QC Development
PO Box 916
Storrs, CT 06268
860-670-9068
Mark.Roberts@QCDevelopment.net

November 30, 2020

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

Notice of Exempt Modification – New Cingular Wireless PCS, LLC (AT&T) – CT1141
179 Shunpike Road, Cromwell, CT 06416
N 41.62323056
W 72.67902778

Dear Ms. Bachman:

AT&T currently maintains nine (9) antennas at the 115-foot level of the existing 170-foot Self Support Tower at 179 Shunpike Road, Cromwell, CT. The tower and property are owned by the Cromwell Fire District. This modification replaces EM-CING-033-180601 due to changes in AT&T's proposed antenna loading. AT&T now intends to remove (3) KMW antennas and (3) Powerwave antennas and replace them with (3) CCI DMP65R-BU6DA antennas and (3) CCI HPA-65R-BUU-H6 antennas. AT&T also intends to remove (3) Ericsson RRUS-12/A2 and (3) RRUS-11 B12 and install (3) Ericsson 4449 B5/B12, (3) 4478 B14 and (3) 8843 B2/B66A Remote Radio Units (RRU). The new antennas and RRUs will also be installed at the 115-foot level of the tower. This modification/proposal includes B2, B5, and B12 hardware that is both 4G (LTE) and 5GNR capable through remote software configuration and either or both services may be turned on or off at various times.

The original CT Siting Council order to approve Tower Sharing by AT&T (Springwich Cellular) was issued on January 25th, 2001. This modification complies with the aforementioned approval.

Please accept this letter as notification pursuant to Regulations of Connecticut State Agencies § 16-50j-73, for construction that constitutes an exempt modification pursuant to R.C.S.A. § 16-50j-

72(b)(2). In accordance with R.C.S.A. § 16-50j-73, a copy of this letter is being sent to the Honorable Enzo Faienza, Mayor of the Town of Cromwell, and the Cromwell Planning & Development Department, as well as the property and tower owner.

The planned modifications to the facility fall squarely within those activities explicitly provided for in R.C.S.A. § 16-50j-72(b)(2).

1. The proposed modifications will not result in an increase in the height of the existing structure.

2. The proposed modifications will not require the extension of the site boundary.

3. The proposed modifications 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 replacement antennas 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 its foundation can support the proposed loading.

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

Please feel free to call me at (860) 670-9068 with any questions regarding this matter. Thank you for your consideration.

Sincerely,

Mark Roberts
QC Development
Consultant for AT&T

Attachments

cc: Mayor Enzo Faienza - Elected Official
Stuart Popper – Director of Planning and Development
Cromwell Fire District – Tower and Property Owner

Power Density

Existing Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							13.69%
AT&T UMTS	2	475	115	0.0028	850	0.5667	0.51%
AT&T UMTS	2	656	115	0.0397	1900	1.0000	0.41%
AT&T LTE	2	1298	115	0.0786	700	0.4667	1.68%
AT&T LTE	3	2178	115	0.1978	1900	1.0000	1.98%
AT&T LTE	2	2178	115	0.1318	2100	1.0000	1.32%
AT&T LTE	2	2178	115	0.1318	2300	1.0000	1.32%
Site Total							20.89%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

Proposed Loading on Tower

Carrier	# of Channels	ERP/Ch (W)	Antenna Centerline Height (ft)	Power Density (mW/cm^2)	Freq. Band (MHz**)	Limit S (mW /cm^2)	%MPE
Other Carriers*							13.69%
AT&T UMTS	1	248	115	0.0075	850	0.5667	0.13%
AT&T LTE	1	1476	115	0.0447	700	0.4667	0.96%
AT&T LTE	1	2951	115	0.0893	700	0.4667	1.91%
AT&T LTE	1	1000	115	0.0303	850	0.5667	0.53%
AT&T LTE	1	1000	115	0.2303	850	0.5667	0.53%
AT&T LTE	3	7328	115	0.6654	1900	1.0000	6.65%
AT&T LTE	1	5070	115	0.1535	2100	1.0000	1.53%
AT&T LTE	1	1285	115	0.0389	2300	1.0000	0.39%
Site Total							26.34%

*Per CSC Records (available upon request, includes calculation formulas)

** If a range of frequencies are used, such as 880-894, enter the lowest value, i.e. 880

PROJECT INFORMATION

SCOPE OF WORK:

ITEMS TO BE MOUNTED ON THE EXISTING LATTICE TOWER:
- NEW AT&T ANTENNAS: DMP65R-BU6DA (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T ANTENNAS: HPA-65R-BUU-H6 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNA: (QS66512-2) @ POS. 2 TO BE RELOCATED TO POS. 3 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T RRUS: B5/B12 4449 (850/700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T RRUS: 8843 B2/B66A (PCS/AWS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- NEW AT&T DIPLEXER: DBCT108F1V92-2 (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- NEW AT&T DC ONLY SURGE ARRESTOR DC6-48-60-0-8C-EV (TOTAL OF 1) WITH (2) DC POWER.
- NEW AT&T ANTENNA MOUNT SABRE PART #C10857001C (TOTAL OF 3)

ITEMS TO BE MOUNTED AT EQUIPMENT LOCATION:
- SWAP BB FOR (2) RSB 6630.
- ADD IDLe.
- NEW AT&T SURGE ARRESTOR (TSXDC-4310FM) (TYP. OF 4 PER ALPHA & BETA SECTOR, TOTAL OF 8)
- NEW AT&T RRUS: 4478 B14 (700) (TYP. OF 1 PER ALPHA & BETA SECTOR, TOTAL OF 2) (GAMMA SECTOR SHARED WITH ALPHA SECTRO).
- NEW AT&T DIPLEXER: DBCT108F1V92-2 (TYP. OF 1 PER SECTOR, TOTAL OF 3)

ITEMS TO BE REMOVED:
- EXISTING AT&T ANTENNAS: 7770 (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T ANTENNAS: AM-X-CD-16-65-00T-RET (TYP. OF 1 PER SECTOR, TOTAL OF 3)
- EXISTING AT&T RRUS: RRUS-12 B2 + RRUS A2 B25 (PCS) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T RRUS: RRUS-11 B12 (700) (TYP. OF 1 PER SECTOR, TOTAL OF 3).
- EXISTING AT&T TMA's: LGP 21401 (TYP. OF 2 PER SECTOR, TOTAL OF 6).
- EXISTING AT&T (6) 1-5/8" COAX CABLES.

ITEMS TO REMAIN:
- (3) ANTENNAS, (3) RRU'S, (2) SURGE ARRESTOR, (6) COAX CABLES, (4) DC POWER & (2) FIBER.

SITE ADDRESS:	179 SHUNPIKE ROAD CROMWELL, CT 06416
LATITUDE:	41.623223° N, 41° 37' 23.60" N
LONGITUDE:	72.679038° W, 72° 40' 44.53" W
TYPE OF SITE:	LATTICE TOWER / INDOOR
STRUCTURE HEIGHT:	170'-0"±
RAD CENTER:	115'-0"±
CURRENT USE:	TELECOMMUNICATIONS FACILITY
PROPOSED USE:	TELECOMMUNICATIONS FACILITY

DRAWING INDEX

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

SITE NUMBER: CT1141

SITE NAME: CROMWELL US MIL

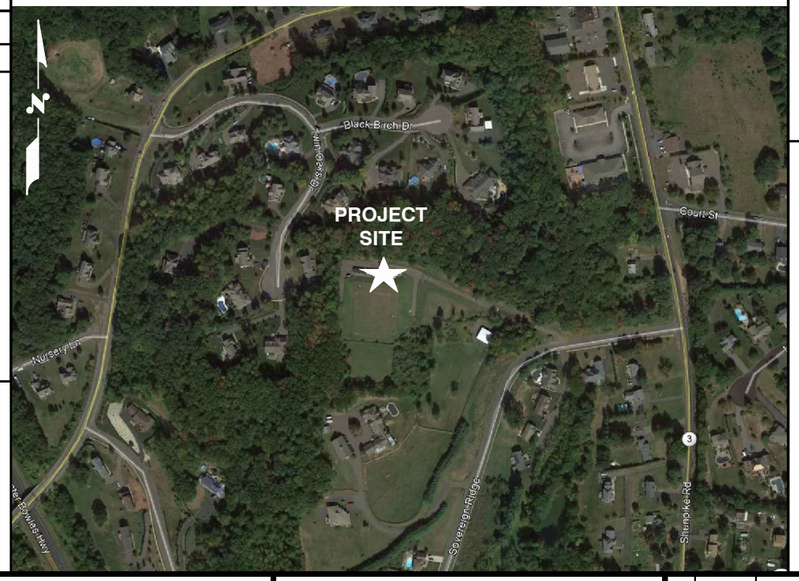
FA CODE: 10035331

PACE ID: MRCTB027153, MRCTB027297, MRCTB047194, MRCTB047285

PROJECT: LTE 4C-5C-5G 2021 UPGRADE

VICINITY MAP

DIRECTIONS TO SITE:
TAKE ROUTE 17 NORTH TO RIDGEWOOD AVE. FOLLOW RIDGEWOOD AVENUE TO THE GARDEN STATE PARKWAY GET ON GOING NORTH. STAY ON THE GARDEN STATE PARKWAY NORTH UNTIL YOU GET TO THE NEW YORK STATE THRUWAY (RT. 87 SOUTH) TOWARDS THE TAPPAN ZEE BRIDGE. CROSS THE TAPPAN ZEE BRIDGE AND GET OFF AT EXIT 8 (CROSS WESTCHESTER PARKWAY /RT. 287). TAKE RT. 287 EAST TO I-95 NORTH (NEW ENGLAND THRUWAY). IN NEW HAVEN GET OFF EXIT 48 THIS WILL BE A LEFT-HAND EXIT THAT WILL PUT YOU ON I-91 NORTH. TAKE EXITS 21 (ROUTE 372). AT END OF EXIT GO LEFT ONTO ROUTE 372, FOLLOW ROUTE AND TAKE A LEFT ONTO SHUNPIKE ROAD (ROUTE 3). FOLLOW SHUNPIKE ROAD FOR ABOUT FOUR MILES. TURN LEFT ONTO SOVEREIGN RIDGE AND THEN FIRST DRIVEWAY ON RIGHT. 179 SHUNPIKE ROAD, CROMWELL CT, 06416



GENERAL NOTES

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

72 HOURS

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

UNDERGROUND SERVICE ALERT

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

Daniel P. Hamm

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

SAI
12 INDUSTRIAL WAY
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SITE NUMBER: CT1141
SITE NAME: CROMWELL US MIL

179 SHUNPIKE ROAD
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at&t
500 ENTERPRISE DRIVE, SUITE 3A
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NO.	DATE	REVISIONS	BY	CHK	APP'D
1	11/20/20	ISSUED FOR CONSTRUCTION	GA	HC	DPH
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SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

AT&T

TITLE SHEET
LTE 4C-5C-5G 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1141	T-1	1

GROUNDING NOTES

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

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

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

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

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

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

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

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

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

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

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

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

GENERAL NOTES

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

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

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

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

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

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

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

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

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

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

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

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

12. SUBCONTRACTOR SHALL LEAVE PREMISES IN CLEAN CONDITION.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

ABBREVIATIONS

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

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT1141
SITE NAME: CROMWELL US MIL

179 SHUNPIKE ROAD
CROMWELL, CT 06416
MIDDLESEX COUNTY

at&t
500 ENTERPRISE DRIVE, SUITE 3A
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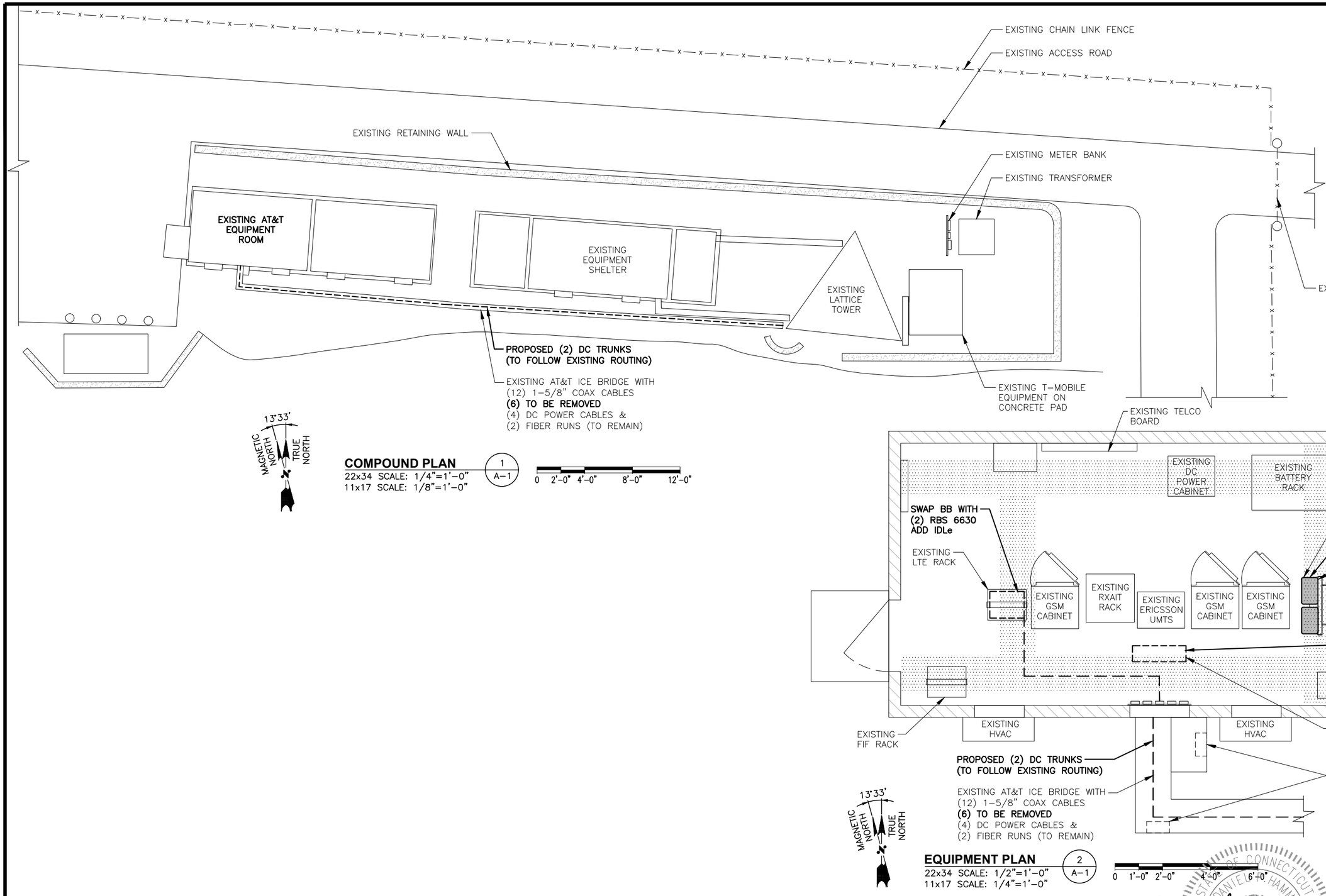
SCALE: AS SHOWN | DESIGNED BY: HC | DRAWN BY: GA

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

AT&T

GENERAL NOTES
LTE 4C-5C-5G 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1141	GN-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: JULY 21, 2020.

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: AECCOM
DATED: SEPTEMBER 3, 2020. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT1141
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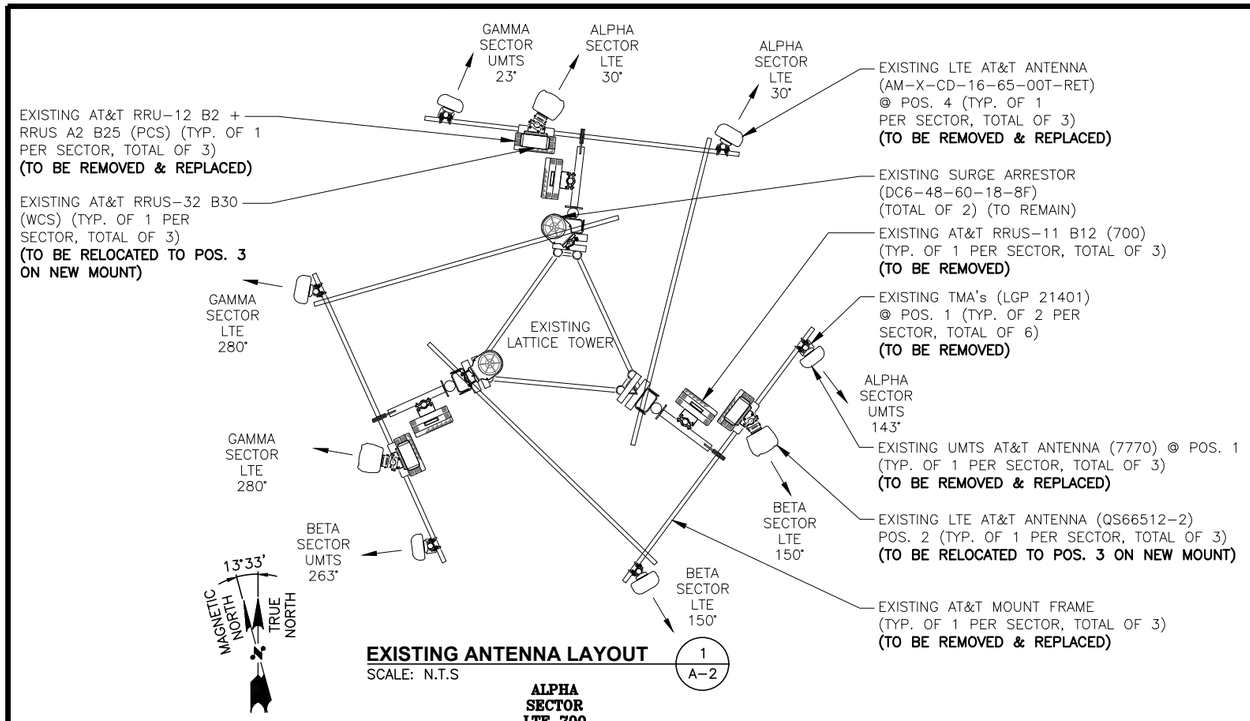
STATE OF CONNECTICUT · DANIEL P. HAMM · No.24178 · LICENSED PROFESSIONAL ENGINEER

AT&T

COMPOUND & EQUIPMENT PLANS
LTE 4C-5C-5G 2021 UPGRADE

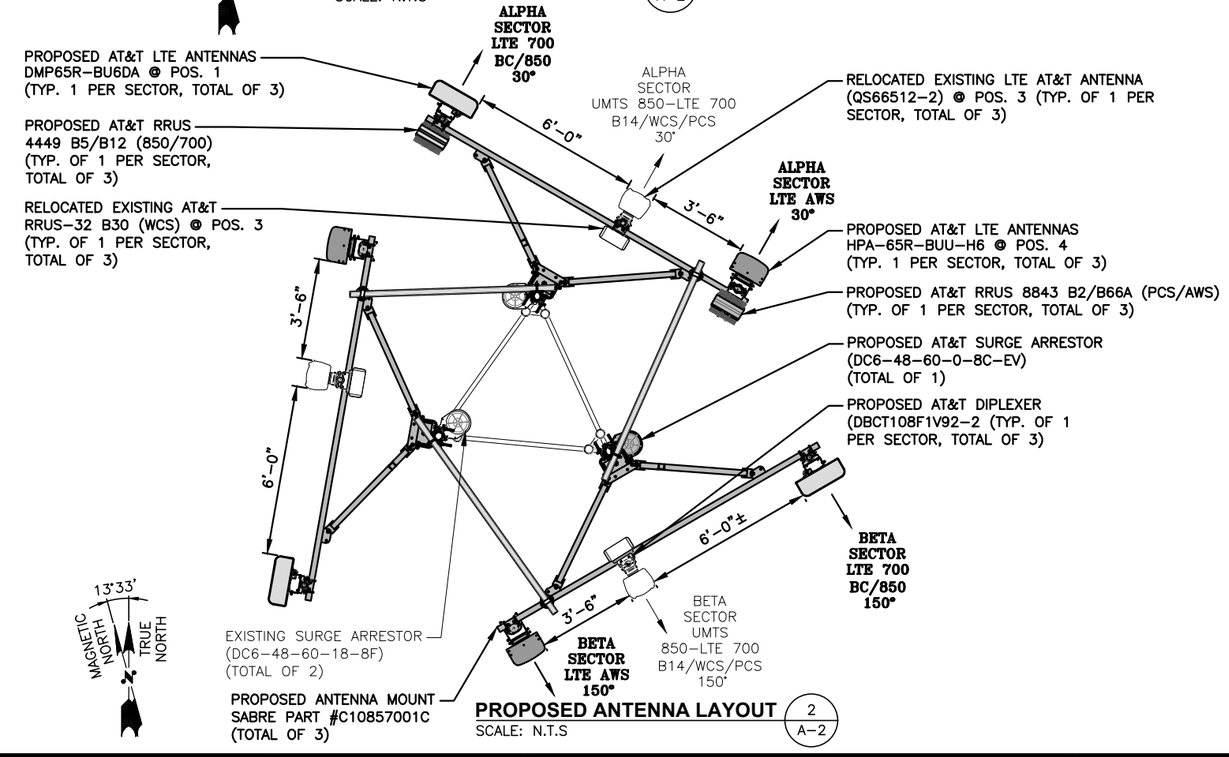
SITE NUMBER	DRAWING NUMBER	REV
CT1141	A-1	1



EXISTING ANTENNA LAYOUT

SCALE: N.T.S

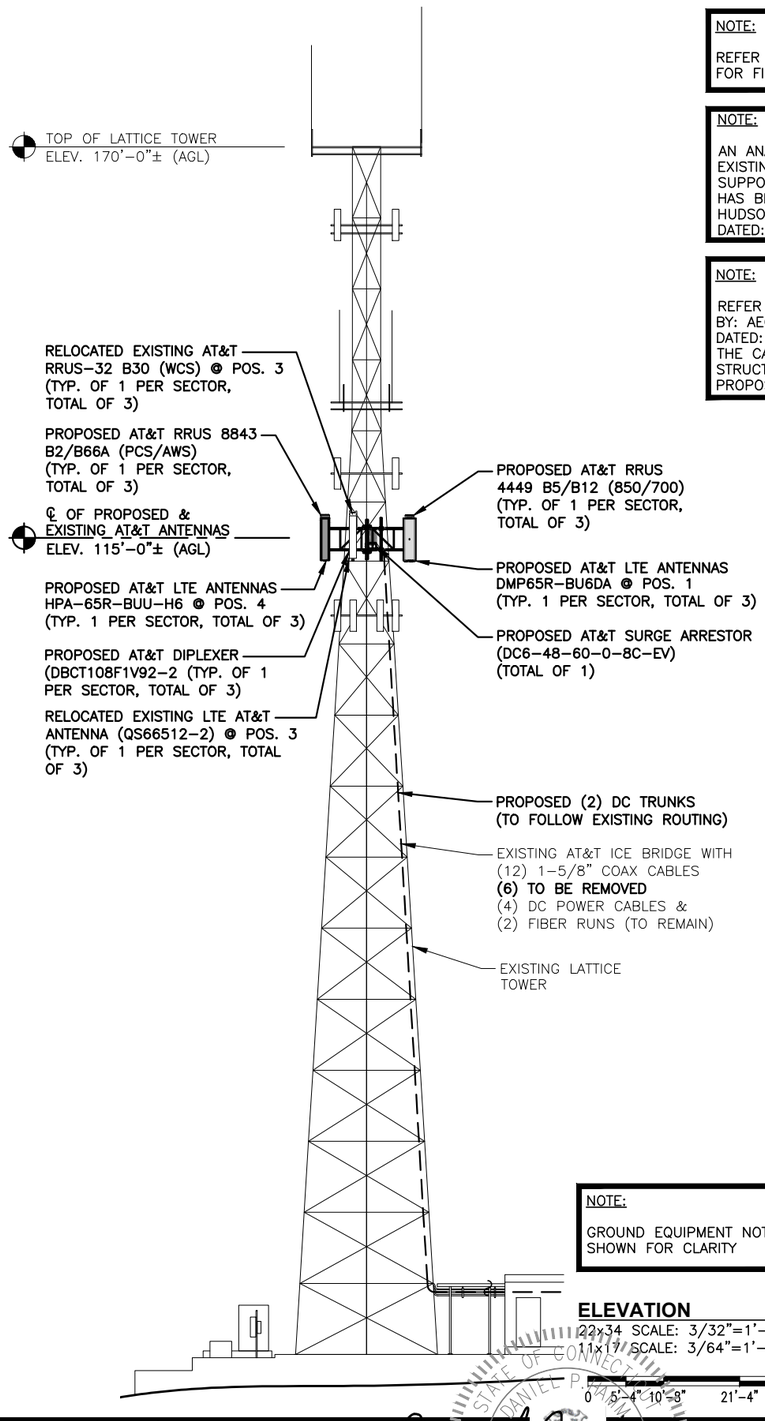
1 / A-2



PROPOSED ANTENNA LAYOUT

SCALE: N.T.S

2 / A-2



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: JULY 21, 2020.

NOTE:

REFER TO **STRUCTURAL ANALYSIS** BY: AECCOM
DATED: SEPTEMBER 3, 2020. FOR THE CAPACITY OF THE EXISTING STRUCTURES TO SUPPORT THE PROPOSED EQUIPMENT.

NOTE:

GROUND EQUIPMENT NOT SHOWN FOR CLARITY

ELEVATION

3 / A-2

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

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

HUDSON Design Group LLC
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SITE NUMBER: CT1141
SITE NAME: CROMWELL US MIL

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at&t
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1	11/20/20	ISSUED FOR CONSTRUCTION	GA	HC	DPH
A	07/22/20	ISSUED FOR REVIEW	GA	HC	DPH

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

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

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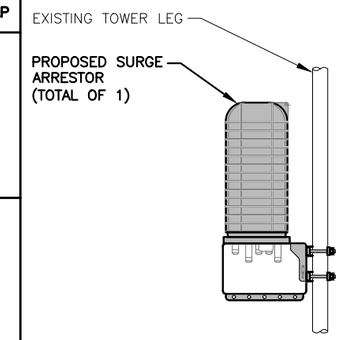
ANTENNA LAYOUTS & ELEVATION
LTE 4C-5C-5G 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1141	A-2	1

ANTENNA SCHEDULE

SECTOR	EXISTING/ PROPOSED	BAND	ANTENNA	SIZE (INCHES) (L x W x D)	ANTENNA ℄ HEIGHT	AZIMUTH	TMA/ DIPLEXER	RRU	SIZE (INCHES) (L x W x D)	FEEDER	RAYCAP
A1	**PROPOSED**	**LTE 700 BC/850**	**DMP65R-BU6DA**	**71.2x20.7x7.7**	**115'-0"±**	**30°**	–	**(1)(P) 4449 B5/B12 (850/700)**	**17.9x13.2x10.4**	(2)(E) DC POWER & (1) FIBER	(E) (1) RAYCAP DC6-48-60-18-8F
A2	–	–	–	–	–	–	–	–	–	–	
A3	EXISTING	UMTS 850-LTE 700 B14/WCS/PCS	QS66512-2	72x12x9.6	115'-0"±	30°	**(1)(P) DBCT108F1V92-2** **(1)(P)(G) DBCT108F1V92-2**	**(1)(P)(G) 4478 B14 (700)** (1)(E) RRUS-32 B30 (WCS)	**18.1x13.4x8.3** –	(2)1-5/8 COAX	
A4	**PROPOSED**	**LTE AWS**	**HPA-65R-BUU-H6**	**72x14.8x9**	**115'-0"±**	**30°**	–	**(1)(P) 8843 B2/B66A (PCS/AWS)**	**14.9x13.2x10.9**	–	
B1	**PROPOSED**	**LTE 700 BC/850**	**DMP65R-BU6DA**	**71.2x20.7x7.7**	**115'-0"±**	**150°**	–	**(1)(P) 4449 B5/B12 (850/700)**	**17.9x13.2x10.4**	(2)(E) DC POWER & (1) FIBER	(E) (1) RAYCAP DC6-48-60-18-8F
B2	–	–	–	–	–	–	–	–	–	–	
B3	EXISTING	UMTS 850-LTE 700 B14/WCS/PCS	QS66512-2	72x12x9.6	115'-0"±	150°	**(1)(P) DBCT108F1V92-2** **(1)(P)(G) DBCT108F1V92-2**	**(1)(P)(G) 4478 B14 (700)** (1)(E) RRUS-32 B30 (WCS)	**18.1x13.4x8.3** –	(2)1-5/8 COAX	
B4	**PROPOSED**	**LTE AWS**	**HPA-65R-BUU-H6**	**72x14.8x9**	**115'-0"±**	**150°**	–	**(1)(P) 8843 B2/B66A (PCS/AWS)**	**14.9x13.2x10.9**	–	
C1	**PROPOSED**	**LTE 700 BC/850**	**DMP65R-BU6DA**	**71.2x20.7x7.7**	**115'-0"±**	**280°**	–	**(1)(P) 4449 B5/B12 (850/700)**	**17.9x13.2x10.4**	**(2)(P) DC POWER**	**(P) (1) RAYCAP DC6-48-60-0-8C-EV**
C2	–	–	–	–	–	–	–	–	–	–	
C3	EXISTING	UMTS 850-LTE 700 B14/WCS/PCS	QS66512-2	72x12x9.6	115'-0"±	280°	**(1)(P) DBCT108F1V92-2** **(1)(P)(G) DBCT108F1V92-2**	**SHARED WITH ALPHA SECTOR** (1)(E) RRUS-32 B30 (WCS)	–	(2)1-5/8 COAX	
C4	**PROPOSED**	**LTE AWS**	**HPA-65R-BUU-H6**	**72x14.8x9**	**115'-0"±**	**280°**	–	**(1)(P) 8843 B2/B66A (PCS/AWS)**	**14.9x13.2x10.9**	–	

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



PROPOSED SURGE ARRESTOR MOUNTING DETAIL (6 / A-3)
SCALE: N.T.S

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

NOTE:
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DATED: JULY 21, 2020.

NOTE:
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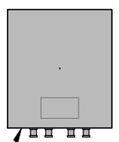
RRU CHART

QUANTITY	MODEL	SIZE (L x W x D)
3(P)	4449 (850/700)	17.9"x13.2"x10.4"
3(P)	8843 (PCS/AWS)	14.9"x13.2"x10.9"
2(P)(G)	4478 B14 (700)	18.1"x13.4"x8.3"
3(E)	RRUS-32 (WCS)	27.2"x12.1"x7.0"

NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS

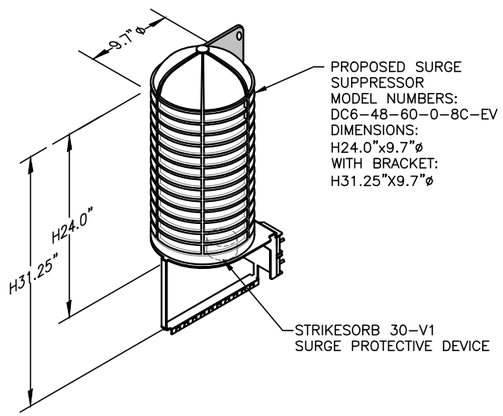
NOTE:
SEE RFDS FOR RRH FREQUENCY AND MODEL NUMBER



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

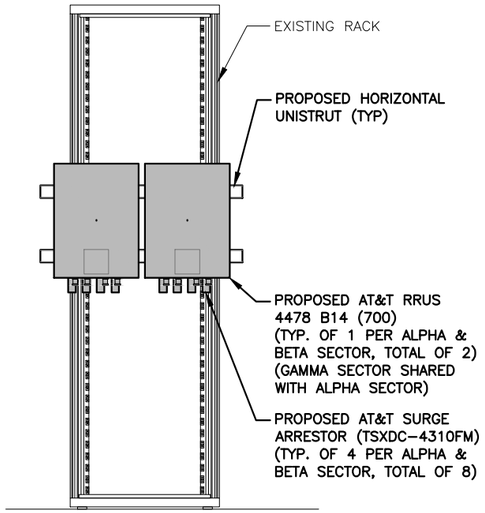
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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



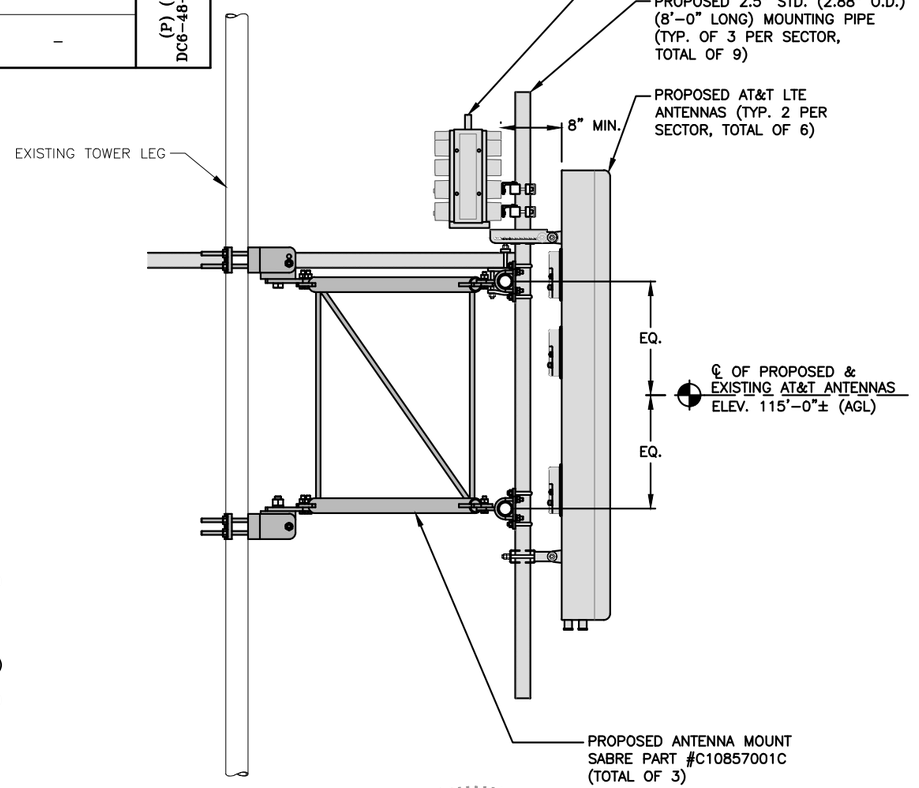
NOTE:
MOUNT PER MANUFACTURER'S SPECIFICATIONS.

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



PROPOSED RRUS MOUNTING DETAIL (4 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

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



PROPOSED LTE ANTENNA MOUNTING DETAIL (5 / A-3)
22x34 SCALE: 1"=1'-0"
11x17 SCALE: 1/2"=1'-0"

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

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

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

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DETAILS
LTE 4C-5C-5G 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1141	A-3	1

STRUCTURAL NOTES:

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

SPECIAL INSPECTIONS (REFERENCE IBC CHAPTER 17):

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

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

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

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

SPECIAL INSPECTION CHECKLIST	
BEFORE CONSTRUCTION	
CONSTRUCTION/INSTALLATION INSPECTIONS AND TESTING REQUIRED (COMPLETED BY ENGINEER OF RECORD)	REPORT ITEM
N/A	ENGINEER OF RECORD APPROVED SHOP DRAWINGS [1]
N/A	MATERIAL SPECIFICATIONS REPORT [2]
N/A	FABRICATOR NDE INSPECTION
N/A	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:	

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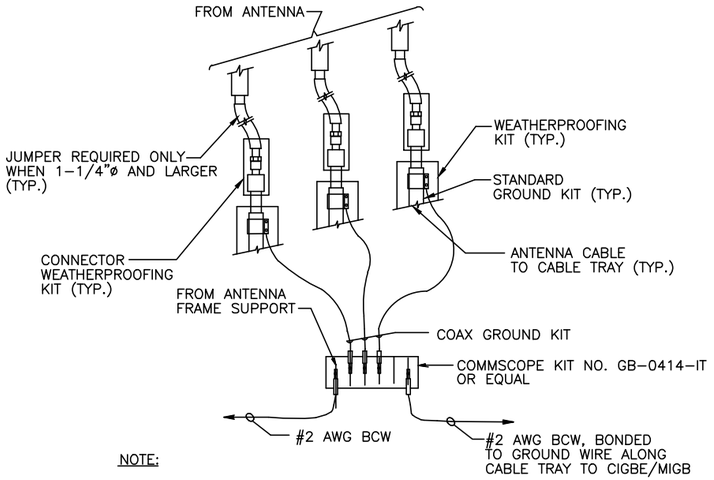
STRUCTURAL NOTES
LTE 4C-5C-5G 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1141	SN-1	1



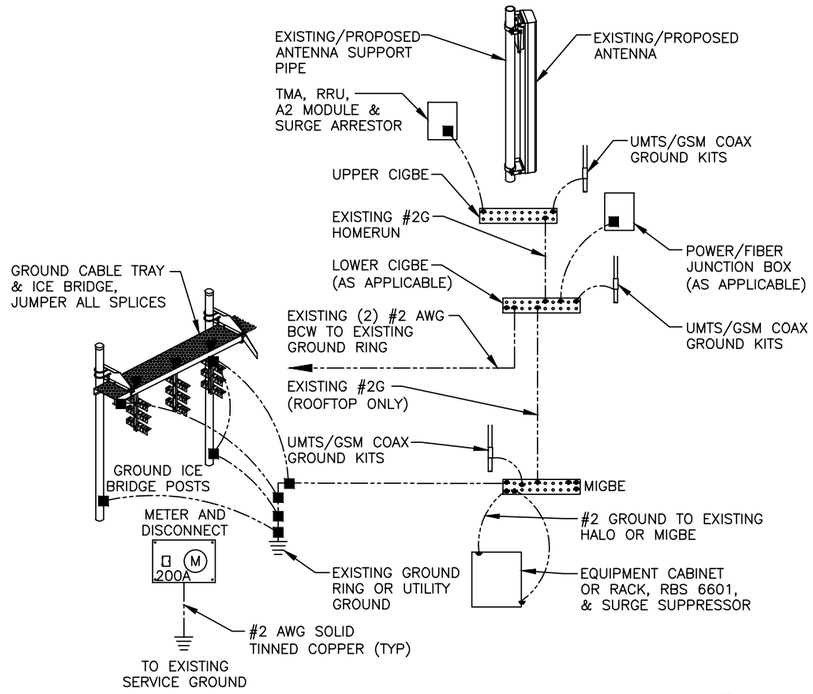
NOTE:

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

GROUND WIRE TO GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

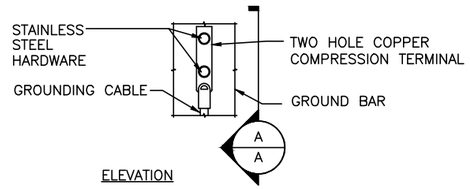
1 / G-1



GROUNDING RISER DIAGRAM

SCALE: N.T.S

2 / G-1



NOTES:

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

TYPICAL GROUND BAR CONNECTION DETAIL

SCALE: N.T.S

3 / G-1

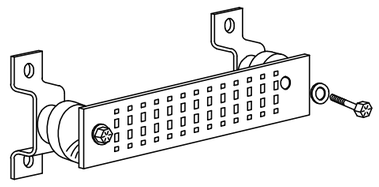
EACH GROUND CONDUCTOR TERMINATING ON ANY GROUND BAR SHALL HAVE AN IDENTIFICATION TAG ATTACHED AT EACH END THAT WILL IDENTIFY ITS ORIGIN AND DESTINATION.

SECTION "P" – SURGE PRODUCERS

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

SECTION "A" – SURGE ABSORBERS

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



GROUND BAR - DETAIL (AS REQUIRED)

SCALE: N.T.S

4 / G-1

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GROUNDING DETAILS
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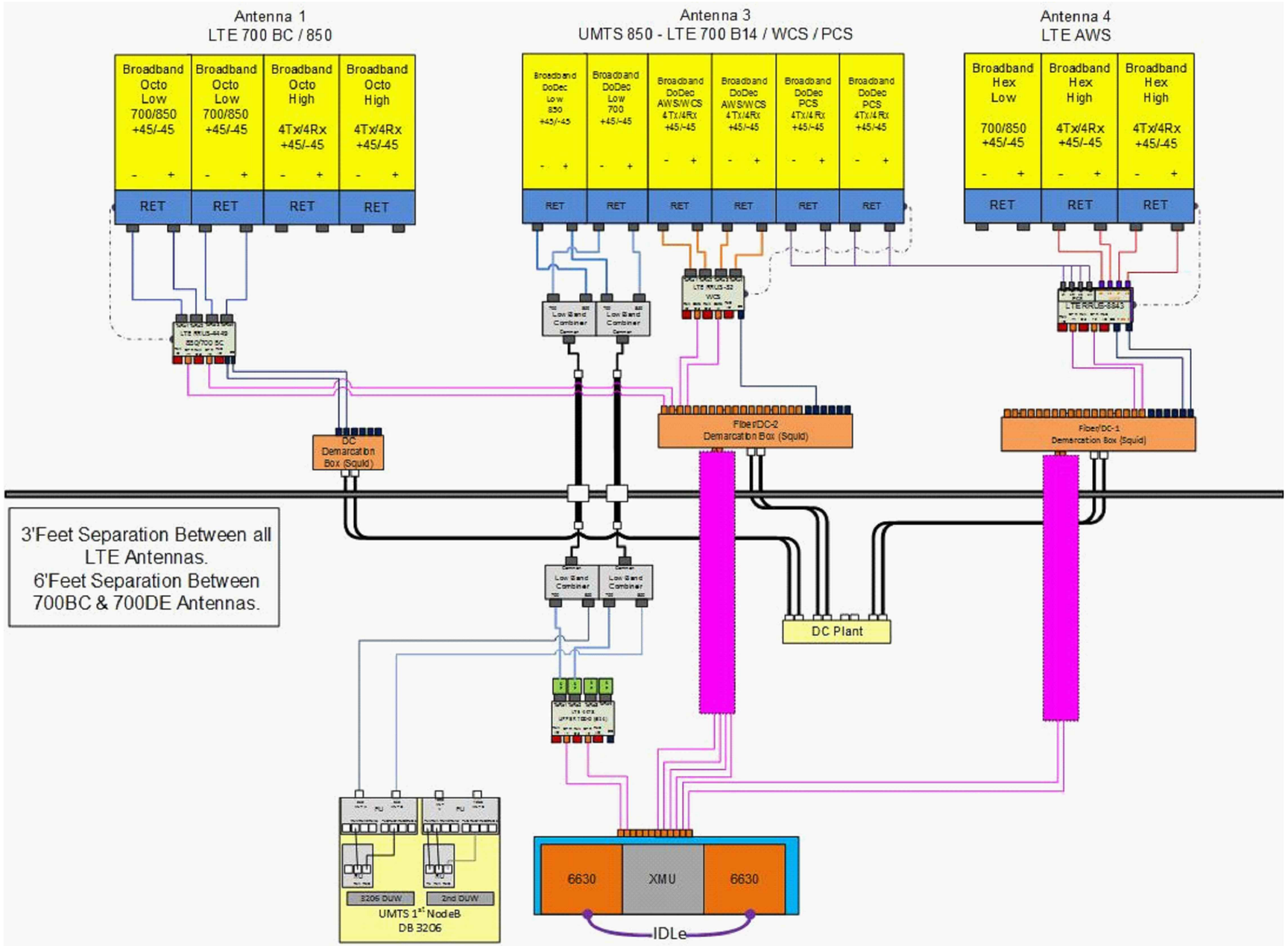


RF PLUMBING DIAGRAM (1 / RF–1)
SCALE: N.T.S

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

NOTE:

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

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

12 INDUSTRIAL WAY
SALEM, NH 03079

SITE NUMBER: CT1141
SITE NAME: CROMWELL US MIL

179 SHUNPIKE ROAD
CROMWELL, CT 06416
MIDDLESEX COUNTY

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

NO.	DATE	REVISIONS	BY	CHK	APP'D
1	11/20/20	ISSUED FOR CONSTRUCTION	GA	HC	DPH
A	07/22/20	ISSUED FOR REVIEW	GA	HC	DPH

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

AT&T

RF PLUMBING DIAGRAM
LTE 4C–5C–5G 2021 UPGRADE

SITE NUMBER	DRAWING NUMBER	REV
CT1141	RF–1	1

AECOM

Submitted to
SAI Communications, Inc.
PO Box 916
Storrs, CT 06268

Submitted by
AECOM
1255 Broad Street
Suite 201
Clifton, NJ 07013
September 3, 2020

DETAILED STRUCTURAL ANALYSIS AND EVALUATION OF AN EXISTING 170’ SELF SUPPORTING LATTICE TOWER AND FOUNDATION FOR PROPOSED ANTENNA ARRANGEMENT

Site ID : CT1141
Site Address: 179 Shunpike Road
Cromwell, CT

60588708
SAI-104

TABLE OF CONTENTS

1. EXECUTIVE SUMMARY
2. INTRODUCTION
3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS
4. FINDINGS AND EVALUATION
5. CONCLUSIONS AND RECOMMENDATIONS
6. DRAWINGS AND DATA

- SEISMIC BASE SHEAR ANALYSIS
- TNX TOWER INPUT / OUTPUT SUMMARY
- TNX TOWER FEEDLINE DISTRIBUTION
- TNX TOWER FEEDLINE PLAN
- TNX TOWER DEFLECTION, TILT, AND TWIST
- TNX TOWER DETAILED OUTPUT
- ANCHOR BOLT ANALYSIS
- FOUNDATION ANALYSIS

1. EXECUTIVE SUMMARY

This report summarizes the structural analysis of the existing 170' self-supporting lattice tower located at 179 Shunpike Road in Cromwell, Connecticut.

The structural analysis was conducted in accordance with the 2018 Connecticut State Building Code which includes the TIA-222-G[1] Standard, 2015 International Building Code, the 2018 Connecticut State Building Code Amendments, the AISC[2] Load Resistance Factor Design (LRFD), and the ASCE 7[3] design Code.

The antenna loading considered in the analysis consists of all the existing antennas, transmission lines and ancillary items as outlined in the Introduction Section of this report.

