-0.0007	0.0381
	160.00	0.0407	-0.0005	0.0545
	170.00	0.0481	-0.0002	0.0426
	180.00	0.0556	-0.0001	0.0467
0.9D + 1.6W 105 mph Wind at 60° From Face	140.00	0.8533	0.1190	1.0976
	150.00	1.0259	0.1473	1.0280
	160.00	1.2120	0.1770	1.3773
	170.00	1.4052	0.2968	1.1178
	180.00	1.5969	0.4152	1.0561
0.9D + 1.6W 105 mph Wind at 90° From Face	140.00	0.8592	-0.0805	1.0912
	150.00	1.0326	-0.0805	1.0356
	160.00	1.2198	-0.0805	1.3670
	170.00	1.4146	-0.0805	1.1360
	180.00	1.6050	-0.0804	0.5104
0.9D + 1.6W 105 mph Wind at Normal To Face	140.00	0.8799	0.0625	1.1354
	150.00	1.0575	0.0630	1.0602
	160.00	1.2498	0.0619	1.4240
	170.00	1.4499	0.0626	1.1138
	180.00	1.6521	0.0625	1.8979
1.0D + 1.0W 60 mph Wind at 60° From Face	140.00	0.1745	0.0157	0.2249
	150.00	0.2097	0.0167	0.2101
	160.00	0.2478	0.0177	0.2819
	170.00	0.2874	0.0222	0.2284
	180.00	0.3265	0.0268	0.2131

1.0D + 1.0W 60 mph Wind at 90° From Face	140.00	0.1758	-0.0160	0.2228
	150.00	0.2112	-0.0158	0.2117
	160.00	0.2495	-0.0156	0.2792
	170.00	0.2894	-0.0150	0.2323
	180.00	0.3282	-0.0147	0.1050
1.0D + 1.0W 60 mph Wind at Normal To Face	140.00	0.1801	0.0137	0.2316
	150.00	0.2165	0.0135	0.2168
	160.00	0.2557	0.0133	0.2906
	170.00	0.2966	0.0129	0.2279
	180.00	0.3380	0.0126	0.3877
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 60° From Face	140.00	0.1992	0.0201	0.2573
	150.00	0.2396	0.0225	0.2416
	160.00	0.2835	0.0249	0.3283
	170.00	0.3290	0.0351	0.2647
	180.00	0.3746	0.0449	0.2711
1.2D + 1.0Di + 1.0Wi 50 mph Wind at 90° From Face	140.00	0.1997	-0.0187	0.2538
	150.00	0.2401	-0.0186	0.2424
	160.00	0.2841	-0.0185	0.3235
	170.00	0.3297	-0.0182	0.2680
	180.00	0.3746	-0.0180	0.0515
1.2D + 1.0Di + 1.0Wi 50 mph Wind at Normal From Face	140.00	0.2020	0.0156	0.2607
	150.00	0.2430	0.0154	0.2460
	160.00	0.2878	0.0152	0.3333
	170.00	0.3345	0.0149	0.2615
	180.00	0.3824	0.0146	0.5302
1.2D + 1.0E - Normal To Face	140.00	0.0274	0.0009	0.0397
	150.00	0.0337	0.0007	0.0382
	160.00	0.0408	-0.0005	0.0546
	170.00	0.0482	-0.0002	0.0427
	180.00	0.0557	-0.0001	0.0469
1.2D + 1.6W 105 mph Wind at 60° From Face - P1	140.00	0.8547	0.1194	1.1002
	150.00	1.0277	0.1478	1.0303
	160.00	1.2142	0.1776	1.3810
	170.00	1.4079	0.2976	1.1203
	180.00	1.6000	0.4163	1.0586
1.2D + 1.6W 105 mph Wind at 60° From Face - P2	140.00	0.6910	0.0899	0.9509
	150.00	0.8408	0.1151	0.8968
	160.00	1.0040	0.1415	1.2432
	170.00	1.1747	0.2481	0.9880
	180.00	1.3435	0.3535	0.9508
1.2D + 1.6W 105 mph Wind at 60° From Face - P3	140.00	0.8242	0.1158	1.0475
	150.00	0.9884	0.1424	0.9757
	160.00	1.1646	0.1702	1.2907
	170.00	1.3471	0.2827	1.0550
	180.00	1.5275	0.3939	0.9982
1.2D + 1.6W 105 mph Wind at 90° From Face - P1	140.00	0.8605	-0.0808	1.0937
	150.00	1.0344	-0.0808	1.0380
	160.00	1.2221	-0.0808	1.3706
	170.00	1.4173	-0.0808	1.1387
	180.00	1.6081	-0.0808	0.5133
1.2D + 1.6W 105 mph Wind at 90° From Face - P2	140.00	0.6951	-0.0541	0.9439
	150.00	0.8455	-0.0541	0.9029
	160.00	1.0096	-0.0541	1.2317
	170.00	1.1815	-0.0541	1.0049
	180.00	1.3489	-0.0541	0.3794
1.2D + 1.6W 105 mph Wind at 90° From Face - P3	140.00	0.8294	-0.0806	1.0399
	150.00	0.9942	-0.0806	0.9818
	160.00	1.1713	-0.0806	1.2793
	170.00	1.3550	-0.0806	1.0716
	180.00	1.5339	-0.0805	0.4375

1.2D + 1.6W 105 mph Wind at Normal To Face - P1	140.00	0.8814	0.0627	1.1380
	150.00	1.0593	0.0631	1.0626
	160.00	1.2521	0.0621	1.4278
	170.00	1.4527	0.0628	1.1165
	180.00	1.6554	0.0626	1.9008

1.2D + 1.6W 105 mph Wind at Normal To Face - P2	140.00	0.7104	0.0413	0.9808
	150.00	0.8641	0.0415	0.9230
	160.00	1.0325	0.0406	1.2836
	170.00	1.2089	0.0411	0.9781
	180.00	1.3874	0.0410	1.7622

1.2D + 1.6W 105 mph Wind at Normal To Face - P3	140.00	0.8480	0.0633	1.0793
	150.00	1.0163	0.0637	1.0026
	160.00	1.1977	0.0628	1.3275
	170.00	1.3859	0.0633	1.0448
	180.00	1.5759	0.0631	1.8196

	Mat Foundation Design for Self Supporting Tower			Date
				1/27/2022
	Customer Name:	SBA Communications Corp	TIA Standard:	TIA-222-G
	Site Name:		Structure Height (Ft.):	180
	Site Nmber:	CT09865-S-SBA	Engineer Name:	H. You
Engr. Number:	122610	Engineer Login ID:		

Foundation Info Obtained from:

Analysis or Design?

Number of Tower Legs:

Base Reactions (Factored):

(1). Individual Leg:

Axial Load (Kips):	434.9	Uplift Force (Kips):	380.4
Shear Force (Kips):	51.5		

(2). Tower Base:

Total Vertical Load (Kips):	68.0	Total Shear Force (Kips):	82.0
Moment (Kips-ft):	8211.3		

Foundation Geometries:

Leg distance (Center-to-Center ft.):	23.0	Mods required -Yes/No ?:	No
Diameter of Pier (ft.):	Round 3.5	Pier Height A. G. (ft.):	0.50
Tower center to mat center (ft):	0	Depth of Base BG (ft.):	6.5
Length of Pad (ft.):	36	Width of Pad (ft.):	36
Thickness of Pad (ft):	2.00		

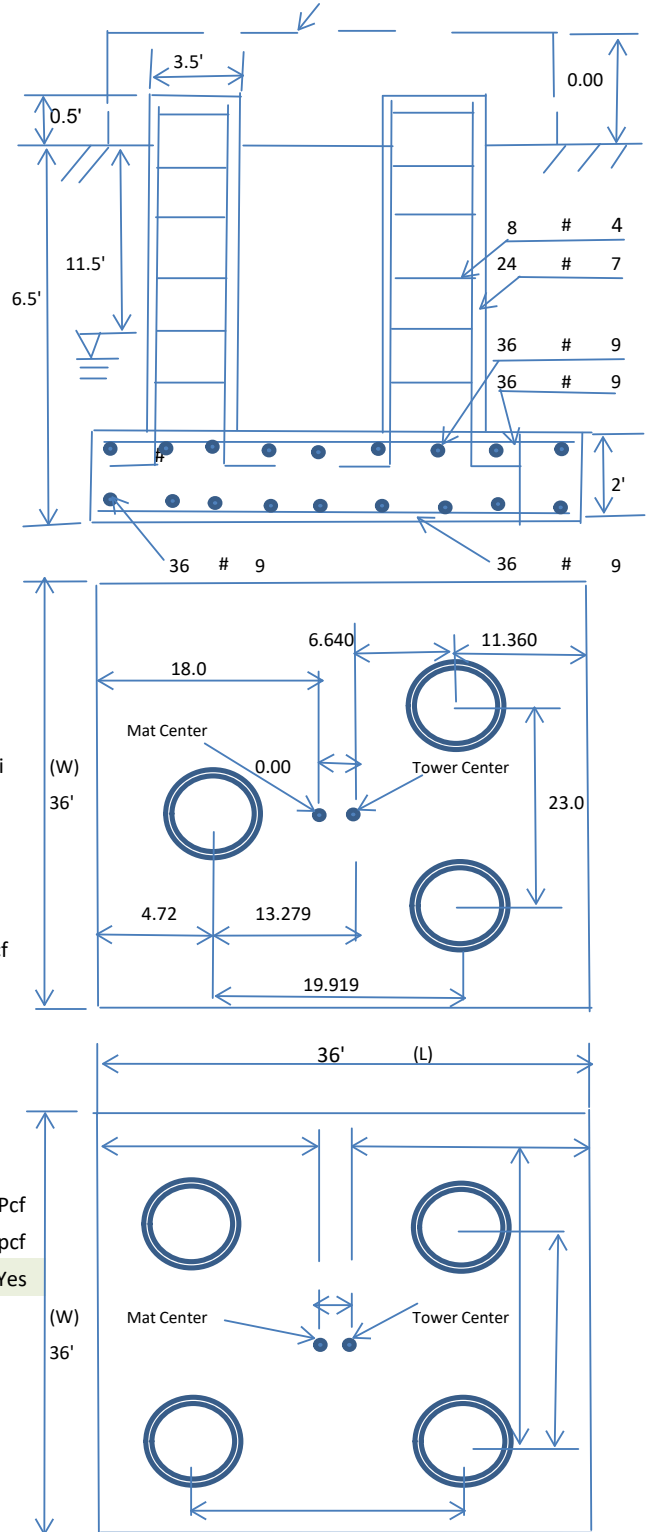
Material Properties and Rebar Info:

Concrete Strength (psi):	3000	Steel Elastic Modulus:	29000	ksi
Vertical bar yield (ksi):	60	Tie steel yield (ksi):	60	
Vertical Rebar Size #:	7	Tie / Stirrup Size #:	4	
Qty. of Vertical Rebars:	24	Tie Spacing (in):	12.0	
Pad Rebar Yield (Ksi):	60	Pad Steel Rebar Size (#):	9	
Concrete Cover (in.):	3	Unit Weight of Concrete:	150.0	pcf

Rebar at the bottom of the concrete pad:			
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36
Rebar at the top of the concrete pad:			
Qty. of Rebar in Pad (L):	36	Qty. of Rebar in Pad (W):	36

Soil Design Parameters:

Soil Unit Weight (pcf):	125.0	Soil Buoyant Weight:	50.0	Pcf
Water Table B.G.S. (ft):	11.5	Unit Weight of Water:	62.4	pcf
Ultimate Bearing Pressure (psf):	8000	Consider ties in concrete shear strength:	Yes	
Consider Soil Lateral Resistance ?				



Foundation Analysis and Design:	Uplift Strength Reduction Factor:	0.75	Compression Strength Reduction Factor:	0.75
Total Dry Soil Volume (cu. Ft.):	5702.11	Total Dry Soil Weight (Kips):	712.76	
Total Buoyant Soil Volume (cu. Ft.):	0.00	Total Buoyant Soil Weight (Kips):	0.00	
Total Effective Soil Weight (Kips):	712.76	Weight from the Concrete Block at Top (K):	0.00	
Total Dry Concrete Volume (cu. Ft.):	2736.32	Total Dry Concrete Weight (Kips):	410.45	
Total Buoyant Concrete Volume (cu. Ft.):	0.00	Total Buoyant Concrete Weight (Kips):	0.00	
Total Effective Concrete Weight (Kips):	410.45	Total Vertical Load on Base (Kips):	1191.20	

Check Soil Capacities:

Calculated Maxium Net Soil Pressure under the base (psf):	2010.40	<	Allowable Factored Soil Bearing (psf):	6000	0.34	OK!
Allowable Foundation Overturning Resistance (kips-ft.):	19419.8	>	Design Factored Momont (kips-ft):	8785	0.45	OK!
Factor of Safety Against Overturning (O. R. Moment/Design Moment):	2.21					OK!

Check the capacities of Reinforceing Concrete:

Strength reduction factor (Flexure and axial tension):	0.90	Strength reduction factor (Shear):	0.75			
Strength reduction factor (Axial compression):	0.65	Wind Load Factor on Concrete Design:	1.00			
				Load/ Capacity Ratio		
(1) Concrete Pier:						
Vertical Steel Rebar Area (sq. in./each):	0.60	Tie / Stirrup Area (sq. in./each):	0.20			
Calculated Moment Capacity (Mn,Kips-Ft):	580.1	>	Design Factored Moment (Mu, Kips-Ft)	257.7	0.44	OK!
Calculated Shear Capacity (Kips):	97.3	>	Design Factored Shear (Kips):	51.5	0.53	OK!
Calculated Tension Capacity (Tn, Kips):	777.6	>	Design Factored Tension (Tu Kips):	380.4	0.49	OK!
Calculated Compression Capacity (Pn, Kips):	1818.0	>	Design Factored Axial Load (Pu Kips):	434.9	0.24	OK!
Moment & Tension Strength Combination:	0.44	OK!	Check Tie Spacing (Design/Req'd):	1.00		
Pier Reinforcement Ratio:	0.010		Reinforcement Ratio is satisfied per ACI			

(2).Concrete Pad:

One-Way Design Shear Capacity (L or W Direction, Kips):	725.4	>	One-Way Factored Shear (L/W-Dir Kips)	394.9	0.54	OK!
One-Way Design Shear Capacity (Diagonal Dir., Kips):	674.5	>	One-Way Factored Shear (Dia. Dir, Kips)	355.3	0.53	OK!
Lower Steel Pad Reinforcement Ratio (L or W-Direct.):	0.0041		Lower Steel Reinf. Ratio (Dia. Dir.):	0.0037		
Lower Steel Pad Moment Capacity (L or W-Dir. Kips-ft):	3152.1	>	Moment at Bottom (L-Direct. K-Ft):	2514.0	0.80	OK!
Lower Steel Pad Moment Capacity (Dia. Direction,K-ft):	3007.3	>	Moment at Bottom (Dia. Dir. K-Ft):	2538.3	0.84	OK!
Upper Steel Pad Reinforcement Ratio (L or W -Direction):	0.0041		Upper Steel Reinf. Ratio (Dia. Dir.):	0.0037		
Upper Steel Pad Moment Capacity (L or W-Dir., Kips-ft):	3152.1	>	Moment at the top (L-Dir Kips-Ft):	991.6	0.31	OK!
Upper Steel Pad Moment Capacity (Dia. Direction, K-ft):	3007.3	>	Moment at the top (Dia. Dir., K-Ft):	738.4	0.25	OK!
Punching Failure Capacity (Kips):	658.7	>	Punch. Failure Factored Shear (K):	434.9	0.66	OK!

December 6, 2021



SAI Communications
12 Industrial Way
Salem NH, 03079

RE: Site Number: CT1270 (Cband)
 FA Number: 10133917
 PACE Number: MRCTB054306
 PT Number: 2051A11KTQ
 Site Name: WATERFORD DANIELS AVE
 Site Address: 51 Daniels Avenue
 Waterford, CT 06385

To Whom It May Concern:

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

- (3) EPBQ-654L8H6-L2 Antennas (73.0"x21.0"x6.3" – Wt. = 73 lbs. /each)
- (3) RRUS-32 B66A RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (3) B14 4478 RRH's (18.1"x13.4"x8.3" – Wt. = 60 lbs. /each)
- (2) Squid Surge Arrestor (24.0"x9.7" Ø – Wt. = 33 lbs.)
- **(3) DMP65R-BU4DA Antennas (48.0"x20.7"x7.7" – Wt. = 68 lbs. /each)**
- **(3) AIR6449 Antennas (30.6"x15.9"x10.6" – Wt. = 82 lbs. /each)**
- **(3) AIR6419 Antennas (31.1"x16.1"x7.3" – Wt. = 66 lbs. each)**
- **(3) 4415 B25 RRH's (16.5"x13.4"x5.9" – Wt. = 46 lbs. /each)**
- **(3) B5/B12 4449 RRH's (17.9"x13.2"x9.4" – Wt. = 73 lbs. /each)**
- **(1) DC9 Surge Arrestor (16.4"x16.6"x8.2" – Wt. = 35 lbs. /each)**

**Proposed equipment shown in bold.*

No original structural design documents or fabrication drawings were available for the existing mounts. HDG's sub-consultant, ProVertic LLC, conducted a survey climb and mapping of the existing AT&T antenna mounts on April 9, 2018. HDG conducted a ground audit of the existing antenna mounts on October 20, 2021.

Mount Analysis Methods:

- This analysis was conducted in accordance with EIA/TIA-222-H, Structural Standards for Steel Antenna Towers and Antenna Supporting Structures, the International Building Code 2015 with 2018 Connecticut State Building Code, and AT&T Mount Technical Directive – R16.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 135 mph with a max basic wind speed with ice of 30 mph and a max ice thickness of 1.0 in. An escalated ice thickness of 1.18 in was used for this analysis.
- HDG considers this site to be exposure category C; tower is located near large, flat, open, terrain/grasslands.
- 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 0.161 and a spectral response acceleration parameter at a period of 1 second, S_1 , of 0.058.
- The mount has been analyzed with load combinations consisting of 500 lbs live load using a service wind speed of 30 mph wind on the worst case antenna. Analysis performed on each antenna pipe to determine worst case location; worst case location was antenna position 1.
- The mount has been analyzed with load combinations consisting of a 250 lbs live load in a worst case location on the mount.
- The existing mounts are secured to the existing tower with bent plates and threaded rods. HDG considers the threaded rods to be the governing connection member.

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

- **Remove existing 2" std. (2.38" O.D.) pipe mast and install new 2-1/2" std. (2.88" O.D.) pipe mast behind new DMP65R-BU4DA antennas secured to existing mount (typ. of 1 per sector, total of 3).**
- **Install new 2" std (2.38" O.D.) diagonal pipe braces secured to existing antenna mount face (typ. Of 2 per sector, total of 6)**

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
Existing (C-BAND) Mount Rating	1	LC40	123%	FAIL
Modified (C-BAND) Mount Rating	1	LC1	96%	PASS

Reference Documents:

- Mount mapping report prepared by ProVertic LLC.

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 mounts must be tightened and re-plumbed prior to the installation of new appurtenances.
6. HDG performed a localized analysis on the mount itself and not on the supporting tower structure.

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

Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Vice President



Daniel P. Hamm, PE
Principal

FIELD PHOTOS:







HUDSON
Design Group LLC

Wind & Ice Calculations

Date: 11/30/2021
 Project Name: WATERFORD DANIELS AVE
 Project No.: CT1270
 Designed By: KM Checked By: MSC



2.6.5.2 Velocity Pressure Coeff:

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

$K_z =$ **1.415**

$z =$ 170 (ft)
 $z_g =$ 900 (ft)
 $\alpha =$ 9.5

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

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**

$K_h =$ 1

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

$K_c =$ 1 (from Table 2-4)

$K_t =$ 0 (from Table 2-5)

$f =$ 0 (from Table 2-5)

Category= **1**

$z =$ 170

$z_s =$ 125 (Mean elevation of base of structure above sea level)

$H =$ 0 (Ht. of the crest above surrounding terrain)

$K_{zt} =$ 1.00 (from 2.6.6.2.1)

$K_e =$ 1.00 (from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness =
 Importance Factor =

$t_i =$ 1.00 in

$I =$ 1.0 (from Table 2-3)

$K_{iz} =$ 1.18 (from Sec. 2.6.10)

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

$t_{iz} =$ 1.18 in

Date: 11/30/2021
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 Designed By: KM Checked By: MSC



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

$h =$ 180

$G_h =$ 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

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

$G_h =$ 1.35

$G_h =$ 1.00

2.6.11.2 Design Wind Force on Appurtenances

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

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

$K_z =$ 1.415 (from 2.6.5.2)

$K_{zt} =$ 1.0 (from 2.6.6.2.1)

$K_s =$ 1.0 (from 2.6.7)

$K_e =$ 1.00 (from 2.6.8)

$K_d =$ 0.85 (from Table 2-2)

$V_{max} =$ 135 mph (Ultimate Wind Speed)

$V_{max(ice)} =$ 50 mph

$V_{30} =$ 30 mph

$q_z =$	55.87
$q_z(ice) =$	7.66
$q_z(30) =$	2.76

Table 2-2

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

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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 = **1.18 in** **Angle = 0 (deg)** **Equivalent Angle = 180 (deg)**

Appurtenances	Height	Width	Depth	Flat Area	Aspect Ratio	Ca	Force (lbs)	Force (lbs) (w/ Ice)	Force (lbs) (30 mph)
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.48	1.24	740	116	37
AIR6449 Antenna	30.6	15.9	10.6	3.38	1.92	1.20	227	38	11
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.93	1.20	233	39	12
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.32	1.20	463	74	23
B14 4478 RRH	18.1	8.3	13.4	1.04	2.18	1.20	70	14	3
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	4.36	1.28	37	9	2
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	3.89	1.26	93	19	5
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	7.77	1.43	53	13	3
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	153	27	8
RRUS-32 B30 RRH (Shielded)	27.2	0.0	7.0	0.00	0.00	1.20	0	4	0
4415 B25 RRH	16.5	13.4	5.9	1.54	1.23	1.20	103	19	5
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.36	1.20	110	20	5
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.99	1.20	127	23	6
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	63	12	3
HSS 3x3	3.0	12.0	-	0.25	0.25	1.25	17		
3-1/2" Pipe	3.5	12.0	-	0.29	0.29	0.70	11		
2-1/2" Pipe	2.9	12.0	-	0.24	0.24	0.70	9		
2" Pipe	2.4	12.0	-	0.20	0.20	0.70	8		

Date: 11/30/2021
 Project Name: WATERFORD DANIELS AVE
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 Designed By: KM Checked By: MSC



WIND LOADS

Angle = 30 (deg)

Ice Thickness = 1.18 in.

Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	740	277	624
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	227	153	208
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	233	113	203
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	463	196	396
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	70	113	81
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	37	113	56
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	93	153	108
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	53	153	78
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	153	93	138
RRUS-32 B30 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	82	93	85
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	103	46	89
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	110	78	102
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	127	63	111

WIND LOADS WITH ICE:

EPBQ-654L8H6-L2 Antenna	75.4	23.4	8.7	12.22	4.53	3.23	8.71	1.23	1.46	115	51	99
AIR6449 Antenna	33.0	18.3	13.0	4.18	2.97	1.81	2.54	1.20	1.20	38	27	36
AIR6419 Antenna	33.5	18.5	9.7	4.29	2.24	1.81	3.46	1.20	1.24	39	21	35
DMP65R-BU4DA Antenna	50.4	23.1	10.1	8.06	3.52	2.18	5.01	1.20	1.31	74	35	64
B14 4478 RRH	20.5	10.7	15.8	1.51	2.24	1.92	1.30	1.20	1.20	14	21	16
B14 4478 RRH (Shielded)	20.5	5.3	15.8	0.76	2.24	3.84	1.30	1.26	1.20	7	21	11
RRUS-32 B66A RRH	29.6	9.4	14.5	1.92	2.97	3.16	2.04	1.23	1.20	18	27	20
RRUS-32 B66A RRH (Shielded)	29.6	4.7	14.5	0.96	2.97	6.32	2.04	1.37	1.20	10	27	14
RRUS-32 B30 RRH	29.6	14.5	9.4	2.97	1.92	2.04	3.16	1.20	1.23	27	18	25
RRUS-32 B30 RRH (Shielded)	29.6	7.2	9.4	1.48	1.92	4.09	3.16	1.27	1.23	14	18	15
4415 B25 RRH	18.9	15.8	8.3	2.06	1.08	1.20	2.28	1.20	1.20	19	10	17
B5/B12 4449 RRH	20.3	15.6	11.8	2.19	1.65	1.30	1.72	1.20	1.20	20	15	19
DC9 Surge Arrestor	18.8	19.0	10.6	2.47	1.37	0.99	1.78	1.20	1.20	23	13	20

WIND LOADS AT 30 MPH:

EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	37	14	31
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	11	8	10
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	12	6	10
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	20
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	6	4
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	6	3
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	5	8	5
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	3	8	4
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	7
RRUS-32 B30 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	4	5	4
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	5	2	4
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	5
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	6	3	5

Date: 11/30/2021
 Project Name: WATERFORD DANIELS AVE
 Project No.: CT1270
 Designed By: KM Checked By: MSC



WIND LOADS

Angle = 60 (deg)

Ice Thickness = 1.18 in.

Equivalent Angle = 240 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	740	277	393
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	227	153	172
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	233	113	143
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	463	196	263
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	70	113	102
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	53	113	98
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	93	153	138
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	73	153	133
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	153	93	108
RRUS-32 B30 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	117	93	99
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	103	46	60
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	110	78	86
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	127	63	79

WIND LOADS WITH ICE:

EPBQ-654L8H6-L2 Antenna	75.4	23.4	8.7	12.22	4.53	3.23	8.71	1.23	1.46	115	51	67
AIR6449 Antenna	33.0	18.3	13.0	4.18	2.97	1.81	2.54	1.20	1.20	38	27	30
AIR6419 Antenna	33.5	18.5	9.7	4.29	2.24	1.81	3.46	1.20	1.24	39	21	26
DMP65R-BU4DA Antenna	50.4	23.1	10.1	8.06	3.52	2.18	5.01	1.20	1.31	74	35	45
B14 4478 RRH	20.5	10.7	15.8	1.51	2.24	1.92	1.30	1.20	1.20	14	21	19
B14 4478 RRH (Shielded)	20.5	8.0	15.8	1.14	2.24	2.56	1.30	1.20	1.20	10	21	18
RRUS-32 B66A RRH	29.6	9.4	14.5	1.92	2.97	3.16	2.04	1.23	1.20	18	27	25
RRUS-32 B66A RRH (Shielded)	29.6	7.0	14.5	1.44	2.97	4.21	2.04	1.28	1.20	14	27	24
RRUS-32 B30 RRH	29.6	14.5	9.4	2.97	1.92	2.04	3.16	1.20	1.23	27	18	20
RRUS-32 B30 RRH (Shielded)	29.6	10.8	9.4	2.23	1.92	2.73	3.16	1.21	1.23	21	18	19
4415 B25 RRH	18.9	15.8	8.3	2.06	1.08	1.20	2.28	1.20	1.20	19	10	12
B5/B12 4449 RRH	20.3	15.6	11.8	2.19	1.65	1.30	1.72	1.20	1.20	20	15	16
DC9 Surge Arrestor	18.8	19.0	10.6	2.47	1.37	0.99	1.78	1.20	1.20	23	13	15

WIND LOADS AT 30 MPH:

EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	37	14	19
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	11	8	8
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	12	6	7
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	13
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	6	5
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	3	6	5
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	5	8	7
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	4	8	7
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 B30 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	6	5	5
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	5	2	3
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	4
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	6	3	4

Date: 11/30/2021
 Project Name: WATERFORD DANIELS AVE
 Project No.: CT1270
 Designed By: KM Checked By: MSC



WIND LOADS

Angle = 90 (deg) Ice Thickness = 1.18 in. Equivalent Angle = 270 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	740	277	277
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	227	153	153
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	233	113	113
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	463	196	196
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	70	113	113
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	37	113	113
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	93	153	153
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	53	153	153
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	153	93	93
RRUS-32 B30 RRH (Shielded)	27.2	0.0	7.0	0.00	1.32	0.00	3.89	1.20	1.26	0	93	93
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	103	46	46
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	110	78	78
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	127	63	63

WIND LOADS WITH ICE:

EPBQ-654L8H6-L2 Antenna	75.4	23.4	8.7	12.22	4.53	3.23	8.71	1.23	1.46	115	51	51
AIR6449 Antenna	33.0	18.3	13.0	4.18	2.97	1.81	2.54	1.20	1.20	38	27	27
AIR6419 Antenna	33.5	18.5	9.7	4.29	2.24	1.81	3.46	1.20	1.24	39	21	21
DMP65R-BU4DA Antenna	50.4	23.1	10.1	8.06	3.52	2.18	5.01	1.20	1.31	74	35	35
B14 4478 RRH	20.5	10.7	15.8	1.51	2.24	1.92	1.30	1.20	1.20	14	21	21
B14 4478 RRH (Shielded)	20.5	6.5	15.8	0.92	2.24	3.14	1.30	1.23	1.20	9	21	21
RRUS-32 B66A RRH	29.6	9.4	14.5	1.92	2.97	3.16	2.04	1.23	1.20	18	27	27
RRUS-32 B66A RRH (Shielded)	29.6	5.9	14.5	1.20	2.97	5.05	2.04	1.31	1.20	12	27	27
RRUS-32 B30 RRH	29.6	14.5	9.4	2.97	1.92	2.04	3.16	1.20	1.23	27	18	18
RRUS-32 B30 RRH (Shielded)	29.6	2.4	9.4	0.48	1.92	12.54	3.16	1.58	1.23	6	18	18
4415 B25 RRH	18.9	15.8	8.3	2.06	1.08	1.20	2.28	1.20	1.20	19	10	10
B5/B12 4449 RRH	20.3	15.6	11.8	2.19	1.65	1.30	1.72	1.20	1.20	20	15	15
DC9 Surge Arrestor	18.8	19.0	10.6	2.47	1.37	0.99	1.78	1.20	1.20	23	13	13

WIND LOADS AT 30 MPH:

EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	37	14	14
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	11	8	8
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	12	6	6
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	10
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	6	6
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	6	6
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	5	8	8
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	3	8	8
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 B30 RRH (Shielded)	27.2	0.0	7.0	0.00	1.32	0.00	3.89	1.20	1.26	0	5	5
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	5	2	2
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	4
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	6	3	3

Date: 11/30/2021
 Project Name: WATERFORD DANIELS AVE
 Project No.: CT1270
 Designed By: KM Checked By: MSC



WIND LOADS

Angle = 120 (deg)

Ice Thickness = 1.18 in.

Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	740	277	393
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	227	153	172
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	233	113	143
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	463	196	263
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	70	113	102
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	53	113	98
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	93	153	138
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	73	153	133
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	153	93	108
RRUS-32 B30 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	117	93	99
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	103	46	60
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	110	78	86
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	127	63	79

WIND LOADS WITH ICE:

EPBQ-654L8H6-L2 Antenna	75.4	23.4	8.7	12.22	4.53	3.23	8.71	1.23	1.46	115	51	67
AIR6449 Antenna	33.0	18.3	13.0	4.18	2.97	1.81	2.54	1.20	1.20	38	27	30
AIR6419 Antenna	33.5	18.5	9.7	4.29	2.24	1.81	3.46	1.20	1.24	39	21	26
DMP65R-BU4DA Antenna	50.4	23.1	10.1	8.06	3.52	2.18	5.01	1.20	1.31	74	35	45
B14 4478 RRH	20.5	10.7	15.8	1.51	2.24	1.92	1.30	1.20	1.20	14	21	19
B14 4478 RRH (Shielded)	20.5	8.0	15.8	1.14	2.24	2.56	1.30	1.20	1.20	10	21	18
RRUS-32 B66A RRH	29.6	9.4	14.5	1.92	2.97	3.16	2.04	1.23	1.20	18	27	25
RRUS-32 B66A RRH (Shielded)	29.6	7.0	14.5	1.44	2.97	4.21	2.04	1.28	1.20	14	27	24
RRUS-32 B30 RRH	29.6	14.5	9.4	2.97	1.92	2.04	3.16	1.20	1.23	27	18	20
RRUS-32 B30 RRH (Shielded)	29.6	10.8	9.4	2.23	1.92	2.73	3.16	1.21	1.23	21	18	19
4415 B25 RRH	18.9	15.8	8.3	2.06	1.08	1.20	2.28	1.20	1.20	19	10	12
B5/B12 4449 RRH	20.3	15.6	11.8	2.19	1.65	1.30	1.72	1.20	1.20	20	15	16
DC9 Surge Arrestor	18.8	19.0	10.6	2.47	1.37	0.99	1.78	1.20	1.20	23	13	15

WIND LOADS AT 30 MPH:

EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	37	14	19
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	11	8	8
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	12	6	7
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	13
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	6	5
B14 4478 RRH (Shielded)	18.1	6.2	13.4	0.78	1.68	2.91	1.35	1.22	1.20	3	6	5
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	5	8	7
RRUS-32 B66A RRH (Shielded)	27.2	5.3	12.1	0.99	2.29	5.18	2.25	1.32	1.20	4	8	7
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	5
RRUS-32 B30 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	6	5	5
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	5	2	3
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	4
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	6	3	4

Date: 11/30/2021
 Project Name: WATERFORD DANIELS AVE
 Project No.: CT1270
 Designed By: KM Checked By: MSC



WIND LOADS

Angle = 150 (deg)

Ice Thickness = 1.18 in.

Equivalent Angle = 330 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio (normal)	Aspect Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	740	277	624
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	227	153	208
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	233	113	203
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	463	196	396
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	70	113	81
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	37	113	56
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	93	153	108
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	53	153	78
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	153	93	138
RRUS-32 B30 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	82	93	85
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	103	46	89
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	110	78	102
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	127	63	111

WIND LOADS WITH ICE:

EPBQ-654L8H6-L2 Antenna	75.4	23.4	8.7	12.22	4.53	3.23	8.71	1.23	1.46	115	51	99
AIR6449 Antenna	33.0	18.3	13.0	4.18	2.97	1.81	2.54	1.20	1.20	38	27	36
AIR6419 Antenna	33.5	18.5	9.7	4.29	2.24	1.81	3.46	1.20	1.24	39	21	35
DMP65R-BU4DA Antenna	50.4	23.1	10.1	8.06	3.52	2.18	5.01	1.20	1.31	74	35	64
B14 4478 RRH	20.5	10.7	15.8	1.51	2.24	1.92	1.30	1.20	1.20	14	21	16
B14 4478 RRH (Shielded)	20.5	5.3	15.8	0.76	2.24	3.84	1.30	1.26	1.20	7	21	11
RRUS-32 B66A RRH	29.6	9.4	14.5	1.92	2.97	3.16	2.04	1.23	1.20	18	27	20
RRUS-32 B66A RRH (Shielded)	29.6	4.7	14.5	0.96	2.97	6.32	2.04	1.37	1.20	10	27	14
RRUS-32 B30 RRH	29.6	14.5	9.4	2.97	1.92	2.04	3.16	1.20	1.23	27	18	25
RRUS-32 B30 RRH (Shielded)	29.6	7.2	9.4	1.48	1.92	4.09	3.16	1.27	1.23	14	18	15
4415 B25 RRH	18.9	15.8	8.3	2.06	1.08	1.20	2.28	1.20	1.20	19	10	17
B5/B12 4449 RRH	20.3	15.6	11.8	2.19	1.65	1.30	1.72	1.20	1.20	20	15	19
DC9 Surge Arrestor	18.8	19.0	10.6	2.47	1.37	0.99	1.78	1.20	1.20	23	13	20

WIND LOADS AT 30 MPH:

EPBQ-654L8H6-L2 Antenna	73.0	21.0	6.3	10.65	3.19	3.48	11.59	1.24	1.55	37	14	31
AIR6449 Antenna	30.6	15.9	10.6	3.38	2.25	1.92	2.89	1.20	1.22	11	8	10
AIR6419 Antenna	31.1	16.1	7.3	3.48	1.58	1.93	4.26	1.20	1.28	12	6	10
DMP65R-BU4DA Antenna	48.0	20.7	7.7	6.90	2.57	2.32	6.23	1.20	1.37	23	10	20
B14 4478 RRH	18.1	8.3	13.4	1.04	1.68	2.18	1.35	1.20	1.20	3	6	4
B14 4478 RRH (Shielded)	18.1	4.2	13.4	0.52	1.68	4.36	1.35	1.28	1.20	2	6	3
RRUS-32 B66A RRH	27.2	7.0	12.1	1.32	2.29	3.89	2.25	1.26	1.20	5	8	5
RRUS-32 B66A RRH (Shielded)	27.2	3.5	12.1	0.66	2.29	7.77	2.25	1.43	1.20	3	8	4
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	8	5	7
RRUS-32 B30 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	4	5	4
4415 B25 RRH	16.5	13.4	5.9	1.54	0.68	1.23	2.80	1.20	1.21	5	2	4
B5/B12 4449 RRH	17.9	13.2	9.4	1.64	1.17	1.36	1.90	1.20	1.20	5	4	5
DC9 Surge Arrestor	16.4	16.6	8.2	1.89	0.93	0.99	2.00	1.20	1.20	6	3	5

Date: 12/6/2021

Project Name: WATERFORD DANIELS AVE

Project No.: CT1270

Designed By: KM Checked By: MSC



ICE WEIGHT CALCULATIONS

Thickness of ice: 1.18 in.
Density of ice: 56 pcf

EPBQ-654L8H6-L2 Antenna

Weight of ice based on total radial SF area:
Height (in): 73.0
Width (in): 21.0
Depth (in): 6.3
Total weight of ice on object: 203 lbs
Weight of object: 73.0 lbs

Combined weight of ice and object: 276 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: 75 lbs
Weight of object: 82.0 lbs

Combined weight of ice and object: 157 lbs

AIR6419 Antenna

Weight of ice based on total radial SF area:
Height (in): 31.1
Width (in): 16.1
Depth (in): 7.3
Total weight of ice on object: 70 lbs
Weight of object: 66.0 lbs

Combined weight of ice and object: 136 lbs

DMP65R-BU4DA Antenna

Weight of ice based on total radial SF area:
Height (in): 48.0
Width (in): 20.7
Depth (in): 7.7
Total weight of ice on object: 134 lbs
Weight of object: 68.0 lbs

Combined weight of ice and object: 202 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: 37 lbs
Weight of object: 60.0 lbs

Combined weight of ice and object: 97 lbs

RRUS-32 B66A RRH

Weight of ice based on total radial SF area:
Height (in): 27.2
Width (in): 12.1
Depth (in): 7.0
Total weight of ice on object: 50 lbs
Weight of object: 60.0 lbs

Combined weight of ice and object: 110 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: 50 lbs
Weight of object: 60.0 lbs

Combined weight of ice and object: 110 lbs

4415 B25 RRH

Weight of ice based on total radial SF area:
Height (in): 16.5
Width (in): 13.4
Depth (in): 5.9
Total weight of ice on object: 31 lbs
Weight of object: 46.0 lbs

Combined weight of ice and object: 77 lbs

B5/B12 4449 RRH

Weight of ice based on total radial SF area:
Height (in): 17.9
Width (in): 13.2
Depth (in): 9.4
Total weight of ice on object: 37 lbs
Weight of object: 73.0 lbs

Combined weight of ice and object: 110 lbs

DC9 Surge Arrestor

Weight of ice based on total radial SF area:
Height (in): 16.4
Width (in): 16.6
Depth (in): 8.2
Total weight of ice on object: 39 lbs
Weight of object: 35.0 lbs

Combined weight of ice and object: 74 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: 31 lbs
Weight of object: 33 lbs

Combined weight of ice and object: 64 lbs

HSS 3x3

Weight of ice based on total radial SF area:
Height (in): 3
Width (in): 3
Per foot weight of ice on object: 8 plf

3-1/2" Pipe

Per foot weight of ice:
diameter (in): 4
Per foot weight of ice on object: 7 plf

2-1/2" pipe

Per foot weight of ice:
diameter (in): 2.88
Per foot weight of ice on object: 6 plf

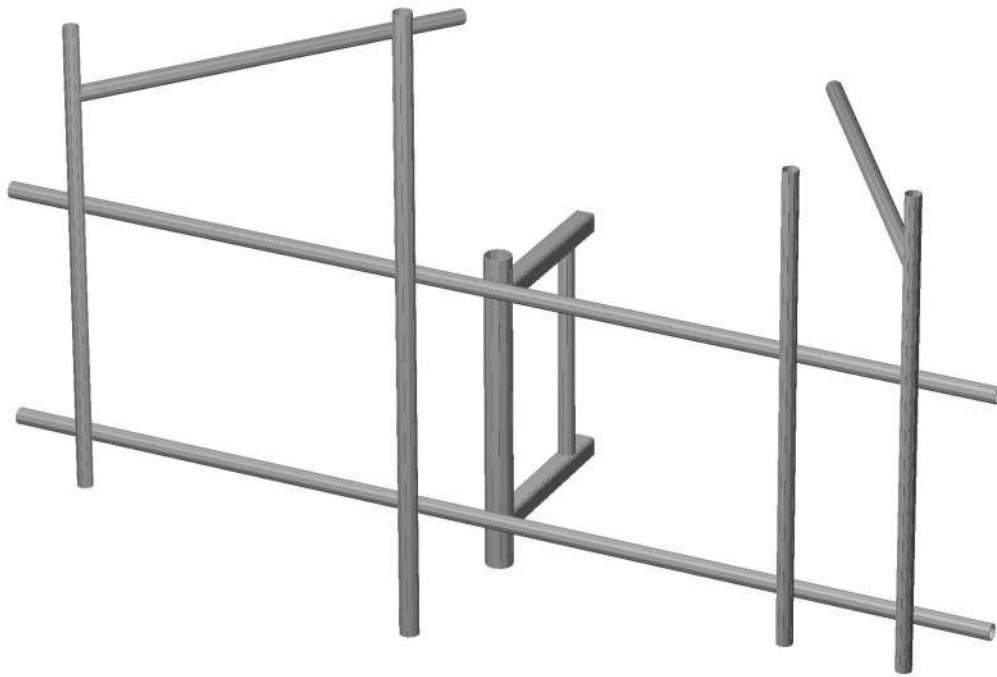
2" pipe

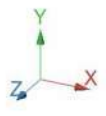
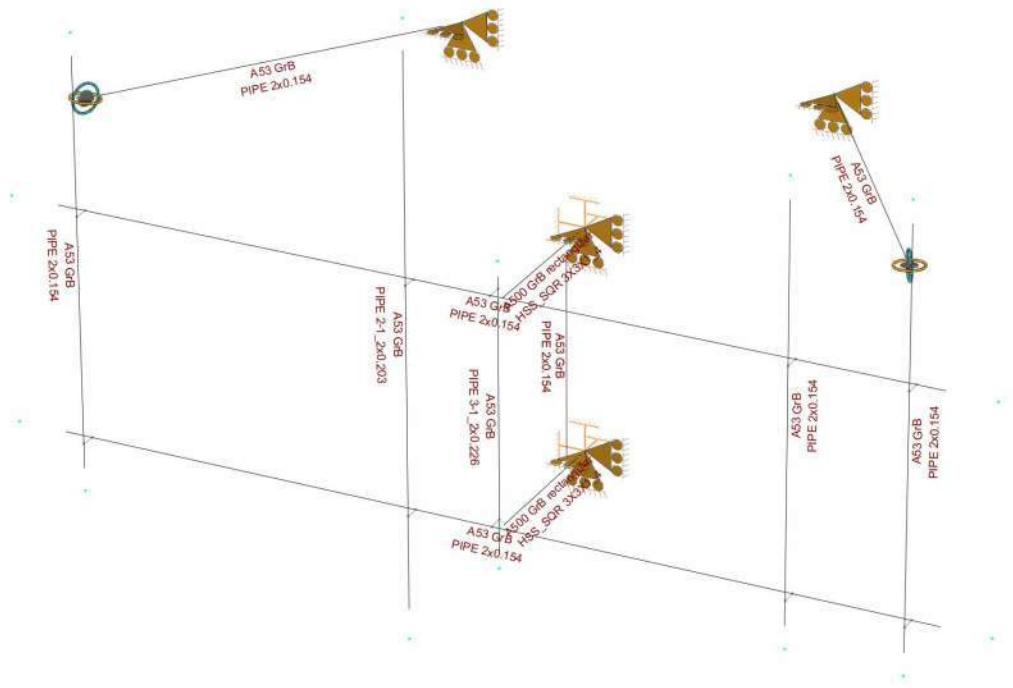
Per foot weight of ice:
diameter (in): 2.38
Per foot weight of ice on object: 5 plf



HUDSON
Design Group LLC

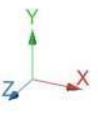
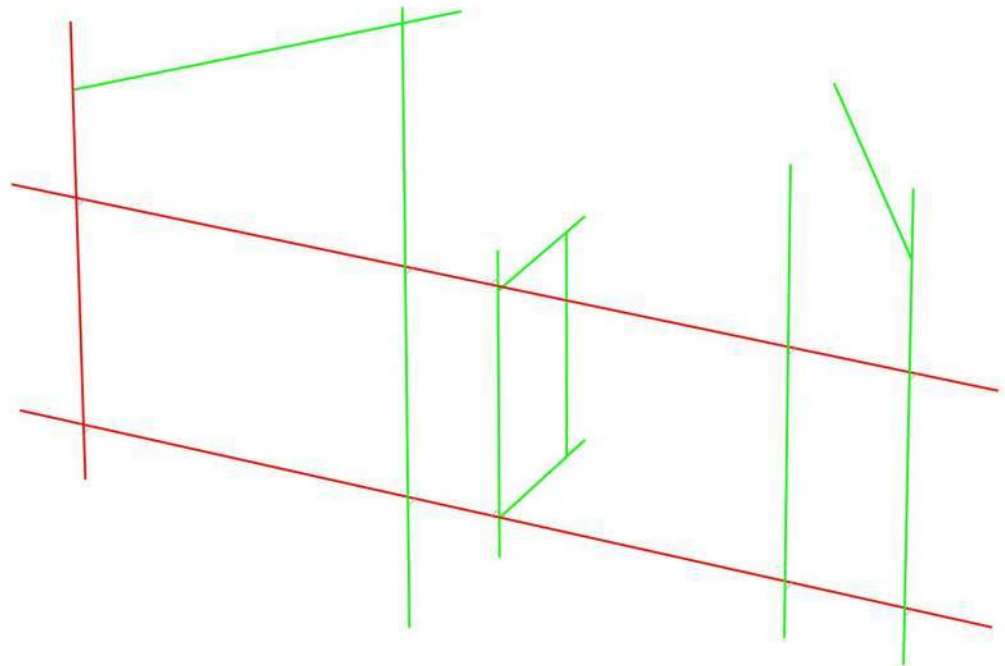
**Mount Calculations
(Existing Conditions)**