The proposed AT&T antenna installation is listed below:

Proposed Antenna and Mount	Carrier	Antenna Center Elevation
Remove: **(3) AM-X-CD-16-65-00T RET Panel Antennas** **(3) Powerwave 7770 Antennas** **(3) RRUS-11 B12 RRH Units** **(3) RRUS-12 B2 + RRUS A2 B25** **(6) LGP21401 TMA Units** **(3) A2 Module Units** **(3) Existing Mount Frames**	**AT&T (existing)**	**@ 115'**
Install: **(3) CCI HPA-65R-BUU-H6 Panel Antennas** **(3) CCI DMP65R-BU6DA Panel Antennas** **(3) Ericsson 4449 B5/B12 RRH Units** **(3) Ericsson 8843 B2/B66a RRH Units** **(1) Raycap DC6-48-60-0-8F Surge Arrestor** **(3) Sabre Antenna Mount Frames (Part #: C10857001C)** **(2) DC lines (analysis considered as ½" coaxial lines)** **(6) CCI Triplexer Units (TPX-070821) (2 per Sector)** **(3) DBCT108F1V92-2 Diplexers**	**AT&T (Proposed)**	**@ 115'**

1. TIA = Telecommunications Industry Association Structural Standard for Antenna Supporting Structures and Antennas (Version G)

2. AISC = American Institute of Steel Construction (14th Edition)

3. ASCE 7 = American Society of Civil Engineers Standard 7 (2010 Edition)

1. EXECUTIVE SUMMARY (continued)

The results of the analysis indicate that:

1. The existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified above.
2. The existing tower anchor bolts ARE considered structurally adequate for the proposed antenna loading with the load classification specified above.
3. The existing foundation caissons ARE considered structurally adequate for the proposed antenna loading with the load classification specified above.
4. The controlling structural capacity for all tower and foundation components is **89.2 %**

This analysis is based on:

1) The tower structure's theoretical capacity, not including any assessment of the condition of the tower.
2) Tower geometry, structural member sizes, and Foundation information taken from a tower report prepared by PiROD Inc., ENG. File No. A-116398, dated November 18, 1999.
3) Foundation modification drawings prepared by Tectonic, dated May 5, 2004.
4) Structural analysis and reinforcement performed by URS Corp. on behalf of Sprint and T-Mobile, project number 36931250, signed and sealed on September 23, 2014.
5) Structural Analysis and evaluation performed by URS Corporation, on behalf of Verizon Wireless (VZW), signed and sealed on January 7, 2015.
6) Geotechnical Study for Evaluation of Existing Communications Tower performed by Welti Geotechnical, P.C., dated August 7, 2017.
7) Tower Mapping Report of existing antenna inventory, provided by Northeast Towers, Inc., obtained via e-mail dated August 31, 2017.
8) Previous structural analysis and evaluation performed by Ramaker & Associates, Inc. on behalf of Sprint, project number 29431, signed and sealed on October 1, 2018.
9) Diagonal connection members edge distance field measurements at elevation range 120' – 140', performed by Northeast Tower, Inc,, obtained via e-mail dated June 17, 2019.
10) Previous structural analysis and modification performed on behalf of the Cromwell Fire District, project # 60605528 / CFD-015 Revision 2, signed and sealed on August 7, 2019.
11) Previous structural analysis and evaluation performed by Paul J. Ford & Company, on behalf of Verizon Wireless (VZW), project # 42912-0018.003.8700, signed and sealed on March 14, 2019.
12) Previous structural analysis and evaluation performed by Hudson Design Group LLC, on behalf of AT&T, signed and sealed on April 9, 2018, along with updated inventory obtained via e-mail dated December 16, 2019.
13) Previous structural analysis and evaluation performed by AECOM, on behalf of AT&T/VZW, signed and sealed on February 17, 2020, project number 60588708/60598757 SAI-104/ VZ5-212 Revision 1.
14) Radio Frequency Data Sheet (RFDS) of proposed antenna inventory on behalf of AT&T, dated June 17, 2020, obtained via e-mail dated July 21, 2020.
15) Proposed additional antenna and mount configuration as specified in Section 2 of this report.

1. **EXECUTIVE SUMMARY** (continued)

This report is only valid as per the assumptions and data utilized in this report for antenna inventory, mounts and associated cables. The user of this report shall field verify the antenna, cabling and mount configurations used, as well as the physical condition of the tower members, connections and foundations. Notify the engineer in writing immediately if any of the information in this report is found to be other than specified.

If you should have any questions, please contact Michael Egan at (860) 263-5817.

Sincerely,

AECOM,

Richard A. Sambor, P.E.
Senior Structural Engineer

RAS/cmc

2. INTRODUCTION

The subject tower is located at 179 Shunpike Road in Cromwell, Connecticut. The structure is a 170' self supporting lattice tower designed and manufactured by PiROD Inc.

The structural analysis was conducted in accordance with the following:

- TIA-222-G Standard for Standard for a wind velocity of range of 100 mph to 120 mph (3-second gust) and 50 mph (3-second gust) concurrent with 0.75" ice thickness, considered to increase in thickness with height.
- 2015 International Building Code with 2018 Connecticut State Building Code Amendments for a wind speed of 105 mph (3-second gust)
- 2010 AISC Load Resistance Factor Design (LRFD)
- 2010 ASCE 7 Minimum Design Loads for Buildings and Other Structures for the ice thickness referenced in the TIA-222-G Standard

The inventory together with the proposed AT&T antenna arrangement is summarized in the table below:

Antenna Type	***Carrier***	***Mount***	***Antenna Centerline Elevation***	***Cable***
(1) Tx Rx 101-90-08 antenna	Town (existing)	15' Mast pipe on 9 Arm Halo Mount (@ Elevation170')	187'	(1) 7/8"
(1) 20' 8 Bay Dipole Antenna	Town (existing)	9 Arm Halo Mount (@ Elevation170')	178'	(1) 7/8"
(1) ANT150F6-3 20' Omni Antenna	Town (existing)	9 Arm Halo Mount (@ Elevation170')	178'	(1) 1-5/8"
(1) DS1F03F36U-D Omni Antenna	Town (existing)	9 Arm Halo Mount (@ Elevation170')	175.5'	(1) AVA7-50 1-5/8"Low Density Foam
(1) 3' Omni Antenna	Town (existing)	9 Arm Halo Mount (@ Elevation170')	175.5'	(1) 3/8"
(3) 2-1/2"Dia. x 15' Whip Omni Antennas	Town (existing)	9 Arm Halo Mount (@ Elevation170')	175'	(2) 7/8", (1) 1/2"
(2) 10' Omni (whip) Antennas	Town (existing)	9 Arm Halo Mount (@ Elevation170')	174.5'	(2) 7/8"
(1) DS1F03F36D-D Omni Antenna	Town (existing)	9 Arm Halo Mount (@ Elevation170')	171.5'	(2) AVA5-50 7/8" Low Density Foam Coaxial Cables
(3) Commscope DT465B-2XR Panels (3) TD-RRH8x20-25 RRH Units (3) RFS APXVSPP18-C-A20 Antennas (3) 1900 MHz RRHs (4x45W) (6) 800 MHz RRHs (2x50W)	Sprint (existing)	9 Arm Halo Mount (@ Elevation170')	170'	(5) RFS HB114-1-0804-MSF Hybrid Cables
(1) DS-2DF6236V-Dome Camera	Town (existing)	WMP-L Attachment Bracket mounted to 9 Arm Halo Mount (@ Elevation170')	170'	(1) 1/2"
(1) SU-RA-HP-2.4 (1' x 1' Antenna)	Town (existing)	9 Arm Halo Mount (@ Elevation170')	168'	(1) 3/8"

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(1) Radiowaves HPD2-4.7 w/ Radome (1) Cambium PTP49600 Antenna	CPD (existing)	9 Arm Halo Mount (@ Elevation170')	168'	(1) WB3176A – Copper Clad Outdoor Cable (2) 4' long 1/2" Jumper Cables
(1) Sinclair SC420-HF1LDF Omni	CPD (existing)	Pipe mount	158'-6"	(1) (AVA7-50) 1-5/8" Low Density Foam Cable
(2) 3" dia x 20' Whip	Town (existing)	20' Platform	144'	(2) 7/8"
2" dia x 15' Whip	Town (existing)	20' Platform	141'	(1) 1/2"
(1) 1.5" dia x 10' Whip	Town (existing)	20' Platform	139'	(1) 1/2"
(1) 3.5" dia x 9' Whip	Town (existing)	20' Platform	138'-6"	---
(1) Grid Dish Antenna	Unknown (existing)	20' Platform	136'	(1) 1/2"
(3) Argus LLPX310R antennas (3) Samsung Remote Radio Heads U-RAS (3) Andrew VHLP2.5 dish (2.5' dia.) (1) Andrew VHLP2 dish (2' dia.) (Gamma Sector)	Clearwire (existing)	20' Platform	134'	(6) CAT 5 cable (4) 1/2"
(3) Commscope LNX-6515DS-VTM Panel Antennas (3) Ericsson RRUS_11 RRH Unit (6) Ericsson AIR21 B4A|B2P Antennas (3) Twin PCS TMAs	T-Mobile (existing)	(3) Existing T-Frames	125'	(12) 1 5/8" (1) 1-5/8" Hybrid Cable
(3) CCI HPA-65R-BUU-H6 Panel Antennas (3) CCI DMP65R-BU6DA Panel Antennas (3) Ericsson 4449 B5/B12 RRH Units (3) Ericsson 8843 B2/B66a RRH Units (1) Raycap DC6-48-60-0-8F Surge Arrestor (6) CCI Triplexer Units (TPX-070821) (2 per Sector)	**AT&T (Proposed)**	**(3) Sabre Antenna Mount Frame (Part # C10857001C)**	**115'**	**(2) DC Cables**

Antenna Type	*Carrier*	*Mount*	*Antenna Centerline Elevation*	*Cable*
(2) Surge Suppressor Units (DC6-48-60-18-8C) (3) QS66512-2 Panel Antennas (3) RRUS-32 B30 RRH Units	AT&T (existing)	*Shared with Below Mount*	115’	(6) 1 5/8” (2) Fiber Optic Cables (4) DC Cables
(1) HBX-6517DS-VTM_04DT_2110 Panel Antenna (Alpha Sector) (2) HBX-6517DS-VTM_02DT_2110 Panel Antennas (Beta & Gamma Sectors) (1) DB-T1-6Z-8AB-0Z Distribution Box (3) LNX-6514DS-VTM Panel Antennas (6) FD9R6004/2C-3L Diplexers (6) Commscope NNHH-65B-R4 Panels (3) Alcatel-Lucent B2/B66A RRH Units (3) Alcatel-Lucent B5/B13 RRH Units (1) Raycap RVZDC-6627-PF-48 Distribution Box	Verizon (existing)	(3) SitePro1 VFA12-RRU V-Frames	100’	(1) 1 5/8” F.O Cable (6) 1 5/8” (1) 1-1/4” Hybrid Coaxial Cable
(1) 3” x 2” x 22” Panel (1) TMA	Unknown (existing)	Pipe Mount	87’	(2) CAT 5
(1) 3’ Dish (1) TMA	Unknown (existing)	3’ Stand-off	83’	(2) CAT 5
(1) 3” x 2” x 22” Panel (1) TMA	Unknown (existing)	3’ Stand-off	80’	(2) CAT 5
(1) Camera	Unknown (existing)	Leg Mounted	30’	(2) 1/2”
(1) 3’ Yagi	Unknown (existing)	Leg Mounted	24’	(1) 1/2"

This structural analysis of the communications tower was performed by AECOM on behalf of AT&T. The purpose of this analysis was to investigate the structural integrity of the existing tower with its existing and proposed antenna loads. This analysis was conducted to evaluate stress on the tower and the effect of forces to the foundation of the tower resulting from existing and proposed antenna arrangements.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS

The structural analysis was done in accordance with, the TIA-222-G–Structural Standard for Antenna Towers and Antenna Supporting Structures and Antennas, the 2015 International Building Code with 2018 Connecticut State Building Code Amendments and the American Institute of Steel Construction (AISC) Manual of Steel Construction – Load Resistance Factor Design (LRFD)

The structural analysis was conducted using TNX Tower version 8.0.7.4. and used the following conditions for this tower review (following the TIA-222-G Standard):

- Structure Class 3 – (Essential Communications)
    - NOTE: ASCE 7 and CT State Building Code Applied Risk Category 4 for design wind loads (see below)
- Topographic Category 3 – (Tower location on top of hill – rolling wind conditions considered)
    - Crest height used for analysis: (approximate elevations listed below)
        - Tower Base Elevation = 250 feet
        - High Point (2 Mile Radius) = 290 feet (Ref. Peak of Near-by Hill)
        - Low Point (2 Mile Radius) = 100 feet (Ref. Pearson Pond)
        - "H" = Base Elevation – (Avg. of High/Low) = 290+100/2-250' = **55 feet**
- Exposure Class C – (Open Terrain with scattered obstructions)
- Load Conditions:
    - Two load conditions were evaluated as shown which were compared to design stresses according to AISC and TIA/EIA-222-G Standard.

Basic Wind Speed:

- TIA-222-G:
    - Middlesex County (Wind Speed Range): V = 100 mph - 120 mph (3-second gust) [Annex of TIA/EIA-222-G 2006]
- IBC 2015 w/ 2018 CT State Building Code Amendment:
    - (2015) IBC Section 1609.1.1 – Determination of Wind Loads – Exception 5 "Designs using TIA-222" applies for determination of Design Wind Load obtained as "V.ult" are to be converted to "V.asd" when applying the TIA-222-G design Standard (under Section 1609.3) for Basic Wind Speed.
    - (2018) CT State Building Code Amendment to the IBC Section 1609.3 wind loads are obtained from Appendix N of the State Building Code.
        - **V.asd = 105 mph** (3-Second Gust) Wind Design Parameter for the Town of Cromwell, Connecticut for Risk Category four (IV) for essential communications (Cromwell Fire/Police Department Communications).

Load Condition 1 = 105 mph (3-second gust) Wind Load (without ice) + Tower Dead Load
Load Condition 2 = 50 mph (3-second gust) Wind Load (with ice) + Ice Load + Tower Dead Load

Ice thickness used for this analysis is **0.75 inch** (assumed to start at the base of the tower) and is considered to increase in thickness with height. The initial ice thickness for design is referenced in the Annex of TIA-222-G and follows the same design criteria as the ASCE 7 Standard.

3. ANALYSIS METHODOLOGY AND LOADING CONDITIONS (cont.)

Seismic event consideration factors/values for design:

- S.s = 0.181 (2018 CT State Building Code – Location Specific Value)
- S.1 = 0.063 (2018 CT State Building Code – Location Specific Value)
- Site Classification = “D”
- Seismic Design Category = “C” – (2015 International Building Code)
- F.a = 1.6 (Obtained from TIA-222-G Table 2-12 Considering above conditions)
- F.v = 2.4 (Obtained from TIA-222-G Table 2-13 Considering above conditions)

Strength Limit State Load Combinations (TIA-222-G Section 2.3.2):

The structural analysis herein has considered the following load combinations within the analysis:

1. ***1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.6 Wind load without ice***
2. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Dead weight of ice due to factored ice thickness + 1.0 Concurrent wind load with factored ice thickness + 1.0 Load effects due to temperature
3. 1.2 Dead Load Tower structure + 1.0 Dead Load Guy Assemblies + 1.0 Earthquake Load

NOTE 1: The above **bolded** load combination is considered to create the governing design loads per the results of the analysis.

NOTE 2: The above “Dead Load Guy Assemblies” are not considered as part of the analysis and are considered as a value of zero.

NOTE 3: The “Load effects due to temperature” do not apply for structures that are self-sustaining (from the TIA-222-G Standard)

4. FINDINGS AND EVALUATION

The combined axial and bending stresses on the tower structure were evaluated to compare with the strength design in accordance with AISC. The results of the analysis indicates that the existing tower structure, anchor bolts and foundation has enough capacity to support the proposed loading conditions noted herein. The results of the analysis indicates that the existing tower anchor bolts and foundation have enough capacity to support the proposed loading conditions noted herein.

The table below summarizes the critical member capacities for each tower component.

TABLE 1: Tower Component Stress vs. Capacity Summary:

Component/ (Section No.)	Existing Component Size	Controlling Component/Elevation	Percent Capacity	Pass/Fail
Tower Leg (T8)	PiROD Truss Leg	Compression 40' – 60'	**89.2 %**	**Pass**
Tower Leg (T6)	PiROD Truss Leg w/ 1" dia bar welded to Truss leg	Tension 80' – 90'	**85.0 %**	**Pass**
Diagonal (T4)	L3x3x1/4	Compression 100' – 120'	**88.2 %**	**Pass**
Top Girt (T1)	7/8" SR	Compression 150' – 170'	**17.0 %**	**Pass**
Bottom Girt (T1)	7/8" SR	Compression 150' – 170'	**6.5 %**	**Pass**
Mid Girt (T4)	L3x3x3/16	Compression 100' – 120'	**41.8 %**	**Pass**
Bolt Checks				
Tower Bolts	(1) 1 " A325N Diagonal Bolt	Member Bearing on connection (100' – 120')	**88.2 %**	**Pass**
Anchor Bolts	(6) 1-1/4"	Tension / ASTM A687 *(Fy = 105 ksi; Fu = 150 ksi)*	**80.0 %**	**Pass**

TABLE 2: Foundation Summary

Foundation	Component	Stress (% capacity/FOS)	Pass/Fail	Comments:
Previously Modified Drilled Concrete Caisson	Uplift	45.47 %	**Pass**	Foundation calculations updated to the TIA-222-G design Standard & Updated Geotechnical Report

Structure Rating (Maximum from all components) =	**89.2 %**	**Pass**

4. FINDINGS AND EVALUATION (cont.)

Maximum Deformations – Proposed Condition

ANSI/TIA-222-G Section 2.8.2 - Limit State Deformations

1. A rotation of 4 degrees about the vertical axis (twist) or any horizontal axis (sway) of the structure
2. A horizontal displacement (in feet) of 3% of the height of the structure.

Load Case Description	Current		Allowable	
	Sway (degree)	Displacement (Feet)	Sway (degree)	Displacement (Feet)
Service Wind Load	0.2753	0.3907	4.0	5.10

5. CONCLUSIONS AND RECOMMENDATIONS

The results of the analysis indicate that:

1. The existing steel tower structure IS considered structurally adequate for the proposed antenna loading with the wind classification specified above.

2. The existing tower anchor bolts ARE considered structurally adequate for the proposed antenna loading with the load classification specified above.

3. The existing foundation caissons ARE considered structurally adequate for the proposed antenna loading with the load classification specified above.

4. The controlling structural capacity for all tower and foundation components is **89.2 %**

Limitations/Assumptions:

This report is based on the following:

1. Tower inventory as listed in this report coordinated with the latest State of Connecticut Siting Council approved Decisions.

2. Tower is properly installed and maintained.

3. All members are as specified in the original design documents and are in good condition.

4. All required members are in place.

5. All bolts are in place and are properly tightened.

6. Tower is in plumb condition.

7. All member protective coatings are in good condition.

8. All tower members were properly designed, detailed, fabricated, and installed and have been properly maintained since erection.

9. Existing tower gusset connection plates were properly constructed to support original design loads and is assumed to support proposed loading conditions stated herein.

10. Foundations are in good condition without defect and were properly constructed to support original design loads as specified in the original design documents.

11. Previous modification analyses as stated within the Executive Summary of this report are assumed constructed unless noted otherwise.

AECOM is not responsible for any modifications completed prior to or hereafter in which AECOM is not or was not directly involved. Modifications include but are not limited to:

A. Adding antennas
B. Removing/replacing antennas
C. Adding coaxial cables

AECOM hereby states that this document represents the entire report and that it assumes no liability for any factual changes that may occur after the date of this report. All representations, recommendations, and conclusions are based upon information contained and set forth herein. If you are aware of any information which conflicts with that which is contained herein, or you are aware of any defects arising from original design, material, fabrication, or erection deficiencies,

you should disregard this report and immediately contact AECOM. AECOM disclaims all liability for any representation, recommendation, or conclusion not expressly stated herein.

Ongoing and Periodic Inspection and Maintenance:

After the Contractor has successfully completed the installation and the work has been accepted, the owner will be responsible for the ongoing and periodic inspection and maintenance of the tower.

The tower owner shall refer to TIA-222-G Section 14.2 for recommendations for maintenance and inspection. The frequency of the inspection and maintenance intervals is to be determined by the owner based upon actual site and environmental conditions. It is recommended that a complete and thorough inspection of the entire tower structural system be performed at least yearly and more frequently as conditions warrant. It is also recommended that the structure be inspected after severe wind and/or ice storms or other extreme loading conditions.

6. DRAWINGS AND DATA

SEISMIC BASE SHEAR ANALYSIS

AECOM

Seismic (Vs) Base Shear Implementing ANSI/TIA–222-G, IBC 2015 & Connecticut State Building Code of 2018

Calculation of Seismic Base Shear Implementing ANSI/TIA-222-G, IBC 2015 & CT State Building Code 2018.

Location: Cromwell, CT -Site Class "D"

$S_{DS} = \frac{2}{3} F_A S_S$, where $S_S = 0.181$ and $F_A = 1.6$ $S_{DS} = \frac{2}{3} F_A S_S = \frac{2}{3} * 1.6 * 0.181 = 0.193$

$S_{D1} = \frac{2}{3} F_V S_1$, where $S_1 = 0.063$ and $F_V = 2.4$ $S_{D1} = \frac{2}{3} F_V S_1 = \frac{2}{3} * 2.4 * 0.063 = 0.101$

TIA-222-G SECTION 2.7 EARTHQUAKE LOADS (PROCEDURES):

1. Importance Factor "I" (tables 2-3 TIA-222-G) = 1.5 (Structure Class 3)

ANSI/TIA-222-G 2.7.7.1 (TOTAL BASE SEISMIC SHEAR (Vs)

W=DL TOWER	=	30.710	Kips
W=Antennas/Mounts	=	17.783	Kips
W=Cables	=	6.450	Kips
		54.943	Kips = WT Total = "W"

$$V_s = \frac{S_{DS} * W * I}{R} = \frac{0.193 * 54.943 kips * 1.5}{3.0} = 5.3 \ kips,$$ where R = 3.0 for Lattice Tower

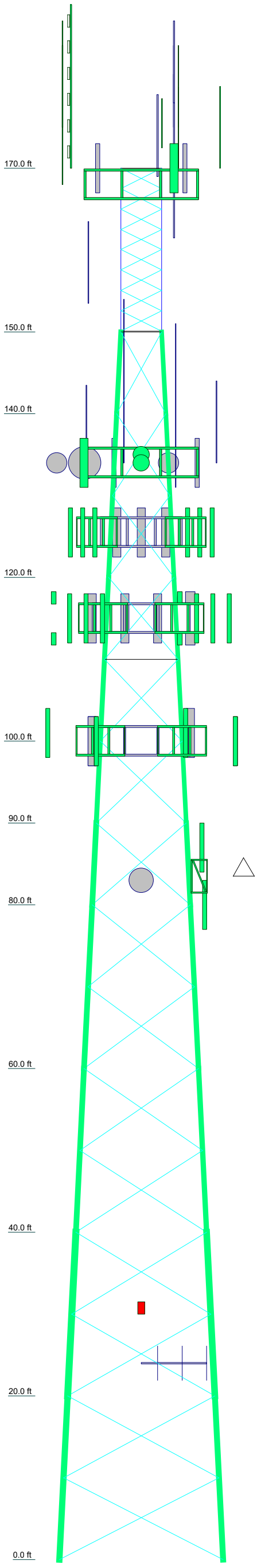
$$V_{S.min} = \frac{0.5 * S_{D1} * W * I}{R} = \frac{0.5 * 0.101 * 54.943 kips * 1.5}{3.0} = 1.387 \ kips$$

*By visual inspection, the above "Base Shear" value when considering the following Load Combination is less that the base shear of wind on structure.

$1.2 * DL + 1.0\ E < 1.2\ DL + 1.6\ W$, (94.3 Kips), therefore seismic effect on structure Does NOT control Design.

TNX TOWER INPUT/OUTPUT SUMMARY

Section	Legs	Leg Grade	Diagonals	Diagonal Grade	Top Girts	Mid Girts	Bottom Girts	Face Width (ft)	# Panels @ (ft)	Weight (lb) 32887.7
T1	SR 1 3/4	A572-50	SR 7/8	A572-50	SR 7/8	N.A.	SR 7/8	5	8 @ 2.48958	1101.1
T2	Pirod 105244		L2 1/2x2 1/2x3/16	A36	L3x3x3/16			6		1071.2
T3	Pirod 105216		L3x3x1/4	A529-50				8		2164.3
T4	Pirod 105217		L 3x3x1/4	A36	L3x3x3/16	N.A.	N.A.	10	15 @ 10	2662.9
T5			L3 1/2x3 1/2x5/16	A529-50				11		1565.1
T6	A			A36				12		1774.7
T7	Pirod 105218 reinf w/ 1" dia bar			A529-50	N.A.			14		4036.4
T8	Pirod 105219			A36	N.A.			16		4241.3
T9	B		L4x4x5/16					18		7988.3
T10	Pirod 105220 reinf w/ 1" dia bar		L5x5x5/16	A529-50				20		6342.5



DESIGNED APPURTENANCE LOADING

TYPE	ELEVATION	TYPE	ELEVATION
DS1F03F36U-D Omni Antenna (CFD - Recently Installed)	170	Sabre C10857801 12' V-Boom Mount Frame (ATI - Proposed)	115
DS1F03F36D 23' Omni Antenna (CFD - Recently Installed)	170	Sabre C10857801 12' V-Boom Mount Frame (ATI - Proposed)	115
101-90-08-0-01 ((183') Municipal - A)	170	DMP65R-BU6DA (ATI - Proposed)	115
15' Mount Pipe ((183') Municipal - A)	170	Quintel QS66512-2 Panel (ATI)	115
20' 8 Bay Di-Pole ((178') Municipal - E)	170	DMP65R-BU6DA (ATI - Proposed)	115
3' Whip (3in diameter) /w mount ((175.5') Municipal - C)	170	Quintel QS66512-2 Panel (ATI)	115
		DMP65R-BU6DA (ATI - Proposed)	115
2.5' Decibel Omni ((175') Municipal - I)	170	Quintel QS66512-2 Panel (ATI)	115
2.5' Decibel Omni ((175') Municipal - I)	170	CCI HPA-65R-BUU-H6 Panel (ATI - Proposed)	115
2.5' Decibel Omni ((175') Municipal - I)	170	CCI HPA-65R-BUU-H6 Panel (ATI - Proposed)	115
2" Dia 10' Omni ((174.5') Municipal - H)	170	CCI HPA-65R-BUU-H6 Panel (ATI - Proposed)	115
2" Dia 10' Omni ((174.5') Municipal - H)	170	Ericsson RRUS-32 RRH Unit (ATI)	115
ANT150F6 ((174') Municipal - B)	170	Ericsson RRUS-32 RRH Unit (ATI)	115
APXVSPP18-C-A20 (Sprint)	170	Ericsson RRUS-32 RRH Unit (ATI)	115
APXVSPP18-C-A20 (Sprint)	170	4449 B5/B12 RRH (ATI - Proposed)	115
APXVSPP18-C-A20 (Sprint)	170	4449 B5/B12 RRH (ATI - Proposed)	115
Panasonic RRH 1900MHZ (Sprint)	170	4449 B5/B12 RRH (ATI - Proposed)	115
Panasonic RRH 1900MHZ (Sprint)	170	8843 B2/B66A RRH (ATI - Proposed)	115
Panasonic RRH 1900MHZ (Sprint)	170	8843 B2/B66A RRH (ATI - Proposed)	115
Andrew 800MHz RRH (Sprint)	170	8843 B2/B66A RRH (ATI - Proposed)	115
Andrew 800MHz RRH (Sprint)	170	(2) Raycap DC6-48-60-18-8C Distribution Unit (ATI)	115
Andrew 800MHz RRH (Sprint)	170		
TD-RRH8x20-25 (Sprint)	170	DC6-48-60-0-8F Squid (ATI-Proposed)	115
TD-RRH8x20-25 (Sprint)	170	(2) CCI TPX-070821 Triplexer Units (ATI-Proposed)	115
TD-RRH8x20-25 (Sprint)	170		
DT465B-2XR-V2 Panels (Commscope) (Sprint)	170	(2) CCI TPX-070821 Triplexer Units (ATI-Proposed)	115
DT465B-2XR-V2 Panels (Commscope) (Sprint)	170		
DT465B-2XR-V2 Panels (Commscope) (Sprint)	170	(2) CCI TPX-070821 Triplexer Units (ATI-Proposed)	115
Andrew 800MHz RRH (Sprint)	170		
Andrew 800MHz RRH (Sprint)	170	HBXX-6517DS-VTM (Verizon - AWS)	101
Andrew 800MHz RRH (Sprint)	170	HBXX-6517DS-VTM (Verizon - AWS)	101
CFD Halo Camera Bracket (Camera)	170	HBXX-6517DS-VTM (Verizon - AWS)	101
CFD Halo Mounted Camera (Camera)	170	SitePro1 VFA12-RRU Mount Assembly (Verizon - Proposed)	100
9 Arm Halo Mount (Municipal)	168	SitePro1 VFA12-RRU Mount Assembly (Verizon - Proposed)	100
SU-RA-HP-2.4 Antenna (Municipal)	168		
PTP49600 (CPD)	168	SitePro1 VFA12-RRU Mount Assembly (Verizon - Proposed)	100
SC420-HF1LDF (Municipal)	158.5		
2.5" x 20'6" Whip (Municipal)	144	LNX-6514DS-T4M (Verizon)	100
2" Dia 15' Omni (Municipal)	141	LNX-6514DS-T4M (Verizon)	100
1.5" x 10' Omni (Municipal)	139	LNX-6514DS-T4M (Verizon)	100
9' Whip (Municipal)	138.5	Raycap RVZDC-6627-PF-48 (Verizon)	100
HPD2-4.7 (Updated Elevation per NET Inc. Inventory)	135	AlcatelLucent B5/B13 RRH Unit (Verizon - Proposed)	100
PiROD 20' Universal Platform (Municipal)	134	AlcatelLucent B5/B13 RRH Unit (Verizon - Proposed)	100
Argus LLPX310R (Clearwire)	134	AlcatelLucent B5/B13 RRH Unit (Verizon - Proposed)	100
Argus LLPX310R (Clearwire)	134	AlcatelLucent B2/B66A RRH Unit (Verizon - Proposed)	100
Argus LLPX310R (Clearwire)	134	AlcatelLucent B2/B66A RRH Unit (Verizon - Proposed)	100
REMOTE RADIO HEAD (RRH) (Clearwire)	134	AlcatelLucent B2/B66A RRH Unit (Verizon - Proposed)	100
REMOTE RADIO HEAD (RRH) (Clearwire)	134	Commscope NNHH-65C-R4 / w 2" Mount Pipe (Verizon - Proposed)	100
REMOTE RADIO HEAD (RRH) (Clearwire)	134	Commscope NNHH-65C-R4 / w 2" Mount Pipe (Verizon - Proposed)	100
VHLP2.5-180 (Clearwire)	134	Commscope NNHH-65C-R4 / w 2" Mount Pipe (Verizon - Proposed)	100
VHLP2.5-180 (Clearwire)	134	Commscope NNHH-65C-R4 / w 2" Mount Pipe (Verizon - Proposed)	100
VHLP2.5-180 (Clearwire)	134	Commscope NNHH-65C-R4 / w 2" Mount Pipe (Verizon - Proposed)	100
VHLP2-180 (Clearwire)	134	Raycap RVZDC-6627-PF-48 (Verizon - Proposed)	100
4' Grid Dish (Unknown)	134	3"x2"x22" Panel (Unknown)	87
LNX-6515DS-VTM w/ 6' 2" sch 40 Piipe Mount (T-Mobile)	125.5	TMA (Unknown)	84.5
Ericsson AIR21 B2A|B4P Panel (T-Mobile)	125.5	3' Stand-off	83.5
Ericsson AIR21 B2A|B4P Panel (T-Mobile)	125.5	3' Stand-off	83.5
Ericsson AIR21 B2A|B4P Panel (T-Mobile)	125.5	3' Dish	83
Ericsson AIR21 B2A|B4P Panel (T-Mobile)	125.5	TMA (Unknown)	82.5
Ericsson AIR21 B2A|B4P Panel (T-Mobile)	125.5	3"x2"x22" Panel (Unknown)	80
Ericsson AIR21 B2A|B4P Panel (T-Mobile)	125.5	TMA (Unknown)	80
Twin PCS TMA (T-Mobile)	125.5	Camera	30
LNX-6515DS-VTM w/ 6' 2" sch 40 Piipe Mount (T-Mobile)	125.5	PC9013N	24
Ericsson RRUS-11 RRH Unit (T-Mobile)	125.5		
Twin PCS TMA (T-Mobile)	125.5		
LNX-6515DS-VTM w/ 6' 2" sch 40 Piipe Mount (T-Mobile)	125.5		
Twin PCS TMA (T-Mobile)	125.5		
Ericsson RRUS-11 RRH Unit (T-Mobile)	125.5		
Ericsson RRUS-11 RRH Unit (T-Mobile)	125.5		
PiROD 10' Lightweight T-Frame (T-Mobile)	125.5		
PiROD 10' Lightweight T-Frame (T-Mobile)	125.5		
PiROD 10' Lightweight T-Frame (T-Mobile)	125.5		
Sabre C10857801 12' V-Boom Mount Frame (ATI - Proposed)	115		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105217 reinf w/ 1" dia bar	B	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
2. Tower designed for a 97 mph basic wind in accordance with the TIA-222-G Standard.
3. Tower is also designed for a 50 mph basic wind with 0.75 in ice. Ice is considered to increase in thickness with height.
4. Deflections are based upon a 60 mph wind.
5. Tower Structure Class III.
6. Topographic Category 3 with Crest Height of 55.00 ft
7. Tower Base Elevation = 250'
8. Top of High point (2 mi. Radius) = 290' Hill next to tower
9. Low Point within 2 mi Radius = 100' Pearon Pond
10. "H" = 250' - (290'+100'/2) = 250'-195' = 55'
11. Windspeed shown as "97mph" is applying the Category 3/4 Wind speed of 105 mph for TIA-G Structure Class 3.
12. Weld together tower sections have flange connections.
13. Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications.
14. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
15. Welds are fabricated with ER-70S-6 electrodes.
16. Edge Distances for Diagonal Members from 0'-20' and 120'-140' were field measured and adapted to this analysis (06/17/2019).

AECOM
1255 Broad St. Suite 201
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Phone: (973) 883-8663
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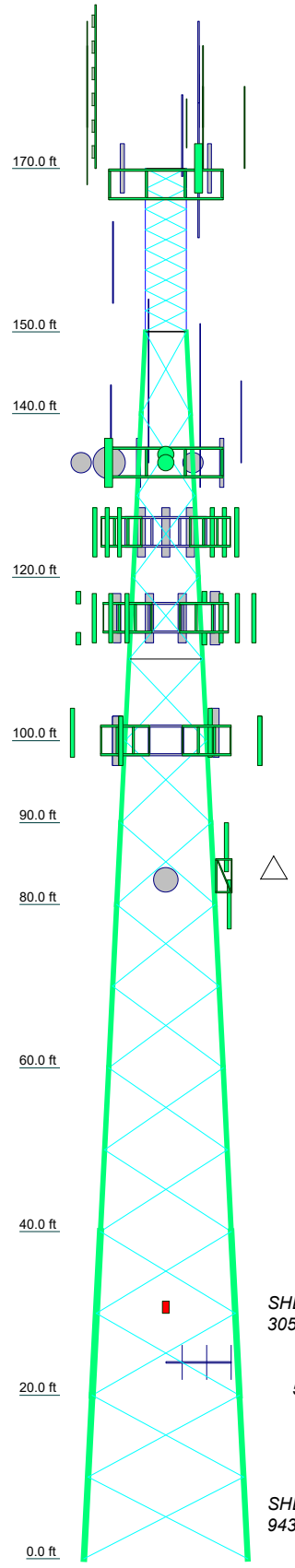
Job:	***PiROD U20'-0"x170' Lattice Tower***		
Project:	***Cromwell, CT Tower***		
Client: AT&T/VZW - Structural Analysis \ Revision 2	Drawn by: christina.carlos	App'd:	
Code: TIA-222-G	Date: 09/03/20	Scale: NTS	
Path: C:\Users\christina.carlos\Desktop\tnxTower\Cromwell\New Analysis - August '20\ERI-GI_AT&T Cromwell_RFDS Update V4 072320.eri		Dwg No. E-1	



Section		T1	T2	T3	T4	T5	T6	T7	T8	T9	T10		
Legs		SR 1 3/4	A	Pirod 105216	Pirod 105217		B	C	Pirod 105219	D	E		
Leg Grade		A572-50											
Diagonals		SR 7/8	F	L3x3x1/4	L 3x3x1/4			L3 1/2x3 1/2x5/16		L4x4x5/16	L5x5x5/16		
Diagonal Grade		A572-50	A36	A529-50	A36	A529-50	A36	A529-50	A36	A529-50			
Top Girts		SR 7/8	L3x3x3/16					N.A.					
Mid Girts			N.A.		L3x3x3/16				N.A.				
Bottom Girts		SR 7/8						N.A.					
Face Width (ft)	20	5		6	8	10	11	12	14	16	18		
# Panels @ (ft)		8 @ 2.48958						15 @ 10					
Weight (lb)	32887.7	1101.1	1071.2	2164.3	2662.9	1505.1	1774.7	4036.4	4241.3	7988.3	6342.5		

SYMBOL LIST

MARK	SIZE	MARK	SIZE
A	Pirod 105244	D	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)
B	Pirod 105217 reinf w/ 1" dia bar	E	Pirod 105220 reinf w/ 1" dia bar
C	Pirod 105218 reinf w/ 1" dia bar	F	L2 1/2x2 1/2x3/16

MATERIAL STRENGTH

GRADE	Fy	Fu	GRADE	Fy	Fu
A572-50	50 ksi	65 ksi	A529-50	50 ksi	65 ksi
A36	36 ksi	58 ksi			

TOWER DESIGN NOTES

1. Tower designed for Exposure C to the TIA-222-G Standard.
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14. Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards.
15. Welds are fabricated with ER-70S-6 electrodes.
16. Edge Distances for Diagonal Members from 0'-20' and 120'-140' were field measured and adapted to this analysis (06/17/2019).
17. TOWER RATING: 89.2%

ALL REACTIONS ARE FACTORED

MAX. CORNER REACTIONS AT BASE:
DOWN: 501169 lb
SHEAR: 59066 lb

UPLIFT: -450553 lb
SHEAR: 53735 lb

AXIAL 229716 lb
SHEAR 30554 lb *MOMENT 2692526 lb-ft*
TORQUE 26390 lb-ft
50 mph WIND - 0.7500 in ICE

AXIAL 68009 lb
SHEAR 94379 lb *MOMENT 8287848 lb-ft*
TORQUE 22113 lb-ft
REACTIONS - 97 mph WIND

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Project: ***Cromwell, CT Tower***			
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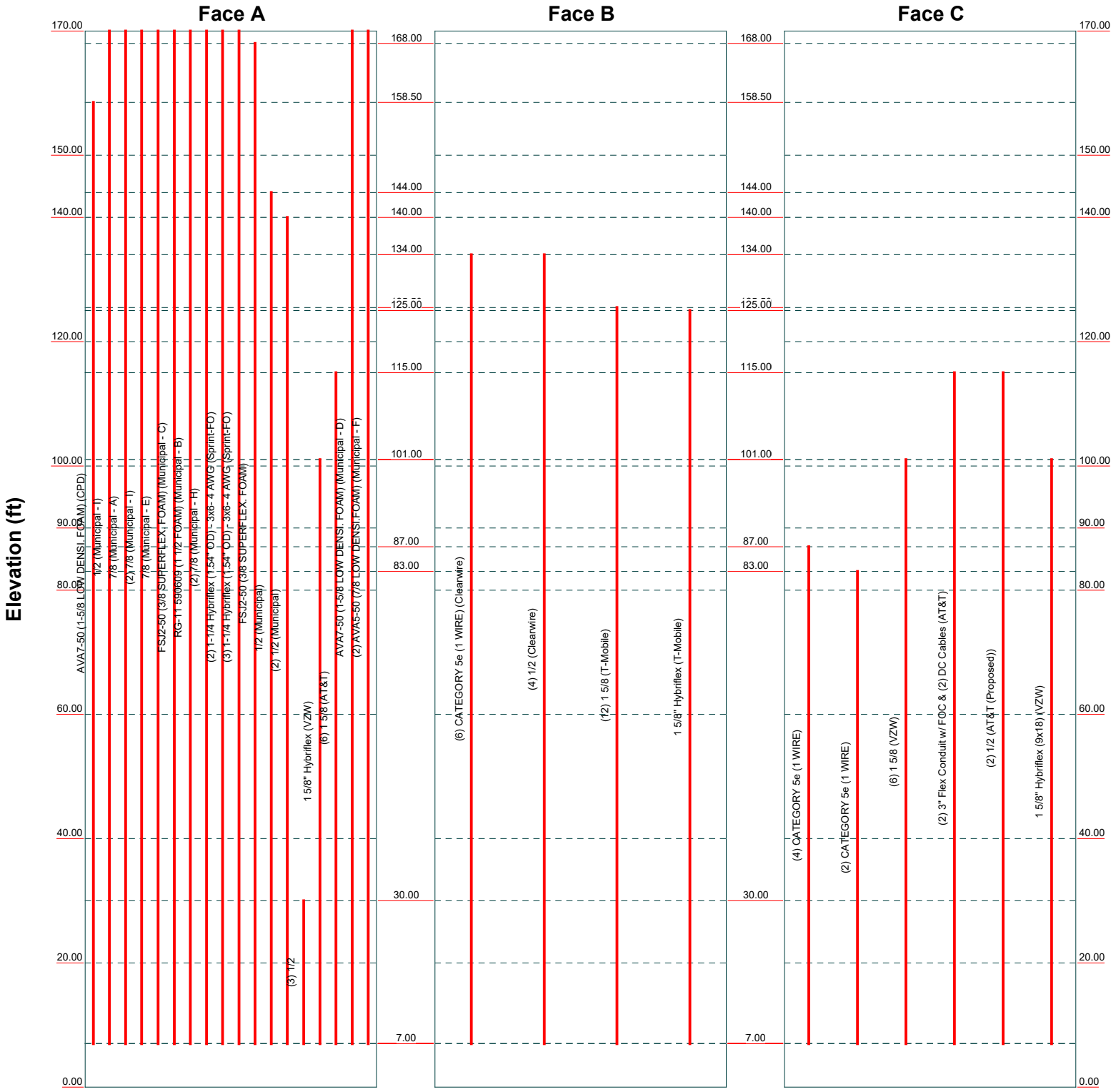
Code: TIA-222-G	Date: 09/03/20	Scale: NTS	
Path: C:\Users\christina.carlos\Desktop\tnxTower\Cromwell\New Analysis - August '20\ERI-G\ AT&T Cromwell RFDS Update V4 072320.eri		Dwg No. E-1	

TNX TOWER FEEDLINE DISTRIBUTION CHART

Feed Line Distribution Chart
0' - 170'

Round | Flat | App In Face | App Out Face | Truss Leg



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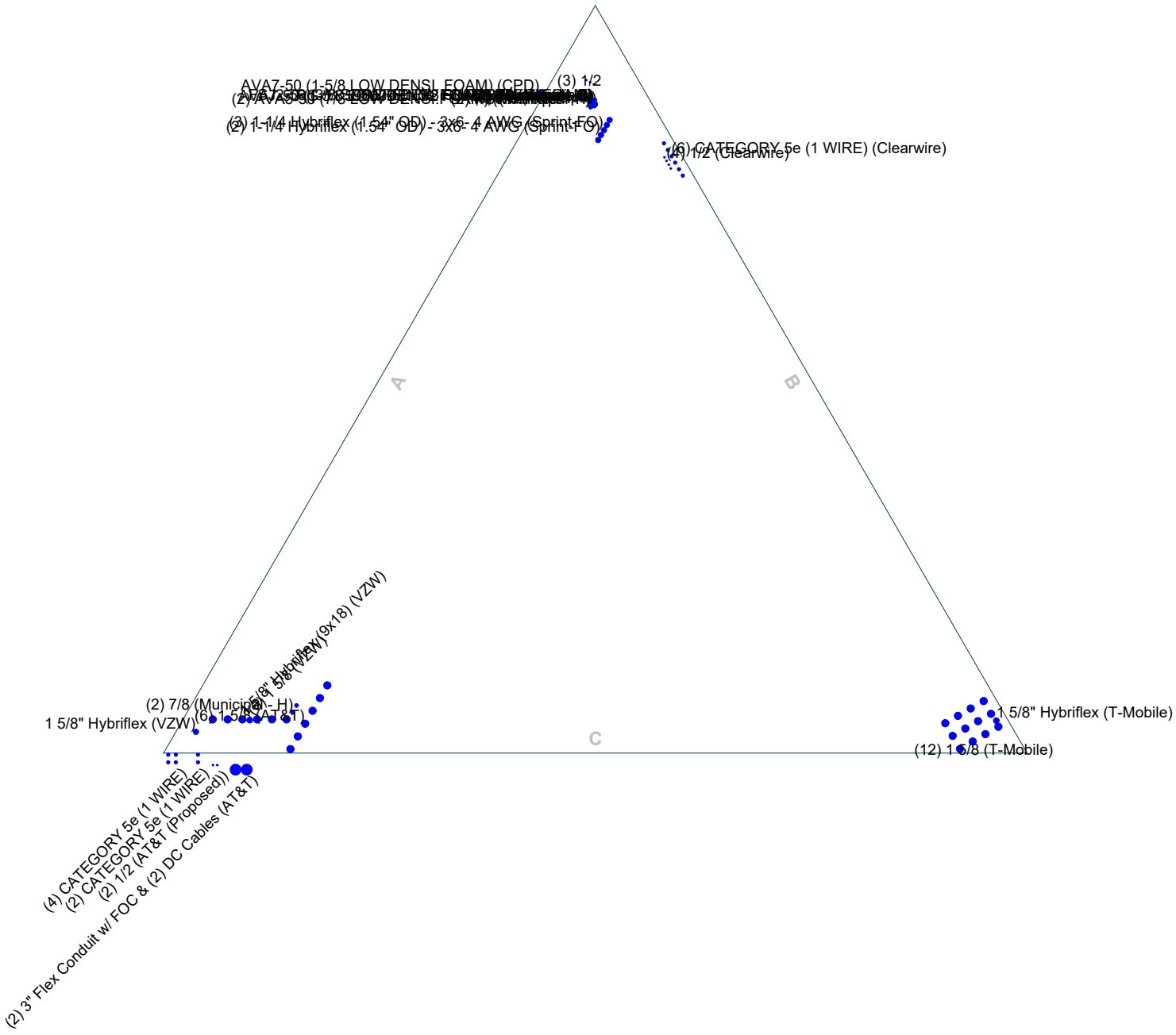
TNX TOWER FEEDLINE PLAN

Feed Line Plan

Round | Flat | App In Face | App Out Face | Truss-Leg



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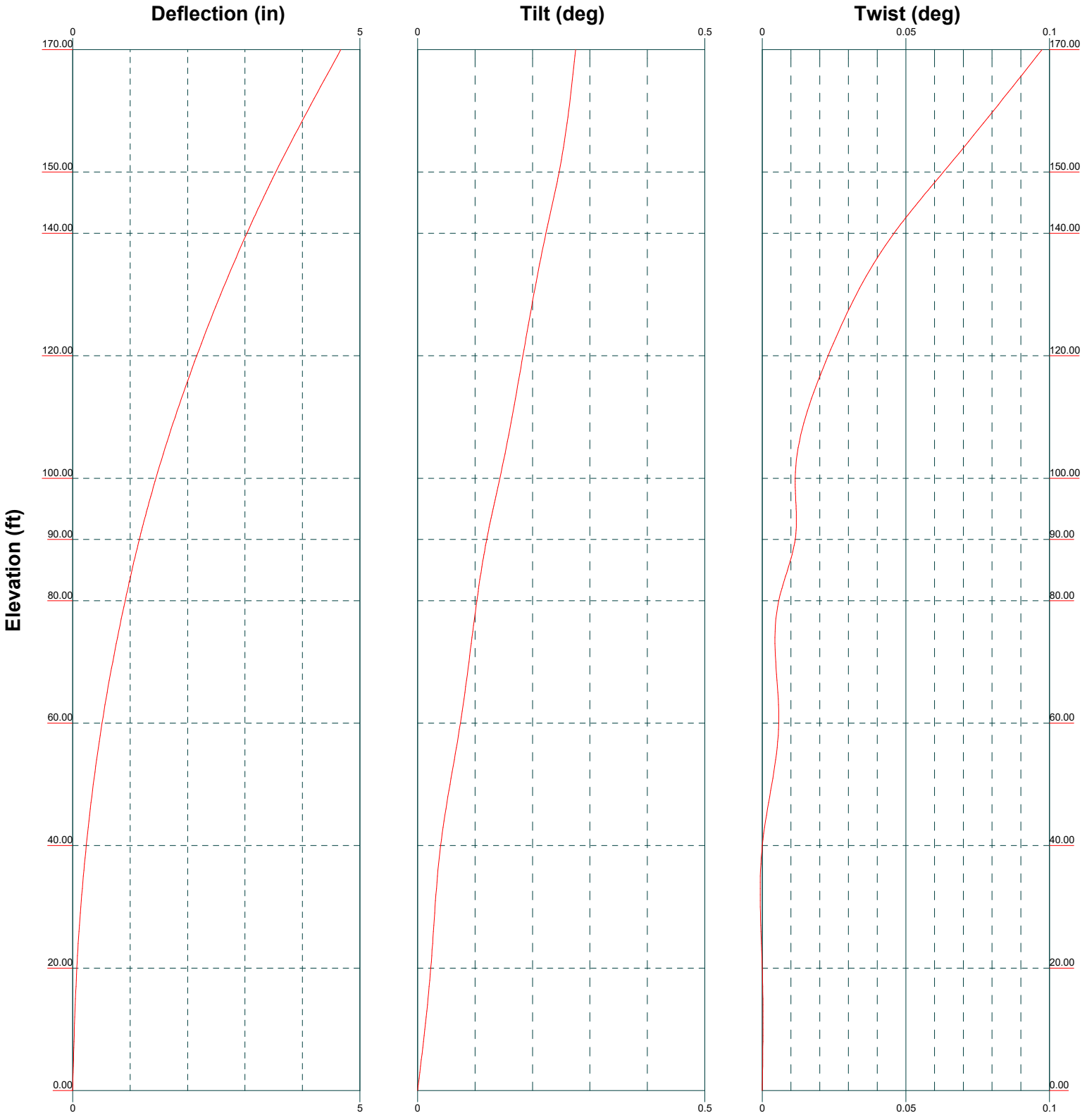
Path: C:\Users\christina.carlos\Desktop\tnxTower\Cromwell\New Analysis - August '20\ERI-G\ AT&T Cromwell_RFDS Update V4 072320.eri			Dwg No. E-7

TNX TOWER DEFLECTION, TILT, AND TWIST

TIA-222-G - Service - 60 mph

Maximum Values



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Client: AT&T/VZW - Structural Analysis \ Revision 2	Drawn by: christina.carlos	App'd:	
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Path: C:\Users\christina.carlos\Desktop\tnxTower\Cromwell\New Analysis - August '20\ERI-G\ AT&T Cromwell_RFDS Update V4 072320.eri		Dwg No. E-5	

TNX TOWER DETAILED OUTPUT

Tower Input Data

The main tower is a 3x free standing tower with an overall height of 170.00 ft above the ground line.
The base of the tower is set at an elevation of 0.00 ft above the ground line.
The face width of the tower is 5.00 ft at the top and 20.00 ft at the base.
This tower is designed using the TIA-222-G standard.
The following design criteria apply:

Basic wind speed of 97 mph.
Structure Class III.
Exposure Category C.
Topographic Category 3.
Crest Height 55.00 ft.
Nominal ice thickness of 0.7500 in.
Ice thickness is considered to increase with height.
Ice density of 56 pcf.
A wind speed of 50 mph is used in combination with ice.
Temperature drop of 50 °F.
Deflections calculated using a wind speed of 60 mph.
Tower Base Elevation = 250'.
Top of High point (2 mi. Radius) = 290' Hill next to tower.
Low Point within 2 mi Radius = 100' Pearon Pond.
"H" = 250' - (290'+100'/2) = 250'-195' = 55'.
Windspeed shown as "97mph" is applying the Category 3/4 Wind speed of 105 mph for TIA-G Structure Class 3..
Weld together tower sections have flange connections..
Connections use galvanized A325 bolts, nuts and locking devices. Installation per TIA/EIA-222 and AISC Specifications..
Tower members are "hot dipped" galvanized in accordance with ASTM A123 and ASTM A153 Standards..
Welds are fabricated with ER-70S-6 electrodes..
Edge Distances for Diagonal Members from 0'-20' and 120'-140' were field measured and adapted to this analysis (06/17/2019)..
Pressures are calculated at each section.
Stress ratio used in tower member design is 1.
Local bending stresses due to climbing loads, feed line supports, and appurtenance mounts are not considered.