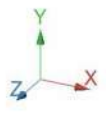
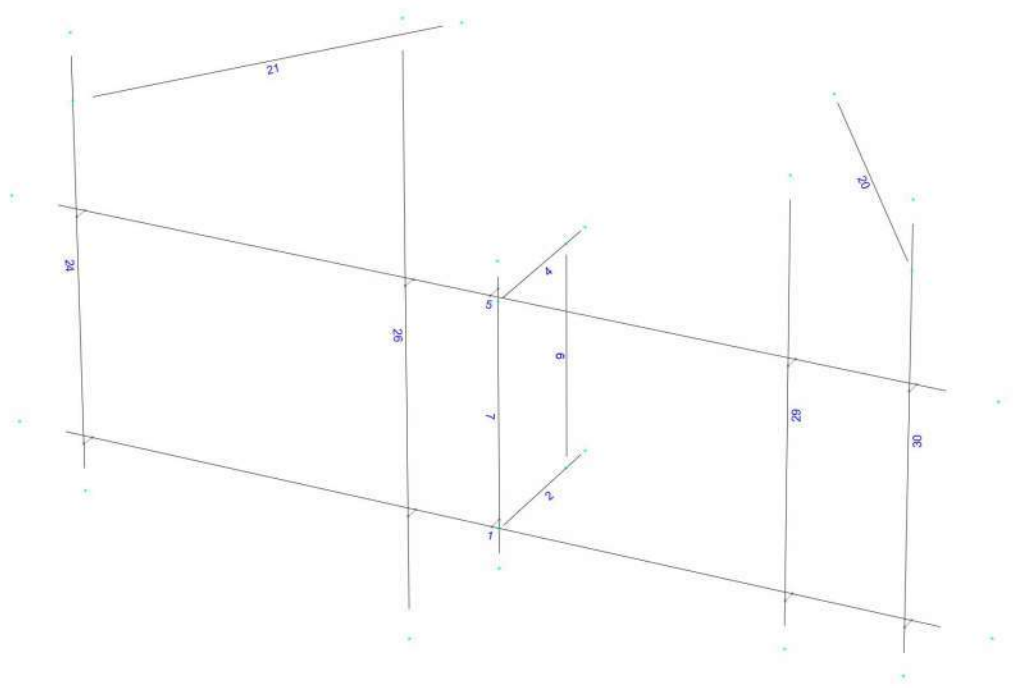




Design status

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





Current Date: 12/6/2021 9:47 AM

Units system: English

File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1270\5G\CT1270 (5G).retx

Load data

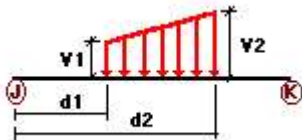
GLOSSARY

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 <td 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
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																																																																																			

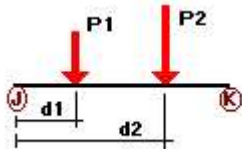
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%	
Wo	1	z	-0.008	-0.008	0.00	No	100.00	Yes	
	5	z	-0.008	-0.008	0.00	No	100.00	Yes	
	7	z	-0.011	-0.011	0.00	No	100.00	Yes	
	20	z	-0.008	-0.008	0.00	No	100.00	Yes	
	21	z	-0.008	-0.008	0.00	No	100.00	Yes	
	30	z	-0.008	-0.008	0.00	No	100.00	Yes	
W30	1	z	-0.008	-0.008	0.00	No	100.00	Yes	
	2	z	-0.017	-0.017	0.00	No	100.00	Yes	
	4	z	-0.017	-0.017	0.00	No	100.00	Yes	
	5	z	-0.008	-0.008	0.00	No	100.00	Yes	
	6	z	-0.008	-0.008	0.00	No	100.00	Yes	
	7	z	-0.011	-0.011	0.00	No	100.00	Yes	
	20	z	-0.008	-0.008	0.00	No	100.00	Yes	
	21	z	-0.008	-0.008	0.00	No	100.00	Yes	
	24	z	-0.008	-0.008	0.00	No	100.00	Yes	
	26	z	-0.009	-0.009	0.00	No	100.00	Yes	
	29	z	-0.008	-0.008	0.00	No	100.00	Yes	
	30	z	-0.008	-0.008	0.00	No	100.00	Yes	
W60	1	x	-0.008	-0.008	0.00	No	100.00	Yes	
	2	x	-0.017	-0.017	0.00	No	100.00	Yes	
	4	x	-0.017	-0.017	0.00	No	100.00	Yes	
	5	x	-0.008	-0.008	0.00	No	100.00	Yes	
	6	x	-0.008	-0.008	0.00	No	100.00	Yes	
	7	x	-0.011	-0.011	0.00	No	100.00	Yes	
	20	x	-0.008	-0.008	0.00	No	100.00	Yes	
	21	x	-0.008	-0.008	0.00	No	100.00	Yes	
	24	x	-0.008	-0.008	0.00	No	100.00	Yes	
	26	x	-0.009	-0.009	0.00	No	100.00	Yes	
	29	x	-0.008	-0.008	0.00	No	100.00	Yes	
	30	x	-0.008	-0.008	0.00	No	100.00	Yes	
W90	2	x	-0.017	-0.017	0.00	No	100.00	Yes	
	4	x	-0.017	-0.017	0.00	No	100.00	Yes	
	6	x	-0.008	-0.008	0.00	No	100.00	Yes	
	7	x	-0.011	-0.011	0.00	No	100.00	Yes	
	20	x	-0.008	-0.008	0.00	No	100.00	Yes	
	21	x	-0.008	-0.008	0.00	No	100.00	Yes	
	24	x	-0.008	-0.008	0.00	No	100.00	Yes	
	26	x	-0.009	-0.009	0.00	No	100.00	Yes	
	29	x	-0.008	-0.008	0.00	No	100.00	Yes	
	30	x	-0.008	-0.008	0.00	No	100.00	Yes	
	W120	1	x	-0.008	-0.008	0.00	No	100.00	Yes
		2	x	-0.017	-0.017	0.00	No	100.00	Yes
4		x	-0.017	-0.017	0.00	No	100.00	Yes	
5		x	-0.008	-0.008	0.00	No	100.00	Yes	
6		x	-0.008	-0.008	0.00	No	100.00	Yes	
7		x	-0.011	-0.011	0.00	No	100.00	Yes	
20		x	-0.008	-0.008	0.00	No	100.00	Yes	
21		x	-0.008	-0.008	0.00	No	100.00	Yes	
24		x	-0.008	-0.008	0.00	No	100.00	Yes	
26		x	-0.009	-0.009	0.00	No	100.00	Yes	
29		x	-0.008	-0.008	0.00	No	100.00	Yes	
30		x	-0.008	-0.008	0.00	No	100.00	Yes	
W150	1	z	0.008	0.008	0.00	No	100.00	Yes	
	2	z	0.017	0.017	0.00	No	100.00	Yes	
	4	z	0.017	0.017	0.00	No	100.00	Yes	
	5	z	0.008	0.008	0.00	No	100.00	Yes	
	6	z	0.008	0.008	0.00	No	100.00	Yes	
	7	z	0.011	0.011	0.00	No	100.00	Yes	
	20	z	0.008	0.008	0.00	No	100.00	Yes	
	21	z	0.008	0.008	0.00	No	100.00	Yes	

	24	z	0.008	0.008	0.00	No	100.00	Yes
	26	z	0.009	0.009	0.00	No	100.00	Yes
	29	z	0.008	0.008	0.00	No	100.00	Yes
	30	z	0.008	0.008	0.00	No	100.00	Yes
Di	1	y	-0.005	-0.005	0.00	No	100.00	Yes
	2	y	-0.008	-0.008	0.00	No	100.00	Yes
	4	y	-0.008	-0.008	0.00	No	100.00	Yes
	5	y	-0.005	-0.005	0.00	No	100.00	Yes
	6	y	-0.005	-0.005	0.00	No	100.00	Yes
	7	y	-0.007	-0.007	0.00	No	100.00	Yes
	20	y	-0.005	-0.005	0.00	No	100.00	Yes
	21	y	-0.005	-0.005	0.00	No	100.00	Yes
	24	y	-0.005	-0.005	0.00	No	100.00	Yes
	26	y	-0.006	-0.006	0.00	No	100.00	Yes
	29	y	-0.005	-0.005	0.00	No	100.00	Yes
	30	y	-0.005	-0.005	0.00	No	100.00	Yes

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	24	y	-0.034	1.50	No
		y	-0.034	4.50	No
		y	-0.06	3.00	No
	26	y	-0.041	1.00	No
		y	-0.041	3.00	No
		y	-0.033	5.00	No
		y	-0.033	7.00	No
	29	y	-0.037	0.50	No
		y	-0.037	5.50	No
		y	-0.06	3.00	No
Wo	24	z	-0.232	1.50	No
		z	-0.232	4.50	No
		z	-0.114	3.00	No
	26	z	-0.114	1.00	No
		z	-0.114	3.00	No
		z	-0.117	5.00	No
		z	-0.117	7.00	No
	29	z	-0.37	0.50	No
		z	-0.37	5.50	No
		z	-0.037	3.00	No
W30	24	3	-0.053	3.00	No
		3	-0.198	1.50	No
		3	-0.198	4.50	No
	26	3	-0.085	3.00	No
		3	-0.104	1.00	No
		3	-0.104	3.00	No
		3	-0.102	5.00	No
	29	3	-0.102	7.00	No
		3	-0.312	0.50	No
		3	-0.312	5.50	No

		3	-0.312	5.50	No
		3	-0.078	3.00	No
W60	24	3	-0.132	1.50	No
		3	-0.132	4.50	No
		3	-0.099	3.00	No
	26	3	-0.086	1.00	No
		3	-0.086	3.00	No
		3	-0.072	5.00	No
		3	-0.072	7.00	No
	29	3	-0.197	0.50	No
		3	-0.197	5.50	No
		3	-0.133	3.00	No
W90	24	x	-0.098	1.50	No
		x	-0.098	4.50	No
		x	-0.093	3.00	No
	26	x	-0.077	1.00	No
		x	-0.077	3.00	No
		x	-0.057	5.00	No
		x	-0.057	7.00	No
	29	x	-0.139	0.50	No
		x	-0.139	5.50	No
		x	-0.153	3.00	No
W120	24	2	-0.132	1.50	No
		2	-0.132	4.50	No
		2	-0.099	3.00	No
	26	2	-0.086	1.00	No
		2	-0.086	3.00	No
		2	-0.072	5.00	No
		2	-0.072	7.00	No
	29	2	-0.197	0.50	No
		2	-0.197	5.50	No
		2	-0.133	3.00	No
W150	24	2	-0.198	1.50	No
		2	-0.198	4.50	No
		2	-0.085	3.00	No
	26	2	-0.104	1.00	No
		2	-0.104	3.00	No
		2	-0.102	5.00	No
		2	-0.102	7.00	No
	29	2	-0.312	0.50	No
		2	-0.312	5.50	No
		2	-0.078	3.00	No
Di	24	y	-0.067	1.50	No
		y	-0.067	4.50	No
		y	-0.05	3.00	No
	26	y	-0.038	1.00	No
		y	-0.038	3.00	No
		y	-0.035	5.00	No
		y	-0.035	7.00	No
	29	y	-0.102	0.50	No
		y	-0.102	5.50	No
		y	-0.037	3.00	No
		y	-0.05	3.00	No
W10	24	z	-0.037	1.50	No
		z	-0.037	4.50	No
		z	-0.004	3.00	No
	26	z	-0.019	1.00	No
		z	-0.019	3.00	No
		z	-0.02	5.00	No
		z	-0.02	7.00	No

	29	z	-0.058	0.50	No
		z	-0.058	5.50	No
		z	-0.009	3.00	No
WI30	24	z	-0.013	3.00	No
		3	-0.032	1.50	No
		3	-0.032	4.50	No
		3	-0.015	3.00	No
	26	3	-0.018	1.00	No
		3	-0.018	3.00	No
		3	-0.018	5.00	No
		3	-0.018	7.00	No
	29	3	-0.05	0.50	No
		3	-0.05	5.50	No
		3	-0.014	3.00	No
WI60	24	3	-0.023	1.50	No
		3	-0.023	4.50	No
		3	-0.019	3.00	No
	26	3	-0.015	1.00	No
		3	-0.015	3.00	No
		3	-0.013	5.00	No
		3	-0.013	7.00	No
	29	3	-0.034	0.50	No
		3	-0.034	5.50	No
		3	-0.024	3.00	No
WI90	24	x	-0.018	1.50	No
		x	-0.018	4.50	No
		x	-0.018	3.00	No
	26	x	-0.014	1.00	No
		x	-0.014	3.00	No
		x	-0.011	5.00	No
		x	-0.011	7.00	No
	29	x	-0.026	0.50	No
		x	-0.026	5.50	No
		x	-0.027	3.00	No
WI120	24	2	-0.023	1.50	No
		2	-0.023	4.50	No
		2	-0.019	3.00	No
	26	2	-0.015	1.00	No
		2	-0.015	3.00	No
		2	-0.013	5.00	No
		2	-0.013	7.00	No
	29	2	-0.034	0.50	No
		2	-0.034	5.50	No
		2	-0.024	3.00	No
WI150	24	2	-0.032	1.50	No
		2	-0.032	4.50	No
		2	-0.015	3.00	No
	26	2	-0.018	1.00	No
		2	-0.018	3.00	No
		2	-0.018	5.00	No
		2	-0.018	7.00	No
	29	2	-0.05	0.50	No
		2	-0.05	5.50	No
		2	-0.014	3.00	No
WLO	24	z	-0.012	1.50	No
		z	-0.012	4.50	No
	26	z	-0.006	1.00	No
		z	-0.006	3.00	No
		z	-0.006	5.00	No
		z	-0.006	7.00	No

	29	z	-0.019	0.50	No
		z	-0.019	5.50	No
		z	-0.002	3.00	No
WL30	24	z	-0.003	3.00	No
		3	-0.01	1.50	No
		3	-0.01	4.50	No
	26	3	-0.004	3.00	No
		3	-0.005	1.00	No
		3	-0.005	3.00	No
		3	-0.005	5.00	No
	29	3	-0.005	7.00	No
		3	-0.016	0.50	No
		3	-0.016	5.50	No
WL60	24	3	-0.004	3.00	No
		3	-0.007	1.50	No
		3	-0.007	4.50	No
		3	-0.005	3.00	No
	26	3	-0.004	1.00	No
		3	-0.004	3.00	No
		3	-0.004	5.00	No
		3	-0.004	7.00	No
	29	3	-0.01	0.50	No
		3	-0.01	5.50	No
WL90	24	3	-0.007	3.00	No
		x	-0.005	1.50	No
		x	-0.005	4.50	No
		x	-0.005	3.00	No
	26	x	-0.004	1.00	No
		x	-0.004	3.00	No
		x	-0.003	5.00	No
		x	-0.003	7.00	No
	29	x	-0.007	0.50	No
		x	-0.007	5.50	No
		x	-0.008	3.00	No
WL120	24	2	-0.007	1.50	No
		2	-0.007	4.50	No
		2	-0.005	3.00	No
	26	2	-0.004	1.00	No
		2	-0.004	3.00	No
		2	-0.004	5.00	No
		2	-0.004	7.00	No
	29	2	-0.01	0.50	No
		2	-0.01	5.50	No
		2	-0.007	3.00	No
WL150	24	2	-0.01	1.50	No
		2	-0.01	4.50	No
		2	-0.004	3.00	No
	26	2	-0.005	1.00	No
		2	-0.005	3.00	No
		2	-0.005	5.00	No
		2	-0.005	7.00	No
	29	2	-0.016	0.50	No
		2	-0.016	5.50	No
		2	-0.004	3.00	No
LL1	5	y	-0.25	50.00	Yes
LL2	5	y	-0.25	100.00	Yes
LL3	5	y	-0.25	0.00	Yes
LLa1	29	y	-0.50	50.00	Yes
LLa2	26	y	-0.50	50.00	Yes
LLa3	24	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

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



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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+W10
LC26=1.2D+Di+W130
LC27=1.2D+Di+W160
LC28=1.2D+Di+W190
LC29=1.2D+Di+W120
LC30=1.2D+Di+W150
LC31=1.2D+Di-W10
LC32=1.2D+Di-W130
LC33=1.2D+Di-W160
LC34=1.2D+Di-W190
LC35=1.2D+Di-W120
LC36=1.2D+Di-W150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+W10+1.6LLa1
LC41=1.2D+W130+1.6LLa1
LC42=1.2D+W160+1.6LLa1
LC43=1.2D+W190+1.6LLa1
LC44=1.2D+W120+1.6LLa1
LC45=1.2D+W150+1.6LLa1
LC46=1.2D-W10+1.6LLa1
LC47=1.2D-W130+1.6LLa1
LC48=1.2D-W160+1.6LLa1
LC49=1.2D-W190+1.6LLa1
LC50=1.2D-W120+1.6LLa1
LC51=1.2D-W150+1.6LLa1
LC52=1.2D+W10+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

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<i>HSS_SQR 3X3X1_4</i>	2	LC71 at 100.00%	0.50	OK	Eq. H1-1b
		4	LC69 at 100.00%	0.50	OK	Eq. H1-1b
	<i>PIPE 2-1_2x0.203</i>	26	LC70 at 79.17%	0.63	OK	Eq. H1-1b
	<i>PIPE 2x0.154</i>	1	LC40 at 50.00%	1.23	N.G.	Eq. H1-1b
		5	LC46 at 50.00%	1.11	N.G.	Eq. H1-1b
		6	LC69 at 100.00%	0.19	OK	Eq. H1-1b
		20	LC11 at 50.00%	0.05	OK	Eq. H1-1b
		21	LC3 at 50.00%	0.05	OK	Eq. H1-1b
		24	LC64 at 89.06%	1.18	N.G.	Eq. H1-1b
		29	LC47 at 39.58%	0.91	OK	Eq. H1-1b
		30	LC7 at 60.94%	0.83	OK	Eq. H1-1b
	<i>PIPE 3-1_2x0.226</i>	7	LC47 at 13.75%	0.27	OK	Eq. H1-1b



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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.375	0.125	0.20	0
3	-6.375	0.125	0.20	0
4	0.00	0.00	-2.30	0
5	0.00	0.00	-1.80	0
10	0.00	2.958	0.00	0
11	0.00	2.958	-2.30	0
12	0.00	2.958	-1.80	0
13	-6.375	3.125	0.20	0
15	6.375	3.125	0.20	0
16	0.00	-0.521	0.00	0
17	0.00	3.479	0.00	0
34	-5.375	5.50	0.40	0
36	-1.00	6.50	0.40	0
38	-5.375	-0.50	0.40	0
40	-1.00	-1.50	0.40	0
42	5.375	4.625	0.40	0
43	2.00	4.00	-5.00	0
44	-5.375	4.625	0.40	0
45	-3.00	4.00	-5.00	0
52	3.875	5.50	0.40	0

53	3.875	-0.50	0.40	0
54	5.375	-0.50	0.40	0
55	5.375	5.50	0.40	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
4	1	1	1	1	1	1
11	1	1	1	1	1	1
43	1	1	1	0	0	0
45	1	1	1	0	0	0

Members

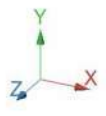
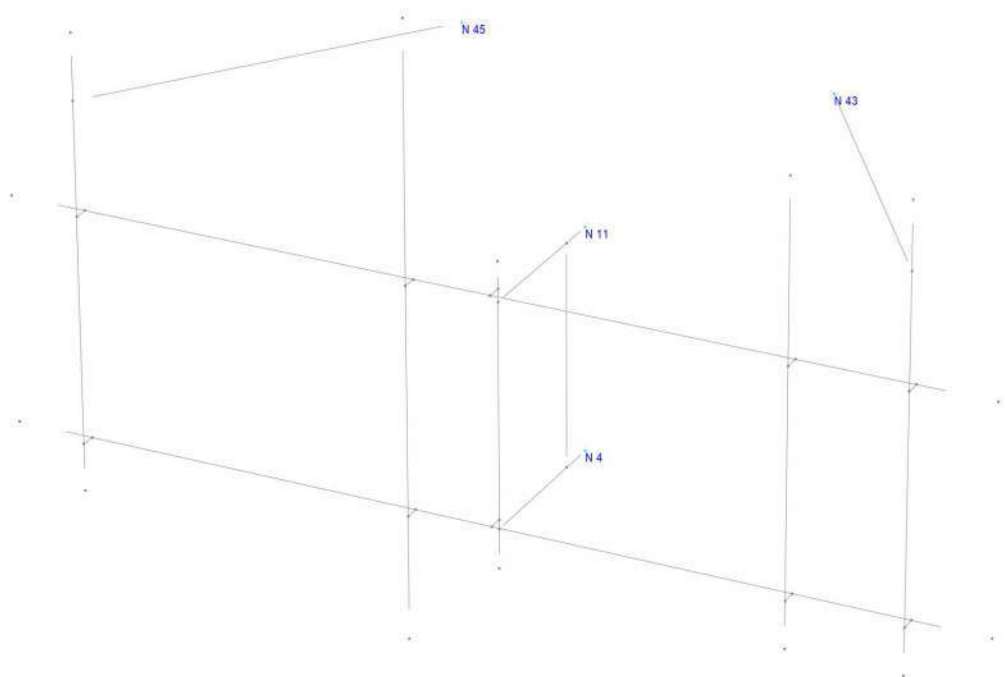
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	3	2		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
2	1	4		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
4	10	11		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
5	13	15		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	5	12		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	17	16		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
20	42	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
21	45	44		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	34	38		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
26	36	40		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
29	52	53		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
30	54	55		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
24	315.00	0	0.00	0.00	0.00
26	315.00	0	0.00	0.00	0.00
29	315.00	0	0.00	0.00	0.00

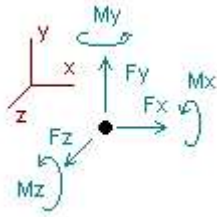
Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
20	1	1	0	0	0	0	0	0	0	0	Full
21	0	0	0	0	1	1	0	0	0	0	Full



Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.2D+W0						
4	0.02098	0.42517	1.23588	-0.49448	-0.13174	0.02113
11	-0.13647	0.42406	0.02999	-0.49479	-0.31411	0.02370
43	0.27726	0.06317	0.45626	0.00000	0.00000	0.00000
45	-0.16177	0.05373	0.37698	0.00000	0.00000	0.00000
SUM	0.00000	0.96613	2.09911	-0.98927	-0.44585	0.04483
Condition LC2=1.2D+W30						
4	0.24896	0.44024	1.08168	-0.50227	0.83450	-0.08880
11	0.87322	0.42951	-0.07214	-0.50356	1.72407	-0.10207
43	0.16630	0.04347	0.28021	0.00000	0.00000	0.00000
45	-0.16065	0.05292	0.37285	0.00000	0.00000	0.00000
SUM	1.12784	0.96613	1.66261	-1.00583	2.55857	-0.19087
Condition LC3=1.2D+W60						
4	0.27199	0.45153	0.74050	-0.51585	0.87861	-0.10825
11	1.01761	0.45069	-0.23153	-0.51815	1.93406	-0.11624
43	0.09229	0.02593	0.11319	0.00000	0.00000	0.00000
45	-0.08028	0.03797	0.23060	0.00000	0.00000	0.00000
SUM	1.30161	0.96613	0.85277	-1.03400	2.81267	-0.22449
Condition LC4=1.2D+W90						
4	0.27921	0.47054	0.44923	-0.53598	0.94868	-0.12962
11	1.17013	0.47085	-0.44782	-0.53731	2.21048	-0.14054
43	-0.01135	0.00690	-0.05316	0.00000	0.00000	0.00000
45	-0.00115	0.01785	0.05176	0.00000	0.00000	0.00000
SUM	1.43684	0.96613	0.00000	-1.07330	3.15917	-0.27017

Condition **LC5=1.2D+W120**

4	0.25072	0.48944	0.15710	-0.55732	0.84609	-0.12035
11	1.07614	0.49111	-0.66261	-0.55630	2.01662	-0.12874
43	-0.10817	-0.01090	-0.20875	0.00000	0.00000	0.00000
45	0.08292	-0.00352	-0.13852	0.00000	0.00000	0.00000

SUM 1.30161 0.96613 -0.85277 -1.11362 2.86271 -0.24909

Condition **LC6=1.2D+W150**

4	0.20491	0.50084	-0.18600	-0.57162	0.82328	-0.11265
11	1.02812	0.51245	-0.81724	-0.57065	1.97749	-0.13021
43	-0.22567	-0.02852	-0.37650	0.00000	0.00000	0.00000
45	0.12048	-0.01863	-0.28287	0.00000	0.00000	0.00000

SUM 1.12784 0.96613 -1.66261 -1.14227 2.80077 -0.24286

Condition **LC7=1.2D-W0**

4	-0.04726	0.51544	-0.34291	-0.58436	0.07491	-0.01777
11	0.16331	0.51811	-0.91684	-0.58112	0.36369	-0.02562
43	-0.27836	-0.03768	-0.46024	0.00000	0.00000	0.00000
45	0.16230	-0.02974	-0.37911	0.00000	0.00000	0.00000

SUM 0.00000 0.96613 -2.09911 -1.16549 0.43861 -0.04339

Condition **LC8=1.2D-W30**

4	-0.27766	0.50047	-0.18889	-0.57661	-0.89499	0.09104
11	-0.84375	0.51276	-0.81427	-0.57237	-1.66952	0.09892
43	-0.16754	-0.01713	-0.28143	0.00000	0.00000	0.00000
45	0.16112	-0.02996	-0.37802	0.00000	0.00000	0.00000

SUM -1.12784 0.96613 -1.66261 -1.14898 -2.56452 0.18996

Condition **LC9=1.2D-W60**

4	-0.29993	0.48918	0.15355	-0.56314	-0.93674	0.11083
11	-0.98855	0.49163	-0.65702	-0.55779	-1.87942	0.11348
43	-0.09389	0.00003	-0.11512	0.00000	0.00000	0.00000
45	0.08075	-0.01471	-0.23418	0.00000	0.00000	0.00000

SUM -1.30161 0.96613 -0.85277 -1.12093 -2.81616 0.22430

Condition **LC10=1.2D-W90**

4	-0.30601	0.47017	0.44523	-0.54304	-1.00461	0.13278
11	-1.14221	0.47149	-0.44133	-0.53862	-2.15807	0.13843
43	0.00956	0.01859	0.04990	0.00000	0.00000	0.00000
45	0.00181	0.00588	-0.05380	0.00000	0.00000	0.00000

SUM -1.43684 0.96613 0.00000 -1.08167 -3.16267 0.27121

Condition **LC11=1.2D-W120**

4	-0.27641	0.45121	0.73731	-0.52165	-0.89994	0.12406
11	-1.04934	0.45117	-0.22649	-0.51960	-1.96635	0.12723
43	0.10634	0.03594	0.20409	0.00000	0.00000	0.00000
45	-0.08220	0.02781	0.13787	0.00000	0.00000	0.00000

SUM -1.30161 0.96613 0.85277 -1.04125 -2.86629 0.25129

Condition LC12=1.2D-W150						
4	-0.22962	0.43991	1.07988	-0.50742	-0.87538	0.11676
11	-1.00203	0.42989	-0.07030	-0.50538	-1.92836	0.12912
43	0.22370	0.05305	0.37003	0.00000	0.00000	0.00000
45	-0.11989	0.04328	0.28300	0.00000	0.00000	0.00000
SUM	-1.12784	0.96613	1.66261	-1.01280	-2.80374	0.24588
Condition LC13=0.9D+W0						
4	0.02436	0.30741	1.12344	-0.35921	-0.12457	0.02079
11	-0.13998	0.30600	0.14188	-0.35992	-0.32078	0.02400
43	0.27747	0.06022	0.45659	0.00000	0.00000	0.00000
45	-0.16184	0.05097	0.37719	0.00000	0.00000	0.00000
SUM	0.00000	0.72460	2.09911	-0.71913	-0.44535	0.04479
Condition LC14=0.9D+W30						
4	0.25194	0.32253	0.96935	-0.36710	0.84051	-0.08940
11	0.87012	0.31151	0.03966	-0.36877	1.71811	-0.10203
43	0.16650	0.04041	0.28053	0.00000	0.00000	0.00000
45	-0.16072	0.05015	0.37306	0.00000	0.00000	0.00000
SUM	1.12784	0.72460	1.66261	-0.73587	2.55862	-0.19143
Condition LC15=0.9D+W60						
4	0.27496	0.33390	0.62837	-0.38082	0.88457	-0.10887
11	1.01452	0.33279	-0.11990	-0.38351	1.92817	-0.11621
43	0.09248	0.02279	0.11350	0.00000	0.00000	0.00000
45	-0.08036	0.03512	0.23080	0.00000	0.00000	0.00000
SUM	1.30161	0.72460	0.85277	-0.76433	2.81275	-0.22508
Condition LC16=0.9D+W90						
4	0.28209	0.35301	0.33732	-0.40113	0.95455	-0.13028
11	1.16715	0.35305	-0.33638	-0.40284	2.20485	-0.14057
43	-0.01118	0.00365	-0.05288	0.00000	0.00000	0.00000
45	-0.00122	0.01489	0.05193	0.00000	0.00000	0.00000
SUM	1.43684	0.72460	0.00000	-0.80397	3.15940	-0.27085
Condition LC17=0.9D+W120						
4	0.25360	0.37201	0.04542	-0.42264	0.85207	-0.12100
11	1.07317	0.37342	-0.55134	-0.42200	2.01107	-0.12875
43	-0.10800	-0.01423	-0.20849	0.00000	0.00000	0.00000
45	0.08284	-0.00660	-0.13836	0.00000	0.00000	0.00000
SUM	1.30161	0.72460	-0.85277	-0.84464	2.86314	-0.24975
Condition LC18=0.9D+W150						
4	0.20777	0.38349	-0.29747	-0.43708	0.82920	-0.11332
11	1.02518	0.39485	-0.70616	-0.43649	1.97198	-0.13023
43	-0.22551	-0.03195	-0.37624	0.00000	0.00000	0.00000
45	0.12040	-0.02179	-0.28273	0.00000	0.00000	0.00000
SUM	1.12784	0.72460	-1.66261	-0.87358	2.80118	-0.24355

Condition LC19=0.9D-W0						
4	-0.04394	0.39814	-0.45428	-0.44992	0.08177	-0.01821
11	0.15991	0.40057	-0.80585	-0.44706	0.35734	-0.02541
43	-0.27820	-0.04116	-0.45999	0.00000	0.00000	0.00000
45	0.16223	-0.03296	-0.37899	0.00000	0.00000	0.00000
SUM	0.00000	0.72460	-2.09911	-0.89697	0.43910	-0.04362
Condition LC20=0.9D-W30						
4	-0.27395	0.38311	-0.30036	-0.44207	-0.88697	0.09085
11	-0.84755	0.39516	-0.70319	-0.43822	-1.67656	0.09940
43	-0.16738	-0.02050	-0.28116	0.00000	0.00000	0.00000
45	0.16105	-0.03318	-0.37790	0.00000	0.00000	0.00000
SUM	-1.12784	0.72460	-1.66261	-0.88029	-2.56353	0.19025
Condition LC21=0.9D-W60						
4	-0.29621	0.37175	0.04188	-0.42845	-0.92869	0.11065
11	-0.99237	0.37394	-0.54577	-0.42349	-1.88653	0.11397
43	-0.09371	-0.00325	-0.11484	0.00000	0.00000	0.00000
45	0.08068	-0.01784	-0.23404	0.00000	0.00000	0.00000
SUM	-1.30161	0.72460	-0.85277	-0.85195	-2.81522	0.22462
Condition LC22=0.9D-W90						
4	-0.30220	0.35264	0.33334	-0.40818	-0.99645	0.13265
11	-1.14614	0.35370	-0.32989	-0.40416	-2.16546	0.13897
43	0.00975	0.01541	0.05020	0.00000	0.00000	0.00000
45	0.00174	0.00286	-0.05365	0.00000	0.00000	0.00000
SUM	-1.43684	0.72460	0.00000	-0.81234	-3.16191	0.27163
Condition LC23=0.9D-W120						
4	-0.27260	0.33358	0.62519	-0.38662	-0.89190	0.12393
11	-1.05330	0.33327	-0.11487	-0.38496	-1.97384	0.12776
43	0.10655	0.03285	0.20441	0.00000	0.00000	0.00000
45	-0.08227	0.02490	0.13805	0.00000	0.00000	0.00000
SUM	-1.30161	0.72460	0.85277	-0.77158	-2.86574	0.25169
Condition LC24=0.9D-W150						
4	-0.22578	0.32220	0.96755	-0.37224	-0.86729	0.11664
11	-1.00602	0.31189	0.04150	-0.37060	-1.93591	0.12967
43	0.22392	0.05005	0.37036	0.00000	0.00000	0.00000
45	-0.11996	0.04046	0.28320	0.00000	0.00000	0.00000
SUM	-1.12784	0.72460	1.66261	-0.74283	-2.80320	0.24631
Condition LC25=1.2D+Di+W10						
4	-0.01245	0.87149	0.95026	-1.00526	-0.05229	0.01003
11	0.00006	0.87305	-0.76917	-1.00309	0.00032	0.00528
43	0.03644	0.03538	0.05830	0.00000	0.00000	0.00000
45	-0.02405	0.03284	0.05461	0.00000	0.00000	0.00000
SUM	0.00000	1.81277	0.29400	-2.00836	-0.05198	0.01531

Condition LC26=1.2D+Di+W130						
4	0.02594	0.87370	0.91199	-1.00722	0.10555	-0.00809
11	0.16656	0.87540	-0.79652	-1.00502	0.33398	-0.01531
43	0.01558	0.03168	0.02494	0.00000	0.00000	0.00000
45	-0.02070	0.03199	0.04697	0.00000	0.00000	0.00000
SUM	0.18738	1.81277	0.18738	-2.01225	0.43953	-0.02340
Condition LC27=1.2D+Di+W160						
4	0.01601	0.87441	0.89730	-1.00819	0.07404	-0.00549
11	0.13918	0.87625	-0.80458	-1.00574	0.27890	-0.01262
43	0.01228	0.03109	0.01965	0.00000	0.00000	0.00000
45	-0.01685	0.03102	0.03825	0.00000	0.00000	0.00000
SUM	0.15061	1.81277	0.15061	-2.01393	0.35294	-0.01810
Condition LC28=1.2D+Di+W190						
4	0.01939	0.87771	0.84520	-1.01158	0.09193	-0.00996
11	0.17241	0.87972	-0.84206	-1.00902	0.33936	-0.01768
43	-0.00597	0.02784	-0.00956	0.00000	0.00000	0.00000
45	-0.00283	0.02750	0.00642	0.00000	0.00000	0.00000
SUM	0.18300	1.81277	0.00000	-2.02060	0.43129	-0.02764
Condition LC29=1.2D+Di+W1120						
4	0.01229	0.88099	0.79296	-1.01522	0.06548	-0.00766
11	0.14854	0.88322	-0.87931	-1.01228	0.29007	-0.01485
43	-0.02259	0.02488	-0.03616	0.00000	0.00000	0.00000
45	0.01238	0.02367	-0.02810	0.00000	0.00000	0.00000
SUM	0.15061	1.81277	-0.15061	-2.02750	0.35555	-0.02251
Condition LC30=1.2D+Di+W1150						
4	0.02135	0.88172	0.77826	-1.01609	0.09515	-0.01083
11	0.17887	0.88407	-0.88722	-1.01291	0.34923	-0.01834
43	-0.02778	0.02395	-0.04449	0.00000	0.00000	0.00000
45	0.01495	0.02302	-0.03393	0.00000	0.00000	0.00000
SUM	0.18738	1.81277	-0.18738	-2.02900	0.44438	-0.02917
Condition LC31=1.2D+Di-W10						
4	-0.02119	0.88386	0.73951	-1.01892	-0.03407	0.00457
11	0.03523	0.88649	-0.91392	-1.01511	0.07809	-0.00118
43	-0.03912	0.02194	-0.06262	0.00000	0.00000	0.00000
45	0.02508	0.02047	-0.05697	0.00000	0.00000	0.00000
SUM	0.00000	1.81277	-0.29400	-2.03403	0.04402	0.00339
Condition LC32=1.2D+Di-W130						
4	-0.05962	0.88166	0.77778	-1.01696	-0.19199	0.02267
11	-0.13123	0.88414	-0.88656	-1.01318	-0.25548	0.01939
43	-0.01826	0.02566	-0.02921	0.00000	0.00000	0.00000
45	0.02173	0.02130	-0.04939	0.00000	0.00000	0.00000
SUM	-0.18738	1.81277	-0.18738	-2.03015	-0.44747	0.04205

Condition LC33=1.2D+Di-WI60						
4	-0.04968	0.88095	0.79249	-1.01600	-0.16045	0.02007
11	-0.10386	0.88329	-0.87853	-1.01246	-0.20043	0.01670
43	-0.01496	0.02625	-0.02393	0.00000	0.00000	0.00000
45	0.01788	0.02227	-0.04065	0.00000	0.00000	0.00000
SUM	-0.15061	1.81277	-0.15061	-2.02846	-0.36088	0.03677
Condition LC34=1.2D+Di-WI90						
4	-0.05303	0.87765	0.84460	-1.01261	-0.17828	0.02456
11	-0.13711	0.87982	-0.84107	-1.00918	-0.26092	0.02177
43	0.00328	0.02948	0.00525	0.00000	0.00000	0.00000
45	0.00386	0.02581	-0.00878	0.00000	0.00000	0.00000
SUM	-0.18300	1.81277	0.00000	-2.02179	-0.43920	0.04633
Condition LC35=1.2D+Di-WI120						
4	-0.04591	0.87437	0.89684	-1.00897	-0.15177	0.02227
11	-0.11326	0.87632	-0.80383	-1.00592	-0.21166	0.01896
43	0.01990	0.03243	0.03182	0.00000	0.00000	0.00000
45	-0.01135	0.02965	0.02578	0.00000	0.00000	0.00000
SUM	-0.15061	1.81277	0.15061	-2.01489	-0.36343	0.04123
Condition LC36=1.2D+Di-WI150						
4	-0.05496	0.87365	0.91153	-1.00810	-0.18142	0.02545
11	-0.14360	0.87547	-0.79589	-1.00530	-0.27084	0.02246
43	0.02509	0.03335	0.04012	0.00000	0.00000	0.00000
45	-0.01392	0.03030	0.03162	0.00000	0.00000	0.00000
SUM	-0.18738	1.81277	0.18738	-2.01339	-0.45226	0.04791
Condition LC37=1.2D+1.6LL1						
4	-0.01354	0.66989	0.62641	-0.77771	-0.02811	0.00115
11	0.01415	0.67152	-0.62380	-0.76956	0.02575	-0.00032
43	-0.00103	0.01279	-0.00165	0.00000	0.00000	0.00000
45	0.00042	0.01193	-0.00096	0.00000	0.00000	0.00000
SUM	0.00000	1.36613	0.00000	-1.54727	-0.00236	0.00083
Condition LC38=1.2D+1.6LL2						
4	0.68354	0.66964	0.62932	-0.77517	1.00443	0.23353
11	-0.68833	0.67104	-0.63340	-0.77190	-0.96832	0.26179
43	0.00387	0.01365	0.00617	0.00000	0.00000	0.00000
45	0.00092	0.01180	-0.00209	0.00000	0.00000	0.00000
SUM	0.00000	1.36613	0.00000	-1.54706	0.03611	0.49532
Condition LC39=1.2D+1.6LL3						
4	-0.71318	0.66937	0.63293	-0.77284	-1.07858	-0.22369
11	0.71811	0.67083	-0.64153	-0.76989	1.02859	-0.26016
43	-0.00066	0.01286	-0.00106	0.00000	0.00000	0.00000
45	-0.00427	0.01307	0.00966	0.00000	0.00000	0.00000
SUM	0.00000	1.36613	0.00000	-1.54274	-0.04999	-0.48386

Condition LC40=1.2D+WL0+1.6LLa1						
4	0.83103	0.86789	0.88800	-1.01182	1.17322	0.29198
11	-0.83508	0.87001	-0.82605	-1.00779	-1.18134	0.32038
43	0.00988	0.01466	0.01577	0.00000	0.00000	0.00000
45	-0.00583	0.01357	0.01328	0.00000	0.00000	0.00000
SUM	0.00000	1.76613	0.09100	-2.01961	-0.00812	0.61235
Condition LC41=1.2D+WL30+1.6LLa1						
4	0.84259	0.86854	0.87621	-1.01249	1.22038	0.28654
11	-0.78489	0.87075	-0.83583	-1.00836	-1.08135	0.31422
43	0.00351	0.01358	0.00560	0.00000	0.00000	0.00000
45	-0.00465	0.01326	0.01059	0.00000	0.00000	0.00000
SUM	0.05657	1.76613	0.05657	-2.02085	0.13902	0.60077
Condition LC42=1.2D+WL60+1.6LLa1						
4	0.83960	0.86881	0.87157	-1.01285	1.21132	0.28759
11	-0.79451	0.87107	-0.83864	-1.00863	-1.09966	0.31531
43	0.00208	0.01333	0.00332	0.00000	0.00000	0.00000
45	-0.00333	0.01291	0.00759	0.00000	0.00000	0.00000
SUM	0.04384	1.76613	0.04384	-2.02148	0.11166	0.60289
Condition LC43=1.2D+WL90+1.6LLa1						
4	0.83945	0.86979	0.85582	-1.01380	1.21396	0.28625
11	-0.78599	0.87208	-0.84889	-1.00959	-1.08438	0.31378
43	-0.00323	0.01243	-0.00516	0.00000	0.00000	0.00000
45	0.00078	0.01183	-0.00177	0.00000	0.00000	0.00000
SUM	0.05100	1.76613	0.00000	-2.02339	0.12958	0.60003
Condition LC44=1.2D+WL120+1.6LLa1						
4	0.83841	0.87076	0.84002	-1.01484	1.20895	0.28686
11	-0.79153	0.87310	-0.85903	-1.01054	-1.09547	0.31452
43	-0.00819	0.01159	-0.01308	0.00000	0.00000	0.00000
45	0.00516	0.01068	-0.01175	0.00000	0.00000	0.00000
SUM	0.04384	1.76613	-0.04384	-2.02538	0.11348	0.60138
Condition LC45=1.2D+WL150+1.6LLa1						
4	0.84094	0.87103	0.83534	-1.01516	1.21942	0.28558
11	-0.78009	0.87342	-0.86168	-1.01077	-1.07276	0.31309
43	-0.01032	0.01123	-0.01648	0.00000	0.00000	0.00000
45	0.00604	0.01045	-0.01375	0.00000	0.00000	0.00000
SUM	0.05657	1.76613	-0.05657	-2.02593	0.14666	0.59867
Condition LC46=1.2D-WL0+1.6LLa1						
4	0.82800	0.87168	0.82349	-1.01611	1.17986	0.29023
11	-0.82347	0.87420	-0.87144	-1.01146	-1.15518	0.31829
43	-0.01377	0.01065	-0.02199	0.00000	0.00000	0.00000
45	0.00924	0.00961	-0.02106	0.00000	0.00000	0.00000
SUM	0.00000	1.76613	-0.09100	-2.02757	0.02468	0.60852

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

4	0.81643	0.87103	0.83528	-1.01544	1.13269	0.29567
11	-0.87366	0.87346	-0.86166	-1.01089	-1.25516	0.32444
43	-0.00740	0.01173	-0.01181	0.00000	0.00000	0.00000
45	0.00806	0.00991	-0.01838	0.00000	0.00000	0.00000

SUM -0.05657 1.76613 -0.05657 -2.02633 -0.12246 0.62011

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

4	0.81942	0.87076	0.83993	-1.01508	1.14175	0.29462
11	-0.86404	0.87314	-0.85886	-1.01062	-1.23686	0.32336
43	-0.00597	0.01197	-0.00953	0.00000	0.00000	0.00000
45	0.00675	0.01026	-0.01538	0.00000	0.00000	0.00000

SUM -0.04384 1.76613 -0.04384 -2.02570 -0.09510 0.61798

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

4	0.81957	0.86979	0.85568	-1.01413	1.13912	0.29595
11	-0.87255	0.87213	-0.84861	-1.00966	-1.25213	0.32489
43	-0.00066	0.01287	-0.00105	0.00000	0.00000	0.00000
45	0.00264	0.01134	-0.00602	0.00000	0.00000	0.00000

SUM -0.05100 1.76613 0.00000 -2.02379 -0.11301 0.62084

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

4	0.82062	0.86882	0.87147	-1.01309	1.14414	0.29535
11	-0.86702	0.87111	-0.83847	-1.00871	-1.24105	0.32415
43	0.00430	0.01371	0.00687	0.00000	0.00000	0.00000
45	-0.00174	0.01249	0.00397	0.00000	0.00000	0.00000

SUM -0.04384 1.76613 0.04384 -2.02180 -0.09691 0.61950

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

4	0.81808	0.86854	0.87615	-1.01278	1.13366	0.29663
11	-0.87846	0.87079	-0.83581	-1.00848	-1.26376	0.32558
43	0.00643	0.01407	0.01026	0.00000	0.00000	0.00000
45	-0.00262	0.01273	0.00597	0.00000	0.00000	0.00000

SUM -0.05657 1.76613 0.05657 -2.02126 -0.13010 0.62221

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

4	-0.22959	0.86771	0.89101	-1.00869	-0.33919	-0.07288
11	0.22628	0.86971	-0.83266	-1.00597	0.31810	-0.08247
43	0.01037	0.01487	0.01661	0.00000	0.00000	0.00000
45	-0.00707	0.01384	0.01605	0.00000	0.00000	0.00000

SUM 0.00000 1.76613 0.09100 -2.01466 -0.02109 -0.15535

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

4	-0.21811	0.86839	0.87927	-1.00941	-0.29232	-0.07835
11	0.27654	0.87049	-0.84247	-1.00659	0.41805	-0.08866
43	0.00401	0.01371	0.00643	0.00000	0.00000	0.00000
45	-0.00588	0.01353	0.01335	0.00000	0.00000	0.00000

SUM 0.05657 1.76613 0.05657 -2.01600 0.12574 -0.16702

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

4	-0.22104	0.86867	0.87463	-1.00978	-0.30131	-0.07729
11	0.26685	0.87081	-0.84529	-1.00686	0.39963	-0.08756
43	0.00259	0.01345	0.00414	0.00000	0.00000	0.00000
45	-0.00456	0.01320	0.01035	0.00000	0.00000	0.00000

SUM 0.04384 1.76613 0.04384 -2.01664 0.09832 -0.16484

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

4	-0.22114	0.86966	0.85892	-1.01076	-0.29870	-0.07860
11	0.27529	0.87184	-0.85556	-1.00785	0.41469	-0.08907
43	-0.00271	0.01249	-0.00434	0.00000	0.00000	0.00000
45	-0.00043	0.01215	0.00098	0.00000	0.00000	0.00000

SUM 0.05100 1.76613 0.00000 -2.01861 0.11599 -0.16767

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

4	-0.22211	0.87065	0.84315	-1.01182	-0.30368	-0.07797
11	0.26964	0.87287	-0.86572	-1.00882	0.40335	-0.08830
43	-0.00766	0.01159	-0.01226	0.00000	0.00000	0.00000
45	0.00397	0.01103	-0.00900	0.00000	0.00000	0.00000

SUM 0.04384 1.76613 -0.04384 -2.02064 0.09968 -0.16627

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

4	-0.21959	0.87093	0.83849	-1.01215	-0.29327	-0.07926
11	0.28109	0.87320	-0.86839	-1.00906	0.42604	-0.08973
43	-0.00978	0.01120	-0.01566	0.00000	0.00000	0.00000
45	0.00485	0.01080	-0.01101	0.00000	0.00000	0.00000