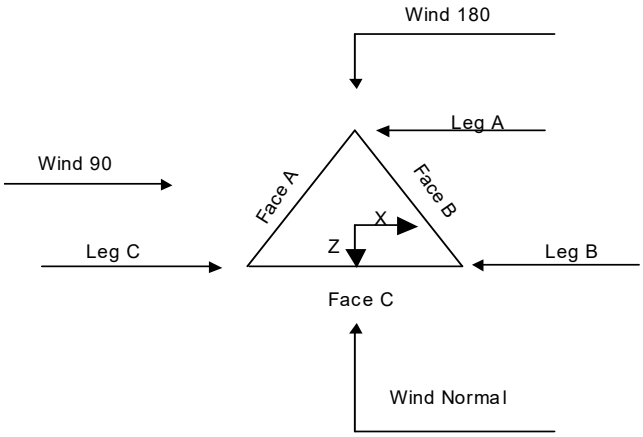
Options

	Consider Moments - Legs		Distribute Leg Loads As Uniform		Use ASCE 10 X-Brace Ly Rules
	Consider Moments - Horizontals		Assume Legs Pinned	√	Calculate Redundant Bracing Forces
	Consider Moments - Diagonals	√	Assume Rigid Index Plate		Ignore Redundant Members in FEA
	Use Moment Magnification	√	Use Clear Spans For Wind Area		SR Leg Bolts Resist Compression
√	Use Code Stress Ratios	√	Use Clear Spans For KL/r	√	All Leg Panels Have Same Allowable
√	Use Code Safety Factors - Guys		Retension Guys To Initial Tension		Offset Girt At Foundation
	Escalate Ice	√	Bypass Mast Stability Checks	√	Consider Feed Line Torque
	Always Use Max Kz		Use Azimuth Dish Coefficients	√	Include Angle Block Shear Check
	Use Special Wind Profile		Project Wind Area of Appurt.		Use TIA-222-G Bracing Resist. Exemption
√	Include Bolts In Member Capacity		Autocalc Torque Arm Areas		Use TIA-222-G Tension Splice Exemption
√	Leg Bolts Are At Top Of Section		Add IBC .6D+W Combination		Poles
√	Secondary Horizontal Braces Leg	√	Sort Capacity Reports By Component		Include Shear-Torsion Interaction
	Use Diamond Inner Bracing (4 Sided)		Triangulate Diamond Inner Bracing		Always Use Sub-Critical Flow
	SR Members Have Cut Ends		Treat Feed Line Bundles As Cylinder		Use Top Mounted Sockets

SR Members Are Concentric

Ignore KL/ry For 60 Deg. Angle Legs

Pole Without Linear Attachments
Pole With Shroud Or No Appurtenances
Outside and Inside Corner Radii Are Known



Triangular Tower

Tower Section Geometry

Tower Section	*Tower Elevation*	*Assembly Database*	*Description*	*Section Width*	*Number of Sections*	*Section Length*
	ft			*ft*		*ft*
T1	170.00-150.00			5.00	1	20.00
T2	150.00-140.00		U6.0 105244	5.00	1	10.00
T3	140.00-120.00		U8.0 105216	6.00	1	20.00
T4	120.00-100.00		U10.0 105217 L3x3/16	8.00	1	20.00
T5	100.00-90.00		U12.0 105216	10.00	1	10.00
T6	90.00-80.00		U12.0 105216	11.00	1	10.00
T7	80.00-60.00		U14.0 105218	12.00	1	20.00
T8	60.00-40.00		U16.0 105219	14.00	1	20.00
T9	40.00-20.00		U18.0 105219	16.00	1	20.00
T10	20.00-0.00		U20.0 105219 L4x1/4	18.00	1	20.00

Tower Section Geometry *(cont'd)*

Tower Section	Tower Elevation ft	Diagonal Spacing ft	Bracing Type	Has K Brace End Panels	Has Horizontals	Top Girt Offset in	Bottom Girt Offset in
T1	170.00-150.00	2.49	X Brace	No	No	0.0000	1.0000
T2	150.00-140.00	10.00	X Brace	No	No	0.0000	0.0000
T3	140.00-120.00	10.00	X Brace	No	No	0.0000	0.0000
T4	120.00-100.00	10.00	X Brace	No	No	0.0000	0.0000
T5	100.00-90.00	10.00	X Brace	No	No	0.0000	0.0000
T6	90.00-80.00	10.00	X Brace	No	No	0.0000	0.0000
T7	80.00-60.00	10.00	X Brace	No	No	0.0000	0.0000
T8	60.00-40.00	10.00	X Brace	No	No	0.0000	0.0000
T9	40.00-20.00	10.00	X Brace	No	No	0.0000	0.0000
T10	20.00-0.00	10.00	X Brace	No	No	0.0000	0.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Type	Leg Size	Leg Grade	Diagonal Type	Diagonal Size	Diagonal Grade
T1 170.00-150.00	Solid Round	1 3/4	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 150.00-140.00	Truss Leg	Pirod 105244	A572-50 (50 ksi)	Single Angle	L2 1/2x2 1/2x3/16	A36 (36 ksi)
T3 140.00-120.00	Truss Leg	Pirod 105216	A572-50 (50 ksi)	Equal Angle	L3x3x1/4	A529-50 (50 ksi)
T4 120.00-100.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Single Angle	L 3x3x1/4	A36 (36 ksi)
T5 100.00-90.00	Truss Leg	Pirod 105217	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A529-50 (50 ksi)
T6 90.00-80.00	Truss Leg	Pirod 105217 reinf w/ 1" dia bar	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T7 80.00-60.00	Truss Leg	Pirod 105218 reinf w/ 1" dia bar	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A529-50 (50 ksi)
T8 60.00-40.00	Truss Leg	Pirod 105219	A572-50 (50 ksi)	Equal Angle	L3 1/2x3 1/2x5/16	A36 (36 ksi)
T9 40.00-20.00	Truss Leg	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)	A572-50 (50 ksi)	Equal Angle	L4x4x5/16	A529-50 (50 ksi)
T10 20.00-0.00	Truss Leg	Pirod 105220 reinf w/ 1" dia bar	A572-50 (50 ksi)	Equal Angle	L5x5x5/16	A529-50 (50 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Top Girt Type	Top Girt Size	Top Girt Grade	Bottom Girt Type	Bottom Girt Size	Bottom Girt Grade
T1 170.00-150.00	Solid Round	7/8	A572-50 (50 ksi)	Solid Round	7/8	A572-50 (50 ksi)
T2 150.00-140.00	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	No. of Mid Girts	Mid Girt Type	Mid Girt Size	Mid Girt Grade	Horizontal Type	Horizontal Size	Horizontal Grade
T4 120.00-100.00	1	Single Angle	L3x3x3/16	A36 (36 ksi)	Single Angle		A36 (36 ksi)

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Gusset Area (per face) ft^2	Gusset Thickness in	Gusset Grade	Adjust. Factor A_f	Adjust. Factor A_r	Weight Mult.	Double Angle Stitch Bolt Spacing Diagonals in	Double Angle Stitch Bolt Spacing Horizontals in	Double Angle Stitch Bolt Spacing Redundants in
T1 170.00-150.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T2 150.00-140.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T3 140.00-120.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T4 120.00-100.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T5 100.00-90.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T6 90.00-80.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T7 80.00-60.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T8 60.00-40.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000
T9 40.00-20.00	0.00	0.0000	A36 (36 ksi)	1	1	1.35	36.0000	36.0000	36.0000
T10 20.00-0.00	0.00	0.0000	A36 (36 ksi)	1	1	1	36.0000	36.0000	36.0000

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
T1	Yes	Yes	1	1	1	1	1	1	1	1
170.00-150.00				1	1	1	1	1	1	1
T2	Yes	Yes	1	1	1	1	1	1	1	1
150.00-140.00				1	1	1	1	1	1	1
T3	Yes	Yes	1	1	1	1	1	1	1	1
140.00-120.00				1	1	1	1	1	1	1
T4	Yes	Yes	1	1	1	1	1	1	1	1
120.00-100.00				1	1	1	1	1	1	1
T5	Yes	Yes	1	1	1	1	1	1	1	1

Tower Elevation ft	Calc K Single Angles	Calc K Solid Rounds	K Factors[1] Legs	X Brace Diags X Y	K Brace Diags X Y	Single Diags X Y	Girts X Y	Horiz. X Y	Sec. Horiz. X Y	Inner Brace X Y
100.00-90.00				1	1	1	1	1	1	1
T6	Yes	Yes	1	1	1	1	1	1	1	1
90.00-80.00				1	1	1	1	1	1	1
T7	Yes	Yes	1	1	1	1	1	1	1	1
80.00-60.00				1	1	1	1	1	1	1
T8	Yes	Yes	1	1	1	1	1	1	1	1
60.00-40.00				1	1	1	1	1	1	1
T9	Yes	Yes	1	1	1	1	1	1	1	1
40.00-20.00				1	1	1	1	1	1	1
T10	Yes	Yes	1	1	1	1	1	1	1	1
20.00-0.00				1	1	1	1	1	1	1

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

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Truss-Leg K Factors: Truss-Legs Used As Leg Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals	Truss-Legs Used As Inner Members — Leg Panels	X Brace Diagonals	Z Brace Diagonals
T2	1	1	0.85	1	0.5	0.85
150.00-140.00						
T3	1	1	0.85	1	0.5	0.85
140.00-120.00						
T4	1	1	0.85	1	0.5	0.85
120.00-100.00						
T5	1	1	0.85	1	0.5	0.85
100.00-90.00						
T6	1.832	1	0.85	1	0.5	0.85
90.00-80.00						
T7	1.896	1	0.85	1	0.5	0.85
80.00-60.00						
T8	1	1	0.85	1	0.5	0.85
60.00-40.00						
T9	1.989	1	0.85	1	0.5	0.85
40.00-20.00						
T10	2.066	1	0.85	1	0.5	0.85
20.00-0.00						

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U	Net Width Deduct in	U
T1 170.00-150.00	0.0000	1	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75	0.0000	0.75
T2 150.00-140.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T3 140.00-120.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T4 120.00-100.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T5 100.00-90.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T6 90.00-80.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T7 80.00-60.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T8 60.00-40.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T9 40.00-20.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1
T10 20.00-0.00	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1	0.0000	1

Tower Section Geometry *(cont'd)*

Tower Elevation ft	Leg Connection Type	Leg		Diagonal		Top Girt		Bottom Girt		Mid Girt		Long Horizontal		Short Horizontal	
		Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.	Bolt Size in	No.
T1 170.00-150.00	Flange	0.7500 A325N	0	0.6250 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T2 150.00-140.00	Flange	1.0000 A325N	6	1.0000 A325N	1	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T3 140.00-120.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T4 120.00-100.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0
T5 100.00-90.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.0000 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T6 90.00-80.00	Flange	0.0000 A325N	0	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T7 80.00-60.00	Flange	1.0000 A325N	6	1.0000 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T8 60.00-40.00	Flange	1.0000 A490N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T9 40.00-20.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0
T10 20.00-0.00	Flange	1.2500 A325N	6	1.2500 A325N	1	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0	0.6250 A325N	0

Feed Line/Linear Appurtenances - Entered As Round Or Flat

Description	Face or Leg	Allow Shield	Exclude From Torque Calculation	Component Type	Placement ft	Face Offset in	Lateral Offset (Frac FW)	#	# Per Row	Clear Spacing in	Width or Diameter in	Perimeter in	Weight plf
*** (Cables in order of height from ground per Leg 05/23/2019													
AVA7-50 (1-5/8 LOW DENSI. FOAM) (CPD)	A	No	No	Ar (CaAa)	158.50 - 7.00	0.0000	0.38	1	1	1.9800	1.9800		0.72
1/2 (Municipal - I)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	1	1	0.5800	0.5800		0.25
7/8 (Municipal - A)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	1	1	1.1100	1.1100		0.54
7/8 (Municipal - I)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	2	2	1.1100	1.1100		0.54
7/8 (Municipal - E)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	1	1	1.1100	1.1100		0.54
FSJ2-50 (3/8 SUPERFLEX. FOAM) (Municipal - C)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	1	1	0.4300	0.4300		0.08
RG-11 590609 (1 1/2 FOAM) (Municipal - B)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	1	1	1.5900	1.5900		0.94
7/8 (Municipal - H)	A	No	No	Ar (CaAa)	170.00 - 7.00	-24.0000	-0.38	2	2	1.1100	1.1100		0.54
1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG (Sprint-FO)	A	No	No	Ar (CaAa)	170.00 - 7.00	-18.0000	0.38	2	2	1.5400	1.5400		1.13
1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG (Sprint-FO)	A	No	No	Ar (CaAa)	170.00 - 7.00	-18.0000	0.38	3	3	1.5400	1.5400		1.13
FSJ2-50 (3/8 SUPERFLEX. FOAM)	A	No	No	Ar (CaAa)	168.00 - 7.00	-12.0000	0.4	1	1	0.4300	0.4300		0.08
1/2 (Municipal)	A	No	No	Ar (CaAa)	144.00 - 7.00	-12.0000	0.4	1	1	0.5800	0.5800		0.25
1/2 (Municipal)	A	No	No	Ar (CaAa)	140.00 - 7.00	-12.0000	0.4	2	1	0.5800	0.5800		0.25
1/2	A	No	No	Ar (CaAa)	30.00 - 7.00	-10.0000	0.42	3	1	0.5800	0.5800		0.25
CATEGORY 5e (1 WIRE) (Clearwire)	B	No	No	Ar (CaAa)	134.00 - 7.00	-2.0000	-0.3	6	6	1.0000	1.0000		0.21
1/2 (Clearwire)	B	No	No	Ar (CaAa)	134.00 - 7.00	-4.0000	-0.3	4	4	0.5800	0.5800		0.25
CATEGORY 5e (1 WIRE)	C	No	No	Ar (CaAa)	87.00 - 7.00	0.0000	0.49	4	2	1.0000	1.0000		0.21
CATEGORY 5e (1 WIRE)	C	No	No	Ar (CaAa)	83.00 - 7.00	0.0000	0.46	2	1	1.0000	1.0000		0.21

Description	*Face or Leg*	*Allow Shield*	*Exclude From Torque Calculation*	*Component Type*	*Placement ft*	*Face Offset in*	*Lateral Offset (Frac FW)*	*#*	*# Per Row*	*Clear Spacing in*	*Width or Diameter in*	*Perimeter in*	*Weight plf*
*** Carrier T-Mobile													
1 5/8 (T-Mobile)	B	No	No	Ar (CaAa)	125.50 - 7.00	-14.0000	0.44	12	3	1.9800	1.9800		1.04
1 5/8" Hybriflex (T-Mobile)	B	No	No	Ar (CaAa)	125.00 - 7.00	-2.0000	0.45	1	1	1.5900	1.5900		2.59
*** Carrier VZW													
1 5/8 (VZW)	C	No	No	Ar (CaAa)	101.00 - 7.00	-8.0000	0.4	6	6	1.9800	1.9800		1.04
1 5/8" Hybriflex (VZW)	A	No	No	Ar (CaAa)	101.00 - 7.00	-4.0000	-0.46	1	1	1.5000	1.5000		1.07
*** Carrier AT&T													
1 5/8 (AT&T)	A	No	No	Ar (CaAa)	115.00 - 7.00	-28.0000	-0.38	6	6	1.9800	1.9800		1.04
3" Flex Conduit w/ FOC & (2) DC Cables (AT&T)	C	No	No	Ar (CaAa)	115.00 - 7.00	3.0000	0.41	2	2	0.0000	3.0000		3.00
*** CFD Replacement Cables													
AVA7-50 (1-5/8 LOW DENSI. FOAM) (Municipal - D)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	1	1	1.9800	1.9800		0.72
AVA5-50 (7/8 LOW DENSI.FOAM) (Municipal - F)	A	No	No	Ar (CaAa)	170.00 - 7.00	-12.0000	0.4	2	2	1.1000	1.1000		0.30
1/2 (AT&T (Proposed))	C	No	No	Ar (CaAa)	115.00 - 7.00	3.0000	0.44	2	2	0.5800	0.5800		0.25
1 5/8" Hybriflex (9x18) (VZW)	C	No	No	Ar (CaAa)	101.00 - 7.00	-8.0000	0.4	1	1	1.5900	1.5900		2.59

Feed Line/Linear Appurtenances Section Areas

Tower Section	*Tower Elevation ft*	*Face*	A_R ft^2	A_F ft^2	C_AA_A *In Face* ft^2	C_AA_A *Out Face* ft^2	*Weight lb*
T1	170.00-150.00	A	0.000	0.000	44.737	0.000	237.16
		B	0.000	0.000	0.000	0.000	0.00
		C	0.000	0.000	0.000	0.000	0.00
T2	150.00-140.00	A	0.000	0.000	23.782	0.000	123.80
		B	0.000	0.000	0.000	0.000	0.00

Tower Section	Tower Elevation ft	Face	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
		C	0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	0.000	0.000	50.580	0.000	260.60
		B	0.000	0.000	25.511	0.000	113.24
		C	0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	0.000	0.000	68.550	0.000	355.27
		B	0.000	0.000	67.340	0.000	346.64
		C	0.000	0.000	12.087	0.000	106.33
T5	100.00-90.00	A	0.000	0.000	38.670	0.000	203.40
		B	0.000	0.000	33.670	0.000	173.32
		C	0.000	0.000	20.630	0.000	153.32
T6	90.00-80.00	A	0.000	0.000	38.670	0.000	203.40
		B	0.000	0.000	33.670	0.000	173.32
		C	0.000	0.000	24.030	0.000	160.46
T7	80.00-60.00	A	0.000	0.000	77.340	0.000	406.80
		B	0.000	0.000	67.340	0.000	346.64
		C	0.000	0.000	53.260	0.000	331.84
T8	60.00-40.00	A	0.000	0.000	77.340	0.000	406.80
		B	0.000	0.000	67.340	0.000	346.64
		C	0.000	0.000	53.260	0.000	331.84
T9	40.00-20.00	A	0.000	0.000	79.080	0.000	414.30
		B	0.000	0.000	67.340	0.000	346.64
		C	0.000	0.000	53.260	0.000	331.84
T10	20.00-0.00	A	0.000	0.000	52.533	0.000	274.17
		B	0.000	0.000	43.771	0.000	225.32
		C	0.000	0.000	34.619	0.000	215.70

Feed Line/Linear Appurtenances Section Areas - With Ice

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T1	170.00-150.00	A	2.198	0.000	0.000	212.213	0.000	3112.03
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T2	150.00-140.00	A	2.178	0.000	0.000	111.571	0.000	1642.19
		B		0.000	0.000	0.000	0.000	0.00
		C		0.000	0.000	0.000	0.000	0.00
T3	140.00-120.00	A	2.158	0.000	0.000	247.073	0.000	3630.13
		B		0.000	0.000	64.162	0.000	1192.01
		C		0.000	0.000	0.000	0.000	0.00
T4	120.00-100.00	A	2.129	0.000	0.000	295.656	0.000	4458.83
		B		0.000	0.000	133.589	0.000	2990.05
		C		0.000	0.000	41.944	0.000	591.60
T5	100.00-90.00	A	2.108	0.000	0.000	160.757	0.000	2446.33
		B		0.000	0.000	66.543	0.000	1484.05
		C		0.000	0.000	64.410	0.000	1049.38
T6	90.00-80.00	A	2.096	0.000	0.000	160.197	0.000	2427.70
		B		0.000	0.000	66.389	0.000	1477.31
		C		0.000	0.000	76.482	0.000	1214.44
T7	80.00-60.00	A	2.080	0.000	0.000	319.011	0.000	4809.57
		B		0.000	0.000	132.395	0.000	2937.99
		C		0.000	0.000	175.511	0.000	2739.50
T8	60.00-40.00	A	2.071	0.000	0.000	318.214	0.000	4783.25
		B		0.000	0.000	132.175	0.000	2928.43
		C		0.000	0.000	175.164	0.000	2726.81
T9	40.00-20.00	A	2.083	0.000	0.000	329.915	0.000	5029.10
		B		0.000	0.000	132.468	0.000	2941.16
		C		0.000	0.000	175.626	0.000	2743.71

Tower Section	Tower Elevation ft	Face or Leg	Ice Thickness in	A_R ft^2	A_F ft^2	C_AA_A In Face ft^2	C_AA_A Out Face ft^2	Weight lb
T10	20.00-0.00	A	2.073	0.000	0.000	220.724	0.000	3384.11
		B		0.000	0.000	85.941	0.000	1904.68
		C		0.000	0.000	113.900	0.000	1774.02

Feed Line Center of Pressure

Section	Elevation ft	CP_X in	CP_Z in	CP_X Ice in	CP_Z Ice in
T1	170.00-150.00	4.3874	-9.7479	3.9053	-8.8515
T2	150.00-140.00	2.2083	-7.0825	1.7097	-5.3052
T3	140.00-120.00	4.6583	-8.5766	3.1219	-11.5651
T4	120.00-100.00	5.5066	-0.3253	1.2916	-8.4098
T5	100.00-90.00	-0.4238	2.8994	-5.3996	-5.5771
T6	90.00-80.00	-2.0580	3.6760	-8.0559	-5.0755
T7	80.00-60.00	-3.5933	4.3607	-11.3061	-4.8066
T8	60.00-40.00	-4.3488	4.5216	-13.5780	-5.9195
T9	40.00-20.00	-4.7897	3.9696	-15.3053	-7.9841
T10	20.00-0.00	-3.8457	2.6359	-13.6908	-8.1763

Shielding Factor Ka

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T1	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	150.00 - 158.50	0.6000	0.4298
T1	5	1/2	150.00 - 170.00	0.6000	0.4298
T1	6	7/8	150.00 - 170.00	0.6000	0.4298
T1	7	7/8	150.00 - 170.00	0.6000	0.4298
T1	9	7/8	150.00 - 170.00	0.6000	0.4298
T1	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	150.00 - 170.00	0.6000	0.4298
T1	11	RG-11 590609 (1 1/2 FOAM)	150.00 - 170.00	0.6000	0.4298
T1	14	7/8	150.00 - 170.00	0.6000	0.4298
T1	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	150.00 - 170.00	0.6000	0.4298
T1	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	150.00 - 170.00	0.6000	0.4298
T1	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	150.00 - 168.00	0.6000	0.4298
T1	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	150.00 - 170.00	0.6000	0.4298
T1	37	AVA5-50 (7/8 LOW DENSI.FOAM)	150.00 - 170.00	0.6000	0.4298
T2	4	AVA7-50 (1-5/8 LOW	140.00 -	0.6000	0.2542

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		DENSI. FOAM)	150.00		
T2	5	1/2	140.00 - 150.00	0.6000	0.2542
T2	6	7/8	140.00 - 150.00	0.6000	0.2542
T2	7	7/8	140.00 - 150.00	0.6000	0.2542
T2	9	7/8	140.00 - 150.00	0.6000	0.2542
T2	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	140.00 - 150.00	0.6000	0.2542
T2	11	RG-11 590609 (1 1/2 FOAM)	140.00 - 150.00	0.6000	0.2542
T2	14	7/8	140.00 - 150.00	0.6000	0.2542
T2	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	140.00 - 150.00	0.6000	0.2542
T2	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	140.00 - 150.00	0.6000	0.2542
T2	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	140.00 - 150.00	0.6000	0.2542
T2	18	1/2	140.00 - 144.00	0.6000	0.2542
T2	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	140.00 - 150.00	0.6000	0.2542
T2	37	AVA5-50 (7/8 LOW DENSI.FOAM)	140.00 - 150.00	0.6000	0.2542
T3	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	120.00 - 140.00	0.6000	0.3790
T3	5	1/2	120.00 - 140.00	0.6000	0.3790
T3	6	7/8	120.00 - 140.00	0.6000	0.3790
T3	7	7/8	120.00 - 140.00	0.6000	0.3790
T3	9	7/8	120.00 - 140.00	0.6000	0.3790
T3	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	120.00 - 140.00	0.6000	0.3790
T3	11	RG-11 590609 (1 1/2 FOAM)	120.00 - 140.00	0.6000	0.3790
T3	14	7/8	120.00 - 140.00	0.6000	0.3790
T3	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	120.00 - 140.00	0.6000	0.3790
T3	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	120.00 - 140.00	0.6000	0.3790
T3	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	120.00 - 140.00	0.6000	0.3790
T3	18	1/2	120.00 - 140.00	0.6000	0.3790
T3	20	1/2	120.00 - 140.00	0.6000	0.3790
T3	22	CATEGORY 5e (1 WIRE)	120.00 - 134.00	0.6000	0.3790
T3	23	1/2	120.00 - 134.00	0.6000	0.3790
T3	27	1 5/8	120.00 - 125.50	0.6000	0.3790
T3	28	1 5/8" Hybriflex	120.00 - 125.00	0.6000	0.3790
T3	36	AVA7-50 (1-5/8 LOW	120.00 -	0.6000	0.3790

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		DENSI. FOAM)	140.00		
T3	37	AVA5-50 (7/8 LOW DENSI.FOAM)	120.00 - 140.00	0.6000	0.3790
T4	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	0.6000	0.4564
T4	5	1/2	100.00 - 120.00	0.6000	0.4564
T4	6	7/8	100.00 - 120.00	0.6000	0.4564
T4	7	7/8	100.00 - 120.00	0.6000	0.4564
T4	9	7/8	100.00 - 120.00	0.6000	0.4564
T4	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	100.00 - 120.00	0.6000	0.4564
T4	11	RG-11 590609 (1 1/2 FOAM)	100.00 - 120.00	0.6000	0.4564
T4	14	7/8	100.00 - 120.00	0.6000	0.4564
T4	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	100.00 - 120.00	0.6000	0.4564
T4	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	100.00 - 120.00	0.6000	0.4564
T4	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	100.00 - 120.00	0.6000	0.4564
T4	18	1/2	100.00 - 120.00	0.6000	0.4564
T4	20	1/2	100.00 - 120.00	0.6000	0.4564
T4	22	CATEGORY 5e (1 WIRE)	100.00 - 120.00	0.6000	0.4564
T4	23	1/2	100.00 - 120.00	0.6000	0.4564
T4	27	1 5/8	100.00 - 120.00	0.6000	0.4564
T4	28	1 5/8" Hybriflex	100.00 - 120.00	0.6000	0.4564
T4	30	1 5/8	100.00 - 101.00	0.6000	0.4564
T4	31	1 5/8" Hybriflex	100.00 - 101.00	0.6000	0.4564
T4	33	1 5/8	100.00 - 115.00	0.6000	0.4564
T4	34	3" Flex Conduit w/ FOC & (2) DC Cables	100.00 - 115.00	0.6000	0.4564
T4	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	100.00 - 120.00	0.6000	0.4564
T4	37	AVA5-50 (7/8 LOW DENSI.FOAM)	100.00 - 120.00	0.6000	0.4564
T4	39	1/2	100.00 - 115.00	0.6000	0.4564
T4	40	1 5/8" Hybriflex (9x18)	100.00 - 101.00	0.6000	0.4564
T5	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	90.00 - 100.00	0.6000	0.5253
T5	5	1/2	90.00 - 100.00	0.6000	0.5253
T5	6	7/8	90.00 - 100.00	0.6000	0.5253
T5	7	7/8	90.00 - 100.00	0.6000	0.5253
T5	9	7/8	90.00 - 100.00	0.6000	0.5253
T5	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	90.00 - 100.00	0.6000	0.5253
T5	11	RG-11 590609 (1 1/2 FOAM)	90.00 - 100.00	0.6000	0.5253

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T5	14	7/8	90.00 - 100.00	0.6000	0.5253
T5	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	90.00 - 100.00	0.6000	0.5253
T5	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	90.00 - 100.00	0.6000	0.5253
T5	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	90.00 - 100.00	0.6000	0.5253
T5	18	1/2	90.00 - 100.00	0.6000	0.5253
T5	20	1/2	90.00 - 100.00	0.6000	0.5253
T5	22	CATEGORY 5e (1 WIRE)	90.00 - 100.00	0.6000	0.5253
T5	23	1/2	90.00 - 100.00	0.6000	0.5253
T5	27	1 5/8	90.00 - 100.00	0.6000	0.5253
T5	28	1 5/8" Hybriflex	90.00 - 100.00	0.6000	0.5253
T5	30	1 5/8	90.00 - 100.00	0.6000	0.5253
T5	31	1 5/8" Hybriflex	90.00 - 100.00	0.6000	0.5253
T5	33	1 5/8	90.00 - 100.00	0.6000	0.5253
T5	34	3" Flex Conduit w/ FOC & (2) DC Cables	90.00 - 100.00	0.6000	0.5253
T5	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	90.00 - 100.00	0.6000	0.5253
T5	37	AVA5-50 (7/8 LOW DENSI.FOAM)	90.00 - 100.00	0.6000	0.5253
T5	39	1/2	90.00 - 100.00	0.6000	0.5253
T5	40	1 5/8" Hybriflex (9x18)	90.00 - 100.00	0.6000	0.5253
T6	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 90.00	0.6000	0.5519
T6	5	1/2	80.00 - 90.00	0.6000	0.5519
T6	6	7/8	80.00 - 90.00	0.6000	0.5519
T6	7	7/8	80.00 - 90.00	0.6000	0.5519
T6	9	7/8	80.00 - 90.00	0.6000	0.5519
T6	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	80.00 - 90.00	0.6000	0.5519
T6	11	RG-11 590609 (1 1/2 FOAM)	80.00 - 90.00	0.6000	0.5519
T6	14	7/8	80.00 - 90.00	0.6000	0.5519
T6	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	80.00 - 90.00	0.6000	0.5519
T6	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	80.00 - 90.00	0.6000	0.5519
T6	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	80.00 - 90.00	0.6000	0.5519
T6	18	1/2	80.00 - 90.00	0.6000	0.5519
T6	20	1/2	80.00 - 90.00	0.6000	0.5519
T6	22	CATEGORY 5e (1 WIRE)	80.00 - 90.00	0.6000	0.5519
T6	23	1/2	80.00 - 90.00	0.6000	0.5519
T6	24	CATEGORY 5e (1 WIRE)	80.00 - 87.00	0.6000	0.5519
T6	25	CATEGORY 5e (1 WIRE)	80.00 - 83.00	0.6000	0.5519
T6	27	1 5/8	80.00 - 90.00	0.6000	0.5519
T6	28	1 5/8" Hybriflex	80.00 - 90.00	0.6000	0.5519
T6	30	1 5/8	80.00 - 90.00	0.6000	0.5519
T6	31	1 5/8" Hybriflex	80.00 - 90.00	0.6000	0.5519
T6	33	1 5/8	80.00 - 90.00	0.6000	0.5519
T6	34	3" Flex Conduit w/ FOC & (2) DC Cables	80.00 - 90.00	0.6000	0.5519
T6	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	80.00 - 90.00	0.6000	0.5519
T6	37	AVA5-50 (7/8 LOW DENSI.FOAM)	80.00 - 90.00	0.6000	0.5519
T6	39	1/2	80.00 - 90.00	0.6000	0.5519
T6	40	1 5/8" Hybriflex (9x18)	80.00 - 90.00	0.6000	0.5519
T7	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	0.6000	0.5865
T7	5	1/2	60.00 - 80.00	0.6000	0.5865

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T7	6	7/8	60.00 - 80.00	0.6000	0.5865
T7	7	7/8	60.00 - 80.00	0.6000	0.5865
T7	9	7/8	60.00 - 80.00	0.6000	0.5865
T7	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	60.00 - 80.00	0.6000	0.5865
T7	11	RG-11 590609 (1 1/2 FOAM)	60.00 - 80.00	0.6000	0.5865
T7	14	7/8	60.00 - 80.00	0.6000	0.5865
T7	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	60.00 - 80.00	0.6000	0.5865
T7	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	60.00 - 80.00	0.6000	0.5865
T7	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	60.00 - 80.00	0.6000	0.5865
T7	18	1/2	60.00 - 80.00	0.6000	0.5865
T7	20	1/2	60.00 - 80.00	0.6000	0.5865
T7	22	CATEGORY 5e (1 WIRE)	60.00 - 80.00	0.6000	0.5865
T7	23	1/2	60.00 - 80.00	0.6000	0.5865
T7	24	CATEGORY 5e (1 WIRE)	60.00 - 80.00	0.6000	0.5865
T7	25	CATEGORY 5e (1 WIRE)	60.00 - 80.00	0.6000	0.5865
T7	27	1 5/8	60.00 - 80.00	0.6000	0.5865
T7	28	1 5/8" Hybriflex	60.00 - 80.00	0.6000	0.5865
T7	30	1 5/8	60.00 - 80.00	0.6000	0.5865
T7	31	1 5/8" Hybriflex	60.00 - 80.00	0.6000	0.5865
T7	33	1 5/8	60.00 - 80.00	0.6000	0.5865
T7	34	3" Flex Conduit w/ FOC & (2) DC Cables	60.00 - 80.00	0.6000	0.5865
T7	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	60.00 - 80.00	0.6000	0.5865
T7	37	AVA5-50 (7/8 LOW DENSI.FOAM)	60.00 - 80.00	0.6000	0.5865
T7	39	1/2	60.00 - 80.00	0.6000	0.5865
T7	40	1 5/8" Hybriflex (9x18)	60.00 - 80.00	0.6000	0.5865
T8	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	40.00 - 60.00	0.6000	0.6000
T8	5	1/2	40.00 - 60.00	0.6000	0.6000
T8	6	7/8	40.00 - 60.00	0.6000	0.6000
T8	7	7/8	40.00 - 60.00	0.6000	0.6000
T8	9	7/8	40.00 - 60.00	0.6000	0.6000
T8	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	40.00 - 60.00	0.6000	0.6000
T8	11	RG-11 590609 (1 1/2 FOAM)	40.00 - 60.00	0.6000	0.6000
T8	14	7/8	40.00 - 60.00	0.6000	0.6000
T8	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	40.00 - 60.00	0.6000	0.6000
T8	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	40.00 - 60.00	0.6000	0.6000
T8	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	40.00 - 60.00	0.6000	0.6000
T8	18	1/2	40.00 - 60.00	0.6000	0.6000
T8	20	1/2	40.00 - 60.00	0.6000	0.6000
T8	22	CATEGORY 5e (1 WIRE)	40.00 - 60.00	0.6000	0.6000
T8	23	1/2	40.00 - 60.00	0.6000	0.6000
T8	24	CATEGORY 5e (1 WIRE)	40.00 - 60.00	0.6000	0.6000
T8	25	CATEGORY 5e (1 WIRE)	40.00 - 60.00	0.6000	0.6000
T8	27	1 5/8	40.00 - 60.00	0.6000	0.6000
T8	28	1 5/8" Hybriflex	40.00 - 60.00	0.6000	0.6000
T8	30	1 5/8	40.00 - 60.00	0.6000	0.6000
T8	31	1 5/8" Hybriflex	40.00 - 60.00	0.6000	0.6000
T8	33	1 5/8	40.00 - 60.00	0.6000	0.6000
T8	34	3" Flex Conduit w/ FOC & (2) DC Cables	40.00 - 60.00	0.6000	0.6000
T8	36	AVA7-50 (1-5/8 LOW	40.00 - 60.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
		DENSI. FOAM)			
T8	37	AVA5-50 (7/8 LOW DENSI.FOAM)	40.00 - 60.00	0.6000	0.6000
T8	39	1/2	40.00 - 60.00	0.6000	0.6000
T8	40	1 5/8" Hybriflex (9x18)	40.00 - 60.00	0.6000	0.6000
T9	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	0.6000	0.6000
T9	5	1/2	20.00 - 40.00	0.6000	0.6000
T9	6	7/8	20.00 - 40.00	0.6000	0.6000
T9	7	7/8	20.00 - 40.00	0.6000	0.6000
T9	9	7/8	20.00 - 40.00	0.6000	0.6000
T9	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	20.00 - 40.00	0.6000	0.6000
T9	11	RG-11 590609 (1 1/2 FOAM)	20.00 - 40.00	0.6000	0.6000
T9	14	7/8	20.00 - 40.00	0.6000	0.6000
T9	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	20.00 - 40.00	0.6000	0.6000
T9	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	20.00 - 40.00	0.6000	0.6000
T9	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	20.00 - 40.00	0.6000	0.6000
T9	18	1/2	20.00 - 40.00	0.6000	0.6000
T9	20	1/2	20.00 - 40.00	0.6000	0.6000
T9	21	1/2	20.00 - 30.00	0.6000	0.6000
T9	22	CATEGORY 5e (1 WIRE)	20.00 - 40.00	0.6000	0.6000
T9	23	1/2	20.00 - 40.00	0.6000	0.6000
T9	24	CATEGORY 5e (1 WIRE)	20.00 - 40.00	0.6000	0.6000
T9	25	CATEGORY 5e (1 WIRE)	20.00 - 40.00	0.6000	0.6000
T9	27	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	28	1 5/8" Hybriflex	20.00 - 40.00	0.6000	0.6000
T9	30	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	31	1 5/8" Hybriflex	20.00 - 40.00	0.6000	0.6000
T9	33	1 5/8	20.00 - 40.00	0.6000	0.6000
T9	34	3" Flex Conduit w/ FOC & (2) DC Cables	20.00 - 40.00	0.6000	0.6000
T9	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	20.00 - 40.00	0.6000	0.6000
T9	37	AVA5-50 (7/8 LOW DENSI.FOAM)	20.00 - 40.00	0.6000	0.6000
T9	39	1/2	20.00 - 40.00	0.6000	0.6000
T9	40	1 5/8" Hybriflex (9x18)	20.00 - 40.00	0.6000	0.6000
T10	4	AVA7-50 (1-5/8 LOW DENSI. FOAM)	7.00 - 20.00	0.6000	0.6000
T10	5	1/2	7.00 - 20.00	0.6000	0.6000
T10	6	7/8	7.00 - 20.00	0.6000	0.6000
T10	7	7/8	7.00 - 20.00	0.6000	0.6000
T10	9	7/8	7.00 - 20.00	0.6000	0.6000
T10	10	FSJ2-50 (3/8 SUPERFLEX. FOAM)	7.00 - 20.00	0.6000	0.6000
T10	11	RG-11 590609 (1 1/2 FOAM)	7.00 - 20.00	0.6000	0.6000
T10	14	7/8	7.00 - 20.00	0.6000	0.6000
T10	15	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	7.00 - 20.00	0.6000	0.6000
T10	16	1-1/4 Hybriflex (1.54" OD) - 3x6- 4 AWG	7.00 - 20.00	0.6000	0.6000
T10	17	FSJ2-50 (3/8 SUPERFLEX. FOAM)	7.00 - 20.00	0.6000	0.6000
T10	18	1/2	7.00 - 20.00	0.6000	0.6000
T10	20	1/2	7.00 - 20.00	0.6000	0.6000
T10	21	1/2	7.00 - 20.00	0.6000	0.6000
T10	22	CATEGORY 5e (1 WIRE)	7.00 - 20.00	0.6000	0.6000
T10	23	1/2	7.00 - 20.00	0.6000	0.6000

Tower Section	Feed Line Record No.	Description	Feed Line Segment Elev.	K_a No Ice	K_a Ice
T10	24	CATEGORY 5e (1 WIRE)	7.00 - 20.00	0.6000	0.6000
T10	25	CATEGORY 5e (1 WIRE)	7.00 - 20.00	0.6000	0.6000
T10	27	1 5/8	7.00 - 20.00	0.6000	0.6000
T10	28	1 5/8" Hybriflex	7.00 - 20.00	0.6000	0.6000
T10	30	1 5/8	7.00 - 20.00	0.6000	0.6000
T10	31	1 5/8" Hybriflex	7.00 - 20.00	0.6000	0.6000
T10	33	1 5/8	7.00 - 20.00	0.6000	0.6000
T10	34	3" Flex Conduit w/ FOC & (2) DC Cables	7.00 - 20.00	0.6000	0.6000
T10	36	AVA7-50 (1-5/8 LOW DENSI. FOAM)	7.00 - 20.00	0.6000	0.6000
T10	37	AVA5-50 (7/8 LOW DENSI.FOAM)	7.00 - 20.00	0.6000	0.6000
T10	39	1/2	7.00 - 20.00	0.6000	0.6000
T10	40	1 5/8" Hybriflex (9x18)	7.00 - 20.00	0.6000	0.6000