SUM 0.05657 1.76613 -0.05657 -2.02121 0.13276 -0.16899

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

4	-0.23235	0.87159	0.82666	-1.01312	-0.33261	-0.07454
11	0.23750	0.87399	-0.87817	-1.00977	0.34326	-0.08446
43	-0.01322	0.01057	-0.02116	0.00000	0.00000	0.00000
45	0.00807	0.00998	-0.01832	0.00000	0.00000	0.00000

SUM 0.00000 1.76613 -0.09100 -2.02288 0.01065 -0.15899

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

4	-0.24383	0.87090	0.83840	-1.01239	-0.37949	-0.06906
11	0.18724	0.87321	-0.86836	-1.00915	0.24332	-0.07827
43	-0.00686	0.01173	-0.01098	0.00000	0.00000	0.00000
45	0.00688	0.01028	-0.01563	0.00000	0.00000	0.00000

SUM -0.05657 1.76613 -0.05657 -2.02154 -0.13617 -0.14733

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

4	-0.24090	0.87063	0.84303	-1.01202	-0.37049	-0.07013
11	0.19693	0.87289	-0.86555	-1.00888	0.26174	-0.07937
43	-0.00543	0.01199	-0.00869	0.00000	0.00000	0.00000
45	0.00556	0.01062	-0.01263	0.00000	0.00000	0.00000

SUM -0.04384 1.76613 -0.04384 -2.02090 -0.10876 -0.14950

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

4	-0.24079	0.86964	0.85875	-1.01105	-0.37310	-0.06881
11	0.18849	0.87186	-0.85528	-1.00789	0.24667	-0.07786
43	-0.00013	0.01296	-0.00021	0.00000	0.00000	0.00000
45	0.00143	0.01167	-0.00326	0.00000	0.00000	0.00000

SUM -0.05100 1.76613 0.00000 -2.01893 -0.12643 -0.14667

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

4	-0.23983	0.86865	0.87452	-1.00999	-0.36812	-0.06944
11	0.19414	0.87083	-0.84511	-1.00692	0.25801	-0.07863
43	0.00481	0.01386	0.00770	0.00000	0.00000	0.00000
45	-0.00296	0.01279	0.00673	0.00000	0.00000	0.00000

SUM -0.04384 1.76613 0.04384 -2.01690 -0.11011 -0.14807

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

4	-0.24234	0.86837	0.87918	-1.00965	-0.37852	-0.06815
11	0.18269	0.87050	-0.84245	-1.00668	0.23532	-0.07719
43	0.00693	0.01425	0.01110	0.00000	0.00000	0.00000
45	-0.00385	0.01302	0.00874	0.00000	0.00000	0.00000

SUM -0.05657 1.76613 0.05657 -2.01633 -0.14319 -0.14535

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

4	-1.19303	0.86783	0.89293	-1.00587	-1.75826	-0.37795
11	1.19105	0.86970	-0.83478	-1.00421	1.72171	-0.43337
43	0.00966	0.01479	0.01551	0.00000	0.00000	0.00000
45	-0.00768	0.01381	0.01734	0.00000	0.00000	0.00000

SUM 0.00000 1.76613 0.09100 -2.01008 -0.03655 -0.81132

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

4	-1.18133	0.86852	0.88117	-1.00660	-1.71104	-0.38334
11	1.24106	0.87047	-0.84457	-1.00483	1.82125	-0.43947
43	0.00332	0.01360	0.00533	0.00000	0.00000	0.00000
45	-0.00648	0.01354	0.01463	0.00000	0.00000	0.00000

SUM 0.05657 1.76613 0.05657 -2.01142 0.11021 -0.82281

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

4	-1.18427	0.86878	0.87652	-1.00695	-1.72012	-0.38228
11	1.23136	0.87079	-0.84736	-1.00509	1.80276	-0.43837
43	0.00190	0.01334	0.00305	0.00000	0.00000	0.00000
45	-0.00515	0.01323	0.01164	0.00000	0.00000	0.00000

SUM 0.04384 1.76613 0.04384 -2.01203 0.08264 -0.82065

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

4	-1.18425	0.86974	0.86072	-1.00788	-1.71753	-0.38356
11	1.23963	0.87177	-0.85756	-1.00603	1.81740	-0.43983
43	-0.00337	0.01235	-0.00542	0.00000	0.00000	0.00000
45	-0.00100	0.01227	0.00227	0.00000	0.00000	0.00000

SUM 0.05100 1.76613 0.00000 -2.01391 0.09988 -0.82339

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

4	-1.18513	0.87068	0.84486	-1.00889	-1.72259	-0.38290
11	1.23385	0.87277	-0.86766	-1.00695	1.80569	-0.43903
43	-0.00830	0.01143	-0.01333	0.00000	0.00000	0.00000
45	0.00342	0.01124	-0.00772	0.00000	0.00000	0.00000

SUM 0.04384 1.76613 -0.04384 -2.01584 0.08309 -0.82193

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

4	-1.18255	0.87096	0.84018	-1.00921	-1.71213	-0.38417
11	1.24523	0.87309	-0.87030	-1.00718	1.82823	-0.44044
43	-0.01041	0.01104	-0.01672	0.00000	0.00000	0.00000
45	0.00431	0.01104	-0.00973	0.00000	0.00000	0.00000

SUM 0.05657 1.76613 -0.05657 -2.01639 0.11610 -0.82461

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

4	-1.19542	0.87159	0.82829	-1.01014	-1.75183	-0.37949
11	1.20172	0.87385	-0.88004	-1.00785	1.74542	-0.43521
43	-0.01383	0.01040	-0.02222	0.00000	0.00000	0.00000
45	0.00754	0.01029	-0.01704	0.00000	0.00000	0.00000

SUM 0.00000 1.76613 -0.09100 -2.01798 -0.00641 -0.81470

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

4	-1.20713	0.87091	0.84005	-1.00941	-1.79905	-0.37410
11	1.15171	0.87307	-0.87025	-1.00723	1.64589	-0.42912
43	-0.00749	0.01158	-0.01203	0.00000	0.00000	0.00000
45	0.00635	0.01056	-0.01433	0.00000	0.00000	0.00000

SUM -0.05657 1.76613 -0.05657 -2.01664 -0.15316 -0.80322

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

4	-1.20419	0.87065	0.84471	-1.00906	-1.78997	-0.37516
11	1.16140	0.87276	-0.86746	-1.00697	1.66438	-0.43022
43	-0.00607	0.01185	-0.00975	0.00000	0.00000	0.00000
45	0.00502	0.01087	-0.01134	0.00000	0.00000	0.00000

SUM -0.04384 1.76613 -0.04384 -2.01603 -0.12559 -0.80538

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

4	-1.20420	0.86969	0.86051	-1.00813	-1.79256	-0.37388
11	1.15313	0.87177	-0.85726	-1.00603	1.64973	-0.42875
43	-0.00080	0.01283	-0.00128	0.00000	0.00000	0.00000
45	0.00087	0.01183	-0.00196	0.00000	0.00000	0.00000

SUM -0.05100 1.76613 0.00000 -2.01416 -0.14283 -0.80263

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

4	-1.20332	0.86874	0.87636	-1.00712	-1.78748	-0.37454
11	1.15891	0.87078	-0.84717	-1.00511	1.66144	-0.42955
43	0.00413	0.01375	0.00663	0.00000	0.00000	0.00000
45	-0.00355	0.01286	0.00802	0.00000	0.00000	0.00000

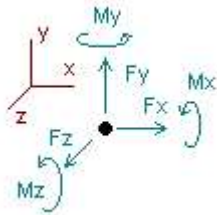
SUM -0.04384 1.76613 0.04384 -2.01223 -0.12604 -0.80409

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

4	-1.20590	0.86846	0.88104	-1.00679	-1.79794	-0.37327
11	1.14753	0.87045	-0.84452	-1.00488	1.63890	-0.42814
43	0.00624	0.01415	0.01002	0.00000	0.00000	0.00000
45	-0.00444	0.01307	0.01004	0.00000	0.00000	0.00000
<hr/>						
SUM	-0.05657	1.76613	0.05657	-2.01167	-0.15905	-0.80141

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+W10
- LC26=1.2D+Di+W130
- LC27=1.2D+Di+W160
- LC28=1.2D+Di+W190
- LC29=1.2D+Di+W1120
- LC30=1.2D+Di+W1150
- LC31=1.2D+Di-W10
- LC32=1.2D+Di-W130
- LC33=1.2D+Di-W160
- LC34=1.2D+Di-W190
- LC35=1.2D+Di-W1120

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

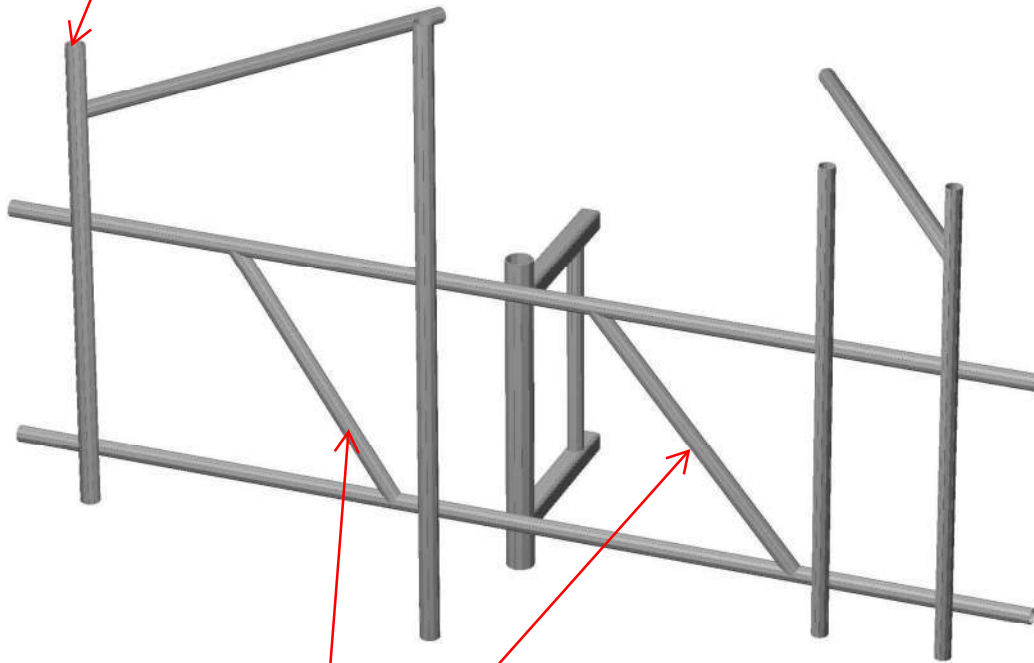
Node		Forces						Moments					
		Fx [Kip]	lc	Fy [Kip]	lc	Fz [Kip]	lc	Mx [Kip*ft]	lc	My [Kip*ft]	lc	Mz [Kip*ft]	lc
4	Max	0.843	LC41	0.884	LC31	1.236	LC1	-0.35921	LC13	1.22038	LC41	0.29663	LC51
	Min	-1.207	LC71	0.307	LC13	-0.454	LC19	-1.01892	LC31	-1.79905	LC71	-0.38417	LC69
11	Max	1.245	LC69	0.886	LC31	0.142	LC13	-0.35992	LC13	2.21048	LC4	0.32558	LC51
	Min	-1.146	LC22	0.306	LC13	-0.917	LC7	-1.01511	LC31	-2.16546	LC22	-0.44044	LC69
43	Max	0.277	LC13	0.063	LC1	0.457	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.278	LC7	-0.041	LC19	-0.460	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1
45	Max	0.162	LC7	0.054	LC1	0.377	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.162	LC13	-0.033	LC20	-0.379	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1



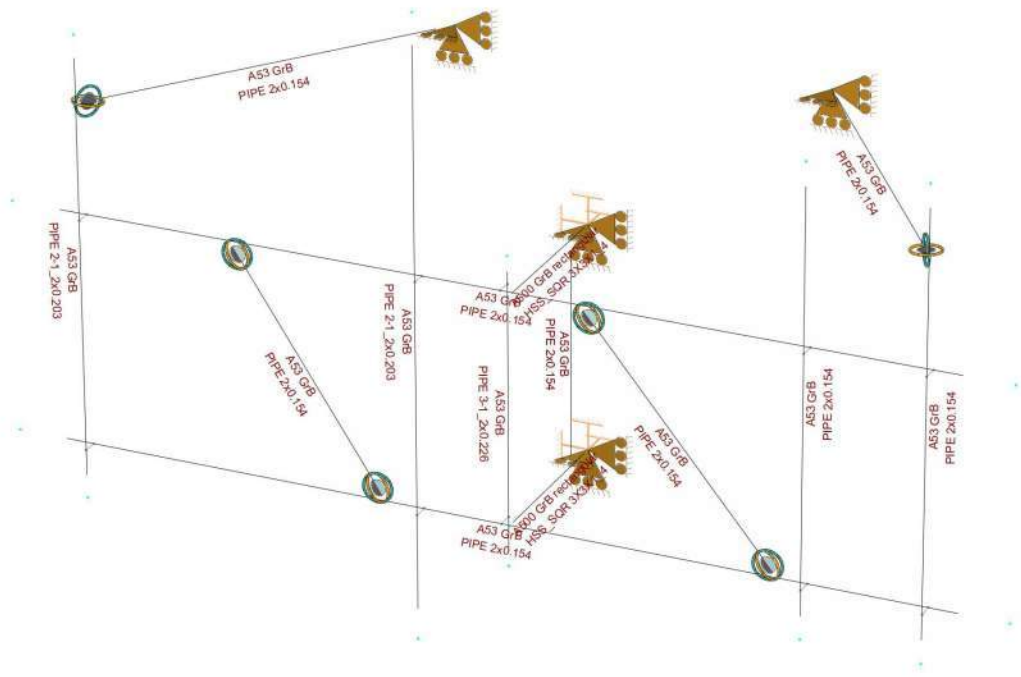
HUDSON
Design Group LLC

**Mount Calculations
(Modified Conditions)**

Remove existing 2" std. (2.38" O.D.) pipe mast and install new 2-1/2" std. (2.88" O.D.) pipe mast behind new DMP65R-BU4DA antennas secured to existing mount (typ. of 1 per sector, total of 3).

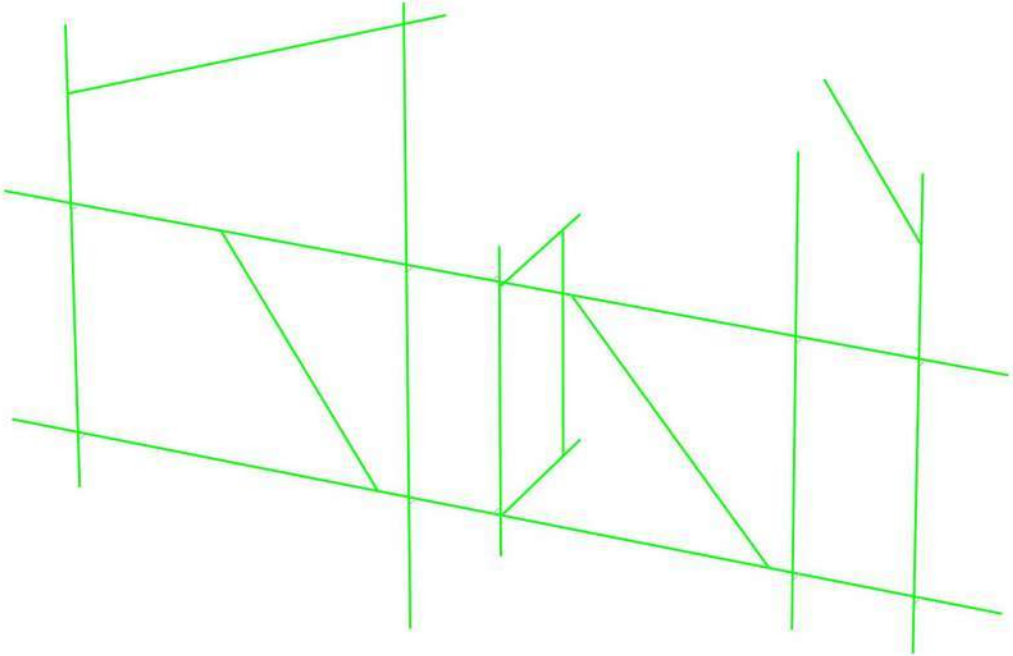


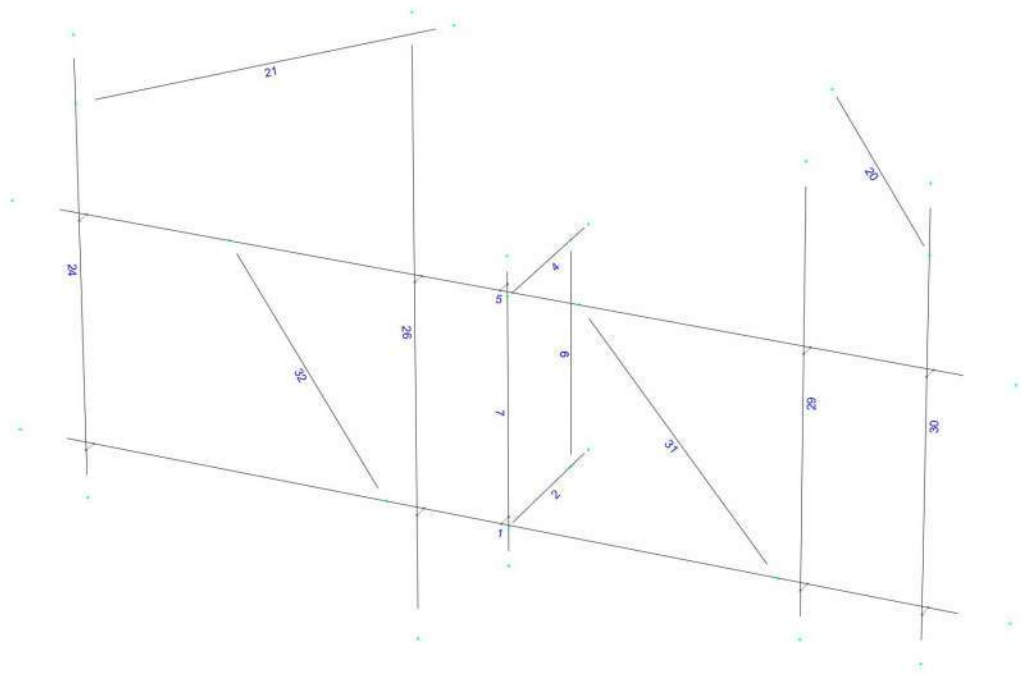
Install new 2" std (2.38" O.D.) diagonal pipe braces secured to existing antenna mount face (typ. of 2 per sector, total of 6)



Design status

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





Current Date: 12/6/2021 9:49 AM

Units system: English

File name: Z:\Shared\Work2.0\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1270\5G\CT1270 (5G) - Mod.retx

Load data

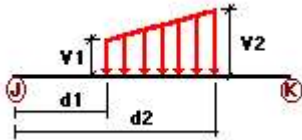
GLOSSARY

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 <td 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

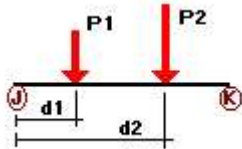
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	1	z	-0.008	-0.008	0.00	No	100.00	Yes
	5	z	-0.008	-0.008	0.00	No	100.00	Yes
	7	z	-0.011	-0.011	0.00	No	100.00	Yes
	20	z	-0.008	-0.008	0.00	No	100.00	Yes
	21	z	-0.008	-0.008	0.00	No	100.00	Yes
	30	z	-0.008	-0.008	0.00	No	100.00	Yes
	31	z	-0.008	-0.008	0.00	No	100.00	Yes
W30	32	z	-0.008	-0.008	0.00	No	100.00	Yes
	1	z	-0.008	-0.008	0.00	No	100.00	Yes
	2	z	-0.017	-0.017	0.00	No	100.00	Yes
	4	z	-0.017	-0.017	0.00	No	100.00	Yes
	5	z	-0.008	-0.008	0.00	No	100.00	Yes
	6	z	-0.008	-0.008	0.00	No	100.00	Yes
	7	z	-0.011	-0.011	0.00	No	100.00	Yes
	20	z	-0.008	-0.008	0.00	No	100.00	Yes
	21	z	-0.008	-0.008	0.00	No	100.00	Yes
	24	z	-0.009	-0.009	0.00	No	100.00	Yes
	26	z	-0.009	-0.009	0.00	No	100.00	Yes
	29	z	-0.008	-0.008	0.00	No	100.00	Yes
W60	30	z	-0.008	-0.008	0.00	No	100.00	Yes
	31	z	-0.008	-0.008	0.00	No	100.00	Yes
	32	z	-0.008	-0.008	0.00	No	100.00	Yes
	1	x	-0.008	-0.008	0.00	No	100.00	Yes
	2	x	-0.017	-0.017	0.00	No	100.00	Yes
	4	x	-0.017	-0.017	0.00	No	100.00	Yes
	5	x	-0.008	-0.008	0.00	No	100.00	Yes
	6	x	-0.008	-0.008	0.00	No	100.00	Yes
	7	x	-0.011	-0.011	0.00	No	100.00	Yes
	20	x	-0.008	-0.008	0.00	No	100.00	Yes
	21	x	-0.008	-0.008	0.00	No	100.00	Yes
	24	x	-0.009	-0.009	0.00	No	100.00	Yes
W90	26	x	-0.009	-0.009	0.00	No	100.00	Yes
	29	x	-0.008	-0.008	0.00	No	100.00	Yes
	30	x	-0.008	-0.008	0.00	No	100.00	Yes
	31	x	-0.008	-0.008	0.00	No	100.00	Yes
	32	x	-0.008	-0.008	0.00	No	100.00	Yes
	2	x	-0.017	-0.017	0.00	No	100.00	Yes
	4	x	-0.017	-0.017	0.00	No	100.00	Yes
	5	x	-0.008	-0.008	0.00	No	100.00	Yes
	6	x	-0.008	-0.008	0.00	No	100.00	Yes
	7	x	-0.011	-0.011	0.00	No	100.00	Yes
	20	x	-0.008	-0.008	0.00	No	100.00	Yes
	21	x	-0.008	-0.008	0.00	No	100.00	Yes
W120	24	x	-0.009	-0.009	0.00	No	100.00	Yes
	26	x	-0.009	-0.009	0.00	No	100.00	Yes
	29	x	-0.008	-0.008	0.00	No	100.00	Yes
	1	x	-0.008	-0.008	0.00	No	100.00	Yes
	2	x	-0.017	-0.017	0.00	No	100.00	Yes
	4	x	-0.017	-0.017	0.00	No	100.00	Yes
	5	x	-0.008	-0.008	0.00	No	100.00	Yes
	6	x	-0.008	-0.008	0.00	No	100.00	Yes
	7	x	-0.011	-0.011	0.00	No	100.00	Yes
	20	x	-0.008	-0.008	0.00	No	100.00	Yes
	21	x	-0.008	-0.008	0.00	No	100.00	Yes
	24	x	-0.009	-0.009	0.00	No	100.00	Yes