Discrete Tower Loads

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
* VZW Inventory									
* VZW Inventory									
***Existing T-Mobile Inventory									
PiROD 10' Lightweight	A	From Leg	2.00	0.0000	125.50	No Ice	9.30	9.30	251.00
T-Frame			0.00			1/2" Ice	14.50	14.50	344.00
(T-Mobile)			0.00			1" Ice	19.70	19.70	437.00
PiROD 10' Lightweight	B	From Leg	2.00	0.0000	125.50	No Ice	9.30	9.30	251.00
T-Frame			0.00			1/2" Ice	14.50	14.50	344.00
(T-Mobile)			0.00			1" Ice	19.70	19.70	437.00
PiROD 10' Lightweight	C	From Leg	2.00	0.0000	125.50	No Ice	9.30	9.30	251.00
T-Frame			0.00			1/2" Ice	14.50	14.50	344.00
(T-Mobile)			0.00			1" Ice	19.70	19.70	437.00
Ericsson AIR21 B2A|B4P	A	From Leg	4.00	0.0000	125.50	No Ice	6.51	4.71	105.80
Panel			3.00			1/2" Ice	6.89	5.07	151.62
(T-Mobile)			0.00			1" Ice	7.27	5.43	202.71
Ericsson AIR21 B2A|B4P	B	From Leg	4.00	0.0000	125.50	No Ice	6.51	4.71	105.80
Panel			3.00			1/2" Ice	6.89	5.07	151.62
(T-Mobile)			0.00			1" Ice	7.27	5.43	202.71
Ericsson AIR21 B2A|B4P	C	From Leg	4.00	0.0000	125.50	No Ice	6.51	4.71	105.80
Panel			3.00			1/2" Ice	6.89	5.07	151.62
(T-Mobile)			0.00			1" Ice	7.27	5.43	202.71
Ericsson AIR21 B2A|B4P	A	From Leg	4.00	0.0000	125.50	No Ice	6.51	4.71	105.80
Panel			-3.00			1/2" Ice	6.89	5.07	151.62
(T-Mobile)			0.00			1" Ice	7.27	5.43	202.71
Ericsson AIR21 B2A|B4P	B	From Leg	4.00	0.0000	125.50	No Ice	6.51	4.71	105.80
Panel			-3.00			1/2" Ice	6.89	5.07	151.62
(T-Mobile)			0.00			1" Ice	7.27	5.43	202.71
Ericsson AIR21 B2A|B4P	C	From Leg	4.00	0.0000	125.50	No Ice	6.51	4.71	105.80
Panel			-3.00			1/2" Ice	6.89	5.07	151.62

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(T-Mobile)			0.00			1" Ice	7.27	5.43	202.71
Twin PCS TMA	A	From Leg	4.00	0.0000	125.50	No Ice	0.77	0.36	10.00
(T-Mobile)			3.00			1/2" Ice	0.96	0.52	20.00
			0.00			1" Ice	1.15	0.68	30.00
Twin PCS TMA	B	From Leg	4.00	0.0000	125.50	No Ice	0.77	0.36	10.00
(T-Mobile)			3.00			1/2" Ice	0.96	0.52	20.00
			0.00			1" Ice	1.15	0.68	30.00
Twin PCS TMA	C	From Leg	4.00	0.0000	125.50	No Ice	0.77	0.36	10.00
(T-Mobile)			3.00			1/2" Ice	0.96	0.52	20.00
			0.00			1" Ice	1.15	0.68	30.00
LNX-6515DS-VTM w/ 6' 2"	A	From Leg	4.00	0.0000	125.50	No Ice	11.45	9.12	70.00
sch 40 Piipe Mount			0.00			1/2" Ice	12.06	10.21	153.66
(T-Mobile)			0.00			1" Ice	12.69	11.18	244.76
LNX-6515DS-VTM w/ 6' 2"	B	From Leg	4.00	0.0000	125.50	No Ice	11.45	9.12	70.00
sch 40 Piipe Mount			0.00			1/2" Ice	12.06	10.21	153.66
(T-Mobile)			0.00			1" Ice	12.69	11.18	244.76
LNX-6515DS-VTM w/ 6' 2"	C	From Leg	4.00	0.0000	125.50	No Ice	11.45	9.12	70.00
sch 40 Piipe Mount			0.00			1/2" Ice	12.06	10.21	153.66
(T-Mobile)			0.00			1" Ice	12.69	11.18	244.76
Ericsson RRUS-11 RRH Unit	A	From Leg	4.00	0.0000	125.50	No Ice	2.57	1.07	50.00
(T-Mobile)			0.00			1/2" Ice	2.76	1.21	69.57
			0.00			1" Ice	2.97	1.36	92.08
Ericsson RRUS-11 RRH Unit	B	From Leg	4.00	0.0000	125.50	No Ice	2.57	1.07	50.00
(T-Mobile)			0.00			1/2" Ice	2.76	1.21	69.57
			0.00			1" Ice	2.97	1.36	92.08
Ericsson RRUS-11 RRH Unit	C	From Leg	4.00	0.0000	125.50	No Ice	2.57	1.07	50.00
(T-Mobile)			0.00			1/2" Ice	2.76	1.21	69.57
			0.00			1" Ice	2.97	1.36	92.08
***Existing T-Mobile Inventory									
*** CFD Recent Install									
DS1F03F36U-D Omni	C	From Leg	8.25	0.0000	170.00	No Ice	3.77	3.77	60.00
Antenna			0.00			1/2" Ice	5.07	5.07	87.31
(CFD - Recently Installed)			8.00			1" Ice	6.38	6.38	122.77
DS1F03F36D 23' Omni	A	From Leg	7.00	0.0000	170.00	No Ice	6.69	6.69	93.00
Antenna			4.00			1/2" Ice	8.95	8.95	141.09
(CFD - Recently Installed)			1.50			1" Ice	11.23	11.23	203.25
*** CFD Recent Install									
*** Remaining Antennas/Appurtenances on Halo mt.									
9 Arm Halo Mount	C	None		0.0000	168.00	No Ice	62.60	62.60	3600.00
(Municipal)						1/2" Ice	80.40	80.40	4800.00
						1" Ice	98.20	98.20	6000.00
101-90-08-0-01	A	From Leg	7.00	0.0000	170.00	No Ice	2.94	2.94	38.00
((183') Municipal - A)			4.00			1/2" Ice	4.31	4.31	61.73
			13.00			1" Ice	4.93	4.93	91.77
15' Mount Pipe	A	From Leg	7.00	0.0000	170.00	No Ice	4.50	4.50	90.00
((183') Municipal - A)			4.00			1/2" Ice	6.03	6.03	119.48
			8.00			1" Ice	7.58	7.58	161.58
20' 8 Bay Di-Pole	C	From Leg	7.00	0.0000	170.00	No Ice	4.00	4.00	55.00
((178') Municipal - E)			0.00			1/2" Ice	6.00	6.00	100.00
			10.00			1" Ice	8.00	8.00	145.00
3' Whip (3in diameter) /w	B	From Leg	0.00	0.0000	170.00	No Ice	1.27	1.27	19.95
mount			0.00			1/2" Ice	1.64	1.64	34.84
((175.5') Municipal - C)			5.50			1" Ice	2.04	2.04	53.10
2.5' Decibel Omni	A	From Leg	7.00	0.0000	170.00	No Ice	0.41	0.41	10.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
((175') Municipal - I)			4.00			1/2" Ice	0.56	0.56	14.00
			10.00			1" Ice	0.71	0.71	18.00
2.5' Decibel Omni	B	From Leg	7.00	0.0000	170.00	No Ice	0.41	0.41	10.00
((175') Municipal - I)			8.00			1/2" Ice	0.56	0.56	14.00
			10.00			1" Ice	0.71	0.71	18.00
2.5' Decibel Omni	C	From Leg	8.25	0.0000	170.00	No Ice	0.41	0.41	10.00
((175') Municipal - I)			0.00			1/2" Ice	0.56	0.56	14.00
			10.00			1" Ice	0.71	0.71	18.00
2" Dia 10' Omni	B	From Leg	8.25	0.0000	170.00	No Ice	2.00	2.00	10.00
((174.5') Municipal - H)			0.00			1/2" Ice	3.03	3.03	25.00
			5.00			1" Ice	4.06	4.06	40.00
2" Dia 10' Omni	B	From Leg	7.00	0.0000	170.00	No Ice	2.00	2.00	10.00
((174.5') Municipal - H)			8.00			1/2" Ice	3.03	3.03	25.00
			5.00			1" Ice	4.06	4.06	40.00
ANT150F6	A	From Leg	1.00	0.0000	170.00	No Ice	4.80	4.80	30.00
((174') Municipal - B)			2.00			1/2" Ice	6.83	6.83	65.72
			4.00			1" Ice	8.87	8.87	114.06
*** Sprint / Ramaker Inventory 10/25/2018									
APXVSPP18-C-A20	A	From Face	8.25	0.0000	170.00	No Ice	8.40	5.28	60.00
(Sprint)			1.00			1/2" Ice	8.95	5.74	107.04
			0.00			1" Ice	9.51	6.20	163.17
APXVSPP18-C-A20	B	From Face	8.25	0.0000	170.00	No Ice	8.40	5.28	60.00
(Sprint)			-1.00			1/2" Ice	8.95	5.74	107.04
			0.00			1" Ice	9.51	6.20	163.17
APXVSPP18-C-A20	C	From Face	8.25	0.0000	170.00	No Ice	8.40	5.28	60.00
(Sprint)			-1.00			1/2" Ice	8.95	5.74	107.04
			0.00			1" Ice	9.51	6.20	163.17
Panasonic RRH 1900MHZ	A	From Face	6.00	0.0000	170.00	No Ice	2.49	3.06	90.00
(Sprint)			0.00			1/2" Ice	2.71	3.30	116.87
			0.00			1" Ice	2.93	3.54	147.08
Panasonic RRH 1900MHZ	B	From Face	6.00	0.0000	170.00	No Ice	2.49	3.06	90.00
(Sprint)			0.00			1/2" Ice	2.71	3.30	116.87
			0.00			1" Ice	2.93	3.54	147.08
Panasonic RRH 1900MHZ	C	From Face	6.00	0.0000	170.00	No Ice	2.49	3.06	90.00
(Sprint)			0.00			1/2" Ice	2.71	3.30	116.87
			0.00			1" Ice	2.93	3.54	147.08
Andrew 800MHz RRH	A	From Face	6.00	0.0000	170.00	No Ice	2.36	1.97	60.00
(Sprint)			0.00			1/2" Ice	2.57	2.17	77.36
			2.00			1" Ice	2.79	2.37	100.68
Andrew 800MHz RRH	B	From Face	6.00	0.0000	170.00	No Ice	2.36	1.97	60.00
(Sprint)			0.00			1/2" Ice	2.57	2.17	77.36
			2.00			1" Ice	2.79	2.37	100.68
Andrew 800MHz RRH	C	From Face	6.00	0.0000	170.00	No Ice	2.36	1.97	60.00
(Sprint)			0.00			1/2" Ice	2.57	2.17	77.36
			2.00			1" Ice	2.79	2.37	100.68
TD-RRH8x20-25	A	From Face	7.00	0.0000	170.00	No Ice	4.05	1.53	70.00
(Sprint)			4.00			1/2" Ice	4.30	1.71	97.14
			0.00			1" Ice	4.56	1.90	127.80
TD-RRH8x20-25	B	From Face	7.00	0.0000	170.00	No Ice	4.05	1.53	70.00
(Sprint)			-4.00			1/2" Ice	4.30	1.71	97.14
			0.00			1" Ice	4.56	1.90	127.80
TD-RRH8x20-25	C	From Face	7.00	0.0000	170.00	No Ice	4.05	1.53	70.00
(Sprint)			-4.00			1/2" Ice	4.30	1.71	97.14
			0.00			1" Ice	4.56	1.90	127.80
DT465B-2XR-V2 Panels	A	From Face	7.00	0.0000	170.00	No Ice	9.10	5.97	58.00
(Commscope)			4.00			1/2" Ice	9.56	6.43	116.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft Vert ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Sprint)			0.00			1" Ice	10.04	6.90	180.29
DT465B-2XR-V2 Panels	B	From Face	7.00	0.0000	170.00	No Ice	9.10	5.97	58.00
(Commscope)			-4.00			1/2" Ice	9.56	6.43	116.00
(Sprint)			0.00			1" Ice	10.04	6.90	180.29
DT465B-2XR-V2 Panels	C	From Face	7.00	0.0000	170.00	No Ice	9.10	5.97	58.00
(Commscope)			-4.00			1/2" Ice	9.56	6.43	116.00
(Sprint)			0.00			1" Ice	10.04	6.90	180.29
Andrew 800MHz RRH	A	From Face	7.00	0.0000	170.00	No Ice	2.36	1.97	60.00
(Sprint)			4.00			1/2" Ice	2.57	2.17	77.36
			-3.00			1" Ice	2.79	2.37	100.68
Andrew 800MHz RRH	B	From Face	7.00	0.0000	170.00	No Ice	2.36	1.97	60.00
(Sprint)			-4.00			1/2" Ice	2.57	2.17	77.36
			-3.00			1" Ice	2.79	2.37	100.68
Andrew 800MHz RRH	C	From Face	7.00	0.0000	170.00	No Ice	2.36	1.97	60.00
(Sprint)			-4.00			1/2" Ice	2.57	2.17	77.36
			-3.00			1" Ice	2.79	2.37	100.68
*** Sprint / Ramaker Inventory 10/25/2018 *** Inventory Below Halo Mount									
SC420-HF1LDF	A	From Face	6.00	0.0000	158.50	No Ice	2.14	2.14	20.00
(Municipal)			0.00			1/2" Ice	3.02	3.02	30.97
			0.00			1" Ice	3.79	3.79	52.56
2.5" x 20'6" Whip	A	From Face	6.00	0.0000	144.00	No Ice	5.14	5.14	150.00
(Municipal)			9.00			1/2" Ice	7.24	7.24	188.59
			0.00			1" Ice	9.37	9.37	240.36
2" Dia 15' Omni	B	From Face	6.00	0.0000	141.00	No Ice	3.20	3.20	40.00
(Municipal)			-5.00			1/2" Ice	4.83	4.83	64.66
			0.00			1" Ice	6.47	6.47	99.46
1.5" x 10' Omni	B	From Face	6.00	0.0000	139.00	No Ice	1.50	1.50	60.00
(Municipal)			5.00			1/2" Ice	2.52	2.52	67.38
			0.00			1" Ice	3.56	3.56	86.17
9' Whip	A	From Face	6.00	0.0000	138.50	No Ice	5.85	5.85	120.00
(Municipal)			0.00			1/2" Ice	7.66	7.66	172.12
			0.00			1" Ice	8.90	8.90	231.71
PiROD 20' Universal Platform	C	None		0.0000	134.00	No Ice	33.10	33.10	2270.00
(Municipal)						1/2" Ice	47.10	47.10	2701.00
						1" Ice	61.10	61.10	3132.00
Argus LLPX310R	A	From Face	6.00	0.0000	134.00	No Ice	4.86	3.46	30.00
(Clearwire)			7.00			1/2" Ice	5.22	3.80	60.63
			0.00			1" Ice	5.58	4.14	97.91
Argus LLPX310R	B	From Face	6.00	0.0000	134.00	No Ice	4.86	3.46	30.00
(Clearwire)			0.00			1/2" Ice	5.22	3.80	60.63
			0.00			1" Ice	5.58	4.14	97.91
Argus LLPX310R	C	From Face	6.00	0.0000	134.00	No Ice	4.86	3.46	30.00
(Clearwire)			7.00			1/2" Ice	5.22	3.80	60.63
			0.00			1" Ice	5.58	4.14	97.91
REMOTE RADIO HEAD	A	From Face	6.00	0.0000	134.00	No Ice	1.82	0.83	30.00
(RRH)			7.00			1/2" Ice	2.00	0.97	44.91
(Clearwire)			0.00			1" Ice	2.19	1.12	59.16
REMOTE RADIO HEAD	B	From Face	6.00	0.0000	134.00	No Ice	1.82	0.83	30.00
(RRH)			0.00			1/2" Ice	2.00	0.97	44.91
(Clearwire)			0.00			1" Ice	2.19	1.12	59.16
REMOTE RADIO HEAD	C	From Face	6.00	0.0000	134.00	No Ice	1.82	0.83	30.00
(RRH)			7.00			1/2" Ice	2.00	0.97	44.91
(Clearwire)			0.00			1" Ice	2.19	1.12	59.16
3"x2"x22" Panel	B	From Leg	2.00	0.0000	87.00	No Ice	0.65	0.47	50.00

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft	Offsets: Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Unknown)			0.00				1/2" Ice	0.81	0.61	54.67
			0.00				1" Ice	0.98	0.76	61.28
TMA	B	From Leg	2.00		0.0000	84.50	No Ice	1.06	0.45	20.00
(Unknown)			0.00				1/2" Ice	1.21	0.57	26.53
			0.00				1" Ice	1.37	0.71	34.91
3' Stand-off	B	From Leg	1.50		0.0000	83.50	No Ice	1.00	2.00	50.00
			0.00				1/2" Ice	1.20	2.70	75.00
			0.00				1" Ice	1.40	3.40	100.00
3' Stand-off	A	From Leg	1.50		0.0000	83.50	No Ice	1.00	2.00	50.00
			0.00				1/2" Ice	1.20	2.70	75.00
			0.00				1" Ice	1.40	3.40	100.00
TMA	A	From Leg	2.00		0.0000	80.00	No Ice	1.06	0.45	20.00
(Unknown)			0.00				1/2" Ice	1.21	0.57	26.53
			0.00				1" Ice	1.37	0.71	34.91
TMA	B	From Leg	2.00		0.0000	82.50	No Ice	1.06	0.45	20.00
(Unknown)			0.00				1/2" Ice	1.21	0.57	26.53
			0.00				1" Ice	1.37	0.71	34.91
3"x2"x22" Panel	B	From Leg	2.00		0.0000	80.00	No Ice	0.65	0.47	50.00
(Unknown)			0.00				1/2" Ice	0.81	0.61	54.67
			0.00				1" Ice	0.98	0.76	61.28
Camera	A	From Leg	0.00		0.0000	30.00	No Ice	0.50	0.50	10.00
			0.00				1/2" Ice	0.60	0.60	20.00
			0.00				1" Ice	0.70	0.70	30.00
PC9013N	A	From Leg	1.00		0.0000	24.00	No Ice	0.46	0.46	3.12
			0.00				1/2" Ice	0.52	0.52	3.50
			0.00				1" Ice	0.58	0.58	3.88
SU-RA-HP-2.4 Antenna	A	From Leg	7.00		0.0000	168.00	No Ice	0.80	0.37	2.40
(Municipal)			0.00				1/2" Ice	0.93	0.47	7.92
			0.00				1" Ice	1.06	0.58	15.06
PTP49600	C	From Leg	7.00		0.0000	168.00	No Ice	2.04	0.53	10.00
(CPD)			8.00				1/2" Ice	2.24	0.65	23.53
			0.00				1" Ice	2.44	0.78	37.28
CFD Halo Camera Bracket	A	From Leg	7.00		0.0000	170.00	No Ice	0.72	0.24	3.00
(Camera)			4.00				1/2" Ice	0.83	0.31	9.07
			0.00				1" Ice	0.95	0.38	16.84
CFD Halo Mounted Camera	A	From Leg	7.00		0.0000	170.00	No Ice	0.32	0.32	18.00
(Camera)			4.00				1/2" Ice	0.54	0.54	24.59
			0.00				1" Ice	0.66	0.66	32.71
*** AT&T Inventory w/ Proposed										
Sabre C10857801 12'	A	From Leg	0.50		0.0000	115.00	No Ice	15.40	14.00	558.00
V-Boom Mount Frame			0.00				1/2" Ice	21.30	20.80	741.00
(AT&T - Proposed)			0.00				1" Ice	27.20	27.60	924.00
Sabre C10857801 12'	B	From Leg	0.50		0.0000	115.00	No Ice	15.40	14.00	558.00
V-Boom Mount Frame			0.00				1/2" Ice	21.30	20.80	741.00
(AT&T - Proposed)			0.00				1" Ice	27.20	27.60	924.00
Sabre C10857801 12'	C	From Leg	0.50		0.0000	115.00	No Ice	15.40	14.00	558.00
V-Boom Mount Frame			0.00				1/2" Ice	21.30	20.80	741.00
(AT&T - Proposed)			0.00				1" Ice	27.20	27.60	924.00
DMP65R-BU6DA	A	From Leg	4.00		0.0000	115.00	No Ice	12.33	5.62	79.40
(AT&T - Proposed)			2.00				1/2" Ice	12.83	6.07	151.54
			0.00				1" Ice	13.32	6.53	230.29
Quintel QS66512-2 Panel	A	From Leg	4.00		0.0000	115.00	No Ice	8.13	6.80	125.00
(AT&T)			-6.00				1/2" Ice	8.59	7.27	182.20
			0.00				1" Ice	9.05	7.72	245.66
DMP65R-BU6DA	B	From Leg	4.00		0.0000	115.00	No Ice	12.33	5.62	79.40
(AT&T - Proposed)			2.00				1/2" Ice	12.83	6.07	151.54

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft / ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
			0.00			1" Ice	13.32	6.53	230.29
Quintel QS66512-2 Panel (AT&T)	B	From Leg	4.00 -6.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	8.13 8.59 9.05	6.80 7.27 7.72	125.00 182.20 245.66
DMP65R-BU6DA (AT&T - Proposed)	C	From Leg	4.00 2.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	12.33 12.83 13.32	5.62 6.07 6.53	79.40 151.54 230.29
Quintel QS66512-2 Panel (AT&T)	C	From Leg	4.00 -6.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	8.13 8.59 9.05	6.80 7.27 7.72	125.00 182.20 245.66
CCI HPA-65R-BUU-H6 Panel (AT&T - Proposed)	A	From Leg	4.00 -2.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	9.49 9.96 10.43	5.49 5.94 6.41	75.00 132.33 195.95
CCI HPA-65R-BUU-H6 Panel (AT&T - Proposed)	B	From Leg	4.00 -2.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	9.49 9.96 10.43	5.49 5.94 6.41	75.00 132.33 195.95
CCI HPA-65R-BUU-H6 Panel (AT&T - Proposed)	C	From Leg	4.00 -2.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	9.49 9.96 10.43	5.49 5.94 6.41	75.00 132.33 195.95
Ericsson RRUS-32 RRH Unit (AT&T)	A	From Leg	4.00 -6.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
Ericsson RRUS-32 RRH Unit (AT&T)	B	From Leg	4.00 -6.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
Ericsson RRUS-32 RRH Unit (AT&T)	C	From Leg	4.00 -6.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	3.31 3.56 3.81	2.42 2.64 2.86	77.00 104.93 136.47
4449 B5/B12 RRH (AT&T - Proposed)	A	From Leg	4.00 6.00 2.50	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	71.00 89.51 110.84
4449 B5/B12 RRH (AT&T - Proposed)	B	From Leg	4.00 6.00 2.50	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	71.00 89.51 110.84
4449 B5/B12 RRH (AT&T - Proposed)	C	From Leg	4.00 6.00 2.50	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.97 2.14 2.33	1.41 1.56 1.73	71.00 89.51 110.84
8843 B2/B66A RRH (AT&T - Proposed)	A	From Leg	4.00 6.00 -2.50	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.98 2.16 2.34	1.70 1.86 2.04	75.00 95.54 119.02
8843 B2/B66A RRH (AT&T - Proposed)	B	From Leg	4.00 6.00 -2.50	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.98 2.16 2.34	1.70 1.86 2.04	75.00 95.54 119.02
8843 B2/B66A RRH (AT&T - Proposed)	C	From Leg	4.00 6.00 -2.50	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.98 2.16 2.34	1.70 1.86 2.04	75.00 95.54 119.02
(2) Raycap DC6-48-60-18-8C Distribution Unit (AT&T)	A	From Leg	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.79 1.27 1.75	0.79 1.27 1.75	20.00 35.12 52.57
DC6-48-60-0-8F Squid (AT&T-Proposed)	A	From Leg	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	1.94 2.13 2.33	1.94 2.13 2.33	33.00 52.58 75.16
(2) CCI TPX-070821 Triplexer Units (AT&T-Proposed)	A	From Leg	0.50 0.00 0.00	0.0000	115.00	No Ice 1/2" Ice 1" Ice	0.47 0.56 0.66	0.10 0.15 0.20	8.00 11.45 16.23
(2) CCI TPX-070821 Triplexer Units	B	From Leg	0.50 0.00	0.0000	115.00	No Ice 1/2" Ice	0.47 0.56	0.10 0.15	8.00 11.45

Description	Face or Leg	Offset Type	Offsets: Horz Lateral ft / Vert ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(AT&T-Proposed)			0.00			1" Ice	0.66	0.20	16.23
(2) CCI TPX-070821	C	From Leg	0.50	0.0000	115.00	No Ice	0.47	0.10	8.00
Triplexer Units			0.00			1/2" Ice	0.56	0.15	11.45
(AT&T-Proposed)			0.00			1" Ice	0.66	0.20	16.23
*** AT&T Inventory w/ Proposed									
*** VZW 09/07/18 RF									
SitePro1 VFA12-RRU Mount	A	From Leg	0.00	0.0000	100.00	No Ice	12.02	7.98	450.00
Assembly			0.00			1/2" Ice	17.63	11.95	580.00
(Verizon - Proposed)			0.00			1" Ice	23.07	15.72	769.00
SitePro1 VFA12-RRU Mount	B	From Leg	0.00	0.0000	100.00	No Ice	12.02	7.98	450.00
Assembly			0.00			1/2" Ice	17.63	11.95	580.00
(Verizon - Proposed)			0.00			1" Ice	23.07	15.72	769.00
SitePro1 VFA12-RRU Mount	C	From Leg	0.00	0.0000	100.00	No Ice	12.02	7.98	450.00
Assembly			0.00			1/2" Ice	17.63	11.95	580.00
(Verizon - Proposed)			0.00			1" Ice	23.07	15.72	769.00
LNX-6514DS-T4M	A	From Leg	4.00	0.0000	100.00	No Ice	8.38	5.41	40.00
(Verizon)			-6.00			1/2" Ice	8.93	5.86	88.75
			0.00			1" Ice	9.49	6.33	145.27
LNX-6514DS-T4M	B	From Leg	4.00	0.0000	100.00	No Ice	8.38	5.41	40.00
(Verizon)			-6.00			1/2" Ice	8.93	5.86	88.75
			0.00			1" Ice	9.49	6.33	145.27
LNX-6514DS-T4M	C	From Leg	4.00	0.0000	100.00	No Ice	8.38	5.41	40.00
(Verizon)			-6.00			1/2" Ice	8.93	5.86	88.75
			0.00			1" Ice	9.49	6.33	145.27
Raycap RVZDC-6627-PF-48	C	From Leg	1.00	0.0000	100.00	No Ice	2.51	3.78	32.00
(Verizon)			0.00			1/2" Ice	2.72	4.03	64.00
			0.00			1" Ice	2.94	4.29	98.56
AlcatelLucent B5/B13 RRH	A	From Leg	4.00	0.0000	100.00	No Ice	2.06	1.31	60.00
Unit			0.00			1/2" Ice	2.34	1.55	70.00
(Verizon - Proposed)			0.00			1" Ice	2.62	1.80	80.00
AlcatelLucent B5/B13 RRH	B	From Leg	4.00	0.0000	100.00	No Ice	2.06	1.31	60.00
Unit			0.00			1/2" Ice	2.34	1.55	70.00
(Verizon - Proposed)			0.00			1" Ice	2.62	1.80	80.00
AlcatelLucent B5/B13 RRH	C	From Leg	4.00	0.0000	100.00	No Ice	2.06	1.31	60.00
Unit			0.00			1/2" Ice	2.34	1.55	70.00
(Verizon - Proposed)			0.00			1" Ice	2.62	1.80	80.00
AlcatelLucent B2/B66A RRH	A	From Leg	4.00	0.0000	100.00	No Ice	2.58	1.57	60.00
Unit			0.00			1/2" Ice	2.90	1.85	70.00
(Verizon - Proposed)			0.00			1" Ice	3.23	2.14	80.00
AlcatelLucent B2/B66A RRH	B	From Leg	4.00	0.0000	100.00	No Ice	2.58	1.57	60.00
Unit			0.00			1/2" Ice	2.90	1.85	70.00
(Verizon - Proposed)			0.00			1" Ice	3.23	2.14	80.00
AlcatelLucent B2/B66A RRH	C	From Leg	4.00	0.0000	100.00	No Ice	2.58	1.57	60.00
Unit			0.00			1/2" Ice	2.90	1.85	70.00
(Verizon - Proposed)			0.00			1" Ice	3.23	2.14	80.00
Commscope NNHH-65C-R4	A	From Leg	4.00	0.0000	100.00	No Ice	17.07	10.10	171.20
/ w 2" Mount Pipe			-6.00			1/2" Ice	17.70	11.52	286.53
(Verizon - Proposed)			0.00			1" Ice	18.33	12.80	412.13
Commscope NNHH-65C-R4	B	From Leg	4.00	0.0000	100.00	No Ice	17.07	10.10	171.20
/ w 2" Mount Pipe			-6.00			1/2" Ice	17.70	11.52	286.53
(Verizon - Proposed)			0.00			1" Ice	18.33	12.80	412.13
Commscope NNHH-65C-R4	C	From Leg	4.00	0.0000	100.00	No Ice	17.07	10.10	171.20
/ w 2" Mount Pipe			-6.00			1/2" Ice	17.70	11.52	286.53
(Verizon - Proposed)			0.00			1" Ice	18.33	12.80	412.13
Commscope NNHH-65C-R4	A	From Leg	4.00	0.0000	100.00	No Ice	17.07	10.10	171.20
/ w 2" Mount Pipe			-6.00			1/2" Ice	17.70	11.52	286.53

Description	Face or Leg	Offset Type	Offsets: Horz Lateral Vert ft ft ft	Azimuth Adjustment °	Placement ft		C_AA_A Front ft^2	C_AA_A Side ft^2	Weight lb
(Verizon - Proposed)			0.00			1" Ice	18.33	12.80	412.13
Commscope NNHH-65C-R4	B	From Leg	4.00	0.0000	100.00	No Ice	17.07	10.10	171.20
/ w 2" Mount Pipe			-6.00			1/2" Ice	17.70	11.52	286.53
(Verizon - Proposed)			0.00			1" Ice	18.33	12.80	412.13
Commscope NNHH-65C-R4	C	From Leg	4.00	0.0000	100.00	No Ice	17.07	10.10	171.20
/ w 2" Mount Pipe			-6.00			1/2" Ice	17.70	11.52	286.53
(Verizon - Proposed)			0.00			1" Ice	18.33	12.80	412.13
Raycap RVZDC-6627-PF-48	B	From Leg	1.00	0.0000	100.00	No Ice	2.51	3.78	32.00
(Verizon - Proposed)			0.00			1/2" Ice	2.72	4.03	64.00
			0.00			1" Ice	2.94	4.29	98.56
HBXX-6517DS-VTM	A	From Leg	4.00	0.0000	101.00	No Ice	9.03	7.54	89.32
(Verizon - AWS)			6.00			1/2" Ice	9.69	8.84	164.68
			0.00			1" Ice	10.28	9.80	249.41
HBXX-6517DS-VTM	B	From Leg	4.00	0.0000	101.00	No Ice	9.03	7.54	89.32
(Verizon - AWS)			6.00			1/2" Ice	9.69	8.84	164.68
			0.00			1" Ice	10.28	9.80	249.41
HBXX-6517DS-VTM	C	From Leg	4.00	0.0000	101.00	No Ice	9.03	7.54	89.32
(Verizon - AWS)			6.00			1/2" Ice	9.69	8.84	164.68
			0.00			1" Ice	10.28	9.80	249.41
*** VZW 09/07/18 RF									

Dishes

Description	Face or Leg	Dish Type	Offset Type	Offsets: Horz Lateral Vert ft	Azimuth Adjustment °	3 dB Beam Width °	Elevation ft	Outside Diameter ft		Aperture Area ft^2	Weight lb
3' Dish	A	Paraboloid w/o Radome	From Leg	2.00 0.00 0.00	Worst		83.00	3.00	No Ice 1/2" Ice 1" Ice	7.07 7.47 7.86	230.00 270.00 310.00
VHLP2.5-180 (Clearwire)	A	Paraboloid w/o Radome	From Face	6.00 0.00 0.00	Worst		134.00	2.50	No Ice 1/2" Ice 1" Ice	4.90 5.24 5.58	69.00 95.89 122.78
VHLP2.5-180 (Clearwire)	A	Paraboloid w/o Radome	From Face	6.00 -7.00 0.00	Worst		134.00	2.50	No Ice 1/2" Ice 1" Ice	4.90 5.24 5.58	69.00 95.89 122.78
VHLP2.5-180 (Clearwire)	B	Paraboloid w/o Radome	From Face	6.00 -7.00 0.00	Worst		134.00	2.50	No Ice 1/2" Ice 1" Ice	4.90 5.24 5.58	69.00 95.89 122.78
VHLP2-180 (Clearwire)	C	Paraboloid w/o Radome	From Face	6.00 0.00 0.00	Worst		134.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.67	25.00 42.49 59.98
HPD2-4.7 (Updated Elevation per NET Inc. Inventory)	C	Paraboloid w/Radome	From Face	9.00 0.00 0.00	Worst		135.00	2.00	No Ice 1/2" Ice 1" Ice	3.14 3.41 3.68	30.00 40.00 60.00
4' Grid Dish (Unknown)	A	Grid	From Leg	6.00 -7.00 0.00	Worst		134.00	4.00	No Ice 1/2" Ice 1" Ice	12.57 13.10 13.62	60.00 110.00 170.00

Truss-Leg Properties

Section Designation	Area	Area Ice	Self Weight	Ice Weight	Equiv. Diameter	Equiv. Diameter Ice	Leg Area
	in^2	in^2	lb	lb	in	in	in^2
Pirod 105244	1026.8606	3350.4195	535.96	880.51	7.1310	23.2668	3.6816
Pirod 105216	1998.0891	6868.3458	481.19	1655.16	6.9378	23.8484	3.6816
Pirod 105217	2130.7479	6915.2992	589.86	1644.14	7.3984	24.0115	5.3014
Pirod 105217	2130.7479	6896.9514	589.86	1617.90	7.3984	23.9477	5.3014
Pirod 105217 reinf w/ 1" dia bar	2291.5652	6972.8239	748.28	1631.86	7.9568	24.2112	7.6570
Pirod 105218 reinf w/ 1" dia bar	2405.8056	7020.1566	877.28	1633.06	8.3535	24.3755	9.5720
Pirod 105219	2441.8688	7007.6237	899.30	1648.35	8.4787	24.3320	9.4248
Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)	2768.5626	7187.1183	1789.82	1721.28	9.6131	24.9553	15.7570
Pirod 105220 reinf w/ 1" dia bar	2697.7688	7142.2922	1226.50	1695.78	9.3673	24.7996	14.2843

Tower Pressures - No Ice

$G_H = 0.850$

Section Elevation	z	K_Z	q_z	A_G	Face	A_F	A_R	A_{leg}	Leg %	C_AA_A In Face	C_AA_A Out Face
ft	ft		psf	ft^2		ft^2	ft^2	ft^2		ft^2	ft^2
T1	160.00	1.397	33	102.917	A	0.000	12.868	5.833	45.33	44.737	0.000
170.00-150.00					B	0.000	12.868		45.33	0.000	0.000
					C	0.000	12.868		45.33	0.000	0.000
T2	145.00	1.369	32	66.055	A	4.893	11.905	11.905	70.87	23.782	0.000
150.00-140.00					B	4.893	11.905		70.87	0.000	0.000
					C	4.893	11.905		70.87	0.000	0.000
T3	130.00	1.337	32	162.111	A	10.467	23.165	23.165	68.88	50.580	0.000
140.00-120.00					B	10.467	23.165		68.88	25.511	0.000
					C	10.467	23.165		68.88	0.000	0.000
T4	110.00	1.291	31	202.528	A	13.964	24.703	24.703	63.89	68.550	0.000
120.00-100.00					B	13.964	24.703		63.89	67.340	0.000
					C	13.964	24.703		63.89	12.087	0.000
T5	95.00	1.252	30	116.264	A	7.655	12.351	12.351	61.74	38.670	0.000
100.00-90.00					B	7.655	12.351		61.74	33.670	0.000
					C	7.655	12.351		61.74	20.630	0.000
T6 90.00-80.00	85.00	1.223	30	126.517	A	8.119	13.283	13.283	62.07	38.670	0.000
					B	8.119	13.283		62.07	33.670	0.000
					C	8.119	13.283		62.07	24.030	0.000
T7 80.00-60.00	70.00	1.174	30	283.388	A	17.668	27.891	27.891	61.22	77.340	0.000
					B	17.668	27.891		61.22	67.340	0.000
					C	17.668	27.891		61.22	53.260	0.000
T8 60.00-40.00	50.00	1.094	30	323.362	A	19.635	28.309	28.309	59.05	77.340	0.000
					B	19.635	28.309		59.05	67.340	0.000
					C	19.635	28.309		59.05	53.260	0.000
T9 40.00-20.00	30.00	0.982	32	364.340	A	24.755	32.097	32.097	56.46	79.080	0.000
					B	24.755	32.097		56.46	67.340	0.000
					C	24.755	32.097		56.46	53.260	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T10 20.00-0.00	10.00	0.85	37	404.134	A	33.906	31.276	31.276	47.98	52.533	0.000
					B	33.906	31.276		47.98	43.771	0.000
					C	33.906	31.276		47.98	34.619	0.000

Tower Pressure - With Ice

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	t_Z in	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	160.00	1.397	8	2.1981	110.244	A	0.000	62.863	20.487	32.59	212.213	0.000
170.00-150.00						B	0.000	62.863		32.59	0.000	0.000
						C	0.000	62.863		32.59	0.000	0.000
T2	145.00	1.369	7	2.1783	69.690	A	4.893	47.079	38.843	74.74	111.571	0.000
150.00-140.00						B	4.893	47.079		74.74	0.000	0.000
						C	4.893	47.079		74.74	0.000	0.000
T3	130.00	1.337	7	2.1576	169.312	A	10.467	94.683	79.627	75.73	247.073	0.000
140.00-120.00						B	10.467	94.683		75.73	64.162	0.000
						C	10.467	94.683		75.73	0.000	0.000
T4	110.00	1.291	7	2.1292	209.634	A	13.964	99.994	80.171	70.35	295.656	0.000
120.00-100.00						B	13.964	99.994		70.35	133.589	0.000
						C	13.964	99.994		70.35	41.944	0.000
T5 100.00-90.00	95.00	1.252	7	2.1085	119.783	A	7.655	49.202	39.979	70.32	160.757	0.000
						B	7.655	49.202		70.32	66.543	0.000
						C	7.655	49.202		70.32	64.410	0.000
T6 90.00-80.00	85.00	1.223	7	2.0957	130.014	A	8.119	50.141	40.419	69.38	160.197	0.000
						B	8.119	50.141		69.38	66.389	0.000
						C	8.119	50.141		69.38	76.482	0.000
T7 80.00-60.00	70.00	1.174	7	2.0799	290.330	A	17.668	102.386	81.387	67.79	319.011	0.000
						B	17.668	102.386		67.79	132.395	0.000
						C	17.668	102.386		67.79	175.511	0.000
T8 60.00-40.00	50.00	1.094	7	2.0708	330.274	A	19.635	104.476	81.242	65.46	318.214	0.000
						B	19.635	104.476		65.46	132.175	0.000
						C	19.635	104.476		65.46	175.164	0.000
T9 40.00-20.00	30.00	0.982	7	2.0829	371.292	A	24.755	109.104	83.323	62.25	329.915	0.000
						B	24.755	109.104		62.25	132.468	0.000
						C	24.755	109.104		62.25	175.626	0.000
T10 20.00-0.00	10.00	0.85	9	2.0725	411.051	A	33.906	110.912	82.803	57.18	220.724	0.000
						B	33.906	110.912		57.18	85.941	0.000
						C	33.906	110.912		57.18	113.900	0.000

Tower Pressure - Service

$G_H = 0.850$

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
T1	160.00	1.397	11	102.917	A	0.000	12.868	5.833	45.33	44.737	0.000

Section Elevation ft	z ft	K_Z	q_z psf	A_G ft²	Face	A_F ft²	A_R ft²	A_{leg} ft²	Leg %	C_AA_A In Face ft²	C_AA_A Out Face ft²
170.00-150.00					B	0.000	12.868		45.33	0.000	0.000
					C	0.000	12.868		45.33	0.000	0.000
T2	145.00	1.369	11	66.055	A	4.893	11.905	11.905	70.87	23.782	0.000
150.00-140.00					B	4.893	11.905		70.87	0.000	0.000
					C	4.893	11.905		70.87	0.000	0.000
T3	130.00	1.337	11	162.111	A	10.467	23.165	23.165	68.88	50.580	0.000
140.00-120.00					B	10.467	23.165		68.88	25.511	0.000
					C	10.467	23.165		68.88	0.000	0.000
T4	110.00	1.291	10	202.528	A	13.964	24.703	24.703	63.89	68.550	0.000
120.00-100.00					B	13.964	24.703		63.89	67.340	0.000
					C	13.964	24.703		63.89	12.087	0.000
T5	95.00	1.252	10	116.264	A	7.655	12.351	12.351	61.74	38.670	0.000
100.00-90.00					B	7.655	12.351		61.74	33.670	0.000
					C	7.655	12.351		61.74	20.630	0.000
T6 90.00-80.00	85.00	1.223	10	126.517	A	8.119	13.283	13.283	62.07	38.670	0.000
					B	8.119	13.283		62.07	33.670	0.000
					C	8.119	13.283		62.07	24.030	0.000
T7 80.00-60.00	70.00	1.174	10	283.388	A	17.668	27.891	27.891	61.22	77.340	0.000
					B	17.668	27.891		61.22	67.340	0.000
					C	17.668	27.891		61.22	53.260	0.000
T8 60.00-40.00	50.00	1.094	10	323.362	A	19.635	28.309	28.309	59.05	77.340	0.000
					B	19.635	28.309		59.05	67.340	0.000
					C	19.635	28.309		59.05	53.260	0.000
T9 40.00-20.00	30.00	0.982	11	364.340	A	24.755	32.097	32.097	56.46	79.080	0.000
					B	24.755	32.097		56.46	67.340	0.000
					C	24.755	32.097		56.46	53.260	0.000
T10 20.00-0.00	10.00	0.85	12	404.134	A	33.906	31.276	31.276	47.98	52.533	0.000
					B	33.906	31.276		47.98	43.771	0.000
					C	33.906	31.276		47.98	34.619	0.000

Tower Forces - No Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	33	1	1	7.276	1337.86	66.89	C
170.00-150.00			B	0.125	2.866		1	1	7.276			
			C	0.125	2.866		1	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	32	1	1	11.870	1185.57	118.56	C
150.00-140.00			B	0.254	2.425		1	1	11.870			
			C	0.254	2.425		1	1	11.870			
T3	373.84	2164.32	A	0.207	2.571	32	1	1	23.806	2887.45	144.37	C
140.00-120.00			B	0.207	2.571		1	1	23.806			
			C	0.207	2.571		1	1	23.806			
T4	808.24	2662.86	A	0.191	2.627	31	1	1	28.118	4285.04	214.25	C
120.00-100.00			B	0.191	2.627		1	1	28.118			
			C	0.191	2.627		1	1	28.118			
T5	530.04	1505.12	A	0.172	2.692	30	1	1	14.697	2469.76	246.98	C
100.00-90.00			B	0.172	2.692		1	1	14.697			
			C	0.172	2.692		1	1	14.697			
T6	537.18	1774.70	A	0.169	2.702	30	1	1	15.687	2572.54	257.25	C
90.00-80.00			B	0.169	2.702		1	1	15.687			
			C	0.169	2.702		1	1	15.687			
T7	1085.28	4036.41	A	0.161	2.732	30	1	1	33.531	5362.80	268.14	C
80.00-60.00			B	0.161	2.732		1	1	33.531			
			C	0.161	2.732		1	1	33.531			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T8	1085.28	4241.30	A	0.148	2.778	30	1	1	35.697	5626.50	281.32	C
60.00-40.00			B	0.148	2.778		1	1	35.697			
			C	0.148	2.778		1	1	35.697			
T9	1092.78	7988.26	A	0.156	2.749	32	1	1	42.992	6493.10	324.66	C
40.00-20.00			B	0.156	2.749		1	1	42.992			
			C	0.156	2.749		1	1	42.992			
T10	715.18	6342.51	A	0.161	2.73	37	1	1	51.696	6998.71	349.94	C
20.00-0.00			B	0.161	2.73		1	1	51.696			
			C	0.161	2.73		1	1	51.696			
Sum Weight:	6588.78	32887.68						OTM	2607481.73 lb-ft	39219.32		

Tower Forces - No Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	33	0.825	1	7.276	1337.86	66.89	C
170.00-150.00			B	0.125	2.866		0.825	1	7.276			
			C	0.125	2.866		0.825	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	32	0.825	1	11.014	1128.39	112.84	C
150.00-140.00			B	0.254	2.425		0.825	1	11.014			
			C	0.254	2.425		0.825	1	11.014			
T3	373.84	2164.32	A	0.207	2.571	32	0.825	1	21.974	2760.19	138.01	C
140.00-120.00			B	0.207	2.571		0.825	1	21.974			
			C	0.207	2.571		0.825	1	21.974			
T4	808.24	2662.86	A	0.191	2.627	31	0.825	1	25.674	4115.92	205.80	C
120.00-100.00			B	0.191	2.627		0.825	1	25.674			
			C	0.191	2.627		0.825	1	25.674			
T5	530.04	1505.12	A	0.172	2.692	30	0.825	1	13.357	2376.35	237.64	C
100.00-90.00			B	0.172	2.692		0.825	1	13.357			
			C	0.172	2.692		0.825	1	13.357			
T6	537.18	1774.70	A	0.169	2.702	30	0.825	1	14.266	2473.98	247.40	C
90.00-80.00			B	0.169	2.702		0.825	1	14.266			
			C	0.169	2.702		0.825	1	14.266			
T7	1085.28	4036.41	A	0.161	2.732	30	0.825	1	30.439	5147.45	257.37	C
80.00-60.00			B	0.161	2.732		0.825	1	30.439			
			C	0.161	2.732		0.825	1	30.439			
T8	1085.28	4241.30	A	0.148	2.778	30	0.825	1	32.261	5380.06	269.00	C
60.00-40.00			B	0.148	2.778		0.825	1	32.261			
			C	0.148	2.778		0.825	1	32.261			
T9	1092.78	7988.26	A	0.156	2.749	32	0.825	1	38.660	6168.17	308.41	C
40.00-20.00			B	0.156	2.749		0.825	1	38.660			
			C	0.156	2.749		0.825	1	38.660			
T10	715.18	6342.51	A	0.161	2.73	37	0.825	1	45.762	6482.62	324.13	C
20.00-0.00			B	0.161	2.73		0.825	1	45.762			
			C	0.161	2.73		0.825	1	45.762			
Sum Weight:	6588.78	32887.68						OTM	2504488.44 lb-ft	37370.99		

Tower Forces - No Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	33	0.8	1	7.276	1337.86	66.89	C
170.00-150.00			B	0.125	2.866		0.8	1	7.276			
			C	0.125	2.866		0.8	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	32	0.8	1	10.891	1120.23	112.02	C
150.00-140.00			B	0.254	2.425		0.8	1	10.891			
			C	0.254	2.425		0.8	1	10.891			
T3	373.84	2164.32	A	0.207	2.571	32	0.8	1	21.712	2742.01	137.10	C
140.00-120.00			B	0.207	2.571		0.8	1	21.712			
			C	0.207	2.571		0.8	1	21.712			
T4	808.24	2662.86	A	0.191	2.627	31	0.8	1	25.325	4091.76	204.59	C
120.00-100.00			B	0.191	2.627		0.8	1	25.325			
			C	0.191	2.627		0.8	1	25.325			
T5	530.04	1505.12	A	0.172	2.692	30	0.8	1	13.166	2363.01	236.30	C
100.00-90.00			B	0.172	2.692		0.8	1	13.166			
			C	0.172	2.692		0.8	1	13.166			
T6	537.18	1774.70	A	0.169	2.702	30	0.8	1	14.063	2459.90	245.99	C
90.00-80.00			B	0.169	2.702		0.8	1	14.063			
			C	0.169	2.702		0.8	1	14.063			
T7	1085.28	4036.41	A	0.161	2.732	30	0.8	1	29.997	5116.69	255.83	C
80.00-60.00			B	0.161	2.732		0.8	1	29.997			
			C	0.161	2.732		0.8	1	29.997			
T8	1085.28	4241.30	A	0.148	2.778	30	0.8	1	31.770	5344.85	267.24	C
60.00-40.00			B	0.148	2.778		0.8	1	31.770			
			C	0.148	2.778		0.8	1	31.770			
T9	1092.78	7988.26	A	0.156	2.749	32	0.8	1	38.041	6121.75	306.09	C
40.00-20.00			B	0.156	2.749		0.8	1	38.041			
			C	0.156	2.749		0.8	1	38.041			
T10	715.18	6342.51	A	0.161	2.73	37	0.8	1	44.915	6408.89	320.44	C
20.00-0.00			B	0.161	2.73		0.8	1	44.915			
			C	0.161	2.73		0.8	1	44.915			
Sum Weight:	6588.78	32887.68						OTM	2489775.1 1 lb-ft	37106.95		

Tower Forces - No Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	33	0.85	1	7.276	1337.86	66.89	C
170.00-150.00			B	0.125	2.866		0.85	1	7.276			
			C	0.125	2.866		0.85	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	32	0.85	1	11.136	1136.56	113.66	C
150.00-140.00			B	0.254	2.425		0.85	1	11.136			
			C	0.254	2.425		0.85	1	11.136			
T3	373.84	2164.32	A	0.207	2.571	32	0.85	1	22.236	2778.37	138.92	C
140.00-120.00			B	0.207	2.571		0.85	1	22.236			
			C	0.207	2.571		0.85	1	22.236			
T4	808.24	2662.86	A	0.191	2.627	31	0.85	1	26.023	4140.08	207.00	C
120.00-100.00			B	0.191	2.627		0.85	1	26.023			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.191	2.627		0.85	1	26.023			
T5	530.04	1505.12	A	0.172	2.692	30	0.85	1	13.548	2389.70	238.97	C
100.00-90.00			B	0.172	2.692		0.85	1	13.548			
			C	0.172	2.692		0.85	1	13.548			
T6	537.18	1774.70	A	0.169	2.702	30	0.85	1	14.469	2488.06	248.81	C
90.00-80.00			B	0.169	2.702		0.85	1	14.469			
			C	0.169	2.702		0.85	1	14.469			
T7	1085.28	4036.41	A	0.161	2.732	30	0.85	1	30.880	5178.21	258.91	C
80.00-60.00			B	0.161	2.732		0.85	1	30.880			
			C	0.161	2.732		0.85	1	30.880			
T8	1085.28	4241.30	A	0.148	2.778	30	0.85	1	32.751	5415.27	270.76	C
60.00-40.00			B	0.148	2.778		0.85	1	32.751			
			C	0.148	2.778		0.85	1	32.751			
T9	1092.78	7988.26	A	0.156	2.749	32	0.85	1	39.279	6214.59	310.73	C
40.00-20.00			B	0.156	2.749		0.85	1	39.279			
			C	0.156	2.749		0.85	1	39.279			
T10	715.18	6342.51	A	0.161	2.73	37	0.85	1	46.610	6556.34	327.82	C
20.00-0.00			B	0.161	2.73		0.85	1	46.610			
			C	0.161	2.73		0.85	1	46.610			
Sum Weight:	6588.78	32887.68						OTM	2519201.7 7 lb-ft	37635.04		

Tower Forces - With Ice - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	3112.03	4197.31	A	0.57	1.825	8	1	1	45.594	1130.58	56.53	C
170.00-150.00			B	0.57	1.825		1	1	45.594			
			C	0.57	1.825		1	1	45.594			
T2	1642.19	3692.01	A	0.746	1.786	7	1	1	44.644	687.79	68.78	C
150.00-140.00			B	0.746	1.786		1	1	44.644			
			C	0.746	1.786		1	1	44.644			
T3	4822.14	9611.36	A	0.621	1.792	7	1	1	82.167	1655.73	82.79	C
140.00-120.00			B	0.621	1.792		1	1	82.167			
			C	0.621	1.792		1	1	82.167			
T4	8040.47	10728.70	A	0.544	1.85	7	1	1	84.908	2265.15	113.26	C
120.00-100.00			B	0.544	1.85		1	1	84.908			
			C	0.544	1.85		1	1	84.908			
T5	4979.76	5518.17	A	0.475	1.935	7	1	1	40.701	1388.54	138.85	C
100.00-90.00			B	0.475	1.935		1	1	40.701			
			C	0.475	1.935		1	1	40.701			
T6	5119.45	5876.33	A	0.448	1.977	7	1	1	41.130	1474.25	147.42	C
90.00-80.00			B	0.448	1.977		1	1	41.130			
			C	0.448	1.977		1	1	41.130			
T7	10487.05	12460.57	A	0.414	2.038	7	1	1	83.420	3166.73	158.34	C
80.00-60.00			B	0.414	2.038		1	1	83.420			
			C	0.414	2.038		1	1	83.420			
T8	10438.49	13037.94	A	0.376	2.114	7	1	1	85.047	3311.41	165.57	C
60.00-40.00			B	0.376	2.114		1	1	85.047			
			C	0.376	2.114		1	1	85.047			
T9	10713.97	17823.14	A	0.361	2.147	7	1	1	92.406	3663.65	183.18	C
40.00-20.00			B	0.361	2.147		1	1	92.406			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
			C	0.361	2.147		1	1	92.406			
T10	7062.80	17404.47	A	0.352	2.166	9	1	1	102.331	3488.68	174.43	C
20.00-0.00			B	0.352	2.166		1	1	102.331			
			C	0.352	2.166		1	1	102.331			
Sum Weight:	66418.35	100350.01						OTM	1534292.92 lb-ft	22232.51		

Tower Forces - With Ice - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	3112.03	4197.31	A	0.57	1.825	8	0.825	1	45.594	1130.58	56.53	C
170.00-150.00			B	0.57	1.825		0.825	1	45.594			
			C	0.57	1.825		0.825	1	45.594			
T2	1642.19	3692.01	A	0.746	1.786	7	0.825	1	43.788	678.06	67.81	C
150.00-140.00			B	0.746	1.786		0.825	1	43.788			
			C	0.746	1.786		0.825	1	43.788			
T3	4822.14	9611.36	A	0.621	1.792	7	0.825	1	80.335	1635.23	81.76	C
140.00-120.00			B	0.621	1.792		0.825	1	80.335			
			C	0.621	1.792		0.825	1	80.335			
T4	8040.47	10728.70	A	0.544	1.85	7	0.825	1	82.464	2237.63	111.88	C
120.00-100.00			B	0.544	1.85		0.825	1	82.464			
			C	0.544	1.85		0.825	1	82.464			
T5	4979.76	5518.17	A	0.475	1.935	7	0.825	1	39.361	1373.03	137.30	C
100.00-90.00			B	0.475	1.935		0.825	1	39.361			
			C	0.475	1.935		0.825	1	39.361			
T6	5119.45	5876.33	A	0.448	1.977	7	0.825	1	39.709	1457.59	145.76	C
90.00-80.00			B	0.448	1.977		0.825	1	39.709			
			C	0.448	1.977		0.825	1	39.709			
T7	10487.05	12460.57	A	0.414	2.038	7	0.825	1	80.328	3129.62	156.48	C
80.00-60.00			B	0.414	2.038		0.825	1	80.328			
			C	0.414	2.038		0.825	1	80.328			
T8	10438.49	13037.94	A	0.376	2.114	7	0.825	1	81.611	3268.08	163.40	C
60.00-40.00			B	0.376	2.114		0.825	1	81.611			
			C	0.376	2.114		0.825	1	81.611			
T9	10713.97	17823.14	A	0.361	2.147	7	0.825	1	88.074	3605.02	180.25	C
40.00-20.00			B	0.361	2.147		0.825	1	88.074			
			C	0.361	2.147		0.825	1	88.074			
T10	7062.80	17404.47	A	0.352	2.166	9	0.825	1	96.398	3394.08	169.70	C
20.00-0.00			B	0.352	2.166		0.825	1	96.398			
			C	0.352	2.166		0.825	1	96.398			
Sum Weight:	66418.35	100350.01						OTM	1516831.55 lb-ft	21908.92		

Tower Forces - With Ice - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	3112.03	4197.31	A	0.57	1.825	8	0.8	1	45.594	1130.58	56.53	C
170.00-150.00			B	0.57	1.825		0.8	1	45.594			
			C	0.57	1.825		0.8	1	45.594			
T2	1642.19	3692.01	A	0.746	1.786	7	0.8	1	43.665	676.67	67.67	C
150.00-140.00			B	0.746	1.786		0.8	1	43.665			
			C	0.746	1.786		0.8	1	43.665			
T3	4822.14	9611.36	A	0.621	1.792	7	0.8	1	80.074	1632.30	81.62	C
140.00-120.00			B	0.621	1.792		0.8	1	80.074			
			C	0.621	1.792		0.8	1	80.074			
T4	8040.47	10728.70	A	0.544	1.85	7	0.8	1	82.115	2233.70	111.68	C
120.00-100.00			B	0.544	1.85		0.8	1	82.115			
			C	0.544	1.85		0.8	1	82.115			
T5	4979.76	5518.17	A	0.475	1.935	7	0.8	1	39.170	1370.81	137.08	C
100.00-90.00			B	0.475	1.935		0.8	1	39.170			
			C	0.475	1.935		0.8	1	39.170			
T6	5119.45	5876.33	A	0.448	1.977	7	0.8	1	39.506	1455.21	145.52	C
90.00-80.00			B	0.448	1.977		0.8	1	39.506			
			C	0.448	1.977		0.8	1	39.506			
T7	10487.05	12460.57	A	0.414	2.038	7	0.8	1	79.886	3124.32	156.22	C
80.00-60.00			B	0.414	2.038		0.8	1	79.886			
			C	0.414	2.038		0.8	1	79.886			
T8	10438.49	13037.94	A	0.376	2.114	7	0.8	1	81.120	3261.89	163.09	C
60.00-40.00			B	0.376	2.114		0.8	1	81.120			
			C	0.376	2.114		0.8	1	81.120			
T9	10713.97	17823.14	A	0.361	2.147	7	0.8	1	87.455	3596.64	179.83	C
40.00-20.00			B	0.361	2.147		0.8	1	87.455			
			C	0.361	2.147		0.8	1	87.455			
T10	7062.80	17404.47	A	0.352	2.166	9	0.8	1	95.550	3380.57	169.03	C
20.00-0.00			B	0.352	2.166		0.8	1	95.550			
			C	0.352	2.166		0.8	1	95.550			
Sum Weight:	66418.35	100350.01						OTM	1514337.07 lb-ft	21862.69		

Tower Forces - With Ice - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	3112.03	4197.31	A	0.57	1.825	8	0.85	1	45.594	1130.58	56.53	C
170.00-150.00			B	0.57	1.825		0.85	1	45.594			
			C	0.57	1.825		0.85	1	45.594			
T2	1642.19	3692.01	A	0.746	1.786	7	0.85	1	43.910	679.45	67.94	C
150.00-140.00			B	0.746	1.786		0.85	1	43.910			
			C	0.746	1.786		0.85	1	43.910			
T3	4822.14	9611.36	A	0.621	1.792	7	0.85	1	80.597	1638.16	81.91	C
140.00-120.00			B	0.621	1.792		0.85	1	80.597			
			C	0.621	1.792		0.85	1	80.597			
T4	8040.47	10728.70	A	0.544	1.85	7	0.85	1	82.813	2241.56	112.08	C
120.00-100.00			B	0.544	1.85		0.85	1	82.813			
			C	0.544	1.85		0.85	1	82.813			
T5	4979.76	5518.17	A	0.475	1.935	7	0.85	1	39.553	1375.24	137.52	C
100.00-90.00			B	0.475	1.935		0.85	1	39.553			
			C	0.475	1.935		0.85	1	39.553			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T6	5119.45	5876.33	A	0.448	1.977	7	0.85	1	39.912	1459.97	146.00	C
90.00-80.00			B	0.448	1.977		0.85	1	39.912			
			C	0.448	1.977		0.85	1	39.912			
T7	10487.05	12460.57	A	0.414	2.038	7	0.85	1	80.769	3134.92	156.75	C
80.00-60.00			B	0.414	2.038		0.85	1	80.769			
			C	0.414	2.038		0.85	1	80.769			
T8	10438.49	13037.94	A	0.376	2.114	7	0.85	1	82.102	3274.27	163.71	C
60.00-40.00			B	0.376	2.114		0.85	1	82.102			
			C	0.376	2.114		0.85	1	82.102			
T9	10713.97	17823.14	A	0.361	2.147	7	0.85	1	88.693	3613.39	180.67	C
40.00-20.00			B	0.361	2.147		0.85	1	88.693			
			C	0.361	2.147		0.85	1	88.693			
T10	7062.80	17404.47	A	0.352	2.166	9	0.85	1	97.245	3407.60	170.38	C
20.00-0.00			B	0.352	2.166		0.85	1	97.245			
			C	0.352	2.166		0.85	1	97.245			
Sum Weight:	66418.35	100350.01						OTM	1519326.0 3 lb-ft	21955.14		

Tower Forces - Service - Wind Normal To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	11	1	1	7.276	445.12	22.26	C
170.00-150.00			B	0.125	2.866		1	1	7.276			
			C	0.125	2.866		1	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	11	1	1	11.870	394.45	39.44	C
150.00-140.00			B	0.254	2.425		1	1	11.870			
			C	0.254	2.425		1	1	11.870			
T3	373.84	2164.32	A	0.207	2.571	11	1	1	23.806	960.67	48.03	C
140.00-120.00			B	0.207	2.571		1	1	23.806			
			C	0.207	2.571		1	1	23.806			
T4	808.24	2662.86	A	0.191	2.627	10	1	1	28.118	1425.66	71.28	C
120.00-100.00			B	0.191	2.627		1	1	28.118			
			C	0.191	2.627		1	1	28.118			
T5	530.04	1505.12	A	0.172	2.692	10	1	1	14.697	821.71	82.17	C
100.00-90.00			B	0.172	2.692		1	1	14.697			
			C	0.172	2.692		1	1	14.697			
T6	537.18	1774.70	A	0.169	2.702	10	1	1	15.687	855.90	85.59	C
90.00-80.00			B	0.169	2.702		1	1	15.687			
			C	0.169	2.702		1	1	15.687			
T7	1085.28	4036.41	A	0.161	2.732	10	1	1	33.531	1784.24	89.21	C
80.00-60.00			B	0.161	2.732		1	1	33.531			
			C	0.161	2.732		1	1	33.531			
T8	1085.28	4241.30	A	0.148	2.778	10	1	1	35.697	1871.97	93.60	C
60.00-40.00			B	0.148	2.778		1	1	35.697			
			C	0.148	2.778		1	1	35.697			
T9	1092.78	7988.26	A	0.156	2.749	11	1	1	42.992	2160.30	108.01	C
40.00-20.00			B	0.156	2.749		1	1	42.992			
			C	0.156	2.749		1	1	42.992			
T10	715.18	6342.51	A	0.161	2.73	12	1	1	51.696	2328.51	116.43	C
20.00-0.00			B	0.161	2.73		1	1	51.696			
			C	0.161	2.73		1	1	51.696			

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
Sum Weight:	6588.78	32887.68						OTM	867525.93 lb-ft	13048.52		

Tower Forces - Service - Wind 45 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	11	0.825	1	7.276	445.12	22.26	C
170.00-150.00			B	0.125	2.866		0.825	1	7.276			
			C	0.125	2.866		0.825	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	11	0.825	1	11.014	375.42	37.54	C
150.00-140.00			B	0.254	2.425		0.825	1	11.014			
			C	0.254	2.425		0.825	1	11.014			
T3	373.84	2164.32	A	0.207	2.571	11	0.825	1	21.974	918.33	45.92	C
140.00-120.00			B	0.207	2.571		0.825	1	21.974			
			C	0.207	2.571		0.825	1	21.974			
T4	808.24	2662.86	A	0.191	2.627	10	0.825	1	25.674	1369.39	68.47	C
120.00-100.00			B	0.191	2.627		0.825	1	25.674			
			C	0.191	2.627		0.825	1	25.674			
T5	530.04	1505.12	A	0.172	2.692	10	0.825	1	13.357	790.63	79.06	C
100.00-90.00			B	0.172	2.692		0.825	1	13.357			
			C	0.172	2.692		0.825	1	13.357			
T6	537.18	1774.70	A	0.169	2.702	10	0.825	1	14.266	823.11	82.31	C
90.00-80.00			B	0.169	2.702		0.825	1	14.266			
			C	0.169	2.702		0.825	1	14.266			
T7	1085.28	4036.41	A	0.161	2.732	10	0.825	1	30.439	1712.59	85.63	C
80.00-60.00			B	0.161	2.732		0.825	1	30.439			
			C	0.161	2.732		0.825	1	30.439			
T8	1085.28	4241.30	A	0.148	2.778	10	0.825	1	32.261	1789.98	89.50	C
60.00-40.00			B	0.148	2.778		0.825	1	32.261			
			C	0.148	2.778		0.825	1	32.261			
T9	1092.78	7988.26	A	0.156	2.749	11	0.825	1	38.660	2052.19	102.61	C
40.00-20.00			B	0.156	2.749		0.825	1	38.660			
			C	0.156	2.749		0.825	1	38.660			
T10	715.18	6342.51	A	0.161	2.73	12	0.825	1	45.762	2156.81	107.84	C
20.00-0.00			B	0.161	2.73		0.825	1	45.762			
			C	0.161	2.73		0.825	1	45.762			
Sum Weight:	6588.78	32887.68						OTM	833259.40 lb-ft	12433.57		

Tower Forces - Service - Wind 60 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	11	0.8	1	7.276	445.12	22.26	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
170.00-150.00			B	0.125	2.866		0.8	1	7.276			
			C	0.125	2.866		0.8	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	11	0.8	1	10.891	372.71	37.27	C
150.00-140.00			B	0.254	2.425		0.8	1	10.891			
			C	0.254	2.425		0.8	1	10.891			
T3	373.84	2164.32	A	0.207	2.571	11	0.8	1	21.712	912.28	45.61	C
140.00-120.00			B	0.207	2.571		0.8	1	21.712			
			C	0.207	2.571		0.8	1	21.712			
T4	808.24	2662.86	A	0.191	2.627	10	0.8	1	25.325	1361.36	68.07	C
120.00-100.00			B	0.191	2.627		0.8	1	25.325			
			C	0.191	2.627		0.8	1	25.325			
T5	530.04	1505.12	A	0.172	2.692	10	0.8	1	13.166	786.19	78.62	C
100.00-90.00			B	0.172	2.692		0.8	1	13.166			
			C	0.172	2.692		0.8	1	13.166			
T6	537.18	1774.70	A	0.169	2.702	10	0.8	1	14.063	818.42	81.84	C
90.00-80.00			B	0.169	2.702		0.8	1	14.063			
			C	0.169	2.702		0.8	1	14.063			
T7	1085.28	4036.41	A	0.161	2.732	10	0.8	1	29.997	1702.35	85.12	C
80.00-60.00			B	0.161	2.732		0.8	1	29.997			
			C	0.161	2.732		0.8	1	29.997			
T8	1085.28	4241.30	A	0.148	2.778	10	0.8	1	31.770	1778.27	88.91	C
60.00-40.00			B	0.148	2.778		0.8	1	31.770			
			C	0.148	2.778		0.8	1	31.770			
T9	1092.78	7988.26	A	0.156	2.749	11	0.8	1	38.041	2036.74	101.84	C
40.00-20.00			B	0.156	2.749		0.8	1	38.041			
			C	0.156	2.749		0.8	1	38.041			
T10	715.18	6342.51	A	0.161	2.73	12	0.8	1	44.915	2132.28	106.61	C
20.00-0.00			B	0.161	2.73		0.8	1	44.915			
			C	0.161	2.73		0.8	1	44.915			
Sum Weight:	6588.78	32887.68						OTM	828364.18 lb-ft	12345.72		

Tower Forces - Service - Wind 90 To Face

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
T1	237.16	1101.05	A	0.125	2.866	11	0.85	1	7.276	445.12	22.26	C
170.00-150.00			B	0.125	2.866		0.85	1	7.276			
			C	0.125	2.866		0.85	1	7.276			
T2	123.80	1071.16	A	0.254	2.425	11	0.85	1	11.136	378.14	37.81	C
150.00-140.00			B	0.254	2.425		0.85	1	11.136			
			C	0.254	2.425		0.85	1	11.136			
T3	373.84	2164.32	A	0.207	2.571	11	0.85	1	22.236	924.38	46.22	C
140.00-120.00			B	0.207	2.571		0.85	1	22.236			
			C	0.207	2.571		0.85	1	22.236			
T4	808.24	2662.86	A	0.191	2.627	10	0.85	1	26.023	1377.43	68.87	C
120.00-100.00			B	0.191	2.627		0.85	1	26.023			
			C	0.191	2.627		0.85	1	26.023			
T5	530.04	1505.12	A	0.172	2.692	10	0.85	1	13.548	795.07	79.51	C
100.00-90.00			B	0.172	2.692		0.85	1	13.548			
			C	0.172	2.692		0.85	1	13.548			
T6	537.18	1774.70	A	0.169	2.702	10	0.85	1	14.469	827.79	82.78	C

Section Elevation ft	Add Weight lb	Self Weight lb	Face	e	C_F	q_z psf	D_F	D_R	A_E ft²	F lb	w plf	Ctrl. Face
90.00-80.00			B	0.169	2.702		0.85	1	14.469			
			C	0.169	2.702		0.85	1	14.469			
T7	1085.28	4036.41	A	0.161	2.732	10	0.85	1	30.880	1722.83	86.14	C
80.00-60.00			B	0.161	2.732		0.85	1	30.880			
			C	0.161	2.732		0.85	1	30.880			
T8	1085.28	4241.30	A	0.148	2.778	10	0.85	1	32.751	1801.69	90.08	C
60.00-40.00			B	0.148	2.778		0.85	1	32.751			
			C	0.148	2.778		0.85	1	32.751			
T9	1092.78	7988.26	A	0.156	2.749	11	0.85	1	39.279	2067.63	103.38	C
40.00-20.00			B	0.156	2.749		0.85	1	39.279			
			C	0.156	2.749		0.85	1	39.279			
T10	715.18	6342.51	A	0.161	2.73	12	0.85	1	46.610	2181.34	109.07	C
20.00-0.00			B	0.161	2.73		0.85	1	46.610			
			C	0.161	2.73		0.85	1	46.610			
Sum Weight:	6588.78	32887.68						OTM	838154.62 lb-ft	12521.42		

Force Totals

Load Case	Vertical Forces lb	Sum of Forces X lb	Sum of Forces Z lb	Sum of Overturning Moments, M_x lb-ft	Sum of Overturning Moments, M_z lb-ft	Sum of Torques lb-ft
Leg Weight	20928.05					
Bracing Weight	11959.63					
Total Member Self-Weight	32887.68			-3761.17	2047.25	
Total Weight	56674.10			-3761.17	2047.25	
Wind 0 deg - No Ice		0.00	-58986.97	-5180800.23	2047.25	-8180.12
Wind 30 deg - No Ice		28701.35	-49712.19	-4410755.82	-2542332.29	-12703.82
Wind 45 deg - No Ice		40403.12	-40403.12	-3591653.34	-3585844.91	-13731.57
Wind 60 deg - No Ice		49254.85	-28437.30	-2533427.39	-4379463.16	-13823.54
Wind 90 deg - No Ice		57402.69	0.00	-3761.17	-5086711.84	-11239.26
Wind 120 deg - No Ice		51084.22	29493.49	2584758.35	-4481400.09	-5643.42
Wind 135 deg - No Ice		41149.96	41149.96	3625746.57	-3627460.49	-2163.14
Wind 150 deg - No Ice		28701.35	49712.19	4403233.47	-2542332.29	1464.56
Wind 180 deg - No Ice		0.00	56874.60	5055571.26	2047.25	8180.12
Wind 210 deg - No Ice		-28701.35	49712.19	4403233.47	2546426.79	12703.82
Wind 225 deg - No Ice		-40403.12	40403.12	3584130.99	3589939.41	13731.57
Wind 240 deg - No Ice		-51084.22	29493.49	2584758.35	4485494.59	13823.54
Wind 270 deg - No Ice		-57402.69	0.00	-3761.17	5090806.34	11239.26
Wind 300 deg - No Ice		-49254.85	-28437.30	-2533427.39	4383557.66	5643.42
Wind 315 deg - No Ice		-40403.12	-40403.12	-3591653.34	3589939.41	2163.14
Wind 330 deg - No Ice		-28701.35	-49712.19	-4410755.82	2546426.79	-1464.56
Member Ice	67462.33					
Total Weight Ice	218381.08			-61182.96	31460.49	
Wind 0 deg - Ice		0.00	-30553.81	-2691548.79	31460.49	-16939.06
Wind 30 deg - Ice		15138.22	-26220.17	-2326184.88	-1276238.97	-24861.43
Wind 45 deg - Ice		21375.99	-21375.99	-1908785.42	-1816141.96	-26391.07
Wind 60 deg - Ice		26140.11	-15092.00	-1366387.95	-2229220.85	-26122.20
Wind 90 deg - Ice		30276.45	0.00	-61182.96	-2583938.44	-20383.54
Wind 120 deg - Ice		26460.38	15276.91	1253999.95	-2246503.13	-9183.13
Wind 135 deg - Ice		21506.75	21506.75	1793474.95	-1823197.42	-2435.61
Wind 150 deg - Ice		15138.22	26220.17	2203818.95	-1276238.97	4477.89
Wind 180 deg - Ice		0.00	30183.99	2549227.00	31460.49	16939.06

Load Case	*Vertical Forces* *lb*	*Sum of Forces X* *lb*	*Sum of Forces Z* *lb*	*Sum of Overturning Moments, M_x* *lb-ft*	*Sum of Overturning Moments, M_z* *lb-ft*	*Sum of Torques* *lb-ft*
Wind 210 deg - Ice		-15138.22	26220.17	2203818.95	1339159.96	24861.43
Wind 225 deg - Ice		-21375.99	21375.99	1786419.49	1879062.95	26391.07
Wind 240 deg - Ice		-26460.38	15276.91	1253999.95	2309424.12	26122.20
Wind 270 deg - Ice		-30276.45	0.00	-61182.96	2646859.43	20383.54
Wind 300 deg - Ice		-26140.11	-15092.00	-1366387.95	2292141.84	9183.13
Wind 315 deg - Ice		-21375.99	-21375.99	-1908785.42	1879062.95	2435.61
Wind 330 deg - Ice		-15138.22	-26220.17	-2326184.88	1339159.96	-4477.89
Total Weight	56674.10			-3761.17	2047.25	
Wind 0 deg - Service		0.00	-19625.35	-1731434.91	-143.43	-2721.58
Wind 30 deg - Service		9549.12	-16539.57	-1475236.19	-846674.86	-4226.64
Wind 45 deg - Service		13442.38	-13442.38	-1202715.53	-1193858.22	-4568.58
Wind 60 deg - Service		16387.40	-9461.27	-850636.95	-1457900.11	-4599.18
Wind 90 deg - Service		19098.25	0.00	-9000.74	-1693206.29	-3739.37
Wind 120 deg - Service		16996.05	9812.67	852216.34	-1491815.18	-1877.60
Wind 135 deg - Service		13690.86	13690.86	1198559.82	-1207703.99	-719.69
Wind 150 deg - Service		9549.12	16539.57	1457234.71	-846674.86	487.27
Wind 180 deg - Service		0.00	18922.55	1674271.68	-143.43	2721.58
Wind 210 deg - Service		-9549.12	16539.57	1457234.71	846388.00	4226.64
Wind 225 deg - Service		-13442.38	13442.38	1184714.05	1193571.36	4568.58
Wind 240 deg - Service		-16996.05	9812.67	852216.34	1491528.32	4599.18
Wind 270 deg - Service		-19098.25	0.00	-9000.74	1692919.43	3739.37
Wind 300 deg - Service		-16387.40	-9461.27	-850636.95	1457613.25	1877.60
Wind 315 deg - Service		-13442.38	-13442.38	-1202715.53	1193571.36	719.69
Wind 330 deg - Service		-9549.12	-16539.57	-1475236.19	846388.00	-487.27

Load Combinations

Comb. No.	*Description*
1	Dead Only
2	1.2 Dead+1.6 Wind 0 deg - No Ice
3	0.9 Dead+1.6 Wind 0 deg - No Ice
4	1.2 Dead+1.6 Wind 30 deg - No Ice
5	0.9 Dead+1.6 Wind 30 deg - No Ice
6	1.2 Dead+1.6 Wind 45 deg - No Ice
7	0.9 Dead+1.6 Wind 45 deg - No Ice
8	1.2 Dead+1.6 Wind 60 deg - No Ice
9	0.9 Dead+1.6 Wind 60 deg - No Ice
10	1.2 Dead+1.6 Wind 90 deg - No Ice
11	0.9 Dead+1.6 Wind 90 deg - No Ice
12	1.2 Dead+1.6 Wind 120 deg - No Ice
13	0.9 Dead+1.6 Wind 120 deg - No Ice
14	1.2 Dead+1.6 Wind 135 deg - No Ice
15	0.9 Dead+1.6 Wind 135 deg - No Ice
16	1.2 Dead+1.6 Wind 150 deg - No Ice
17	0.9 Dead+1.6 Wind 150 deg - No Ice
18	1.2 Dead+1.6 Wind 180 deg - No Ice
19	0.9 Dead+1.6 Wind 180 deg - No Ice
20	1.2 Dead+1.6 Wind 210 deg - No Ice
21	0.9 Dead+1.6 Wind 210 deg - No Ice
22	1.2 Dead+1.6 Wind 225 deg - No Ice
23	0.9 Dead+1.6 Wind 225 deg - No Ice
24	1.2 Dead+1.6 Wind 240 deg - No Ice
25	0.9 Dead+1.6 Wind 240 deg - No Ice
26	1.2 Dead+1.6 Wind 270 deg - No Ice
27	0.9 Dead+1.6 Wind 270 deg - No Ice

Comb. No.	Description
28	1.2 Dead+1.6 Wind 300 deg - No Ice
29	0.9 Dead+1.6 Wind 300 deg - No Ice
30	1.2 Dead+1.6 Wind 315 deg - No Ice
31	0.9 Dead+1.6 Wind 315 deg - No Ice
32	1.2 Dead+1.6 Wind 330 deg - No Ice
33	0.9 Dead+1.6 Wind 330 deg - No Ice
34	1.2 Dead+1.0 Ice+1.0 Temp
35	1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp
36	1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp
37	1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp
38	1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp
39	1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp
40	1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp
41	1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp
42	1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp
43	1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp
44	1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp
45	1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp
46	1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp
47	1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp
48	1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp
49	1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp
50	1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp
51	Dead+Wind 0 deg - Service
52	Dead+Wind 30 deg - Service
53	Dead+Wind 45 deg - Service
54	Dead+Wind 60 deg - Service
55	Dead+Wind 90 deg - Service
56	Dead+Wind 120 deg - Service
57	Dead+Wind 135 deg - Service
58	Dead+Wind 150 deg - Service
59	Dead+Wind 180 deg - Service
60	Dead+Wind 210 deg - Service
61	Dead+Wind 225 deg - Service
62	Dead+Wind 240 deg - Service
63	Dead+Wind 270 deg - Service
64	Dead+Wind 300 deg - Service
65	Dead+Wind 315 deg - Service
66	Dead+Wind 330 deg - Service

Maximum Member Forces

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
T1	170 - 150	Leg	Max Tension	9	43635.76	-65.76	59.79
			Max. Compression	2	-48713.82	33.63	550.85
			Max. Mx	24	-47053.12	422.07	-361.93
			Max. My	2	-48713.82	33.63	550.85
			Max. Vy	24	-4151.01	422.07	-361.93
			Max. Vx	2	-5375.96	33.63	550.85
		Diagonal	Max Tension	31	5272.97	0.00	0.00
			Max. Compression	14	-5313.13	0.00	0.00
			Max. Mx	35	1152.73	-10.85	0.00
			Max. My	10	2373.21	-3.75	-1.32
			Max. Vy	35	17.27	-10.85	0.00
			Max. Vx	10	-0.47	0.00	0.00
		Top Girt	Max Tension	25	645.36	0.00	0.00
			Max. Compression	18	-665.84	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	34	-30.88	33.46	0.00
			Max. Vy	34	26.77	0.00	0.00
		Bottom Girt	Max Tension	8	249.73	0.00	0.00
			Max. Compression	2	-253.54	0.00	0.00
			Max. Mx	34	3.38	33.46	0.00
			Max. Vy	34	26.77	0.00	0.00
T2	150 - 140	Leg	Max Tension	9	47939.84	-527.30	103.05
			Max. Compression	2	-53550.87	3987.38	211.62
			Max. Mx	8	47372.65	-4353.21	1049.14
			Max. My	10	-4185.25	-176.49	6567.62
			Max. Vy	18	635.31	-4310.05	-181.37
			Max. Vx	10	-1173.01	-176.49	6567.62
		Diagonal	Max Tension	29	7466.37	49.94	-30.80
			Max. Compression	12	-7999.29	0.00	0.00
			Max. Mx	28	1808.03	54.14	-15.84
			Max. My	28	-5408.97	-17.49	-33.85
			Max. Vy	38	36.68	52.02	10.39
			Max. Vx	28	6.80	0.00	0.00
		Top Girt	Max Tension	8	670.20	0.00	0.00
			Max. Compression	3	-607.43	0.00	0.00
			Max. Mx	34	114.74	-67.28	0.00
			Max. My	34	49.08	0.00	1.94
			Max. Vy	34	53.82	0.00	0.00
			Max. Vx	34	-1.55	0.00	0.00
T3	140 - 120	Leg	Max Tension	29	83234.08	-5078.74	-137.64
			Max. Compression	2	-94299.16	4466.79	-140.81
			Max. Mx	2	-93153.39	5251.26	410.63
			Max. My	4	-5110.76	-413.17	-7548.50
			Max. Vy	18	1084.32	-5002.67	-430.00
			Max. Vx	10	1312.55	-176.49	6567.62
		Diagonal	Max Tension	7	11067.11	127.65	19.69
			Max. Compression	22	-11286.58	0.00	0.00
			Max. Mx	2	5975.69	155.79	9.78
			Max. My	26	-7069.68	-83.92	-37.14
			Max. Vy	35	-63.00	135.39	14.69
			Max. Vx	26	7.21	0.00	0.00
T4	120 - 100	Leg	Max Tension	29	134077.67	-6525.23	-42.92
			Max. Compression	2	-150489.38	3637.97	-20.68
			Max. Mx	2	-150018.68	7317.38	-28.77
			Max. My	4	-5316.96	-413.17	-7548.50
			Max. Vy	24	-1392.97	7240.01	-16.36
			Max. Vx	4	-1759.35	-413.17	-7548.50
		Diagonal	Max Tension	9	13742.88	0.00	0.00
			Max. Compression	24	-14550.76	0.00	0.00
			Max. Mx	35	1933.86	142.68	-19.20
			Max. My	26	7872.48	109.92	-41.36
			Max. Vy	38	71.35	110.83	15.62
			Max. Vx	26	7.22	0.00	0.00
		Mid Girt	Max Tension	28	4251.11	0.00	0.00
			Max. Compression	3	-3709.54	0.00	0.00
			Max. Mx	34	1208.27	-212.80	0.00
			Max. My	34	887.10	0.00	6.14
			Max. Vy	34	94.58	0.00	0.00
			Max. Vx	34	-2.73	0.00	0.00
T5	100 - 90	Leg	Max Tension	9	167387.44	-4187.83	266.28
			Max. Compression	2	-187705.16	5411.24	-10.25
			Max. Mx	2	-187705.16	5411.24	-10.25
			Max. My	26	-10269.31	-345.88	-7533.53
			Max. Vy	8	-2299.64	-4281.48	279.42
			Max. Vx	32	2544.55	-374.58	7158.65
		Diagonal	Max Tension	6	16238.23	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Compression	14	-16380.99	0.00	0.00
			Max. Mx	2	12754.19	281.93	9.44
			Max. My	39	3744.81	229.63	28.79
			Max. Vy	35	-103.62	254.53	22.69
			Max. Vx	39	-6.83	0.00	0.00
T6	90 - 80	Leg	Max Tension	29	201252.13	-5150.97	5.74
			Max. Compression	2	-224672.86	6221.23	-10.19
			Max. Mx	2	-224672.86	6221.23	-10.19
			Max. My	4	-10663.21	77.99	-5260.42
			Max. Vy	18	455.87	-6076.09	13.12
			Max. Vx	10	-401.13	23.32	4739.32
		Diagonal	Max Tension	20	15822.65	0.00	0.00
			Max. Compression	20	-15917.76	0.00	0.00
			Max. Mx	35	3633.49	228.34	25.88
			Max. My	39	3714.38	210.88	31.16
			Max. Vy	35	-104.37	228.34	25.88
			Max. Vx	39	-7.07	0.00	0.00
T7	80 - 60	Leg	Max Tension	9	264372.10	-5717.80	-9.09
			Max. Compression	2	-292645.45	6589.27	25.27
			Max. Mx	2	-292645.45	6589.27	25.27
			Max. My	32	-12274.79	-83.25	6274.48
			Max. Vy	3	-264.69	6569.02	25.38
			Max. Vx	15	384.06	-1542.76	-6074.65
		Diagonal	Max Tension	20	16125.29	0.00	0.00
			Max. Compression	20	-16227.29	0.00	0.00
			Max. Mx	35	3776.69	239.69	27.49
			Max. My	46	-5542.77	142.92	-32.06
			Max. Vy	38	117.70	220.86	30.82
			Max. Vx	46	7.04	0.00	0.00
T8	60 - 40	Leg	Max Tension	9	323180.61	-5853.26	-16.84
			Max. Compression	2	-356683.67	7106.54	39.79
			Max. Mx	2	-356683.67	7106.54	39.79
			Max. My	32	-15027.22	-173.72	7418.82
			Max. Vy	2	-329.23	7106.54	39.79
			Max. Vx	32	-411.40	-173.72	7418.82
		Diagonal	Max Tension	20	16604.04	0.00	0.00
			Max. Compression	20	-16805.14	0.00	0.00
			Max. Mx	35	3902.42	288.33	34.99
			Max. My	38	4006.78	261.60	37.21
			Max. Vy	48	133.69	271.80	30.98
			Max. Vx	38	-7.56	0.00	0.00
T9	40 - 20	Leg	Max Tension	29	379882.71	-6408.65	40.11
			Max. Compression	2	-420987.71	8934.56	65.06
			Max. Mx	48	61380.64	-9710.09	-76.24
			Max. My	26	-17095.17	73.40	-6673.62
			Max. Vy	38	1226.59	-9696.66	178.83
			Max. Vx	32	404.05	55.98	6639.30
		Diagonal	Max Tension	20	17721.58	0.00	0.00
			Max. Compression	20	-17951.10	0.00	0.00
			Max. Mx	48	5476.60	379.39	-49.33
			Max. My	37	-5391.69	319.91	54.29
			Max. Vy	48	184.70	379.39	-49.33
			Max. Vx	37	-10.20	0.00	0.00
T10	20 - 0	Leg	Max Tension	29	435160.95	-6510.46	37.67
			Max. Compression	2	-483620.06	0.00	0.11
			Max. Mx	35	-208643.13	11246.59	-38.33
			Max. My	32	-20984.68	-464.02	12773.42
			Max. Vy	38	-1815.94	-9696.66	178.83
			Max. Vx	32	1566.96	-464.02	12773.42
		Diagonal	Max Tension	7	20539.15	0.00	0.00
			Max. Compression	22	-21042.36	0.00	0.00

Section No.	Elevation ft	Component Type	Condition	Gov. Load Comb.	Axial lb	Major Axis Moment lb-ft	Minor Axis Moment lb-ft
			Max. Mx	35	2142.38	596.77	56.65
			Max. My	46	8208.00	329.54	-77.42
			Max. Vy	48	222.88	585.41	-55.11
			Max. Vx	46	12.72	0.00	0.00

Maximum Reactions

Location	Condition	Gov. Load Comb.	Vertical lb	Horizontal, X lb	Horizontal, Z lb
Leg C	Max. Vert	24	500900.76	50824.29	-30087.24
	Max. H_x	24	500900.76	50824.29	-30087.24
	Max. H_z	7	-435756.43	-44074.65	27820.32
	Min. Vert	9	-450368.67	-46215.42	27413.51
	Min. H_x	9	-450368.67	-46215.42	27413.51
	Min. H_z	24	500900.76	50824.29	-30087.24
Leg B	Max. Vert	12	500655.16	-51010.23	-29754.76
	Max. H_x	29	-450552.87	46406.62	27090.15
	Max. H_z	31	-435940.63	44344.12	27361.40
	Min. Vert	29	-450552.87	46406.62	27090.15
	Min. H_x	12	500655.16	-51010.23	-29754.76
	Min. H_z	12	500655.16	-51010.23	-29754.76
Leg A	Max. Vert	2	501168.73	-380.90	59064.50
	Max. H_x	27	17197.61	6072.10	1470.66
	Max. H_z	2	501168.73	-380.90	59064.50
	Min. Vert	19	-450167.69	375.64	-53726.16
	Min. H_x	10	22930.15	-6077.36	1960.88
	Min. H_z	19	-450167.69	375.64	-53726.16

Tower Mast Reaction Summary

Load Combination	Vertical lb	$Shear_x$ lb	$Shear_z$ lb	Overturning Moment, M_x lb-ft	Overturning Moment, M_z lb-ft	Torque lb-ft
Dead Only	56674.10	-0.00	-0.00	-3760.17	2046.72	0.00
1.2 Dead+1.6 Wind 0 deg - No Ice	68008.91	-0.00	-94379.17	-8287847.33	2456.06	-13084.85
0.9 Dead+1.6 Wind 0 deg - No Ice	51006.69	-0.00	-94379.17	-8286719.28	1842.05	-13084.85
1.2 Dead+1.6 Wind 30 deg - No Ice	68008.91	45922.16	-79539.51	-7055766.53	-4068587.51	-20321.60
0.9 Dead+1.6 Wind 30 deg - No Ice	51006.69	45922.16	-79539.51	-7054638.48	-4069201.53	-20321.60
1.2 Dead+1.6 Wind 45 deg - No Ice	68008.91	64645.00	-64645.00	-5745191.02	-5738222.74	-21965.86
0.9 Dead+1.6 Wind 45 deg - No Ice	51006.69	64645.00	-64645.00	-5744062.97	-5738836.75	-21965.86
1.2 Dead+1.6 Wind 60 deg - No Ice	68008.91	78807.76	-45499.68	-4052014.46	-7008023.47	-22113.19
0.9 Dead+1.6 Wind 60 deg - No Ice	51006.69	78807.76	-45499.68	-4050886.41	-7008637.49	-22113.19
1.2 Dead+1.6 Wind 90 deg - No Ice	68008.91	91844.32	-0.00	-4512.20	-8139631.08	-17979.57