W150	30	x	-0.008	-0.008	0.00	No	100.00	Yes
	31	x	-0.008	-0.008	0.00	No	100.00	Yes
	32	x	-0.008	-0.008	0.00	No	100.00	Yes
	1	z	0.008	0.008	0.00	No	100.00	Yes
	2	z	0.017	0.017	0.00	No	100.00	Yes
	4	z	0.017	0.017	0.00	No	100.00	Yes
	5	z	0.008	0.008	0.00	No	100.00	Yes
	6	z	0.008	0.008	0.00	No	100.00	Yes
	7	z	0.011	0.011	0.00	No	100.00	Yes
	20	z	0.008	0.008	0.00	No	100.00	Yes
	21	z	0.008	0.008	0.00	No	100.00	Yes
	24	z	0.009	0.009	0.00	No	100.00	Yes
	26	z	0.009	0.009	0.00	No	100.00	Yes
	29	z	0.008	0.008	0.00	No	100.00	Yes
	30	z	0.008	0.008	0.00	No	100.00	Yes
Di	31	z	0.008	0.008	0.00	No	100.00	Yes
	32	z	0.008	0.008	0.00	No	100.00	Yes
	1	y	-0.005	-0.005	0.00	No	100.00	Yes
	2	y	-0.008	-0.008	0.00	No	100.00	Yes
	4	y	-0.008	-0.008	0.00	No	100.00	Yes
	5	y	-0.005	-0.005	0.00	No	100.00	Yes
	6	y	-0.005	-0.005	0.00	No	100.00	Yes
	7	y	-0.007	-0.007	0.00	No	100.00	Yes
	20	y	-0.005	-0.005	0.00	No	100.00	Yes
	21	y	-0.005	-0.005	0.00	No	100.00	Yes
	24	y	-0.006	-0.006	0.00	No	100.00	Yes
	26	y	-0.006	-0.006	0.00	No	100.00	Yes
	29	y	-0.005	-0.005	0.00	No	100.00	Yes
	30	y	-0.005	-0.005	0.00	No	100.00	Yes
	31	y	-0.005	-0.005	0.00	No	100.00	Yes
32	y	-0.005	-0.005	0.00	No	100.00	Yes	

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	24	y	-0.034	1.50	No
		y	-0.034	4.50	No
		y	-0.06	3.00	No
	26	y	-0.041	1.00	No
		y	-0.041	3.00	No
		y	-0.033	5.00	No
		y	-0.033	7.00	No
	29	y	-0.037	0.50	No
		y	-0.037	5.50	No
		y	-0.06	3.00	No
Wo	24	z	-0.232	1.50	No
		z	-0.232	4.50	No
	26	z	-0.114	1.00	No
		z	-0.114	3.00	No

		z	-0.114	3.00	No
		z	-0.117	5.00	No
		z	-0.117	7.00	No
	29	z	-0.37	0.50	No
		z	-0.37	5.50	No
		z	-0.037	3.00	No
		z	-0.053	3.00	No
W30	24	3	-0.198	1.50	No
		3	-0.198	4.50	No
		3	-0.085	3.00	No
	26	3	-0.104	1.00	No
		3	-0.104	3.00	No
		3	-0.102	5.00	No
		3	-0.102	7.00	No
	29	3	-0.312	0.50	No
		3	-0.312	5.50	No
		3	-0.078	3.00	No
W60	24	3	-0.132	1.50	No
		3	-0.132	4.50	No
		3	-0.099	3.00	No
	26	3	-0.086	1.00	No
		3	-0.086	3.00	No
		3	-0.072	5.00	No
		3	-0.072	7.00	No
	29	3	-0.197	0.50	No
		3	-0.197	5.50	No
		3	-0.133	3.00	No
W90	24	x	-0.098	1.50	No
		x	-0.098	4.50	No
		x	-0.093	3.00	No
	26	x	-0.077	1.00	No
		x	-0.077	3.00	No
		x	-0.057	5.00	No
		x	-0.057	7.00	No
	29	x	-0.139	0.50	No
		x	-0.139	5.50	No
		x	-0.153	3.00	No
W120	24	2	-0.132	1.50	No
		2	-0.132	4.50	No
		2	-0.099	3.00	No
	26	2	-0.086	1.00	No
		2	-0.086	3.00	No
		2	-0.072	5.00	No
		2	-0.072	7.00	No
	29	2	-0.197	0.50	No
		2	-0.197	5.50	No
		2	-0.133	3.00	No
W150	24	2	-0.198	1.50	No
		2	-0.198	4.50	No
		2	-0.085	3.00	No
	26	2	-0.104	1.00	No
		2	-0.104	3.00	No
		2	-0.102	5.00	No
		2	-0.102	7.00	No
	29	2	-0.312	0.50	No
		2	-0.312	5.50	No
		2	-0.078	3.00	No
Di	24	y	-0.067	1.50	No
		y	-0.067	4.50	No
		y	-0.05	3.00	No

	26	y	-0.038	1.00	No
		y	-0.038	3.00	No
		y	-0.035	5.00	No
		y	-0.035	7.00	No
	29	y	-0.102	0.50	No
		y	-0.102	5.50	No
		y	-0.037	3.00	No
		y	-0.05	3.00	No
WI10	24	z	-0.037	1.50	No
		z	-0.037	4.50	No
		z	-0.004	3.00	No
	26	z	-0.019	1.00	No
		z	-0.019	3.00	No
		z	-0.02	5.00	No
		z	-0.02	7.00	No
	29	z	-0.058	0.50	No
		z	-0.058	5.50	No
		z	-0.009	3.00	No
		z	-0.013	3.00	No
WI130	24	3	-0.032	1.50	No
		3	-0.032	4.50	No
		3	-0.015	3.00	No
	26	3	-0.018	1.00	No
		3	-0.018	3.00	No
		3	-0.018	5.00	No
		3	-0.018	7.00	No
	29	3	-0.05	0.50	No
		3	-0.05	5.50	No
		3	-0.014	3.00	No
WI160	24	3	-0.023	1.50	No
		3	-0.023	4.50	No
		3	-0.019	3.00	No
	26	3	-0.015	1.00	No
		3	-0.015	3.00	No
		3	-0.013	5.00	No
		3	-0.013	7.00	No
	29	3	-0.034	0.50	No
		3	-0.034	5.50	No
		3	-0.024	3.00	No
WI190	24	x	-0.018	1.50	No
		x	-0.018	4.50	No
		x	-0.018	3.00	No
	26	x	-0.014	1.00	No
		x	-0.014	3.00	No
		x	-0.011	5.00	No
		x	-0.011	7.00	No
	29	x	-0.026	0.50	No
		x	-0.026	5.50	No
		x	-0.027	3.00	No
WI120	24	2	-0.023	1.50	No
		2	-0.023	4.50	No
		2	-0.019	3.00	No
	26	2	-0.015	1.00	No
		2	-0.015	3.00	No
		2	-0.013	5.00	No
		2	-0.013	7.00	No
	29	2	-0.034	0.50	No
		2	-0.034	5.50	No
		2	-0.024	3.00	No
WI150	24	2	-0.032	1.50	No

		2	-0.032	4.50	No
		2	-0.015	3.00	No
	26	2	-0.018	1.00	No
		2	-0.018	3.00	No
		2	-0.018	5.00	No
		2	-0.018	7.00	No
	29	2	-0.05	0.50	No
		2	-0.05	5.50	No
		2	-0.014	3.00	No
WL0	24	z	-0.012	1.50	No
		z	-0.012	4.50	No
	26	z	-0.006	1.00	No
		z	-0.006	3.00	No
		z	-0.006	5.00	No
		z	-0.006	7.00	No
	29	z	-0.019	0.50	No
		z	-0.019	5.50	No
		z	-0.002	3.00	No
		z	-0.003	3.00	No
WL30	24	3	-0.01	1.50	No
		3	-0.01	4.50	No
		3	-0.004	3.00	No
	26	3	-0.005	1.00	No
		3	-0.005	3.00	No
		3	-0.005	5.00	No
		3	-0.005	7.00	No
	29	3	-0.016	0.50	No
		3	-0.016	5.50	No
		3	-0.004	3.00	No
WL60	24	3	-0.007	1.50	No
		3	-0.007	4.50	No
		3	-0.005	3.00	No
	26	3	-0.004	1.00	No
		3	-0.004	3.00	No
		3	-0.004	5.00	No
		3	-0.004	7.00	No
	29	3	-0.01	0.50	No
		3	-0.01	5.50	No
		3	-0.007	3.00	No
WL90	24	x	-0.005	1.50	No
		x	-0.005	4.50	No
		x	-0.005	3.00	No
	26	x	-0.004	1.00	No
		x	-0.004	3.00	No
		x	-0.003	5.00	No
		x	-0.003	7.00	No
	29	x	-0.007	0.50	No
		x	-0.007	5.50	No
		x	-0.008	3.00	No
WL120	24	2	-0.007	1.50	No
		2	-0.007	4.50	No
		2	-0.005	3.00	No
	26	2	-0.004	1.00	No
		2	-0.004	3.00	No
		2	-0.004	5.00	No
		2	-0.004	7.00	No
	29	2	-0.01	0.50	No
		2	-0.01	5.50	No
		2	-0.007	3.00	No
WL150	24	2	-0.01	1.50	No

		2	-0.01	4.50	No
		2	-0.004	3.00	No
	26	2	-0.005	1.00	No
		2	-0.005	3.00	No
		2	-0.005	5.00	No
		2	-0.005	7.00	No
	29	2	-0.016	0.50	No
		2	-0.016	5.50	No
		2	-0.004	3.00	No
LL1	5	y	-0.25	50.00	Yes
LL2	5	y	-0.25	100.00	Yes
LL3	5	y	-0.25	0.00	Yes
LLa1	29	y	-0.50	50.00	Yes
LLa2	26	y	-0.50	50.00	Yes
LLa3	24	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

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
W10	0.00	0.00	0.00
W130	0.00	0.00	0.00
W160	0.00	0.00	0.00
W190	0.00	0.00	0.00
W1120	0.00	0.00	0.00
W1150	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



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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+W10
LC26=1.2D+Di+W130
LC27=1.2D+Di+W160
LC28=1.2D+Di+W190
LC29=1.2D+Di+W120
LC30=1.2D+Di+W150
LC31=1.2D+Di-W10
LC32=1.2D+Di-W130
LC33=1.2D+Di-W160
LC34=1.2D+Di-W190
LC35=1.2D+Di-W120
LC36=1.2D+Di-W150
LC37=1.2D+1.6LL1
LC38=1.2D+1.6LL2
LC39=1.2D+1.6LL3
LC40=1.2D+W10+1.6LLa1
LC41=1.2D+W130+1.6LLa1
LC42=1.2D+W160+1.6LLa1
LC43=1.2D+W190+1.6LLa1
LC44=1.2D+W120+1.6LLa1
LC45=1.2D+W150+1.6LLa1
LC46=1.2D-W10+1.6LLa1
LC47=1.2D-W130+1.6LLa1
LC48=1.2D-W160+1.6LLa1
LC49=1.2D-W190+1.6LLa1
LC50=1.2D-W120+1.6LLa1
LC51=1.2D-W150+1.6LLa1
LC52=1.2D+W10+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

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	<i>HSS_SQR 3X3X1_4</i>	2	LC75 at 100.00%	0.50	OK	Eq. H1-1b
		4	LC69 at 100.00%	0.51	OK	Eq. H1-1b
	<i>PIPE 2-1_2x0.203</i>	24	LC65 at 40.63%	0.56	OK	Eq. H1-1b
		26	LC71 at 79.17%	0.39	OK	Eq. H1-1b
	<i>PIPE 2x0.154</i>	1	LC1 at 50.00%	0.96	OK	Eq. H1-1b
		5	LC46 at 50.00%	0.79	OK	Eq. H1-1b
		6	LC69 at 100.00%	0.19	OK	Eq. H1-1b
		20	LC11 at 50.00%	0.05	OK	Eq. H1-1b
		21	LC3 at 50.00%	0.05	OK	Eq. H1-1b
		29	LC7 at 37.50%	0.74	OK	Eq. H1-1b
		30	LC7 at 60.94%	0.84	OK	Eq. H1-1b
		31	LC47 at 0.00%	0.08	OK	Eq. Sec. D2
		32	LC70 at 100.00%	0.09	OK	Sec. E1
	<i>PIPE 3-1_2x0.226</i>	7	LC69 at 85.00%	0.28	OK	Eq. H1-1b



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Geometry data

GLOSSARY

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

Nodes

Node	X [ft]	Y [ft]	Z [ft]	Rigid Floor
1	0.00	0.00	0.00	0
2	6.375	0.125	0.20	0
3	-6.375	0.125	0.20	0
4	0.00	0.00	-2.30	0
5	0.00	0.00	-1.80	0
10	0.00	2.958	0.00	0
11	0.00	2.958	-2.30	0
12	0.00	2.958	-1.80	0
13	-6.375	3.125	0.20	0
15	6.375	3.125	0.20	0
16	0.00	-0.521	0.00	0
17	0.00	3.479	0.00	0
34	-5.375	5.50	0.40	0
36	-1.00	6.50	0.40	0
38	-5.375	-0.50	0.40	0
40	-1.00	-1.50	0.40	0
42	5.375	4.625	0.40	0
43	2.00	4.00	-5.00	0
44	-5.375	4.625	0.40	0
45	-3.00	4.00	-5.00	0
52	3.875	5.50	0.40	0

53	3.875	-0.50	0.40	0
54	5.375	-0.50	0.40	0
55	5.375	5.50	0.40	0
56	3.50	0.125	0.20	0
57	1.00	3.125	0.20	0
58	-1.50	0.125	0.20	0
59	-3.50	3.125	0.20	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
4	1	1	1	1	1	1
11	1	1	1	1	1	1
43	1	1	1	0	0	0
45	1	1	1	0	0	0

Members

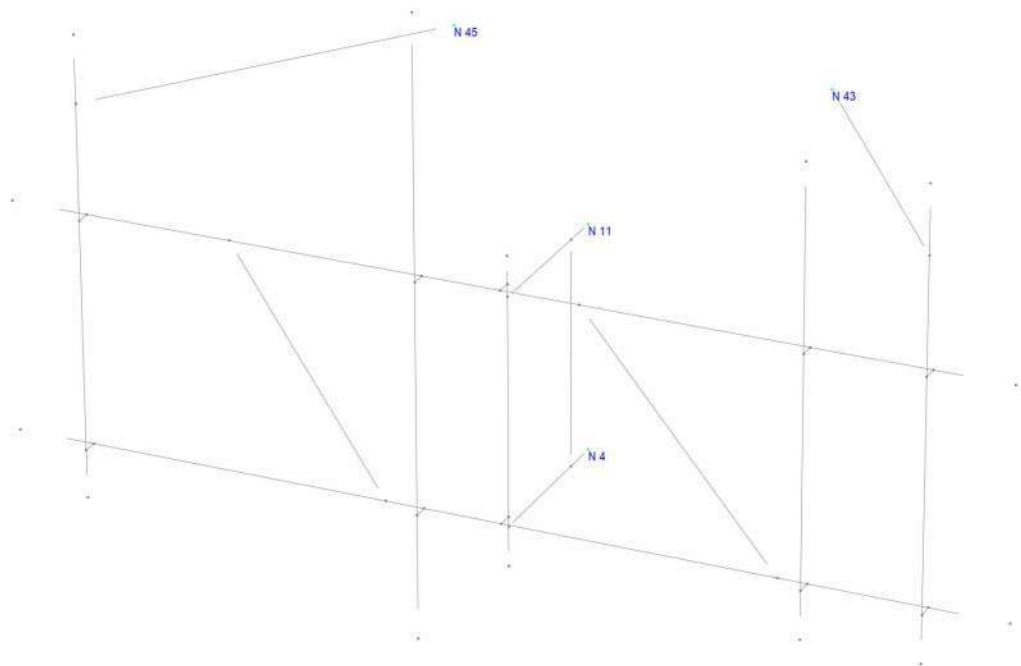
Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	Ig factor
1	3	2		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
2	1	4		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
4	10	11		HSS_SQR 3X3X1_4	A500 GrB rectangular	0.00	0.00	0.00
5	13	15		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
6	5	12		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
7	17	16		PIPE 3-1_2x0.226	A53 GrB	0.00	0.00	0.00
20	42	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
21	45	44		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
24	34	38		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
26	36	40		PIPE 2-1_2x0.203	A53 GrB	0.00	0.00	0.00
29	52	53		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
30	54	55		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	57	56		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
32	59	58		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
24	315.00	0	0.00	0.00	0.00
26	315.00	0	0.00	0.00	0.00
29	315.00	0	0.00	0.00	0.00

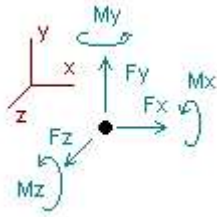
Hinges

Member	Node-J				Node-K				TOR	AXL	Axial rigidity
	M33	M22	V3	V2	M33	M22	V3	V2			
20	1	1	0	0	0	0	0	0	0	0	Full
21	0	0	0	0	1	1	0	0	0	0	Full
31	1	1	0	0	1	1	0	0	0	0	Full
32	1	1	0	0	1	1	0	0	0	0	Full



Analysis result

Reactions



Direction of positive forces and moments

Node	Forces [Kip]			Moments [Kip*ft]		
	FX	FY	FZ	MX	MY	MZ
Condition LC1=1.2D+Wo						
4	0.00073	0.44640	1.29003	-0.52114	-0.19396	0.00308
11	-0.10844	0.44456	0.01712	-0.51656	-0.32483	0.02140
43	0.27749	0.06379	0.45659	0.00000	0.00000	0.00000
45	-0.16978	0.05622	0.39545	0.00000	0.00000	0.00000
SUM	0.00000	1.01097	2.15919	-1.03770	-0.51878	0.02448
Condition LC2=1.2D+W30						
4	0.22720	0.46073	1.14164	-0.52977	0.77002	-0.10704
11	0.90563	0.45001	-0.09321	-0.52461	1.71857	-0.10488
43	0.16702	0.04394	0.28134	0.00000	0.00000	0.00000
45	-0.17201	0.05629	0.39892	0.00000	0.00000	0.00000
SUM	1.12784	1.01097	1.72869	-1.05438	2.48859	-0.21192
Condition LC3=1.2D+W60						
4	0.27379	0.47280	0.76309	-0.54688	0.88546	-0.13012
11	1.07695	0.47307	-0.26077	-0.53924	2.00413	-0.11934
43	0.08980	0.02564	0.10920	0.00000	0.00000	0.00000
45	-0.08492	0.03946	0.24125	0.00000	0.00000	0.00000
SUM	1.35561	1.01097	0.85277	-1.08612	2.88959	-0.24946
Condition LC4=1.2D+W90						
4	0.28136	0.49195	0.46847	-0.57026	0.97248	-0.15392
11	1.22590	0.49464	-0.46420	-0.55781	2.29539	-0.14311
43	-0.01439	0.00624	-0.05804	0.00000	0.00000	0.00000
45	-0.00203	0.01815	0.05377	0.00000	0.00000	0.00000
SUM	1.49084	1.01097	0.00000	-1.12806	3.26787	-0.29703

Condition LC5=1.2D+W120

4	0.25361	0.51114	0.17285	-0.59474	0.88918	-0.14656
11	1.12756	0.51638	-0.66506	-0.57647	2.11761	-0.13076
43	-0.11178	-0.01196	-0.21457	0.00000	0.00000	0.00000
45	0.08622	-0.00458	-0.14598	0.00000	0.00000	0.00000

SUM	1.35561	1.01097	-0.85277	-1.17121	3.00679	-0.27732
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Condition LC6=1.2D+W150

4	0.18463	0.52349	-0.20725	-0.61259	0.82505	-0.13828
11	1.04157	0.53976	-0.82736	-0.59132	2.02055	-0.13013
43	-0.23066	-0.03016	-0.38452	0.00000	0.00000	0.00000
45	0.13229	-0.02212	-0.30955	0.00000	0.00000	0.00000

SUM	1.12784	1.01097	-1.72869	-1.20391	2.84560	-0.26840
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Condition LC7=1.2D-W0

4	-0.06450	0.53832	-0.36315	-0.62707	0.09813	-0.04656
11	0.17411	0.54595	-0.91946	-0.60161	0.41765	-0.02389
43	-0.28424	-0.03979	-0.46970	0.00000	0.00000	0.00000
45	0.17464	-0.03351	-0.40688	0.00000	0.00000	0.00000

SUM	0.00000	1.01097	-2.15919	-1.22868	0.51578	-0.07045
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Condition LC8=1.2D-W30

4	-0.29277	0.52396	-0.21561	-0.61835	-0.86735	0.06280
11	-0.83772	0.54050	-0.80823	-0.59343	-1.62056	0.10144
43	-0.17399	-0.01893	-0.29174	0.00000	0.00000	0.00000
45	0.17665	-0.03456	-0.41312	0.00000	0.00000	0.00000

SUM	-1.12784	1.01097	-1.72869	-1.21178	-2.48792	0.16424
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Condition LC9=1.2D-W60

4	-0.33909	0.51175	0.16298	-0.60111	-0.98132	0.08605
11	-1.00882	0.51734	-0.64139	-0.57864	-1.90541	0.11609
43	-0.09719	-0.00081	-0.12038	0.00000	0.00000	0.00000
45	0.08949	-0.01732	-0.25398	0.00000	0.00000	0.00000

SUM	-1.35561	1.01097	-0.85277	-1.17976	-2.88673	0.20213
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Condition LC10=1.2D-W90

4	-0.34593	0.49256	0.45752	-0.57768	-1.06698	0.11028
11	-1.15852	0.49573	-0.43791	-0.56002	-2.19855	0.14035
43	0.00682	0.01818	0.04552	0.00000	0.00000	0.00000
45	0.00679	0.00450	-0.06514	0.00000	0.00000	0.00000

SUM	-1.49084	1.01097	0.00000	-1.13770	-3.26554	0.25062
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Condition LC11=1.2D-W120

4	-0.31735	0.47336	0.75335	-0.55320	-0.98235	0.10334
11	-1.06116	0.47398	-0.23714	-0.54138	-2.02288	0.12849
43	0.10422	0.03590	0.20067	0.00000	0.00000	0.00000
45	-0.08132	0.02773	0.13589	0.00000	0.00000	0.00000

SUM	-1.35561	1.01097	0.85277	-1.09458	-3.00523	0.23183
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Condition LC12=1.2D-W150						
4	-0.24762	0.46120	1.13353	-0.53555	-0.91716	0.09534
11	-0.97581	0.45074	-0.07389	-0.52677	-1.92707	0.12821
43	0.22298	0.05350	0.36885	0.00000	0.00000	0.00000
45	-0.12740	0.04553	0.30021	0.00000	0.00000	0.00000
SUM	-1.12784	1.01097	1.72869	-1.06232	-2.84423	0.22355
Condition LC13=0.9D+Wo						
4	0.00888	0.32331	1.17482	-0.37749	-0.18187	0.00859
11	-0.11701	0.32067	0.12946	-0.37663	-0.33713	0.02181
43	0.27846	0.06078	0.45814	0.00000	0.00000	0.00000
45	-0.17034	0.05347	0.39677	0.00000	0.00000	0.00000
SUM	0.00000	0.75823	2.15919	-0.75412	-0.51900	0.03040
Condition LC14=0.9D+W30						
4	0.23535	0.33766	1.02618	-0.38615	0.78173	-0.10163
11	0.89711	0.32613	0.01942	-0.38473	1.70658	-0.10458
43	0.16796	0.04090	0.28284	0.00000	0.00000	0.00000
45	-0.17258	0.05354	0.40025	0.00000	0.00000	0.00000
SUM	1.12784	0.75823	1.72869	-0.77087	2.48831	-0.20621
Condition LC15=0.9D+W60						
4	0.28190	0.34976	0.64741	-0.40333	0.89706	-0.12473
11	1.06850	0.34922	-0.14788	-0.39944	1.99226	-0.11907
43	0.09071	0.02258	0.11066	0.00000	0.00000	0.00000
45	-0.08550	0.03667	0.24258	0.00000	0.00000	0.00000
SUM	1.35561	0.75823	0.85277	-0.80277	2.88932	-0.24380
Condition LC16=0.9D+W90						
4	0.28943	0.36894	0.35255	-0.42678	0.98402	-0.14856
11	1.21753	0.37083	-0.35105	-0.41810	2.28371	-0.14288
43	-0.01350	0.00315	-0.05662	0.00000	0.00000	0.00000
45	-0.00262	0.01531	0.05511	0.00000	0.00000	0.00000
SUM	1.49084	0.75823	0.00000	-0.84488	3.26773	-0.29144
Condition LC17=0.9D+W120						
4	0.26162	0.38817	0.05670	-0.45134	0.90069	-0.14121
11	1.11928	0.39261	-0.55166	-0.43685	2.10604	-0.13054
43	-0.11091	-0.01507	-0.21317	0.00000	0.00000	0.00000
45	0.08562	-0.00747	-0.14463	0.00000	0.00000	0.00000
SUM	1.35561	0.75823	-0.85277	-0.88819	3.00674	-0.27175
Condition LC18=0.9D+W150						
4	0.19260	0.40055	-0.32360	-0.46926	0.83649	-0.13294
11	1.03337	0.41603	-0.71372	-0.45179	2.00904	-0.12992
43	-0.22981	-0.03330	-0.38317	0.00000	0.00000	0.00000
45	0.13168	-0.02505	-0.30820	0.00000	0.00000	0.00000
SUM	1.12784	0.75823	-1.72869	-0.92104	2.84553	-0.26286