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
0.9 Dead+1.6 Wind 90 deg - No Ice	51006.69	91844.32	-0.00	-3384.15	-8140245.10	-17979.57
1.2 Dead+1.6 Wind 120 deg - No Ice	68008.91	81734.76	47189.58	4137155.36	-7171122.57	-9028.34
0.9 Dead+1.6 Wind 120 deg - No Ice	51006.69	81734.76	47189.58	4138283.41	-7171736.58	-9028.34
1.2 Dead+1.6 Wind 135 deg - No Ice	68008.91	65839.94	65839.94	5802751.54	-5804807.67	-3461.09
0.9 Dead+1.6 Wind 135 deg - No Ice	51006.69	65839.94	65839.94	5803879.59	-5805421.68	-3461.09
1.2 Dead+1.6 Wind 150 deg - No Ice	68008.91	45922.16	79539.51	7046742.13	-4068587.51	2342.03
0.9 Dead+1.6 Wind 150 deg - No Ice	51006.69	45922.16	79539.51	7047870.18	-4069201.53	2342.03
1.2 Dead+1.6 Wind 180 deg - No Ice	68008.91	0.00	90999.37	8090492.31	2456.06	13084.85
0.9 Dead+1.6 Wind 180 deg - No Ice	51006.69	0.00	90999.37	8091620.37	1842.05	13084.85
1.2 Dead+1.6 Wind 210 deg - No Ice	68008.91	-45922.16	79539.51	7046742.13	4073499.64	20321.60
0.9 Dead+1.6 Wind 210 deg - No Ice	51006.69	-45922.16	79539.51	7047870.18	4072885.62	20321.60
1.2 Dead+1.6 Wind 225 deg - No Ice	68008.91	-64645.00	64645.00	5736166.61	5743134.86	21965.86
0.9 Dead+1.6 Wind 225 deg - No Ice	51006.69	-64645.00	64645.00	5737294.66	5742520.85	21965.86
1.2 Dead+1.6 Wind 240 deg - No Ice	68008.91	-81734.76	47189.58	4137155.36	7176034.69	22113.19
0.9 Dead+1.6 Wind 240 deg - No Ice	51006.69	-81734.76	47189.58	4138283.41	7175420.68	22113.19
1.2 Dead+1.6 Wind 270 deg - No Ice	68008.91	-91844.32	-0.00	-4512.20	8144543.21	17979.57
0.9 Dead+1.6 Wind 270 deg - No Ice	51006.69	-91844.32	-0.00	-3384.15	8143929.19	17979.57
1.2 Dead+1.6 Wind 300 deg - No Ice	68008.91	-78807.76	-45499.68	-4052014.46	7012935.59	9028.34
0.9 Dead+1.6 Wind 300 deg - No Ice	51006.69	-78807.76	-45499.68	-4050886.41	7012321.58	9028.34
1.2 Dead+1.6 Wind 315 deg - No Ice	68008.91	-64645.00	-64645.00	-5745191.02	5743134.86	3461.09
0.9 Dead+1.6 Wind 315 deg - No Ice	51006.69	-64645.00	-64645.00	-5744062.97	5742520.85	3461.09
1.2 Dead+1.6 Wind 330 deg - No Ice	68008.91	-45922.16	-79539.51	-7055766.53	4073499.63	-2342.03
0.9 Dead+1.6 Wind 330 deg - No Ice	51006.69	-45922.16	-79539.51	-7054638.48	4072885.62	-2342.03
1.2 Dead+1.0 Ice+1.0 Temp	229715.90	-0.00	-0.00	-61931.41	31867.60	0.00
1.2 Dead+1.0 Wind 0 deg+1.0 Ice+1.0 Temp	229715.90	-0.00	-30553.82	-2692337.37	31867.60	-16938.26
1.2 Dead+1.0 Wind 30 deg+1.0 Ice+1.0 Temp	229715.90	15138.23	-26220.18	-2326968.09	-1275851.93	-24860.21
1.2 Dead+1.0 Wind 45 deg+1.0 Ice+1.0 Temp	229715.90	21376.00	-21376.00	-1909562.25	-1815763.23	-26389.75
1.2 Dead+1.0 Wind 60 deg+1.0 Ice+1.0 Temp	229715.90	26140.11	-15092.00	-1367156.46	-2228848.50	-26120.88
1.2 Dead+1.0 Wind 90 deg+1.0 Ice+1.0 Temp	229715.90	30276.45	-0.00	-61931.41	-2583571.47	-20382.48
1.2 Dead+1.0 Wind 120 deg+1.0 Ice+1.0 Temp	229715.90	26460.38	15276.91	1253271.58	-2246130.78	-9182.61
1.2 Dead+1.0 Wind 135 deg+1.0 Ice+1.0 Temp	229715.90	21506.75	21506.75	1792754.90	-1822818.70	-2435.43

Load Combination	Vertical	$Shear_x$	$Shear_z$	Overturning Moment, M_x	Overturning Moment, M_z	Torque
	lb	lb	lb	lb-ft	lb-ft	lb-ft
1.2 Dead+1.0 Wind 150 deg+1.0 Ice+1.0 Temp	229715.90	15138.23	26220.18	2203105.27	-1275851.93	4477.73
1.2 Dead+1.0 Wind 180 deg+1.0 Ice+1.0 Temp	229715.90	-0.00	30184.00	2548518.70	31867.60	16938.26
1.2 Dead+1.0 Wind 210 deg+1.0 Ice+1.0 Temp	229715.90	-15138.23	26220.18	2203105.27	1339587.13	24860.21
1.2 Dead+1.0 Wind 225 deg+1.0 Ice+1.0 Temp	229715.90	-21376.00	21376.00	1785699.43	1879498.44	26389.75
1.2 Dead+1.0 Wind 240 deg+1.0 Ice+1.0 Temp	229715.90	-26460.38	15276.91	1253271.58	2309865.99	26120.88
1.2 Dead+1.0 Wind 270 deg+1.0 Ice+1.0 Temp	229715.90	-30276.45	-0.00	-61931.41	2647306.67	20382.48
1.2 Dead+1.0 Wind 300 deg+1.0 Ice+1.0 Temp	229715.90	-26140.11	-15092.00	-1367156.46	2292583.71	9182.61
1.2 Dead+1.0 Wind 315 deg+1.0 Ice+1.0 Temp	229715.90	-21376.00	-21376.00	-1909562.25	1879498.44	2435.43
1.2 Dead+1.0 Wind 330 deg+1.0 Ice+1.0 Temp	229715.90	-15138.23	-26220.18	-2326968.09	1339587.13	-4477.73
Dead+Wind 0 deg - Service	56674.10	0.00	-19625.35	-1726209.45	2046.72	-2720.88
Dead+Wind 30 deg - Service	56674.10	9549.12	-16539.57	-1470008.69	-844492.26	-4225.70
Dead+Wind 45 deg - Service	56674.10	13442.38	-13442.38	-1197485.63	-1191678.74	-4567.94
Dead+Wind 60 deg - Service	56674.10	16387.41	-9461.27	-845403.93	-1455723.03	-4598.25
Dead+Wind 90 deg - Service	56674.10	19098.25	-0.00	-3760.17	-1691031.24	-3738.70
Dead+Wind 120 deg - Service	56674.10	16996.05	9812.67	857464.47	-1489638.11	-1877.37
Dead+Wind 135 deg - Service	56674.10	13690.86	13690.86	1203811.07	-1205524.52	-719.70
Dead+Wind 150 deg - Service	56674.10	9549.12	16539.57	1462488.36	-844492.26	487.00
Dead+Wind 180 deg - Service	56674.10	-0.00	18922.55	1679527.36	2046.72	2720.88
Dead+Wind 210 deg - Service	56674.10	-9549.12	16539.57	1462488.36	848585.70	4225.70
Dead+Wind 225 deg - Service	56674.10	-13442.38	13442.38	1189965.30	1195772.18	4567.94
Dead+Wind 240 deg - Service	56674.10	-16996.05	9812.67	857464.47	1493731.54	4598.25
Dead+Wind 270 deg - Service	56674.10	-19098.25	-0.00	-3760.17	1695124.68	3738.70
Dead+Wind 300 deg - Service	56674.10	-16387.41	-9461.27	-845403.93	1459816.47	1877.37
Dead+Wind 315 deg - Service	56674.10	-13442.38	-13442.38	-1197485.63	1195772.18	719.70
Dead+Wind 330 deg - Service	56674.10	-9549.12	-16539.57	-1470008.69	848585.70	-487.00

Solution Summary

	Sum of Applied Forces			Sum of Reactions			
Load Comb.	PX lb	PY lb	PZ lb	PX lb	PY lb	PZ lb	% Error
1	0.00	-56674.10	0.00	0.00	56674.10	0.00	0.000%
2	-0.00	-68008.91	-94379.16	0.00	68008.91	94379.17	0.000%
3	-0.00	-51006.69	-94379.16	0.00	51006.69	94379.17	0.000%
4	45922.15	-68008.91	-79539.51	-45922.16	68008.91	79539.51	0.000%
5	45922.15	-51006.69	-79539.51	-45922.16	51006.69	79539.51	0.000%
6	64645.00	-68008.91	-64645.00	-64645.00	68008.91	64645.00	0.000%
7	64645.00	-51006.69	-64645.00	-64645.00	51006.69	64645.00	0.000%
8	78807.76	-68008.91	-45499.68	-78807.76	68008.91	45499.68	0.000%
9	78807.76	-51006.69	-45499.68	-78807.76	51006.69	45499.68	0.000%
10	91844.31	-68008.91	0.00	-91844.32	68008.91	0.00	0.000%
11	91844.31	-51006.69	0.00	-91844.32	51006.69	0.00	0.000%
12	81734.75	-68008.91	47189.58	-81734.76	68008.91	-47189.58	0.000%
13	81734.75	-51006.69	47189.58	-81734.76	51006.69	-47189.58	0.000%
14	65839.94	-68008.91	65839.94	-65839.94	68008.91	-65839.94	0.000%
15	65839.94	-51006.69	65839.94	-65839.94	51006.69	-65839.94	0.000%
16	45922.15	-68008.91	79539.51	-45922.16	68008.91	-79539.51	0.000%
17	45922.15	-51006.69	79539.51	-45922.16	51006.69	-79539.51	0.000%
18	0.00	-68008.91	90999.36	-0.00	68008.91	-90999.37	0.000%

Load Comb.	Sum of Applied Forces PX lb	PY lb	PZ lb	Sum of Reactions PX lb	PY lb	PZ lb	% Error
19	0.00	-51006.69	90999.36	-0.00	51006.69	-90999.37	0.000%
20	-45922.15	-68008.91	79539.51	45922.16	68008.91	-79539.51	0.000%
21	-45922.15	-51006.69	79539.51	45922.16	51006.69	-79539.51	0.000%
22	-64645.00	-68008.91	64645.00	64645.00	68008.91	-64645.00	0.000%
23	-64645.00	-51006.69	64645.00	64645.00	51006.69	-64645.00	0.000%
24	-81734.75	-68008.91	47189.58	81734.76	68008.91	-47189.58	0.000%
25	-81734.75	-51006.69	47189.58	81734.76	51006.69	-47189.58	0.000%
26	-91844.31	-68008.91	0.00	91844.32	68008.91	0.00	0.000%
27	-91844.31	-51006.69	0.00	91844.32	51006.69	0.00	0.000%
28	-78807.76	-68008.91	-45499.68	78807.76	68008.91	45499.68	0.000%
29	-78807.76	-51006.69	-45499.68	78807.76	51006.69	45499.68	0.000%
30	-64645.00	-68008.91	-64645.00	64645.00	68008.91	64645.00	0.000%
31	-64645.00	-51006.69	-64645.00	64645.00	51006.69	64645.00	0.000%
32	-45922.15	-68008.91	-79539.51	45922.16	68008.91	79539.51	0.000%
33	-45922.15	-51006.69	-79539.51	45922.16	51006.69	79539.51	0.000%
34	0.00	-229715.90	0.00	0.00	229715.90	0.00	0.000%
35	0.00	-229715.90	-30553.81	0.00	229715.90	30553.82	0.000%
36	15138.22	-229715.90	-26220.17	-15138.23	229715.90	26220.18	0.000%
37	21375.99	-229715.90	-21375.99	-21376.00	229715.90	21376.00	0.000%
38	26140.11	-229715.90	-15092.00	-26140.11	229715.90	15092.00	0.000%
39	30276.45	-229715.90	0.00	-30276.45	229715.90	0.00	0.000%
40	26460.38	-229715.90	15276.91	-26460.38	229715.90	-15276.91	0.000%
41	21506.75	-229715.90	21506.75	-21506.75	229715.90	-21506.75	0.000%
42	15138.22	-229715.90	26220.17	-15138.23	229715.90	-26220.18	0.000%
43	-0.00	-229715.90	30183.99	0.00	229715.90	-30184.00	0.000%
44	-15138.22	-229715.90	26220.17	15138.23	229715.90	-26220.18	0.000%
45	-21375.99	-229715.90	21375.99	21376.00	229715.90	-21376.00	0.000%
46	-26460.38	-229715.90	15276.91	26460.38	229715.90	-15276.91	0.000%
47	-30276.45	-229715.90	0.00	30276.45	229715.90	0.00	0.000%
48	-26140.11	-229715.90	-15092.00	26140.11	229715.90	15092.00	0.000%
49	-21375.99	-229715.90	-21375.99	21376.00	229715.90	21376.00	0.000%
50	-15138.22	-229715.90	-26220.17	15138.23	229715.90	26220.18	0.000%
51	0.00	-56674.10	-19625.35	-0.00	56674.10	19625.35	0.000%
52	9549.12	-56674.10	-16539.57	-9549.12	56674.10	16539.57	0.000%
53	13442.38	-56674.10	-13442.38	-13442.38	56674.10	13442.38	0.000%
54	16387.40	-56674.10	-9461.27	-16387.41	56674.10	9461.27	0.000%
55	19098.25	-56674.10	0.00	-19098.25	56674.10	0.00	0.000%
56	16996.05	-56674.10	9812.67	-16996.05	56674.10	-9812.67	0.000%
57	13690.86	-56674.10	13690.86	-13690.86	56674.10	-13690.86	0.000%
58	9549.12	-56674.10	16539.57	-9549.12	56674.10	-16539.57	0.000%
59	-0.00	-56674.10	18922.55	0.00	56674.10	-18922.55	0.000%
60	-9549.12	-56674.10	16539.57	9549.12	56674.10	-16539.57	0.000%
61	-13442.38	-56674.10	13442.38	13442.38	56674.10	-13442.38	0.000%
62	-16996.05	-56674.10	9812.67	16996.05	56674.10	-9812.67	0.000%
63	-19098.25	-56674.10	0.00	19098.25	56674.10	0.00	0.000%
64	-16387.40	-56674.10	-9461.27	16387.41	56674.10	9461.27	0.000%
65	-13442.38	-56674.10	-13442.38	13442.38	56674.10	13442.38	0.000%
66	-9549.12	-56674.10	-16539.57	9549.12	56674.10	16539.57	0.000%

Maximum Tower Deflections - Service Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 150	4.668	51	0.2753	0.0990
T2	150 - 140	3.536	51	0.2447	0.0652

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T3	140 - 120	3.032	51	0.2261	0.0458
T4	120 - 100	2.160	51	0.1817	0.0247
T5	100 - 90	1.449	51	0.1438	0.0127
T6	90 - 80	1.160	51	0.1213	0.0100
T7	80 - 60	0.913	51	0.1044	0.0079
T8	60 - 40	0.511	51	0.0749	0.0045
T9	40 - 20	0.237	51	0.0427	0.0023
T10	20 - 0	0.072	51	0.0229	0.0009

Critical Deflections and Radius of Curvature - Service Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	DS1F03F36U-D Omni Antenna	51	4.668	0.2753	0.0990	87433
168.00	9 Arm Halo Mount	51	4.551	0.2724	0.0959	87433
158.50	SC420-HF1LDF	51	4.003	0.2583	0.0806	38014
144.00	2.5" x 20'6" Whip	51	3.228	0.2340	0.0532	24387
141.00	2" Dia 15' Omni	51	3.081	0.2282	0.0476	25739
139.00	1.5" x 10' Omni	51	2.985	0.2240	0.0442	26482
138.50	9' Whip	51	2.961	0.2230	0.0434	26637
135.00	HPD2-4.7	51	2.798	0.2153	0.0384	27522
134.00	VHLP2.5-180	51	2.753	0.2130	0.0372	27755
125.50	PiROD 10' Lightweight T-Frame	51	2.383	0.1935	0.0288	29911
115.00	Sabre C10857801 12' V-Boom Mount Frame	51	1.966	0.1721	0.0211	29944
101.00	HBXX-6517DS-VTM	51	1.481	0.1460	0.0131	26449
100.00	SitePro1 VFA12-RRU Mount Assembly	51	1.449	0.1438	0.0127	26344
87.00	3"x2"x22" Panel	51	1.082	0.1156	0.0093	30558
84.50	TMA	51	1.020	0.1113	0.0088	34344
83.50	3' Stand-off	51	0.996	0.1097	0.0086	36123
83.00	3' Dish	51	0.984	0.1089	0.0085	37034
82.50	TMA	51	0.972	0.1082	0.0084	37939
80.00	TMA	51	0.913	0.1044	0.0079	41682
30.00	Camera	51	0.141	0.0320	0.0016	44820
24.00	PC9013N	51	0.097	0.0266	0.0012	43211

Maximum Tower Deflections - Design Wind

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T1	170 - 150	22.115	2	1.2797	0.4761
T2	150 - 140	16.822	2	1.1480	0.3137
T3	140 - 120	14.452	2	1.0638	0.2204
T4	120 - 100	10.322	2	0.8620	0.1186
T5	100 - 90	6.940	2	0.6855	0.0610
T6	90 - 80	5.560	2	0.5792	0.0480
T7	80 - 60	4.378	2	0.4990	0.0378
T8	60 - 40	2.454	2	0.3587	0.0215
T9	40 - 20	1.139	2	0.2050	0.0112

Section No.	Elevation ft	Horz. Deflection in	Gov. Load Comb.	Tilt °	Twist °
T10	20 - 0	0.348	2	0.1097	0.0048

Critical Deflections and Radius of Curvature - Design Wind

Elevation ft	Appurtenance	Gov. Load Comb.	Deflection in	Tilt °	Twist °	Radius of Curvature ft
170.00	DS1F03F36U-D Omni Antenna	2	22.115	1.2797	0.4761	19879
168.00	9 Arm Halo Mount	2	21.570	1.2675	0.4611	19879
158.50	SC420-HF1LDF	2	19.010	1.2078	0.3878	8643
144.00	2.5" x 20'6" Whip	2	15.373	1.0997	0.2560	5437
141.00	2" Dia 15' Omni	2	14.679	1.0731	0.2288	5683
139.00	1.5" x 10' Omni	2	14.227	1.0543	0.2125	5823
138.50	9' Whip	2	14.115	1.0495	0.2087	5854
135.00	HPD2-4.7	2	13.347	1.0145	0.1848	6039
134.00	VHLP2.5-180	2	13.132	1.0042	0.1788	6089
125.50	PiROD 10' Lightweight T-Frame	2	11.383	0.9159	0.1386	6555
115.00	Sabre C10857801 12' V-Boom Mount Frame	2	9.404	0.8180	0.1015	6489
101.00	HBXX-6517DS-VTM	2	7.090	0.6956	0.0629	5597
100.00	SitePro1 VFA12-RRU Mount Assembly	2	6.940	0.6855	0.0610	5570
87.00	3"x2"x22" Panel	2	5.187	0.5521	0.0449	6446
84.50	TMA	2	4.889	0.5319	0.0423	7242
83.50	3' Stand-off	2	4.773	0.5243	0.0413	7616
83.00	3' Dish	2	4.715	0.5205	0.0408	7807
82.50	TMA	2	4.658	0.5169	0.0403	7997
80.00	TMA	2	4.378	0.4990	0.0378	8780
30.00	Camera	2	0.679	0.1533	0.0076	9349
24.00	PC9013N	2	0.464	0.1275	0.0059	9007

Bolt Design Data

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T1	170	Diagonal	A325N	0.6250	1	5313.13	12425.20	0.428 ✔	1	Bolt Shear
T2	150	Leg	A325N	1.0000	6	7989.97	53014.40	0.151 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	7466.37	10662.90	0.700 ✔	1	Member Block Shear
		Top Girt	A325N	1.0000	1	670.20	10163.70	0.066 ✔	1	Member Block Shear
T3	140	Leg	A325N	1.0000	6	10733.60	53014.40	0.202 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	11067.10	18890.60	0.586 ✔	1	Member Block Shear
T4	120	Leg	A325N	1.0000	6	17862.90	53014.40	0.337 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	13742.90	15576.60	0.882 ✔	1	Member Block Shear
		Mid Girt	A325N	1.0000	1	4251.10	10163.70	0.418 ✔	1	Member Block

Section No.	Elevation ft	Component Type	Bolt Grade	Bolt Size in	Number Of Bolts	Maximum Load per Bolt lb	Allowable Load per Bolt lb	Ratio Load / Allowable	Allowable Ratio	Criteria
T5	100	Leg	A325N	1.0000	6	27897.90	53014.40	0.526 ✔	1	Shear Bolt Tension
		Diagonal	A325N	1.0000	1	16238.20	22851.60	0.711 ✔	1	Member Block Shear
T6	90	Diagonal	A325N	1.0000	1	15822.60	20337.90	0.778 ✔	1	Member Block Shear
T7	80	Leg	A325N	1.0000	6	38869.50	53014.40	0.733 ✔	1	Bolt Tension
		Diagonal	A325N	1.0000	1	16125.30	22851.60	0.706 ✔	1	Member Block Shear
T8	60	Leg	A490N	1.0000	6	49095.30	66562.50	0.738 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	16604.00	20537.10	0.808 ✔	1	Member Block Shear
T9	40	Leg	A325N	1.2500	6	58745.50	82835.00	0.709 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	17721.60	23232.40	0.763 ✔	1	Member Block Shear
T10	20	Leg	A325N	1.2500	6	68003.40	82835.00	0.821 ✔	1	Bolt Tension
		Diagonal	A325N	1.2500	1	20539.20	36562.50	0.562 ✔	1	Member Block Shear

Compression Checks

Leg Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	1 3/4	20.00	2.49	68.3 K=1.00	2.4053	-48713.80	76967.90	0.633 [1] ✔
T2	150 - 140	Pirod 105244	10.02	10.02	45.4 K=1.00	3.6816	-53550.90	142493.00	0.376 [1] ✔
T3	140 - 120	Pirod 105216	20.03	10.02	45.4 K=1.00	3.6816	-94299.20	142493.00	0.662 [1] ✔
T4	120 - 100	Pirod 105217	20.03	10.02	37.8 K=1.00	5.3014	-150489.00	214859.00	0.700 [1] ✔
T5	100 - 90	Pirod 105217	10.02	10.02	37.8 K=1.00	5.3014	-187705.00	214859.00	0.874 [1] ✔
T6	90 - 80	Pirod 105217 reinf w/ 1" dia bar	10.02	10.02	57.7 K=1.00	7.6570	-224673.00	270179.00	0.832 [1] ✔
T7	80 - 60	Pirod 105218 reinf w/ 1" dia bar	20.03	10.02	53.4 K=1.00	9.5720	-292645.00	349720.00	0.837 [1] ✔
T8	60 - 40	Pirod 105219	20.03	10.02	28.4 K=1.00	9.4248	-356684.00	399868.00	0.892 [1] ✔
T9	40 - 20	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)	20.03	10.02	43.6 K=1.00	15.7570	-420988.00	616864.00	0.682 [1] ✔
T10	20 - 0	Pirod 105220 reinf w/ 1" dia bar	20.03	10.02	47.6 K=1.00	14.2843	-483620.00	544587.00	0.888 [1] ✔

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$

[1] P_u / ϕP_n controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n lb	A in^2	V_u lb	ϕV_n lb	Stress Ratio
T2	150 - 140	0.5	1.48	121.0	165670.00	0.1963	1174.15	3388.58	0.347 ✓
T3	140 - 120	0.5	1.48	121.0	165670.00	0.1963	1413.20	3292.47	0.429 ✓
T4	120 - 100	0.5	1.47	120.0	238565.00	0.1963	1763.91	3335.33	0.529 ✓
T5	100 - 90	0.5	1.47	120.0	238565.00	0.1963	2561.60	3335.33	0.768 ✓
T6	90 - 80	0.5	1.46	118.8	344565.00	0.1963	468.09	3386.58	0.138 ✓
T7	80 - 60	0.5	1.45	118.0	430740.00	0.1963	389.83	3422.18	0.114 ✓
T8	60 - 40	0.625	1.45	94.4	424115.00	0.3068	416.43	6957.62	0.060 ✓
T9	40 - 20	0.625	1.42	92.6	709067.00	0.3068	1227.69	7082.04	0.173 ✓
T10	20 - 0	0.625	1.42	93.0	642792.00	0.3068	1816.30	7056.20	0.257 ✓

Diagonal Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	7/8	5.59	2.71	133.9 K=0.90	0.6013	-5313.13	7581.20	0.701 [1] ✓
T2	150 - 140	L2 1/2x2 1/2x3/16	11.42	4.98	120.8 K=1.00	0.9020	-7999.29	13558.30	0.590 [1] ✓
T3	140 - 120	L3x3x1/4	12.50	5.63	115.5 K=1.01	1.4400	-11286.60	24365.50	0.463 [1] ✓
T4	120 - 100	L 3x3x1/4	13.80	6.33	128.2 K=1.00	1.4375	-14550.80	19614.30	0.742 [1] ✓
T5	100 - 90	L3 1/2x3 1/2x5/16	14.50	6.74	117.9 K=1.01	2.0900	-16381.00	33961.70	0.482 [1] ✓
T6	90 - 80	L3 1/2x3 1/2x5/16	15.24	7.12	123.9 K=1.00	2.0900	-15917.80	30185.30	0.527 [1] ✓
T7	80 - 60	L3 1/2x3 1/2x5/16	16.80	7.92	137.8 K=1.00	2.0900	-16227.30	24863.70	0.653 [1] ✓
T8	60 - 40	L3 1/2x3 1/2x5/16	18.45	8.73	151.8 K=1.00	2.0900	-16805.10	20489.10	0.820 [1] ✓

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T9	40 - 20	L4x4x5/16	20.16	9.59	145.5 K=1.00	2.4000	-17951.10	25599.30	0.701 [1] ✔
T10	20 - 0	L5x5x5/16	21.92	10.43	125.9 K=1.00	3.0300	-21042.40	43196.30	0.487 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	7/8	5.00	4.85	186.4 K=0.70	0.6013	-665.84	3909.80	0.170 [1] ✔
T2	150 - 140	L3x3x3/16	5.00	3.67	96.9 K=1.31	1.0900	-607.43	21161.80	0.029 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	7/8	5.00	4.85	186.4 K=0.70	0.6013	-253.54	3909.80	0.065 [1] ✔

[1] P_u / ϕP_n controls

Mid Girt Design Data (Compression)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100	L3x3x3/16	9.00	7.67	154.4 K=1.00	1.0900	-3709.54	10334.40	0.359 [1] ✔

[1] P_u / ϕP_n controls

Tension Checks

Leg Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	1 3/4	20.00	2.49	68.3	2.4053	43635.80	108238.00	0.403 [1] ✔
T2	150 - 140	Pirod 105244	10.02	10.02	45.4	3.6816	47939.80	165670.00	0.289 [1] ✔
T3	140 - 120	Pirod 105216	20.03	10.02	45.4	3.6816	83234.10	165670.00	0.502 [1] ✔
T4	120 - 100	Pirod 105217	20.03	10.02	37.8	5.3014	134078.00	238565.00	0.562 [1] ✔
T5	100 - 90	Pirod 105217	10.02	10.02	37.8	5.3014	167387.00	238565.00	0.702 [1] ✔
T6	90 - 80	Pirod 105217 reinf w/ 1" dia bar	10.02	10.02	57.7	7.6570	201252.00	344565.00	0.584 [1] ✔
T7	80 - 60	Pirod 105218 reinf w/ 1" dia bar	20.03	10.02	53.4	9.5720	264372.00	430740.00	0.614 [1] ✔
T8	60 - 40	Pirod 105219	20.03	10.02	28.4	9.4248	323181.00	424115.00	0.762 [1] ✔
T9	40 - 20	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)	20.03	10.02	43.6	15.7570	379883.00	709067.00	0.536 [1] ✔
T10	20 - 0	Pirod 105220 reinf w/ 1" dia bar	20.03	10.02	47.6	14.2843	435161.00	642792.00	0.677 [1] ✔

[1] $P_u / \phi P_n$ controls

Truss-Leg Diagonal Data

Section No.	Elevation ft	Diagonal Size	L_d ft	Kl/r	ϕP_n lb	A in^2	V_u lb	ϕV_n lb	Stress Ratio
T2	150 - 140	0.5	1.48	121.0	165670.00	0.1963	1174.15	3388.58	0.347 ✔
T3	140 - 120	0.5	1.48	121.0	165670.00	0.1963	1413.20	3292.47	0.429 ✔
T4	120 - 100	0.5	1.47	120.0	238565.00	0.1963	1763.91	3335.33	0.529 ✔
T5	100 - 90	0.5	1.47	120.0	238565.00	0.1963	2561.60	3335.33	0.768 ✔
T6	90 - 80	0.5	1.46	118.8	344565.00	0.1963	468.09	3386.58	0.138 ✔
T7	80 - 60	0.5	1.45	118.0	430740.00	0.1963	389.83	3422.18	0.114 ✔
T8	60 - 40	0.625	1.45	94.4	424115.00	0.3068	416.43	6957.62	0.060 ✔
T9	40 - 20	0.625	1.42	92.6	709067.00	0.3068	1227.69	7082.04	0.173 ✔
T10	20 - 0	0.625	1.42	93.0	642792.00	0.3068	1816.30	7056.20	0.257 ✔

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

Diagonal Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	7/8	5.59	2.71	148.7	0.6013	5272.97	27059.40	0.195 [1] ✔
T2	150 - 140	L2 1/2x2 1/2x3/16	11.42	4.98	80.1	0.9020	7466.37	29224.80	0.255 [1] ✔
T3	140 - 120	L3x3x1/4	12.50	5.63	75.3	1.1588	11067.10	56489.10	0.196 [1] ✔
T4	120 - 100	L 3x3x1/4	13.80	6.33	84.3	1.4375	13742.90	46575.00	0.295 [1] ✔
T5	100 - 90	L3 1/2x3 1/2x5/16	14.50	6.74	76.7	1.7384	16238.20	84748.80	0.192 [1] ✔
T6	90 - 80	L3 1/2x3 1/2x5/16	15.24	7.12	81.0	2.0900	15822.60	67716.00	0.234 [1] ✔
T7	80 - 60	L3 1/2x3 1/2x5/16	16.80	7.92	89.9	1.7384	16125.30	84748.80	0.190 [1] ✔
T8	60 - 40	L3 1/2x3 1/2x5/16	18.45	8.73	99.2	2.0900	16604.00	67716.00	0.245 [1] ✔
T9	40 - 20	L4x4x5/16	20.16	9.59	94.8	1.9703	17721.60	96052.70	0.184 [1] ✔
T10	20 - 0	L5x5x5/16	21.92	10.43	81.6	2.6003	20539.20	126765.00	0.162 [1] ✔

[1] P_u / ϕP_n controls

Top Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	7/8	5.00	4.85	266.3	0.6013	645.36	27059.40	0.024 [1] ✔
T2	150 - 140	L3x3x3/16	5.00	3.67	51.1	1.0900	670.20	35316.00	0.019 [1] ✔

[1] P_u / ϕP_n controls

Bottom Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T1	170 - 150	7/8	5.00	4.85	266.3	0.6013	249.73	27059.40	0.009 [1] ✔

[1] P_u / ϕP_n controls

Mid Girt Design Data (Tension)

Section No.	Elevation ft	Size	L ft	L_u ft	Kl/r	A in^2	P_u lb	ϕP_n lb	Ratio $\frac{P_u}{\phi P_n}$
T4	120 - 100	L3x3x3/16	9.00	7.67	102.2	1.0900	4251.10	35316.00	0.120 [1] ✔

[1] P_u / ϕP_n controls

Section Capacity Table

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
T1	170 - 150	Leg	1 3/4	1	-47053.10	76967.90	61.1	Pass
		Leg	1 3/4	2	-47479.10	76967.90	61.7	Pass
		Leg	1 3/4	3	-48713.80	76967.90	63.3	Pass
T2	150 - 140	Leg	Pirod 105244	58	-51323.40	142493.00	36.0	Pass
		Leg	Pirod 105244	59	-51660.50	142493.00	36.3	Pass
		Leg	Pirod 105244	60	-53550.90	142493.00	37.6	Pass
T3	140 - 120	Leg	Pirod 105216	70	-92216.50	142493.00	64.7	Pass
		Leg	Pirod 105216	71	-92020.60	142493.00	64.6	Pass
		Leg	Pirod 105216	72	-94299.20	142493.00	66.2	Pass
T4	120 - 100	Leg	Pirod 105217	85	-148774.00	214859.00	69.2	Pass
		Leg	Pirod 105217	86	-148774.00	214859.00	69.2	Pass
		Leg	Pirod 105217	87	-150489.00	214859.00	70.0	Pass
T5	100 - 90	Leg	Pirod 105217	103	-186272.00	214859.00	86.7	Pass
		Leg	Pirod 105217	104	-186238.00	214859.00	86.7	Pass
		Leg	Pirod 105217	105	-187705.00	214859.00	87.4	Pass
T6	90 - 80	Leg	Pirod 105217 reinf w/ 1" dia bar	112	-223067.00	270179.00	82.6	Pass
		Leg	Pirod 105217 reinf w/ 1" dia bar	113	-223196.00	270179.00	82.6	Pass
		Leg	Pirod 105217 reinf w/ 1" dia bar	114	-224673.00	270179.00	83.2	Pass
T7	80 - 60	Leg	Pirod 105218 reinf w/ 1" dia bar	121	-291479.00	349720.00	83.3	Pass
		Leg	Pirod 105218 reinf w/ 1" dia bar	122	-291551.00	349720.00	83.4	Pass
		Leg	Pirod 105218 reinf w/ 1" dia bar	123	-292645.00	349720.00	83.7	Pass
T8	60 - 40	Leg	Pirod 105219	136	-355911.00	399868.00	89.0	Pass
		Leg	Pirod 105219	137	-355850.00	399868.00	89.0	Pass
		Leg	Pirod 105219	138	-356684.00	399868.00	89.2	Pass
T9	40 - 20	Leg	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)	151	-420520.00	616864.00	68.2 70.9 (b)	Pass
		Leg	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5" dia)	152	-420336.00	616864.00	68.1 70.9 (b)	Pass
		Leg	Pirod 105219 w/ Reinf (1" dia bar) w/ SitePro1 TI8 kit (1.5"	153	-420988.00	616864.00	68.2 70.8 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
			dia)					
T10	20 - 0	Leg	Pirod 105220 reinf w/ 1" dia bar	166	-483345.00	544587.00	88.8	Pass
		Leg	Pirod 105220 reinf w/ 1" dia bar	167	-483094.00	544587.00	88.7	Pass
		Leg	Pirod 105220 reinf w/ 1" dia bar	168	-483620.00	544587.00	88.8	Pass
T1	170 - 150	Diagonal	7/8	10	-2433.55	7581.20	32.1	Pass
		Diagonal	7/8	11	-2421.61	7581.20	31.9	Pass
		Diagonal	7/8	12	-5313.13	7581.20	70.1	Pass
		Diagonal	7/8	13	-5204.68	7581.20	68.7	Pass
		Diagonal	7/8	14	-4556.12	7581.20	60.1	Pass
		Diagonal	7/8	15	-4664.94	7581.20	61.5	Pass
		Diagonal	7/8	16	-2325.29	7581.20	30.7	Pass
		Diagonal	7/8	17	-2325.29	7581.20	30.7	Pass
		Diagonal	7/8	18	-5090.77	7581.20	67.1	Pass
		Diagonal	7/8	19	-5144.52	7581.20	67.9	Pass
		Diagonal	7/8	20	-4515.59	7581.20	59.6	Pass
		Diagonal	7/8	21	-4461.84	7581.20	58.9	Pass
		Diagonal	7/8	22	-2276.76	7581.20	30.0	Pass
		Diagonal	7/8	23	-2276.82	7581.20	30.0	Pass
		Diagonal	7/8	24	-5052.64	7581.20	66.6	Pass
		Diagonal	7/8	25	-4985.35	7581.20	65.8	Pass
		Diagonal	7/8	26	-4386.45	7581.20	57.9	Pass
		Diagonal	7/8	27	-4453.67	7581.20	58.7	Pass
		Diagonal	7/8	28	-2193.89	7581.20	28.9	Pass
		Diagonal	7/8	29	-2193.84	7581.20	28.9	Pass
		Diagonal	7/8	30	-4853.80	7581.20	64.0	Pass
		Diagonal	7/8	31	-4878.12	7581.20	64.3	Pass
		Diagonal	7/8	32	-4214.45	7581.20	55.6	Pass
		Diagonal	7/8	33	-4190.20	7581.20	55.3	Pass
		Diagonal	7/8	34	-2163.31	7581.20	28.5	Pass
		Diagonal	7/8	35	-2144.36	7581.20	28.3	Pass
		Diagonal	7/8	36	-4784.14	7581.20	63.1	Pass
		Diagonal	7/8	37	-4723.61	7581.20	62.3	Pass
		Diagonal	7/8	38	-4029.76	7581.20	53.2	Pass
		Diagonal	7/8	39	-4090.20	7581.20	54.0	Pass
		Diagonal	7/8	40	-2036.68	7581.20	26.9	Pass
		Diagonal	7/8	41	-2036.58	7581.20	26.9	Pass
		Diagonal	7/8	42	-4581.04	7581.20	60.4	Pass
		Diagonal	7/8	43	-4614.52	7581.20	60.9	Pass
		Diagonal	7/8	44	-3942.66	7581.20	52.0	Pass
		Diagonal	7/8	45	-3909.29	7581.20	51.6	Pass
		Diagonal	7/8	46	-2086.54	7581.20	27.5	Pass
		Diagonal	7/8	47	-2086.68	7581.20	27.5	Pass
		Diagonal	7/8	48	-4607.68	7581.20	60.8	Pass
		Diagonal	7/8	49	-4567.97	7581.20	60.3	Pass
		Diagonal	7/8	50	-3935.51	7581.20	51.9	Pass
		Diagonal	7/8	51	-3975.08	7581.20	52.4	Pass
		Diagonal	7/8	52	-1532.91	7581.20	20.2	Pass
		Diagonal	7/8	53	-1009.67	7581.20	13.3	Pass
		Diagonal	7/8	54	-3632.77	7581.20	47.9	Pass
		Diagonal	7/8	55	-3391.99	7581.20	44.7	Pass
		Diagonal	7/8	56	-2514.68	7581.20	33.2	Pass
		Diagonal	7/8	57	-3047.39	7581.20	40.2	Pass
T2	150 - 140	Diagonal	L2 1/2x2 1/2x3/16	64	-3667.26	13558.30	27.0 31.7 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	65	-2217.87	13558.30	16.4 18.4 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	66	-7999.29	13558.30	59.0 70.0 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	67	-6475.57	13558.30	47.8 57.9 (b)	Pass
		Diagonal	L2 1/2x2 1/2x3/16	68	-4992.60	13558.30	36.8	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	L2 1/2x2 1/2x3/16	69	-7304.36	13558.30	44.5 (b) 53.9	Pass
T3	140 - 120	Diagonal	L3x3x1/4	73	-4950.29	24365.50	63.9 (b) 20.3	Pass
		Diagonal	L3x3x1/4	74	-5263.16	24365.50	25.6 (b) 21.6	Pass
		Diagonal	L3x3x1/4	75	-10646.50	24365.50	26.5 (b) 43.7	Pass
		Diagonal	L3x3x1/4	76	-9729.60	24365.50	54.5 (b) 39.9	Pass
		Diagonal	L3x3x1/4	77	-10600.80	24365.50	51.8 (b) 43.5	Pass
		Diagonal	L3x3x1/4	78	-11286.60	24365.50	56.0 (b) 46.3	Pass
		Diagonal	L3x3x1/4	79	-2805.63	25967.90	58.6 (b) 10.8	Pass
		Diagonal	L3x3x1/4	80	-2808.59	25967.90	14.8 (b) 10.8	Pass
		Diagonal	L3x3x1/4	81	-8890.09	25967.90	14.8 (b) 34.2	Pass
		Diagonal	L3x3x1/4	82	-8467.69	25967.90	46.0 (b) 32.6	Pass
		Diagonal	L3x3x1/4	83	-8303.65	25967.90	45.7 (b) 32.0	Pass
		Diagonal	L3x3x1/4	84	-8777.90	25967.90	44.5 (b) 33.8	Pass
T4	120 - 100	Diagonal	L 3x3x1/4	91	-10139.10	19614.30	45.3 (b) 51.7	Pass
		Diagonal	L 3x3x1/4	92	-10244.40	19614.30	60.9 (b) 52.2	Pass
		Diagonal	L 3x3x1/4	93	-14446.80	19614.30	61.5 (b) 73.7	Pass
		Diagonal	L 3x3x1/4	94	-13108.60	19614.30	87.6 (b) 66.8	Pass
		Diagonal	L 3x3x1/4	95	-13290.30	19614.30	81.2 (b) 67.8	Pass
		Diagonal	L 3x3x1/4	96	-14550.80	19614.30	82.4 (b) 74.2	Pass
		Diagonal	L 3x3x1/4	97	-8360.11	21311.50	88.2 (b) 39.2	Pass
		Diagonal	L 3x3x1/4	98	-8637.84	21311.50	50.9 (b) 40.5	Pass
		Diagonal	L 3x3x1/4	99	-13457.60	21311.50	52.5 (b) 63.1	Pass
		Diagonal	L 3x3x1/4	100	-12307.90	21311.50	82.7 (b) 57.8	Pass
		Diagonal	L 3x3x1/4	101	-12776.70	21311.50	77.4 (b) 60.0	Pass
		Diagonal	L 3x3x1/4	102	-13721.80	21311.50	80.5 (b) 64.4	Pass
T5	100 - 90	Diagonal	L3 1/2x3 1/2x5/16	106	-13047.60	33961.70	85.2 (b) 38.4	Pass
		Diagonal	L3 1/2x3 1/2x5/16	107	-13048.40	33961.70	57.0 (b) 38.4	Pass
		Diagonal	L3 1/2x3 1/2x5/16	108	-16381.00	33961.70	57.0 (b) 48.2	Pass
		Diagonal	L3 1/2x3 1/2x5/16	109	-16086.70	33961.70	70.9 (b) 47.4	Pass
		Diagonal	L3 1/2x3 1/2x5/16	110	-16135.60	33961.70	70.7 (b) 47.5 70.9 (b)	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
		Diagonal	L3 1/2x3 1/2x5/16	111	-16291.50	33961.70	48.0 71.1 (b)	Pass
T6	90 - 80	Diagonal	L3 1/2x3 1/2x5/16	115	-13222.80	30185.30	43.8 64.5 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	116	-13220.70	30185.30	43.8 64.6 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	117	-15900.00	30185.30	52.7 77.4 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	118	-15831.40	30185.30	52.4 77.6 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	119	-15858.00	30185.30	52.5 77.8 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	120	-15917.80	30185.30	52.7 77.5 (b)	Pass
T7	80 - 60	Diagonal	L3 1/2x3 1/2x5/16	124	-13976.30	24863.70	56.2 60.7 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	125	-13972.90	24863.70	56.2 60.7 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	126	-16184.10	24863.70	65.1 69.8 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	127	-16047.70	24863.70	64.5 70.0 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	128	-16178.60	24863.70	65.1 70.6 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	129	-16227.30	24863.70	65.3 70.4 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	130	-13477.60	27483.70	49.0 58.6 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	131	-13469.40	27483.70	49.0 58.7 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	132	-16224.20	27483.70	59.0 69.7 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	133	-16018.90	27483.70	58.3 70.0 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	134	-16016.00	27483.70	58.3 70.0 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	135	-16079.80	27483.70	58.5 69.7 (b)	Pass
T8	60 - 40	Diagonal	L3 1/2x3 1/2x5/16	139	-15039.60	20489.10	73.4	Pass
		Diagonal	L3 1/2x3 1/2x5/16	140	-15041.00	20489.10	73.4	Pass
		Diagonal	L3 1/2x3 1/2x5/16	141	-16658.40	20489.10	81.3	Pass
		Diagonal	L3 1/2x3 1/2x5/16	142	-16430.10	20489.10	80.2	Pass
		Diagonal	L3 1/2x3 1/2x5/16	143	-16773.10	20489.10	81.9	Pass
		Diagonal	L3 1/2x3 1/2x5/16	144	-16805.10	20489.10	82.0	Pass
		Diagonal	L3 1/2x3 1/2x5/16	145	-14329.80	22557.20	63.5 69.8 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	146	-14328.50	22557.20	63.5 69.8 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	147	-16089.50	22557.20	71.3 78.2 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	148	-16049.80	22557.20	71.2 78.4 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	149	-16288.90	22557.20	72.2 79.5 (b)	Pass
		Diagonal	L3 1/2x3 1/2x5/16	150	-16329.90	22557.20	72.4 79.3 (b)	Pass
T9	40 - 20	Diagonal	L4x4x5/16	154	-16494.70	25599.30	64.4 70.0 (b)	Pass
		Diagonal	L4x4x5/16	155	-16500.50	25599.30	64.5 70.0 (b)	Pass
		Diagonal	L4x4x5/16	156	-17538.20	25599.30	68.5	Pass

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							73.9 (b)	
		Diagonal	L4x4x5/16	157	-17386.80	25599.30	67.9	Pass
							74.0 (b)	
		Diagonal	L4x4x5/16	158	-17931.50	25599.30	70.0	Pass
							76.3 (b)	
		Diagonal	L4x4x5/16	159	-17951.10	25599.30	70.1	Pass
							76.2 (b)	
		Diagonal	L4x4x5/16	160	-15822.70	28036.80	56.4	Pass
							68.0 (b)	
		Diagonal	L4x4x5/16	161	-15826.30	28036.80	56.4	Pass
							68.0 (b)	
		Diagonal	L4x4x5/16	162	-16995.30	28036.80	60.6	Pass
							72.9 (b)	
		Diagonal	L4x4x5/16	163	-16966.10	28036.80	60.5	Pass
							73.0 (b)	
		Diagonal	L4x4x5/16	164	-17424.60	28036.80	62.1	Pass
							75.0 (b)	
		Diagonal	L4x4x5/16	165	-17450.20	28036.80	62.2	Pass
							74.9 (b)	
T10	20 - 0	Diagonal	L5x5x5/16	169	-19581.80	43196.30	45.3	Pass
							52.3 (b)	
		Diagonal	L5x5x5/16	170	-19589.80	43196.30	45.4	Pass
							52.2 (b)	
		Diagonal	L5x5x5/16	171	-20907.00	43196.30	48.4	Pass
							54.6 (b)	
		Diagonal	L5x5x5/16	172	-20145.50	43196.30	46.6	Pass
							53.8 (b)	
		Diagonal	L5x5x5/16	173	-20853.80	43196.30	48.3	Pass
							55.7 (b)	
		Diagonal	L5x5x5/16	174	-21042.40	43196.30	48.7	Pass
							56.2 (b)	
		Diagonal	L5x5x5/16	175	-17030.20	46887.80	36.3	Pass
							47.1 (b)	
		Diagonal	L5x5x5/16	176	-17038.00	46887.80	36.3	Pass
							47.1 (b)	
		Diagonal	L5x5x5/16	177	-17791.20	46887.80	37.9	Pass
							49.1 (b)	
		Diagonal	L5x5x5/16	178	-17768.00	46887.80	37.9	Pass
							49.2 (b)	
		Diagonal	L5x5x5/16	179	-18417.80	46887.80	39.3	Pass
							50.9 (b)	
		Diagonal	L5x5x5/16	180	-18433.30	46887.80	39.3	Pass
							50.9 (b)	
T1	170 - 150	Top Girt	7/8	4	-665.84	3909.80	17.0	Pass
		Top Girt	7/8	5	-660.81	3909.80	16.9	Pass
		Top Girt	7/8	6	-662.49	3909.80	16.9	Pass
T2	150 - 140	Top Girt	L3x3x3/16	61	-607.43	21161.80	2.9	Pass
							6.4 (b)	
		Top Girt	L3x3x3/16	62	-593.35	21161.80	2.8	Pass
							6.6 (b)	
		Top Girt	L3x3x3/16	63	-596.58	21161.80	2.8	Pass
							6.6 (b)	
T1	170 - 150	Bottom Girt	7/8	7	-253.54	3909.80	6.5	Pass
		Bottom Girt	7/8	8	-246.79	3909.80	6.3	Pass
		Bottom Girt	7/8	9	-247.97	3909.80	6.3	Pass
T4	120 - 100	Mid Girt	L3x3x3/16	88	-3709.54	10334.40	35.9	Pass
							41.2 (b)	
		Mid Girt	L3x3x3/16	89	-3665.73	10334.40	35.5	Pass
							41.8 (b)	
		Mid Girt	L3x3x3/16	90	-3665.15	10334.40	35.5	Pass
							41.8 (b)	

Section No.	Elevation ft	Component Type	Size	Critical Element	P lb	ϕP_{allow} lb	% Capacity	Pass Fail
							Summary	
							Leg (T8) 89.2	Pass
							Diagonal (T4) 88.2	Pass
							Top Girt (T1) 17.0	Pass
							Bottom Girt (T1) 6.5	Pass
							Mid Girt (T4) 41.8	Pass
							Bolt Checks 88.2	Pass
							RATING = **89.2**	**Pass**

ANCHOR BOLT EVALUATION

ANCHOR BOLT ANALYSIS

Input Data

Tower Reactions:

Uplift:	Uplift := 450.553·kips	*user input*	
Shear:	Shear := 59.066·kips	*user input*	
Compression:	Compression := 501.169·kips	*user input*	

Anchor Bolt Data:

Use ASTM A687

Number of Anchor Bolts = N	N := 6	*user input*	
Bolt Ultimate Strength:	F_u := 150·ksi	*user input*	
Bolt Yield Strength:	Fy := 105·ksi	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	
Thickness of Anchor Bolts	D := 1.25in	*user input*	
Threads per Inch:	n := 7	*user input*	
Coefficient of Friction:	μ := 0.55	*user input*	(for baseplate with grout ASCE 10-15)
Length from top of pier to bottom of leveling nut:	L_{ar} := 0in	*user input*	
Bolt Modulus:	E := 29000·ksi	*user input*	

Anchor Bolt Section Properties:

Gross Area of Bolt:

$$A_g := \frac{\pi}{4}\cdot D^2 \qquad A_g = 1.23\cdot in^2$$

Net Area of Bolt:

$$A_n := \frac{\pi}{4}\cdot\left(D - \frac{0.9743\cdot in}{n}\right)^2 \qquad A_n = 0.97\cdot in^2$$

Net Diameter:

$$D_n := D - \frac{0.9743 in}{n} \qquad D_n = 1.11\cdot in$$

Radius of Gyration of Bolt:

$$r := \frac{D_n}{4} \qquad r = 0.28\cdot in$$

Plastic Section Modulus of Bolt:

$$Z_x := \frac{D_n^3}{6} \qquad Z_x = 0.23\cdot in^3$$

Forces:

Tension Force:

$$T_u := \frac{Uplift}{N}$$

$$T_u = 75.09\cdot kip \qquad T_{ub} := T_u$$

Shear Force:

$$V_u := \frac{Shear}{N}$$

$$V_u = 9.84\cdot kip \qquad V_{ub} := V_u$$

Resistance Factor for Flexure (ANSI/TIA-222-G 4.7):

$$\phi_f := 0.9$$

Resistance Factor for Anchor Bolt (ANSI/TIA-222-G 4.5.4.2):

$$\phi_b := 0.80$$

Resistance Factor for Tension (ANSI/TIA-222-G 4.9.6.1):

$$\phi_t := 0.75$$

Resistance Factor for Shear (ANSI/TIA-222-G 4.9.6.3):

$$\phi_v := 0.75$$

ANSI/TIA-222-G 4.7.1 Flexural Members:

Nominal Flexure Strength, Mn:

$M_n := Fy \cdot Z_x$

$M_n = 2 \cdot ft \cdot kip$

$\phi_f \cdot M_n = 1.8 \cdot ft \cdot kip$

Applied Moment due to Shear (worst case lever arm), Mu:

$M_u := L_{ar} \cdot V_u$

$M_u = 0 \cdot ft \cdot kip$

Flexure Check:

$FlexureCheck := if\left(M_u \le \phi_f \cdot M_n, "OK", "NO\ GOOD"\right)$

$FlexureCheck = "OK"$

$$\frac{M_u}{\phi_f \cdot M_n} = 0 \cdot \%$$

ANSI/TIA-222-G 4.9.6.1 Tensile Strength:

Design Tensile Strength, Rnt:

$R_{nt} := F_u \cdot A_n$

$R_{nt} = 145.37 \cdot ft \cdot kip$

$\phi_t \cdot R_{nt} = 109.02 \cdot ft \cdot kip$

Tension Check:

$TensionCheck := if\left(T_u \le \phi_t \cdot R_{nt}, "OK", "NO\ GOOD"\right)$

$TensionCheck = "OK"$

$$\frac{T_u}{\phi_t \cdot R_{nt}} = 68.88 \cdot \%$$

ANSI/TIA-222-G 4.9.6.3 Design Shear Strength:

Design Shear Strength, Rnv:

$R_{nv} := 0.45 \cdot F_u \cdot A_g$

$R_{nv} = 82.83 \cdot ft \cdot kip$

$\phi_v \cdot R_{nv} = 62.13 \cdot ft \cdot kip$

Shear Check:

$ShearCheck := if\left(V_u \le \phi_v \cdot R_{nv}, "OK", "NO\ GOOD"\right)$

$ShearCheck = "OK"$

$$\frac{V_u}{\phi_v \cdot R_{nv}} = 15.85 \cdot \%$$

ANSI/TIA-222-G 4.9.6.4 Combined Shear and Tension:

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 \le 1$$

$$\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 = 0.5$$

Combined Shear and Tension Check:

$$\text{ShearAndTensionCheck} := \text{if}\left[\left[\frac{V_{ub}}{(\phi_v \cdot R_{nv})}\right]^2 + \left[\frac{T_{ub}}{(\phi_t \cdot R_{nt})}\right]^2 \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

ShearAndTensionCheck = "OK"

ANSI/TIA-222-G 4.9.9 Anchor Rods (Capacity):

$$\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot P_n} \le 1$$

$\eta := 0.55$ *user input from ANSI/TIA-222-G 4.9.9*

$$\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot F_u \cdot A_n} = 0.800$$

Capacity Check:

$$\text{CapacityCheck} := \text{if}\left[\frac{\left[T_u + \left(\frac{V_u}{\eta}\right)\right]}{\phi_b \cdot F_u \cdot A_n} \le 1, \text{"OK"}, \text{"NO GOOD"}\right]$$

CapacityCheck = "OK"

FOUNDATION EVALUATION

AECOM

				Page	of
Job	170' Self-Supporting Lattice Tower - Cromwell, CT	Project No.	SAI-014 / VZ5-121 Rev 2	Sheet 1	of 2
Description	Caisson Foundation Analysis (TIA-222-G)	Computed by	CMC	Date	08/13/20
	Analysis Calculations	Checked by		Date	

FOUNDATION ANALYSIS

Input Data

Maximum Pier Reactions:

Compression: $C_t := 501.169 \cdot kips$ *user input*

Uplift: $U_t := 450.553 \cdot kips$ *user input*

Foundation Dimensions:

Drilled Caisson Length: $C_{Length} := 41.5 \cdot ft$ *user input*

Diameter of Pier: $d_p := 5.5ft$ *user input*

Extension of Pier Above Grade: $L_{pag} := 0.5ft$ *user input*

Additional Concrete

$$Conc_{addl} := 5ft \cdot \left(13ft \cdot 13ft - \frac{\pi \cdot d_p^{\,2}}{4} \right)$$

$$Conc_{addl} = 726.2 \cdot ft^3$$

Foundation reinforcement per drawings by Tectonic, dated May 5, 2004

Material Properties:

Unit Weight of Concrete: $\gamma c := 150pcf$ *user input*

Unit Weight of Water: $\gamma w := 62.4pcf$ *user input*

Unit Weight of Soil: $\gamma s := 125pcf$ *user input*

Allowable Rock Bearing Capacity (Allowable Bearing Pressure at Depth 41') $q_s := 16 \cdot ksf$ *user input*

Ultimate Rock Bearing Capacity (Ulimate Bearing Pressure at Depth 41') $q_s := q_s \cdot 2.0 = 32.0 \cdot ksf$

Water Table Below Grade: $Wd := 42 \cdot ft$ *user input*

Average Allowable Shear: $fl := 900 \cdot psf$ *user input*

Average Ultimate Shear: $fl := fl \cdot 2.0 = 1800.0 \cdot psf$

Depth Neglected for Skin Friction at Top: $Depthunbond := 6 \cdot ft$ *user input*

Assumed Allowable Soil Bearing Capacity For Conc Pad: $q_u := 4ksf$ *user input*

Ultimate Soil Bearing Capacity For Conc Pad: $q_u := q_u \cdot 2.0 = 8.0 \cdot ksf$

CALCULATION NOTES:

1. *Use of the "2.0" value from Allowable to Ultimate for soil bearing and shear friction (skin friction) comes from TIA-222-G Section 9.4 (Design Strength)*
2. *Assumed "Allowable" Soil Bearing capacity is obtained from the State of Connecticut Building Code Section 1806.2 (Presumptive Load-Bearing Values) along with International Building Code (2015) Section 1801.2 - Design Basis., unless indicated otherwise*

Loading:

$$TotalDownLoad := C_t + \pi \cdot \frac{d_p^{\,2}}{4} \cdot \left[L_{pag} \cdot \gamma c + \left[\gamma c \cdot \left(C_{Length} - L_{pag} \right) \right] \right]$$

$$TotalDownLoad = 649.1 \cdot kips$$

$$PierWeight := \pi \cdot \frac{d_p^{\,2}}{4} \cdot \left[\left(Wd + L_{pag} \right) \cdot \gamma c + \left(C_{Length} - Wd - L_{pag} \right) \cdot \left(\gamma c - \gamma w \right) \right] + \left(\gamma c \cdot Conc_{addl} \right)$$

$$PierWeight = 258.3 \cdot kips$$

$$SoilShear := \pi \, d_p \cdot \left[fl \cdot \left(Wd - Depthunbond \right) + fl \cdot \left(C_{Length} - Wd - L_{pag} \right) \right]$$

$$SoilShear = 1088.6 \cdot kips$$

Compression Capacity:

$$\text{TotalDownLoadCapacity} := \left[\left[\text{SoilShear} + q_s \cdot \left(\pi \cdot \frac{d_p^{\,2}}{4}\right) + q_u \cdot \left(13\text{ft} \cdot 13\text{ft} - \frac{\pi \cdot d_p^{\,2}}{4}\right)\right] \cdot 0.5\right]$$

Reduction Factor per TIA-222-G Section 9.4.1
Bearing --> 0.75
Friction --> 0.75

$\text{TotalDownLoadCapacity} = 1505.4 \cdot \text{kips}$

$\text{CheckDownLoadCapacity} := \text{if}(\text{TotalDownLoad} < \text{TotalDownLoadCapacity}, \text{"Okay"}, \text{"No Good"})$

$\text{CheckDownLoadCapacity} = \text{"Okay"}$

Tension Capacity:

Reduction Factor per TIA-222-G Section 9.4.1
Pull-out --> 0.75
Friction --> 0.75

$\text{TotalUpLiftCapacity} := (\text{SoilShear} + 0.9\text{PierWeight}) \cdot 0.75$

$\text{TotalUpLiftCapacity} = 990.8 \cdot \text{kips}$

$$\text{CheckUpLiftCapacity} := \text{if}\left[\left(\frac{\text{TotalUpLiftCapacity}}{U_t}\right) \geq 1, \text{"Okay"}, \text{"No Good"}\right]$$

$\text{CheckUpLiftCapacity} = \text{"Okay"}$

$$\text{UpliftResistance}_{\text{provided}} := \frac{1 \cdot U_t}{\text{TotalUpLiftCapacity}}$$

$\text{UpliftResistance}_{\text{provided}} = 45.47 \cdot \%$

Check (Soil) Cone Failure:

$$\text{ConeFailureCapacity} := \frac{\left[\left(C_{\text{Length}} - L_{\text{pag}} - 6\text{ft}\right) \cdot \tan(30\text{deg}) \cdot 2 + d_p\right]^2 \cdot \pi}{4} \cdot \frac{C_{\text{Length}} - L_{\text{pag}} - 6\text{ft}}{3} \cdot \gamma_s$$

$\text{ConeFailureCapacity} = 2414.61 \cdot \text{kips}$

$\text{CheckConeFailureCapacity} := \text{if}\left(U_t < \text{ConeFailureCapacity} \cdot 0.5, \text{"Okay"}, \text{"No Good"}\right)$

$\text{CheckConeFailureCapacity} = \text{"Okay"}$

$$\text{SoilConeUpliftCapacity} := \frac{U_t}{\text{ConeFailureCapacity} \cdot 0.75}$$

Reduction Factor per TIA-222-G Section 9.4.1
Pull-out --> 0.75

$\text{SoilConeUpliftCapacity} = 24.88 \cdot \%$

$$\text{CheckConeFailure} := \text{if}\left[\left(\frac{\text{ConeFailureCapacity} \cdot 0.75}{1 \cdot U_t}\right) \geq 1, \text{"Okay"}, \text{"No Good"}\right]$$

$\text{CheckConeFailure} = \text{"Okay"}$

About AECOM

AECOM (NYSE: ACM) is a global provider of professional technical and management support services to a broad range of markets, including transportation, facilities, environmental, energy, water and government. With approximately 45,000 employees around the world, AECOM is a leader in all of the key markets that it serves. AECOM provides a blend of global reach, local knowledge, innovation, and collaborative technical excellence in delivering solutions that enhance and sustain the world's built, natural, and social environments. A Fortune 500 company, AECOM serves clients in more than 100 countries and has annual revenue in excess of $6 billion.

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HUDSON Design Group LLC

July 21, 2020

SAI Communications
12 Industrial Way
Salem NH, 03079

RE:

Site Number:	CT1141 (LTE 4C-5C-5G NR 2021 UPGRADE)
FA Number:	10035331
PACE Number:	MRCTB047285
PT Number:	2051A0VDA4
Site Name:	CROMWELL US MIL
Site Address:	179 Shunpike Road Cromwell, CT 06416

To Whom It May Concern:

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

- (3) QS66512-2 Antennas (72.0"x12.0"x9.6"– Wt. = 45 lbs. /each)
- (3) RRUS-32 B30 RRH's (27.2"x12.1"x7.0" – Wt. = 60 lbs. /each)
- (2) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)
- **(3) DMP65R-BU6DA Antennas (71.2"x20.7"x7.7" – Wt. = 80 lbs. /each)**
- **(3) HPA-65R-BUU-H6 Antennas (72.0"x14.8"x7.4" – Wt. = 51 lbs. /each)**
- **(3) 4449 B5/B12 RRH's (17.9"x13.2"x9.5" – Wt. = 71 lbs. /each)**
- **(3) B2/B66A 8843 RRH's (14.9"x13.2"x10.9" – Wt. = 72 lbs. /each)**
- **(6) DBCT108F1V92-2 Diplexers (10.7"x6.8"x7.2" – Wt. = 29 lbs. /each)**
- **(1) Squid Surge Arrestor (24.0"x9.7" Φ – Wt. = 33 lbs. /each) (Tower Mount)**

**Proposed equipment shown in bold*

Fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10857001C, dated January 20, 2017 were available for the proposed mounts.

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 – R13.
- HDG considers this mount to be asymmetrical and has applied wind loads in 30 degree increments all around the mount. Per TIA-222-H and Appendix N of the Connecticut State Building Code, the max basic wind speed for this site is equal to 125 mph with a max basic wind speed with ice of 50 mph and a max ice thickness of 1.5 in. An escalated ice thickness of 1.81 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 3; tower is located at the upper half of a hill.
- The mount has been analyzed with load combinations consisting of 250 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.

Based on our evaluation, we have determined that the New Sabre Industries Towers and Poles C10857001C mounts **ARE CAPABLE** of supporting the proposed installation.

	Component	Controlling Load Case	Stress Ratio	Pass/Fail
New (LTE 4C-5C-5G NR 2021 UPGRADE) Mount Rating	26	LC7	57%	**PASS**

Reference Documents:

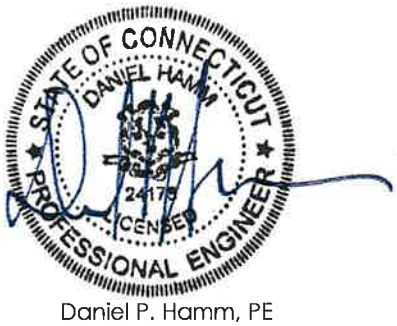
- Fabrication drawings prepared by Sabre Industries Towers and Poles, P/N C10857001C, dated January 20, 2017

This determination was based on the following limitations and assumptions:

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

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

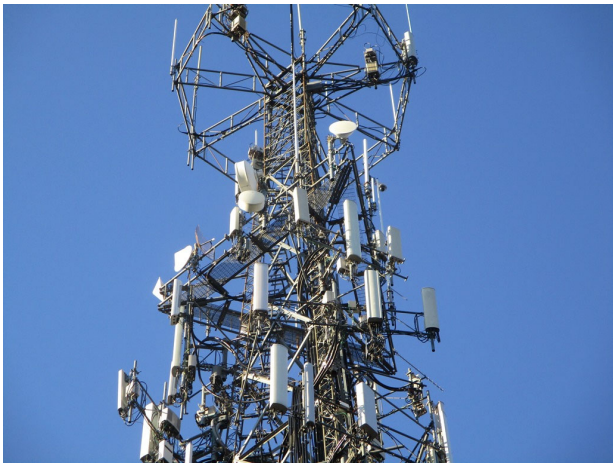
Respectfully Submitted,
Hudson Design Group LLC



Michael Cabral
Vice President

Daniel P. Hamm, PE
Principal

FIELD PHOTOS:
**Existing mounts to be removed*







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HUDSON
Design Group LLC

Wind & Ice
Calculations

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

2.6.5.2 Velocity Pressure Coeff:

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

z=	115	(ft)
z_g=	900	(ft)
α=	9.5	

K_z= 1.303

Kzmin ≤ Kz ≤ 2.01

Table 2-4

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

2.6.6.2 Topographic Factor:

Table 2-5

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

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

K_{zt}= 1.1888543

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

Category= **3**

K_h=	5.8663391	
K_c=	1	(from Table 2-4)
K_t=	0.53	(from Table 2-5)
f=	2	(from Table 2-5)
z=	115	
z_s=	272	(Mean elevation of base of structure above sea level)
H=	130	(Ht. of the crest above surrounding terrain)
K_{zt}=	1.19	(from 2.6.6.2.1)
K_e=	0.99	(from 2.6.8)

2.6.10 Design Ice Thickness

Max Ice Thickness = t_i = 1.50 in
Importance Factor = I= 1.0 (from Table 2-3)
K_{iz} = 1.13 (from Sec. 2.6.10)

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

t_{iz} = 1.81 in

Date: 7/21/2020
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HUDSON Design Group LLC

2.6.9 Gust Effect Factor

2.6.9.1 Self Supporting Lattice Structures

G_h = 1.0 Latticed Structures > 600 ft

G_h = 0.85 Latticed Structures 450 ft or less

G_h = 0.85 + 0.15 [h/150 - 3.0] h= ht. of structure

h=	170	G_h=	0.85
2.6.9.2 Guyed Masts		G_h=	0.85
2.6.9.3 Pole Structures		G_h=	1.1
2.6.9 Appurtenances		G_h=	1.0

2.6.9.4 Structures Supported on Other Structures

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

G_h=	1.35	**Gh=**	**1.00**

2.6.11.2 Design Wind Force on Appurtenances

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

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

		K_z=	1.303	(from 2.6.5.2)
		K_{zt}=	1.2	(from 2.6.6.2.1)
		K_s=	1.0	(from 2.6.7)
q_z=	**52.17**	K_e=	0.99	(from 2.6.8)
$q_{z\ (ice)}$=	**8.35**	K_d=	0.85	(from Table 2-2)
$q_{z\ (30)}$=	**3.00**	V_{max}=	125	mph (Ultimate Wind Speed)
		$V_{max\ (ice)}$=	50	mph
		V_{30}=	30	mph

Table 2-2

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

Date: 7/21/2020
Project Name: CROMWELL US MIL
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HUDSON Design Group LLC

Determine Ca:

Table 2-9

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

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

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

Ice Thickness = **1.81** **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)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.44	1.24	**663**	**131**	**38**
QS66512-2 Antenna	72.0	12.0	9.6	6.00	6.00	1.36	**424**	**93**	**24**
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	4.86	1.31	**504**	**105**	**29**
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.13	1.20	**86**	**22**	**5**
4449 B5/B12 RRH (Shielded)	14.9	7.5	10.4	0.78	1.99	1.20	**49**	**14**	**3**
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	2.25	1.20	**143**	**34**	**8**
RRUS-32 B30 RRH (Shielded)	27.2	0.1	7.0	0.02	272.00	10.23	**10**	**68**	**1**
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.20	**86**	**22**	**5**
B2/B66A 8843 RRH (Shielded)	14.9	1.6	10.9	0.17	9.31	1.48	**13**	**8**	**1**
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	1.57	1.20	**32**	**10**	**2**
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	3.15	1.23	**16**	**7**	**1**
Surge Arrestor	24.0	9.7	9.7	1.62	2.47	0.70	**59**	**15**	**3**
2" Pipe	2.4	12.0		0.20	0.20	1.20	**12**		
3/4" Round Bar	0.8	12.0		0.06	0.06	2.00	**7**		

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 30 (deg) | Ice Thickness = 1.81 in. | Equivalent Angle = 210 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Aspect Ratio	Aspect Ratio	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	663	293	571
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	424	355	407
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	504	288	450
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	86	67	81
4449 B5/B12 RRH (Shielded)	14.9	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	43	67	49
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	143	87	129
RRUS-32 B30 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	77	87	79
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	86	71	82
B2/B66A 8843 RRH (Shielded)	14.9	6.6	10.9	0.68	1.13	2.26	1.37	1.20	1.20	43	71	50
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	32	33	32
DBCT108F1V92-2 Diplexer (Shielded	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	16	33	21

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	74.8	24.3	11.3	12.63	5.88	3.08	6.61	1.23	1.38	129	68	114
QS66512-2 Antenna	75.6	15.6	13.2	8.20	6.94	4.84	5.72	1.30	1.34	89	78	86
HPA-65R-BUU-H6 Antenna	75.6	18.4	11.0	9.67	5.78	4.11	6.87	1.27	1.39	103	67	94
4449 B5/B12 RRH	18.5	16.8	14.0	2.16	1.80	1.10	1.32	1.20	1.20	22	18	21
4449 B5/B12 RRH (Shielded)	18.5	8.4	14.0	1.08	1.80	2.20	1.32	1.20	1.20	11	18	13
RRUS-32 B30 RRH	30.8	15.7	10.6	3.36	2.27	1.96	2.90	1.20	1.22	34	23	31
RRUS-32 B30 RRH (Shielded)	30.8	7.9	10.6	1.68	2.27	3.92	2.90	1.26	1.22	18	23	19
B2/B66A 8843 RRH	18.5	16.8	14.5	2.16	1.87	1.10	1.28	1.20	1.20	22	19	21
B2/B66A 8843 RRH (Shielded)	18.5	8.4	14.5	1.08	1.87	2.20	1.28	1.20	1.20	11	19	13
DBCT108F1V92-2 Diplexer	14.3	10.4	10.8	1.03	1.07	1.37	1.32	1.20	1.20	10	11	10
DBCT108F1V92-2 Diplexer (Shielded	14.3	7.0	10.8	0.70	1.07	2.04	1.32	1.20	1.20	7	11	8

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	38	17	33
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	24	20	23
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	29	17	26
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	5	4	5
4449 B5/B12 RRH (Shielded)	14.9	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	2	4	3
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	5
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	5
B2/B66A 8843 RRH (Shielded)	14.9	6.6	10.9	0.68	1.13	2.26	1.37	1.20	1.20	2	4	3
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	2	2	2
DBCT108F1V92-2 Diplexer (Shielded	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	1	2	1

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	60	(deg)	Ice Thickness =	1.81	in.	Equivalent Angle =	240	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	663	293	385
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	424	355	372
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	504	288	342
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	86	67	72
4449 B5/B12 RRH (Shielded)	14.9	9.9	10.4	1.02	1.08	1.51	1.43	1.20	1.20	64	67	67
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	143	87	101
RRUS-32 B30 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	109	87	93
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	86	71	74
B2/B66A 8843 RRH (Shielded)	14.9	9.9	10.9	1.02	1.13	1.51	1.37	1.20	1.20	64	71	69
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	32	33	33
DBCT108F1V92-2 Diplexer (Shielded	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	16	33	29

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	74.8	24.3	11.3	12.63	5.88	3.08	6.61	1.23	1.38	129	68	83
QS66512-2 Antenna	75.6	15.6	13.2	8.20	6.94	4.84	5.72	1.30	1.34	89	78	81
HPA-65R-BUU-H6 Antenna	75.6	18.4	11.0	9.67	5.78	4.11	6.87	1.27	1.39	103	67	76
4449 B5/B12 RRH	18.5	16.8	14.0	2.16	1.80	1.10	1.32	1.20	1.20	22	18	19
4449 B5/B12 RRH (Shielded)	18.5	12.6	14.0	1.62	1.80	1.47	1.32	1.20	1.20	16	18	18
RRUS-32 B30 RRH	30.8	15.7	10.6	3.36	2.27	1.96	2.90	1.20	1.22	34	23	26
RRUS-32 B30 RRH (Shielded)	30.8	11.8	10.6	2.52	2.27	2.61	2.90	1.21	1.22	25	23	24
B2/B66A 8843 RRH	18.5	16.8	14.5	2.16	1.87	1.10	1.28	1.20	1.20	22	19	19
B2/B66A 8843 RRH (Shielded)	18.5	12.6	14.5	1.62	1.87	1.47	1.28	1.20	1.20	16	19	18
DBCT108F1V92-2 Diplexer	14.3	10.4	10.8	1.03	1.07	1.37	1.32	1.20	1.20	10	11	11
DBCT108F1V92-2 Diplexer (Shielded	14.3	7.0	10.8	0.70	1.07	2.04	1.32	1.20	1.20	7	11	10

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	38	17	22
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	24	20	21
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	29	17	20
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	5	4	4
4449 B5/B12 RRH (Shielded)	14.9	9.9	10.4	1.02	1.08	1.51	1.43	1.20	1.20	4	4	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	6
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
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	4
B2/B66A 8843 RRH (Shielded)	14.9	9.9	10.9	1.02	1.13	1.51	1.37	1.20	1.20	4	4	4
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	2	2	2
DBCT108F1V92-2 Diplexer (Shielded	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	1	2	2

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	90	(deg)	Ice Thickness =	1.81	in.	Equivalent Angle =	270	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	663	293	293
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	424	355	355
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	504	288	288
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	86	67	67
4449 B5/B12 RRH (Shielded)	14.9	7.5	10.4	0.78	1.08	1.99	1.43	1.20	1.20	49	67	67
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	143	87	87
RRUS-32 B30 RRH (Shielded)	27.2	0.1	7.0	0.02	1.32	272.00	3.89	10.23	1.26	10	87	87
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	86	71	71
B2/B66A 8843 RRH (Shielded)	14.9	1.6	10.9	0.17	1.13	9.31	1.37	1.48	1.20	13	71	71
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	32	33	33
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	16	33	33

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	74.8	24.3	11.3	12.63	5.88	3.08	6.61	1.23	1.38	129	68	68
QS66512-2 Antenna	75.6	15.6	13.2	8.20	6.94	4.84	5.72	1.30	1.34	89	78	78
HPA-65R-BUU-H6 Antenna	75.6	18.4	11.0	9.67	5.78	4.11	6.87	1.27	1.39	103	67	67
4449 B5/B12 RRH	18.5	16.8	14.0	2.16	1.80	1.10	1.32	1.20	1.20	22	18	18
4449 B5/B12 RRH (Shielded)	18.5	11.1	14.0	1.43	1.80	1.67	1.32	1.20	1.20	14	18	18
RRUS-32 B30 RRH	30.8	15.7	10.6	3.36	2.27	1.96	2.90	1.20	1.22	34	23	23
RRUS-32 B30 RRH (Shielded)	30.8	3.7	10.6	0.79	2.27	8.30	2.90	1.44	1.22	10	23	23
B2/B66A 8843 RRH	18.5	16.8	14.5	2.16	1.87	1.10	1.28	1.20	1.20	22	19	19
B2/B66A 8843 RRH (Shielded)	18.5	5.2	14.5	0.67	1.87	3.55	1.28	1.25	1.20	7	19	19
DBCT108F1V92-2 Diplexer	14.3	10.4	10.8	1.03	1.07	1.37	1.32	1.20	1.20	10	11	11
DBCT108F1V92-2 Diplexer (Shielded)	14.3	7.0	10.8	0.70	1.07	2.04	1.32	1.20	1.20	7	11	11

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	38	17	17
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	24	20	20
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	29	17	17
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	5	4	4
4449 B5/B12 RRH (Shielded)	14.9	7.5	10.4	0.78	1.08	1.99	1.43	1.20	1.20	3	4	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	5
RRUS-32 B30 RRH (Shielded)	27.2	0.1	7.0	0.02	1.32	272.00	3.89	10.23	1.26	1	5	5
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	4
B2/B66A 8843 RRH (Shielded)	14.9	1.6	10.9	0.17	1.13	9.31	1.37	1.48	1.20	1	4	4
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	2	2	2
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	1	2	2

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle = 120 (deg) | Ice Thickness = 1.81 in. | Equivalent Angle = 300 (deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	663	293	385
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	424	355	372
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	504	288	342
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	86	67	72
4449 B5/B12 RRH (Shielded)	14.9	9.9	10.4	1.02	1.08	1.51	1.43	1.20	1.20	64	67	67
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	143	87	101
RRUS-32 B30 RRH (Shielded)	27.2	9.1	7.0	1.71	1.32	3.00	3.89	1.22	1.26	109	87	93
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	86	71	74
B2/B66A 8843 RRH (Shielded)	14.9	9.9	10.9	1.02	1.13	1.51	1.37	1.20	1.20	64	71	69
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	32	33	33
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	16	33	29

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	74.8	24.3	11.3	12.63	5.88	3.08	6.61	1.23	1.38	129	68	83
QS66512-2 Antenna	75.6	15.6	13.2	8.20	6.94	4.84	5.72	1.30	1.34	89	78	81
HPA-65R-BUU-H6 Antenna	75.6	18.4	11.0	9.67	5.78	4.11	6.87	1.27	1.39	103	67	76
4449 B5/B12 RRH	18.5	16.8	14.0	2.16	1.80	1.10	1.32	1.20	1.20	22	18	19
4449 B5/B12 RRH (Shielded)	18.5	12.6	14.0	1.62	1.80	1.47	1.32	1.20	1.20	16	18	18
RRUS-32 B30 RRH	30.8	15.7	10.6	3.36	2.27	1.96	2.90	1.20	1.22	34	23	26
RRUS-32 B30 RRH (Shielded)	30.8	11.8	10.6	2.52	2.27	2.61	2.90	1.21	1.22	25	23	24
B2/B66A 8843 RRH	18.5	16.8	14.5	2.16	1.87	1.10	1.28	1.20	1.20	22	19	19
B2/B66A 8843 RRH (Shielded)	18.5	12.6	14.5	1.62	1.87	1.47	1.28	1.20	1.20	16	19	18
DBCT108F1V92-2 Diplexer	14.3	10.4	10.8	1.03	1.07	1.37	1.32	1.20	1.20	10	11	11
DBCT108F1V92-2 Diplexer (Shielded)	14.3	7.0	10.8	0.70	1.07	2.04	1.32	1.20	1.20	7	11	10

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	38	17	22
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	24	20	21
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	29	17	20
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	5	4	4
4449 B5/B12 RRH (Shielded)	14.9	9.9	10.4	1.02	1.08	1.51	1.43	1.20	1.20	4	4	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	6
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
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	4
B2/B66A 8843 RRH (Shielded)	14.9	9.9	10.9	1.02	1.13	1.51	1.37	1.20	1.20	4	4	4
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	2	2	2
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	1	2	2

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM Checked By: MSC

HUDSON Design Group LLC

WIND LOADS

Angle =	150	(deg)	Ice Thickness =	1.81	in.	Equivalent Angle =	330	(deg)

WIND LOADS WITH NO ICE:

Appurtenances	Height	Width	Depth	Flat Area (normal)	Flat Area (side)	Ratio (normal)	Ratio (side)	Ca (normal)	Ca (side)	Force (lbs) (normal)	Force (lbs) (side)	Force (lbs) (angle)
DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	663	293	571
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	424	355	407
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	504	288	450
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	86	67	81
4449 B5/B12 RRH (Shielded)	14.9	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	43	67	49
RRUS-32 B30 RRH	27.2	12.1	7.0	2.29	1.32	2.25	3.89	1.20	1.26	143	87	129
RRUS-32 B30 RRH (Shielded)	27.2	6.1	7.0	1.14	1.32	4.50	3.89	1.29	1.26	77	87	79
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	86	71	82
B2/B66A 8843 RRH (Shielded)	14.9	6.6	10.9	0.68	1.13	2.26	1.37	1.20	1.20	43	71	50
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	32	33	32
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	16	33	21

WIND LOADS WITH ICE:

DMP65R-BU6DA Antenna	74.8	24.3	11.3	12.63	5.88	3.08	6.61	1.23	1.38	129	68	114
QS66512-2 Antenna	75.6	15.6	13.2	8.20	6.94	4.84	5.72	1.30	1.34	89	78	86
HPA-65R-BUU-H6 Antenna	75.6	18.4	11.0	9.67	5.78	4.11	6.87	1.27	1.39	103	67	94
4449 B5/B12 RRH	18.5	16.8	14.0	2.16	1.80	1.10	1.32	1.20	1.20	22	18	21
4449 B5/B12 RRH (Shielded)	18.5	8.4	14.0	1.08	1.80	2.20	1.32	1.20	1.20	11	18	13
RRUS-32 B30 RRH	30.8	15.7	10.6	3.36	2.27	1.96	2.90	1.20	1.22	34	23	31
RRUS-32 B30 RRH (Shielded)	30.8	7.9	10.6	1.68	2.27	3.92	2.90	1.26	1.22	18	23	19
B2/B66A 8843 RRH	18.5	16.8	14.5	2.16	1.87	1.10	1.28	1.20	1.20	22	19	21
B2/B66A 8843 RRH (Shielded)	18.5	8.4	14.5	1.08	1.87	2.20	1.28	1.20	1.20	11	19	13
DBCT108F1V92-2 Diplexer	14.3	10.4	10.8	1.03	1.07	1.37	1.32	1.20	1.20	10	11	10
DBCT108F1V92-2 Diplexer (Shielded)	14.3	7.0	10.8	0.70	1.07	2.04	1.32	1.20	1.20	7	11	8

WIND LOADS AT 30 MPH:

DMP65R-BU6DA Antenna	71.2	20.7	7.7	10.24	3.81	3.44	9.25	1.24	1.47	38	17	33
QS66512-2 Antenna	72.0	12.0	9.6	6.00	4.80	6.00	7.50	1.36	1.42	24	20	23
HPA-65R-BUU-H6 Antenna	72.0	14.8	7.4	7.40	3.70	4.86	9.73	1.31	1.49	29	17	26
4449 B5/B12 RRH	14.9	13.2	10.4	1.37	1.08	1.13	1.43	1.20	1.20	5	4	5
4449 B5/B12 RRH (Shielded)	14.9	6.6	10.4	0.68	1.08	2.26	1.43	1.20	1.20	2	4	3
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	5
B2/B66A 8843 RRH	14.9	13.2	10.9	1.37	1.13	1.13	1.37	1.20	1.20	5	4	5
B2/B66A 8843 RRH (Shielded)	14.9	6.6	10.9	0.68	1.13	2.26	1.37	1.20	1.20	2	4	3
DBCT108F1V92-2 Diplexer	10.7	6.8	7.2	0.51	0.54	1.57	1.49	1.20	1.20	2	2	2
DBCT108F1V92-2 Diplexer (Shielded)	10.7	3.4	7.2	0.25	0.54	3.15	1.49	1.23	1.20	1	2	1

Date: 7/21/2020
Project Name: CROMWELL US MIL
Project No.: CT1141
Designed By: KM **Checked By:** MSC

HUDSON Design Group LLC

ICE WEIGHT CALCULATIONS

Thickness of ice:	1.81	in.
Density of ice:	56	pcf

DMP65R-BU6DA Antenna

Weight of ice based on total radial SF area:		
Height (in):	71.2	
Width (in):	20.7	
Depth (in):	7.7	
Total weight of ice on object:	314	lbs
Weight of object:	80.0	lbs
Combined weight of ice and object:	394	lbs

QS66512-2 Antenna

Weight of ice based on total radial SF area:		
Height (in):	72.0	
Width (in):	12.0	
Depth (in):	9.6	
Total weight of ice on object:	228	lbs
Weight of object:	111.0	lbs
Combined weight of ice and object:	339	lbs

HPA-65R-BUU-H6 Antenna

Weight of ice based on total radial SF area:		
Height (in):	72.0	
Width (in):	14.8	
Depth (in):	7.4	
Total weight of ice on object:	244	lbs
Weight of object:	51.0	lbs
Combined weight of ice and object:	295	lbs

4449 B5/B12 RRH

Weight of ice based on total radial SF area:		
Height (in):	17.9	
Width (in):	13.2	
Depth (in):	9.5	
Total weight of ice on object:	60	lbs
Weight of object:	71.0	lbs
Combined weight of ice and object:	131	lbs

RRUS-32 B30 RRH

Weight of ice based on total radial SF area:		
Height (in):	27.2	
Width (in):	12.1	
Depth (in):	7.0	
Total weight of ice on object:	79	lbs
Weight of object:	60.0	lbs
Combined weight of ice and object:	139	lbs

B2/B66A 8843 RRH

Weight of ice based on total radial SF area:		
Height (in):	14.9	
Width (in):	13.2	
Depth (in):	10.9	
Total weight of ice on object:	52	lbs
Weight of object:	72.0	lbs
Combined weight of ice and object:	124	lbs

DBCT108F1V92-2 Diplexer

Weight of ice based on total radial SF area:		
Height (in):	10.7	
Width (in):	6.8	
Depth (in):	7.2	
Total weight of ice on object:	23	lbs
Weight of object:	29.0	lbs
Combined weight of ice and object:	52	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:	51	lbs
Weight of object:	33	lbs
Combined weight of ice and object:	84	lbs

2" pipe

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

3/4" Round Bar

Per foot weight of ice:		
diameter (in):	0.75	
Per foot weight of ice on object:	6	plf

HUDSON
Design Group LLC

Mount Calculations
(Proposed Conditions)

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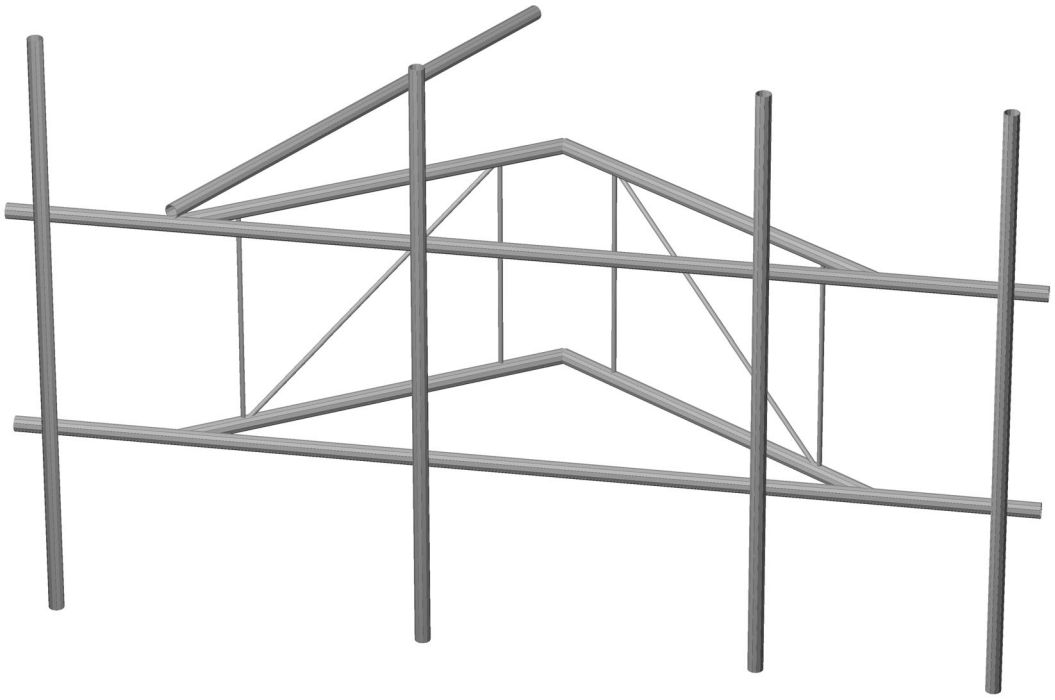

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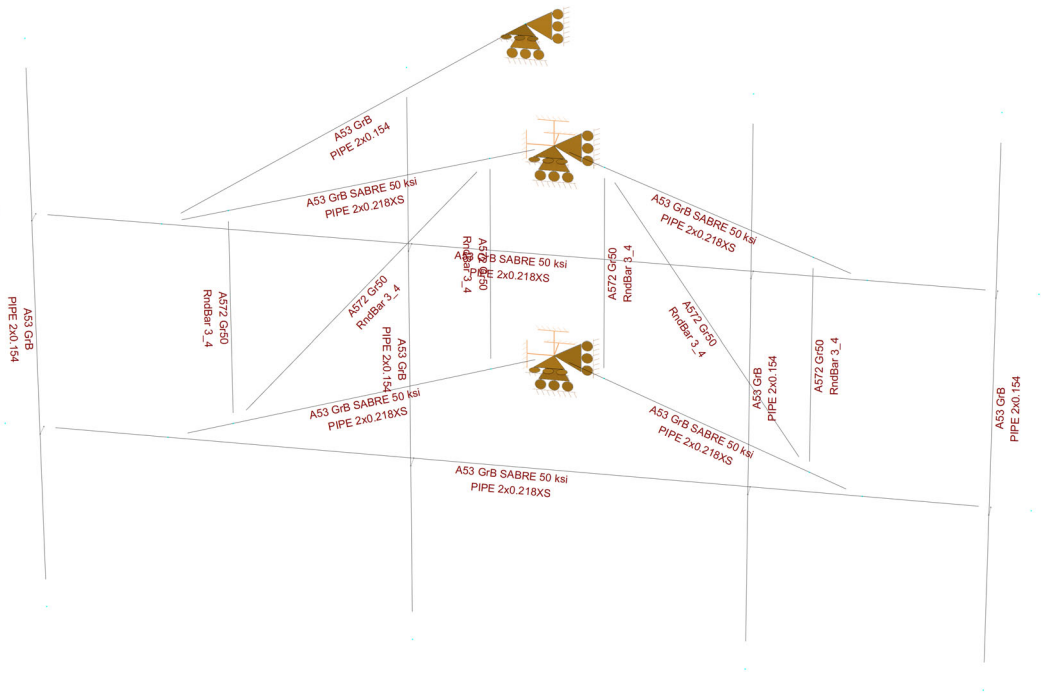

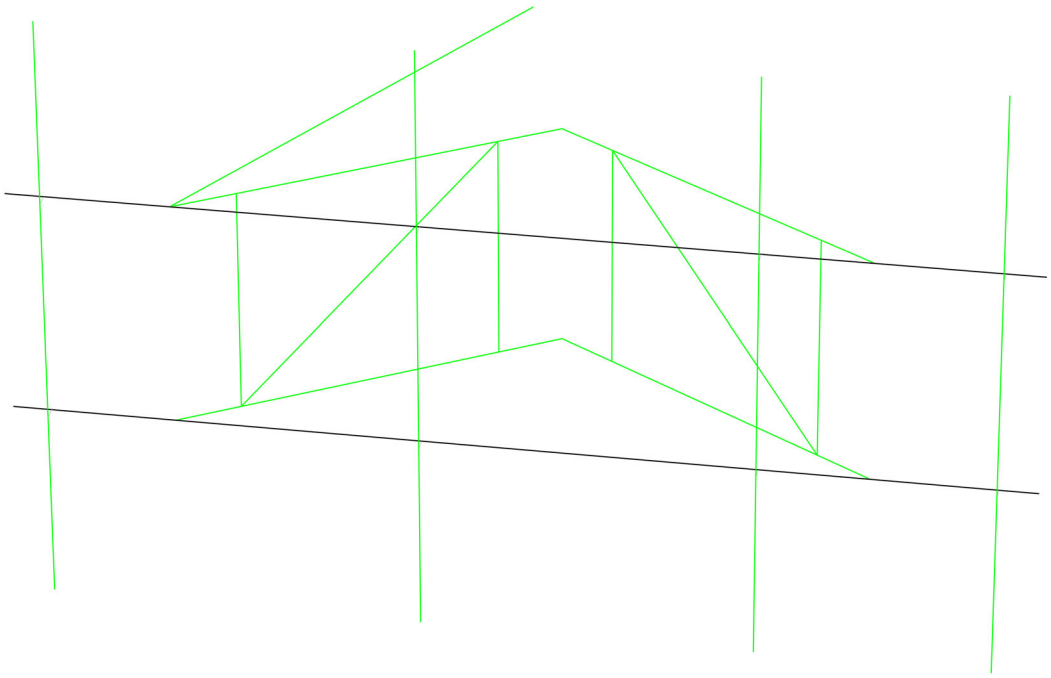
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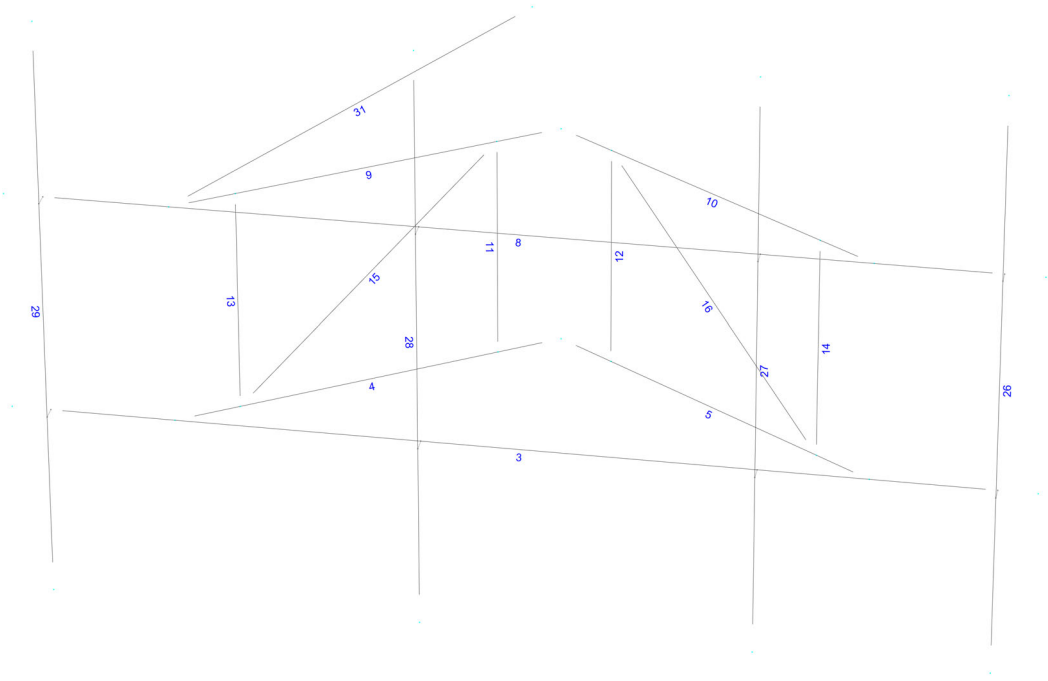