Condition LC19=0.9D-Wo						
4	-0.05651	0.41539	-0.47960	-0.48378	0.10976	-0.04115
11	0.16589	0.42224	-0.80571	-0.46212	0.40584	-0.02361
43	-0.28340	-0.04294	-0.46834	0.00000	0.00000	0.00000
45	0.17402	-0.03647	-0.40554	0.00000	0.00000	0.00000
SUM	0.00000	0.75823	-2.15919	-0.94590	0.51561	-0.06476
Condition LC20=0.9D-W30						
4	-0.28478	0.40102	-0.33181	-0.47503	-0.85534	0.06831
11	-0.84598	0.41678	-0.69478	-0.45390	-1.63268	0.10183
43	-0.17311	-0.02205	-0.29033	0.00000	0.00000	0.00000
45	0.17603	-0.03752	-0.41177	0.00000	0.00000	0.00000
SUM	-1.12784	0.75823	-1.72869	-0.92893	-2.48802	0.17014
Condition LC21=0.9D-W60						
4	-0.33106	0.38879	0.04700	-0.45772	-0.96920	0.09158
11	-1.01716	0.39358	-0.52819	-0.43903	-1.91765	0.11651
43	-0.09628	-0.00390	-0.11893	0.00000	0.00000	0.00000
45	0.08889	-0.02024	-0.25264	0.00000	0.00000	0.00000
SUM	-1.35561	0.75823	-0.85277	-0.89675	-2.88685	0.20809
Condition LC22=0.9D-W90						
4	-0.33785	0.36955	0.34178	-0.43422	-1.05481	0.11584
11	-1.16694	0.37193	-0.32497	-0.42031	-2.21098	0.14080
43	0.00775	0.01511	0.04701	0.00000	0.00000	0.00000
45	0.00620	0.00163	-0.06381	0.00000	0.00000	0.00000
SUM	-1.49084	0.75823	0.00000	-0.85453	-3.26579	0.25664
Condition LC23=0.9D-W120						
4	-0.30922	0.35032	0.63783	-0.40966	-0.97016	0.10891
11	-1.06967	0.35014	-0.12445	-0.40158	-2.03542	0.12896
43	0.10517	0.03286	0.20218	0.00000	0.00000	0.00000
45	-0.08189	0.02491	0.13721	0.00000	0.00000	0.00000
SUM	-1.35561	0.75823	0.85277	-0.81125	-3.00558	0.23787
Condition LC24=0.9D-W150						
4	-0.23945	0.33813	1.01822	-0.39194	-0.90490	0.10092
11	-0.98439	0.32687	0.03856	-0.38689	-1.93969	0.12869
43	0.22396	0.05048	0.37040	0.00000	0.00000	0.00000
45	-0.12795	0.04275	0.30152	0.00000	0.00000	0.00000
SUM	-1.12784	0.75823	1.72869	-0.77883	-2.84458	0.22961
Condition LC25=1.2D+Di+W10						
4	-0.02810	0.90399	0.97085	-1.05987	-0.06379	-0.02947
11	0.01843	0.90933	-0.77403	-1.03201	0.00748	0.01256
43	0.03078	0.03455	0.04923	0.00000	0.00000	0.00000
45	-0.02111	0.03223	0.04795	0.00000	0.00000	0.00000
SUM	0.00000	1.88011	0.29400	-2.09188	-0.05630	-0.01691

Condition LC26=1.2D+Di+W130						
4	0.00977	0.90617	0.93323	-1.06219	0.09295	-0.04779
11	0.18538	0.91183	-0.80230	-1.03389	0.34178	-0.00822
43	0.01003	0.03074	0.01605	0.00000	0.00000	0.00000
45	-0.01780	0.03137	0.04040	0.00000	0.00000	0.00000
SUM	0.18738	1.88011	0.18738	-2.09608	0.43474	-0.05600
Condition LC27=1.2D+Di+W160						
4	0.00001	0.90692	0.91836	-1.06330	0.06265	-0.04539
11	0.15769	0.91274	-0.80958	-1.03461	0.28721	-0.00541
43	0.00665	0.03012	0.01064	0.00000	0.00000	0.00000
45	-0.01374	0.03033	0.03119	0.00000	0.00000	0.00000
SUM	0.15061	1.88011	0.15061	-2.09791	0.34987	-0.05081
Condition LC28=1.2D+Di+W190						
4	0.00341	0.91030	0.86604	-1.06734	0.08352	-0.05028
11	0.19032	0.91652	-0.84517	-1.03785	0.35041	-0.01040
43	-0.01168	0.02675	-0.01870	0.00000	0.00000	0.00000
45	0.00096	0.02654	-0.00217	0.00000	0.00000	0.00000
SUM	0.18300	1.88011	0.00000	-2.10519	0.43392	-0.06068
Condition LC29=1.2D+Di+W1120						
4	-0.00348	0.91368	0.81345	-1.07161	0.06080	-0.04831
11	0.16558	0.92033	-0.88013	-1.04111	0.30403	-0.00744
43	-0.02842	0.02368	-0.04549	0.00000	0.00000	0.00000
45	0.01693	0.02242	-0.03845	0.00000	0.00000	0.00000
SUM	0.15061	1.88011	-0.15061	-2.11272	0.36484	-0.05575
Condition LC30=1.2D+Di+W1150						
4	0.00547	0.91442	0.79883	-1.07257	0.09060	-0.05149
11	0.19595	0.92124	-0.88794	-1.04174	0.36368	-0.01097
43	-0.03361	0.02272	-0.05382	0.00000	0.00000	0.00000
45	0.01958	0.02174	-0.04446	0.00000	0.00000	0.00000
SUM	0.18738	1.88011	-0.18738	-2.11431	0.45429	-0.06246
Condition LC31=1.2D+Di-W10						
4	-0.03628	0.91667	0.75968	-1.07586	-0.03467	-0.03653
11	0.05107	0.92386	-0.91269	-1.04398	0.09362	0.00657
43	-0.04509	0.02062	-0.07216	0.00000	0.00000	0.00000
45	0.03030	0.01896	-0.06883	0.00000	0.00000	0.00000
SUM	0.00000	1.88011	-0.29400	-2.11983	0.05895	-0.02996
Condition LC32=1.2D+Di-W130						
4	-0.07419	0.91450	0.79728	-1.07354	-0.19145	-0.01823
11	-0.11583	0.92137	-0.88438	-1.04209	-0.24058	0.02733
43	-0.02435	0.02444	-0.03894	0.00000	0.00000	0.00000
45	0.02698	0.01980	-0.06134	0.00000	0.00000	0.00000
SUM	-0.18738	1.88011	-0.18738	-2.11563	-0.43203	0.00910

Condition LC33=1.2D+Di-WI60						
4	-0.06442	0.91375	0.81216	-1.07243	-0.16113	-0.02062
11	-0.08815	0.92045	-0.87713	-1.04137	-0.18603	0.02453
43	-0.02097	0.02506	-0.03354	0.00000	0.00000	0.00000
45	0.02292	0.02085	-0.05211	0.00000	0.00000	0.00000
SUM	-0.15061	1.88011	-0.15061	-2.11380	-0.34716	0.00391
Condition LC34=1.2D+Di-WI90						
4	-0.06781	0.91037	0.86448	-1.06839	-0.18196	-0.01572
11	-0.12079	0.91667	-0.84154	-1.03813	-0.24925	0.02952
43	-0.00264	0.02842	-0.00422	0.00000	0.00000	0.00000
45	0.00823	0.02465	-0.01871	0.00000	0.00000	0.00000
SUM	-0.18300	1.88011	0.00000	-2.10652	-0.43121	0.01381
Condition LC35=1.2D+Di-WI120						
4	-0.06090	0.90699	0.91708	-1.06412	-0.15921	-0.01769
11	-0.09607	0.91285	-0.80659	-1.03487	-0.20291	0.02658
43	0.01409	0.03148	0.02253	0.00000	0.00000	0.00000
45	-0.00774	0.02879	0.01760	0.00000	0.00000	0.00000
SUM	-0.15061	1.88011	0.15061	-2.09899	-0.36212	0.00889
Condition LC36=1.2D+Di-WI150						
4	-0.06984	0.90625	0.93169	-1.06317	-0.18899	-0.01450
11	-0.12644	0.91195	-0.79876	-1.03423	-0.26258	0.03011
43	0.01929	0.03243	0.03084	0.00000	0.00000	0.00000
45	-0.01039	0.02947	0.02362	0.00000	0.00000	0.00000
SUM	-0.18738	1.88011	0.18738	-2.09740	-0.45157	0.01562
Condition LC37=1.2D+1.6LL1						
4	-0.03245	0.69181	0.64221	-0.81205	-0.04765	-0.02223
11	0.03392	0.69551	-0.63025	-0.79053	0.04781	-0.00066
43	-0.00395	0.01225	-0.00632	0.00000	0.00000	0.00000
45	0.00248	0.01139	-0.00563	0.00000	0.00000	0.00000
SUM	0.00000	1.41097	0.00000	-1.60258	0.00016	-0.02289
Condition LC38=1.2D+1.6LL2						
4	0.67041	0.69161	0.64187	-0.81543	0.99517	0.18288
11	-0.67169	0.69558	-0.63115	-0.78942	-0.97185	0.26937
43	-0.00202	0.01262	-0.00321	0.00000	0.00000	0.00000
45	0.00330	0.01116	-0.00751	0.00000	0.00000	0.00000
SUM	0.00000	1.41097	0.00000	-1.60485	0.02333	0.45226
Condition LC39=1.2D+1.6LL3						
4	-0.73469	0.69026	0.64428	-0.81334	-1.08931	-0.24089
11	0.73811	0.69674	-0.63527	-0.78683	1.06826	-0.25832
43	-0.00433	0.01217	-0.00694	0.00000	0.00000	0.00000
45	0.00091	0.01181	-0.00206	0.00000	0.00000	0.00000
SUM	0.00000	1.41097	0.00000	-1.60017	-0.02105	-0.49921

Condition LC40=1.2D+WL0+1.6LLa1						
4	0.82188	0.89012	0.89712	-1.05542	1.17024	0.22148
11	-0.81977	0.89466	-0.81624	-1.02295	-1.20464	0.33385
43	0.00137	0.01323	0.00218	0.00000	0.00000	0.00000
45	-0.00348	0.01296	0.00793	0.00000	0.00000	0.00000
SUM	0.00000	1.81097	0.09100	-2.07837	-0.03439	0.55533
Condition LC41=1.2D+WL30+1.6LLa1						
4	0.83327	0.89077	0.88562	-1.05622	1.21700	0.21597
11	-0.76943	0.89546	-0.82638	-1.02352	-1.10444	0.32763
43	-0.00497	0.01209	-0.00792	0.00000	0.00000	0.00000
45	-0.00231	0.01265	0.00525	0.00000	0.00000	0.00000
SUM	0.05657	1.81097	0.05657	-2.07974	0.11257	0.54360
Condition LC42=1.2D+WL60+1.6LLa1						
4	0.83037	0.89106	0.88094	-1.05663	1.20836	0.21695
11	-0.77919	0.89580	-0.82895	-1.02379	-1.12264	0.32876
43	-0.00642	0.01183	-0.01025	0.00000	0.00000	0.00000
45	-0.00092	0.01228	0.00210	0.00000	0.00000	0.00000
SUM	0.04384	1.81097	0.04384	-2.08042	0.08573	0.54570
Condition LC43=1.2D+WL90+1.6LLa1						
4	0.83026	0.89206	0.86517	-1.05778	1.21186	0.21549
11	-0.77089	0.89690	-0.83869	-1.02474	-1.10666	0.32726
43	-0.01175	0.01087	-0.01876	0.00000	0.00000	0.00000
45	0.00338	0.01114	-0.00771	0.00000	0.00000	0.00000
SUM	0.05100	1.81097	0.00000	-2.08252	0.10520	0.54275
Condition LC44=1.2D+WL120+1.6LLa1						
4	0.82930	0.89306	0.84931	-1.05901	1.20786	0.21600
11	-0.77670	0.89802	-0.84824	-1.02569	-1.11699	0.32804
43	-0.01674	0.00998	-0.02672	0.00000	0.00000	0.00000
45	0.00798	0.00992	-0.01819	0.00000	0.00000	0.00000
SUM	0.04384	1.81097	-0.04384	-2.08470	0.09086	0.54404
Condition LC45=1.2D+WL150+1.6LLa1						
4	0.83179	0.89334	0.84469	-1.05936	1.21834	0.21471
11	-0.76525	0.89836	-0.85091	-1.02592	-1.09414	0.32659
43	-0.01886	0.00960	-0.03011	0.00000	0.00000	0.00000
45	0.00888	0.00968	-0.02025	0.00000	0.00000	0.00000
SUM	0.05657	1.81097	-0.05657	-2.08529	0.12420	0.54131
Condition LC46=1.2D-WL0+1.6LLa1						
4	0.81915	0.89402	0.83271	-1.06046	1.18003	0.21924
11	-0.80906	0.89920	-0.86005	-1.02662	-1.17633	0.33193
43	-0.02236	0.00897	-0.03569	0.00000	0.00000	0.00000
45	0.01227	0.00878	-0.02798	0.00000	0.00000	0.00000
SUM	0.00000	1.81097	-0.09100	-2.08708	0.00370	0.55117

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

4	0.80776	0.89337	0.84420	-1.05966	1.13327	0.22475
11	-0.85940	0.89840	-0.84990	-1.02605	-1.27652	0.33815
43	-0.01603	0.01011	-0.02557	0.00000	0.00000	0.00000
45	0.01110	0.00909	-0.02530	0.00000	0.00000	0.00000

SUM -0.05657 1.81097 -0.05657 -2.08571 -0.14325 0.56290

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

4	0.81067	0.89309	0.84889	-1.05925	1.14191	0.22378
11	-0.84965	0.89806	-0.84733	-1.02578	-1.25832	0.33702
43	-0.01457	0.01037	-0.02325	0.00000	0.00000	0.00000
45	0.00971	0.00945	-0.02214	0.00000	0.00000	0.00000

SUM -0.04384 1.81097 -0.04384 -2.08503 -0.11641 0.56080

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

4	0.81077	0.89209	0.86466	-1.05810	1.13842	0.22524
11	-0.85794	0.89696	-0.83759	-1.02483	-1.27430	0.33852
43	-0.00924	0.01133	-0.01474	0.00000	0.00000	0.00000
45	0.00541	0.01060	-0.01233	0.00000	0.00000	0.00000

SUM -0.05100 1.81097 0.00000 -2.08293 -0.13588 0.56376

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

4	0.81173	0.89109	0.88052	-1.05687	1.14242	0.22472
11	-0.85214	0.89584	-0.82805	-1.02388	-1.26397	0.33774
43	-0.00425	0.01222	-0.00678	0.00000	0.00000	0.00000
45	0.00081	0.01182	-0.00185	0.00000	0.00000	0.00000

SUM -0.04384 1.81097 0.04384 -2.08075 -0.12155 0.56246

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

4	0.80924	0.89081	0.88514	-1.05652	1.13194	0.22601
11	-0.86359	0.89550	-0.82538	-1.02365	-1.28683	0.33919
43	-0.00213	0.01260	-0.00340	0.00000	0.00000	0.00000
45	-0.00009	0.01206	0.00021	0.00000	0.00000	0.00000

SUM -0.05657 1.81097 0.05657 -2.08016 -0.15489 0.56520

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

4	-0.24903	0.88952	0.90685	-1.04296	-0.36035	-0.09443
11	0.24663	0.89371	-0.83960	-1.02675	0.34109	-0.08305
43	0.00754	0.01438	0.01207	0.00000	0.00000	0.00000
45	-0.00515	0.01336	0.01169	0.00000	0.00000	0.00000

SUM 0.00000 1.81097 0.09100 -2.06972 -0.01926 -0.17748

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

4	-0.23763	0.89019	0.89520	-1.04378	-0.31363	-0.09993
11	0.29696	0.89451	-0.84957	-1.02735	0.44119	-0.08927
43	0.00121	0.01321	0.00193	0.00000	0.00000	0.00000
45	-0.00396	0.01306	0.00900	0.00000	0.00000	0.00000

SUM 0.05657 1.81097 0.05657 -2.07113 0.12756 -0.18920

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

4	-0.24052	0.89048	0.89050	-1.04419	-0.32224	-0.09895
11	0.28718	0.89486	-0.85211	-1.02762	0.42293	-0.08813
43	-0.00024	0.01294	-0.00039	0.00000	0.00000	0.00000
45	-0.00257	0.01270	0.00584	0.00000	0.00000	0.00000

SUM 0.04384 1.81097 0.04384 -2.07181 0.10069 -0.18708

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

4	-0.24060	0.89148	0.87461	-1.04534	-0.31872	-0.10039
11	0.29542	0.89596	-0.86172	-1.02857	0.43876	-0.08961
43	-0.00557	0.01195	-0.00892	0.00000	0.00000	0.00000
45	0.00175	0.01158	-0.00397	0.00000	0.00000	0.00000

SUM 0.05100 1.81097 0.00000 -2.07391 0.12005 -0.18999

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

4	-0.24152	0.89248	0.85866	-1.04656	-0.32267	-0.09985
11	0.28954	0.89707	-0.87116	-1.02953	0.42827	-0.08881
43	-0.01055	0.01103	-0.01689	0.00000	0.00000	0.00000
45	0.00636	0.01039	-0.01445	0.00000	0.00000	0.00000

SUM 0.04384 1.81097 -0.04384 -2.07609 0.10560 -0.18865

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

4	-0.23902	0.89276	0.85400	-1.04692	-0.31220	-0.10113
11	0.30099	0.89742	-0.87377	-1.02977	0.45110	-0.09025
43	-0.01267	0.01064	-0.02029	0.00000	0.00000	0.00000
45	0.00727	0.01016	-0.01651	0.00000	0.00000	0.00000

SUM 0.05657 1.81097 -0.05657 -2.07669 0.13890 -0.19138

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

4	-0.25163	0.89345	0.84197	-1.04802	-0.35046	-0.09659
11	0.25711	0.89825	-0.88287	-1.03047	0.36877	-0.08489
43	-0.01615	0.00999	-0.02587	0.00000	0.00000	0.00000
45	0.01067	0.00928	-0.02424	0.00000	0.00000	0.00000

SUM 0.00000 1.81097 -0.09100 -2.07848 0.01832 -0.18147

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

4	-0.26303	0.89278	0.85362	-1.04720	-0.39719	-0.09109
11	0.20680	0.89745	-0.87290	-1.02987	0.26868	-0.07867
43	-0.00982	0.01117	-0.01572	0.00000	0.00000	0.00000
45	0.00949	0.00958	-0.02156	0.00000	0.00000	0.00000

SUM -0.05657 1.81097 -0.05657 -2.07707 -0.12850 -0.16976

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

4	-0.26014	0.89250	0.85832	-1.04679	-0.38857	-0.09207
11	0.21657	0.89710	-0.87036	-1.02960	0.28694	-0.07981
43	-0.00837	0.01143	-0.01340	0.00000	0.00000	0.00000
45	0.00810	0.00994	-0.01840	0.00000	0.00000	0.00000

SUM -0.04384 1.81097 -0.04384 -2.07639 -0.10163 -0.17188

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

4	-0.26006	0.89149	0.87421	-1.04564	-0.39209	-0.09063
11	0.20833	0.89600	-0.86075	-1.02865	0.27110	-0.07833
43	-0.00305	0.01242	-0.00488	0.00000	0.00000	0.00000
45	0.00378	0.01106	-0.00858	0.00000	0.00000	0.00000

SUM -0.05100 1.81097 0.00000 -2.07428 -0.12099 -0.16896

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

4	-0.25914	0.89049	0.89016	-1.04441	-0.38813	-0.09117
11	0.21420	0.89489	-0.85131	-1.02769	0.28159	-0.07913
43	0.00193	0.01334	0.00309	0.00000	0.00000	0.00000
45	-0.00083	0.01225	0.00190	0.00000	0.00000	0.00000

SUM -0.04384 1.81097 0.04384 -2.07211 -0.10654 -0.17030

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

4	-0.26164	0.89021	0.89482	-1.04406	-0.39860	-0.08988
11	0.20276	0.89454	-0.84870	-1.02745	0.25876	-0.07769
43	0.00405	0.01373	0.00648	0.00000	0.00000	0.00000
45	-0.00174	0.01249	0.00396	0.00000	0.00000	0.00000

SUM -0.05657 1.81097 0.05657 -2.07151 -0.13984 -0.16757

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

4	-1.21721	0.88753	0.89986	-1.05245	-1.76460	-0.38812
11	1.21198	0.89734	-0.81810	-1.01659	1.77504	-0.43018
43	0.00545	0.01401	0.00875	0.00000	0.00000	0.00000
45	-0.00022	0.01209	0.00049	0.00000	0.00000	0.00000

SUM 0.00000 1.81097 0.09100 -2.06903 0.01045 -0.81830

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

4	-1.20573	0.88820	0.88821	-1.05327	-1.71773	-0.39358
11	1.26218	0.89815	-0.82805	-1.01719	1.87493	-0.43635
43	-0.00086	0.01282	-0.00139	0.00000	0.00000	0.00000
45	0.00098	0.01180	-0.00221	0.00000	0.00000	0.00000

SUM 0.05657 1.81097 0.05657 -2.07046 0.15720 -0.82993

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

4	-1.20861	0.88848	0.88352	-1.05368	-1.72636	-0.39259
11	1.25239	0.89850	-0.83060	-1.01745	1.85662	-0.43521
43	-0.00231	0.01254	-0.00371	0.00000	0.00000	0.00000
45	0.00238	0.01145	-0.00537	0.00000	0.00000	0.00000

SUM 0.04384 1.81097 0.04384 -2.07113 0.13026 -0.82780

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

4	-1.20862	0.88947	0.86767	-1.05481	-1.72280	-0.39400
11	1.26051	0.89958	-0.84024	-1.01839	1.87219	-0.43665
43	-0.00762	0.01154	-0.01224	0.00000	0.00000	0.00000
45	0.00673	0.01038	-0.01520	0.00000	0.00000	0.00000

SUM 0.05100 1.81097 0.00000 -2.07320 0.14939 -0.83065

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

4	-1.20949	0.89046	0.85175	-1.05601	-1.72675	-0.39344
11	1.25454	0.90068	-0.84970	-1.01933	1.86146	-0.43582
43	-0.01258	0.01060	-0.02020	0.00000	0.00000	0.00000
45	0.01137	0.00924	-0.02569	0.00000	0.00000	0.00000

SUM 0.04384 1.81097 -0.04384 -2.07534 0.13471 -0.82925

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

4	-1.20697	0.89074	0.84710	-1.05637	-1.71624	-0.39471
11	1.26594	0.90102	-0.85231	-1.01957	1.88421	-0.43725
43	-0.01469	0.01020	-0.02360	0.00000	0.00000	0.00000
45	0.01229	0.00901	-0.02775	0.00000	0.00000	0.00000

SUM 0.05657 1.81097 -0.05657 -2.07594 0.16796 -0.83196

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

4	-1.21959	0.89141	0.83511	-1.05745	-1.75459	-0.39017
11	1.22205	0.90185	-0.86145	-1.02025	1.80179	-0.43189
43	-0.01817	0.00954	-0.02917	0.00000	0.00000	0.00000
45	0.01571	0.00817	-0.03549	0.00000	0.00000	0.00000

SUM 0.00000 1.81097 -0.09100 -2.07770 0.04720 -0.82206

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

4	-1.23108	0.89074	0.84676	-1.05663	-1.80147	-0.38471
11	1.17185	0.90104	-0.85150	-1.01964	1.70191	-0.42571
43	-0.01185	0.01074	-0.01903	0.00000	0.00000	0.00000
45	0.01451	0.00846	-0.03280	0.00000	0.00000	0.00000

SUM -0.05657 1.81097 -0.05657 -2.07628 -0.09955 -0.81043

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

4	-1.22820	0.89046	0.85145	-1.05622	-1.79283	-0.38570
11	1.18165	0.90070	-0.84895	-1.01938	1.72023	-0.42686
43	-0.01041	0.01101	-0.01671	0.00000	0.00000	0.00000
45	0.01311	0.00880	-0.02964	0.00000	0.00000	0.00000

SUM -0.04384 1.81097 -0.04384 -2.07561 -0.07261 -0.81255

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

4	-1.22818	0.88947	0.86730	-1.05509	-1.79638	-0.38429
11	1.17352	0.89961	-0.83932	-1.01844	1.70465	-0.42542
43	-0.00510	0.01202	-0.00818	0.00000	0.00000	0.00000
45	0.00876	0.00988	-0.01980	0.00000	0.00000	0.00000

SUM -0.05100 1.81097 0.00000 -2.07353 -0.09174 -0.80970

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

4	-1.22732	0.88848	0.88322	-1.05388	-1.79244	-0.38485
11	1.17949	0.89851	-0.82985	-1.01751	1.71538	-0.42625
43	-0.00014	0.01296	-0.00022	0.00000	0.00000	0.00000
45	0.00412	0.01102	-0.00931	0.00000	0.00000	0.00000

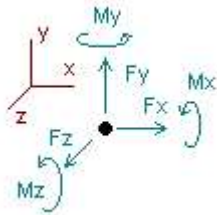
SUM -0.04384 1.81097 0.04384 -2.07139 -0.07706 -0.81110

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

4	-1.22984	0.88820	0.88788	-1.05352	-1.80294	-0.38357
11	1.16809	0.89817	-0.82724	-1.01727	1.69263	-0.42482
43	0.00197	0.01336	0.00317	0.00000	0.00000	0.00000
45	0.00320	0.01125	-0.00724	0.00000	0.00000	0.00000
SUM	-0.05657	1.81097	0.05657	-2.07080	-0.11031	-0.80839

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+W10
- LC26=1.2D+Di+W130
- LC27=1.2D+Di+W160
- LC28=1.2D+Di+W190
- LC29=1.2D+Di+W1120
- LC30=1.2D+Di+W1150
- LC31=1.2D+Di-W10
- LC32=1.2D+Di-W130
- LC33=1.2D+Di-W160
- LC34=1.2D+Di-W190
- LC35=1.2D+Di-W1120

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

Node		Forces						Moments					
		Fx [Kip]	lc	Fy [Kip]	lc	Fz [Kip]	lc	Mx [Kip*ft]	lc	My [Kip*ft]	lc	Mz [Kip*ft]	lc
4	Max	0.833	LC41	0.917	LC31	1.290	LC1	-0.37749	LC13	1.21834	LC45	0.22601	LC51
	Min	-1.231	LC71	0.323	LC13	-0.480	LC19	-1.07586	LC31	-1.80294	LC75	-0.39471	LC69
11	Max	1.266	LC69	0.924	LC31	0.129	LC13	-0.37663	LC13	2.29539	LC4	0.33919	LC51
	Min	-1.167	LC22	0.321	LC13	-0.919	LC7	-1.04398	LC31	-2.21098	LC22	-0.43725	LC69
43	Max	0.278	LC13	0.064	LC1	0.458	LC13	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.284	LC7	-0.043	LC19	-0.470	LC7	0.00000	LC1	0.00000	LC1	0.00000	LC1
45	Max	0.177	LC8	0.056	LC2	0.400	LC14	0.00000	LC1	0.00000	LC1	0.00000	LC1
	Min	-0.173	LC14	-0.038	LC20	-0.413	LC8	0.00000	LC1	0.00000	LC1	0.00000	LC1

Date: 12/6/2021
Project Name: WATERFORD DANIELS AVE
Project No.: CT1270
Designed By: KM Checked By: MSC



CHECK CONNECTION CAPACITY (Worst Case)

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

Bolt Type = A36 1/2" Threaded Rod

Allowable Tensile Load =

$$F_{Tall} = 4271 \text{ lbs.}$$

Allowable Shear Load =

$$F_{vall} = 2562 \text{ lbs.}$$

TENSILE FORCES

Reaction $F = 1290$ lbs. (See Bentley Output)

SHEAR FORCES

Reactions in X direction: 1231 lbs. (See Bentley Output)

Reactions in Y direction: 917 lbs. (See Bentley Output)

Resultant: 1535 lbs.

No. of Supports = 1

No. of Bolts / Support = 4

Tension Design Load /Bolts =

$$f_t = 322.50 \text{ lbs.} < 4271 \text{ lbs.} \text{ Therefore, OK !}$$

Shear Design Load / Bolts=

$$f_v = 383.75 \text{ lbs.} < 2562 \text{ lbs.} \text{ Therefore, OK !}$$

CHECK COMBINED TENSION AND SHEAR

$$\begin{array}{rclclcl} f_t / F_T & + & f_v / F_v & \leq & 1.0 & \\ 0.076 & + & 0.150 & = & 0.225 & < 1.0 \text{ Therefore, OK !} \end{array}$$

51 DANIELS AVENUE

Location 51 DANIELS AVENUE

Mblu 143 / 1783 /

Acct# 00153300

Owner WATERFORD TOWN OF

Assessment \$2,924,780

Appraisal \$4,178,257

PID 1783

Building Count 1

Current Value

Appraisal			
Valuation Year	Improvements	Land	Total
2017	\$2,498,257	\$1,680,000	\$4,178,257

Assessment			
Valuation Year	Improvements	Land	Total
2017	\$1,748,780	\$1,176,000	\$2,924,780

Parcel Addresses

Additional Addresses
No Additional Addresses available for this parcel

Owner of Record

Owner WATERFORD TOWN OF

Co-Owner SOUTHWEST SCHOOL

Sale Price \$0

Certificate

Book & Page 0107/0567

Sale Date 09/15/1956

Instrument 00

Ownership History

Ownership History					
Owner	Sale Price	Certificate	Book & Page	Instrument	Sale Date
WATERFORD TOWN OF	\$0		0107/0567	00	09/15/1956

Building Information

Building 1 : Section 1

Year Built: 1960
Living Area: 29,627
Replacement Cost: \$3,608,900
Building Percent Good: 65

Building Attributes

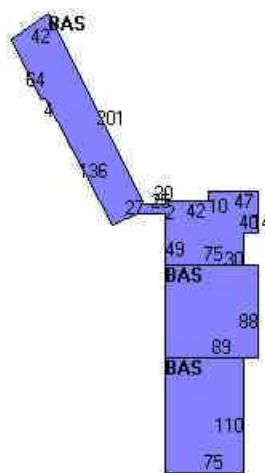
Field	Description
STYLE	School
MODEL	Comm/Ind
Grade	Above Ave
Stories:	1.00
Occupancy	1.00
Exterior Wall 1	Brick Veneer
Exterior Wall 2	
Roof Structure	Flat
Roof Cover	Rolled
Interior Wall 1	Typical
Interior Wall 2	
Interior Floor 1	Comp Tile
Interior Floor 2	
Heating Fuel	Oil
Heating Type	Hot Water
% Central Air	0
Foundation	Poured Conc
Bldg Use	Exempt Comm
Total Rooms	0
Total Bedrms	0
Total Fixtures	0
% Wet Sprinkler	
% Dry Sprinkler	
1st Floor Use	
Heat/AC	Typical
Frame Type	MASONRY
Baths/Plumbing	AVERAGE
% Finished	100
Class	C
Wall Height	10,00
Usrflid 214	

Building Photo



(<http://images.vgsi.com/photos/WaterfordCTPhotos//00\01\54\22.jpg>)

Building Layout



(http://images.vgsi.com/photos/WaterfordCTPhotos//Sketches/1783_1783.j)

Building Sub-Areas (sq ft)			<u>Legend</u>
Code	Description	Gross Area	Living Area
BAS	First Floor	29,627	29,627
		29,627	29,627

Extra Features

Extra Features				Legend
Code	Description	Size	Value	Bldg #
ELV1	ELEVATOR PASS	1.00 STOPS	\$16,250	1
MSC13	RADIO TOWER	5000.00 UNIT	\$32,500	1
GEN	GEN BACKUP DIESEL	1.00 UNITS	\$10,000	1

Land

Land Use

Use Code 920
Description Exempt Comm
Zone R-40
Neighborhood 800
Alt Land Appr No
Category

Land Line Valuation

Size (Acres) 20
Frontage 0
Depth 0
Assessed Value \$1,176,000
Appraised Value \$1,680,000

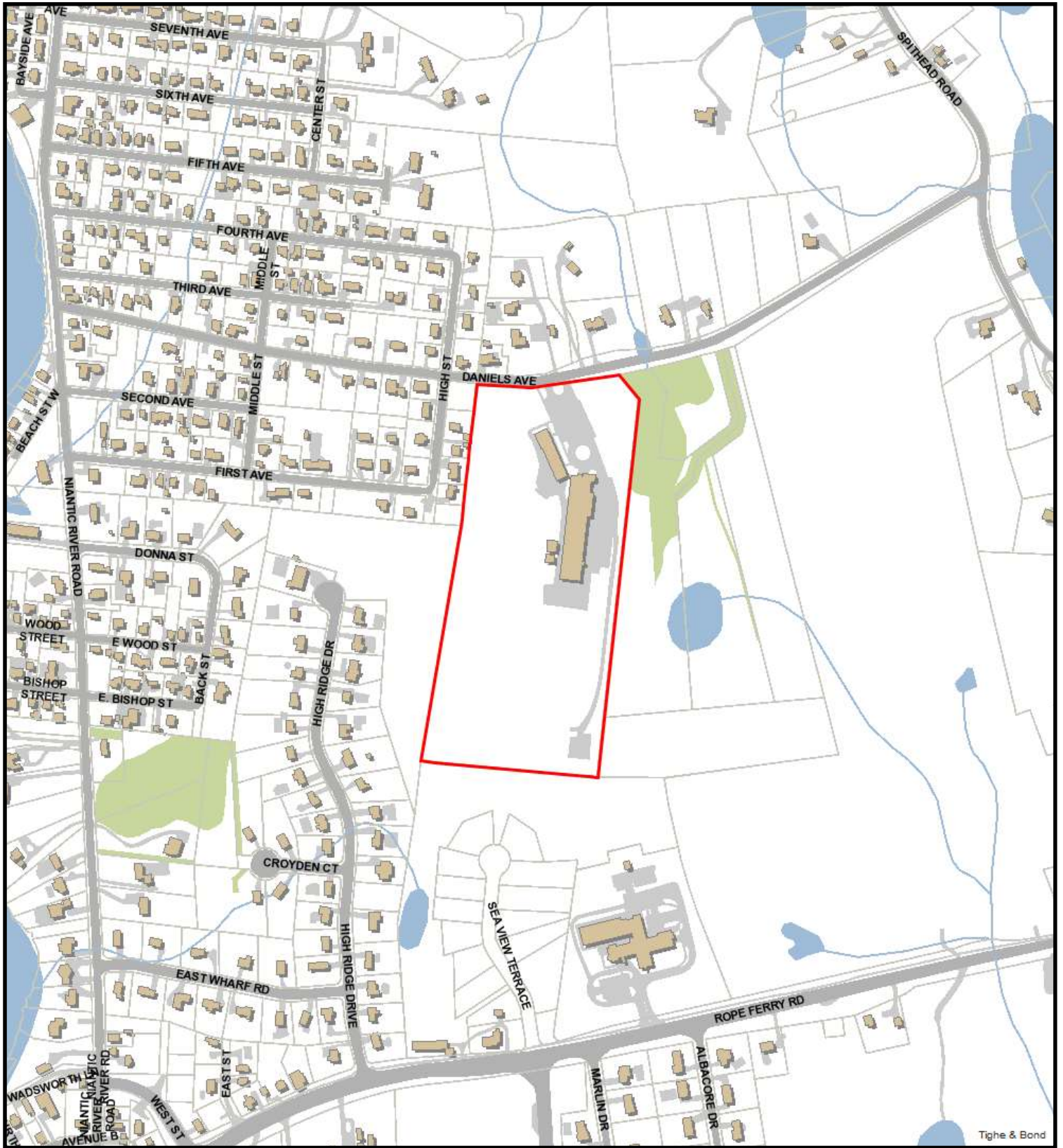
Outbuildings

Outbuildings						Legend
Code	Description	Sub Code	Sub Description	Size	Value	Bldg #
PAV1	Paving	AS	Asphalt	42000.00 S.F.	\$78,750	1
SHD1	Shed	FR	Frame	400.00 S.F.	\$6,750	1
SHD1	Shed	FR	Frame	200.00 S.F.	\$3,380	1
SHD1	Shed	FR	Frame	400.00 S.F.	\$6,750	1

Valuation History

Appraisal			
Valuation Year	Improvements	Land	Total
2021	\$2,498,257	\$1,680,000	\$4,178,257
2020	\$2,498,257	\$1,680,000	\$4,178,257

Assessment			
Valuation Year	Improvements	Land	Total
2021	\$1,748,780	\$1,176,000	\$2,924,780
2020	\$1,748,780	\$1,176,000	\$2,924,780



Tighe & Bond

51 Daniels Avenue

3/4/2022 10:38:04 AM

Scale: 1"=500'

Scale is approximate

The information depicted on this map is for planning purposes only. It is not adequate for legal boundary definition, regulatory interpretation, or parcel-level analyses.





**TOWN OF WATERFORD
PLANNING & ZONING COMMISSION**

NOTICE OF GRANT OF A SPECIAL PERMIT

This is to certify that on November 24, 2008, the Waterford Planning & Zoning Commission granted Special Permit #PZ2008-033.

Owner of Record: Town of Waterford

Address: 51 Daniels Avenue

Description of Premises:

As recorded in Volumes 107, Page(s) 567 of the Waterford Land Records.

Nature of Special Permit: Special Permit and site plan approval granted for erection of a telecommunications tower

Applicable Zoning Regulations: Sections 5, 22 & 23.

Permit findings, stipulations and conditions are filed in the office of the Town Clerk as stated in the minutes of the Planning & Zoning Commission meeting of November 24, 2008.

PLANNING & ZONING COMMISSION

By: *Dawn Choisy*
Dawn Choisy
Recording Secretary
Planning & Zoning Commission

This notice is to be recorded on the land records of the Town of Waterford, indexed in the Grantor's Index under the name of the record owner.

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

October 17, 2008

Christopher B. Fisher, Esq.
Cuddy & Feder LLP
445 Hamilton Avenue, 14th Floor
White Plains, NY 10601

RE: Conservation Permit #2008-041
51 Daniels Avenue – Communications Tower

Dear Mr. Fisher:

At a meeting held on October 16, 2008, the Waterford Conservation Commission approved the above referenced application with conditions.

Please submit two copies of the finalized site plans in accordance with the terms and conditions of the permit (attached). Once submitted, the Chairman will sign the plans and permit and a set will be forwarded to you for your records. If you have any questions, please feel free to call Maureen FitzGerald, Environmental Planner, at 860-444-5813.

Sincerely,

Carol Libby
Recording Secretary
Conservation Commission

Certified Mail #7006 0810 0006 0893 5010

cc: Town of Waterford – 1st Selectman
SBA Network Services, Inc.

FIFTEEN ROPE FERRY ROAD
November 25, 2008



WATERFORD, CT 06385-2886

SBA Towers II, LLC
c/o SBA Network Services, Inc.
80 Eastern Boulevard
Glastonbury, CT 06033

RE: Application #PZ2008-033
51 Daniels Avenue/Communications Tower

Dear Mr. Dupont:

At a meeting on November 24, 2008, the Town of Waterford Planning and Zoning Commission took the following action in regards to the above referenced application:

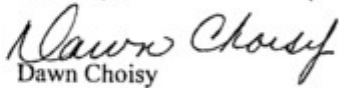
APPROVED WITH CONDITIONS: #PZ2008-033 - Request of the Town of Waterford by its agent SBA Towers II, LLC, applicant; Town of Waterford, owner, Christopher B. Fisher, Esq. agent for special permit and site plan approval to locate a communications tower at 51 Daniels Avenue, R-40 zone, in accordance with Sections 5.2.1, 5.2.2, 22 and 23 of the Zoning Regulations and as shown on plans entitled "Site Name: Southwest School, Site Address: 51 Daniels Avenue, Waterford, CT 06385" dated July 28, 2008 with revisions to September 13, 2008.

Please refer to the attached minutes and special permit for the conditions of the approval.

In order to comply with the record retention schedule required by the State of Connecticut, you are required to file a Notice of Special Permit with the Waterford Town Clerk. This Notice can be filed after the 15 day appeal period expires, which is December 16, 2008. At the time you are ready to file this Notice, please come to the Permitting Office and the original notice and one copy will be given to you. Both of these shall be stamped in at the Clerk's Office, and the copy is to be returned to this office.

Please also submit two sets of check prints incorporating the conditions of the Planning and Zoning Commission and Conservation Commission approvals for Staff review. After this review, you will be notified to submit one mylar and 12 sets of final plans for the Chairmen's signatures.

Sincerely,


Dawn Choisy
Recording Secretary
Planning and Zoning Commission

Enclosure: Minutes
Notice of Action

Certified #7008 0500 0000 7478 7841

Cc: Christopher B. Fisher, Esq., w/attachments

FIFTEEN ROPE FERRY ROAD



WATERFORD, CT 06385-2886

November 25, 2008

The Day Publishing Company – Legal Ads
Eugene O'Neill Drive
New London, CT 06320

Please prepare the following notice for publication in your newspaper on Monday December 1, 2008 and send a Publisher's Certificate along with your bill, charged to #92962:

**TOWN OF WATERFORD
PLANNING AND ZONING COMMISSION
NOTICE OF ACTION**

At a meeting held on November 24, 2008, the Waterford Planning and Zoning Commission took the following actions:

APPROVED WITH CONDITIONS

#PZ2008-033 - Request of the Town of Waterford by its agent SBA Towers II, LLC, applicant; Town of Waterford, owner, Christopher B. Fisher, Esq. agent for special permit and site plan approval to locate a communications tower at 51 Daniels Avenue, R-40 zone.


#PZ2008-030 – Request of Jeffrey J. Barclay, applicant Edmund O & Vincent P. DeSantis owners; Boundaries, LLC, agent for Coastal Site Plan review and approval to construct a new single family home on property located at 14 Westcot Road, RU-120 zone.

#PZ2008-038 – Request of Michael Hoelck, applicant; Hoelck's Realty LLC, owner, for modification of an approved site plan at 341 Boston Post Road, R-20 zone. The approval of this site plan includes fire zones as may be established and enforced pursuant to Chapter 8.08 of the Waterford Code of Ordinances.

Information regarding the above actions is on file in the office of the Planning and Zoning Commission, Waterford, Connecticut.

Dated at Waterford, CT this 25th day of November, 2008.

Edwin Maguire, Chairman
Gwendolyn Hughes, Secretary

By:  Dawn Choisy, Recording Secretary 444-5813



SBA Communications Corporation
8051 Congress Avenue
Boca Raton, FL 33487-1307

T + 561.995.7670
F + 561.995.7626

sbasite.com

LETTER OF AUTHORIZATION

SBA Site ID: CT09865-S, Niantic

Property Located at: 51 Daniel's Avenue, Waterford, CT, 06385

THE CITY/COUNTY OF: Waterford / New London

APPLICATION FOR ZONING/USE/BUILDING PERMIT

This letter authorizes AT&T and its authorized agents to file for all necessary zoning, planning and building permits (local, state and federal) for the purposes of installing, operating and maintaining a telecommunications facility on the existing tower on the property referenced above on behalf of Unknown.

All approval conditions that may be granted to AT&T in connection with above referenced facility relating to this specific application are the sole responsibility of AT&T.

SBA Towers II LLC

A handwritten signature in black ink, appearing to read "Jason Silberstein", written in a cursive style.

Jason Silberstein

Executive VP, Site Leasing

Date: 3/15/2022



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HOLLIS M REDDING

Expected Delivery Date: 03/19/22

SAI GROUP

Ref#: CT1270

12 INDUSTRIAL WAY

SALEM NH 03079-2837

0006

C010

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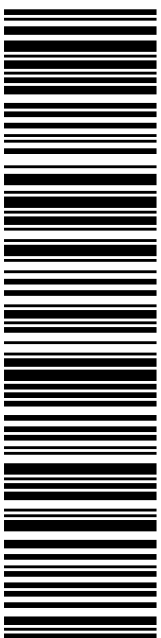
TO: HON. ROBERT J. BRULE, 1ST SELECTMAN MS. ABBY

TOWN OF WATERFORD

15 ROPE FERRY RD

WATERFORD CT 06385-2806

USPS TRACKING #



9405 5036 9930 0193 4292 29

Electronic Rate Approved #038555749



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HOLLIS M REDDING

Expected Delivery Date: 03/19/22

SAI GROUP

Ref#: CT1270

12 INDUSTRIAL WAY

SALEM NH 03079-2837

0006

C006

SHIP

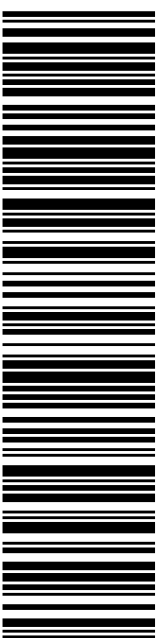
TO: MELANIE BACHMAN EXECUTIVE DIRECTOR

CT SITING COUNCIL

10 FRANKLIN SQ

NEW BRITAIN CT 06051-2655

USPS TRACKING #



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Electronic Rate Approved #038555749

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03/16/2022

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

Expected Delivery Date: 03/19/22

Ref#: CT1270

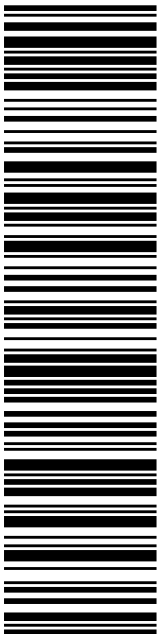
0006

C036

SHIP
TO:

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

USPS TRACKING #



9405 5036 9930 0193 4292 81

Electronic Rate Approved #038555749

Cut on dotted line.





Town of Waterford

[FAQs >](#)

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MERIDEN, CT 06450

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