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Load data

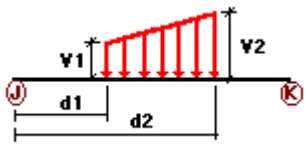
GLOSSARY

Comb : Indicates if load condition is a load combination

Load Conditions

Condition	Description	Comb.	Category
D	Dead Load	No	DL
Wo	Wind Load (NO ICE)	No	WIND
W30	WL 30deg	No	WIND
W60	WL 60deg	No	WIND
W90	WL 90deg	No	WIND
W120	WL 120deg	No	WIND
W150	WL 150deg	No	WIND
Di	Ice Load	No	LL
WI0	WL ICE 0deg	No	WIND
WI30	WL ICE 30deg	No	WIND
WI60	WL ICE 60deg	No	WIND
WI90	WL ICE 90deg	No	WIND
WI120	WL ICE 120deg	No	WIND
WI150	WL ICE 150deg	No	WIND
WL0	WL 30 mph 0deg	No	WIND
WL30	WL 30 mph 30deg	No	WIND
WL60	WL 30 mph 60deg	No	WIND
WL90	WL 30 mph 90deg	No	WIND
WL120	WL 30 mph 120deg	No	WIND
WL150	WL 30 mph 150deg	No	WIND
LL1	250 lb Live Load Center of Mount	No	LL
LL2	250 lb Live Load Right End of Mount	No	LL
LL3	250 lb Live Load Left End of Mount	No	LL
LLa1	250 lb Live Load Antenna 1	No	LL
LLa2	250 lb Live Load Antenna 2	No	LL
LLa3	250 lb Live Load Antenna 3	No	LL
LLa4	250 lb Live Load Antenna 4	No	LL

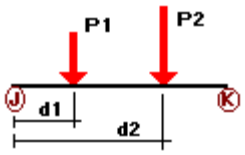
Distributed force on members



Condition	Member	Dir1	Val1 [Kip/ft]	Val2 [Kip/ft]	Dist1 [ft]	%	Dist2 [ft]	%
Wo	3	z	-0.012	0.00	0.00	No	0.00	No
	4	z	-0.012	0.00	0.00	No	0.00	No
	5	z	-0.012	0.00	0.00	No	0.00	No
	8	z	-0.012	0.00	0.00	No	0.00	No
	9	z	-0.012	0.00	0.00	No	0.00	No
	10	z	-0.012	0.00	0.00	No	0.00	No
	11	z	-0.007	0.00	0.00	No	0.00	No
	12	z	-0.007	0.00	0.00	No	0.00	No
	13	z	-0.007	0.00	0.00	No	0.00	No
	14	z	-0.007	0.00	0.00	No	0.00	No
	15	z	-0.007	0.00	0.00	No	0.00	No
	16	z	-0.007	0.00	0.00	No	0.00	No
	27	z	-0.012	0.00	0.00	No	0.00	No
	31	z	-0.012	0.00	0.00	No	0.00	No
W30	3	z	-0.012	0.00	0.00	No	0.00	No
	4	z	-0.012	0.00	0.00	No	0.00	No
	5	z	-0.012	0.00	0.00	No	0.00	No
	8	z	-0.012	0.00	0.00	No	0.00	No
	9	z	-0.012	0.00	0.00	No	0.00	No
	10	z	-0.012	0.00	0.00	No	0.00	No
	11	z	-0.007	0.00	0.00	No	0.00	No
	12	z	-0.007	0.00	0.00	No	0.00	No
	13	z	-0.007	0.00	0.00	No	0.00	No
	14	z	-0.007	0.00	0.00	No	0.00	No
	15	z	-0.007	0.00	0.00	No	0.00	No
	16	z	-0.007	0.00	0.00	No	0.00	No
	27	z	-0.012	0.00	0.00	No	0.00	No
	31	z	-0.012	0.00	0.00	No	0.00	No
W60	3	x	-0.012	0.00	0.00	No	0.00	No
	4	x	-0.012	0.00	0.00	No	0.00	No
	5	x	-0.012	0.00	0.00	No	0.00	No
	8	x	-0.012	0.00	0.00	No	0.00	No
	9	x	-0.012	0.00	0.00	No	0.00	No
	10	x	-0.012	0.00	0.00	No	0.00	No
	11	x	-0.007	0.00	0.00	No	0.00	No
	12	x	-0.007	0.00	0.00	No	0.00	No
	13	x	-0.007	0.00	0.00	No	0.00	No
	14	x	-0.007	0.00	0.00	No	0.00	No
	15	x	-0.007	0.00	0.00	No	0.00	No
	16	x	-0.007	0.00	0.00	No	0.00	No
	27	x	-0.012	0.00	0.00	No	0.00	No
	31	x	-0.012	0.00	0.00	No	0.00	No
W90	3	x	-0.012	0.00	0.00	No	0.00	No
	4	x	-0.012	0.00	0.00	No	0.00	No
	5	x	-0.012	0.00	0.00	No	0.00	No
	8	x	-0.012	0.00	0.00	No	0.00	No
	9	x	-0.012	0.00	0.00	No	0.00	No
	10	x	-0.012	0.00	0.00	No	0.00	No
	11	x	-0.007	0.00	0.00	No	0.00	No
	12	x	-0.007	0.00	0.00	No	0.00	No
	13	x	-0.007	0.00	0.00	No	0.00	No
	14	x	-0.007	0.00	0.00	No	0.00	No
	15	x	-0.007	0.00	0.00	No	0.00	No
	16	x	-0.007	0.00	0.00	No	0.00	No
	27	x	-0.012	0.00	0.00	No	0.00	No
	31	x	-0.012	0.00	0.00	No	0.00	No
W120	3	x	-0.012	0.00	0.00	No	0.00	No
	4	x	-0.012	0.00	0.00	No	0.00	No
	5	x	-0.012	0.00	0.00	No	0.00	No
	8	x	-0.012	0.00	0.00	No	0.00	No

	9	x	-0.012	0.00	0.00	No	0.00	No
	10	x	-0.012	0.00	0.00	No	0.00	No
	11	x	-0.007	0.00	0.00	No	0.00	No
	12	x	-0.007	0.00	0.00	No	0.00	No
	13	x	-0.007	0.00	0.00	No	0.00	No
	14	x	-0.007	0.00	0.00	No	0.00	No
	15	x	-0.007	0.00	0.00	No	0.00	No
	16	x	-0.007	0.00	0.00	No	0.00	No
	27	x	-0.012	0.00	0.00	No	0.00	No
	31	x	-0.012	0.00	0.00	No	0.00	No
W150	3	z	0.012	0.00	0.00	No	0.00	No
	4	z	0.012	0.00	0.00	No	0.00	No
	5	z	0.012	0.00	0.00	No	0.00	No
	8	z	0.012	0.00	0.00	No	0.00	No
	9	z	0.012	0.00	0.00	No	0.00	No
	10	z	0.012	0.00	0.00	No	0.00	No
	11	z	0.007	0.00	0.00	No	0.00	No
	12	z	0.007	0.00	0.00	No	0.00	No
	13	z	0.007	0.00	0.00	No	0.00	No
	14	z	0.007	0.00	0.00	No	0.00	No
	15	z	0.007	0.00	0.00	No	0.00	No
	16	z	0.007	0.00	0.00	No	0.00	No
	27	z	0.012	0.00	0.00	No	0.00	No
	31	z	0.012	0.00	0.00	No	0.00	No
Di	3	y	-0.009	0.00	0.00	No	0.00	No
	4	y	-0.009	0.00	0.00	No	0.00	No
	5	y	-0.009	0.00	0.00	No	0.00	No
	8	y	-0.009	0.00	0.00	No	0.00	No
	9	y	-0.009	0.00	0.00	No	0.00	No
	10	y	-0.009	0.00	0.00	No	0.00	No
	11	y	-0.006	0.00	0.00	No	0.00	No
	12	y	-0.006	0.00	0.00	No	0.00	No
	13	y	-0.006	0.00	0.00	No	0.00	No
	14	y	-0.006	0.00	0.00	No	0.00	No
	15	y	-0.006	0.00	0.00	No	0.00	No
	16	y	-0.006	0.00	0.00	No	0.00	No
	26	y	-0.005	0.00	0.00	No	0.00	No
	27	y	-0.009	0.00	0.00	No	0.00	No
	28	y	-0.009	0.00	0.00	No	0.00	No
	29	y	-0.009	0.00	0.00	No	0.00	No
	31	y	-0.009	0.00	0.00	No	0.00	No

Concentrated forces on members



Condition	Member	Dir1	Value1 [Kip]	Dist1 [ft]	%
D	26	y	-0.04	2.00	No
		y	-0.04	7.00	No
		y	-0.071	1.00	No
	28	y	-0.023	2.00	No
		y	-0.023	7.00	No
		y	-0.06	4.00	No
		y	-0.058	6.00	No
	29	y	-0.026	2.00	No
		y	-0.026	7.00	No
		y	-0.072	1.00	No
Wo	26	z	-0.332	2.00	No
		z	-0.332	7.00	No
		z	-0.049	1.00	No
	28	z	-0.212	2.00	No
		z	-0.212	7.00	No
		z	-0.01	4.00	No
		z	-0.032	6.00	No
	29	z	-0.252	2.00	No
		z	-0.252	7.00	No
		z	-0.013	1.00	No
W30	26	3	-0.286	2.00	No
		3	-0.286	7.00	No
		3	-0.049	1.00	No
	28	3	-0.204	2.00	No
		3	-0.204	7.00	No
		3	-0.079	4.00	No
		3	-0.042	6.00	No
	29	3	-0.225	2.00	No
		3	-0.225	7.00	No
		3	-0.05	1.00	No
W60	26	3	-0.193	2.00	No
		3	-0.193	7.00	No
		3	-0.067	1.00	No
	28	3	-0.186	2.00	No
		3	-0.186	7.00	No
		3	-0.093	4.00	No
		3	-0.058	6.00	No
	29	3	-0.171	2.00	No
		3	-0.171	7.00	No
		3	-0.069	1.00	No
W90	26	x	-0.147	2.00	No
		x	-0.147	7.00	No
		x	-0.067	1.00	No
	28	x	-0.178	2.00	No
		x	-0.178	7.00	No
		x	-0.087	4.00	No
		x	-0.066	6.00	No
	29	x	-0.144	2.00	No
		x	-0.144	7.00	No
		x	-0.071	1.00	No
W120	26	2	-0.193	2.00	No
		2	-0.193	7.00	No
		2	-0.067	1.00	No
	28	2	-0.186	2.00	No
		2	-0.186	7.00	No
		2	-0.093	4.00	No
		2	-0.058	6.00	No
	29	2	-0.171	2.00	No
		2	-0.171	7.00	No
		2	-0.069	1.00	No

W150	26	2	-0.286	2.00	No
		2	-0.286	7.00	No
		2	-0.049	1.00	No
	28	2	-0.204	2.00	No
		2	-0.204	7.00	No
		2	-0.079	4.00	No
		2	-0.042	6.00	No
	29	2	-0.225	2.00	No
		2	-0.225	7.00	No
		2	-0.05	1.00	No
Di	26	y	-0.157	2.00	No
		y	-0.157	7.00	No
		y	-0.06	1.00	No
	28	y	-0.114	2.00	No
		y	-0.114	7.00	No
		y	-0.079	4.00	No
		y	-0.046	6.00	No
	29	y	-0.122	2.00	No
		y	-0.122	7.00	No
		y	-0.052	1.00	No
WI0	26	z	-0.066	2.00	No
		z	-0.066	7.00	No
		z	-0.014	1.00	No
	28	z	-0.047	2.00	No
		z	-0.047	7.00	No
		z	-0.068	4.00	No
		z	-0.014	6.00	No
	29	z	-0.053	2.00	No
		z	-0.053	7.00	No
		z	-0.008	1.00	No
WI30	26	3	-0.057	2.00	No
		3	-0.057	7.00	No
		3	-0.013	1.00	No
	28	3	-0.043	2.00	No
		3	-0.043	7.00	No
		3	-0.019	4.00	No
		3	-0.016	6.00	No
	29	3	-0.047	2.00	No
		3	-0.047	7.00	No
		3	-0.013	1.00	No
WI60	26	3	-0.042	2.00	No
		3	-0.042	7.00	No
		3	-0.018	1.00	No
	28	3	-0.041	2.00	No
		3	-0.041	7.00	No
		3	-0.024	4.00	No
		3	-0.02	6.00	No
	29	3	-0.038	2.00	No
		3	-0.038	7.00	No
		3	-0.018	1.00	No
WI90	26	x	-0.034	2.00	No
		x	-0.034	7.00	No
		x	-0.018	1.00	No
	28	x	-0.039	2.00	No
		x	-0.039	7.00	No
		x	-0.023	4.00	No
		x	-0.022	6.00	No
	29	x	-0.034	2.00	No
		x	-0.034	7.00	No
		x	-0.019	1.00	No

WI120	26	2	-0.042	2.00	No
		2	-0.042	7.00	No
		2	-0.018	1.00	No
	28	2	-0.041	2.00	No
		2	-0.041	7.00	No
		2	-0.024	4.00	No
		2	-0.02	6.00	No
	29	2	-0.038	2.00	No
		2	-0.038	7.00	No
		2	-0.018	1.00	No
WI150	26	2	-0.057	2.00	No
		2	-0.057	7.00	No
		2	-0.013	1.00	No
	28	2	-0.043	2.00	No
		2	-0.043	7.00	No
		2	-0.019	4.00	No
		2	-0.016	6.00	No
	29	2	-0.047	2.00	No
		2	-0.047	7.00	No
		2	-0.013	1.00	No
WL0	26	z	-0.019	2.00	No
		z	-0.019	7.00	No
		z	-0.003	1.00	No
	28	z	-0.012	2.00	No
		z	-0.012	7.00	No
		z	-0.001	4.00	No
		z	-0.002	6.00	No
	29	z	-0.015	2.00	No
		z	-0.015	7.00	No
		z	-0.001	1.00	No
WL30	26	3	-0.017	2.00	No
		3	-0.017	7.00	No
		3	-0.003	1.00	No
	28	3	-0.012	2.00	No
		3	-0.012	7.00	No
		3	-0.005	4.00	No
		3	-0.002	6.00	No
	29	3	-0.013	2.00	No
		3	-0.013	7.00	No
		3	-0.003	1.00	No
WL60	26	3	-0.011	2.00	No
		3	-0.011	7.00	No
		3	-0.004	1.00	No
	28	3	-0.011	2.00	No
		3	-0.011	7.00	No
		3	-0.005	4.00	No
		3	-0.004	6.00	No
	29	3	-0.01	2.00	No
		3	-0.01	7.00	No
		3	-0.004	1.00	No
WL90	26	x	-0.009	2.00	No
		x	-0.009	7.00	No
		x	-0.004	1.00	No
	28	x	-0.01	2.00	No
		x	-0.01	7.00	No
		x	-0.005	4.00	No
		x	-0.004	6.00	No
	29	x	-0.009	2.00	No
		x	-0.009	7.00	No
		x	-0.004	1.00	No

WL120	26	2	-0.011	2.00	No
		2	-0.011	7.00	No
		2	-0.004	1.00	No
	28	2	-0.011	2.00	No
		2	-0.011	7.00	No
		2	-0.005	4.00	No
		2	-0.004	6.00	No
	29	2	-0.01	2.00	No
		2	-0.01	7.00	No
		2	-0.004	1.00	No
WL150	26	2	-0.017	2.00	No
		2	-0.017	7.00	No
		2	-0.003	1.00	No
	28	2	-0.012	2.00	No
		2	-0.012	7.00	No
		2	-0.005	4.00	No
		2	-0.002	6.00	No
	29	2	-0.013	2.00	No
		2	-0.013	7.00	No
		2	-0.003	1.00	No
LL1	8	y	-0.25	6.50	No
LL2	8	y	-0.25	13.00	No
LL3	8	y	-0.25	0.00	No
LLa1	26	y	-0.25	4.00	No
LLa2	27	y	-0.25	4.00	No
LLa3	28	y	-0.25	4.00	No
LLa4	29	y	-0.25	4.00	No

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	250 lb Live Load Antenna 1	No	0.00	0.00	0.00
LLa2	250 lb Live Load Antenna 2	No	0.00	0.00	0.00
LLa3	250 lb Live Load Antenna 3	No	0.00	0.00	0.00
LLa4	250 lb Live Load Antenna 4	No	0.00	0.00	0.00

Earthquake (Dynamic analysis only)

Condition	a/g	Ang. [Deg]	Damp. [%]
D	0.00	0.00	0.00
Wo	0.00	0.00	0.00
W30	0.00	0.00	0.00
W60	0.00	0.00	0.00
W90	0.00	0.00	0.00
W120	0.00	0.00	0.00
W150	0.00	0.00	0.00
Di	0.00	0.00	0.00
WI0	0.00	0.00	0.00
WI30	0.00	0.00	0.00
WI60	0.00	0.00	0.00
WI90	0.00	0.00	0.00
WI120	0.00	0.00	0.00
WI150	0.00	0.00	0.00
WL0	0.00	0.00	0.00
WL30	0.00	0.00	0.00
WL60	0.00	0.00	0.00
WL90	0.00	0.00	0.00
WL120	0.00	0.00	0.00
WL150	0.00	0.00	0.00
LL1	0.00	0.00	0.00
LL2	0.00	0.00	0.00
LL3	0.00	0.00	0.00
LLa1	0.00	0.00	0.00
LLa2	0.00	0.00	0.00
LLa3	0.00	0.00	0.00
LLa4	0.00	0.00	0.00

Current Date: 7/21/2020 1:00 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1141\LTE 4C 5C 5G NR\CT1141.retx

Steel Code Check

Report: Summary - Group by member

Load conditions to be included in design :

LC1=1.2D+Wo
LC2=1.2D+W30
LC3=1.2D+W60
LC4=1.2D+W90
LC5=1.2D+W120
LC6=1.2D+W150
LC7=1.2D-Wo
LC8=1.2D-W30
LC9=1.2D-W60
LC10=1.2D-W90
LC11=1.2D-W120
LC12=1.2D-W150
LC13=0.9D+Wo
LC14=0.9D+W30
LC15=0.9D+W60
LC16=0.9D+W90
LC17=0.9D+W120
LC18=0.9D+W150
LC19=0.9D-Wo
LC20=0.9D-W30
LC21=0.9D-W60
LC22=0.9D-W90
LC23=0.9D-W120
LC24=0.9D-W150
LC25=1.2D+Di+WI0
LC26=1.2D+Di+WI30
LC27=1.2D+Di+WI60
LC28=1.2D+Di+WI90
LC29=1.2D+Di+WI120
LC30=1.2D+Di+WI150
LC31=1.2D+Di-WI0
LC32=1.2D+Di-WI30
LC33=1.2D+Di-WI60
LC34=1.2D+Di-WI90
LC35=1.2D+Di-WI120
LC36=1.2D+Di-WI150
LC38=1.2D+1.5LL1
LC39=1.2D+1.5LL2
LC40=1.2D+1.5LL3
LC41=1.2D+WL0+1.5LLa1
LC42=1.2D+WL30+1.5LLa1
LC43=1.2D+WL60+1.5LLa1
LC44=1.2D+WL90+1.5LLa1
LC45=1.2D+WL120+1.5LLa1
LC46=1.2D+WL150+1.5LLa1
LC47=1.2D-WL0+1.5LLa1
LC48=1.2D-WL30+1.5LLa1
LC49=1.2D-WL60+1.5LLa1
LC50=1.2D-WL90+1.5LLa1
LC51=1.2D-WL120+1.5LLa1
LC52=1.2D-WL150+1.5LLa1
LC53=1.2D+WL0+1.5LLa2
LC54=1.2D+WL30+1.5LLa2

LC55=1.2D+WL60+1.5LLa2
LC56=1.2D+WL90+1.5LLa2
LC57=1.2D+WL120+1.5LLa2
LC58=1.2D+WL150+1.5LLa2
LC59=1.2D-WL0+1.5LLa2
LC60=1.2D-WL30+1.5LLa2
LC61=1.2D-WL60+1.5LLa2
LC62=1.2D-WL90+1.5LLa2
LC63=1.2D-WL120+1.5LLa2
LC64=1.2D-WL150+1.5LLa2
LC65=1.2D+WL0+1.5LLa3
LC66=1.2D+WL30+1.5LLa3
LC67=1.2D+WL60+1.5LLa3
LC68=1.2D+WL90+1.5LLa3
LC69=1.2D+WL120+1.5LLa3
LC70=1.2D+WL150+1.5LLa3
LC71=1.2D-WL0+1.5LLa3
LC72=1.2D-WL30+1.5LLa3
LC73=1.2D-WL60+1.5LLa3
LC74=1.2D-WL90+1.5LLa3
LC75=1.2D-WL120+1.5LLa3
LC76=1.2D-WL150+1.5LLa3
LC77=1.2D+WL0+1.5LLa4
LC78=1.2D+WL30+1.5LLa4
LC79=1.2D+WL60+1.5LLa4
LC80=1.2D+WL90+1.5LLa4
LC81=1.2D+WL120+1.5LLa4
LC82=1.2D+WL150+1.5LLa4
LC83=1.2D-WL0+1.5LLa4
LC84=1.2D-WL30+1.5LLa4
LC85=1.2D-WL60+1.5LLa4
LC86=1.2D-WL90+1.5LLa4
LC87=1.2D-WL120+1.5LLa4
LC88=1.2D-WL150+1.5LLa4

Description	Section	Member	Ctrl Eq.	Ratio	Status	Reference
	PIPE 2x0.154	**26**	LC7 at 68.75%	**0.57**	**OK**	Eq. H1-1b
		27	LC4 at 31.25%	0.22	OK	Eq. H1-1b
		28	LC7 at 68.75%	0.38	OK	Eq. H1-1b
		29	LC1 at 68.75%	0.43	OK	Eq. H1-1b
		31	LC16 at 100.00%	0.27	OK	Eq. H1-1b
	PIPE 2x0.218XS	**3**	LC7 at 83.04%	**0.46**	**With warnings**	Eq. H1-1a
		4	LC10 at 100.00%	0.25	OK	Eq. H1-1b
		5	LC3 at 100.00%	0.23	OK	Eq. H1-1b
		8	LC6 at 41.07%	0.36	With warnings	Eq. H1-1a
		9	LC30 at 100.00%	0.23	OK	Eq. H1-1b
		10	LC26 at 100.00%	0.22	OK	Eq. H1-1b
	RndBar 3_4	**11**	LC26 at 0.00%	0.40	OK	Eq. H1-1a
		12	LC28 at 100.00%	0.37	OK	Eq. H1-1a
		13	LC36 at 100.00%	**0.52**	**OK**	Eq. H1-1a
		14	LC26 at 0.00%	0.44	OK	Eq. H1-1a
		15	LC25 at 100.00%	0.18	OK	Eq. H1-1b
		16	LC30 at 100.00%	0.17	OK	Eq. H1-1b

Current Date: 7/21/2020 1:00 PM
Units system: English
File name: W:\STRUCTURAL DEPARTMENT\ANALYSIS SOFTWARE\RAM Elements\RAM Projects\AT&T\CT\CT1141\LTE 4C 5C 5G NR\CT1141.retx

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
2	6.50	0.00	0.00	0
3	-6.50	0.00	0.00	0
8	-4.40	0.00	0.00	0
9	4.40	0.00	0.00	0
10	0.00	0.00	-3.00	0
11	-3.6667	0.00	-0.50	0
12	3.6667	0.00	-0.50	0
13	0.7333	0.00	-2.50	0
14	-0.7333	0.00	-2.50	0
16	6.50	3.00	0.00	0
17	-6.50	3.00	0.00	0
22	-4.40	3.00	0.00	0
23	4.40	3.00	0.00	0
24	0.00	3.00	-3.00	0
25	-3.6667	3.00	-0.50	0
26	3.6667	3.00	-0.50	0
27	0.7333	3.00	-2.50	0
28	-0.7333	3.00	-2.50	0
33	-6.00	5.50	0.20	0
34	6.00	5.50	0.20	0
35	-6.00	-2.50	0.20	0
36	6.00	-2.50	0.20	0

42	3.00	5.50	0.20	0
43	3.00	-2.50	0.20	0
48	-1.25	5.50	0.20	0
49	-1.25	-2.50	0.20	0
51	-1.00	3.00	-6.50	0

Restraints

Node	TX	TY	TZ	RX	RY	RZ
10	1	1	1	1	1	1
24	1	1	1	1	1	1
51	1	1	1	0	0	0

Members

Member	NJ	NK	Description	Section	Material	d0 [in]	dL [in]	lg factor
3	3	2		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
4	8	10		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
5	9	10		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
8	17	16		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
9	22	24		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
10	23	24		PIPE 2x0.218XS	A53 GrB SABRE 50...	0.00	0.00	0.00
11	14	28		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
12	27	13		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
13	25	11		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
14	12	26		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
15	28	11		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
16	27	12		RndBar 3_4	A572 Gr50	0.00	0.00	0.00
26	34	36		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
27	42	43		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
28	48	49		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
29	33	35		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00
31	22	51		PIPE 2x0.154	A53 GrB	0.00	0.00	0.00

Orientation of local axes

Member	Rotation [Deg]	Axes23	NX	NY	NZ
12	315.00	0	0.00	0.00	0.00
26	315.00	0	0.00	0.00	0.00
27	315.00	0	0.00	0.00	0.00
28	315.00	0	0.00	0.00	0.00
29	315.00	0	0.00	0.00	0.00

Rigid end offsets

Member	DJX [in]	DJY [in]	DJZ [in]	DKX [in]	DKY [in]	DKZ [in]
31	0.00	2.00	0.00	0.00	2.00	0.00

Hinges

	Node-J				Node-K						
Member	**M33**	**M22**	**V3**	**V2**	**M33**	**M22**	**V3**	**V2**	**TOR**	**AXL**	**Axial rigidity**
15	0	0	0	0	0	0	0	0	0	0	Tension only
16	0	0	0	0	0	0	0	0	0	0	Tension only

TOWN OF CROMWELL

Parcel ID: **00109100** ***Location:*** 179 SHUNPIKE ROAD ***Map-Lot*** 24-17B ***Last Revaluation -*** ***October 1, 2017***

Current Owner	***Percent***
CROMWELL FIRE DISTRICT	100

1 WEST ST, CROMWELL, CT 06416-0000

Previous Owner

Current Value Information

Mkt Adj Cost

Use Code	Land Value	PA 490 Value	Building Value	Outbuildings	Total Value	Total Assessed	
920	120,300		0	0	0	120,300	84,210
TOTAL	**120,300**		**0**	**0**	**0**	**120,300**	**84,210**

Patriot
Properties Inc.

Previous Value Information

TaxYr	Land Value	Bldg Value	Outbuildings	Total Value	Total Assessment	
2017	120,300	0		0	120,300	84,210
2016	118,140	0		0	118,140	82,700
2015	118,140	0		0	118,140	82,700
2014	118,140	0		0	118,140	82,700
2013	118,140	0		0	118,140	82,700
2012	118,140	0		0	118,140	82,700

Property Factors

Census	5701
Flood:	
Topo:	
Street:	Paved
Dev. Map	
Dev. Map	

Zoning Data

Desc.	%
R-25	100.00

Utilities

6	Septic
9	Well-Pot Wat

BAA

BAA

General Notes

Communication Tower Fire Dept

Sales Information

Grantee	Vol-Page	Type	SaleDate	SalePrice	Sale Verif	GeneralNotes
CROMWELL FIRE DISTRICT	86-469		09/21/1970	0		

Activity Information

Date	Results	Visited By
09/07/2017	Change - Value Change Company	John Valente
05/19/2017	No Change - Field Review	Dave Stannard
11/13/2014	Permit- Miscellaneous	AO
01/31/2013	Permit- Miscellaneous	AO
01/07/2013	Permit- Miscellaneous	AO
09/11/2012	Permit - Measure Exterior	
09/11/2012	Permit- Miscellaneous	AO
10/22/2010	Permit- Miscellaneous	AO
04/12/2010	Permit- Miscellaneous	AO
04/06/2009	Permit- Miscellaneous	AO

Building Permit Information

Date	Permit #	Description	Amount	% Comp	Visit Date	CO Date	GeneralNotes
11/13/2014	23012	Other	15,000	100	11/13/2014	08/11/2015	Modifications to existing
01/31/2013	21434	Other	5,000	100	01/31/2013		Rplc & insll 2 Telecom ca
01/07/2013	21382	Other	15,000	100	01/07/2013	02/21/2013	Swap 12 of 12 existing an
07/31/2012	20958	Other	25,000	100	09/11/2012		Add 3 new antennas to exs
10/22/2010	19434	Electric	8,000	100	10/22/2010		Feed for cell towers
04/12/2010	18982	Electric	0	100	04/12/2010		Disconnect & re-connect c
04/13/2009	18277	Electric	15,000	100	04/06/2009		rep 6 antennas & modifyin
11/17/2008	18085	Electric	15,000	100	11/06/2008		Electric work at cell sit

Land Data

Use	Description	Units	Unit Type	Neigh	Land Adjustments	Special Land Calc	Appraised Value	PA 490 Asmt	Neigh Order	Notes
920	Mun Land Com	43,560	SF	ED			85,000	0	2700	
920	Mun Land Com	3.000	AC	ED			35,300	0	2700	

Total Area: 4.00 **PA 490 Use Asmt: 0** **Total Appraised: 120,300** **Assessed Value: 84,210**

ParcelID: 00109100 **Location:** 179 SHUNPIKE ROAD **Printed By:** Shawna 01/10/2018 1:23:37PM

Bldg Seq 1 **Of** 1

Exterior Information

Building Type:
Story Ht:
Living Units: 0
Foundation:
Prim. Ext. Wall:
Sec. Ext. Wall:
Roof Type:
Roof Cover:
Avg. Wall Ht:
Color:

Condo Information

Name:
Style:
Location:
Tot Units:

General Information

Year Blt:
Grade:
Remodeled Yr:
Rem. Kitchen Yr:
Rem. Bath Yr:

Interior Information

Prime Wall:
Sec. Wall:
Floor Type:
Sec. Floor:
Heat Fuel:
Heat Type:
Sec. Ht Type:
% A/C: 0
% Sprinkled: 0
Bsmt. Gar: 0
Kitchens: 0 **Add. Kit:** 0
Fireplaces: 0 **Gas:** 0
Int. Condition: Typical

Depreciation %

Phys Cond	Average	0.00
Func		
Econ		
Spec		
OV		
Total %Dep:		**0.00**

Calculation

Basic $/SQ	0.00
Replacement Cost	0
Depreciation	0
Depreciated Value	0
Final Total (Rounded)	**0**

Room Count

Total Rooms:
Bedrooms:

Bath Features

Full Baths: 0
Addl. Full Baths: 0
Half Baths: 0
Addl. Half Baths: 0
Full Bths Below: 0
Half Bths Below: 0
Other Fixtures: 0
Total Baths: 0 0

Extra Features / Yard Items (1st 10 Lines Displayed)

Code	Description	Qty	Size	Cond.	Year	Unit Price	Dep%	UndepValue	Appraised Value	Assessment

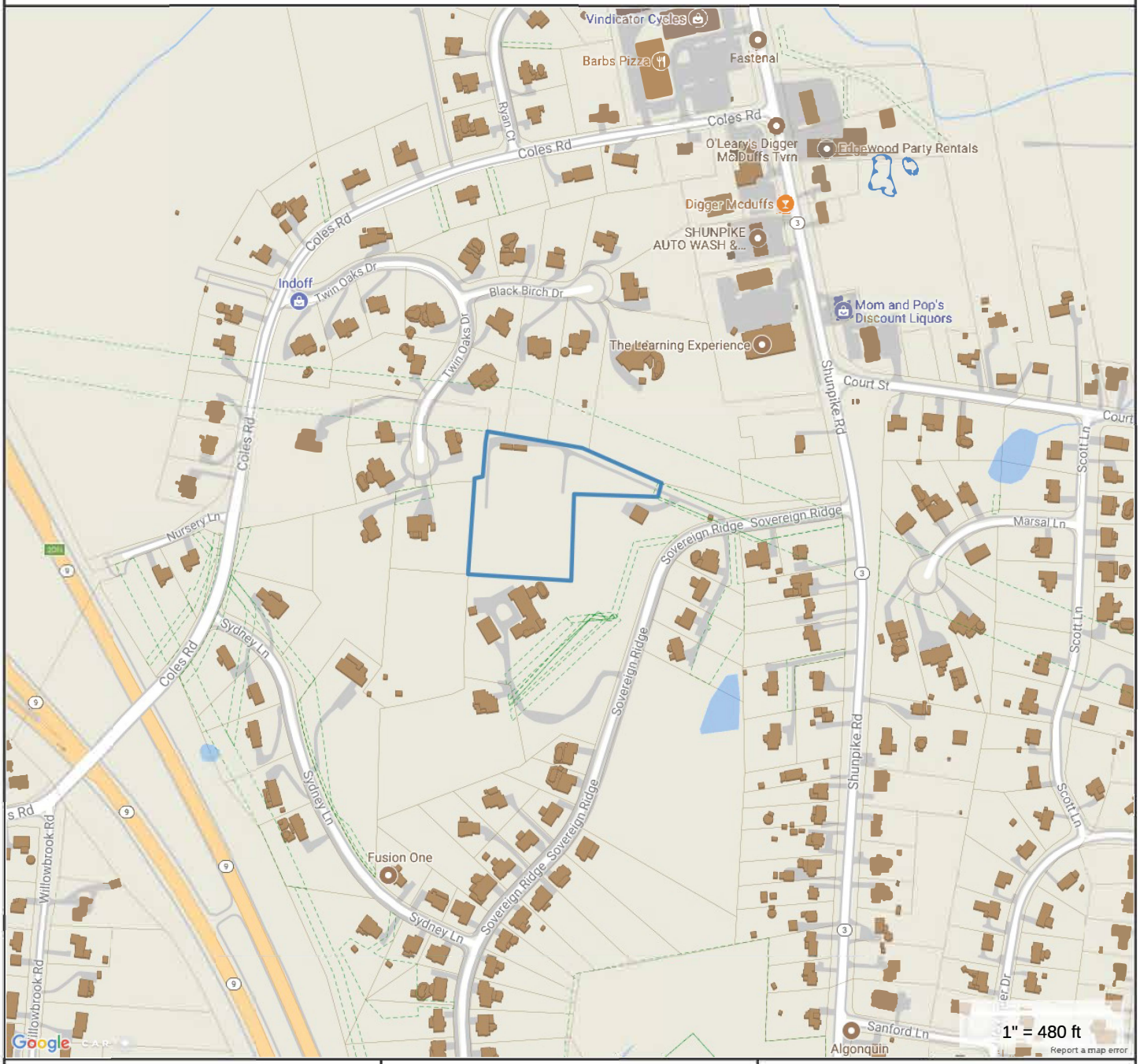
Total Sp. Features: **Total Yard Items:** **Total Appraised:** **Total Assessed Value:**

Sub Area Detail

Code	Desc.	Living	Gross Area
Total			

Town of Cromwell, CT

179 SHUNPIKE ROAD, CROMWELL



Property Information

Property ID	00109100
Location	179 SHUNPIKE ROAD
Owner	CROMWELL FIRE DISTRICT

MAP FOR REFERENCE ONLY
NOT A LEGAL DOCUMENT

Town of Cromwell, CT makes no claims and no warranties, expressed or implied, concerning the validity or accuracy of the GIS data presented on this map.

STATE OF CONNECTICUT

CONNECTICUT SITING COUNCIL

Ten Franklin Square
New Britain, Connecticut 06051
Phone: (860) 827-2935
Fax: (860) 827-2950

January 26, 2001

Peter W. van Wilgen
Springwich Cellular Limited Partnership
500 Enterprise Drive
Rocky Hill, CT 06067-3900

RE: **TS-SCLP-033-010104** - Springwich Cellular Limited Partnership request for an order to approve tower sharing at an existing telecommunications facility located at 179 Shunpike Road, Cromwell, Connecticut.

Dear Mr. van Wilgen:

At a public meeting held January 25, 2001, the Connecticut Siting Council (Council) ruled that the shared use of this existing tower site is technically, legally, environmentally, and economically feasible and meets public safety concerns, and therefore, in compliance with General Statutes § 16-50aa, the Council has ordered the shared use of this facility to avoid the unnecessary proliferation of tower structures. This facility has also been carefully modeled to ensure that radio frequency emissions are conservatively below State and federal standards applicable to the frequencies now used on this tower.

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

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

The proposed shared use is to be implemented as specified in your letter dated January 4, 2001.

Thank you for your attention and cooperation.

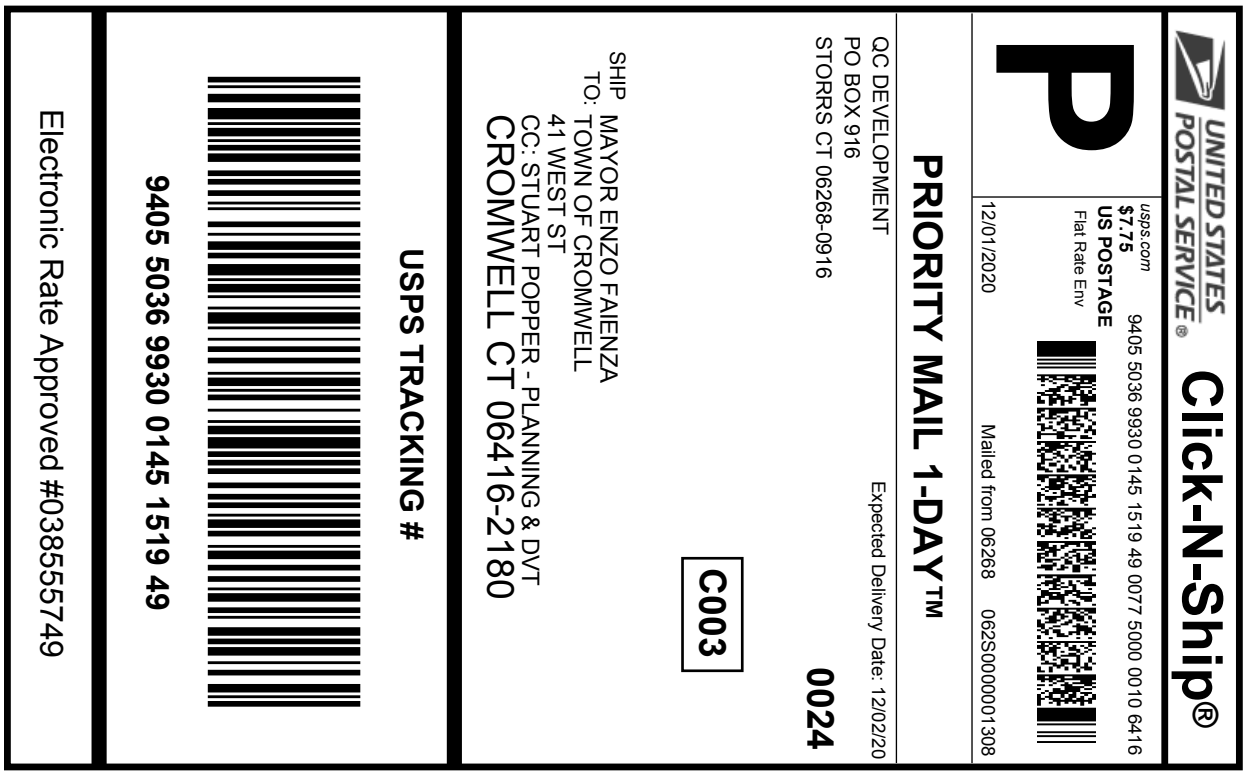
Very truly yours,

Mortimer A. Gelston
Chairman

MAG/RKE/laf

c: Honorable Stanley A. Terry, Jr., First Selectman, Town of Cromwell
Planning and Zoning Department
Frank Salerno, Director of Finance, Cromwell Fire District
Christopher B. Fisher, Esq., Cuddy & Feder & Worby LLP
Michael Fulton, VoiceStream Wireless Corporation

I:\siting\cm\springwich\cromwell\dc012501.doc



Cut on dotted line.

Instructions

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2. **Place your label so it does not wrap around the edge of the package.**
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5. **Mail your package on the "Ship Date" you selected when creating this label.**

Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0145 1519 49

Trans. #:	515283497
Print Date:	11/30/2020
Ship Date:	12/01/2020
Expected Delivery Date:	12/02/2020

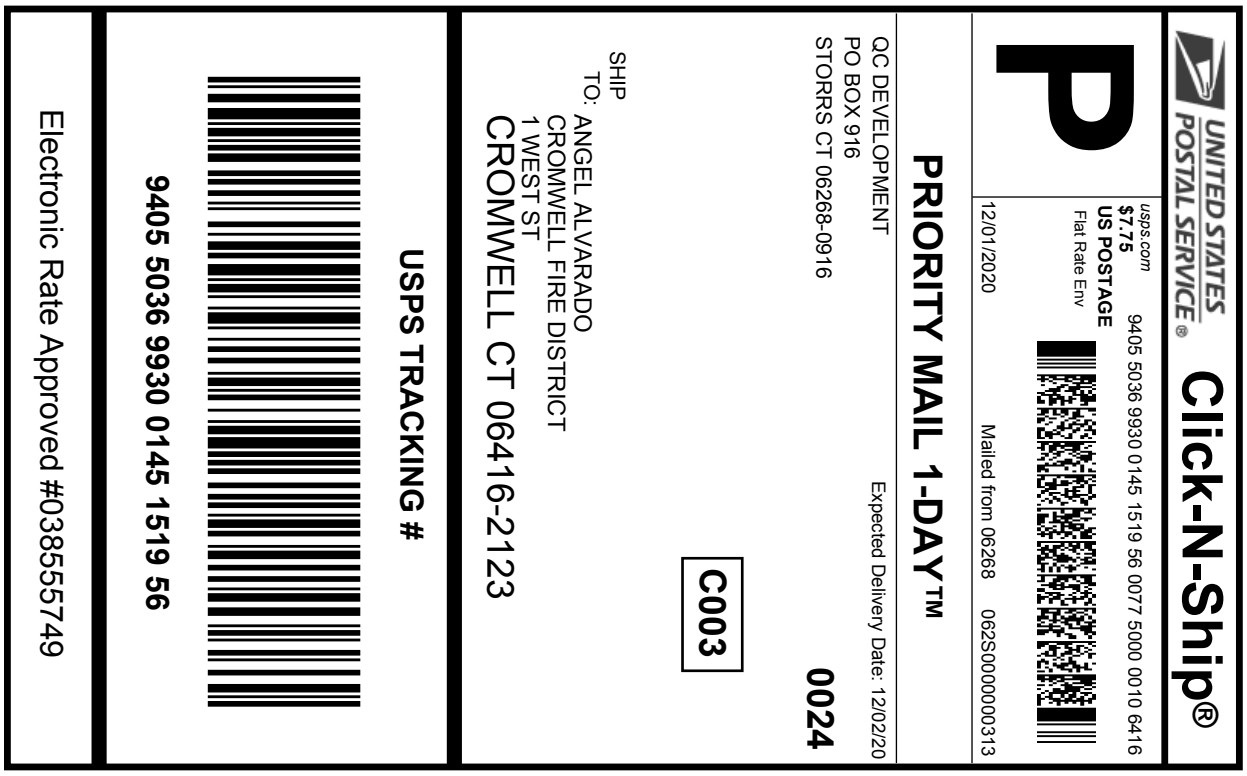
Priority Mail® Postage:	**$7.75**
Total:	**$7.75**

From: QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: MAYOR ENZO FAIENZA
TOWN OF CROMWELL
41 WEST ST
CC: STUART POPPER - PLANNING & DVT
CROMWELL CT 06416-2180

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

Thank you for shipping with the United States Postal Service!
Check the status of your shipment on the USPS Tracking® page at usps.com



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Click-N-Ship® Label Record

USPS TRACKING # :
9405 5036 9930 0145 1519 56

Trans. #:	515283497
Print Date:	11/30/2020
Ship Date:	12/01/2020
Expected Delivery Date:	12/02/2020

Priority Mail® Postage:	**$7.75**
Total:	**$7.75**

From: QC DEVELOPMENT
PO BOX 916
STORRS CT 06268-0916

To: ANGEL ALVARADO
CROMWELL FIRE DISTRICT
1 WEST ST
CROMWELL CT 06416-2123

* Retail Pricing Priority Mail rates apply. There is no fee for USPS Tracking® service on Priority Mail service with use of this electronic rate shipping label. Refunds for unused postage paid labels can be requested online 30 days from the print date.

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